LEARNING TOOLBOX
& instruction manual

INTRODUCTION

Learning a musical instrument is a fantastic opportunity that all children should enjoy. Whether it becomes a hobby for personal enjoyment, a way to entertain friends and family, or a career, music skills can provide a lifetime of creative expression.

Advancements in technology mean that there are entirely new music learning tools that didn't exist even 20 years ago. "Instruments" now go beyond the violin, piano, guitar and voice. Instead, these new sounds come from synthesizers, either in the form of classic hardware keyboards, or advanced music production software. Every year electronic music producers are pioneering new and exciting sounds unlike anything humans have experienced before.

But the complexity of synthesis has limited how early children can start exploring this technology. The concept of oscillators, filters, triggers and envelopes are not easily explained to little kids. Many existing synthesis methods remain complicated, expensive and contain small parts not safe for young children.

From its earliest conception, the Blipblox was designed to encourage anyone, especially young children, to quickly start exploring electronic music and synthesis in a fun and easy way.

Although this Learning Toolbox includes all the technical details about how the Blipblox works, it is important to know that a comprehensive knowledge of synthesis is not required. The primary goal of the Blipblox is to be a fun musical toy.

Our vision is that children will want to learn on their own how these sounds are being made. The purpose of this Learning Toolbox is to facilitate this education. As you will see, there is a lot of complicated stuff happening under the hood of the Blipblox. But we are confident children have the capacity to learn this complexity if it intrigues and entertains them.

Providing access to advanced synthesis tools to young children will provide the fundamentals to produce electronic music. We hope the simplified design of the Blipblox will encourage more children, even those who are very young, to embark on a lifetime of music enjoyment.

CAUTION - ELECTRIC TOY: Not recommended for children under 3 years of age.
As with all electric products, precautions should be observed during handling and use to prevent electric shock.

This toy should be periodically examined for potential hazardous. Parts are to be repaired or replaced.

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Designed in USA. Produced in China. www.playtimeengineering.com

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INTRODUCTION

Included in this package

- Blipblox
- USB to 5.5 mm/2.1 mm 5 Volt DC Barrel Jack Power Cable
- Three (3) AA batteries

Compatible 3rd Party Components

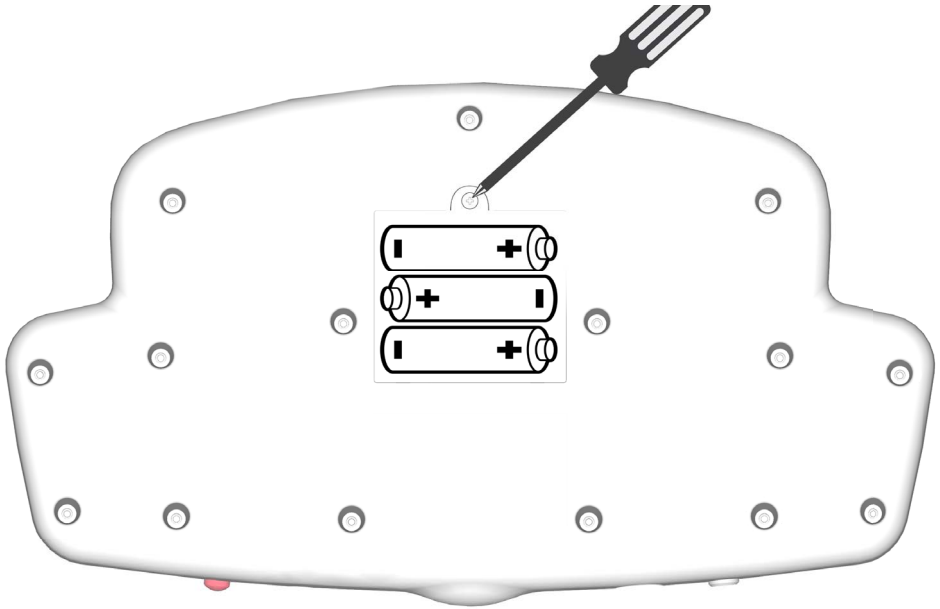
- MIDI cord
- External MIDI keyboard
- External MIDI sequencer

WARNING: Audio Out jack not intended for headphone use. Like a real synthesizer, the Blipblox produces dynamic sounds that can suddenly change volume. Because of this, using the Blipblox with headphones is not recommended. The mono Audio Out jack is designed to be used with professional recording equipment or an external speaker.

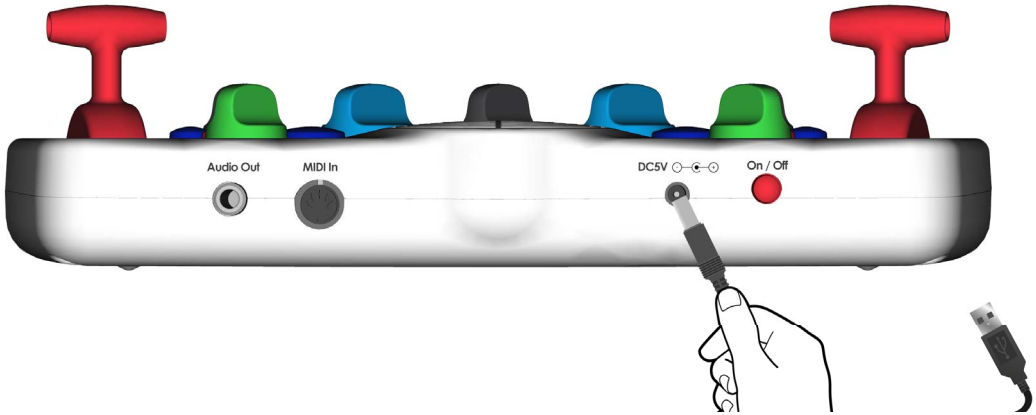
Getting the Blipblox ready to play

1. Peel the protective plastic film from the faceplate.
2. Install batteries. The battery compartment is on the underside of the Blipblox. Use a Phillips screwdriver to open the battery cover. Place batteries in the order indicated. **Note:** The Blipblox checks the status of the batteries every time it is powered on. If the top left LED flashes yellow your batteries are running low. Replace them soon. If the top left LED flashes red, your batteries are too low for the Blipblox to function. Replace them, or switch to USB-DC adapter (see Step 3).

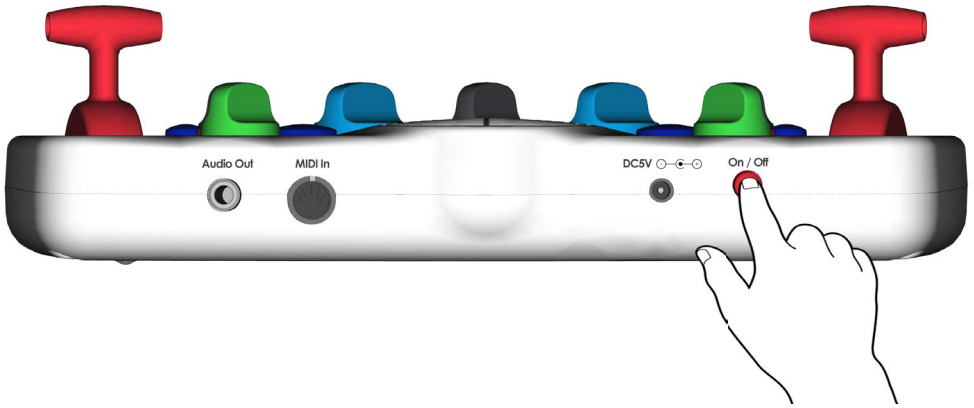
   Battery warnings:
   - Different types of batteries or new and used batteries are not to be mixed.
   - Non-rechargeable batteries are not to be recharged.
   - Rechargeable batteries are to be removed from the toy before being charged.
   - Rechargeable batteries are only to be charged under adult supervision.
   - Batteries are to be inserted with the correct polarity.
   - Exhausted batteries are to be removed from the toy.
   - The supply terminals are not to be short-circuited.



3. As an alternative, or if your batteries are low, you can use the USB-DC adapter. Plug the round side of the adapter in the back of the Blipblox where you see “DC 5V ⊙—⊂—⊙ 60mA” and the USB side into a USB adapter. **Note:** Batteries do not need to be removed to use power adapter, but adapter will not charge batteries.

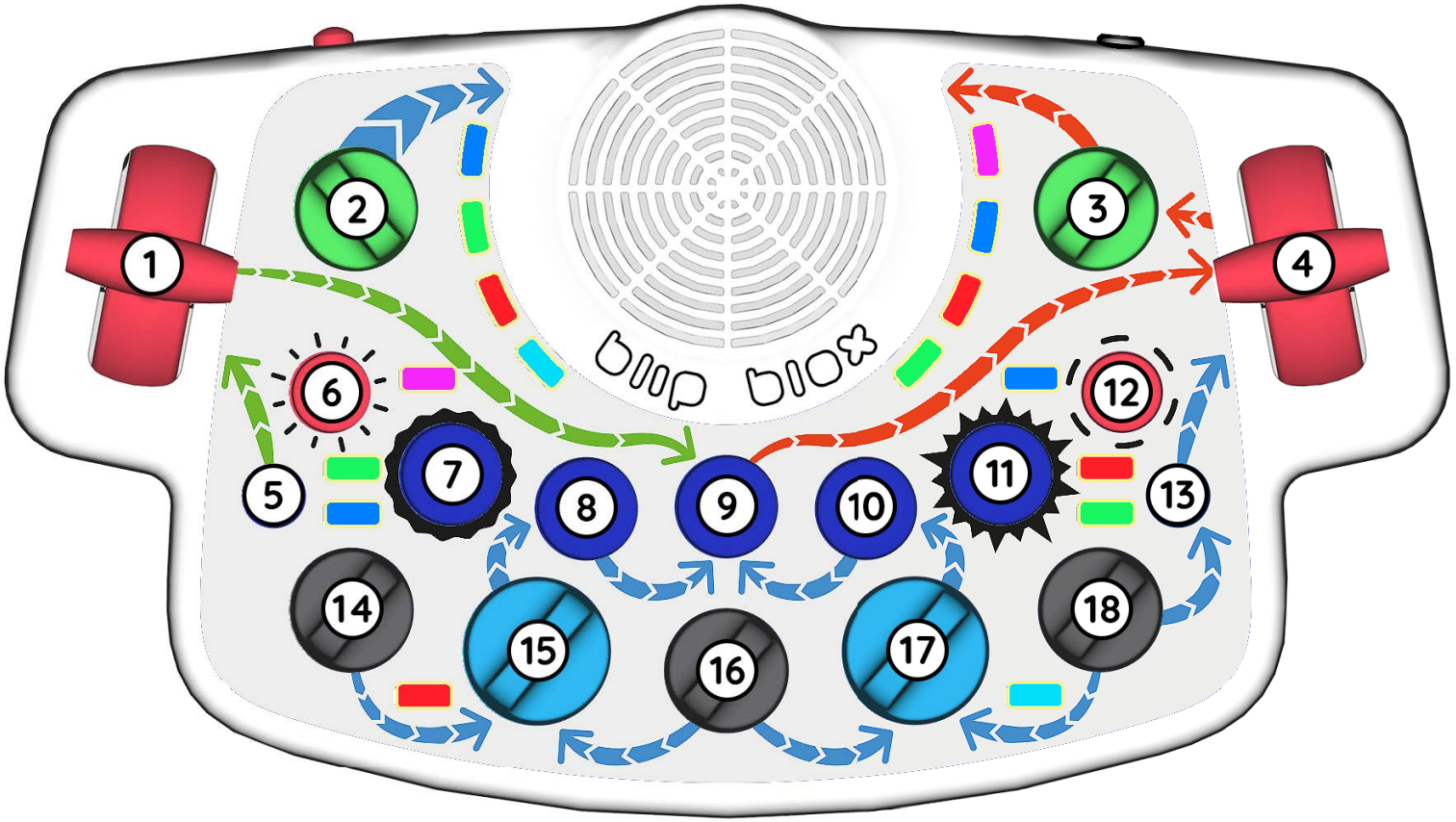


4. Press the red button on the back of the unit to turn on. **Note:** If no buttons are pushed, or no MIDI data is received for 30 minutes, the Blipblox will automatically shut down to save power. Use the power switch to turn the Blipblox off then on again to restart.



