



NATIVE INSTRUMENTS
SOFTWARE SYNTHESIS

Battery 2

Operation Manual

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Welcome to Battery 2!

The original BATTERY was the first virtual drum module to incorporate the advanced programming techniques associated with Native Instruments' award-winning product line. BATTERY 2 builds on that tradition with a host of new features, such as these options for individual drum sounds:

- Flexible filtering with 15 different filter types
- Compression optimized for percussive sounds
- Up to four loops per drum sample, viewable in a separate looping window
- Extensive envelope and LFO modulation in the modulation section
- Simplified velocity mapping
- Additional “lo-fi” processing — adjustable sample rate and saturation, along with bit reduction

What's more, the matrix of drum cells is resizeable up to 72 cells, and the interface allows extensive show/hide options so that you can focus on what *you* want to edit — without taking up a lot of workspace. And of course, Battery retains the features that established it as the best software drum module:

- Sample import from Akai, SF2, GIG, AIFF, and WAV sources, with 8- to 32-bit resolution
- Up to 128 velocity layers per cell
- Intuitive, clean interface
- Multiple outputs (up to 16 mono / 8 stereo)

BATTERY 2 has been designed to be an efficient tool for creating the music of your dreams. As a result, it's bundled with a variety of great drum sounds, and there are also third party kits and sounds available. BATTERY 2 can serve as a stand-alone module — load it into a laptop, add a pad controller, and take a great set of drums on the road — or use Battery 2 as a plug-in for any host that accepts Audio Unit, VSTi, DXi, and RTAS plug-ins.

BATTERY is not simply another drum playback machine, but combines sampling and synthesis so your sounds can range from the realistic to the radical. We thank our existing BATTERY owners

whose enthusiasm and feedback has guided us in creating BATTERY 2, and we sincerely hope you enjoy using it as much as we enjoyed creating it.

- The Native Instruments BATTERY 2 Team

Product Authorization

Part of the Battery installation is a **Product Authorization** which has to be fulfilled in order to make permanent use of the software. We recommend that you take notice of this section first, then proceed with the software installation as described in the following sections and finally return to this section.

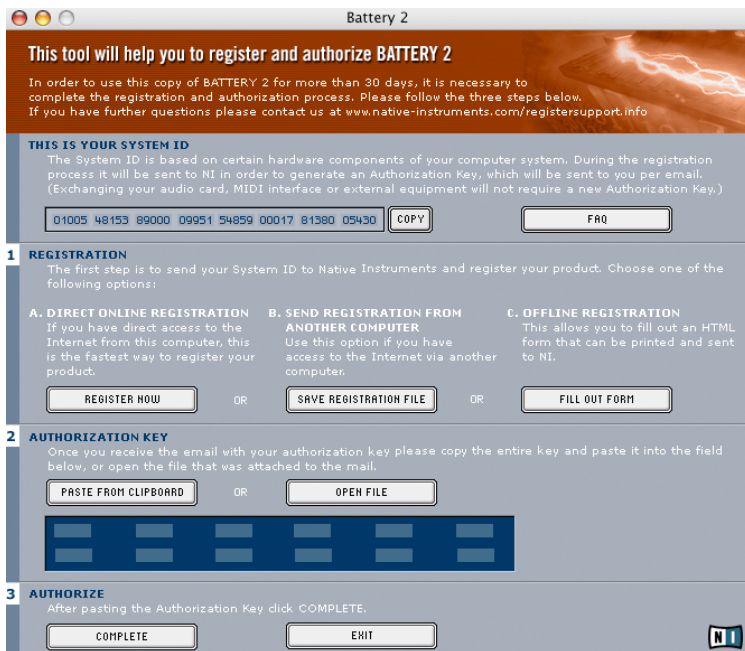
What is the Product Authorization?

The **Product Authorization** includes a full registration. After having completed the authorization, you can make use of all online services related to the registered product. On the Native Instruments website you can read online tutorials, get technical support, participate in the NI forums and download updates.

Battery requires the **Product Authorization** in order to use the software permanently. You can run Battery for 30 days without any limitations. As long as the software runs unauthorized a message at every program start reminds you that the authorization has not been completed yet and indicates how many more days the software is running without an authorization.

The **Product Authorization** is performed by a small application called **Registration Tool**. The **Registration Tool** generates a so called **System ID** which serves as request code for receiving an **Authorization Key**. The **System ID** is based on some hardware

components of your computer system, the operating system version and the serial number you have entered at the Battery installation.



Registration Tool

Note: Exchanging your audio card, MIDI interface or external equipment will not start the request for a new **Authorization Key**. Only exchanging a basic hardware component in your computer or installing a new operating system might produce a new **Product Authorization** request. In this case the **Registration Tool** will reflect the change by displaying a new **System ID** and you have to repeat the **Product Authorization**.

The **System ID** has to be sent to Native Instruments in order to receive the **Authorization Key** which allows the permanent use of Battery. Since the **Product Authorization** is part of the license agreement Battery will stop launching after 30 days if it was not authorized until then. Of course, it is also possible to complete the

Product Authorization after 30 days. In this case the software will launch again as soon as the **Product Authorization** has been completed.

Note: The data transfer at the online Product Authorization is done via a secure connection using 128 bit encryption. Native Instruments keeps your personal data like email and postal address in confidence. No data will be passed to a third party.

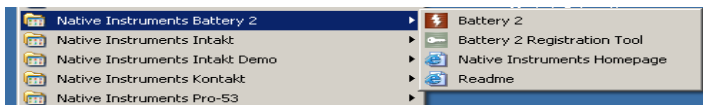
Conducting the Product Authorization

Native Instruments has set a high value on making the authorization procedure as easy and comfortable as possible. In the following sections we describe three methods of conducting the **Product Authorization**. We recommend **Method A** and **Method B** since these result in the easiest and fastest way of receiving the **Authorization Key**.

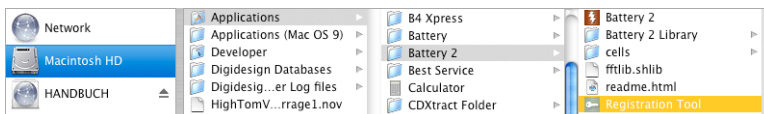
Method A: Battery computer has direct access to the internet

Important: This method requires a valid email address to complete the **Product Authorization**, since the registration code will be sent to you by email.

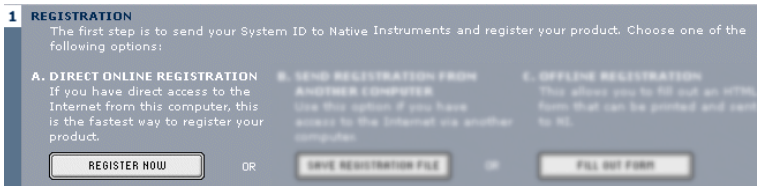
- **Windows:** Start the **Registration Tool** from the start menu (**Native Instruments Battery** ⇨ **Battery Registration Tool**) or from the Battery installation folder (default path: **C:\Program Files\Native Instruments\Battery 2**).



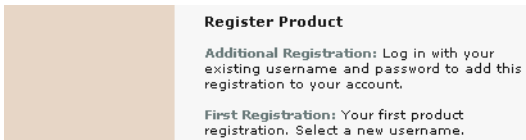
- **MacOS:** Start the **Registration Tool** from the Battery installation folder (default path: **Applications\Battery 2**).



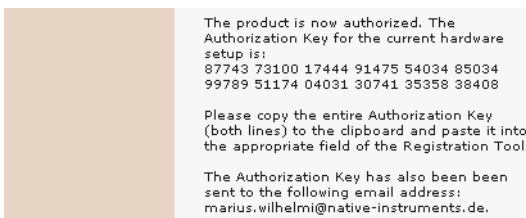
- A click on the **Register Now** button opens the Native Instruments registration webpage. Therefore your standard Internet Browser will be opened and an internet connection will be established according to your system settings. Your **System ID** will be automatically transmitted to the registration form.



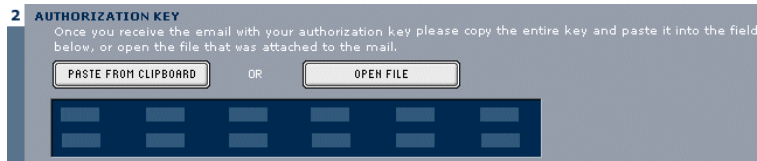
- On the first online page you are asked if it is your **First Registration** at Native Instruments or if you want to do an **Additional Registration**.



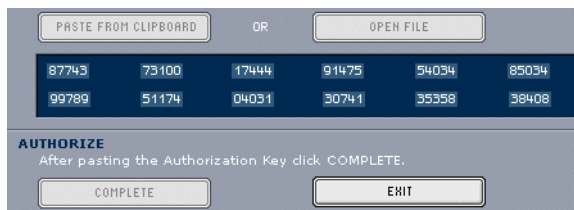
- Depending on the option you have chosen on the first online page you now get a login page asking for your username and password or a form where you can fill out your address data. Please fill out all required fields and follow the instructions on the screen to complete the registration.
- On the last online registration page your **Authorization Key** is directly shown in the browser. Please copy the full number (12 x 5 digits) and paste it to the registration tool. Within a few minutes you will also receive an email from the Native Instruments registration system containing the **Authorization key**. The **Authorization key** is available in the email body and additionally as text attachment. This email also contains the password which is required for using the online services.



- Start the **Registration Tool** again and either copy the **Authorization Key** from the email and press the **Paste from Clipb.** button in the Registration Tool or use the **Open File** button in the Registration Tool to open the email attachment which you previously have saved to hard disk.



- Click on the **Complete** button.



After completing the Product Authorization the Registration Tool looks like this

Now the Battery **Product Authorization** has been completed. The authorization message at every Battery start has disappeared and you can use the software permanently:

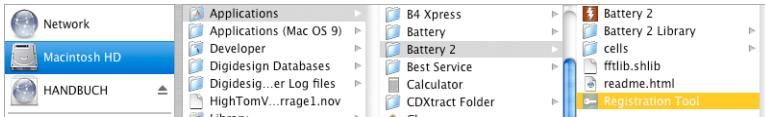
Method B: Internet Connection on another computer

Important: This method requires a valid email address to complete the **Product Authorization**, since the **Authorization Key** will be send to you by email.

- **Windows:** Start the **Registration Tool** from the start menu (**Native Instruments Battery 2** ⇨ **Battery Registration Tool**) or from the Battery installation folder (default path: **C:\Program Files\Native Instruments\Battery 2**).



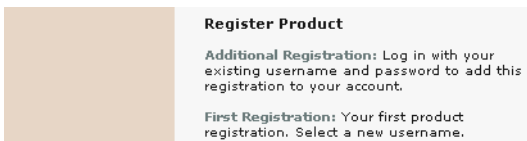
- **MacOS:** Start the **Registration Tool** from the Battery installation folder (default path: **Applications\Battery 2**).



- A click on the **Save Registration File** button opens a **Save** dialog for saving a HTML file. Save the HTML file to any storage medium.

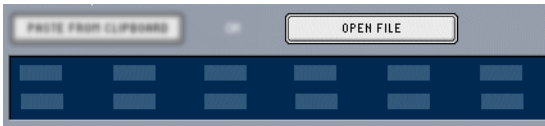


- Transfer the HTML file to another computer where you have internet access (via floppy disk, CDR etc.).
- Open the HTML file in your internet browser.
- The HTML page contains a link for the registration page on the Native Instruments website. When you click on this link an internet connection will be established according to your system settings.
- On the first online page you are asked if it is your **First Registration** at Native Instruments or if you want to do an **Additional Registration**.

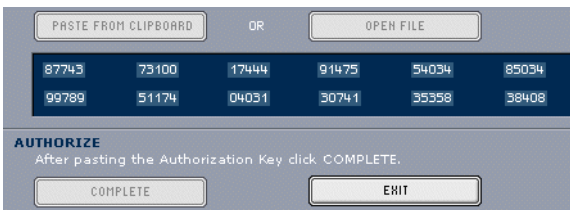


- Depending on the option you have chosen on the first online page you now get a login page asking for your username and password or a form where you can fill out your address data. Please fill out all required fields and follow the instructions on the screen to complete the registration.

- Within a few minutes you will receive an email from the Native Instruments registration system containing the **Authorization key**. The **Authorization key** is available in the email body and additionally as text attachment. This email also contains the password which is required for using the online services.
- Transfer the text attachment to the computer where you have installed Battery 2.
- Start the **Registration Tool** again and use the **Open File** button in the Registration Tool to open the email attachment which you previously have saved to hard disk.



- Click on the **Complete** button.



