



Reference Manual
BFD v.1.5



WELCOME TO BFD

Thank you for choosing FXpansion's BFD! We hope you will agree that the painstaking effort of putting it together has resulted in the most realistic and versatile acoustic drum machine ever.

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Manual revision 1.5

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1 INTRODUCTION

BFD is a high-quality acoustic drum module. It concentrates on playing back impeccably-recorded multi-velocity acoustic drumkits, with some crucial differences to using a general-purpose sampler with sample-CDs, or using pre-recorded acoustic drum loops.

1:1 The BFD concept

- **Flexible mixing of multiple microphone placements: 17 mics were used in total, with each part of the kit being recorded through 11 microphones**
- **Hyper-detailed kits: up to 46 velocity layers and a wide selection of articulations**
- **Easy compilation of new kits without wrestling with time-consuming editing and combining of sampler programs, or having to load multiple whole kits**
- **A versatile automated drummer in the Groove Librarian**
- **Endlessly variable sound and feel**

All this and more is provided in an intuitive, highly integrated interface, plugged into the heart of your favourite sequencing environment, via the VSTi, DXi, RTAS, AudioUnit and ReWire interfaces. A standalone version is also supplied, which uses the ASIO and CoreAudio protocols.

BFD supports Windows and MacOSX operating systems. While BFD may work in Windows 98SE and ME environments, we only recommend and support its use in Windows 2000 and XP. For Mac users, MacOSX version 10.2.8 or higher is required.

When designing BFD, we tried to make it easy to use for people who prefer to write music rather than mess with the inner workings of a plugin. However, it still offers a massive amount of control and flexibility for people who want to deeply customize the sound and response of the drumkit.

Multiple microphone positions

Each drum component, or Kit-Piece, in BFD is sampled with a number of microphone placements simultaneously:

Direct: a clean, close-mic'd signal. A variety of microphone types were used for this, including Sennheiser MD421, Neumann KM81 and M49, ElectroVoice Re20, AKG 451 and Shure SM57. They were recorded through custom modified API preamps.

Overhead: a lush set of overhead mics - namely AKG C-12's (which, incidentally, cost around \$15,000 each), recorded through Summit MPC-100A tube preamps.

Room: a room ambience signal, recorded with Neumann U87's and Avalon preamps.

PZM: Crown PZM microphones placed at floor level, tracked with API preamps, and an additional compression stage (Empirical Labs Distressor set at 3:1 ratio) for added body and sustain.

These signals can be mixed together as desired, so you can 'dial in' exactly the amount and type of natural ambience you need, without having to use CPU-heavy reverb plugins. The ambience in BFD is totally natural and the result of painstaking recording through the best possible equipment in a high-quality space. Any reverb processor can only try to emulate such a sound, while BFD gives you the real thing. There is additional control over the distance placement of each set of mics, and the width of its stereo field.

The ambient send levels of each kit element (such as kick, snare, toms, hats and cymbals) can be adjusted in the detailed Mixer section, resulting in exceptionally versatile control over the final drum sound. The Mixer even has controls to handle the blend between mics inside and outside the kick drum, and above and below the snare. In addition, each individual microphone bus, and even each individual direct mic signal, can easily be routed to an individual output into the host sequencer's mixer for further sound processing.

Each part of the kits in BFD is recorded with up to 11 microphones, including the ambient and bleed channels. Please see section 10:1 of this manual for more details on BFD's audio architecture.

Hyper-realistic kits

As well as the flexibility offered by the multiple microphone positions, BFD's high quality drum sample library features an unparalleled degree of realism. For each part of each kit, there are a number of different articulations, or 'Hit types': for example, the snares offer flams, drags, rims and side-sticks, while the hihats include closed, 1/2-open and open pedal positions, in tip and shank versions.

Each of these Hit types is sampled at up to 46 velocity layers, resulting in drum parts of unparalleled detail and expressiveness.

The *BFD XFL* and *8 Bit Kit* expansion packs, as well as some free downloads, expand on the number of Hit types and velocity layers available

Easy compilation of new kits

Ever tried to edit and combine elements of large disk-streamed sample libraries? You'll know that it isn't exactly the most productive use of creative time in the studio. To save you this tedious, time-consuming process, BFD allows you to easily mix and match the kicks, snares, toms, hats and cymbals of the various supplied kits to create custom kits. All this within seconds, and with just a few mouse-clicks! You can preview any potential kit changes in real-time and in context, leaving you free to concentrate on the sound rather than losing your creative flow through excessive file and sample management operations.

Custom kit creations can be easily saved into a small preset file, so it's easy to create a library of drumkits tailored to your requirements, and the small size of these files makes it simple to share your kits with others.

Flexible play modes: introducing the Groove Librarian

In addition to functioning as a single-hit module which can be triggered via a MIDI controller or a host sequencer's MIDI engine, BFD also incorporates an extensive library of 'Grooves', in a number of different styles, feels and time signatures. There is

also a comprehensive fill library. What makes BFD so powerful is that these 'Grooves' are standard MIDI files, so it is incredibly easy to create and import your own, or use commercial MIDI-file libraries, such as the Twiddly Bits and GrooveMonkee products. BFD conforms to the General MIDI (GM) standard as much as possible (BFD includes some articulations which do not exist in the GM specification), making it very easy to import standard MIDI drum parts as Grooves.

Endless variety of sound and feel

BFD offers a huge array of controls with which to shape the sound and response of the drumkit. Virtual damping controls are provided, as are a variety of different levels of choking and velocity variation in order to further enhance the realism of your drum tracks. Artificial-sounding rolls are banished forever with the Anti-machinegun mode! There are even some rather experimental controls, for modulating the damping amount and tuning with velocity.

Within the Groove Librarian, BFD's intelligent humanization techniques inject that elusive 'soul' into your drum parts. The provided MIDI Grooves are dripping with a variety of feels, and the integrated swing controls make it easy to tighten or relax the vibe as much as required. On top of this, the feel of the Groove can be further humanized through the controlled randomization of velocity and timing.

1:2 Potential uses for BFD

BFD has the ability to be many things to many people. Perhaps the primary reason for BFD's existence is that it provides convenient access to the very highest quality sampled drum sounds for producers without access to a real drumkit and good recording facilities. It also caters for composers who require 'ready-rolled' but flexible and realistic acoustic drum accompaniments which facilitate song-writing without interruption to the creative flow.

BFD's sounds and Grooves are perfectly suited to rock, jazz, funk, hip-hop, blues, metal, drum & bass... in fact, anything that may require a real drumkit. It can be used for anything from auto-accompaniment, traditional song-writing and production, to modern techniques such as creating new drum breaks to use in hip-hop and drum & bass music.

1:3 Documentation

We have designed BFD to be as intuitive as possible, to the point where it is possible to fire it up and be up and running within seconds for instant gratification. However, we urge you to thoroughly read this manual, in order to learn how to make full use of BFD's sheer depth.

Please also be aware of the supplemental electronic PDF documentation installed with BFD, which contains further information on a number of issues such as host/sequencer integration and technical issues regarding performance and troubleshooting.

Please also check our website at <http://www.fxexpansion.com> for tutorial videos, additional documentation and up-to-date FAQs.

1:4 Technical support and updates

Before contacting our support department, please make sure you have fully read the manual, and in particular, the supplemental electronic documentation which deals with troubleshooting.

The first thing you should do after purchasing BFD is register on our website. You'll then get access to the latest version of BFD. We are constantly updating our software with new features and performance enhancements, so this is the first thing you should try if you encounter a problem.

As a special bonus for registering, you will be able to download extra content, such as bell samples for two of the BFD rides, and a free hihat with an extra 1/2-open tip position.

It is also very useful to look at the BFD FAQ:

<http://www.fxansion.com/product-bfd-userFAQ.php>

If you still cannot resolve your problem, our support department will be only too happy to help.

For full details on registering, downloading updates and obtaining technical support, please go to our support page:

<http://www.fxansion.com/support>

Many thanks,

The FXansion team.

2 INSTALLATION

2:1 System Requirements

BFD requires a substantial amount of computing power. Here is the minimum recommended specification:

- **1 GHz Pentium III or Athlon (for Windows platform)**
- **Apple PowerMac G4 733 MHz (for MacOSX platform)**
- **512 MB of RAM (preferably 768 MB or more)**
- **DVD drive (for installation)**
- **Windows 2000 or XP, or MacOSX 10.2.8**
- **9 GB of free hard disk space**
- **800x600 resolution with 16-bit colour graphics**

On the Mac, it will not work on OS9 or earlier versions.

To get the best out of BFD, we recommend a similar or better system to the following:

- **1.5 GHz Pentium 4, Pentium M, or Athlon (for Windows platform)**
- **Apple PowerMac G5 (for MacOSX platform)**
- **1 GB of RAM (the more the better)**
- **DVD drive (for installation)**
- **Windows 2000 or XP, or MacOSX 10.3.x or 10.4.x**
- **9 GB of free hard disk space on a fast dedicated hard drive**
- **1024x768 resolution with 16-bit colour graphics**

Much of the enhanced functionality in BFD 1.5 really comes into its own when used with the BFD expansion packs, such as *BFD XFL* and *8 Bit Kit*. The hihat control and 18 Kit-Piece slots, in particular, benefit from the enhanced detail and variety of an expanded BFD system.

BFD works by streaming all its samples from the hard disk, so in order to prevent glitches during playback, please follow these guidelines.

- **Try to install the BFD audio data on a clean, defragmented hard disk.**
- **If possible, install BFD on a dedicated drive, separate from those used for the computer's operating system and any audio data used with the sequencer.**
- **If you use a notebook or laptop, try and use an external FireWire or USB2.0 drive for the audio data. Laptop drives (often as slow as 4200 RPM) can be quite slow for BFD's disk-streaming technology.**

2:2 Installation

BFD comes on two DVD's. The first DVD contains the stand alone program, plugins, presets and several drum kits. The second DVD contains only drum kits.

Before installing from the DVD, **always** check to see if there is a newer version available on our website. Please see the following webpage for full details on obtaining updates, or if you are encountering problems during installation:

<http://www.fxexpansion.com/support>

- Please note that the BFD data needs to be installed on a hard disk with around 9 GB of free space. Ideally, you should not be using this drive for your operating system, or for streaming other audio data.

If you intend to use a host which does not support multiple outputs from a plugin, you should install the ReWire version, See 'ReWire installation' below for help on setting your ReWire options.

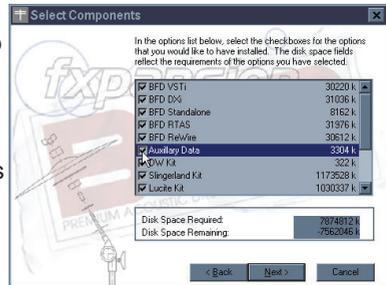
Windows installation

1. Insert the first DVD (or extract the archive if installing from an update), examine the contents and run the **BFD Windows Setup.exe** program. After you click through the Welcome screen, you will need to select the components you wish to install – each plugin version, the kit data and Auxiliary data such as presets can be selected or deselected in the 'Select Components' stage of the installation.

- Please note that the VST version **must** be installed regardless of which formats you intend to use.

- *You do not need to install the kit data again if it already exists on your hard drive from a previous install.* If this is the case, de-select the checkboxes for the Kits (and Extras).

- Even if you already have the data installed, it is recommended to keep **Auxiliary data** checked, although you may want to back up your own Kits, Programs and other presets before you do this.



2. After you click **Next**, depending on your choices in the Select Components stage, you will be prompted for folders for each of the following:

- BFD Data (It is recommended to install the data to a fast, dedicated hard drive).
- VST plugin files
- DXi plugin files
- Standalone application files
- RTAS plugin files
- ReWire files

3. Once you've finished specifying folders, you will see the Start Installation message – Click **Next** to install. Please be patient when installing kit data, as it can take a long time!



MacOSX installation

Software installation (standalone CoreAudio and all plugin versions)

Insert BFD DVD1, or mount the disk image if you are installing from an update downloaded from the website. Examine the contents in the Finder.



1. Double-click on **BFD Setup.mpkg** in order to begin installing BFD standalone (CoreAudio) and plugin files. **BFD DVD1 Data Setup.mpkg** and **BFD DVD2 Data Setup.mpkg** are for installing the BFD data (more on this later).



2. After accepting the License Agreement, select the **OS** drive for the destination. BFD standalone and plugin software **must** be installed to the OS drive.



3. At this point you can choose either the Easy install (all components) by clicking **Install**, or the Custom install option by clicking **Customize**, if you want to install selected components. Ignore the next step if you choose the Easy install.



4. If you choose the Custom install, it is a good idea to leave the **Arial font installer** checked unless you are sure you already have it installed. The VST and AU versions **must** be installed. Click **Install** when ready to proceed.

Data installation

You need not install the data if it already exists on your hard drive as a result of a previous installation.

1. When you've installed the standalone and plugin software, run the **BFD DVD1 Data Setup.mpkg** file in order to install the kit data and various other required files, such as Grooves, presets etc. The installation procedure is very similar to that above, except you can install the data to any hard drive destination on your system. It is recommended to install the data to a fast, dedicated hard drive.
2. After this, insert DVD2 and run the **BFD DVD2 Data Setup.mpkg** program in order to install the kit data from DVD2. Follow the on-screen instructions for the rest of the installation.

Please be patient during this stage, as the data installation can take a long time!

ReWire installation

If you choose to install the **BFD ReWire** version, during the installation process you may be prompted to set your ReWire options. The main reason to use ReWire is to support BFD's multiple outputs so you will probably want to choose 'All outputs' or 'Group outputs'. ReWire functionality is **disabled** by default when installed, so enable this with the checkbox in the dialog which appears, or by using the **BFD ReWire Applet** in order to set the options at any time. *You need not install the ReWire version if you only intend to use hosts which support multiple outputs from plugins.*

2:3 Authorization

When you first launch BFD, you will need to authorize it with your serial number (also known as the license number). Enter the serial/license **exactly** as it appears, starting with the FXBFD- and including all hyphens. It's a good idea to authorize BFD using the standalone version (**BFD (CoreAudio)** on Mac).

2:4 Installation and Authorization problems

If you encounter a problem, please consult the supplemental electronic PDF documentation installed with BFD. It is also very useful to look at the BFD FAQ:

<http://www.fxexpansion.com/product-bfd-userFAQ.php>

Also, register and download the latest version of BFD. If you still cannot resolve your problem, our support department will be only too happy to help.

2:5 Registration and support

For support on a BFD problem, or to get the latest version, please visit our support page:

<http://www.fxexpansion.com/support>

You will need to register in order to receive support and updates. We are constantly updating our software with new features and performance enhancements, so this is the first thing you should try if you encounter a problem.

As a special bonus for registering, you will be able to download extra content, such as bell samples for two of the BFD rides, and a free hihat with an extra 1/2-open tip position, plus other downloads which are made available periodically.

2:6 Getting started

It's useful to have a look at the supplemental electronic PDF documentation when getting started with BFD. It includes a tutorial and various other information on getting up and running.

Please also check our website for tutorial videos and other documentation and support information.

3 OVERVIEW OF THE BFD INTERFACE

Help buttons

Click one of the  (main interface) or  (panels) help buttons in various parts of the BFD interface in order to launch an HTML help file documenting that area of the plugin.

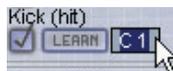
Context info display

The Context info display shows helpful information, labels and parameter values, depending on the control underneath or being edited by the mouse.

Control conventions

Controls are adjusted by clicking and dragging them vertically up and down. Controls can also be adjusted by moving the mouse over them and scrolling the mousewheel.

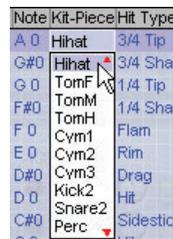
Text-boxes are edited by double-clicking them and entering a new value (press [ENTER] when you're done).



Numerical and MIDI note text-boxes can usually be clicked and dragged up and down. They can also be adjusted by moving the mouse over them and scrolling the mousewheel.

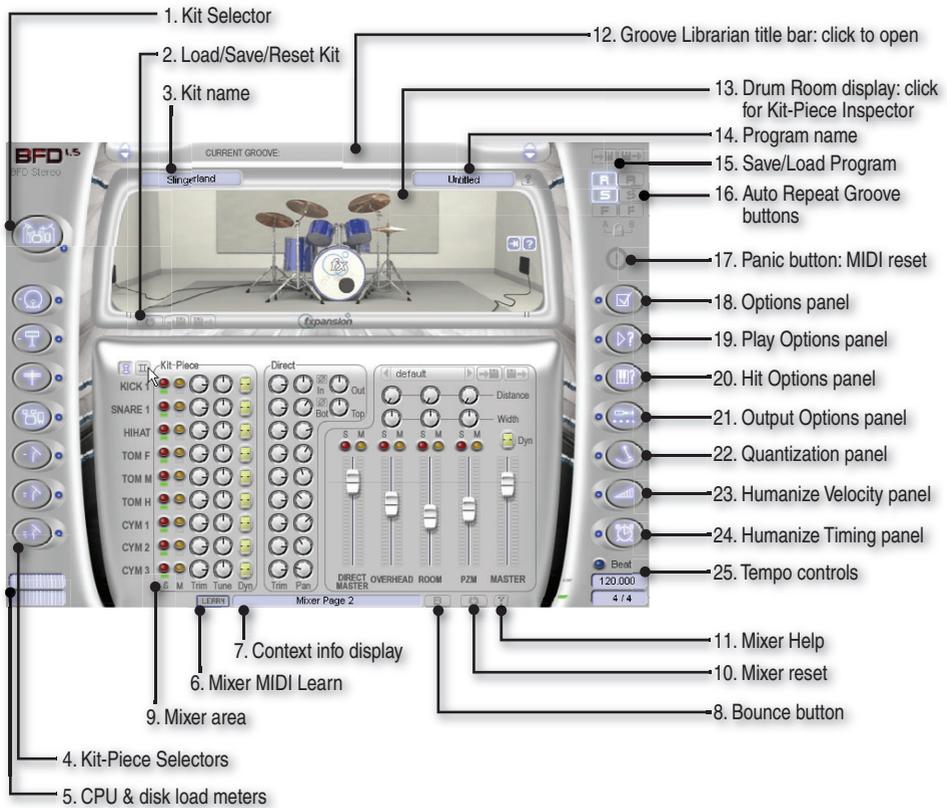
Please be aware of scrollbars in many panels – for example in the Hit Options Advanced and MIDI CCs tab editors, and in the Kit and Kit-Piece selector panels. Where a scrollbar exists, you can also use the mousewheel to scroll through the list.

There are a number of drop-down menus in the BFD interface. Wherever the list of items exceeds the size of the menu, the ability to scroll through the list, by clicking and dragging up or down at the menu boundaries, is indicated by small red arrows.



Any specific control techniques and additional shortcuts, including those involving keyboard modifiers, are explained where necessary for the relevant controls and parameters discussed throughout the course of this manual.

When note names (such as C3, D4 etc.) are mentioned in this manual, the -2 octave numbering system is used (see section 9:1).



