

Bitbox mk2 2.1 User Manual



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INTRODUCTION

Welcome to bitbox mk2. Bitbox mk2 puts powerful digital sampling and mangling for Eurorack at your fingertips. With this module, you can capture samples one at a time, automate creation of a multi-sample pack, or port over samples from your computer. You can play back samples in interesting ways, including slicing, granular sounds and musically intelligent looping capabilities. You can add more interaction by using CV and MIDI to trigger and modulate samples and effects. You can stream large samples of up to 4 GB file size straight from the microSD card. Tweak your configurations to get them just right, then save them to presets for future reuse. With its 3.5 inch touchscreen, bitbox mk2 makes easy work of selecting, editing, and tweaking your samples. The more powerful processor of the mk2 enables you to do more with your samples, including play more polyphony and apply reverb and delay to your sounds.

This manual will walk you through all of the capabilities of bitbox mk2. If you want to start playing right away, please consult the Quick Start Guide found in the box and available at 1010music.com/support/mk2docs.

We will start by reviewing the general workflow used with bitbox mk2, then continue with an overview of the controls. Next, we will cover how to install the module in your rack and do initial setup of the firmware options. Once the module it set up, we will describe how to create a preset and configure pads. This will include a discussion of the different pad modes, and how to record a new WAV file. Once you have pads setup, we will apply effects and adjust the mix. Next, we will go into more depth about preset management tasks. That will be followed by a discussion of how to use MIDI and CV to interact with the module, including triggering pads, modulating parameters and synchronizing clocks. To go deeper, we will discuss how to use presets as templates and some processor management tips. After that, we will cover how to backup your presets and WAV files, and upgrade or swap your firmware.

This user manual documents the functionality available in version 2.1.2 of bitbox mk2. If you have an earlier version of the mk2 firmware, you can upgrade for free. See [Install New Firmware](#) below for the steps to upgrade. To determine which version of the firmware you are running, push the Home button repeatedly until you see the Menu screen shown on the right. The number in the lower right corner is the current version. The screen shot shows version 2.1.2S.



Menu Screen

GENERAL WORKFLOW

The bitbox mk2 module allows you to record and playback samples in creative ways. When working with bitbox mk2, you create presets that store the selection of samples and parameters that you want to use together. You can create any number of presets, limited only by the space available on your microSD card (up to 256 GB cards). You can get even more space by getting more microSD cards.

When creating a preset, you start by assigning WAV files or banks of files to pads. Once loaded, bitbox mk2 shows you a visual representation of your WAV files. Here you can set the Pad mode and adjust start, length, and loop points. You can also cut the samples into slices that can be triggered independently. Pinch and stretch gestures on the touch screen allow you to zoom into the display of the wave file to get more precise control when you need it, and also allow you to zoom out to see the whole picture.

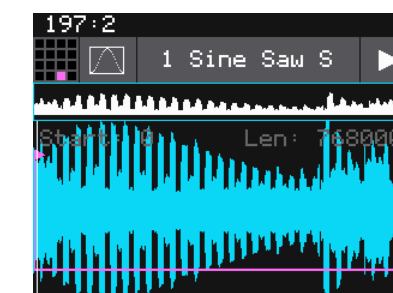
You then use the parameter screen to adjust playback settings for the pad, and configure modulation sources for some parameters, such as pitch and filter. Here you can apply an envelope, configure the per pad LFO, change between gate, toggle and trigger mode, control looping, and configure MIDI options.

You can also record a new wav file or a bank of wav files into a pad if you want to create your own sounds.

Once you have some pads set up, you can trigger them on the pads screen, play notes with them on the Keys or Grid screen, or use an external MIDI or CV controller to trigger them.



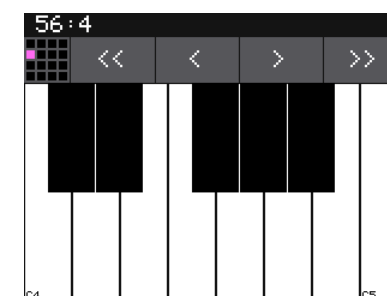
Pads Screen



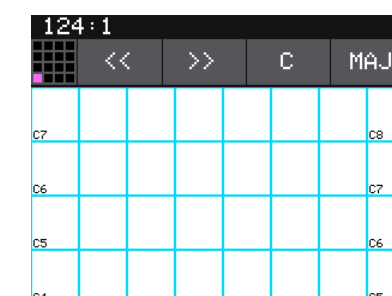
WAV Screen



Pad Parameters Screen



Keys Screen



Grid Screen

To further refine your sound, use the FX screen to apply delay and reverb, and then use the Mix screen to adjust level and pan per pad.

15:1	SY C	SY C	PC O	SN O	
	LFO	LFO	Blip	Drop	
	SY Chor	SY Chor	SY Chor	SY Chor	
	BA B	BA B	BA B	BA B	
	D#	G#	C#	D# 2	
FX 1	KI O	SN O	SN O	HH O	
	Hard	Drop	Hard	Nois	FX 2

FX Screen

64:1	FL L	FL L		CY O	
	+0.0	+0.0	+0.0	+4.4	
	BA L	GA L	PI L	SA L	
	+0.0	+0.0	+0.0	+0.0	
	BA L	GA L	PI L	SA L	
	+0.0	+12.	+0.0	+0.0	
	DR L	PC L	PC L	PC L	
	+0.0	+0.0	+12.	-57.	

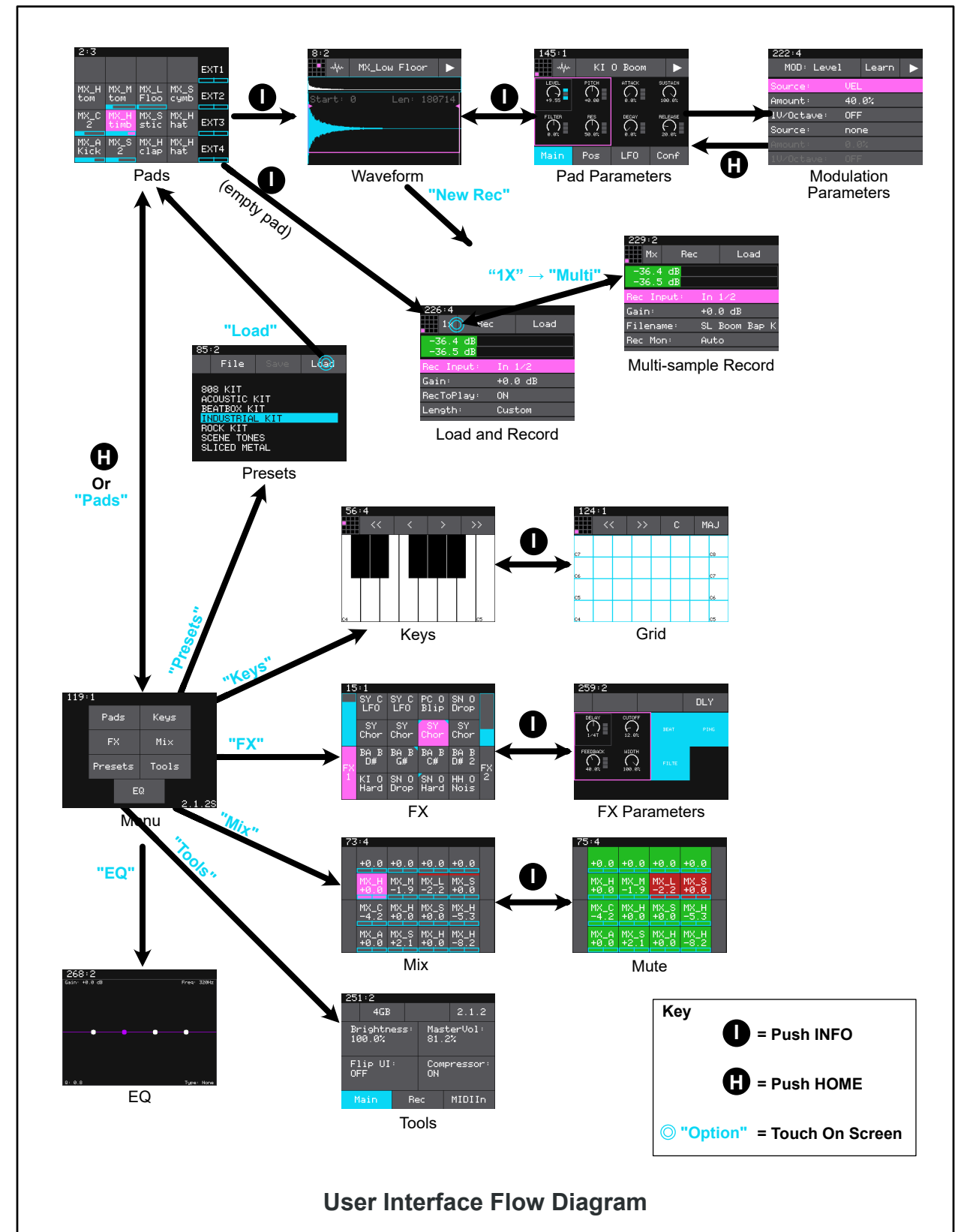
Mix Screen

To save your work, you will save the Preset. The preset stores all of the pad settings, FX settings and Mix settings.

You can add a final touch to your song with the 4 band EQ.

The diagram on the next page shows the general navigation flow for bitbox mk2. In general, you push INFO to drill down for more information and HOME to go back a screen. At the highest level, HOME will toggle between the Pads and Menu screens. Push INFO to get more information about the item selected on screen. Some screens have buttons you can touch to navigate to other functions. On some screens, like Pad Parameters or Keys, you can touch the grid icon in the top left to select a different pad to edit. We will go into more detail about all of this below as we describe each area of functionality.

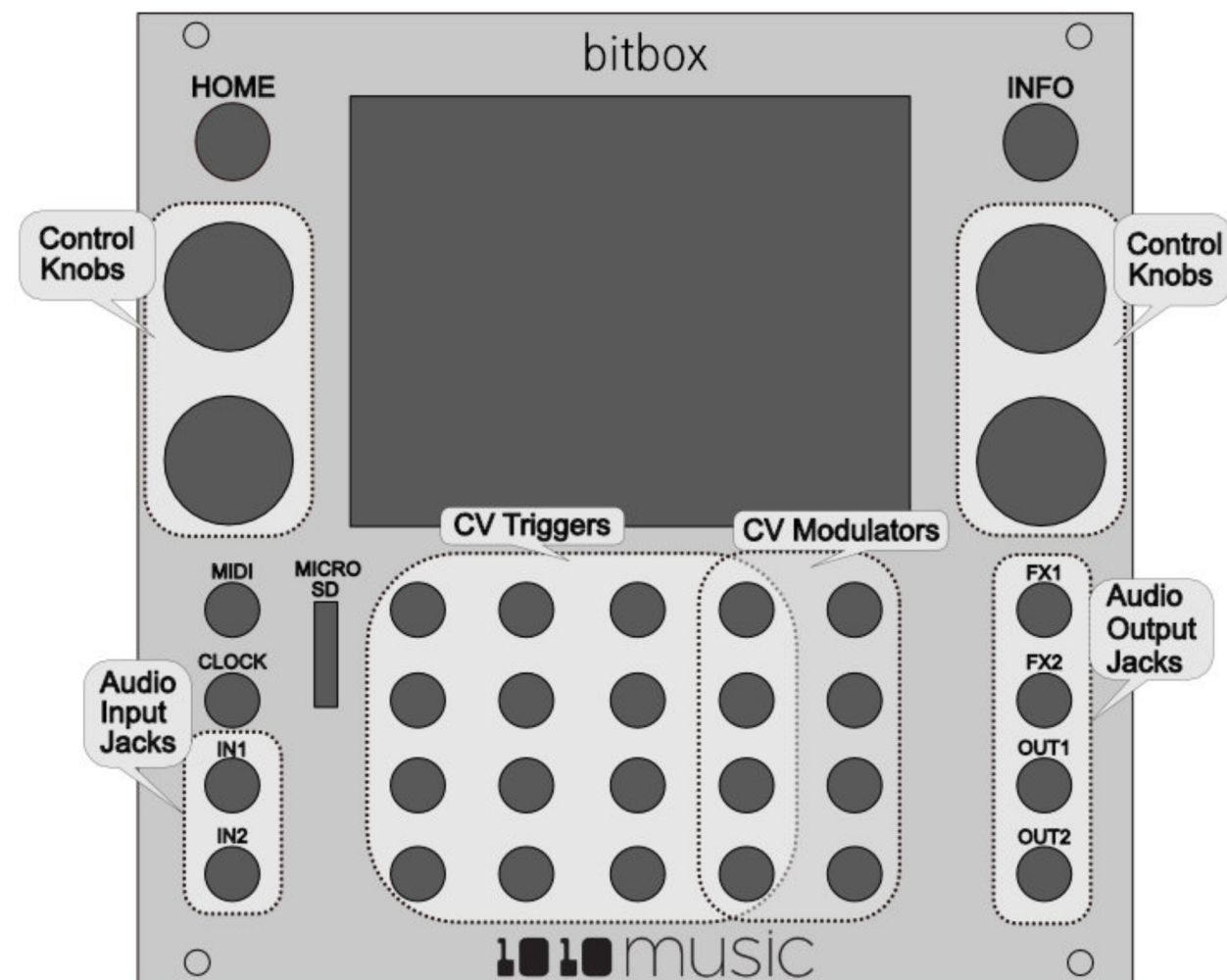
For now, we recommend you use the diagram on the next page to just get an idea of the scope of screens available and the general navigation flow.



User Interface Flow Diagram

FRONT PANEL AND CONTROLS OVERVIEW

The front panel of bitbox mk2 contains a touch screen, control knobs, HOME and INFO buttons, a MIDI input jack, a clock input jack, 2 audio input jacks, 20 CV input jacks and 4 audio output jacks as shown in Front Panel Overview. This manual will refer to the controls, inputs and outputs of the module using the labels shown in this figure.



Front Panel Overview

The touchscreen displays the firmware running on the module and allows you to use touch gestures to interact with the firmware. The INFO and HOME buttons are used to navigate the screens. Press INFO to view the information screen for the current selection. In some cases, you can press INFO more than once to get to deeper information. The HOME button takes you back a screen. If you get lost, you can push HOME until you get back to the Pads screen.

The control knobs are used to cycle through options on the screen. When there is a list of parameters on the screen, use the top knob to select the parameter and the bottom knob to set it's value. When there are virtual knobs on the screen, the physical knobs

control the four parameters within the focus ring. You can also touch and drag the knobs to control them..

Below the screen and knobs there are a series of mini jacks that are used for MIDI and control voltage input and output. The MIDI input jack allows you to trigger pads and modulate signals. You can also use the MIDI clock to synchronize playback. The CLOCK input is used to sync with a CV clock signal. The two audio inputs (IN1 and IN2) are used to record WAV files and for more precise modulation. The grid of mini jacks directly below the screen can accept CV signals to trigger pads. The right two columns of jacks can be used to modulate parameters.

Bitbox mk2 allows the user to configure how the audio outputs of the pads are routed to FX1, FX2, OUT1, and OUT2, either as mono or stereo signals.

The MICRO SD slot accepts a microSD card that is used to store WAV files and presets. All of your data and settings are stored on the microSD card.

Pads Screen Overview

The Pads screen of the bitbox mk2 firmware provides ready access to the WAV files in the selected preset. The grid on the Pads screen contains 16 gray pads that can each be assigned one WAV file or a folder of WAV files. Each preset may contain a different configuration of WAV files and parameters. The pads display the abbreviated name of the selected WAV file or folder. A blue bar across the bottom of the pad represents the playback state of the pad. The four pads along the right side of the screen, labeled EXT1 through EXT4, are mapped to external inputs jacks. The column of jacks to the left of the EXT jacks can also be used as additional external inputs EXT5 through EXT8, in addition to simultaneously being used to trigger samples mapped to those pads.



Pads Screen

You can touch a pad on the screen to select it and trigger it. The selected pad is highlighted pink. Press the INFO button to drill down and see the Waveform screen for that pad. Press INFO again to access the pad parameters. Touch the tabs across the bottom to select the different pad parameter pages. Press HOME to navigate back up the screen hierarchy. You can also use the control knobs to scroll through the pads. The top two knobs scroll horizontally, and the bottom left knob scrolls vertically. The control knobs allow you to select a pad without triggering it. The bottom right knob switches the right column of the display to toggle between the EXT display and the clipboard menu.

A counter in the top left corner of the screen tracks the number of measures and beats (e.g. 2:3 in the example) that have played since the clock started. Reset the measure counter by powering down the module, stopping the CV clock input for a few seconds, or sending a MIDI Start signal.

SETUP BITBOX MK2

In this section we will discuss how to install the bitbox mk2 module in a Eurorack, insert the microSD card, and configure some general settings.

Choose an Orientation

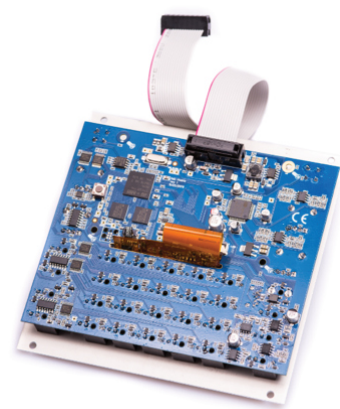
Bitbox mk2 can be configured so that the user interface will be right side up with either the touchscreen at the top of the module, or at the bottom. We originally designed the module to run with the touchscreen on the top of the module, and the text on the face plate right side up. If you are running the module in a tabletop skiff and want to be able to access the touchscreen without reaching over the cables, install the module with the touchscreen at the bottom. You can purchase an inverted face plate on our website if you like to work with the screen below the jacks. Think about how you want to use the module and decide on the orientation that will work for your setup. We will talk about how to flip the user interface when we configure the general module settings.

Note:

- ▶ When the user interface is flipped, the alignment of the knobs will be slightly higher than the on-screen elements that they control. However, the general orientation mapping will be correct.

Rack Installation

Let's make sure you have a compatible Eurorack. Bitbox mk2 requires a +12V connection and uses the standard 16-pin ribbon cable to connect to the rack. You should always power down the Eurorack when connecting new modules. Remove bitbox mk2 from the packing material and attach the ribbon cable to the back of the module. The cable is the same on both ends so it does not matter which end is inserted into the module. However, the connector must be in the correct orientation. The connector on the module is keyed so the ribbon cable won't easily fit in the wrong orientation. The correct orientation places the edge of the ribbon cable with the red line on the left side of the module as shown in the photo to the right. Next, connect the other end of the ribbon cable to the power supply for your Eurorack. Be careful when connecting to the Eurorack power supply because not all power supplies are keyed to ensure correct orientation. The ribbon cable should be connected to the power supply so that the edge of the ribbon cable with the red line is aligned with the -12V pins on the power supply bus. When you power up, watch closely to make sure that the module powers up. If the touch screen doesn't respond right away, turn off the rack and confirm the cable orientation. 1010music



Ribbon Cable Orientation on Module

modules do contain some buffering to prevent burning out the module but that only buffers for so long. Don't power up yet.