After completing the Product Authorization the Registration Tool looks like this

Now the Battery **Product Authorization** has been completed. The authorization message at every Battery start has disappeared and you can use the software permanently:

Method C: No Internet Connection available

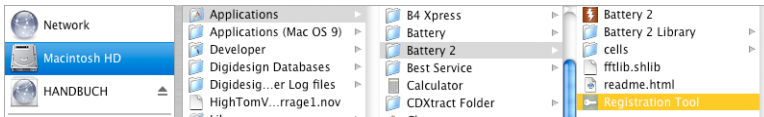
Important: Following this method you will have to fill in a form which you send to Native Instruments. You will receive the **Authorization Key** either by email (recommended), by postal mail or by fax. If you do not provide Native Instruments with a valid email address in the form, be prepared to type in the Authorization Key manually (about 60 digits).

If you do not have access to the internet or if you do not have a working email address, the **Product Authorization** can also be done via postal mail or fax. Although Native Instruments goes after a fast handling of your authorization requests, it is generally recommended that you prefer **Method A** or **Method B** for shortest return times and most comfortable operation. Please note the following instructions to fulfill the **Product Authorization**:

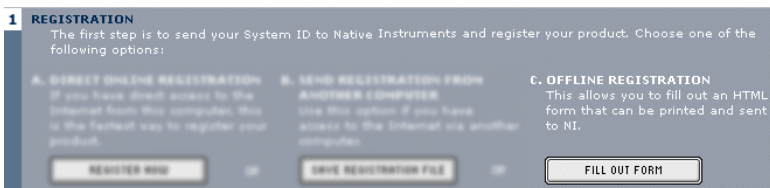
- **Windows:** Start the **Registration Tool** from the Windows start menu (**Native Instruments Battery** ⇒ **Battery Registration Tool**) or from the Battery installation folder (default path: **C:\Program Files\Native Instruments\Battery 2**).



- **MacOS:** Start the **Registration Tool** from the Battery installation folder (default path: **Applications\Battery 2**).



- A click on the **Fill Out Form** button opens a local HTML file in the operating system's standard browser or another program which you have defined as standard application for opening HTML files.



- The HTML file contains all information Native Instruments requires for completing the **Product Authorization** and registration. Please fill in the required data and print it out, or write a letter containing the data.

If you write a letter please attend to a legible handwriting to avoid mistakes at the Native Instruments registration team. Not legible email or postal addresses can cause problems with the **Authorization Key** delivery.

- Send the form to Native Instruments using one of the following contact addresses:

Native Instruments GmbH

Registration

Schlesische Straße 28

10997 Berlin

Germany

Fax: +49 30 61103535

Native Instruments USA

5631 A Hollywood Boulevard

Los Angeles

CA 90028

USA

Fax: +1-323-372-3676

- You will receive the **Authorization Key** via email (recommended), fax or mail.
- Start the Registration Tool again and either copy the **Authorization Key** from the email and press the **Paste from Clipboard** button in the Registration Tool or use the **Open File** button in the Registration Tool to open the email attachment which you previously have saved to hard disk. If you have received the Authorization Key by mail or fax, type it in manually.
- Click on the **Complete** button.

Now the Battery **Product Authorization** has been completed. The authorization message at every Battery start has disappeared and you can use the software permanently:

Registration support

If you run into problems during the **Product Authorization** the Native Instruments registration support team will be happy to help you. In this case send a support request on the NI website using the following URL:

<http://www.native-instruments.com/registersupport.info>

Please describe the occurred problem as accurate as possible and provide the registration support team with the necessary details to solve the problem.

Installation under Windows XP

System Requirements and Recommendations

To use the Battery software, you need a computer with the following minimum specifications:

Hardware

- Pentium III/Athlon with 400 MHz.
- 256 MB RAM
- up to 4GB free space on your hard disk
- A sound card compatible with Windows XP.

The audio engine in Battery has been designed to make optimum use of the available computing power in the CPU. The powerful FPU's integrated in modern CPUs are best suited to carrying out the complex computations of real-time synthesis. We recommend the following high-performance processors for using Battery : Pentium III or 4 with 1.2 GHz or faster, Athlon XP with 1.2 GHz or faster. We also recommend that you use a large amount of RAM (512 MB or more) that is optimally matched to the architecture of your processor.

Software

- Windows XP

Software Installation

- Insert the Battery DVD into the DVD-ROM drive.
- Use the Windows Explorer to view the contents of the DVD.
- Start the installation by double-clicking **Battery Setup.exe**.
- The setup program will suggest **C:\Program Files\Native Instruments\Battery2** as the path for the destination folder. You may also choose another folder if you wish.

Installed Folders, Files, and Links

The setup program creates a new folder called **Battery 2** in the installation directory (**Program Files\Native Instruments**). This folder contains the files required to operate the software.

If you do not choose a different program group during the installation, links to Battery and a ReadMe file are added to the Start menu under **Programs** ⇒ **Native Instruments**.

VST plug-in Installation

- Insert the Installation DVD into the DVD drive.
- Use the Windows Explorer to view the contents of the DVD. To start, double-click the **Battery 2 Setup.exe** file.
- When the choice is given by the installer, select **VST plug-in** from the list of components to install.
- You can now choose to automatically search for the VST plug-in folder or manually select the VST plug-in folder of your choice. Please select the option that best suits your installation requirements.

Note: If more than one host program for VST 2.0 plug-ins is installed on your computer, the installer lets you install to multiple VST-folders by shift-clicking them. If you decide to install them at a later date, simply copy the “**Battery 2 VST.dll**” file into the VST plug-ins folders of these programs. Windows: If the VST plug-in files are not visible in the Windows Explorer, select the **Show All Files** option. This option is located in the Explorer menu **View** ⇒ **Folder Options...** on the **View** tab below **Hidden Files**. Optionally, you can set up your programs so that they all use the same VST plug-ins folder.

DXi 2 plug-in Setup

DXi 2 is a plug-in interface for software synthesizers and instruments based on Microsoft DXi technology. Sonar from Cakewalk and Fruity Loops are the most well known host sequencers that support DXi.

Installation

- Insert the Installation DVD into the DVD drive of your computer.
- Use the Windows Explorer to view the contents of the DVD and double-click the **Battery 2 Setup.exe** file to start the installation.
- Continue the Battery installation until you come to the **Choose plug-ins** page. Tick the checkbox **DXi plug-in**.

The installation program copies the Battery plug-in to your hard disk and registers it as a DXi 2 plug-in for use in DXi 2-compatible host programs. After the installation, Battery appears as a plug-in in the host program.

Installation under MacOS X

System Requirements and Recommendations

To use the Battery software, you need a computer with the following minimum specifications:

Hardware

- Apple PowerMac G3 500MHz or faster (OS X)
- 256 MB RAM (OS X)
- Audio interface compatible with Core Audio
- CoreMIDI compatible MIDI interface for connecting a MIDI keyboard or an external sequencer (only for the stand-alone version)
- up to 4GB free space for the library.

The audio engine in Battery has been designed to make optimum use of the available computing power in the CPU. The parallel data processing expansions and powerful FPU's integrated in modern CPUs are best suited to carrying out the complex computations of real-time synthesis. Battery makes extensive use of these expansions in order to achieve optimum performance. As a minimum requirement, we recommend using a G4 1.0 GHz or faster with 512 MB RAM.

Software

MacOS 10.2.6

Installing Battery 2 OS X

- Insert the Installation DVD into the DVD drive of your computer.
- Double-click the installation program **Install Battery 2** to start it.

- The start screen appears first. After clicking **Continue** and confirming the license agreement, a dialog opens where you can select the installation location and the destination folder.

The installation program suggests a path for the Battery folder; if you do not select a different destination, the Battery folder is created on the first hard disk. You can choose between **Easy Install**, where both the stand-alone and plug-in versions are installed, or **Custom Install**, where you can select which versions you want to install.

MacOS Audio Unit plug-in Installation

- Launch the Battery Installer from the DVD
- Select the **Custom** installation type.
- Select only **Audio Unit** from the list of components to install.

Mac/Windows RTAS plug-in installation

- Launch the Battery Installer from the DVD
- Select the **Custom** installation type.
- Select only **RTAS** from the list of components to install.

Audio Interfaces

Audio interfaces, which include software routines called drivers, allow BATTERY 2 (and other programs you have installed, if present) to communicate with your computer's audio hardware. This section describes how to use various audio interfaces with BATTERY 2.

There are two main ways to implement BATTERY 2:

- As a "stand-alone" device that requires no host software. BATTERY 2's audio and MIDI connections interact directly with your computer's audio/MIDI hardware interface.
- As a plug-in that works in conjunction with a "host" program, such as sequencing or hard disk recording software. In this case, the host program interacts directly with the computer's hardware interface. BATTERY 2 connects to the host program via "virtual patch cords." BATTERY 2's audio outputs appear as signals in the host's mixer, and the host passes MIDI data to BATTERY 2.

We'll describe each mode in detail, but first let's look at the various interface drivers and plug-in formats used by different operating systems and programs.

Stand-alone Application

BATTERY 2 works in stand-alone mode with ASIO, MME, DirectSound, and Core Audio. The BATTERY 2/computer combination acts as an instrument, similar to a hardware digital synthesizer. For example, you can connect MIDI drum pads to your interface's MIDI input and trigger BATTERY 2's sounds, then run its outputs to an amplification system - instant electronic drums.

Interface/driver	Windows	MacOS X
ASIO 2.0	●	
DirectSound	●	
MME	●	
Core Audio		●

Plug-In

Used as a plug-in, Battery is not a stand-alone program but rather a program “module” that can be integrated into a “host” program such as a sequencer. plug-in mode allows you to integrate it seamlessly with the sequencer. Furthermore, it has many other uses as a plug-in:

- MIDI sequencing of Battery and audio mix-down of the MIDI tracks within a single program
- Comfortable automation of Battery parameters in the sequencer
- Further processing of Battery signals using additional plug-ins
- Sample-accurate timing with MIDI controllers (when used as VST 2.0 plug-in)
- Restoring of all plug-in settings when the host document (such as a song file of the sequencer) is loaded
- Integration with other instruments into a “virtual studio”

The shortcuts / key commands do not work in sequencers. This is due to the fact that the host capture keys for themselves and do not pass them on to the plug-in.

This table provides you with an overview of which interfaces are supported by which host programs:

Interface/driver	Host Programs	Windows	Mac
VST 2.0 plug-in	Cubase, Nuendo	●	●
Cakewalk DXi	Sonar	●	
Audio Units	Logic 6.x, 7.x		●
RTAS	Pro Tools 6.x, LE, Free	●	●

Overview of Operating Systems Interfaces and plug-ins

The interfaces described below are effectively different ways in which Battery can communicate with your sound card. The interfaces that are available on your computer depend on the sound card you are using as well as your computer platform (Windows or MacOS).

ASIO ("Audio Streaming Input Output") is a sound card driver architecture developed by Steinberg. ASIO is available for MacOS and Windows computers. It offers low latency and supports multichannel audio cards. With its high performance and low latency, the ASIO driver interface is highly recommendable.

DirectSound is an interface developed by Microsoft and is a component of DirectX 5.0 or higher for Windows 98/ME/2000/XP. Whether or not DirectX works well depends on the sound card you are using. If the audio buffer size that you set is too small with DirectSound, glitches and clicks may occur in the audio.

Important: The interfaces DirectSound and MME are not recommended. These have extremely high latencies.

MME is the standard "Wave" driver in Windows. Most sound cards support this interface and work with it quite well. However, MME is even less suitable than DirectSound for real-time applications. This is noticeable by a comparatively high latency.

DXI 2 is a plug-in interface for software synthesizers and instruments based on Microsoft DXi technology. Sonar from Cakewalk and Fruity Loops are the most well known host sequencers that support DXi.

VST is the plug-in format of the company Steinberg. It is a cross platform format and can be used in many hosts.

Core Audio is a new audio interface available with MacOS X that allows you to use external audio hardware as well as the integrated audio output of the Mac.

Audio Units is an OS X plug-in format developed by Apple. Audio Units plug-ins work similar like VST plug-ins.

RTAS is based on an interface protocol from DigiDesign that allows you to use plug-ins with ProTools (or other software that is compatible with DigiDesign). RTAS plug-ins function independently from additional TDM hardware and are nonetheless able to offer the widest range of features. In this case, the host processor alone performs all of the computations for the plug-in.

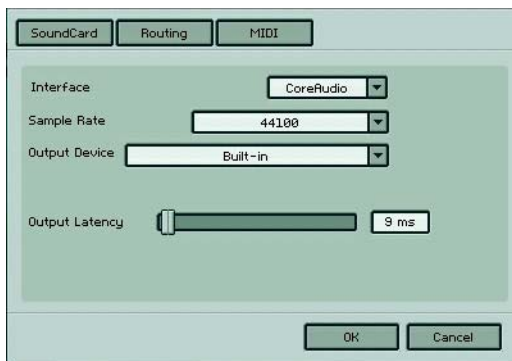
Battery 2 as Standalone

When used as a plug-in, the host program has already set up its audio and MIDI connections, and BATTERY 2 simply "plugs in" to these. However, with stand-alone operation BATTERY 2 communicates directly with your audio interface. It's therefore necessary to specify audio and MIDI settings, as well as the preferred driver protocol (of course, plug-in format is not an issue).

