User Guide

English

Manual Version 3.5.0
(RevA)

Table of Contents

1.0 Introduction

Thank you for purchasing BFD3!

Please take time to study this manual in order to get the most out of BFD3's deep and powerful functionality. To complete setup of BFD, continue reading Chapter 1. For an overview of how to operate BFD3, please proceed to Chapter 2. For more information on using BFD3 with other software, please refer to your software's documentation for adding and using plugins.

1.1 System Requirements & Product Support

For complete system requirements and compatibility information, visit **bfddrums.com**.

For technical support, visit **support.bfddrums.com**.

1.2 Setup

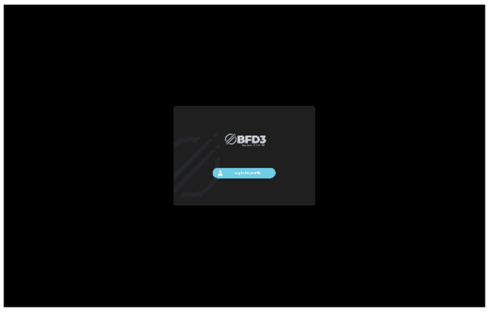
1.2.1 Installation

i. Double-click the **.exe** (Windows) or **.dmg** (macOS) installer file you downloaded for the BFD3 application. Follow the on-screen instructions to install both the software and content pack.

ii. Open BFD3.

iii. Click **Log In to profile** to sign into your inMusic Brands Profile using your Internet browser. If you do not have an inMusic Brands Profile yet, you will be prompted to create one.

iv. Once you have logged in, you can return to the BFD Player application.



To install the included Core Library content pack, and if you have purchased additional content packs, you will need to register the serial number(s) and authorize them with BFD3. Your content pack serial number will be available in your inMusic Brands Profile or in the email account associated with your purchase. To download content, use the inMusic Software Center, which you can download from **bfddrums.com/downloads.html**.

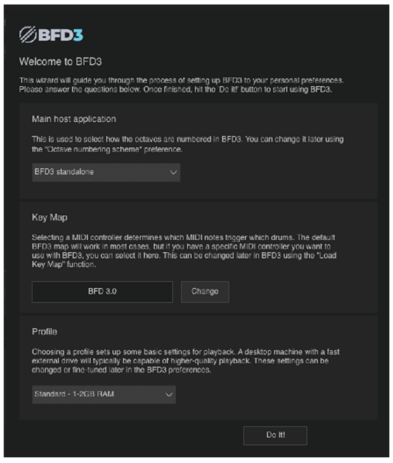
Additionally, BFD3 will clear content paths after the initial installation to ensure no older, unsupported content versions are present in the database.

See ***Setting Up Additional Content*** to learn how to register a serial number, authorize a pack, and set up your content locations.

1.2.2 Setup Wizard

The first time you run BFD3, you will be prompted to complete the Setup Wizard, which will guide you through some initial settings that affect how BFD3 is operated.

The Setup Wizard can be accessed at any time using BFD3's ***Help*** menu.



- **Main host application**

  This setting determines how MIDI note octaves are numbered in BFD3. If you are using BFD3 within a host application, such as a DAW, select the appropriate one from the list. If you are using BFD3 as a standalone application, select BFD3 standalone. You can change this setting at any time using the **Octave numbering scheme** option in the ***MIDI Preferences*** menu.

- **Key Map**

  This setting determines the MIDI layout of how drums are triggered. The default BFD3 map will work in most cases, but if you have a specific MIDI controller or drum module you want to use with BFD3, you can select it here. You can change this setting at any time using the **Load Key Map** function of the File menu.

- **Profile**

  This setting determines the quality of BFD3's playback. A desktop machine with a fast external drive will typically be capable of higher-quality playback. These settings can be changed or fine-tuned later in the BFD3 ***Preferences*** menu.

1.2.3 Audio/MIDI Setup

Next, you should set up your audio and MIDI devices.

Note: If you are using BFD3 as a plugin in a host program, you will need to set up your audio and MIDI devices using the *Preferences* or *Device Setup* menu in your DAW of choice.

i. Click the **menu icon** in the upper-left corner of the window and select the **Tools** menu.

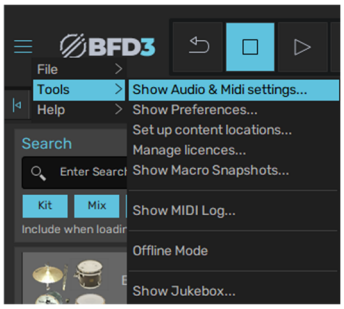
ii. Click **Show Audio & Midi settings**.

iii. Under **Audio**, use the **Output** menu to select your audio output device. Click the **Refresh** button if you need to refresh the list of connected devices.

iv. Once you have set an audio output device, you can adjust its **Sample Rate** and **Buffer Size** as needed using the respective menus.

v. Under **MIDI**, use the **Input Device** menu to select your MIDI input device. Click the **Refresh** button if you need to refresh the list of connected devices.

vi. Once you have set up your devices, click anywhere outside the Preferences menu to return to the main window.



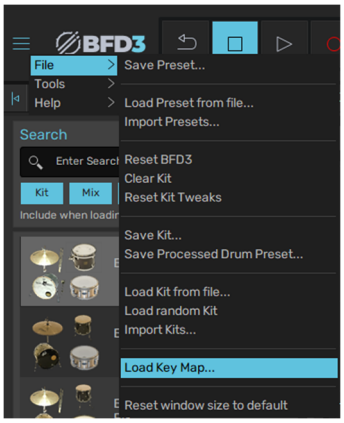
If you have not already done so using the Setup Wizard described above, you will need to select a keymap for your kit module or other MIDI input device to complete MIDI setup. You can do this using the Load Key Map function.

i. Click the **menu icon** in the upper-left corner of the window and select the **File** menu.

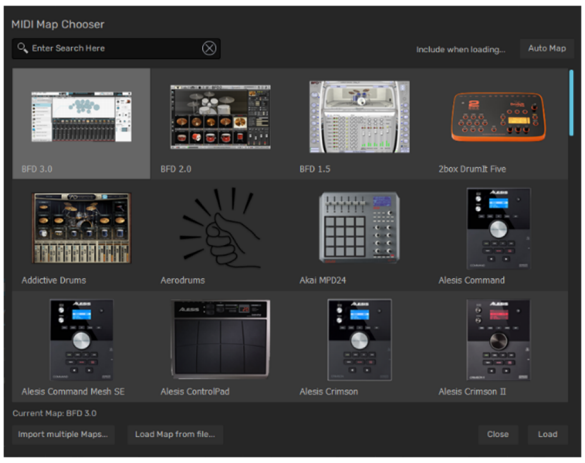
ii. Click **Load Key Map**.

iii. Use the MIDI Map Chooser to select your desired key map. The default BFD3 key map is described in ***Appendix > Key Map Reference***.

You can learn more about setting up your own key maps later in the ***MIDI Key Maps*** section.



You are now set up to use BFD3! See the following ***Operation*** section for an overview of the controls and to learn about setting up additional BFD3 content.



1.2.4 Setting Up Additional Content

If you're using BFD3 with only the BFD3 Core Library, the location where audio data was installed is already specified within BFD3 when it is launched.

If you have purchased additional libraries or expansion packs, your content can be downloaded using the inMusic Software Center, which you can download from **bfddrums.com/downloads.html**. To use additional libraries or expansion packs once they have been downloaded, they must first be added to the BFD3 Content Locations panel and scanned.

To display the Content Locations panel, use the **Set up content locations** function in BFD3's **Tools menu**.

Setting up additional content locations

Before any additional content can be specified within BFD3, one or more content locations must be selected on your drive(s).

Click **Add** to browse your computer or connected drives for BFD3 content packs. Use the file browser to locate each content pack folder path individually, or select the parent folder, which will also scan all subfolders. Click **OK** to select the path and add the content to BFD3.

Click **Rescan All** to rescan the contents of all currently detected content locations for new BFD3 content packs. The drive(s) or folder is searched for compatible data. This process can take a while so please be patient.

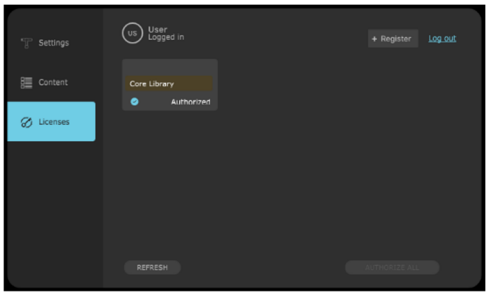
The software will automatically attempt to patch any previously existing BFD content for BFD3. If the auto-patching fails, you will be prompted to install a new version of the content, and the remainder of the scan will be aborted.

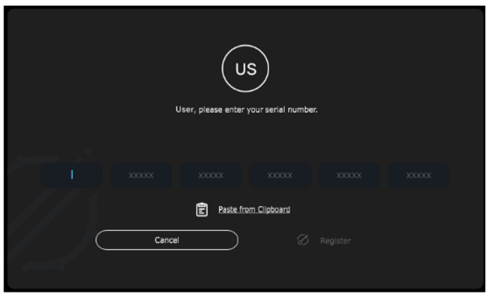
Click **Activate** to activate the selected content path for new content. To avoid using any detected content location, simply deactivate its **Activate** box.

Click **Remove All** to remove all content packs that have been added to BFD3.

Authorizing additional expansion packs

Once you have located your content packs, you will need to authorize your purchase for use with your machine. This can be done using the **Licenses** menu, which can be accessed by clicking the **Licenses** option on the left-side of the Settings / Content window, or by selecting **Manage Licenses** from the **Tools** menu.





Click **Register** to register a serial number.

In the window that appears, enter the serial number for your content pack. You can also copy and paste it into the field by using the **Paste From Clipboard** button or pressing **Ctrl+V** (Windows) or **Cmd (⌘)+V** (macOS). Your content pack serial number will be available in your inMusic Brands Profile or in the email account associated with your purchase.

If the serial number is valid, click **Register** to continue.

If there is an issue with your serial number, a message will appear to notify you the serial number is invalid.

If the serial number is in use, a message will appear to notify you that it has already been registered. Pack serial numbers can be registered to one inMusic Profile only. Each registered serial number can authorize a content pack on up to three machines.

Click **Refresh** to update the list of licenses for registered content packs.

Content packs that have already been authorized with show "**Authorized**" under the content pack name.

Unauthorized content packs will appear as "**Not Authorized**" in this window and in the Browser.

Select an unauthorized content pack and then click "**AUTHORIZE**" to add it to your machine. You can also click "**AUTHORIZE ALL**" to authorize multiple content packs at the same time.

If an authorization attempt fails, a window will appear to notify you. Click **Close** to continue to BFD Player, although the content pack will remain unusable until authorized. Click **Retry Authorization** to try again, or click **Contact Support** for technical support.

If you need to remove an authorization from one machine to add it to another, select the content pack(s) and then click "**DEAUTHORIZE**."

Click **Log out** to log out of your inMusic Profile. When logged out, you will not be able to access your authorized content packs.

Potential issues with content locations/data paths

If you are having problems with content not appearing within BFD3, please ensure the following:

Content location folder structure

- Kits, Presets, and Grooves are located next to the **/Audio** sub-folder.
- If you are continuing to use BFD2 on your system to load older sessions, the new folder should also be added to your BFD2 data paths after which the BFD2 database must be rescanned.
- Users of the BFD Big Orchestral Marching Band expansion pack should be aware that its original installer offered a choice of installing to a BFD1 or BFD2 data path.
- If in any doubt regarding the above, please contact our support team who will be happy to assist you.

Check for all installed elements

- **Drums**

  Expansion pack content often contains multiple types of files which can be loaded, such as Presets, Kits, Kit-pieces (Drums), or Grooves. Not all expansion packs feature Kits and/or Presets, so to conclusively verify whether the expansion pack has been installed and authorized, please make sure that its contained Drums exist in the Drums Browser. Use the Library Quick-filter menu to filter the Browser to only show the contents of the expansion pack.

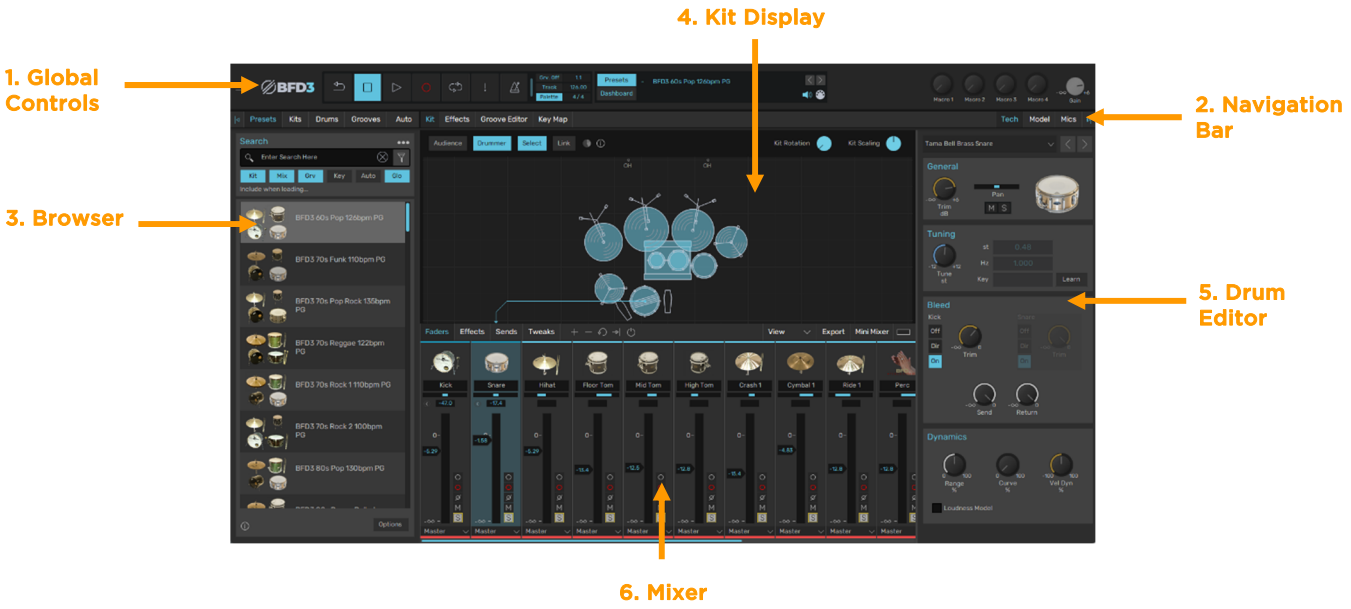
- **Presets and Kits**

  All expansion packs which were released prior to BFD3 will feature only BFD2 and/or BFD1 Presets or Kits. If any such files exist in an activated content location, they are shown in BFD3's Presets and Kits Browsers.

2.0 Operation

2.1 Using BFD 3.5

2.1.1 BFD3 layout



1. **Global controls and navigation bar**

   The upper part of the BFD3 interface features the *Global controls* that relate to working with and managing BFD3.

2. **Navigation bar**

   The navigation bar features buttons to access various parts of BFD3, described below.

3. **Browser**

   The *Browser* panel is used to load sounds and Grooves into BFD3. Using the tab buttons in the navigation bar at the top of this panel, it can be switched to browse for **Presets** (entire BFD3 states), **Kits** (configurations of Drums in slots), **Drums** (individual percussive instruments to load into the current kit), or **Grooves** (patterns or sequences that play BFD3's sounds).

   This panel is also switchable to the Automation panel using the **Auto** button.

   The Browser panel can be hidden by clicking the currently active tab button. Click any of the buttons to make it visible again.

   To get started with BFD3, double-click any item in the **Presets** browser to load an entire mix-ready preset.

4. **Kit display**

   The *Kit display* shows the physical layout of the kit, which is comprised of a number of Drum slots.

   The currently selected Drum slot is highlighted. Click any slot to select it and audition the Drum.

   The Kit display is also used for the **Link** function which allows you to layer Drums together so that they are played at the same time.

5. **Drum Editor**

   The *Drum Editor* contains a wide array of parameters for tweaking the sound and response of the currently selected Drum, and contains two pages accessed by the **Tech** and **Model** buttons in the navigation bar.

   Clicking the currently active button hides the Drum Editor panel entirely. Click either button again to display it if it is currently hidden.

6. **Mixer**

   The *Mixer* area represents a comprehensive mixing engine for the audio channels within BFD3's sounds.

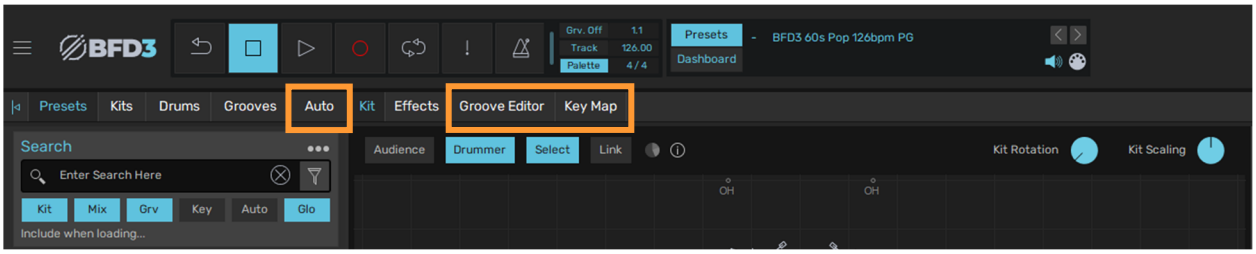
   A Drum (or Drum slot if it is empty) can be selected by clicking its mixer channel.

7. **Effects Editor**

   The *Effects Editor* is shown by clicking the **Effects** button in the main BFD3 navigation bar. It displays the currently selected mixer channel's effect slots and Send controls.

Additional pages and panels

The following pages and panels are accessed using buttons in the navigation bar:



1. Groove Editor

The Groove Editor is displayed by clicking the **Groove Editor** button. This page represents the entire ***Groove Engine***—it shows the Groove Palette, Groove Editor and Groove FX sections.

2. Key Map panel

Click the **Key Map** button to display the ***Key Map*** page, used for creating and editing custom Key Map setups for assigning MIDI notes to Drum articulations.

This page is also useful for checking the layout of the current Key Map.

3. Automation panel

Click the **Auto** button above the Browser to display the ***Automation panel*** in place of the Browser. This panel provides control over assigning MIDI CC, note, and host automation parameters to BFD3 controls for remote control purposes.

Click any other Browser tab button to exit the Automation panel.

How to approach the BFD3 interface

The philosophy of BFD3 is to recreate all aspects of studio drum recording and production within your computer.

- The **Kit display** and **Drum Editor** can be considered as the *drum kit* in a studio.
- The **Mixer** and **Effects Editor** represent the *control room* with a mixing console and outboard processing.
- The **Groove engine** and **Key Map panel** are related to the two ways that BFD3's sounds can be played, in effect representing the *drummer*.

Working with BFD3

The basic workflow in BFD3 can be considered in the following steps:

1. Load a BFD3 Preset, a kit or assemble a kit from individual Drums using the Browser.

2. Use the Drum Editor to modify the underlying drum sounds.

3. Use the Mixer to either process the sounds internally or to route microphone audio channels (either completely discretely or after some submixing if you require) into individual channels in your host/DAW for further processing or recording.

4. Play the Drum sounds with MIDI notes or with the Groove engine.

5. The resulting audio can be recorded by BFD3's audio export functions or, if you've routed channels discretely into your host, you can use its own recording functions.

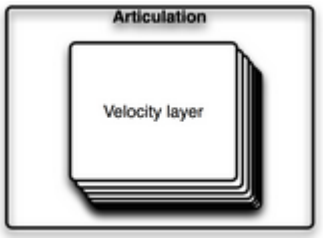
Please consult the opening sections of ***Browsing for Sounds*** and ***Using BFD3.5's Sounds*** for a more detailed guide to the main aspects of this workflow. See ***Using the Groove Engine*** for a full guide to operation of the Groove engine.

2.1.2 Important concepts in BFD3

Drums, articulations, and velocity layers

An **articulation** is a type of way of hitting a drum, cymbal, hihat, or other percussive instrument. The following are examples of articulations:

- striking the main surface, bell, or edge of a cymbal
- striking the main head of a snare, or playing a rim-shot or sidestick



Within BFD3, an articulation is the smallest addressable entity. It is itself composed of a series of individual samples, called **velocity layers**, because they represent a dynamic graduation from quiet to loud, designed to be addressable by the MIDI note velocity range of 0 (silent) to 127 (loudest possible sound).

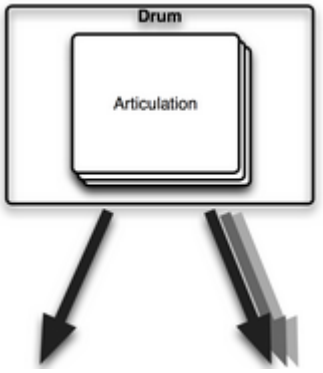
Each velocity layer sample is actually composed of multiple *direct and ambient mic channels*: audio channels captured by multiple microphones. See below for more details on mic channels.

Articulations can be triggered in 2 ways:

- MIDI notes assigned to articulations with the Key Map
- Groove engine events

Articulations can also be triggered by audition previews in various parts of BFD3. The Drum Editor lets you preview all articulations in a Drum, for example.

BFD3's Drums contain a variety of articulations. See the section below for a list of available articulations.



Direct mic channels

Ambient mic channels: OH, Room, Amb3, etc.

A **Drum** is composed of 1 or more articulations, and is the name given to any instrument within the kit in BFD3, whether it is a kick, snare, tom, cymbal, hihat, or percussion instrument.

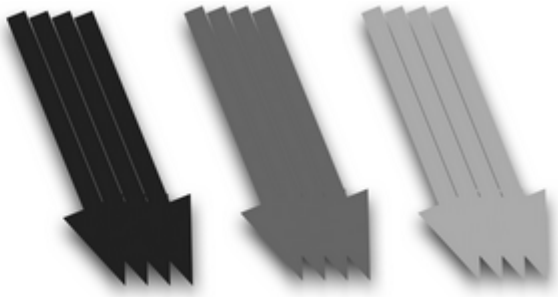
Snares contain between five and seven articulations, and hihats contain up to 11 while other instruments such as toms may feature only one.

Mic channels

When Drum articulations are triggered by incoming MIDI or Groove engine events, the audio generated is fed to BFD3's mixer in the form of Direct mic channels and Ambient mic channels. Direct mic channels contain audio signals recorded by microphones close to the Drum, while Ambient mic channels contain audio signals recorded by stereo mic pairs over the kit (Overhead, or OH) and at various positions in the recording room (Room, Amb3). BFD3's library also contains further mono room and hardware-compressed direct mic channels for increased mixing flexibility.

Direct mic channels from each Drum are represented by an individual Drum channel on the BFD3 mixer.

Kicks and Snares feature multiple sub-mics which are mixed into single Kick and Snare "mix" channels. These channels, along with Tom channels, can also contain bleed and spill signals from other Drums, depending on their Bleed settings.



Ambient mic channels of each type—OH, Room, Amb3, etc.—from all Drums are mixed together into the OH, Room, Amb3, etc. channels in the BFD3 mixer.

These Ambient mic channels are mixed into the **Ambient Mix** channel.

For further details on mic channels, bleed and spill signals and other aspects of mixing within BFD3, see *Using BFD3.5's Sounds*.

Articulations in BFD3's Drums

Note: The following list represents all possible articulations for each Drum. Not all included Drums include all possible articulations. Articulations also vary between different BFD-compatible libraries and expansion packs. BFD3 can support all articulations—any Key Map assignments use an intelligent substitution system if a required articulation is not present in the currently loaded Drum.

Kicks

- Hit [Default]
- NoSnare

Snares

- Drag
- Flam
- HalfEdge
- Hit [Default]
- Rim Shot)
- SS (SideStick)
- Rim Click

Hihats

- Closed Shank
- Closed Tip [Default]
- Half Shank
- Half Tip
- Open Shank
- Open Tip
- Quarter Shank
- Quarter Tip
- Splash
- ThreeQ Shank
- ThreeQ Tip
- Bell Tip
- Splash

Toms

- Hit [Default]
- Rim
- Rim Click

Cymbals

- Edge
- Bow [Default]
- Bell

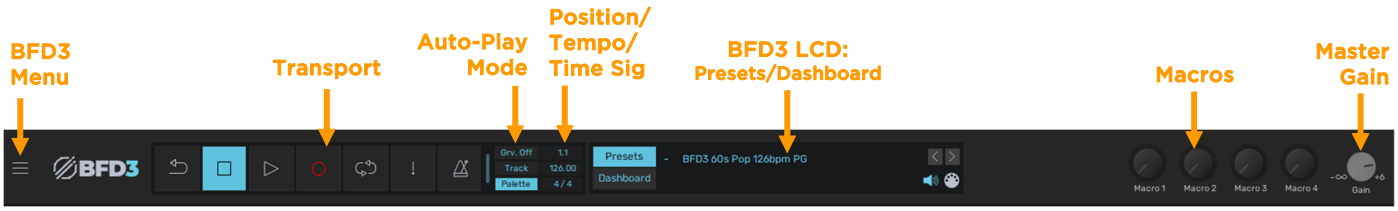
Percussion

- Hit
- Alt

Note: Some Percussion Drums are classified as Snares, due to possessing more than two articulations. For example, the included Carroll Sound Tambourine which features five articulations. Drums such as these can be loaded in the same way as any other Percussion Drum into a Percussion slot. However, the additional articulations are not available via MIDI notes until they are assigned in the Key Map panel. They are, however, always accessible in the Groove engine.

Alternatively, these drums can be loaded into the Snare slot if you prefer, in which case the articulations are already mapped to MIDI notes. An additional Snare slot can also be used, although all its articulations would need to be mapped using the Key Map panel.

2.1.3 Global Controls



Transport, Position, Tempo & Time Signature controls

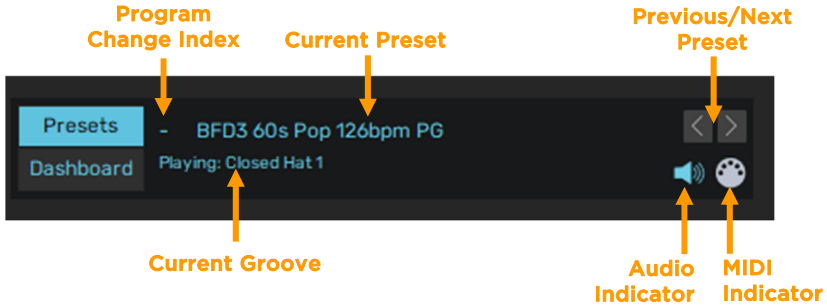
These controls are used in conjunction with the Groove Engine. See ***Using the Groove Engine*** for more information.

Grooves Auto-play mode

The **Auto-play mode** allows you to define how the BFD3 Transport affects Groove playback.

- **Auto-play Off**
  In the *Off* mode, Groove playback is not started automatically when the transport is started.
  Instead, Grooves must be assigned to MIDI notes and played via MIDI. This mode should be used if you intend to trigger BFD3's sounds with external MIDI notes rather than with its internal Groove engine.
- **Auto-play Palette or Track**
  When set to *Palette* or *Track*, Groove playback is started in the Palette or Drum Track.
  See the ***Palette*** section for more details on the **Auto-play mode** setting.

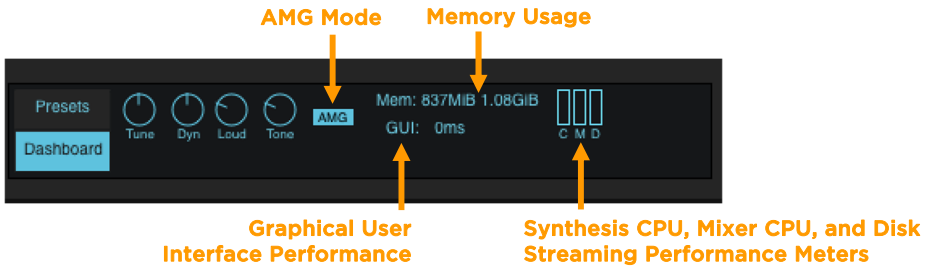
BFD3 LCD: Presets view



- **Current Preset**
  This indicator displays the name of the last loaded BFD3 Preset.
- **Program Change Index**
  If a Program Change playlist is currently active, this part of the LCD displays the index number of the current program in the playlist.
- **Previous/Next Preset**
  These buttons browse through the available Presets sequentially.
- **Current Groove**
  If the Groove engine is currently active, the currently playing Groove is shown here.
- **Audio Stream indicator**
  The **Audio Stream indicator** is lit when the BFD3 plugin has successfully launched and been integrated into the host audio engine or when the BFD3 standalone app has successfully established communication with the specified audio device.
- **MIDI Message indicator**
  The **MIDI Message indicator** is momentarily lit whenever BFD3 receives any MIDI input.

Display Dashboard

Click the **Dashboard** button in the display to show the Dashboard controls if they are not currently visible.



- **Tune (Master Tune)**

  The **Tune** control adjusts the overall tuning (pitch) of all Drums in the kit relative to their individual **Tuning** settings.

- **Dyn (Master Dynamics)**

  The **Dyn** control shifts the velocity range of incoming events (from MIDI notes or from the Groove engine) across the entire kit, in effect making the "drummer" play the kit with more or less intensity.

- **Loud (Loudness Randomization)**

  The **Loud** control sets the overall amount of loudness randomization across all Drums while the **AMG** button is activated. The degree of randomization imposed upon each Drum in the kit depends upon its individual **AMG Var.** setting, found within the Articulations section of the Drum Editor's Model page. In fact, this setting can be made for each articulation within each Drum.

  Since this control scales, or multiplies, the individual **AMG Var.** settings (in the *Drum Editor*) for each Drum articulation, if it is set to zero then no loudness randomization will occur for any Drum articulations.

- **Tone (Tone Randomization)**

  The **Tone** control sets the amount of velocity layer randomization across all Drums while the **AMG** button is activated. The name of this control relates to the fact that velocity layer randomization predominantly imparts timbral or tonal variation due to multiple velocity layer samples being used. As well as sounding different due to subtle differences in drum resonances on each strike, different samples also feature subtle differences in loudness, so a degree of subtle variation in amplitude is to be expected.

  The **Tone** control operates in conjunction with each Drum articulation's **AMG Var.** setting in the same way as the **Loud** control described above.

- **AMG (Anti-MachineGun mode)**

  The **AMG mode** button activates or deactivates the AMG (Anti-MachineGun) functions in BFD3.

  If it is deactivated, there is no additional humanization applied; each incoming event velocity always triggers the corresponding velocity layer directly.

- **Memory Usage**

  This indicator features two parts:

  - The first part displays how much RAM is being used by BFD3. This includes the cached start portion of each sound, plus a small overhead for BFD3's engine.
  - The second part displays the entire size for the current kit, including the start portions of sounds held in RAM and the remaining data on disk.

- **CPU and Disk Performance Meters**

  The three horizontal meters in the status bar measure several aspects of BFD3's system resource usage.

- **Synthesis Engine CPU Usage**

  The synthesis engine is involved in receiving MIDI input or generating Groove engine events and playing back the relevant articulations.

- **Mixer Engine CPU Usage**

  The mixer engine processes all routing, mixing, and FX functions in BFD3.

- **Hard Disk Load**

  This meter indicates the intensity of hard disk resource usage. Do not be alarmed if this meter reaches high values, as your machine may well be able to handle a large amount of disk usage. It is intended as an indicator of the amount of hard disk activity that is occurring.

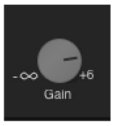
  If your machine cannot handle the amount of disk usage required, the side-effects are usually clearly audible. Tails may be cut or intermittent, and audio dropouts or other artifacts may occur.

Macros

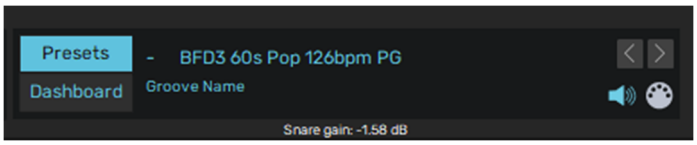
If a preset has Macros, the four dials will have a descriptive label. Turn the dials to hear the effect, which could be anything from the mixer, tech, and model panels (or a combination of any/all). More information can be found on the *Macro Snapshots* page.

Master Gain

The **Master Gain** control can be considered as an overall volume level for the entire BFD3 audio engine. It adjusts the level of all kit-piece mic channels relative to any individual settings.



Context info display



The context info, located underneath the Display, shows the parameter name and value for the control currently under the mouse cursor.

While a control is being adjusted, the context info display remains locked to the parameter until the mouse button is released, showing the control's value as it changes.

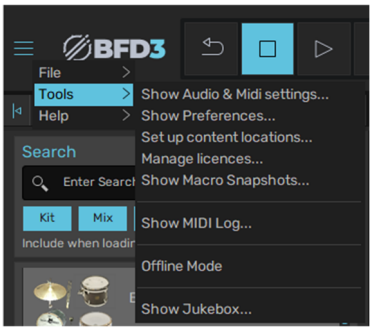
BFD3 main menus

The BFD3 menus at the upper-left of the interface provide additional functions.

File menu

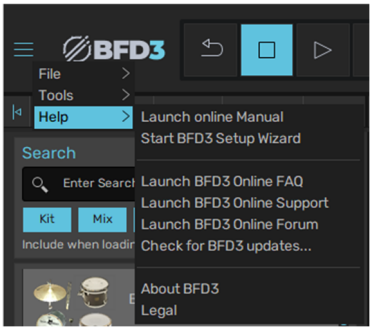
The contents of this menu are covered in the ***Browser*** chapter. It mainly provides additional loading/import and functions to those in the Browser as well as functions to save various elements in the current BFD3 session.

Tools menu



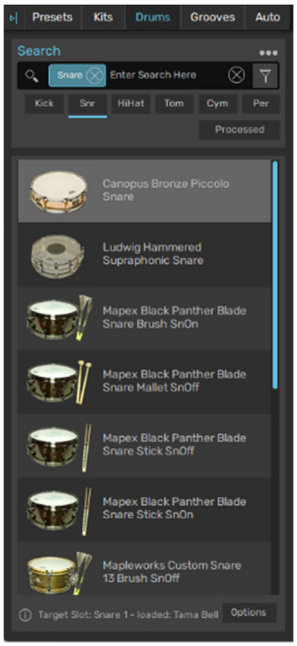
- **Show Audio & MIDI Settings**
  Click here to open the ***Audio & MIDI Setup*** preferences.
- **Show Preferences**
  Click here to open the ***Preferences*** panel.
- **Set up content locations**
  This function displays the ***Content Locations*** panel.
- **Manage licenses**
  This function opens the Licenses menu for authorizing your purchased content packs for use with your machine. See ***Setting Up Additional Content***.
- **Show Macro Snapshots**
  This function opens the ***Macro Snapshots*** panel.
- **Show MIDI Log**
  Click here to open the external MIDI Log window, showing incoming MIDI data for troubleshooting purposes.
- **Offline mode**
  This switch is intended for use with hosts that provide an offline (non-real time) bounce or mixdown facility. When the **Offline** switch is activated, BFD3 waits for all data to be properly delivered from the hard disk before allowing the host to continue, ensuring that sounds are not cut off before their full decay is complete.
  Please note that Offline mode is non-real time, and should only be used during offline mixdown or rendering in your sequencer, if it even offers this feature. Do not leave the **Offline** switch enabled during regular real-time playback.
  If your sequencer only provides real-time bouncing facilities, you should leave Offline mode turned off at all times.
- **Show Jukebox**
  Click here to open the ***Jukebox Player***, which you can use to load backing tracks to play along with.

Help menu



- **Launch online Manual**
  This function opens this User Guide.
- **Start BFD3 Setup Wizard**
  This function starts the BFD3 Setup Wizard, which adjusts a few preferences, the most important of which is the **Profile**. This sets up BFD3's engine preferences in a way that is best suited to the amount of RAM you have in your machine.
  Use the drop-down menu to specify the amount of RAM in your machine from the three available choices.
  The **Main host application** setting simply adjusts the **Octave numbering scheme** setting in the BFD3 Preferences, while the **MIDI controller** setting specifies the current Key Map. This can also be achieved using the **Load Key Map** function in the **File menu**.
- **Launch BFD3 Online FAQ/Online Support/Online Forum**
  These functions launch various online help resources.
- **Check for BFD3 updates**
  This function checks the **bfddrums.com** website for BFD3 updates.
- **About BFD3**
  This function displays the About box, containing the credits listing for BFD3. Click the About Box to return to the main BFD3 interface.
- **Legal**
  Click here to open legal information about BFD3.

2.2 Browsing for Sounds



The Browser lists only one of four types of components at any time. Click any of the following Browser mode buttons to switch the Browser view to one of these loadable elements in BFD3:

1. **Presets:** The entire state of BFD3.
2. **Kits:** A set of Drums with additional Drum Editor settings.
3. **Drums:** Individual drums, cymbals, or other instruments within a kit, such as kicks, snares, hihats, rides, crashes, toms, cowbells, and other percussion.
4. **Grooves:** Drum performance patterns.

The Browser panel is also switchable between the Browser and Automation mapping panel. Click the **Auto** button to switch to the Automation mapping panel. If the Automation mapping mode is currently shown, click any of the above Browser mode buttons to switch back to the Browser.

Click the **Show/Hide Arrow** button to hide the Browser/Automation panel if required.

Loading a preset

By default, the Browser shows the available factory presets. Presets are loaded in either of two ways:

- **Double-click**

  Double-click a Preset in the Browser listing to load it.

  Loading a preset replaces the entire state of BFD3 including grooves, key and automation mappings, and session-specific settings. Therefore, you are prompted for confirmation before the Preset is loaded.

  This confirmation prompt can be disabled by deactivating the **Confirm Preset loading** setting in the **Options** menu.

- **Drag and drop**

  Drag and drop a Preset from the Browser listing onto the main part of the BFD3 interface. Again, you are prompted for confirmation before the preset is loaded. The prompt can be disabled in the Options menu.

It is possible to avoid loading parts of presets by deactivating the various **Include when loading** buttons (see the ***Browser Reference*** section).

Try loading one of the factory presets. This also loads a set of Grooves, so press **Play** in the BFD3 transport or in your host/DAW to hear the sounds being played.

Loading a Kit

A Kit is loaded in the same ways as a Preset. In both cases, you are asked for confirmation when loading a Kit by default. This prompt can be disabled by deactivating the **Confirm Kit loading** setting in the **Options** menu.

- **Double-click**

  Double-click a Kit in the Browser listing to load it.

- **Drag and drop**

  Drag and drop a Kit from the Browser listing onto the main part of the BFD3 interface.

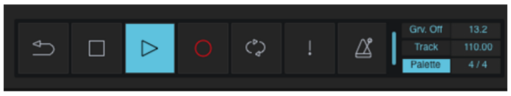
When loading a Kit, it is possible to choose whether to *Include* its stored Drum Editor **Tweaks** and whether to *Reset* the current array of Drum **Slots** and **Mixer** settings. See the ***Browser Reference*** section for more details on these controls.

Loading Drums into slots

Drums are the basic building blocks for building your own kit or for replacing parts of an existing Kit or Preset. There are several ways of loading Drums:

- **Preview-in-context**

  Let's say you've loaded a preset as described above. Try swapping out the snare as follows:



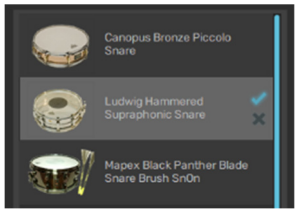
  i. Press play on the BFD3 transport (or in your host/DAW) if it is not already running.

  ii. Double-click the Snare channel in the mixer or the Snare in the kit display. The snare slot is now selected and the Browser switches to show the available snares in your library (the **Focus Browser** setting in the Drums Browser Options menu must be enabled for this to occur).

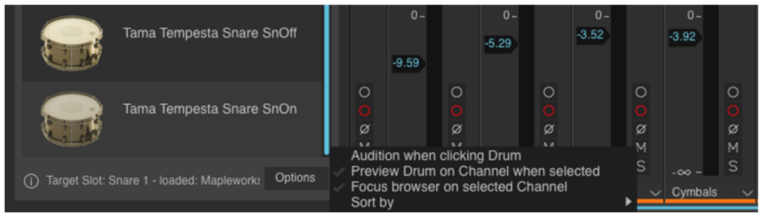
  iii. Click a snare in the listing. This previews it in place of the previous snare and will be heard whenever the snare slot is triggered by the Groove engine (or by incoming MIDI).

  iv. Try out the various snares until you find one you want to load into the kit permanently.

  Click the **Load** button flashing at the right to do this. Or click the **Cancel** button to return to the previous snare without loading anything.



  The preview-in-context function requires that the **Preview drum on channel when selected** setting is activated in the Drums Browser **Options** menu.



Drums can also be loaded in the following ways:

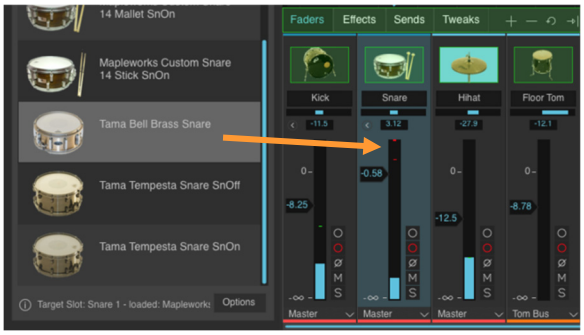
- **Double-click**

  First, select the desired destination Drum slot by clicking it in the Kit display or in the mixer.

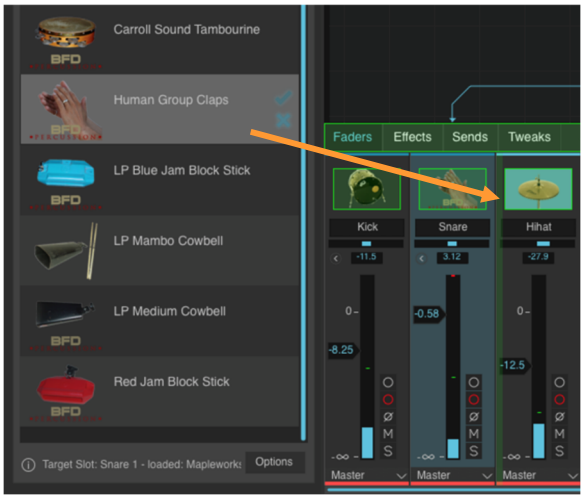
  Then, double-click a Drum in the Browser listing to load it to the currently selected Drum slot.

- **Drag and drop**

  To load to a specific Drum slot, drag and drop from the Drums Browser onto the desired Drum mixer channel.



To load to a *new* Drum slot, drag from the Drums Browser and drop *between* channels in the mixer.



Drums can also be dragged to the Kit display, into a specific slot or to an empty area to load the Drum into a new slot. In the below example, a second Kick is being added to the current Kit for a double-kick configuration.

In addition, Drums can be loaded to Drum lanes in the ***Groove Editor*** page, either via drag and drop or by double-clicking to load to the slot associated with the currently selected Drum lane.

The **Target slot indicator** always shows the currently selected destination slot when loading a Drum, along with its currently loaded Drum if it exists.

Audition methods

Drums can be auditioned in several ways before loading:

- **Preview-in-context**

  The preview-in-context system, enabled by the **Preview drum on channel when selected** setting in the Options menu, is described in the **Loading Drums into slots** section ***above***.

- **Hold down ALT during selection**

  Hold down ALT when clicking any Drum in the listing to audition its main articulation.

  The preview click area is velocity-sensitive: click towards the left side of the Drum item in the Browser for lower velocity layer previews, and towards the right for higher velocity layers.

- **Preview on select**

  If the **Audition when clicking drum** setting is enabled in the Options menu, the main articulation of the Drum is played when it is selected, *without* the ALT key having to be held down.

  Again, the preview click area for the Drum item is velocity sensitive.

- **Previewing articulations**

  The Info display panel contains functions for auditioning any articulation within the selected Drum. See the next section for details.

Processed Drums

Many Drums in the listing feature the same underlying Drum, transformed with additional damping, tuning, effects, and other settings within BFD3. The purpose of these Processed Drums is to have an array of production-ready sounds which can slot straight into a mix with little or no further adjustment. You can think of them as “Drum channel strips.”

To show Processed Drums in the Browser, activate the **Processed** button. To revert to viewing only raw Drums with no additional processing, deactivate the **Processed** button in the browser.

Loading files from BFD 1.5 and BFD2

Presets and Kits from BFD 1.5 and BFD2 are shown in the Browser if they are found within any data locations scanned by BFD3's Content Locations panel. Their settings are recreated within BFD3 as closely as possible, bearing in mind the differences within BFD3's audio engine and approach to dynamics and humanization.

If you have chosen not to add your BFD 1.5 and BFD2 file locations to BFD3, the **Load from file** and **Import** functions in BFD3's **File menu** can be used to load files into the current session or to convert files to BFD3 format manually.

Loading Grooves

See the ***Grooves Browser*** section for information on loading Grooves.

2.2.1 Browser Reference

2.2.1.1 Loading options for Presets and Kits

Include when loading...

- **Presets**

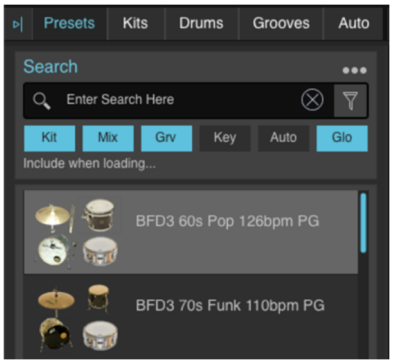
  When the Preset Browser is visible, several toggle switches are shown at the top of the Browser panel. These allow you to activate or deactivate certain elements when loading Presets.

  By default, all elements of Presets are loaded, effectively replacing the entire previous state of BFD3.

  By deactivating its switch, any of the following elements can be prevented from loading:

  - **Kit**: Drums and Drum Editor settings
  - **Mix**: Mixer
  - **Grv**: Groove Palette, Drum Track and Groove Editor settings
  - **Key**: Key Map
  - **Auto:** Automation map. MIDI CC, note and host automation assignments
  - **Glo**: Global settings, Session preferences

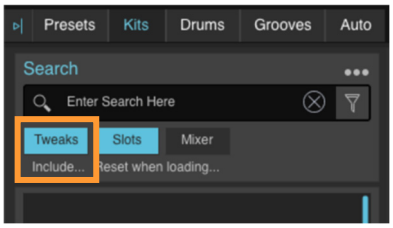
  By default, the **Key** and **Auto** buttons are deactivated, because typically it would not be desirable to keep changing these settings when trying different Presets.



- **Kits**

  In the Kit Browser, if the **Include... Tweaks** button is activated, the Drum Editor settings for each Drum in the Kit are loaded.

  If the button is deactivated, the Drum Editor settings are reset to factory defaults when a Kit is loaded.



Reset when loading... (Kits only)

These buttons toggle whether certain elements in BFD3 are reset when loading a new Kit.

- **Slots**

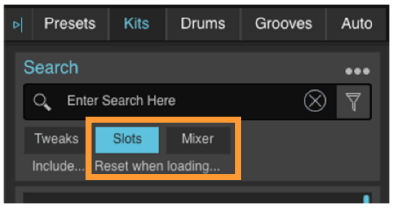
  If the **Slots** button is activated, any current slots not which are used in the kit to be loaded are removed.

  If the button is deactivated, only slots used by the kit are affected. Unused slots remain completely unaffected.

- **Mixer**

  If the **Mixer** button is activated, all mixer channels are reset when the kit is loaded. Unused mixer channels including Aux channels are deleted and the Drum channels used by the Kit are set to factory defaults.

  If the button is deactivated, the current mixer configuration and settings remain unchanged.

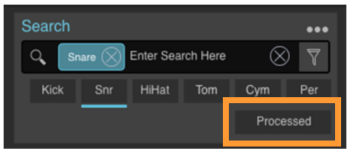


Processed (Drums only)

This button toggles visibility between regular Drums and Processed Drums in the Browser listing.

Processed Drums are regular Drums saved with additional Drum Editor and mixer channel settings for a more produced, mix-ready sound compared to that of a raw underlying Drum.

Processed Drums are shown separately to regular Drums to reinforce the fact that loading them changes the entire contents of the Drum channel including mixer settings, which is much more difficult to overcome than returning to the previous Drum if you decide you don't like the one you just loaded.



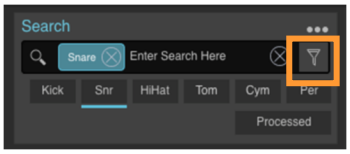
2.2.1.2 Filtering the browser listing

The Browser's filtering functions allow you to narrow down the Browser listing according to various criteria.

Click the **Filters** button to open the Filters panel. This panel allows you to see all available filtering criteria simultaneously.

Many filters are also available on the main Browser panel in the form of **Quick-filter** drop-down menus; see below.

Filters panel: Drums



The Filters panel shows all filtering criteria simultaneously. The numbers in brackets represent the number of items that would be available when specifying each of the filtering criteria.

The Drums Browser offers a number of criteria with which to filter the listing.

- **Favorites**
  Favorites are user-defined groups to which any Drums can be added. Working with Favorite Lists is discussed in the **Favorites** section *below*.
- **Library**
  The Library field refers to the original library to which the Drum belongs. For example, the BFD3 Core Library content represents a library, as does the BFD2 factory content, or any expansion pack.
- **Class**
  The Class field represents the Drum class or type, whether it is a kick, snare, tom, cymbal, hihat, or percussion instrument. Toms and cymbals also feature sub-classes.
  By changing the Class that is shown by default for the currently selected slot, you can load any type of Drum into it, not just those intended for the particular slot type, but please note that certain caveats apply when doing so. See the *Possible loading problems* section below for usage guidelines.
- **Beater**
  The Beater type varies according to various Drum classes.
- **Manufacturer**
  This filter type lets you see all Drums by certain manufacturer(s).

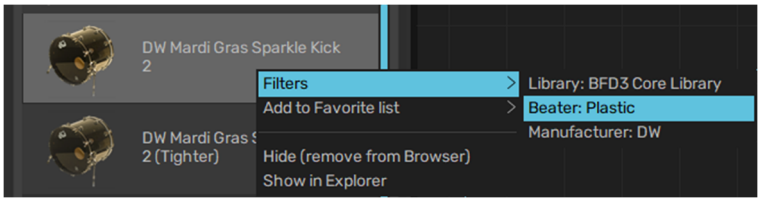
Filtering the listing to display only cymbals played with brushes

Filters panel: Kits, Presets

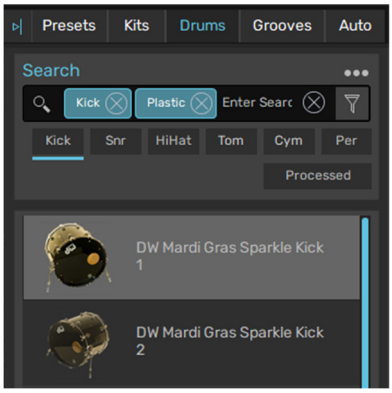
The Kits and Presets tabs of the Browser feature only two filtering criteria: **Favorites** and **Library**.

Setting filters according to Browser items

The Browser context menu contains a Filters sub-menu which lists the filtering criteria for an item in the Browser listing.



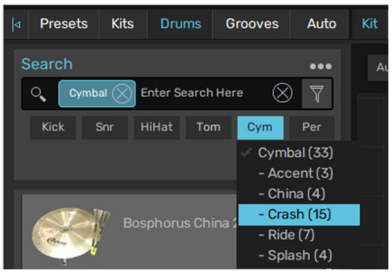
Selecting the Beater type, for example, adds it to the Search bar and filters the Browser listing accordingly.



Quick-filters: Class filters (Drums only)

The Drums Browser features dedicated buttons which display drop-down menus for filtering the Drum Class (and sub-class in the case of toms and cymbals). These achieve the same function as using the popout Filters panel.

When the **Focus browser** setting is activated in the **Options menu**, the corresponding **Class filter** button is enabled when selecting a Drum slot if the Drums Browser is currently visible. Double-click the Drum slot to bring the Drums Browser into view as well as enabling the relevant Class filter.



Quick-filters: Favorites and Library filters

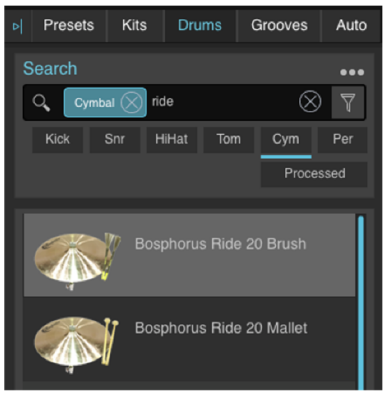
The Presets, Kits and Drums Browsers all feature dedicated buttons which display drop-down menus for setting the Favorites and Library filters. The **Favorites** system is described *below*.

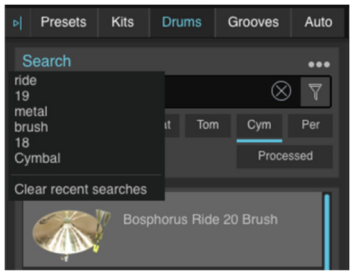
Searching

Using the Search text-box is another way of narrowing down the Browser listing.

Click the text-box and type a search term. The example shows typing "ride" while viewing all cymbals to find all available ride cymbals.

Searches operate in conjunction with the Filters described above.





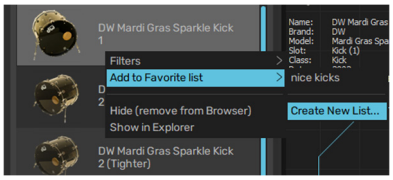
The **Recent searches** drop-down menu lists all recent searches for the Drum type. Use the **Clear recent searches** function to remove all entries from this menu.

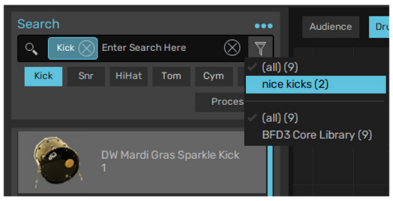
Favorites

Right-click on a Browser item in order to display the **Add to Favorite list** function. This is a sub-menu showing all available Favorite Lists to which to add the selected item.

In the above example, no groups have yet been set up. Click the **Create New List...** function to display a dialog prompting you to enter a name for the new Favorite List.

The item is added to the newly created Favorite List, which is now shown on the Fav menu and also in the Filters panel under the Favorites column. When the List is activated, the Browser listing is filtered to show the items in the List.

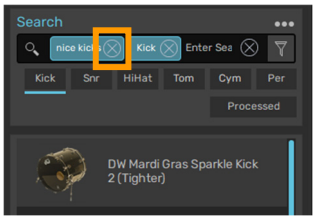




Search/Filter status and removal

Each search term or filter that is active is represented within the search bar at the top of the Browser panel.

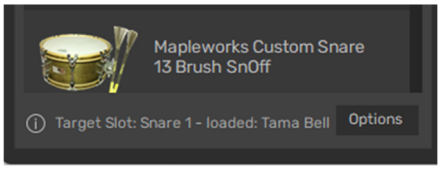
To deactivate any item, simply click the **Remove** button at the right side of each item. The item is then removed from the active searches/filters.



2.2.1.3 Other controls

Target Slot indicator (Drums only)

The **Target Slot** indicator displays information about the destination Drum slot:

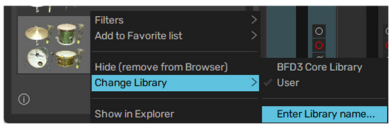


- **Target Slot**
  This part of the indicator shows which slot is currently set as the destination for previewing-in-place and loading when a Drum is selected in the listing.
- **Currently loaded in Slot**
  This part of the indicator shows the name of any Drum already loaded into the slot.

Browser context menu

Right-click on any item in the Browser listing to display the Browser context menu.

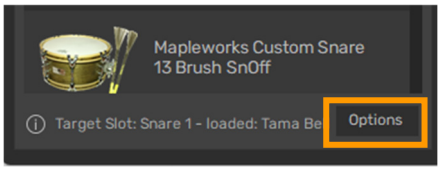
- **Filters**
  This sub-menu provides a convenient way to set Filters according to the selected Preset/Kit/Drum. For Presets and Kits, the sub-menu shows the **Library** Filter settings. For Drums, the **Library**, **Beater** and **Manufacturer** Filter settings are shown. Click any of these items to filter the Browser listing according to the Filter setting.
- **Add to Favorite list**
  This function is used for the Favorites system (see above).
- **Hide (remove from Browser)**
  This function removes the item from the Browser listing. No files are deleted—instead, the item is hidden until the next time the content location which includes them is rescanned.
  To remove items permanently, their files must be deleted from disk. The location of each file can be seen using the Info display panel (see below) or the **Show in Finder** / **Show in Explorer** functions.
- **Change Library**
  This function is available only for user-generated Presets and Kits. It allows the Library tag of the file to be set. An existing Library tag can be used, or a new tag can be created by using the **Enter Library name** function.



- **Show in Finder (Mac)**
  Show in Explorer (Windows)
  This function displays the selected file within a system file window (Finder on Mac, Explorer on Windows).

Options menu

Most functions in the **Options menu** are available only when the Drums Browser is currently visible.



- **Confirm Preset loading (Presets only)**

  Deactivate this setting to disable the confirmation prompt when loading a new Preset.

- **Confirm Kit loading (Kits only)**

  Deactivate this setting to disable the confirmation prompt when loading a new Kit (or when using the **Load random Kit** function in the **File menu**).

- **Audition when clicking Drum (Drums only)**

  Enabling this setting results in the main articulation of each Drum being automatically previewed as it is selected in the Browser.

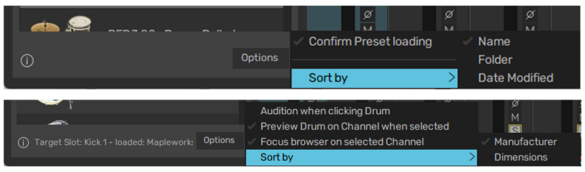
- **Preview drum on channel when selected (Drums only)**

  Activating this setting enables the preview-in-place functionality of the Browser.

- **Focus browser on selected channel (Drums only)**

  With this setting activated, selecting a Drum slot or Drum mixer channel results in the relevant Drum type being shown in the Browser listing. This means that with a kick slot selected, the Browser shows available kicks, when a snare slot is selected, the available snares are shown, and so on.

- **Sort by...**

  The **Sort by** function offers a number of ways to order items in the Browser.

  Presets and Kits can be sorted by **Name**, **Folder**, or **Date Modified** (again, this is particularly useful for user Presets/Kits). The **Folder** setting is particularly useful if user presets are arranged within sub-folders in the user location or if factory or expansion pack Presets/Kits have been manually rearranged into sub-folders within the factory location.

  Drums can be sorted alphabetically by **Manufacturer** name or by **Dimensions**.

Browser info display

Activating the **Info display** button enables the Info display at the lower part of the Browser. This display contains information about the currently selected item in the Browser. For Drums, it also has additional functions for manually auditioning individual articulations.

Click and drag up/down on the separator above the Info display to resize the area of the Browser devoted to the actual item listing and the Info display panel at the bottom.

- **Presets, Kits**

  The info display shows information about which Drums exist in each of the slots within a Preset or Kit. Any contained Drums which are invalid—unauthorized, not present, or corrupt—are listed in red.

  The location of the Preset or Kit file is also shown.