Next make sure the microSD card that came with the module is inserted into the MICRO SD slot. Most modules come with the microSD card already inserted. The card should be inserted with the straight edge closest to the touchscreen. Bitbox mk2 has been tested with microSD cards that hold up to 256 GB of data, but theoretically can support even larger cards. Now you can power up the rack. The module should start up in less than 10 seconds and you will see the Pads screen as shown on the right.



Pads Screen

Note:

- ▶ A microSD card must be inserted into bitbox mk2 before you can get started. All presets are stored on the microSD card.
- ▶ Preset changes are only saved when you choose to save them.

Connect an Output

In order to hear the sounds that are playing on your bitbox mk2, you will need to connect the outputs to some speakers. Start by inserting two mini TS cables to the OUT1 and OUT2 jacks and then connecting the other ends to your mixer or speakers.

Connect an Input

Bitbox mk2 accepts several different forms of input. For now we will set up some basic inputs to get you started. If you are going to use a MIDI device to drive your bitbox mk2, connect it to the MIDI input on the bitbox.

Note:

- ▶ The Bitbox mk2 MIDI input is compatible with both Type A and Type B mini TRS connections. For information about MIDI adapters and compatibility see our knowledge base article at <https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide>.
- ▶ Use the provided mini TRS to MIDI 5 Pin DIN adapter to connect to a standard MIDI cable.

You can also use control voltage (CV) signals with bitbox. If you prefer this method, connect some CV signals from other modules or devices to one or two CV Trigger jacks in the array of jacks below the touch screen. Connect one input in the right column of CV Trigger jacks, and another input in one of the first four columns. Configure your external device to send a varying CV signal in the -5V to +5V range.

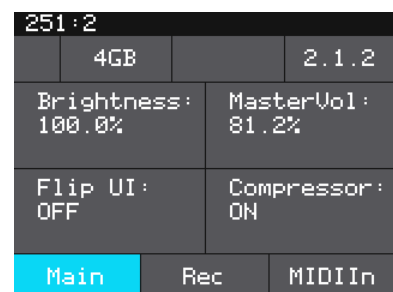
Tools

Before we dive into using the module, we will configure some general module settings via the Tools screen.

To access these settings, press the HOME button repeatedly until you see the Menu screen shown on the right. Touch Tools to display the Tools screen. Use the control knob closest to the parameter to adjust its value. Touch the tabs at the bottom of the screen to access additional settings.



Menu Screen



Tools Main Page



Tools Rec Page



Tools MIDI In Page

Here are the available settings:

Page	Parameter	Description
Main	Brightness	Controls the brightness of the display screen, with 100% being the brightest and 0% being totally dark.
	MasterVol	Controls the output level to Out 1 and Out 2.
	Flip UI	This will turn the user interface upside down so you can use the module with the touchscreen on the bottom. As soon as you change the value for Flip UI, the user interface will be inverted. This means you will need to change which control knob you use to change it back. The input jacks are mapped to the new orientation as well.
	Compressor	When set to On, bitbox mk2 will apply a compressor to the signals sent to Out1 and Out2.

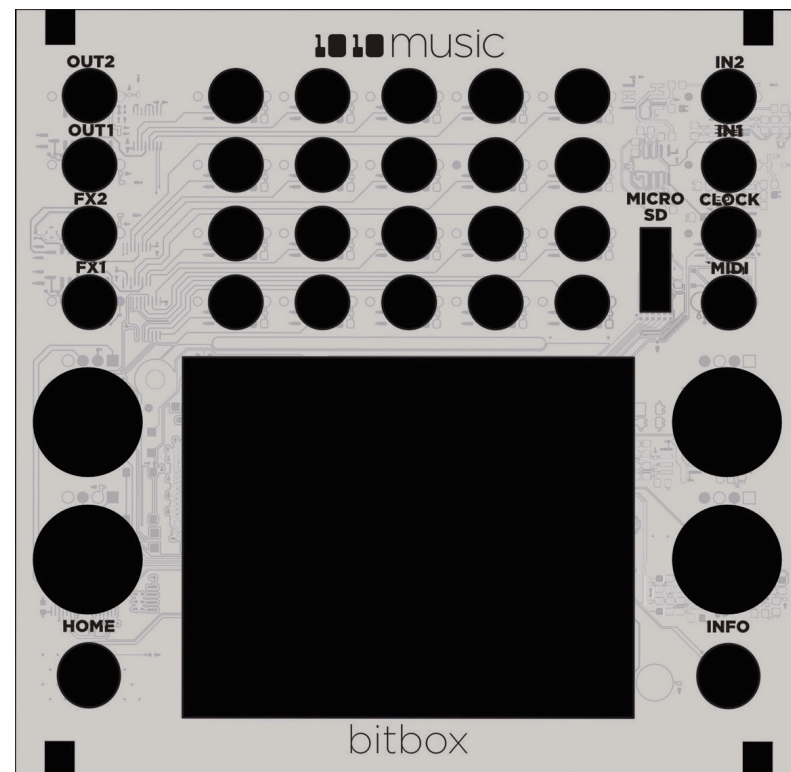
Page	Parameter	Description
Rec	RecToPlay	If you have RecToPlay set to ON, bitbox mk2 will automatically start to play the new sample when recording ends if the Length parameter was set to a value other than Custom for recording.
	RecConfig	When this is set to Global, changes made to recording settings on the Pad Loading and Recording screen will apply to all empty pads. When this is set to Per Pad, these changes only change the current pad and do not change what is used for other empty pads. Use Per Pad when you want to set up a Template preset with different recording configurations for each pad.
	SD Mode	This is a troubleshooting option. If you get the message "Please insert microSD" when the microSD card is inserted, try changing this to Compatible. You may also try Compatible mode if your device seems to be having trouble writing to high speed microSD cards. If everything is behaving properly, leave this set to High Speed.
MIDI In	MIDI Pads	Specifies which MIDI channel is used to trigger pads. If a channel selected here is also chosen as the MIDI IN channel for a pad, that pad will also play notes in response to signals received on this MIDI channel. See the section Use MIDI and CV with Bitbox mk2 below for more information. When this parameter is set to Omni, pad hits and can be triggered by all MIDI channels. However, any MIDI channel that is assigned as the MIDI In for a pad or as the MIDI Keys parameter will be excluded from the list of channels that will trigger pad hits when MIDI Pads is set to OMNI. MIDI Program Change messages received on this channel will be processed by bitbox mk2 if the ProgChange parameter is set to ON.
	ProgChange	When set to ON, bitbox mk2 will respond to MIDI program change messages received on the MIDI Pads and MIDI Keys channels by opening the Preset that maps to the specified program number. See the section Use MIDI and CV with Bitbox mk2 below for more information. Program change messages on other channels will be ignored. Remember that bitbox mk2 does not automatically save changes. This means that when you change presets you will lose any unsaved changes.
	MIDI Keys	Specifies which MIDI channel is used to play notes for the currently selected pad. If a channel selected here is also chosen as the MIDI IN channel for a pad, that pad will also play notes in response to signals received on this MIDI channel. See the section Use MIDI and CV with Bitbox mk2 below for more information. When this parameter is set to Omni, notes will be triggered for the currently selected pad by all MIDI channels. However, any MIDI channel that is assigned as the MIDI In for a pad or as the MIDI Pads parameter will be excluded from the list of channels that will trigger notes for the currently selected pad. MIDI Program Change messages received on this channel will be processed by bitbox mk2 if the ProgChange parameter is set to ON.
	MIDI Rec	When enabled, bitbox will respond to certain MIDI notes to control recording and clearing of pads. See section MIDI Triggered Recording below for more information.

At the top of the Tools page, you can see two numbers. The left number (4GB in the sample screenshots) is the space remaining on the microSD card. The other number (2.1.2 in the sample screenshots) is the current firmware version number.

When you are done, press the HOME button to go back to the Pads screen.

Working in Flipped Mode

When the value for Flip UI is set to ON, the user interface on the touch screen will be inverted. Use this setting when the module is installed in a rack with the touchscreen on the bottom. When flipped, the firmware adjusts how the buttons, control knobs and CV Trigger jacks are mapped to the user interface. One noteworthy change is that the HOME and INFO buttons now reverse functions. This is done so that HOME is always on the left and INFO is always on the right. The alignment of the control knobs in this mode is slightly high compared to the parameters on the touch screen. However, the top left control knob will control the top left parameter, and the lower right control knob will control the lower right parameter. The CV trigger inputs are also now mapped to the inverted display. The input jacks and output jacks maintain their original assignments. The image below shows the face plate labels for an inverted module.



Inverted Face Plate

Test Your Setup

Before we start creating our own presets, let's make sure the module is setup properly by playing back some content from a preset that comes with the module and triggering playback through external inputs.

Use the Touchscreen to Trigger a Cell

Bitbox mk2 automatically loads the last used preset when you start it up. Trigger playback of a WAV file by touching a pad in the grid that has a name displayed. You will see a blue progress bar appear at the bottom of the pad during playback. You will hear the WAV file played back through the audio output selected for that pad. The default presets are configure to play out through OUT1 and OUT2.

Trigger a Cell via Control Voltage Signal

You can use an external signal to trigger the playback of a pad. Plug a trigger source into one of the CV Trigger jacks. The CV Trigger jacks are mapped to the pads on the touchscreen. The pad that corresponds to the used CV Trigger jack will now be triggered when the CV Trigger input receives a high signal of around 5V. Depending on the Launch Mode selected for the pad, you may need to send another CV Trigger to stop playback of the pad.

Trigger a Cell via MIDI Input

You can use MIDI signals to sequence samples and get a more tactile play mode. Connect your MIDI source to the MIDI input jack, and configure the MIDI source to use the channel specified for MIDI Pads in Tools. (See Tools above to learn how to set the MIDI Pads channel.) Now you can use the MIDI device to trigger pads. MIDI inputs for notes 36 to 51 map to the pads in the grid as shown in the diagram on the right. EXT1 through EXT4 are assigned notes 55 to 52 for use as Recording triggers. However, these MIDI mappings for notes 52 to 55 do not work with modulation.

48	49	50	51	55
			D#3	
44	45	46	47	54
40	41	42	43	53
36	37	38	39	52
C2				

Default Mapping of MIDI Notes to Bitbox mk2 Cells and EXTs

Note:

- ▶ The MIDI input is compatible with both Type A and Type B mini TRS connections. Be sure to use a TRS cable and not a TS cable. Read the blog post **Mini TRS Jacks for MIDI Connections Compatibility Guide** on our website at <https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide> for more details about Type A and Type B TRS connections.
- ▶ Bitbox mk2 by default responds to MIDI inputs on all MIDI Channels. You can change this in the [Tools](#) screens as described above.
- ▶ Bitbox mk2 can also use MIDI inputs on a specific channel to trigger playback of slices within a Slicer pad. See [To Use MIDI Notes to Play Slices](#) below for more information.
- ▶ The MIDI parameter for a pad can be used to configure a pad to be triggered by a MIDI channel other than the one specified for MIDI Pads. We'll talk about this some more we when cover Cell Parameters later.

CREATE A NEW PRESET AND CONFIGURE PADS

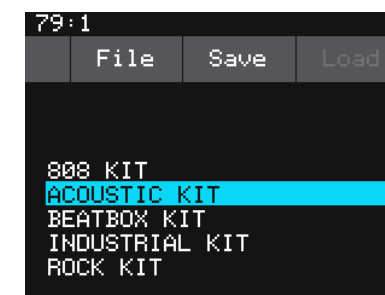
Let's get you working with bitbox mk2 by creating a new preset and configuring the different pad modes. This section will also cover managing and recording WAV files.

Starting a New Preset

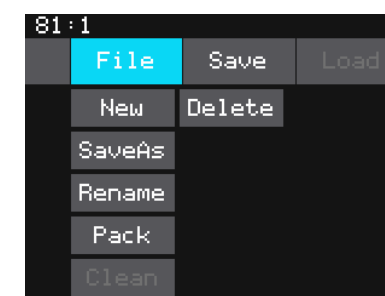
First, create a new preset that will be used to store the configuration parameters you select.

To Create a New Preset:

1. Push the HOME button repeatedly until you see the Menu screen. Touch the Presets option to display the Preset Management screen. The Preset Management screen shows a list of the presets stored on the microSD card with a menu across the top. The currently selected preset is highlighted in blue.
2. Touch File then New in the top menu. A new preset is added to the list with the name New Preset. You can use the on-screen keyboard to change the name.
3. Touch Clear to erase the preset name. Then use the on-screen keyboard to type in a new name. Turn the knob to change where you are typing. Use the carat button ^ to toggle between upper- and lower-case letters. Touch the 123 button to display the numeric keyboard if needed.
4. When the name is complete, touch Enter to save the name and go to the Presets screen with the new preset selected. The new preset is loaded. Push HOME to go back to the Pads screen.



Preset Management Screen



Preset File Menu







Keyboard Screen

Note:

- ▶ If you attempt to save the file using a name that is already in use on the microSD card, bitbox mk2 will append " 2" to the end of the name to make it unique.

Assign WAV Files to Pads and Control Playback Options

Now you will choose assign WAV files to pads and select a mode for each pad. The main screen has a 4x4 grid of 16 light gray pads. A WAV file can be assigned to each of these pads, and each pad is assigned a pad mode. The available pad modes are sample, clip, slicer, granular, New Rec and New Multi. The table below will help you choose which pad type to use:

Icon	Pad Mode	Description	Reverse Playback	Beat Sync	Set Loop Points	Play Slices	Poly-phony
	Sample	Use to play single notes or drum hits. You can control start and end points for playback and looping. Supports reverse playback, along with forward and bidirectional looping.	✓		✓		Up to 16 notes (See Poly Mode below.)
	Sample: Multi-Sample Mode	Spread a folder full of wav files across the keyboard to get more realistic instrument pitch shifting or to map different sounds to each key on the keyboard.					Up to 16 notes (See Poly Mode below.)
	Clip	Use for synchronized loops and quantized playback, e.g. drum loops and guitar tracks between one and eight measures long.		✓			2 notes
	Slicer	Use with a WAV file with different sections that you want to trigger independently.				✓	2 notes
	Granular	Generate new sounds from your samples. The sample is played back in small portions about 10 to 200ms in length, called grains.	✓			✓	mono
	New Rec	Use to start recording a new WAV file or to clear a WAV from a pad.					
	New Multi	Use this for automatic recording of a multi-sample bank.					

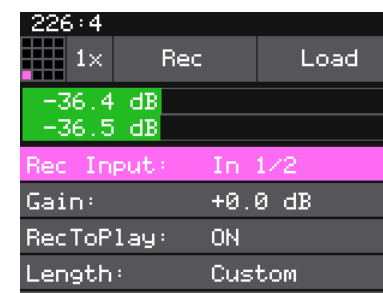
Note:

- ▶ Bitbox mk2 can support playback of up to 24 total voices across all pads at one time. Additionally, there is a configurable limit for each pad mode as identified in the table above. See [Poly Mode](#) and [Maximum Number of Voices Supported](#) below for more information.

Each pad can have a different Pad Mode. You can use the same WAV file in different pads in different pad modes.

To Load a WAV File into a Pad:

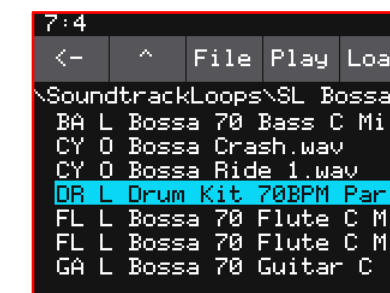
1. Select a pad by touching it or using the control knobs to cycle through the pads. The top control knobs move the selection horizontally. The bottom left control knob move the selection vertically. The selected pad is highlighted pink.
2. Press the INFO button. If the pad was empty, the Load and Record screen will be displayed. If the pad already had a WAV file assigned, the Waveform screen will be displayed.



Load and Record Screen



Waveform Screen



WAV File Selection Screen

3. If you are on the Load and Record screen, touch Load in the top menu bar. If you are on the Waveform screen, touch the name of the Waveform at the top of the screen (MX_Low Floor in the screenshot above). You will now be on the WAV File Selection screen.
4. From the WAV File Selection screen, use the control knobs to scroll through the list of files. The selected file name has a blue highlight. Touch Play to preview the highlighted file. The Play button will turn blue to show that auto-preview is enabled. Bitbox mk2 will play each WAV file one time when you pause on it while scrolling. If you have an input trigger configured for this pad, bitbox mk2 will play the selected WAV file whenever a trigger is received for this pad. Touch the Play button again to disable auto-preview mode. Touch Load to assign the selected WAV file to this pad. When looking at the list of files, list items that start with a slash \ are directories. Load a directory to see its contents. The file path is displayed above the list of files (e.g. Piano in the example above.) Touch the caret ^ to navigate back up the directory tree. Touch the back arrow <-- to go back to the previous screen.

You will now be on the Waveform screen. There are a number of important features on the Waveform screen. The grid icon in the top left of the screen provides a graphical representation of which pad in the grid you are configuring. You can touch it to select a different pad. The icon just to the right of that is a button that allows you to select the pad mode. The text in the top bar displays the first characters of the name of the loaded WAV file. Touch the name to choose a different file. Trigger playback by touching the triangle play button on the right.

There are two views of the waveform displayed on the screen. The top view always displays the full waveform with a blue square indicating the subsection of the waveform that is displayed in the bottom, bigger waveform. You can use pinch and stretch touchscreen gestures to zoom in and out of the waveform, or swipe to scroll along the length of the waveform. You can quickly jump to a different section of a long waveform by touching that section of the wave in the top view.

To Configure Basic Cell Parameters:

Now that you've chosen a WAV file to play, let's tell bitbox mk2 how you want to play it.

1. Touch the icon immediately to the left of the WAV file name at the top of the waveform screen to display the Pad Mode menu. Touch one of the options, Sample, Clip, Slicer, or Granular, to set the pad mode. The icon changes to represent the selected pad mode. See the table at the beginning of this section for help in choosing the pad mode. If you choose New Recording here instead, you will clear the WAV file assigned to this pad and go back to the Load and Record screen.