Setup for Mac and Windows machines is essentially identical, except where indicated. Note that if you change your audio interface, you will almost certainly need to re-adjust these settings.

Call up the **Audio + MIDI Settings** setup dialog from the **File** menu. You'll see three tabs for **SoundCard**, **Routing** (audio output patching), and **MIDI**.

Soundcard (Audio Interface)



Audio + MIDI Settings dialog

Interface: Choose the fastest interface protocol supported by your interface, which will be ASIO or Core Audio. For Windows, you can also use DirectSound and Multimedia (also called MME), but expect a significant delay between the time you play a note and the time you hear it.

Windows only: Avoid using any drivers listed as "emulated," as they provide poorer performance than other drivers. For example, although DirectSound drivers generally outperform MME drivers, MME drivers will outperform emulated DirectSound drivers.

Sample rate: The drop-down menu will display compatible sample rates for your audio interface. 44.1kHz is the same sample rate used for CDs, and is the most "universal" choice. However, some audio interfaces offer 48kHz and 96kHz (Battery accepts up to 96kHz sample rates). These higher rates stress your computer more, but offer somewhat better high frequency response. If you are using Battery standalone, choose whichever rate you prefer. When used as a plug-in with a host program (*e.g.*, Cubase, Digital Performer, Logic, Sonar, etc.), the host will determine the sample rate.

Output Device: Use ASIO written specifically for your audio interface (not "ASIO DirectX" or "ASIO Multimedia," unless no other choices are available), or for the Mac, Core Audio.

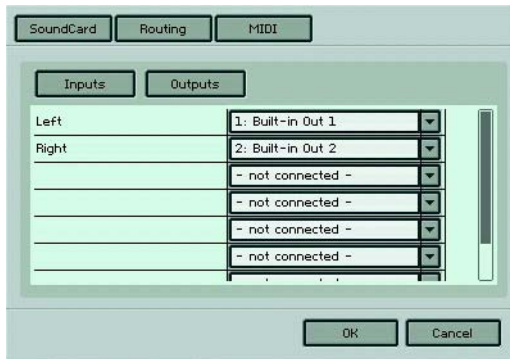
Output Latency: This field displays the output latency. For some drivers you can adjust the latency individually using a fader.

Adjust latency for the fastest possible setting that gives consistent audio performance. The CPU may not be able to keep up with fast settings, resulting in possible crackles or pops in the audio. Slower settings will give more consistent audio performance, but the amount of delay may be musically unsatisfying.

Experiment with the latency setting until you find the best compromise between consistent audio performance and fast response. A quick way to adjust latency is as follows:

- Select any drum kit and play it while moving the Latency slider.
- Move the Latency slider to the left until you start to hear clicks in the audio output.
- Now move the slider to the right until the clicks disappear. This is the optimum setting.

Routing



Using the drop-down menu, Battery's Output 2 is being assigned to an output from a multi-output sound card.

If your sound card offers multiple outputs, you can choose which ones connect to Battery. Click on **Outputs** to select the outputs from drop-down menus.

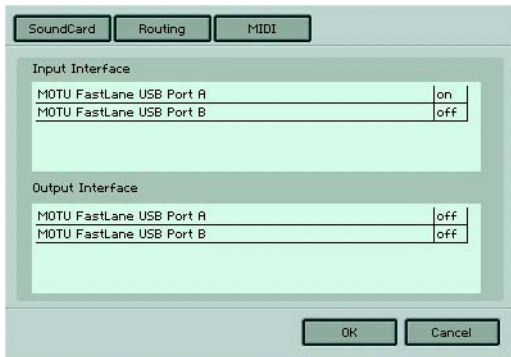
BATTERY 2 provides up to 16 monophonic outs. Using all of these in stand-alone mode requires an audio interface with eight (or more) output channels.

However, it is not necessary to have this many channels. For example, if a notebook computer has built-in audio and offers only a single stereo output (two channels), you can assign all the BATTERY 2 drum sounds to the stereo output.

Each drop-down list shows what outputs are available from the driver/audio interface selected under the Interface tab. Assign each BATTERY 2 "software" audio out (Channel 1/2 Left, Channel 1/2 Right, Channel 3/4 Left, Channel 3/4 Right, Channel 5, Channel 6, Channel 7, and Channel 8) to the desired hardware output.

Windows only: The audio interface's overall level may be determined by a mixer applet included with your interface hardware, or the built-in Windows mixer. If you encounter excessively low or high levels, please check the Windows volume control by going Start > Programs > Accessories > Entertainment > Volume Control. Then check the Wave volume slider, and adjust its level as needed.

MIDI



If your MIDI interface offers multiple ins and outs, you can choose which one connects to Battery. When you click on the MIDI tab you'll see a list of MIDI I/O. Initially, each one will be Off. This field is a toggle – click on Off to turn an input or output On, click on On to turn an input or output Off.

- If you enable more than one input, they will be merged.

Battery 2 as Plug-In

VST 2.0 plug-in

In addition to the stand-alone version, Battery can also be used as a VST Audio Effect plug-in. The advantages of the VST 2.0 format allow us to provide you with a powerful plug-in.

For more information on the VST 2.0 format, refer to the user guide provided with your VST host program.

Using the Battery plug-in in Cubase SX 2

- Launch Cubase, go to the **Devices** menu option and select the **VST Instruments** menu option or press F11 on your keyboard.
- A window showing the instrument rack appears. Click on an empty slot and choose Battery 2 from the available list of instrument plug-ins.



- The plug-in will now appear in your list and automatically be turned on. It will also create a set of audio channels in your VST mixer that will be used for mixdown within your project. This will allow you to mix, pan, and process Battery's output just like any other existing audio track in your Cubase song.
- Click on the **Edit** button to call up the Battery interface. Here you can control and edit all the features and functions that Battery has to offer.
- Now go to the "Project" page and add a MIDI track (if you do not have one already created).



- Go to the **Output** parameter section for this MIDI Track and click on the field. This will create a list of available MIDI out ports to assign to this MIDI track. Choose **Battery** from the list.

Note: If Battery does not appear in the list of available VST instruments inside your VST 2 host application, then it is not installed correctly. Please refer to the previous section on installing the plug-in for both Windows and Mac platforms for more assistance on setting this up.

After having loaded an Instrument from the library you should be able to trigger it via MIDI using a keyboard controller. Battery's sound will generate through the VST mixer and directly to your sound card. If the plug-in does not receive MIDI or generate audio, then make sure to check the following areas:

- Make sure "MIDI thru" is enabled in Cubase.
- The MIDI channel of your MIDI track must correspond to the receive channel of the loaded instrument.
- Make sure that you have properly configured your sound card for use with Cubase.

(please refer to your Cubase manual for more information)

Using the Battery plug-in in Nuendo 2.0

- Launch an empty or current project in Nuendo.
- Click on the **Devices** menu and choose **VST instruments** from the menu options (or press F11 on your keyboard).
- A window showing the instrument rack appears. Click on an empty slot and choose **Battery 2 VST** from the available list of installed plug-ins.



- The plug-in will now appear in your list and automatically be turned on. It will also create a set of audio channels in your VST mixer that will be used for mixdown within your project. This will allow you to mix, pan, and process Battery's output just like any other existing audio track in your Nuendo project.

- Click on the **Edit** button to call up the Battery interface. Here you can control and edit all the features and functions that Battery has to offer.
- Now go to the "Project Editor" page and create a MIDI track (if you do not have one already created).
- Go to the **Output** parameter section for this MIDI Track and click on the field. This will create a list of available MIDI out ports to assign to this MIDI track. Choose **Battery 2 VST** from the list. Also make sure you assign the MIDI input port to correspond to whatever MIDI controller you are using.



- Record enable the MIDI track.

Note: If Battery does not appear in the list of available VST instruments inside your VST 2 host application, then it is not installed correctly. Please refer to the previous section on installing the plug-in for both Windows and Mac platforms for more assistance on setting this up.

After having loaded an Instrument from the library you should be able to trigger it via MIDI using a keyboard controller. Battery's sound will generate through the VST mixer and directly to your sound card. If the plug-in does not receive MIDI or generate audio, then make sure to check the following two areas:

- Make sure "MIDI thru" is enabled in Nuendo.
- The MIDI channel of your MIDI track must correspond to the receive channel of the loaded instrument.
- Make sure that you have properly configured your sound card for use with Nuendo

(please refer to your Nuendo manual for more information).

Using the Battery plug-in in Logic

- Launch Logic and create an audio instrument track or set an existing audio or MIDI track to an audio instrument track by clicking on it, holding down the mouse button and choose **Audio** ⇒ **Audio Instrument** ⇒ **AudiInst 1**.



- Double click the audio instrument track to open the environment window. Logic scrolls automatically to the first instrument bus in the Logic mixer.
- Choose the Battery 2 Audio Unit/VST plug-in in the appropriate insert slot of the instrument mixer bus, either in the arrange or mixer window. Then click onto the insert slot, hold down the mouse button and choose **Stereo** ⇒ **Audio Units/VST** ⇒ **Native Instruments** ⇒ **Battery 2**. (Battery is also available as a multi-channel insert)



- The plug-in now appears in the instrument slot and is ready to use. The instrument mixer channel will allow you to mix, pan, and process Battery's output just like any other existing audio track in Logic.
- If the Battery interface is not already open, double click on the mixer's Battery slot to call up the Battery interface. Here you can control and edit all the features and functions that Battery has to offer.

Note: If Battery does not appear in the list of available VST instruments inside your VST 2 host application, then it is not installed correctly. Please refer to the previous section on installing the plug-in for both Windows and Mac platforms for more assistance on setting this up.

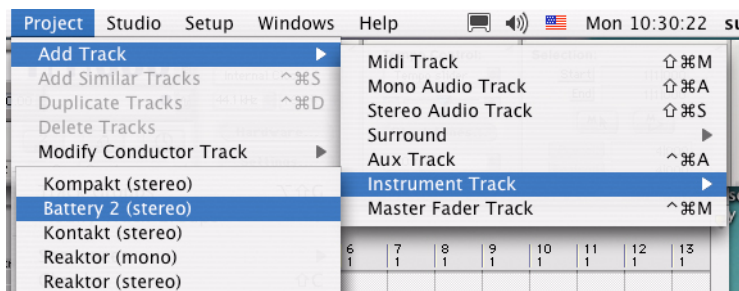
After having loaded an Instrument from the library you should be able to trigger it via MIDI using a keyboard controller. Battery's sound will generate through the VST mixer and directly to your sound card. If the plug-in does not receive MIDI or generate audio, then make sure to check the following two areas:

- Make sure "MIDI thru" is enabled in Logic.
- The MIDI channel of your MIDI track must correspond to the receive channel of the loaded instrument.
- Make sure that you have properly configured your sound card for use with Logic.

(please refer to your Logic manual for more information).

Using the Battery Audio Units plug-in in Digital Performer 4.1 (or higher)

- Launch Digital Performer and create an instrument track by selecting **Project** ⇒ **Add Track** ⇒ **Instrument Track** ⇒ **Battery 2**.



- Create a MIDI track by selecting **Project** ⇒ **Add Track** ⇒ **Midi Track**. In Digital Performer's track overview window (or in the sequence editor window) assign the output of this MIDI track to "Battery 2-1" and a MIDI channel. If you instantiate further Battery 2 Plug-Ins they will be named "Battery 2-2", "Battery 2-3" etc.



- The plug-in is now ready to use. The mixer of Digital Performer will allow you to mix, pan, and process Battery's output just like any other existing audio track.
- To play Battery with your keyboard, record enable the MIDI track which you have routed to Battery and make sure **Midi Patch Through** is enabled in the Studio menu of Digital Performer.
- Double click on the Battery slot in Digital Performers mixing board to call up the Battery interface. Here you can control and edit all the features and functions that Battery has to offer.

Note: If Battery does not appear in the list of available Audio Unit plug-ins inside your Audio Units host application, then it is not installed correctly. Please refer to the previous section on installing the plug-in for Mac platforms for more assistance on setting this up.

After having loaded an Instrument from the library you should be able to trigger it via MIDI using a keyboard controller. Battery's sound will generate through Digital Performers mixer and directly to your sound card. If the plug-in does not receive MIDI or generate audio, then make sure to check the following two areas:

- Make sure **Midi Patch Through** is enabled in the Studio menu of Digital Performer.
- The MIDI channel of your MIDI track must correspond to the receive channel of the loaded instrument.
- Make sure that the instruments track output is correctly set.
- Make sure that you have properly configured your sound card for use with Digital Performer.

(please refer to your Digital Performer manual for more information).