1, 2, 3, 4, 14, 15: Kit and Kit-Piece management – see chapter 4

9, 10, 11: Mixer controls – see chapter 5

13: The Drum Room display contains graphical indicators for Hihat pedal position, ambient mic Distance and Width, and Kick In/Out and Snare Bottom/Top (see chapters 7 and 5). Click on it to bring up the Kit-Piece Inspector (see chapter 6)

20: The Hit Options panel lets you configure controllers and keymapping – see chapter 7

12, 16, 22, 24: Groove Librarian controls – see chapter 8

24: Humanize velocity panel – see section 8:10

18, 19: Options with which to customize BFD – see chapter 9

21: The Output Options panel lets you freely route audio channels to plugin outputs – see chapter 10

5, 6, 7, 8, 17, 26: Other interface functions – see chapter 11

4 LOADING KITS AND KIT-PIECES

The Kit Selector and Kit-Piece Selectors are used to load sounds into BFD. When you launch BFD, you'll see the first Mixer Page: this is used for the 'basic' drumkit, and provides slots for kick, snare, hihat, tom set and three cymbals.

If you click the  button, the second Mixer Page will appear. This is used for a second kick and snare, a percussion Kit-Piece, a second tom set, and another three cymbals. Click  to return to Mixer Page 1.

Selector panels

The Kit-Piece Selectors load sounds into slots according to the currently viewed Mixer Page. The Kit Selector, however, will always load Kit-Pieces into the slots in which they were saved.

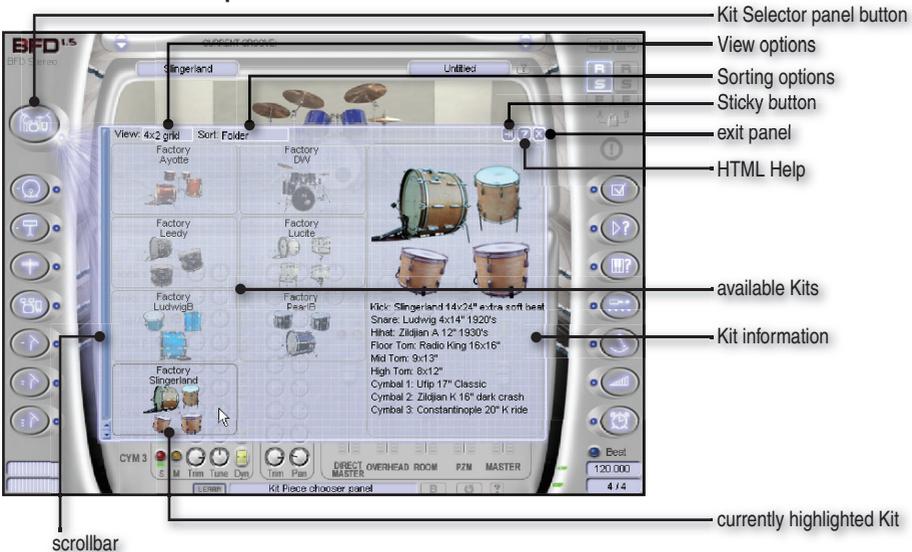
Exit the panels by clicking their buttons again, or by clicking the  button in their top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.

Sticky Button

If you click the  Sticky button on the Kit or Kit-Piece Selector panels, you can load Kits or Kit-Pieces into BFD without exiting the Selector Panel. This can be useful for listening to a number of Kit-Pieces in context while MIDI sequences or Grooves are playing through BFD.

4:1 Loading Kits

The Kit Selector panel



Clicking on the Kit Selector button brings up the Kit Selector panel. Here, you can load one of the supplied full drumkits. Moving the mouse over each Kit brings up information about the Kit on the right of the panel. You can navigate around the Kits with the arrow keys and the [PageUp] and [PageDn] keys, and use the scrollbar or mousewheel to scroll through longer kit listings. See section 4:2 for more details on the View and Sort options.

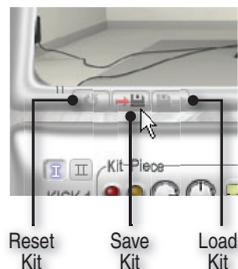
Click on any Kit in order to load it and exit the Panel (the panel will continue to be displayed if the  Sticky button is engaged). This will load all Kit-Pieces of the chosen drumkit to the slots in which they were when the Kit was saved, **removing anything already loaded into any slots.**

Load & Save Kit buttons

You can also load Kits, and save the current Kit, by using the Load and Save Kit buttons to the top-left of the BFD Mixer area. Kits are saved to the **BFD/Kits/User** folder.

Reset Kit button

Clicking this button results in all Kit-Piece slots being cleared.



Saving & Loading Programs

A Program file is a complete BFD setup: the current Kit, and Mixer, Kit-Piece Inspector, Hit Options, Play Options and Groove Librarian settings. A Program is the only type of preset file within BFD which stores the state of the Hit trim and Unload settings in the Hit Options panel. It is the same information which is saved with a song when using BFD as a plugin inside a host.

The buttons at the top-right of the BFD interface allow you to Load and Save Programs. Programs are saved to the **BFD/Programs** folder.



To summarize:

- A Kit is a collection of Kit-Pieces: no other information is stored with it. Therefore, a Kit will not contain any key assignments, Mixer settings, damping settings etc.
- A Program stores all settings within BFD : the Kit, the Mixer and Kit-Piece inspector settings, note, MIDI CC and output assignments, Play Options, Hit trim and Unload settings and the state of the Groove Librarian.

Kit name and Program name

These text fields are located at the top of the Drum Room display. Double-click on either name in order to edit it.



Loading a default Kit when BFD is initialized

If you would like to load one of the supplied factory Kits, or any Kit you compile yourself, when BFD is initialized, it is very simple to do so. Use the BFD Options panel to specify a Kit file and enable the Load default kit when BFD starts option. See section 9:1 for more details on this option.

4:2 Loading Kit-Pieces

Kit-Piece Selector panels

The Kit-Piece Selector buttons in the left-hand column bring up individual Selector panels. These allow you to load Kit-Pieces into individual slots in a similar way to that in which you would load a Kit.

BFD features two Mixer Pages. The first Page (the default) shows the basic Kit-Piece slots, while the second Page shows the extra slots. The Kit-Piece Selector buttons change depending on which Mixer Page is currently being viewed.

It is important to remember that each Kit-Piece Selector button corresponds

to one of the Kit-Piece slots within the Mixer. Each Kit-Piece Selector can be made to load any type of Kit-Piece into that slot, using the Type drop-down menu (see 'Loading Options', below).

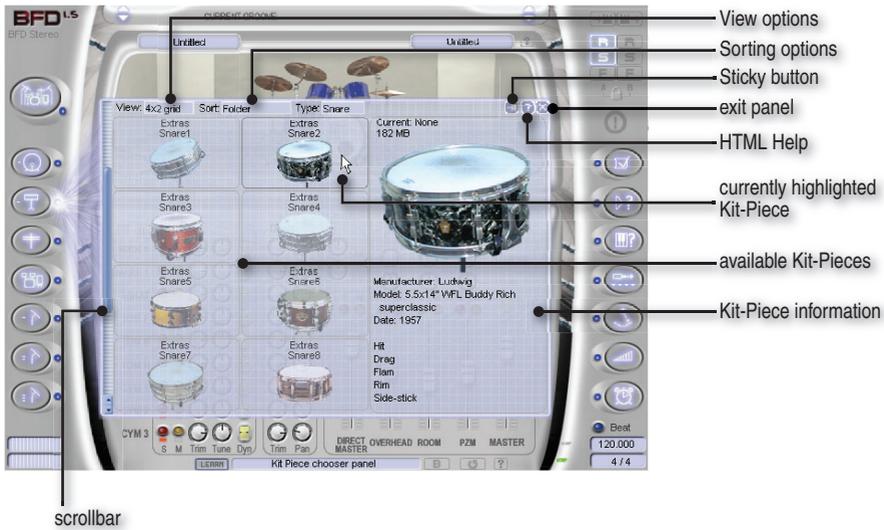
It is a good idea to read this chapter fully, especially section 4:3, as well as section 5:1, in order to gain a good understanding of the flexibility of BFD's Kit compilation features.



• Mixer Page 1 Kit-Piece Selector buttons

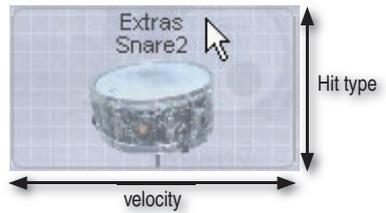


• Mixer Page 2 Kit-Piece Selector buttons

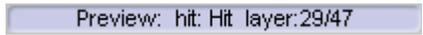


Auditioning Kit-Pieces

You can audition each available Hit in each Kit-Piece at different velocities by holding down the [SHIFT] key and clicking on its icon. Different Hit types are auditioned by varying the clicking position vertically, while varying it horizontally varies the velocity.

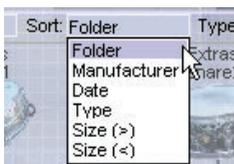


The readout in the context info display shows exactly which Hit type and velocity layer is currently being auditioned.

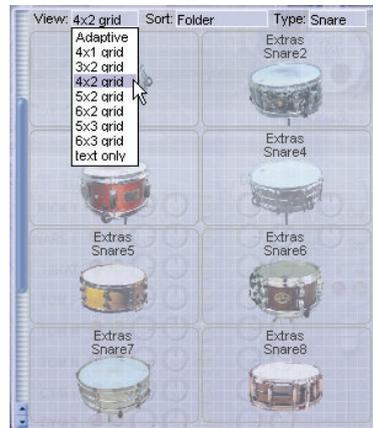


View and Sort Options

You can change the size of the browsable Kit-Piece icons in the Selector Panels by using the **View** drop-down menu. You can choose a variety of icon sizes, or even text-only (this is faster, as images do not need to be recalled).



You can sort Kit-Pieces in the browsable list by folder, manufacturer, date, type and size (both ascending and descending). This is achieved via the **Sort** drop-down menu.



These settings are also available in the Kit Selector panel. View and Sort settings are global for all panels.

Loading Options

BFD allows you to switch each Kit-Piece Selector panel to view and load any type of Kit-Piece, with the use of the **Type** drop-down menu. This allows complete flexibility when building your Kit. You can, for example, load a floor tom into a kick slot, by bringing up the Kick Selector panel and using the Type menu to access toms.



The Tom set and Tom set 2 Selector panels feature an extra drop-down menu in order to load a different Kit-Piece into each tom slot (floor, mid and high). When you use the Type drop-down menu to specify anything except a tom set, an extra drop-down menu appears, labelled **Slot**. This allows you to specify the tom slot to which the selected Kit-Piece will be loaded.



- In the above screenshot, notice the individual listings of toms, rather than the default representation of tom sets.

4:3 Hit types and Kit-Piece slots

When loading Kit-Pieces, it is important to understand BFD's approach to articulations, or 'Hit types' (sometimes referred to within BFD as 'Hits'). A snare drum, for example, has several Hit types: the regular hit, sidestick, rim hit (rim and skin hit simultaneously), flam and drag. Hihats, meanwhile, can have even more: pedal, closed, 1/2-open and fully-open for tip and shank. Additionally, 1/4-open and 3/4-open positions also exist in the *BFD XFL* and *8 Bit Kit* expansion packs.

As a registration bonus for all BFD users, a free Zildjian hihat is available for download containing an additional 1/4-open tip position. There are also ride bell Hit samples for two of the BFD rides for free download after registration.

It is useful to note that the word 'hit' is also used to describe the primary Hit type of kicks, snares, toms and cymbals.

Because each type of Kit-Piece has a different range of Hit types, the Kit-Piece slots are specialized. BFD's two Mixer Pages allow you a substantial amount of freedom to create a pretty extravagant Kit: you can load two kicks and snares, both with the full array of Hits, and create six-tom and six-cymbal Kits (with a cowbell for good measure!) with ease.

You can, using the Type drop-down menu in the Kit-Piece Selector panels, load any Kit-Piece into any slot. However, please be aware that you are limited to the capabilities of each slot. You won't be able to achieve the full functionality of a Kit-Piece by loading it into a slot for which it was not designed.

In practice this is only potentially a problem if you want a second hihat or third snare. These types of Kit-Pieces simply use too much RAM and too many MIDI notes for it to be viable to have more than the existing number of dedicated slots.

If you load a hihat into a slot capable of using only two Hit types, only the closed tip and 1/2-open tip Hits will be used. Similarly, for a snare, only the hit and sidestick Hit types will be made available.

When using BFD, please refer to the Hit Options panel (the Page 1 and Page 2 tabs) in order to remind yourself quickly of the capacity of each Kit-Piece slot within BFD.

Not all Kit-Pieces feature the full range of possible Hit types. This is because with some drums, certain Hit types just did not sound interesting or unique enough to justify the RAM and disk space required.

Kit-Piece slots in BFD

Here is a list of the Kit-Piece slots within BFD, together with a summary of the Hit types they can contain as well as the default MIDI notes assigned to each Hit.

The note names given below, and all other references to notes in this manual, are given in the most commonly used -2 octave numbering system, which can be set in the Options panel (see Section 9:1 for more details).

The Kick 2, Snare 2, Percussion, Tom set 2, and Cymbals 4-6 slots are located on Mixer Page 2.

Kick 1

hit	C1
no snare	B0



Snare 1

hit	D1
drag	D#1
flam	F1
rim	E1
sidestick	C#1



Hihat

The 1/4-open and 3/4-open positions are only available when using the BFD XFL and 8 Bit Kit expansion packs. There is, however, a free hihat for download upon registering which has an additional 1/4-open position.

open tip	A#1
3/4-open tip	A0
3/4-open shank	G#0
1/2-open tip	D2
1/2-open shank	E2
1/4-open tip	G0
1/4-open shank	F#0
closed tip	F#1
closed shank	C2
pedal	G#1



Tom set (Floor Tom, Mid Tom, High Tom)

Tom slots are slightly different to the others, as one Selector panel is used for three Kit-Piece slots. You can load individual toms (or any other type of Kit-Piece) into each tom slot by using the Type and Slot drop-down menus in the Tom Selector.

Floor Tom (hit)	G1
Mid Tom (hit)	A1
High Tom (hit)	B1



Cymbals 1,2,3

BFD does not come with ride bell samples on the installation disks. Bell samples for two of the included rides (PearlB and Slingerland) are provided for free download after registering on our website.

The choke hit does not represent a sound. Instead, it offers a means of stopping a ringing cymbal before it completes its natural decay. Choking can also be controlled using polyphonic pressure (aftertouch) messages: see section 7:2 for details).

Cymbal 1 (hit)	C#2
Cymbal 1 (bell)	F#2
Cymbal 1 (choke)	A2



Cymbal 2 (hit)	G2
Cymbal 2 (bell)	G#2
Cymbal 2 (choke)	A#2



Cymbal 3 (hit)	D#2
Cymbal 3 (bell)	F2
Cymbal 3 (choke)	B2



Kick 2

hit	B-1
no snare	C0

**Snare 2**

hit	D0
drag	D#0
flam	F0
rim	E0
sidestick	C#0

**Percussion**

This is effectively a multi-purpose slot which can hold two Hit types. There are no percussion Kit-Pieces in BFD, only in the expansion packs.

hit	C-2
alt	C#-2

**Tom Set 2 (Toms 4,5, and 6)**

Unlike the set of tom slots on Mixer Page 1, Tom Set 2 possess an additional hit for each slot. This is to facilitate loading other types of Kit-Pieces, such as more cymbals or some of the more varied Kit-Pieces on the expansion packs.

Tom 4 (hit)	D-2
Tom 4 (alt)	D#-2
Tom 5 (hit)	E-2
Tom 5 (alt)	F-2
Tom 6 (hit)	F#-2
Tom 6 (alt)	G-2

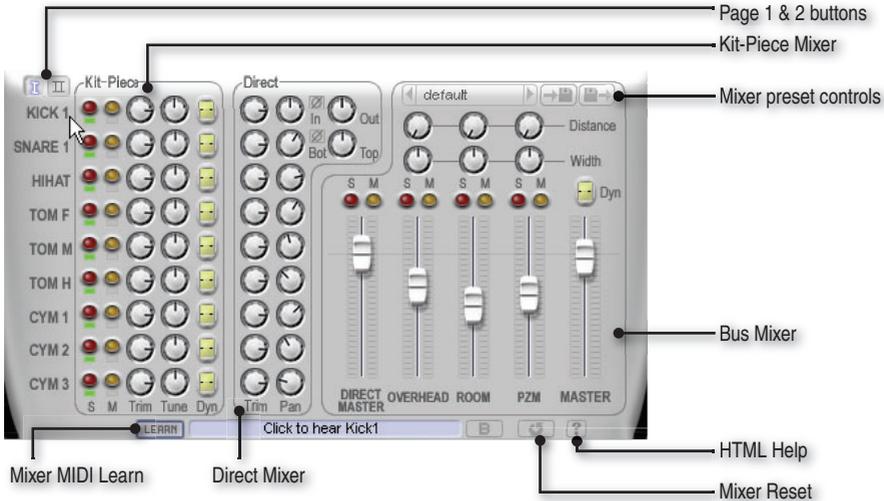
**Cymbals 4,5,6**

These slots operate in exactly the same way as Cymbals 1,2,3 on Mixer Page 1.

Cymbal 4 (hit)	G#-2
Cymbal 4 (bell)	A-2
Cymbal 4 (choke)	D-1
Cymbal 5 (hit)	A#-2
Cymbal 5 (bell)	B-2
Cymbal 5 (choke)	D#-1
Cymbal 6 (hit)	E-1
Cymbal 6 (bell)	C#-1
Cymbal 6 (choke)	B2



5 MIXING IN BFD



5:1 Mixer Pages

BFD's Mixer has two Pages, accessed using the **I** and **II** buttons at the top-left of the Mixer area.

Page 1 is the 'basic kit'. It has 'slots' for loading a kick, snare, hihat, three toms and three cymbals.

Page 2 contains nine extra slots: secondary kick and snare, percussion, three extra toms and three extra cymbals. The secondary kick and snare slots (kick 2 and snare 2) behave in exactly the same way as Page 1's kick and snare slots. The other seven slots, despite their names, can be used to load any Kit-Piece, although only two Hit types can be used.

Please see section 4:3 in the previous chapter for more details about Hit types and Kit-Piece slots.



• Mixer Page 2

Note that the Bus Mixer is the same on both Pages. Only the Kit-Piece and Direct Mixer areas are changed (as well as the Kit-Piece Selector panel buttons – see section 4:2).

5:2 Control conventions, shortcuts and remote operation

Controls are manipulated by clicking on them and dragging up and down.

You can also move a control by hovering the mouse pointer over it, and moving your mouse-wheel, if your mouse has one.

Control shortcuts

Double-click: reset control to its default value.

[SHIFT]-click and drag: Fine adjustment of Mixer control or fader

Ganging Mixer controls (changes affect both Mixer Pages):

[CTRL]-click and drag (can be combined with [SHIFT])

Moves the same control for all Kit-Piece slots.