- **Drums**

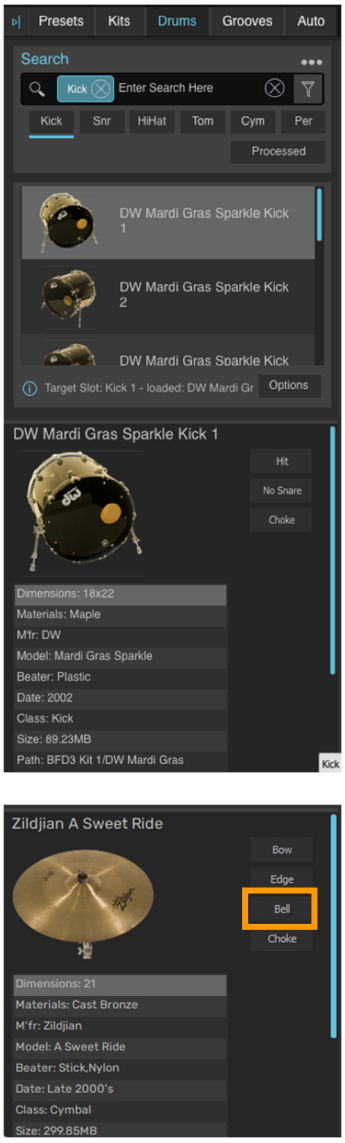
  The Info display shows information about the selected Drum and audition functions for its articulations.

- **Articulation audition strips**

  Each articulation present within the selected kit-piece can be previewed by clicking its Audition strip. Click towards the left of the strip for lower velocity layers, and towards the right for higher layers.

- **Info**

  The info box shows factory information about the selected kit-piece.
  - Dimensions
  - Materials
  - Manufacturer
  - Model/name
  - Beater type
  - Production date
  - Class
  - Size on disk
  - Location in the data path
  - Factory Library



Auditioning a Bell articulation for a ride cymbal

Possible loading problems

Even though each Drum slot in BFD3 is intended for a certain type of Drum—be it a kick, snare, hihat, cymbal or percussion instrument—it also allows you to change the Drum Class filter to load any Drum into any slot. When building arbitrary kits in this way, you should be aware of the following potential issues:

1. Articulation mappings

Because different Drums have different numbers of articulations, the Key Map may not feature enough articulation mappings for the non-standard Drum.

If you load a Snare into a Tom slot, for instance, the slot holds six Snare articulations although only three are actually mapped. The extra snare articulations need to be mapped to MIDI notes before they can be triggered.

If, on the other hand, you load a Tom into a Snare slot, any mappings which exist for the Snare that do not have a logical equivalent for a Tom "fall back" to a suitable available tom articulation.

It is not recommended to load different types of Drums into the Hihat slot. This slot is specially designed to load Hihats and there is no real reason to load any other type of Drum into this slot.

If you have an electronic drumkit, you should be aware that the Hihat slot is the only slot that supports variable hihat control. Likewise, only the Snare1 slot supports positional sensing control.

2. Grooves

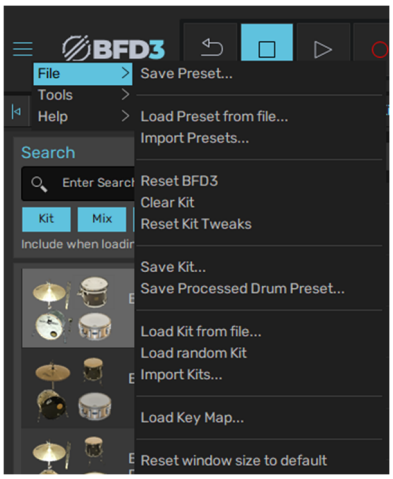
Even though Groove events do not rely on articulations being mapped, they are nevertheless usually intended for a certain type of kit-piece articulation. In the vast majority of cases, Grooves are designed for kits that follow suggested kit-piece slot uses.

Like articulation mappings, Groove events fall back intelligently to suitable articulations in the loaded kit-piece, so this can be good for experimentation. Please bear in mind, however, that a Groove simply may not make sense when played with a completely different type of kit configuration.

2.2.2 BFD3.5 File Menu

BFD3's **File menu** contains functions for managing your BFD3 session and is also used to save elements for loading into future sessions.

Many functions on the menu are context-dependent—they vary depending on whether the Groove Editor, Key Map panel or Automation panel are currently visible. These dependencies are specified below wherever applicable.



- **Save Preset**

  Save Kit (not available with Groove Editor or Key Map panel visible)

  These functions save a Preset (entire BFD3 state) or a Kit (Drums loaded into Drum slots along with Drum Editor settings) from the current session.

  A system file save dialog is displayed, prompting you to save the Preset or Kit to disk. Type the desired name and hit ENTER or click the Save button.

  The default save location is within the user folder: **<user location>/Presets or <user location>/Kits**

  It is recommended that you use this location so that your Presets and kits are accessible from the Browser without further adding and scanning of data locations.

  Elements saved with Presets

  When a Preset is saved, all the following elements are always saved with it:

  - Kit (Drums and Drum Editor tweaks)
  - Mixer
  - Groove Palette, Drum Track, and other Groove page settings
  - Key Map
  - Automation map – MIDI CC, note, and host automation assignments.
  - Session Preferences

  Using the **Include while loading** buttons in the Preset Browser, you can choose to load only certain elements (except for embedded Session preferences) when reloading Presets later.

  If you specifically do not want to save certain elements, for example Grooves or mixer effects, within a Preset, you should first clear the Palette or remove the effects from mixer channels before saving the Preset.

- **Save Processed Drum Preset (not available with Groove Editor or Key Map panel visible)**

  This function saves the current slot's Drum with its Drum Editor settings as a Processed Drum preset, available when the **Processed** button is activated in the Drum Browser (see the previous section for details).

- **Load Preset from file**

  Load Kit from file (not available with Groove Editor or Key Map panel visible)

  Clicking this button brings up a system file open dialog that allows you to browse to and load a specific Preset or Kit file into the current session. This may be useful after downloading a file created by another user.

  When loading the file, you are prompted if you would like to save it into the BFD3 database for future use. Even if you opt not to do so, the current session can be saved later as a Preset or Kit into your user location if you change your mind.

  These functions can load Presets and Kits in BFD 1.5 or BFD2 format. Their contents are recreated within BFD3 as closely as possible.

- **Import Presets**

  Import Kits (not available with Groove Editor or Key Map panel visible)

  These functions create BFD3 Presets or Kits within the database (saved into the user location) from a folder containing these files. It may be useful to do this if downloading multiple presets or kits created by another user.

  The **Import Kits** function can import BFD 1.5 or BFD2 format kit files. Their contents are recreated within BFD3 as closely as possible.

  The **Import Presets** function works only with BFD3 Presets. BFD 1.5 and BFD2 Presets can be loaded directly from the Browser—simply ensure that your BFD 1.5 and/or BFD2 user locations are included within BFD3's Content Locations panel.

- **Groove-related functions (only available with Groove Editor visible)**

  Save Groove palette

  Save Groove

  Export Groove MIDI

  Export Groove audio

  Export Drum Track MIDI

  Export Drum Track audio

  These functions are discussed in the *Saving and Exporting Grooves* section.

- **Key Map-related functions (only available with Key Map panel visible)**
  Load Key Map
  Save Key Map
  Save Key + Automation maps
  Load Key Map from file
  Import Key Maps
  Save MIDI Event Log
  These functions are discussed in the *MIDI Key Maps* section.

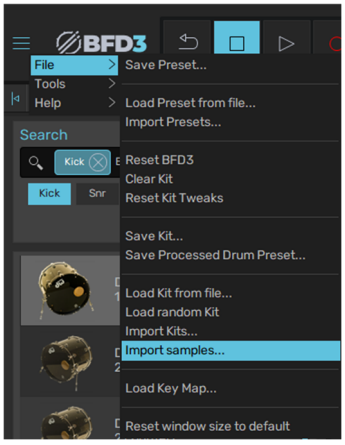
- **Automation Map-related functions (only available with Automation panel visible)**
  Load Automation Map
  Save Automation Map
  Save Key + Automation maps
  Load Automation Map from file
  Load Program Change Playlist
  Save Program Change Playlist
  Save MIDI Event Log
  These functions are discussed in the *Automation Maps* section.

- **Reset BFD3**
  This function resets BFD3 to its factory default state.
- **Clear Kit**
  This function clears the kit within BFD3 while leaving other elements in BFD3 unchanged.
- **Load random Kit**
  This function loads a random selection from the available Drums into the current set of Drum slots. You are prompted for confirmation in order to continue, in the same way as when a Kit is loaded from the Browser.

2.2.3 Importing Samples into BFD3.5

Overview

BFD3 allows you to import mono or stereo .WAV files to create single-articulation Drums, which can have multiple velocity layers.

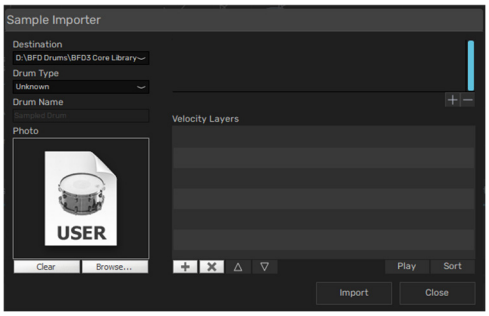


The following caveats apply with the Sample Import function:

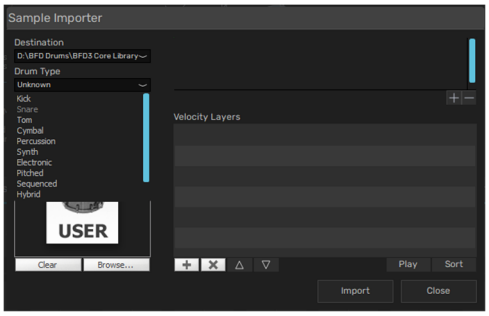
- There can be only one articulation in the imported Drum. It can be either one amplitude-scaled sample, or multiple velocity layers.
- Imported Drums only produce sound in the direct bus. There is no facility for multiple microphones or ambience channels. It is possible to add space to imported sounds by using BFD3's reverb effects.
- Only one channel is active for the imported Drum in the mixer, regardless of which Kit-Piece slot is used, unless it is loaded into the *kick1* or *snare1* slots.
- Samples can be mono or stereo, but you cannot use a combination of mono and stereo samples in the same imported Drum.

Sample Import panel

In order to create a Drum from a set of one or more samples, you must open the Sample Import panel using the **Import samples...** function in the File Menu while viewing the Drum Browser.



Import settings



- **Destination**

  Select a Content Location to which to save the imported samples as a Drum.

  Imported sounds stream in the same way as other sounds in BFD3, so the path must be one of the locations set up in the BFD3 Content Locations panel.

  If you receive an error when importing samples, make sure that you have adequate permissions to write to the location, and try again.

- **Drum Type**

  Choose the Drum type (Class) from this drop-down menu. The Drum can be classified as a Kick, Snare, Tom, Cymbal, or Percussion Drum. Hihats are not an available option because they would require more than one articulation.

  If you require imported hihats, create separate Drums for open and closed samples with a Percussion classification. Load each of these into Percussion slots, then use the Key Map page to layer the relevant hihat articulations with those of the imported Drums. It is advised to save the session as a Preset to use it again in the future if required.

- **Drum Name**

  Type a name for the created Drum. This is the name which is visible in the Drum Browser.

- **Photo settings**

  Any JPEG, PNG, or TGA image file can be specified as a photo to associate with the imported Drum. If none is specified, a default image is used.

- **Browse button**

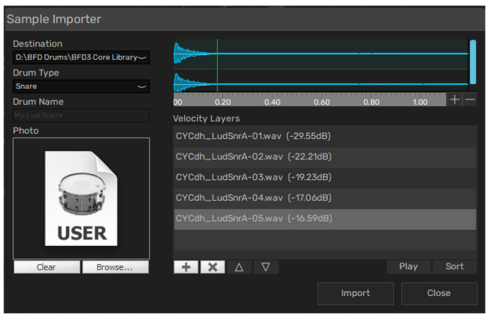
  Clicking the **Browse** button opens a system file open dialog allowing you to browse to a JPEG, PNG, or TGA file to specify for the imported Drum. The file must have a resolution of 180x150 pixels.

- **Clear button**

  Clicking this button removes the photo currently specified for the imported Drum.

Velocity layer settings

This section lets you add samples, and sort them into the desired order, from the lowest velocity layer at the top of the list, to the highest layer at the bottom.



- **Add Layer(s) (+)**

  Click this button to add a sample. Any mono or stereo WAV file can be selected, but it must be at a sample rate of 44.1kHz and at a bit depth of either 16 or 24 bit.

  If only one sample is specified, BFD3 automatically scales the amplitude of the imported Drum with incoming Groove/MIDI event velocity.

  If two or more samples are specified, they are split proportionally across the velocity range. Any additional amplitude scaling must be applied manually with the Range control after the Drum has been loaded.

- **Remove Layer(s) (X)**

  With a sample selected, click this button to remove the sample from the list of velocity layers.

- **Move layer up (△)**

  Click this button to move the selected sample up the list of velocity layers: it changes places with the sample immediately above it.

- **Move layer down (▽)**

  Click this button to move the selected sample down the list of velocity layers: it changes places with the sample immediately below it.

- **Play**

  Click this button to preview the highlighted sample. Click it again to Stop the preview.

- **Sort**

  Click this button to automatically sort the loaded velocity layers samples according to their level.

- **Import & Cancel**

  Click the **Import** button to import the Drum with the current settings. It is saved to the content location specified and added to the current database, so once the Import operation is complete, it is now available to use from the Drum Browser (it is not loaded automatically to the current session).

  If you change your mind and decide that you don't want to import a Drum at this time, click the **Cancel** button.

2.3 Using BFD3.5's Sounds

Once you've assembled a kit in BFD3 using the Browser (see the *previous chapter*), you're free to manipulate the sounds using the extensive Drum modelling and mixing engine.

This section provides an overview for using BFD3's audio engine. The subsequent sections throughout this chapter go into more detail about each part of the interface.

2.3.1 Overview

2.3.1.1 Drum slots and selection

Central to BFD3 is the concept of selection. Selecting a Drum slot results in showing its adjustable parameters in the Drum Editor.

Selecting a Drum slot in the Kit display

Click a Drum slot in the Kit display to select it.

Selecting Drum slots is central to many functions in BFD3.

As described in the previous chapter, the selected slot is used as the target destination slot for loading Drums from the browser via double-click.

If the slot already contains a loaded Drum, its contents are shown in the Drum Editor when selected.

Selecting a mixer channel

Clicking a mixer channel to select it. If a channel is associated with a Drum—a Drum channel or one of its mic sub-channels—it is also selected as the current Drum slot, and its contents are displayed in the Drum Editor.

The differences between Drum Slots and Mixer Channels

While some mixer channels represent Drum slots, this is not true of all mixer channels, such as Ambient or Aux channels for example.

The currently selected Drum slot is effectively *the last Drum slot that was selected*.

See the *Kit Display* section for further details on using the Kit display panel to manage slots and use the **Link** function for Drum layering.

2.3.1.2 Using the Drum Editor

The Drum Editor contains a comprehensive set of tools to adjust the sound and response of the Drum in the currently selected slot. It is divided into two pages: the **Tech** page features "drum tech"-oriented functions, while the **Model** page's functions deal with modelling real-world kit behavior. Click the **Tech** or **Model** buttons to show the panel if it is currently hidden. The following controls are described in full detail in the *Drum Editor* section.

Tech page

- **General & Tuning**

  The **Trim** and **Pan** controls allow you to change the overall level of the Drum and the panning of its direct mic channels within the stereo field. Each Drum also features **Mute** and **Solo** buttons. The **Tuning** function changes the pitch of the Drum.

- **Bleed**

  These controls relate to certain mic channels for each Drum which are mixed with signals from other Drums before the mixer. These controls allow you to adjust levels and other aspects of these signals. Bleed can be disabled or routed to the Drum's own mixer channel.

- **Loudness**

  The **Loudness** functions allow you to adjust the dynamic response of the Drum. BFD3's drum sounds are recorded at a wide variety of velocities (striking intensity). Adjusting these settings can drastically alter the feel and sound of drum performances.

  The **Velocity Dynamics** control scales the velocity of incoming events (from MIDI notes or from the Groove engine), in effect making the "drummer" play the kit with more or less intensity. The **Curve** control alters the velocity response of incoming events to the Drum from the default linear 1:1 mapping. The **Dynamic Range** control introduces amplitude scaling to increase or decrease the dynamic range (the difference in level between the quietest and loudest layers) of the Drum's velocity layer range.

Model (Modelling) page

- **Damping/Hihat Tighten**

  The **Damping** section lets you reduce the decay time of a Drum. For basic damping, simply increase the Damping **Amount** control as desired.

  The **Hihat Tighten** controls (available only for the hihat slot) achieve a similar result, except that only the closed articulations of hihats are affected.

- **Choke Response**

  This set of controls provides adjustment over the choking behavior of a Drum; in other words, how a preceding event for the Drum decays when a new event is triggered.

- **Tom resonance and Cymbal Swell**

  The modelled functions in BFD3 use dedicated synthesis to recreate certain properties of a drumkit.

  The **Tom Resonance** function creates the sympathetic resonance generated by toms when other toms, kicks and snares are struck.

  When the **Cymbal Swell** function is activated, additional shaping is applied to cymbal articulations when played rapidly in succession to simulate their real-world behavior.

- **Articulations**

  This section offers level control and more advanced velocity-related functions for individual articulations.

  It also contains the **Variance** control. This adjusts the degree to which articulations are affected by the **AMG** (Anti-MachineGun) functions in the Display Dashboard section of BFD3's *Global Controls*.

  By default, these controls are applied to *All Articulations*, as indicated by the drop-down menu, so the entire Drum is affected.

Mics page

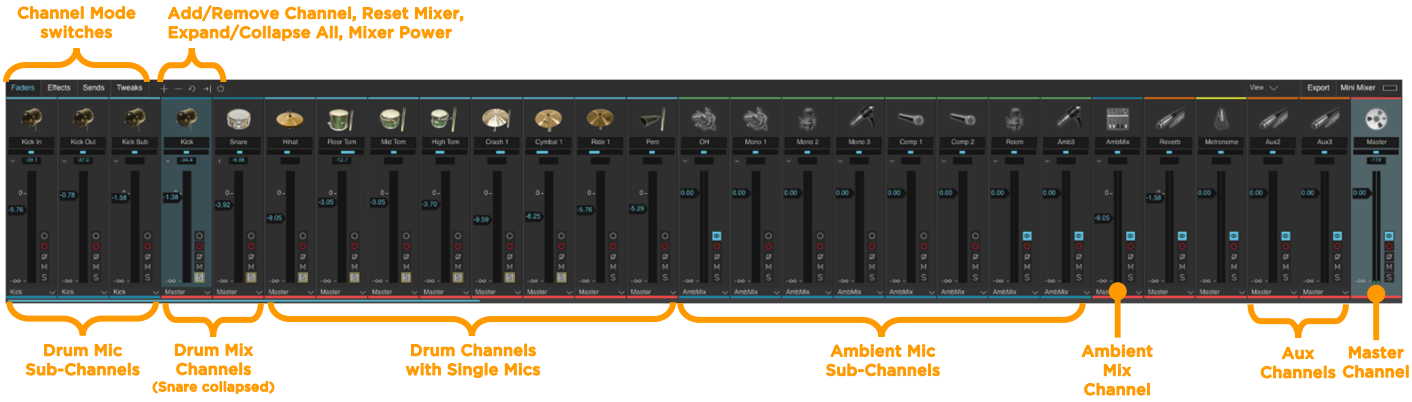
- **Ambient Mics**

  These controls relate to certain mic channels for each Drum which are mixed with signals from other Drums before the mixer. These controls allow you to adjust levels and other aspects of these signals. Ambient mic signals can be routed to discrete Aux channels, if you wish.

2.3.1.3 Using the Mixer and Effects

Channel types

BFD3's mixer contains a number of different types of channels.



Drum channels

Drum channels are the basic building blocks in BFD3's mixer. They can be considered in the same way as recorded drum tracks.

A Drum channel represents a Drum slot and its direct microphone channel(s) and can take the following forms:

- A *Drum Mix channel* fed by a mix of *Drum mic sub-channels*
- The first Kick and Snare slots exist in this form.
- A single direct microphone channel
- Hihat, Tom, Cymbal, Percussion, and further Kick/Snare slots

Using the Kick 1 and Snare 1 channels

Click the **Expand/Collapse** button to show the mic channels within the Kick or Snare channel.

Click the **Expand/Collapse** button again on any of the mic sub-channels or the parent Mix channel to return it to a single mixer channel.

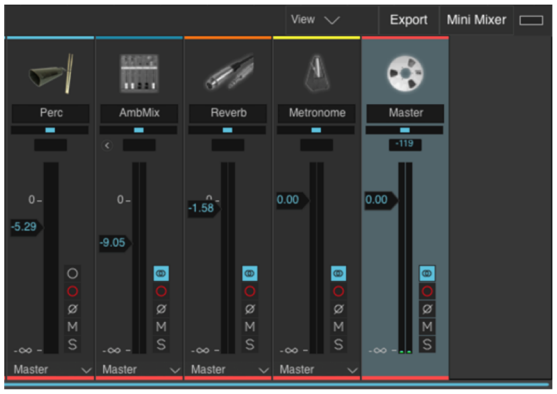
Each mic sub-channel can be treated individually, from basic adjustment of the level and pan controls to using effects and sends for processing. If you prefer, these channels can be routed to other Aux channels instead of their parent Kick or Snare channel.

Auditioning Drum channels

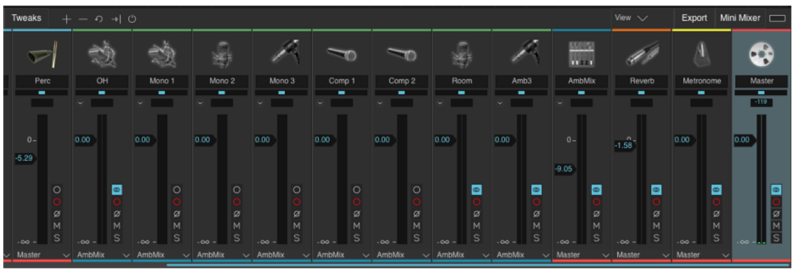
Drum channels feature an audition function for auditioning the main articulation of the Drum loaded within them. ALT-click the image at the top of the channel to preview its main articulation.

Ambient channels

Ambient mic channels appear in the mixer in a similar way to Kick and Snare mic channels. They are comprised of an *Ambient Mix channel* fed by a mix of *Ambient mic sub-channels.*



Click the **Expand/Collapse** button to show the ambient mic channels within the Ambient Mix channel. The Ambient Mix channel is selected in this example.



Click the **Expand/Collapse** button again on any of the Ambient mic sub-channels or the parent Ambient Mix channel to return it to a single mixer channel.

Each *Ambient mic sub-channel* is a mix of the Ambient mic channels of that type from all Drums in the current kit: for example, the OH channel is a mix of all Drums' Overhead mic channels.

All sounds compatible with BFD3 contain at least three sets of stereo ambient mics: OH (OverHead), Room, and Amb3 (usually a set of PZM boundary mics or a room mic set further back than the Room set). Some Drums feature additional mono room and compressed direct channels which appear as numbered Mono and Comp channels.

Adjusting the *Ambience Mix* channel's level effectively sets the "wet" level of the overall mix.

Note that the Drum Editor's Ambient Mics section allows powerful control over each Drum's Ambient mic channels. It is possible to independently set levels and also to route Ambient mic channels to Aux channel destinations rather than the default routing to the corresponding Ambient channel in the mixer.

Aux channels

Aux channels, two of which exist in the default BFD3 mixer layout, can be considered in the same way as a "buss" or a "group" on a mixing console. Any number of signals can be routed to an Aux channel, from the following sources:

- **Drum and Ambience mixer channels**

  The entire output of one or more mixer channels can be routed to an Aux channel using their **Output selector** controls for sub-mixing before further routing afterwards.

  Alternatively, a variable amount of one or more mixer channels can be routed to an Aux channel in parallel using the Send controls.

  The **Output selector** and other mixer channel controls are discussed in detail in the ***Mixer Controls*** section later in this chapter.

- **Drum Editor**

  The controls in the Ambient Mics section of the ***Drum Editor*** allow individual Drums' Ambient mic channels to be sent to Aux channels for discrete processing.

In fact, the Kick, Snare and Ambient mix channels are special Aux channels to which the Kick, Snare and Ambient sub-mics are routed via their **Output selector** controls. However, even if their sub-mics are routed to other destination channels or outputs, the **Expand/Collapse** buttons still toggle their visibility in the mixer.

Master channel

The *Master channel* is, by default, the eventual Output destination for all channels in BFD3. It is effectively a special Aux channel that is hard-wired to the primary stereo output of the BFD3 plugin.

As mentioned above, channels can be sub-mixed into other Aux channel "stems." Alternatively, channels can be routed outside BFD3 using its multiple sub-outputs.

Of course, a combination of all these approaches can be used.

Routing channels to plugin outputs for further external processing

The **Output selector** control at the bottom of each channel lets you route any channel to one of BFD3's multiple sub-outputs. This routing can occur at any stage of the mix. Individual Drum mic channels can be routed externally to do all your mixing with plugins in your DAW or outboard gear, or some sub-mixing using Aux channels can be conducted first within BFD3, with the Aux channels being routed to external outputs.

Shortcuts for sequential output assignment

The mixer channel context menu, displayed by right-clicking on any channel, offers shortcuts for simple sequential output assignment. To conduct all mixing and processing of mic signals outside BFD3, use the **Auto-Assign outputs (Direct)** function on the mixer's channel context menu. Use the **Auto-Assign outputs (Master)** function to return to the default output assignments.

Using the built-in mixing functions, FX and Sends

Selecting a Mixer channel results in showing its contents in the **Effects Editor**. This panel displays the channel's six effect slots and four Sends, which operate in a very similar way to those found in most DAWs. See the ***Effects and Sends*** section for a detailed guide.

This panel and the Kit display cannot be viewed simultaneously. Use the **Effects** and **Kit** buttons in the navigation bar to switch between them.

2.3.1.4 Mixer channel modes

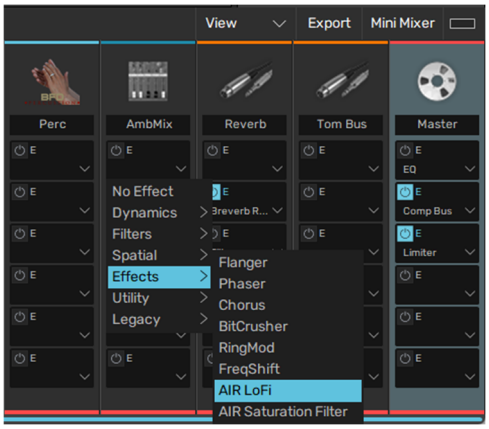
The mixer features four modes, activated by the Channel Mode switches: the **Faders**, **Effects**, **Sends** and **Tweaks** buttons above the mixer. Each mode shows a different set of controls on each mixer channel.

Faders channel mode

The **Faders** mode is the default, and displays controls regularly found on mixer channels, most of which should be familiar to you already. See the *Mixer controls > Fader Mode* section for full details of all the controls.

Effects and Sends channel modes

The **Effects** channel mode displays all channels' Effect insert slots, allowing an overview of multiple channels' Effect slots simultaneously.



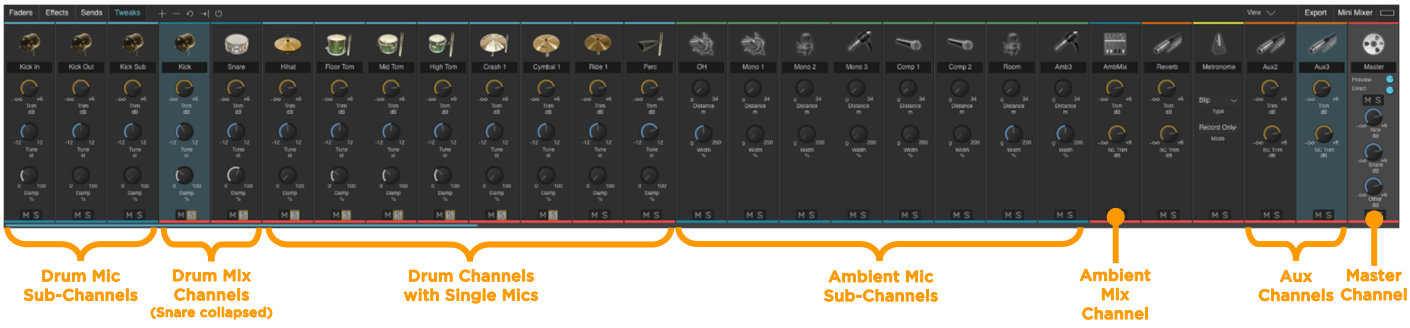
Effect devices cannot be edited directly in this mode, devices can be only inserted and powered on/off. Clicking the **E** (Edit) button for a slot takes you directly to the *Effects and Sends* device editor.

See the *Mixer Controls > Effects/Sends Mode* section for more details of these controls.

The **Sends** channel mode shows all controls for the channel's four Sends. The controls are smaller versions of all the controls in the Sends panel in the Effects Editor.

Tweaks channel mode

The **Tweaks** channel mode offers varying types of controls for each channel, depending on the channel type. The most important functions are described below. See the *Mixer Controls > Tweaks Mode* section for details of all controls.



Drum channels

Drum Mix channels feature **Tune**, **Trim** and **Damp** (Damping amount) controls in Tweaks mode. These parameters are also found in the Drum Editor but are provided within the mixer for convenience and overview of multiple channels' settings.

Ambient channels

The **Distance** control adjusts the distance of each pair of ambience mics from the kit. This control effectively introduces a delay between the relevant set of ambient mics and the direct mic signals.

The **Width** control (available only on stereo channels such as OH (Overhead), Room and Amb3) adjusts the stereo width of the channel between mono (especially useful for powerful, fat room sounds), stereo at the center position, and expanded stereo at the fully clockwise position.

2.3.1.5 Other mixing functions and exporting audio

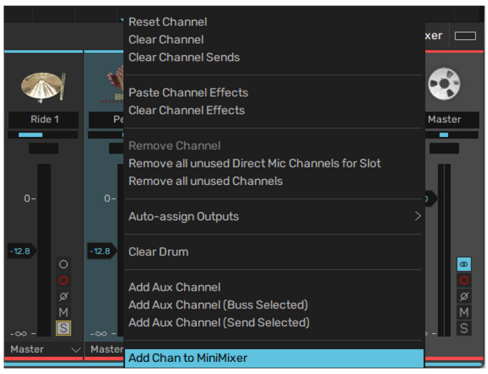
Mini Mixer

The Mini Mixer displays any combination of often-used mixer channels within a panel visible at the right side of the mixer. Click the **Mini Mixer** button to toggle its visibility.

Any channel(s) can be added to the Mini Mixer using the channel context menu. Simply right-click on any channel and use the **Add Chan to Mini Mixer** function.

See the *Mixer Controls > Other Mixer Controls* section for more details on using the Mini Mixer.

In the example below, the Overhead, Room, Amb3 and Master channels have been added to the Mini Mixer so they are always visible.



Mixer toolbar

The toolbar above the mixer features a number of controls for managing mixes. See the *Mixer Controls* section for a guide to these controls.

Export panel

BFD3 allows you to export audio directly to disk using the controls in the Export panel. These functions are useful for creating drum recordings using the BFD3 standalone application, or they may be more convenient for creating multi-channel mixdowns than your host/DAW. See the *Exporting audio from BFD3* section later in this chapter for more details.

2.3.2 Kit Display

The kit display offers a top-down view of the current kit, representing its physical layout. Each part of the kit that is shown represents a Drum slot.

Selecting slots

The Kit display has two modes—**Select** and **Link**—selectable via the corresponding buttons at the top of the panel.

With the **Select** function active, click a Drum slot in the display to select it.

When a slot is selected in the Kit display, it also becomes selected in the mixer, and vice versa. Its contents are also shown in the Drum Editor if it is currently visible.

When the **Link** function is active, slots cannot be selected. See below for details of using Link mode.

Slot indicators

Moving the cursor over a Drum slot results in indicating the location of the slot in the mixer with an arrow.

The same is true of the reverse: mousing over a Drum mixer channel highlights the corresponding slot in the Kit display (if it is currently displayed) using the same type of indicator arrow.

In the screenshot, the Snare slot is selected—shown by the selection indicators on the Kit display and mixer—but the cursor is hovered above the Hihat slot. Its mixer channel is indicated by an arrow.

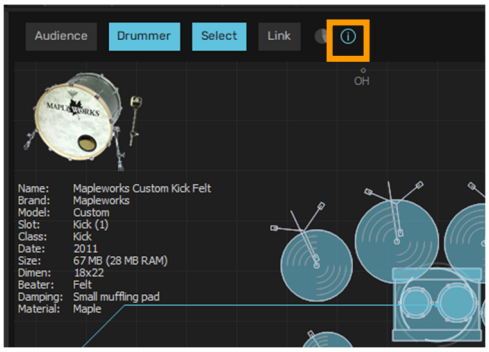
Auditioning Drums within slots

The current contents of any slot can be quickly auditioned by clicking the slot. This plays the main articulation for the Drum: closed tip for hihats, or “Hit” for other Drum types. To audition any articulations, use the Articulations section in the Drum Editor Model page.

Drum event indicators

When a Drum receives a MIDI, Groove or preview event, its surface flashes in the kit display to indicate that it has been played.

Info display



Click the **Info display** button to show the Kit display info. This shows information about the Drum slot under the cursor. If the cursor is moved away from any slots, information about the currently selected slot is shown.

The display shows information such as the name, manufacturer, model, materials, and other information about the Drum within the slot.

This display also shows the Drum **Slot** identifier, the **Class** (type) of Drum currently loaded into it and its **Size**, in MB, both on disk and currently in RAM.

Audience / Drummer perspective

By default, BFD3 is set to Drummer perspective, meaning that the panning of the kit is oriented towards the drummer's perspective, as seated at the drumkit.

Switching to Audience perspective by clicking the **Audience** button inverts all mic channels within BFD3, meaning that the kit is heard from the other side with the audience facing the drummer at the kit. Click the **Drummer** button to switch back to Drummer perspective.

Link mode

Enter Link mode by clicking the **Link** button at the top of the Kit display panel. When the Link function is active, it is not possible to select Drum slots in the Kit display. Instead, this mode is used for linking Drums together for layering purposes.

To link two Drums while in Link mode, click and drag one of the Drums (the source) onto the other (the destination).

When the source Drum is triggered, the linked destination Drum is also triggered. If it is the same Drum type, the corresponding articulation is triggered. If the destination Drum's Class differs from that of the source Drum, an attempt is made to trigger an articulation with the same name. If this does not exist, the first articulation is played ("closed tip" for hihats and "hit" for all other Drum types).

It is also possible to set up Links using the slot context menu; see the **Slot context menu** section *below*.

Note that to layer specific individual articulations, it is necessary to set this up in the Key Map.

After the link has been created, it is represented on the Kit display and in the mixer when the mouse cursor is moved over the source slot.

Removing a link

To remove a link, right-click on the source Drum slot and use the **Unlink from...** sub-menu on the slot context menu that appears.

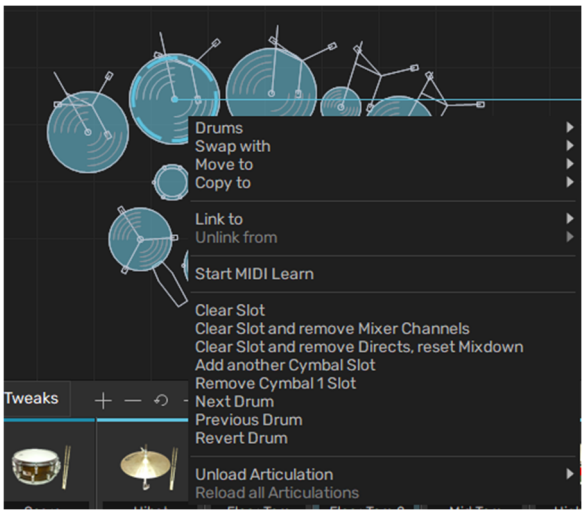
A list of links from the Drum are shown in the context menu that appears. Click on the link that you want to remove in order to break the link.

Slot context menu

Right-click on a slot to display the slot context menu.

Note that the channel context menu applies only to the slot on which it appears, regardless of whether multiple slots are currently selected. The exception is the **Remove all unused** function, which removes all currently unused channels in the mixer.

The Slot context menu is also available on the mixer channel context menu for Drum slots (within its Drum sub-menu).



- **Drums load menu**

  This menu item is used for loading Drums without using the Browser.

  The item opens a sub-menu that displays the available Drums in the database, arranged into sub-menus according to their parent library.

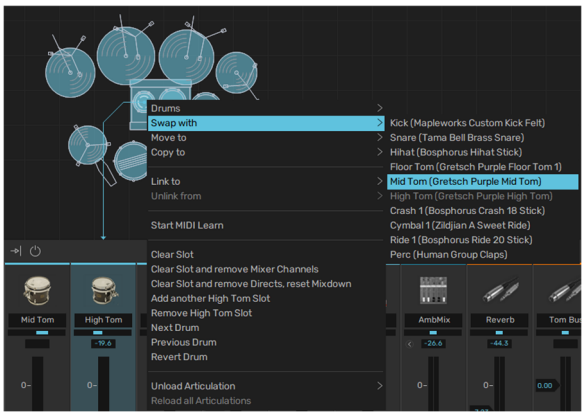
  Navigate to the required Drum in the menu and click on it to load it.

- **Swap with**
  Move to
  Copy to

  These menu items allow you to swap, move and copy Drums between slots. All slots in the current kit size are shown in a sub-menu for each function, with details of their contents if applicable.

  Navigate to the required slot in the list and click on it to perform the swap, move, or copy operation. If a move or copy operation is attempted on an occupied slot, a warning is shown, and you are prompted for confirmation in order to continue.

  Generally, during conventional kit-oriented usage, these functions should be used for rearranging kicks, toms, cymbals, and percussion. It is recommended to avoid rearranging snare and hihat slots, as these slots feature more articulations than others. If a snare or hihat is moved to a slot with fewer articulation mappings, the additional articulations are inaccessible via MIDI until they are assigned to keys using the Key mapping panel. All articulations are always accessible via the Groove engine.



- **Link to**

  This context menu item performs the same function as Link mode (see above), using a list of Drum slots in a sub-menu instead of dragging one slot over another.

- **Unlink from**

  This function allows you to unlink Drum slots that have been previously linked using the Link function.

  In the context menu for the source slot, any links that exist are shown as items on the Unlink from sub-menu. Click an item to remove the link.

- **Start MIDI Learn**

  This function starts the MIDI Learn wizard from the slot - see below for details of this function.

- **Clear slot**

  This function clears the slot of any kit-piece it contains.

- **Add another [Drum type] slot**

  This function adds another Drum slot of the same type to the kit. To add a channel for any type of kit-piece, use the Add Channel button in the mixer.

  Note that only one hihat slot is available in BFD3. It is not possible to add a second.

- **Remove slot**

  This function removes the selected Drum slot.

- **Next Drum**

  Clicking this item loads the next Drum of the same type from the available Drums in the database.

- **Previous Drum**

  Clicking this item loads the previous Drum of the same type from the available Drums in the database.

- **Unload Articulation**

  This sub-menu displays all the articulations present for the Drum in the slot. Click on any articulation to unload it from the current session.

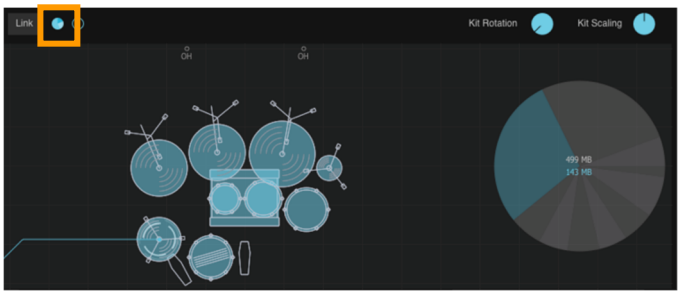
  Unloading any articulation(s) that you don't need frees up RAM resources, as the associated pre-cached start portions of audio are unloaded from RAM.

  Any unloaded articulations remain unavailable until another Drum is loaded into the slot.

Drum memory display

Click the **Drum memory display** button to show a graphic indicating the amount of RAM for the currently selected Drum.

- The upper figure shows the size of the entire Drum on disk.
- The lower figure shows the amount of RAM used by the cached portions of the Drum's samples.
- The circular graph represents the amount of RAM used by the current Drum in relation to the rest of the Kit.



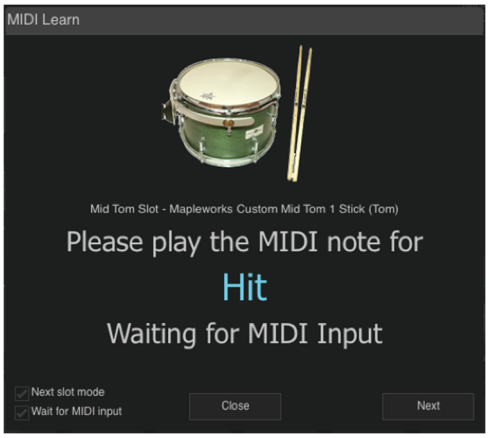
MIDI Learn wizard

The MIDI Learn wizard is a simple tool for mapping Drum articulations to MIDI notes. It is provided as an alternative to using the *MIDI Key Maps* panel, although for more complex mapping operations and fine-tuning existing mappings, it is necessary to use the functions in the Key Map panel.

When the wizard is launched using the **Start MIDI Learn** button from a Drum's slot context menu (see above), the relevant Drum's first articulation is presented on-screen, along with a message indicating that BFD3 is waiting for MIDI note input. Play a MIDI note to map it to the articulation.

The wizard then allows an additional time period for a different MIDI note to be played (in case the original note was played in error). This additional time period can be defined using the **MIDI learn accept time** setting in the *Preferences*. The default setting is five seconds.

The wizard then moves onto the Drum's remaining articulations until they are all assigned or until the wizard is closed with the **Close** button.



Next slot mode

If this setting is activated, the wizard moves onto the Drum in the next slot after all the current Drum's articulations have been assigned to MIDI notes.

If **Next slot mode** is deactivated, the wizard is closed after all the current Drum's articulations have been assigned.

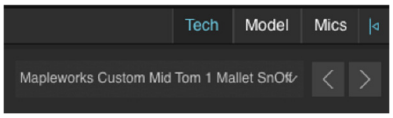
Wait for MIDI input

When this setting is activated, the wizard waits indefinitely for a MIDI note to be played before moving onto the next articulation in the Drum.

When **Wait for MIDI input** is deactivated, a set time is allowed for a MIDI note to be played for each articulation (the default is 15 seconds). If no note is received within this time, no assignment is made for the articulation.

The amount of time that is allowed can be defined in the *Preferences* using the **MIDI learn skip time** setting.

2.3.3 Drum Editor



The Drum Editor contains a comprehensive set of tools to adjust the sound and response of the Drum in the currently selected slot. It is designed to allow you to tweak each part of the kit just like you would in a real-world drum recording environment.

The Drum Editor features two pages, each displayed with the **Tech** and **Model** tab buttons on the main BFD3 navigation bar.

Click the **Tech** or **Model** tab buttons to make the panel visible if it is currently hidden. To hide the panel again, click the currently active tab button.

- The **Tech** page deals with "drum-technician" type tasks such as tuning, control over bleed, and ambient mics.
- The **Model** page is oriented towards BFD3's drum modelling functions such as tom resonance, cymbal swells, damping, and choking response. It also features advanced control over individual Drum articulations.

2.3.3.1 Tech page

General section

- **Trim**

  The **Trim** control is an overall volume control for the Drum. Adjusting it affects the level of all the Drum's mic channels equally. It can be considered as a "pre" volume control—it sets the level of the Drum at the start of the signal path before any routing and mixing features are applied.

- **Pan**

  The Drum's **Pan** control is identical to that on its channel in the mixer.

  It sets the position in the stereo field of the Drum's *Direct mics only*. It does not affect the Drum's Ambient mic channels.

  The Ambient mics section features the **Flip LR** button to invert the stereo image of the Drum's stereo Ambient mic channels. This can be useful if you need to pan a Drum to the other side of the stereo field.

- **Mute / Solo**

  These buttons mute and solo all mic channels for the Drum.

- **Drum image**

  ALT-click this image to preview the Drum's main articulation.

Tuning section

- **Tune / st**

  The **Tune** function increases (clockwise from center position) or decreases (anti-clockwise from center position) the pitch of the Drum. It is possible to tune Drums up to an octave away from its original pitch.

  The amount of tuning is shown in the **st** display. Click this display to enter a tuning amount in semitones.

  While tuning cymbals has no obvious real-world equivalent, it is still very useful to do so in the virtual domain. With snares, the sidestick can optionally remain unaffected if the **Disable sidestick tuning** option is enabled in the BFD3 *Engine Preferences*.

- **Hz / Key / Learn**

  These displays and controls are available only for Tom slots. When a Tom is loaded, BFD3 automatically calculates its fundamental pitch, which is shown in the **Hz** display, and its equivalent MIDI note is shown in the **Key** display. Click the **Learn** button and play a MIDI key—the **Tune** setting for the Tom is set to a pitch equivalent to that of the played key, within an octave of the tom's original pitch. The key that is played is shown in the **Key** display, with the new pitch displayed in the **Hz** and **st** displays.

Bleed section

The Bleed controls allow you to adjust the level and routing of a Drum's bleed and spill signals. Bleed signals in BFD3 represent the sound of other Drums captured by the Kick and Snare mics, while spill is simulated bleed in the Tom mics.

- **Bleed destination**

  The Bleed destination buttons allow control over the routing of the *recorded bleed* from the Drum within the Kick and Snare mics. 3 routings are possible:

- **On**

  The Drum's bleed is routed as normal to the first Kick and Snare slots' mixer channels.

- **Direct**

  The Drum's bleed is routed to its primary direct mic channel. Therefore, there would be no bleed from the Drum in the Kick and Snare mic channels.

- **Off**

  The Drum's bleed is disabled completely and not heard in the mix at all.

- **Trim**

  This control adjusts the level of the recorded Kick/Snare bleed signals.

- **Bleed Send**

  The **Bleed Send** control adjusts the overall level of all bleed output from the Drum. This includes *recorded bleed* (the sound of the Drum recorded in the Kick/Snare mics) and *simulated spill*. Simulated bleed signals of the following types:

  - Kick in the Tom mics
  - Snare in the Tom mics
  - Toms in other Tom mics

- **Bleed Return**

  The **Bleed Return** control sets the input level of the mix of all bleed signals routed to the Drum's direct mic channels. This includes the following:

  - Any recorded bleed or simulated spill signals from other Drums
  - The recorded bleed signal from the Drum itself if it is routed to its primary direct mic channel (using the **Direct** Bleed destination setting described above). This is the only possible signal for hihat/cymbal/percussion slots.

- **Adjusting bleed levels globally**

  You can change overall bleed levels by using the **Kick**, **Snare**, and **Other** Master bleed controls on the mixer's Master channel, visible while the Tweaks channel mode is active (click the **Tweaks** button above the mixer).

Loudness section

The Loudness controls relate to the dynamics of the Drum—its playing intensity and the resulting level and timbre.

- **Power**

  Activating this button enables the Loudness section controls. With the **Power** button deactivated, none of the controls in the Loudness section have any effect on the Drum.

- **Vel Dyn (Velocity Dynamics)**

  The **Velocity Dynamics** control shifts the velocity range of incoming events (from MIDI notes or from the Groove engine), in effect making the "drummer" play the Drum with more or less intensity.

- **Curve**

  The **Curve** control allows you to alter the amplitude of the Drum in response to the incoming velocity of MIDI or Groove trigger events.

  With the Curve control at zero, there is an exact 1:1 mapping of incoming velocity to the natural recorded amplitude of the corresponding velocity layer.

  As the control is increased, the level of the resulting audio from the event is increased from its natural recording level between the minimum and maximum velocity values. The greatest increase in gain occurs at the middle of the velocity range.

- **Range (Dynamic Range)**

  The **Range** control effectively extends the range of the dynamics curve by using automatic amplitude adjustment of the range of samples for the velocity layers. Increasing the control creates a larger difference in amplitude between the quietest and loudest layers for each articulation.

2.3.3.2 Model (Modelling) page

Damping section

The **Damping** controls allows you to decrease the decay of the Drum, simulating the effect of a blanket or pillow inside a kick drum or placing objects which absorb vibrations onto a snare or tom head.

- **Amount**

  Use the **Amount** control to set the amount of damping required.

- **Freq**

  The **Freq** control represents a crossover frequency. Below this frequency, the decay of the Drum's ambient mic channels is shortened according to the damping amount. Above the frequency, less damping is required. This results in a more natural ambience sound when using the damping functions. To damp the entire frequency range within the ambient mics, increase the **Freq** control to its maximum setting.

- **Amb Ratio**

  The **Amb Ratio** control allows you to adjust the amount of damping in the Ambient channels. With the control at the default maximum setting, less damping occurs in the Ambient channels than on the direct channels. With the control at the minimum setting, the same amount of damping is applied in the direct and Ambient channels.

Envelope section

The **Envelope** controls allow you to adjust the **Attack** and **Sustain** portions of the drum's amplitude envelope. This gives you greater control over the shape of the sound, from softening the initial attack to increasing the drum's sustain.

- **Power button**

  The Power button must be activated for the settings in this section to be applied to the current Drum. If the button is deactivated, the default envelope shaping settings specified in the Preferences are used.

- **Boost**

  The **Boost** control to decrease or increase the level of the Attack and Sustain.

- **Time**

  The **Time** control adjusts the length of the Attack and Sustain phases of the envelope.

  At lower values, the initial Attack will be faster, and the Sustain will be shorter. At higher values, the initial attack will be slower, and the Sustain will be longer.

Choke Response section

The Choke Response section provides control over the choking behavior of a Drum; in other words, how a preceding event for the Drum decays when a new event is triggered.

- **Power button**

  The Power button must be activated for the settings in this section to be applied to the current Drum. If the button is deactivated, the default choke response settings specified in the Preferences are used.

- **Base/Range**

  All Drum types have a default choking behavior which is defined in the BFD3 preferences using a set of Base/Range values. The **Base** and **Range** controls in the Drum Editor allow custom choking responses for individual Drums. See the ***Engine Preferences*** section for more details on setting Base/Range values.

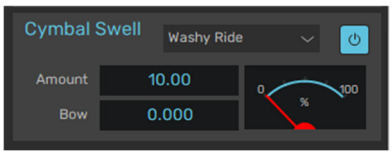
- **Drag (Snare only)**

  This parameter allows the adjustment of the additional Drag Choke fade time for Snares, and is not available for other Drum types.

- **Choke Group**

  The **Choke Group** function allows you to create choking behavior between Drums. Setting two Drums to the same Choke Group means that they choke (cut off) each other.

Cymbal Swell section



The controls in this section are only available when a Cymbal is the currently selected Drum. When activated with the **Power** button, Cymbal articulations played in rapid succession are shaped to simulate their real-world behavior.

- **Swell algorithms**

  Several Swell algorithms are provided, selectable via the drop-down menu. Each provides different swell characteristics.

- **Amount**

  The **Amount** control adjusts the intensity of the cymbal swell emulation.

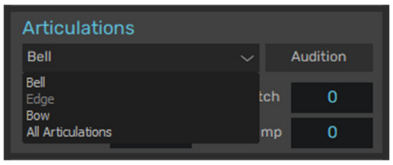
  The meter displays a real-time representation of the energy within the cymbal when the Swell function is active.

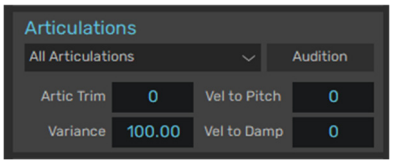
- **Bow**

  The **Bow** control dampens the cymbal.

Articulations section

These controls are provided for tweaking the response of individual Drum articulations although they can be applied for all articulations if you wish.





- **Articulation selector**

  Select the articulation to adjust using the **Articulation selector** drop-down menu. Select *All articulations* to affect all articulations in the Drum.

- **Multiple values**

  If any articulations feature individual settings for any of the controls in the Articulations section, a **Multiple Value** indicator is shown beside it when *All Articulations* is currently selected for editing. Note that adjusting any control with *All Articulations* selected results in overwriting the individual settings for any articulations.

- **Audition**

  The **Audition button** plays a preview the selected articulation when clicked. The velocity of the audition depends on where the strip is clicked. The lowest velocity layer is at the left side of the strip and the highest later is at the right.

  With *All articulations* specified in the selector, a preview of the Drum's main articulation is played.

- **Artic Trim**

  The **Artic Trim** control adjusts the level of articulations between -inf and +12dB.

  One of the most common examples for using this control would be to change the level of closed hihat articulations in relation to open ones. With the Hihat slot selected, select the Closed Tip articulation, and adjust the **Artic Trim** control, repeating the process for the Closed Shank articulation.

  The default setting for this control is 0 dB, meaning that all articulations are played at their natural recorded levels.

- **Vel to Pitch**

  The **Vel to Pitch** control allows the tuning of each articulation to vary depending on incoming trigger event velocity. Uses of this control range from extreme creative effects to very subtle changes which can give some extra character to the sound of the kit.

  Settings range from -100% to 100%. Positive values result in increasing pitch with higher velocities, while negative values result in decreasing pitch with higher velocities.

- **Vel to Damp**

  The **Vel to Damp** control allows the amount of damping applied to the articulation to be varied according to the velocity of incoming trigger events. It effectively allows you to control the decay of articulations with velocity and can offer very interesting approaches to dynamics and space within your drum tracks.

  Any changes in the damping applied to each articulation as a result of this parameter are applied relative to the Drum's overall **Damping Amount** setting.

  Settings range from -100% to 100%. Positive values result in increased damping with higher velocities, while negative values result in reduced damping with higher velocities.

- **Variance (Anti-machinegun variation)**

  This control adjusts the maximum amount of loudness or tonal humanization that is possible for the articulation.

  BFD3 features 2 controls to adjust the global amount of "Anti-MachineGun" humanization, located in the Display Dashboard section of the *Global Controls*. Click the **Dashboard** button in the LCD display in the top-center of the interface. The **Loud** (Loudness humanize) control adjusts the amount of volume randomization applied across the kit, while the **Tone** (Tone humanize) adjusts the amount of randomization between velocity layers, leading to tonal variation due to the Drum being struck at a different intensity. The maximum amount of variation for each Drum in the kit is dictated using the Drum Editor's **Variance** control. The **AMG** button in the Dashboard must be activated to enable these functions.

  These functions serve to make drum parts sound less "robotic" or "machinegun-like" by adding natural-sounding dynamic and tonal variations that are inherent in a human drummer's performance.

  Setting the **Variance** control to zero can be useful for avoiding humanization of certain parts of the kit.

Tom Resonance

The **Tom Resonance** functions create the sympathetic resonance generated by Toms when other Drums are played. These functions are available only for the Kick, Snare, and Tom slots.

- **Power**
  This button enables or disables the resonance function for the Drum. When it is active, the Drum triggers the tom resonance algorithm in the Tom slots.
- **Res Trim**
  This control adjusts the level of the resonance generated by the Drum in the Tom slots.
- **Spill Trim**
  This control adjusts the level of the Drum's bleed or spill signals (if they exist) in the Tom slots.

Hihat tighten (Hihat slot only)

This function allows you to adjust the closed Hihat sound to sound tighter and snappier. It achieves a similar result to the regular Damping functions at the top of the Modelling page, except that only the closed Hihat articulations (Closed Tip and Closed Shank) are affected.

The **Damping** control adjusts the amount of tightening that is applied to closed tip articulations. The **Pitch** control adjusts the amount of subtle pitch increase that occurs as the hihat is tightened.

The Hihat Tighten function varies within the closed zone when using variable hihat control (see the *MIDI Key Maps > Using Electronic Drum Kits* section) so that the amount specified with the controls is applied at the maximum closed pedal position (when the pedal MIDI CC# value is 127).

2.3.3.3 Mics page

Ambient Mics section

The Ambient Mics section's controls allow manipulation of the various Ambient mic channels for a Drum, providing many creative opportunities that would simply not be possible in a real-world drum recording.

- **Flip LR**

  Most Ambient mic channels, such as Overhead/Room/Amb3 channels, are stereo and the sound of the Drum is “fixed” within it. It cannot be panned within the stereo field, unlike the Drum's direct mics. This is an inherent drawback of true stereo ambience.

  The **Flip LR** button inverts the stereo image of any stereo ambient mic channels for the Drum which can be useful if panning a Drum's direct mics to the other side of the stereo field.

  In addition, the **Width** controls for Ambient mic sub-channels (when the mixer is set to Tweaks channel mode by clicking the **Tweaks** button) can be used to manipulate their stereo properties.

- **Trim**

  The Ambient Mics **Trim** control provides an overall level control for all ambient mic channels for the Drum. It can be considered as a simple “wet/dry” control for the Drum.

  Any Ambient Mics **Trim** adjustments are applied in addition to the individual **Level** controls described below.

- **Link**

  Enabling the Ambient Mics **Link** button results in the Drum's main mixer channel level fader being linked to its Ambient Mics **Trim** parameter. This means that adjusting the kit-piece's mixer level results in a corresponding adjustment being applied to the **Ambience Trim** meaning that you can adjust the level of the Drum in the direct and ambient mics using a single fader.

- **Power / Level controls**

  Each Ambient mic channel type contained within the Drum features its own horizontal Level fader in this section, allowing you to independently set the level of the Drum within each set of ambient mics.

  Each channel can be disabled entirely by deactivating its **Power** button.

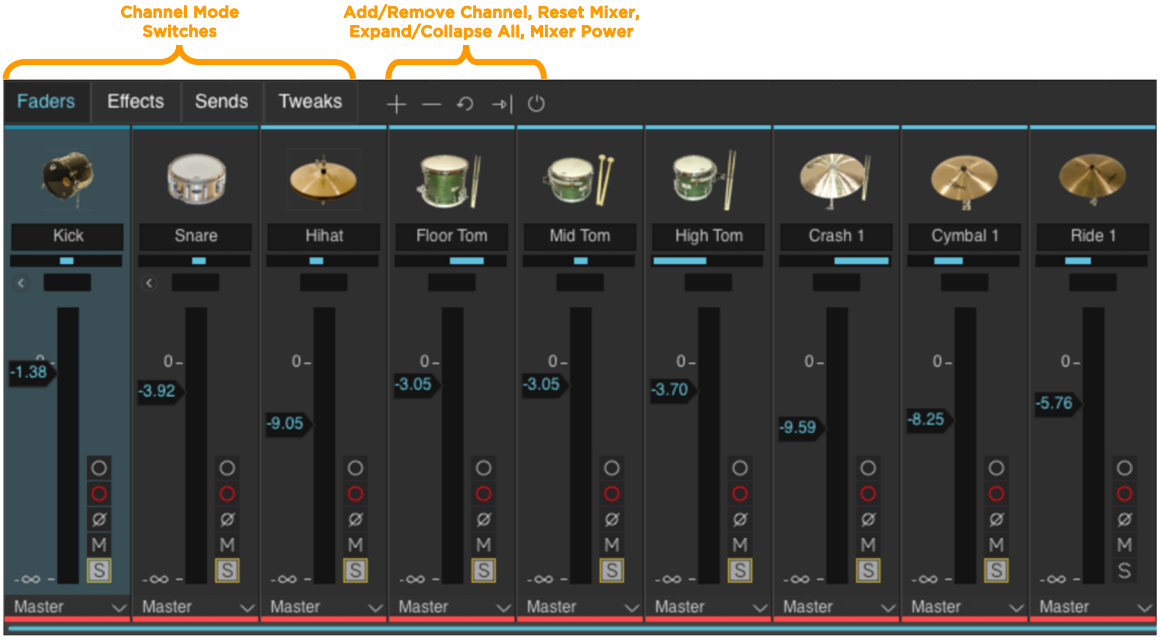
- **Routing selector**

  By default, all Ambient mic signals for each Drum is routed to the corresponding Ambience mic channels in the BFD3 mixer. However, the **Routing selector** drop-down menus override these default routings. Each channel can be routed to a discrete Aux channel for further processing or subsequent routing outside BFD3.