Pad Mode Menu

2. From the Waveform screen, press the INFO button to display the first tab of the Cell Parameters screen. You can press HOME to return to the Waveform screen. On the Cell Parameters screen, touch the tabs across the bottom to access additional parameters.



Pad Parameters Screen

3. On the Main Cell Parameters screen, there are four controls below the measure and beat count. The left most control is the pad selector grid. Touch this grid and then touch a pad in the grid to select a different pad to edit.
4. The second header control is the Pad Mode selector, as seen on the Waveform screen.

5. The text in the header displays the WAV file name, or an abbreviation of it.
6. Touch the triangle on the right side to start playback of the pad. The playback functionality will depend on the other parameter settings. The WAV file is playing when this menu item is highlighted light blue.

Control Pad Parameters

On the Main, LFO and CONF tabs of the Pad Parameters page you configure the general pad options that are the same for all pad modes. Some of the options on these screens vary by pad mode. The behavior of the parameters on the POS tab vary by pad mode. The GRAN tab contains parameters specific to granular pads.

There are two styles of parameter pages: knob pages and list pages. On knob pages, you control the virtual knobs in the focus ring with the physical knobs. Touch a knob to select the corresponding group of knobs in the focus ring. You can also touch a virtual knob and drag up and down or left and right to change the value of the knob. On list pages, turn one of the top two knobs to select a parameter to edit, then turn one of the bottom two knobs to set the value for that parameter.

The tables below list the parameters that apply across all sample modes. We will cover the other parameters as we discuss the specific pad modes.

Main Pad Parameters:

Parameter	Description	Range of Values	Mod Target?
Level	Adjusts the loudness level of the pad	0 to 100%	Yes
Pitch	Adjusts the pitch of the pad up or down	-24.0 to +24.0 semitones	Yes
Filter	Applies either a high pass or low pass filter to this pad.	-100% to +100% Negative values apply a low pass filter. Positive values apply a high pass filter.	Yes
Res	Filter resonance. The amount of boost added to the audio frequencies around the filter cutoff point.	0 to 100%	Yes
Attack	The time it takes for the sound to reach its loudest level	0.0 to 100.0% The attack percentage is a logarithmic scale between 0 and 9 seconds.	Yes
Decay	How long it takes for the sound to go from the initial peak to the sustain level	0.0 to 100.0% The decay percentage is a logarithmic scale between 0 and 38 seconds.	Yes

Parameter	Description	Range of Values	Mod Target?
Sustain	The volume level that the sound maintains when you hold a note	0.0 to 100.0%	No
Release	The release specifies how long the note will continue to play and fade out when the note is released. In Gate mode, the release begins when the touch ends, the gate signal goes low, or the MIDI note off event occurs. In Toggle mode, the release begins when the toggle off occurs. In Trigger mode with sample pads the release begins when reaching the Loop End point in loop mode, or the Start + Len point when not looping. In Trigger mode for Clips and Slicers, the release has no effect.	0 to 100% The release percentage is a logarithmic scale between 0 and 38 seconds.	Yes

LFO Parameters: <New in 2.1>

Bitbox mk2 has a low frequency oscillator per pad that can be used to modulate pad parameters in a synchronized way. You configure this on the LFO tab of the Pad Parameters page for each pad.

Parameter	Description	Range of Values	Mod Target?
Waveform	Sets the shape of the wave used by the low frequency oscillator for this pad.	Saw, Rev Saw (Reverse Saw), Triangle, Pos Tri (Positive Triangle), Sine, Pos Sine (Positive Sine), Square, Pos Square (Positive Square), Random	No
Depth	The amplitude of the oscillating wave.	0.0% to 100.0%	Yes
Rate	The frequency of the LFO from about 0.1Hz to 12 Hz. When Beat Sync is On, this specifies the rate in beats and measures. Set to 0.0 to stop the LFO.	When LFO Beat is OFF: 0.0% to 100.0% When LFO Beat is ON: 8, 4, 2, 1, 1/2, 1/2 T, 1/4, 1/4 T, 1/8, 1/8 T, 1/16, 1/16 T, 1/32, 1/32 T, 1/64 bars	Yes
Beat	Controls the behavior of the Rate parameter. When this is ON, the wave cycle is synchronized with the clock.	On, Off	No
Trig	When active, the LFO will restart each time the pad is triggered.	On, Off	No

Conf Pad Parameters:

Several settings that used to be controlled via buttons across the top of various pad parameter pages can now be found on the Conf tab of the Pad Parameters page. This is also where you can control the launch mode and MIDI mapping for the pad. The new Poly Mode parameter found here can be used to optimize the polyphony pool allocation across pads.

Parameter	Description	Range of Values	Mod Target?
Launch Mode	This controls how a note trigger affects the playback of a pad.	Trigger: Activate the Pad by touching the pad or through MIDI note on. Bitbox mk2 will start playback of the WAV file and play through to the end. Gate: Begin the WAV file playback in the same manner as Trigger mode. But in Gate mode, playback will stop when you release the touch or the MIDI note is released. Toggle: Begin the WAV file playback in the same manner as Trigger mode. When another trigger event happens, the playback will stop.	No
Output	The output of this pad is sent to the output or outputs selected here. It will always also be sent to the output configured as the Master output, if you have an output configured to carry the Master output.	Out1/2, Out 1, Out 2, FX1/2, FX1, FX2	No
Pan	For Pads routed to stereo outputs, this controls the position of the output in the stereo channel.	-100% to +100%	Yes
Poly Mode	Controls the maximum polyphony for this pad. The note playback across all pads draws from a recommended maximum 24 note pool. Does not apply to Granular pads. If Poly X, this pad will use any available notes in the pool beyond what is used by other pads, up to 16 max. To avoid glitching, minimize the use of Poly X.	Mono, Poly 2, Poly 4, Poly 6, Poly 8, Poly X	No
Excl Group	Exclusive Grouping. When Excl X is selected, there will not be an exclusive behavior for this pad. When a pad is assigned to an Exclusive Group, any other pad in this group will stop whenever a pad in the group is triggered.	Excl X, Excl A, Excl B, Excl C or Excl D	No

Parameter	Description	Range of Values	Mod Target?
MIDI In	<p>Specifies a MIDI channel to be used to play this pad chromatically or sliced across keys. and for some MIDI parameters.</p> <p>More than one pad can be assigned to the same MIDI channel. In this case, all assigned pads will be triggered.</p> <p>Any MIDI channel that is mapped to a pad using this parameter no longer triggers any events for MIDI parameters set to OMNI.</p> <p>Modulation sources PTCH (pitch bend), MODW (Modulation Wheel), MVOL (Volume control), and MPAN (Pan control) follow this channel assignment.</p> <p>See the section Use MIDI and CV with Bitbox mk2 below for more information.</p>	None, Ch1 through Ch16.	No
Pad Note	Controls which MIDI note on the MIDI Pads channel will trigger playback of this pad.	Default, C#-1 through G9. C#-1 maps to MIDI Note Number 0.	No

Note:

- ▶ Pay attention to the **LaunchMode** parameter because this impacts how the pad responds to triggers.
- ▶ We will cover the other parameters as we discuss the specific pad modes.

Several of the pad parameters have three black or blue boxes on the right side. These pads are potential modulation targets, and the boxes indicate which slots are filled. We will discuss modulation later.

To Assign a Cell to an Exclusive Playback or Choke Group:

Navigate to the Conf tab of the pad parameters page. The Excl Group parameter allows you to control exclusive grouping or choking of pads.

1. Select a Pad and push Info twice to go to the Pad Parameters page.
2. Touch Conf at the bottom of the screen to go to the Conf parameters tab.
3. Select the Excl Group parameter and turn the bottom knob to scroll through the available options. When Excl X is selected, there will not be an exclusive behavior for this pad. When a pad is assigned to Exclusive Group A, B, C or D, any other pad in this group will stop whenever a pad in the group is triggered.

Other Pad Parameters

The remaining configuration options for a pad vary based on which pad mode is selected. We will walk through the configuration of each of the pad modes next.

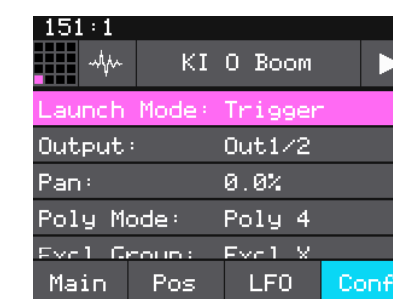
Set up a Sample Cell



Use a sample pad when you want to play or loop through a single note or drum hit within a WAV file, or you want to play a pad chromatically. This pad mode supports reverse playback, along with forward and bidirectional looping. For example, you might use Sample mode with a WAV file that contains spoken words, a backing track or a single melodic note.

Follow the steps in the previous section to create a sample pad. An example of a good WAV file to use for a sample pad is Soundopolis\Humans\Cartoon_Voice_003.wav. Touch the Pos and Conf tabs on the Pad Parameters screen to access parameters that are specific to Sample mode.

The tables below describes the parameters available that are specific to Sample mode.



Sample Mode POS Parameters

Pos Parameters for Sample Mode

Parameter	Description	Range of Values	Mod Target?
Loop Mode	<p>Controls whether the WAV file plays in a loop, and the direction of the loop.</p> <p>When looping is enabled, if you have the Launch Mode set to Trigger, looping will happen for the duration of the Release phase of the note.</p> <p>If you have the Launch Mode set to Gate, looping plays through the gate pulse and the release time.</p> <p>If you have the Launch Mode set to Toggle, looping starts to play when the initial pulse is received and continues until the terminating toggle pulse is received.</p> <p>If Loop Mode is Bidirect, and Rev is ON, playback will start from the end of the sample, and then loop as described, but starting with the Loop End to Loop Start pass.</p>	<p>None: Plays once from the value assigned to the Start parameter through the value assigned to the Length parameter.</p> <p>Forward: Plays from the value assigned to the Start parameter through the value assigned to the Loop End Parameter, then jumps back to the value of the Loop Start parameter. Play continues to loop between Loop Start and Loop End for the duration of the note.</p> <p>Bidirect: Works similarly to forward, but loop playback proceeds from Loop Start to Loop End then backwards to Loop Start. It then repeats the looping back and forth.</p>	No
Loop Fade	<p>The amount of overlap used in the cross fade at the loop points. The cross fade is accomplished by overlapping part of the WAV file from before the loop start point. This number represents how long the overlap content should be. If this is set to 100%, it will use an overlap that is the same length as the loop. If it is 10%, it will use an overlap that is 10% of the length of the loop. In order to truly loop 100%, the length of the WAV file before the loop point must be as long as the loop length. Otherwise, the cross fade will max out at a lower number.</p> <p>Loop fade does not work with Reverse looping.</p>	0 to 100%	No
Reverse	When Reverse is ON, the WAV file will play in reverse.	ON, OFF	No
Start	Point where playback will begin when playing forward or ends when playing in reverse. Expressed as a sample number.	0 to number of samples in the file	Yes
Length	When Loop Mode is None, how long the sample will play past the value of the Start parameter. Expressed in samples.	0 to number of samples in the file	Yes

Parameter	Description	Range of Values	Mod Target?
Loop Start	<p>Point where the looping will begin when playing forward, or looping will end when playing in reverse. Expressed in samples. Must be before or equal to Loop End.</p> <p>Loop Start is read from the WAV file when sample is loaded, and saved to the WAV file when the WAV is saved. You can override the setting for this pad in this preset by changing it here in these pad settings.</p>	0 to number of samples in the file	Yes
Loop End	<p>Point where the looping will end when playing forwards, or looping will begin when playing in reverse. Expressed in samples. Must be after or equal to Loop Start.</p> <p>Loop End is read from the WAV file when a sample is loaded, and saved to the WAV file when the WAV is saved. You can override the setting for this pad in this preset by changing it here in these pad settings.</p>	Loop Start to number of samples in the file	Yes

You can also set the values for Start, Length, Loop Start and Loop End from the Waveform screen. When viewing the waveform, the pink frame on the large waveform represents the Start and Length parameters. You can move these end points by turning the top two control knobs. If Loop Mode is set to Forward or Bidirect, you will also see a white frame within the pink frame that defines the Loop Start and Loop End points. Use the bottom two control knobs to adjust these end points. The corresponding values for the end points are displayed above and below the large waveform. The sensitivity of the control knobs depends on the Zoom level. Zoom out to make big adjustments then zoom in to make fine adjustments.

Conf Parameters for Sample Mode

Parameter	Description	Range of Values	Mod Target?
Interp	Controls Playback quality option. For most WAV files, the Normal mode provides high quality playback with a moderate draw on the processor. If you hear aliasing during playback of your WAV file, set this parameter to HighQ mode. HighQ mode has a higher draw on the processor, so it is recommended that you use Normal mode unless you are having issues.	Normal, HighQ	No
Root Note	The base sample will play for the note specified here. The sample will be pitch shifted up or down one semi-tone for each note away from the root note. This will load from the WAV file if available when you add the WAV to the preset. You can specify a different value here to be used for this WAV on this pad in this preset. When None is specified, the sample is assumed to have a root note of middle C. If you save the WAV file from this pad, the Root Note value will be saved with it.	None, C#-1 through G9	No

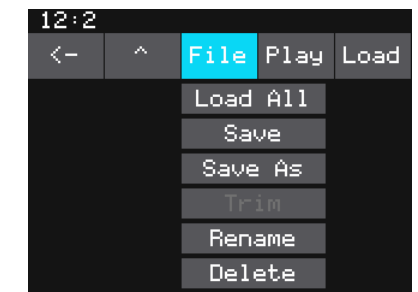


Set Up a Multi-Sample Cell

Multi-sampling is a useful tool for improving the sound quality when playing samples pitch shifted, and when you want to map a number of different WAV files to different keys on the keyboard.

If you have a number of samples of a single instrument at various pitches with root notes defined for each WAV file, you can map these samples together to reduce the amount of pitch shifting required to play a broad range of notes. Put the files you want to use in one multi-sample pad into a single directory by themselves. There are several folders of samples like this in the \Symplesound folder included on the microSD card. To load one of these sample banks into a pad:

1. Push Home to go to the Pads screen.
2. Select a pad by touching it or using the control knobs to cycle through the pads.
3. Press the INFO button. If the pad was empty, the Load and Record screen will be displayed. If the pad already had a WAV file assigned, the Waveform screen will be displayed. If you are on the Load and Record screen, touch Load in the top menu bar. If you are on the Waveform screen, touch the name of the WAV file at the top of the screen. You will now be on the WAV file selection screen.
4. From the WAV file selection screen, Use the control knobs to scroll through the list of files and directories. The selected file name has a blue highlight. When looking at the list of files, list items that start with a slash \ are directories. Load a directory to see its contents. The file path is displayed above the list of files. Touch the caret ^ to go back to the previous directory. Highlight one of the files in the directory of samples that you want to load into the pad. A good example of a directory to use with multi-samples is \Symplesound\Housepiano. You can select any file within that directory.
5. Touch File and then Load All.



Wav File Selection File Menu

Bitbox mk2 will now load all of the files in the current directory into this pad and map the files to notes across the keyboard based on the root notes defined in the WAV files. Now, use the KEYS screen or an external MIDI controller to play notes for that pad, and bitbox mk2 will play the sample that has the root note closest to the note played, and pitch shift as needed to achieve the necessary tone.

You can also use multi-sampling to map multiple waves across the keyboard. This can be useful if you have a folder full of drum sounds that you want to trigger with a keyboard. If you follow the steps above and load a folder where the files do not have root note mappings, it will load the files in alphabetical order, map the first file to note C2, and then each subsequent file to the next note above that. If you load the folder \Soundopolis\Sci Fi, you can see this in action. This folder has 16 samples which get mapped to notes C2 through D#4.

You can use bitbox mk2 to map the files to specific notes if you want. Open the files as individual samples on bitbox mk2 and edit the Root Note on the Misc tab of the Parameters screen. Save the WAV file with the root note information. (See [Save and Load Parameters in WAV Files](#) below to learn how to do this.) After you have done this for all of the files in the folder, use File-> Load All to load them all into a pad and you will hear that the notes are mapped accordingly.

Because a multi-sample pad uses multiple samples, it is not possible to set start, length, loop start or loop end points for these pads. Therefore, it doesn't make sense to enable looping for these pads either. As a result, the Pos and Misc tabs of the parameter page are not used when multiple samples are loaded in a pad. Only the standard Main, ADSR and MIDI parameter tabs are supported for Multi-samples.

Note:

- ▶ Multi-sampling can quickly use a lot of samples. In order to prevent potential issues, bitbox mk2 limits you to loading 80 wav files at a time. If you hit that limit, it won't load any more wav files until you free up some slots by clearing out a pad. There is also a limit of 64 WAV files per pad.
- ▶ If you change the pad mode of a multi-sample pad to something other than Sample, it will load only the first sample in the folder and work with that. You will need to reload the files to change back to multi-sample mode.
- ▶ Anytime you use File -> Load All to load a directory of samples into a pad the pad mode will automatically be changed to Sample.



Work with a Clip Cell

Use Clip Mode for WAV files where you want to use synchronized loops and quantized playback for the entire WAV file. Clip Mode works well with drum loops between one and eight measures long, but there is no hard limit to the length. This is the only Pad Mode that supports beat synchronization. An example of a file that works well with Clip Mode is \SountrackLoops\SL Dark Ambient\BA L BassArpegg 100 C.wav. This clip is used in the preset SL Dark Ambient. The Pos parameters have unique behaviors for pads in Clip Mode.