5. Now you're ready to have some fun, pressing buttons, pulling levers and twisting knobs!

GUIDE TO BLIPBLOX BUTTONS, KNOBS & LEVERS



1. TEMPO SEQUENCER LEVER changes the speed of the music
2. AMPLIFIER ENVELOPE RELEASE KNOB fades the sound
3. VOLUME KNOB makes the sound louder or quieter
4. FILTER LEVER makes the sound smoother
5. SEQUENCER BUTTON selects the melody
6. SOUND FREAK BUTTON adds something a bit freaky
7. KICK DRUM BUTTON plays a kick beat
8. OSCILLATOR CONTROL 1 BUTTON selects oscillator control #1
9. OSCILLATOR BUTTON selects the sound wave
10. OSCILLATOR CONTROL 2 BUTTON selects the oscillator control #2
11. SNARE DRUM BUTTON plays a snare beat
12. RANDOMIZER BUTTON changes random parts of the music
13. FILTER CONTROL BUTTON changes the amount of modulation to the filter
14. LFO KNOB 1 changes the speed of low frequency oscillator #1
15. OSCILLATOR MODULATOR 1 KNOB changes the amount of modulation to the oscillator
16. MODULATION ENVELOPE ATTACK KNOB changes the rise time of the control envelope
17. OSCILLATOR MODULATOR 2 KNOB changes the amount of modulation to the oscillator
18. LFO 2 KNOB changes the speed of low frequency oscillator #2

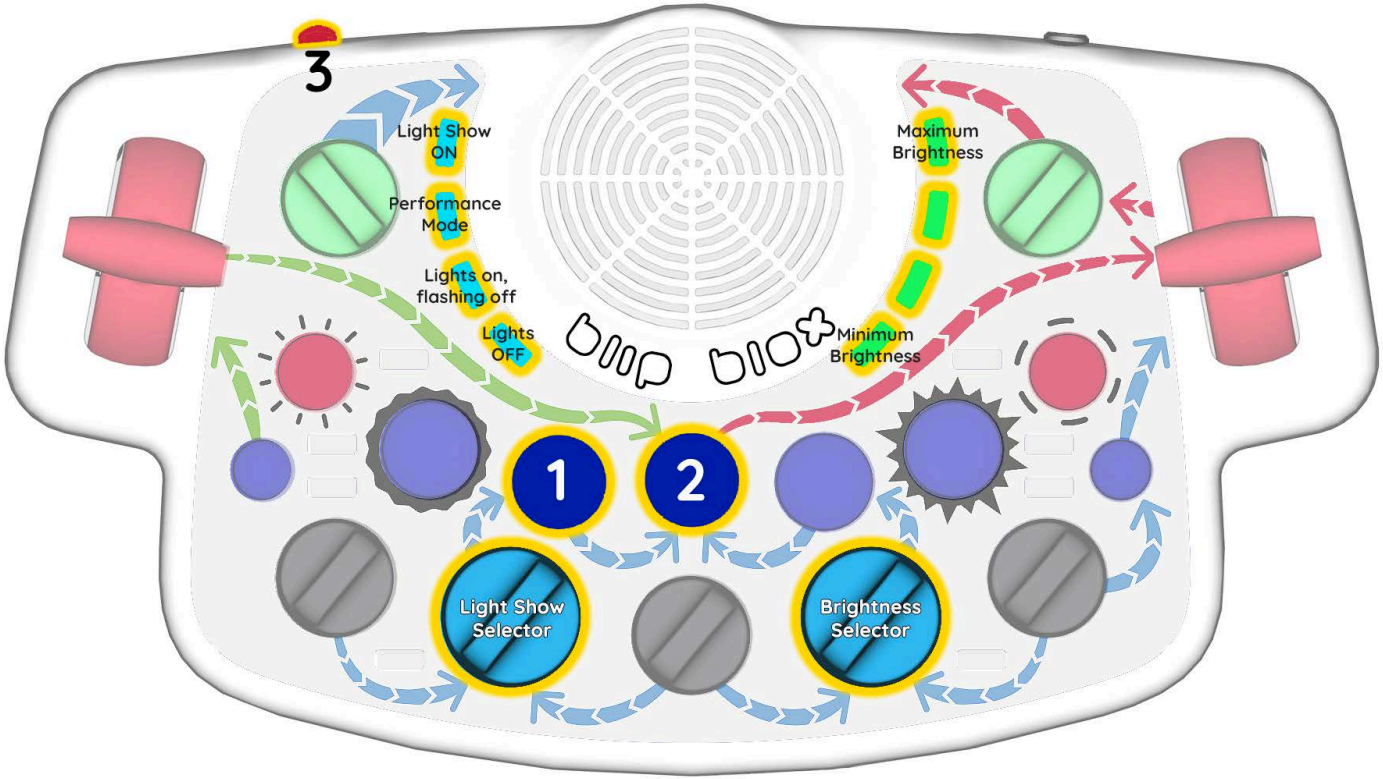
LIGHT, VOLUME & AUTO-OFF CONTROL MODES

We take our tag line “Synthesis for All” seriously. We want the Blipblox to be accessible to all so we’ve developed a few features especially for users with sensitivities to light or parents looking to set a maximum volume.

Modifying the LED Show Lights

Before you can make a change, you will need to enter the **LED Controls Mode.** Hold down the Oscillator Modulation 1 (1) and Oscillator Select (2) buttons at the same time while powering on the device (3) [see illustration below for button location].

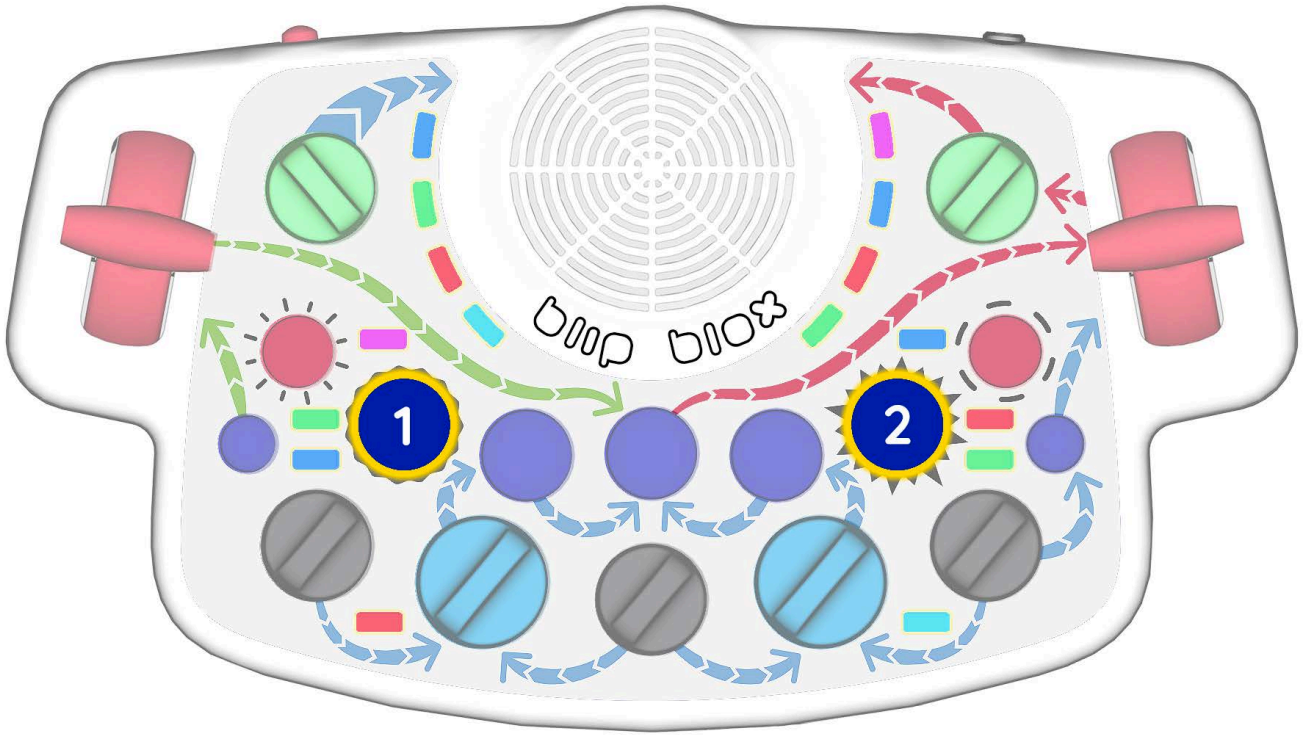
- As soon as the Blipblox starts you will see a blue light on the left side of the speaker, and a green light on the right.
- The blue lights are the LED Light Show indicators. You can cycle through LED Show Options using the Oscillator Modulator 1 knob.
    1. Default Light Show - The first blue LED is illuminated. This selection will show the standard synchronized light show.
    2. Performance LED Mode - The second blue LED is illuminated. This forces the Blipblox to display the Performance Mode LED display as described later in this manual.
    3. Static LED Mode - The third blue LED is illuminated. The LEDs will light up, but they will not flash or change.
    4. LED Off Mode - The bottom blue LED is illuminated. This will turn off all LEDs except for one green LED near the power switch to indicate the Blipblox is powered on.
- The green LED on the right is the current Brightness. You can cycle from bright to dim using the Oscillator Modulator 2 knob. The selected brightness is indicated by the green LEDs. When the first green LED is illuminated, the lights are at their brightest. When the last green LED is illuminated, the lights are their most dim.


3
Light Show ON
Performance Mode
Lights on, flashing off
Lights OFF
Maximum Brightness
Minimum Brightness
1
2
Light Show Selector
Brightness Selector

Locking Special Controls Settings

- Once you have made your selections, press the Snare (1) and the Kick (2) buttons at the same time to lock in new settings.
- The bottom LEDs on both sides of the speaker will flash green, indicating the settings are stored.
- Turn the Blipblox off and on to see the new mode.

Note: Settings made in this mode will stay in effect even when the unit is powered off and on again.

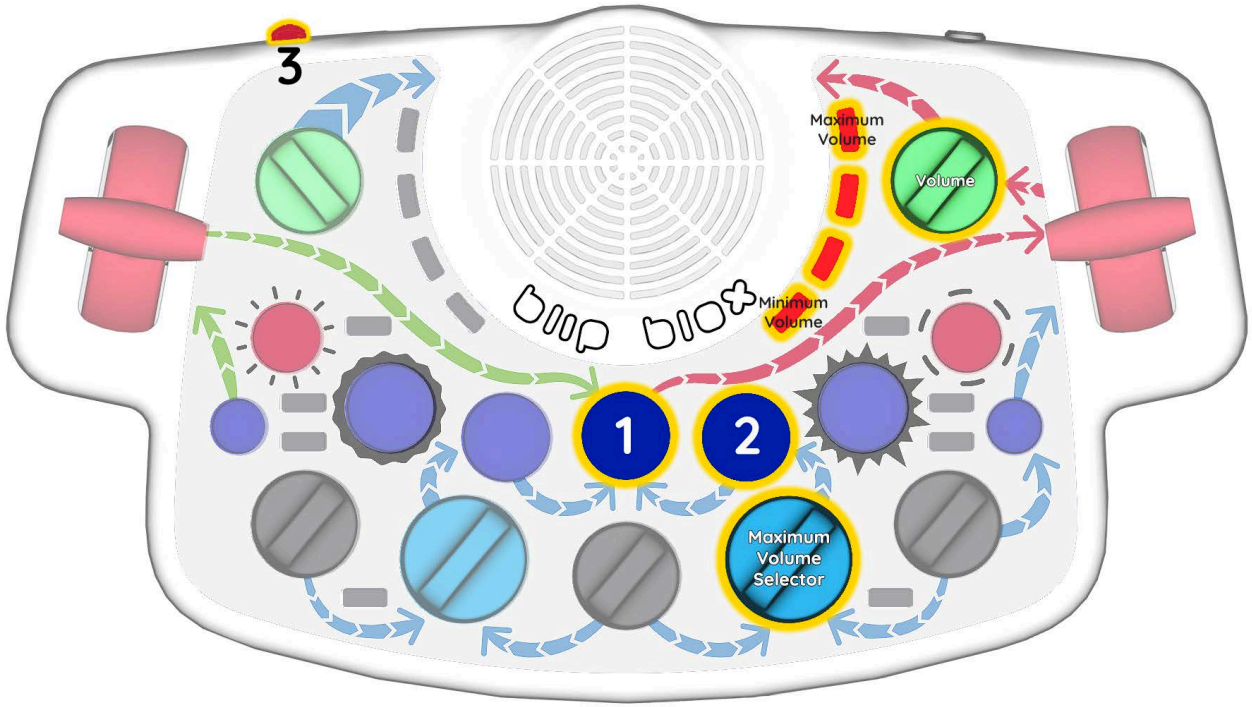


The green knob on the top right of the Blipblox is the primary Volume control. If you turn your Blipblox on and see the lights blinking but hear no sound, it's likely the Volume is turned down.

Maximum Volume Control

- Before you can make a change, you will need to enter the **Volume Controls Mode.** Hold down the Oscillator Select (1) and Oscillator Modulation 2 (2) buttons at the same time while powering on the device (3).
- As soon as the Blipblox starts you will see a red light on the right side of the speaker.
- You can cycle through Volume Options using the Oscillator Modulator 2 knob.
- The red LED on the right is the current Volume. You can cycle from bright to dim using the Oscillator Modulator 1 knob. The selected brightness is indicated by the green LEDs. When the first green LED is illuminated, the lights are at their brightest. When the last green LED is illuminated, the lights are their most dim.
- After you've made your selection, **Lock the Special Controls Settings** (described and pictured on page 8).

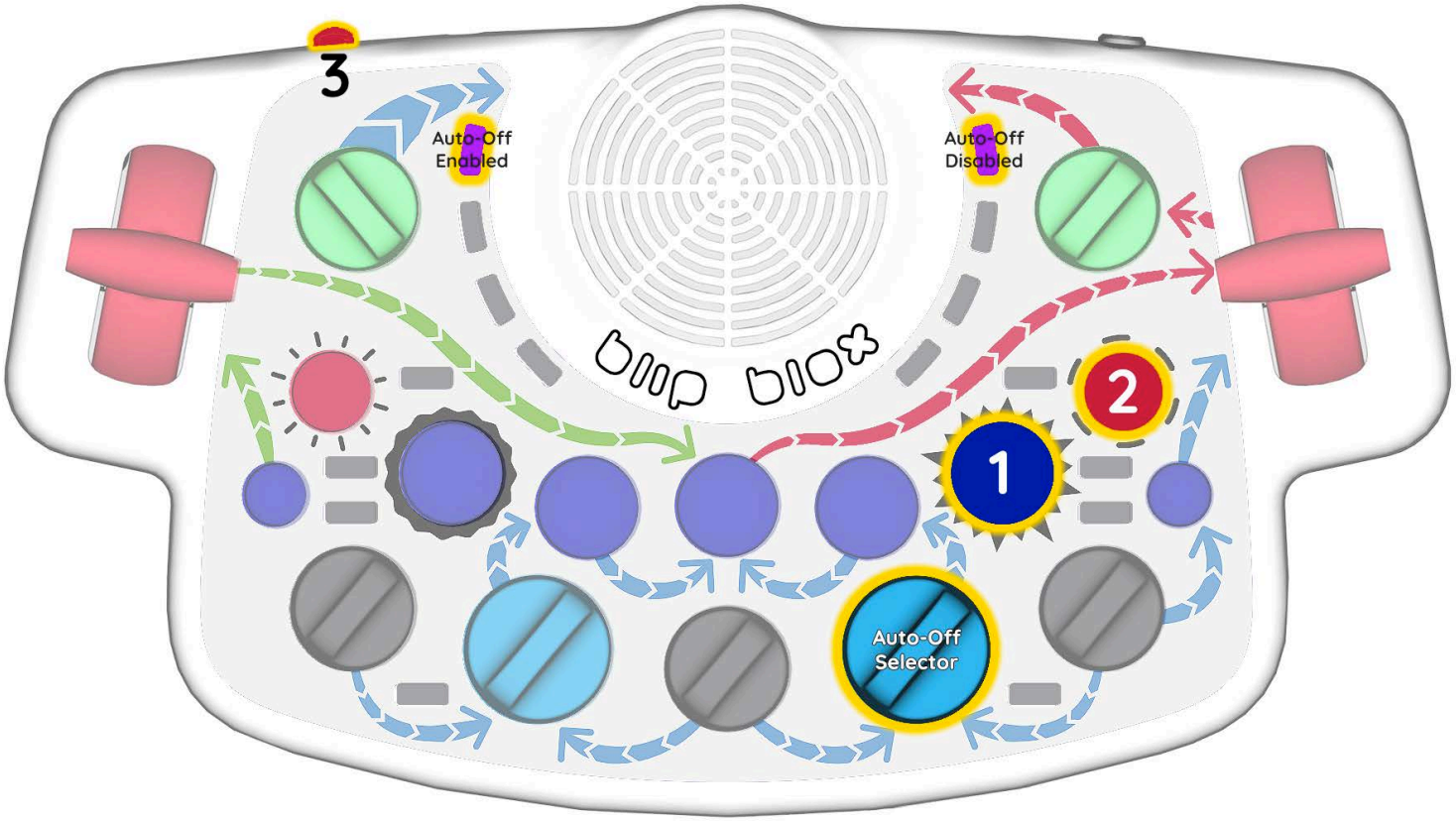
Note: If you are using the Blipblox for studio production, we recommend setting volume at the maximum (red LED at the top of the speaker) to ensure highest quality audio output.