All changes are relative to the controls' original positions.

[ALT]-click and drag (can be combined with [SHIFT])

Moves the same control for all Kit-Piece slots in the opposite direction to the one being moved.

Ganging Bus Mixer faders:

[CTRL]-click and drag (can be combined with [SHIFT])

Moves all faders together (except the Master).

Changes occur relative to the faders' original positions.

[ALT]-click and drag (can be combined with [SHIFT])

Moves all faders in the opposite direction to the one being moved (except the Master).

Changes occur relative to the faders' original positions.

Solo and Mute button ganging (changes affect both Mixer pages).

[SHIFT]-click

Inverts the Solo & Mute status of all Kit-Pieces.

[CTRL]-click

Sets the Solo & Mute status of all Kit-Pieces to the new value of the clicked button.

[ALT]-click

Sets the Solo & Mute status of all Kit-Pieces to the opposite of the new value of the clicked button.

MIDI remote control of Mixer controls

All of the BFD Mixer controls can be assigned to MIDI continuous controller messages.

Please see section 11:1 for more details on using the **Mixer MIDI Learn** button to set up BFD to respond to your MIDI controller hardware. You can also use the MIDI CCs tab of the Hit Options panel to make assignments: see section 7:5.

5:3 Mixer controls

BFD's Mixer is divided into three areas: the Kit-Piece Mixer, the Direct Mixer and the Bus Mixer.

BFD audio architecture

In order to fully take advantage of BFD's Mixer, it is useful to have an understanding of BFD's audio architecture and multiple output functionality. It is a particularly good idea to acquaint yourself with the concepts of mic channels and mic buses.

Certain controls will have different effects depending on which BFD output configuration and plugin type is being used.

Please see section 10:1 for more details on the audio architecture, different plugin types, and how to customize audio routing when using multiple output versions.

Kit-Piece Mixer area

Kit-Piece labels (Kit-piece audition)

The name labels for each Kit-Piece have a handy audition functionality. Clicking on the name auditions the sound with the left to right position mapping to increased velocity.

Load status LEDs

The multi-colour indicator LEDs beneath the Solo buttons show the loading status of each Kit-Piece slot.

Red status LED

No Kit-Piece is loaded into the slot.

Orange status LED

A Kit-Piece is queued up for loading into the slot.

Yellow status LED

A Kit-Piece is in the process of being loaded into the slot.

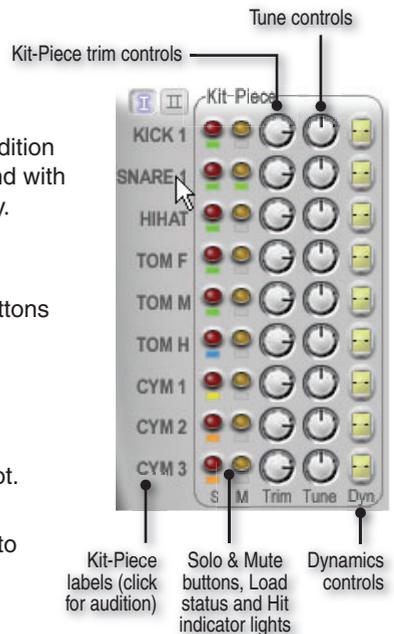
Green status LED

A Kit-Piece has successfully been loaded into the slot.

Additionally, there is also a special case for tom slots when loading a tom set:

Blue status LED

A tom substitution has occurred.



- In the above screenshot, a Kit is in the process of loading. The kick, snare, hihat and toms have finished loading, cymbal 1 is in the process of loading, and cymbals 2 and 3 are queued up for loading. Note the tom substitution in the high tom slot.

To explain this further: some of BFD's tom sets have only two toms, because the original kit did not have either a mid or a high tom. In these cases, one of the other toms in the Kit is substituted for the missing one (details are shown in the info text for each tom set, or in any factory Kit which uses them, when using the Selector panels).

You can still independently mix the substituted tom: in other words, you can alter the tuning, panning and levels without affecting the original. To preserve a realistic three-tom set, it is advisable to suitably retune the substituted tom.

Hit indicator LEDs

The indicator LEDs under the Mute buttons light up when any Hits in each Kit-Piece are triggered via MIDI, or via the Groove Librarian. This functionality can be turned off in the BFD Options panel.

Solo and Mute buttons

These LED buttons allow you to Solo or Mute any Kit-Piece(s). When one or more Kit-Pieces are Soloed, the Mute LEDs light up for all non-Soloed Kit-Pieces, giving an easily-visible indication of the Mute/Solo status. If a Muted part is Soloed the Muted status will return when the Solo button is deactivated.

Please be aware of the Solo and Mute shortcuts, detailed in section 5:2.

Trim (Kit-Piece Trim)

This control allows you to trim the level of each Kit-Piece within the Overhead, Room and PZM mic buses, between +6 and -inf dB. Effectively, it functions as a 'reverb send' for the natural ambience in BFD's three stereo ambient mic buses.

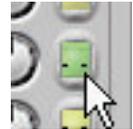


Tune

Using this control, the pitch of each Kit-Piece can be tuned up or down an octave (1200 cents). This control acts globally for all mic buses, including the Direct bus.

Dyn (Dynamics)

This control scales the velocity of incoming MIDI triggers for each Kit-Piece. The control's value (-127 to 127) is added onto the velocity of each incoming MIDI note for that particular Kit-Piece.



Using this control, you can make a Kit-Piece play 'more softly' or 'harder'. BFD's sounds are recorded with many velocity layers: using the Dynamics controls can achieve a variety of realistic levels of striking force: from soft and jazzy to hard and loud.

Direct Mixer area

This area of the Mixer controls the sound of the Direct mic channels, and does not affect the Overhead, Room or PZM mic Buses.

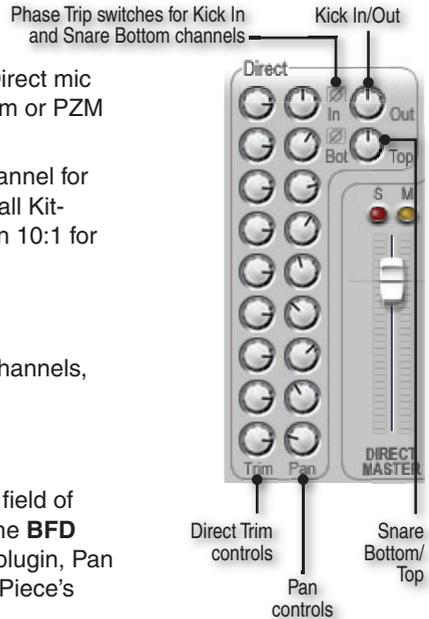
The Direct mic channels include the close mic channel for each Kit-Piece, as well as the bleed channels for all Kit-Pieces within the kick and snare mics (see section 10:1 for more details).

Trim (Direct Trim)

Controls the level of each Kit-Piece's Direct mic channels, between -inf and +6 dB.

Pan

The Pan control adjusts the position in the stereo field of each Kit-Piece's Direct mic signals. When using the **BFD Groups**, **BFD All** and **BFD Ultra** versions of the plugin, Pan settings will only be effective when one of the Kit-Piece's Direct mic channels is routed to a stereo output.



Kick In/Out (kick 1 & 2 only)

This control adjusts the blend between signals from the mic placed inside the kick drum, and the mic located outside it (all kicks within BFD are recorded with this mic setup).

You will notice graphical feedback in the Drum Room display while this parameter is being changed.

If you click the Phase flip button, the phase of the Kick In mic channel is inverted.



Snare Bot/Top: (snare 1 & 2 only)

Using this control, the blend between signals from the mics below and above the snare drum can be adjusted.

You will notice graphical feedback in the Drum Room display while this parameter is being changed.

If you click the Phase flip button, the phase of the Snare Bottom mic channel is inverted.



Bus Mixer area

This Mixer area allows easy control over the overall mix. Within BFD, a bus is a grouping of mic channels of a similar type (see section 10:1).

Direct Master

This bus incorporates the Direct mic channels for all Kit-Pieces, including the bleed channels in the kick and snare mics. The Direct Master level fader controls the volume of these signals for all Kit-Pieces after the individual Direct trim settings have been applied.

Overhead

This bus incorporates the stereo Overhead mic channels for all Kit-Pieces. The Overhead level fader controls the volume of these channels for all Kit-Pieces after the Kit-Piece Trim settings have been applied.

Room

This bus incorporates the stereo Room mic channels for all Kit-Pieces. The Room level fader controls the volume of these channels for all Kit-Pieces after the Kit-Piece Trim settings have been applied.

PZM

This bus incorporates the stereo PZM mic channels for all Kit-Pieces. The PZM level fader controls the volume of these signals for all Kit-Pieces, after the Kit-Piece Trim settings have been applied.

Meter LEDs

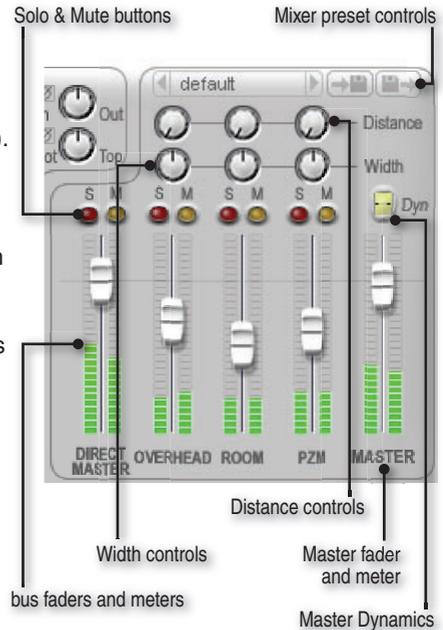
The volume of each bus is represented on LED VU meters. These can be turned off in the BFD Options panel.

Solo and Mute buttons

These function in exactly the same way to Solo and Mute buttons in the Kit-Piece Mixer area, except that these affect the mic buses.

Distance

This control, available for the Overhead, Room and PZM buses, allows you to virtually manipulate the distance of each ambient mic set from the drumkit. Increasing the control shifts the mic set away from the kit from the default position at the minimum value. Changes to the distance parameters are reflected in the Drum Room 'moving mics'.



Width

This control, available for the Overhead, Room and PZM buses, adjusts the stereo width of each ambient mic bus. It ranges from mono (minimum) through stereo (centre position) to enhanced stereo (maximum). Extreme settings of enhanced stereo should be used carefully as they can add an out of phase component to your mix. Changes to the distance parameters are reflected in the Drum Room ‘moving mics’.

Master

This is an overall master volume level control for all of the Buses together. In the master output plugin (**BFD Stereo**) this will control the overall level of the single stereo channel. In the multi-channel versions of the plugin (**BFD Groups**, **BFD All** and **BFD Ultra**), it controls the relative level of all separate outputs.

Master Dynamics

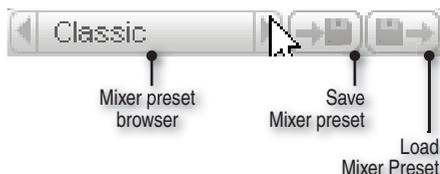
This is a global control to scale the incoming velocity of all Kit-Piece triggers. Its value, ranging from -127 to 127, is added to the velocity of all incoming notes (from either normal MIDI input or from the Groove Librarian), after the individual Kit-Piece Dynamics values have been added.

5:4 Mixer presets

The Load and Save Mixer preset buttons bring up a standard file browser with which to store and recall mixer settings. The default location is the **BFD/Mixers** folder, and presets are saved as **.bfm** files.

Mixer preset browser

If you save your Mixer presets into the **BFD/Mixers** folder, you can use the Mixer preset browser in order to quickly switch between the various presets stored in the folder. Use the  and  buttons to browse sequentially through the presets in the folder. The name of the preset will be displayed between these buttons.

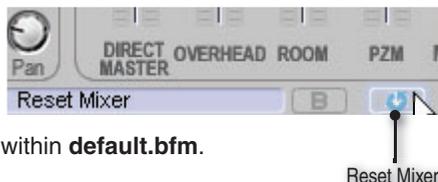


Saving defaults

If you have custom Mixer settings which you want to use whenever BFD is initialized, save them into the **BFD/Mixers** folder as **default.bfm**. You can always recall the factory default settings by loading **factorydefault.bfm**, re-saving it as the default if necessary.

Reset button

Clicking the Reset button, found at the bottom of the BFD interface (to the right of the context info display and Bounce button), reverts the Mixer back to the settings contained within **default.bfm**.



[SHIFT]-clicking the Reset button reverts back to the factory defaults.

6 TWEAKING THE KIT

The Kit-Piece Inspector

As well as its Mixer controls, BFD contains further ways of shaping the sound of the Kit.

6:1 Different ways of tweaking the Kit

Kit-Piece Inspector

The Kit-Piece Inspector allows you to apply virtual damping to your Kit. You can also link two Kit-Pieces together, and remove a Kit-Piece from the current Kit. Any settings you make here are saved with the host song, or in a BFD Program file. They are *not* saved with a Kit file, although the Unload Kit-Piece setting can affect any subsequently saved Kit file. See section 6:2 for more details.

Hit Options panel

This houses the Hit trim and Unload controls for individual Hit types (giving you, for example, the ability to tweak the relative volumes of the various hihat Hit types), and a number of parameters specific to the hihat, including the ability to 'tighten' the hihat in the closed position. The Advanced tab of the panel also includes numerous detailed options to further creatively alter the Kit. See chapter 7 for more details.

Options panel

The Choke Fade times within BFD can be adjusted within the Options panel. These settings control how BFD fades out any older event of the same Kit-Piece still playing when a new event is received. In particular, it is very important to adjust hihat choking to your own taste. These settings are not saved with each song (or BFD Programs): they are global settings for BFD and apply all the time. See section 9:1 for more details.

Play Options panel

This panel contains the Anti-machinegun mode and Disable sidestick tuning options. These settings are saved with the song (and in a BFD program), and whenever you make a change in the panel, they will be saved to the registry (Windows) or to a preferences file (MacOSX). See section 9:2 for more details.

Humanize Velocity panel

You can use the Humanize Velocity panel to add controlled randomization to the velocity response of the Kit as an alternative or an addition to the Anti-machinegun mode in the Play Options panel. Please see section 8:10 for more details on the Humanize Velocity panel.

6:2 Kit-Piece Inspector

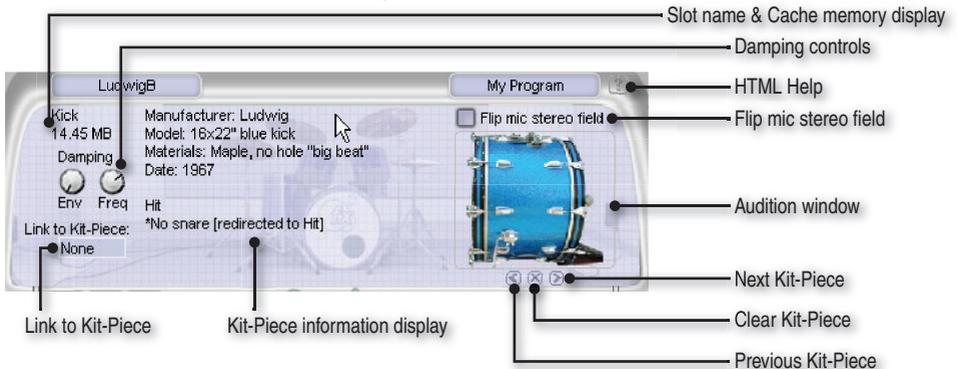


Click on the Drum Room display in order to show the Kit-Piece Inspector.

The Kit-Piece Inspector allows a substantial amount of control over each Kit-Piece, the main highlight of which is the Damping functionality. The panel also contains several other useful controls and information displays.

Kit-Piece Inspector settings are *only* saved in BFD Program presets.

Click the middle of the Kit-Piece Inspector in order to return to the Drum Room display.



Next / Previous / Clear Kit-Piece buttons

The Next & Previous buttons cycle through the Kit-Piece slots for editing in the Kit-Piece Inspector. You can also jump to any Kit-Piece in the Inspector by clicking its label in the BFD Mixer.

The Clear Kit-Piece button allows you to remove the Kit-Piece from the current Kit.

Information displays and auditioning loaded Kit-Pieces

Slot name

This convenient display of the currently-inspected Kit-Piece slot is very useful while you are in the process of tweaking multiple Kit-Pieces.

Cache memory display

This readout shows the amount of RAM used by the Kit-Piece: BFD stores a short portion of the beginning of each drum sound in RAM. See section 9:1 for more details.

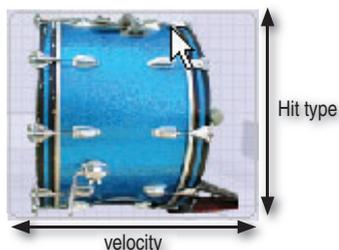
Kit-Piece information display

The text display in the Inspector displays the information regarding the manufacturer, date and other details about each Kit-Piece. This information is also displayed within the Kit-Piece Selector panels.

It is very useful to note the summary of the Hits present in the Kit-Piece. This can be very useful when deciding whether to unload certain Hit types in order to free up more RAM. Please see section 7:2 for further details on unloading Hits.

Audition window

The Kit-Piece image in the Inspector panel functions as a clickable audition window, in much the same way as the audition functionality within the Kit-Piece Selectors. Varying the clicking position horizontally auditions different velocities, while varying it vertically results in the different Hit types being auditioned.



The readout in the context info display shows exactly which Hit type and audio file is currently being auditioned.



Damping controls

The virtual damping controls allow you to shape the decay of Kit-Pieces. BFD's recordings are unprocessed and natural, meaning that there is often a very long ringing decay on the drums: something especially noticeable on the toms and snares, for example. Using the damping controls allows you to simulate real damping techniques, such as damping rings or tape on snares and toms, or blankets in kick drums.

Env

As it is increased, this control shortens the decay of the Kit-Piece. It effectively processes the sounds within the Kit-Piece with an amplitude envelope. In the Direct Master channel, the entire signal is enveloped. However, in the ambient mic buses, the enveloped signal is controlled by the Freq parameter.

Freq

This is a crossover filter. All frequencies below the value of this parameter will be affected by the Env control. All frequencies above it will pass through, unprocessed. The end result is a more naturally damped sound: the main body of the sound in the ambient mic buses is enveloped, while higher frequency reverberations continue to decay.

Link to Kit-Piece

The Link function lets you associate one Kit-Piece slot with another. Specifying a Linked Kit-Piece will result in both Kit-Pieces playing at the same time when either is triggered.

It takes the form of a drop-down menu showing each Kit-Piece slot available.

You can link individual Hit types by using the Key2 parameter in the Advanced tab of the Hit Options panel.



Flip stereo mic field

Because the ambient mic buses are stereo, you can encounter problems when panning the Direct mic channels for a Kit-Piece. The position of the Kit-Piece within the stereo field of the ambient mic buses cannot be changed. However, activating the Flip stereo mic field option will result in the Kit-Piece's Overhead, Room and PZM left/right channels being swapped around.