Clip Cell Misc Parameters Page

Pos Parameters

Parameter	Description	Range of Values	Mod Target?
Loop Mode	Controls whether the WAV file plays in a loop. The whole WAV file will be played in the loop for clip pads. Only forward looping is supported with clip pads.	On, Off	No
Beat Count	Enter the number of beats in the clip file to give bitbox mk2 more information to work with when synchronizing playback to the current song BPM. If set to Auto, bitbox mk2 will attempt to detect the beat count automatically.	Auto, 1 to 512	No
Quant Size	Use Quant Size to quantize when the playback starts and stops. Quantization will cause playback to snap to a musical grid with intervals specified by the Quant Size parameter. When quantization is used, the note trigger will cause playback to start and end on the next quant size boundary. For example, if the Quant Size is set to 1-bar and you press the pad, the playback will begin at the start of the next bar.	None - always start and stop immediately 1/16, 1/8, 1/4, 1/2, 1 bar, 2 bars, 4 bars, 8 bars	No
Sync	Sync is only enabled when quantizing is enabled (the Quant Size parameter is not None.) The Sync feature prevents timing drift that can occur when the length and BPM of a clip does not align exactly with the tempo of playback. When Sync is used, bitbox mk2 will realign the audio to match the clock at the step size specified here. Even slight differences between WAV file BPM and clock tempo can cause significant drift over time. Select a value for Sync that will control the size of the musical unit to which the clip will be synchronized. Choose small settings, like 1/16th, for rhythmic or percussion clips. Choose large settings, like 1-bar, for sustained tones or drones	None – playback will occur at the original rate. Looping will happen as soon as the sample ends. 1/16, 1/8, 1/4, 1/2, 1 bar, Slice (See To Use Slices to Synchronize Playback of Clip Pads below for more information.)	No

Let's talk some more about Quant Size and Sync. When a Quant Size other than None is selected, the playback of the wave file will be delayed until the next selected unit of music as specified in Quant Size. This will ensure that your playback "snaps to the grid" of the beats established by your clock. Sometimes, the WAV file you are playing is longer than one beat. For example, the WAV file might contain a 2 bar drum riff. For a clip pad, bitbox mk2 will make some assumptions about where the beats in your file occur. In Clip mode, the module will play the whole 2 bar riff when the note is triggered. But the beats in the WAV file might not be playing at the same tempo as the clock speed. If you leave Sync set to None, the WAV file will play in its entirety and will get out of sync with your clock. If your WAV file tempo is faster than your clock tempo, it will sound like the beats are running ahead of the rest of the music. If your WAV file tempo is slower than your clock tempo, it will sound like your drums are lagging. If you want to fix that, then choose the value for Sync that identifies how tightly you want to snap to the clock while the WAV file is playing in response to a single sustained note trigger. While the note is playing, the sync will cause the playback of the WAV file to jump to the next selected sync increment in the file when the corresponding clock time has passed. So if the WAV was a little faster than your clock, the playback position will jump backwards to move the playback of the WAV to the selected clock increment. If the WAV is slower than your clock, the playback position will jump ahead to the selected clock increment. This will work well if the difference between the BPM of your WAV file and the BPM of your clock is small. It will sound like a stutter if the difference is large.

Note:

- ▶ Bitbox mk2 assumes your clips use 4:4 time. If you are using other time signatures or polyrhythms, the module will have trouble synchronizing the clip.

Tips for Synchronizing Clips:

- Make sure your WAV file starts at the beginning of a measure and ends at end of a measure. There should be no blank space at either end and it should loop cleanly at full length.
- Help bitbox mk2 determine the beat count. Bitbox mk2 will use the following methods in this order to identify the beat count:
 - Look at the BeatCount parameter when it is not Auto
 - Look for a valid ACID Tag in the WAV file that includes the beat count
 - Try to calculate it using the following assumptions:
 - the time signature is 4:4
 - the beat count is a power of two (2, 4, 8, 16, 32, 64, ...)
 - the clip tempo is close to the current clock tempo



Set Up a Slicer Cell

Slicer Mode is useful when a single WAV file has multiple sections that you want to trigger independently. For example, if you have a drum riff you may want to trigger different drum hits within the drum riff independently. Or if you have a recording of a vocal track, you may get an interesting effect if you skip around to playback different words or phrases over time.

In order to use Slicer mode effectively, you will need to configure the Slicer related parameters and identify slices within the WAV file. Bitbox mk2 can automatically detect the slice points within the wave file, and you can manually add or remove slice points. The WAV file \SoundtrackLoops\SL Trance\Y L Pad 2 130 B.wav is a good example to try with slicer mode.



Slicer Cell Pos Parameters Page

The parameters with unique behaviors for Slicer mode are listed below.

Pos Parameters

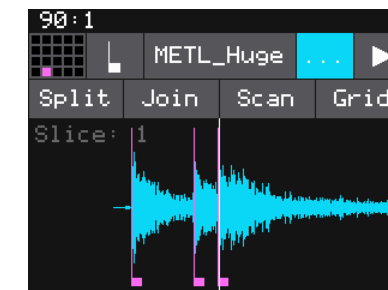
Parameter	Description	Range of Values	Mod Target?
Loop Mode	Controls whether the slice playback is looped. This does not work with Launch Mode of Trigger. Use Launch Mode of Gate or Toggle if you want to loop slices.	ON, OFF	No
PlayThru	Controls whether or not playback continues through the end of the slice.	ON – playback will continue past the end of the slice to the end of the file. OFF – playback will stop at the end of the triggered slice.	No
Beat Count	Enter the number of beats in the clip file to give bitbox mk2 more information to work with when synchronizing playback to the current song BPM. If set to Auto, bitbox mk2 will attempt to detect the beat count automatically. Only used when Sync is set to ON.	Auto, 1 to 512	No

Parameter	Description	Range of Values	Mod Target?
Quant Size	Use Quant Size to quantize when the playback starts and stops. Quantization will cause playback to snap to a musical grid with intervals specified by the Quant Size parameter. When quantization is used, the note trigger will cause playback to start and end on the next quant size boundary. For example, if the Quant Size is set to 1-bar and you press the pad, the playback will begin at the start of the next bar.	None - always start and stop immediately 1/64, 1/32T, 1/32, 1/16T, 1/16, 1/8T, 1/8, 1/4T, 1/4, 1/2T, 1/2, 1 bar, 2 bars. Assumes 4/4 time.	No
Sync	The Sync feature prevents timing drift that can occur when the length and BPM of a clip does not align exactly with the tempo of playback. When Sync is used, bitbox mk2 will realign the audio to match the clock at the step size specified here. Even slight differences between WAV file BPM and clock tempo can cause significant drift over time. Select a value for Sync that will control the size of the musical unit to which the clip will be synchronized. Choose small settings, like 1/16th, for rhythmic or percussion clips. Choose large settings, like 1-bar, for sustained tones or drones.	OFF – playback will occur at the original rate. Looping will happen as soon as the sample ends. ON – bitbox mk2 will synchronize the playback of the slice.	No
Slice	Indicates which slice will be played when a note is triggered. You can use modulation to vary this value over time.	1 through the number of slices in the pad.	Yes
Slice Seq	When Slice Seq is set to a value other than None, each new note will advance the selection of the next slice to play. The value of this parameter controls the order in which slice selection is advanced.	None: This parameter will not be used to control the order of playback of slices. Forward: A trigger will cause the playback to move to the next slice. Backwards: A trigger will cause the playback to move to the previous slice Random: A trigger will cause the playback to move to a randomly selected slice Stagger: A trigger will cause the playback to move through the slices in a somewhat random way. It will move forward a few slices, then back a couple of slices, and repeat.	Yes

In addition to setting parameters for a slicer pad, you also need to create the slices. There are three ways to do this: manually, auto scan, and slice to grid. When you configure slices manually, you use the Split and Join menu options to add and remove splits. The manual process may also be used to refine the results after you use auto scan or slice to grid. When you use auto scan, bitbox mk2 uses an internal algorithm to decide where to place the splits. You can control the sensitivity of the algorithm. When you use slice to grid, you define a fixed number of slices and bitbox mk2 will create splits that evenly divide the WAV file into the specified number of slices.

To Manually Create or Remove Slices:

1. On the Waveform screen for the slicer pad touch the menu item with the three dots "...". This will display the Waveform Slicing menu.
2. Use touch gestures to move the waveform so the fixed cursor position (the vertical white line) is at the position where you want to add another slice point. Touch Split to create a slice point. The slice point is shown as a pink horizontal line with a small pink square near the bottom.
3. Use touch gestures to move the waveform so the fixed cursor position (the vertical white line) is on or near a slice point that you want to remove. Touch Join to remove the slice point.



Waveform Slicing Menu

You can have as many or as few slices as you want.

To Use Auto Scan to Create Slices:

1. From the Waveform screen for the slicer pad, touch the menu item with the three dots "...". This will display the Waveform Slicing menu.
2. Touch Scan and then use a control knob to select a Threshold percentage for the sensitivity of the scan. The lower the threshold, the higher the number of slices that will be created. Touch OK when you are ready to scan. (You can touch anyplace outside of the Threshold field to cancel the scan.) Bitbox mk2 will detect and create slice points in the file automatically. The slice points are shown as pink horizontal lines with a small pink square near the bottom.

To Use Slice to Grid:

1. From the Waveform screen for the slicer pad, touch the menu item with the three dots “. . .”. This will display the Waveform Slicing menu.
2. Touch Grid and then use a control knob to select the number of Slices to create. Touch OK when you are ready to scan. (You can touch anyplace outside of the Slices field to cancel the scan.) Bitbox mk2 will automatically divide up the WAV file evenly into the number of slices you specified. The slice points are shown as pink horizontal lines with a small pink square near the bottom.

You can adjust the results of the slice to grid or auto scan by manually adding or removing slices to get the slices that match your creative vision.

To Use Slices to Synchronize Playback of Clip Pads:

You can use slices in a clip pad to synchronize playback of the beats in the clip. When the value of the Sync parameter for a clip pad is set to Slice, bitbox mk2 will use the location of the slices in the WAV file as the location of the “beats” for Sync purposes in order to prevent timing drift.

But how do you get slices in a clip pad? First configure the pad in Slicer Mode, create the slices, and then change the Pad Mode to Clip. The slices will still be visible on the Waveform screen and can be used for synchronization.



Set Up a Granular Pad

The final pad mode is granular mode. Granular is similar to sample mode, but with the additional ability to use multiple grains when playing back your sample. You can use granular to facilitate loop cross fading and to generate new sounds from your samples. In this mode, the sample is played back in small portions about 10 to 200ms in length, called grains. You can control the size, count, spread and playback speed of the grains.

Granular pads support all of the same parameters as sample pads, along with the parameters on the Gran tab. The Root Note parameter has unique behavior for granular pads.

Gran Parameters <Updated in 2.0>

Parameter	Description	Range of Values	Mod Target?
Grain Si	The size of the small segments of the WAV file that will be played.	0% to 100% which is about 20ms to about 1 second.	No
Density	Controls the number of grains per second. At the lowest end, you will get about 1 grain every few seconds. At 50%, you will get 3 grains with some overlap. Above 50% there is constant overlap that becomes more pronounced	0% to 100%,. Keep in mind that more grains require more processor power.	No
Scatter	When density is less than 50%, scatter controls how evenly the grains are distributed over time. When density is above 50%, scatter has no impact.	0.0% to 100.0%	No
Speed	How quickly the playback of the grains advances through the source WAV file. At 100% it will sound most like the original file. At 50% it will be half speed. At 200%, it will progress through the WAV file at twice the original rate.	0 to 200%	Yes
Window	The length of file on either side of the current playback position from which the grains are selected. When set to 0%, the grains are always pulled from the same place in the WAV file. When set to 100%, the grains are pulled from a window of about a few seconds around the current playback position.	0.0% to 100.0%	No
Pan Rnd	Controls how widely the sound is spread apart across the left and right speakers. This controls how far apart the grains sound.	0.0% to 100.0%	No

In granular mode, the root note is used as a guide for randomizing the slice positions. If the source file is a single tone, make sure the root note is set correctly to achieve more musical sounds. If the source WAV file has multiple tones, experiment with the root note parameter to get the effect you want or set it to None to remove this factor from the grain engine.

If you want to use granular mode to generate tonal content, use a very low speed, a mid range density, small grain size, and small scatter.

To start with something that is close to the original wav file use the following settings:

- Density: 50%
- Grain size: 0.0%
- Window: 0.0%
- Scatter: 0.0%
- Pan Rnd: 0.0%
- Speed: 100.0%

These settings are useful when you want to use granular mode to smooth out the cross-over points for your loops. To get a better feel for each of the parameters, start with these settings and vary one parameter at a time.

Conf Parameters

Parameter	Description	Range of Values	Mod Target?
Root Note	In granular mode, the root note is used as a guide for randomizing the slice positions. If the source file is a single tone, make sure the root note is set correctly to achieve more musical sounds. If the source WAV file has multiple tones, experiment with the root note parameter to get the effect you want or set it to None to remove this factor from the grain engine.	0% to 100% which is about 20ms to about 1 second.	No

Save and Load Parameters in WAV Files

There are several pad parameters that bitbox mk2 can read from and write to WAV files. These parameters are:

Parameter	Description	Supported Pad Modes
Root Note	When you use Notes to play this sample, the base sample will play for this root note. The sample will be pitch shifted up or down one semi-tone for each note away from the root note. Bitbox mk2 will read the root note from the WAV file if available when you add the WAV to the preset. However, you can specify a different value here to be used for this WAV on this pad in this preset. If you save the WAV file from this pad, the Root Note value will be saved with it. Stored in the WAV smpl tag.	Sample (Single and Multi), Granular
Loop Start	Point where the looping will begin when playing forward, or looping will end when playing in reverse. Expressed in samples. Must be before or equal to Loop End. Loop Start is read from the WAV file when sample is loaded, and saved to the WAV file when the WAV is saved. Stored in the WAV smpl tag.	Sample (Single)
Loop End	Point where the looping will end when playing forwards, or looping will begin when playing in reverse. Expressed in samples. Must be after or equal to Loop Start. Loop End is read from the WAV file when a sample is loaded, and saved to the WAV file when the WAV is saved. Stored in the WAV smpl tag.	Sample (Single)
Beat Count	Enter the number of beats in the clip file to give bitbox mk2 more information to work with when synchronizing playback to the current song BPM. Stored in the WAV acid tag.	Clip
Slice Points	The slice markers that are inserted into the file. Some other software calls these Cue Points. Stored in the WAV cue points.	Slicer, Clip

These parameters are saved in a format that is commonly used by other music products. This means you can set these values in the other product and then use them in bitbox mk2, and the reverse.

When bitbox mk2 first loads a WAV file that has parameters stored in it, it will load the values of the parameters that are in the WAV and use default values for the other parameters. If you change a value of one of these parameters for the pad, those changes only apply to this pad and are not automatically saved back to the WAV file. This allows you to override parameters for specific pads. Bitbox mk2 also makes an assumption about the pad mode based on the parameters that are available in the WAV file. If there are slices in the WAV, then it sets the pad mode to slicer. If there are loop points in the WAV, then it sets the pad mode to sample.

To save the values you have configured for a pad back to the WAV file:

1. Open the WAV screen for the pad.
2. Touch the name of the WAV file at the top of the screen to display the WAV selection screen.
3. Touch File and then Save or Save As. If you selected Save, bitbox mk2 will save the configured parameters into the same WAV file you have loaded. If you chose Save As, you will see the WAV file naming screen. Type in a new name to save the changes to a different WAV file, and then touch Enter to save. Bitbox mk2 will now load the newly modified WAV file into the pad.

To revert back to the parameter and slice values stored in the WAV file, simply reload the file into the pad.

Note:

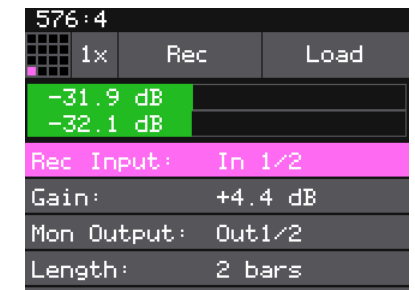
- ▶ If you use an existing file name when you use Save As, the old file will be overwritten with the current WAV file and parameters.

Record a New WAV File

Bitbox mk2 comes with hundreds of WAV files loaded on the microSD card. You can also record new WAV files to create your own custom sound.

To Record a WAV File:

1. Start by plugging an audio signal source into the IN1 and IN2 jacks. These jacks form a stereo pair.
2. Push the Home button to display the Pads screen.
3. Touch a pad in the grid to select it. With the pad selected, press the INFO button. If the pad is empty, bitbox mk2 will display the Load and Record screen. If the pad is already loaded, bitbox mk2 will display the Waveform screen. If you are on the Waveform screen, press the Pad Mode icon to the left of the WAV file name at the top of the screen and then touch New Rec. You will now see the Load and Record screen.
4. Just above the recording parameters, you will see a VU meter that shows the audio input levels. Adjust the level of your incoming signal or adjust the gain parameter if needed.
5. Configure your recording session by selecting values for the parameters in the table below. Turn the top knob to select a parameter, then turn the bottom knob to select a value for that parameter.



Load and Record Screen

Parameter	Description	Range of Values
Rec Input	Sets whether you are recording from only one input, the stereo input pair, or re-sampling the audio currently being generated by the module to OUT1 and OUT2.	In 1/2, In 1, In 2, Resam
Gain	The VU meters represent the level of the signal to be recorded. You can adjust the gain to get the desired level and avoid clipping.	-96.00 dB to +20.00 dB
RecToPlay	When this is On, and Length is not Custom, bitbox will automatically start to play the pad when recording ends.	ON, OFF
Length	This parameter allows you to specify a length of time that you want to record, in terms of notes and bars. When Custom is selected, touch the Stop button to stop recording.	Custom, 1/4, 1/2, 1 bar, 2 bars, 4 bars, 8 bars, 16 bars, 32 bars, 64 bars, 128 bars

Parameter	Description	Range of Values
Rec Quant	This parameter lets you quantize the recording to start and stop at the designated musical time interval. This is not available when Threshold recording is enabled.	None - always start and stop immediately 1/16 - quantize to the next sixteenth note time 1/8 - eighth note 1/4 - quarter note 1/2 - half note 1 bar - a whole note assuming 4/4 time 2 bars 4 bars 8 bars
Rec Mon:	Controls whether the input signals received through IN1 and IN2 are played out through the outputs selected in Mon Output to enable you to monitor the recording.	Off - Inputs are never played through the outputs. Auto - Inputs play through the outputs while recording or the recording screen is visible. On - Inputs always play through the outputs.
Mon Output	Controls where the input signals received through IN1 and IN2 are played out to enable you to monitor the recording.	Out 1/2, Out 1, Out 2, FX1/2, FX1, FX2,
RecThresh	Use the threshold recording option if you want to start recording when a sound level threshold is reached.	ON, OFF
Threshold	When threshold recording is enabled, this controls the minimum sound level required to trigger recording to begin.	-96.00 dB to +12.00 dB

- Send a signal to the audio Input. The source will play through the selected Mon Output if the Rec Mon setting is ON or Auto. For best results, when setting the gain, leave some room (a few dB) between your loudest level and the max allowed, which is 0dB. If a red bar appears to the right of the level, the signal is clipping and the level of the input signal should be lowered for best quality.
- Touch the Rec button at the top of the screen. Bitbox mk2 will start recording. If you are using threshold recording, the recording will start once the input level meets the threshold level specified. If you selected a time value for Length, recording will stop after the selected length of time. The Load and Record screen displays a running clock of measures and beats and time duration of the recording. There may be a delay between when you touch Rec

and when the recording starts as bitbox mk2 waits to quantize the recording to the selected Rec Quant time interval. See [Synchronize with an External Clock](#) below for more information about clocks and quantization.