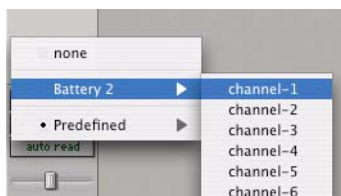
Using Battery RTAS with Pro Tools 6.x under Mac and Windows

The RTAS format is an interface protocol for Mac OS and Windows that allows you to use plug-ins with ProTools independently from additional TDM hardware, while nonetheless offering the widest range of features. In this case, the host processor alone performs all of the computations for the plug-in.

- Launch Pro Tools
- Create a new **AUX** track **File** ⇨ **New Track**
- Create a new **MIDI** track the same way
- Locate the channel mixer **Windows** ⇨ **Show mix**
- The dark grey box at the topmost section of the AUX channel is the RTAS insert section. Click on the first empty slot to show all available RTAS plug-ins.
- Choose **Battery** from the menu



- Now locate the **MIDI** channel you just created
- In the output slot, choose Battery and the appropriate channel



After recording enabling the midi track, you will be able to play Battery with your midi keyboard.

(Please refer to your Pro Tools manual for more information on how to record Battery's output).

DXi 2 Plug-in

Using Battery in Sonar

- Launch Sonar
- In the synth rack choose **Battery 2 DXi**.



Loading the Battery DXi plug-in in the synth rack

- Route a MIDI track to the DXi 2-Plug-in by selecting **Battery 2** in the Out drop down list.



Assign a MIDI track to the Battery 2-DXi-Plug-in

Using Battery 2 in Garage Band

- Launch Garage Band
- Press the “+” button to create a new “Software Instrument” Track. From here you can choose the icon you wish to use.
- Double-click the instrument track icon or press the “I” icon to get the Track Info.
- From the Info window expand the Details triangle underneath the Instrument icon to expose the track settings.

- From the Generator drop-down menu, choose Battery 2 from among Audio Unit plug-ins.



- Clicking on the pencil icon next to the “Manual” drop-down menu will open the Battery interface for editing.
- Battery can now be played using an external midi keyboard or auditioned by clicking on the preferred cells.

The Drum/Sample Matrix consists of a number of rows and columns. At the intersection of each row and column is a *Cell*, which you can consider as a particular “drum” (or other sound – some people use BATTERY 2 to play back sound effects or even bass lines).

Each Cell can contain up to 128 samples. If the Cell contains multiple samples, they can be layered and/or velocity-switched (e.g., different velocity levels trigger different drum samples to give realistic dynamics or special effects).

The matrix can contain up to 72 Cells, viewable as 9 (54 cells) or 12 columns wide. You can add or delete rows as desired so that the matrix doesn’t take up no more space than needed.

One reason for setting up Cells as rows and columns is that this allows for powerful mute, solo, copy, paste, and delete options. For example, not only can you mute and solo individual Cells, but also individual rows and/or columns. You could organize 12 percussion instruments as one row in a matrix that’s 12 columns wide; to hear just the percussion, you would solo just that row. Or you could mute just the percussion and listen to everything else, delete just the percussion, etc.

The Edit Pane



Note the small triangle in the upper right corner. This is a shortcut to show/hide the Edit Pane. The function key F2 will also perform the same action.

The Edit Pane works on the Cell level, just as the Master Section works on a global level and the Drum Matrix works on a kit level. Here is where you can map samples within a cell, add expressive signal processing such as modulation, filtering, and dynamics, set

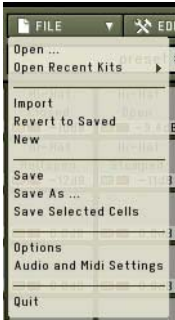
up loop points for a sample, alter pitch, assign outputs, and much more. The Edit Pane is your key to drum kit customization and personalization.

The next few sections cover each element in detail.

The Master Section

File Menu: Loading Kits and Sounds


There are several ways to load complete kits and individual sounds into BATTERY 2. We'll start with the master section File Menu.




There are two ways to call up the File Menu: From the menu bar (stand-alone mode only) or from within the program itself.

When you access these functions from the menu bar's File menu, you can also see the keyboard equivalents for calling up some of these functions:


The shortcuts / key commands do not work in host sequencers. This is due to the fact that the hosts capture keys for themselves and do not pass them on to the plug-in.


New (PC: Ctrl+N/ MAC )

Open (PC: Ctrl+O / MAC )

Open Recent kits...

Import (F1)

Save (PC: Ctrl+S / MAC )

Save As... (PC: Ctrl+Shift+S / MAC )

Save Selected Cells

Revert to Saved

Options

Audio and MIDI Settings

New

Use this when you want to create a new, blank kit. The Cells have no contents, and use default parameter settings.

Open

When selected, a file selection box appears that recognizes all file types supported by BATTERY 2. This is a somewhat “intelligent” function. For example, if you load a kit, as expected it will replace the existing kit with a new kit (and ask you first if this is what you want to do).

If you load a Sound Font™ file (which will likely contain multiple samples), your current kit will be replaced and the various samples will be mapped in cells from left to right beginning with row A.

On the other hand if you have selected a single Cell and choose a WAV or AIF file, it will load into only that Cell. If you Ctrl-click on several WAV or AIF files, it will load all of them, starting at the currently selected Cell. As expected, opening a .cel (Cell) file will load one or more Cells (depending as what was saved as the .cel file), starting at the selected Cell.

The bottom line is that BATTERY 2 makes it easy to load/import a variety of sounds or kits in a very flexible way. Supported file types are:

Kontakt™ Instruments (*.nki)

Cells (*.cel)

Battery™ 1 kits (*.kit)

Battery 2™ kits (*.kt2)

Wave audio (*.wav)

AIF audio (*.aif, *.aiff)

MPC samples (*.snd)

HALion™ (*.fxp)

Samplecell™ (*.bnk)
LM4™(*.txt)
SF2™ (Sound Font) container (*.sf2)
Gigasampler™ container (*.gig)
REX files (*.rex)
REX2 files (*.rx2)
Sound Designer II (SD2) files (*.sd2)
AKAI™ S1000/S3000

Open Recent Kits

This displays a list of your most recently used kits. It's like a "favorites" function, as you can return quickly to a kit used in a recent project.

Import



Those who like to browse, drag, and drop will probably prefer the import function.

Import opens up a file browser for viewing your computer's "file tree." All supported file types can be loaded from this window. In addition you can load and browse in Native Instruments' monolith container files (.nks), AKAI™ S1000/S3000 and Gigasampler™ .gig files. If you drag a kit into the drum/sample matrix, BATTERY 2 will open the kit. But you can also drag individual sound files (e.g., WAV and AIF) to Cells, as well as drag over .cel files to Cells.

Note the **Volume Slider**, **Auto** button, and **Listen** button toward the top of the Import browser. With individual sample, clicking on Listen will play the sample, at the volume set with the slider. Click on Auto to automatically audition a sound as soon as it is selected.

Save

This saves the current kit and overwrites the kit's previously-saved version. If you Save a kit that has never been saved before, it will be treated the same way as the "Save As..." option described next.

Save As...

This saves the kit, but presents the option to specify a different file name and location. Furthermore, there are three saving options:

Patch Only (Cell settings along with pointers to where samples reside on your hard disk). This file references samples, but does not include them in the file, thus producing a smaller file size than if the samples were included. Checking **Absolute Sample Paths** forces BATTERY 2 to look in a specific path to find the associated samples.

Patch and Samples. Here you can choose a directory into which the samples will be saved. This is a good **Save As...** choice if you want a "transportable" patch, for example, when collaborating with another musician. Send the musician the patch and directory containing the samples, and it will be possible to reproduce exactly the kit and sounds you used.

The default **Save As...** option is for **Patch and Samples** since this continues to be the surest way that you will always be able to load your kits and as quickly as possible. This being because they are saved all in one folder. If your kits are built with samples from multiple folders, then it is best to use **Absolute Sample Paths**. However, please be aware that renaming folders or moving them may result in having to relocate the used samples. In this case, please find them and then resave your kit.

Save Selected Cells

You can save one or more Cells as a .cel file. This function allows you to name the .cel file and choose its location. Hold down the **shift or ctrl/⌘** key and make your selection. When finished, use this function to save them as a .cel file.

Revert to Saved

When creating kits, it's a good idea to Save frequently (as described later) in case you “over-edit” and wish you had stayed with a previous version. This function returns the current kit to its last saved state.

Options

Most processing parameters within BATTERY 2 can be assigned to any of 8 MIDI controller “channels,” labeled A-H. The Options menu lets you assign these channels to specific MIDI controller numbers, such as 7 (volume), 1 (mod wheel), etc. These controllers can be used as modulation sources.

Velocity curve: If using a MIDI keyboard you can customize the way the Battery 2 responds to your MIDI keyboard by using the Velocity Curve Control.

Key follow: selects the cell(s) for editing when key input is received from your MIDI keyboard.

Trigger cell on select: Plays the cell by selecting it.

Trigger sample on velocity map: Plays the velocity layer's audio when selecting it in the velocity map.

Lock cell display to parameter: With this enabled you have your choice of a locked parameter that each cell displays underneath itself. When disabled this value changes depending on which parameter you edit.

Battery 2 Library path: Setting this directory allows quick access to the Battery 2 library from the “fast find” drop-down menu.

Audio and MIDI Settings

This brings up the dialog boxes for stand-alone mode where you can change SoundCard drivers, Routing, and MIDI assignments, as described earlier.

Exit/Quit


This closes BATTERY 2, and asks if you want to save your work before quitting.


Edit Menu: Modify the Cells



As with the File Menu, you can call up the Edit Menu from the menu bar (stand-alone mode only) or from within the program itself.

When you access these functions from the menu bar's **Edit** menu, you can also see the keyboard equivalents for calling up the following functions:

Copy (PC: Ctrl+C / MAC: +C)

Paste (PC: Ctrl+V / MAC: +V)

Randomize (PC: Ctrl+R / MAC: +R)

Copy

Copies all selected Cell(s).

Paste

Pastes cell(s) into the drum / sample matrix. If multiple Cells were copied, they will paste starting at the selected Cell.

Delete

Deletes all selected Cells. *Note:* In the section on the drum/sample matrix, we will cover the various ways to select multiple Cells and groups of Cells for Copy, Paste, and Delete operations.

Swap

If two Cells are selected, this function switches them. For example, if the first Cell in Row A and the second Cell in Row B are selected, choosing Swap will place the contents of the first Cell in Row A into the second Cell in Row B, and the contents of the second Cell in Row B into the first Cell in Row A.

If multiple Cells are selected, then all will be swapped based on the number of Cells selected and the order in which they were selected. For example, if the first five cells of a row are called A, B, C, D, and E, you select them in that order, and then choose Swap, the new order will be E, D, C, B, A.

Randomize

This places any selected Cells at random locations within the drum matrix. Try this if you're getting into a creative rut and want to shake things up a bit!

Consider saving your kit before using Randomize so that you can "Revert to Saved" if desired.

View Menu: Alter the Workspace



As with the File and Edit Menus, you can call up the View Menu from the menu bar (stand-alone mode only) or from within the program itself.

Add Row

This will be visible only if there are fewer than six rows. Select this to add another row to the bottom of the existing rows.

Delete Row

This will be visible only if there is more than one row. Select this to delete the lowest row from the bottom of the existing rows.

This function always deletes the lowest row; do not confuse it with the Delete function, which deletes the contents of *any* selected row.

Matrix Size (9 x “n” or 12 x “n”)

This chooses whether the matrix will have 9 columns or 12 columns. This setting is independent of the number of rows.

Hide Details

Disables the cell information that appears when mousing over a cell.

Hide Edit Pane

This shows/hides the Edit Pane, and duplicates the show/hide shortcut button located toward the upper right of the Edit Pane.

Cell Settings, Velocity Mapping, Modulation, Filter, Compressor, Loop

The Edit Pane's left side offers views of several different groups of parameters, which saves space compared to showing them all at once. There are two main ways to select a particular parameter group:

- Click on the corresponding tab in the Edit Pane (Cell, Map, Mod, Filter, Comp, Loop)
- Call up the desired group by selecting the corresponding item in the View menu.

Yet another method (stand-alone mode only) is to use the View menu in the menu bar. This also shows the keyboard equivalents for calling up these functions:

Hide Edit Pane (F2)

- Cell Settings (F3)
- Velocity Mapping (F4)
- Modulation (F5)
- Filter (F6)
- Compressor (F7)
- Loop (F8)

Library “Fast Find”



You can step through kits rapidly with the + and — buttons, as well as select kits from within the BATTERY 2 Library folder.

The Library Fast Find section under the File, Edit, and View menus browses the kits located in the BATTERY 2 Library folder (located within the BATTERY 2 program folder). Click on the name for a drop-down menu of kits within the Library. You can also load the next kit in the Library by clicking on the (+) button, or the previous kit by clicking on the (–) button.