When using the Blipblox for studio production, it may be desirable to prevent the Blipblox from automatically turning off if not touched for 30 minutes.

- Before you can make a change, you will need to enter the **Auto-Off Controls Mode.** Hold down the Snare (1) and Randomizer (2) buttons at the same time while powering on the device (3).
- The top left LED will illuminate purple. Toggle from auto-off to always-on using the Oscillator Modulator 2 knob. When the purple LED on the left is illuminated, the Blipblox will turn off after 30 minutes if untouched. When this LED is on the right side of the speaker, automatic shutdown is disabled.
- After you've made your selection, **Lock the Special Controls Settings** (described and pictured on page 8).

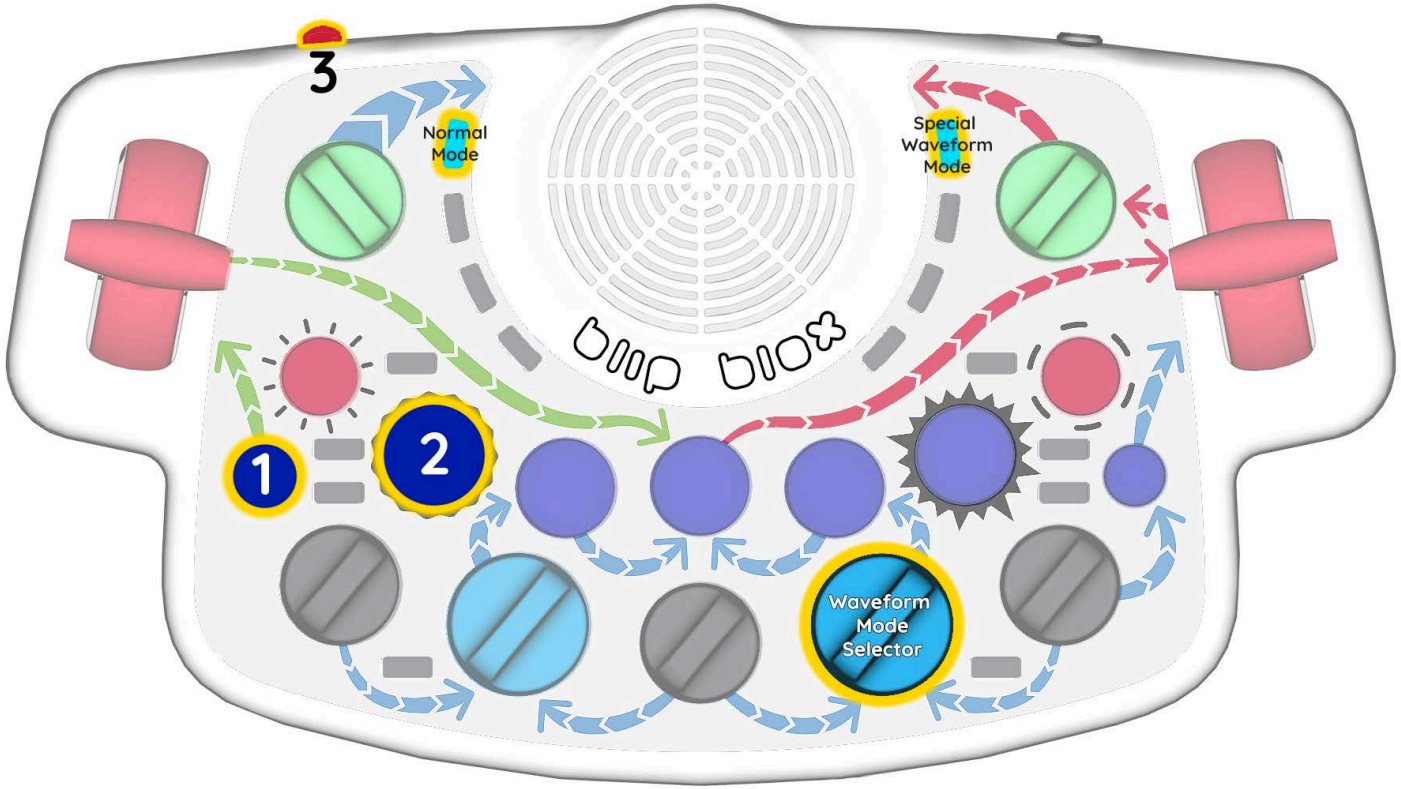
Note: We recommend using the AC Adapter when Auto-Off is disabled to prevent draining the batteries if the unit is left on.



ACCESSING “BONUS” WAVEFORM MODE

This mode allows you to access a secret stock of special sounds that were a little too crazy to include in the default settings.

- Before you can make a change, you will need to enter the **Bonus Waveform Mode.** Hold down the Sequencer (1) and Kick (2) at the same time while powering on.
- The top LED will turn aqua blue. Toggle from Normal Mode to Special Waveform mode using the Oscillator Modulator 2 knob. When the LED is on the left, this is normal mode. When the LED is on the right, it is the Special Waveform mode. The Special Waveform Mode will change the sound in oscillator models 5, 6, 7 and 8.
- After you’ve made your selection, **Lock the Special Controls Settings** (described and pictured on page 8).



BLIPBLOX SYNTHESIS ENGINE

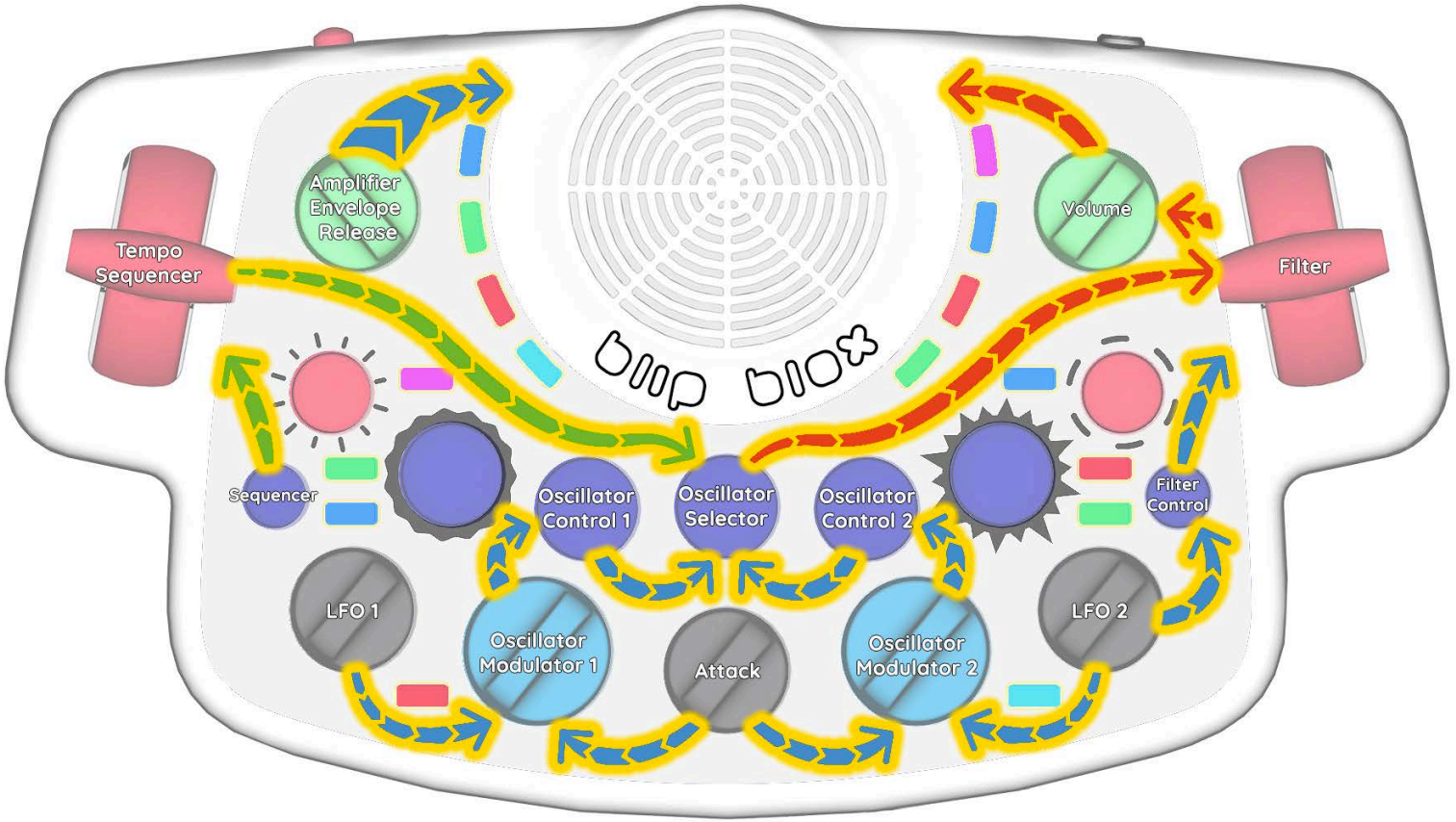
Now that you know synthesizer basics and what each of the buttons and knobs on the Blipblox are for, you might be wondering about what those colorful arrows mean. They represent what is called the signal flow, which powers the "Blipblox Synthesis Engine."

Signal flow is the path the electronic signals take through each of the filters, modulators and other controls on their way to creating an audible sound. The Blipblox signal flow generally moves from the left of the box to the right.

There are three types of signals in the Blipblox:

- **Musical Notes.** Represented by the GREEN lines on the Blipblox.
  The signal flow begins with the Sequencer which generates the musical notes. The Sequencer button selects one of the melodies. The speed of the melodies is controlled by the Tempo Sequencer lever. The musical notes then feed into the Oscillator.
- **Audio Signals.** Represented by the RED lines on the Blipblox.
  The Oscillator uses the musical notes from the Sequencer to generate audio. The audio then flows into the Filter which can further shape the tone of the sound. Finally, the audio leaves the Filter and goes into the Amplifier, then out to the speaker.
- **Control Signals.** Represented by the BLUE lines on the Blipblox.
  The Control Signals are used to shape the tones of the sounds. There are three control signal generators: Low Frequency Oscillator (LFO) 1, LFO 2 and the Modulation Envelope. Any of these control signals can be selected for use in the two Oscillator Modulators and the Filter Modulator.

Press the Sequencer button until you find a melody you like. Now push and pull the Tempo Lever. The notes get slower as you move the Lever toward you and faster as you push it away. Now follow the GREEN line and click on the Oscillator Selector. You've just learned the first step in the signal path!

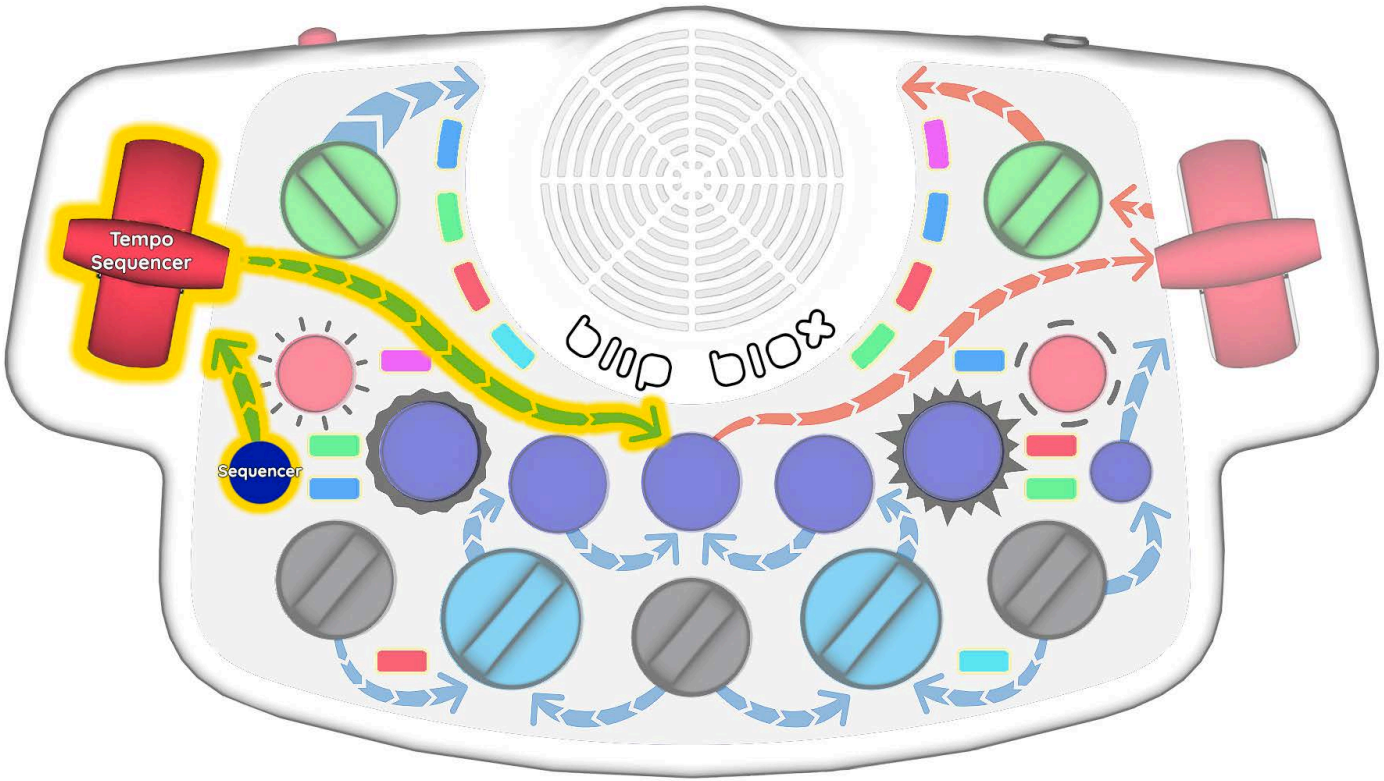


The Sequencer

The first step to creating sound from the Blipblox is to engage the Sequencer. The Sequencer generates the melodies, or the musical notes that the Blipblox plays.