- Touch Stop to end recording. There may be a delay between when you touch Stop and when the recording ends due to quantization. When the recording has stopped, the main screen is displayed with the new WAV file loaded in the selected pad. The clip name will be RC with a numeric suffix. We will discuss changing file names and managing WAV files in [Manage WAV Files](#) below. If you have the Tools setting RecToPlay set to ON, bitbox mk2 will automatically start to play the new sample when recording ends if the Length parameter was used for recording.

When you record a new WAV file, the file is stored on the microSD card in the folder associated with the preset. This folder is located under \Presets and has the same name as the preset. For example, if your preset name is KickinGroove then your recordings will be in the folder \Presets\KickinGroove. How you will work with these files depends on whether you are recording samples to build a library to use in presets in the future, or whether you are recording WAVs specifically for the current preset.

If you are recording WAVs for the current preset:

- Record WAVS until you get the files you need. The WAVs are stored in the preset specific folder.
- Assign the WAVs you want to use to individual pads.
- Push HOME until you see the menu screen. Touch Presets and then touch File and then Pack to create copies of any of the other files used in the preset into the preset folder.

If you are recording WAVs to build up a library of sounds:

- Create a new preset to host the content from your recording session.
- Record into pads as desired. Bitbox mk2 places the WAVs into the preset's folder.
- You can optionally use your computer to move the WAV files from the preset's folder on the microSD card into sound library folders on the card. When you want to use these files in another preset, point to the WAV files you moved to the library folders. Then pack up those presets to preserve copies of the WAVs you used.

Note:

- ▶ If you record into a loaded pad, the original WAV file remains intact on the microSD card and a new WAV file is created.
- ▶ Bitbox mk2 streams the recording directly to your microSD card. The length of your recording is limited to the space available on the microSD card. The space remaining on the card is displayed at the top of the Tools screen.
- ▶ If you have RecToPlay set to ON in the Tools pages, bitbox mk2 will automatically start playing the new sample when recording ends if the Length parameter was used for recording.
- ▶ Use the Resam input option to layer recordings, apply effects or capture new clips.
- ▶ Bitbox mk2 won't stop you from loading a WAV file from Preset B's folders into Preset A. However, if you do this, you could potentially break Preset A if you ever move or rename Preset B for any reason. Therefore, if you have WAV files that you want to re-use across presets, we encourage you to move these WAV files into library folders outside of the \Presets folder, and to Pack your presets often.

Record a Multi-sample Pack

Bitbox mk2's Auto-Sample feature makes it easy to create a multi-sample pack if the source you are recording can be triggered by CV. You can also create a multi-sample pack manually if needed.

Recording a multi-sample pack starts out the same way as recording a single sample, but you use the 1x button next to the grid icon to change to Multi (Mx) mode.

To Auto-Sample a Multi-sample Pack:

In Auto-sample mode, you can choose the range of notes to be recorded, how many steps between recorded samples, how many velocity layers to include, and the length of the notes. Once you start recording, bitbox mk2 will send out CV signals through FX1 and FX2 to set the pitch and trigger the notes. It will record each note into a separate WAV file. When finished, you will have a folder full of WAV files that you can use as a multi-sample pack.

1. Connect the FX outputs from bitbox mk2 to the source to be recorded. Connect FX1 of bitbox mk2 to the pitch control of the instrument to be recorded. Connect FX2 of bitbox mk2 to the Gate control of the instrument to be recorded. Bitbox mk2 will send out a CV signal on FX1 that maps 1 V per octave. -2V= C0, 0V=C2, 2V=C4, 5V = C7.
2. Connect the audio output from the source instrument to IN1 and IN2 on bitbox mk2. If you are only recording one channel, you only need to connect to one input.
3. Now we can set up the pad for recording. Push the HOME button to display the Pads screen.
4. Touch a pad to select it. With the pad selected, press the right arrow button. If the pad is empty, bitbox will display the Load and Record screen. If the pad is already loaded, bitbox will display the Waveform screen. If you are on the Waveform screen, press the Pad Mode icon to the left of the WAV file name at the top of the screen and then touch New Multi. You will now see the Load and Record screen.
5. At the top of the Load and Record screen, the button to the right of the grid icon says 1x or Mx. If it says 1x, you are set up to record a single file. Touch the 1x button to open the Mode Selector menu. Touch Multi to enter Multi or Mx mode. The list of recording parameters changes based on the selected mode.



WAV File Load and Record Screen - Mode Selector

6. Select values for the following parameters to configure your recording session:

Recording Parameter	Description	Range of Values
Rec Input	Choose which input to record. You can choose one or both audio inputs, or you can choose to resample the signal being sent to outputs 1 and 2.	In 1/2, In 1, In2, Resam
Gain	The VU meters above the list of parameters represent the level of the signal to be recorded. You can adjust the gain to get the desired level and avoid clipping.	-96.0 dB to + 20.0 dB
Filename	The name of the folder that will store the multi-sample bank recordings. It will also be used as a prefix for the individual file names.	Select this parameter and then push the INFO button to open the file naming screen. Turn a knob to move the cursor position. Touch the onscreen keyboard to enter a file name. Touch Enter to save the filename and return to the parameters screen.
Rec Mon	Controls when the incoming audio signal will be played out through the bitbox mk2 outputs.	On - the audio input will always be played. Auto - the audio input will only be played when you are on the recording page for this pad. Off - the audio input will never be played out.
Mon Output	Controls where the input signals received through IN1 and IN2 are played out to enable you to monitor the recording.	Out 1/2, Out 1, Out 2, FX1/2, FX1, FX2,
Start Note	The note that will be sent out as a trigger to record the first WAV file.	C#-1 (1) through G9 (127)
End Note	The note that will be sent out to trigger the last WAV file that will be recorded.	C#-1 (1) through G9 (127)
Sample Every	How many semi-tones or notes are between each WAV file recorded. Set to 1 to record a WAV file for each note. Set to 12 to record one note per octave.	1 through 16
Note Length	In seconds, the length of time that the note gate will be on.	1 to 60
Release Len	In seconds, the length of time that recording will continue after the note length is over. This will record the tail of the note.	1 to 16

7. Touch the Rec button at the top of the screen and sit back and let the auto-sampler do its work. Bitbox mk2 will display which note it is currently recording. When recording is complete, the files will be saved on the microSD card in a folder named with the filename you selected. The folder will be in the directory for the current preset. Bitbox mk2 will then display the Waveform screen.
8. You can touch Stop to interrupt recording. Any completed recordings will still be on the micro SD card. You can remove them with the Preset Clean command. Keep in mind that if you have a folder full of WAVs that you recorded but that are not used on any pads, bitbox mk2 will assume you do not need them and the folder and its contents will be deleted.

When the auto-sampling is complete, you will have a series of WAV files in a new folder. The folder name will be \Presets\\<Filename>. See [Working with WAV Files on the microSD Card](#) below for more information about file organization. The WAV files will be named <Filename> + "-" + <MIDI Note Number> + "-" + <MIDI Velocity>. For example, if your preset name is Pet Sounds and your multi-sample filename is Cat Meows, an example file name would be \Presets\Pet Sounds\Cat Meows\Cat Meows-036-100. Each WAV file will have the Root Note parameter set based on the MIDI Note used to trigger it. The pad used for recording will be changed to a Multi-Sample pad with the new sample bank loaded.

To Manually Record a Multi-sample Pack onto Bitbox mk2:

If you need to record a multi-sample pack and the source instrument cannot be triggered by CV, here is what to do:

1. Create a preset for the multi-sample pack. Let's call it MyBank.
2. Record the files into the new MyBank preset. Delete any extra files that are not needed.
3. Assign root notes to each of the files if you want to ensure bitbox mk2 maps the files to the correct note. For example, if you recorded a sample for C3 and you want that sample to be used when you play C3 and pitched shifted for notes on either side of it, then set the root note parameter for that WAV file to C3. Do this for each of the pitched samples that you recorded. This means you will have to load each WAV into a pad individually in order to set the root note. Be sure to [save the WAV file](#) after you set the root note so the setting will be saved into the file.
4. Open the Preset where you want to use the multi-sample pack. Let's call it MySong.
5. Create a new sample pad and use "Load All" to load the multi-sample preset's folder into the sample. For our example, that would mean using "Load All" for the folder \presets\MyBank into the multi-sample pad.

6. Pack up the target preset (MySong in our example) to copy the multi-sample files into a sub-folder under the target preset's folder. In this case, you would end up with the following folder: \Presets\MySong\MyBank
7. Now you are free to delete or move the original MyBank preset if desired, or leave it there for future re-use.

Trim WAV Files

When recording new samples, you sometimes get some unwanted material at the start or the end of the WAV file. Here's how to trim the file:

1. Open a pad with a WAV file you want to trim.
2. Set the pad mode to Sample.
3. On the WAV screen, turn the top left knob to set the left side of the pink bracket to where you want the new file to begin. Turn the top right knob to set the length of the pink bracket to the desired end point for the WAV file.
4. Touch the name of the WAV file at the top of the screen to display the WAV selection screen.
5. Touch File and then Trim. Bitbox mk2 will ask if you want to Trim and Save? Touch OK to overwrite the WAV file with the portions outside of the pink bracket trimmed off. Touch anywhere else on the screen to cancel.
6. Save your preset to save the change to the pad. Otherwise, the length parameter for the pad will be wrong when you reload the preset.

Note:

- ▶ You may want to use File -> Save As before you trim the file to give yourself a backup copy of the file.

2:4				CUT
DOOR wood	CREA cupb	INSC swir	DOG_ bark	COPY
DRON fore	HORR Hous	LIQ_ bed	RAIN Drop	PSTE
ACTN Scar	BELL chur	BOW_ stri	HORR pian	CLR

Clipboard Menu

Use Clipboard Functions with Cells

Bitbox mk2 has a slightly hidden set of clipboard buttons on the Pads screen. You can use these buttons to Cut, Copy and Paste between pads and to Clear a pad. To access these functions, turn the lower right knob while on the Pads screen. The column of EXT bar graphs on the right edge of the screen will be replaced with several clipboard buttons. Select the pad you want to act on, then touch the button for the desired action. Turn the lower right knob back the other way to go back to the EXT bar.

Manage WAV Files

Bitbox mk2 comes with hundreds of WAV files bundled with the firmware. You can load WAV files into pads in order to add them to a preset. We talked about how to configure pads previously in this document. Here we will discuss what tasks you can perform to manage the WAV files themselves.

Working with WAV Files on the microSD Card

You can use the microSD card with your computer to manage the WAV files on the card. You can load new WAV files onto the card or backup your existing WAV files for safekeeping. Bitbox mk2 is compatible with all standard WAV files.

You can use a microSD Adapter to insert your microSD card into your computer. Then you may use standard file techniques to rename the WAV files, reorganize them into directories, delete them, copy them onto your computer or copy them onto other microSD cards. We recommend that you occasionally make backup copies of your WAV files, especially before upgrading to new firmware.

Bitbox mk2 supports organizing WAV files into folders and sub-folders. You can create your own folder structure on the microSD card.

When you create a new recording, bitbox mk2 will store it in the folder for that preset. For example, the first new recording for the My Kickin Grooves preset will be saved as \Presets\My Kickin Grooves\RC000001.wav. When you load an existing WAV file into a pad, the preset will have a pointer to that WAV file in its source folder. If you want to gather copies of all of the files for a preset into the preset folder, use the [preset Pack option](#). We will discuss how to do this below.

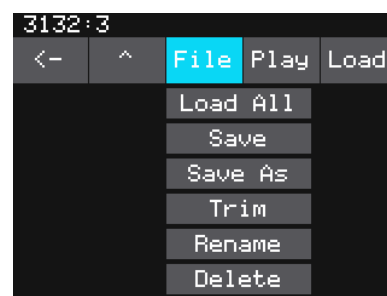
Note:

- ▶ If you delete, move or rename a WAV file, it will no longer be available for use by presets that were previously using it. The name of the WAV file will still appear in the Preset, but the Waveform screen will be blank until you load a new WAV file into the pad.
- ▶ Bitbox mk2 supports samples in the WAV file format. It supports 1 or 2 channel files with 16, 24 or 32 bit resolution at any sample rate. 48kHz is the preferred sample rate.
- ▶ WAV file names may use Alpha Numeric Characters (A-Z, 0-9) and some special characters. The following characters are NOT allowed:
 “ / \ ? * < > : |
 File names must be less than 256 characters, including the path name. Files that do not conform to these naming constraints will not be recognized by bitbox mk2.

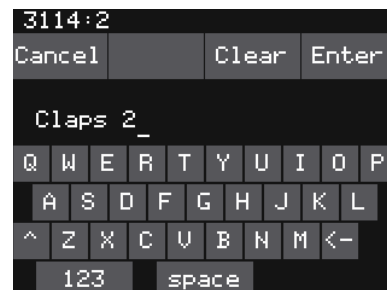
To Delete, Save As or Rename a WAV File:

When you use bitbox mk2 to delete a WAV file, that file is removed from the microSD card. This file will no longer be available for use by presets. This means that any presets that previously used this WAV file will no longer include this WAV file. To delete a WAV file:

1. Touch a loaded pad on the Pads screen to display the Waveform Screen.
2. Touch the name of the WAV file at the top of the screen to display the WAV File Management screen.
3. Use the control knobs to scroll to the WAV file you want to work with. You may need to load directories to navigate to the file you want.
4. Touch File to display the WAV File menu.
5. Touch Delete to delete the selected WAV file from the microSD card. Touch Save As to save a copy of the WAV file with a different name. Touch Rename to change the name of the file on the microSD card.
6. If you select Delete, bitbox mk2 will display a confirmation prompt. Touch OK to confirm, or touch anywhere else to cancel.
7. If you select Rename or Save As, bitbox mk2 displays the file naming keyboard. Use the touchscreen to enter letters using the keyboard. Touch the <-- to delete the previous letter. Turn a knob to position the cursor. Touch Enter to save your changes.
8. You can Load a different WAV file from here as well.
9. Touch the back arrow <-- in the top left to exit the WAV Edit Screen.



WAV File Menu



File Naming Keyboard

Note:

- ▶ If you delete, move or rename a WAV file, it will no longer be available for use by presets that were previously using it. The name of the original WAV file will still appear in the Preset, but the Waveform screen will be blank until you load a new WAV file into the pad.

To Remove a WAV File from a Pad:

To remove a WAV file from a pad without deleting the file:

1. Go to the Pads screen and turn the lower right knob to access the clipboard menu.
2. Select the pad you want to clear by touching it or turning a knob.
3. Touch CLR to clear the currently selected pad.

Use Pack To Save Copies of WAV files with a Preset:

After you spend time carefully crafting a preset, you don't want to worry about it getting broken if you make changes to that WAV file or re-organize your sample library. You may also want to gather up all of the files used in a preset so you can move it to another microSD card or archive it on your computer. The Pack feature was created to address these needs.

1. Load the preset you want to pack.
2. Push the HOME button until you see the Menu screen, and then touch Presets.
3. Touch File, then Pack. Bitbox mk2 will find all of the WAV files that are assigned to pads and copy them into the folder for this preset. Multi-sample banks will be copied to a sub-folder. A progress meter is displayed until the packing is complete.

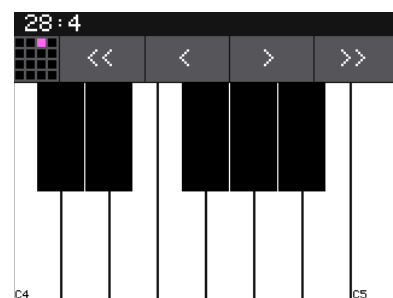
Note:

- ▶ If you continue to add WAV files to your preset after you pack it, the preset will still point to these WAV files in their source folders. Pack the preset again to copy these files over.
- ▶ If the Pack option is disabled, then the preset is fully packed already.

WORK WITH KEYS

The Keys screens provide two alternative ways for you to play WAV files that have been loaded into pads. When you select a sample or clip pad to play with Keys, bitbox mk2 will play the WAV file for that pad pitch shifted based on the triggered note. The native sample will play with the root note, and it will shift up or down the appropriate number of semitones based on the note you play. When you select a slicer pad to play with Keys, bitbox mk2 will map the slices in the pad to the notes on the keyboard. When you use a multi-sample pad with Keys, it will play the sample that has the root note closest to the played note and then pitch shift as needed.

There are two Keys input modes. The first time you touch the Keys button on the menu screen, bitbox mk2 will display a traditional black and white keyboard. Push the INFO button to switch to the grid keyboard. Use the HOME button to go back to the traditional keyboard layout. On the grid keyboard, you can trigger four octaves of notes within the scale specified using Scale selection buttons in the top right of the screen, so you don't have to worry about scale specific sharps and flats. Touch the arrow buttons (<< and >>) at the top of the screen to access additional octaves.



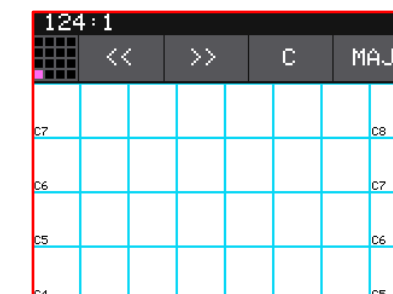
Traditional Keyboard Screen

To Play a Sample With the Traditional Keyboard:

1. Go to the Pads screen and select a pad that has a tonal sound.
2. Push INFO twice to display the Pad Parameters screen.
3. Touch Conf at the bottom of the screen if needed to go to the Conf page.
4. Set the Launch Mode parameter to Gate. You can use other settings, but this is the setting that most closely mimics playing a keyboard.
5. Push HOME 3 times to display the Menu screen.
6. Touch the Keys button at the top right of the menu to display the Traditional Keyboard screen.
7. Touch the keys on the screen to play notes. You can slide your finger across the screen to play adjacent notes.
8. Touch the arrow buttons at the top of the screen or turn a knob to scroll left or right one note or one octave. The current octave label is displayed on each C note.