2.3.4 Mixer Controls

Mixer Toolbar

The toolbar at the top of the mixer channels provides several useful functions for managing your mixes.

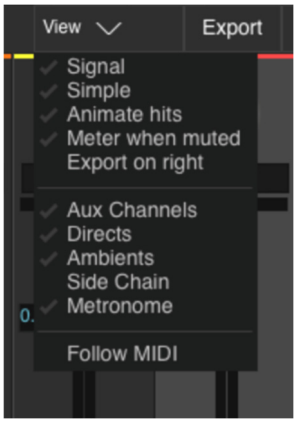


Export

This button toggles visibility of the Export panel, containing settings relating to exporting audio from BFD3.

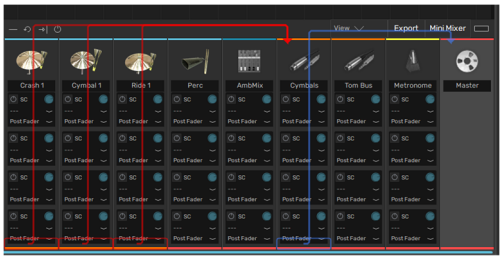
View menu

The **View menu** features several settings to customize the current view of the mixer.



- **Signal**

  The **Signal** setting toggles the overlaid signal routing indicators which visually indicate output, send and sidechain routings for the channel underneath the cursor.



- **Simple**

  When this setting is enabled, certain advanced controls are omitted from being displayed on BFD3's mixer channels:
  - Input trim controls (Input, Bleed, Sidechain)
  - Effect/Send slot indicators

- **Animate Hits**

  When this setting is enabled, Drum channels are animated to indicate that an incoming trigger for one of its articulations has been received.

- **Meter when muted**

  If enabled, a channel will show grey metering but have no audio output. If disabled, the channel will show no metering when muted (old behavior).
  - Downstream mixer channels of muted mixer channels will not show a signal. Source channels must pass a signal to a downstream channel for it to meter when muted.
  - A channel receiving active inputs directly from the synth can meter when muted, as muting applies at the final stage of the mixer channel. AUX busses which sum other channels may not get any signal in the first place if all their upstream channels are muted.
  - E.g., load a kit and choose a groove with just a kick drum. Solo a kick direct mic: the snare mixdown buss shows nothing, but if you show the snare's direct mics, they have grey muted metering. Now, solo a snare direct mic: there is now a signal passing to the snare mixdown bus. If this is muted, grey muted metering appears again.

- **Export on Right**

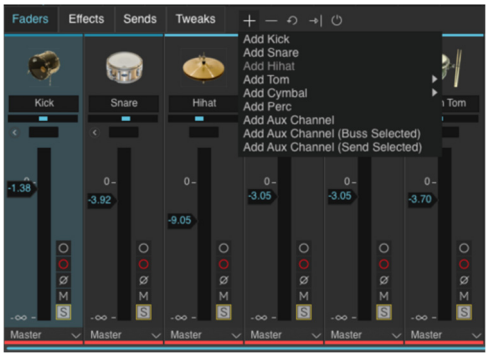
  Enabling the **Export on Right** setting results in the Export panel appearing on the right side of the mixer when opened, rather than the left.

- **Visibility toggle settings**

  The relevant settings toggle the visibility of **Aux Channels**, **Direct** channels, **Ambient** channels, **Sidechain**, and **Metronome** channels in the mixer.

Add channel

Clicking the **Add channel** button displays a menu of the types of channels that can be added: Aux channels and kit-piece channels/slots.



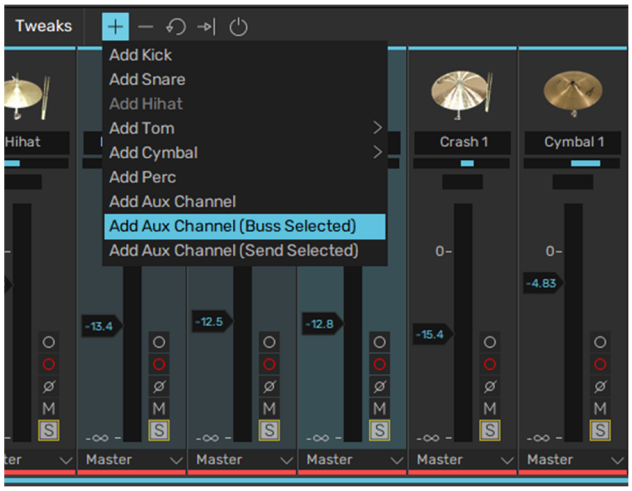
There are also two additional functions for automatic routing to newly created Aux channel(s).

- **Add Aux channel (Buss Selected)**

  If one or more mixer channels are currently selected, using this function creates a new Aux channel and sets their **Output selectors** to route the channels' audio to the new aux channel.

- **Add Aux channel (Send Selected)**

  If one or more mixer channels are currently selected, using this function creates a new Aux channel, creating Send routings to it from each of the selected channels.



In this example, the Floor Tom, Mid Tom, and High Tom channels are selected before using the **Add Aux Channel (Buss Selected)** function.

The new Aux channel is added to the right of the selected channels. The **Output selector** of all three channels is set to the new Aux channel.

Remove channel

The **Remove channel** button removes the currently selected channel(s) from the mixer.

Reset Mixer

The **Reset Mixer** button resets the current mixer to the default settings for the currently loaded set of Drums.

Clicking the **Reset Mixer** button resets all channel settings to their defaults, as well as removing any FX and Sends settings entirely. You are prompted for confirmation before this is performed.

If there are any unused channels in the current mixer, you are also prompted to remove them. Unused channels are typically Drum channels that are empty or do not have any signals routed to them from other Drums.

Expand/Collapse all

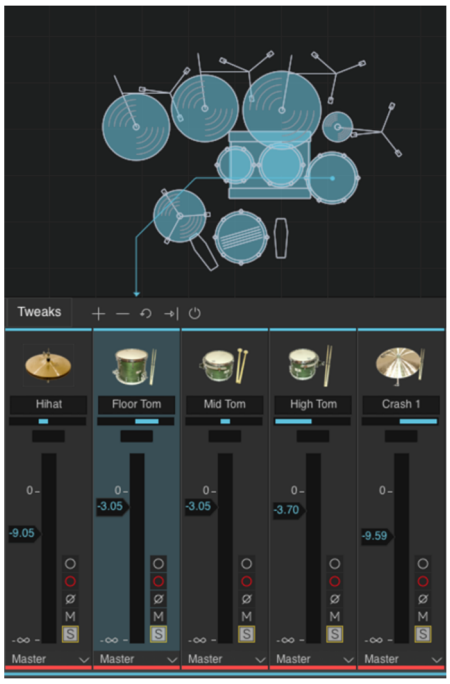
As described earlier in this chapter, this button expands or collapses the sub-mic channels within Kick, Snare, and Ambient Mix channels.

Mixer Power

The **Mixer Power** button is a global power button for all effects currently loaded into the mixer. It operates in addition to the **Power** buttons on each effect slot. Therefore, after turning the **Mixer Power** off and on again, any **Power** settings that existed previously still apply.

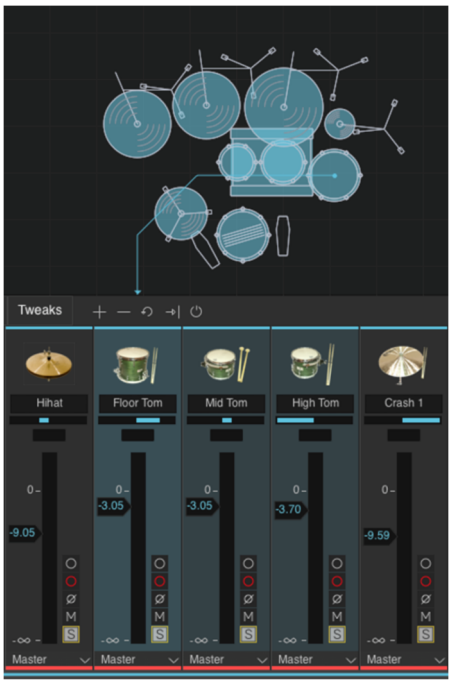
2.3.4.1 Working with the Mixer

Selecting channels



Click anywhere on a channel in order to select it. The selected channel is highlighted.

The last selected Drum channel is shown in the Drum Editor.



You can select multiple channels to manipulate their controls simultaneously.

All selected channels are highlighted.

Click any selected channel to select it as the current channel. This can be useful with Drum channels in order to show their settings in the Drum Editor.

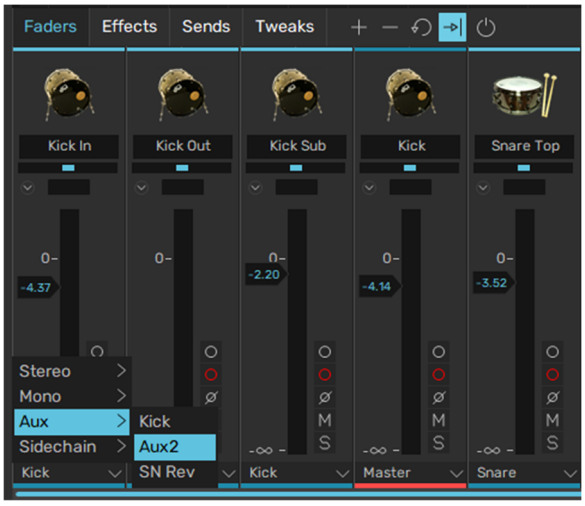
To select multiple channels:

- **CTRL-click on a channel (Windows)**
  CMD-click on a channel (Mac)
  Adds the channel to the current selection.
- **SHIFT-click**
  Selects all channels between the SHIFT-clicked channel and the existing selection.

Manipulating multiple channels

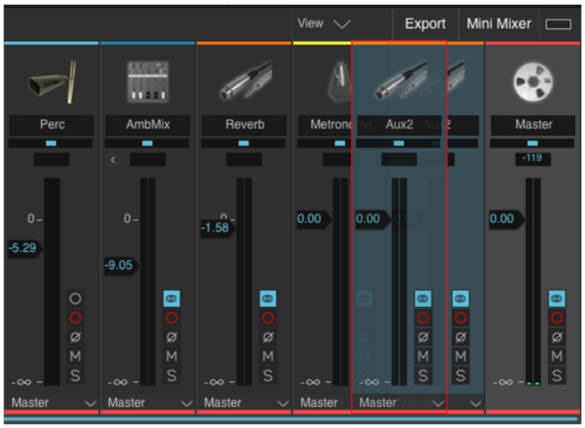
When multiple channels are selected, their main controls can be adjusted together: the **Level**, **Pan**, **Mute**/**Solo** functions, **Record enable**, **Phase flip**, and **Output selector** controls can all be adjusted in this way.

- Adjusting a control on one of the selected channels results in the control being changed for all selected channels.
- Holding down ALT while adjusting a control on one of the selected channels results in the control being inversely affected on all the other selected channels. This functionality does not include the channel output routing selector.
- Holding down the ALT and SHIFT keys while setting the channel output routing results in the selected channels being set to ascending destinations of the same type (i.e., either outputs or aux channels).



Rearranging channels on the mixer

You may want to move channels around in the mixer to suit personal preference. In order to do this, click on a channel's selection bar and drag it left or right as desired.



Channel processing order

There is one important caveat when rearranging channels. The processing order in the mixer is defined from left to right.

- A channel's **Output selector** or Send **Destination** can only be routed to another channel to its right.
- BFD3 does not allow you to move any channel that contains a valid routing to a position in the mixer that would break this rule.

The Master channel must always be at the extreme right of the mixer, and cannot be moved to any other position.

2.3.4.2 Faders Mode

Channel controls: Faders mode

This is the default channel mode featuring controls that are typically found in most mixing consoles or host/DAW mixing environments.

- **Channel color**

  The colored strip at the top of each channel is indicative of the channel type. Drum channels are light-blue, Ambience channels are green, the Ambience Mix channel is dark blue, Aux channels are orange, and the Master channel is red.

- **Channel Image**

  The channel image serves as a visual indicator of the mixer channel type.

- **Drum channels**

  Drum channels display an image of the Drum loaded into them and feature an audition function. ALT-click the channel image on any Drum channel to audition its main articulation (if the Drum slot is not empty).

- **Label strip and colored tab**

  The label strip allows you to change the default labelling for each channel. Double-click the label strip to edit its contents, and press ENTER to finish.

  It is recommended to keep names short, as only a small number of characters are visible on the strip!

- **Level fader**

  The Level fader sets the final level of the channel.

- **Level meter**

  The Level meter provides a visual guide of the channel's level. It includes momentary peak level indicators as well as red clip indicators. Click these to reset their state.

- **Pan**

  For Drum channels, a Pan control exists on the main Drum channel (but not on its mic sub-channels), which allows you to set the pan position of the Drum's direct mic channels.

  Drum channel Pan controls are duplicated within the Drum Editor (in the Tech page).

  On stereo channels, the Pan control actually functions as a balance control.

- **Expand/Collapse (Kick/Snare Drum and Ambience channels only)**

  The **Expand/Collapse** button is only available for Kick and Snare Drum channels and Ambience channels. It toggles the visibility of the parent Mix channel's mic sub-channels.

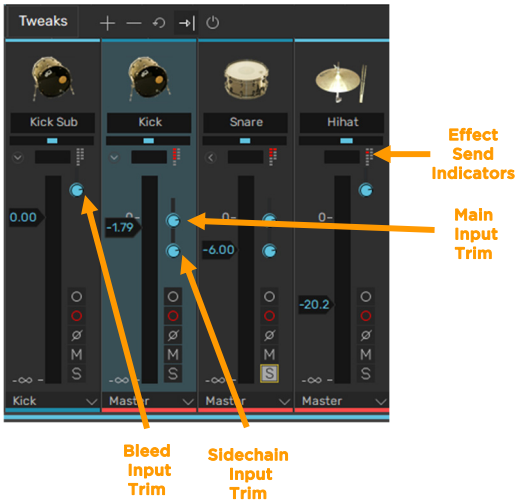
  The **Expand/Collapse All** button above the mixer can be used to fold out all Drum and Ambience mic sub-channels.

- **Effect and Send indicators**

  All channels feature a set of six orange LEDs to represent active Effect slots on the channel.

  Additionally, they also feature a set of four yellow LEDs to represent active Sends on the channel.

  In the example to the right, the indicators show that Send 1 is active on the Perc channel and effects 1-3 are active on the Aux 1 channel.



- **Input trim controls (only available when Simple view disabled)**

  The following input trim controls are not visible by default. To enable them, disable the **Simple** option within the **View Options** menu.

  - **Bleed input trim (Drum mic channels only)**

    This control is available on Kick, Snare and Tom Drum mic channels and adjusts the level of all recorded bleed and simulated spill signals arriving at the channel.

    This control is not available for Hihat, Cymbal, and Percussion channels.

  - **Input trim (Drum Mix channels, Ambience Mix channel, Aux channels, and Master channel only)**

    This control adjusts the level of the channel's *main input* signal. This input can receive signals by routing one or more channels' outputs to it, and/or by creating one or more sends to the channel's main input: the **Input trim** adjusts the level of the mix of all signals routed to it.

    The current input signal's level is represented on the small LED meter above the control.

  - **Sidechain trim (Drum Mix channels, Ambience Mix channel, Aux channels, and Master channel only)**

    Certain channels feature a *sidechain input*, for which the **Sidechain trim** control provides an overall level control. Sidechains can receive signals from more than one source: this control adjusts the level of the overall mix of these signals.

    The current sidechain input signal's level is represented on the small LED meter above the control.

- **Mono/Stereo (Aux channels, Drum Mix and Ambience Mix channels only)**

  By default, Aux channels (and similar channels such as Drum Mix and Ambience Mix channels) are added to the mixer as stereo channels. The **Mono/Stereo** button toggles the channel between stereo and mono operation.

  If any FX devices exist on an aux channel before it is changed from stereo to mono status, they are switched for mono versions automatically with their settings intact, and vice versa.

- **Record enable**

  This button is used in conjunction with BFD3's audio export features, as described in *Exporting audio from BFD3*. Enabling this button for a channel means that the channel is exported as a discrete audio file when performing any audio export.

  Click the button to record enable a mixer channel; click it again to record disable it.

  The Export panel contains several other features allowing you to record enable and disable multiple mixer channels.

- **Phase flip**

  This button allows you to invert the phase of any channel.

  Please note that all BFD3's mic channels are provided in phase with each other (including for Drums which feature multiple out of phase mics, such as kicks and snares).

- **Mute & Solo**

  All channels have a mute and solo button.

  The mixer features very flexible mute and solo behavior. It features two types of mute and solo states: implied and hard.

  - Engaging only the solo button on a channel results in *implied mutes* on all other channels: mutes are shown elsewhere, but the mute state of those channels is only implied. When the solo button is disengaged, the implied mutes on the other non-soloed channels are also disengaged.
  - Implied solos are generated on channels contributing signals to the soloed channel, or in its subsequent signal path. They are shown in a "half-lit" state.
  - Engaging only the mute button on a channel results in only that channel being hard muted (it is in an actual muted state).
  - Engaging both mute and solo buttons on a channel results in the mute overriding the solo. Both buttons are lit to show that the hard solo and mute states are engaged. While in this state, unmuting the channel results in it reverting to a hard-soloed state. If the channel is instead unsoloed, it will be left in a hard-muted state—it is not an implied mute.
  - Hard-muting an "auto-soloed" channel (in implied solo state) overrides the implied solo and the channel is muted.

Solo Isolate function

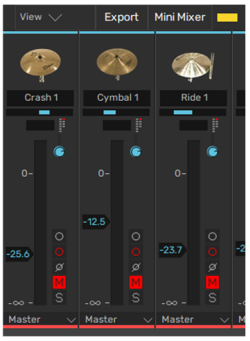
Channels can be set to solo isolate mode, which means that they are always heard when soloing any other channel.

To put a channel into solo isolate mode, click its solo button while holding down the SHIFT key. The solo button becomes “half-lit,” and is always heard along with any other soloed channel.

Rude Solo indicator

The mixer toolbar contains a **Rude Solo indicator**, as shown in the image to the right. It is always lit whenever one or more channels are currently soloed.

This indicator can be ALT-clicked to un-solo all channels currently in a hard solo state.



- **Output selector**

  Using the **Output selector** control, each mixer channel can be routed to any available output or any available Aux channel as long as it is positioned to the right of the source channel in the mixer layout (see the *Channel Processing Order* section above).

  Any number of channels may be routed to the same output or Aux channel. They are summed before the output or before the input of the destination Aux channel.

  The output routing selector does not exist on the master channel, as it is hardwired to the first set of BFD3 outputs.

Special channel types

There are two other types of channels within BFD3, which are enabled using the **View menu** in the mixer toolbar.

- **Metronome channel**

  The *Metronome channel* lets you adjust the BFD3 metronome, used when ***Recording Grooves with MIDI***. Its level can be set using the channel's fader and, using the **Output selector**, it can be routed to a discrete output if required. The level can also be quickly set to one of four settings by right-clicking on the **Metronome** button in the Transport.

- **Sidechain channel**

  BFD3 features an external sidechain input, allowing you to drive compression effects within BFD3's mixer The *Sidechain channel* allows you to process the Sidechain input discretely.

  To use the sidechain input, a suitable signal (such as a bass track) should first be routed to BFD3's external sidechain input. Please set this accordingly in the standalone application's menus or consult your host/DAW's documentation for details on how to accomplish this when using BFD3 as a plugin.

  The output of the sidechain channel (as specified by its **Output selector**) is always routed to the destination channel's sidechain input rather than its main input. See the ***Effects and Sends*** section later in this chapter for details on using the sidechain input on a channel to drive suitable effects.

2.3.4.3 Tweaks Mode

Channel controls: Tweaks mode

The controls in this mode vary depending on the channel type.

Drum channels

For Drum channels, controls for **Tune**, **Trim**, and **Damp (Damping amount)** are available. These controls are also located within the *Drum Editor*.

Note that these controls are disabled for Drum mic sub-channels.

Ambient channels

The following controls exist for Ambient mic channels. Like Aux channels, the Ambient Mix channel features **Trim** and **SC Trim** controls. See below for details of these controls.

- **Distance (Ambient mic channels)**

  The **Distance** control offers a virtual control over the distance of each set of ambient mic channels from the kit.

  Effectively it puts a short delay between the ambience channels and the direct mics. It has a similar effect to the ambience as a "pre-delay" control has over the wet signal on an artificial reverb unit.

  If custom routing of ambience signals has been set up using the Drum Editor, the **Distance** control has no effect on these signals with altered routings. It is possible to achieve the same effects using the Delay FX device on the relevant destination Aux channel(s).

- **Width (stereo channels only)**

  Using the **Width** control, you can change the width of Ambient mic channels' stereo field. Settings range from mono to fully enhanced stereo.

  This setting is available only for stereo ambient mic channels. It applies to ambient mic signals of the relevant type even if they have been routed to custom Aux channel destinations using the Drum Editor.

Aux channels

The following controls adjust the levels of the signals entering the Aux channel's input. If the input is clipping, it may be more convenient to decrease these controls instead of reducing the levels of all signals routed to it.

- **Trim**

  This control adjusts the level of the main input to the Aux channel.

- **SC Trim**

  This control adjusts the level of the Aux channel's sidechain input.

Metronome channel

In Faders mode, This channel is used for level control and setting the **Output routing** of the Transport's **Metronome** function, which is intended to be used while *Recording Grooves with MIDI*.

Tweaks mode allows access to additional options for the Metronome. These settings can also be found in the *Grooves Preferences*.

- **Type**

  Click the **Type** setting to display a drop-down menu allowing you to select between several available metronome sounds.

- **Mode**

  The **Mode** setting can be switched so that the metronome is heard in either of the following transport situations: *Record only* and *Record and Play.* This function can also be accessed by right-clicking on the **Metronome** button.

Master channel

- **Preview (Preview level)**

  The **Preview Level** fader sets the level of all Drum slot and Browser audition previews.

- **Direct (Direct level)**

  This fader controls the level of all direct channels together. It is a pre-mixer control; it alters the level of all mic channels before they enter their direct channels on the mixer.

- **Mute & Solo**

  These buttons allow you to mute and solo all direct mic channels in the mixer.

- **Kick (Master Kick bleed level)**

  This control adjusts the overall level of bleed signals in the Kick mic channels, relative to the individual bleed levels set for each Drum in the Drum Editor.

- **Snare (Master Snare bleed level)**

  This control operates similarly to the Kick bleed level control except it acts on the overall level of Snare mic bleed.

- **Other (Other mic bleed level)**

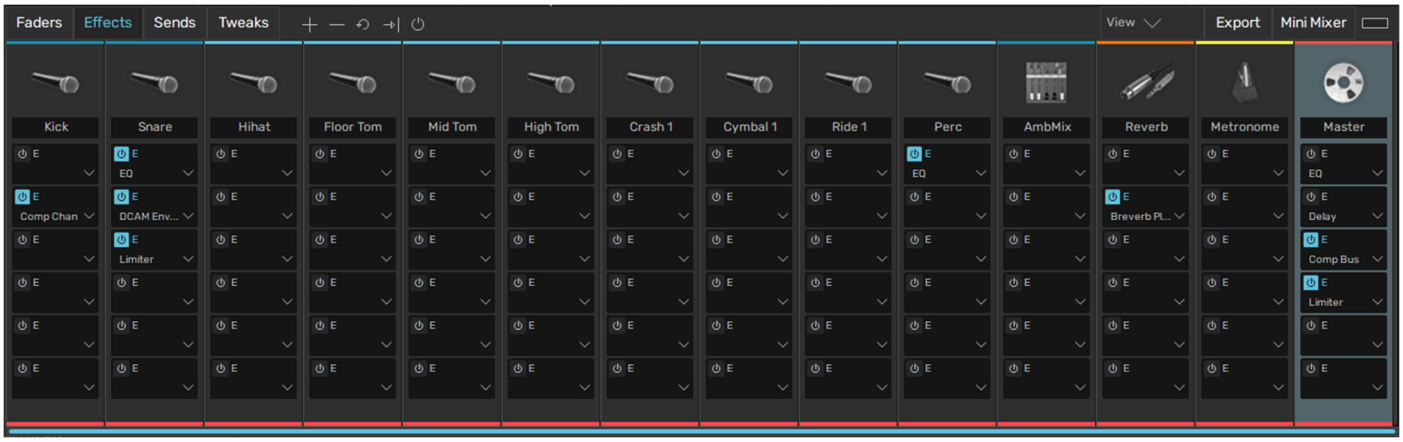
  Some expansion pack libraries contain bleed in direct channels other than the kick and snare channels. For example, some BFD XFL kicks and snares possess an additional bleed signal in the hihat direct mic channel. This bleed appears in the hihat slot direct mic channel if one of these kit-pieces is used.

  The Other control sets the bleed levels in all other direct mics except kicks and snares. If you are not using any such kit-pieces, this control does not have any effect.

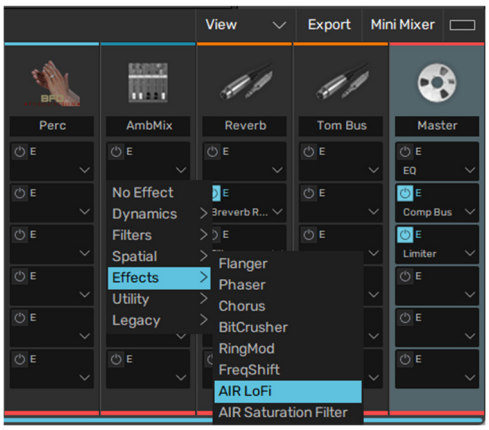
2.3.4.4 Effects/Sends Mode

Channel controls: Effects mode

The Effects channel mode displays effect selection and power controls for each channel simultaneously, allowing an overview for multiple channels.



Full control of the effect devices loaded into each slot is only possible within the Effects Editor, described in the *Effects and Sends* section.



- **Effect slot Power**

  Each effect slot features a **Power** button to activate or deactivate it. Deactivate the **Power** button to bypass the effect.

  ALT-click any **Power** button to activate or deactivate all effect slots in the channel.

- **Effect device selector**

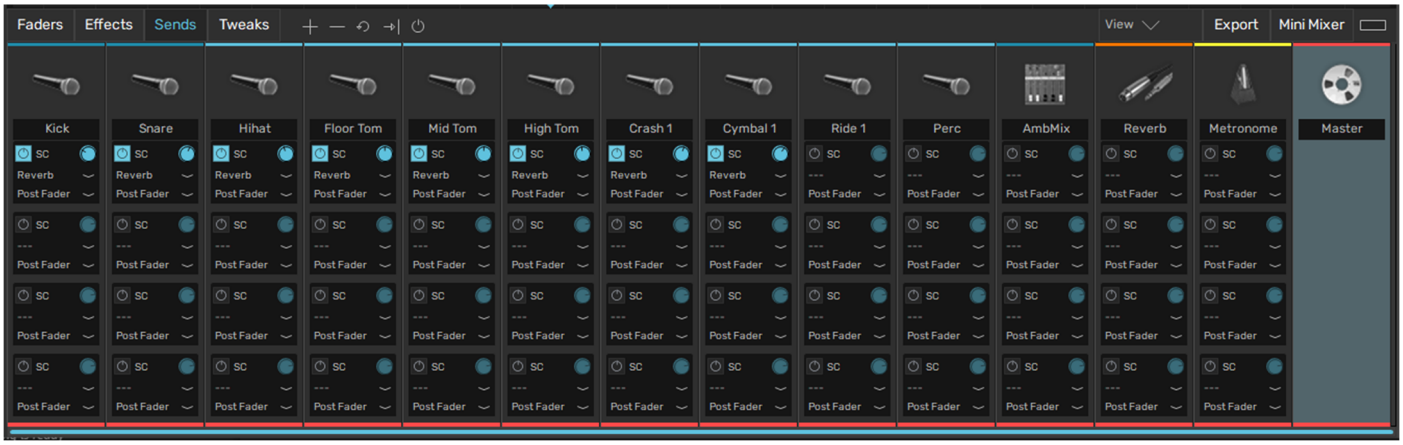
  Click the **Effect device selector** to display a drop-down menu of available effects.

  To remove a device from the slot, select *No Effect* from the menu.

- **E (Edit)**

  Clicking the **Edit** button for any of the six effect slots displays the contained device's interface within the Effects Editor (this panel replaces the Kit display if it is not already visible).

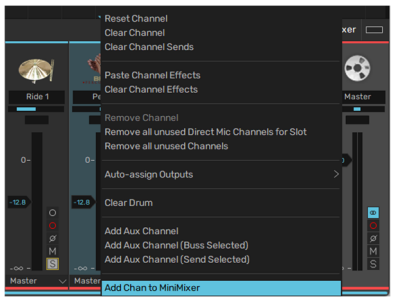
Channel controls: Sends mode



This mode displays the Send controls for all channels. The controls in this mode are fully editable (see the *Effects and Sends* section for details about the controls).

2.3.4.5 Other Mixer Controls

Mini Mixer



The Mini Mixer allows you to add any combination of often-used mixer channels to an additional panel which is always visible at the right side of the mixer when the **Mini Mixer** button at the top-right of the mixer is activated.

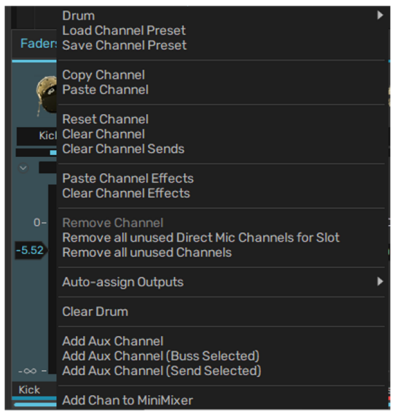
This can be useful for viewing certain channels regardless of the current scroll position in the mixer, or whether the required Drum or Ambient Mix channel is expanded.

Any channel(s) can be added to the Mini Mixer using the channel context menu. Simply right-click on any channel and use the **Add Chan to Mini Mixer** function.

Once the required channels have been added, click the **Mini Mixer** button. Click and drag left/right on the border between the Mini Mixer and the rest of the mixer to adjust the space devoted to each.

The above example shows a Mini Mixer configuration of Overhead, Room, Amb3 and Master channels.

Channel context menu



BFD3's mixer features a comprehensive system of managing channel settings, including loading and saving channel settings as presets. This is achieved by using the channel context menu.

This context menu is displayed by right-clicking anywhere on a channel (in Faders mode) or on the channel image in Effects/Sends/Tweaks modes.

Note that the channel context menu applies only to the channel on which it appears, regardless of whether multiple channels are currently selected. The exceptions are the **Remove all unused channels** and **Auto-Assign outputs** functions.

- **Drum sub-menu**
  This sub-menu, available only on Drum channels, offers the same functions as the slot context menu in the *Kit Display*.
- **Load Channel Preset**
  This function brings up a system file load dialog which allows you to load a previously saved channel strip preset. Any applicable settings are loaded. if the preset contains settings that are inappropriate for the destination channel, they are ignored.
- **Save Channel Preset**
  Using this function, you can save the contents of a channel strip to a preset for future use via a system file save dialog box.
- **Copy Channel**
  This function copies the settings of the channel strip to the clipboard.
- **Paste Channel**
  This function pastes the channel strip settings stored in the clipboard to the current channel. Any applicable settings are applied. If the clipboard preset contains settings that are inappropriate for the destination channel, they are ignored.
- **Reset Channel**
  This function resets the channel's parameters to their initialized state (default settings), although effects and sends are not affected.
- **Clear Channel**
  This function clears all effect and send settings on the channel.
- **Clear Channel Sends**
  This function removes any send settings on the channel. It does not appear on the master channel's context menu, as it does not possess any sends.
- **Paste Channel Effects**
  This function pastes all devices from a copied channel's effect slots.

- **Clear Channel Effects**
  This function removes all devices from the channel's effect slots.
- **Remove Channel**
  This function appears only when applicable. It allows you to remove aux channels and direct or ambience channels that are not being used by loaded kit-pieces or by bleed signals from other kit-pieces.
- **Remove all unused Direct Mic Channels for Slot**
  This function appears only when applicable. It allows you to clear any unused direct channels for the selected slot that are not being used by loaded kit-pieces or by bleed signal from other kit-pieces.
- **Remove all unused channels**
  Unlike the other functions on the channel context menu, **Remove all unused channels** does not apply only to the current channel. It removes all currently unused channels in the mixer. This includes direct and ambience channels that are not being used by loaded Drums or by bleed signals from other Drums, as well as aux channels that are not output or send destinations from any channels.
- **Auto-Assign outputs functions**
  These functions set the **Output selector** parameter for all channels simultaneously for three common routing scenarios. These functions can radically alter your mix configuration so please proceed with caution. You are prompted for confirmation before proceeding.
  - **Auto-Assign outputs (Direct)**
    This function assigns the **Output selector** for all individual microphones to discrete outputs. This includes Drum mic/sub-mic channels and Ambient mic channels.
    When this function is used, any existing **Output selector** assignments to Aux channels and "parent" Mix channels (Kick/Snare/Ambient Mix channels) are lost.
    This feature is designed to allow you to easily transmit all Drum and Ambient mic channels to your host/DAW for further mixing, processing or to bounce the signals as audio tracks.
  - **Auto-Assign outputs (Mixdown)**
    This feature is intended to be used with Aux channel sub-mixes of Drums. It assigns the **Output selector** for all Aux channels and Mix channels (Kick/Snare/Ambient Mix channels) to discrete outputs.
    This means that, for example, the default routing setup would be altered so that the Kick, Snare and Ambient Mix are set to discrete stereo outputs, with the Master channel containing all other Drums (and hard-wired to the first stereo output). The two Aux channels in the default mixer setup are also routed to discrete stereo outputs.
    If Aux channel sub-mixes of the other Drums have been created (for example, if the Toms and Cymbals have each been mixed down to a single Aux channel), these Aux channels are also routed to discrete stereo outputs.
  - **Auto-Assign outputs (Master)**
    This function assigns all channels to their default **Output selector** routing assignments, effectively sending all signals to the Master channel.
    - Kick/Snare Drum sub-mics are routed to their parent Drum Mix channels.
    - Ambient mics are routed to the Ambient Mix channel.
    - Drum Mix, Ambient Mix, and all other Drum and Aux channels are routed to the Master channel.
- **Add Aux Channel**
  This function adds a new Aux Channel to the mixer. There are also two additional functions for automatic routing to newly created Aux channel(s):
  - **Add Aux Channel (Buss Selected)**
    If one or more mixer channels are currently selected, using this function creates a new Aux channel and sets their **Output selectors** to route the channels' audio to the new aux channel.
  - **Add Aux Channel (Send Selected)**
    If one or more mixer channels are currently selected, using this function creates a new Aux channel, creating Send routings to it from each of the selected channels.

  These are the same as described in the *Mixer Controls* section.

2.3.5 Effects and Sends

The Effects Editor allows full control over the currently selected channel's six insert effect slots and its four Sends. This panel and the Kit display cannot be viewed simultaneously. Click the **Effects** button to show the Effects Editor in place of the Kit display.

See *Appendix > Effects* for a full list of effects and their parameters.

2.3.5.1 Overview

The Effects rack

Effects are BFD3's built-in DSP audio processors. The Effects rack shows the contents of the six effect slots on the currently selected mixer channel.

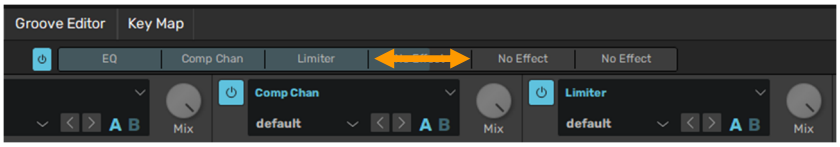
Effect slots

Each of the 6 available effect slots can host any of the internal BFD3 DSP effect devices.

Effect scroller

The **Effect scroller** is a representation of the selected channel's six available effect slots, with the highlighted area indicating which slots are currently visible. The size of the visible area depends upon the current width setting of the BFD3 window.

To change the visible area, click and drag the highlighted area or simply click the part of the scroller representing the desired effect slots.



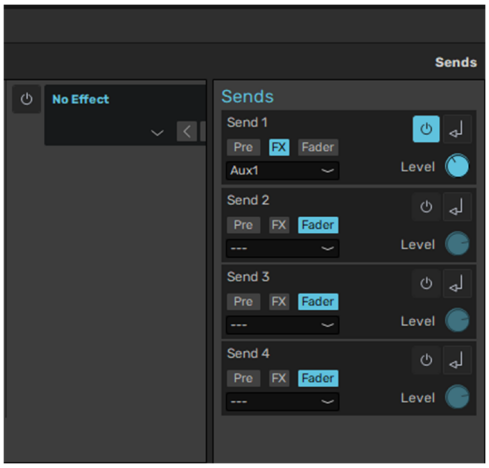
Sends

The Send controls represent the four Send routings available from the selected mixer channel, usually to destination Aux channels, allowing you to set up parallel processing routings suitable for reverbs and parallel compression: like any other mixer channel, destination Aux channels feature six effect slots for these purposes.

Sends can also be routed to other channels for Sidechain processing purposes.

Click the **Sends** button at the top-right of the Effects Editor panel to show the Send controls if they are not currently visible. Click the **Sends** button again to hide the controls.

Sends are discussed later in this section.



2.3.5.2 Initializing and using Effects

Initializing an effect device within a channel's effect slot

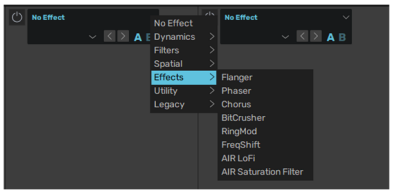
There are three ways to load a device into an effect slot:

1. **Effect slot's Effect device selector**

   Each of the six effect slots for a channel features a main header section which features an **Effect device selector** drop-down menu with a number of other controls.

   First, select the desired channel in the mixer by clicking it. Then, display the Effects Editor by clicking the **Effects** button in BFD3's main navigation bar.

   Click the part of the desired effect slot header that shows *No Effect* (if the slot is empty) or the name of the effect already loaded into the slot. This displays a menu of available effects arranged within sub-menus according to effect type. Navigate to the desired effect device and click it to load it into the slot. The previous contents of the effect slot are discarded.

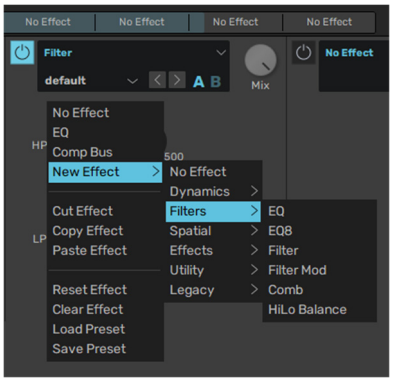


2. **Effect context menu**

   Display the Effects Editor for a mixer channel as described above.

   Right-click inside any effect slot to display the effect context menu. The **Effect device selector** menu is located within the **New Effect** sub-menu, again providing all available effects arranged within sub-menus according to effect type.

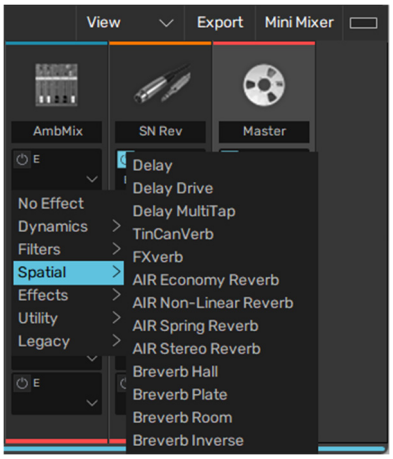
   Navigate to the desired effect device and click it to load it into the slot. The previous contents of the effect slot are discarded.



3. **Effects channel mode in the mixer**

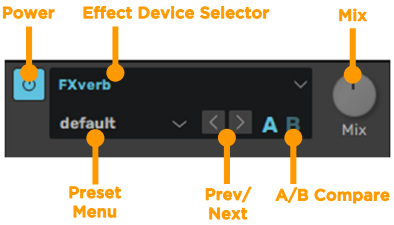
   Switching the mixer to Effects channel mode (with the **Effects** channel mode switch) shows basic controls for all channels' six effect slots simultaneously.

   The **Effect device selector** allows you to load an effect device into each slot. Each slot's **Power** button is also available, as is an **Edit** button to quickly switch to viewing the effect in the Channel Editor if it is not already visible.



Main effect slot controls

All effect slots share the following common controls on their interfaces:



- **Power button**

  The **Power** button enables or disables the effect device loaded into the slot. With the button deactivated, the device is disabled and bypassed.

  This control is also available in the mixer's Effects channel mode.

  You can also turn all currently loaded effect devices on and off using the main **Effect Power** button above the mixer.

- **Effect device selector**

  This drop-down menu provides a menu of available effects. Click any effect in the menu to load it into the slot and replace its previous contents.

- **Preset menu**

  The **Preset menu** features a drop-down menu showing all available presets for the effect device in the slot.

- **Preset Prev / Next**

  The **Preset Prev / Next** cycle through the effect's available presets.

- **A/B Compare**

  These buttons toggle between two distinct states for the effect, each with its own settings and preset-loading.

  By default, the "A state" is in operation and highlighted in blue. To try completely different settings without having to save the current settings as a preset first, click the **B** button. This switches to the "B state," and all further adjustments are now made to the B state. Presets can be loaded and any effect settings can be changed as desired.

  To return to the A state, click the **A** button again. The original settings reappear. Of course, any adjustments previously made to the B state are recalled should you decide to return to it by clicking the **B** button again.

- **Mix**

  The **Mix** control, which allows blending between the processed (wet) and unprocessed (dry) signals, exists on all BFD3 effect devices.

  Note that this control only appears when an effect device is loaded into the slot.

  By default, all effects are set to 100% wet, but this control allows you to adjust this as required.

  This control is useful on compressor devices for creating parallel compression effects for a single channel without needing to set up an additional aux channel.

- **Sidechain mode**

  The **Sidechain mode** button is only available on certain sidechain-enabled effects when used on Aux channels and the Master channel.

  When the button is activated on the Comp Bus as in this example, the effect uses the sidechain input for driving the peak detection circuit, meaning that the amplitude characteristics of a separate signal are used to treat the amplitude of the actual signal entering the compressor's main input.

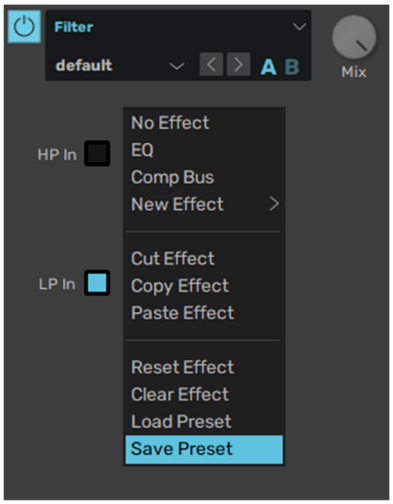
  When the EQ or EQ8 devices are used, activating the sidechain mode button results in the device processing the sidechain signal before it reaches a sidechain-enabled effect further on in the channel's signal path.

  This function is provided for situations when greater tonal control of the sidechain input signal is required than that offered by the **Key HP** control on the Comp Bus effect, for example.

  BFD3's sidechain features are discussed in more detail later in this chapter.

Managing Effects with the Effect context menu

Right-click on an effect interface to display the effect context menu.



- **No Effect**
  This function replaces any loaded effect with a blank No Effect slot.
- **EQ / Comp Bus**
  These items represent shortcuts for loading the EQ or Bus Compressor into the effect slot, as these are likely to be the most commonly used processors in a mix.
- **New effect**
  This sub-menu performs the same function as the slot's **Effect device selector**—it provides a menu of available effects. Click any effect in the menu to load it into the slot and replace its previous contents.
- **Cut / Copy / Paste Effect**
  These functions allow you to cut/copy/paste effect devices between effect slots and mixer channels.
- **Reset effect**
  This function resets the current effect to its default settings.
- **Clear effect**
  This function removes the effect from the slot.
- **Load preset**
  Clicking this item displays a system file open dialog which allows you to load previously saved preset files for the effect.
  You can also use the **Preset selector** to quickly browse through available presets saved in the default preset folder for the effect.
- **Save preset**
  Clicking this item brings up a system file save dialog, allowing you to save the effect's current settings as a preset. It is recommended to use the default location so that presets become available on the effect's **Preset menu**.

Swapping and copying effect devices between slots using drag and drop

Effects can be re-ordered and copied between a channel's effect slots using drag and drop. This offers a quicker way of performing these tasks compared to using the **Copy**/**Paste** and **Clear** functions on the effect context menu.

Swapping effects between slots

Simply click an effect device's interface, drag it to the left or right and drop it into another slot.

Any effect device already loaded within the destination is swapped into the original slot that was moved over it.

Copying an effect from one slot to another

Hold down the ALT key while performing a drag and drop operation as described above to copy the original effect onto the destination slot.

Any effect device previously in the destination slot is discarded.

Using Sends and Sidechains

Four Sends are available per channel for parallel processing and sidechaining purposes. Sends can be routed to any available Aux channel as long as the destination channel is to the right of the source channel. They can also be routed to the Master channel and other channels such as Drum and Ambient Mix channels (these are effectively Aux channels with Drum sub-mic or Ambient mic channels' outputs routed to them) for sidechain applications.

Sends can be routed into the main input or to the sidechain input of the destination channel. Sidechaining is used for certain effects which allow you to process the main input while reacting to properties of the sidechain input signal.

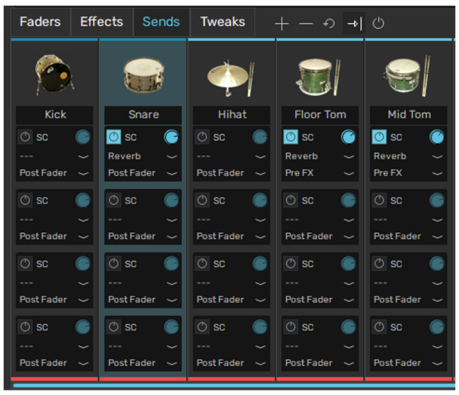
Displaying Send controls

Controls for Sends can be displayed in two ways:

Sends panel in Effects Editor

First, select the desired channel in the mixer by clicking it. Then, display the Effects Editor by clicking the Effects button in BFD3's main navigation bar.

If the Sends panel is not currently displayed within the Effects Editor, click the Sends button to make it visible.

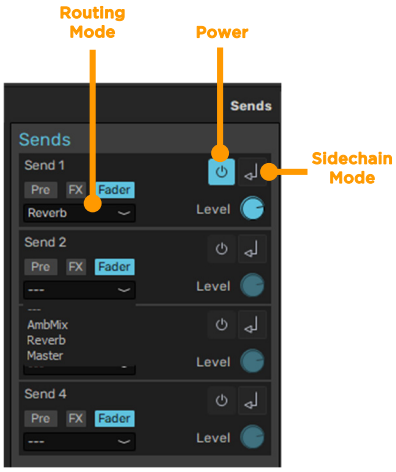


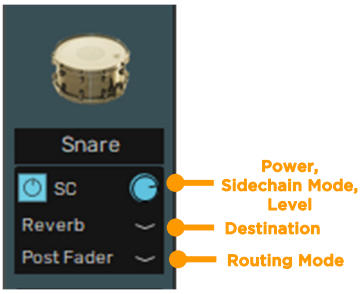
Sends channel mode in the mixer

Switching the mixer to Sends channel mode shows smaller versions of the Send controls for all channels simultaneously.

Send controls

The following controls are available for all four Sends from the currently selected channel, and can be accessed using the Sends panel in the Effects Editor or using the Sends channel mode in the mixer.





- **Power**

  The **Power** button activates or deactivates the Send. This button is activated automatically when the **Dest** control is used to set a Send destination.

- **Dest (Destination)**

  The Send destination is selected using the **Dest** drop-down menu.

- **Level**

  This control sets the Send level—the amount of the signal that is sent to the destination.

- **Routing mode**

  Using this set of buttons, each Send can be routed from any of three source points in the channel signal path:

  - **Pre (Pre FX, pre-fader)**

    The Send signal is tapped before the channel's effect slots. This point is also pre-fader. Therefore, the signal reaches the Send destination without being processed by the channel's effects, and is not affected by any level adjustment via the channel's level fader.

  - **FX (Post-FX, pre-fader)**

    The Send signal is tapped after the channel's effects but before the fader. Therefore, the signal reaches the Send destination after being processed by the channel's effects, but is not affected by any level adjustment via the channel's level fader.

  - **Fader (Post-fader)**

    The Send signal is tapped after the channel's level fader. Therefore, the signal reaches the Send destination after being processed by the entire channel including its effect slots and level fader.

    This is the default setting for the **Routing mode** parameter.

Sidechain mode

The send signal can be routed to either the *main input* for the destination channel or, with the **Sidechain mode** button activated, to its *Sidechain input*.

If the signal is sent to the sidechain input, the signal is not processed through the channel and its effects, but instead is used for sidechain-enabled effects with their **Sidechain mode** button enabled. There is one exception: the EQ is capable of processing a channel's sidechain signal for reasons which are discussed in the **Using sidechaining** section below.

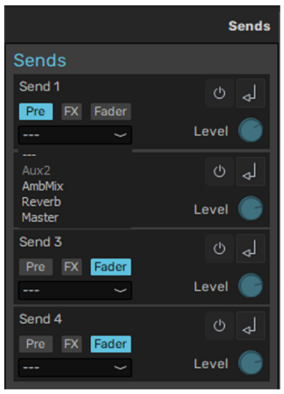
Using Sidechaining

Sidechaining is the use of one signal to control the behavior of a processor that acts on another signal. Generally, the amplitude of the sidechained signal is used to determine the dynamic output of the processed signal and it is not directly heard in the output of the processor at all. It is a common feature in compressors, in order to compress one signal according to the amplitude of another for a variety of dynamic effects.

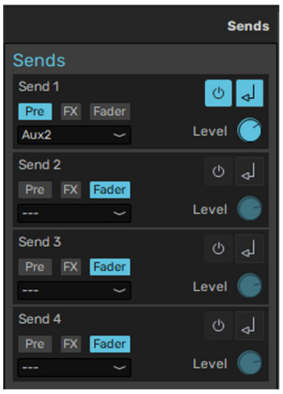
In BFD3, any mixer channel can be used as a sidechain source for a compressor or gate inserted on an Aux channel or the Master channel.

In addition, the sidechain can also be used as the FM source when the filter FM function is used in the Filter Mod device.

Setting up sidechains



To set up a channel as a sidechain source for a compressor on another channel, first set up a Send to a destination channel with the compressor, and turn up the level of the Send.



Then, click the Sidechain button for the **Send source** setting in the Sends panel.

This Send is now routed to the sidechain input of the destination channel.

Click the **sidechain mode** button on a compressor loaded into a slot on the destination channel. It now reacts to the sidechain signal with the resulting gain reduction applied to the main input signal.

EQing the sidechain

A common problem when compressing is the existence of excessive low-end frequencies in a sidechain signal causing a compressor to react more than desired. BFD3's compressors include a high-pass filter to quickly filter out the low end from the signal used by the peak detection process.

However, you may need to apply a more complex EQ process to a sidechain signal in order to isolate a particular band of frequencies such as the mid "crack" of a snare sound. In such cases, proceed as described above, but insert an EQ on the destination channel, ensuring that it is inserted *before* the compressor.

Now, click the **SC** button on the EQ's interface: the channel's sidechain input signal is processed by the EQ rather than the channel's main input signal. The processed sidechain signal is then used by the compressor as the source for its peak detection circuit (after the compressor's **SC** button has also been enabled).

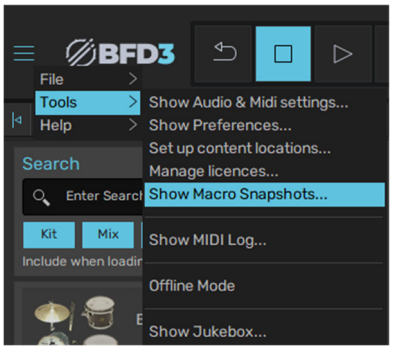
2.3.6 Macro Snapshots

Macro Snapshots can be used to control many parameters in the mixer, tech, and model panels at once—effectively treating BFD as a performance tool.

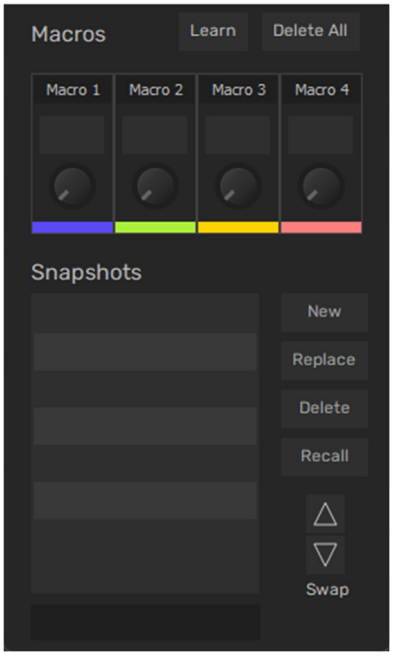
To adjust, use the **Macro knobs** in the upper-right corner of the window:

Creating Macros

To open the Macro Snapshots panel, click the Tools menu and select **Show Macro Snapshots**.

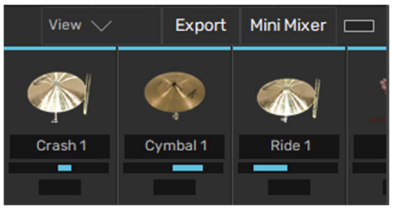


Macro Snapshots Panel



- **Learn**
  Once enabled, a red overlay will appear on any parameter that is assignable. Right-clicking the parameter will allow you to assign it to any of the four macros.
- **Delete All**
  This will clear any settings that have been programmed.
- **Macros 1-4**
  Each macro has a **label**, an **activation button,** and a **dial.**
- **New**
  With parameters assigned to a macro, the **New** button will create a snapshot; effectively recording the position and value of the parameters. Change the parameters and press **New** and the macro will blend between the two snapshots of settings.
- **Replace**
  To overwrite the snapshot with updated values, click **Replace**.
- **Delete**
  Deletes the snapshot.
- **Recall**
  Recall the position of the macro by highlighting it and pressing **Recall.**
- **Swap**
  Swaps the positions of the snapshots (i.e., reverse the direction that the macro operates by swapping Snapshot 1 with Snapshot 2).

2.3.7 Exporting audio from BFD3



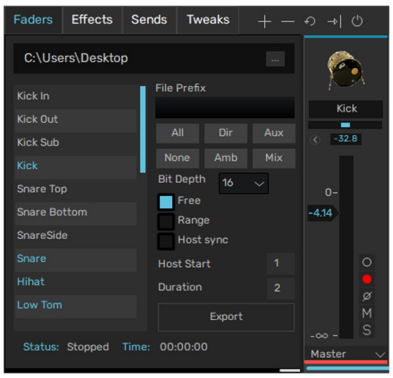
Click the **Export** button to display the Export panel if it is not currently visible. This panel allows you to export multi-channel mixdowns directly to disk from BFD3.

BFD3's export functions operate in conjunction with the mixer's **Record enable** buttons. Activate the **Record enable** button for any channel that you desire to export as a discrete audio file, or use the functions for record enabling channels within the Export panel as described below.

Exporting is also possible from the Groove engine. Individual Grooves or the Drum Track can be exported using BFD3's **File menu** when the Groove Editor is visible.

Groove engine export operations follow the settings specified in the Export panel where applicable.

Export folder



This control shows the path (folder location) to which to write exported audio files. Click the Browse button at the right to specify any location on your system.

It is recommended to use a drive that is not used for BFD3's audio data, as it may not be possible to properly stream samples for playback while recording to the same drive.

- **File Prefix**

  The filename of each exported audio file contains the name of each mixer channel (editable in the label strip) enabled for export, along with the optional **File Prefix**. Resulting files are named in the following format:

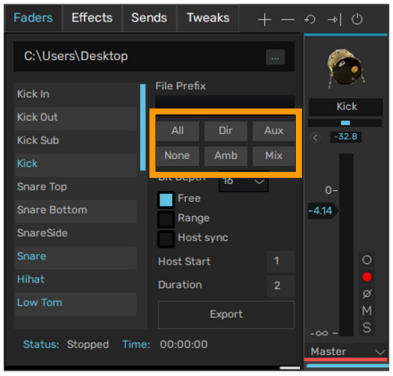
  FilePrefix_MixerChannel.WAV

- **Bit depth**

  This setting dictates the resolution of the exported audio files. 16-, 24-, and 32-bit resolutions are available.

Functions for record enabling channels

Export channel list



All current mixer channels are displayed in the channel list at the left of the Export panel. Click any channel to toggle its **Record enable** status.

Alternatively, click any channel and drag up or down to toggle the **Record enable** status of multiple adjacent channels. The Arm Group buttons can also be used to quickly Record enable various channel types:

- **All**

  Click this button to activate the **Record enable** function on all mixer channels.

- **None**

  Click this button to deactivate the **Record enable** function on all mixer channels.

- **Dir**

  Click this button to toggle the **Record enable** function on all Direct mic mixer channels.

- **Amb**

  Click this button to toggle the **Record enable** function on all Ambient mic mixer channels.

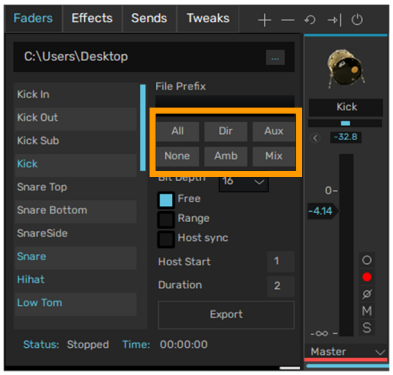
- **Aux**

  Click this button to toggle the **Record enable** function on all Aux mixer channels.

- **Mix**

  Click this button to toggle the **Record enable** function on the Kick/Snare/Ambient Mix channels.

Export Sync mode (Free/Range/Host sync buttons)



- **Free**

  The **Free** mode lets you manually start and stop the export by clicking the **Export** button. Audio is written in real time as BFD3 is used, until the **Export** button is clicked again.

  The Groove engine's functions (in BFD3's **File menu**) can also be used when in standalone mode.

- **Range**

  This mode starts and stops exporting within a definable **Start** point and **Duration**, set below.

  Before performing the export, you must first "arm" the Export function by clicking the **Export** button.

- **Host Sync**

  When Host Sync mode is selected, the Export function commences when the host transport (or BFD3 transport when using the standalone application) is started, and stops recording when the transport is stopped.

  Before performing the export, you must first "arm" the Export function by clicking the **Export** button.