The main control for the Sequencer is the Sequencer Button. Pressing the button randomly cycles through the hundreds of melodies built into the Blipblox. Once you select a melody, the sound travels along the green line to the Tempo Lever. Moving this lever up and down changes how fast the Blipblox plays the sequences.

Try pressing the Sequencer button to change the melody.
Then push or pull the lever to change the speed of the notes.



The Oscillator

The oscillator is the most important part of making sound on the Blipblox. The oscillator takes the notes from the sequencer and the two control signals to generate sound.

What is an Oscillator?

An Oscillator generates an audio wave. Audio waves control the movement of the Blipblox speaker, which turn the signals into sound waves that travel to our ears. If you tie one end of a rope to a doorknob, stand back a few feet, and wiggle the other end of the rope up and down really fast, you're doing roughly the same thing as an oscillator. The difference is that you're wiggling a rope, whereas the oscillator is wiggling an audio signal. Also, the Blipblox Oscillator wiggles really fast, thousands of times every second.

Oscillator Controls

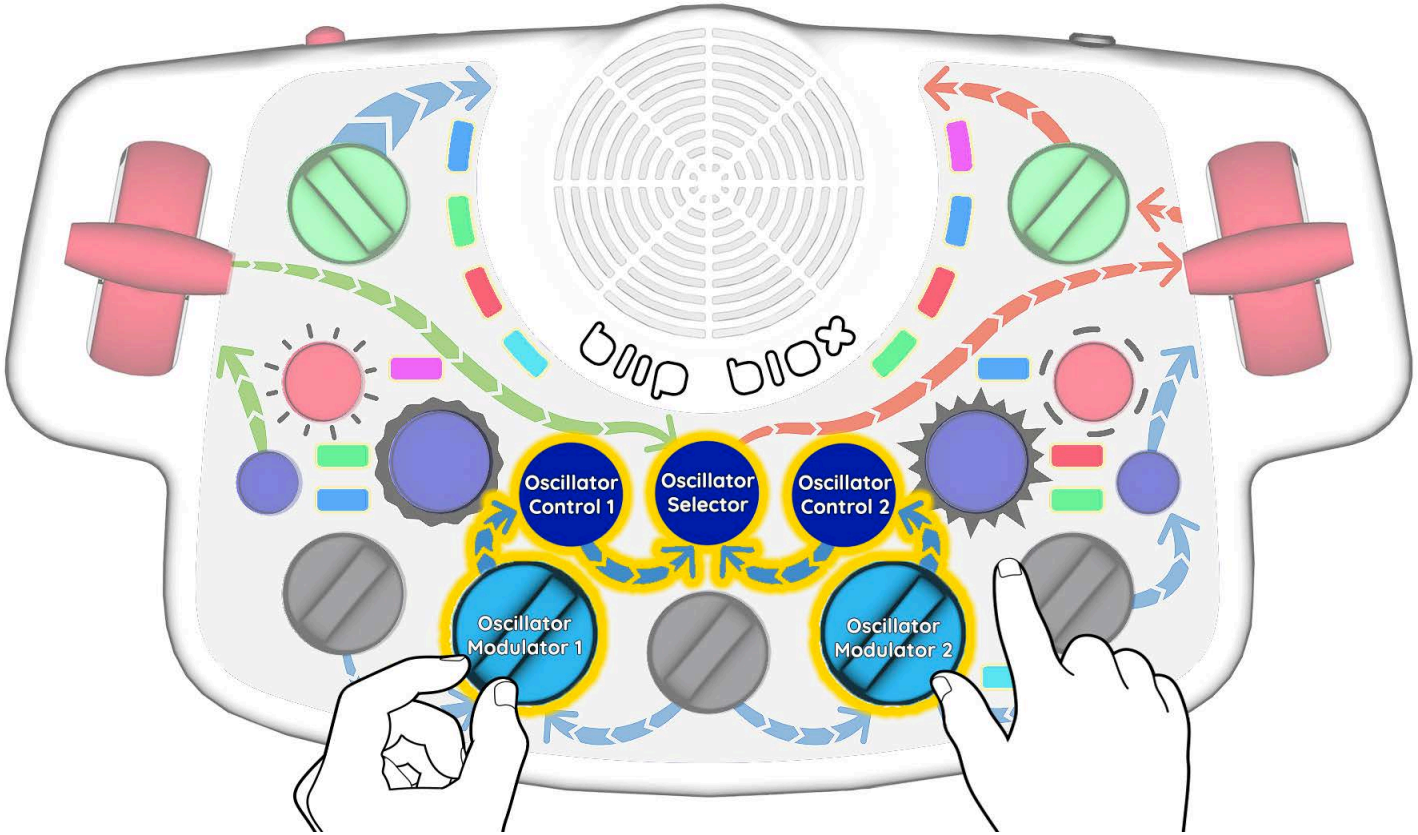
The Sequencer provides the pitch to the Oscillator in the form of musical notes. The pitch represents how fast the Oscillator wiggles.

In addition to the pitch, the Oscillator also receives two unique Control Signals. These control signals shape the audio wave, giving the sounds different textures. You can choose which Control Signal goes into each of the two Oscillators by pressing Oscillator Control 1 or Oscillator Control 2 buttons. Each Oscillator Control can use Modulation Envelope, LFO 1, LFO 2 or Knob Only as modulation sources.

Blipblox Oscillator Details

Although we use the term "Oscillator" for simplicity, most Blipblox sounds are made by a modulating parameters on several oscillators connected together. Blipblox has 8 different ways to modulate different types of oscillators. That is why they are called "Oscillator modulation schemes". These schemes include Pulse Width Modulation, Oscillator Sync, Frequency Modulation, and other oscillator modulation types.

Press the Oscillator Selector button to cycle through the 8 Oscillator Modulation Schemes. Now, select one of the Oscillator Control buttons. Now try twisting one of the two Oscillator Modulator knobs. Hear the difference?

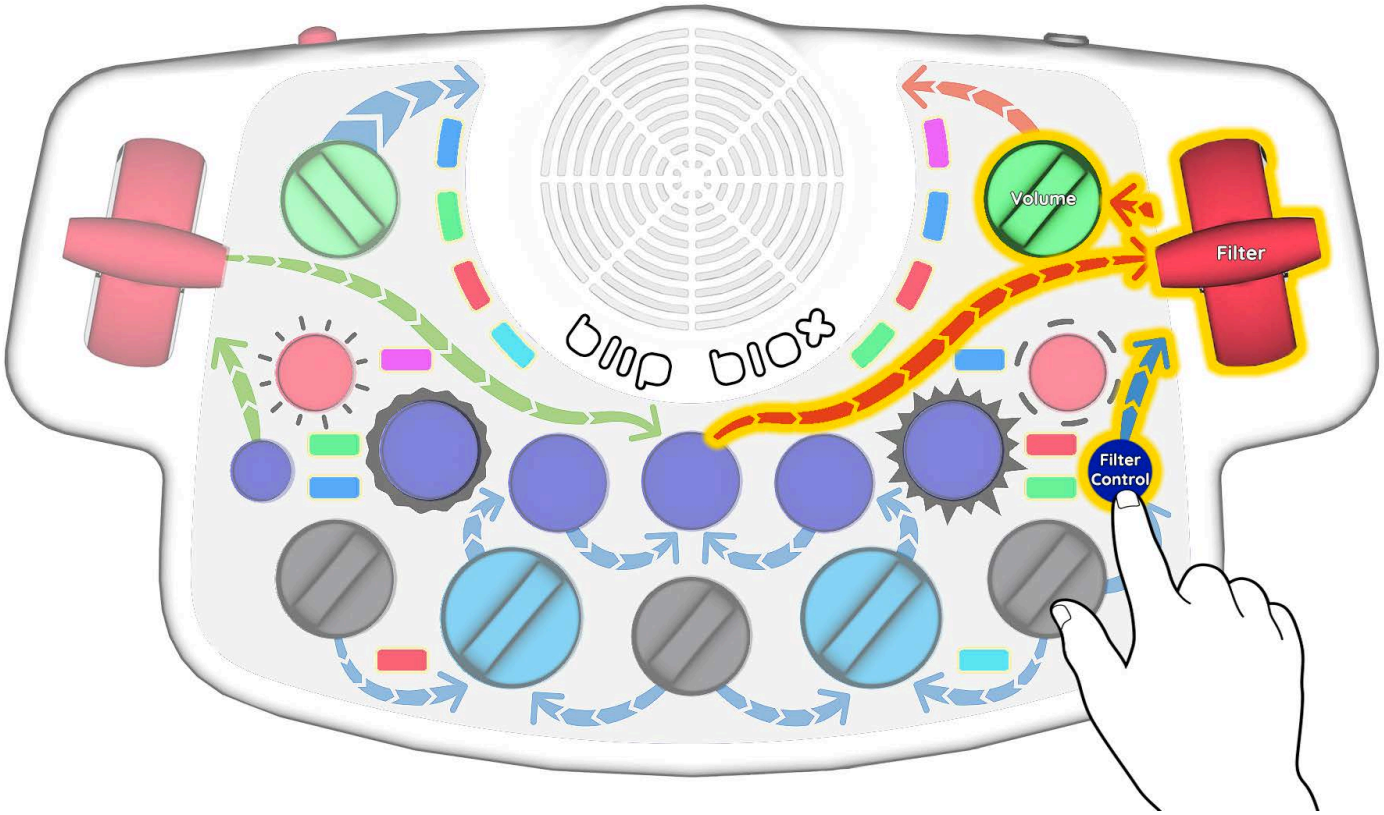


The Filter

The audio waves leave the Oscillator along the red line, and travel all the way to right side of the box into the Filter Lever. The Filter removes high frequency portion of the sound wave. It makes the sound smoother, and lower in tone.

The Filter also gets a single Control Signal (similar to the two that go to the Oscillator). You use the Filter Control button to choose the Filter modulation. The Filter Control options are Modulation Envelope, LFO 1, LFO 2, or Lever Only. The Filter is controlled by both the lever and the Control Signal which feeds in along the blue line.

Press the Filter Control button then push and pull the Filter lever to hear how the sound changes.

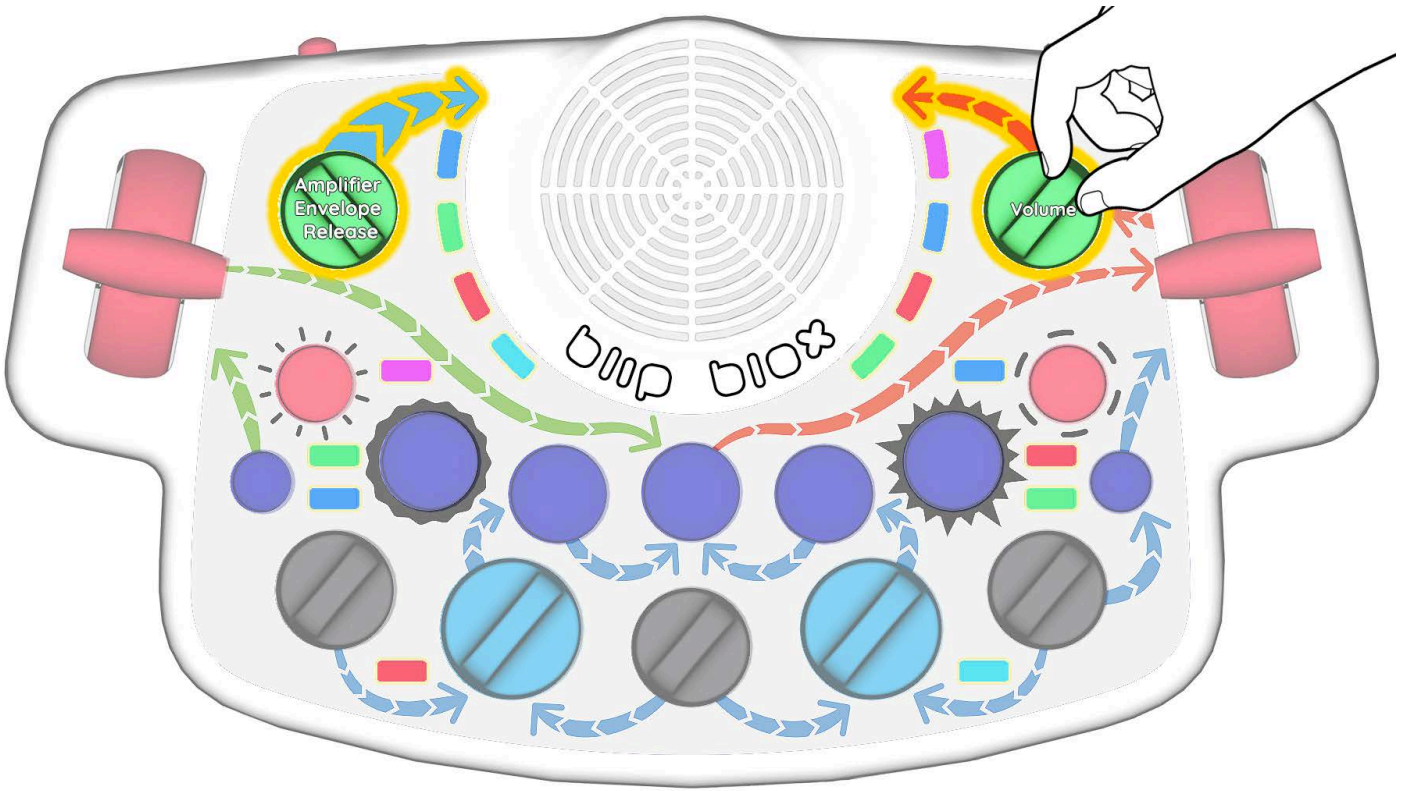


The Amplifier

On the top left is the Amplifier Decay Knob. It controls how long it takes the sound to fade out after the note is released.