To Play a Sample, Clip or Granular Mode Pad With the Grid Keyboard:

1. Go to the Pads screen and select a pad that has a tonal sound.
2. Push INFO twice to display the Pad Parameters screen.
3. Touch Conf at the bottom of the screen if needed to go to the Conf page.
4. Set the Launch Mode parameter to Gate. You can use other settings, but this is the setting that most closely mimics playing a keyboard.
5. Push HOME 3 times to display the Menu screen.
6. Touch the Keys button at the top right of the menu to display the Traditional Keyboard screen.
7. Push the INFO button to display the Grid Keyboard screen. Touch the grid squares on the screen to play notes. You can slide your finger across the screen to play adjacent notes.
8. Touch the arrow buttons at the top of the screen to scroll up or down one octave. The current octave label is displayed on each root note.
9. Use the two buttons in the top right of the screen to select the Key and Scale that will be used by the grid keyboard. Now you can play without worrying about hitting an off-key note.



Grid Keyboard Screen

To Play Slicer Mode Pads With Keys:

You can use the Keys screen to trigger individual slices within a pad. Here is a basic example of how to do this:

1. Create a slicer pad and create 4 or more slices by either using the Scan feature or manually creating the slices.
2. Set the following values for the pad parameters:

Parameter	Value	Explanation
Launch Mode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	OFF	We will turn off looping for this example.
Slice	3	This does not impact how the Keys screen plays the slices.
Slice Seq	None	We do not want to use the Slice Sequencer in this example.
PlayThru	OFF	If we turn this on, playback will continue past the end of the triggered slice into the next slice.

- On the Pads screen, with the slicer pad selected, push HOME and then touch Keys to go to the Traditional Keyboard screen.
- Play C2 on the Traditional Keyboard screen. You will hear that slice 1 is played.
- Play D#2 and slice 4 will be played. Keys C2 and up are now mapped to Slices 1 and up for playback.
- Push the INFO button to go to the Grid Keyboard screen. Bitbox mk2 will display numbered squares in the grid for each slice in the WAV file. Use the arrows at the top of the screen to access additional octaves if needed. Bitbox mk2 will display one square on the grid for each slice in the pad.
- Touch a numbered square on the grid to play that slice.
- Touch STOP at the top of the screen to stop playing all slices. (The SLICE button next to the STOP button does not do anything, it is just a reminder that this is a slice pad.)



Grid Keyboard for Slices

Note:

- ▶ On the traditional keyboard, the last slice will be played for all notes above the last slice. Nothing will play for notes below C2.
- ▶ If you use the Grid-based keyboard with a slicer pad, the slices are mapped to the notes available in the selected scale.
- ▶ The steps above show a simple example of using Keys alone to trigger different slices within one pad. You can use this with Loop Mode ON with Launch Modes of Gate or Toggle to achieve different effects. You could also use this with Slice Seq if you wanted to have the Slice Seq control what slices play when a pad trigger is received.

To Select a Scale on the Grid Keyboard:

- On the Grid keyboard, touch the left Scale Selector button (labeled C in the screenshot) to display a list of values for the Root Note. Touch an option to select it. Alternatively, you can turn any knob while on the grid keyboard to change the Root Note.
- Touch the right Scale Selector button (labeled MAJ in the screenshot) to display the Scale or Mode options. Turn any knob to scroll through the values. Touch the screen or any button when the desired value is displayed.



Note:

- ▶ To find the right key to match some music, tap a root note on the grid while turning a knob to scan through the root notes.

APPLY EFFECTS

Bitbox mk2 has two effects that can be applied to as many pads as you want. You apply an effect by selecting the send amount for the pad for each of the desired effects (Delay and Reverb) and then configuring the parameters for each effect. All pads get the same parameter values for each effect. The output of the effects, the wet stereo signal, is routed to Outs 1 and 2. The pad output without the effects is routed to the the output configured for each pad.

To Route a Pad to an Effect:

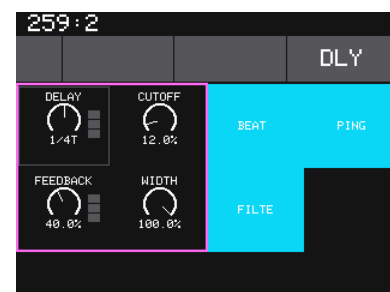
1. Push the HOME button repeatedly until you see the menu screen, and then touch FX to display the FX screen.
2. On the FX screen, touch the pad that you want to use. Touching a pad does not trigger it on this screen.
3. Turn one of the left knobs to set the Delay send amount for the pad. This is the amount of the signal from this pad that you want to send to the Delay for effects processing. You can also use the touch screen to slide the level bar graph for the effect. When a pad is sending some of its signal to Delay, a blue triangle is displayed in the top left corner of the pad. Turn one of the right knobs to apply Reverb to the pad and a blue triangle will appear in the top right corner of the pad.



FX Screen

To Modify Effect Parameters:

1. Push the HOME button repeatedly until you see the menu screen, and then touch FX to display the FX screen.
2. Touch the FX1 or FX2 box on either side of the screen to select it. The currently selected effect is highlighted pink.
3. Push the INFO button to display the effect parameters screen for the selected effect.
4. Turn the knobs to adjust the effect parameters. You will hear the impact of the parameter changes in real time. Here are the available effect parameters:



Delay Effect Parameters Screen

Effect	Parameter	Settings	Mod Target?
Delay	Delay	Determines the delay length. When Beat Sync is On, delay is specified in musical intervals: 1/64, 1/32, 1/16, 1/8T, 1/16D, 1/8, 1/4T, 1/8D, 1/4, 1/2T, 1/2, 1 bar When Beat Sync is Off, delay is specified as a percentage from 0% to 100%.	Yes
	Feedback	0 to 100%. Determines the amount of regeneration or echo in the delayed signal.	Yes
	Cutoff	When Filter is on, this is the cutoff frequency for the filter. Select a positive value for a high pass filter and negative value for a low pass filter.	No
	Width	The width of the range of frequencies included when FILTER is on.	No
	Beat	This parameter controls whether the delay is measured in musical time intervals or percentage.	No
	Filter	Turn Filter on and then adjust the cutoff and width parameters to filter the delay.	No
	Ping	When Ping is on, the echoes will alternate (or ping pong) from side to side. When off, the echoes are the same in the left and right channels.	No
Reverb	Decay	0 to 100%. How long the reverberation will ring out.	Yes
	Damping	0 to 100%. The amount of damping that is applied to the reverb. Higher values will make the reverb end sooner.	Yes
	Predelay	0 to 100%. Determines the amount of delay in the signal before the reverberation is applied. In real life, this is related to how close the sources is to the walls.	No

5. When you are done adjusting parameters, push HOME to go back to the FX screen.

Note:

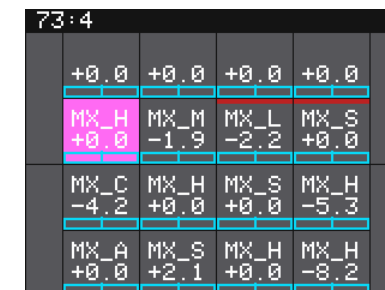
- ▶ The same effect parameter values are applied to all pads that are sending signals to that effect.
- ▶ The Reverb effect is very processor intensive. Bitbox mk2 does not limit what you can do based on anticipated processor needs. As a result, it is possible to overdrive the processor, causing crackling and drop outs. See [Processor Management Tips](#) below for more information about preventing sound artifacts.
- ▶ You can configure modulation to control effect parameters via MIDI or CV. See [Modulate Pad and Effect Parameters](#) below to learn how this is done.

ADJUST THE MIX

On the Mix screen you can adjust the volume and pan of each pad. The number on the pad represents the dB level of the audio output. The bar at the bottom of the grid pad represents the pan position for the pad. When the pan line is in the middle, the output is balanced equally between left and right. A solid blue bar below the sound level indicates a pad is actively playing. A red bar at the top of a pad indicates that pad is muted.

To Adjust the Sound Level and Pan of a Pad:

1. Push HOME until you see the Menu screen, then touch Mix to display the mixer screen.
2. Touch the pad you want to adjust.
3. Turn one of the top two knobs to adjust the level of the currently selected pad.
4. Turn one of the bottom two knobs to adjust the pan.



Mixer Screen

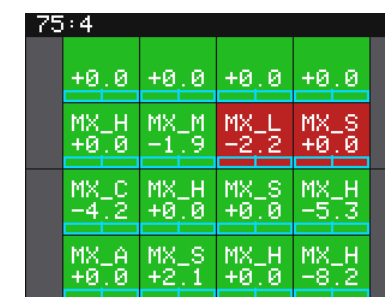
Note:

- ▶ You can hear adjustments to pan and volume in real time when a pad is playing.

To Mute and Unmute Pads:

The mixer screen also allows you to mute individual pads.

1. Push HOME until you see the Menu screen, then touch Mix to display the mixer screen.
2. Push the INFO button to enter Mute Mode. Active pads will have a green background and muted pads will have a red background.
3. Touch a pad while in Mute Mode to toggle its mute state.
4. Push INFO again to go back to controlling level and pan. Any muted pads will have a red bar across the top of the pad on the Mixer screen.



Mixer Screen in Mute Mode

Note:

- ▶ Mute settings are not saved. No pads are muted when a preset is loaded.

MANAGE PRESETS

Bitbox mk2 stores a set of pad configurations and mixer settings as a preset. You can save as many presets as you want, as long as there is room for the files on your microSD card. When you turn on bitbox mk2, it automatically loads the most recently used preset on this microSD card. The microSD card that comes with bitbox mk2 has over 75 presets and over 800 WAV files on it.

When bitbox mk2 loads a preset, it loads the set of WAV files and configured parameters for each pad saved in the preset. Review the loaded presets to see some examples of bitbox mk2 features in action. The presets that are loaded on bitbox mk2 use only a small fraction of the WAV files that are available on the microSD card. You can use the microSD card to load your own WAV files into bitbox mk2, as well as record new ones. Bitbox mk2 also enables you to customize and create your own presets.

Presets are saved on the microSD card when you choose to save them. If you load a different preset or power down the module without first saving the current preset, you will lose your work. If you change to a different microSD card, you will have a different set of presets. When you switch to a different preset, all previous settings will be replaced with the settings of the newly selected preset, which may be blank.

Bitbox mk2 stores all of the preset xml files in sub-folders under the \Presets folder. Each preset has its own sub-folder with the name of the preset, and a preset.xml file within that sub-folder. E.g. the preset My Kickin Grooves will be stored as a file named preset.xml in the \Presets\My Kickin Grooves folder. When you first start working with the preset, it will point to the WAV files in their source folders. The Pack function will copy all of the used WAV files into the preset folder.

When you create a new recording, it will be stored in the folder for that preset. For example, the first new recording for the My Kickin Grooves preset will be saved as \Presets\My Kickin Grooves\RC000001.wav.

If bitbox mk2 finds legacy bitbox presets in the root folder, it will migrate them to the new file structure as you use them.

In summary:

- All of the preset folders are gathered under one \Presets folder at the root.
- Before you Pack a preset file, the .xml file lives in its own sub-folder under \Presets which is created as soon as you create a preset, but the WAV files stay in their source folders until you pack them.
- Bitbox mk2 will automatically move a legacy preset into the new folder location the first time you load that preset. You may then use the Pack function to consolidate all of the files used by the preset into the preset's folder.
- New WAV files are stored in the folder for the preset.

All presets have a file named preset.xml under the folder that has the name of the preset. This file contains all of the settings for this preset.

We covered how to create a new preset in [Starting a New Preset](#) above. We will cover more preset and WAV file management tasks next.

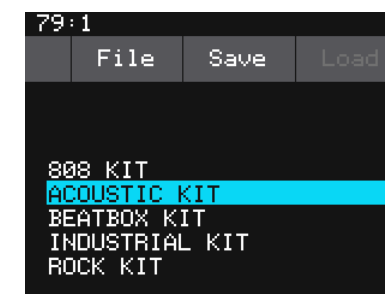
Note:

- ▶ Presets are not saved automatically in the background. This ensures that you don't make unintended changes to a preset.

To Save Changes to a Preset:

By now you may have added a few pads to your preset and spent some time configuring them. If you want to keep the results of your efforts, you will need to save the preset. Bitbox mk2 does not automatically save changes as you work. If you change to a different preset or unplug bitbox mk2, you will lose your work. To save the preset:

1. Push HOME until you see the Menu screen, then touch Presets to display the Preset Management screen.
2. Touch Save to store your changes to the currently loaded preset, or touch Save As to save changes to a new preset.



Preset Management Screen

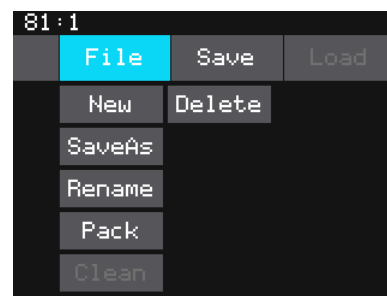
To Load a Preset:

1. Press the HOME button repeatedly until you see the Menu screen, then touch Presets to display the Preset Management screen.
2. Use the knobs to scroll through the list of presets. The blue highlight indicates the currently selected preset.
3. Touch Load to load into bitbox mk2 the information that was previously saved for this preset. The only values that are not stored in each preset are the values on the TOOLS pages. These are global settings that apply across presets and are stored separately on the microSD card.

To Pack a Preset:

After you spend time carefully creating a preset, you don't want to worry about it getting broken if you make changes to that WAV file or re-organize your sample library. You may also want to gather up all of the files used in a preset so you can move it to another microSD card or archive it on your computer. The Pack feature was created to address these needs.

1. Load the preset you want to pack.
2. Push HOME until you see the Menu screen, then touch Presets to display the Preset Management screen.
3. Touch File, then Pack. Bitbox mk2 will copy all of the WAV files used by this preset into the preset's folder. Any multi-sample banks will be copied with their folder. The preset.xml file will be updated to point to these copies of the WAV files and will be saved.



Preset File Menu

Note:

- ▶ If you continue to add WAV files to your preset after you pack it, the preset will still point to these WAV files in their source folders. Pack the preset again to copy these files over.
- ▶ If the Pack option is disabled, then the preset is fully packed already.

To Delete a Preset:

When you delete a preset, you remove the preset from the list of presets on the Preset Management Screen, and you delete the corresponding folder and XML file from the microSD card. All files in the preset folder, including new recordings, will be deleted. To delete a preset:

1. Press the HOME button repeatedly until you see the Menu screen, then touch Presets to display the Preset Management screen.
2. Use the control knobs to scroll through the list of presets.
3. Touch File to display the Preset File Menu.
4. Touch Delete to delete the highlighted preset. Touch OK on the confirmation prompt to continue with Delete, or touch anywhere else to cancel.

Note:

- ▶ You cannot undo deleting a preset.

To Rename a Preset:

1. Press the HOME button repeatedly until you see the Menu screen, then touch Presets to display the Preset Management screen.
2. Use the control knobs to scroll through the list of presets. The blue highlight indicates the currently selected preset.
3. Touch File to display the Preset File Menu.
4. Touch Rename to display the keyboard screen.
5. Touch the back arrow <- to erase the previous character in the preset name, or touch Clear to start over. Turn a knob to position the cursor where you want type. Use the onscreen keyboard to type in a new name. Use the carat button ^ to toggle between upper- and lower-case letters. Touch the 123 button to display the numeric keyboard if needed. When the name is complete, touch Enter to save the name and return to the Presets screen with the preset selected, but not loaded.



Keyboard Screen

Note:

- ▶ Renaming a preset does not load that preset.

To Save Current Changes as a New Preset:

Sometimes while working on a preset, you decide to save your changes to a different preset in order to save your work while still preserving the original preset state. To save current changes as a new preset:

1. Press the HOME button repeatedly until you see the Menu screen, then touch Presets to display the Preset Management screen.
2. Touch File to display the Preset File Menu.
3. Touch Save As. Bitbox mk2 displays a touch screen keyboard you can use to enter a new name. Touch the enter button to save the changes and go back to the Pads screen with the renamed preset loaded.

Note:

- ▶ If you enter a name that is already in use, you will replace the old file with the current preset.

Work with Preset Files on the MicroSD Card

Preset files can be backed up on your computer or shared with other bitbox mk2 users. The presets are saved as XML files on the microSD card. Each preset is saved in a preset.xml file in a folder with the name of the preset under the \Presets folder. For example, a preset named April Gig will be stored as \Presets\April Gig\presets.xml. If you have packed a preset, all of the WAV files for that preset will be stored in the preset's folder.

You can use a microSD Adapter to insert your microSD card into your computer. You can then use standard file techniques to rename the preset folders, delete them, copy them onto your computer or copy them onto other microSD cards. We recommend that you occasionally make backup copies of your presets, especially before upgrading to new firmware. Keep in mind that if you move a preset file to another microSD card, it will only work properly if the WAV files needed for that preset are on the new card in the same directory structure. The pack function makes that much easier.

Note:

- ▶ Bitbox mk2 stores all presets in self named folders under the \Presets folder. Bitbox mk2 will not find them if you move the XML files outside of these folders or move these folders outside of the \Presets folder.

Preset Compatibility with 1010music Samplers

Bitbox mk2 is compatible with preset files from other 1010music samplers: original bitbox, bitbox micro, and blackbox. When you load presets, bitbox mk2 will display a single list with all presets stored at the root (from bitbox mk1) and all presets stored under the \Presets folder. The files will be in alphabetical order by file name, independent of where they are stored. Each time you open a preset that is stored in the root, bitbox mk2 will create the preset folder for this preset and move the preset into that folder. In this way, as you open legacy presets, they will be migrated to the new structure one at a time. You can then use the File->Pack feature to collect all of the WAV files used by this preset into the corresponding sub folder. Any new recordings you make will be stored in the preset sub folder.

Bitbox mk2 can open presets from other 1010music samplers, but when you save them, you might lose the settings related to features not supported by this module. For example, if you open a blackbox preset on bitbox mk2 and then save it, you will lose the sequencer information from the preset. Similarly, if you take a bitbox mk2 preset over to a bitbox mk1, the mk1 will open the files and work with pads, but any FX settings from the mk2 will be lost when you save the file.

When will my legacy bitbox mk1 presets and WAV files get cleaned out of the root folder?

We won't move them automatically. We recommend that you pack up all of your presets one by one, which will copy all of the files used by the presets into their respective folders. When that is done, you may choose to delete the files that are stored at the root or safely move them to a sub folder for future use.

Can I use my bitbox mk1 or blackbox microSD in my bitbox mk2?

Yes, you can. You don't need to copy the bin file over. The bin file is only used when programming the module. See the notes above about preset compatibility.

USE MIDI AND CV WITH BITBOX MK2

You can use control voltage (CV) and MIDI signals with bitbox mk2 to further control your music. Both MIDI and CV can be used to:

- Trigger pad hits
- Playback samples pitched via MIDI notes or CV values
- Control slice playback
- Modulate parameters
- Synchronize with an external clock

MIDI can also be used to:

- Trigger recording a WAV file
- Select, clear and trigger pads
- Change presets via a MIDI Program Change
- Customize the MIDI Note mapping for Pads

We covered [using MIDI](#) and [CV to trigger pads](#) earlier in the manual. We will address the other external control options in this section.