Using this method, the Kit-Piece's ambient reflections can at least be made to more closely follow its Direct Pan setting.

In addition you can use the Width controls in the Bus Mixer in order to manipulate the stereo properties of the ambient mic buses.

7 CONTROLLING BFD

The Hit Options Panel



The Hit Options panel's primary function is to allow adjustment of the key assignments for the different Hit types within each Kit-Piece of the currently loaded Kit.

It also has several other useful functions in order to tweak your Kit, and for allowing remote control of BFD's controls.

Exit the panel by clicking its button again, or by clicking the  button in the top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.

7:1 Overview

There are four tabs in the Hit Options panel: **Page 1**, **Page 2**, **Advanced** and **MIDI CCs**. It is very important to understand the differences between them.

Page 1 & Page 2: Assign Kit-Piece Hit types to notes

These tabs allow you to assign Kit-Piece Hit types to notes. These tabs correspond to Mixer Pages 1 and 2 and hence reflect the functionality of each Page's slots: for example, Page 1 contains several hihat-specific options (in fact, it is essential to use these in order to properly set up an electronic drum hihat mechanism).

These two panels also have several other useful functions, such as being able to preview, unload from memory and trim the volume of each Hit type in each Kit-Piece.

Page 1, Page 2 and Advanced settings, with the exception of Hit trim and Unload settings, are saved together in the same preset file (**.bft**).

Advanced: Assign notes to Kit-Piece Hit types

As opposed to the Page 1 & Page 2 tabs, the Advanced tab allows you to assign notes to Kit-Piece Hit types. This is useful if you're a 'keyboard drummer': this is the panel to use if you want to assign multiple notes to the same Kit-Piece Hit type. This panel is also useful if you have more esoteric MIDI controller equipment with specific needs, such as certain electronic drum systems.

There are also a number of advanced options for tweaking the response of the BFD sounds, which can be useful for creative purposes.

Page 1, Page 2 and Advanced settings, with the exception of Hit trim and Unload settings, are saved together in the same preset file (**.bft**).

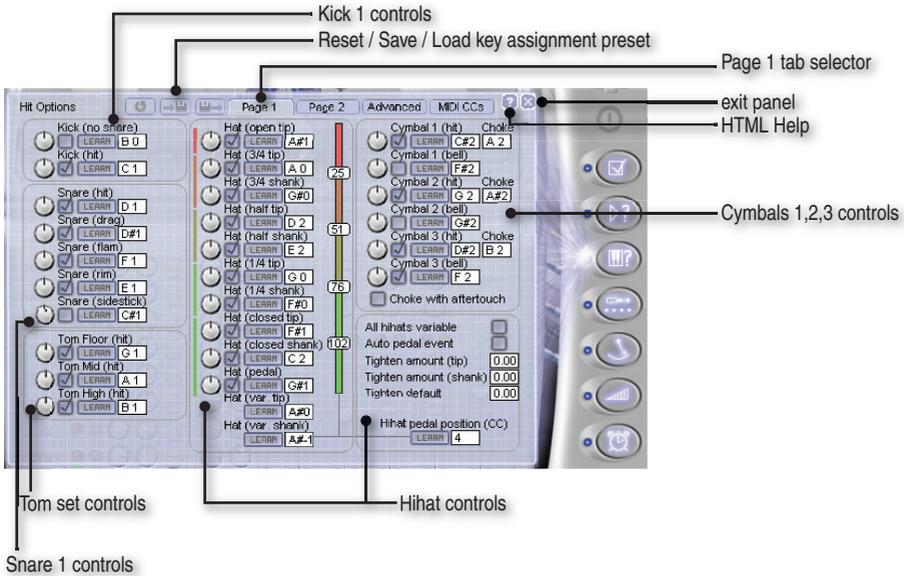
MIDI CCs: Set up remote control for BFD controls

This tab in the Hit Options panel allows you to configure how MIDI continuous controller messages are handled within BFD. MIDI CCs may be assigned to most of BFD's controls.

MIDI CCs settings are saved in a different type of preset file to the other tabs in the Hit Options panel (**.bfc** files).

It is essential to save a MIDI CCs preset file along with the **.bft** file when creating electronic drum control setups, as it stores the Hihat pedal position (cc) setting, which is also located in the Page 1 tab for convenience.

7:2 Page 1 tab



Editing key assignments

You can assign a Hit type to a note in four ways:

Use the mouse

Click and drag vertically on a note box.

Use the mousewheel

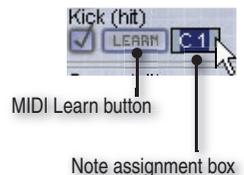
Move the mouse pointer above the note box and scroll the mousewheel.

Use the keyboard

Double-click the notebox and enter a new value.

Use MIDI Learn

Click the Learn button for the Hit type for which you wish to change the key mapping assignment. The button will be highlighted, indicating that it is waiting for a MIDI signal. Play the MIDI note you wish to use – the Learn button will no longer be highlighted, the note box is updated with the new note and BFD will have learned the assignment.



Any duplicate note assignments are highlighted in blue.

Hihat controls

These settings let you set up BFD to work with a variable hihat pedal system such as those used in electronic drumkits. These systems use a MIDI continuous controller (the **hihat pedal position**) to represent the position within open and closed states of the hihat pedal.

Whenever the **variable tip** and **variable shank** notes are triggered, BFD will, depending on the Hihat pedal position, play the relevant Hit type from those available (**closed**, **1/2-open**, and **open**). When using *BFD XFL* or *8 Bit Kit*, additional **1/4-open** and **3/4-open** hihat positions are available. The free 'Zildjian Sweet' hihat download for all registered BFD users provides an additional **1/4-open** tip Hit type.



• The current position of the hihat pedal controller is shown in the Drum Room area, if the Animate hihat position option is enabled in the BFD Options panel.

Defining hihat pedal position (cc) and variable tip and shank notes

To define a controller number for the Hihat pedal position, click the MIDI Learn button and move the controller pedal, or enter it manually.

It is vital to remember that, since the hihat pedal position is a MIDI continuous controller, it is saved in the MIDI CCs preset file. It is additionally presented on the Page 1 tab for convenience. Please see section 7:5 for more details on the MIDI CCs tab.

You will also need to define the notes for the **variable tip** and **variable shank** Hit type. These are assigned in the same way as any other Hit type. These are special types of Hit: they do not represent a sound, but rather a way of triggering one of various possible sounds depending on the position of the Hihat pedal position MIDI CC.

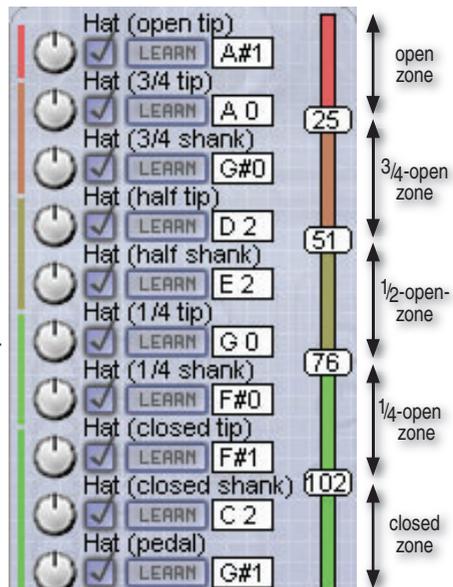
In order to properly use the variable hihat technique, you will need to assign the 'regular' hihat Hit types to notes as normal, avoiding any duplicate assignments.

Hihat pedal position define slider

This slider represents the travel of the hihat pedal, oriented according to the list of 'regular' hihat note triggers, with open at the top and closed at the bottom.

There are four adjustable points on this slider, which represent the transitions between the hihat positions, forming five 'zones' (for **open**, **3/4-open**, **1/2-open**, **1/4-open** and **closed** positions). Each of these points displays a value from 0 to 127, which corresponds to the MIDI CC value at which the transition will occur.

By moving these points on the slider, you can adjust how BFD reacts to the Hihat pedal position.



When using a hihat with less than the maximum amount of position Hit types, BFD intelligently remaps triggers to Hits which are present.

All hihats variable

When enabled, this option causes any hihat note received (i.e. all of the 'regular' tip and shank notes as well as the variable tip and shank notes) to act as a variable tip or shank note. The actual hihat position Hit type played will depend on the value of the Hihat pedal position.

Auto pedal event

This is to be used when using a variable hihat technique with an e-drum brain which does not send out a pedal note automatically when the hihat pedal is fully depressed. When enabled, this option causes BFD to generate and play a **pedal** note whenever the hihat pedal is fully depressed (in other words, whenever it receives a maximum value of 127 from the hihat pedal position MIDI CC).

If your e-drum brain sends out a pedal/foot-chick note when the hihat pedal is fully depressed (*D-Drum* and *V-Drum* brains fall into this category), then you should disable this setting.

Tighten amount (tip / shank)

As these controls are increased from 0 towards 1, they 'tighten' the hihat when playing the **variable tip** and **variable shank** Hit types, while the variable hihat pedal controller is in the closed position. The tightening involves subtle adjustments in decay time and tuning in order to simulate what would happen in reality.

The amount of tightening is proportional to the value of the Hihat pedal position CC: at the start of the closed position zone, there will be no tightening, while higher pedal controller values result in more tightening.

For example, if the closed zone is between pedal controller values 80-127, there will be no tightening when the pedal is at 80, with maximum tightening (as defined by the tighten amount) at 127. There will be a gradual increase of the tighten amount between these pedal controller values.

A Tighten amount is provided for both **closed tip** and **closed shank** Hit types, as the amount of tightening required for shank notes may be greater. This is because shank notes tend to sound more 'splashy', and generally have a longer decay.

Tighten default

This option allows you to set a default tighten value, between 0 and 1, at the beginning of the closed position zone.

Using the above example, increasing the Tighten default sets a tightening amount at controller position 80, instead of it being zero.

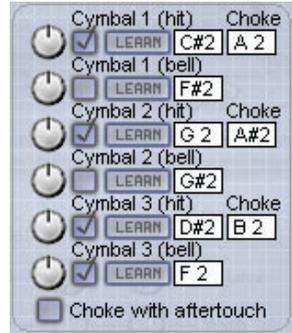
This is especially useful when not using a hihat controller pedal, while wanting to make all your closed hats sound tighter.

Cymbal Choking

BFD allows you to choke cymbals either with a MIDI note or, for compatibility with e-drum brains, with aftertouch (polyphonic pressure) signals.

You cannot use MIDI Learn for **choke** notes: you will need to set them manually in the same way as other key assignments.

Choke notes are not like other Hit types: they do not represent a sound. Instead, they are a way of stopping a cymbal sound from decaying.



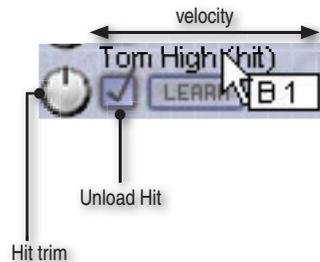
Choke with Aftertouch

Enable this option in order to make BFD respond to polyphonic pressure (aftertouch) signals for choking cymbals. This method of cymbal choking is commonly implemented in electronic drum brains such as those in *V-Drum* and *D-Drum* systems.

Please note that, during tests with *D-Drum* cymbal triggers, it was found that the *D-Drum* brain sends out slowly decaying polyphonic pressure signals for a long period after the initial choke was initiated. BFD is optimized as much as possible to ignore these redundant signals, but it is worth bearing in mind if you encounter problems while choking cymbals with the *D-Drums*.

Auditioning Hits

You can audition each Hit type at varying velocity by clicking on its name in the Page 1 and Page 2 tabs. Velocity is varied from the left (velocity 0) to the right (127) of the name label.



Unloading Hits

The checkbox next to each Hit type indicates that it is loaded in the current Kit. If you choose to, you can unload any Hit by unchecking the box.

This is useful for unloading flams and drags if you prefer to play/program these yourself, for example, or if you do not need fully open or shank hihats (unless going for a very splashy, ringy sound). Since a small portion of the initial attack of each Hit in every Kit-Piece is stored in RAM, it can be a very good idea to unload any Hit types which are not required.

It is important to note that any unload settings are saved at the BFD Program level: these settings are not saved with the Hit Options presets.

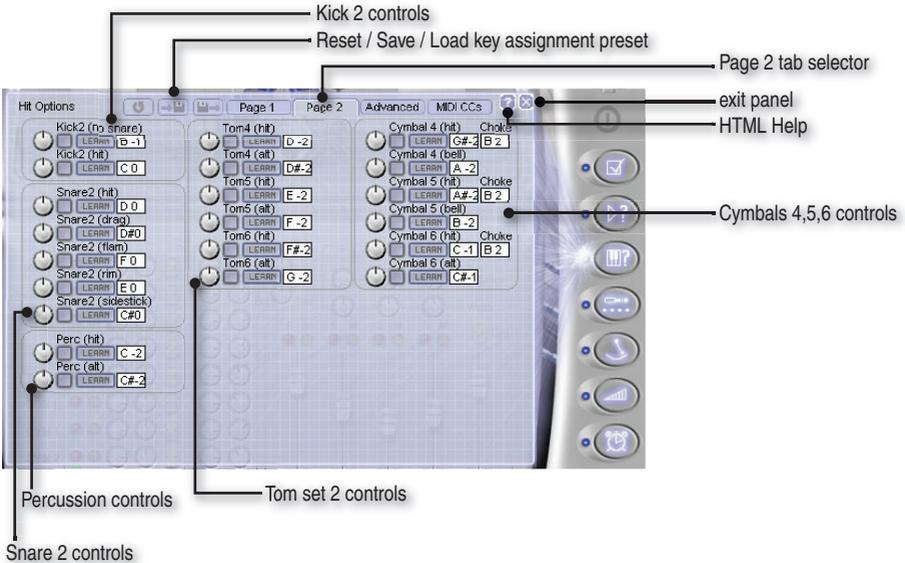
If you play a note for a Hit type which has been unloaded (or if a playing Groove contains it) then the closest available Hit type in the Kit-Piece will be used.

Hit trim

Using the Hit trim controls, you can adjust the volume of each Hit within the Kit-Pieces, by +/- 12dB. This is extremely useful when you want to adjust the relative levels of open and closed hi-hats, for example.

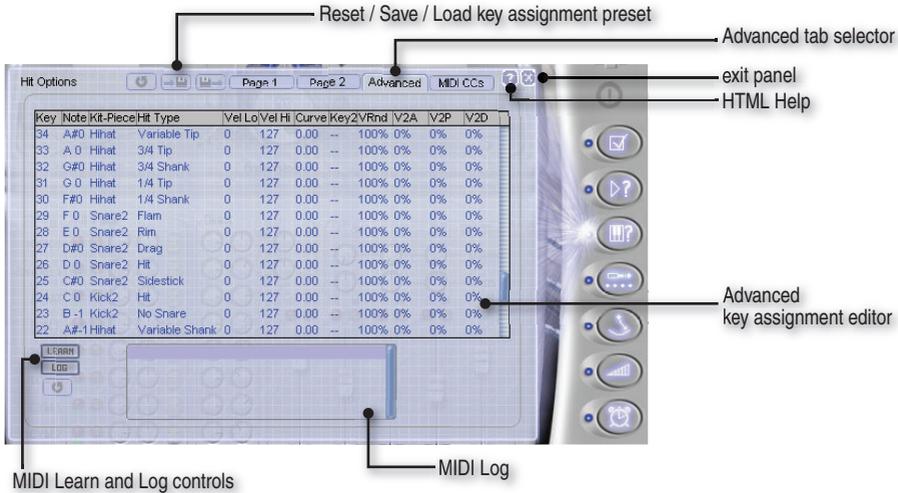
It is important to note that any Hit trim settings are saved at the BFD Program level: these settings are not saved with the Hit Options presets.

7:3 Page 2 tab



This tab of the Hit Options panel works in exactly the same way as the Page 1 tab, except that the Hit types listed reflect the functionality of the slots available on Page 2 of the BFD Mixer. Please see section 4:3 for more details.

7:4 Advanced tab



The Advanced tab of the Hit Options panel is designed for more demanding and complex keymapping setups. It involves a crucial difference to the key assignment method used in the 'simple' Page 1 and Page 2 tabs. Instead of assigning a Hit type in a Kit-Piece to a MIDI note, the Advanced tab allows you to assign MIDI notes to Kit-Piece Hit types. Therefore, you can assign multiple MIDI notes to one Hit type.

There are also several advanced parameters with which to adjust the way Hit types respond to being played.

This tab can seem a little more complex: this is why both key assignment methods are provided. If you do not require the features that the Advanced tab makes possible, you can ignore it and just use the Page 1 and Page 2 tabs.

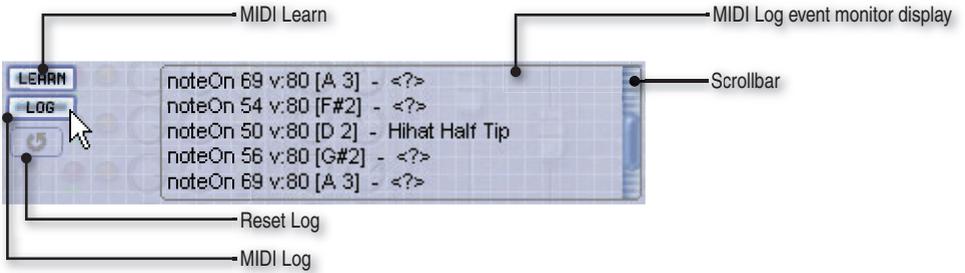
Cut, Copy and Paste settings

You can manipulate rows of settings using the Cut, Copy and Paste functions.

[CTRL]-X : Cut settings for the currently-selected note to the clipboard.

[CTRL]-C : Copy settings for the currently-selected note to the clipboard.

[CTRL]-V : Paste settings from the clipboard onto the currently-selected note.



MIDI Learn

In the Advanced tab, MIDI Learn functions in a different way to Pages 1 & 2. When the Learn button is activated, any incoming MIDI note will cause the display to jump straight to the corresponding note in the list. Click the button again to deactivate MIDI Learn mode.

MIDI Log

When the Log button is activated, any MIDI input received by BFD is displayed in the event monitor display.

Clicking the Reset Log button clears the display.

Advanced key assignment editor

Each line in the note assignment list corresponds to a MIDI note, numbered from 0 (C-2, at the bottom of the list) to 127 (G8, at the top), with columns for specifying the Kit-Piece and Hit type, as well as a number of other parameters.

Any assignments which have been made are highlighted in blue.

If Respond to Groove notes is enabled in the Play Options panel (see section 9:2), then the notes used for the Grooves, and for the Auto-repeat button functions, are shown and highlighted in green, with GRV shown in the Kit-Piece column.

With the exception of the Kit-Piece and Hit Type drop-down menus, values are changed by clicking and dragging them.

Kit-Piece

Clicking on this column for any note will bring up a drop-down menu with which to select the Kit-Piece slot to use with the note.