Finally, the finished sound wave leaves the Amplifier, and goes through the Volume knob, then into the speaker. The speaker converts the electrical wave you have designed, and turns it into sound.

Twist the Amplifier Envelope Release knob to hear how it makes the notes longer or shorter.



The Control Signals & Modulation Matrix

Control Signals are low-frequency signals that shape the sound parameters in a synthesizer. The Blipblox has three knobs that control three different generators.

Control Signal Generators

The gray knobs on the far left and right are the Low Frequency Oscillators, or more commonly referred to as LFOs. These two knobs control how fast the LFOs move up and down. LFOs make a repeating sound often described by musicians as “wha-wha-wha-wha”.

The lower center knob controls the “Attack” speed of the Modulation Envelope. This signal slowly rises when a note goes on. This knob controls how fast that signal rises.

Control Signal Destinations

The three Control Signal generators can be selected into three destinations. On synthesizers, this is referred to as a “3x3 Modulation Matrix.” Three signals are generated, and they can be used to control any three destinations.

The Oscillator receives two control signals, while the Filter receives one. These are the three destinations.

Selecting the Control Signals

The three control signals that go into a destination are controlled by pushing the Oscillator Control buttons. These are located immediately to the left and the right of the Oscillator button. The Filter control signal is selected by the far right Filter Control button. You can see the blue Control Signal lines going in and out of these buttons.

Pressing these button cycles through the modulation options: Modulation Envelope, LFO 1, LFO 2, and Knob Only. If the Modulation is Knob Only, the modulation is just controlled by adjusting the Oscillator Modulation knobs, or the Filter lever.

Controlling the Amount of the Control Signals

The amount that the control signals effect the sound can be adjust to be small and subtle, or big and bold.

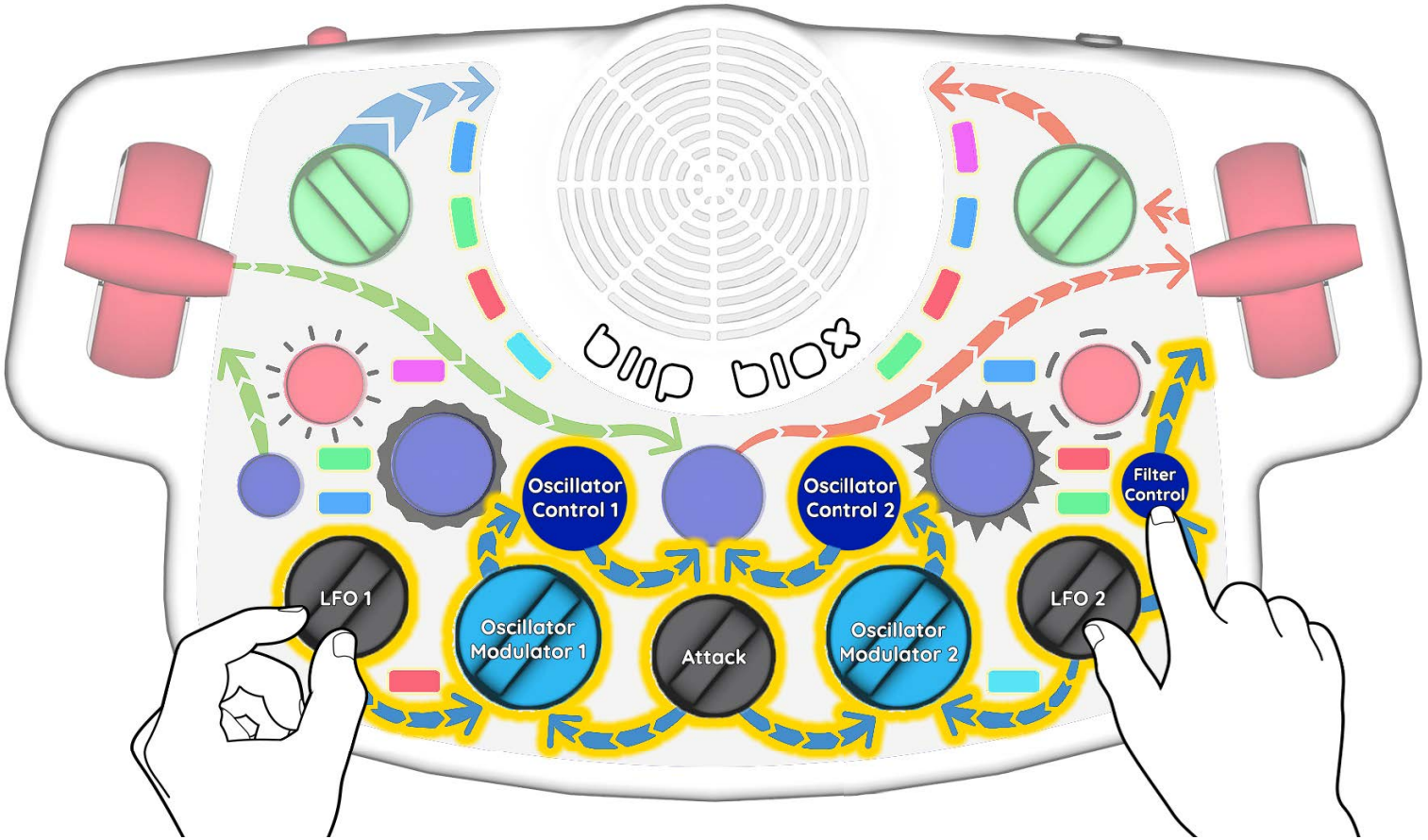
The two Control Signals modulating the Oscillator are independently controlled by the two big light blue Oscillator Modulator knobs. The amount of Filter modulation is controlled by the Filter lever.

Although this Modulation Matrix may seem complicated, it is easy and fun to play with. It also gives the Blipblox its wide range of different sound possibilities.

You can use a single Control Generator, say, LFO 1, to modulate any or all of the three Modulation Destinations.

Or, you can do something like have LFO 2 control Oscillator Modulation 1, and the Filter Modulation, while the Attack Envelope controls Oscillator Modulation 2. This is all advanced synthesizer modulation technique. But on the Blipblox, it is designed to be easy and fun.

Press the Oscillator Controls buttons, then twist the LFO, Oscillator Modulator and Attack knobs to hear what the different modulation sources do to the sound.

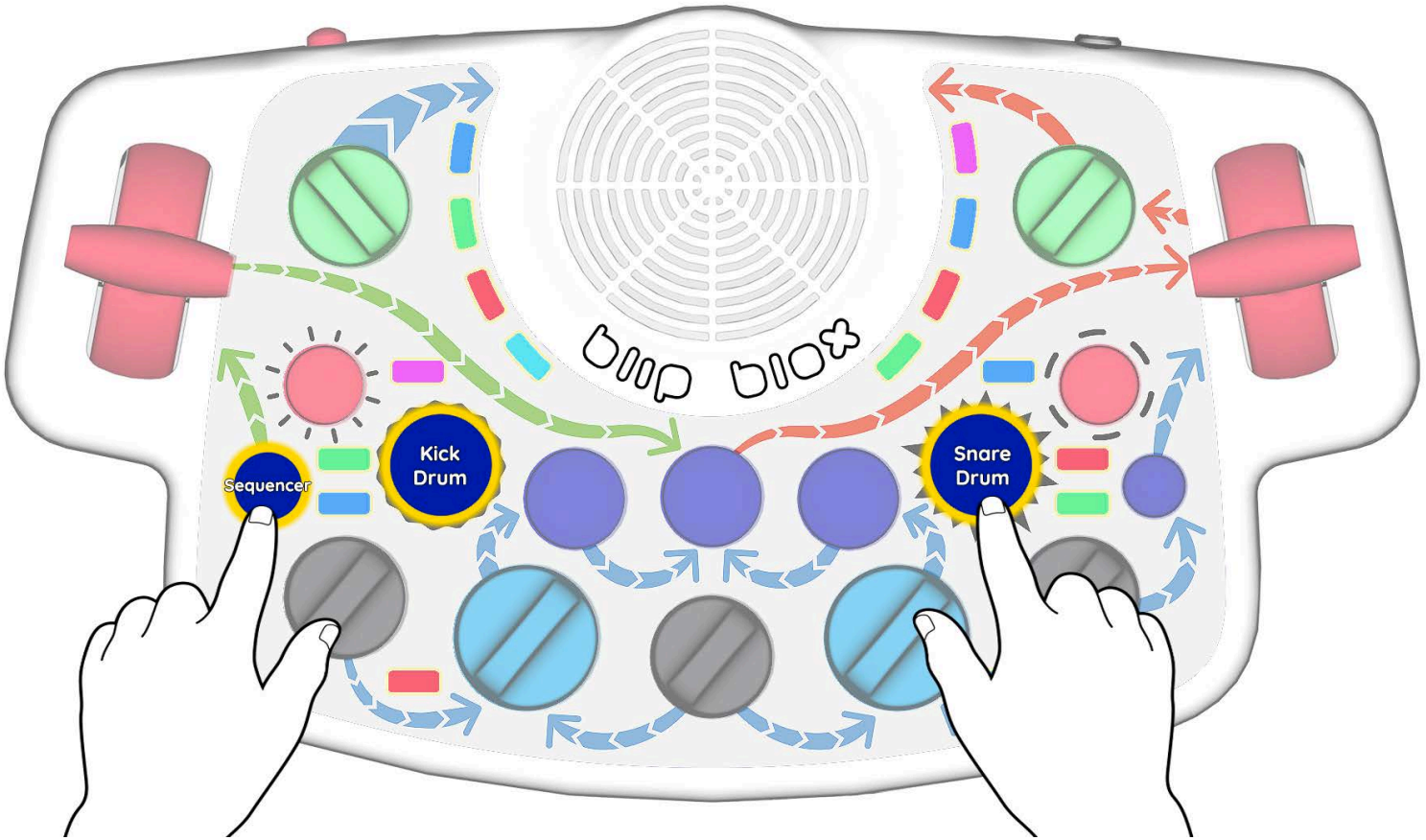


The Drum Machine

The Blipblox includes a Drum Machine. You can play a Kick or Snare drum by pressing the respective drum buttons. The Blipblox can also play the drum machine itself, creating a beat that is synchronized to the sequencer melodies. Pressing the Sequencer Select button turns the drum machine on and off along with changing the sequences.

The drum machine automatically turns off at high tempos to prevent the drums from overwhelming the synthesizer sound.

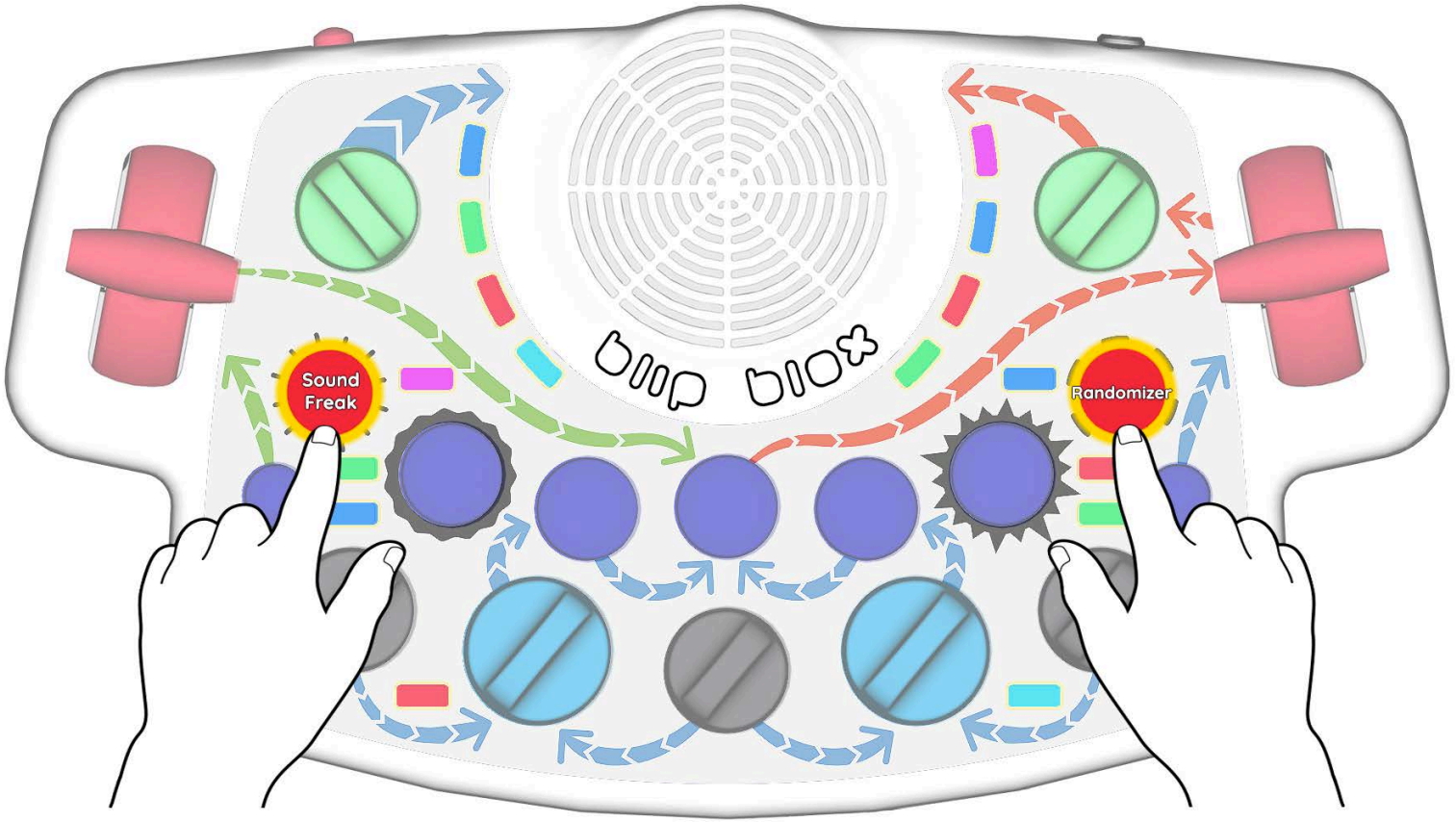
You can adjust the sound of the drums using the Drum Tweak Mode described later in this manual.