Master Volume Control



The Master Volume control and associated display field allow for precise level setting, whether in stand-alone mode or used with a host.

The Master Section volume control sets the overall level for all outputs used by the kit. The display field to the left of the control provides a precise numeric readout of the control’s setting. This is handy if, for example, the mixer in your host shows that BATTERY 2 is overloading a mixer channel by 0.6dB, even though BATTERY 2’s level is set to 0.0dB. You can then use this information to reduce BATTERY 2’s level control to -0.7dB, thus insuring the host mixer will not distort.

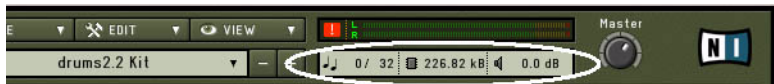
Output Meter

The output meter shows the total level of the signals being produced by BATTERY 2. To avoid distortion, avoid having the meters go into the red.

Panic! Button

The red exclamation mark to the left of the output meters is there for those moments when things get a bit hectic. This cuts off all playing notes.

Data Fields



Use the data fields to check polyphony, the amount of memory required by the current kit, and the master volume level.

We already covered the right-most data field, which shows the master volume level. The left-most data field indicates the amount of polyphony being used. For example, if it shows 4/32, then four out of 32 voices are being used. The voice filed is editable. Click and enter the maximum ployphony by hand or drag the mouse up or down.

The middle field shows how much memory the kit requires.

The Drum/Sample Matrix

The Drum/Sample Matrix is where you assign samples to Cells, check info about Cells, mute and solo layers (rows and columns) of Cells, and copy/paste/delete individual Cells or groups of Cells. More detailed Cell editing occurs in the section Edit Pane.

Loading a kit loads samples into the matrix's Cells, and sets any Cell-related parameters to the same values as when the kit was saved.

Various View commands let you modify the Drum/Sample Matrix by adding or deleting rows, and changing the number of columns in the matrix. These functions were described in the previous section, and can be accessed from the View menu in the Master Section (as well as from the View menu option on the menu bar when in stand-alone mode).

Cell Contents

Each Cell contains up to 128 samples (layered and/or velocity-split) and a set of parameters that affect the sound. These include key range (the range of notes to which the sound will respond), volume, pan, tuning, compression, modulation, etc. Although BATTERY 2 is a drum sampler, you can of course load any sample into a Cell – background vocals, sound effects, phrases, scratches, notes, whatever.

Auditioning Cells

To hear what's in a Cell, click on it with the mouse, or feed it a MIDI signal that triggers the Cell (as specified in the Edit Pane). When BATTERY 2 receives MIDI from a sequencer or other MIDI device, cells that are sounding have a blue "backlight."

Get Cell Info



Holding your cursor over a Cell reveals info concerning several parameters.

To see several crucial Cell parameter values (Name, Key Range, Root Key, Volume, Pan, and Tune) at a glance, hold your mouse's cursor anywhere over the Cell for about half a second. Active functions (i.e. loop, compressor, filter) will also be shown in this list. This is for informational purposes only; you cannot edit these parameters from this particular view.

Copying and Moving Cells

Cells are freely movable among Cells. For example, suppose you have a great snare drum, but it sounds too mechanical when you trigger it repeatedly. You can copy the Cell contents to another Cell, make a few small changes to the copy (e.g., a slight pitch change), then alternate hits between the two Cells. This gives a more "humanized" effect.

Following are the procedures for manipulating Cell contents.

If you move a source Cell to a non-empty destination Cell, then the destination Cell's contents will replace the source Cell's contents – in other words, an automatic swap function. If you move a source Cell to an empty destination cell, then the source Cell becomes empty after the move is complete.

Move Cells (default): Click on the source Cell you want to move, and drag it to the destination Cell. The destination cell's keyrange will be used. Moving a cell to an occupied cell will swap them.

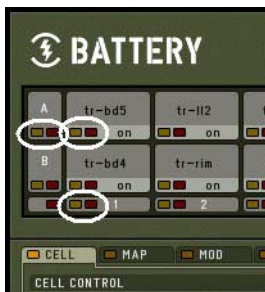
Move a Cell with key range to another Cell: Alt+drag (PC); ⌘+drag (Mac) on the source Cell you want to move, and drag it to the destination Cell. This moves the cell, the key range and root key.

Copy a Cell to another Cell: Ctrl+drag (PC); Alt+drag (Mac) on the source Cell you want to copy, and drag it to the destination Cell. The destination cell's keyrange will be used.

Copy a Cell with key range to another Cell: Alt+Ctrl+drag (PC); ⌘+Alt+drag (Mac) on the source Cell you want to copy, and drag it to the destination Cell. This copies the cell, the key range and root key.

You can access several more Cell-related functions by right-clicking on the Cell. See the section “Right-Click Cell Edits.”

Cell Solo and Mute



Each row, column, and Cell has a solo and mute button.

Each Cell, row, and column has two LEDs – yellow (solo) and red (mute).

- Click on the red LED to mute the Cell, row, or column. Click on it again to unmute.
- Click on the yellow LED to solo the Cell, row, or column. Click on it again to cancel.

The solo function is additive (not a “radio button”-type function): You can solo multiple Cells, rows, and columns. Solos can also be combined; for example, solo a row *and* a column.

If *all* Cells in a row or column are muted or soloed, the row's or column's mute or solo LED will be lit. If a column or row contains a combination of soloed and muted Cells, then it will have no lit row or column LEDs.

Selecting and Editing Cells


Parameter-related editing operations (modulation, pan, tuning, etc.) affect ALL SELECTED Cells. For example, if you select an entire row of Cells and change tuning, all Cells within that row will have their tuning changed. As a result, BATTERY 2 includes flexible ways to select anything from a single Cell to various groups of Cells.

Selecting Cells



Select any arbitrary collection of Cells by Shift-clicking on them.

Select an individual Cell: Click on it.

Select discontinuous Cells: Ctrl-click (PC) / -click (Mac) on the Cells to be selected.

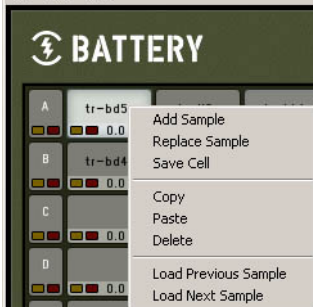
Select continuous cells (not a row/column): Shift-click the first and last cell in the range.

Select a row of Cells: Click on one of the row letters to the left of the matrix (A, B, C, etc.).

Select a column of Cells: Click on one of the column numbers on the bottom on of the matrix (1, 2, 3, etc.).

Shift- or Ctrl-clicking applies to rows and columns as well as individual Cells. For example, if you Shift-click on rows A and C, all the Cells in both rows will be selected. If you Shift-click on row C and column 3, all the Cells in row C and column 3 will be selected.

Right-Click Cell Edits



Common Cell edit functions are only a click away.

Right-clicking on a Cell offers several editing functions:

Add Sample: Opens a dialog box where you can navigate to a sample you want to add to the Cell.

Note that if you open a kit, it will replace the existing kit.

Replace Sample: Opens a dialog box where you can navigate to a sample. If you select this, it will replace the Cell's current contents.

Save Cell: Opens up a “tree” view where you can choose a folder into which the Cell will be saved under its current name.

Copy: Copies the Cell.

Paste: Pastes the Cell into the currently selected Cell.

Delete: Deletes the Cell.

Load Previous Sample: With multi-sampled sounds, samples are often saved in a folder and named so they can be differentiated easily (e.g., KickLowVel, KickMedVel, KickHiVel). Selecting this option loads the previous sample in the series compared to the existing sample within the Cell.

Load Next Sample: This is similar to Load Previous Sample, but loads the next sample in the series compared to any existing sample within the Cell.

The same loading functions are available as + and - in the Cell tab view. There it is called **sample**.

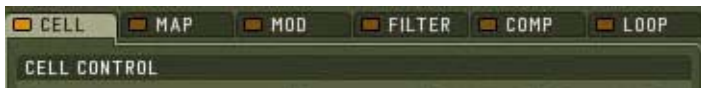
The Edit Pane

This is where you can take your creativity to the max by manipulating drum and other samples with anything from subtle to extreme processing. It's also a place where you can do Cell "housekeeping," such as making MIDI trigger and controller assignments.

Edit Pane Overview

There are four main sections to the Edit Pane.

Cell Control and Processing Views: The six tabbed sections (Cell, Map, Mod, Filter, Comp, and Loop) let you organize samples within a Cell, as well as process them in multiple ways.

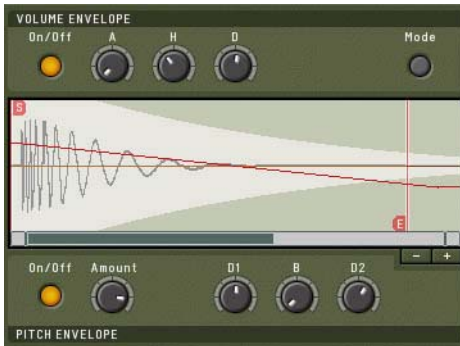


Modify: The Modify parameters affect the Cell, including the composite sound if it contains multiple samples.



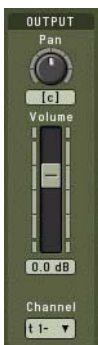
These four controls affect tuning, as well as offer various "lo-fi" and "bitmashing" options.

Envelope: Each sample can have its own amplitude and/or pitch envelope. A typical envelope application would be to program a drum sound with a looped, ringing tone, then superimpose an amplitude envelope to create a natural-sounding decay.



You can see both the amplitude and pitch envelopes simultaneously in this window.

Output: Set the Cell's overall level, pan (position in the stereo field), and choose an output from the various multiple outputs.



Think of this as one channel in a mixer that mixes together the various Cells.

Three Very Important Points!

- Remember that altering most of these parameters can affect everything from a single Cell to all Cells in the matrix, depending on which Cells you have selected.

- One extremely cool feature is that when you select a parameter for editing, the Info Strip toward the bottom of each Cell shows the status of that same parameter for each Cell. For example, if you tweak the Pan parameter, you'll see the current pan position for all Cells in their info strips. This makes it easy to compare settings for the various Cells. In the options menu you can set a standard parameter to always be visible.
- Most numeric fields can be edited in two ways: Double-click on the parameter value and type in a new number, or click on the field and drag up to increment the value, or down to decrement. For “fine tuning,” hold **shift** while dragging.
- Double-clicking on knobs resets them to default values.

Now let's consider each section in detail.

Cell View Tab



This view provides basic Cell management with respect to MIDI, voice groups, name, and similar parameters.

The Cell section defines the current Cell's basic MIDI and sample assignment functions.

Cell Control

Cell Name: Shows the Cell's currently selected name. This defaults to the name of a sample within the Cell; to rename, double-click on the name, then type in the new name.

Key Range: These two fields determine the MIDI note range that will trigger the current Cell. For example, a key range of C2-C2 means that the Cell will play only upon receiving MIDI note C2. If set to C1-E1, then C1, C#1, D1, D#1, and E1 will all trigger the Cell (see the Track section for info on whether these different notes will change the Cell's pitch).

There are two ways to set the Key Range:

- Double-click on the low range and type in a new note name or numeric value. If you type in a numeric value, BATTERY 2 will automatically convert it to a "musician-friendly" MIDI note name (for example, type "60," and the display will show C3). If necessary, do the same for the high range. Using this method does not change the root key.
- Click on the Learn button. Use a keyboard or other MIDI note generator to play first the low range note, then the high range note. After playing the second note, the display will update to show the new key range. With this method the root key will be changed to the low note.

Sample (-) and (+) buttons: When the sample used in the Cell is stored in a folder containing other samples, these buttons choose the previous or next sample in the folder respectively.

MIDI: This specifies whether a cell should receive data from ALL MIDI channels, or a specific MIDI channel from 1-16. Click on the down arrow and make the desired assignment.

Track: When selected (lit) and the Key Range exceeds one note, all samples in the current Cell will change pitch in response to the MIDI input. For example, if the key range is C1-D1 and you play D1 with track On, the pitch will be two semitones higher than if you had played C1. With Track disabled, the sample's pitch will be determined solely by its root key (as set in the Map view).

Rev: This reverses playback for all samples within the Cell. The sample plays from end to beginning rather than from beginning to end; the waveform display in the Envelope window changes to reflect this. Reverse produces the well-known "backwards tape" effect.

Rel Trig: When enabled, the Cell plays when it receives a note-off command (generated when you *release* a note). When disabled, the Cell plays when it receives a note-on command. In case your release trigger experiments get out of control, then use the **PANIC** button.

Voice Groups

The Voice Group function allows linking the response of particular Cells to note on-off commands so that the most recently-played Cell has priority over other Cells in the group. Probably the easiest way to explain this is with some typical applications.