Pitch Shift Samples to Play Different Notes

The approaches for using MIDI and CV to play samples pitch shifted to different notes are very different. We will first cover how to do this with MIDI and then we will address CV.

There are two ways to set up bitbox mk2 to trigger pads chromatically using MIDI. You can use the MIDI Keys setting on the Tools screen to configure a MIDI channel that will be used to play whichever pad is currently selected. You can also use the MIDI In setting on the pad parameters screen to configure a pad to always respond to a specific MIDI channel, even when the pad is not selected.

To Use MIDI to Play the Currently Selected Pad Chromatically:

1. Push HOME until you see the Menu screen, then touch Tools to display the Tools screen.
2. Touch the MIDI In tab at the bottom of the screen to access the page of MIDI related parameters.
3. Set the MIDI Keys parameter to the MIDI channel you want to use to chromatically play whichever pad is selected. If you select OMNI, all MIDI channels will be used this way, with some exceptions noted below.

4. Connect a MIDI controller to the MIDI jack and set up the controller to use the MIDI channel specified for the MIDI Keys parameter.
5. Push HOME to go back to the Pads screen, and select a loaded pad. This will be easiest to hear if you choose a WAV file that has a tone (not a drum hit).
6. Start playing notes on the MIDI controller and the selected pad will be played pitch shifted. If the Root Note parameter for this pad is set to Default, the original sample will be played for note C4. If the Root Note parameter is set to a specific note, then the original sample will be played when this specific note is played. When other notes are received, the sample will be pitch shifted an amount that corresponds to the incoming note. If you have configured the pad as a multi-sample, the WAV file with the closest root note will be used.
7. Choose a different pad and continue to play notes on the MIDI device. Now this pad is played chromatically.

To Use MIDI to Always Play a Specific Pad Chromatically:

Let's say you want to use a MIDI device to play a specific sample pad chromatically while you also trigger other pads on the touchscreen. In this case, you need to set up the pad to respond to a specific channel even when the pad is not selected.

1. Push HOME to return to the Pads screen.
2. Select a loaded pad that uses sample mode and push INFO twice to go to the Pad Parameters screen.
3. Touch the Conf tab at the bottom of the screen to go the page with MIDI parameters.
4. Set the value for the MIDI In parameter to the channel that you want to use to play this pad chromatically.
5. Connect a MIDI controller to the MIDI jack and set up the controller to use the MIDI channel specified for the MIDI In parameter.
6. Push HOME to go back to the Pads screen where you can see the pad being triggered.
7. Start playing notes on the MIDI controller and the pad assigned to that MIDI channel will be played pitch shifted. If the Root Note parameter for this pad is set to Default, the original sample will be played for note C4. If the Root Note parameter is set to a specific note, then the original sample will be played when this specific note is played. When other notes are received, the sample will be pitch shifted an amount that corresponds to the incoming note. If you have configured the pad as a multi-sample, the WAV file with the closest root note will be used.

8. Choose a different pad and continue to play notes on the MIDI device. The pad you configured for this MIDI channel will be played, independent of which pad is selected on screen.

Note:

- ▶ If you have the same channel assigned to both a specific pad and to the MIDI Keys setting, the assigned pad and the currently selected will both respond to the MIDI input.
- ▶ You can have more than one pad mapped to a specific MIDI channel. In this case, bitbox mk2 will play all mapped pads when a note is received on that channel.
- ▶ If you are using a modulation source other than MIDI CC for this pad, then the corresponding MIDI Modulation signals received on this pad's MIDI In channel (e.g. MIDI Velocity) will be applied as configured for this pad.

To Use CV to Play Samples Chromatically:

You will need two signals to use CV to play a pad chromatically: a Gate signal to start and stop the note and a CV signal to select the pitch.

1. Open the Parameters screen for the desired pad and navigate to the Main tab.
2. Push one of the three black squares below the Pitch parameter to open the Modulation Parameters screen.
3. Use the knobs to select the EXT port you want to use for input.
4. Use the knobs to set the 1V/Octave parameter to ON. This will configure bitbox mk2 to map the voltage on the CV so that one volt spans one octave. You can set 1V/Octave to off and use the Amount parameter to control how bitbox mk2 maps the voltage.
5. Push HOME to go back to the Pad Parameters screen.
6. Set the LaunchMode parameter to Gate. You can experiment with other modes as well, but let's use Gate for now.
7. Connect a gate signal to the input jack below the screen that maps to the position of the pad on the screen. The pad will be triggered when the gate signal goes high and continue to play until the gate goes low.
8. Connect a CV signal to the EXT ports selected for the Pitch Modulation source. The sample will be pitch shifted as the voltage input varies.

Note:

- ▶ A CV signal of 2 volts will play the sample with no pitch shifting. Different voltages will play the sample pitch shifted.

Control Slice Playback

There are a few different ways to use CV and MIDI signals to control the playback of slicer pads. You can use MIDI to map each slice to a MIDI Note. You similarly map each slice to a CV voltage range. You can also use MIDI and CV to control the sequencing of slices that are triggered by touch or CV Trigger.

To Use MIDI Notes to Play Slices:

When a Slicer pad responds to MIDI Notes, it plays individual slices within the WAV file.

1. Create a slicer pad and create 4 or more slices by either using the Scan feature or manually creating the slices.
2. Set the following values for the pad parameters:

Parameter	Value	Explanation
Launch Mode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	Off	We will turn off looping for this example.
Slice	3	This doesn't impact how the MIDI device or Keys screen plays the slices in this example.
MIDI	Choose a MIDI channel not used by other pads or the MIDI Pads or MIDI Keys settings.	We want to see the difference between the default MIDI behavior on the MIDI Keys and MIDI Pads Channels and using MIDI to trigger slices, so we need to use a separate channel. MIDI notes received on the channel you select here will choose a slice to play.
Slice Seq	None	We will not use the Slice Sequencer in this example.
PlayThru	OFF	For this example, we want to stop sample playback when we reach the end of the slice.

3. Connect a MIDI device for input that uses the MIDI Channel you selected for the MIDI parameter. Play MIDI note 36 (usually C2). You will hear that slice 1 is played.
4. Play MIDI Note 39 and slice 4 will be played. MIDI Notes 36 and up are now mapped to Slices 1 and up for playback.

The steps above show a simple example of using MIDI alone to trigger different slices within one pad. You can use this with Loop Mode ON with Launch Modes of Gate or Toggle to achieve different effects.

To Use a CV Signal to Select Specific Slices:

Now we will use modulation of the Slice parameter to control which slice will be played back when a trigger is received.

1. Create a slicer pad and create 4 or more slices by either using the Scan feature or manually creating the slices.
2. Set the following values for the pad parameters:

Parameter	Value	Explanation
Launch Mode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	Off	We will turn off looping for this example.
Slice	3	This parameter does not impact which slice is triggered in this example, because the modulation for this parameter will override it.
MIDI	Default	We want the default behavior where the MIDI channel selected for MIDI Pads on the Tools screen will be used to trigger this pad.
Slice Seq	None	We will not use the Slice Sequencer in this example.
PlayThru	OFF	For this example, we want to stop sample playback when we reach the end of the slice.

3. Touch one of the three black boxes below the Slice parameter to open the Modulation Parameters Screen.
4. For the Source parameter, choose IN1, IN2, or EXT 1 through EXT 8
5. Set 1V/Octave to ON for now to map 1 volt of CV signal across one octave of equivalent notes, with one slice per semi-tone. When this is set to ON, the Amount parameter is disabled.
6. Connect a CV signal to the EXT or IN jack selected for the Source parameter.
7. Press INFO until you see the Waveform screen. Trigger playback of this pad by pressing the triangular Play button in the top right corner of the screen while varying the voltage sent to the selected port. Each time you press play, the Trig modulation will play the slice mapped to the current CV value. You will see the waveform display jump around to show which slice is being played.

On the Modulation Parameters Screen for Slice, you can set 1V/Octave to Off and use the Amount parameter to control how the CV voltage range is mapped to slices.

To Control the Slice Sequence with a MIDI or CV Signal:

You can use this method with CV or MIDI to control which slice will be played the next time a slicer pad is triggered.

1. Create a Slicer Cell and create 4 or more slices as described in Work with Slicer Cells above. One example of a WAV file to use with this feature is \SFX\Metal\METL_shake and squeal.wav.
2. Set the following values for the pad parameters:

Parameter	Value	Explanation
Launch Mode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	Off	We will turn off looping for this example.
Slice	1	When a MIDI Note is received on either the MIDI Pads channel, or the MIDI channel configured for this pad, Slice 1 will serve as the starting point for the sequencer.
MIDI	Default	We want the default behavior where the MIDI channel selected for MIDI Pads on the Tools screen will be used to trigger this pad.
Slice Seq	Random	This will cause the bitbox mk2 to select a slice at random each time the pad is triggered.
PlayThru	OFF	For this example, we want to stop sample playback when we reach the end of the slice.

3. Slice Seq will not work unless we choose a modulation signal to work with it. Touch one of the three black boxes below the Slice Seq parameter to bring up the Modulation Parameters screen.
4. Choose a value for Source. For demonstration purposes choose TRIG and touch the pad or push the Play button to trigger playback.

5. Press INFO until you see the Waveform screen. Trigger playback of this pad by pressing the triangular Play button in the top right corner of the screen. Each time you press play, the Trig modulation will select a different slice to play at random. You will see the waveform display jump around to show which slice is being played.
6. Connect a CV signal to EXT 1.
7. Set Modulation source for Slice Seq to EXT 1 and set Slice Seq to Forward. Now, when bitbox mk2 receives a CV pulse on EXT1, the current slice position will advance to the next slice. Press Play or use any of the other ways to trigger a pad repeatedly and you should hear the slices advance with each CV pulse. If you are using a CV input as the Slice Seq modulation source (IN1, IN2 or EXT 1 through 8), the position of the slice selector cursor may change several times before the note is triggered again, or it might not change at all. It depends on the frequency of the note trigger compared to the frequency of the CV input.

You can change the value of Slice Seq to change the way the modulation pulse moves the slice selection. You can use other modulation sources to experiment with other ways to advance the slice selection. You can use Toggle or Gate for Launch Mode to get additional effects. Looping can also be used in combination with slicing in these other Launch Modes.

Modulate Pad and Effect Parameters

Bitbox mk2 allows you to adjust the values of pad and effect parameters in real time using external signals and internal LFOs. For example, you can use MIDI Velocity to control the Level of a pad, or EXT1 to adjust the Loop Start point. You can use a Trigger or CV input to control which slice of a Slicer pad will be played on the next note event. The parameter tables in this document indicate which parameters can be used as modulation targets. On the parameter screens you can easily identify the modulation targets by the three black boxes that appear to their right. You can use up to three different signal sources to modulate each parameter. The same signal can be used to modulate multiple parameters.

With the new LFO per pad, you can use the LFO to modulate parameters such as Pan, while using an external signal such as EXT1 to in turn modulate the LFO depth or rate.

To Apply CV or MIDI Modulation:

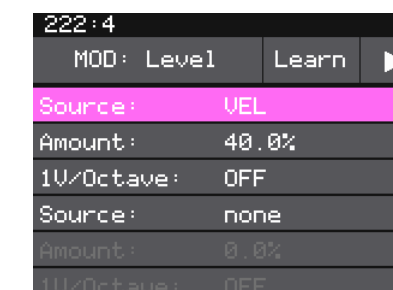
1. From the Pads screen, touch the pad you want to modulate. If you want to modulate an effect parameter, go to the FX screen and touch the effect (FX1 or FX2) you want to modulate.
2. Press INFO once or twice to display the Parameters screen. If needed, touch a tab to access the parameter you want to modulate.
3. Select the parameter you want to modulate by touching it or by turning the top knob.
4. Push INFO to display the Modulation Parameters screen.
5. Use the top knob to select the modulation parameter to edit. There are sets of modulation parameters in the list, one for each modulation slot. Choose a Source for a modulation slot and then the other modulation parameters will be enabled. The Source specifies which signal will be used to control this parameter. Available sources are shown in the table on the next page.



LFO Parameters with Modulation Targets

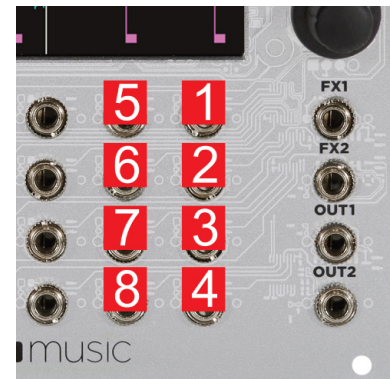


Pos Parameters with Modulation Targets



Modulation Parameters Screen

Modulation Source	Description
none	No modulation source will be used.
EXT1 to EXT8	External Control Voltage connected to one of the numbered EXT ports as shown in the image on the right.
IN1 and IN2	The audio input jacks can also be used for high quality Control Voltage inputs. If you want to use 1V/Octave to control pitch, these inputs are the best choice.
Trig	Any input that is used to trigger a pad, such as CV input, touch, or MIDI Note.
Vel	MIDI Velocity.
Pitch	MIDI Pitch Bend Signal.
MODW	MIDI Mod Wheel.
MVol	MIDI Volume.
MPAN	MIDI Pan.
MIDI CC	A learned MIDI Continuous Controller source. (More details on MIDI learn below.)



EXT Ports

- Select a value for the Amount of modulation that will be applied for each slot. This is used to increase or decrease the amount of impact the modulation will have on this parameter. The Amount does not apply to all modulation targets. An amount of 0.0% (the default) means the modulation will not impact this parameter. Set low values to enable fine control. Set values for coarse control.
- If you are modulating Pitch or Slice Sel, you can optionally turn on the 1V/Octave setting. When this is set to OFF, the Amount parameter controls how the voltage maps to pitch or slice selection. When this is ON, 1V difference in CV maps to one octave difference in pitch playback. In this case, 1/12th of a volt maps to one semitone. Each semitone of voltage level changes the pitch or slice selection by 1.

NOTE:

- ▶ EXT1 through EXT8 can be used as modulation sources when these pads are triggered via CV. Modulation will not be applied for these modulation sources when MIDI is used to trigger the pad.
- ▶ The Modulation sources **VEL**, **PITCH**, **MODW**, **MVOL** and **MPAN** only impact the pad if the modulation signal is received on the MIDI In channel for this pad.
- ▶ EXT5 through EXT8 are the same jacks used to trigger the right column of pads. If you have loaded a WAV into the pad that corresponds to an EXT jack, a signal on that jack will both serve as a modulation source and as a trigger for the pad.

To Use MIDI CC in Learn mode to Modulate Parameters:

In addition to the MIDI signals listed in the table on the previous page, you can teach bitbox mk2 to respond to specific MIDI CC signals from your MIDI controller.

- Connect a MIDI controller to bitbox.
- Navigate to the parameter page for the pad parameter you want to modulate.
- Touch one of the three black boxes below the parameter you want to modulate. This brings up the Modulation Source screen.
- Touch Learn in the top right corner to enable MIDI CC learning mode.
- Move the MIDI control, such as a knob or slider, that you want to use with this parameter. When bitbox mk2 has learned the mapping, the Learn button will turn from blue to gray, and the Source parameter will change to MIDI CC.
- Turn the top right knob to adjust the Amount of modulation you want to apply with this controller.
- Now play the pad and use the controller and you will hear the modulation. The Modulation box associated with this mapping will be labeled CC.

To Remove Modulation from a Parameter:

- Go to the parameter screen for that parameter.
- Touch the modulation box you want to clear.
- On the modulation parameters screen, turn the top left knob to set the Source to none.

MIDI Triggered Recording <New in 2.1>

MIDI triggered recording can help streamline the workflow for live looping, field sampling, and more. With this feature, you can use a connected MIDI controller to start and stop recording for an empty pad, clear a pad, and change pad selections.

There are two different techniques you can use for MIDI Triggered recording. The MIDI Note to Pad mapping approach works well if you can dedicate 16 to 32 MIDI Notes to the task. If you prefer to work with a range of 5 MIDI notes, use the MIDI Note Actions mapping approach. In either case, the pad must be empty for recording to occur and MIDI Recording must be enabled. You can only record to one pad at a time.

To Configure Bitbox MK2 to Use MIDI Triggered Recording:

Whether you will use MIDI Note to Pad mapping or MIDI Note to Actions mapping, bitbox mk2 needs to be configured to allow MIDI Recording on the Tools page. You will also need to set bitbox mk2 to receive MIDI Pads on the channel used for output by your MIDI controller. Follow these steps to set up bitbox mk2 for MIDI Triggered Recording:

1. Push Home until you see the Menu Page.
2. Touch Tools to open the Settings page.
3. Touch the MIDI In tab.
4. Set MIDI Rec to ON.
5. Connect your MIDI controller to the MIDI jack on bitbox mk2.
6. Set the value of the MIDI Pads channel to the MIDI channel used by your MIDI controller. Choose Omni to allow all incoming MIDI channels to control Pads. Keep in mind that this also controls which channel will trigger pads and sequences to play.
7. You may also want to use Pad Templates to set up your pads in advance of recording. See [Create Preset Templates for Re-Use](#) to learn how to do this.



Tools - MIDI In Tab with Recording Settings

MIDI Triggered recording is now enabled.

Trigger Recording with the MIDI Note to Pad Mapping Approach

When you use MIDI Note to Pad Mapping, bitbox mk2 maps two MIDI notes to each pad: one note starts and stops recording; the other note clears the pad. Recording will only work if the pad is already empty. Clearing a pad removes the WAV file from the pad, but does not delete the WAV file from the microSD card.

For MIDI triggered recording to work, the target pad must be empty. Bitbox mk2 will not allow MIDI triggered recording to record into a loaded pad.

To Trigger Recording to a Specific Pad Using MIDI:

This recording method will only work if the target pad is empty.

1. Set up bitbox mk2 for MIDI Triggered Recording as described above.
2. Press the MIDI Note that maps to the pad you want to record into, as shown in the map on the right.

80	81	82	83 B5
76	77	78	79
72	73	74	75
68 G#4	69	70	71

MIDI Notes to Trigger Pad Recording

Bitbox mk2 will jump to the PADS screen and select the corresponding pad. If the pad is empty, you will see the recording screen and recording will begin, the same as if you had touched the Rec button. Any armed Clips will start to play.