The Other Controls

The second button to the right, on the top, is the Randomize button. This will randomize a new sound. It does not change the drums or the sequence playing.

The second button to the left, on the top, is the Sound Freak button. This freaks out the sound!



MIDI SEQUENCER FEATURES

Playing the Blipblox with an External Device

The Blipblox's synthesizer will respond to notes sent on Channel 1 from an external keyboard, sequencer or computer. Drums will respond on Channel 2.

You can enter "sequencer off mode" by holding down the right-most Filter Modulation Select button, and then pressing the left-most Sequencer Select button. This turns off the internal sequencer and drum machine, so the BlipBlox will only make sound from an external MIDI device.

Synchronizing the Blipblox to an External Device

The Blipblox will respond to MIDI start, stop and tempo data. Once the Blipblox detects a MIDI clock, it will use the MIDI clock to control tempo. The Tempo lever no longer controls tempo in this mode. Once the Blipblox detects an external MIDI clock, it will stay in external synchronization mode until the unit is turned off and back on again.

SPECIAL PERFORMANCE MODES

One of the features that makes the Blipblox a professional device are the various Special Performance Modes. These modes were designed to allow you to have more control over the Blipblox and its synthesis output.

These include:

- Parameter Display Mode - In this mode, you can see the activity of all the envelopes and LFOs on the LED display. You can also see all modulation selections for the oscillator and filter. This mode also shows which oscillator modulation scheme is being used. Because there are several features in this mode, an LED Guide is also provided at the end of this section.
- Drum Solo Mode - In this mode, the sequencer stops playing the notes, but the drum sounds continue. This can be used to make a dramatic pause in the music while the drums continue to play.
- Sequencer Freeze Mode - In normal operation, the Blipblox is always cycling through different sequencer melodies and drum patterns. But if you hear a melody you really like, you can “freeze” it so it does not automatically change to something else.
- Sequencer Off Mode - This mode turns off the sequencer and the drum machine. This is what can be used when the Blipblox is being controlled by an external keyboard or sequencer through MIDI.
- Drum Tweak Mode - This mode lets you change the drum sounds. Because there are several features in this mode, an LED Guide is also provided at the end of this section.

You will find specific instructions for accessing each of these modes in the following pages, but in general the modes are accessed by holding down one button while pressing another. In the diagrams that follow, the button labeled “1” will be the button that you hold down continuously, while pressing the button labeled “2.” Unless otherwise noted, to you will press the buttons again in the same order to exit the mode.

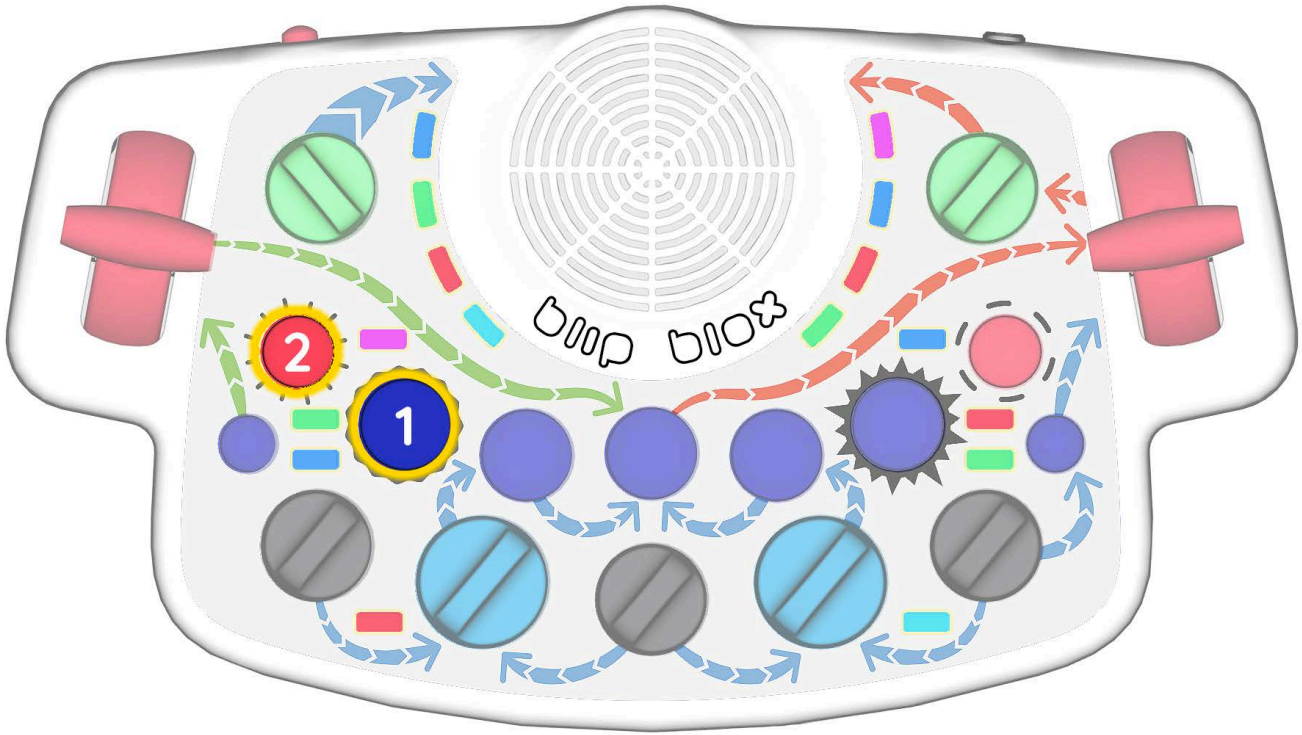
Parameter Display Mode

What it Does

This mode will display the specific synthesizer parameters that are currently in use. See “Guide to Parameter Display Mode” in following section to learn more about this mode and its capabilities.

How to Activate

Hold down the Kick Drum button (1), then press the Sound Freak button (2), release both buttons. Press these buttons in the same order to exit this mode.



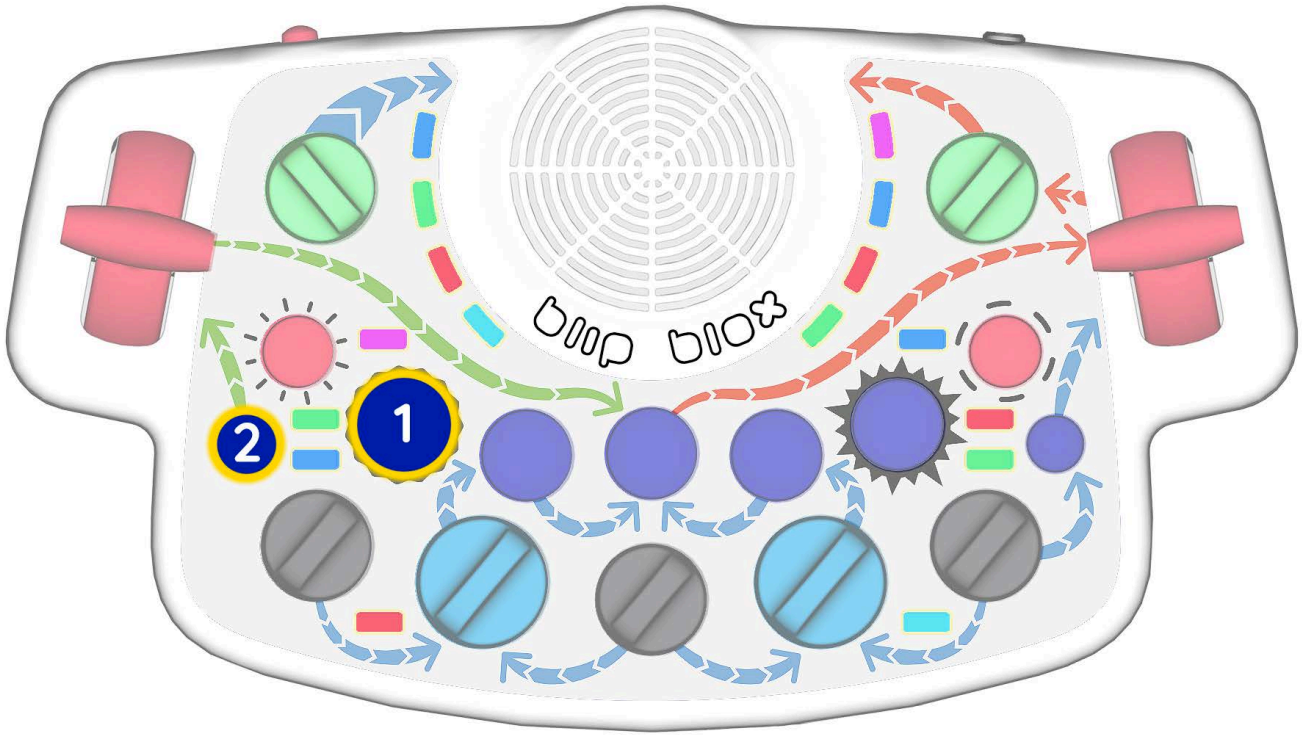
Drum Solo Mode

What it Does

Turns off all synthesizer sounds so you can isolate the drums. Note, if the drums are not playing, the BlipBlox won't make any sound in this mode.

How to Activate

Hold down the Kick Drum (1), then press Sequencer Select (2), release both buttons. Press these buttons in the same order to exit this mode.



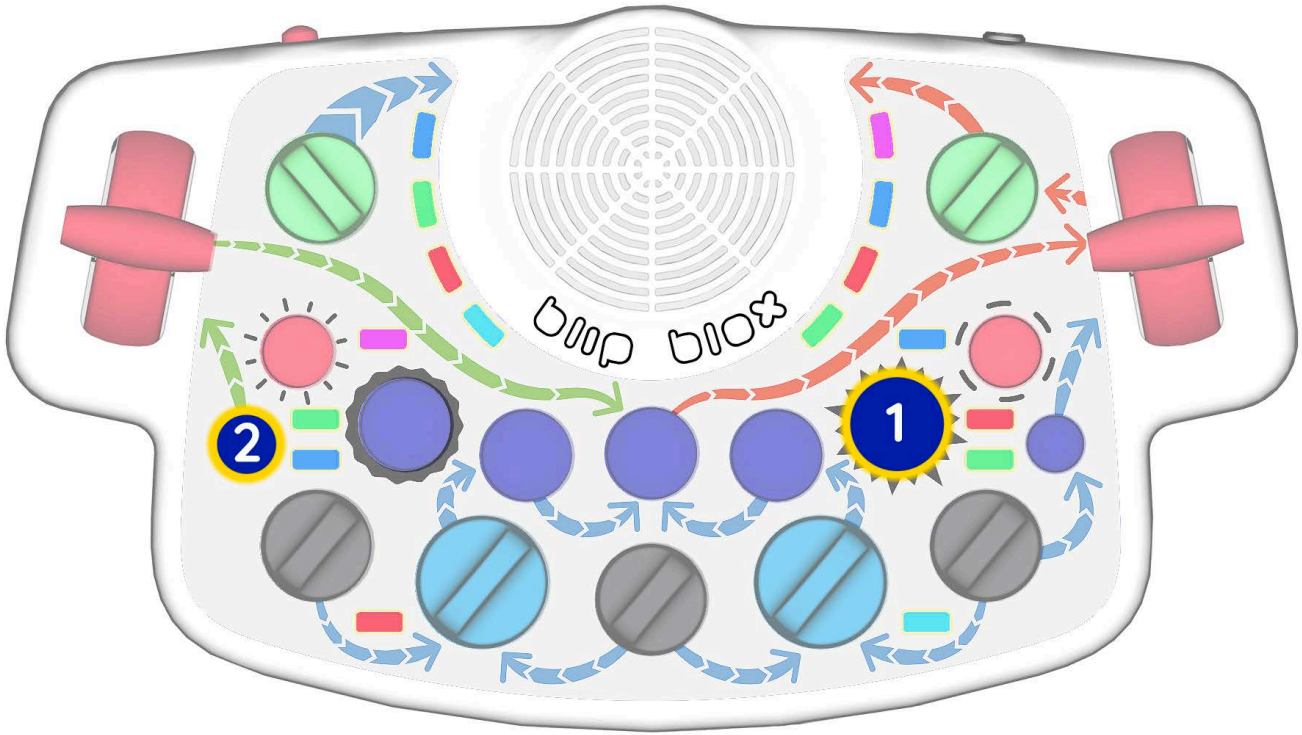
Sequencer Freeze Mode

What it Does

Freezes the current sequencer pattern.