Key	Note	Kit-Piece	Hit Type
33	A 0	Hihat	Closed Tip
32	G#0	Hihat	Closed Tip
31	G 0	Hihat	Closed Shank
30	F#0	Hihat	Half Tip
29	F 0	Snare2	Half Shank
28	E 0	Snare2	Open Tip
27	D#0	Snare2	Pedal
26	D 0	Snare2	1/4 Tip
25	C#0	Snare2	1/4 Shank
24	C 0	Snare2	3/4 Tip
23	B -1	Snare2	3/4 Shank
22	A#-1	Snare2	Hit
21	A -1	Snare2	No Snare
			Variable Shank

Hit Type

The Hit Type column is used to select which Hit in the Kit-Piece is assigned to the note, via a drop-down menu. The contents of the menu change dynamically according to which Kit-Piece slot has been selected. You must specify a Kit-Piece before you can access the Hit Type drop-down menu.

Key	Note	Kit-Piece	Hit Type
33	A 0	Hihat	3/4 Tip
32	G#0	Hihat	3/4 Shank
31	G 0	TomF	1/4 Tip
30	F#0	TomM	1/4 Shank
29	F 0	TomH	Flam
28	E 0	Cym1	Rim
27	D#0	Cym2	Drag
26	D 0	Cym3	Hit
25	C#0	Snare2	Hit
24	C 0	Perc	Hit
23	B -1	Kick2	No Snare
22	A#-1	Hihat	Variable Shank
21	A -1	<?>	

Vel Lo**Vel Hi**

These parameters allow you to proportionally scale incoming velocities over a certain range. For example,

if Vel Lo is set to 64 and Vel Hi is set to 127, an incoming velocity of 0 will produce an output velocity of 64, while an incoming velocity of 16 will produce an output velocity of 72, and so on.

Key	Note	Kit-Piece	Hit Type	Vel Lo	Vel Hi
33	A 0	Hihat	3/4 Tip	0	127
32	G#0	Hihat	3/4 Shank	0	127
31	G 0	Hihat	1/4 Tip	0	127

Curve

This parameter controls the velocity curve of triggered note events. Clicking and dragging the parameter causes a small graph curve to appear and change shape. The graph represents incoming velocity (x-axis) against output velocity (y-axis).

Key	Note	Kit-Piece	Hit Type	Vel Lo	Vel Hi	Curve	Key2	VF
33	A 0	Hihat	3/4 Tip	0	127		--	10
32	G#0	Hihat	3/4 Shank	0	127	0.00	--	10
31	G 0	Hihat	1/4 Tip	0	127	0.00	--	10

Key2

This column allows you to specify a second note with which to link the Hit type. This results in a layering of the two Hits whenever either is triggered.

Please note that if you simply want to link two Kit-Pieces together, it is quicker to use the Link to Kit-Piece function in the Kit-Piece Inspector (see section 6:2). The Key2 parameter works on the Hit type level.

Key	Note	Kit-Piece	Hit Type	Vel Lo	Vel Hi	Curve	Key2	VF
41	F 1	Snare	Flam	0	127	0.00	--	10
40	E 1	Snare	Rim	0	127	0.00	--	10
39	D#1	Snare	Drag	0	127	0.00	--	10
38	D 1	Snare	Hit	0	127	0.00	--	10
37	C#1	Snare	Sidestick	0	127	0.00	C#0	10
36	C 1	Kick	Hit	0	127	0.00	--	10
35	B 0	Kick	No Snare	0	127	0.00	--	10
34	A#0	Hihat	Variable Tip	0	127	0.00	--	10
33	A 0	Hihat	3/4 Tip	0	127	-1.86	--	10

- In the above example, the Snare 1 sidestick Hit type is being linked to the note for the Snare 2 sidestick. No other Snare 1 and Snare 2 Hit types are linked.

VRnd [Velocity Randomize amount]

The VRnd parameter controls to what extent the Hit type is affected by the Humanize Velocity panel and the Anti-machinegun mode in the Play Options panel. Settings range from 0% (not affected at all) to 100% (the default setting – maximum effect).

V2A [Velocity to Amp]

This is the degree to which incoming velocity affects the amplitude of the triggered sound. The scaling of the velocity operates in addition to playing different velocity layers.

Ordinarily, there is no amplitude scaling with different velocities within BFD: the detailed velocity layers take care of the 'loudness'. However, you may want to add some amplitude scaling for creative reasons, or if you are using a small number of velocity layers after adjusting the Maximum layers setting in the Options panel (see section 9:1).

Settings range from -100% to 100%. This parameter can have positive and negative values for increases and decreases in amplitude with higher velocities.

V2P [Velocity to Pitch]

By adjusting this parameter, the incoming velocity of note events can affect the tuning of the Hit type.

Settings range from -100% to 100%. This parameter can have positive and negative values for increases and decreases in pitch with higher velocities.

Any pitch changes to the Hit type as a result of this parameter are relative to the tuning of its parent Kit-Piece, as determined by the Tune control on the Mixer (see section 5:3).

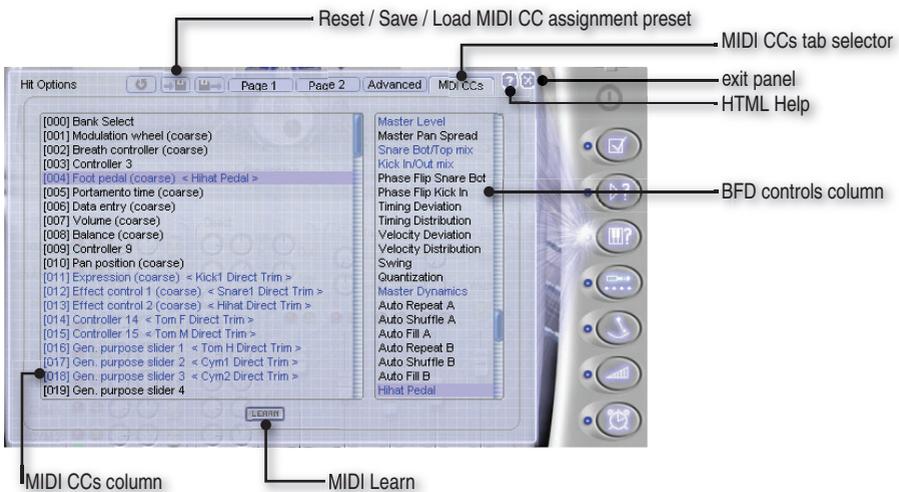
V2D [Velocity to Damping]

The V2D parameter alters the amount of damping applied to the Hit type according to the velocity of incoming note events.

Settings range from -100% to 100%. This parameter can have positive and negative values for increases and decreases in the damping amount with higher velocities.

Any changes in the damping applied to the Hit type a result of this parameter are relative to its parent Kit-Piece's Env setting in the Kit-Piece Inspector (see section 6:2).

7:5 MIDI CCs tab



The MIDI CCs tab allows you to assign MIDI continuous controller messages to most of BFD's controls.

To assign a MIDI CC, simply click on the CC number in the left column. Once the MIDI CC number is selected in this way, click on a BFD control from the list in the column on the right. Scroll through the lists in the two columns by using the scrollbars or the mousewheel.

Once a BFD control has been assigned to a MIDI CC, the MIDI CC in the left column will be **highlighted in blue**. The name of the BFD control will also be shown in brackets next to the name of the MIDI CC.

To unassign a MIDI CC from a BFD control, select the control as described above, and assign it to “<none>” (at the top of the list in the right column).

The hihat pedal controller assignment from the Page 1 tab is also editable in the MIDI CCs panel. However, it is *only* saved with a MIDI CCs preset file.



MIDI Learn

In the MIDI CCs tab, MIDI Learn functions in a similar way to the Advanced tab. When the Learn button is activated, the display jumps to and highlights the next received MIDI CC number. You can then carry out the assignment as described above. Click the button again to deactivate MIDI Learn mode.

Mixer MIDI CC assignment

The main BFD interface features a method of assigning multiple BFD control to MIDI CCs quickly. Please see section 11:1 for more details.

You will still need to save any assignments created using this method as a preset from the MIDI CCs Hit Options tab!



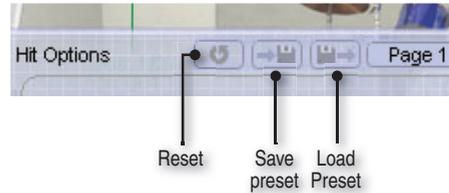
Default MIDI CCs

Here is a list of the default MIDI continuous controller numbers and the controls to which they are linked:

Control	MIDI CC
Direct Master Level	16
Overhead Level	17
Overhead Distance	21
Overhead Width	20
PZM Level	19
PZM Distance	25
PZM Width	24
Room Level	18
Room Distance	23
Room Width	22
Master Level	7
Master Dynamics	11

7:6 Hit Options presets

There are two types of Hit Options preset files: Key assignment files and MIDI CC assignment files.



Key assignment preset file (.bft)

This type of file stores all settings on Page 1, Page 2 and Advanced tabs of the Hit Options panel, with the exception of the Hihat pedal position MIDI controller. This is stored in the MIDI CC assignment file.

MIDI CC assignment preset file (.bfc)

This type of file stores all settings in the MIDI CCs tab of the Hit Options panel. It is the only file which stores the Hihat pedal position MIDI CC, which is also shown in the Page 1 tab.

Use the Save and Load buttons on each tab in order to store and recall presets. The files are stored in the **BFD/Keymaps** folder.

The Hit trim and Unload settings on Pages 1 & 2 of the Hit Options panel are *not* saved with Hit Options presets. These settings are only saved in BFD Programs.

Saving defaults

If you have custom Hit Options settings which you would like to take effect whenever you launch BFD, save them as presets named **default.bft** and **default.bfc**. You will have to over-write the current defaults. You can always recall the factory default settings by loading **factorydefault.bft** and **factorydefault.bfc**, and re-save them as defaults if necessary.

Reset buttons

Clicking the Reset buttons in each tab, next to the Load and Save buttons, reverts back to the settings contained within the default preset file.

[SHIFT]-clicking the Reset buttons in each tab resets to the factory defaults.

The Reset button on the MIDI CCs tab does not affect settings on Page 1, Page 2 and Advanced tabs, and vice versa.

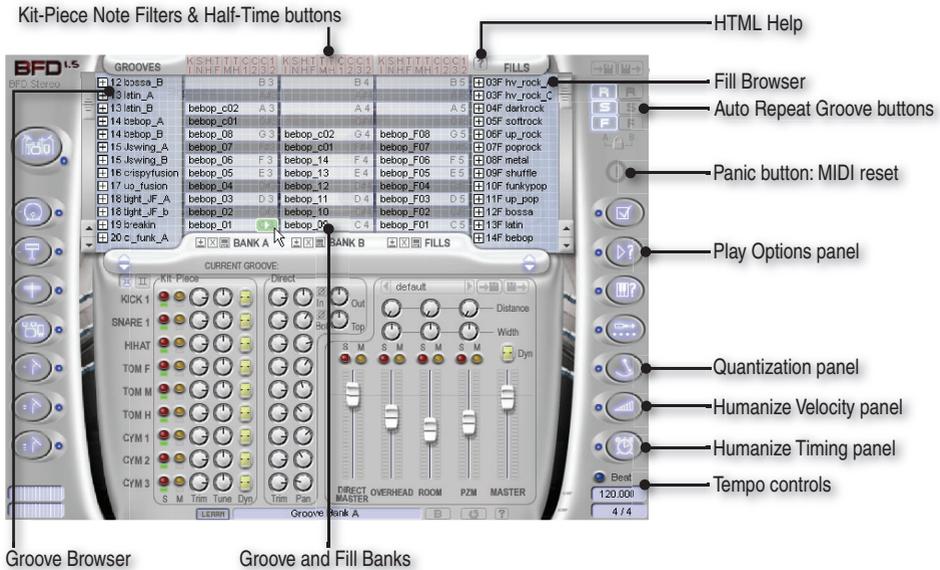
8 THE GROOVE LIBRARIAN

The BFD Groove Librarian is an integrated auto-accompaniment module, designed to provide a means of playing patterns through BFD's sounds without any MIDI input from an external MIDI controller, or from a host sequencer.



To open the Groove Librarian, click the top bar of BFD's plugin window. To close it again, click on the bottom or top bars of the Groove Librarian drop-down panel.

Overview of Groove Librarian-related functions



- Groove and Fill Banks and Browsers: see section 8:1
- Kit-Piece Note Filters & Half-Time buttons: see section 8:6
- Auto-Repeat Groove buttons: see section 8:7
- Quantization, Humanize Velocity and Humanize Timing panels: see section 8:10
- Play Options panel: see section 9:2
- Panic Button and Tempo controls: see section 11:1

Please read this chapter thoroughly to fully understand the Groove Librarian, and any additional sections detailed above for related functions.

8:1 Fundamental Groove Librarian concepts

Groove

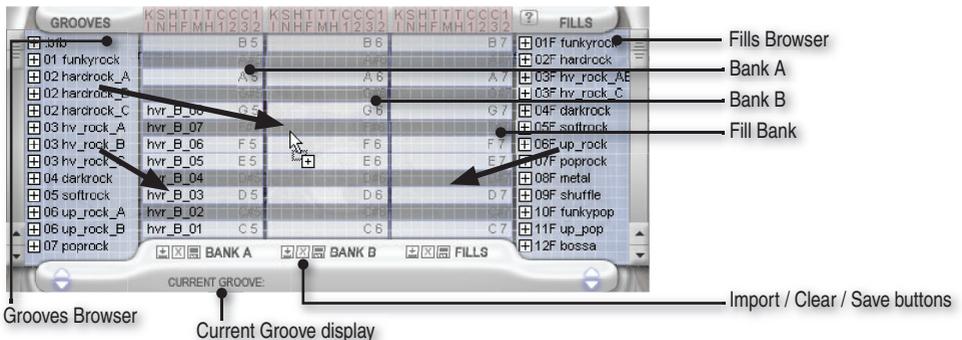
A MIDI drum sequence used in BFD's Groove Librarian. BFD comes with a large variety of Grooves, and can import any General MIDI (GM) MIDI file (type 0 and type 1). See section 8:9 for more tips on importing your own Grooves into BFD.

Fill

The same type of file as a Groove, but distinctly categorized as a Fill: anything which could be used as a transition between Grooves.

Bundle

A group of up to twelve Grooves. Bundles are small files which point to Groove or Fill MIDI files. BFD comes supplied with a comprehensive library of Grooves and Fills sorted into Bundles.



Groove and Fill Browsers

There are two tree-view Browsers in BFD's Groove Librarian, which are used to select Groove and Fill Bundles, located within the **BFD/Grooves** and **BFD/Fills** folders, and the individual Grooves within them. The top 'tree-level' is the Bundle itself. If you expand the tree structure (click on the  icon next to the Bundle name), you will see the individual Grooves which comprise it. Use the scroll-bars to move down through the list of available Bundles.

You can drag whole Bundles to any Groove Bank, or individual Grooves and Fills into slots within the Groove Banks.

Groove Banks and slots

There are three Banks, each with twelve 'slots', in BFD's Groove Librarian. These areas are where you drag Bundles or individual Grooves from the Browsers. It can also be used in order to compile and save Bundles. There are two Banks for Groove Bundles and one for Fill Bundles.

Each slot in each Bank corresponds to a MIDI note, an indicator for which is displayed on the slot, to the right of the name of any Groove which is loaded into it. When a MIDI key within the Groove Librarian's key range is played, the MIDI note value and the Groove name are highlighted in red. If you are in Auto Shuffle mode, the MIDI key highlight will remain on the originally triggered note, while the actual Groove which is playing will be highlighted instead. The current Groove is also shown in the Current Groove display.

Bank	Note range
Bank A	C3 to B3
Bank B	C4 to B4
Fill Bank	C5 to B5

There are a number of shortcuts to facilitate Bank management:

[SHIFT]-click Groove slot

Auditions the Groove in the slot.

[ALT]-click Groove slot

Deletes the Groove from the slot.

Click and drag Groove from one slot to another

Swaps around the Grooves in the slots.

[CTRL]-click and drag Groove from one slot to another

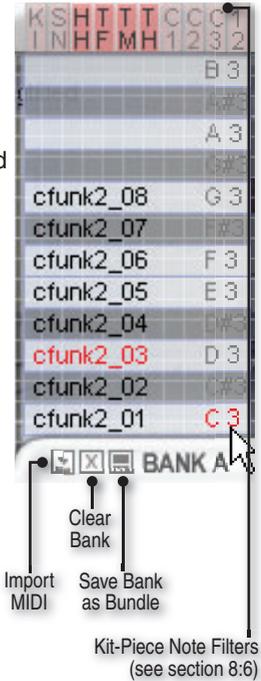
Copies the Groove to another slot.

[CTRL]-click and drag Groove to host sequencer arrange

Copies the Groove to a track on your host sequencer's arrange page, if it supports drag & drop import of MIDI files.

double-click Groove slot

Introduces a File Open dialog in which you can select 1-12 MIDI files to load into the slot(s) in the Bank. Please see section 8:9 for more details.



- In the above screenshot of Bank A, slots 1-8 contain Grooves. Auto Repeat and Auto Shuffle are enabled.
- The Groove in slot 1 was originally triggered, while the Groove in slot 3 is currently playing.

As well as double-clicking a Groove slot to load 1-12 MIDI files, you can drag and drop MIDI sequences from your sequencer's arrange page, if your host supports this feature. Alternatively, the Import MIDI button beneath each Bank allows you to import a longer MIDI file into the Bank, cutting it into smaller length chunks and placing each chunk into a slot.

Please see section 8:9 for more details on importing MIDI into the Groove Librarian.

After a Bundle has been compiled in one of the Banks, it can be saved for future use by clicking the Save Bank button under each Bank. It is best to save it in the **BFD/Grooves** folder, or in **BFD/Fills** if it is a Fill Bundle, so that it appears in the Browsers. You can clear the contents of any Bank by clicking the Clear Bank button beneath each one.

8:2 Play Options panel



Many aspects of how the Groove Librarian works can be adjusted in the Play Options panel. Some of these options are discussed in this chapter – refer to section 9:2 in order to learn more about them. In particular, ensure that the Respond to Groove notes option is enabled: otherwise, you will be unable to trigger Grooves at all, as Groove notes will be disabled.

8:3 Auditioning Grooves

Grooves or Fills within any Bank can be auditioned just by clicking on them while holding down the [SHIFT] key. The name of the Groove and the MIDI note label will turn red, and you'll notice that the overlaid green  Play icon turns into a red  Stop icon. This is to indicate that [SHIFT]-clicking the Groove again will stop auditioning it.

You can also stop any Groove that is playing by clicking the Panic button.



If you want to audition the Groove while it repeats, turn on the Auto Repeat Groove button for the relevant Bank. See section 8:7 for further details on the Auto Repeat functions.

8:4 Auto-accompaniment inside a host sequencer

If you would like the Groove Librarian to play along while your host sequencer is playing, enable the Respond to song start and Respond to song stop options, and specify a Default Groove note to play, in the Play Options panel. It is also a good idea to enable the Sync to song option, so that it plays in sync with your sequencer.