Recording will end when you press the corresponding MIDI Note again, when the recording reaches the length specified in the recording settings, or when you press the STOP transport button. If you have RecToPlay set to ON and have specified a recording length, the pad will start playing as soon as recording is finished.

While recording, If the MIDI Action note to Record the current pad is received, the recording will stop. MIDI Clear notes and other MIDI Action notes will be ignored.

To Clear a Specific Pad Using MIDI:

Clearing a pad removes the mapping between the WAV file and the pad. It does not delete the WAV file.

1. Set up bitbox mk2 for MIDI Triggered Recording as described above.
2. Press the MIDI Note that maps to the pad you want to clear, as shown in the map on the right. Bitbox mk2 will open the PADS screen and select the corresponding pad. Any existing mapping to WAV files for that pad will be cleared. Pad parameters will not be cleared.

96	97	98	99 D#7
92	93	94	95
88	89	90	91
84 C6	85	86	87

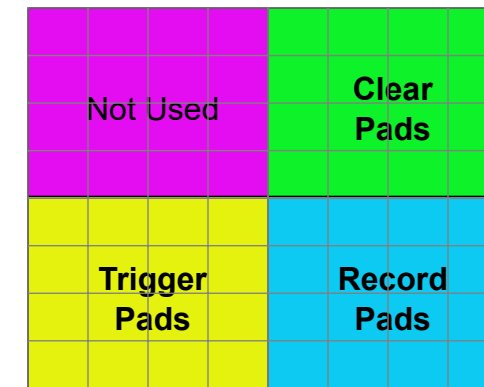
MIDI Notes to Clear Pads

NOTE:

- ▶ Some devices map the MIDI note numbers one octave lower. The mapping here assumes C4 is Note 60.
- ▶ If you want to configure lengths for each pad independently, make sure you have RecConfig set to Per Pad on the Recording settings page in TOOLS mode.
- ▶ If you have the same MIDI channel (or Omni) for both MIDI Pads and MIDI Keys, you will trigger both playback of the pad via MIDI Keys mode, and the MIDI Pads mapping action when you trigger a MIDI note into bitbox. This may be fun to do, but you may want to use separate MIDI channels if you don't want to trigger MIDI Keys and MIDI pads behavior with the same controller.

NOTE:

- ▶ The Novation Launch Pad controllers work well with bitbox mk2 as a MIDI Pads controller when the LaunchPad is configured in Drum mode. With the default note mapping, the bottom left quadrant of the LaunchPad triggers pads, the bottom right quadrant triggers recording, the top left quadrant triggers sequences, and the top right quadrant clears pads. When in the correct mode, the Launchpad lights the buttons using the color pattern shown in the diagram pattern below.



Trigger Recording with the MIDI Note Actions Mapping

When using the MIDI Note Actions mapping, you use a smaller number of MIDI notes that perform the actions of selecting next pad, selecting previous pad, playing the current pad, recording into the current pad, or clearing the current pad.

To Use MIDI Note Actions to Record or Clear a Pad:

Bitbox mk2 has allocated a range of MIDI Notes that map to actions that control pads. To use this mapping:

1. Set up bitbox mk2 for MIDI Triggered Recording as described above.
2. Press the MIDI Note that maps to the desired action using the MIDI Note to Action Map below:

MIDI Note/ Number	Action
E7 / 100	Select Previous Pad
F7 / 101	Select the Next Pad
F#7 / 102	Play the currently selected pad
G7 / 103	Record to currently selected pad (must be empty)
G#7 / 104	Clear the currently selected pad

NOTE:

- ▶ Some devices map the MIDI note numbers one octave lower. The mapping here assumes C4 is middle C.
- ▶ If you want to configure lengths for each pad independently, make sure you have RecConfig set to Per Pad on the Settings page.
- ▶ If you have the same MIDI channel (or Omni) for both MIDI Pads and MIDI Keys, you will trigger both playback of the pad via MIDI Keys mode, and the MIDI Pads mapping action when you trigger a MIDI note into bitbox mk2. This may be fun to do, but you may want to use separate MIDI channels if you don't want to trigger MIDI Keys and MIDI pads behavior with the same controller.

To Disable MIDI Triggered Recording and Pad Clearing:

If you are not careful with MIDI Triggered recording and pad clearing, you could unintentionally clear a pad or trigger recording. If you are not using this feature, you can disable it.

1. Push TOOLS to open the Settings screen.
2. Set MIDI Rec to OFF.

Summary of MIDI Pads Note Mappings

Here's a summary of all of the note mappings that bitbox mk2 will respond to when notes are received on a MIDI Channel:

MIDI Note Range	Mapping
C2 - D3# (36 - 51)	Trigger playback for a Pad. Pads are mapped starting in the bottom left, moving across and then up.
E3 - G4 (52 - 67)	Trigger a Sequence. Sequences are mapped starting in the bottom left, moving across and then up.
G#4 - B5 (68 - 83)	Trigger recording for a pad. Pads are mapped starting in the bottom left, moving across and then up.
C6 - D#7 (84 - 99)	Clear a pad. Pads are mapped starting in the bottom left, moving across and then up.
E7 / 100	Select Previous Pad
F7 / 101	Select the Next Pad
F#7 / 102	Play the currently selected pad
G7 / 103	Record to currently selected pad (must be empty)
G#7 / 104	Clear the currently selected pad

Synchronize with an External Clock

Here are the three different musical clocks that you can use with bitbox mk2:

Name	Description	Priority
Clock In	Bitbox mk2 gets the CV Clock signal from an input to the Clock jack on the front panel of the module. Bitbox mk2 expects a clock pulse signal with 4 pulses per quarter (PPQs), or a pulse per 16th note.	1
MIDI Input	When a MIDI signal is connected to the MIDI In TRS jack, bitbox mk2 will follow MIDI Start, Stop and Clock messages	2
Bitbox mk2 Internal Clock	When no other clock input is provided, bitbox mk2 will use its own internal clock fixed at 120 BPM.	3

Bitbox mk2 displays the current clock time in the top left corner of most screens in the format <measure>: <beat>. If more than one clock input is available, the highest priority clock signal (lowest priority number) will be used. Bitbox mk2 can delay the timing of the playback of a Clip pad to synchronize it with a specified unit of musical clock time. To synchronize the playback of Clip pads with the clock, configure a pad in Clip mode and set the value for Quant to something other than None. Bitbox mk2 only synchronizes pads with a pad mode of Clip, and only when Quant is set to something other than None, such as Quant: 1 bar. Bitbox mk2 will then delay the playback of the pad if needed to quantize it to the selected quantization unit.

Note:

- ▶ The Clock input must use 4 pulses per quarter (PPQs), or a pulse per 16th note.
- ▶ If MIDI and CLOCK inputs are both used, Bitbox mk2 will select the highest priority clock based on the following order of priority: 1.) CLOCK Input; 2.) MIDI Input; 3.) Internal Clock.

Reset the Clock

You can use the following methods to reset the clock counter back to 0:0:

- Stop the CV clock input for a few seconds
- Send a Clock Start signal over MIDI
- Power down the module

Use a MIDI Program Change to Load Presets

Some MIDI controllers support a MIDI command to trigger a program change. Bitbox mk2 can be configured to respond to MIDI program changes by loading a preset. Bitbox mk2 will map the presets on the device in alphabetical order to program numbers. The first preset on the device will be mapped to the first program change message. Some products call the first program number 1. On others, the first program is zero. The important thing to know is that there are 128 valid program change slots that may be numbered 0-127 or 1-128 depending on what you have connected. Keep in mind that when you change presets, even with a program change, bitbox mk2 does not save your changes. So be sure to save your preset if needed before initiating a program change.

Because of the potential for data loss, bitbox mk2 has a global parameter that allows you to control whether or not the device responds to program change signals. By default, this is set to off.

To Enable or Disable MIDI Program Changes:

1. Push Home until you see the Menu screen.
2. Touch Tools to open the Tools Parameters screen.
3. Touch the MIDI In tab at the bottom of the screen to change the page.
4. Turn the knob to set the value of the ProgChange parameter to ON or OFF as needed.

Customize MIDI Note Mapping for Pads

If the default note mapping for triggering MIDI pads does not map well to your MIDI device, you can customize the mapping.

1. Open the Parameters page for a pad.
2. Touch MIDI at the bottom of the screen to change the page.
3. Turn the knob to set the value of the Pad Note parameter to the note you want to use with this pad.
4. Repeat the above steps for each pad you want to customize. You can use the pad selector icon in the top left to quickly switch pads to do this.

Sharing of MIDI Input Channels

How do all of these MIDI Input channel assignments work together? Basically, they all work together, with one big exception for Omni settings. Any channel that is assigned to anything else will no longer be included in the list of channels responded to by a parameter with the Omni setting. Here's another way to think about it:

- If the MIDI In channel is assigned on a pad, that pad will always respond to MIDI notes received on that channel.
- The currently active pad will always respond to MIDI notes on a given MIDI channel if that channel has been specifically assigned as the MIDI Keys channel on the TOOLS screen.
- Pad hits will be triggered by notes on an incoming MIDI channel if that channel has been specifically assigned as the MIDI Pads channel on the TOOLS screen.
- If the MIDI Keys parameter is set to Omni, and the incoming notes are on a MIDI channel that has not been specifically assigned to anything else (a pad's MIDI In, or the MIDI Pads parameter), then the currently selected pad will respond to notes on this channel.
- If the MIDI Pads parameter is set to Omni, and the incoming notes are on a MIDI channel that has not been specifically assigned to anything else (a pad's MIDI In or the MIDI Keys parameter), then the incoming notes will trigger pad hits.

As a result, if you, for example, assign the same MIDI channel to both a specific pad's MIDI In parameter and to the MIDI Pads parameter on the TOOLS screen, notes on that channel will be played by that specific pad and they will trigger pad hits. This gives you lots of flexibility but could result in confusing results if you aren't careful.

CREATE PRESET TEMPLATES FOR RE-USE

Preset template support was added to help users who like to set up their presets a certain way each time, and those who want to configure different presets in preparation for a live performance. Preset templates allow you to configure the pad mode, output, MIDI settings, modulation and other settings before you have associated a WAV file with the pad.

A preset template is simply a preset that has pads which have been configured but do not have WAV files associated with them.

To Configure a Pad without a WAV file:

1. Select the pad you want to configure as a template on the Pads screen.
2. Push INFO. If the pad is loaded with a WAV file, this will display the WAV screen. In this case, touch the pad mode icon on the top left of the screen and then select New Recording to remove the WAV file mapping. You will now see the Load and Record screen.
3. Push INFO again to see the Parameters screen for this pad.
4. Choose the Pad Mode on the Main page of the Parameters screen.
5. Use the buttons across the bottom of the screen to choose the desired page and update the parameters as you normally would.
6. Push HOME until you see the Menu screen, then touch Presets to display the Preset Management screen. Touch Save to save the current preset, or touch File then Save As to save to a new or different preset.



**Pad Parameters -
Template Mode**

To Add a WAV file to a Template Pad:

1. Select the pad you configured as a template on the Pads screen.
2. Push INFO to display the Load and Record screen.
3. Touch Load if you want to use an existing WAV file. Otherwise, begin recording a new WAV as usual.

NOTE:

- ▶ Not all parameters are available before you add a WAV file to the Pad. For example, you cannot add loop points to a sample mode pad because bitbox mk2 does not know how long the file will be.

PROCESSOR MANAGEMENT TIPS

If you have experienced drop outs or crackling sounds with bitbox mk2, you have probably pushed the processor to its limits. Bitbox mk2 does not limit what you can do based on anticipated processor load. We have tried to balance the design of the system to optimize what you can do without over-driving the processor while still giving you room to make creative choices. That being said, here are some tips you can use to reduce your processor load and the corresponding chance of encountering sound artifacts:

- Configure your pads to run monophonic whenever possible. On most percussion sounds, you won't hear the difference and this is an easy win.
- Use mono samples instead of stereo where appropriate. Stereo samples are twice the work to load and play.
- Use 48kHz samples when possible—especially for stuff played at unity pitch. This gives the CPU less work to do.
- Reduce the Grain Density of granular pads.

UPDATE AND SWAP FIRMWARE

Owners of bitbox mk2 modules can update the module's firmware to get the latest features and other updates. This process can also be used to convert a module to run any Series 1 firmware. This means that your bitbox mk2 can be converted to a synthbox or an fxbox and then back again. The firmware can be updated with the factory image, which includes the original presets, or just the firmware itself. You can also choose individual presets to copy over to your microSD Card. Fxbox and synthbox firmware will be available by the end of summer 2020.

Switch to a New microSD Card While Operating Bitbox mk2

You can switch to a different microSD card while operating bitbox. Simply remove the current card and insert the new one, then load a preset from the new card as usual.

Backup Your Presets and WAV Files

Before you re-use a microSD to update or swap firmware, backup the files that are stored on the microSD card:

1. Remove the microSD card from your module and insert into your computer. You may need to use a microSD adapter.
2. Copy the files from the microSD card onto your computer.

Install New Firmware

Here are the steps required:

1. Backup your microSD card as described above.
2. Download the desired firmware onto your computer. You can choose to download either synthbox, fxbox or bitbox mk2 firmware, but only one set of firmware can run at a time. You can find the latest firmware images on the forum at <https://forum.1010music.com>. You must be a registered user of the forum to access the download files. Forum registration is free.
3. Unpack the zip file. Some browsers do this automatically for you. Make sure the files you downloaded saved with a file named BITBOXmk2.bin. Sometimes if you have downloaded an update in the past, the new file will be automatically renamed with a number in the name. Rename the file if needed.
4. Prepare a microSD card with the FAT32 or exFAT format. The card that comes with your module is formatted properly, but you may need to reformat a card that came from somewhere else. Make sure you only have the files from one firmware on the microSD card at a time.
5. If you want to replace the Presets with the factory image, copy the full contents of the zip file onto a microSD card. If you do not want to overwrite

your presets, copy only the BITBOXmk2.BIN file to the microSD card.

6. Turn off power to the Eurorack.
7. Place the microSD card in your module.
8. While powering up the unit, hold the INFO button. When you see the message about upgrading the firmware, you can let go.
9. When the upgrade finishes in about 15 seconds, the unit will restart with the new software. You can confirm the firmware version on the startup screen or in the top right corner of the Tools page.

TECHNICAL SPECS

Module Specs

Bitbox mk2 is designed with the following specs:

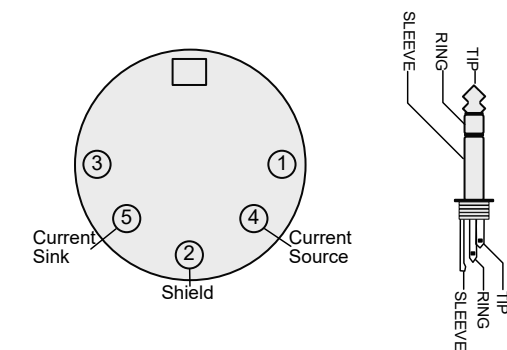
- Rack width: 26 HP
- Power supply requirements:
 - +12V: 350mA
 - -12V: 0mA
 - 5V: 0mA
- Touchscreen: 3.5" diagonal
- Sample Pads: 16
- 24-bit ADC and DAC

Pin Mapping for Mini TRS Jack to MIDI 5 Pin DIN Connectors

The musical instrument industry currently uses several different ways of mapping MIDI 5 Pin DIN signals to mini TRS jack connectors. The diagram below to the right shows the numbering of the pins on a MIDI connector and the labels of the connection components of a mini TRS jack. 1010music bitbox mk2 is compatible with both TRS Type A and TRS Type B configurations. The included MIDI adapter uses the following PIN mapping.

MIDI Signal	MIDI Connector	Mini TRS
Current Source	Pin 4	Tip
Current Sink	Pin 5	Ring
Shield	Pin 2	Sleeve

MIDI Connector to Mini TRS Jack Signal Mapping



5 Pin DIN and Mini TRS Jack Connectors

For more information on the use of adapters, read the blog post on our website, [Mini TRS Jacks for MIDI Connections Compatibility Guide](#) at:

<https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide>

On-Board Memory

Bitbox mk2 has 64MB of on-board RAM. However, this is a cache--not a hard limit to what can be loaded at once.

Maximum Sample Length

Bitbox mk2 streams longer samples from the microSD card, so the maximum length is a function of the maximum file size for a sample. The maximum file size is 4GB, which can be many hours depending on the sample rate and bit depth. Bitbox mk2 caches smaller samples as needed.

Samples Supported

Bitbox mk2 supports stereo samples. It can record in stereo and has stereo outputs.

Bitbox mk2 supports samples in the WAV file format. It supports 1 or 2 channel files with 16, 24 or 32-bit resolution at any sample rate. 48kHz is the preferred sample rate. The bitbox mk2 engine uses a 24-bit ADC and DAC.

WAV file names may use Alpha Numeric Characters (A-Z, 0-9) and some special characters. The following characters are NOT allowed: double quotes, forward slash, back slash, question mark, asterisk, less than and greater than symbols, the colon and the pipe symbol (" / \ ? * < > : |). File names must be less than 256 characters, including the path name. Files that do not conform to these naming constraints will not be recognized by bitbox.

Maximum Number of Voices Supported

Bitbox mk2 can reliably play up to 24 polyphonic notes across all pads when your samples fit in the 64 MB of internal memory or up to 8 larger samples streaming directly from the microSD card.

Additionally, there is a per pad limit based on the pad mode. The limit for each pad mode is identified in the table on the right.

Nothing in bitbox mk2 will prevent you from trying to play 24 voices on all 16 pads at the same time. However, the CPU can be overloaded if you play too many notes at once. You can reliably play 24 voices across all pads simultaneously. Beyond that, you may encounter some sound quality issues like crackling. The exact breaking point depends on the overall usage scenario. The absolute maximum number of simultaneous voices is 32.

Pad Mode	Max Pad Polyphony
Sample	16
Multi-Sample	16
Clip	2
Slicer	2
Granular	1

STAY UP TO DATE

Demonstration Videos and Latest Docs

You can find video demonstrations of bitbox mk2 on our YouTube channel at youtube.com/c/1010music. You can find updated versions of this user manual at 1010music.com/mk2docs.

Connect with Other Bitbox mk2 Users

There is a very active community of users of 1010music modules at <https://forum.1010music.com>. If you have a question about the module that isn't answered in this manual, this is your best source for help. We actively monitor the wish list sub-forums for ideas for future versions of our products. Forum registration is free. We hope to see you out there!

Contact Us

Are you loving bitbox? Have questions? You can contact us through our website at <http://1010music.com/contact-us>.