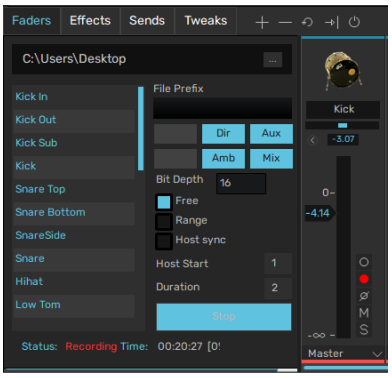
- **Host Start**

  This value defines the start time (in bars) to commence the export when the Export Sync mode is set to **Range**. This setting is disabled when any other **Export Sync** mode is selected.

- **Duration**

  This value defines the length of the export (in bars) when the Export Sync mode is set to **Range**. This setting is disabled when any other Export Sync mode is selected.

Export button



The functionality of this button changes depending upon the state of the Export Sync mode setting.

When the Export Sync mode is set to **Range** or **Host**, clicking this button "arms" the export function, meaning that the export commences when certain conditions are reached.

Click the Export button again to disarm the Export function.

When using the **Host sync** mode, the export commences when the host or BFD3 transport is started and stops when the host or BFD3 Transport is stopped.

In **Range** mode, exporting commences when playback in the host or the BFD3 Drum Track reaches the **Start** point, and stops when the **Duration** has been completed.

When the Export Sync mode is set to **Free**, clicking the Export button starts exporting immediately, and clicking it again stops it.

Time

During an export, this display shows the time, in minutes and seconds, that has elapsed since the export began.

2.4 Using the Groove Engine

2.4.1 Groove Engine Overview

The Groove Engine is BFD3's sequencer or "virtual drummer." It provides access to a large library of drum performances as well as providing the ability to edit these performances or create your own.

If you simply intend to use BFD3 as a sound module triggered by external MIDI notes, it is possible to ignore the Grooves page completely.

To use the Groove engine, click the **Groove Editor** button in BFD3's main navigation bar.

Groove Browser

BFD3's Browser, on the left side of its interface, is used to preview and load Groove and Palette files. Click the **Grooves** button at the top of the Browser to switch to the *Grooves Browser* from any other Browser tab or if the Browser is currently hidden.

Previewing is synchronized to the BFD3 transport (which is synchronized to the host/DAW when running as a plugin) so you can preview different sets of Grooves in context with your project. In fact, it is possible to jam in a live situation using Groove and Palette previewing in the Browser. However, to create controllable, flexible setups that can be recalled in future, Grooves must be loaded into the **Palette** or **Drum Track**.

Palette

At the right side of the Groove Editor panel is the Palette. Click the **Palette** button to make it visible if it is not currently displayed. The Palette is a bank of "slots" to which Grooves are loaded.

Grooves loaded into the Palette can be used in several ways:

- They can be played automatically in sync with the BFD3 transport (and that of your host/DAW when running the BFD3 plugin) using the Auto-play settings.
- They can be arranged into the single-lane Drum Track, allowing you to lay out a full song's drums within BFD3.
- They can be assigned to MIDI notes using the Key Map panel and triggered using external MIDI notes.

The *Palette* is discussed in detail later in this chapter.

Palette files

BFD3 also contains the concept of Palette files on disk. These represent saved states of the entire Groove engine: a set of Grooves loaded into the Palette slots along with all other Groove engine settings.

Grooves and Groove events

The basic components used in the Groove engine are **Grooves**: pattern "clips" containing sequenced events that trigger BFD3's Drum articulations. Grooves aren't MIDI clips, but they behave in a very similar way. They are sequences of time-stamped drum hit events, but they bypass MIDI note mappings, instead triggering BFD3's Drum articulations directly.

It is possible to record events into Grooves via MIDI note input (see *Recording Grooves with MIDI*) and *Import* or *Export* Grooves as MIDI files or sequences in your host/DAW. Grooves can also be triggered with MIDI notes. Each Groove 'slot' within BFD3's Palette can be assigned to a MIDI note for external triggering.

Drum Track

Grooves can be arranged on the ***Drum Track***—a simple, single-lane sequencer for Grooves—by dragging them from the Palette or directly from the Groove Browser. The Drum Track is activated by setting the **Auto-play mode** accordingly. When active, the Drum Track is automatically synchronized to the BFD3 transport or that of your host/DAW when using the BFD3 plugin.

Groove Editor

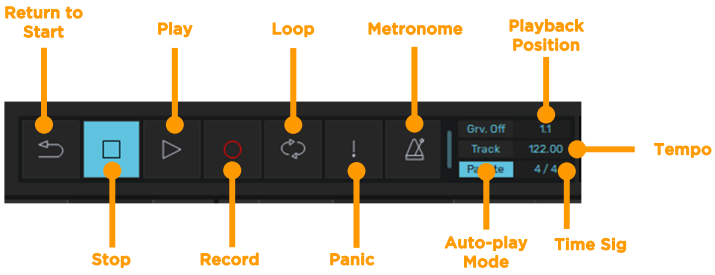
The ***Groove Editor*** provides comprehensive tools for creating and editing Groove events.

Groove FX

The ***Groove FX*** section can apply several non-destructive real-time processes to change the feel of the Groove engine's output in a number of different ways. It is possible to make Grooves sound more "humanized" or more quantized and "robotic" while the dynamics, complexity, and amount of swing-style syncopation that is applied to Grooves can also be adjusted.

Transport and Auto-play mode

The BFD3 transport is central to most aspects of Groove engine operations. The transport is started by activating the **Play** button.



When using BFD3 as a plugin in a host/DAW, the BFD3 transport is started simultaneously with that of the host. It is also possible to start the BFD3 plugin's transport with the **Play** button while the host is stopped. However, subsequently starting the host transport results in resynchronizing BFD3 to the host.

The transport is used in conjunction with BFD3's **Auto-Play mode** which is located to its right. The Auto-play functions dictate whether to automatically start Groove playback from the Drum Track or the Palette when the transport is started.

The **Auto-play mode** setting is discussed in more detail in the ***Palette*** section later in this chapter and in the ***Global controls*** section in the opening chapter.

The **Stop** button stops the transport. This is possible even when the BFD3 plugin is playing in sync with the host; Groove playback stops while the host keeps playing. If the host is stopped and restarted, Groove playback restarts in sync with the host position. After playback has been stopped in this way when using the Drum Track, if BFD3 is restarted without host sync, playback commences from the position at which playback was previously stopped.

The **Panic** button stops playback of any Grooves that may be currently playing (it also stops any drum sounds and effect tails that may be currently playing).

The **Record**, **Loop**, **Metronome** and **Return to start** buttons are used for certain features involved with ***Recording Grooves with MIDI*** and using the ***Drum Track***.

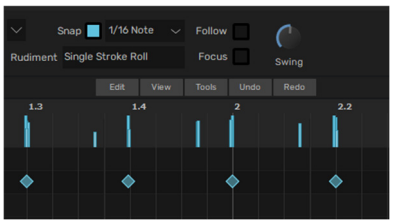
The **Tempo** and **Time signature** indicators display the current tempo and time signature. When running BFD3 as a plugin in a host/DAW that provides tempo and time signature information, these controls are not editable and BFD3 is locked to the host. In other situations, these displays can be manually adjusted: double-click and type a new value. The Tempo can also be adjusted via click/drag up/down.

The **Beat light** indicator flashes on every beat when the Groove engine is playing.

The **Playback position** indicator displays the current playback position in bars and beats while the transport is started. When using BFD3 in a host, this indicator shows the current song position of the host. When using the standalone application, this indicator can show any of the following:

- The current position in the current Groove when using any **Auto-Play mode** except *Track.*
- The current position in the Drum Track when using the *Track* **Auto-play mode.**
- The current position in the Groove when recording events in real time via MIDI.

Undo/Redo function



Every operation performed in the Groove page can be reversed by clicking the **Undo** and **Redo** buttons. The multiple-level **Undo** function is very useful as many functions which can drastically change your work are only a click away. Clicking the **Redo** button reverses the last Undo operation.

To view the action that would be undone by clicking the **Undo** button, move the mouse over the button. The last action is shown in the context info display.

Virtually any action can be undone, even loading an entirely new Palette.

While you can set up any number of levels for the multiple-level Undo/Redo in the ***Grooves Preferences***, note that more undo levels use more RAM.

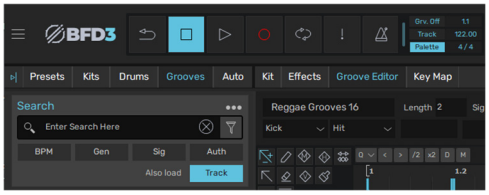
MIDI Out function

In compatible hosts, the output of the BFD3 plugin's Groove engine is available as a MIDI output stream for triggering other instruments on entirely different MIDI tracks.

The only plugin format that supports this feature is VST although not all hosts support MIDI output from plugins.

To use the MIDI output, the **Send MIDI out** setting must be activated in the ***Session Preferences***. By default, MIDI Channel 1 is used for transmitted note events. This can be changed using the **MIDI Out channel** setting.

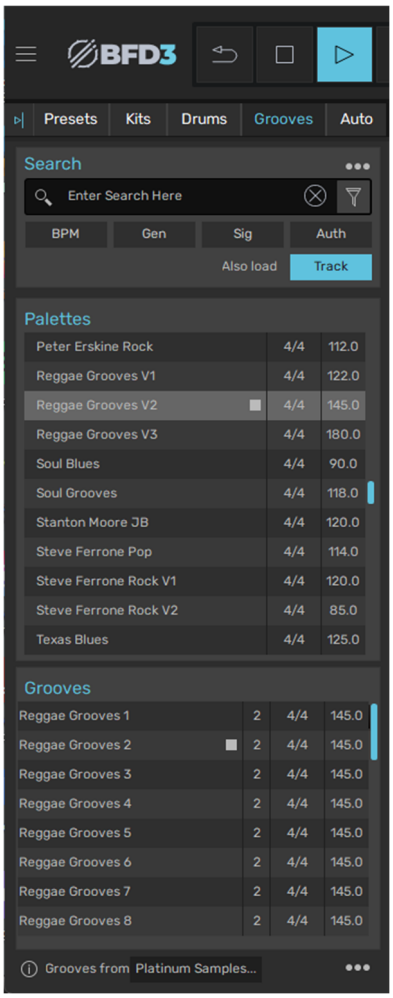
2.4.2 Grooves Browser



The Grooves Browser is part of the main BFD3 Browser. It is accessed by clicking the **Grooves** tab button at the top of the Browser panel.

If the Palette is empty or no Groove is selected, a button is also shown in the middle of the screen which opens the Grooves Browser.

2.4.2.1 Selecting and Previewing Palettes and Grooves



There are two main areas in the Grooves Browser. The upper area displays a listing of all available Palettes. Click a Palette in the listing to display its constituent Grooves in the lower part of the Browser.

Grooves shown in the lower section can be selected in the same way as Palettes.

Information about each Palette or Groove can be seen by clicking the **Info display** button at the lower-left corner of the Grooves Browser.

Previewing Grooves

Each Palette and Groove displays an **Audition preview** button with the mouse cursor hovered above it. Click the button to start previewing the Palette or Groove; click it again to stop the preview. If any Grooves are already being previewed (or if there are Grooves already loaded and playing in the Palette), they are muted when using the **Audition preview** function.

When previewing a Palette, playback steps through each of its contained Grooves sequentially.

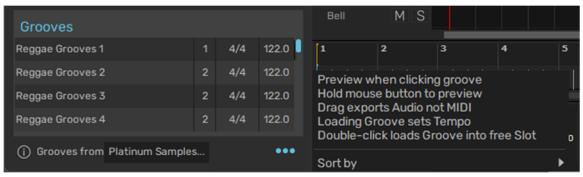
You can also click another Palette or Groove's **Audition preview** button to preview it instead.

Auditioned grooves play at the current tempo through the Drums currently loaded into BFD3. Note that if the previewed Groove contains events for currently empty Drum slots, they do not produce any sound. If no Drums are loaded at all, previewing the Groove results in silence.

The **Hold mouse button to preview** setting in the **Options menu** results in auditions only playing back while the mouse button is held down on the audition preview buttons.

Automatic previews on selection

Using the **Preview when clicking groove** function in the **Options menu**, Grooves are automatically previewed when selected in the Groove Browser, without having to click its **Audition preview** button.



When Palettes are selected, playback steps through each of its constituent Grooves sequentially.

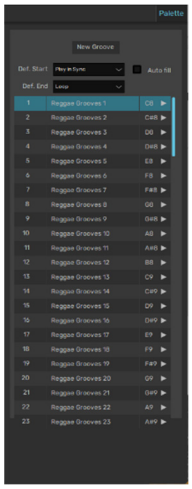
Previewed Grooves are looped and synchronized to your host tempo and transport.

Loading by drag & drop to the Palette

To load Palettes and Grooves into the Palette via drag and drop, the Palette panel at the right of the Groove Editor page must be visible. Click the **Palette** button at the top-right of the Groove Editor page to display it if it is currently hidden.

Palettes

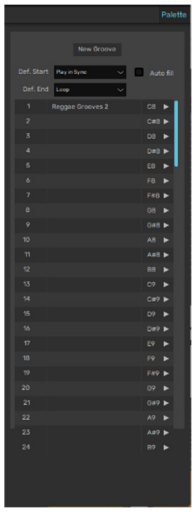
To load a Palette, drag it from the Browser to the Palette at the right of the Groove Editor page.



Any previous contents in the Palette and Drum Track are replaced.

Grooves

To load a single Groove, drag it to the desired slot in the Palette. This can also be achieved with multiple selections: the Grooves are assigned to sequential slots starting from the destination. Any previous contents in destination slots are replaced.



The loaded Groove.

Using drag and drop to export Grooves directly from the Browser

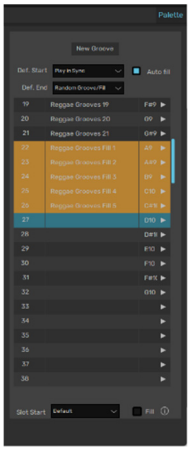
This method can be used to export Grooves or a Palette as MIDI or audio directly to your host/DAW or to an operating system file window or desktop. This function is described in the *Saving and Exporting Grooves* section later in this chapter.

Loading using double-click

Palettes

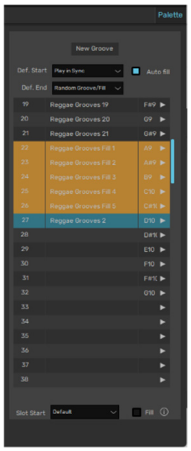
Double-click any Palette to load it (replacing all currently loaded Grooves). Any previous contents within the destination are replaced.

Grooves



i. First, click the desired destination Groove slot in the Palette to select it.

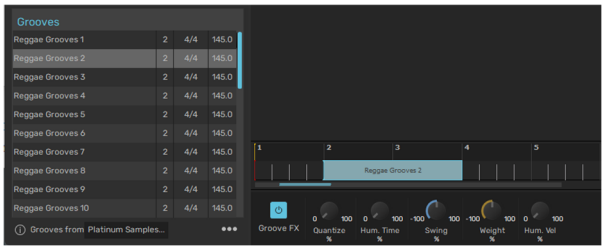
ii. Then, double-click the required Groove in the Browser.



iii. The Groove is loaded to the selected slot in the Palette.

Loading using drag & drop to the Drum Track

Grooves or Palettes can be dropped directly from the Browser onto the desired position in the *Drum Track*.



The Groove(s)/Palette is also loaded to the next free slot(s) in the Palette.

When dragging an entire Palette (or a multiple selection of Grooves) in this way, the Grooves within it are arranged sequentially in the Drum Track.

Loading multiple Grooves

To select multiple Grooves in the listing:

- **CTRL-click** (Windows) on a Groove
  COMMAND-click (Mac) on a Groove
  Adds the Groove to the current selection. If the Groove is already selected, it is de-selected.
- **SHIFT-click**
  Selects all Grooves between the currently selected Groove and the lowest or highest selected Groove (a contiguous selection).

With the desired Grooves selected, click, and drag the selection to the required destination slot in the Palette. The Grooves are loaded into sequential slots starting from the destination slot, overwriting any previous contents of these slots.

A warning is displayed if the end of the Palette is reached and it is not possible to load all the selected Grooves.

Searching and filtering the Groove library

Using the Search, Filters and Favorites functions in the Grooves Browser involves the same processes as the other Browser tabs. See the *Browser Reference* section for a guide to using these functions.

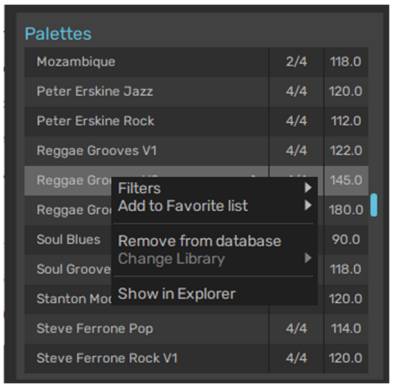
The following Filter categories are available in the Grooves Browser:

- **Favorites**: show only specific Favorites groups
- **Library**: show BFD1, BFD2, BFD3 or other libraries
- **Genre**: filter Grooves by musical genres
- **BPM**: filter Grooves by original tempo range
- **Time signature**: filter Grooves by specific time signatures
- **Author**: filter Grooves by specific authors

2.4.2.2 Other Groove Browser functions

Groove Browser context menu

Right-click on any Palette or Groove in the Browser listing to display the Groove Browser context menu.



- **Filters**

  Add to Favorite list

  Show in Finder (Mac)

  Show in Explorer (Windows)

  Change Library

  These functions are described in the ***Browser Reference*** section.

  In the Grooves Browser, the **Filters** sub-menu shows the **Library**, **Genre**, **BPM**, **Time Sig** and **Author** fields for the Palette or Groove.

  The **Change Library** function is only usable with user-generated Grooves and Palettes.

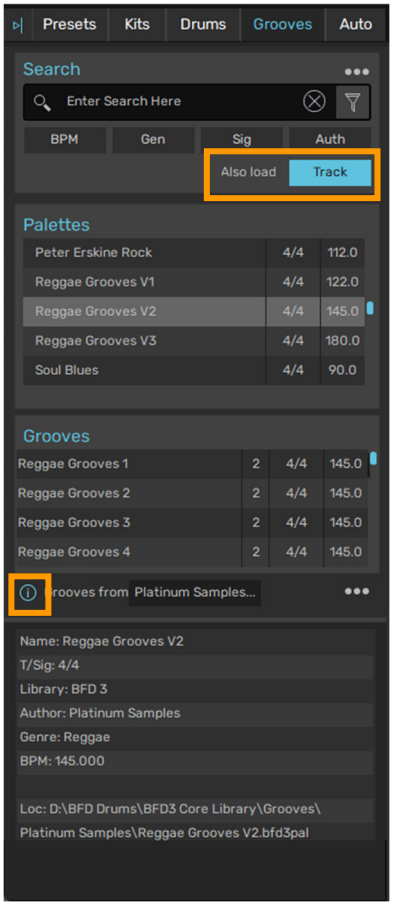
- **Remove from database**

  This function removes the Groove/Palette from the listing. No files are deleted; instead, the item is hidden until the next time the content location which includes them is rescanned.

  To remove items permanently, their files must be deleted from disk. The location of each file can be seen using the Info display panel (see below) or the **Show in Finder** / **Show in Explorer** functions.

Also load: Associated Track

Palette files also store a Drum Track if it existed when the Palette was originally saved. If the **Also load Track** button is deactivated, when a Palette is loaded, the Drum Track is initialized to an empty state.



Info display

Click the **Info display** button at the lower-left of the Grooves Browser to show a panel displaying information about the currently selected Palette or Groove.

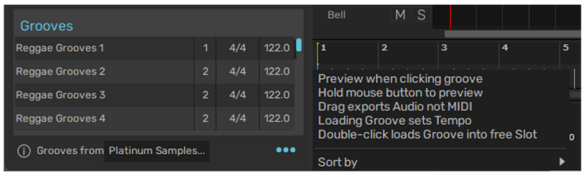
The fields that are shown are identical to those in the Palette panel's Info display. See the ***Palette*** section for details of each field.

The border between the Info display and the Palette/Groove listing can be clicked and dragged up/down to adjust the visible area of each section.

The Info display panel can be hidden again by clicking the **Info display** button.

Options menu

Preview when clicking Groove



If this setting is activated, Grooves are automatically previewed when selected in the Groove Browser, without its **Audition preview** button needing to be clicked. Previewed Grooves are looped and synchronized to your host tempo and transport.

Hold mouse button to preview

This setting changes the behavior of preview buttons in the Grooves Browser and Palette. With the setting activated, Groove previews play while the mouse button is held down on its preview button. When the setting is deactivated, clicking a preview button starts playing the Groove, and clicking it again stops it.

Drag exports Audio not MIDI

This function relates to exporting Palettes and Grooves directly from the Browser and is identical to that in the Groove Editor's **Tools menu**. See the *Saving and Exporting Grooves* section for more details.

Loading Groove sets Tempo

When running BFD3 in standalone mode, activate this setting to set the current tempo to that of a Groove or Palette when it is loaded.

When the setting is disabled, Grooves are always auditioned and loaded at the current tempo.

Double-click loads Groove into free Slot

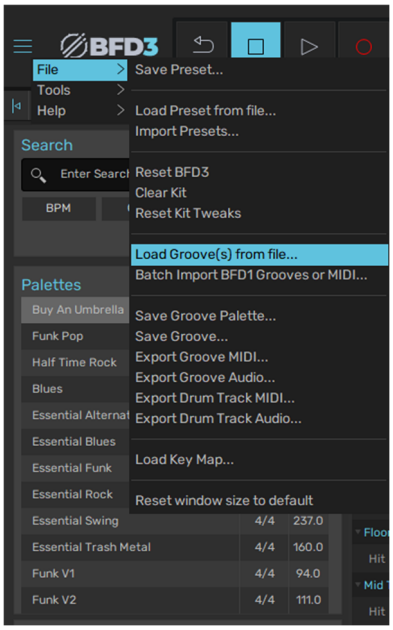
This setting is provided in order to make it easier to compile Palettes from individual Grooves. With the setting activated, double-clicking a Groove in the Browser listing results in loading it to the next free Slot in the Palette. With the setting deactivated, double-clicking a Groove loads it into the currently selected Slot, overwriting the Slot's previous contents.

Sort by

This sub-menu offers various sorting options for the Groove Browser display: items can be sorted by **Name**, **Folder**, **BPM** (tempo), **Time Signature** or **Date Modified**. The **Folder** setting is particularly useful if user Grooves are arranged within sub-folders in the user location or if factory or expansion pack Grooves have been manually rearranged into sub-folders in the factory location.

Additional Groove functions in the BFD3 File menu

Load Groove(s) from file



This function displays a system file open dialog allowing you to browse to and load Palettes or Groove(s) from any location that may not already exist in the database. This may be useful after downloading a Palette made by another user.

For the loaded Palette(s) or Groove(s) to be accessible in the Groove Browser in future, they must be saved after it is loaded into the current session.

If the file type extension is changed to *.MID in the open dialog, this function imports a MIDI file instead, as when using the Import functions described below.

Batch Import BFD1 Grooves or MIDI...

This function is used for converting MIDI files or BFD 1.x Grooves into BFD3 Grooves. See below.

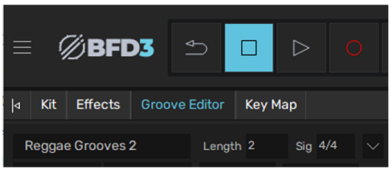
Importing MIDI files and BFD 1.x Grooves

The Groove Browser displays BFD 1.x format Grooves in the Browser if they are found in the scanned content locations. There are several other ways of getting BFD 1.x format Grooves and other MIDI files into BFD3 such using the **File menu** while the Groove Browser is visible.

When they are imported, a MIDI Key Map needs to be consulted to determine which MIDI notes to assign to which BFD3 Drum articulations (see *MIDI Key Maps*). This is specified using the **Import MIDI Key Map** setting in the Preferences (it can also be set in the MIDI Import panel which appears when using the **File menu** import functions).

See the *Importing MIDI Files* section later in this chapter for more detailed information on these functions.

2.4.3 Palette

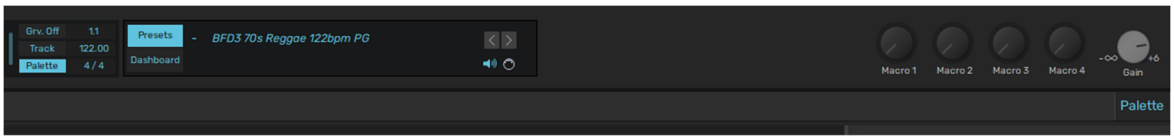


The Palette is central to the Groove engine in BFD3. It represents a “pool” of the Grooves stored in memory and is composed of 128 individual slots.

To show the Palette, the Groove Editor must be visible. Click the **Groove Editor** button in BFD3's navigation bar.

To show the Palette if it is currently hidden, click the **Palette** button near the upper-right corner of the BFD3 interface.

Click the **Palette** button again to hide the Palette when required.



Any Groove used in BFD3 must be assigned to a slot in the Palette, regardless of which of the various playback methods are to be used.

Use the scrollbar or mouse wheel to access the full range of the 128 slots in the Palette.

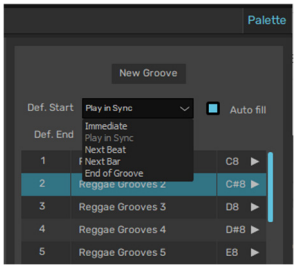
Selecting slots

Click a Groove slot to select it. If the slot contains a Groove, it is now shown in the Groove Editor (if visible) and its **Slot Actions** settings are shown below the Palette.

2.4.3.1 Actions and Fills

Note that Actions *do not* apply to Grooves on the ***Drum Track***. Any structuring of Groove playback over time in the Drum Track must be created in the Drum Track itself by arranging Parts within it using drag and drop.

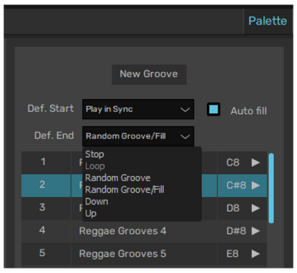
Start Actions



The Start Action defines how a Groove should start playing when triggered.

- **Next Beat:** the new Groove starts on the next beat.
- **Next Bar:** the new Groove starts at the beginning of the next bar.
- **End of Groove:** the new Groove starts at the end of the current Groove.
- **Play in Sync:** the new Groove starts immediately from the position within it that corresponds to the current play position.
- **Immediate:** the new Groove starts immediately from its beginning regardless of the current play position.
- **Default:** this is available for the **Slot Start** Action only and specifies that the slot follows the **Default Start** Action.

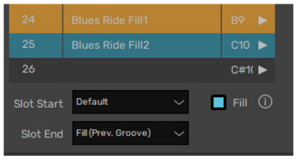
End Actions



The End Action specifies what happens after a Groove completes playback.

- **Stop:** the Groove stops (in effect, stopping Groove playback entirely).
- **Loop:** the Groove repeats.
- **Random Groove:** a random Groove in the Palette is played.
- **Random Groove/Fill:** a random Groove or Fill in the Palette is played.
- **Down:** the Groove in the next slot in the Palette is played.
- **Up:** the Groove in the previous slot in the Palette is played.
- **Default:** this is available for the **Slot End** Action only and specifies that the slot follows the **Default End** Action.

Fill slots and Actions

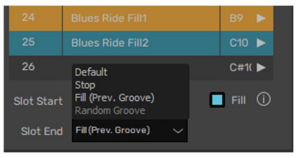


The Slot Actions section contains the **Fill** setting. If this button is activated, the current Groove slot is designated as a Fill slot and highlighted in green.

Designating a slot as a Fill means that it can be triggered if the *Random Groove/Fill* End Action is specified on another slot (the **Slot End** Action of the Fill slot should typically be set to *Random Groove*), or by the **Auto-Fill** button located in the **Default Actions** section.

When activated, the **Auto-Fill** function plays a Fill slot at random at a definable period (a number of bars defined in the Preferences) during Groove playback.

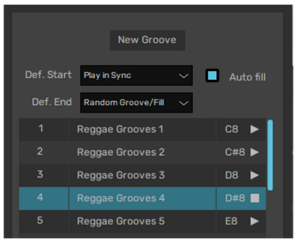
Fill Slot End Actions



Fill slots feature the following **Slot End** Actions:

- **Stop:** Groove playback is stopped.
- **Fill (Prev Groove):** the Groove that was previously playing before the Fill is played again.
- **Random Groove:** a random Groove in the Palette is played.

2.4.3.2 Previewing Grooves



The playback indicators on the right of each slot in the Palette double as **Preview** buttons. Click the button to play the Groove contained within the slot.

Once playback of a Groove has been started, it then follows the behavior defined by its **Slot Actions** settings. Click another slot's **Preview** button in order to start playing the Groove within it instead. The method of transition is dictated by the **Slot Start** Action setting.

Stopping previews

Each Groove can be stopped by clicking its respective **Preview** button again. You can also use the **Stop** or **Panic** buttons in the Transport to stop playback of all currently playing Grooves.

Preview mouse behavior

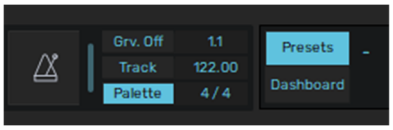
Activating the **Hold mouse button to preview** setting in the ***Groove Editor*** **Tools menu** results in previews being active only while the mouse button is held down on a **Preview** button. When the mouse button is released, playback stops.

2.4.3.3 Playing Grooves

Playing Grooves using Auto-play modes

The **Auto-play mode** function is crucial in determining how the Groove engine is used. It has three modes:

1. **Palette**



   By default, BFD3 is in the *Palette* **Auto-play mode**. In this mode, BFD3 plays back Grooves in the Palette when the transport is started.

   Three sub-modes exist for this mode, configurable in the *Session Preferences* with the **Palette Auto-Play Mode** setting:

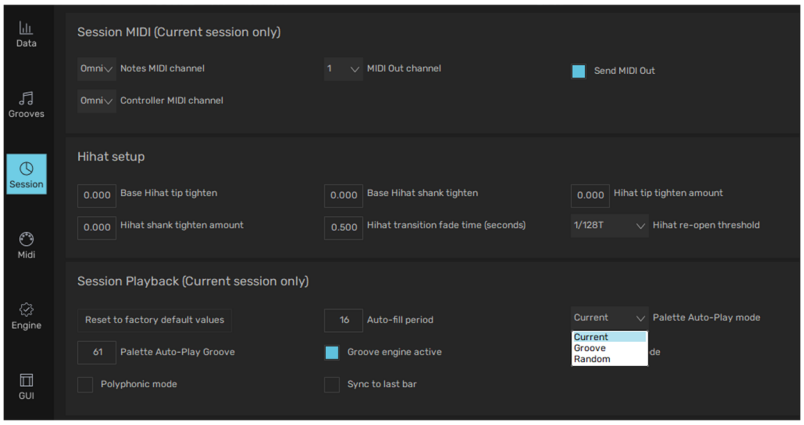
   - **Current**

     When playback is started the currently selected Groove in the Palette is played according to the behavior defined by Slot Actions.

     This is the default sub-mode for the *Palette* **Auto-Play mode**.

     Since the currently selected Groove is also shown in the Groove Editor, this mode is very useful when editing a Groove. Set the Groove's **Slot End** Action to *Loop* so that it keeps looping while you edit.

     Clicking on another Palette slot that contains a Groove causes it to start playing and stops the original Groove.



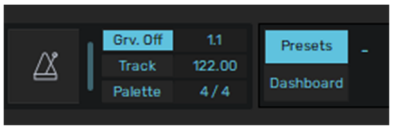
   - **Groove**

     In this sub-mode, you can specify a specific Groove to play when the transport is started. The desired Groove slot is specified via the **Palette Auto-Play Groove** setting in the Session Preferences.

   - **Random**

     In this sub-mode, a random Groove from the Palette is played when the transport is started.

2. **Grv. Off**



   When the **Auto-Play mode** is set to *Grv. Off*, Grooves are only heard when they are played via MIDI notes, or when the **Preview** buttons are used to start playback.

3. **Track**

   Choosing the *Track* **Auto-Play mode** allows you to arrange a sequence of Grooves from the Palette within BFD3's *Drum Track*.

Playing Grooves via MIDI

BFD3's Groove slots can also be mapped to MIDI notes so that they can be played with a keyboard or other controller that sends MIDI notes. Groove slots must be assigned to MIDI keys in BFD3's Key Map panel. The default BFD3 Key Map features MIDI assignments for the first 41 Groove slots.

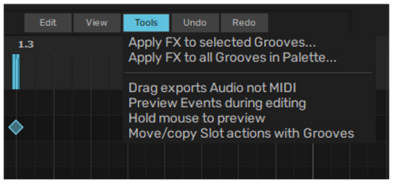
Latching mode

By default, Grooves play while the MIDI note is held down. If the **Latching mode** setting is enabled in the *Grooves Preferences*, playback of a Groove is toggled on and off when its MIDI note is played. In other words, play a Groove's MIDI note once to start playback. Playback then continues as normal according to **End** Actions. Play the same note to stop playback, or use the Stop or Panic buttons in the Transport.

Whichever mode is used, the behavior when the Groove starts depends on its **Start** Action. In most circumstances you would typically set this to *Play in Sync*, *Next Bar* or *End of Groove*.

2.4.3.4 Managing Grooves in the Palette

Moving and copying Grooves



Grooves can be moved and copied around slots using drag and drop. Hold down the ALT key while dragging in order to copy a Groove.

When the destination slot which already contains a Groove, the contents of both slots are swapped. When copying, any destination content is overwritten.

If the **Move/copy slot actions with grooves** setting is enabled in the *Groove Editor* **Tools menu**, a Groove slot's **Fill** status and other **Slot Actions** settings are transferred with its contained Groove when it is swapped with or moved/copied to another Palette slot.

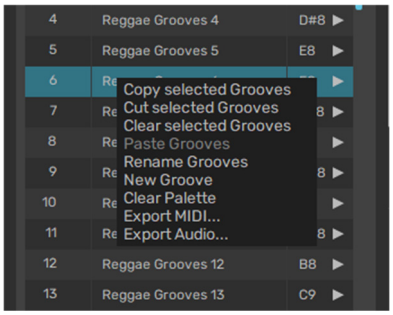
Multiple selections

The above processes can be conducted on multiple selections. Hold down the CTRL or SHIFT keys when clicking to select slots to create arbitrary or contiguous selections.

When multiple Grooves are moved, they are placed on sequential Groove slots ascending from the slot on which they were dropped. If any other Grooves already exist within this sequence of slots, they are swapped into the original slot of the Groove which replaces it.

Even if an arbitrary multiple selection is moved or copied (in other words, the selected Grooves are not all in neighboring slots to each other), the moved or copied Grooves are placed on sequential, neighboring available slots.

Slot context menu

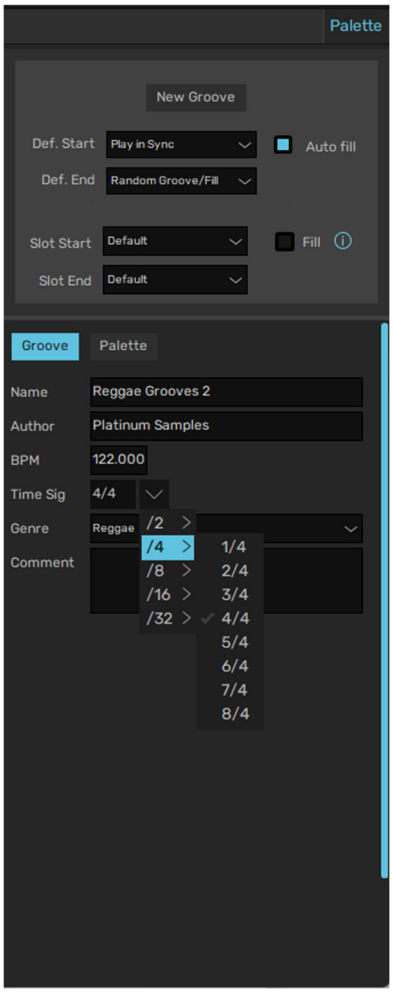


Right-clicking on any selected Groove slot displays the Slot context menu containing a number of further Groove-based operations. The Slot context menu features a number of functions for managing Grooves in the Palette such as the **Cut**, **Copy**, **Clear**, **Paste** and **Rename** functions for selected Grooves. When the **Rename Grooves** function is used on a multiple selection, a numerical suffix is used for the second Groove onwards.

There are also functions to create a **New Groove** (if you want to write or record a Groove from scratch in the **Editor**) to clear the contents of the Palette entirely (**Clear Palette**) and to export selected Grooves as MIDI or audio (**Export MIDI.../Export Audio...**).

The **Cut** and **Copy** functions can also be used to insert Grooves onto the *Drum Track* using the Paste functions on the Part context menu.

Info display



The Info display in the Palette allows you to view and edit additional information for Grooves and the entire current Palette.

Palette Info display visibility

Click the **Info display** button to reveal the display at the lower part of the Palette panel. Click the button again to hide it and devote all available space to the Palette.

The border between the Info display and the rest of the Palette can be clicked and dragged up/down to adjust the visible area of each section.

Info display fields

Click the **Groove** button to show the Groove Info display, and the **Palette** button to show the Palette Info display.

Any changes are stored with the Groove or Palette when it is next saved.

If you have assembled your own set of individual Grooves in the Palette (without starting from a loaded factory Palette), the Palette Info display's fields are empty.

- **Name**

  The name of the Groove/Palette is shown here and can be edited by clicking the field. If no name has been entered, the filename of the Groove or Palette is shown.

- **Author**

  The name of the Groove/Palette author is shown here and can be edited by clicking the field.

- **BPM**

  This shows the recommended tempo of the Groove in beats per minute (BPM), and can be edited by clicking the field.

  Please note that Grooves are always played back at the current tempo, but this field shows what the author considers is the best tempo for the Groove.

- **Time Sig**

  This shows the time signature of the Groove and can be edited using the drop-down menu or by clicking and typing in the field.

  It is possible for the current time signature to be different to that of the individual Groove itself. If this is the case part of the Groove may be looped or truncated as necessary to fit the duration of the bar.

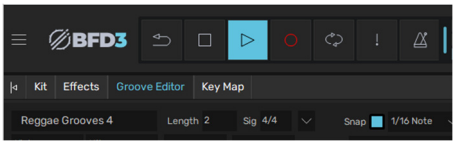
- **Genre**

  Choose the Genre of the current Groove/Palette using the drop-down menu.

- **Comment**

  An additional text field is provided for adding your own notes to the stored information for the Groove/Palette.

2.4.4 Groove Editor

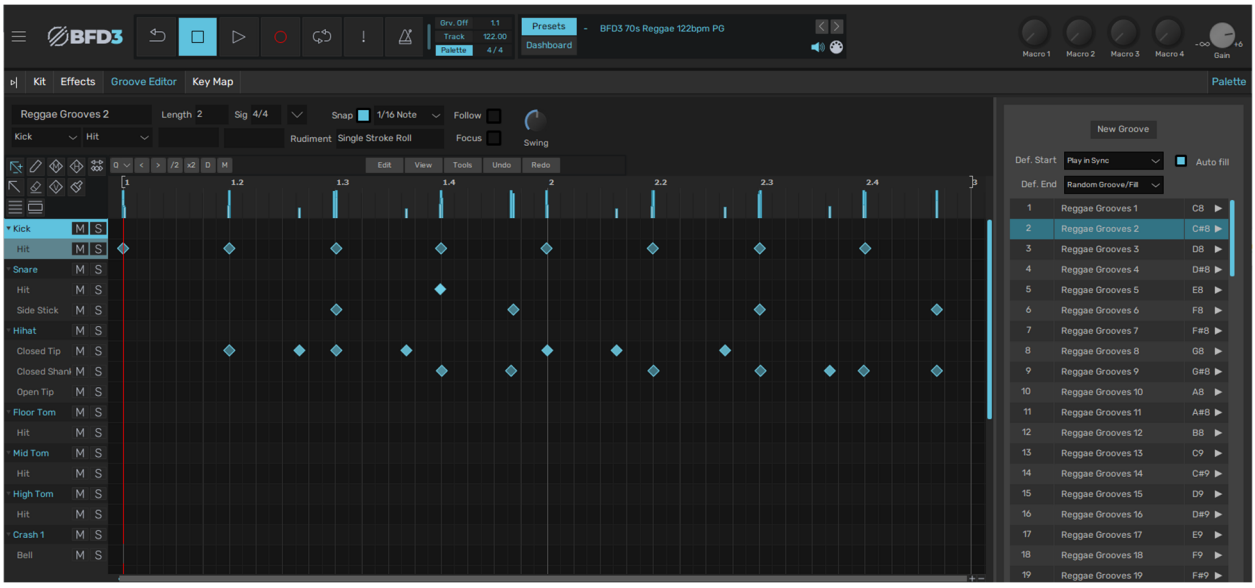


Click the **Groove Editor** button in the main BFD3 navigation bar to open the Groove Editor panel. This panel replaces any other controls in BFD3 with the exception of the Browser and the Global controls.

BFD3's Groove Editor is an advanced, fully functional environment for recording, creating, and editing events within Grooves. As well as the usual kinds of controls you'd expect for inserting, deleting, moving and copying events, the Editor also features specially designed tools for painting sequences of events in rhythmically meaningful ways.

Using the Editor

Click a Groove in the Palette to display its events in the Editor grid.



To start from scratch and create a new Groove, select a slot in the Palette and click the **New Groove** button, or right-click on a slot and use the **New Groove** function on the slot context menu that appears.

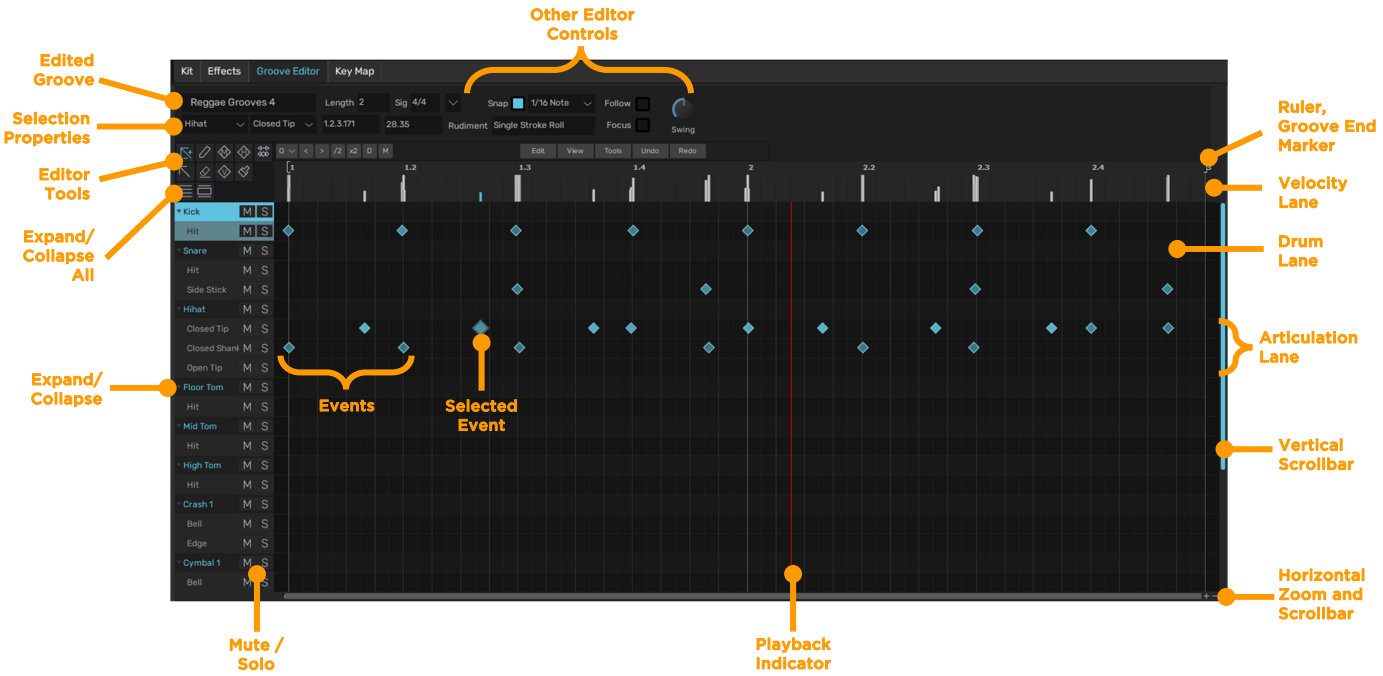
An empty one-bar Groove is created and shown in the Editor grid.

Playing the currently edited Groove

When using the Editor, it can be useful to set the **Auto-play mode** to *Palette* (using the default *Current* sub-mode in the Preferences). This means that every time the BFD3 transport is started, the currently selected Groove, and therefore the Groove shown in the Editor, is played. To continuously repeat the Groove, set its **End Action** to *Loop*. For a guide to these settings, see the previous ***Playing Grooves*** section.

It is crucial to be aware of the End Action settings. If the current Groove's End Action is set to play another Groove when it ends, then the next Groove plays while the previous Groove remains displayed in the Editor. If the **Focus** button is activated, the next Groove is shown in the Editor when it starts playing.

Editor Grid



Edited Groove

This field displays the name of the currently edited Groove. The field can be clicked to enter a new name for the Groove.

Drum lanes

Each Drum slot features its own Drum lane in the editor. This lane shows all events for the Drum's articulations in the current Groove.

Events can be created and edited on the Drum lane, but any newly created events are inserted on the first articulation lane. To edit events with full control, you must use individual articulation lanes.

Note: Some Drum lanes may not be visible with certain **View menu** settings; see below.

Loading Drums from the Browser onto Groove editor lanes

If a Drum is currently selected in the mixer, its Drum lane is highlighted. Drums can be loaded into the kit within the Grooves page either via drag and drop from the Drum Browser to a Drum lane or by double-clicking a Drum to add it to the currently selected Drum slot.

Articulation lanes

To the left of the Drum lane is its **Expand/Collapse** button. Click the button to expand the kit-piece lane to show each articulation within it as a separate lane. Articulation lanes hold all events for the articulation in the current Groove. These lanes can be collapsed again by clicking the **Expand/Collapse** button.

Click the **Expand/Collapse** button to the left of the Drum lane to display a lane for each articulation within the Drum. These lanes show and allow you to edit events for each individual articulation.

The articulation lanes for a Drum can be collapsed by clicking the Drum's **Expand/Collapse** button again.

ALT-click any kit-piece's **Expand/Collapse** button to expand or collapse all kit-pieces' articulation lanes, or use the **Expand All** or **Collapse All** buttons.

Alternatively, activate the **Auto collapse when expanding Event lanes** option in the Editor's **View menu**. When this setting is active, expanding a Drum lane results in collapsing all other expanded Drum lanes.

Mute / Solo

Each Drum lane and all its individual articulation lanes feature **Mute** and **Solo** buttons. Mutes override Solos: if a Drum is muted, none of its articulations' events are heard, irrespective of their solo status. These buttons are not shown when using the **Paint tool** as the area of the interface is used for displaying the indicator for the secondary articulation. See the *Editor Tools* section for details.

Events

Events are shown as "diamonds" on each articulation lane that represent one-shot triggers; in other words, they represent the beginning of each event. There is no way of controlling the duration of events. Triggered sounds play until they decay naturally.

The length of each event depends upon the triggered articulation itself and any damping and choke settings that may be active. A Drum's Choke articulation also stops any other articulations for the Drum that are playing.

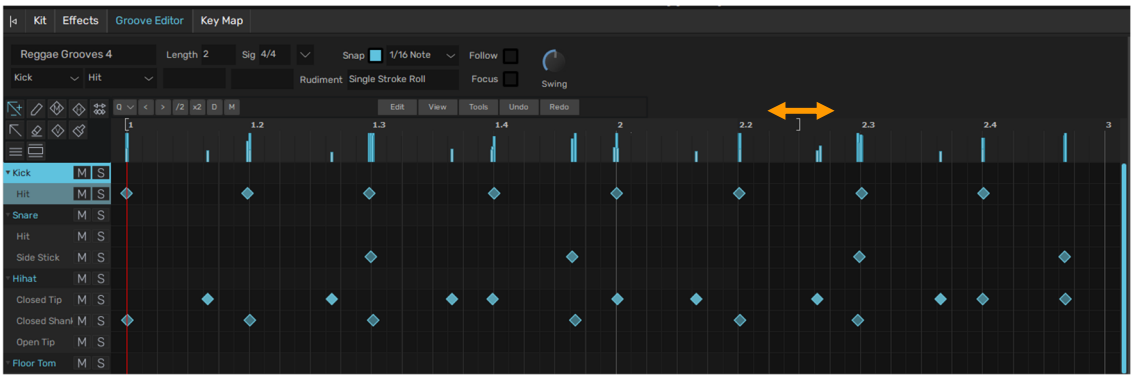
- High velocity events are darker in color than low velocity events.
- Selected events are shown with an outline.
- Muted events are shown as solid white: these do not produce any sound until they are unmuted again.

Ruler and Groove length

The Ruler at the top of the Editor grid shows a timeline in bars and beats. The end of the Groove is represented by the Groove End marker.

To change the length of a Groove, click and drag the **Groove End marker** left or right. The cursor changes to a horizontal arrow.

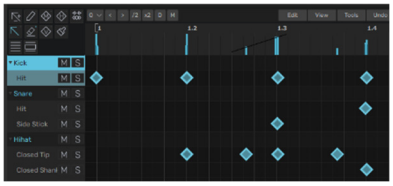
Click and drag at the right edge of the Ruler to increase the Groove length beyond the current workspace. It may be necessary to decrease the current zoom level in order to set the desired length more easily.



The **Len** (**Length**) parameter can also be edited directly to change the Groove's length (see the **Other Editor Controls** section ***below***).

The Ruler can also be used for zooming and scrolling (see the **Zoom and scrollbar controls** section ***below***).

Velocity lane



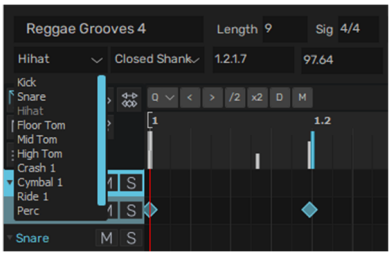
The **Velocity lane** underneath the **Ruler** shows event velocities as vertical stalks, with higher stalks denoting high velocity events, while lower velocity events are represented by shorter stalks.

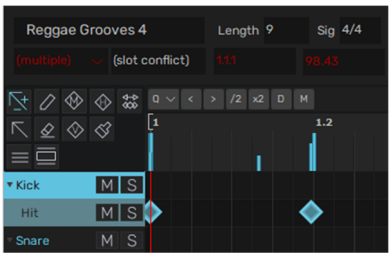
Draw across the velocity lane to "paint" velocity changes. Hold down the ALT key to shape a series of event velocities with a straight line.

If one or more events are selected, the velocity stalks of selected events are highlighted and using the above editing functions affects only the selection.

The **Velocity tool** can also be used for adjusting event velocities (see the ***Editor Tools*** section below).

Selection properties





The **Selection properties** area displays and allows you to directly edit properties for the currently selected event(s).

The **Drum/Artic** controls show the Drum and Articulation triggered by the currently selected event. Click the drop-down menus to move the event to any other Drum/Articulation.

The **Pos/Vel** controls show the Position and Velocity of the selected event. Click each value to type a new value.

If multiple events are selected, the **Drum** control displays *(multiple)*; the events can still be moved to a new Drum using the drop-down menu. Even if the selection involves multiple articulations from multiple Drums, all events are moved to the same Drum, with articulations matched if possible.

The **Pos/Vel** controls display values for the *primary selection*. By default, it is the first selected event, but clicking any event that is part of a multiple selection results in it becoming the primary selection.

Entering a new **Pos** value adjusts the **Pos** value for all selected events relative to the primary selected event. The primary selected event is moved to the newly-specified position with all other selected events moved by the same amount.

Entering a new **Vel** value results in setting the velocity of all events to this value.

Editor Tools

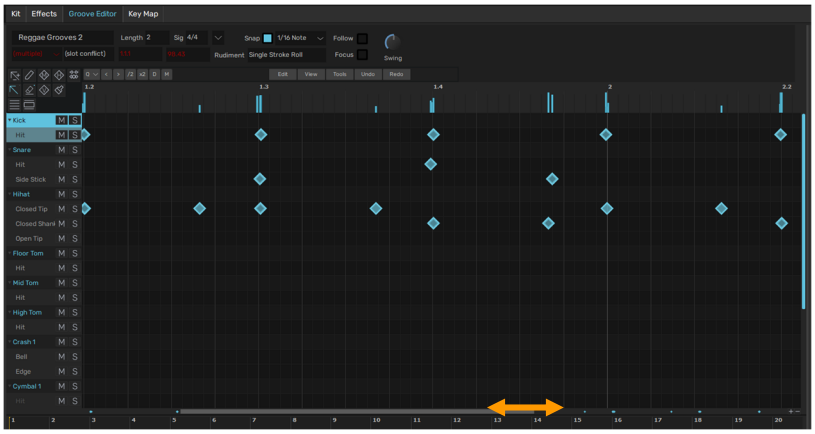
This set of tools provides features for manipulating events directly on the editor grid using click and drag processes. See the *Editor Tools* section for a full guide to using these tools.

Zoom and scrollbar controls

The **Zoom in/out** buttons at the bottom-right of the Editor grid control the horizontal zoom level.

If the Zoom level results in part of the Groove not being visible in the Editor grid, use the **Horizontal scrollbar** to change the visible area. If there are too many kit-pieces or articulations to be visible at once, use the **Vertical scrollbar** to change the visible area.

You can also use the mouse wheel to scroll up and down in the Editor grid. Hold down ALT while using the mouse wheel in order to zoom in and out.



The Ruler can also be used for zooming and scrolling by clicking and dragging:

Click and drag down/up to zoom in/out.

Click and drag left/right to scroll when zoomed in.

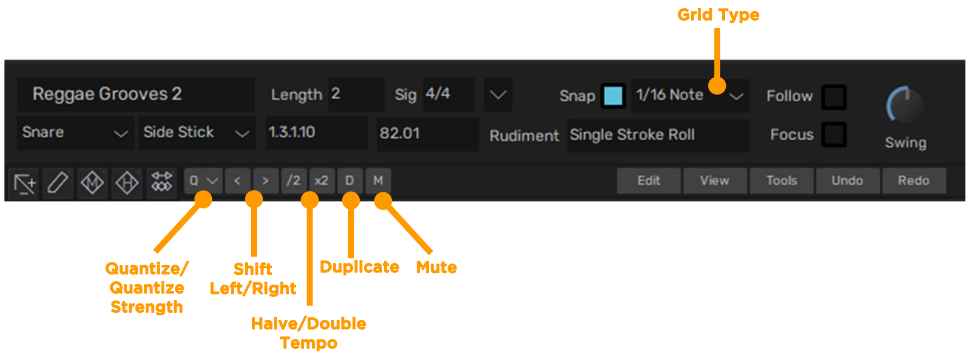
The orientation of the zooming and scrolling can be altered in the Preferences, using the **Invert Ruler Zoom Y** and **Invert Ruler Drag X** settings.

Other Editor Controls

- **Len (Length)**

  The **Len** setting specifies the length of the Groove in bars and beats of the current **Sig** (time signature). Click this value and enter a new numerical value in the form of *bars.beats* to change the length of the Groove.

  Groove length can also be altered by clicking and dragging the **Groove End marker** in the **Ruler**.



- **Sig (Time Signature)**

  This control sets the time signature of the Groove. Click the field to type a new value or use the drop-down menu.

- **Follow**

  When zoomed into a Groove so that only part of it is visible, enabling the **Follow** function causes the display to scroll and follow the playback position indicator. This function also affects the *Drum Track*.

- **Focus**

  By default, the Editor shows the currently selected Groove. With the **Focus** button enabled, the Editor always shows the currently playing Groove instead.

  This means that if, for instance, a Groove's **Slot End** Action setting results in a transition to another Groove, the new Groove is shown in the Editor when the transition takes place.

  With this button disabled, the Editor only ever shows the currently selected Groove.

- **Snap**

  If this function is activated, event drawing and moving operations are snapped to the currently selected grid resolution and to other events in the Groove.

  With the **Show Snap hints** function activated in the **View menu**, a dotted line indicates which other event in the Groove is being used as the snap reference.

- **Grid Type**

  This drop-down menu sets the grid resolution for quantizing and snapping. Straight, triplet and dotted note grid resolutions are available.

- **Swing (Grid Swing)**

  If a straight grid type is chosen, the Swing control moves every off-beat grid division so that events can be entered at or moved/copied to swung positions when the **Snap** function is enabled or when the **Quantize** function is used.

- **Rudiment**

  This function is used in conjunction with the **Paint tool**. See the *Editor Tools* for details.

- **Quantize**

  Clicking this button causes every selected event to be quantized towards the nearest grid division, the extent of which is dictated by the **Quantize strength** setting. The *Groove FX* section allows non-destructive quantizing.

- **Quantize strength**

  This control sets the amount of **Quantize** that is applied. At 100%, events are fully quantized while at lower values, events are quantized proportionally between the original and ideal quantize position.

- **Shift Left**

  Click this button to move every selected event left (earlier in the Groove) by one grid division. Any event moved past the start of the Groove cycles round to the end.

- **Shift Right**

  Click this button to move every selected event right (later in the Groove) by one grid division. Any event moved past the end of the Groove cycles round to the start.

- **/2 (Halve Tempo)**

  x2 (Double Tempo)

  With no events selected, these functions halve or double the tempo between the Groove's events (in other words, the time between them is doubled or halved). With a selection of events, this process is applied only to the selection.

  If necessary, the Groove's length is increased to accommodate the new position of the affected events.

  The *Groove FX* section features non-destructive versions of these functions.

- **Duplicate**

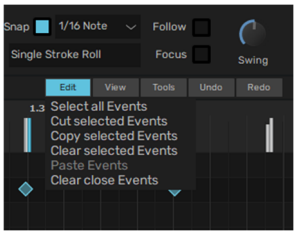
  With no events selected, clicking the **Duplicate** button doubles the length of the current Groove and duplicates its contents to fill this extra period.

  With a selection of events, the events are duplicated from the start of the next grid division. The length of the Groove is increased if necessary.

- **Mute**

  Activating the **Mute** button results in muting the selected event(s). This function can also be achieved using the **Mute tool**.

Edit menu



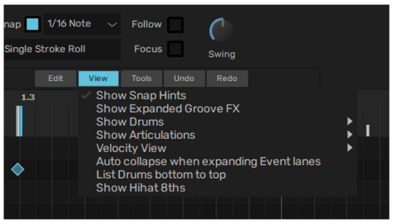
The **Edit menu** provides several selection and editing functions. It is also possible to perform these operations using keyboard shortcuts although many hosts do not allow all keyboard events to get through to BFD3.

As well as commands to **Cut**, **Copy**, **Clear** and **Paste** selected events, there is also a function to **Select all events** in the current Groove.

When using the **Paste events** function with multiple events, the same rules apply as when using the **Selection properties** controls (see above).

An additional function, **Clear close Events**, is useful when editing performances recorded from MIDI controller hardware prone to double-triggering. Electronic drumkits are often susceptible to this problem. The function removes unnecessary notes which are positioned very close together; higher velocity notes are prioritized, and weaker velocity notes are cleared.

View menu



The View menu features a number of settings to customize various aspects of the Editor grid.