You can then use the Auto Repeat, Auto Shuffle and Auto Fill functions (see section 8:7) in order to vary the automated drumming performance.

8:5 Playing Bundles using MIDI notes

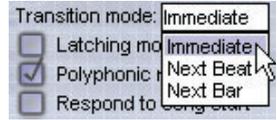
The Grooves and Fills in all three Banks are mapped to MIDI notes. The actual notes used are displayed in the Bank slots, to the right of the name of each Groove. These values change dynamically depending upon the status of the -2 octave numbering setting in the Options panel.

It is highly recommended to turn on the Polyphonic Mode option (in the Play Options panel) when using the Groove Librarian. This mode allows two or more Grooves to play at the same time. This is important for overlaying 'drumloop'-type Grooves in one Bank with ride and crash patterns from another, especially when working with the Kit-Piece Note Filters (see section 8:6).

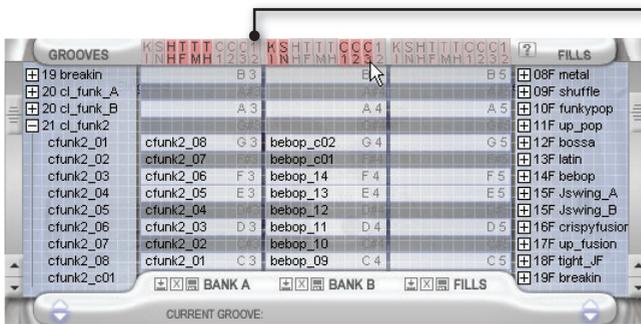
When playing the Groove notes, (or painting them in your sequencer's MIDI editor and playing them back through BFD), a MIDI note-on triggers the Groove, while a MIDI note-off stops it playing, except when Latching mode is enabled.

When Latching mode is enabled in the Play Options panel, Grooves are not turned off by a note-off message, but by another note-on message of the same note number.

It is also crucial to familiarize yourself with the different Transition modes and other settings in the Play Options panel, and also the Auto Repeat Groove buttons, when playing Grooves via MIDI.



8:6 Kit-Piece Note Filters / Half-time buttons



Half-Time button

• In this example, the Groove output will contain kick, snare and cymbals from Bank A and hi-hat and toms from Bank B.

It can be nice to use this with the A-B Link function, in order to always make the Grooves in corresponding slots in both Banks play together.

At the top of the Groove Librarian you will notice three rows of pink buttons above the Groove and Fill Banks. These buttons (with one exception, the Half-time button at the extreme-right of each row – see below) are used to filter out individual Kit-Pieces’ notes from Grooves playing from each of the Banks.

Please note that the Kit-Piece Note Filters only apply to Kit-Piece slots in Mixer Page 1.

There are a variety of potential uses for this function: for example, it can be used when you only want to play certain Kit-Pieces in each Groove Bank while you jam other parts in live. Another application is combining two Groove sets – for instance, you can use the kicks, snares and toms from one Bank and the hi-hats and cymbals from another. If you are working in this way, please ensure you enable Polyphonic Mode in the Play Options panel.

Shortcuts

[SHIFT]-click a Note Filter:

The state of all the Bank’s Note Filters is inverted relative to the one on which you click.

[CTRL]-click a Note Filter

The settings for that type of Note Filter are inverted between Bank A and Bank B.

Half-time button

Engaging the Half-time button for any Bank results in that Bank’s Grooves playing in half-time.

8:7 Auto Repeat Groove functions

The two columns of three buttons on the right of the BFD interface offer repetition and variation when using the Groove Librarian. Each column represents one of the two Groove Banks: the column on the left represents Bank A, while the one on the right represents Bank B.

The Auto Repeat functions are especially useful for drum pattern variation when using BFD as an auto-accompaniment module.

Auto Repeat

When this option is checked, any triggered Groove will repeat until it is stopped by a note-off (or by another note-on if in Latching Mode). You can toggle this option via MIDI:

Auto Repeat Bank A ON/OFF: F4

Auto Repeat Bank B ON/OFF: F#4

Auto Shuffle

When in Auto Repeat mode, turning on this button causes random Grooves within the same Bank to play, instead of the triggered Groove being repeated.

Enabling the Sequenced Auto Shuffle option, in the Play Options panel, results in Grooves playing sequentially in the Bank, instead of at random.

This button has no effect when Auto Repeat is turned off.

You can toggle this option via MIDI:

Auto Shuffle A ON/OFF: G4

Auto Shuffle B ON/OFF: G#4

Auto Fill

When in Auto Repeat mode, enabling this option causes a random Fill from the Fill Bank to be played every n bars, where n is defined by the Auto Fill Period setting in the Play Options panel.

You can toggle this option via MIDI:

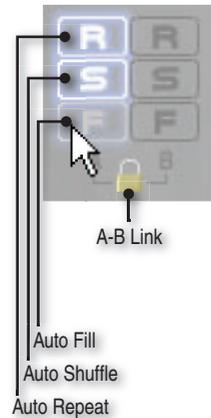
Auto Fill A ON/OFF: A4

Auto Fill B ON/OFF: A#4

Swap A/B

This function is only available via MIDI. It swaps the target of the repeating Groove triggers, from one Bank to the other.

Swap A/B: E4



A-B Link

Also located near the Auto Repeat Groove buttons is the A-B Link function. When this is activated, any Groove note which is routed to Bank A will be also routed to the corresponding Groove slot in Bank B, and vice versa.

This is useful when using the Kit-Piece Note Filters for example – you can use mutually exclusive Kit-Pieces in each Bank, then use one note to trigger a Groove from each Bank, making new Groove styles quickly and easily.

8:8 MIDI out and drag & drop export/import

MIDI out

When using BFD as a VST Instrument, the output of the Groove Librarian can be routed back to the host as a MIDI input by switching on the Enable MIDI out option in the Play Options panel.

Any Groove Librarian processing which is being used, such as the Auto Repeat and Humanization functions (see section 8:10), is also recorded in the MIDI output stream.

Please note that, currently, VST is the only plugin format which supports this functionality, and only certain hosts, such as *Cubase* and *Nuendo*, support this aspect of the VST format. The BFD MIDI output will be available as a MIDI input source for MIDI tracks in your sequencer if it supports this feature.

Drag & drop export & import

If your host supports drag & drop import of MIDI files, you can drag Grooves straight to a MIDI track in its arrange page. Simply drag & drop the Groove while holding down the [CTRL] key.

On hosts that support drag & drop export of MIDI sequences, you can drag & drop a MIDI clip straight from your sequencer's arrange page into a Bank slot on BFD.

Please note that not all sequencers support these features.

8:9 Creating and importing your own Grooves and Fills

BFD's Grooves and Fills use the standard MIDI file format. This makes it easy to create and import your own Grooves. It is advisable to import MIDI files with only one track. If BFD encounters a file with multiple tracks, it will import only the track with the largest amount of notes (most likely to be the drum track).

Tips on creating Grooves

- You can use any MIDI sequencer which allows the export of MIDI files.
- Load BFD into the sequencer to program or record the sequences you want to convert into Grooves.
- You can also import any commercial or freeware MIDI files you have, using the import function in your sequencer (some sequencers also allow dragging MIDI files from the operating system file browsers right into the arrange page). Make sure that the notes in the MIDI files correspond properly with BFD's key assignments: you may need to do some editing of the MIDI data in order to achieve this.
- Grooves can be of any length. BFD's Grooves tend to be of shorter bar lengths, but there's no reason why you shouldn't use longer ones.
- Please also remember that, in general, each Groove must be written for any particular time signature. If presented with a Groove which is intended for a different time signature than the current one, it will do one of two things. If the Groove's time signature has more beats in the bar than the current time signature, then the notes within the extra beats are cut off. If the Groove's time signature contains less beats in the bar than the current time signature, then the Groove will be repeated until the end of the bar.

Importing Grooves into BFD

You can import Grooves into BFD in a number of ways. Remember to save the Bundle file afterwards for future use by clicking the  Save Bank button under each Bank. It is best to save it in the **BFD/Grooves** folder, or in **BFD/Fills** if it is a Fill Bundle, so that it appears in the Browsers.

Drag and Drop

If your host supports drag & drop export, you can import MIDI sequences straight into BFD from the sequencer's arrange page by dragging and dropping it onto a Groove slot in a Bank.

Open MIDI files

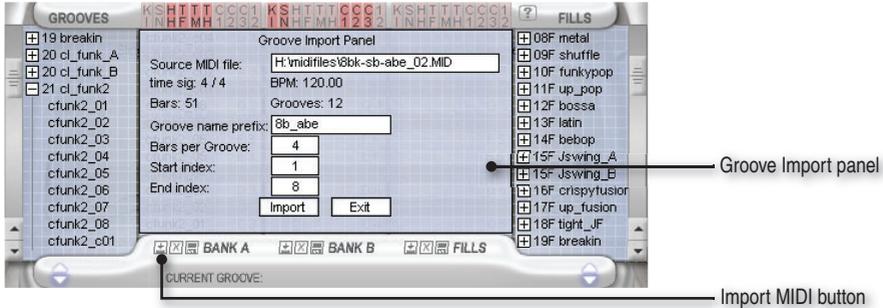
Use your sequencer's MIDI export function to save MIDI sequences to standard MIDI format. BFD supports both Type 0 and Type 1 MIDI files. Organize your Grooves into subfolders within the BFD/Grooves or BFD/Fills folders for convenience.

You can then import these sets of MIDI files into a Groove slot in a Bank by double-clicking on the slot and locating and selecting a MIDI file in the File Open dialog which appears. You can fill multiple slots by selecting up to 12 MIDI files: the MIDI files will be distributed in sequential slots going up from the original slot which was clicked.

Groove Import panel

Each Bank has the ability to fill its slots by importing a long MIDI file, cutting it at specified intervals and distributing the first 12 resulting Grooves across the 12 slots in the Bank.

Click the  Import MIDI button underneath any Bank to bring up the Groove Import panel.



Source MIDI file

Clicking on the text-box brings up an open file dialog in which to browse for a MIDI file.

Groove name prefix

This text-box allows you to specify a name prefix for the imported Grooves. This name prefix will be followed by numbers determined by the Start index and End index values. Double-click the text-box and enter some text.

Bars per Groove

The source MIDI file will be cut into smaller Grooves with a length, in bars, specified in this text-box. Double-click it and enter a number.

Start index

Specifies the numbering of the first Groove to be imported from the MIDI file.

End index

Specifies the numbering of the last Groove to be imported from the MIDI file. This option is provided in order to limit the number of Grooves to be extracted and imported from the source MIDI file.

When you've specified the settings you want, click the Import button in order to import the MIDI. Click the Exit button to cancel and return to the Groove Librarian.

After you've imported Grooves in this way, remember to save the contents of the Bank as a Bundle if you'd like to use it again.

8:10 Humanization functions

BFD's humanization system is comprised of the **Quantization** panel, and the **Humanize Velocity** and **Humanize Timing** panels. All of these functions take effect only when BFD is playing Grooves, with the exception of the Humanize Velocity panel, which also affects BFD's output when using standard MIDI input – in other words, when triggering BFD's sounds using the MIDI functions of your sequencer or an external MIDI controller, rather than the integrated Groove Librarian.

You can add an extra degree of humanization by using the Anti-machinegun mode option in the Play Options panel.

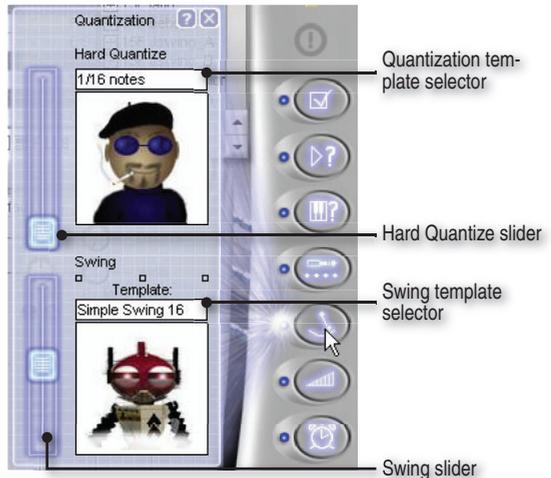
Quantization panel



To access the Quantization panel, click the Quantization Panel button. Here, you can control the variation from the original timing of the Groove and a hard-quantized, robotic feel, and also apply a timing distortion map loaded from a 'Swing Template'.

The Quantization panel does **not** apply to notes from your sequencer or MIDI controller – *only to Grooves*.

Exit the panel by clicking its button again, or by clicking the  button in the top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.

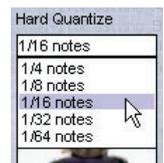


Hard Quantize

This Hard Quantize slider and drop-down menu allow you to gradually vary the timing of the playing Groove from its original timing, to a hard-quantized, rigid, 'robotic' feel. Any timing deviations of notes away from a metrical grid (which impart a more realistic 'human' feel) are gradually 'snapped' back to strict timing divisions as the slider is moved up.

You can select what metrical grid you would like to use, ranging from 4th to 64th notes, by using the drop-down menu selector.

The graphic represents the point between natural ('Groove dude') and quantized ('Beatsborg') timing.



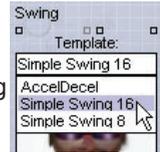
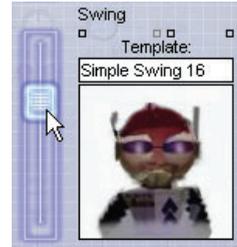
Swing

BFD's Swing Templates can be considered as a cross between 'groove templates' in sequencers such as *Cubase* or *Logic*, and the 'shuffle' or 'swing' function on classic drum machines. They define an X-Y map which translates original time into swing time to achieve different feels. Currently, BFD comes with the common 8th and 16th note swings.

The Swing slider gradually varies the timing of the playing Groove between the setting specified with the Hard Quantize slider and the currently selected Swing Template. Positive and negative time displacement is possible, with no effect at the central point of the slider.

The drop-down menu allows the selection of one of a number of Swing Templates supplied with BFD.

The graphic represents the point between straight ('Beatsborg'), and swung ('Groove dude') timing.



Humanize panels

In addition to the versatile Quantization panel, BFD offers a further two functions to vary the expressive character of its output: the Humanize Timing and Humanize Velocity panels.

These work in a slightly different way to the other panels. To bring up either panel, click the timing or velocity buttons. You will see that a popup graph is displayed, the curve of which can be shaped by moving the mouse over the graph. Changes to the curve shape will take effect in real time.

Once you've found the setting you want, click the graph to finalize it and exit the panel. Please see below for details of how to interpret the curve shapes.

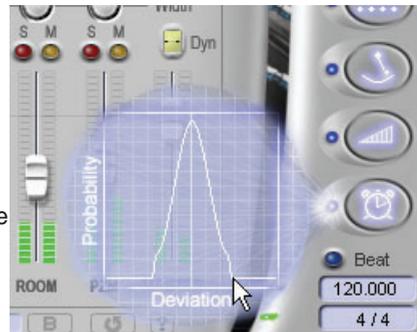


Humanize Timing panel

Use this panel to introduce random timing variations to make a Groove sound more 'human' - in other words, with less mechanically perfect timing. The panel graph's x-axis shows time deviations away from a note's original time position (marked by a white line in the centre), while the y-axis represents the probability of a certain deviation occurring, the top of the graph being 'highly probable'.

If you are playing a Groove with Auto Repeat enabled, the timing variations will be different for every repetition.

Timing randomizations are **not** applied to notes from your sequencer or MIDI controller – *only to Grooves*.



- With a graphical shape similar to that shown on the right, the randomization can be quite extreme. Effectively, the graph is showing you that there is an equal probability of timing displacements to all notes. The timing displacements can be large or small.



- With a graph shape like this, there will be a reasonable amount of randomization: most notes will have a slight timing deviation, but there will be the odd note which is displaced to a more extreme degree.



- When the graph looks like this, there will be no randomization of timing: the graph shows that there is an equal probability of no timing deviations occurring.



Humanize Velocity panel

This panel graph works in exactly the same way as the Humanize Timing panel, except that the x-axis represents deviations in velocity from the original input value. Using this panel, it is possible to emulate the slight variations in force exerted by a real drummer during a performance.

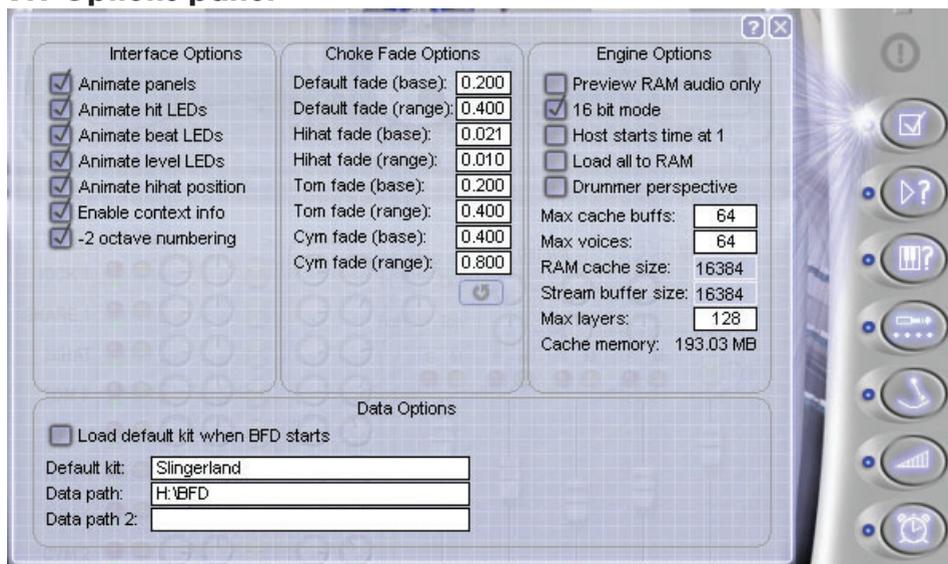
This panel is unique among BFD's humanization functions in that it not only applies to the Groove Librarian, but also when using the plugin as a sound module - i.e. using the host's sequencing functions or an external MIDI controller to trigger its sounds as single hits.



9 CUSTOMIZING BFD

Options and Play Options Panels

9:1 Options panel



The Options panel contains a substantial array of settings with which you can customize many aspects of BFD. These settings are stored in the registry (Windows) or the BFD preferences file (MacOSX).

Exit the panel by clicking its button again, or by clicking the  button in the top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.

Interface options

It is strongly recommended to turn off animations if you are using a relatively slow computer, or a laptop, as the additional CPU load generated by the animations might lead to an impairment of performance.

Animate panels

Enables animation for the holographic panels 'growing' from their buttons.

Animate Hit LEDs

Enables the Hit indicator LEDs, which light up when a Kit-Piece is triggered.

Animate beat LED

Enables the beat indicator LED

Animate level LEDs

Enables animation of the level LED strips beneath the Mixer faders

Animate hihat position

Enables vector animation of the hihat position in the drum room window (especially useful when operating hihat controller on an e-drum brain).