How to Activate

Hold down the Snare Drum (1), then press Sequencer Select (2), release both buttons. Press the Sequencer Select button to exit this mode and start a new sequence.



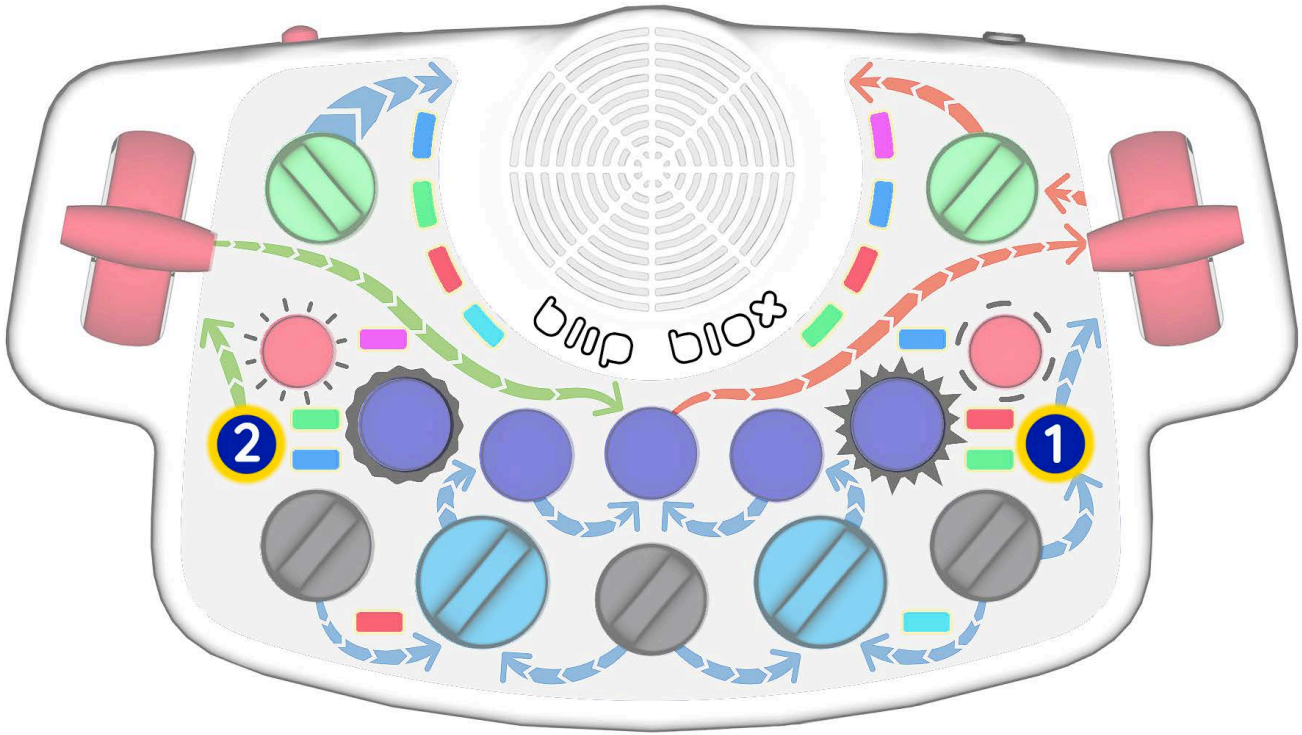
Sequencer Off Mode

What it Does

Turns off the internal sequencer for the synth and drums so you can use an external sequencer or keyboard.

How to Activate

Hold down the Filter Modulation Select button (1), then press Sequence Select (2), release both buttons. Press the Sequence Select button to exit this mode, and start playing a new sequence.



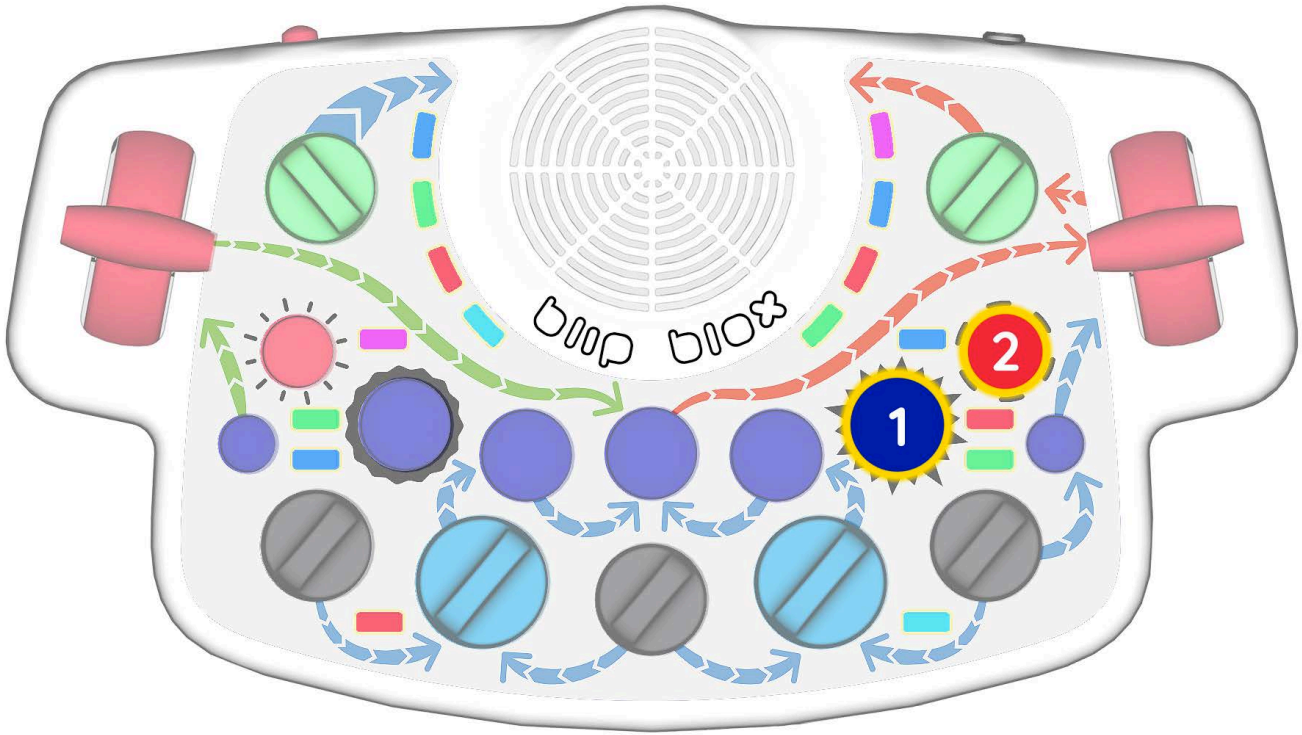
GUIDE TO DRUM TWEAK MODE

What it Does

Allows you to modify the drum sounds using the Blipblox knobs. See “Guide to Drum Tweak Mode” in the following section to learn more about this mode and its capabilities.

How to Activate

Hold down the Snare Drum button (1), then press the Randomize button (2), release both buttons. Note, your synthesizer sound will not randomize. Press these buttons in the same order to exit this mode.



GUIDE TO DRUM TWEAK MODE

Once you have put the Blipblox into Drum Tweak Mode (see section above) you will be able to change the pitch and duration of the Kick Drum and the tone and duration of the Snare Drum.

Kick Drum Tweak: The Modulation 1 knob becomes Kick Pitch and the LFO 1 knob becomes Kick Duration.

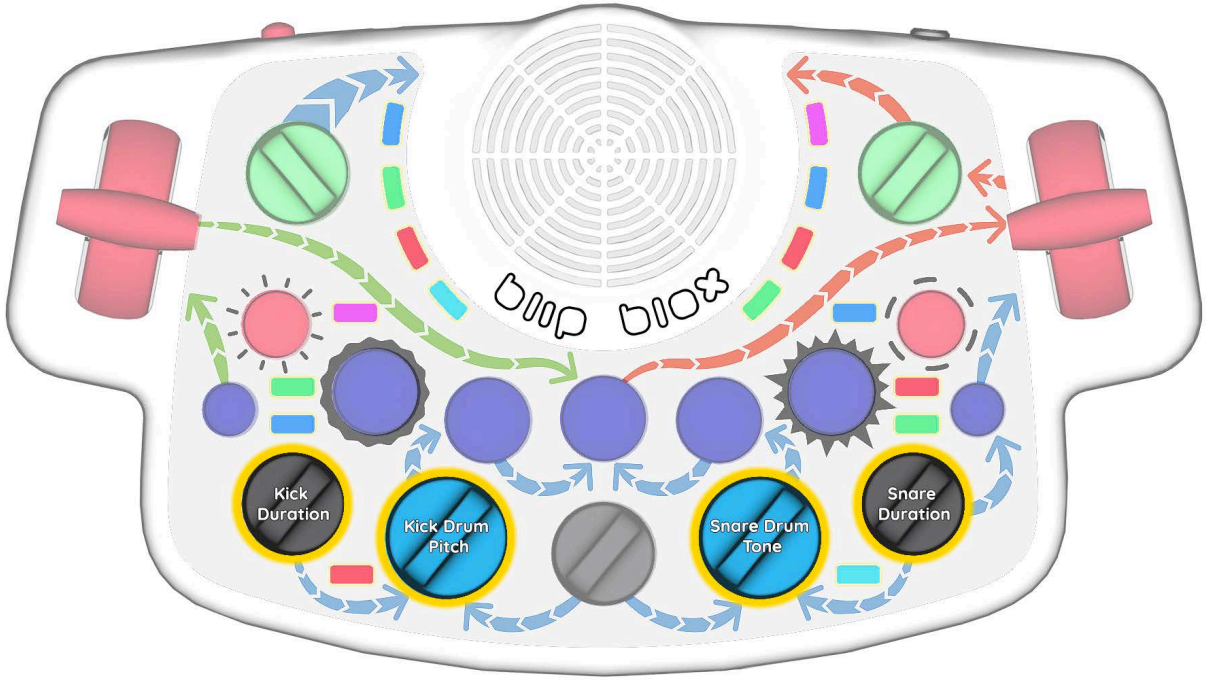
Snare Drum Tweak: The Modulation 2 knob becomes Snare Tone and the LFO 2 knob becomes Snare Duration.

While in this mode the LEDs will reflect the drums being played:

Kick Drum LED indicators: The LEDs at the lower left will glow aqua showing the kick drum. The upper-left 4 LEDs show kick drum parameters. The blue LEDs indicate kick pitch. The Red LEDs indicate Kick duration.

Snare Drum LED indicators: The LEDs at the lower right will glow aqua showing the snare drum. The upper-right 4 LEDs show snare drum parameters. The blue LEDs indicate snare tone. The Red LED indicate snare duration.

Note: The blue Pitch indicator will glow purple when overlapping with the duration LEDs.



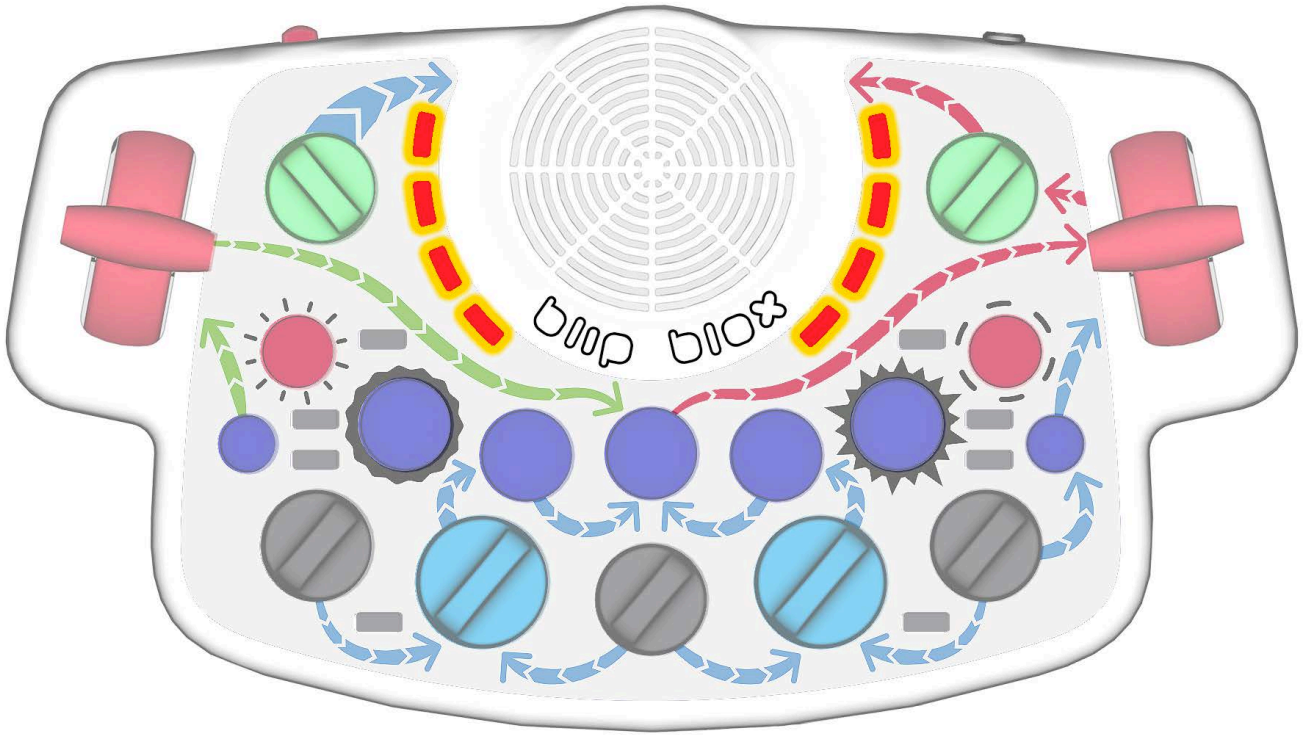
Amplifier & Modulation Envelopes in Parameter Display

Amplifier Envelope

The four LEDs on the left side of the speaker light up red showing the state of Amplifier Envelope. The lower LED turns purple when there is a “note on” triggering the envelope.