- **Show Snap Hints**

  As mentioned earlier in this section, the **Show Snap Hints** function, when activated, displays indicators to show when other Groove events are used as a snap reference.

- **Show expanded Groove FX**

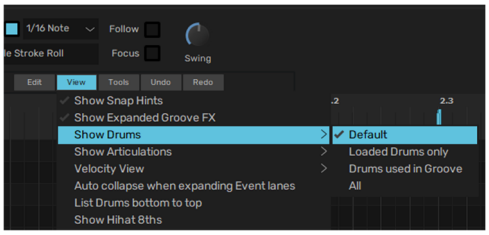
  This function is discussed in the *Groove FX* section later in this chapter.

- **Show Drums**

  Show Articulations

  These sub-menus allow you to customize which Drums and articulations appear as lanes in the Editor grid. The **Drums used in Groove** and **Artics used in Groove** settings result in the fewest possible lanes, although to draw events for an unused Drum or articulation requires you to change to the **Loaded Drums only** or **All** settings.

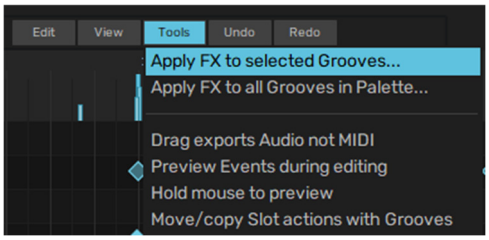
  The **Default** settings for each function are a factory-specified set of lanes.



- **Auto collapse when expanding Event lanes**

  When this setting is activated, expanding a Drum's Event lane results in collapsing all other Drum lanes that may be currently expanded.

Tools menu



- **Apply FX to selected Grooves**

  Apply FX to all Grooves in Palette

  These functions are related to the *Groove FX* section.

- **Drag exports Audio not MIDI**

  This function relates to exporting Grooves (see *Saving and Exporting Grooves*).

- **Preview events during editing**

  With this setting enabled, events are heard when being edited in the Groove editor. This occurs during the following operations:

  - drawing an event
  - selecting an event
  - moving an event to a different articulation lane
  - changing an event's velocity

- **Hold mouse button to preview**

  This setting is identical to that in the Grooves Browser **Options menu** and is discussed in the *Previewing Grooves* section.

- **Move/copy Slot actions with Grooves**

  This function is discussed in the *Managing Grooves in the Palette* section.

Keyboard shortcuts

Many Groove Editor functions can be assigned to keyboard shortcuts using the *GUI Preferences*.

2.4.4.1 Editor Tools

Using the Editor tools

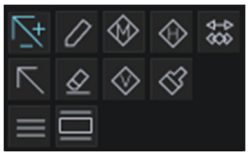
The *Groove Editor* provides a number of editing tools with which to manipulate events within the Editor grid's lanes.

Hearing events during editing

With the **Preview events during editing** setting enabled in the Groove Editor's **Tools menu**, the relevant articulation is heard when entering, selecting, moving, unmuting, and altering the velocity of events.

Multi tool

The **Multi tool** is designed to provide the main functions from several editing tools.



It provides functions on the left and right mouse buttons, and combines functions of the **Select tool**, **Erase tool** and **Velocity tool**.

- **Left mouse button functions**
  - Click an event to select it.
  - Hold down SHIFT while clicking on another event to add it to the current selection. SHIFT-clicking an event which is already selected deselects it.
  - Drag the cursor from an empty area on the editor grid to create a selection of any notes enclosed by the resulting selection box. Hold down SHIFT during this operation to add to an existing selection. Any events which are already selected are deselected.
  - Clicking an event within a multiple selection changes its status to the primary selection. This means that its position and velocity is shown in the Selection Properties section at the top-left of the Groove Editor page, and any adjustment of these values occurs relative to it (see the last section for more details of the Selection Properties controls).
  - Hold down ALT while clicking in an empty part of a lane to draw an event. The position and Drum/articulation of the event can be altered by dragging the event before releasing the mouse button.

  Moving selected events

  Drag a selection left/right to keep it on the same articulation; drag up/down to move it to other Drum/articulation lanes.

  If the **Snap** function is activated, moved events are snapped to the current Grid resolution or to other events in the Groove at the relevant grid division and at the original position between grid divisions. When this function is disabled, selected events can be freely moved with no snapping.

  When events are moved to different sets of articulations or Drums, BFD3 attempts to maintain the arrangement. If the target Drum contains fewer articulations than the original, or if the selection is dropped so that some articulations fall outside the Drum's articulation lanes, the moved events are merged onto the Drum's available lanes.

  Copying selected events

  Hold down the ALT key while moving a selection in order to copy it.

- **Right mouse button functions**
  - Right-click an event to select it.
  - Hold down SHIFT while right-clicking on another event to add it to the current selection. SHIFT-clicking an event which is already selected deselects it.
  - Right-click and drag the cursor from an empty area on the editor grid to create a selection of any notes enclosed by the resulting selection box. Hold down SHIFT during this operation to add to an existing selection. Any events which are already selected are deselected.
  - Right-click and drag up/down on a selection to adjust its velocity.
  - Hold down ALT while clicking an event to delete it.

Specialized editing tools: Select, Draw, Erase, Mute, Velocity, Humanize, Stretch, Paint

For more detailed editing work and certain functions which are not covered by the **Multi tool**, it may be more convenient to use the other specialized tools.

Dual-button tool operation

When using these individual tools, it is possible to assign a tool to each of the left and right mouse buttons. When using a single-button mouse, [CTRL]-click can be used for right mouse button functionality.

- Left-click on a tool to use it with the left mouse button.
- Right-click on a tool to use with the right mouse button. The current right mouse button tool is highlighted by the small "**R**" indicator at the lower-right of the toolbar button.

Since the **Multi tool** itself features dual-button operation, it is not possible to use it in conjunction with other tools in this way.

The currently active tool(s) are retained between sessions. When BFD3 is reinitialized, the tools in use at the end of the previous session are still active.

Select tool

The **Select tool** operates identically to the Left mouse button functions in the **Multi tool**. It can, of course, be assigned to the right mouse button when not using the **Multi tool**.

All events in the current Groove can be selected using the **Select all Events** function in the **Edit menu** or a keyboard shortcut if it is defined in the *GUI Preferences*.

Draw tool

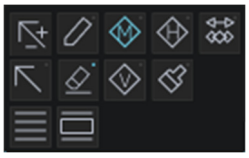
- Click on the grid with the **Draw tool** to create a new event at the cursor position. The velocity of the previous edited event is used. After entering an event, it becomes the current selection.
- If the **Snap** function is enabled, the event's position is snapped to the nearest division at the current grid resolution or to other events in the Groove.
- Drag left/right just before releasing the mouse button to reposition the event in time, snapping to grid divisions and other Groove events.
- Drag up/down before releasing the mouse button to adjust the event's velocity.
- **Using Select tool processes while the Draw tool is active:**
  - When using the **Draw tool**, existing events can be clicked to select them (and SHIFT-clicked to add to an existing selection).
  - While holding down the ALT key, click an empty area of the Editor grid and drag to create a selection of all events enclosed by the resulting selection box.
  - Selections can also be moved or copied using drag and drop in the same way as the **Select tool**.

Erase tool

- Click an event or selection of events with the **Erase tool** to erase it.
- Click an empty area of the editor grid and drag to create a selection box: any enclosed events are deleted.

  Alternatively, a keyboard shortcut can be set up to erase the current selection when any Editor tool is active.

Mute tool



- Click a selection of events with the **Mute tool** to mute the events. If an event or selection is already muted, click it again to unmute it.
- Click an empty area of the editor grid and drag to create a selection box: any enclosed events are muted.
- Clicking a selection which contains both muted and unmunted events results in their state being inverted.

Velocity tool

- Click an event or selection of events and down and drag up/down to adjust their velocity: drag up to increase the velocity of the events; drag down to decrease it.

  The **Velocity tool** can be used on a selection of events to increase their velocities by the same amount. However, trying to adjust values beyond the velocity range results in values being clipped at the minimum or maximum value.

  Event velocities can also be adjusted using the Velocity lane while any Editor tool is active. This function is described in the **Editor Grid** section in *Groove Editor* above.
- **Using Select tool processes while the Velocity tool is active:**
  - When using the **Velocity tool**, events can be clicked to select them (and SHIFT-clicked to add to an existing selection).
  - Click an empty area of the editor grid and drag to create a selection of any events enclosed by the resulting selection box.
  - Selections can also be moved or copied using drag & drop in the same way as the **Select tool**.

Humanize tool

The **Humanize tool** creates subtle randomization which approximates the variance in striking intensity and timing that can be displayed by a human drummer.

- Click and drag up/down on an event or selection of events to humanize the velocity of events in the selection.
- Click and drag left/right to humanize the timing of the events in the selection.
- **Using Select tool processes while the Humanize tool is active:**
  - When using the **Humanize tool**, events can be clicked to select them (and SHIFT-clicked to add to/remove from an existing selection).
  - Click an empty area of the editor grid and drag to create a selection of any events enclosed by the resulting selection box.

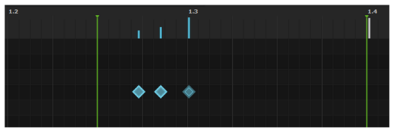
Stretch tool

The **Stretch tool** allows you to stretch a selection of events so that they are grouped more closely or further apart.

Before using the Stretch tool, it is usually necessary to click in the Ruler to create Stretch markers. These are used as anchors for the stretching process, and stretching occurs relative to them.

Then, click and drag the first or last event in the selection towards the left or right to compress or stretch the events relative to the Stretch marker(s).

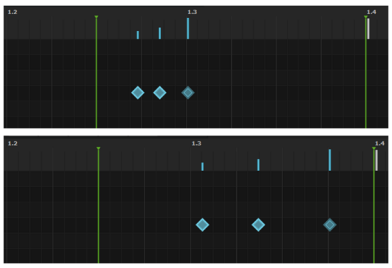
Any events that exist at the exact point of a Stretch marker are not moved during Stretch operations.



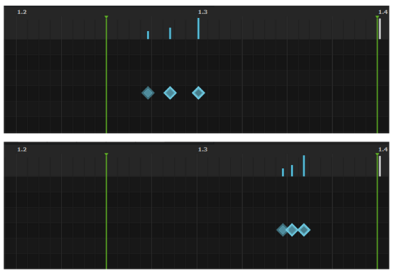
If no Stretch markers are created, all stretching occurs relative to the start of the Groove.

A selection of 3 events could be stretched as follows:

- Click and drag the last note in the above selection to stretch the selection out as follows:



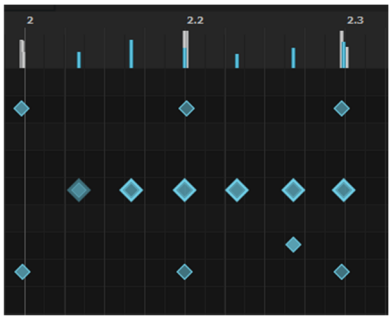
- Click and drag the first event in the above selection to stretch the entire selection relative to the Stretch marker:



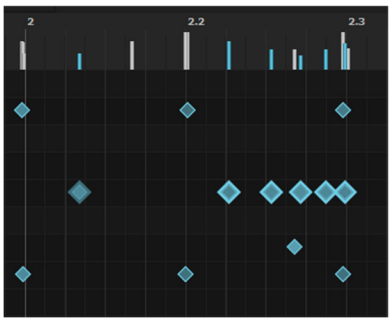
Creating accelerando / decelerando effects

The Stretch tool allows you to create events that “speed up” or “slow down” within a period of time. This can be performed with or without Stretch markers as follows:

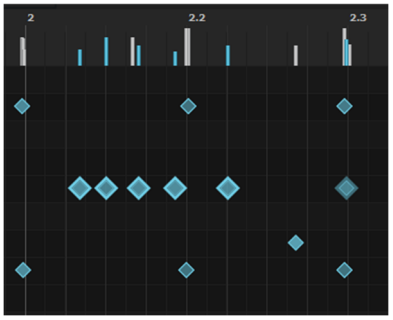
i. First select some events (no Stretch markers are currently active).



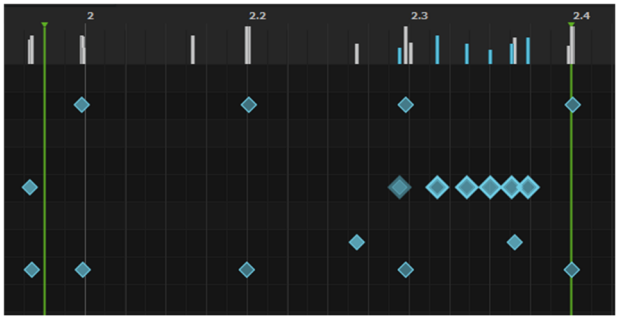
ii. Click/drag the events towards the right while holding down the ALT key to create an accelerando effect within the bounds of the selection.



iii. Click/drag the events towards the right while holding ALT to create a decelerando effect.



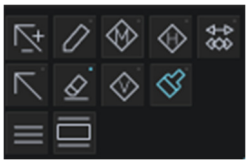
iv. With Stretch markers active, the effect is created relative to the markers rather than within the bounds of the selection.



Using Select tool processes while the Stretch tool is active:

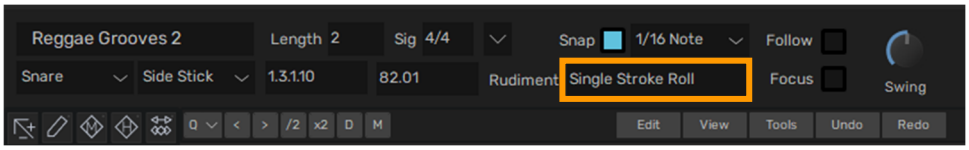
- When using the **Stretch tool**, events can be clicked to select them (and SHIFT-clicked to add to/remove from an existing selection).
- Click an empty area of the editor grid and drag to create a selection of any events enclosed by the resulting selection box.

Paint tool



The **Paint tool**, in conjunction with the **Rudiments menu**, offers an easy way to create a rhythmically meaningful series of events in a single action. Events are created with velocity and position data to create convincing rhythmic lines like rolls, paradiddles and more.

Click the **Rudiment** button to show the Rudiments menu, described on the next page. This panel allows you to browse and select between various types of drumming pattern to "paint" onto one or two lanes in the Editor grid with the **Paint tool**.



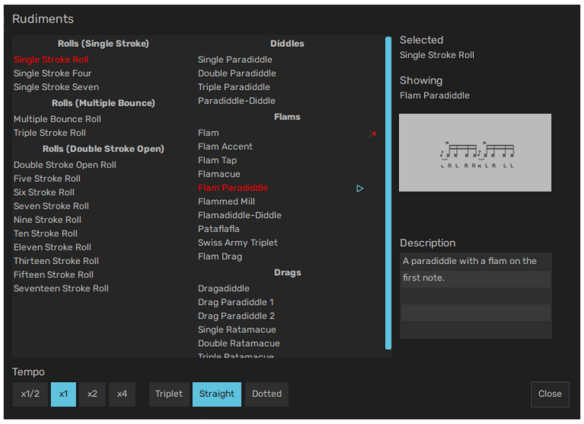
Rudiments menu

The Rudiments menu displays a variety of drumming patterns or "Rudiments" which can be selected to use with the **Paint tool**.

The currently selected Rudiment is highlighted in blue with its name listed under the **Selected** heading on the right side of the panel.

The cursor can be moved over any other Rudiment in order to highlight its **Description** and musical score pattern in the displays on the right, with its name listed under the **Showing** heading.

Each Rudiment displays a **Preview** button when it under the cursor. Click the button to hear a preview of the rudiment pattern with the currently loaded Snare.



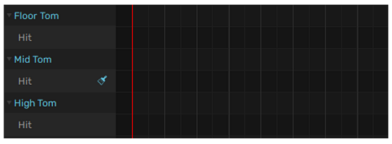
The **Tempo** section at the lower part of the Rudiments panel allows you to adjust the rudiment pattern to Half (**x1/2**), Double (**x2**) or Quadruple (**x4**) the timing of the original pattern (**x1**).

This section also selects between **Straight**, **Triplet**, and **Dotted** feels.

Click any Rudiment to select it as the current Rudiment, or click the **Close** button to exit the panel without changing the currently selected Rudiment.

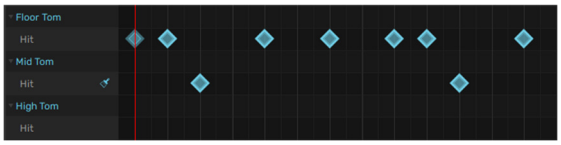
Painting with the selected Rudiment

To paint events onto two articulations, first right-click on the name of the desired secondary articulation. This allows you to recreate typical left/right hand patterns on two Drum articulations. The secondary articulation can be considered as the "left" hit for a right-handed drummer, or vice-versa.



This function should not be used if you intend to paint onto a single articulation.

Then, simply paint across the lane from the desired starting point for the desired articulation. Events are painted in the selected Rudiment pattern across the articulation lane(s).



After creating the first event, drag up/down to adjust the velocity of the event. All subsequently painted events' velocities are created relative to that of the first event.

The following additional actions are available before releasing the mouse button:

- Drag up/down to increase/decrease the event velocities over the course of the painted sequence.
- Drag up/down while holding down the ALT key to increase/decrease the velocity of each secondary event within the pattern - these events would occur on the secondary articulation if one has been selected previously.

2.4.4.2 Saving and Exporting Grooves

Overview

Saving Grooves and Palettes

The currently selected Groove or the entire Palette can be saved using the **Save Groove** and **Save Groove Palette** functions in the *BFD3 File menu*. Grooves are stored in BFD3's own format - they are not MIDI files. To create MIDI files from Grooves, it is necessary to use the Export features.

Exporting Grooves and the Drum Track using the File menu

The **File menu** contains the **Export Groove MIDI**, **Export Groove audio**, **Export drum track MIDI** and **Export drum track audio** functions.

Exporting Grooves using drag & drop

Grooves can also be exported via drag & drop, either to MIDI or audio tracks in your host/DAW or to an OS file window as MIDI or audio files.

Grooves can be dragged from *Palette* slots, or entire Palettes and Grooves can be dragged directly from the *Grooves Browser*.

If the **Groove drags Audio not MIDI** setting is activated (in the *Groove Editor* **Tools menu** or the *Grooves Browser* **Options menu**), all drag and drop exports occur as audio rather than MIDI.

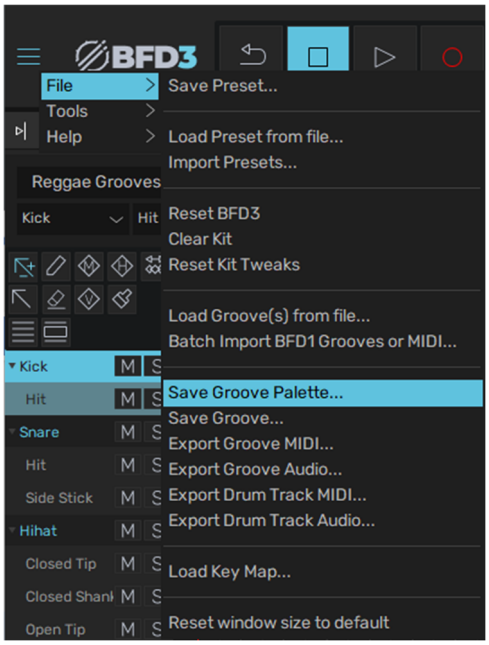
Saving Grooves and Palettes

To save an individual Groove, use the **Save Groove...** function in BFD3's **File menu** while the desired Groove is selected or, to save the current Palette, use the **Save Palette** function.

This function opens a system file save dialog prompting for a location and filename.

It is recommended to use the default location **<user location>/Grooves** so that it remains accessible from the Grooves Browser after rescanning content locations (see *Setting Up Additional Content*). Subfolders within this folder can also be used. Wherever a Groove or Palette is saved, it is added to the current BFD3 database.

The information specified in the Groove/Palette Info display is saved with Palettes. Additionally, the Library field of saved Grooves/Palettes is set to *User*.



Naming the saved Groove or Palette file

The current name of the Groove or Palette, as defined in the Groove/Palette Info display, is the default filename shown when saving. Type a different filename if required and then hit ENTER or click the **Save** button in order to save the file. If a new filename is specified, you are prompted whether the name stored in the Groove or Palette Name field should also be changed.

The Name field is used to label the Groove/Palette in BFD3's database, so setting the Name properly is important for locating the item in future.

BFD3 Groove format

When a Groove is saved in this way, it is stored in BFD3's proprietary Groove format—this is not a MIDI file. The reason for this is that Grooves contain events related directly to BFD3's articulations, meaning that accurate playback is not dependent on a corresponding MIDI Key Map.

To save a Groove as a MIDI file, the **Export Groove MIDI** function should be used.

BFD3 Palette format

When a Palette is saved, the entire state of the Groove page is saved with it. In other words, it contains the following:

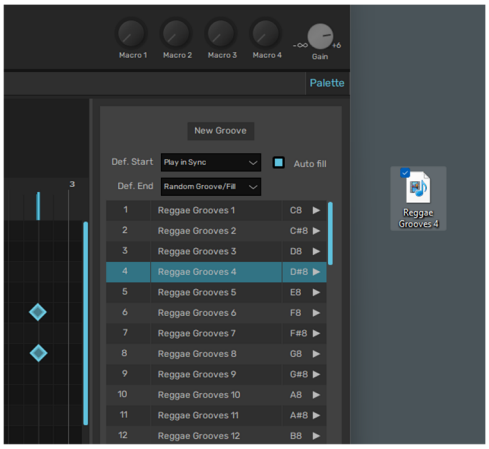
- constituent Grooves
- the currently selected Groove
- settings for Default and individual Slot Groove Actions
- Groove FX settings
- settings in the Groove Editor (such as grid swing, view settings, etc.)
- Auto-Play settings
- the contents of the Drum Track

When reloaded, a Palette overwrites all current settings in the Groove engine.

If the Palette is intended for a certain Kit, Mixer, and Key Map setup, it is recommended that a BFD3 Preset is saved for easy recall. This saves the entire state of BFD3 to one file.

Exporting Grooves as MIDI

Exporting Grooves as MIDI using drag & drop



Single Grooves or multiple selections can be exported via drag and drop, either to a MIDI file or to a MIDI or audio instrument track in your host sequencer. As mentioned earlier, the **Groove drags Audio not MIDI** setting must be *deactivated* for this to occur.

To initiate a drag & drop export, select either:

- One or more Grooves in the Palette and drag them outside the BFD3 window.
- One or more Grooves or Palettes from the Grooves Browser and drag them outside the BFD3 window.

Then proceed as follows:

- **Exporting to a MIDI file**

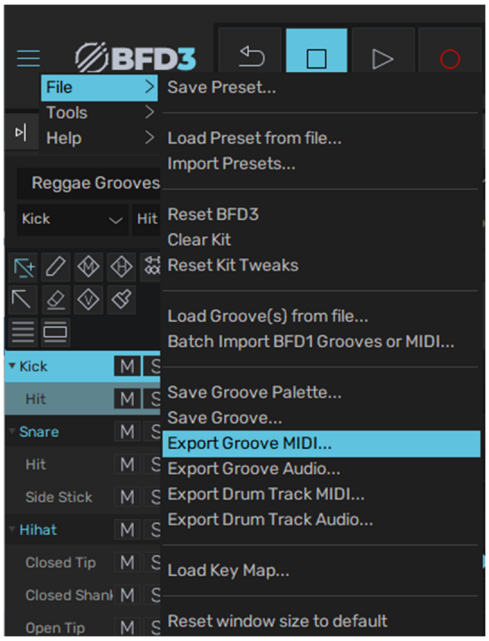
  If the selection is dropped onto a suitable save location—in other words, the desktop or a folder shown in a system file browser window—the Grooves are saved as individual MIDI files at the destination.

- **Exporting to a host MIDI track**

  If the Groove selection is dropped onto a MIDI or audio instrument track in your host sequencer while running BFD3 as a plugin, each Groove is created as a MIDI part sequentially from the point at which they are dropped.

  This functionality depends upon the host's level of support for MIDI file import via drag & drop. Some hosts may support drag & drop of single files but not multiple files, and others may not support drag & drop at all. Please consult your host's documentation or technical support services to determine how it reacts to drag & drop of MIDI files.

Exporting Grooves as MIDI using the File menu



The BFD3 **File menu** provides the **Export Groove MIDI...** function, which displays a system file save dialog prompting for the location to which to export the current selection of Grooves as individual MIDI files.

The name of each Groove is used as the filename (with a .mid extension).

Exporting the Drum track as MIDI

The entire *Drum Track* can be exported as a MIDI file using the **Export Drum Track MIDI...** function in the **File menu**.

A system file save dialog is displayed, prompting for a filename for the saved MIDI file (saved with a .mid extension). If required, navigate to a different location before typing a filename, and then hit ENTER or click **Save**.

MIDI Export settings

The current MIDI Key Map is used for mapping Drum articulation events to MIDI notes when exporting Grooves or the Drum Track. If an articulation is mapped to more than one key, the lowest key to which it is mapped is used for its MIDI events in the exported file.

Using the **MIDI export mode** setting in the *Grooves Preferences*, exported MIDI files can be set to contain *One track for all Drums*, *One track per Drum* or *One track per articulation*.

Exporting Grooves as Audio

Audio Export settings

The settings in the mixer's Export panel (see *Exporting Audio from BFD 3*) are used for the **Export Folder**, **File Prefix**, and **Bit Depth**, while the **Record-enable** buttons on each mixer channel are used to determine which channels are exported. A separate audio file is generated for each mixer channel enabled for recording. If you attempt to initiate an export before a valid **Export Folder** has been set, an error message is displayed to inform you of this fact, and the operation is cancelled.

If the **File menu** functions below are used and no channels are currently Record enabled in the mixer, BFD3's behavior when performing the export function is dictated by the **Auto-arm Mixer Channels for audio export** setting in the *Grooves Preferences*:

- **Manual**

  An additional panel is displayed with the Export panel settings so that it is not necessary to cancel the operation and switch to the mixer.

- **Master**

  The stereo Master channel is automatically Record enabled and the export function commences.

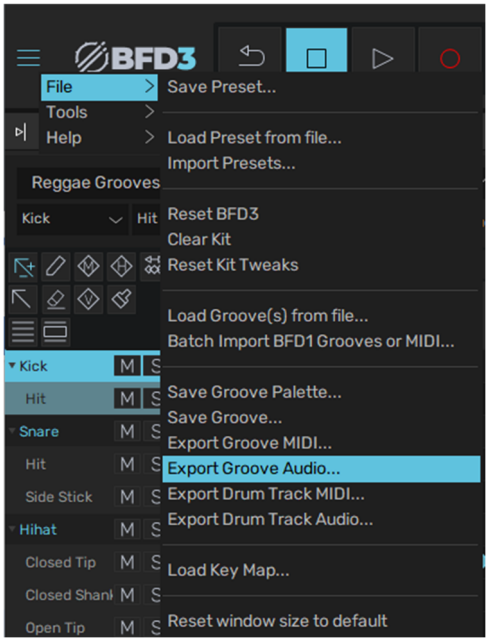
- **All**

  All mixer channels are automatically Record enabled and the export function commences.

Exporting Grooves as Audio using the File menu

The current selection of Grooves can be exported as audio files using the **Export Groove Audio...** function on BFD3's **File menu**. The resulting files are cut to the exact length of the Groove at the current tempo, with an optional tail that can be defined in the BFD3 preferences.

If multiple Grooves are selected, a separate set of audio files is saved in a separate folder for each selected Groove.



Exporting the Drum track as audio using the File menu

The **Export Drum Track Audio...** function in the **File menu** performs an audio export of the Grooves in the Drum Track, from the beginning to the end of the last part on the track.

Optionally, a tail can optionally be added in order to capture any lingering decays at the end of the track. The size of the tail is defined in the preferences.

Exporting Grooves as Audio using drag and drop

Single Grooves or multiple selections can be exported via drag and drop, either to an audio file or to audio tracks in your host sequencer. As mentioned earlier, the **Groove drags Audio not MIDI** setting must be *activated* for this to occur.

Grooves can be dragged from ***Palette*** slots, or entire Palettes and Grooves can be dragged directly from the ***Grooves Browser***.

When performing a drag and drop export, the Export panel settings are not shown even when the **Auto-arm Mixer Channels for audio export** setting is set to *Manual* in the Preferences—the mixer's current Export panel settings are always used. If no channels are currently Record enabled, the export automatically Record enables the stereo Master channel before starting the export operation.

To initiate a drag & drop export, select either:

- One or more Grooves in the Palette and drag them outside the BFD3 window.
- One or more Grooves or Palettes from the Grooves Browser and drag them outside the BFD3 window.

Then proceed as follows:

- **Exporting to an audio file**

  If the selection is dropped onto a suitable save location (in other words, the desktop or a system file browser window), the Grooves are saved as individual audio files at the destination.

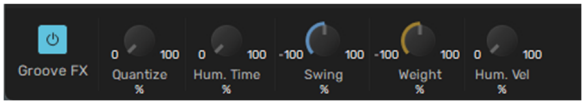
- **Exporting to a host audio track**

  If the Groove selection is dropped onto an audio track in your host sequencer while running BFD3 as a plugin, Grooves are created as sequential audio clips from the point at which they are dropped.

  If multiple channels are record enabled in the mixer, BFD3 instructs the host to create new tracks of the relevant mono/stereo types to import the audio. This functionality depends upon the host's level of support for audio file import via drag & drop. Please consult your host's documentation or technical support services to determine how it reacts to drag & drop of audio files.

2.4.5 Groove FX

Using the Groove FX section

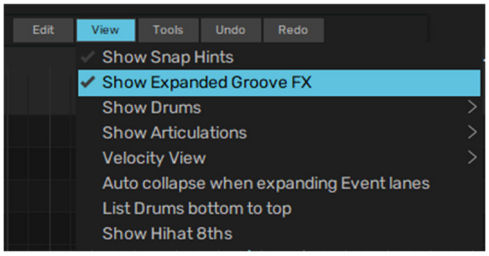


The **Groove FX** section can apply a number of non-destructive real-time processes to change the feel of the Groove engine's output. As well as making Grooves sound more 'humanized' or more mechanical, you can adjust the dynamics, complexity, and amount of swing-style syncopation.

The **Power** button enables or disables the Groove FX section.

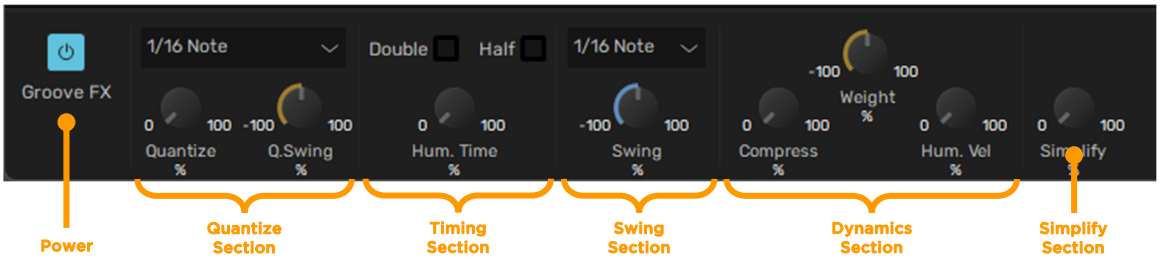
With the **Power** deactivated, Grooves are played exactly as their contents dictate.

Simple and Expanded views

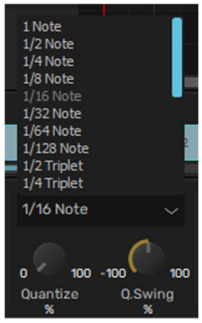


By default, the Groove FX section is shown with minimal controls. To display the full set of Groove FX controls, activate the Show Expanded Groove FX setting in the Groove Editor's View menu.

Expanded Groove FX controls



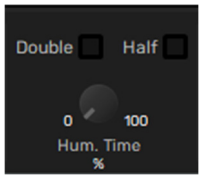
Quantize section



The Quantize section allows you to force events to a timing grid specified by the **Quantize resolution** drop-down menu. The setting of the **Quantize** control dictates how much quantization is applied. With the control turned to the maximum setting, events are fully quantized. Lower settings can tighten the timing of events while leaving some of the original feel intact.

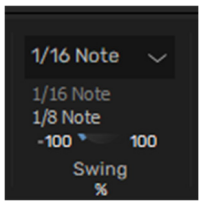
The **Q.Swing** control applies a variable amount of swing to *1/8*, *1/16*, *1/32*, *1/64* and *1/128* settings in the **Quantize resolution** drop-down menu. This control should not be confused with the Swing section elsewhere in the Groove FX.

Timing section



The **Double** and **Half** buttons simply change the tempo of the Groove engine to double-time or half-time. The **Hum. Time** (Humanize Time) control introduces random variations in timing which approximate the slight fluctuations in timing of a real drummer.

Swing section



The Swing controls allow you to add classic drum-machine style swing/shuffle to the output of the Groove engine. The **Swing Template** drop-down menu sets the timing grid, while the **Swing** control sets the amount of swing. Values higher than the center position result in swung events occurring later, while values lower than the center make swung events occur earlier.

When used in conjunction with each other, the Quantize and Swing sections allow you to neutralize the feel of a variety of Grooves and apply a totally different feel to them. Because of the number of variable controls in these two effects, a huge range of different timing feels can be achieved.

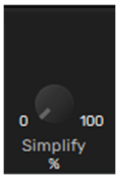
Dynamics section

The **Compress** control reduces the range of dynamic variation of the Groove engine output. As it is increased, the velocity of quieter events is increased. Turning it all the way to the right makes all events play at the maximum velocity, assuming that other Groove FX processes that affect event velocity are inactive. This function should not be confused with an audio compressor - it is instead an event velocity compressor, the effect of which is akin to telling a drummer to use less intense accenting or, at extreme settings, to play every hit at exactly the same intensity.

The **Weight** control allows you to scale up or down the velocity of playing Groove events. This is like asking a drummer to play more softly or harder overall. It is useful as a "makeup velocity gain" control when used in conjunction with the **Compress** control. The **Weight** parameter works in a similar way to the **Dyn** control in the BFD3 Dashboard although it applies only to the Groove engine. Any triggering of articulations via the Key Map is unaffected.

The **Hum. Vel.** (Humanize Velocity) control applies varying degrees of randomization to Groove event velocities. Subtle settings recreate the effect of human variance when a real drummer plays.

Simplify section

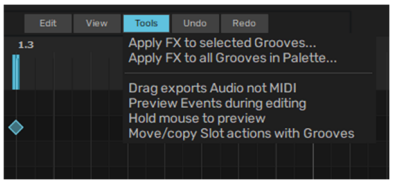


The **Simplify** control dials in an algorithm that selectively mutes events in terms of "importance" to the Groove. It could be described as a "complexity gate," with the control acting as a threshold parameter. It is very useful if you find a Groove to be too "busy," such as if a lot of ghost notes intrude upon the rest of your song too much.

The function judges events based on their velocity and distance from the current Quantize grid settings. At smaller settings, low velocity events that are a substantial distance from the quantize grid division are muted. As the parameter is increased, more and more events are removed to further simplify the Groove.

Applying Groove FX destructively

The Groove Editor's **Tools menu** features two functions for applying the current Groove FX settings permanently to Grooves in the Palette.



- **Apply FX to selected Grooves**

  This function destructively applies the currently active Groove FX functions to the current selection of Grooves. After the functions have been applied, you are prompted whether the Groove FX section should be powered off. If the Groove FX processes remain active, they continue to be applied in real time to the already processed Grooves.

  Any randomization-based functions are, of course, entirely random. If the result is undesirable, use the **Undo** function and try again.

- **Apply FX to all Grooves in Palette**

  This function is similar to the above, except all the Grooves in the Palette are destructively processed with the current Groove FX settings.

2.4.6 Drum Track

2.4.6.1 Drum Track Overview

The Drum Track is a simple single-track arrangement tool for Grooves in the Palette.

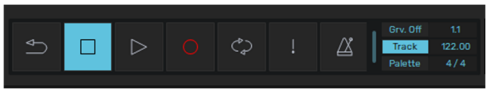
This feature is particularly useful if you use the standalone version of BFD3 as a live drum accompaniment tool. You can put together a whole song's drum arrangement with as many changes as you like, manipulating each part in the ***Groove Editor***.

The state of the Drum Track is saved with Palettes and BFD3 Presets, making it easy to quickly load up a whole song's worth of drums in new projects.

Another useful feature of the Drum Track is the built-in offline export functions (see ***Saving and Exporting Grooves***) allowing you to export the entire track as a multi-channel bounce faster than real time.

Enabling the Drum Track

To enable the Drum Track, the **Auto-play mode** must be set to *Track*.



Adding Grooves to the Drum Track

Adding Grooves to the Palette is as simple as dragging them to the desired position either from the ***Palette*** or directly from the ***Groove Browser.*** When dragging Grooves from the Browser, they are added not only to the Drum Track but also to the Palette. Grooves in the Drum Track are called *Parts*. It is also possible to right-click and **Copy** a Groove in the Palette, right-click in the desired position in the Drum Track and **Paste** the Groove.

If the **Auto-play mode** is not yet set to *Track*, it is set automatically when a Part is added.

Parts

Once a Groove has been dropped onto the Drum Track, it is referred to as a *Part*. It is important to remember several facts about Parts in the Drum Track:

- *Drum Track parts reference Palette Groove slots.*

  Parts on the Track are actually instructions to play a Groove from the current palette.

  If you attempt to clear a Palette Groove which is used in a Drum Track Part, the Part is also cleared from the Drum Track. You are prompted for confirmation before proceeding.

- *Default and Slot Groove Actions are ignored.*

  Parts on the Drum Track do not follow the Default and Slot Groove Actions of their original Grooves. Any structuring of Parts over time must be explicitly created in the track itself.

- *Only one Part can be played on the Drum Track at any one time.*

  The Drum Track has a single "layer." It does not permit any type of layering of multiple Parts on top of each other. Only one Part can be playing on the Drum Track at once.

Drum Track synchronization

Playback follows the host tempo and time signature if you are running BFD as a plugin within a host, and synchronizes to its the host playback position when the host transport is running.

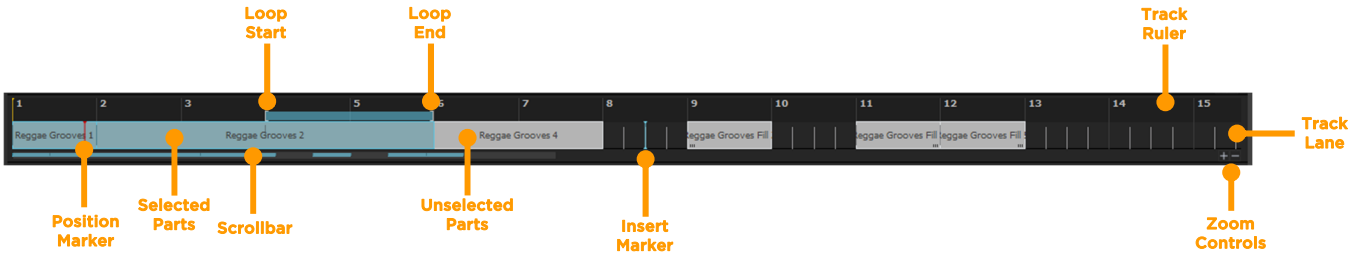
If you are using the standalone version of BFD3, or if the host transport is stopped, BFD3's internal transport can be used.

It is not possible to create tempo or time signature changes in the BFD3 Drum Track. If you need such functionality, you must use a host that is capable of this.

The Drum Track can, however, follow host tempo changes. It also tracks host time signature changes, but does not represent them graphically.

If you use tempo and time signature changes, it is recommended that you sequence BFD3's sounds entirely from a suitable DAW.

Drum Track interface



Track ruler and Track lane

The **Track ruler** represents the Drum Track timeline in bars and beats. Grooves are added as *Parts* into the **Track lane** using drag and drop from the Palette or the Groove Browser. Only one Part can play on the Track at any one time.

Markers

- **Position marker**

  The **Position marker** indicates the current playback position when the Drum Track is playing.

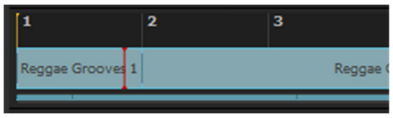
  Double-click in the **Track ruler** (outside any loop indicator) to set the blue position marker. If the Drum Track is currently playing, the playback position immediately moves to this new position. This also results in disconnecting host sync when playing in sync with the host/DAW while running BFD3 as a plugin.

- **Insert marker**

  The **Insert marker** indicates the insertion point when adding a part to the Drum Track and when moving or copying parts within it. It also specifies the point at which part split operations occur.

  To change the position of the **Insert marker**, click the desired position in the **Track lane**.

- **Start marker**

  When in standalone mode or when the host transport is stopped, the white **Start marker** specifies the point at which playback starts. By default, the Start marker is set at the start of the Drum Track.

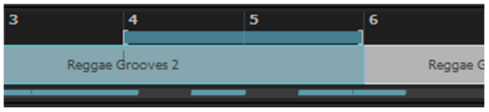
  To set the **Start marker**, ALT-click at the desired point in the Track ruler.

  If the **Position marker** has passed the **Start marker**, clicking the Return to start button causes the playback position to return to the position specified by the Start marker.

  If the **Position marker** has not yet reached the **Start marker**, clicking the **Return to start** button causes the playback position to return to the start of the Drum Track.

  The **Return to start** button can be used during playback. The playback position shifts immediately to the **Start marker** point with playback continuing. If this is performed while running BFD3 as a plugin in a host/DAW, the same behavior occurs but synchronization with the host is disconnected.

- **Loop start and end markers (Looped playback only)**

  When the **Loop** button is enabled on the BFD3 Transport, the **Loop start** and **Loop end** marker appear on the Drum Track ruler. When the position marker reaches the Loop end marker, playback loops back to the position specified by the **Loop start** marker.

  Click and drag the **Loop start** and **Loop end** markers by clicking and dragging them left/right along the **Track ruler**.

  Both the loop start and end markers can be moved simultaneously by click-dragging the red area in the ruler between the markers.

Zoom controls and scrollbar

The **Zoom in/out** buttons at the bottom-right of the Drum Track display control the horizontal zoom level of the Drum Track. If the zoom level results in part of the Drum Track not being visible, use the **Scrollbar** to change the visible area.

The right or left edge of the **Scrollbar** can also be dragged left/right to change the zoom level. An overview representation of the Drum Track's Part arrangement is shown within the **Scrollbar**.

It is also possible to use your mouse wheel to change the zoom level - hold down ALT while scrolling.

Editor controls relating to the Drum Track

The following buttons are located above the ***Groove Editor*** grid and affect aspects of the Groove Editor's behavior.

- **Focus**

  With the **Focus** button activated, the Editor shows the Groove that is currently playing in the Drum Track. With the button deactivated, the Editor always shows the selected Groove in the Palette.

- **Follow**

  When zoomed into the Drum Track so that only part of it is visible, activating the **Follow** button causes the display to scroll, following the playback position indicator.

2.4.6.2 Working with the Drum Track

Adding Parts to the Track

Adding a part between 2 other parts

To add a part between 2 other parts, drag and drop the part from the Palette or Browser to the Track ruler.

This technique also applies when moving or copying Parts within the Drum Track (see below).

Adding a part over another

Drag and drop a part over an existing Part to replace it.

Existing Parts are shortened if they are only partially replaced by the new Part - note the truncation indicator at the lower-right of the Part.

This behavior also applies when moving or copying Parts within the Drum Track (see below).

Selecting Parts

Click on a Part to select it. Several adjacent Parts can be selected by clicking on the song background and drawing a selection box over the desired Parts.

Any currently selected Parts are highlighted.

You can also multiple-select parts in the following ways:

- CTRL-click on a Part (Windows)
- CMD-click on a Part (Mac)

Adds the Part to the current selection. If the Part is already selected, this process de-selects it.

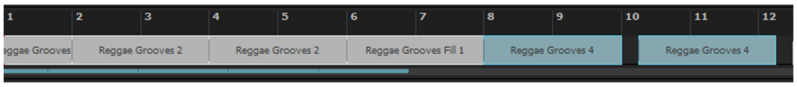
- SHIFT-click on a Part

Creates a contiguous selection between two Parts.

Moving and copying Parts

Click a Part (or selection of Parts) and drag it left/right to move its position within the Track lane.

Hold down ALT during the drag & drop operation to copy the Part(s).



Parts can also be dropped between or over existing Parts in the same way as the operations described above to add Parts.

Additionally, it is also possible to use the Part context menu's **Cut**/**Copy**/**Paste** functions (see below).

Changing the size of Parts

It is possible to change the length of a Part by clicking and dragging its left and right edges. Any truncation is reflected in the Groove Editor display; any truncated areas are greyed out on the Editor grid.

Click and drag its left edge to the right in order to shorten a Part, changing its start point. Note the truncation indicator at the lower-left of the Part.

Drag the edge towards the left to lengthen an existing shortened Part.

Click and drag the right edge to the left in order to shorten a Part, changing its end point. Note the truncation indicator at the lower-right of the Part.

Drag the edge towards the right to lengthen an existing shortened Part.

Parts can also be made longer, in which case they loop throughout the duration of the Part. If the lengthened Part begins/ends after or before the actual start/end of the Groove, truncation indicators are shown as above.

Part context menu

Right-clicking on the Drum Track displays a menu with several additional functions for manipulating Parts. The functions available depend on whether an empty area of the track or a selection of Parts is under the cursor when invoking the menu.

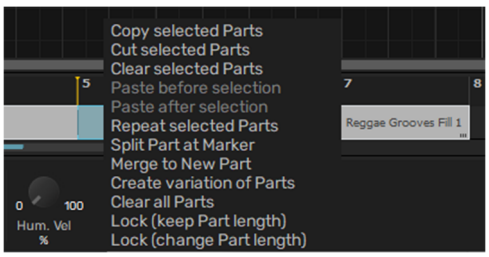
Cut, Copy, Clear and Split Parts

The **Cut Selected Parts** and **Copy Selected Parts** functions add Parts to the clipboard for use with the Paste functions (see below). The **Clear selected Parts** function removes the selection from the Drum Track without affecting the clipboard.

If you right-click on a part, you can split the part at the position marker with the **Split Part at marker** function.

When a part is split, the first of the resulting two Parts shows a truncation indicator at its lower-right to show that it has been shortened.

The second of the resulting Parts shows a truncation indicator at its lower-left to show that its start point has been moved later than the actual start of Groove.



Paste at marker/before selection/after selection

The Paste functions insert Parts stored in the clipboard as a result of using the **Cut Selected Parts** and **Copy Selected Parts** functions.

The **Paste at marker** function can be used when right-clicking on an empty section of the Drum Track. When the function is used, the Parts stored in the clipboard are inserted sequentially from the **Insert marker** in their original order. Their relative positions when they were originally Cut or Copied are not retained. If any existing Parts are encountered before the end of the paste, they are shifted to the right as needed.

When right-clicking on an existing Part, the **Paste before selection** and **Paste after selection** functions are available. These functions insert the clipboard contents before or after the Part. Again, any existing Parts are shifted to the right as required.

Grooves can also be copied to the clipboard from the Slot context menu in the ***Palette*** before insertion onto the Drum Track using the above Paste functions.

Repeat selected parts

When one or more Grooves are selected, performing this operation results in inserting copies of the selected Parts immediately after the selection.

If there is an insufficient gap to accommodate the copied Parts between the last selected Part and any subsequent Parts, all Parts after the selection are moved back by the length of the Groove selection.

Merge to New Part

The **Merge to New Part** function is available only when multiple contiguous Parts are selected. When used, it combines all selected Parts into a new single Part.

Create variation of Parts

This function creates duplicates of Grooves in the Palette based on the currently selected Drum Track Parts, and changes the selected Parts to reference the duplicated Grooves.

The duplicated Grooves are created sequentially in the next available Palette slots higher than the original Groove.

If multiple selected Parts reference the same original Groove, only 1 duplicate Groove is created, and all relevant parts are changed to reference this Groove.

This functionality is intended to make the creation of variations easier by avoiding the need to delete Parts and drag new Grooves back into the Drum Track to replace them.

After performing this operation, simply edit the duplicated Grooves as desired to create the variations you need.

Clear All Parts

The **Clear All Parts** function clears the current contents of the Drum Track. The Grooves in the Palette remain unchanged. You are prompted for confirmation before proceeding.

Saving and loading Drum Track contents

The contents of the Drum Track cannot be saved in isolation since they are dependent on Grooves in the Palette. Therefore, the Drum track can only be saved and loaded along with the Palette. It is also possible to export the contents of the Drum Track as MIDI or audio.

See the *Saving and Exporting Grooves* section for more details of these functions.

2.4.7 Recording Grooves with MIDI

BFD3 provides the ability to record Groove events into a new or existing Groove using MIDI input in real time.

All recording occurs into the currently selected Groove within the Palette. It is not possible to record directly onto the Drum Track.

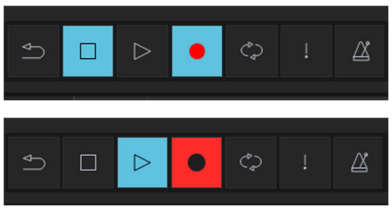
MIDI Key Map assignments

While BFD3's Groove engine does not require any MIDI note mappings in order to play back events, a Key Map must be set up for Drum articulation events to be recorded into Grooves via MIDI.

Note that even if an articulation is mapped to more than one MIDI key, all its recorded events are represented on a single articulation lane.

Likewise, if any MIDI notes containing multiple articulation mappings are recorded, each articulation is recorded to its specific articulation lane.

Initiating recording



1. To begin the recording process, select a Groove in the Palette, or create a new Groove and set it to the desired length.
2. To arm MIDI recording, click the **Record** button on the BFD3 transport. The record function is now ready to start recording when the transport is started. To hear a click, ensure the **Metronome** button is activated.
3. Press the **Play** button on the BFD3 transport to start recording in standalone mode, or when running in a host/DAW if you'd like to record without the host playing in sync.
4. To record while the host plays in sync, press play in your host. BFD3's transport starts when the host transport is started.
5. Whichever of the above methods you use to start the transport when it is record-armed, the **Record** button starts flashing and enters recording mode. Any MIDI notes received are recorded as events for articulations to which the notes are mapped.

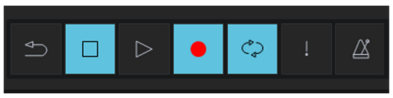
Recording modes

Default recording mode

By default, when the position reaches the end of the defined Groove length, recording continues, with the length of the Groove increasing, until the **Stop** button is pressed. When recording is stopped, the Groove length is set automatically to accommodate the recorded events.

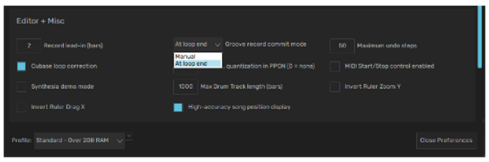
Loop record mode

Activate the **Loop** button on BFD3's transport to record in loop mode. This means that when the defined end of the Groove is reached, the record position returns to the start of the Groove. Then, elements can be overdubbed until the transport is stopped.



Loop commit record mode

Normally, clicking **Undo** after stopping recording would undo all events recorded during that take. However, if the **Groove commit record mode** setting in the *Grooves Preferences* is set to *At loop end*, the events recorded on each loop cycle are stored as a separate **Undo** step.

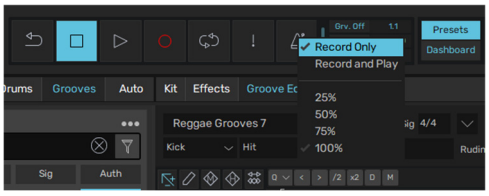


After recording, the **Undo** button can be used repeatedly to regressively undo the events recorded during each loop cycle in the take.

The **Undo** button can even be used without leaving record mode. Try assigning the **Undo** button to a suitable MIDI note in the automation map.

Metronome settings

When the **Metronome** button in the transport is activated, a click is heard on every beat when recording.



The Metronome channel in BFD3's mixer allows you to adjust the level and **Output routing** of the metronome. Using *Tweaks Mode*, further adjustments can be made to the sound (**Type**) and behavior (**Mode**) of the Metronome. These settings are also available in the *Grooves Preferences*. In addition, right-click the **Metronome** button itself for quick access to the Metronome's **Mode** and level.

Record lead-in

A lead-in time, in bars, can be set for recording. The number of bars is defined with the **Record lead-in** setting the *Grooves Preferences*. The default setting is 2 bars.

If the **Metronome** button is enabled, it is heard during the lead-in period.

2.4.8 Importing MIDI Files

Importing MIDI files into the Palette

BFD3 allows you to import a MIDI file into a destination slot in the Palette and, using the MIDI Import panel, optionally split the file into smaller Grooves to be placed on ascending slots beginning with the destination slot.

Initiating MIDI import

There are two ways of initiating the MIDI import process - either of the following ways invokes the MIDI Import panel:

- **Using drag & drop**

  Drag & drop the MIDI file(s) onto the destination Palette slot from a system file location such as the desktop or a folder window. When using this method, it is not possible to split the file into smaller Grooves. All controls in the MIDI Import panel are disabled except for the Import MIDI key map setting. Each file is created as an individual Groove in slots ascending from the destination slot.

- **Using the File menu (with the Groove Browser visible)**

  BFD3's File menu contains two functions for importing MIDI files. These functions display the MIDI Import panel with all functions accessible, allowing you to split files into smaller Grooves:

  - The **Load Groove(s) from file...** function allows you to import files into the current session.
  - The **Batch Import BFD1 Grooves or MIDI...** function processes multiple files to create native BFD3 versions which are imported into the database.

Import MIDI key map setting

MIDI files simply contain pitched notes - they do not contain any information about the BFD3 articulations that should be triggered. Therefore, a key map must be defined and used as a reference in order to assign a MIDI file's note events to articulations within BFD3. The **Import MIDI key map** setting in the *Grooves Preferences* and in the MIDI Import panel (see below) specifies the Key Map that is used for the import process. By default, it is set to the BFD 1.5 Key Map to allow loading BFD 1.x-format Grooves and Bundles (see below). It can, however, be changed to any other available key map, such as the General MIDI Key Map supplied in the factory data. Alternatively, a new Key Map can be created in the Key Map panel and used instead.

By default, BFD3 ignores any MIDI notes encountered that are not defined in the referenced keymap. The **Unmapped MIDI note mode** setting in the *Grooves Preferences* can be set to show a warning when this occurs instead of simply ignoring any unused notes.

MIDI Import panel

After initiating the MIDI import process using one of the two above methods, the MIDI Import panel appears.

- **MIDI file summary**

  The summary area displays an analysis of the imported MIDI file. The filename, tempo, time signature and length in bars are shown.

- **MIDI import map**

  This setting is identical to the **Import MIDI key map** setting in the *Grooves Preferences*. It is also provided in the MIDI Import panel for convenience. Note that when the setting is changed in the MIDI import panel, it is also changed in the Preferences.

Importing the MIDI file(s) as a single Groove

To import the entire MIDI file as a single Groove into a slot, no adjustments in the MIDI import panel are required, simply click the **Import** button.

Click the **Cancel** button or the ESC key to return to the main BFD3 interface without importing anything.

Splitting and importing a single MIDI file as multiple Grooves

The MIDI Import panel allows you to split the MIDI file into smaller Grooves of equal length, to be imported into ascending Palette slots beginning with the destination slot. The settings in the panel determine how this occurs:

- **Bars per Groove**

  This setting specifies the length of each smaller Groove in bars.

- **Grooves**

  This display shows the number of smaller Grooves that will be created with the current **Bars per Groove** setting.

- **Import Groove**

  This pair of values allows you to set up a range of the smaller Grooves created to actually import to Palette slots.

- **New name**

  This field allows you to enter a name for the Grooves to import. The named Grooves are numbered sequentially in the Palette.

- **Import & Cancel**

  Once the parameters above have been set, click the **Import** button. The MIDI file is split as specified and the desired segments are imported into the Palette as Grooves, in ascending slots starting with the destination slot.

  Click the **Cancel** button to return to main BFD3 interface without importing anything.

Importing BFD 1.5 Grooves

BFD3 Groove and Palette files are stored in a proprietary format which allows the software to associate events with specific articulations, and are therefore independent of MIDI mappings. The Palette can contain up to 128 Grooves, while a saved Palette file includes these and also includes the state of the entire Grooves page.

On the other hand, BFD 1.x used MIDI files as Grooves, routing notes to articulations according to the default BFD key map. Up to 12 MIDI files were referenced from a text file called a Bundle file. The MIDI files exist in a subfolder with the same name as the Bundle file.

Accessing BFD 1.x Bundles in the Groove Browser

If BFD3's scanning process discovers BFD1.x format Grooves and Bundles, they are displayed in the ***Grooves Browser*** in the same way as BFD3 Palettes and Grooves. When they are loaded, they are always loaded according to the current **Import MIDI key map** setting in the ***Grooves Preferences*** and MIDI Import panel.

Assembling Palettes from BFD1.5 bundles

Groove Bundle sets generally consist of one or two Groove Bundles and an accompanying Fill Bundle, each consisting of up to 12 MIDI files. To assemble these into a single BFD3 Palette, proceed as follows:

1. Load the first Groove Bundle from the Palettes section (upper half) of the ***Grooves Browser***, either with a double-click or using drag and drop to the ***Palette*** area. When loading a Bundle as a Palette in this way, the Groove engine is reset, and the Grooves from the Bundle are placed into ascending slots starting at slot 1.
2. Click on the second Bundle, if it exists, in the Palettes section (upper half) of the Groove Browser. It's contained Grooves are shown in the Grooves section (the lower half of the Groove Browser).
3. Select and then drag and drop the Grooves to a destination empty slot in the Palette - the Grooves are placed on sequentially ascending Groove slots starting with the destination slot.
4. Repeat steps 2 and 3 for the Fills Bundle if it exists.
5. Select the slots containing Fills in the BFD3 Palette and **Fill** button in the Slot Groove Actions area. These slots are now designated as Fills.
6. Save the assembled Palette to the BFD3 User location for future use.

Batch converting BFD 1.5 Grooves/Bundles and MIDI files to BFD3 format Grooves

If you prefer, MIDI files or BFD 1.5 format Grooves can be permanently converted and resaved in native BFD3 format files and inserted into the database. Converted files are no longer dependent on the current **Import MIDI key map** setting.

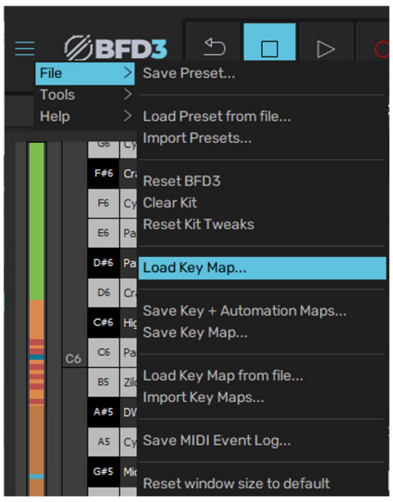
After ensuring that the Groove Browser is visible, use the **Batch Import BFD1 Grooves or MIDI...** function on BFD3's **File menu**.

This button brings up a system file open dialog allowing you to browse to and select a folder of MIDI files to convert into BFD3 Groove files.

This function can be used either for MIDI files, BFD1.x Grooves (which are MIDI files) and Bundle files (in the case of Bundles, all their referenced Grooves are imported).