Enable context Info

This enables the context Info display at the bottom of the plugin interface. When you move the mouse over a control or adjust it, the display shows a readout of the control name and its value. You can turn off this functionality here if you don't need it or find it a distraction.

-2 octave numbering

Some sequencers, such as *Cubase* and *Logic*, use an octave numbering system which begins at C-2, rather than C0 in sequencers such as *Sonar* and *FL Studio*. When it launches, BFD attempts to detect the sequencer used and adjusts the naming convention used in the Hit Options panel and Groove Librarian Banks. You can override this by manually setting this option in order to use whichever convention you prefer.

Choke Fade options

A Choke Fade occurs if a Hit is triggered before an older Hit from the same Kit-Piece has finished decaying. For example, if you play 2 high toms rapidly in succession, the first will be faded out while the second is triggered.

The Choke Fade options allow you to adjust the fade times for the Kit. The **default** settings apply to all Kit-Piece slots except for the **hihat**, **tom** and **cymbal** slots, which possess their own sets of values. Different Kit-Piece types require different Choke Fade times to sound realistic. Whilst short fade times for snares and kicks will sound fine, cymbals will need much longer fade times, for example. Underneath the settings is a Reset button, which causes all Choke Fade settings to revert to factory defaults.

There are two components to the Choke Fade time for each of the above categories: fade (base) is the minimum fade time, while fade (range) is a maximum of extra fade time added to the (base) value, according to BFD's 'dominant excitation preservation' algorithm. The aim of this algorithm is to try to allow louder Hits (higher velocity) longer fade times when choked by softer Hits (lower velocity), and to reduce the fade time when a softer Hit is choked by a following louder Hit.

For example, a soft Hit choked by a loud Hit will have a fade time of fade (base), whereas a loud Hit choked by a soft Hit will have a fade time of fade (base) + fade (range). This leads to more realistic ringing when a cymbal is repeatedly struck, whilst reducing the disk streaming load when possible.

You may want to reduce the hihat fade (base) and (range) times to very small values if you want a really tight, cutting choke of open hats when pedalling or triggering a closed hat.

You can achieve a very broad range of 'responses' for the Kit using these controls. It can lead to a very broad range of sounds, so it can be considered as a way of tweaking the Kit. Please note that the settings are quite powerful, and with extreme settings you can achieve results which may sound unrealistic. Subtle use is advised if you want realistic results! Extreme settings are, however, facilitated as an aid to creativity and experimentation.

Default fade (base)

Minimum fade time for all Kit-Piece slots without individual fade times (in other words, kicks, snares and percussion).

Default fade (range)

Maximum fade time for all Kit-Piece slots without individual fade times (in other words, kicks, snares, percussion).

Hihat fade (base)

Minimum fade time for the hihat slot.

Hihat fade (range)

Maximum fade time for the hihat slot.

Tom fade (base)

Minimum fade time for tom slots.

Tom fade (range)

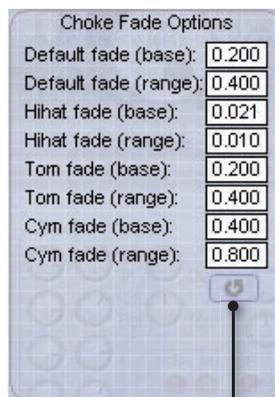
Maximum fade time for tom slots.

Cym fade (base)

Minimum fade time for cymbal slots.

Cym fade (range)

Maximum fade time for cymbal slots.



Reset Choke Fade settings

Reset choke fade settings

This button resets the Choke Fade settings to factory defaults.

Engine Options

Preview RAM audio only

This option makes BFD play only the initial part of the sounds which are held in RAM before the disk streaming process begins. In this mode no data is accessed from the hard disk. It can be useful as a preview mode while composing to save resources, and turned off during mixdown. The actual amount of each sound stored in RAM is determined by the RAM cache size option.

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 BFD.

Host time starts at 1

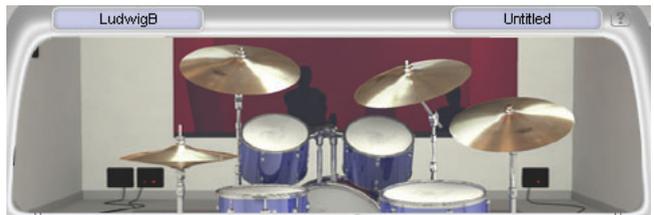
This option is provided for sequencers such as *Digital Performer*, which start their time numbering at 1 instead of 0, which would lead to Grooves playing at the wrong time.

Load all to RAM

With the Load all to RAM option enabled, BFD loads the entire Kit to RAM, and no data is streamed from the disk. Please ensure you have enough RAM before using this option! The size of each Kit-Piece is shown in the Kit-Piece Selector panels. To use this option with the highest Kit-Piece detail levels, you would realistically require several gigabytes of RAM. However, if you use this option in conjunction with 16 bit mode and a low Maximum layers value, it can be a viable option with smaller amounts of RAM.

Drummer perspective

Enabling this option allows you to hear BFD's output from the drummer's perspective, rather than that of a listener on the other side of the kit. All Pan settings are flipped, as are the ambient mic buses (relative to the Flip stereo mic field setting in the Kit-Piece Inspector). The Drum Room graphics change to reflect the state of this setting.



Maximum cache buffers

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 of your RAM you want to set aside in the hope of achieving such reuse.

If you have even a moderate amount of dynamics in the performance, or if you are using the Humanize Velocity panel or Anti-machine gun mode, you may find that not much reuse occurs at all, and could possibly reduce this parameter a little.

You still need at least 1 cache buffer per voice!

To adjust the amount of cache buffers, double-click the box and enter a new value between 16 and 96.

Only do this when BFD is idle!

Maximum voices

The maximum number of Hits BFD will play simultaneously. If the voice limit is exceeded, BFD implements an intelligent voice-stealing system, based on the oldest note which is still playing.

The number of voices required for a performance can be larger than you think. For example, decaying and Choke faded cymbals and toms can raise polyphony requirements quite considerably. 64 is a safe number to use, and voices don't take too much RAM.

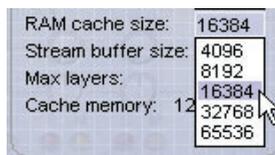
To adjust the number of voices, double-click the box and enter a new value between 2 and 96.

RAM cache size

This value, in sample frames, is the size of the portion of each sound held in RAM to enable low latency operation within BFD (to circumvent the inherent latency involved with hard disk seek times). This portion plays while BFD 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.

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. 16384 or 32768 will be fine for most systems: you should try to use the lowest setting possible on your system.



Stream buffer size

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 a note is choked.

Settings of 4096, 8192, 16384, 32768 and 65536 samples are possible, selectable via a drop-down menu. 8192, 16384 or 32768 will be fine for most systems: you should try to use the lowest setting possible on your system.

Maximum layers

You can limit the amount of velocity layers used by BFD, thereby reducing the strain on the hard disk and RAM, at the expense of detail. Smaller values can be useful as an efficient preview mode while composing. Simply increase the value during mixdown for full quality.

To change the setting, double-click the box and enter a new value between 1 and 256.

If you are using a low number of layers, you may want to increase the V2A setting in the Hit Options panel Advanced tab. This causes changes in the amplitude of individual Hits, proportional to incoming velocity.

Cache memory display

This display shows the amount of RAM being used by BFD. As already discussed above, BFD stores a small amount of each Kit-Piece Hit type (at all velocities) in RAM, in order to circumvent inherent hard disk latencies.

This display will show a figure of around 44MB by default (in 24 bit mode), as BFD needs to allocate a certain amount of RAM for the cache buffers and voices.

Data options

Load default kit when BFD starts

With this option and the Default Kit selector box, you can specify and load a Kit by default when BFD is initiated. Click on the Default Kit box in order to bring up a file browser so that a Kit file can be selected.

Data path

Clicking on this box allows you to specify a new BFD data path. Make sure you select the **BFD** folder, *not* **BFD/Data** or anything else!

Data path 2

This box allows you to specify a second BFD data path. Only the Data subfolder will be used in this second BFD folder. It is useful if you need to split data across more than one drive for disk-space reasons.

9:2 Play Options panel



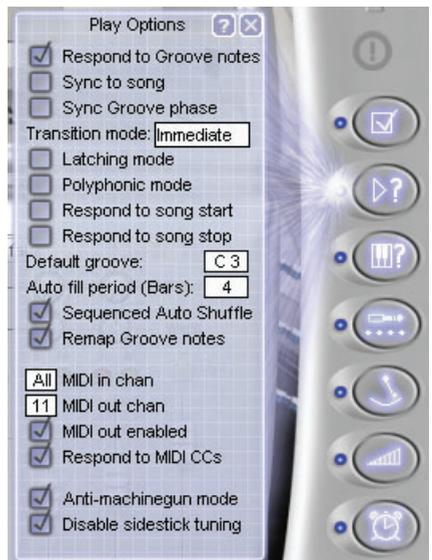
This panel lets you change a number of different aspects of the Groove Librarian's behaviour, as well as certain

other advanced settings related to the way in which BFD plays.

These settings are saved in the registry (Windows) and in a preferences file (MacOSX) *only* when changes are explicitly made in the panel.

This is because the settings are also saved and recalled with the host song, and also within BFD Programs.

Therefore, the settings stored in the registry or preferences file can be considered as the default settings which are recalled when BFD is initialized.



Exit the panel by clicking its button again, or by clicking the  button in the top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.

Respond to Groove notes

This setting enables the Groove MIDI notes (and, in effect, this turns on or off the Groove Librarian). If you need to use a drum mapping that includes MIDI notes in the range that triggers Grooves, or if you simply don't need the Groove Librarian, you can disable this option.

Sync to song

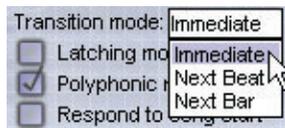
This setting sets the host sequencer's song clock as the synchronization source for BFD's Grooves, so that they play in phase with the song clock. Effectively, it means that if a Groove is triggered, it starts playing from the point in the bar at which it is triggered. For example, if you trigger a Groove on the 2nd beat of a bar in your song, it will play the Groove from its 2nd beat - so that if there is a kick on the 1st beat, and a snare on the 2nd, it will start playing with the snare.

Sync Groove phase

This setting makes subsequent Grooves play in phase with the first Groove played. So, if you trigger a new Groove whilst the original is playing its third beat, the new Groove will start playing from its third beat as well. Note that Polyphonic mode (see below) must be enabled for this to have any effect.

Transition mode

This drop-down menu sets how transitions between Grooves are handled.



Immediate

When in this mode, a newly triggered Groove will start playing immediately. Any Groove synchronization options will still be in effect, however, which may lead to an apparent delay in the Groove's playback if, for instance, the Groove has no notes at the synchronized play start point.

Next Beat

Using this mode, when a new Groove is triggered, the transition takes place on the next beat of the Sync Mode source. For example, if the new Groove is triggered between the 2nd and 3rd beats of a bar, it will actually start playing on the 3rd beat, which is the next beat after the trigger is made.

Next Bar

This mode works in a similar way to Next Beat except that, when the next Groove is triggered, it starts playing from the start of the next bar.

Latching mode

When this mode is enabled, Grooves are turned off not by a MIDI note-off message, but by another note-on message of the same MIDI note number. Therefore, you play a note once to start a Groove, and then again in order to stop it.

Please be aware that this applies to all notes – those that you trigger from an external MIDI controller, and those from your sequencer.

Polyphonic mode

When in Polyphonic mode, multiple Grooves may be played simultaneously. A newly triggered Groove doesn't stop any other Grooves currently playing. This is useful, for example, to layer grooves that are partial beat components, and for overlaying ride and crash patterns over kick/snare/hat drumloop Grooves.

Respond to song start

Checking this option results in the default Groove (specified with the Default Groove option) being played when the sequencer is started. Use the Auto Repeat buttons in order to keep a Groove playing while your sequencer plays. This is very useful in using BFD as an auto-accompaniment module, in conjunction with the Respond to song stop option.

Respond to song stop

This option stops all Grooves which may be playing when the sequencer is stopped. Used in conjunction with Respond to song start for auto-accompaniment functions.

Default Groove

This parameter specifies the default Groove note to play when the Respond to song start option is enabled. Whichever Groove you have loaded into this note's corresponding Groove Bank slot will be triggered when you start playing your song.

Auto-fill period (bars)

This value sets the period, in bars, between every Fill played when in Auto Fill mode. For example, setting it to 16 will result in a Fill being played every 16 bars (see section 8:7).

Sequenced Auto Shuffle

With this option enabled, the Auto Shuffle function causes BFD to shuffle through Grooves sequentially, rather than at random (see section 8:7).

Remap Groove notes

Enabling this option plays Grooves according to the current Hit Options settings. It is useful if you have created your own Grooves with a different key mapping and want to play them without remapping all the MIDI notes to the correct assignments.

MIDI in channel

This parameter sets the MIDI channel on which BFD responds.

MIDI out channel

This option sets the MIDI channel on which to transmit events if the MIDI out function is enabled.

MIDI out enabled

When using BFD as a VST Instrument, the output of the Groove Librarian can be routed back to the host as a MIDI input if this option is enabled. Please note that, currently, VST is the only plugin format which supports this functionality. Please see section 8:8 for more details on this feature.

Respond to MIDI CCs

This option enables MIDI continuous controller support. It is essential when using the variable hihat pedal method of playing different hihat Hit types (see section 7:2).

MIDI CCs can also be used to automate most controls in BFD. Please see sections 7:5 and 11:1 for more details on adjusting MIDI CC assignments.

You can safely disable this option if you don't need this functionality.

Anti-machinegun mode

Enabling the Anti-machinegun mode option forces BFD not to play two identical velocity layers if the same Kit-Piece Hit type is triggered at the same velocity layer twice in succession. This effectively removes the 'machinegun' effect which can make drum rolls and other intricate parts sound unrealistic.

The effect of this setting can be adjusted for individual Hit types by using the VRnd parameter within the Hit Options Advanced tab (see section 7:4).

Disable sidestick tuning

With this option checked, the sidestick Hit type for snares will not be affected by changes to the Tune parameter, more closely resembling how a real snare works.

10 BFD AND MULTIPLE OUTPUTS

10:1 BFD audio architecture

Before explaining BFD's output assignment system, it would be useful to explain the BFD audio architecture.

Microphone channels

Each Kit-Piece Hit type has 8 mic channels (3 stereo, 5 mono):

Overhead (stereo)

The signal from the stereo Overhead mic set, above the kit.

Room (stereo)

The signal from the stereo Room mic set, further back in the room.

PZM (stereo)

The signal from the stereo PZM mic set, on the floor on either side of the kit.

Kick In (mono)

The signal from the mic inside the kick drum.

Kick Out (mono)

The signal from the mic outside the kick drum.

Snare Bottom (mono)

The signal from the mic underneath the snare drum.

Snare Top (mono)

The signal from the mic above the snare drum.

Multi (mono)

The signal from the direct mic for all Kit-Pieces except kicks and snares. This is usually empty for kicks and snares.

The Overhead, Room and PZM mics are sometimes known collectively as the 'ambient' mic channels.

The Kick In, Kick Out, Snare Bottom, Snare Top and Multi mic channels are known collectively within BFD as Direct mic channels. This concept is used in the Direct Mixer, whose controls affect all the Direct mic channels of a Kit-Piece together (see section 5:3).

The kick and snare mics are used for all Kit-Pieces, as bleed signals are recorded through them (see below, 'Primary direct and bleed channels').

A Kit-Piece's own close mic'd direct signal is known as the primary direct mic channel. For a kick, this is in the Kick In and Out mic channels, and for a hihat or cymbal, it is in the Multi mic channel.

Microphone buses

As well as mic channels, when using BFD you will need to be aware of the four microphone buses, which are 'groups' of the mic channels, and can be manipulated as groups using the Bus Mixer.

The Overhead, Room and PZM mics are sometimes known collectively as the 'ambient' mic buses.

Direct Master

This Bus comprises all mono Direct mic channels: it includes all bleed channels as well as primary direct mic channels. The Direct mic channels for each Kit-Piece can be manipulated individually using the Direct Mixer area. The Direct Master fader in the Bus Mixer controls the volume of the overall mix of Direct mic channels.

Overhead

This bus groups the Overhead mic channels from all Kit-Pieces.

Room

This bus groups the Room mic channels from all Kit-Pieces.

PZM

This bus groups the PZM mic channels from all Kit-Pieces.

Primary direct and bleed channels

The Kick In/Out mic channels are the primary direct mic channels for the kick. Bleed from the kick appears in the Snare Bottom/Top mic channels. The Multi mic channel is empty for kicks, except on certain *BFD XFL* kicks, which feature bleed captured through the hihat mic.

The Snare Bottom/Top mic channels are the primary direct mic channels for the snare. Bleed from the snare appears in the Kick In/Out mic channels. The Multi mic channel is empty for snares, except on certain *BFD XFL* snares, which feature bleed captured through the hihat mic.

The Multi mic channel is the primary direct mic channel for **all** other Kit-Pieces, whose bleed appears in the Kick In/Out and Snare Bottom/Top mic channels.

Bleed is *only* present in the kick and snare mic channels. Bleed from the other mics is not included, because the levels were just too low to justify the extra RAM and hard disk bandwidth required. In any case, bleed can be, in many cases, an annoying side effect of the drum-recording process, which is often minimized during post-processing by using noise gates. The Output Options panel features a number of ways to control bleed.

10:2 BFD plugin output configurations

There are four versions of the BFD plugin, which give different permutations of outputs into the host. This is due to some hosts' inability to properly change plugin output configurations. The name of the plugin version which is currently being used is shown on the top-left of the BFD interface, just underneath the logo.

Please note that BFD must be used as a plugin in order to have multiple output functionality. The BFD standalone version always uses **BFD Stereo**.

For more information on using these plugin types in your host sequencer, please consult the supplemental PDF documentation installed with BFD.

BFD Stereo

Stereo Master output only. This version mixes all the ambient mic buses together with the Direct Master bus inside the plugin, outputting everything to a single stereo pair. The Master level fader controls the overall output volume of the plugin.

When using **BFD Stereo**, the Output Options panel is very limited. However, it still allows you to change bleed levels, and mute any mic channels you do not require. Please see section 10:3 for further details.



BFD Groups

Stereo Group outputs version. This version outputs each stereo mic bus as an independent stereo output. The Master output fader affects the volume of all buses in a relative manner.



Output	Stereo mic bus
1-2	Direct Master bus
3-4	Overhead bus
5-6	Room bus
7-8	PZM bus

This output routing scheme can be changed using the Output Options panel, which allows you to freely adjust the routing of all audio streams, including bleed signals, to the available outputs (4 stereo). Please see section 10:3 for further details.