- With “real” drums, you cannot have an open and closed hi-hat sound at the same time. With BATTERY 2, assigning these two sounds to a group, then setting the group polyphony to 1, means that triggering the closed hi-hat will turn off the open hi-hat (and vice-versa). This is because a polyphony setting of 1 allows only one voice to play at a time, which will be the most recently-played note.
- If you have several tom sounds with long, “ringing” tails, the sound may get muddy if several tom tails sustain at the same time. Assign the toms to a group, and set polyphony to 2. Thus, only two tails can ring at the same time – the most recently-triggered tom, and the tom triggered just prior to it.
- Some musicians use BATTERY 2 to play back rhythmic loops or phrases loaded into each Cell. Assigning these to a group means that triggering a new loop will turn off any previously-playing loop, which is often desirable.
- Also when using loops, you could assign a “silent” sample (no sound) to a group so that triggering this Cell turns off any loops that are playing, and silences the output.

For Battery’s old mute group behavior you would make all cells one voice group and set the maximum voices for each cell to 1.

Following are the various voice group parameters.

Voice Group: Click on the down arrow to assign a Cell to no voice group, or any of 63 voice groups. Remember that selecting this parameter will show voice group assignments in each Cell's info strip, making it very easy to check on voice group assignments for an entire kit.

Max Voices: This sets the polyphony for each group, from 1 to 127 voices.

Voice Overlap Time: This allows a period of time where the voices overlap (i.e., the previously-played voice sustains for a while even after a new voice has been triggered). This prevents an overly-abrupt transition between voices. Overlap time is variable from 5 milliseconds to 2.5 seconds.

Choke Group: This is an advanced programming feature that allows for more realistic mute groups to be set up. Choke groups allow you to turn off different voice groups by setting them to the same choke group. The advantage here is polyphonic mute grouping vs. monophonic.

Let us expand on the previous voice group example. Take those same hi-hat sounds and set them to exclusive voice groups. Such that the open hi-hat is voice group 1 and the closed hi-hat is voice group 2. Now the open hi-hat sound can be set to more voices, 5 for example. This allows some "trails" to be heard. The second voice group can be set to 1 max voice. Both of these groups should now be assigned a choke group of 1. With this setup you obtain the desired effect of trailing drum sounds, while having a controlled polyphony (voice group 1) and you can still choke that group with the closed hi-hat.

Cell Activation

Off: default setting

On key: With this function you can activate cell with a specific key of the MIDI-Keyboard. Select "Start on Key" from the menu . A key-number field will appear right next to the menu where you can set the specific key which will activate the cell for incoming MIDI notes.

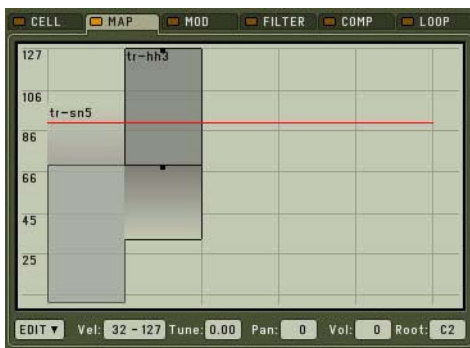
On controller: This function activates cells by a MIDI controller instead of a MIDI-key (like above). It allows for example, to activate different cells depending on the position of the Modwheel or any other controller. Select **Start on controller** from the menu and choose the controller number of the controller you want to use for activating a cell (first value field). Then set the lowest (**Rng min**) and highest value (**Rng max**) in between which the cell will be activated when the modwheel is set to this position.

Round Robin: This function can be used to cycle through different cells while hitting the same key again and again. A good place to start would be an example.

Select multiple cells and press the **learn** button. Then press a key on your MIDI keyboard. You have just assigned all these cells to one key. Now select the **cell tab** and set cell activation to **round robin** from the drop-down menu. Each cell also gets a desired position in the cycle. Select the individual cells in order to edit the position in the round robin cycle. You can type the in number or drag the mouse upward to change it.

This is a nice technique that can result in humanized playing since you can load similar sounding samples with subtle differences in each cell and cycle through them.

Map View Tab



Mapping is the process of determining which samples are layered or velocity-switched, and whether samples crossfade smoothly as they transition to other samples or switch abruptly. You can also adjust several important sample parameters from this view.

BATTERY 2 allows for extremely sophisticated mapping of multiple samples within a Cell – in fact, far more sophisticated than many soft samplers.

Mapping sets several characteristics for any sample(s) within a Cell:

- The minimum velocity at which it will trigger (e.g., the sample triggers only with velocities over 20).
- The maximum velocity at which it will trigger (e.g., the sample will not trigger with velocities over 110).
- If the range over which a sample triggers overlaps with any other samples, it's possible to crossfade between them to provide a smoothed, rather than stepped, transition from one sound to another.
- Independent control over Tune, Pan, Volume for each sample within a Cell. Root key, on the other hand, is for the entire cell, not the samples within it.

Map Layout

Upon selecting the Map tab, you'll see the samples included in the Cell. They show up as blocks, with the sample name toward the top of the block. You can control auditioning the samples from within the option menu. Clicking on the zone plays back the original sample. Clicking on the velocity map's y-axis auditions the cell with its parameters (i.e. saturation, tune, etc)

If there are more samples than can fit comfortably within the Map window, you'll see a horizontal scroll bar to scroll past the window's visible boundaries, as well as (-) and (+) buttons to zoom in or out. A vertical scroll bar, again with (-) and (+) zoom buttons, may be visible so that you can see more detail in the vertical axis (velocity).

Zones vs. Samples

In the Map View, samples acquire additional parameters involving how they trigger and are crossfaded. Thus, the combination of the sample and the parameters defining its response is called a Zone.

Selecting Zones

As with the Drum/Sample Matrix, editing operations within the Map View apply to all selected Zones. To select multiple Zones, Shift-click on them. Selected Zones are a darker shade than non-selected Zones.

Zone Cursors

When moving your mouse over a Zone, various cursors may appear:

- Four-way (cross) cursor. Use this to click on a Zone and move it left or right or up and down.
- Two-way (up/down) arrow. This sets the lower or upper velocity limit graphically as well as the velocity fade, depending on the position of the arrow. There are other ways to set these limits, as described later.

The uses for these different cursors will become clear as we cover the various mapping functions.

Zone Edit Operations

To access Zone edit operations, select the Zone(s) to be edited and click on the Edit field down arrow. Choose from the following:

Cut Zone(s): Removes the Zone(s) from the Map and stores the parameter values for the Zone(s) parameter values.

Copy Zone(s): Stores the parameter values for the Zone(s).

Paste Zone(s): After a Cut or Copy operation, pastes contents into the Map.

Replace sample: Opens a dialog to locate the new sample.

Delete Zone(s): Removes the Zone(s) from the Map.

Set Crossfade (Velocity): Draws lines that show the Crossfade velocity boundaries, and enables using the arrow cursor to set these boundaries. We will discuss crossfading in more detail shortly.

Remove Crossfade (Velocity): Removes any Crossfade velocity boundaries.

Setting Zone Upper/Lower Velocity Limits

The velocity range settings determine the minimum and maximum Zone triggering ranges. For example, to have a Zone respond to all velocities, set the lowest velocity value to 1 and the highest to 127.

However, you may want to use several samples to create more realistic drum dynamics. Suppose you have three kick drum hits – one played softly, the other at medium volume, and the third hit hard. You might want to set up the velocities as follows:

Soft hit = 1-80

Medium hit = 81-110

Hard hit = 111-127



Three kick drum samples have been velocity-switched so that higher velocities trigger harder-hit samples.

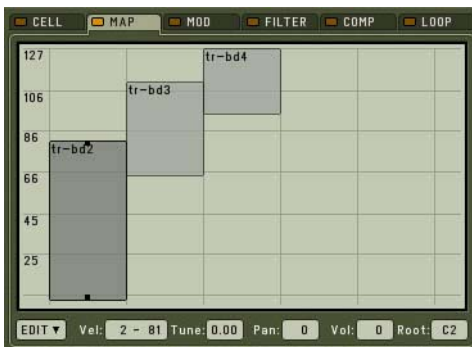
As a result, different velocities play back different samples. There are three ways to edit the velocity boundary values:

- Position the cursor over a Zone's upper or lower boundary, either to the left or right of center, until you see the up/down arrow cursor. Drag the boundary to the desired velocity value. A small readout displays the current velocity.
- Double-click on the lower or upper velocity value in the Vel: field, and enter the desired velocity value.
- Click and drag on the parameter.

Velocity Crossfading

Sometimes, simply switching between samples provides too abrupt a transition. In this case, you can crossfade between samples for a smoother transition. You do this by adding crossfade information within the sample's Zone.

To create a crossfade, first set up the velocity switching boundaries so that the sample Zones overlap. We will add crossfades where these overlaps occur.



The three velocity-switched kick drum samples shown previously have had their velocity boundaries adjusted so that there is some overlap between the Zones.

We want the soft sample (on the left) to fade out as the middle sample fades in. This occurs in the Zones' overlapping range. Similarly, we want the middle sample to fade out in the overlap range while the loud sample (on the right) fades in.

To set up a velocity crossfade:

- Select the Zone where you want to add the crossfade.

- Click on the Edit down arrow and select Set Crossfade (Velocity).
- There are upper and lower crossfade boundaries, as adjusted by the arrow cursor. The sample fades in from the Zone's lower velocity trigger boundary up to the lower velocity crossfade boundary, and fades out from the upper velocity crossfade boundary to the upper velocity trigger boundary. The Zone uses shading to show where crossfading occurs (i.e., the shade gets lighter as the signal fades).



Crossfades have been added in the places where the three kick drum Zones overlap. Note the middle Zone, with two black lines toward the middle of the Zone. The upper line indicates where the Zone's fade-out begins; the lower line indicates where the fade-in ends. The right-most sample has only a fade-in (it's the loudest sample, so you don't want it to fade out at the top of its range), as indicated by the black line toward the middle of the Zone. Similarly, the left-most sample only has a fade-out because it's the softest sample, so it fades in naturally. Note the black line that indicates where the fade-out occurs, and how the Zone's shading gets lighter as it goes higher to indicate the fade.

Other Map Edit Options

The following affect any selected Zones.

Tune: Changes tuning from -12 semitones up to +12 semitones.

Pan: Places the Zone from full left in the stereo field (-100) to center (0) to full right (+100)

Volume: Adds a volume offset from -36 to +36.

Root Key: This field sets the original pitch (note center), which usually equals the pitch at which the sample was recorded. For example, if the sample has a pitch of D#1, setting the Root Key to D#1 will play it back at its normal pitch. The root key also defines the basis for pitch shifting when Track is enabled; for each semitone (note) that you deviate from the selected root key note, BATTERY 2 will pitch-shift the selected Zones by one semitone. For example, if a Zone's Root Key is set to C1 and you play a D1 note, the sample will be pitched 2 semitones higher. If on the other hand the Root Key is set to D1 and you play a D1 note, it will sound at its normal pitch. This field's range is the entire MIDI note range (C-2 through G8).

Modulation View Tab



Modulate various BATTERY 2 patch parameters with a variety of sources, such as LFO, envelopes, aftertouch, and external MIDI controllers.

The Modulation View tab allows various controllers to change the values of particular parameters within the BATTERY 2 patch. This can not only add dynamics and interest to a patch, but in conjunction with a software sequencer, can automate functions that add dramatic, real-time changes. As these modulation sources can also be MIDI controllers, it's possible to feed signals from external hardware MIDI fader boxes and manipulate the sound as a real-time performance. If you record these signals in a sequencer, you can have the best of both worlds: Real-time improvisation and signal warping, recorded as automation data for later playback.

Modulation Router

This section provides up to 8 modulation paths, each selected by a corresponding button. An illuminated button indicates that the path has all the following elements programmed:

- A modulation source (selected from a drop-down menu)
- Slider with display to determine the amount of modulation (this can be positive or negative)
- A modulation destination – what the modulation signal will control

If there is no modulation source or modulation destination, the button will not be lit because the path does nothing.

Please note that certain modulation sources cannot be routed to certain targets. These targets will not be available as an option from the drop-down menu.

Modulation Sources

Available modulation sources are:

None (no modulation)

Velocity

Modulation wheel

Pitchbend

Polyphonic Aftertouch

Mono (Channel) Aftertouch

Key Position

MIDI Controllers A-H (as defined in the Options menu)

Constant Amount

Random Unipolar (a random number between 0 and 127)

Random Bipolar (a random number between -127 and 127)

Release Velocity

Release Trigger Counter

LFO (modulation view tab)

Modulation Envelope (modulation view tab)

Volume Envelope

Pitch Envelope

Modulation Amount Slider

This determines the “depth” of the effect on the Modulation Destination. The range is from -100% to +100%, with 0% (no effect) at the fader’s center. The display field to the right of the fader displays the current setting value.

If any combination of modulations exceed an effect level of 100%, the value will be “clipped,” or limited, to the maximum value.