Modulation Envelope

The four LEDs on the right side of the speaker light up red showing the state of Modulation Envelope. The lower LED turns purple when there is a “note on” triggering the envelope.



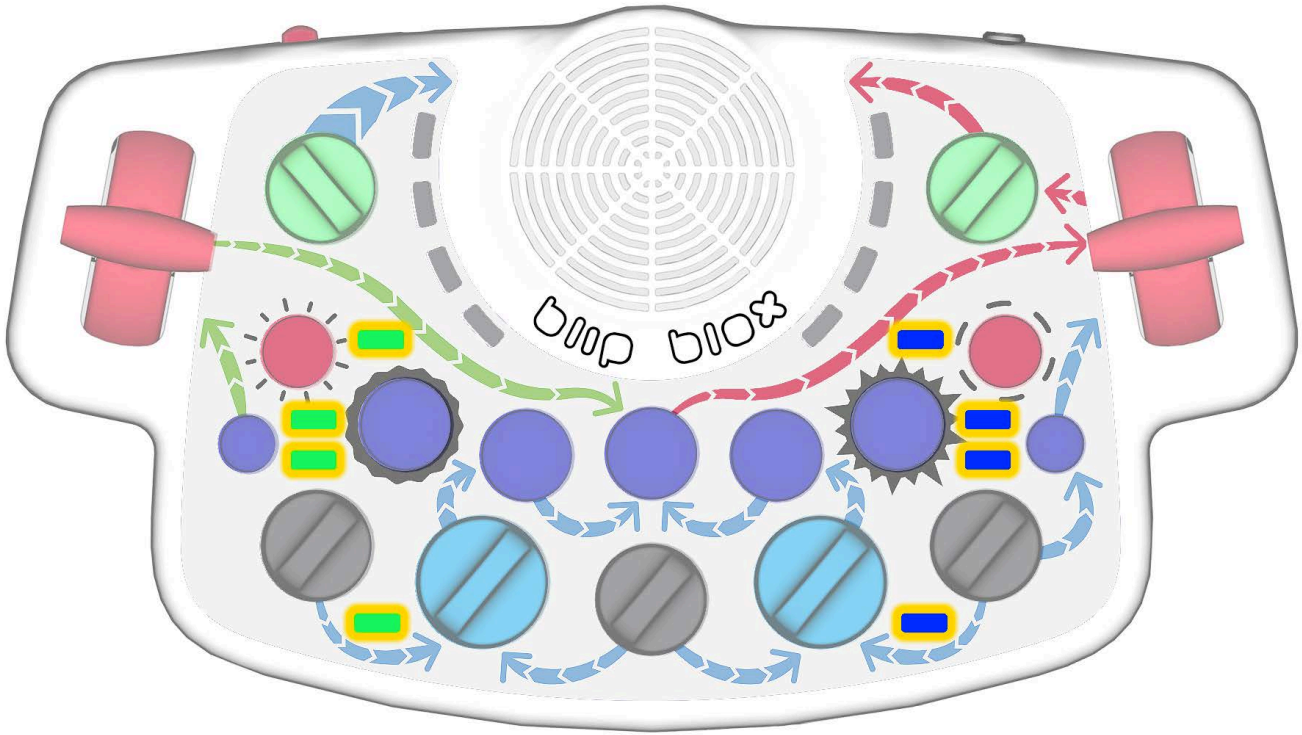
LFOs in Parameter Display

LFO 1

The four LEDs on the left side of the Blipblox buttons and knobs illuminate green showing the state of LFO 1.

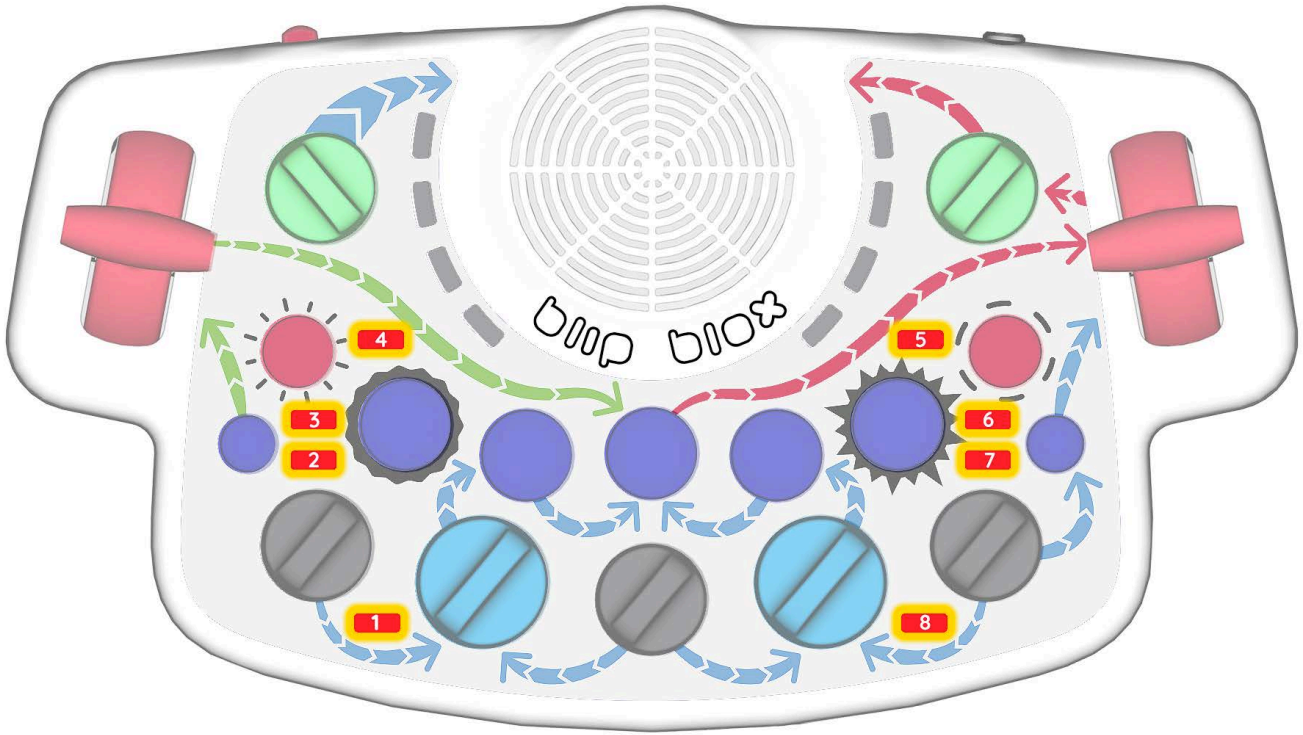
LFO 2

The four LEDs on the right side of the Blipblox buttons and knobs illuminate blue showing the state of LFO 2.



Oscillator Modulation Scheme in Parameter Display

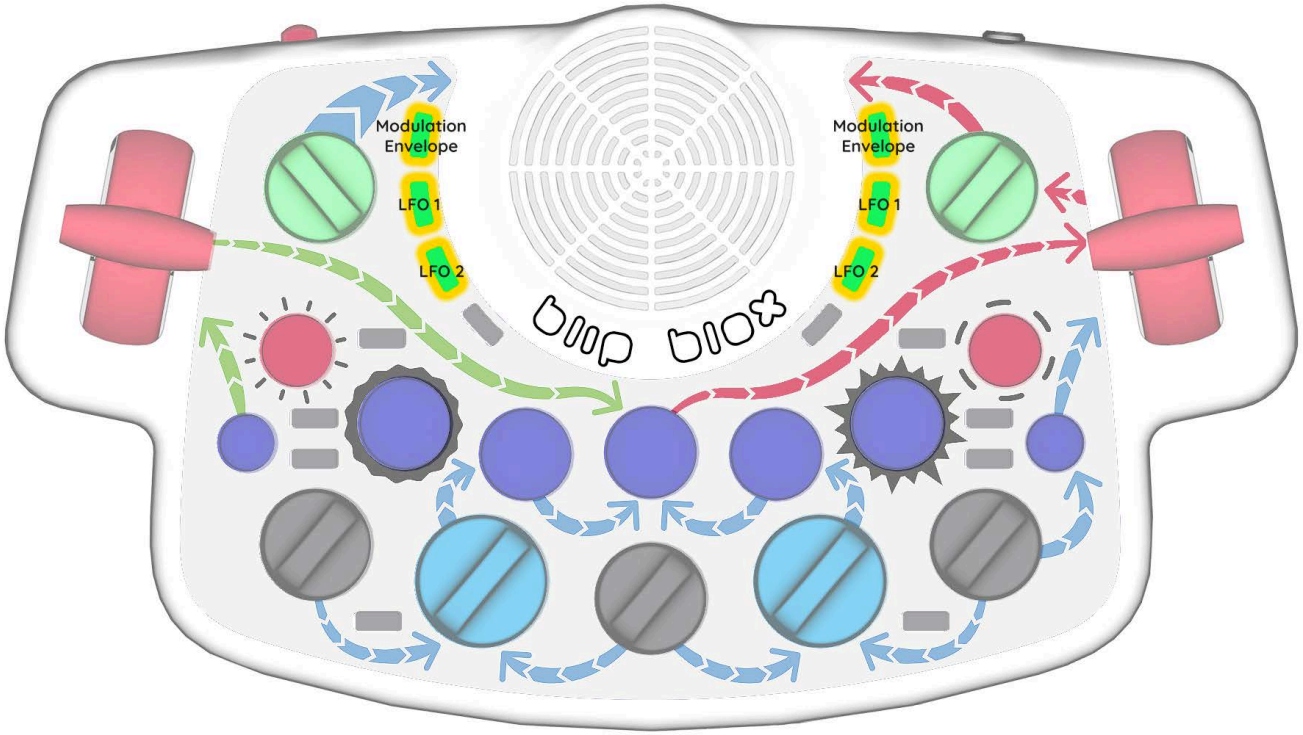
The eight LEDs that surround the button and knob area of the Blipblox will illuminate red to indicate which of the eight Oscillator Modulation Schemes is currently being used. Refer to the diagram below to see which of the schemes is assigned to each of the LEDs.



Oscillator Modulation Selection in Parameter Display

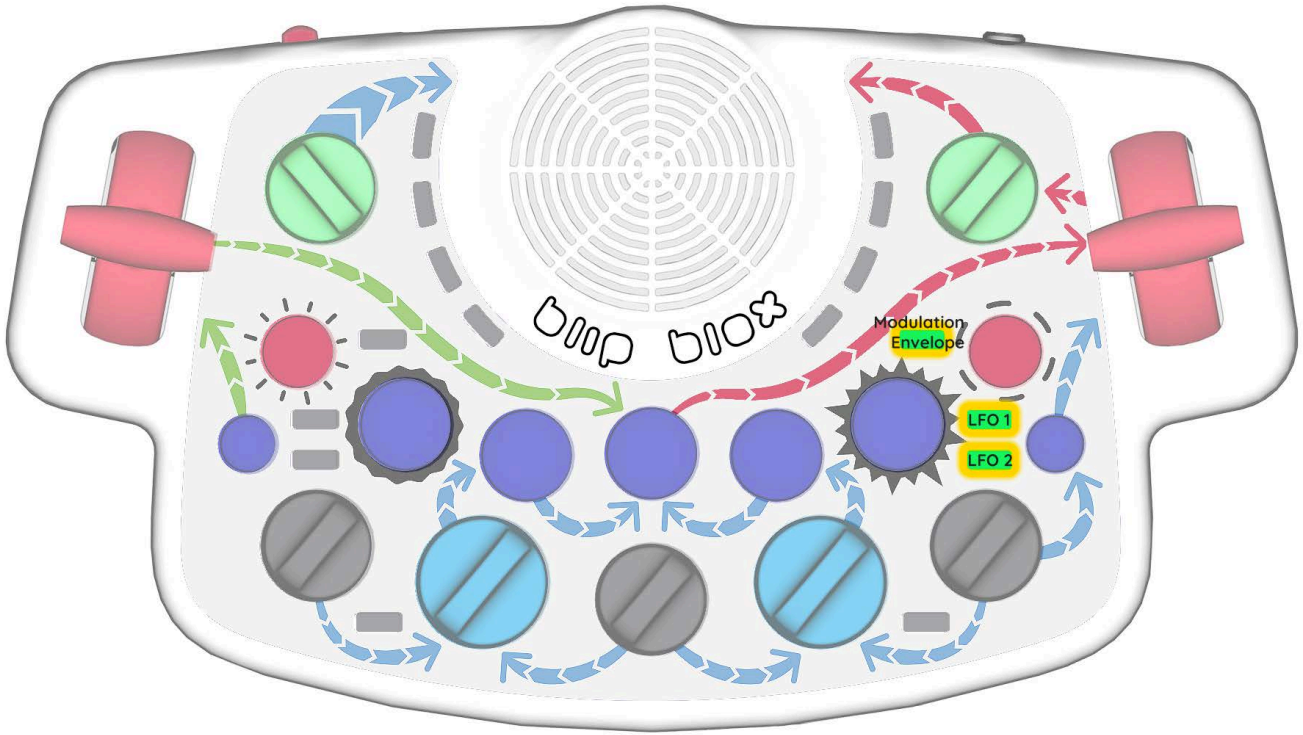
Modulation 1 select. One of the 3 LEDs (pictured below) on the left side of the speaker will glow green indicating which control signal source is going into Oscillator Modulation 1. If no LED is illuminated, then the modulation is only controlled by the Modulation 1 knob.

Modulation 2 select. One of the 3 LEDs (pictured below) on the right side of the speaker will glow green indicating which control signal source is going into Oscillator Modulation 2. If no LED is illuminated, then the modulation is only controlled by the Modulation 2 knob.



Filter Modulation in Parameter Display

One of these 3 LEDs (pictured below) will glow green indicating which control signal source is going into Filter Modulation. If no LED is illuminated, then the modulation is only controlled by the Filter Lever, not any LFOs or the envelope.



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Serial Number _____

Purchased From _____

Date of Purchase _____