BFD All



All Outputs version. In this version, as well as a stereo output for the Overhead, Room and PZM buses, each individual Kit-Piece slot on Mixer Page 1 has its own mono output for their primary direct channels (the kick and snare feature 2 outputs each – for In/Out and Bottom/Top channels). The same outputs are used for the corresponding slots on Mixer Page 2. The Direct Master does not have a stereo mix output as in **BFD Groups**. The Master level fader affects the volume of all channels in a relative manner, while the Direct Master fader affects the volume of all Direct mic channels in a relative manner.

Note that *Logic* and *Samplitude* only support a maximum of 16 outputs from a plugin. Therefore, when using these hosts, the primary direct signal from cymbal 2 and 3 are mixed together.

When using **BFD All**, please note that, by default, the Direct mic channels from the extra Kit-Piece slots in Page 2 of the Mixer will be routed to the same outputs as the corresponding slots on Page 1. For example, kick 2 In/Out will be routed to outputs 7 and 8, the percussion slot will be routed to output 11 and toms 4-6 will be routed to outputs 12-14. The default configuration is shown below.

Output	Mic Channels
1-2	Overhead mic Bus
3-4	Room mic Bus
5-6	PZM mic Bus
7	Direct Kick 1 & Kick 2 In
8	Direct Kick 1 & Kick 2 Out
9	Direct Snare 1 & Snare 2 Bottom
10	Direct Snare 1 & Snare 2 Top
11	Direct Hihat & Percussion
12	Direct Floor Tom & Tom 4
13	Direct Mid Tom & Tom 5
14	Direct High Tom & Tom 6
15	Direct Cymbal 1 & Cymbal 4
16	Direct Cymbal 2 & Cymbal 5*
17	Direct Cymbal 3 & Cymbal 6*

*Some hosts, such as *Logic / Samplitude*, will not allow more than 16 outputs. For these hosts, Cymbals 2, 3, 5 and 6 will appear in channel 16 by default.

This output routing scheme can be changed using the Output Options panel, which allows you to freely adjust the routing of all audio streams, including bleed signals, to the available outputs (3 stereo, 11 mono). Please see section 10:3 for further details.

BFD Ultra



BFD Ultra gives you 6 stereo and 22 mono outputs: similar to **BFD All**, except that all Kit-Piece slots have their own outputs for their primary direct channels, and 3 extra general-purpose stereo outputs are also provided. It is inadvisable to use this version of BFD in Logic or Samplitude, or any other host which cannot handle 34 outputs from a plugin.

BFD Ultra is only necessary if you really need 34 outputs: for the vast majority of applications, you can simply use BFD All and create 'submixes' within BFD for the various mic channels. However, if you absolutely must have a separate output for each Kit-Piece slot within BFD, you can use BFD Ultra.

The default configuration is shown below. This can be freely changed using the Output Options panel. In fact, the BUS1, 2 and 3 stereo outputs require something to be routed to them, via the Output Options panel, before you hear anything from them. They are provided as 'utility' outputs, to facilitate extra submixing possibilities such as stereo tom and cymbal mixes, for example. Please see section 10:3 for more details on the Output Options panel.

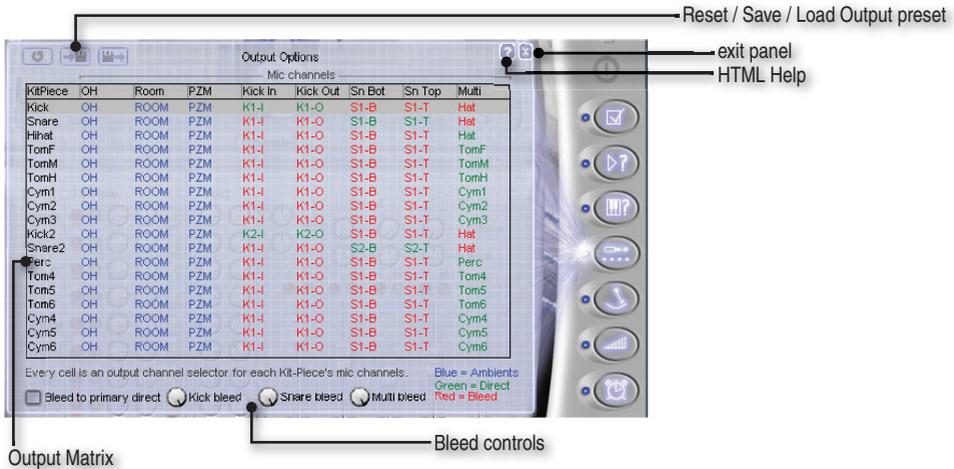
Output	Mic Channels
1-2	Overhead mic bus
3-4	Room mic bus
5-6	PZM mic bus
7-8	Bus 1 (general-purpose)
9-10	Bus 2 (general-purpose)
11-12	Bus 3 (general-purpose)
13	Direct Kick 1 In
14	Direct Kick 1 Out
15	Direct Snare 1 Bottom
16	Direct Kick 1 Top
17	Direct Hihat
18	Direct Floor Tom
19	Direct Mid Tom
20	Direct High Tom
21	Direct Cymbal 1
22	Direct Cymbal 2
23	Direct Cymbal 3
24	Direct Kick 2 In
25	Direct Kick 2 Out
26	Direct Snare 2 Bottom
27	Direct Snare 2 Top
28	Direct Percussion
29	Direct Tom 4
30	Direct Tom 5
31	Direct Tom 6
32	Direct Cymbal 4
33	Direct Cymbal 5
34	Direct Cymbal 6

10:3 Output Options panel



The Output Options panel allows you to route any mic channel within any Kit-Piece to any available output, or mute it entirely. Please ensure you are familiar with BFD's audio architecture (see section 10:1) before you attempt to use this panel.

Exit the panel by clicking its button again, or by clicking the button in the top-right corner. Alternatively, bring up a new panel instead by clicking another panel button.



Output Matrix

While the Output Matrix may seem rather complex at first, it is actually very logical. Once you've set up the configuration how you want it, or selected one of the presets, you can save your setup as the default and not worry about it again.

Each row in the Output Matrix represents a Kit-Piece slot within BFD, and features eight columns: one for each mic channel from each Kit-Piece slot.

Each 'cell' in the Output Matrix allows you to assign a mic channel from a Kit-Piece slot to one of the available outputs, via a drop-down menu. Simply click on a cell (keeping the mouse button held down) to access and select from the output menu. Outputs are named according to their default routings.

KitPiece	OH	Room	PZM	Kick In	Kick Out	Sn Bot	Sn Top	Multi
Kick	BUS1	BUS1	BUS1	BUS1	BUS1	BUS1	BUS1	BUS1
Snare	OH	ROOM	BUS1	K1-I	K1-O	S1-B	S1-T	Hat
Hihat	OH	ROOM	BUS2	K1-I	K1-O	S1-B	S1-T	Hat
TomF	OH	ROOM	BUS3	K1-I	K1-O	S1-B	S1-T	TomF
TomM	OH	ROOM	K1-I	K1-I	K1-O	S1-B	S1-T	TomM
TomH	OH	ROOM	K1-O	K1-I	K1-O	S1-B	S1-T	TomH
Cym1	OH	ROOM	S1-B	K1-I	K1-O	S1-B	S1-T	Cym1
Cym2	OH	ROOM	S1-T	K1-I	K1-O	S1-B	S1-T	Cym2
Cym3	OH	ROOM	Hat	K1-I	K1-O	S1-B	S1-T	Cym3
Kick2	OH	ROOM	TomF	K1-I	K1-O	S1-B	S1-T	Hat
Snare2	OH	ROOM	TomM	K2-I	K2-O	S1-B	S1-T	Hat
				K1-I	K1-O	S2-B	S2-T	Hat

- In this example all mic channels for kick 1, including all ambient, primary direct and bleed channels, are being routed to the BUS1 stereo output.

The following table shows which actual plugin outputs correspond to the cell output names, in each BFD plugin version:

Output name	BFD Stereo	BFD Groups	BFD All	BFD Ultra
<null>		Mute mic channel – (do not send to any outputs)		
OUT	1-2	-	-	-
Dir	-	1-2	-	-
OH	-	3-4	1-2	1-2
RM	-	5-6	3-4	3-4
PZM	-	7-8	5-6	5-6
BUS1	-	-	-	7-8
BUS2	-	-	-	9-10
BUS3	-	-	-	11-12
K1-I	-	-	7	13
K1-O	-	-	8	14
S1-B	-	-	9	15
S1-T	-	-	10	16
Hat	-	-	11	17
TomF	-	-	12	18
TomM	-	-	13	19
TomH	-	-	14	20
Cym1	-	-	15	21
Cym2	-	-	16	22
Cym3	-	-	17	23
K2-I	-	-	-	24
K2-O	-	-	-	25
S2-B	-	-	-	26
S2-T	-	-	-	27
Perc	-	-	-	28
Tom4	-	-	-	29
Tom5	-	-	-	30
Tom6	-	-	-	31
Cym4	-	-	-	32
Cym5	-	-	-	33
Cym6	-	-	-	34

The output cells are colour-coded to enhance usability:

Ambient outputs are shown in **blue**

Bleed outputs for each Kit-Piece slot are shown in **red**

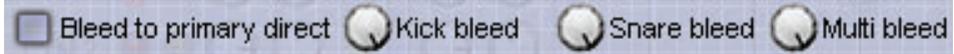
Direct outputs for each Kit-Piece slot are shown in **green**

If you route a Kit-Piece's mono mic channel to a stereo output, its position within the stereo field is determined by that Kit-Piece's Pan setting in the Mixer.

If you route a stereo mic channel to a mono output, it is summed to mono.

To remove a mic channel entirely from the mix, use the <null> output.

Bleed controls



Bleed to primary direct

When enabled, this option over-rides any output settings for all bleed channels, routing them to the same outputs to which the Kit-Piece's primary direct mic channels have been routed. The new routings are displayed on the Output Matrix, although they cannot be edited.

When the option is disabled, the Output Matrix reverts to the previous settings.

Kick Bleed trim

This control adjusts the level of the bleed signals in the Kick In/Out mics.

Snare Bleed trim

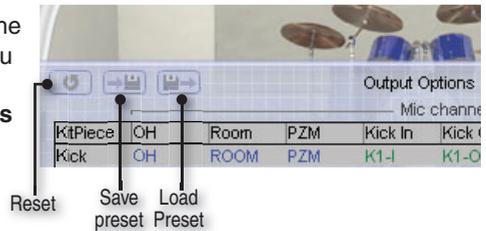
This control adjusts the level of the bleed signals in the Snare Bottom/Top mics.

Multi Bleed trim

This control adjusts the level of any other bleed signals: at this time, this control will only affect certain *BFD XFL* kicks and snares with an extra bleed signal recorded through the hi-hat mic, and provided on the Multi mic channel.

Output Options presets

The Save & Load Output preset buttons at the top-left of the Output Options panel allow you to store and recall your Output assignment setups. Presets are saved to the **BFD/Mixers** folder, as **.bfd_OM** files.



Saving defaults

You can save a file as **default.bfd_OM** in order to use it whenever BFD is launched. The Reset button resets the Output Options settings back to the settings stored in this default file. You can always recall the factory default settings by loading **factorydefault.bfd_OM**, and re-save it as the default if necessary.

Reset button

Clicking the Reset button, located to the right of the Load and Save buttons, reverts the Output Options panel back to the settings contained within **default.bfd_OM**.

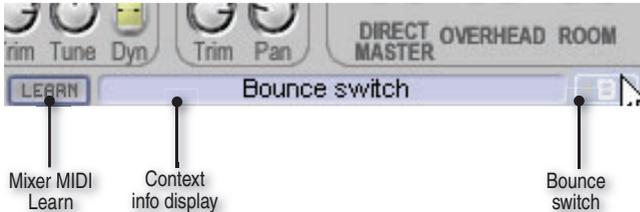
[SHIFT]-clicking the Reset button reverts the panel back to the factory defaults.

11 OTHER CONTROLS AND DISPLAYS

11:1 Miscellaneous functions on the interface

Help buttons

Click one of the  (main interface) or  (panels) help buttons in various parts of the BFD interface in order to launch an HTML help file documenting that area of the plugin.



Context info display

The Context info display shows helpful information, labels and parameter values, depending on the control underneath or being edited by the mouse.

Mixer MIDI Learn

The Learn button at the bottom of the BFD interface allows you to quickly assign multiple BFD controls to MIDI continuous controllers, without using the MIDI CCs tab of the Hit Options panel.

Click the Learn button and then move a BFD control. Then, move the control on the external MIDI controller device which you want to assign to it. This process can be repeated as many times as necessary for any number of BFD controls. When you're done, exit MIDI Learn mode by clicking the Learn button again.

Please note that if you wish to save your assignments, you need to use the Save button in the MIDI CCs tab of the Hit Options panel.

Bounce switch

This switch is intended for use with hosts that provide an offline bounce facility. When the Bounce switch is on, BFD 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 the Bounce mode is non-realtime, and should only be used during offline rendering in your sequencer (if it offers this feature).

If your sequencer only provides realtime bounce facilities (such as *Logic 5.5.1* on Windows), you should leave Bounce mode turned off, and bounce the output from BFD in the host in the normal way.

Panic button

Clicking this button sends a MIDI reset to BFD, stopping any sounds and Grooves which may be playing. It is useful if you get any stuck notes, or if you are auditioning Grooves using the Auto-repeat Groove buttons.

Tempo display

This display shows the current tempo in your sequencer, in BPM (beats per minute). You can also use it *in the standalone version only* for setting a tempo for the Groove Librarian. Double-click the display and enter a new value.

Time signature display

Shows the current time signature in your sequencer. You can also use it *in the standalone version only* for setting a time signature for the Groove Librarian. Double-click the display and enter a new value.



Beat LED

This LED flashes on every beat according to the tempo shown in the Tempo display.

MIDI activity and Audio stream LEDs

The MIDI activity LED flashes whenever BFD receives any MIDI data.

The Audio stream LED is lit whenever BFD is streaming audio data from the drive.

CPU and disk load meters

These meters display how much CPU and hard disk load is being caused by BFD.



12 OTHER INFORMATION

12:1 Preset files used within BFD

BFD has six different types of presets:

Kit preset: **.bfb**

Location: **BFD/Kits**

This preset type stores a combination of Kit-Pieces. The Load and Save Kit buttons are located just above the Mixer area.

Mixer preset: **.bfm**

Location: **BFD/Mixers**

These files store Mixer settings. These can be stored and recalled using the Save and Load buttons at the top-right of the Mixer. They can be browsed quickly with the Mixer preset buttons.

Hit Options key assignment preset: **.bft** (*BFD trigger preset*)

Location: **BFD/KeyMaps**

These presets store layouts of note assignments as defined in the Hit Options panel. Hit trim and Unload settings are *not* saved in these presets – they are only saved in Programs.

Hit Options MIDI CC assignment preset: **.bfc** (*BFD controller preset*)

Location: **BFD/KeyMaps**

These presets store layouts of MIDI continuous controller assignments as defined in the Hit Options panel.

Output Options preset: **.bfm_OM** (*BFD Mixer output map*)

Location: **BFD/Mixers**

These presets store Output Options panel settings.

BFD Program: **.bfd**

Location: **BFD/Programs**

This type of preset file saves the state of the whole of BFD: it contains Kit, Mixer, Output Options, Play Options, Kit-Piece Inspector and Hit trim & Unload settings, Hit Options note and MIDI CC assignments and the contents and state of the Groove Librarian. It is a combination of **.bfb**, **.bfm**, **.bft**, **.bfc**, and **.bfm_OM** files, with Kit-Piece Inspector and Hit trim & Unload settings in addition.

To load and save a global preset, use the buttons on the top-right of the BFD interface.

When you save a song, your host should save everything which would be saved in a BFD Program. Effectively this is like saving a **.bfd** file.

12:2 Other file types used in BFD

As well as the preset file formats listed above, BFD uses several other filetypes:

Grooves and Fills: .mid

Location: **BFD/Grooves** and **BFD/Fills**

These are standard MIDI files.

Groove and Fill Bundles: .bfb

Location: **BFD/Grooves** and **BFD/Fills**

These are text files which reference up to twelve Grooves and Fills.

Swing Templates: .txt

Location: **BFD/SwingTemplates**

These are text files which contain information on time-distortion mapping used in the Quantization panel's Swing Template functionality.

12:3 BFD audio content

BFD's high-quality drum content was produced and edited by Steve Duda:

<http://www.devine-machine.com/steve>

The audio was recorded by Elan Trujillo and Steve Duda at Eldorado Studios, Burbank, CA, USA: <http://www.eldoradorecording.com>

Drums were provided courtesy of Josh Baldwin and Christopher S. Heuer at Vintage Drum Rental, Los Angeles: <http://www.vintagedrumrental.com>

Here is a comprehensive breakdown of how each drum was recorded:

Direct signals:

Kick In:	ElectroVoice Re20
Snare top and bottom:	Shure SM57
Kick Out:	Neumann M49
Hihats:	Neumann KM81
Toms:	Sennheiser MD421
Cymbals:	AKG 451

All the above microphones were recorded through custom modified API preamps. Please note that the Sennheiser MD421 used to record the toms is actually two mics, one placed on the top and one on the bottom of the drum. Each part was fed into custom API preamps, and then summed on an SSL desk.

Overhead set:

2x AKG C-12 recorded through Summit MPC-100A tube preamps.

These were placed 5 feet directly above the kit, with the capsules facing each other, 3 ft. apart.

Room set:

2x Neumann U87 recorded through Avalon preamps.

They were placed 15 feet back from the bass drum, each at a 45 degree angle from the kit.

A room set like this is often mixed in mono and set back 10 to 24 dB. It provides a nice 'filler' for the drum tone, and adds a live room flavour.

PZM set:

2x Crown PZM microphones at floor level recorded through API preamps and Empirical Labs Distressors set at 3:1 compression ratio with a gentle threshold (removing 0 to 6dB depending on drum-hit velocity). This compression stage was added in order to bring more body and sustain to the PZM recordings.

Their placement was 10 feet back from the bass drum, each at a 45 degree angle from the kit, forming a right-angle intersecting bass drum trajectory.

PZMs are also good 'filler' as they capture a good room tone and drum trajectory/stereo image not captured by the other mics.

12:4 BFD MIDI content

Most of the Grooves supplied with BFD are performed on *V-Drums* and *D-Drums* by Chris Dagley, a renowned UK session drummer. As well as playing with the National Youth Jazz Orchestra for several years, Chris has played with such diverse luminaries of the international music scene as Lalo Schifrin, Des'ree, Gary Barlow, All Saints, Rosie Gaines, Jamiroquai, Tom Scott, Gloria Gaynor, Chaka Khan, Ray Charles, Eric Clapton, Ella Fitzgerald, George Michael and countless others. He has also played on numerous film soundtracks, theatre productions and adverts, and somehow also finds time to play in various jazz fusion and big band groups. Additionally, Chris was an early pioneer of internet-based session recording, via WorldNetStudios.

<http://www.worldnetstudios.com>

Additional Grooves:

Mayur Maha

Rory Dow

Derik White

Set Creative

Ellis Breen

Tom Santamera

12:5 License agreement

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