Modulation Destination

The Modulation Destination is the BATTERY 2 parameter that will be controlled by the Modulation Source. Available Destinations are:

None (no modulation)

Volume

Pan

Tune

Sat

Bits

Hertz

Filter Cutoff

Filter Resonance

EQ Frequency 1

EQ Bandwidth 1

EQ Gain 1

EQ Frequency 2
EQ Bandwidth 2
EQ Gain 2
EQ Frequency 3
EQ Bandwidth 3
EQ Gain 3
Loop Start
Loop Length
Sample Start
Pitch envelope
Volume envelope

LFO

The LFO provides a periodic modulation effect. Its controls are:

Frequency: Varies the LFO modulation rate.

Waveform: Choose from sine, sawtooth, or square.

Trig: When enabled, the LFO always starts from the same point when the Cell using the LFO is triggered.

Sync: When BATTERY 2 serves as a plug-in, this syncs the Frequency to the host tempo. In this case, the Freq control indicates note values rather than an absolute rate.

Fade in: Sets the time over which the LFO signal fades in after triggering.

PW: The pulse width control changes the waveform's duty cycle. For example, it can continuously vary the square waveform's width. This is only available for the square wave.

Modulation Envelope

The Envelope adds a modulation signal that varies over time in a non-periodic way. The controls are:

Mode: This pushbutton toggles between two envelope types, AHDSR (Attack-Hold-Decay-Sustain-Release) and the less complex AHD (Attack-Hold-Decay) envelope. Typically, the AHDSR envelope is for samples with a significant sustain time (especially when played from a MIDI keyboard), while the AHD envelope is better for “one-shot” sample playback. AHD mode disables the Sustain and Release controls.

Attack (A): The time it takes for the envelope to reach its maximum level.

Curve: Sets the shape of the envelope curves from concave, to linear (0), to convex.

Hold (H): How long the envelope will hold at its maximum level. Set this to 10-30 ms to add “punch” to a signal.

Decay (D): The time it takes for the envelope to fall from the held level to the sustain level.

Sustain (S): The level that will be maintained as long as the incoming MIDI note is held.

Release: The time for the sustain level to return to zero after receiving a MIDI note-off (i.e., the MIDI trigger ends).

Filter View Tab



Change a Cell's tonality with the wide selection of filter types.

The Filter View can change the frequency characteristics of a Cell in various ways, from bassy and muddy, to bright and trebly, to anywhere in between (and even more!).

A filter is basically a special kind of amplifier that changes gain only at specific frequencies, either boosting or cutting those frequencies.

On/Off Switch

Filters require a fair amount of CPU power to sound good (and of course, being Native Instrument filters, they *do* sound good), so leave filters off unless needed.

Filter Type

Different filter types affect the sound differently. Following are your options; note that the graph in this view provides a graphic representation of the filter's frequency response. Also note that the available complement of controls depends on what filter type you've selected. Controls that don't pertain to a particular filter type are not shown.

Incidentally, filter cutoff and resonance parameters make excellent modulation destinations!

Low-Pass: Passes frequencies below a certain cutoff point, and attenuates signals above the cutoff point. The more poles, the steeper the cutoff, and the more rapidly response falls past the cutoff point. (For the technically curious, each pole increases the slope by about 6dB octave. For example, a 4-pole low-pass filter has a 24dB/octave slope, which means that above the cutoff frequency, the response drops by 24dB for each additional octave.)

High-Pass: This is the inverse of the Low-Pass response. It passes frequencies above a certain cutoff point, while attenuating signals below the cutoff point.

Band-Pass: This attenuates signals above and below the cutoff frequency (or more correctly, the *resonant* frequency). Again, more poles create a steeper cutoff.

Band EQ: Each band has three parameters, *Boost/Cut* (increases or decreases response), *Frequency* (the center point where the boosting or cutting occurs), and *Bandwidth* (the range of

frequencies over which boosting or cutting occurs, from narrow to broad). A 1-Band EQ has one such stage, a 2-band EQ has two such stages, etc.

Phase Filter: Provides the type of filtering associated with “phase shifter” effects.

Vowel A and B Filters: These two filters model the response created by the human mouth when pronouncing vowels (yes, your mouth is a type of mechanical filter). Sweeping a vowel filter’s cutoff and resonance controls can produce very “humanized” filtering sounds.

Comp(ressor) View Tab



Add punch and control dynamics with compression.

Compression is a signal processing technique that controls dynamics, and is commonly used in recording. It reduces peaks and raises low-level signals to produce a higher average signal level, thus creating a “hotter” sound. Use caution, though; too much compression may sound impressive at first (“wow, that sounds really loud! Cool!”) but can be fatiguing. Most people feel that it’s important for music to have some degree of dynamics, and if you want a loud sound, it’s better to turn up the volume than add excessive compression.

On/Off Switch

As with filters, dynamics processors require some CPU power. Only turn on a compressor when needed.

Threshold

This sets the level above which compression begins. For example, with a threshold of -10dB , signals below that level will be relatively unaffected, but signals above that level will be attenuated. The degree of attenuation is set by the...

Ratio

This setting indicates the ratio of input signal to output signal once a signal exceeds the threshold. For example, a ratio of 3:1 means that if a signal is above the threshold, a 3dB increase in input level yields only a 1dB increase in output level.

Gain

Because the peak level has been reduced, use the gain to make up the difference. However, be careful to avoid clipping. A good rule of thumb is to set the Gain so that peaks with the compressor On reach the same level as peaks with the compressor Off.

Attack

This determines how long it takes for the compression effect to kick in once the input signal exceeds the threshold. The higher the value, the more percussive the effect, with the tradeoff being higher peak levels. Lower values give a more “squashed” sound, but keep peaks to a minimum.

Decay

Sets how long it takes for the compressor gain to return to normal after the input signal has gone below the threshold.

Compressor Tips

- **Minimizing noise.** Do not overcompress, as this makes for a thin, unnatural sound. Use the bypass switch to compare the compressed and non-compressed sounds; you may find that even a little bit of compression gives the desired effect.

- **“Mystery” compression increases.** If it seems like there’s been a sudden increase in compression but you didn’t increase the compression amount, then the input signal going to the compressor may have increased.

Loop View Tab



Looping samples can add sustain, which you can then shape with the amplitude envelope.

The Loop View tab adds an important effect to your percussion samples: The ability to loop (repeat indefinitely) a section of the sample. You can choose up to four sections to loop, and the number of times you want each section to loop (from 0 to 127 times). This allows BATTERY 2 to extend percussion sampling beyond mere “one-shot” sample playback into sustained sounds that can evolve over time, and be modified by envelopes to add dynamics.

Select Loop

Choose one of the four loops for editing. If a loop is on, its button will glow yellow.

Snap to Zero

When enabled, loop start and end points will “snap” to the nearest audio “zero-crossing” – the place where the audio amplitude is at zero (if the loop start and end points have different amplitudes, there will likely be a click every time the loop repeats). However,

some sound designers loop at non-zero-amplitude points to create buzzer (and therefore more jarring) loops. Experiment with snap to see which works best for you. Enabling this feature is for ALL loops.

On/Off

Enable or disable the loop with this button. Note that when the loop is enabled, the waveform display toward the right shows the loop start and end points, as well as its effect on the sample.

Count

This control determines the number of times the loop will repeat before continuing to play through the rest of the sample, and can range from 0 to infinity repeats. The display field to the right of the control shows the number of repeats.

Start

This slider sets where the loop begins. The display field to the control's right shows the current value, expressed in samples. The control's range equals the number of samples in selected sound.

Length

This parameter determines the loop length, and therefore also sets the loop's end point. As you edit length, the waveform display will show the results of your edits (if looping is enabled). The display field to the right of the control shows the current length in samples.

Tune

Each loop can be tuned independently, from an octave down to an octave up.

X-Fade

The X-Fade function mixes some of the end of a loop in with its beginning to create a more seamless loop. The display field shows the length of the section being mixed, in samples. While not a “foolproof” way to improve a loop, it’s worth trying, particularly on sustained sounds.

Please note that x-fade is not possible when the sample start is 0 because a fade-in requires some sample material..

Modify Module

This module affects any selected Cells, and provides a broad range of modifications. Note that the waveform display shows the results of any changes you make with these controls, and that the display has (-) and (+) buttons in the lower right corner so you can zoom in or out on the waveform view.



When you really want to beat up a sound, the Modify module is there to help.

Tune

Use this to change the pitch of all sample layers contained in a Cell. The range is three octaves up or down, which allows for some serious sound design effects. Try sweeping this at low Hertz settings (described later).

When used as a modulation destination the range is one octave up or down.

Saturation

This saturation function can give a sound a lot more punch and attack. With standard drum sounds, a bit of saturation can shave off the peaks, thus creating a more harmonically-rich attack while bringing up the overall signal level.

Note that you can also dial in negative saturation values. This works like an expander. The advantage here is decreasing “punch” while maintaining the peaks. This helps to lighten drum mixes.

Bits

“Vintage digital” isn’t a buzzword yet, but when it is, BATTERY 2 will be ready. This parameter dials in the bit resolution, from 16 bits down to 1 bit. Along the way, you can emulate the 13-bit sound of the Ensoniq EPS, 12-bit sound of the E-mu SP-12 and Akai S900, the 8-bit sound of the Ensoniq Mirage, and even go for extreme lo-fi with 6 bits and under of resolution. On top of emulating old school integer digital equipment you can also employ sci-fi fractional bit reduction.

Hertz

Here’s another outstanding candidate for a modulation destination: Hertz changes the sample rate, from 15.8kHz down to 1kHz. Not only can it give “clangy,” tonally metallic sounds, but when swept with modulation, produces almost ring modulator-type effects.

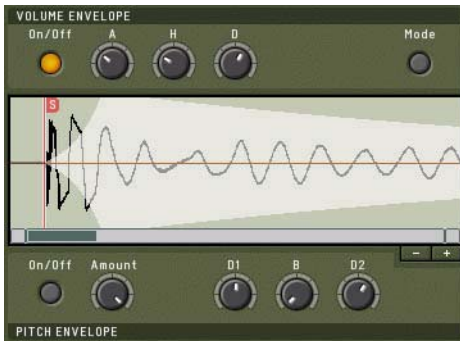
Envelope/Waveform Display Module

This part of BATTERY 2 is a multi-purpose module. With it, you can:

- Set an overall Volume envelope for a Cell or selected Cells.
- Set an overall Pitch envelope for a Cell or selected Cells.
- Adjust sample Start and End points.

- Adjust loop start and end points
- Receive visual feedback on the results of your edits, and how they affect the Cell's audio waveform.

Volume Envelope



Note the Volume envelope superimposed over the waveform. As you change the envelope controls, the envelope shape follows along.

The following controls work in conjunction with the Volume envelope.

On/Off: Enables/disables the envelope. When enabled, you can see the envelope shape against the waveform.

Mode: This pushbutton toggles between two envelope types, AHDSR (Attack-Hold-Decay-Sustain-Release) and AHD (Attack-Hold-Decay) envelope. Typically, the AHDSR envelope is for sustained samples, while the AHD envelope is more for “one-shot” sample playback. AHD mode disables the Sustain and Release controls.

Attack (A): The time it takes for the envelope to reach its maximum level.

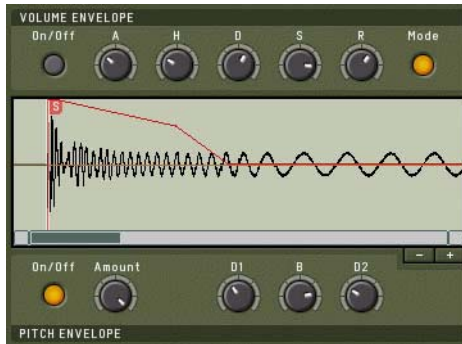
Hold (H): How long the envelope will hold at its maximum level. Set this to 10-30 ms to add “punch” to a signal.

Decay (D): The time it takes for the envelope to fall from the held level to the sustain level.

Sustain (S): The level that will be maintained as long as the incoming MIDI note is held.

Release (R): The time for the sustain level to return to zero after receiving a MIDI note-off (i.e., the MIDI trigger ends).

Pitch Envelope



The Pitch Envelope is shown as a red line superimposed on the waveform. As with the Volume envelope, when you change the envelope controls, the envelope shape follows along.

The following controls work in conjunction with the Pitch envelope.

On/Off: Enables/disables the envelope.

Amount: Sets the degree to which the modulation envelope affects pitch.

D1: Edits the time for the envelope to go from its maximum level (as set by the amount control) to the level set by...

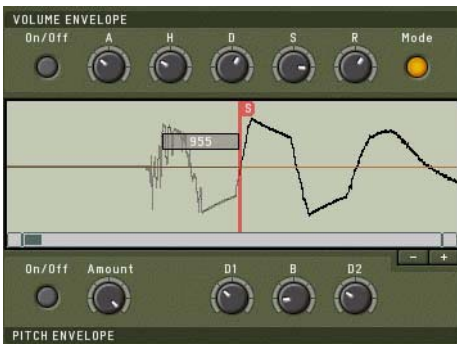
B: This is a “breakpoint” control that adjusts level. The value can be positive or negative, so the pitch can be either higher or lower than normal pitch.