2.5 MIDI Key and Automation Mapping

Key Maps

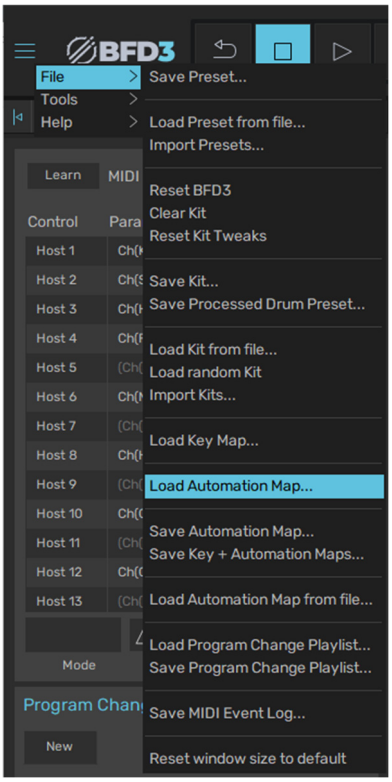


A Key Map allows you to play BFD3's *Drum articulations* and *Grooves* with MIDI notes. It contains defined mappings between MIDI notes and these entities along with a number of other parameters for specialized types of control, especially with electronic drum trigger hardware.

Key Maps can be loaded and saved using the BFD3 File menu, and the Key Map panel provides a comprehensive environment with which to view, modify and create mappings for MIDI notes. Click the **Key Map** button in the main BFD3 navigation bar to display the Key Map panel (see *MIDI Key Maps* for more information).

BFD3 also features an alternative way of creating mappings: the *Kit display* features the **Start MIDI Learn** function on the slot context menu for accomplishing this. However, in order to set up advanced mapping functions and fine adjustment, it is necessary to use the Key Map panel.

Automation Maps



An Automation Map allows you to control BFD3 parameters with MIDI control data and with host automation parameters when using BFD3 in a suitable host/DAW application. Because BFD3 simply contains too many parameters, it would be impossible to map them all for MIDI or host automation control. There simply are not enough MIDI continuous controllers (CCs) in the MIDI spec, and there would be too many host automation parameters to manage in a DAW.

Automation Maps can be loaded and saved using the BFD3 File menu, and the Automation panel allows you to view, modify and create mappings as required (see *Automation Maps* for more information). The Automation panel is shown by clicking the **Auto** button above the Browser; the Browser area is replaced by the Automation panel. Click any of the other tab buttons (Presets, Kits, Drums or Grooves) to return to the desired Browser.

Program Change Playlists

The *Program Change Playlist* function, available in the Automation panel, allows you to use MIDI program change messages to switch through a 'playlist' of BFD3 Presets and Kits.

Loading Maps

- **Key Maps**

  In most cases, you can simply load a suitable factory Key Map for your MIDI controller or electronic drumkit hardware using the **Load Key Map** function in the BFD3 **File menu**. In the Load Map panel that appears, scroll through the list and double-click the desired Key Map to load it. See below for a more detailed guide to the Load Map panel.

  To save the current Key Map, use the **Save Key Map** function on the File menu.

- **Automation Maps**

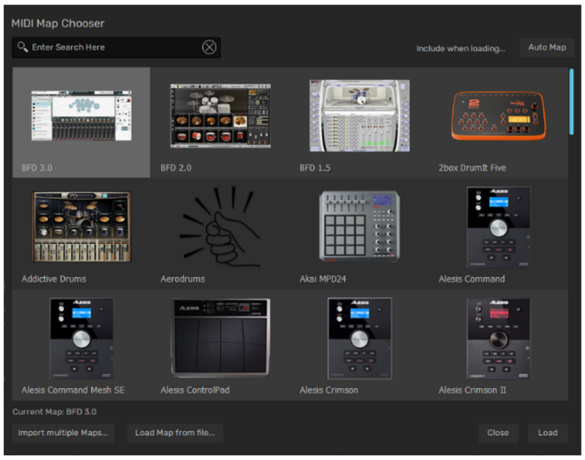
  Automation maps are loaded in a very similar way to Key Maps - use the Load Automation Map function in the BFD3 File menu.

  In the Load Map panel that appears, scroll through the list and double-click the desired Automation Map to load it. See below for a more detailed guide to the Load Map panel.

  To save the current Automation Map, use the **Save Automation Map** function on the File menu.

Load Key Map and Load Automation Map panels

The Load Key Map panel and Load Automation Map panels are very similar in operation.



- **Map listing**

  The listing shows maps that exist within the factory maps and the **<user location>/Maps** folder.

- **Search**

  The Search text-box allows you to type a keyword(s) with which to narrow down the listing. Click the **Recent** drop-down menu to the left of the text-box to display a list of recent searches. Click the relevant search term to perform the search again.

- **Current Map indicator**

  The currently loaded map is shown by this indicator. If no map has been loaded, the factory default map is indicated.

  If any modifications have been made to the current map since it was loaded, an asterisk is shown next to this indicator.

- **Import multiple Maps**

  The **Import multiple Key Maps** and **Import multiple Automation Maps** functions create BFD3-format map files within the database (saved into the user location) from one or more key map files which are currently not within BFD3's content locations. It may be useful to do this after downloading files created by another user.

  The Import Multiple Key Maps function can import maps from BFD 1.5 or BFD2. Their contents are recreated for BFD3 as closely as possible.

- **Load Map from file**

  The **Load Key Map from file** and **Load Automation Map from file** functions load a map file into the current session from locations in your system which are not within BFD3's content locations. It may be useful to do this after downloading a file created by another user. When loading the file, you are prompted whether the file should be saved into the BFD3 database for future use.

  This function can load maps from BFD 1.5 or BFD2. Their contents are recreated for BFD3 as closely as possible.

- **Include when loading**

  This button varies depending on whether you are using the Load Key Map or Load Automation Map panel.

  In the Load Key Map panel, activate the **Automation Map** button. This loads any associated Automation Map with the same name along with the new Key Map.

  In the Load Automation Map panel, activate the **Key Map** button. This loads any associated Key Map with the same name along with the new Automation Map.

  The corresponding map file must exist within the **<user location>/Maps** folder. If no corresponding map exists, the settings in question remain unchanged.

- **Load / Close buttons**

  To load the currently selected key map, click the **Load** button. You can also load any key map in the listing by double-clicking it.

  To return to the BFD3 interface without loading a new Key Map, click the **Close** button.

Maps loaded when BFD3 is launched

When an instance of BFD3 is launched, it reloads the last Key Map and Automation Map files that were loaded. If a load operation has never taken place, the BFD3 factory defaults are loaded.

However, if you have specified a startup preset in the Preferences, the mapping settings contained within it override the above.

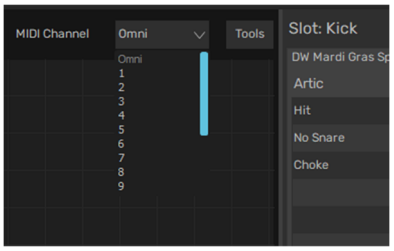
If you create any of your own mappings, you must save your changes! See the guide to saving maps in each of the sections in this chapter.

2.5.1 MIDI Key Maps

Click the **Key Map** button in the main BFD3 navigation bar to display the Key Map panel. This panel provides functions for mapping Drum articulations and Grooves to MIDI notes so that they can be played using MIDI note input. It is possible to modify and fine-tune existing Key Maps, add further assignments for additional Drums or create new Key Maps from scratch.

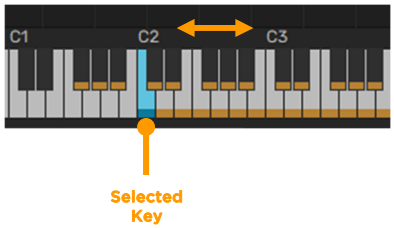
2.5.1.1 Mapping page layout and MIDI keyboard displays

MIDI channel



Key Map assignments can be created on any MIDI channel. By default, BFD3 responds in *Omni* mode; in other words, on any MIDI channel. This can be changed to a specific channel using the **MIDI Channel** drop-down menu. Alternatively, double-click the field and type a number between 0 and 16 (0 = *Omni*).

Vertical and Horizontal keyboard layouts



The Key Map panel features 2 representations of the MIDI keyboard range - horizontal and vertical. These essentially function identically to each other, although the horizontal keyboard lacks individual note and name labels.

Click and drag the keyboard scroller to the left of the **Vertical Keyboard** to adjust its visible area, or use your mouse wheel.

Click and drag above the keys on the **Horizontal Keyboard** to adjust its visible area (depending on the current width of the BFD3 window, the entire keyboard may already be visible).

Key coloring (both keyboards)

Keys feature color-coding to represent various states.

Orange	One or more articulation mappings exist on the key.
Green	A Groove note exists on the key.
Red	A slot choke note exists on the key.
Dark Blue	Keys mapped to the currently selected Drum.
Light Blue shading	Currently selected key.
Purple shading	Destination slot during a mapping operation.

Key labelling (vertical keyboard only)

Keys with an articulation are labelled with the current Drum loaded into the relevant slot along with the articulation name. If the slot is empty, the default slot name is shown.

If multiple articulations exist on a key, *multiple* is shown.

Keys with Grooves always show the relevant Groove slot number.

Previews

Whenever a key on the keyboard is selected, it is previewed in the same way as it would be heard when being played via MIDI. Previews are velocity sensitive depending on the click position on the key:

- On the horizontal keyboard, the loudest velocity is heard towards the lower part of the keys.
- On the vertical keyboard, the loudest velocity is heard towards the right of the keys.

To select a key without hearing a preview, click it while holding down the ALT key.

Follow MIDI

Activating the **Follow MIDI** button results in an incoming note selecting the relevant key in the keyboard layout.

The last state of this button is used when launching a new instance of BFD3.

Articulations list

The Articulations list shows the available articulations for the *currently selected Drum slot*.

This list is only visible if the **Show Grooves** button is deactivated.

After one or more mappings have been created, the mapped MIDI note is shown under the **Mapping** column for each **Artic** (Articulation) in the Articulations list.

The numbers shown after the MIDI note represent the velocity **Input Range** for the assignment. When multiple articulations are mapped to a key, velocity split ranges can be set up using the **Input Range** control in the Mapping Response panel (see below). This velocity readout is not available if the articulation has been mapped to more than 1 key.

Mapping Editor

The Mapping Editor provides a number of functions for the articulations on the *currently selected Key*. It features an **Assignments** list displaying the current assignments on the key, as well as the Mapping Response panel which provides advanced fine-tuning functions for mappings.

Show Grooves

Activating the **Show Grooves** button displays a list of the Groove Palette's 128 Groove slots in place of the Articulation list. This mode is used in order to assign Grooves to MIDI keys.

Show MIDI Log

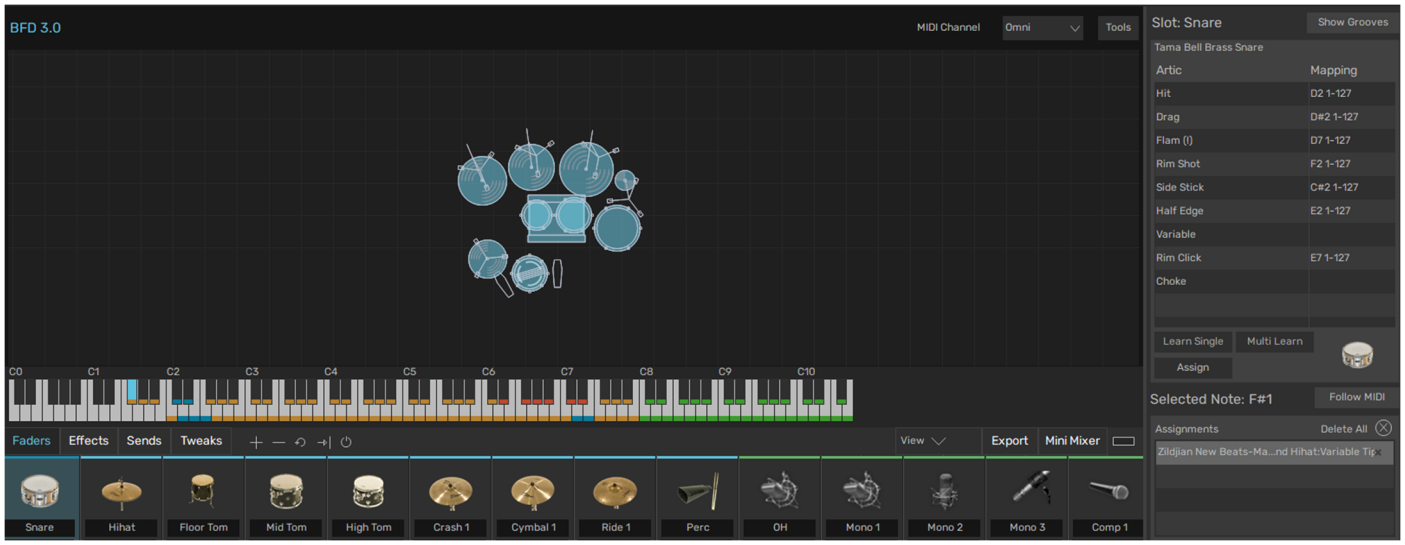
Activating this button displays the MIDI Log at the lower-left part of the interface. The MIDI Log provides an overview of incoming MIDI messages, useful for troubleshooting mapping operations. Click the **Show MIDI Log** button again to hide the panel.

2.5.1.2 Mapping Drum articulations to keys

Note that it is not necessary to load a Drum into a slot to map the slot's articulations: the default choices of articulations for the slot's intended purpose are assignable. However, it is highly recommended to do so to be able to test and hear the results of assignments.

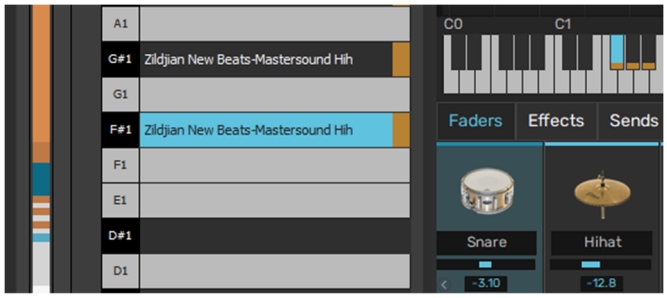
Using the Assign to Selected button

1. Select a Drum such as the Snare in this example, either in the Kit Display or in the Mixer. The Drum's articulations are shown in the **Articulations** list.



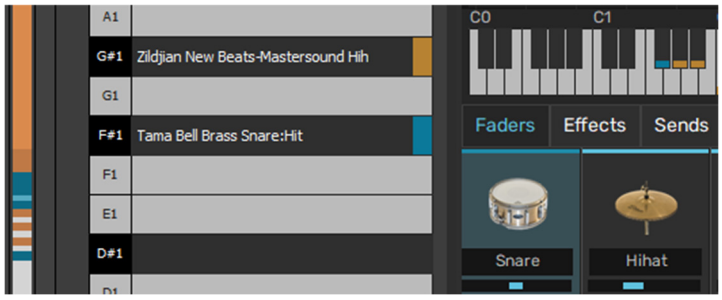
Note that the selected *key* in this example is still a key assigned to the Hihat.

2. Select the key to which you wish to assign a Snare articulation. The mapping is also represented on both keyboards.

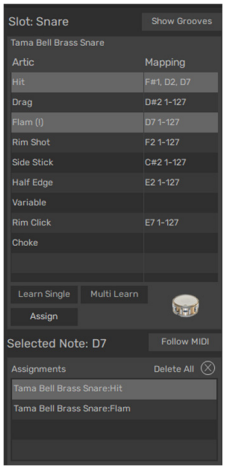


3. Select an Articulation—the Hit articulation in this example—and then click the **Assign to Selected** button to make the assignment.

   The selected key, showing the mapping that has just been created, is shown in the Mapping Editor below the Articulation list for the selected slot.



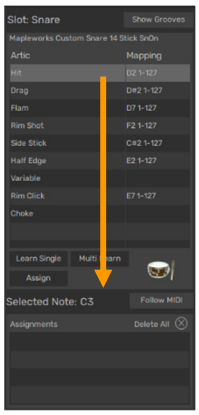
Select multiple articulations using SHIFT and CMD/CTRL before clicking the **Assign to Selected** button to stack them all on the key.



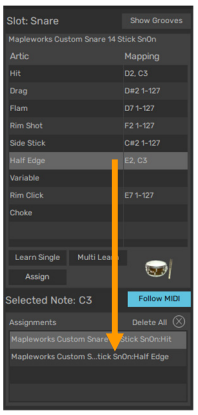
Drag and drop to the Mapping Editor for the selected key

With a key selected, drag and drop the desired articulation to the Mapping Editor Assignments list.

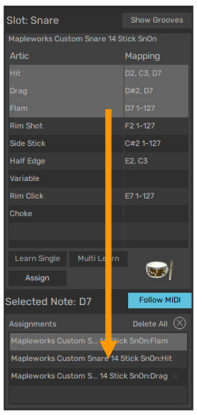
Any previous assignments on the key are replaced.



To stack another articulation to the key, drag and drop an articulation (select a different Drum slot first if required) onto the list while holding down the ALT key.



Multiple articulations from the same Drum can be dragged simultaneously to the same key's Assignments list to stack them.

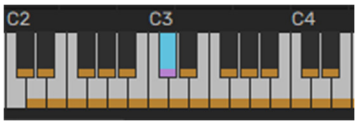


Drag and drop directly to any key(s)

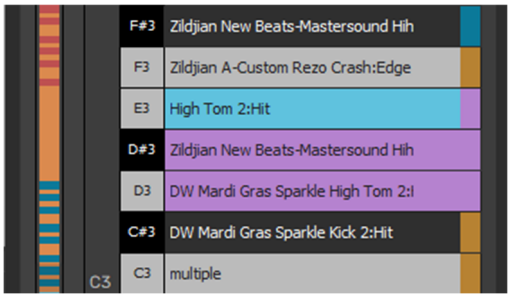
Articulations can also be dragged to keys in the horizontal or vertical keyboards.

If the key already contains any assignments, they are replaced.

Hold down ALT to stack another articulation onto a key with existing assignment(s).



Drag multiple assignments to either keyboard to assign them to sequential keys ascending from the destination key.

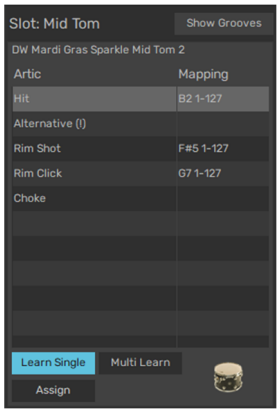


Use the Learn Single function

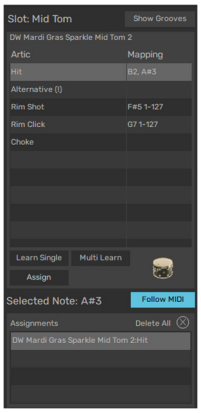
The **Learn Single** function is designed to allow you play a MIDI key to which to assign the currently selected articulation.

To map an articulation to a key, first select the desired Drum and articulation within it.

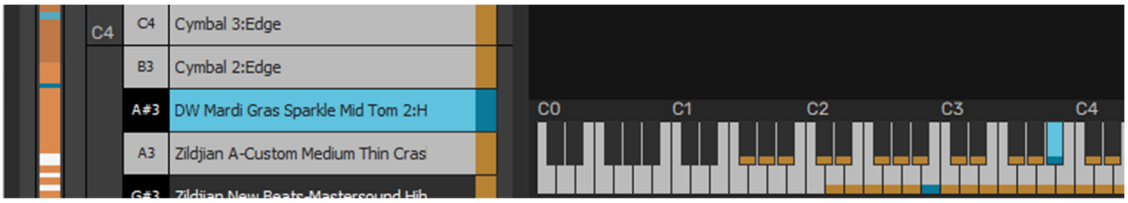
Then, click the **Learn Single** button.



Now play a note. In the above example, C0 has been played (and selected as the **Follow MIDI** button is activated). The new mapping is shown in the **Assignments** list.



The mapping is also represented on both keyboards.

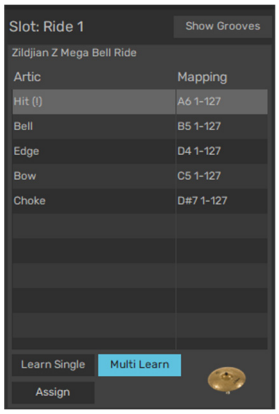


Use the Multi Learn function

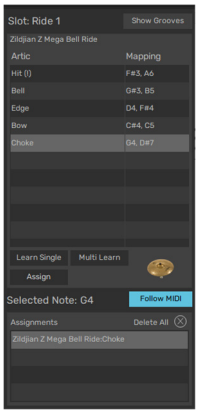
The **Multi Learn** function lets you play multiple MIDI keys to map multiple articulations from the currently selected Drum.

Select an articulation and then click the **Multi Learn** button. This function waits for multiple MIDI notes, assigning them to each of the subsequent articulations in the Drum.

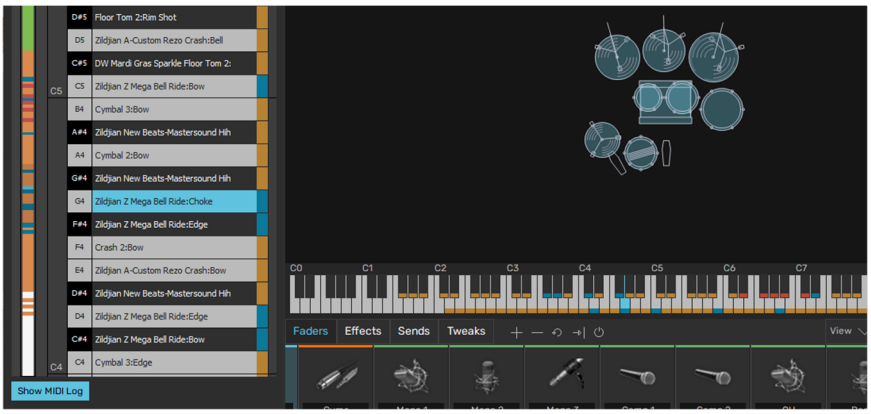
The process ends after the last articulation in the list, or when the **Multi Learn** button is clicked again.



The additional MIDI note that has just been mapped to each articulation is shown in the Articulations list along with the original mappings. Due to limited space, the active velocity range cannot be shown if an articulation has been mapped to multiple keys.



The mappings are also represented on both keyboard displays.



Stacking multiple articulations on a single key

As described above, articulations can be stacked, or layered, onto a single key. This offers more advanced Drum layering than the simple Drum **Link** function in the Kit display but is intended only for using MIDI notes rather than the Groove engine to play BFD3's sounds.

When articulations are stacked on a key, they simply play at the same time at the relevant velocity whenever the key is played.

It is also possible to create "velocity splits" with layered articulations using the Mapping Response panel (see below).

Please note that Choke articulations cannot be stacked with other articulations. Attempting to assign a Choke articulation results in it overwriting any previous contents on the key. Likewise, attempting to stack any articulation onto a key already containing a Choke, the existing Choke is overwritten.

Special articulations

- **Choke**

  Any playing articulation for a Drum can be choked by playing the slot's Choke articulation. This stops the decay of any Drum articulation according to its Choke Response settings (default settings exist in the BFD3 Preferences, while settings for loaded Drums exist in the Drum Editor

  Chokes can be stacked on the same key with other articulations - when triggering an articulation, it may be useful to choke 1 or more other Drums which may be playing.

  BFD3 can also choke cymbal slots with polyphonic aftertouch signals from electronic drumkits (see the next section).

- **Variable tip (hihat slot only)**

  Variable shank (hihat slot only)

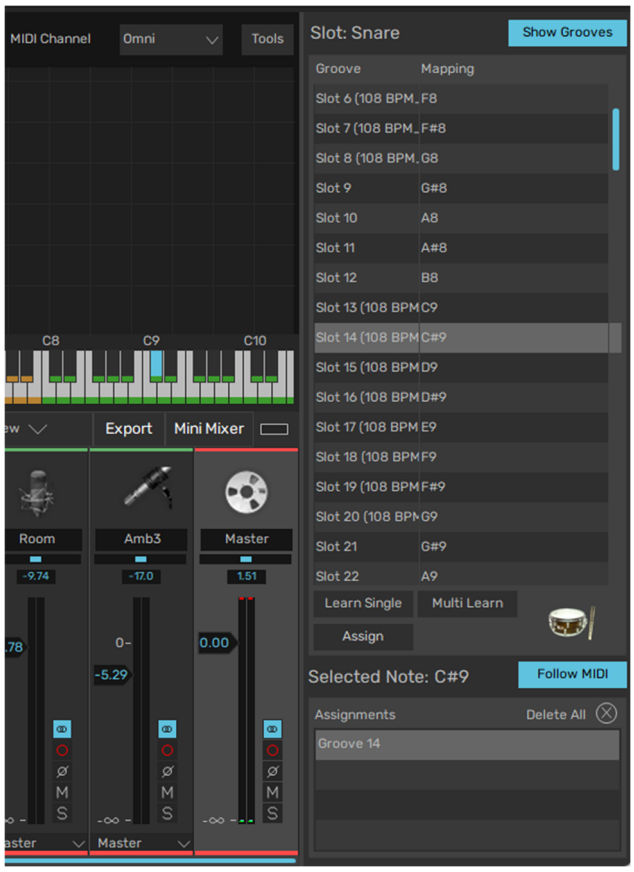
  These articulations appear for the Hihat slot only and are intended for use with electronic drumkits (see the next section).

- **Variable snare (snares only)**

  This articulation appears for Snare slots only and is intended for use with electronic drumkits (see the next section).

Mapping Grooves

Click the **Show Grooves** button in order to map Groove slots in the Palette to MIDI keys. The view on the right side of the Key Map panel changes to show a list of all 128 Groove slots.



Groove listing

Under the **Groove** column, The list of Groove slots shows the name of the Groove currently in each slot if it exists alongside the slot number.

The **Mapping** column displays the current MIDI note mapping for the Groove if it exists.

Creating mappings

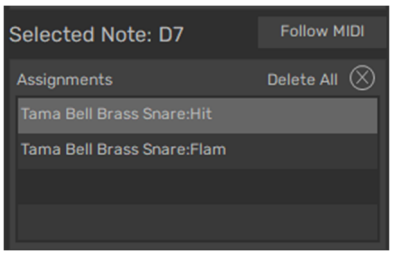
Grooves are mapped to keys in exactly the same ways as Drum articulations:

- Drag and drop from the list of slots to a key or to the Mapping Editor list for the currently selected key.
- Select a key, select a Groove slot, and then click the **Assign to Selected** button.
- Use the **Learn Single** or **Learn Multi** functions.

Mapping Editor

The Mapping Editor panel displays information and additional parameters for the mappings that exist on the currently selected key.

Assignments list



Each articulation that has been mapped to the key is shown in the articulation list. Click any articulation to select it and edit its parameters.

- **Delete mapping**

  When the cursor is hovered above a mapping in the list whether it is a Groove or Drum articulation, a Delete mapping button (**X**) is shown at the right. Click the button to delete the mapping.

- **Delete All**

  Click this button to delete all mappings on the currently selected key.

Mapping Response panel

The Mapping Response panel cannot be visible at the same time as the Hihat or Snare Response panels. Click the **Response** button to display the Mapping Response panel if it is not already visible.

Note that the Snare panel is only visible if a Variable Snare articulation exists on the currently selected key. The Hihat and Snare Response panels are described in the *Using Electronic Drum Kits* section.

The Mapping Response panel features a number of functions for adjusting the way that incoming MIDI note velocity is mapped to articulations.

This panel is only concerned with articulation mappings; its controls are not available if a Groove key is currently selected.

- **Input (Input Range)**

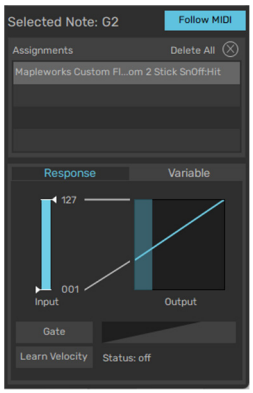
  This control defines the MIDI note velocity range to which the selected articulation responds. The primary use for this control is for creating velocity-based splits for keys with multiple articulations, so that different velocity ranges can trigger different articulations.

- **Output (Output Curve)**

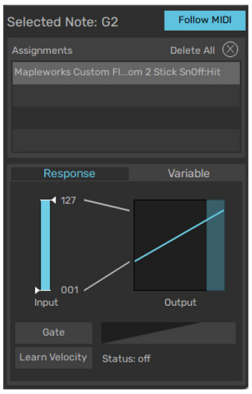
  This control adjusts how input velocities are translated to the range of the articulation's velocity layer samples.

  By default, a linear 1:1 mapping is used. The active range of MIDI input velocity (defined by the Input control) is distributed proportionally across all available velocity layers for the articulation.

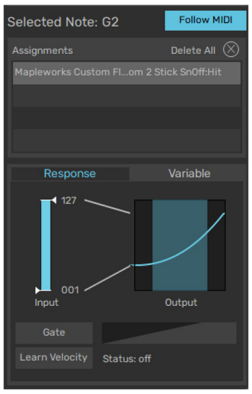
  The graph allows you to change the lowest and highest velocity layer that is accessed by the velocity range of the input range, as well as vary the curve response from linear to exponential (drag down) or inverse-exponential (drag up).



Click and drag up/down at the left side of the graph to set the lowest velocity layer for the mapping.



Click and drag up/down at the right side of the graph to set the highest velocity layer for the mapping.



Click and drag up/down in the center of the graph to set the response curve of the range.

Gate

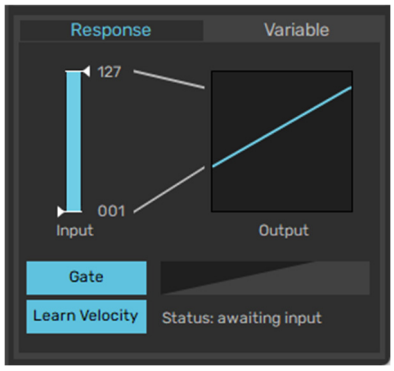
With the **Gate** setting activated, any incoming MIDI notes with velocities outside the input range are ignored for the articulation mapping. This behavior can be very useful when creating velocity splits or for eliminating crosstalk-related issues when playing BFD3 from an electronic drumkit.

With the **Gate** button deactivated, such notes trigger the articulation, with velocity values that are forced to the **Input Range** boundaries. For example, if the Input Range is set from 25 to 90 and an incoming note's velocity is 10, it is treated as a velocity of 25. If an incoming note's velocity is 100, it is treated as a velocity of 90.

Learn Velocity

This function is designed to analyze incoming MIDI note input and set the **Input Range** accordingly. Activate the button and play a series of low-velocity and high-velocity notes within the velocity range you intend to use with the articulation mapping.

The detected notes are analyzed, and the **Input Range** is set.

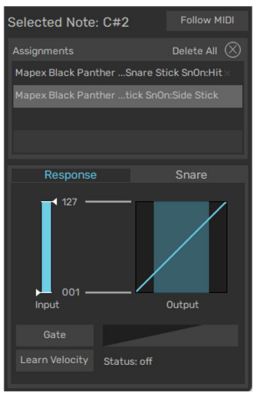


Setting up velocity splits

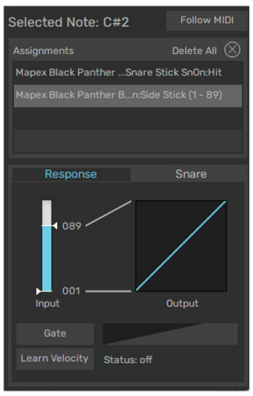
The Mapping Response panel functions can be used for setting up velocity splits for keys containing stacked articulations.

The following examples demonstrates how to create a velocity split setup for a key mapped to Snare Hit and SideStick articulations.

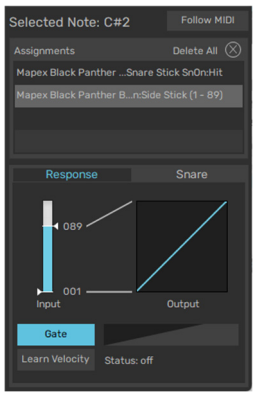
1. Select the SideStick articulation in the **Assignments** list.



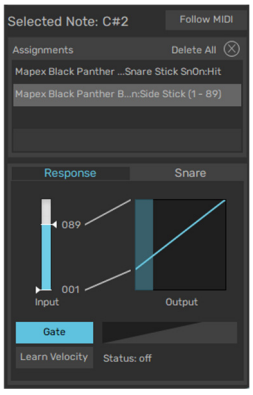
2. Set the upper limit for the Input Range control. This will be the highest velocity that triggers the SideStick.



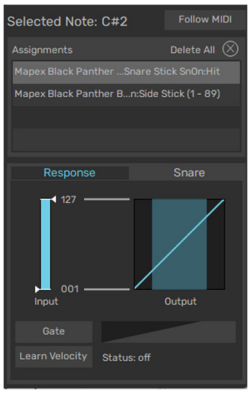
3. Activate the **Gate** button to ignore velocities above the upper limit.



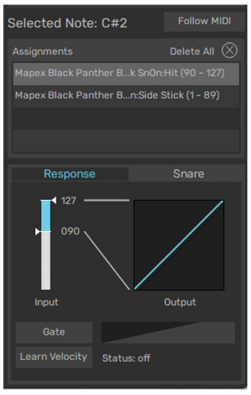
4. Optionally, fine-tune the velocity layer graph to set the lowest and highest velocity layers that will be triggered.



5. Select the Hit articulation in the **Assignments** list.

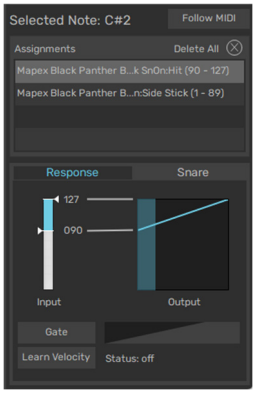


6. Set the lower limit for the Input Range control to a value 1 higher than the upper limit for the SideStick.



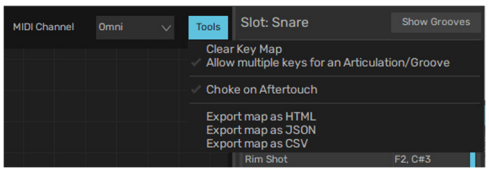
7. Optionally, fine-tune the velocity layer graph to set the lowest velocity layer that will be triggered. In this example, the snare sound triggered by MIDI notes with velocities of or above 90 is from the upper part of the velocity layer range, meaning that it is struck with high intensity.

   Velocity splits can overlap each other if the Input Ranges are set up to do so, with both articulations being heard within the overlap areas.



2.5.1.3 Additional controls

Tools menu



- **Clear all keys**

  This function clears all current key mappings, allowing you to build a Key Map entirely from scratch.

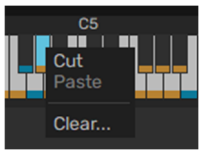
- **Allow multiple keys for an Articulation/Groove**

  With this setting deactivated, any articulation or Groove can be mapped only to a single key. If an articulation or Groove is mapped again, the old assignment is lost.

- **Choke on Aftertouch**

  This function is intended to be used with electronic drumkits (see the *Using Electronic Drum Kits* section).

Key context menu



Right-click on the horizontal or vertical keyboards to display the key context menu.

The menu allows you to **Cut** and **Paste** mappings between keys. Use the SHIFT key to select multiple sequential keys. Any assignments that already exist on keys affected by a **Paste** operation are lost.

The **Clear...** function removes the mappings on the selected keys. You are prompted for confirmation before proceeding.

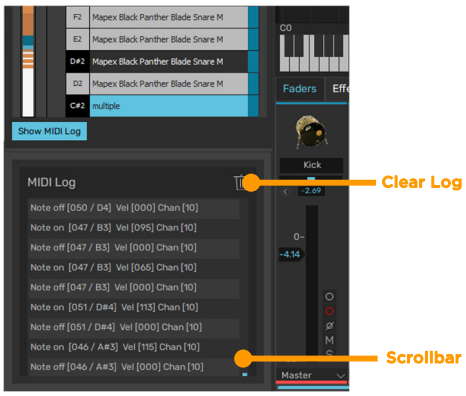
MIDI event log

Click the **Show MIDI Log** button to display the MIDI Event Log panel. This panel displays a list of all MIDI events received by BFD3's MIDI input and can be very useful for troubleshooting during mapping tasks.

Click the **Show MIDI Log** button again to hide the panel.

Note that this log is also provided as an auxiliary window: use the **Show MIDI Log** function in BFD3's **Tools menu** to open the external window.

The log displays incoming MIDI data in the following format:



MIDI Notes

Note On [C0 - G10] Velocity [1-127] Channel [1-16]

MIDI Continuous Controllers (CCs)

CC [0-127] Value [0-127] Channel [1-16]

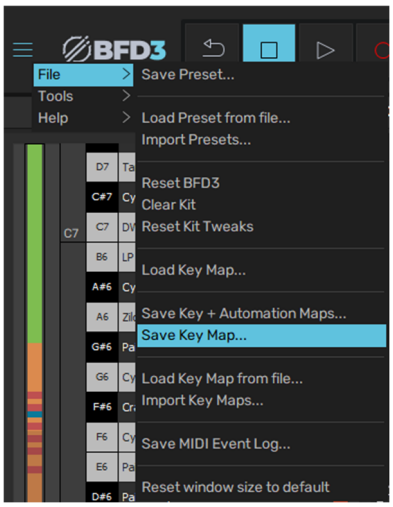
Other MIDI messages (e.g., Pitchbend etc.)

Message [value] Channel [1-16]

Use the scrollbar to display earlier events in the log buffer and the **Clear Log** button to clear the buffer.

Saving in the Key Map panel

All the following functions can be found in BFD3's **File menu**.



- **Save Key + Automation maps**

  This function saves the current Key Map and Automation Map with the same name (although the two resulting map files have different file extensions: .bfd3map and .bfd3auto).

- **Save Key Map**

  This function opens a system file save dialog prompting for a location and filename to save the current Key Map.

  It is recommended to save the Key Map to the default location—**<user location>/Maps**—so that it is accessible from the Load Key Map panel without further adding and scanning of data locations.

- **Save MIDI Event Log**

  This function saves the contents of the MIDI Log for diagnostic and troubleshooting reasons. Logs are saved with the .log file extension.

2.5.2 Using Electronic Drum Kits

BFD3 supports the use of electronic drumkits for triggering sounds, with pre-made maps provided for most kits. The Key Map panel provides a number of tools to customize mappings or response characteristics.

Most triggers/pads on electronic kits are fairly straightforward to map to BFD3's Drum articulations. Certain types of triggers which use more advanced control techniques may require some customization for your playing style, such as hihat and positional snare triggers when using kits capable of sending out MIDI CCs in order to control articulation switching. BFD3 provides "variable" hihat and snare articulations to use with these types of controllers.

This section assumes that you are familiar with using the Key Map panel, explained in the previous section.

How electronic drumkits work

Electronic drumkits, or "e-drums" usually consist of a number of pads which transmit trigger signals as control voltage over an audio connection. Additionally, a pedal mechanism that transmits the variable state of the pedal between open and closed, again using a control voltage over an audio connection.

The audio signals are routed to a converter box, commonly referred to as a "drum brain," which translates audio signals received from pads into MIDI messages. The brain often also has onboard sounds, which tend to be rather limited due to memory constraints.

Common e-drum systems include D-Drums (formerly made by Clavia), Roland V-Drums, the Yamaha DT series, and Alternate Mode Drumkat. Note that some budget e-drum systems such as the Ion kit do not support variable hihat pedals, instead using a switch pedal that simply changes between open and closed states. You cannot utilize variable hihat control with such kits.

Cross-talk between triggers and zones

It is very common to experience cross-talk symptoms when using e-drum systems. When a pad is struck, the resulting vibrations are picked up by other pads' trigger sensors.

This crosstalk problem is often compounded by the fact that most e-drum systems are supplied with a single-frame mounting system, resulting in little isolation for each pad. In addition to cross-talk between individual pads, substantial cross-talk also occurs between zones on multi-zone pads.

In practice, this is often not a major problem, as it reflects what would happen with real drumkit to some extent. However, when using BFD3, it can cause the following issues:

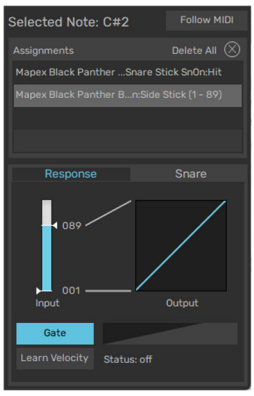
- Excess disk streaming due to more voices being triggered at once.
- Problems when using MIDI learn for note assignments due to multiple notes being transmitted when striking a pad or zone on a pad.

It can be more effective to manually assign notes in the Key Map page rather than using Learn-based functions.

In order to do this, you will need documentation regarding the notes transmitted by each pad on your electronic kit. Alternatively, the brain itself may provide setup pages which provide this information.

There may be situations, however, when you may have to examine the MIDI output from your drum brain: BFD3's MIDI Event Log allows you to do this.

The **Input Range** and **Gate** functions in BFD3's Mapping Response panel can be used to overcome the problems associated with crosstalk. See the *Mapping Drum Articulations to Keys* section for details on using these functions.



Double-triggering: setting the Retrigger threshold

Another similar problem is "double-triggering" and unwanted choking of sounds, especially when using dual-zone triggers. Most drum brains feature configuration parameters for overcoming cross-talk and double-triggering problems.

The **Retrigger threshold** setting in the *Engine Preferences* adjusts for double-triggers in real time. It defines a length of time after each received note during which all further notes are ignored.

Note that it is usually preferable to eradicate these problems at the source. Please consult your e-drum system documentation for information on how to minimize the effects of cross-talk and double-triggering with your kit.

Latency

An inherent problem with computer-based digital audio systems is the concept of latency, meaning that BFD3 may not respond as quickly as any onboard sounds in the drum brain.

It is important to remember that latency is NOT caused by BFD3. Any sources of latency issues lie elsewhere in your system:

- Possible additional processing time required in the brain to create the MIDI output, as opposed to triggering the internal sounds.
- Any inherent latency and timing inaccuracies involved with connecting the brain's MIDI output to the computer's MIDI interface.
- Any latency involved in getting the data from the MIDI interface to BFD3. This varies with the quality of the hardware and drivers of the MIDI interface.
- Audio interface latency/buffer size - smaller buffer sizes result in lower latencies. However, they also require more CPU power and well-engineered audio interface hardware and drivers.

Bus traffic problems

You may find it particularly difficult to achieve low latencies on laptops and smaller machines with limited expansion potential (no ability to install dedicated internal drives or audio interfaces). This means you may need to chain devices on the same firewire or USB bus for example. This often leads to dropouts at lower latencies.

It is highly recommended to run the hard drive containing BFD3's sounds from a separate bus to the audio interface.

Recommended systems for low latency

- A high-quality audio interface capable of reliably operation at 64 or 32 sample latency (1.5ms or 0.75ms at 44.1 kHz). A PCI, PCI-Express, Thunderbolt, CardBus or ExpressCard interface tends to achieve the best results.
- A reliable PCI, USB2 or USB3 MIDI interface.
- An internal SATA-connected 7200 RPM drive or SSD for the sounds is preferable – if this is not possible, use an external USB2 or USB3 drive on its own bus.
- A fast CPU, well set-up drivers and 8GB or more of RAM.

If it is not possible to assemble a system capable of stable low latency operation, it may be best to record your performance while monitoring the sounds in your drum brain, and subsequently route the recorded MIDI to BFD3's sounds.

Simple hihat control

The easiest way to control hihats in BFD3 with an electronic kit is by ignoring the MIDI CC transmitted by the brain according to the hihat pedal position and instead simply using the open, closed, and pedal hihat notes transmitted by the brain.

The drum brain calculates whether to send out an open or closed hihat note depending on the state of the hihat pedal. Some brains that support multi-zone triggers are capable of sending out different open and closed notes for tip (also known as bow) and shank (edge) triggers. A pedal note is usually transmitted when the hihat pedal controller is fully depressed.

- **Example: Roland TD-20**

  The following table shows how to map the notes transmitted by a Roland TD-20 to achieve non-variable hihat control.

Roland note	MIDI note* (note no.)	BFD3 mapping
Open Bow	A#1 (46)	open tip
Closed Bow	F#1 (42)	closed tip
Open Edge	D0 (26)	open shank
Closed Edge	A#-1 (22)	closed shank
Pedal	G#1 (44)	pedal

* MIDI note octaves are specified using -2 octave numbering (lowest note is C-2)

It is highly recommended to remap A#1 and D0 to 1/2-open tip and 1/2-open shank, as these represent the most common type of open hat sound. The Open tip articulation in particular is more like a hihat bell sound, or a small ride cymbal.

Advantages and disadvantages of non-variable hihat control

While it may be argued that using this method is less expressive than using the variable hihat control method described below, the resulting MIDI data is much easier to edit in a MIDI sequencer or DAW.

When using a MIDI CC for the hihat pedal position, recorded CC values must be moved along with any notes when editing, which may be cumbersome.

With the simple hihat control method, any editing and quantizing required is much more straightforward as only notes are involved. The open notes can be moved to other hihat articulations after recording in order to make parts more expressive.

BFD3's internal Groove recording function automatically converts any variable note/CC input that is received to discrete articulations. See *Recording Grooves with MIDI*.

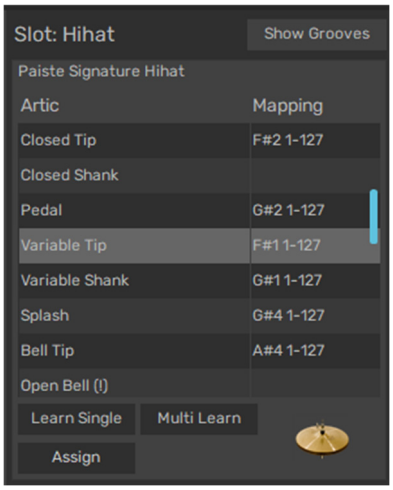
Variable hihat control

Overview

Electronic drumkits often use a hihat pedal controller which sends out MIDI continuous controller messages to represent its position within open and closed states. BFD3 is capable of analyzing this controller data while a hihat trigger is received to determine which hihat articulation to play from those available: closed, 1/4-open, 1/2-open, 3/4-open or fully open. For this to occur, hihat MIDI notes must be mapped to special 'Variable' hihat articulations.

Important note: BFD3 allows variable hihat control only for the Hihat slot. You may load additional hihats in other slots and trigger their articulations directly with MIDI notes, but variable hihat control is restricted to the Hihat slot only.

Assigning variable tip and variable shank articulations



Any hihat note transmitted by your electronic drumkit brain should be assigned to either a *Variable tip* or *Variable shank* articulation, with one important exception. Almost all brains send out a "pedal," or "foot-chick," sound when the hihat control pedal is depressed fully: this note should always be mapped to BFD3's *Pedal* articulation.

The Variable tip is used for the main surface or "bow" of the hihat, which should be used if you only have a single-zone hihat trigger pad. "Tip" refers to the fact that the surface of the hihat is struck with the tip of the stick.

The Variable shank is used for the edge of the hihat. This should be used in addition to the variable tip if your hihat pad has a dual-zone trigger. "Shank" refers to the fact that the edge of the hat is struck with the shank, or body, of the stick.

- **Example: Roland TD-20**

  A good example is the Roland V-Drums range of kits. Most Roland drum brain models send out the same set of notes for the hihat. The following table illustrates which notes to map to which articulation.

Roland note	MIDI note (note no.)	BFD3 mapping
Open Bow	A#1 (46)	Variable tip
Closed Bow	F#1 (42)	Variable tip
Open Edge	D0 (26)	Variable shank
Closed Edge	A#-1 (22)	Variable shank
Pedal**	G#1 (44)	Pedal

* MIDI note octaves are specified using -2 octave numbering (lowest note is C-2)

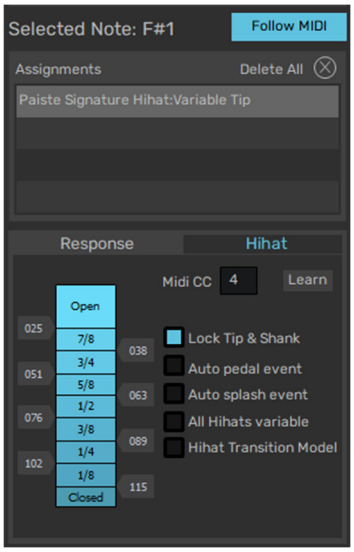
** The hihat pedal controller signal is transmitted via MIDI CC #4.

The Roland brain decides whether to send the "open" or "closed" note depending on the pedal controller value and a setting on the brain dictating the transition point between open and closed.

This distinction is unimportant to BFD3 because it contains additional 1/4-open, 1/2-open, and 3/4-open sounds. Therefore, the open and closed sounds should be mapped to the same Variable articulation. BFD3 makes its own decisions about which actual hihat articulation to play, depending on the value of the pedal controller and the settings in the Hihat response panel in the Key Map page.

The pedal note, meanwhile, chokes any playing open sound and plays the hihat pedal articulation (the "foot-chick" sound).

Assigning the hihat pedal MIDI CC and adjusting its response



Hihat pedals in most electronic kits transmit a MIDI continuous controller (CC) in order to represent the position of the pedal between open and closed. A value of 0 means that the pedal is open (fully up). As the pedal is moved down, the value of the MIDI CC increases. The maximum possible value is 127.

Usually, MIDI CC #4 is used for this purpose, and this is the default setting for the Hihat MIDI CC in BFD3. The Hihat Response panel can be used to change this to a different MIDI CC#, and to customize the response of BFD3 to received pedal controller values.

Hihat Response panel

In order to view the Hihat Response panel, a key containing a Variable tip or Variable shank hihat articulation must first be selected using the keyboard displays in the *Key Map* panel.

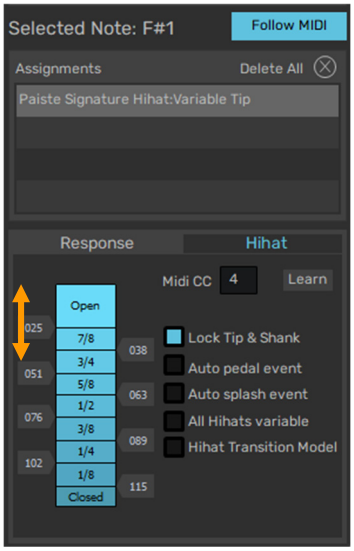
The controls in this panel allow you to define a number of settings for variable hihat control:

MIDI CC

This setting specifies the MIDI CC# to use for the hihat pedal. The setting used here depends on the value transmitted by your drum brain. To set the value, you can either:

- Click the value, type a new number between 1 and 127 and hit ENTER.
- Click the **Learn** button to the right of the setting and move your hihat pedal to detect the pedal CC. You may need to strike your hihat pad shortly before moving the pedal for the value to be transmitted.

Pedal transitions



The **Pedal transitions** control specifies the articulation transition points over the range of hihat height MIDI CC values.

This control features 4 adjustable points on a vertical slider, with each point representing the transitions between the hihat articulations over the pedal range. These transition points form 5 “zones” for closed, 1/4-open, 1/2-open, 3/4-open, and fully open articulations.

Each of the transition points displays a value from 0 to 127, which corresponds to the hihat pedal MIDI CC value at which the transition occurs. Click and drag the transition points up and down to adjust them.

When a Variable tip is triggered, the concurrent value of the hihat pedal MIDI CC is analyzed. The appropriate articulation is played depending in which “zone” of values the MIDI CC falls.

For example, let's say that the points for the Variable tip articulation are set to values of 10, 50, 80, and 110. This means that the “zones” of MIDI CC values translate to hihat articulations as follows:

0-9	open
10-49	3/4-open
50-79	1/2-open
80-109	1/4-open
110-127	closed

* MIDI note octaves are specified using -2 octave numbering (lowest note is C-2)

** The hihat pedal controller signal is transmitted via MIDI CC #4.

Therefore, if the CC value is 30 and the Variable tip articulation is triggered, a 3/4-open tip articulation is played. If it is 110, a closed tip is played, and so on.

Variable tip and Variable shank articulations have distinct **Pedal transitions** settings, although by default they are linked with the **Lock Tip & Shank** setting.

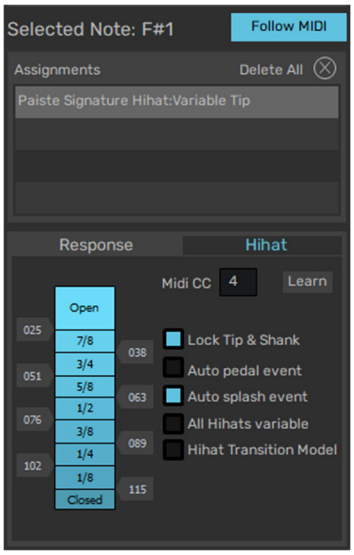
When using a hihat with less than the maximum number of articulations, BFD3 intelligently remaps triggers to closest appropriate articulation that does exist. This occurs if any articulations are unloaded in the Kit display, or when using hihats from other BFD3-compatible libraries which do not feature a full set of articulations.

The **Pedal transitions** settings can be used to overcome the common problem of hihat controller pedals not sending out the maximum possible range of MIDI CC values. For example, its maximum value (when fully closed) may be 90 instead of 127. If this is the case, adjust the transition point between closed and 1/4-open so that its value is 90 or less (80 would be a good starting point to try) and move the other sliders to appropriate points over the rest of the available range.

The MIDI Event Log can be very useful in examining the data transmitted by your controller pedal and drum brain.

Lock Tip and Shank

If you don't need to separately adjust the Variable tip and Variable shank **Pedal transitions** response, you can activate the **Lock Tip and Shank** button. This locks the settings of both Variable articulations together, so that the **Pedal transitions** slider values are exactly the same for both articulations. This setting is activated in the default BFD3 Key Map.



Auto pedal event

This setting is to be used when using variable hihat control with electronic drum brains which do not send out a pedal (foot-chick) note automatically when the hihat pedal is full depressed.

When the setting is activated, a pedal note is generated whenever the hihat pedal MIDI CC reaches the first value within the "closed zone" defined with the Pedal transitions control in the Hihat Response panel.

If your drum brain sends out a pedal note when the hihat pedal is fully depressed (Clavia D-Drum and Roland V-Drum brains fall into this category), then you should deactivate this setting if it is enabled.

Auto splash event

When using an electronic drumkit with variable hihat controller pedal, activating this setting results in an open hihat sound being generated if the hihat pedal is opened soon after a closed tip, closed shank, or Pedal articulation. The length of time within which this function operates is defined by the Hihat Reopen Threshold setting in the Preferences.

It is highly recommended to enable this setting when using some Roland drum brains such as the TD-20.

All Hihats variable

This setting represents a quick way of changing a set of regular hihat articulations into a variable hihat setup. It works by changing all hihat articulation mappings (with the exception of the pedal articulation) to variable equivalents.

To illustrate this using the Roland TD-20 example:

Roland note	MIDI note* (note no.)	BFD3 mapping	All Hihats variable enabled
Open Bow	A#1 (46)	open tip	Variable tip
Closed Bow	F#1 (42)	closed tip	Variable tip
Open Edge	D0 (26)	open shank	Variable shank
Closed Edge	A#-1 (22)	closed shank	Variable shank
Pedal**	G#1 (44)	pedal	Pedal

* MIDI note octaves are specified using -2 octave numbering (lowest note is C-2)
** The hihat pedal controller signal is transmitted via MIDI CC #4.

In the table above, the column to the extreme right shows the effective mappings with the setting enabled. The original mappings are not changed - you can return to normal by disabling the preference.

While the preference is enabled, hihat articulations display the relevant variable hihat controls in the Advanced mapping settings display instead of the standard settings, so you can customize hihat response as you would when dealing with variable tip and variable shank articulations.

Hihat Transition Mode

Activating this setting enables smooth transition modelling between hihat positions.

Preference settings related to hihat control

- **Retrigger threshold (Engine Preferences/Synth Engine section)**

  As mentioned earlier, the **Retrig Threshold** setting in the *Engine Preferences* exists to combat double-triggering problems. Dual-zone hihats can be especially prone to this. Increasing this setting may help in overcoming such problems.

- **Hihat choke fade settings (Engine Preferences/Fades section)**

  The hihat has more choke fade settings than other Drum types because of its more complex nature (see *Engine Preferences)*. The default Hihat choke fade settings should be adequate for most purposes, using both e-drums and more conventional input means.

  The default values are as follows:

  - Hihat choke fade (base): 0.500
  - Hihat choke fade (range): 0.500
  - Hihat closed tip choke fade: 0.050
  - Hihat pedal choke fade: 0.050

  These settings result in a fast choke on a hihat articulation that is currently playing if a pedal note (usually G#1) is received (it also performs a fast choke on closed tip articulations; see later). Most drum brains send out a pedal note when the hihat pedal is fully depressed, in addition to the MIDI controller messages for pedal movement.

  All other articulations are choked more slowly, allowing more natural cymbal-style choking for open hihat sounds. This also means that that open hats will not be choked when drum brains send out spurious MIDI notes due to cross-talk between zones etc.

Additionally, there is a separate choke fade setting for Closed Tip sounds. This is provided for keyboard drummers and programmers who are accustomed to choking open hats with a closed hat due to unfamiliarity with physical hihat behavior.

You may find that your e-drum system is demonstrating a lot of cross-talk between hihat zones and perhaps sending out undesired Closed Tip notes. If this is the case, try increasing the **Hihat closed tip choke fade** setting to a larger value.

Please note that since the Closed Shank articulation is quite a splashy sound, not unlike a 1/4-open tip, it is treated as an "open" articulation. It chokes open articulations with the standard **Hihat choke fade** times.

Hihat reopen threshold (Session Preferences/Hihat setup section)

This setting (in *Session Preferences*) defines the length of time after a Closed or Pedal hihat articulation within which the Auto Pedal Splash function, set in the Hihat Response panel, is active.

This setting is defined in musical notes, as the time required for this function typically varies according to the tempo. It is set at 1/64-note by default, which is optimal for most situations. However, if you need to adjust this response, it can be set to between 1/128-note and 1/16-note.

Hihat transition fade time (Session Preferences/Hihat setup section)

This setting (in *Session Preferences*) adjusts the amount of time for the transmuting processes associated with the **Hihat Transition Mode** and the **Auto Pedal Splash** settings.

Positional snare control

BFD3's snares, and those of many other compatible expansion packs, feature a Half Edge snare articulation, with the head of the snare struck halfway between the center and the edge. The regular Hit articulation, on the other hand, is a result of the snare head being struck in the center.

The *Variable snare* articulation allows you to access the Hit and Half Edge articulations using the positional sensing of snares in electronic drumkits such as those by Roland.

Positional sensing works by the drum brain sending out a MIDI CC representing the distance from the center (where the value is 0) and the edge (value 127).

Using positional snares in BFD3

In order to utilize this functionality, a variable snare articulation must be mapped in the Key Map page. Typically, you should assign it to the key normally assigned to the Hit articulation, usually D2. Please ensure that it is the only articulation on the key. Delete any articulations that may have originally existed.

Snare Response panel

After a Variable snare articulation has been mapped, select the key on which the mapping exists using the keyboards in the Key Map panel and then click the Snare button in the Mapping Editor to show the Snare Response panel.

MIDI CC

This setting specifies the MIDI CC# to use for the snare position. The setting used here depends on the value transmitted by your drum brain. On Roland kits, this MIDI CC is usually CC #17. To set the value, you can either:

- Click the value, type a new number between 1 and 127 and hit ENTER.
- Click the **Learn** button to the right of the setting and strike your snare. If it transmits a CC for the position information, it is detected.

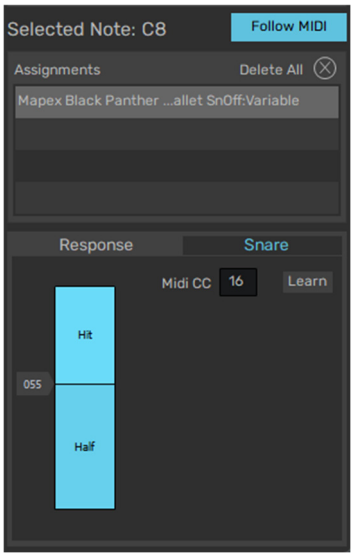
Snare transition

The **Snare transition** control is very similar in concept to the Pedal transitions control in the Hihat Response panel. It specifies the articulation transition point between Hit and Half Edge articulations over the range of the snare position MIDI CC.

This control features an adjustable point on a vertical slider, with the point representing the transition between the two articulation "zones." The transition point displays a value from 0 to 127, which corresponds to the snare position MIDI CC value at which the transition occurs. Click and drag the point up and down to adjust it.

If the point is set at 55, this means that the two resulting zones are set as follows:

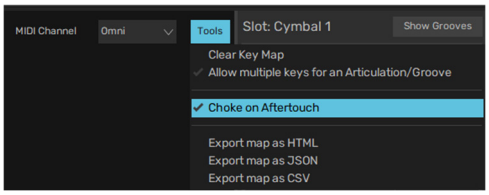
Hit	0-54
Half-edge	55-127



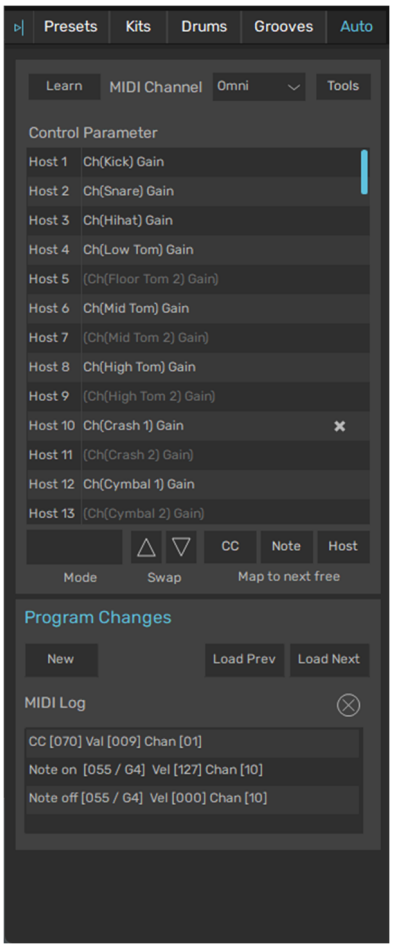
Controlling cymbals

Many electronic drumkits feature manual choking of cymbals by “grabbing” the cymbal trigger pad. Such cymbal pads usually involve a pressure controller that transmits polyphonic aftertouch (poly pressure) messages associated with the cymbal MIDI notes.

This feature can be used in BFD3 by enabling the **Choke on aftertouch** setting in the Key Map panel's **Tools menu** (see *MIDI Key Mapping*). Please note that aftertouch choking only works on Cymbal slots.



2.5.3 Automation Maps



The Automation panel allows you to view, create and modify MIDI and host automation assignments to BFD3 parameters.

It also provides access to the *Program Change Playlist*, which is described in the next section.

The Automation panel is not visible at the same time as BFD3's Browser. To make it visible, click the **Auto** button above the Browser.

To exit the Automation panel, click the **Auto** button again to hide it or click any other Browser tab button to display it instead.

MIDI automation and host automation

MIDI and host automation both have their own advantages and disadvantages:

Hardware MIDI controllers tend to be cheap and widely available while host automation controllers can tend to be less plentiful and more expensive. Despite this, it is usually possible to simply draw automation data in terms of lines and curves directly in your host instead of using hardware to create this data. It is also usually possible to draw MIDI CC automation in a similar way. Please check your host's documentation for more details on its support for MIDI CCs and host automation.

Host automation tends to offer greater resolution (although this varies wildly depending on your particular DAW's implementation) while MIDI CCs are limited to 7-bit resolution (128 steps), which can lead to smoother automation.

In the case of MIDI, BFD3 is capable of using both MIDI continuous controllers (CCs) and MIDI notes. The latter are particularly useful for automating button-type controls.

Automation panel layout

- **MIDI channel**

  Automation Map assignments can be created on any MIDI channel. By default, BFD3 responds in Omni mode (in other words, on any MIDI channel). This can be changed to a specific channel from 1-16 using the **MIDI Channel** drop-down menu.

  Automation assignments can exist on a separate MIDI channel to that used for the Key Map. Its MIDI channel setting is entirely distinct. Setting a different MIDI channel to that used for the Key Map is useful when using significant numbers of MIDI note mappings.

  The current **MIDI Channel** setting applies to all current automation assignments, regardless of the MIDI channel used when it was created.

- **Learn button**

  Activate this button to enter Learn mode, used for the process of mapping BFD3 parameters to automation control sources. See the guide below for details of how to use this button.

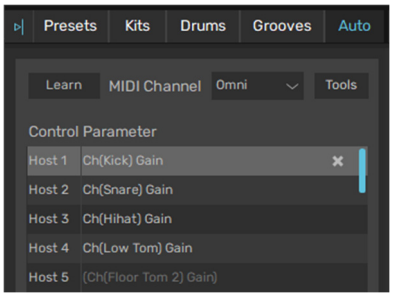
- **Map to next free**

  These three buttons are also used in the mapping process. See the **Creating an automation assignment** guide *below* for details.

- **Mapped parameters list**

  This list displays current automation mappings as well as program changes for the program change playlist. Program changes are always displayed underneath automation mappings. The Program Change playlist is discussed in the next section.

  Each mapped **Parameter** is shown to the right of the **Control** source to which it is assigned.



- **Delete mapping**

  When the cursor is hovered above a mapping in the list, a **Delete mapping** button (**X**) is shown at the right. Click the button to delete the mapping.

- **Swap**

  These buttons swap the assignments of adjacent MIDI CCs/host automation parameters.

- **Mode**

  This setting is used to adjust the behavior of the selected mapping in the Mapped parameter list. See the **Adjusting automation behavior for a mapping section** *below* for a guide to using this setting.

- **Program Changes**

  This part of the panel is discussed in the *Program Change Playlist* section.

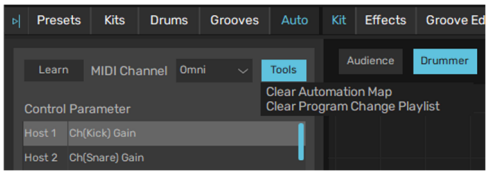
- **MIDI Log**

  The MIDI Log provides an overview of incoming MIDI messages, useful for troubleshooting mapping operations.

- **Tools menu**
  - **Clear Automation Map**

    This function clears all current automation assignments of all types. You are prompted for confirmation before this function is applied.
  - **Clear Program Change Playlist**

    This function clears the *Program Change Playlist*.



Creating an automation assignment

1. First, display the Automation panel if it is not currently visible, using the **Auto** button above the Browser.
2. Then click the **Learn** button in the Automation Panel.

The BFD3 interface changes to highlight any controls that can be automated. Any existing automation mappings are labelled on the control.

In this state, you can use the interface to display the desired control if it is not currently visible.

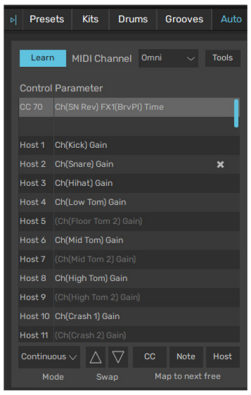
3. The assignment is then created in any of the following ways:
   - **Learn an incoming message**

i. Click the parameter within the BFD3 interface you wish to assign to an automation control source.

ii. Move/adjust the hardware knob/fader/key to which you wish to map the BFD3 parameter.

Alternatively, suitable data can be drawn/painted within a track in your host/DAW and played into the BFD3 plugin. Usually, values are sent as they are drawn. Please consult your host's documentation for details on sending values for MIDI CCs, host automation parameters and MIDI notes.

iii. The BFD3 parameter is now labelled with the learned automation source to confirm that it is now mapped.

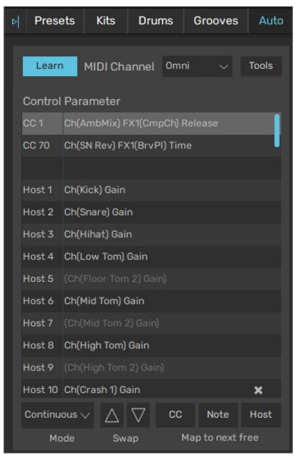


The mapping is also shown in the **Mapped parameters** list in the Automation panel.

MIDI assignments are shown above host automation assignments.

- **Use the Map to next free function**

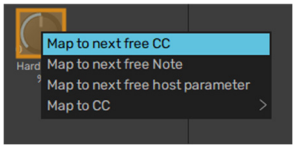
i. Click the parameter within the BFD3 interface you wish to assign to an automation control source.



ii. Click one of the **Map to next free** buttons in the Automation panel to map the BFD3 parameter to the next unmapped **CC**, **Note** or **Host** automation source.

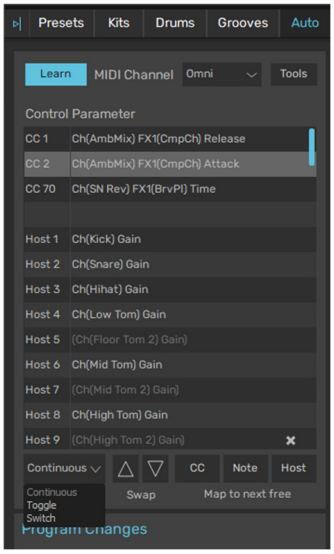
iii. The mapping is now shown on the BFD3 parameter and in the **Mapped parameters** list in the Automation panel.

Alternatively, right-click on the desired BFD3 parameter and use the **Map to next free** functions on the menu that appears.



Adjusting automation behavior for a mapping

The **Mode** setting changes the behavior of the selected mapping in the Mapped parameter list. Click the button to display a drop-down menu of the three following settings:



- **Continuous (default for MIDI CCs)**

  This is the default mode and the most typically useful way to control a fader or knob. The fader or knob's value follows the MIDI CC values continuously.

- **Switch**

  This mode is intended to be used when controlling button parameters with MIDI CCs. The MIDI CC range is divided in two, with values of 0-64 triggering an "Off" state and values of 65-127 triggering an "On" state.

  This mode can also be used with MIDI notes: notes with a velocity between 0-64 switch the BFD3 parameter to an "Off" state, while notes with a velocity between 65-127 switch the BFD3 parameter to an "On" state.

- **Toggle**

  This mode is available for MIDI note assignments and sets the assignment to "latching"-style behavior: play the note once and release it to trigger an "On" state, and play/release the note again to return it to its "Off" state.

  This mode is recommended when assigning the **Record/Loop** transport buttons to MIDI notes.

- **Momentary**

  This mode is available only for MIDI *note* assignments. The assigned BFD3 parameter is set to an "On" state while the MIDI note is held down (when it sends a MIDI note on message).

  Upon release of the MIDI note (when a MIDI note off message is received) the control returns to its "Off" state.

  This mode is recommended when assigning the **Play/Stop/Return to Start** transport controls.

Saving the Automation Map

All the following functions can be found in BFD3's **File menu**.

- **Save Automation Map**

  This function opens a system file save dialog prompting for a location and filename to save the current Automation Map.

  It is recommended to save the Automation Map to the default location (**<user location>/Maps**) so that it is accessible from the Load Automation Map panel without further adding and scanning of data locations.

- **Save Key + Automation maps**

  Save MIDI Event Log

  See the *MIDI Key Maps* section for details on these functions.

2.5.4 Program Change Playlist

The Program Change Playlist manages mappings between MIDI program change messages and BFD3 Presets. No mappings are set up by default, but they can be created and saved in the Automation panel's Program Change Playlist section.

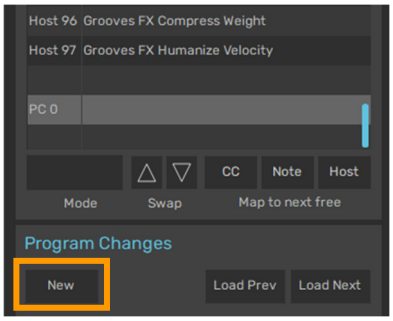
The Automation Map panel is not visible at the same time as BFD3's Browser. To make it visible, click the **Auto** button above the Browser.

To exit the Automation panel, click any other Browser tab button—either the **Presets**, **Kits**, **Drums** or **Grooves** buttons.

Creating program change entries in the playlist

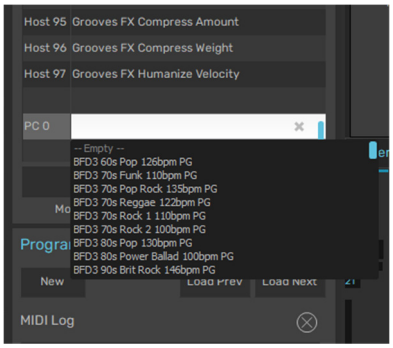
Create a New playlist entry

Click the New button to create a new entry in the Program Change Playlist. A new entry appears named "PC 0" under the **Control** column of the Automation panel's Mapped parameter list, unless any entries already exist, in which case its name is PC *n* , where *n* is 1 higher than the last program change in the list.



Assign the playlist entry to a BFD3 Preset

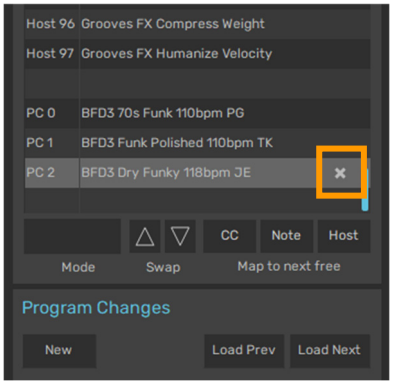
Click a program change entry that has been newly created using the New button, under the **Parameter** column. A drop-down menu of the available Presets in the BFD3 database is shown. Simply scroll down to and click the required Preset to make the assignment.



Managing program change playlists

- **Removing entries in the playlist**

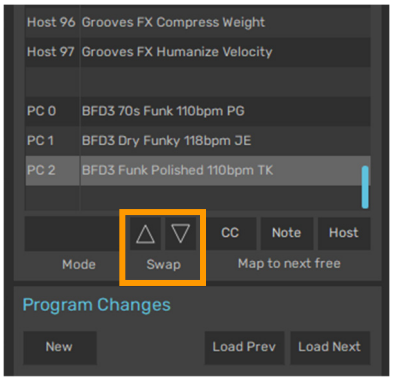
  When the cursor is hovered above program change entry, a **Delete mapping** button (**X**) is shown at the right. Click the button to delete the mapping.



- **Re-ordering entries in the playlist**

  The **Swap** buttons allow you to re-order the program change playlist by moving the selected playlist entry up or down in the list.

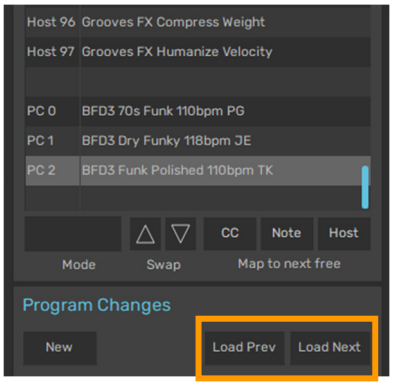
  Click the playlist entry under the **Control** column in order to select it without displaying the drop-down menu of Presets.



Using the playlist with MIDI or the Load Prev / Load Next buttons

To switch between the different playlist entries, you will need a MIDI controller capable of transmitting program change messages. A good solution is a MIDI footswitch board. These are relatively easy and cheap to source and are commonly used to send program change messages. Other possibilities include the preset +/- buttons on many keyboards, which often transmit program change messages from the MIDI output.

Alternatively, you can use the **Load Prev / Load Next** buttons. These can be mapped to a MIDI or host automation source in order to cycle through program changes remotely.



Loading and Saving Program Change Playlists

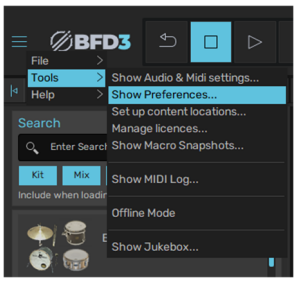
It is important to note that Program Change Playlist is *not* saved with a BFD3 Preset. This part of BFD3 lies outside the scope of the Preset since it switches between Presets.

The BFD3 **File menu** features the **Load Program Change Playlist** and **Save Program Change Playlist** functions. Both of these functions display a system file dialog for specifying a filename to load or save. It defaults to the **<user location>/Playlists** folder.

The **Default Program Change Playlist** setting in the ***Data Preferences*** allows you to define a Program Change Playlist to load whenever BFD3 is launched.

2.6 Preferences

Preferences panel



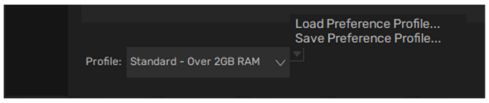
The Preferences panel is displayed with the Show Preferences function in BFD3's Tools menu.

It features a number of functions to customize various aspects of BFD3's performance, resource usage, control behavior and interface.

The panel features the following pages:

- *Data Preferences*: settings related to BFD3's content locations and various startup loading options.
- *Grooves Preferences*: settings related to the Groove engine.
- *Session Preferences*: settings which are loaded and saved with Presets and host/DAW sessions when running the BFD3 plugin.
- *MIDI Preferences*: settings related to MIDI input.
- *Engine Preferences*: settings related to BFD3's core engine, modelling, and streaming functions.
- *GUI Preferences*: settings related to BFD3's graphical user interface.
- **Health Preferences**: settings which are designed for troubleshooting purposes when you require support. Please ignore this page unless instructed to use it by our technical support team.

Profiles



The Preferences panel features a Profile system which loads/saves settings for all settings in the Engine Preferences page with the exception of the Simulation settings.

These profiles allow you to define different profiles for different situations; for example, low quality/detail level settings for composition work, and high-detail settings for mixdowns and exports.

Click the **Load/Save** button to display the **Load Preference Profile...** and **Save Preference Profile...** functions. Use the latter function to save the current settings as a profile. Use the former function to load a profile from any location on disk, or use the main drop-down menu to choose from the available profiles currently in the database.

The profile is also set using the BFD3 Setup Wizard, launched when using BFD3 for the first time or available at any time in BFD3's **Help menu**.

2.6.1 Data Preferences

Program Bank section

- **Default Program Change Playlist**

  This setting specifies a default Program Change Playlist to load when BFD3 is launched. Click the **Browse** button to specify the desired file.

Preference and Database management section

- **RESET ALL PREFERENCES**

  Clicking this button, and agreeing to the subsequent confirmation dialog, results in all your preference settings being trashed, reverting to factory default settings.

Data Paths section

- **Launch Content Paths Manager**

  This button opens the Content Locations panel, which can also be opened using the **Set up content locations** function in BFD3's **Tools menu**. See *Setting Up Additional Content* for more information.

- **Prompt for missing Data Paths**

  With this setting activated, BFD3 prompts for any missing content locations when it is launched. Typically, these may include external hard drives which are not yet connected and mounted.

Export section

- **Enable NFUZD Export features**

  This setting is provided for users of the NFUZD Audio NSPIRE electronic drumkit. When activated, two additional functions are available in the Tools menu related to exporting kits and loop kits for standalone use with the NSPIRE module.

Startup section

- **Startup Preset**

  Any Preset currently in the database can be used as the Startup Preset which is loaded whenever BFD3 is launched. When this is set to *Don't load anything*, BFD3 is launched in its factory default state.

Migration section

- **Migrate BFD settings files from FXpansion**

  This setting will attempt to copy any existing files from FXpansion program locations, including kits, presets, grooves, keymaps, and other content. This may result in duplicate presets depending on your content setup. We recommend running this only if you have content missing that existed prior to BFD v3.3.

2.6.2 Grooves Preferences

Fall Through section

- **Slot fall through enabled**

  When this setting is enabled, if a groove is loaded that has notes for drums that do not exist in the currently loaded kit, BFD will attempt to redirect those notes to another drum of the same class and sub-class. For instance, if there is a missing Floor Tom 2, the note would redirect to Floor Tom 1.

MIDI Import section

- **Import MIDI key map**

  Unmapped MIDI note mode

  These settings are described in the *Importing MIDI Files* section.

MIDI & Audio Export section

- **MIDI export Mode**

  This setting specifies the track structure of exported MIDI files. It can be set to *One track for all Drums*, *One track per Drum* or *One track per articulation.*

- **Export adds unmapped Key Map articulations**

  If this setting is activated, exporting a MIDI file from the Groove engine adds mappings to any unmapped articulations automatically, so that the MIDI file sounds the same when played back with BFD3's sounds. It is advisable to subsequently save a BFD3 Preset or a Key Map with the mappings in place if you intend to use the MIDI file in future.

- **Export prefers variable articulations**

  If this setting is activated, hihat events are converted to variable articulations along with accompanying hihat pedal controller MIDI CC data when Grooves are exported as MIDI. Variable articulation mappings and a hihat pedal MIDI CC must be specified in the Key Map used for the export.

  With the setting deactivated, specific hihat articulations are exported.

- **Export tail length (seconds)**

  This setting specifies the size of the tail retained at the end of an audio export. The length of the tail is set in seconds. Retaining a tail at the end of exports makes sure that any lingering decays are captured.

  When creating audio files that are an exact number of bars long (for example, when creating "loops" with the **Export Groove Audio** function), set this preference to *0*.

- **Auto-arm Mixer Channels for audio export**

  This function is described in the ***Saving and Exporting Grooves*** section.

Editor + Misc Preferences

- **Record lead-in (bars)**

  Groove record commit mode

  These functions are described in the ***Recording Grooves with MIDI*** section.

- **Maximum undo steps**

  This setting specifies the maximum number of undo steps in the Groove Editor's multi-stage **Undo** function. More steps use more RAM!

- **Cubase loop correction**

  This preference should be activated to achieve correct timing when using Cubase's loop function.

- **MIDI rec. quantization in PPQN (0 = none)**

  This setting adjusts the resolution of quantization when recording Groove events via MIDI, with the default setting providing 960 PPQN resolution. With a setting of 0, no quantization is applied.

- **MIDI Start/Stop control enabled**

  With this setting activated, BFD3's transport responds to external MIDI start/stop commands.

- **Max Drum Track length (bars)**

  This setting specifies the maximum possible length of the Drum Track, in bars. The default is *1000*. If you require longer drum tracks, increase this value.

- **Invert Ruler Zoom Y**

  Invert Ruler Drag X

  These functions invert the orientation of the zoom/scroll functions when clicking and dragging in the **Ruler** in the ***Groove Editor***.

- **High-accuracy song position display**

  This setting is enabled by default and results in a highly accurate position marker in the Groove Editor grid. This can cause more CPU usage on some systems so if you find you are experiencing audio artifacts when using the Groove Editor, try deactivating this setting.

Metronome section

- **Metronome volume**

  This setting allows you to specify a volume level for the metronome, and ranges between a maximum of 100 and a minimum of 1. The level of the metronome can also be set using the Metronome channel in the mixer; it must be enabled with the View menu if it is currently hidden.

  Four preset volume levels can be quickly accessed by right-clicking on the **Metronome** button in the Transport.

- **Metronome type**

  Metronome mode

  These settings are discussed in the ***Recording Grooves with MIDI*** section.

2.6.3 Session Preferences

Session preferences are settings that are useful to save on a session-by-session basis.

To use custom Session preference settings on all new projects, a suitable **Startup preset** should be created and saved in BFD3 and then specified in the Data preferences.

Session MIDI section

- **Notes MIDI channel**

  Controller MIDI channel

  These settings specify the MIDI channels on which BFD3 receives MIDI data for the following purposes:
  - triggering articulations with MIDI notes
  - automating BFD3 controls with MIDI CCs and MIDI notes

  By default, both settings are specified as *Omni*, which means that the Key Map and MIDI automation functions respond on all MIDI channels.

- **Send MIDI Out**

  MIDI Out channel

  These settings relate to BFD3's MIDI Out function, which outputs events from the Groove engine for use with other MIDI-compatible instruments. Your host/DAW and plugin format must support this feature for it to operate.

Hihat setup section

- **Base Hihat tip tighten**

  Hihat tip tighten (amount)

  Base Hihat shank tighten

  Hihat shank tighten (amount)

  These settings are related mostly to controlling hihats from electronic drum systems when using the Tighten controls in the ***Drum Editor*** for the current Hihat.

  The **Hihat tip tighten** sets the amount of tightening for the start of the closed zone, with the **Hihat tip tighten (amount)** setting the amount of tightening for the highest value in the closed zone (i.e., fully closed). The same applies to **Hihat shank tighten** and **Hihat shank tighten (amount)**.

  However, even if you are not using an electronic drum system, the **Hihat tip tighten** and **Hihat shank tighten** values set the maximum amount of tightening applied by the controls in the Drum Editor's Hihat Tighten section.

  Note that for these controls to have any effect, the Tighten controls for the loaded Hihat must be activated and increased from their minimum settings in the Drum Editor.

- **Hihat transition fade time**

  Hihat re-open threshold

  These functions are related to playing the Hihat with an electronic drumkit. See ***Using Electronic Drum Kits*** for more information.

Session Playback preferences

- **Revert to factory defaults**

  Click this button to revert to the factory defaults for the settings in the Session Playback section.

- **Auto-fill period**

  This setting specifies the number of bars between fills when using the **Auto-fill** function in the Groove Palette's Default Actions section.

- **Palette Auto-Play mode**

  Palette Auto-Play Groove

  These settings are described in the ***Palette*** section.

- **Groove engine active**

  Deactivating this setting disables the Groove engine entirely if it not required (if you are only triggering BFD3 with external MIDI notes).

- **Latching mode**

  When this setting is activated, Groove are started and stopped with a MIDI note on message, instead of the usual behavior (MIDI note on to start a Groove, MIDI note off to stop it).

  Each Groove's Start/End Actions still apply.

- **Polyphonic mode**

  By default, BFD3 does not allow more than one Groove to play simultaneously. However, this can be changed by activating the **Polyphonic mode** setting. In this mode, a newly-triggered Groove does not stop any other Grooves that are already playing. This is useful for layering Grooves.

- **Sync to last bar**

  When this setting is activated, grooves sync to the last bar. This is useful when there are multiple time signatures in a host song. When deactivated, grooves sync to position 1.1, which is better when there are no time signature changes in the host song.

2.6.4 MIDI Preferences

MIDI Channel section

- **Live MIDI key map**
  This setting determines the selected key map for BFD3.

MIDI display section

- **Octave numbering scheme**
  Some sequencers and MIDI controller devices use an octave numbering system which begins at *C-2*, rather than *C0*, while others use *C-1* as the lowest key.
  This setting allows you to set the note numbering convention according to your own preference. This setting can be specified using the **Main Host Application** item in the BFD3 Setup Wizard.
- **Use MIDI numbers rather than notes**
  With this setting activated, MIDI note numbers between 0 and 127 are used instead of note/octave naming in the form of C-2, C-1, C0, C1 etc.
- **Program Change index starts at 0**
  With this setting activated, the Program Change Playlist's numbering starts from 0 rather than from 1.
- **Show low keys at keyboard bottom**
  This setting applies only to the vertical keyboard representation in the Key Map panel. With the setting deactivated, the keyboard is inverted; the highest note is at the bottom rather than the top.

MIDI Select section

- **Select keys with MIDI notes**
  With this setting activated, incoming MIDI notes will cause the MIDI key map to jump to the key played. When deactivated, incoming MIDI notes are ignored. You can override this value from the MIDI mapping page.
- **MIDI Follow Enabled**
  MIDI Follow Minimum Interval
  With this setting activated, the current kit piece in focus will switch to the kit piece associated with the incoming MIDI notes. The **Minimum Interval** setting is used to set the length of time that any additional switching is blocked after the focus is changed. This can help BFD ignore notes caused by crosstalk on electronic drum kits.

Key Mapping section

- **Prompt for Choke note overwrite**
  With this setting activated, attempting to map a slot Choke articulation to a key already containing other articulations results in a warning and request for confirmation.

MIDI Learn Note Wizard preferences

These settings control the behavior of the MIDI Learn wizard in the Kit display.

- **MIDI learn wait mode default**
  This setting determines whether **Wait mode** is activated by default.
- **Only learn 1 note per articulation**
  When this setting is enabled, the MIDI note learn wizard does not allow the same key to be mapped to more than one articulation. If this is attempted, the previous mapping is removed.
- **MIDI learn next slot mode default**
  This setting specifies whether **Next slot mode** is activated by default.
- **MIDI learn accept time (sec)**
  This setting defines the amount of time that is allowed after a Learn mapping has been created for an alternative note to be played, in case the original note was played in error. The value of this setting is 5 seconds by default.
- **MIDI learn skip time (sec)**
  When **Wait mode** is deactivated in the wizard, this setting specifies the time delay before the wizard moves onto learning the next articulation (or the next Drum, if the current articulation is the last in the current Drum and **Next slot mode** is activated). The default value of this setting is 15 seconds.

2.6.5 Engine Preferences

Streaming Engine section

- **Stream buffer**

  This is the size, in sample frames, of the buffers of data being streamed into RAM from the hard disk for each voice. Generally, hard drives are more efficient at reading fewer large chunks of data than many smaller chunks. However, a larger Stream buffer uses more RAM, and may be inefficient if not all the data is used, such as when notes are choked.

  Settings of *4096*, *8192*, *16384*, *32768* and *65536* samples are possible, selectable via a drop-down menu. Settings of *8192*, *16384* or *32768* are fine for most systems.

- **16 bit mode**

  In this mode, sample data is loaded into RAM and streamed from disk at 16 bit instead of 24 bit. Because 24 bit data is stored in memory as 32 bit floats, using 16 bit mode effectively halves the memory footprint required by BFD3.

- **Max voices**

  The **Max voices** setting dictates the maximum number of voices the BFD3 engine can play simultaneously. If the voice limit is exceeded, an intelligent voice-stealing system is applied, based on the oldest voice which is still playing.

  The number of voices required for a performance can be much larger than anticipated. For example, decaying cymbals and toms can raise polyphony requirements significantly. 64 is a safe number to use for this setting; voices do not consume a large amount of RAM when unused.

- **RAM buffer**

  This value, in sample frames, is the size of the portion of each sound held in RAM to enable low latency playback, circumventing the inherent latency involved with disk seek times. The portion held in RAM plays while the streaming engine cues up the rest of the data from the hard disk. A larger value gives the hard drive longer to deliver the data, but is more demanding on RAM. If the setting is too low for your system, you are likely to suffer from dropouts and other audio artifacts.

  This value determines the length of each sound played when the Preview RAM audio only option is enabled.

  Settings of 4096, 8192, 16384, 32768 and 65536 samples are possible, selectable via a drop-down menu. A setting of *16384* or *32768* is fine for most systems, while fast newer machines may be able to run with settings of *4096* or *8192*.

- **Load all to RAM**

  With this setting activated, the entire kit is loaded to RAM and no data is streamed from the disk during playback.

  Please ensure you have enough RAM before using this option, and that you are running BFD3 within a suitable environment with the other engine preferences set to suitable values. Unless your system is fully 64-bit (64-bit plugin within a 64-bit host in a 64-bit OS) with a high amount of RAM, it is unlikely that you will be able to load full detail kits with **Load all to RAM** activated. In 32-bit environments, **16-bit mode** should be activated, and the **Max velocity layers** setting reduced to a much smaller value.

- **Load on demand**

  This setting only loads velocity layers into memory when they are required. The more a drum is played, typically the more detailed it becomes and the more memory it uses.

- **Max velocity layers**

  This setting limits the number of velocity layers used for each Drum articulation, thereby reducing the strain on the hard disk and RAM but at the expense of detail.

  If a Drum is loaded that has more layers than the number specified with this setting, only selected velocity layers at proportional intervals over the range are loaded. The Drum's natural timbral variations are still heard but with less “resolution” over the velocity range.

  Smaller values can be useful as an efficient preview mode while composing, especially with other RAM-intensive plugins and instruments in your host/DAW project.

  Simply increase the value and restart the engine before performing a final mixdown with full quality.

  To change the setting, click the field and enter a new value between 1 and 256.

  Note that the Detail section in the Engine Preferences allows further Detail settings for each Drum class. These operate as proportional reductions of the **Max velocity layers** setting.

- **Max cache buffers**

  This setting represents the maximum number of disk streaming buffers cached in RAM. If the same velocity layer is triggered repeatedly, it is possible to avoid reading from the disk by reusing the disk streaming buffers with the same data. This parameter determines how much RAM to devote to storing layers to play again.

  With any kind of dynamics in a performance or when using the Anti-MachineGun functions, layers do not tend to be reused very often so this setting can be reduced if you wish. Each voice does still require 1 cache buffer.

- **Preview RAM audio only**

  This setting forces the engine to play only the initial part of the sounds which are held in RAM without streaming the remaining parts from disk.

  This mode may be useful while composing in order to avoid disk usage, and reactivated during mixdown. The actual amount of each sound stored in RAM is determined by the **RAM Buffer** setting.

- **Restart engine**

  If any of the following settings are changed, it is necessary to use the **Restart engine** button in order to make them active:

  - Load all to RAM
  - 16 bit mode
  - RAM buffer
  - Stream buffer
  - Max cache buffers
  - Max velocity layers

  If any Drums are currently loaded when this function is used, they are automatically reloaded after the engine is reinitialized with the new settings.

- **Enable BFD3 extended channels**

  When this setting is deactivated, only the OH, Room and Amb3 ambient channels are active. Extra Mono and Comp channels are ignored, meaning that kits use much less RAM.

  When the setting is activated, all channels possessed by a Drum are loaded.

Synth Engine section

- **Drummer perspective**

  This preference provides the default setting for the **Audience/Drummer** switch in the *Kit Display*.

- **Disable SideStick tuning**

  With this setting activated, the SideStick articulation is not affected by any tuning changes for the Snare. This results in behavior that more closely resembles how a real snare works.

- **Anti-MachineGun mode**

  This preference provides the default setting for the AMG button in the BFD3 Dashboard (see *Global Controls*).

- **Retrigger threshold**

  This setting defines a period of time after each received MIDI note within which further received notes are ignored. This setting is useful for trigger systems such as electronic kits that are prone to double triggering.

  The value is set in seconds. The default value is 0.050 (50 milliseconds).

- **Enable AVX instructions**

  Enable AVX2 instructions

  Enable FMA instructions

  The x64 CPU vector instruction preferences control BFD's use of advanced AVX, AVX2 and FMA fast math instructions on Intel and AMD x64 processors. If enabled, they can significantly reduce the CPU load of the synthesizer and mixer. BFD will attempt to automatically determine if they are available.

  You should leave these enabled unless directed by Support to disable them, or you are using an older (pre-2013) processor which may not have these instruction sets, and BFD is unable to correctly determining if they are present.

- **Multi-threaded synthesis**

  Multi-threaded mixer

  The BFD35 engine can use four CPU cores in parallel to boost CPU processing power available for extra mixer effects and synthesis voices. However, some DAWs have their own parallel plugin processing schemes which can fight with BFD's multithreading when BFD is dynamically boosted to be a high-priority focused plugin (Apple Logic, for example). If you experience crackling when BFD is focused in DAWs, you can disable BFD's parallel processing with these preferences.

Fades section

A choke fade, or fade, occurs if an articulation in a Drum is triggered before an older articulation from the same Drum has finished decaying.

For example, when playing a high tom twice rapidly in succession, the first is faded out when the second is triggered. The fade settings allow you to adjust the duration of these fades that occur when using choking.

Fade times for each Drum slot are available within the Choke Response section of the *Drum Editor* (on the **Model** page).

The fade settings in the Preferences represent default settings to use in an empty launch state. Hihat, Tom and Cymbal slots possess their own fade defaults in this section. The **Default choke fade (base)** and **Default choke fade (range)** settings apply to all other Drum types.

How fades work

There are two components to choke fade times: **fade (base)** is the minimum fade time, while **fade (range)** is the maximum additional time added to the (base) value, according to BFD3's "dominant excitation preservation" algorithm. This algorithm allows longer fade times for louder events (higher velocities) when choked by quieter events (lower velocities) and reduces the fade time when a low velocity event is choked by a subsequent higher velocity articulation. A quiet event choked by a loud event has a fade time of **fade (base)**, whereas a loud event choked by a quiet event has a fade time of **fade (base) + fade (range)**. This approach achieves realistic results while reducing the disk streaming load when possible.

Please note that adjusting fade settings to extreme values can achieve results which may sound unrealistic. Subtle use is advised if realistic results are desired. Extreme settings are, however, allowed as an aid to experimentation.

Additional hihat fades

Hihats feature 2 additional fade times: **Hihat closed tip choke fade** and **Hihat pedal choke fade**.

The pedal is the only thing that chokes an open hihat when playing a drumkit. When playing BFD3's sounds from an electronic drumkit, the pedal note transmitted when the pedal is moved down fully is used to choke any playing open hihat articulation. It has also become conventional for sample-based drumkits to choke open hats with a closed hat note.

Both of these settings should be set to low values, with the other fade times for the Hihat (which cover all open positions and the Closed Shank articulation) set to higher values.

Additional snare fade

Snares feature an additional choke articulation and associated fade time for choking Drag articulations, allowing you to shorten drag roll articulations. The fade time for this type of choke is set with the **Snare drag choke fade** setting. This setting is also available in the Drum Editor via the **Special** setting in the Choke Response section.

Detail section

The Detail settings specify the level of velocity layer detail for each Drum Class: **Kicks**, **Snares**, **Hihats**, **Toms**, **Cymbals**, and **Percussion**.

These settings operate relative to the **Max velocity layers** setting, with proportional layer selection throughout the maximum range occurring in the same way.

Four detail level options are available for each Drum class:

- **Minimal**
  A single velocity layer is loaded for each articulation in the Drum class.
- **Small**
  Approximately 25% of the number of layers specified by the **Max velocity layers** setting are loaded.
- **Medium**
  Approximately 50% of the number of layers specified by the **Max velocity layers** setting are loaded.
- **Large**
  The maximum possible number of layers as specified by the **Max velocity layers** setting are loaded.

Simulation section

- **Kick to Tom Spill**
  Snare to Tom Spill
  Kick to Tom Resonance
  Snare to Tom Resonance
  These settings provide overall gain scaling levels for the Drum Editor's *Res Trim* and *Spill Trim* settings for the Kick and Tom slots.

2.6.6 GUI Preferences

Mixer GUI section

- **Default mixer direct channel gain**
  Default mixer OH channel gain
  Default mixer ambient channel gain
  These settings provide default levels for direct Drum channels, the OH (OverHead), and other Ambient mic channels.
- **Create mixdown busses**
  With this setting deactivated, Kick, Snare and Ambient channels appear in the mixer without parent Kick/Snare/Ambient Mix channels. Note that this setting applies only to mixes created from default settings in future. Existing presets still retain whatever mixer configuration with which they were saved.
- **Show Drum linking**
  With this setting activated, Drum linking setups are shown overlaid on Drum mixer channel images in addition to within the Kit display.
- **Show mixer signal routing**
  Show Export panel
  Export on right
  Show ambience channels
  Show aux channels
  Show direct channels
  Show metronome channel
  Show side chain input channel
  Simple channel view
  Show mini mixer
  Show channel info
  Show KP Vis info
  Animate mixer hits
  These preferences provide default settings for the corresponding functions in the mixer.
- **Animate mixer meters**
  Animate FX meters
  These settings allow you to disable metering on mixer channels and in FX interfaces. While these settings are enabled by default, they are provided in case the metering graphics cause excess CPU usage on your system.
- **Meter when muted**
  With this setting activated, mixer metering will continue when the channel is muted. When deactivated, metering will stop when mute is enabled.
- **Show output names as numbers**
  With this setting activated, all outputs are shown as names rather than numbers in the mixer's Output selectors and Export panel.

Kit page section

- **Select triggers preview**
  When this setting is activated, a preview is heard when clicking a Drum slot in the Kit display with the Select tool active.
- **Animate hits**
  When this setting is activated, Drum slots in the Kit display are animated to represent incoming event triggers (from MIDI or from the Groove engine).

Control behavior section

- **Startup Screen**
  This setting dictates which part of the BFD3 interface should be shown by default on launch. It can be set to show the *Kit* display, *Effects* Editor or *Groove* Editor. Alternatively, the last panel in use (*last used*) can be specified instead.
- **Startup Browser**
  This setting determines which Browser tab should be shown by default on launch. Alternatively, the last used tab (*last used*) can be specified instead.
- **Circular knob control**
  When this setting is activated, circular mouse movement is required to rotary knobs in BFD3's interface. When the setting is deactivated, circular knobs are controlled by vertical mouse movement (drag up to increase, and drag down to decrease).
  The setting is deactivated by default.

- **Left-right velocity-scaled preview support**

  With this setting activated, the following preview hotspots feature low to high velocity previews from left to right (or from the top down in the case of the horizontal keyboard in the Key Map page):

  - Clicking Drum slots in the Kit display
  - ALT-clicking Drum mixer channel images
  - Clicking items in the Drums Browser
  - Clicking keys in the Key Map page's vertical and horizontal keyboards

  If the setting is disabled, clicking anywhere in these preview hotspots results in fixed velocity previews.

- **Display tool-tips**

  Enabling this setting results in a tool-tip—a short piece of context-sensitive help—appearing when the mouse cursor hovers over a part of the user interface for a certain amount of time.

- **Tool-tip appear time**

  This setting specifies the time required to hover over a control or part of the user interface for a tool-tip to appear. The time is defined in animation frames. A setting of 23 is roughly equivalent to 1 second.

- **Restore panel on load**

  If this setting is activated, the currently viewed panels remain in focus rather than being changed to those stored in Presets when they are loaded.

  If the setting is deactivated, the panels in focus when a Preset was originally saved is recalled when it is loaded.

Keyboard Shortcuts section

This section allows you to set up keyboard shortcuts for various functions within BFD3. Please note that many hosts/DAWs "steal" keyboard input from any plugins; in such cases, it is not possible to use keyboard shortcuts with BFD3.

To ensure that no problems occur with hosts that do not handle plugin key commands well, all key commands are disabled by default and must be set up manually.

If keyboard shortcuts are set up and you experience problems when working in any hosts, deactivate the **Enable keyboard support** setting.

- **Assigning shortcuts with the Learn and Learn Multi buttons**

  Shortcuts are assigned to functions by clicking the function in the list, and then clicking the **Learn** button above the list. Now press the desired key or key/modifier combination to assign it to the function. CTRL, SHIFT and ALT modifiers are accepted.

  Use the **Learn Multi** button to keep assigning keyboard shortcuts to the subsequent entries in the list, either until the end of the list is reached or until the **Learn Multi** button is deactivated.

- **Clearing shortcut assignments**

  To remove an assignment, select a function and click the **Clear** button.

  Click the **Clear All** button to remove all current assignments.

3.0 Appendix

3.1 Key Map Reference

The following chart represents the default BFD3 Key Map assignments.

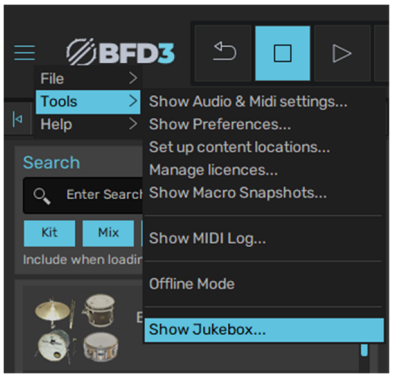
Note that the lowest note is shown at the bottom of the chart.

MIDI note names are shown with the **Octave Numbering** setting in the *MIDI Preferences* set to *Normal* (with C0 as the lowest note).

Note: Some kits may not use all sounds, so those notes will be silent when played.

MIDI key (lowest key C0)	MIDI key number	BFD3 articulation	MIDI key (lowest key C0)	MIDI key number	BFD3 articulation
C8 to G10	96-127	Grooves 1-32			
B7	95	Perc 2: **Hit**	B4	59	Cymbal 3: **Bow**
A#7	94	High Tom 2: **Rim Click**	A#4	58	Hihat: **Bell Tip**
A7	93	High Tom: **Rim Click**	A4	57	Cymbal 2: **Bow**
G#7	92	Mid Tom 2: **Rim Click**	G#4	56	Hihat: **Splash**
G7	91	Mid Tom: **Rim Click**	G4	55	Cymbal 1: **Bow**
F#7	90	Floor Tom 2: **Rim Click**	F#4	54	Hihat: **3/4 Shank**
F7	89	Floor Tom: **Rim Click**	F4	53	Crash 2: **Bow**
E7	88	Snare: **Rim Click**	E4	52	Crash 1: **Bow**
D#7	87	Ride 1: **Choke**	D#4	51	Hihat: **3/4 Tip**
D7	86	Snare: **Flam**	D4	50	Ride 1: **Edge**
C#7	85	Cymbal 3: **Choke**	C#4	49	Hihat: **Half Shank**
C7	84	Kick: **No Snare**	C4	48	Cymbal 3: **Edge**
B6	83	Perc: **Hit**	B3	47	Cymbal 2: **Edge**
A#6	82	Cymbal 2: **Choke**	A#3	46	Hihat: **Half Tip**
A6	81	Ride 1: **Hit**	A3	45	Cymbal 1: **Edge**
G#6	80	Cymbal 1: **Choke**	G#3	44	Hihat: **1/4 Shank**
G6	79	Cymbal 3: **Hit**	G3	43	Crash 2: **Edge**
F#6	78	Crash 2: **Choke**	F#3	42	Hihat: **1/4 Tip**
F6	77	Cymbal 2: **Hit**	F3	41	Crash 1: **Edge**
E6	76	Cymbal 1: **Hit**	E3	40	High Tom 2: **Hit**
D#6	75	Crash 1: **Choke**	D#3	39	Hihat: **Open Shank**
D6	74	Crash 2: **Hit**	D3	38	High Tom: **Hit**
C#6	73	High Tom 2: **Rim Shot**	C#3	37	Hihat: **Closed Shank**
C6	72	Crash 1: **Hit**	C3	36	Mid Tom 2: **Hit**
B5	71	Ride 1: **Bell**	B2	35	Mid Tom: **Hit**
A#5	70	High Tom: **Rim Shot**	A#2	34	Hihat: **Open Tip**
A5	69	Cymbal 3: **Bell**	A2	33	Floor Tom 2: **Hit**
G#5	68	Mid Tom 2: **Rim Shot**	G#2	32	Hihat: **Pedal**
G5	67	Cymbal 2: **Bell**	G2	31	Floor Tom: **Hit**
F#5	66	Mid Tom: **Rim Shot**	F#2	30	Hihat: **Closed Tip**
F5	65	Cymbal 1: **Bell**	F2	29	Snare: **Rim Shot**
E5	64	Crash 2: **Bell**	E2	28	Snare: **Half Edge**
D#5	63	Floor Tom 2: **Rim Shot**	D#2	27	Snare: **Drag**
D5	62	Crash 1: **Bell**	D2	26	Snare: **Hit**
C#5	61	Floor Tom: **Rim Shot**	C#2	25	Snare: **Side Stick**
C5	60	Ride 1: **Bow**	C2	24	Kick: **Hit**

3.2 Jukebox Player

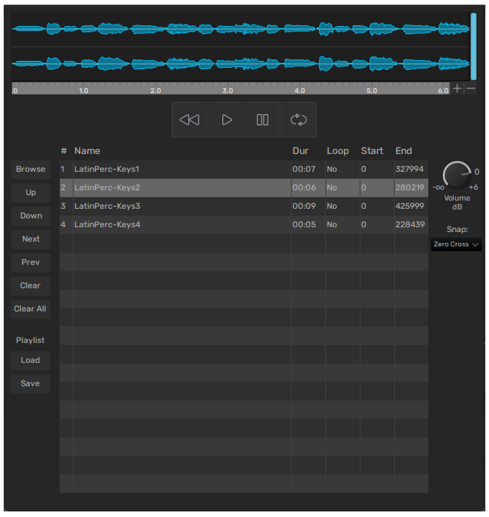


The Jukebox player offers a simple way to play/practice along with a playlist of any audio files such as your favorite music, backing tracks and so on, alongside BFD3. This function exists within a separate window. Use the **Show Jukebox** function in the **Tools menu** to open it. To close the player window, use the standard OS controls at the upper-left (Mac) or upper-right (Windows) of the window.

The Jukebox player's audio output is routed to BFD3's master output (the first stereo output) although it is not affected by the master channel's settings or effects.

Therefore, it is routed to your audio interface along with BFD3's audio output, without requiring any additional mixing software or hardware.

Use the Jukebox player panel's **Volume** control to adjust its level relative to the sound of the kit in BFD3's master channel.



- **Browse**

  The **Browse** button displays an OS file browser for loading audio files into the currently selected slot in the Jukebox player playlist. One file can be added at a time to each slot.

  A file can also be added to a slot from an OS file window via drag and drop.

  Alternatively, double-click on a playlist slot to display an OS Open file dialog box. Navigate to and select the desired sample, then click the Open button.

- **Rwd (Rewind)**

  Click this button to rewind to the beginning of the currently playing audio file.

- **Play/Stop**

  The **Play** button starts playback from the play position in the current audio file. While playback is in progress, this button can be clicked again to **Stop** playback.

- **Pause**

  This button pauses playback until it is clicked again.

- **Next, Previous**

  Click these buttons to select the **Next** or **Previous** audio file in the playlist.

- **Up, Down**

  These buttons are used to re-order the playlist by moving the currently selected audio file **Up** (before the previous file) or **Down** (after the next file) in the list.

- **Volume**

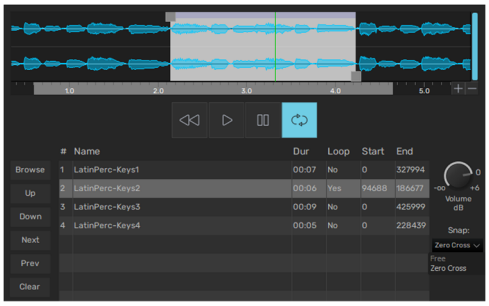
  The **Volume** control adjusts the level of the Jukebox player's output.

- **Loop**

  When the **Loop** button is activated, the current audio file is repeated between its **Loop Start** and **Loop End** markers.

  By default, these loop markers are located at the start and end of the audio file. Click and drag the markers to adjust the looping portion.

  Set the **Snap** function to *Zero Cross* in order to snap the **Loop Start** and **Loop End** markers to zero crossings in the audio file waveform. With the *Free* setting active, no snapping occurs when adjusting the loop markers.



- **Playlist Load & Save**

  These functions are used to Save and Load Jukebox playlists for future use.

3.3 Effects

3.3.1 Dynamics

Common compression parameters

The following definitions apply to most of BFD3's dynamics processors. However, please note that the DCAM EnvShaper device has a very different approach to its time-related parameters (**Attack** and **Sustain**).

- **Attack**

  The **Attack** control on a compressor represents the speed at which the gain is reduced when transients pass through it.

  This control is often misunderstood—the Attack time does NOT indicate the amount of time taken before the compressor starts to compress.

- **Release**

  The **Release** control on a compressor sets the speed at which the gain level returns to normal after a transient has passed.

- **Ratio**

  The **Ratio** specifies the gain reduction applied by the compressor. The numbers in the ratio represent the change in gain before and after compression.

  For example, assuming that the threshold level has been breached, then a ratio of 2:1 would mean that for every 2 dB of increased signal level coming into the compressor, the output level rises by 1 dB.

Advanced features in BFD3's dynamics processors

- **Sidechain button**

  The BFD3 Comp Bus, NoiseGate and DCAM EnvShaper feature the ability to process a signal using the transient characteristics of another. By enabling the **Sidechain** button, the device's peak detection circuit reacts to the channel's sidechain input rather than the main input but still applies the processing to the main input signal. This allows you to control the dynamics of the main input signal with another signal entirely.

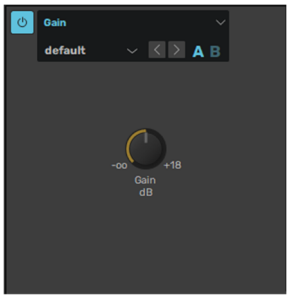
  The Filter Mod device also features a **Sidechain** button for driving its envelope follower and FM functions while the EQ and EQ8 devices also have a **Sidechain** button for EQing the channel's sidechain signal.

- **Parallel compression and the Mix control**

  Parallel compression involves mixing a compressed signal (usually fairly heavily compressed) with the original dry signal, in order to achieve the "huge" sound of a compressed drum mix while keeping the transients of the original drums intact.

  While it is uncommon to see a wet/dry mix control on a compressor, the **Mix** control on BFD3's compressors is very useful for applying parallel compression to a single mono or stereo channel without needing to create additional Aux channels. If you need to apply parallel compression to more than one channel at once, you must first create a sub-mix on an Aux channel.

Gain



The Gain effect is a simple tool for increasing or decreasing a channel's level.

- **Gain**

  The **Gain** control lets you increase the channel's gain up to 18 dB, or decrease it up to -inf dB.

Comp Chan

Comp Chan (channel compressor) is derived from a classic "feedback-based FET limiting amplifier" design.

It features a "fixed-threshold" design, meaning the threshold at which compression starts is not adjustable. In practice, this means you may need to adjust the **Input** and **Output** levels when changing ratios.

- **Input & Output**

  This control adjusts the level of the signal entering the compressor. Once the input level has reached the internal threshold, compression begins. When this happens, use the Output control to turn down the increased input. The **Input** control ranges from -20 to +40 dB, while the **Output** control ranges from -40 dB to +20 dB.

- **Attack**

  The **Attack** control has a range between 0.02 ms and 0.8 ms.

- **Release**

  The **Release** control has a range between 50 ms and 1.1 seconds.

- **Ratio**

  This control sets the compression **Ratio** to 4:1, 8:1, 12:1, 20:1, or "Nuke," which is an emulation of the "all buttons" mode on a classic limiting amplifier design. It results in a particularly brutal type of compression with accompanying distortion artifacts.

Comp Bus

This device is based on a classic bus compressor design from the center section of a well-known British large-format mixing console.

It is most commonly used to add “glue” and power to a drum bus. However, it also works very well as a channel compressor in its own right, offering a different flavor of compression compared to the Comp Chan.

- **Key HP (Key signal High-pass)**

  The **Key HP** control adjusts a variable high pass filter on the key signal that is used for the compressor's amplitude detection. It is applied whether the main input or the sidechain input is being used to drive the compressor. No filtering is applied to the audible signal, only to the signal being used to drive the peak detection circuit.

  This control is useful when there is too much low-end in the sidechain signal, resulting in the compressor reacting more heavily than desired.

- **Attack**

  Six **Attack** times are available: 0.1 ms, 0.3 ms, 1 ms, 3 ms, 10 ms, 30 ms.

- **Release**

  Five **Release** settings are available: 0.1 ms, 0.3 ms, 0.6 ms, 1.2 ms, and Auto.

- **Ratio**

  Three **Ratio** settings are available: 2:1, 4:1, and 10:1.

- **Threshold**

  Unlike the Comp Chan, the Comp Bus device allows you to adjust the **Threshold**, which represents the signal level at which the compressor begins to react.

- **Output**

  The **Output** control allows you to increase the overall output level after the compressor circuit has applied gain reduction to the input signal.

- **Limit**

  The **Limit** button applies analog non-linearities to the input to the compressor's amplitude detection circuit (while not affecting the input signal itself). This results in a more transparent character to the compression effect, especially on attack phases of transients.

Comp VCA

The Comp VCA device is a modelled emulation of a VCA-based compressor circuit with a fast and clean compression characteristic.

- **Input**

  The **Input** control adjusts the signal level entering the compressor circuit. Higher levels result in the compressor circuit reacting more heavily.

- **Attack**

  The **Attack** time can be set between 100 µs (microseconds) and 100 ms (milliseconds).

- **Release**

  The **Release** time can be set between 10 ms and 2 seconds.

- **Ratio**

  The **Ratio** can be set between 1:1 and 50:1.

- **Threshold**

  The **Threshold** represents the signal level at which the compressor begins to react.

- **Output**

  The **Output** control allows you to increase the overall output level after the compressor circuit has applied gain reduction to the input signal.

DCAM EnvShaper

DCAM EnvShaper offers an alternative approach to dynamics processing by allowing you to adjust the intensity of the attack and sustain portions of transients.

- **Attack**

  The **Attack** control adjusts the intensity of the attack phase of detected peaks in the audio signal. Increase the control to intensify attack transients, and decrease it to soften transients.

- **Sustain**

  The **Sustain** control adjusts the intensity of release portions of detected peaks in the audio signal, which increases or decreases the apparent sustain of sounds in the signal.

  Increase this control for more sustain, and decrease it for less sustain. This control is useful for adjusting the perceived level of ambience in a channel. Negative settings can produce damping effects for drum sounds.

- **Signal Bias**

  The **Signal Bias** control adjusts the sensitivity and release characteristics of DCAM EnvShaper. At low settings it is more sensitive to short transients while at higher settings it is more sensitive to longer transients.

Distortion

The Distortion device is an updated version of BFD2's ***Drive*** processor which is now available within the Legacy sub-menu.

- **Mode**

  The **Mode** drop-down menu selects between a wide variety of distortion types.

- **Drive**

  The **Drive** control sets the amount of distortion that takes place.

- **Input Filter**

  This control provides high-pass and low-pass filters before the distortion stage to enable you to shape the tonal characteristics of the signal going into the drive circuit.

  For example, you may want to distort the high end of a kick drum while leaving the deep low end unchanged.

  To adjust this control, click and drag the light blue arrows at the left and right of the blue active frequency band the light-blue arrows represent the cutoff frequencies of the high-pass and low-pass filters.

  These filters are crossover filters. The active frequency band is processed by the distortion circuit with its level adjustable via the **Dirty** control. The frequencies that are filtered out before the distortion stage are accessible via the **Clean** control.

- **Dirty & Clean**

  The **Dirty** control sets the amount of post-distortion signal that is heard at the output.

  The **Clean** control sets the amount of the clean signal, which is comprised of the signals filtered out by **Input Filter** control.

  Please note that these are not “wet” and “dry” controls. Use the standard **Mix** control at the top of the effect interface to mix between the pre- and post-effect signals.

- **Tone**

  The **Tone** control provides a simple -6 dB/oct low-pass filter for the processed signal after the distortion stage. It allows you to roll off unwanted high frequencies that may have been generated in the signal as part of the distortion effect.

NoiseGate

A noise gate is a type of dynamics processor that attenuates the input signal until its amplitude exceeds an adjustable threshold level, at which time the gate 'opens' to allow audio through at its actual level.

They are often used during drum mixing to isolate drums within signals containing bleed or spill from other drums. Another common use is to reduce the decay of toms and kicks. Noise gates are often referred to simply as “gates.”

While BFD3 contains bleed channels, these can be turned down or off completely rather than having to use gates to minimize bleed. Likewise, the decay of kit-pieces can be adjusted using the Damping controls in the Drum Editor. However, using gates can be good for creative effects, or simply for recreating the types of techniques used in real drum mixing sessions.