D2: This determines how long it takes for the level set by the Breakpoint control to decay back to zero again.

Start and End Point Adjust

The waveform view shows a start (S) and end (E) marker. You can move these as desired to alter the Cell start point, length, or both.

One application is to use the Start adjust to remove part or all of a drum's attack. This can give a very different, more muted type of drum sound. Another common usage is to set the point 20ms or so into the sample. If you then apply negative velocity modulation to the sample (do this in the Modulation View tab), harder hits will play more of the attack, adding impact to the sound. This can make percussion sounds far more realistic.



Moving the Start time further into a sample can cut off a drum's characteristic attack, producing a softer, more muted type of drum sound.

Output Module



The Output module is sort of like the Cell's "channel strip."

This module is extremely straightforward: It simply sets the Cell's pan, level, and output assignment.

Pan: Places the Cell in the stereo field, from full left (100l) to center (c) to full right (100r).

Volume: Adjusts the Cell's level in the overall mix, from +12dB to -8.

Channel: Chooses the output to which you want to assign the Cell. This field selects an audio interface's physical output in stand-alone mode, or a "logical output" when used as a plug-in.

Tips and Techniques

As with any sample-based system, BATTERY 2 gives the best results if you start with high-quality samples, then learn how to exploit its many sound-shaping features. Here are some tips to get you started.

Drum Pitch Tuning

- The Root Key setting, in combination with the Key Range, determines the sample's "baseline" pitch. However, many modern drum sounds (especially in dance and experimental music) use extreme pitch-shifting. For example, downward pitch shifts are common in industrial music, while upward shifts have found favor in drum and bass as well as house music.
- You can use the Modify Module's Tune control to alter tuning of an entire Cell, or the Tune control in the Map View tab if you want to tune individual samples within a Cell. Also remember that you can use key velocity or MIDI note number to modulate pitch, and that adding a pitch envelope can create "movement" in the drum sound.
- An important part of drum kit tuning is matching the tuning to your song's key. Although most percussion samples are un-pitched, you will find that certain pitch adjustments allow your drum kits to "sit" better in your mix. This is particularly true with hi-hats and cymbals. Once you have completed a track, spend some time working with your kit's Tune settings to optimize the kit for a particular piece of music.
- Use tuning to create multiple drum sounds from one. Want to play a two-hand shaker part, but have only one shaker sample? Copy it to another Cell, then detune the copy to provide a slight sonic variation. Detuning can also create a family of cymbals or toms out of one cymbal or tom.
- Use radical transpositions to create new sounds. Most sample CDs don't seem to have a gong sound, but don't let that stop you. Take your longest cymbal sound, add it to a Cell, and in the Map view, detune it by -12 semitones. Now, copy that

Zone within the same Cell, and detune it by about -3 semi-tones. When you trigger the two together, the slightly detuned cymbal gives a convincing attack, while the highly detuned one provides the necessary sustain.

- Although one of the above tips mentions using velocity, note number, or an envelope to modulate pitch, one of the best applications of pitch modulation is very subtle (almost unnoticeable) velocity control. A small pitch increase with high velocities emulates a drum's skin being stretched, hence pitched higher, when it's first hit.

Tweaking the Drum Mix

Creating a great drum and percussion mix is as much art as science. Drum mixes are the measure of greatness in engineers, and a poorly mixed percussion mix can ruin an otherwise great song. While it would be impossible to list all of the “great ideas” that have been written about creating drum mixes, here are a few points worth noting. Luckily, when using the BATTERY 2 software, we don't have to worry about microphone location!

Try these tips on for size – but realize that in electronic music, there are no rules.

- **Use individual drum outputs.** When using BATTERY 2 as a VST instrument, you can have multiple outputs with unique EQ and effects settings. A typical output setup would include a stereo output mix, individual snare and hi-hat outputs, and a loop output. This lets you add a unique reverb to the snare, EQ the hi-hats cleanly, and process sample loops without affecting the “main” mix.
- **Watch your hi-hat volume.** Many beginning drum programmers create kits with overly loud hi-hats. Make sure that the hi-hats slide into the mix, and don't dominate it.
- **Use more than sub-bass tones for the kick.** Using a sub-bass kick will sound great on your studio monitors and in a big club system. However, anyone listening to your mix with headphones or a boombox will probably not hear the kick at all. Make sure your kick includes some high end, perhaps by layering it with a second sample, or adding a bit of distortion to increase high-frequency content.

- **Use caution when combining sounds into a kit.** You generally want to keep each drum within a specific pitch/EQ range. If you find that your basic samples take up too much “sonic space,” you can route the samples to individual outputs, and “thin” them with external EQs and effects.
- **Check your mix in mono.** While a wide stereo drum mix may sound great, it may also keep you from creating a great mix. Try monitoring in mono as you set up the mix; it’s often easier to get a good blend (even of a stereo mix) when you do some of your mixing in mono.
- **Don’t forget processing during mixdown.** For example, suppose you have a good drum part but it seems to lack dynamics. While mixing down, you can overdub a controller track using a mod wheel or fader to control the sample start point. As mentioned previously in the manual, setting the Start point a few milliseconds into the sample creates a more muted drum sound. Adding negative modulation includes the entire attack, giving a more dynamic sound. Or, use velocity to control saturation so that high-velocity hits increase saturation.

Filter Modulation

For dynamic control beyond tying velocity to level and/or sample start point, assign velocity to the Low-Pass filter cutoff so that hitting the drum harder produces a slightly brighter sound. This gives extra emphasis to the hardest hits, making the drums feel more “alive.”

If the drum sound isn’t too bright to begin with, using a low-pass response might produce too “dull” a sound with soft hits. The solution here is to use velocity to boost the filter’s treble, or resonance (assuming the cutoff is somewhere in the treble range). This will again give the effect of creating a brighter sound with harder hits.

Multiple-Cycle Looping = Long Sustain

This sampling-oriented trick can turn a quick hit into one with a super-long decay, particularly with toms and kicks. This takes advantage of BATTERY 2’s Loop view, but we’ll be using only one loop.

The object is to loop a single cycle in the drum's decay tail, and set Count to a higher number of repeats. Then, turn on the Volume envelope and edit the decay parameter for the desired length. Try different individual cycles for looping; they may appear almost identical, but some will usually loop better than others.

Infinite-Cycle Looping = Infinite Sustain

To turn a one-shot into a sustained sound - so long as you hold the key - activate loop 1, set the loop count to infinite, adjust the loop start and end points to a desired location; turn on the volume envelope, activate mode and make sure the sustain is turned up. Holding notes should result in sustained sounds.

Click Layering

Sometimes modulating an existing sample just isn't enough to create serious dynamics. This is where a "click sample" or sound can come in handy.

To make a click sample, you can simply draw some spikes in a digital audio editor (e.g. Wavelab, Peak, Audition, Sound Forge, etc.) for about 35 ms, then save that as a file. Map the click sample into the same Cell as the sample you want to augment and reduce its volume so it blends in with the main sound, but set the velocity triggering and crossfade so that the click sample responds only to higher-velocity signals. In other words, the click's entire dynamic range should cover mostly the upper dynamic range of the sound with which it is layered. Now with really hard hits, the click will come in and add some extra spice.

MIDI Timing Tweaks

BATTERY 2 is only half of the drum part equation: The part that makes sounds. The other half is the sequence driving BATTERY 2. While it's important to tweak BATTERY 2 to deliver the best possible sounds, it's equally important to tweak the MIDI data that's triggering those sounds if you want to produce the best possible drum part.

There's a saying that "timing is everything," yet mathematically *perfect* timing is most certainly not everything, otherwise drum machines would have replaced drummers a long time ago. Good drummers enhance music by playing with the time—subtly speeding up or slowing down to change a tune's "feel," and leading or lagging specific beats to push a tune or make it lay back a bit more in the groove.

Often, these time changes ahead of or behind the beat are very small; even a few milliseconds (ms) can make a difference. This is surprising, since sound itself moves at about 1/3 meter per second, so a 6ms change theoretically affects a track about as much as moving an amplifier 2 meters further behind the drummer. Yet when you conduct timing shift experiments, it becomes obvious that even very small timing differences can change a tune's groove when you hear these changes in comparison to a relatively steady beat.

Quantizing everything is the quickest way to suck the life out of a piece of music. Fortunately, we can use other aspects of sequencers to put the feel back in to sequenced music.

Why Randomization is Not the Answer

Many sequencers provide timing randomization options to help give a more human-sounding track. Randomization is great if you want to simulate the effect of a drummer who's had too many beers; however, for a great groove, shift timings the way a drummer would. Human drummers add variations in a mostly non-random way—often subconsciously, so these changes tap directly into the source of the drummer's "feel."

Drummers often hit some drums slightly ahead of, or behind, the beat to give certain effects. For example, jazz drummers tend to hit a ride cymbal's bell a bit ahead of the beat to "push" a song. Rock drummers frequently hit the snare behind the beat (listen to any Led Zeppelin album) to give a "big" sound. Of course, the sound isn't really bigger; but our brain interprets slight delays as indicating a big space, since we know that in a big space, sound travels a while through the air before it reaches us.

A sequencer or drum machine's track shift (or track offset) function, which can move a track back and forth in increments of single clock pulses, is your first line of defense against mechanical grooves. Keep the kick drum on the beat as a reference, and use track shifting to change the timing of the snare, toms, and percussion by a few milliseconds. Here are some other track timing tricks.

- For techno, dance, and acid jazz tunes try moving any double-time percussion parts (shaker, tambourine, etc.) a little bit ahead of the beat to give a “faster” feel.
- Sometimes it works well to shift individual notes rather than an entire track. With tom fills, delay each subsequent note of the fill a bit more (e.g., the first note of the fill is on the beat, the second note approximately 2ms after the beat, the third note 4-5ms after the beat, the fourth note 6-8ms after the beat, and so on until the last note ends up about 20ms behind the beat). This can make a tom fill sound gigantic.
- If two percussion sounds often hit on the same beat in a rhythm pattern, try sliding one part ahead or behind the beat by a small amount (a few ms) to keep the parts from interfering with each other.
- If some drums fight with melodic parts (e.g., the kick drum and bass mosh together), slightly advance the part you want to emphasize in the mix. It will grab the ear's attention just before the beat, therefore bringing more attention to itself.
- Hitting a crash cymbal a bit ahead of the beat makes it really stand out. Moving it behind the beat meshes it more with the track.

Why Quantization Isn't the Answer, Either

Remember, machines don't kill music, people do—and quantization is one of the main weapons. Although quantization has its place, it's a very artificial process because no drummer plays with crystal-controlled precision.

Fortunately, sequencers usually let you quantize by a certain percentage (usually called “quantize strength” or “intensity”). In other words, 100% quantization moves a note exactly to the nearest beat, but 50% quantization moves it halfway closer to the

beat. Try quantizing the kick to 100% and all other drum tracks to somewhere between 50% and 80%. The result is a track that sounds rhythmically correct, but retains most of a performance's "feel."

Tempo Track Timing Tweaks

People generally set the tempo in a sequencer to the desired beat, then just lit it sit there. That's not the way real music works; in a fascinating study, Ray Williams and Ernest Cholakis (of DNA Groove Templates) compared the tempo tracks of two classical pianists playing Moonlight Sonata, and plotted out the tempo changes. The results were anything but a constant tempo—the changes looked like a relief map of the Alps.

Even though pop music doesn't change tempo as much as classical pieces, real drummers insert subtle tempo changes, inserted over several measures or just in selected parts of individual measures, to build anticipation and change moods. Fortunately, most sequencers let you change the tempo track throughout a song; once you start working with this technique, you'll find it an essential part of the production process. Here are some examples of track shifting.

- To boost a song's energy level, increase tempo slightly (by 1 or 2 beats per minute). This is the timing equivalent of modulating pitch upward by a semitone; both increase excitement. Decreasing tempo has the reverse effect. Tempo shifts are useful when transitioning between song sections (verse to chorus, chorus to instrumental, etc.) as well as within a particular section (such as upping the tempo for the last two measures of a solo).
- Change tempo a little bit *before* the first beat of the measure you want to change. For example, if you're going from verse to chorus, increase the tempo halfway through the measure prior to the chorus. This creates a smoother lead-in than having the tempo change coincide with a measure change.
- For really dramatic effects, ritard the tempo over the course of a measure (e.g., one BPM or less lower on each beat) then return to the original tempo. Having a drum roll during the ritard creates a particularly effective transition.

Acknowledgement: Most of this section was written by author/ musician (and BATTERY user) Craig Anderton, and is used with his permission.

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