BFD3's NoiseGate has a **sidechain** function which allows you to create triggered “chopping” effects very easily. For example, route any channel such as a hihat or a user sample direct channel to the master channel's sidechain input and insert a noise gate in one of the master channel's effect slots. Enable the sidechain button for the gate and adjust the threshold until the sidechain input triggers the audio on the channel.

When setting very fast **Attack** and **Release** times, it is common to hear “clicks” in the audio when the gate opens and closes, especially with sounds predominantly comprised of low frequencies such as kicks and toms. This behavior is completely normal—these times simply need to be increased slightly to overcome the problem.

- **Attack**

  The **Attack** control adjusts the speed at which the gate opens once the **Threshold** has been exceeded by the input signal's amplitude.

- **Hold**

  The **Hold** parameter controls the amount of time the gate remains open after the input signal has dropped below the **Threshold** level.

- **Release**

  The **Release** control adjusts the speed at which the gate closes at the end of the hold time.

- **Threshold**

  The **Threshold** control allows you to set the level at which the gate starts to open. When the input signal amplitude exceeds the level specified by the Threshold control, the gate starts to open to allow audio through.

- **Input Filter**

  This control provides high-pass and low-pass filters to process the input signal used to trigger the gate (whether it is the main input signal or the sidechain input signal) while leaving the actual processed signal *unfiltered*. This allows you to isolate certain frequencies in the input to improve the gating response. For example, excessive low frequencies in the input can make the gate react more sensitively than required.

  To adjust this control, click and drag the light blue arrows at the left and right of the blue active frequency band the light-blue arrows represent the cutoff frequencies of the high-pass and low-pass filters.

- **Key Listen**

  Enabling the **Key Listen** button lets you hear the key input being used to trigger the NoiseGate's amplitude detection circuit instead of the processed input signal. The key signal can be either the main input or the sidechain input.

  It is very useful when using the **Input Filter** and/or the sidechain input.

- **Hysteresis**

  Noise gates have a tendency to open and close very quickly when the input signal's amplitude remains close to the threshold level for longer periods, something that can result in “gate chatter.”

  Increasing the **Hysteresis** control smooths out the gate response to reduce this problem, although the gate becomes less sensitive to small changes around the threshold level.

- **Mix**

  With the Mix control at 100%, the NoiseGate mutes the signal completely when closed. If you want to let the signal through at a low level, decrease the Mix control to allow more of the dry signal through.

Limiter

A limiter is effectively a compressor with a very fast attack time and a high ratio for signals that exceed the maximum level.

- **Input**

  The **Input** control adjusts the level of the signal going into the Limiter algorithm. Higher input levels lead to more pronounced and “brutal” limiting.

- **Hardness**

  The **Hardness** control adjusts the strength of the Limiter's “knee.” At high settings, peaks are clipped with a “brick-wall” limiting effect. At lower settings, gain reduction occurs more slowly (with slower attack and release settings), leading to a more natural effect with less “pumping.”

- **Output**

  The **Output** control allows you to attenuate the processed output signal from the Limiter.

AIR Compressor

The AIR Compressor changes the dynamic range of a signal by automatically reducing its gain if it exceeds a certain level (the threshold).

- **Mode**
  - **Peak** the compressor will respond when any peak overshoots the threshold.
  - **RMS** the compressor responds to the average loudness of a signal. It will only compress the incoming signal if its average level is above the threshold for a sustained period.
  - **Opto** emulates an optical compressor. Typically has a slow attack time, which facilitates a warm but distortion-free gain reduction effect.
- **Threshold**

  This is the volume level at which compression will be applied. Any sound at this volume or higher will be compressed. Any signal lower than this setting will bypass the compressor.
- **Attack**

  This is how much time the compressor takes to start applying compression to the incoming signal once it exceeds the threshold. High settings may allow some signal peaks to bypass the compressor.
- **Release**

  This is how much time the compressor takes to stop applying compression to the incoming signal once it falls below the threshold.
- **Knee**

  The **Knee** control adjusts the strength of the Limiter's "knee." At high settings, peaks are clipped with a "brick-wall" limiting effect. At lower settings, gain reduction occurs more slowly (with slower attack and release settings), leading to a more natural effect with less "pumping."
- **Ratio**

  This determines how much compression is applied to any signal that exceeds the threshold.
- **Low Sens & High Sens**

  These knobs determine how much the compressor is triggered by Low and High frequency material in the sound.
- **Output**

  This setting lets you raise or lower the gain level of the compressed signal. If the signal is heavily compressed, you may want to set this to a higher value.

AIR Distortion

AIR Distortion adds color to the audio signal with various types and varying amounts of distortion.

- **Mode**
  - **Hard** distortion mode provides a sharp, immediate distortion of the signal.
  - **Soft** distortion mode provides a softer, more gradual distortion of the signal.
  - **Wrap** distortion mode wraps the waveform back on itself for a complex distortion tone that changes quickly from soft to harsh.
- **Drive**

  The **Drive** control lets you increase the drive (input volume) of the signal from 0 dB (no distortion) to 60 dB (way too much distortion!) Sometimes an increase or decrease of just 1 or 2 decibels can make a big difference on the amount and quality of distortion.
- **Pre-Shape**

  The **Pre-Shape** control lets you increase or decrease a broad gain boost (or attenuation) of treble frequencies in the processed signal. Pre-Shape is essentially a pre-distortion tone control that makes the distortion bite at different frequencies. Set to 0%, the Pre-Shape control doesn't affect the tone at all. Higher settings provide a boost in the high end of the distorted signal (more treble distortion), while lower settings suppress the high end, with some mid-range boost, for a darker less distorted tone.
- **High Cut**

  The **High Cut** control lets you adjust the frequency for the High Cut filter. To attenuate the high end of the processed signal, lower the frequency.
- **Edge**

  The **Edge** control lets you change clipping from being symmetrical to being asymmetrical, which makes it sound richer, and nastier at high settings. The difference is most noticeable at lower Drive settings.
- **Threshold**

  The **Threshold** lets you adjust the headroom for the dynamic range of the distorted signal between –20.0 dBFS and 0.0 dBFS. Rather than using the Drive to adjust the signal level relative to a fixed clipping level, use the Headroom control to adjust the clipping level without changing the signal level.
- **Output**

  The **Output** control lets you lower the Output level of the distorted signal from 0–100%. At 0%, no distorted signal passes through the output. At 100%, the distorted signal passes through the output at full volume.
- **Stereo**

  When **Stereo** is enabled, the left and right channels of the incoming stereo signal are processed separately. When it is disabled, the incoming stereo signal is summed and processed as mono. The Stereo button is lit when it is enabled.

AIR Dyn3 Compressor

The AIR Dyn3 Compressor plug-in applies either compression or limiting to audio material, depending on the ratio of compression used.

- **Knee**

  The Knee control sets the rate at which the compressor reaches full compression once the threshold has been exceeded. As you increase this control, it goes from applying “hard-knee” compression to “soft-knee” compression. With hard-knee compression, compression begins when the input signal exceeds the threshold. This can sound abrupt and is ideal for limiting. With soft-knee compression, gentle compression begins and increases gradually as the input signal approaches the threshold, and reaches full compression after exceeding the threshold. This creates smoother compression.

- **Ratio**

  The Ratio control sets the compression ratio, or the amount of compression applied as the input signal exceeds the threshold. For example, a 2:1 compression ratio means that a 2 dB increase of level above the threshold produces a 1 dB increase in output. This control ranges from 1:1 (no compression) to 100:1 (hard limiting).

- **Attack**

  The Attack control sets the attack time, or the rate at which gain is reduced after the input signal crosses the threshold. The smaller the value, the faster the attack. The faster the attack, the more rapidly the Compressor/Limiter applies attenuation to the signal. If you use fast attack times, you should generally use a proportionally longer release time, particularly with material that contains many peaks in close proximity. This control ranges from 10 µs (fastest attack time) to 300 ms (slowest attack time).

- **Release**

  The Release control sets the length of time it takes for the Compressor/Limiter to be fully deactivated after the input signal drops below the threshold. Release times should be set long enough that if signal levels repeatedly rise above the threshold, the gain reduction “recovers” smoothly. If the release time is too short, the gain can rapidly fluctuate as the compressor repeatedly tries to recover from the gain reduction. If the release time is too long, a loud section of the audio material could cause gain reduction that continues through soft sections of program material without recovering. This control ranges from 5 ms (fastest release time) to 4 seconds (slowest release time).

- **Threshold**

  The Threshold control sets the level that an input signal must exceed to trigger compression or limiting. Signals that exceed this level will be compressed. Signals that are below it will be unaffected.

- **Output**

  This control lets you boost overall output gain to compensate for heavily compressed or limited signals. This control ranges from 0 dB (no gain boost) to +30 dB (loudest gain boost).

AIR Expander

The AIR Expander applies expansion to audio material, depending on the ratio setting. Expansion decreases the gain of signals that fall below a chosen threshold. They are particularly useful for reducing noise or signal leakage that creeps into recorded material as its level falls, as often occurs in the case of headphone leakage.

- **Ratio**

  The Ratio control sets the amount of expansion. For example, if this is set to 2:1, it will lower signals below the threshold by one half. At higher ratio levels (such as 30:1 or 40:1) the Expander functions like a gate by cutting off signals that fall below the threshold. This control ranges from 1:1 (no expansion) to 100:1 (gating).

- **Range**

  The Range control sets the depth of the Expander. Setting it to higher range levels allows more and more of the audio that falls below the threshold to peek through at all times. This control ranges from 0 dB (lowest depth) to 40 dB (highest depth).

- **Threshold**

  The Threshold sets the level below which an input signal must fall to trigger expansion or gating. Signals that fall below the threshold will be reduced in gain. Signals that are above it will be unaffected. This control has an approximate range of –40 dB to 0 dB, with a setting of 0 dB equivalent to no compression or limiting. The default value for the Threshold control is –20 dB.

- **Attack**

  The Attack control sets the attack time, or the rate at which gain is reduced after the input signal crosses the threshold. Use this along with the Ratio setting to control how soft the Expander’s gain reduction curve is. This control ranges from 10 µs (fastest attack time) to 100 ms (slowest attack time).

- **Release**

  The Release control sets how long it takes for the gate to close after the input signal falls below the threshold level and the hold time has passed. This control ranges from 10 ms (fastest release time) to 10 seconds (slowest release time).

- **Output**

  This setting lets you raise or lower the gain level of the compressed signal. If the signal is heavily compressed, you may want to set this to a higher value.

AIR Maximizer

The AIR Maximizer is a limiter optimized for mastering.

- **Threshold**
  This is the volume level at which limiting will be applied. Any sound at this volume or higher will be limited. Any signal lower than this setting will pass through Maximizer unaffected.
- **Release**
  This is how much time the AIR Maximizer takes to stop limiting to the incoming signal once it falls below the threshold.
- **LF Mono**
  This knob controls the range of low frequencies that will be mono instead of stereo. Any frequencies below this setting will be summed into a mono signal. This is useful when mastering songs for a vinyl format.
- **Ceiling**
  This knob sets the highest possible level of the audio signal after limiting is applied.
- **Knee**
  This determines how much the signal's gain is reduced as it exceeds the threshold. The **Hard** setting does not affect the signal until it exceeds the threshold, after which it dramatically reduces its gain. The Select **Soft** setting slightly reduces the signal's gain before it exceeds the threshold, resulting in a more gradual gain reduction (this option actually applies more limiting to the signal than Hard limiting).
- **Lookahead**
  This plugin "looks ahead" to determine its response.

AIR Transient

The AIR Transient can be used to add more attack or increase the sustain of a sound.

- **Attack**
  A positive Attack value emphasizes attack events, whereas a negative Attack value will smooth out the attack envelope.
- **Attack Shape**
  This controls the shape of the attack. At its lowest value, the attack will have a very fast rise and fall. The higher the value, the less "sharp" it will sound.
- **Sustain**
  A positive Sustain value lengthens the sustain, whereas a negative Sustain value will shorten the sustain.
- **Output**
  This knob adjusts the level of the output signal (-20.0 to +20.0 dB).
- **Limit**
  With the **Limit** button enabled, peaks are clipped with a "brick-wall" limiting effect. The Limit button is lit when it is enabled.

AIR Tube Drive

AIR Tube Drive emulates the sound of the signal being played through a mildly "overdriven" tube amp, creating a warm, smooth-sounding distortion.

- **Drive**
  This knob lets you increase the drive (input volume) of the signal from 0 dB (no distortion) to 60 dB (way too much distortion!). Sometimes an increase or decrease of just 1 of 2 decibels can make a big difference on the amount and quality of distortion.
- **Headroom**
  This knob adjusts the point at which the incoming signal starts to distort. At lower settings, the signal will distort even at low volumes. At higher settings, the signal will remain "clean" at lower or mid-range volumes and then start distorting when it becomes very loud. Traditional tube amplifiers for guitars can be modified to adjust their headroom—this control lets you do that instantly.
- **Saturation**
  This knob adjusts how saturated the distorted signal is, which affects the "color" of the sound. At lower settings, the distortion will sound subtler and warmer. At higher settings, the distortion will sound harsher.
- **Output**
  This knob adjusts the level of the output signal (-20.0 to +20.0 dB).

3.3.2 Filters

EQ

BFD3's EQ provides 4 bands of EQ, including two parametric mid bands.

- **L (Low) and H (High) bands**
  The Low and High bands are switchable between a bell with a fixed **Q** of 2.5 octave (with the **Bell** button activated) and a shelving response with a fixed roll off of 12 dB per octave (with the **Bell** button deactivated).
  - Low band **Freq** range: 40 to 600 Hz
  - Low band **Gain** range: +/- 16.5 dB
  - High band **Freq** range: 600 to 14 kHz
  - High band **Gain** range: +/- 20 dB
- **LM (Low Mid) and HM (High Mid) parametric bands**
  The Mid bands feature bell curves with adjustable Q.
  - Low Mid Band **Freq** range: 200 Hz to 2 kHz
  - High Mid band **Freq** range: 800 Hz to 7 kHz
  - **Q** range: 0.5 octave to 2.5 octave
- **Band Power**
  Each band has its own **Power** button allowing you to save CPU by only using the bands you need.
- **Sidechain**
  Enabling the EQ's **Sidechain** button allows you to EQ the channel's sidechain input. It can be very useful to EQ a sidechain input before it enters a compressor as it may feature excessive energy in a part of the frequency spectrum leading to an undesired compression response. Note that the EQ must be placed *before* the sidechain-enabled processor in the channel's effect chain.
- **Frequency Display control**
  The EQ curve can be adjusted by clicking and dragging the graphical display in the EQ effect interface. To edit a band in this way, move the mouse cursor over the display. The display is divided into four zones for each band, each highlighted in a different color corresponding to that of each band's controls on the interface.
  With a band highlighted, click, and drag up/down to adjust the band's **Gain**, and left/right to adjust its **Freq**. For the two Mid bands, click and drag up/down while holding down the ALT key to adjust the band's **Q**.

EQ8

The EQ8 device is an 8-band version of the EQ. It features the same controls but for eight bands (numbered 1-8) instead of the four bands in the standard EQ device.

Bands 1 and 8 behave in the same way as the Low and High bands in the standard EQ device, while all other bands behave in the same way as the EQ's parametric Low Mid and High Mid bands.

Filter

The Filter effect provides non-resonant high-pass and low-pass filters for broad tonal shaping of signals.

It can be used to roll off the low end in Overhead and Room buses, or to remove ultra-low frequencies from kick drums, especially when low-shelving EQ is applied.

- **HP Frequency**
  The -18 dB/Oct high-pass filter removes frequencies below the specified frequency which can be set within a range between 20 Hz and 500 Hz.
- **LP Frequency**
  The -12 dB/Oct low-pass filter removes frequencies above the specified frequency, which can be set within a range of 35 Hz to 3 kHz.
- **Power buttons**
  The **HP In** and **LP In** buttons are power buttons for each filter. When activated, the filter is enabled, and when deactivated, the filter is bypassed.

Filter Mod

This device features a state-variable multimode filter with a response of 12 dB per octave, capable of self-oscillation and featuring input and output drive stages.

It has a built-in envelope follower to modulate the filter's cutoff frequency relative to the input's amplitude. This function is modelled on an analogue full-wave rectified envelope follower. Additionally, the filter frequency can be modulated at audio rate by the input signal.

Alternatively, the channel's sidechain input can be used as the audio source for the envelope follower and audio-rate FM functions. For example, you could use a bass drum tuned very low as a rough and ready LFO to modulate the filter.

- **Mode**

  4 filter Mode settings are available, each offering different filtering functions relative to the cutoff frequency.

  - **Low (Low-pass)**

    Low-pass mode allows through only frequencies below the cutoff frequency.
  - **High (High-pass)**

    High-pass mode allows through only frequencies above the cutoff frequency.
  - **Band (Band-pass)**

    Band-pass mode allows through only a band of frequencies around the cutoff frequency.
  - **Notch**

    This is the opposite of a band pass. It allows through all other frequencies except a band of frequencies around the cutoff frequency.

    Modulating a notch filter can give phaser-like results.

- **In Drive**

  The **In Drive** control sets the amount of signal gain before the filtering stage. As well as increasing the gain, using more drive results in a rich and complex interaction with the filter's resonance due to modelled non-linearities within it.

- **Out Drive**

  The **Out Drive** control adjusts the gain of an OTA-type non-linear amp function at the output, in order to boost and color the filtered signal.

- **Pitch**

  The **Pitch** control adjusts the cutoff frequency of the filter. It is measured in semitones.

- **Resonance**

  This control adjusts the resonance of the filter, accentuating the frequencies around the cutoff frequency set by the **Pitch** control. High **Resonance** settings cause the filter to self-oscillate—please exercise caution with your speaker levels when using resonant self-oscillation.

- **Attack**

  This control changes how quickly the envelope follower section responds to transients in the input signal. Longer **Attack** times mean that the filter takes a longer time to respond to amplitude changes.

- **Release**

  The **Release** control changes how quickly the envelope follower causes the filter to return to its original position when the input signal decreases after a transient.

- **Env Depth**

  The **Env Depth** control adjusts the amount of modulation of the filter's cutoff frequency by the built-in envelope follower.

- **FM Depth**

  The **FM Depth** control sets the amount of audio-rate modulation of the cutoff frequency by the input.

- **Sidechain**

  Enabling the **Sidechain** button results in the channel's sidechain input being used as the source for the FilterMod device's envelope follower and audio-rate FM features. This means other channels can be used to modulate the filter cutoff.

  This function allows you to be very creative with the filter. Here's a few ideas to try out:

  - For quick and dirty LFOs, try tuning a kick down really low and using it as the filter FM source, perhaps after some additional processing such as low-pass filtering.
  - Load arbitrary sounds as user samples using BFD3's sample import functions, and use them as the filter FM source.
  - Try using the TestTone or TestPulse devices as filter FM sources.

Comb

The Comb device is useful for psychedelic chorus and phaser-style effects. Comb filters use technique of feeding a delayed version of the signal back into itself to create a series of harmonically related notches across the frequency spectrum reminiscent of the teeth of a comb. Changing the amount of delay affects the position of these notches and creates the effect of “sweeping” the resultant frequency bands.

- **Pitch**

  The **Pitch** control adjusts the center frequency of the comb filter, changing the position of the comb frequency bands.

- **Resonance**

  The **Resonance** control adjusts the amount of feedback used for the comb filter.

- **Mode**

  The **Mode** control sets the feedback polarity between positive and negative settings.

- **Drive**

  The **Drive** control increases the level of the signal entering the comb filter circuit, adding saturation and overdrive.

- **Rate**

  The **Rate** control adjusts the speed of the Comb device's built-in sine LFO for modulating the **Pitch**.

- **Depth**

  The **Depth** control adjusts the amount of modulation of the **Pitch** control with the internal sine LFO.

HiLo Balance

The HiLo Balance device is a “tilt”-style EQ which cuts high frequencies when boosting low frequencies, and vice versa.

- **Balance**

  The **Balance** control sets the degree of “tilt” between low and high frequencies. At the center position no effect is applied to the incoming audio.

  At values higher than the center position, high frequencies are boosted while low frequencies are attenuated by the same amount.

  At values lower than the center position, low frequencies are boosted while high frequencies are attenuated by the same amount.

- **Crossover**

  This control sets the point between the low and high frequency bands.

3.3.3 Spatial

Delay

The Delay effect can operate as a stereo or mono delay line, depending on whether it is used on a stereo or mono channel.

- **Time**

  The delay **Time** can be set either in absolute time values in seconds or in tempo-based values (selectable using the **Sync** control).

- **Sync**

  When the **Sync** button is set to *BPM*, the delay time is set in tempo-based values relative to BFD3's current tempo. Possible values range from 64th note to 2 bars, including dotted and triplet variations, the latter being especially useful for classic shuffle grooves using simple 1/4-note input. In *Seconds* mode, the delay time is set as an absolute time value, ranging from 31 ms to 4 seconds.

- **Feedback**

  The **Feedback** control sets the amount of delay regenerations, caused by feeding the delayed signal back into the input. Higher values feed the delayed signal back in at a higher amplitude, leading to more regenerations of the input signal. Settings of 100% lead to indefinite regenerations until the value is reduced, and with good use of the built-in filtering can result in classic psychedelic, dubby analog delay effects.

- **Swing**

  The delay features two taps, which are played at the same time with the swing control at the center position.

  By turning down the **Swing** control, you can move the left tap before the right tap, up to a distance of half the delay time. By turning up the **Swing** control, the right tap is moved up to a distance of half the delay time before the left tap.

  This control opens up a wide variety of swung delay grooves.

- **Feedback Filter**

  This control consists of a high-pass and low-pass filter allowing you to apply tonal shaping to each delay regeneration.

  To adjust this control, click and drag the light blue arrows at the left and right of the blue active frequency band. The light-blue arrows represent the cutoff frequencies of the high-pass and low-pass filters.

- **Sum In (stereo only)**

  When the Delay is used on a stereo channel, activating this button sums the left and right inputs to a single mono signal and feeds one delay line instead of two.

Delay Drive

This device is a version of the **Delay** with an additional circuit-modelled overdrive stage. The **Drive** parameter adjusts the amount of overdrive.

Delay Multi Tap

This device provides four separate delay taps.

- **Time**

  The four **Time** controls set the delay time for each of the four delay taps.

- **Sync**

  When the **Sync** parameter is set to *BPM*, the delay time is set in tempo-based values relative to BFD3's current tempo. Possible values range from 64th note to 2 bars, including dotted and triplet variations, the latter being especially useful for classic shuffle grooves using simple 1/4-note input. In *Seconds* mode, the delay time is set as an absolute time value, ranging from 31 ms to 4 seconds.

- **Gain**

  The 4 **Gain** controls allow you to set the level of each of the four delay taps.

- **Feedback**

  The 4 **Feed** controls set the amount of feedback for each of the four delay taps.

- **Pan (Stereo only)**

  When the device is used on a stereo channel, the **Pan** control allows each of the four taps can be positioned within the stereo field.

- **Feedback Filter**

  This control consists of a high-pass and low-pass filter allowing you to apply tonal shaping to each delay regeneration. The same filtering settings are applied to all four delay taps.

  To adjust this control, click and drag the light blue arrows at the left and right of the blue active frequency band. The light-blue arrows represent the cutoff frequencies of the high-pass and low-pass filters.

- **Time (Master)**
  This control offers a master control for the delay time of all four delay taps. It applies an offset to the **Time** settings for all four taps.
- **Feedback (Master)**
  This control offers a master control for the feedback of all four delay taps. It applies an offset to the **Feedback** settings for all four taps.

TinCanVerb

This effect is a recreation of a cheap-sounding room reverb unit, perfect for trashy sounding drum mixes and an antidote to the lush, real ambience in BFD3's recordings. It is not intended to serve the function of a premium quality digital reverb. For this purpose, it's best to use a good quality external reverb plugin or hardware unit.

- **Size**
  The **Size** control lets you adjust the size of the virtual reverberation room. Smaller rooms offer subtle ambience, while large rooms result in a more "cavernous" and reflective effect.
- **Decay time**
  This control adjusts the **Decay time** of the reverb effect. Use shorter settings for subtle small room effects and longer times for special effects.
- **Damp**
  Increasing the **Damp** control results in less high frequencies in the effected signal, leading to a darker reverb sound. At least some damping is essential to avoid overly tinny and fatiguing results.
- **Pinch & Squeeze**
  These controls manipulate the shape of the virtual reverb room, leading to a variety of resulting effects. They make the reverb sound a lot more artificial and are useful for special effects.
- **Freeze**
  As the name suggests, this button "freezes" the current reverb buffer and loops it indefinitely until the button is disabled. Automating this effect is excellent for dubby special effects.

FXverb

FXverb is a high-end algorithmic reverb device.

- **Input & Output**
  These controls adjust the level of the **Input** signal into the device and the **Output** signal from the device.
- **Room Size**
  This control adjusts the size of the virtual reverberation chamber. Increasing the **Room Size** leads to a more pronounced and longer reverberation effect.
- **Decay**
  This control adjusts the length of the reverberation tail (which is also affected by the **Room Size** control).
- **Pre delay**
  The **Predelay** control introduces a delay between the dry sound and the reverberated output, creating a sense of space and distance.
- **Density**
  The **Density** control adjusts the density of reflections in the generated reverberation.
- **Early**
  The **Early** control adjusts the level of early reflections within the reverb output signal.
- **Late**
  The **Late** control adjusts the level of late reflections within the reverb output signal.
- **Damping Gain**
  The **Damping Gain** control adjusts the amount of damping applied by the Damping EQ before the output of the FXverb device. Increasing this control leads to more attenuation at the **Damping Freq**.
- **Damping Freq**
  The **Damping Freq** control adjusts the center frequency of the Damping EQ positioned before the final output.

AIR Economy Reverb

Use the AIR Economy Reverb to apply Reverb to the audio signal, creating a sense of room or space. Typically, you'll want to use Reverb on one of the Aux Send inserts or Main Effects inserts. This way you can process audio from multiple channels, giving them all a sense of being in the same space.

- **Room Size**

  Adjust the **Room Size** control to change the apparent size of the space.

- **Pre-Delay**

  The Pre-Delay control determines the amount of time that elapses between the original audio event and the onset of reverberation. Under natural conditions, the amount of pre-delay depends on the size and construction of the acoustic space, and the relative position of the sound source and the listener. Pre-Delay attempts to duplicate this phenomenon and is used to create a sense of distance and volume within an acoustic space. Long Pre-Delay settings place the reverberant field behind rather than on top of the original audio signal.

- **Time**

  Adjust the Reverb Time to change the rate at which the reverberation decays after the original direct signal stops. At its maximum value, infinite reverberation is produced.

- **Width**

  The Width control lets you widen or narrow the effect's stereo field.

- **Damping**

  Damping is the absorption of high frequencies in the reverb. Lower the Damping control to allow high frequencies to decay for longer to create a brighter reverb sound, or raise the damping to choke the high frequencies and make a darker sound.

- **Low Cut**

  The Low Cut lets you adjust the frequency for the Low Cut filter. For less bass, raise the frequency.

- **High Cut**

  The High Cut control lets you adjust the frequency for the High Cut filter. For less treble, lower the frequency.

AIR Non-Linear Reverb

Use the AIR Non-Linear Reverb plug-in to apply special gated or reversed Reverb effects to the audio signal, creating a synthetic, processed ambience.

- **Shape**

  Choose between a **Gated** or **Reverse** effect.

- **Time**

  Adjust the **Time** to change the length of the reverberation's decay.

- **Pre-Delay**

  The **Pre-Delay** determines the amount of time that elapses between the original audio event and the onset of reverberation.

- **Dry-Delay**

  The **Dry-Delay** applies a specified amount of delay to the dry portion of the signal, which can create a "reverse reverb" effect, where the reverb tail is heard before the dry signal.

- **Diffusion**

  Adjust the **Diffusion** control to change the rate at which the sound density of the reverb tail increases over time. Higher Diffusion settings create a smoother reverberated sound. Lower settings result in more fluttery echo.

- **Width**

  The **Width** control lets you widen or narrow the effect's stereo field.

- **Low Cut**

  The **Low Cut** lets you adjust the frequency for the Low Cut filter. For less bass, raise the frequency.

- **High Cut**

  The **High Cut** control lets you adjust the frequency for the High Cut filter. For less treble, lower the frequency.

AIR Spring Reverb

The AIR Spring Reverb plug-in models an analog spring reverb. An analog spring reverb is an electromechanical device much like a plate reverb. An audio signal is fed to a transducer at the end of a long, suspended metal coil spring. The transducer causes the spring to vibrate, which results in the signal reflecting from one end of the spring to the other. At the other end of the spring is another transducer that converts the motion of the spring back into an electrical signal, thus creating a delayed and reverberated version of the input signal.

- **Pre-Delay**

  The **Pre-Delay** control determines the amount of time (0–250 ms) that elapses between the original audio event and the onset of reverberation.

- **Time**

  Adjust the **Time** control to change the reverberation decay time (1.0–10.0 seconds) after the original direct signal stops. Shorter times result in a tighter, more ringing and metallic reverb, such as when walking down a narrow hall with hard floors and walls. Longer times result in a larger reverberant space, such as an empty, large, concrete cistern.

- **Diffusion**

  Adjust the **Diffusion** control to change the rate at which the sound density of the reverb tail increases over time. Higher Diffusion settings create a smoother reverberated sound. Lower settings result in more fluttery echo.

- **Width**

  Adjust the **Width** control to change the spread of the reverberated signal in the stereo field. A setting of 0% produces a mono reverb, but leaves the panning of the original source signal unprocessed. A setting of 100% produces an open, panned stereo image.

- **Low Cut**

  The **Low Cut** control lets you adjust the frequency of the Low Cut Filter (20.0 Hz–1.00 kHz). Use the Low Cut filter to reduce some of the potential "boomyness" you can get with longer Reverb Times.

AIR Stereo Reverb

Use the AIR Stereo Reverb to apply Reverb to the audio signal, creating a sense of room or space. Typically, you'll want to use Reverb on one of the Aux Send inserts or Main Effects inserts. This way you can process audio from multiple channels, giving them all a sense of being in the same space.

NOTE: Be aware that this plug-in will only instantiate on a stereo channel (i.e., AmbMix, Aux or Master).

- **Early Reflection Type**

  The following Types of Early Reflection models are provided:
  - **Booth**: a vocal recording booth.
  - **Club**: a small, clear, natural-sounding club ambience.
  - **Room**: the center of a small room without many reflections.
  - **Small Chamber**: a bright, small-sized room.
  - **Medium Chamber**: a bright, medium-sized room.
  - **Large Chamber**: a bright, large-sized room.
  - **Small Studio**: a small, live, empty room.
  - **Large Studio**: a large, live, empty room.
  - **Scoring Stage**: a scoring stage in a medium-sized hall.
  - **Philharmonic**: the space and ambience of a large, symphonic, concert hall.
  - **Concert Hall**: the space and ambience of a large concert hall.
  - **Church**: a medium-sized space with natural, clear-sounding reflections.
  - **Opera House**: the space and ambience of an opera house.
  - **Vintage 1** simulates a vintage digital reverb effect.
  - **Vintage 2** simulates a vintage digital reverb effect.

- **ER Length**

  The **ER Length** This control adjusts the length of the Early Reflection tail.

- **ER/Tail Mix**

  Adjust the **ER/Tail Mix** to change the output level of the early reflections. Setting the Level control to 0% produces a reverb effect that is only the reverb tail.

- **Pre-Delay**

  The **Pre-Delay** determines the amount of time that elapses between the original audio event and the onset of reverberation. Under natural conditions, the amount of pre-delay depends on the size and construction of the acoustic space, and the relative position of the sound source and the listener. Pre-Delay attempts to duplicate this phenomenon and is used to create a sense of distance and volume within an acoustic space. Long Pre-Delay settings place the reverberant field behind rather than on top of the original audio signal.

- **Room Size**

  Adjust the **Room Size** control to change the apparent size of the space.

- **Reverb Time**
  Adjust the **Reverb Time** to change the rate at which the reverberation decays after the original direct signal stops. At its maximum value, infinite reverberation is produced.
- **In Width**
  Widens or narrows the stereo width of the incoming audio signal before it enters the reverb algorithm.
- **Out Width**
  Widens or narrows the stereo width of the signal once reverb has been applied.
- **Reverb Delay**
  Sets the size of the delay lines used to build the reverb effect. Higher values create longer reverberation.
- **Ambience**
  This control affects the attack of the reverb signal. At low settings, the reverb arrives quickly, simulating a small room. At higher settings, the reverb ramps up more slowly, emulating a larger room.
- **Density**
  Adjust the **Density** control to change the rate at which the sound density of the reverb tail increases over time. Higher Density settings create a smoother reverberated sound. Lower settings result in more fluttery echo.
- **High Frequencies Section Controls**
  Adjust the **Time** Adjust the Time control to decrease or increase the decay time for mid- to high-range frequency bands. Higher settings provide longer decay times and lower settings provide shorter decay time. With lower settings, high frequencies decay more quickly than low frequencies, simulating the effect of air absorption in a hall.

  Adjust the **High Freq** to set the frequency boundary between the mid- and high-range frequency bands.

  The **High Cut** control lets you adjust the frequency for the High Cut filter (1.00–20.0 kHz). Adjust the High Cut control to change the decay characteristics of the high frequency components of the Reverb. To cut the high end of the processed signal, lower the frequency.
- **Low Frequencies Section Controls**
  Adjust the **Time** Adjust the Time control to decrease or increase the decay time for low- to mid-range frequency bands. Higher settings provide longer decay times and lower settings provide shorter decay time. With lower settings, high frequencies decay more quickly than low frequencies, simulating the effect of air absorption in a hall.

  Adjust the **Low Freq** to set the frequency boundary between the low- and mid-range frequency bands.

  The **Low Cut** control lets you adjust the frequency for the Low Cut filter (1 Hz – 1 kHz). Adjust the Low Cut control to change the decay characteristics of the low frequency components of the Reverb. To cut the low end of the processed signal, lower the frequency.

Breverb Hall

- **Time (Sec)**
  The **Time** control sets the duration of the reverberation tail (which is also influenced by the **Size** parameter).
- **Size**
  The **Size** control sets the rate of build-up diffusion after the initial period (the amount of diffusion is controlled by the **Diffusion** parameter). The **Size** control also acts as a master control for the amount of **Time** and **Spread**. The apparent size of the space created by Breverb Hall is actually a combination of the settings of the **Size**, **Shape** and **Spread** controls.
- **Diffusion**
  The **Diffusion** control sets the degree to which the initial echo density increases over time.
- **Shape**
  The **Shape** control works together with the **Spread** parameter to control the overall ambience of the reverberation created by Breverb Room. It specifically determines the contour of the reverberation envelope. With the **Shape** control fully turned down, reverberation builds explosively and decays very quickly. As the control is increased, reverberation builds up more slowly and sustains for the time set by the **Spread** parameter.
- **Spread**
  The **Spread** control sets the duration of the initial contour of the reverberation envelope. Low settings result in a rapid onset of reverberation at the beginning of the envelope, with little or no sustain, while higher settings spread out both the build-up and sustain.
- **Pre delay (Sec)**
  The **Pre delay** control sets the time that elapses between the original signal and the onset of reverberation. It can be used to create a sense of distance and volume within an acoustic space.
- **Low, High**
  The **Low** and **High** parameters can be used to adjust the frequency response of the reverb.
  - **Low** (kHz): Sets the frequency under which the reverberation is attenuated.
  - **High** (kHz): Sets the frequency over which the reverberation is attenuated.

Breverb Plate

- **Time (Sec)**
  The **Time** control sets the duration of the reverberation tail (which is also influenced by the **Size** parameter).
- **Size**
  The **Size** control sets the apparent size of the metal plate emulated by the Breverb Plate algorithm.
- **Diffusion**
  The **Diffusion** control sets the degree to which the initial echo density increases over time.
- **Pre delay (Sec)**
  The **Pre delay** control sets the time that elapses between the original signal and the onset of reverberation. It can be used to create a sense of distance and volume within an acoustic space.
- **Shape**
  The **Shape** control determines the contour of the reverberation envelope. With the control fully turned down, reverberation builds explosively and decays very quickly. As the control is increased, reverberation builds up more gradually and sustains for longer.
- **Low, High**
  The **Low** and **High** parameters can be used to adjust the frequency response of the reverb.
  - **Low** (kHz): Sets the frequency under which the reverberation is attenuated.
  - **High** (kHz): Sets the frequency over which the reverberation is attenuated.

Breverb Room

- **Time (Sec)**
  The **Time** control sets the duration of the reverberation tail (which is also influenced by the **Size** parameter).
- **Size**
  The **Size** control sets the apparent size of the acoustic space being emulated by the algorithm. Values from minimum to 50% are typical of the ambience of a typical recording room.
- **Diffusion**
  The **Diffusion** control sets the degree to which the initial echo density increases over time.
- **Decay**
  The **Decay** control sets the balance between late reverberation and early reflections. When the control is fully turned down, only the early reflections are present. As it is increased, late reverberations are introduced to the signal.
- **Pre delay (Sec)**
  The **Pre delay** control sets the time that elapses between the original signal and the onset of reverberation. It can be used to create a sense of distance and volume within an acoustic space.
- **Low, High**
  The **Low** and **High** parameters can be used to adjust the frequency response of the reverb.
  - **Low** (kHz): Sets the frequency under which the reverberation is attenuated.
  - **High** (kHz): Sets the frequency over which the reverberation is attenuated.

Breverb Inverse

- **Time (Sec)**
  The **Time** control sets the duration of the reverberation tail. This time, added to the **Pre delay** time, is the time that elapses from the original signal to the end of the reverberation process.
- **Diffusion**
  The **Diffusion** control sets the degree to which the initial echo density increases over time.
- **Pre delay (Sec)**
  The **Pre delay** control sets the amount of time that elapses between the original signal and the onset of reverberation. It can be used to create a sense of distance and volume within an acoustic space.
- **Low, High**
  The **Low** and **High** parameters can be used to adjust the frequency response of the reverb.
  - **Low** (kHz): Sets the frequency under which the reverberation is attenuated.
  - **High** (kHz): Sets the frequency over which the reverberation is attenuated.

3.3.4 Effects

Flanger

The Flanger effect is a short, modulated delay line with feedback to the input. It is used for a sense of movement and for psychedelic effects from the subtle to the extreme. It features a built-in sine LFO for modulating the flanging delay line.

- **Rate**
  The **Rate** control affects the speed of modulation of the flanger delay time.
- **Depth**
  The **Depth** control adjusts the amount of modulation of the delay time.
- **Display**
  The VU-style display represents the current flanging delay time.
- **Pos (Position)**
  This control introduces an additional fixed delay time to the Flanger's delay line. It is a very short delay, ranging from 0 ms to 15 ms.
- **Feedback**
  This control adjusts the amount of the flanged signal that is fed back into the input.
  Higher **Feedback** settings result in a more pronounced flanging effect. Settings over 50% lead to extreme comb filter type effects.
- **Spread (stereo only)**
  This control allows you to adjust the panning of the left and right channel processed signals.
- **Phase (stereo only)**
  The Phase control offsets the phase of the internal LFOs for the left and right channels.
- **Flip Phase**
  By default (with the **Flip Phase** button deactivated), the flanged signal is in positive phase with the input signal.
  Activating the **Flip Phase** button inverts the flanged signal's phase in relation to the input signal.
  A positive phase setting tends to lead to a more obvious flanging effect.

Phaser

The Phaser uses phase cancelling techniques (with the use of all-pass filtering) to create a series of peaks across the frequency spectrum. When these peaks are swept, a psychedelic sweeping effect is created.

- **Mode**
  The **Mode** control selects between a number of phaser responses. 4, 6, 8, and 12 stage phaser types are available, with positive or negative feedback. The number of stages refers to the number of all-pass filters within the algorithm.
- **Pitch**
  The **Pitch** control adjusts the center frequency of the all-pass filters used in the Phaser algorithm.
- **Resonance**
  The **Resonance** control adjusts the amount of resonance (feedback) in the all-pass filters.
- **Phase**
  The **Phase** control adjusts the phase between the dry signal and the all-pass filtered signal.
- **Depth**
  The **Depth** control adjusts the amount of Pitch modulation from the Phaser device's internal LFO that modulates the **Pitch** parameter for classic phaser effect sounds.
- **Rate**
  The **Rate** control adjusts the speed of the internal LFO.
- **Sync**
  When the **Sync** parameter is set to *BPM*, the **Rate** control is set in tempo-based values relative to BFD3's current tempo. Possible values range from 64th note to 2 bars, including dotted and triplet variations.
  In *Seconds* mode, the Rate control is set as an absolute time value, ranging from 31 ms to 4 seconds.

Chorus

The Chorus effect is a modulation effect that is pitch-based. It is used for thickening up sounds.

- **Rate**
  The **Rate** control adjusts the speed of pitch modulation.
- **Depth**
  The **Depth** control adjusts the amount of modulation away from the input signal's original pitch.
- **Spread (stereo only)**
  This control varies the panning of the left and right pitch-modulated signals.

Bit Crusher

The Bit Crusher effect provides a type of digital distortion that occurs when the sample-rate and bit-depth of the audio is reduced. It allows you to simulate the sound of early samplers, useful for underground hip-hop and other “lo-fi” styles.

- **Bits**
  The **Bits** control reduces the bit depth from a maximum of 16-bits to a minimum of 1-bit, which is effectively digital noise. The digital noise generated by the bit-reduction process is referred to as quantization noise.
  Early digital drum machines and samplers tended to have 8- or 12-bit resolution.
- **Freq**
  The **Freq** control adjusts the sample rate frequency of the audio processed by the effect and ranges from a maximum of 100 kHz to a minimum of 1 Hz.
  Lower sample rates result in an aliasing effect on the processed audio.
- **Drive**
  The **Drive** control adjusts the amount of drive in an OTA-type distortion stage after the crossover filters. This allows gain and color to be added to the signal before it is processed by the **Bit** and **Freq** processes.
- **Input Filter**
  This control provides high-pass and low-pass filters for isolating a part of the signal before the sample-rate and bit-depth reduction stages.
  To adjust this control, click and drag the light blue arrows at the left and right of the blue active frequency band the light-blue arrows represent the cutoff frequencies of the high-pass and low-pass filters.
  These filters are crossover filters. The active frequency band is processed by the bit crushing circuit with its level adjustable via the **Dirty** control. The frequencies that are filtered out before the bit crushing stage are accessible via the **Clean** control.
- **Dirty & Clean**
  The **Dirty** control sets the amount of processed signal that is heard at the output.
  The **Clean** control sets the amount of the clean signal, which is comprised of the signals filtered out by the **Input Filter** before processing.
  Please note that these are not “wet” and “dry” controls. Use the **Mix** control at the top of the effect interface in order to mix between the pre- and post-effect signals.
- **Tone**
  The **Tone** control provides a simple -6 dB/oct low-pass filter for the **Dirty** signal after the bit crushing process. It allows you to roll off unwanted high frequencies that may have been generated in the signal as part of the distortion effect.

RingMod

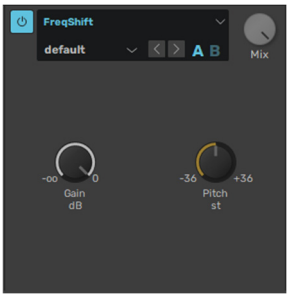
A ring modulator multiplies two signals together, giving you the sum and the difference between them and the output.

BFD3's RingMod device contains an internal oscillator that provides one of the signals, the other being the drum sound passing through it.

This effect is useful for radical, inharmonic timbral changes for more experimental-sounding mixes.

- **Mode**
  The **Mode** control adjusts the waveshape of the internal oscillator which is multiplied with the audio input to the effect. Sine, Triangle, Saw, Square and Parabolic oscillator shapes are available, as well as white or pink noise.
- **Pitch**
  The **Pitch** control tunes the internal oscillator within a range of an octave.
- **Drive**
  The **Drive** control introduces an adjustable amount of distortion on the input signal. Overdriving the signal in this way changes the waveshape of the input, leading to further variations in the resulting effect.

Frequency shifter



A frequency shifter changes the frequency of the sound passing through it—all frequencies in the signal are adjusted by a fixed amount. This differs from a pitch-shifter which adjusts the frequencies of fundamental frequencies and their harmonics by a proportional amount to preserve the harmonic series of the original signal. Therefore, a frequency shifter usually results in inharmonic and clangorous sounds.

- **Pitch**

  The **Pitch** control adjusts the amount of frequency shifting, and is represented in semitones. You can shift the input signal's frequencies up or down by up to 36 semitones (3 octaves).

- **Gain**

  The **Gain** control adjusts the level of the output signal.

AIR LoFi

AIR LoFi bit-crushes, downsamples, clips, rectifies, or mangles an input signal.

- **Sample Rate**

  This knob resamples the audio signal at another sample rate.

- **Bit Depth**

  This knob truncates the bit depth of the incoming signal from 16-bits all the way down to 1-bit.

- **Anti-Alias Controls**

  This section controls the anti-aliasing filters that can be used before and after downsampling to reduce aliasing in the resampled audio signal.

  - **Pre**: resamples the audio signal at another sample rate.
  - **Post**: adjusts the range of anti-aliasing filter cutoff applied to the audio signal after resampling. The filter is applied as a multiplier of the sample frequency (Fs) between 0.12 Fs and 2.00 Fs.
  - **Anti-Alias**: For a much grittier sound, disable the Anti-Alias filter. The Anti-Alias button is lit when the filter is enabled.

- **Envelope Modulation Controls**

  This section provides control over an envelope follower that can affect the Sample Rate. This is useful for accentuating and enhancing signal peaks (such as in drum loops) with artificially generated high-frequency aliasing.

  - **Attack**: This knob adjusts the time it takes to respond to increases in the audio signal level.
  - **Release**: This knob adjusts the time it takes to recover after the signal level falls.

- **Distortion Controls**

  This section provides controls for adding dirt and grunge to the signal.

  - **Clip**: Adds transistor-like distortion to the signal.
  - **Noise Mod**: Adds a buzzy, noisy edge to the signal.
  - **Rectify**: Acts as a waveshaper, adding aggressive, harsh distortion to the signal.

- **LFO Controls**

  The LFO controls apply a low-frequency oscillator (LFO) to modulate the Sample Rate.

  - **LFO Sync**: Enable this button to synchronize the LFO Rate to your session tempo. When LFO Sync is disabled, you can set the Rate time in Hertz (Hz) independently of your session tempo. The LFO Sync button is lit when it is enabled.
  - **LFO Rate**: When Sync is disabled, the LFO Rate knob lets you change the effect rate independently of your session tempo.
  - **LFO Wave**: Select from the following waveforms for the LFO:
    - **Sine:** provides a sine wave
    - **Tri:** provides a triangle wave
    - **Saw:** provides a saw-tooth wave
    - **Square:** provides a square wave
    - **Morse:** provides a Morse code-like rhythmic effect
    - **S&H:** provides a Sample and Hold modulation
    - **Random:** provides random modulation

- **LFO Depth**

  This knob adjusts the amount of modulation applied to the Sample Rate.

AIR Saturation Filter

The AIR Saturation Filter applies a filter to an incoming audio signal and then applies a selectable type of distortion, reduction, etc. to that filtered signal.

- **Cutoff**
  This knob adjusts the filter cutoff frequency.
- **Resonance**
  This knob adjusts the resonance at the cutoff frequency.
- **Filter Section**
  These controls determine how the incoming signal is filtered.
  - **Filter Type**: this selector sets the type of filter:
    - **LP4:** Four-pole low-pass. Frequencies above the cutoff are attenuated at 24 dB/octave.
    - **LP3:** Three-pole low-pass. Frequencies above the cutoff are attenuated at 18 dB/octave.
    - **LP2:** Two-pole low-pass. Frequencies above the cutoff are attenuated at 12 dB/octave.
    - **LP1:** One-pole low-pass. Frequencies above the cutoff are attenuated at 6 dB/octave.
    - **BP2:** Two-pole band-pass: 6 dB/octave high-pass and 6 dB/octave low-pass in series. Frequencies below and above the cutoff are attenuated at 6 dB/octave.
    - **BP4:** Four-pole band-pass: 12 dB/octave high-pass and 12 dB/octave low-pass in series. Frequencies below and above the cutoff are attenuated at 12 dB/octave.
    - **HP2_LP1:** Combination that forms a three-pole asymmetric band-pass. Frequencies below and above the cutoff are attenuated. With a 12 dB/octave high-pass and a 6 dB/octave low-pass in series, low frequencies are faster attenuated than high frequencies.
    - **HP3_LP1:** Combination that forms a four-pole asymmetric band-pass. Frequencies below and above the cutoff are attenuated. With an 18 dB/octave high-pass and a 6 dB/octave low-pass in series, low frequencies are faster attenuated than high frequencies.
    - **HP4:** Four-pole high-pass. Frequencies below the cutoff are attenuated at 24 dB/octave.
    - **HP3:** Three-pole high-pass. Frequencies below the cutoff are attenuated at 18 dB/octave.
    - **HP2:** Two-pole high-pass. Frequencies below the cutoff are attenuated at 12 dB/octave.
    - **HP1:** One-pole high-pass. Frequencies below the cutoff are attenuated at 6 dB/octave.
    - **BR2:** Two-pole band-reject: 6 dB/octave low-pass and 6 dB/octave high-pass in parallel. Frequencies around the cutoff are attenuated at 6 dB/octave.
    - **BR4:** Four-pole band-reject: 12 dB/octave low-pass and 12 dB/octave high-pass in parallel. Frequencies around the cutoff are attenuated at 12 dB/octave.
    - **BR2_LP1:** Combination that forms a three-pole asymmetric band-reject. Frequencies around and above the cutoff are attenuated. With a two-pole band-reject and a 6 dB/octave low-pass in series, high frequencies obtain more attenuation than mid frequencies.
    - **BR2_LP2:** Combination that forms a four-pole asymmetric band-reject. Frequencies around and above the cutoff are attenuated. With a two-pole band-reject and a 12 dB/octave low-pass in series, high frequencies obtain more attenuation than mid frequencies.
    - **HP1_BR2:** Combination that forms a three-pole asymmetric band-reject. Frequencies below and around the cutoff are attenuated. With a 6 dB/octave high-pass and a two-pole band-reject in series, low frequencies obtain more attenuation than mid frequencies.
    - **BP2_BR2:** Combination that is sometimes called a four-pole tooth filter because the frequency plot of the filter forms the shape of a tooth.
    - **HP1_LP2:** Combination that forms a three-pole asymmetric band-pass. Frequencies below and above the cutoff are attenuated. With a 6 dB/octave high-pass and a 12 dB/octave low-pass in series, high frequencies are faster attenuated than low frequencies.
    - **HP1_LP3:** Combination that forms a four-pole asymmetric band-pass. Frequencies below and above the cutoff are attenuated. With a 6 dB/octave high-pass and an 18 dB/octave low-pass in series, high frequencies are faster attenuated than low frequencies.
    - **AP3:** Phase shifter, using three poles of the filter for phasing effects.
    - **AP3_LP1:** Phase shifter with a one-pole low-pass in series. In addition to the phasing effect, high frequencies are attenuated at 6 dB/octave.
    - **HP1_AP3:** Phase shifter with a one-pole high-pass in series. In addition to the phasing effect, low frequencies are attenuated at 6 dB/octave.
  - **Filter Mode**
    This menu selects the filter's mode. Select **DCF** to apply a digitally controlled filter. Select **VCF** to apply a voltage-controlled filter.
- **Saturation Section**
  This section determines the type and amount of saturation applied to the filtered signal.
  - **Saturation Type**: this selector sets the type of saturation:
    - **Resample:** This type of saturation removes bits from the filtered digital signal and applies several additional filters and anti-aliasing to attempt to retain the original sound quality. This is a method used by popular vintage samplers and sampling drum machines from the 1980s. Resampler can be used to achieve a "dirty" sound on drum loops, without the harshness of distortion.
    - **Bit Crush:** This type of saturation downsamples the filtered signal by removing bits from it. The result is an effect ranging from mild to almost completely pure digital distortion, depending on the setting and the source material.

- **Rectify:** This type of saturation shapes any monophonic wave into a rectangular waveform—a familiar, “classic” type of edgy distortion.
- **Hard Clip:** This type of saturation emulates “clipping” of the filtered signal as though its input volume were too high, creating a harsh type of distortion.
- **Distort:** This type of saturation applies a “fuzzy” distortion to the filtered signal.
- **Overdrive:** This type of saturation emulates a mildly “overdriven” tube amp, creating a smoother-sounding distortion.

o **Drive**: This knob lets you increase the amount of saturation applied to the signal. Sometimes an increase or decrease of just 1 or 2 decibels can make a big difference on the amount and quality of saturation.

- **Output**

  This setting lets you raise or lower the output level of the saturated signal.

3.3.5 Utility

Utility

The Utility device provides control over the left and right stereo channels.

- **Amp**
  These controls adjust the amplitude of the left and right stereo channels.
- **Pan**
  These controls adjust the stereo panning of the left and right channels.
- **Phase**
  These controls allow you to flip the phase of the left and right stereo channels.
- **Mute**
  These controls allow you to mute the left or right stereo channel.

LR 2 MS

The LR 2 MS device converts a standard left/right stereo audio signal to a mid/side audio signal. This allows you to process the center (mid) and sides of the audio signal independently.

- **Mid Gain**
  This control adjusts the level of the center (mid) audio signal.
- **Mid Gain Power**
  This control enables or disables the center (mid) audio signal.
- **Side Gain**
  This control adjusts the level of the side audio signals.
- **Side Gain Power**
  This control enables or disables the side audio signals.

MS 2 LR

The LR 2 MS device converts a mid/side audio signal to a standard left/right audio signal.

- **Mid Gain**
  This control adjusts the level of the center (mid) audio signal.
- **Mid Gain Power**
  This control enables or disables the center (mid) audio signal.
- **Side Gain**
  This control adjusts the level of the side audio signals.
- **Side Gain Power**
  This control enables or disables the side audio signals.

FFT

The FFT device is a spectrum analysis tool.

It shows a representation of the output signal from the effect device immediately to its left. It is useful for tracking down causes of problematic frequency output that may be generated by some effect settings.

Please note that FFT processing consumes substantial amounts of CPU power.

- **Smoothing**
  This control adjusts the amount of smoothing used to reduce jitter in the display. Increasing the **Smoothing** control results in a more stable display although accuracy may be compromised.
- **Update Time**
  This control adjusts the frequency at which the audio signal is analyzed and displayed. Shorter **Update Time** settings consume more CPU cycles (FFT analysis is a substantially CPU-hungry process).
- **Log**
  This control changes the scale of the FFT display between **linear** and **logarithmic**.

TestTone

The TestTone device is a sine wave generator which can be used for checking the frequency and transient response of effects further down the signal path.

The **On Time** and **Off Time** controls allow the device to cycle on and off for testing the responses of dynamics processors and other transient-sensitive effects. This device may also be used as an audio-rate FM modulation source for use with suitable devices such as the FilterMod effect.

- **Pitch**

  This control adjusts the frequency of the sine tone generated by the device between 7 Hz and 28 kHz.

- **Amp**

  This control adjusts the level of the test tone between -36 and +12 dB.

- **On Time**

  This control sets the time for the test tone to be active if the **Off Time** control is set to a value greater than 0.

  A continuous tone is generated with the **On Time** and **Off Time** controls set to 0. If the **On Time** control is set to 0 and the **Off Time** control is set to a value greater than 0, the device produces silence.

- **Off Time**

  This

  . control sets the period of silence before the tone is produced again for the duration set by the **On Time** control.

TestPulse

The TestPulse device generates a pulse wave with a minimal PWM setting so that its value is 1 for a single sample with silence for the rest of the duty cycle. This creates even and odd harmonics, useful for checking the response of spectral effects such as filters further down the channel's signal path.

Like the TestTone device, the pulse tone can cycle on and off for testing dynamics and other transient-sensitive devices and it can also be used as an audio-rate modulation source for suitable devices.

- **Pitch**

  This control adjusts the frequency of the pulse tone generated by the device between 0.1 Hz and 10 kHz.

- **Amp**

  This control adjusts the level of the test tone between -36 and +12 dB.

- **On Time, Off Time**

  These controls behave identically to the **On Time** and **Off Time** controls in the TestTone device (see above).

TestNoise

The TestNoise device generates a white noise burst with an adjustable ramp which can be used for testing the transient response of effects further down the signal path.

- **Noise Filter**

  This control adjusts the frequency range of the white noise generated by the device between 10.00 Hz and 22.00 kHz.

- **Amp Start**

  This control adjusts the initial level of the test noise between -36 and +12 dB.

- **Amp**

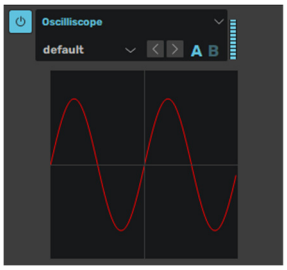
  This control adjusts the final level of the test tone between -36 and +12 dB.

- **On Time, Off Time**

  These controls behave identically to the **On Time** and **Off Time** controls in the TestTone device (see above).

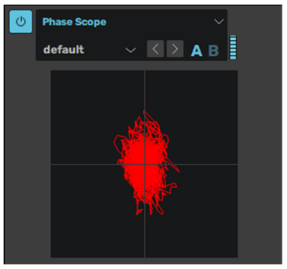
Oscilloscope

The Oscilloscope visualizes the incoming audio as a waveform.



Phase Scope

The Phase Scope visualizes the incoming audio with a representation of the level and phase of the left and right stereo channels.



3.3.6 Legacy

Env Shaper

The Env Shaper device has been superseded by *DCAM EnvShaper*. It is provided in the Legacy section for compatibility with older projects.

It allows you to adjust transients and change the dynamic shape of a signal in a different way to using a compressor.

- **Sensitivity**

  The **Sensitivity** control adjusts the response of Env Shaper's peak detection circuit to transients with higher values leading to more detected peaks.

- **Attack**

  The **Attack** control adjusts the intensity of the attack phase of detected transients in the audio.

  Increase the control to intensify attack transients and to make drum sounds punch through the mix harder.

  Decrease the control to soften transients. This can be particularly useful on percussion sounds and on one of two linked Drums.

- **Sustain**

  The **Sustain** control adjusts the intensity of release portions of detected transients in the audio. This effectively increases or decreases the apparent sustain of sounds in the signal.

  Increasing the control results in more sustain, which is useful for intensifying the natural reverb in BFD3's sounds. It is particularly suited to making room ambience sound huge.

  Decrease the control for less sustain and making ambience appear "drier." At higher settings it can produce damping effects for drum sounds.

- **Gain**

  Use the **Gain** control to adjust the level of the signal as needed after the Env Shaper's dynamic processing.

Drive

The Drive device offers 4 distortion circuit models, useful for adding color, grit, or more extreme distortion to your drum sounds. This device has been superseded by the *Distortion* device, but the older version from BFD2 is provided as a legacy device for compatibility with older projects.

- **Mode**

  The **Mode** control selects between four available distortion types:

  - **Diode**

    Diode clip circuits are found in countless guitar pedals and other distortion units. It gradually drives the input throughout the amplitude range.

  - **OTA (Operational Transconductance Amplifier)**

    This mode models the behavior of an overdriven OTA chip.

  - **OpAmp (Operational amplifier)**

    This mode models the behavior of an overdriven OpAmp chip.

  - **HalfRect (Half Rectifier)**

    This type of distortion allows through only the top half of the input signal's waveform.

- **Drive**

  The **Drive** control adjusts the amount of distortion applied to the signal.

- **Input Filter, Dirty, Clean, Tone**

  These controls function in the same way as those on the *Distortion* effect device.

3.4 Trademarks and Licenses

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