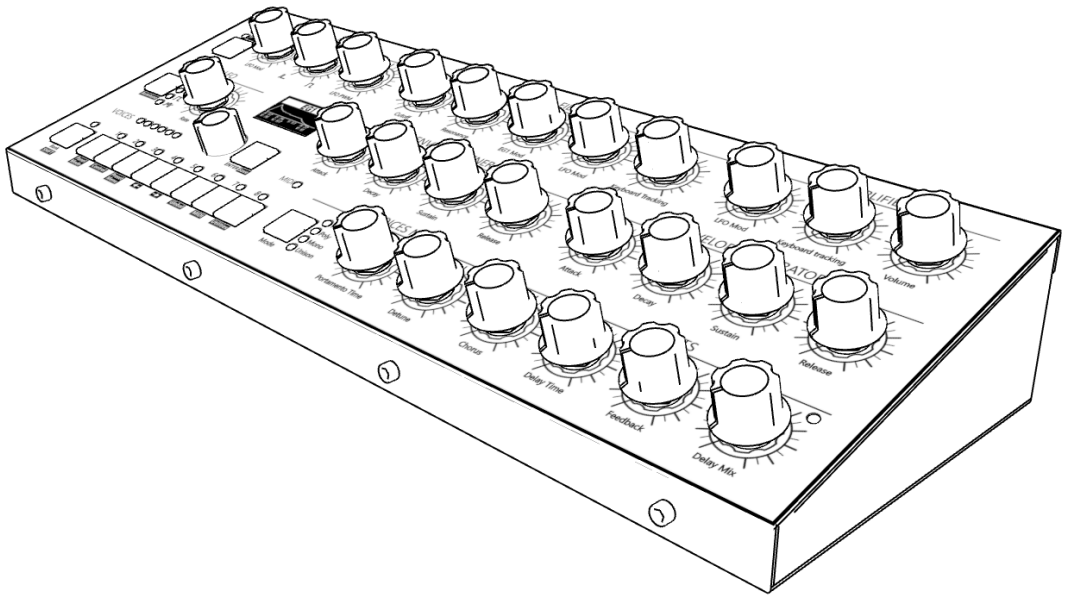
GS MUSIC




# bree6

## USER MANUAL

# Index

# CREDITS AND ACKNOWLEDGMENTS

We want to express our deepest gratitude to everyone who contributed to the creation of the Bree6 synthesizer. This product is the result of collaboration, passion, and dedication from many talented individuals.

## ENGINEERING AND DESIGN

- **Guido Salaya**: Responsible for electronic design, mechanical design, testing design, graphic design, and firmware programming. All engineering aspects of the Bree6 synthesizer were crafted with precision and care.

## ASSEMBLY AND TESTING

- **Elena Epuin**: Assembly, PCB programming, final testing, and packaging.
- **Maria del Carmen Epuin**: Assembly, PCB programming, final testing, and packaging.
- **Maria Belen Hipolito**: PCB assembly.
- **Gonzalo Donadio**: PCB assembly.

## SOUND DESIGN

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- synth_nyc
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## SPECIAL THANKS

- To the people who believed in GS Music when we were just a very tiny company.

**Guido Salaya**
Buenos Aires, Argentina
February, 2025

# INTRODUCTION

The Bree6 synthesizer is the latest innovation from GS Music, designed to provide musicians with an intuitive and expressive analog experience. With its six-voice polyphony and robust analog architecture, the Bree6 is perfect for creating rich, dynamic sounds that inspire creativity. We encourage you to explore this manual for a comprehensive understanding of the synthesizer's features and capabilities.

# SAFETY INSTRUCTIONS

- Avoid using the Bree6 near water, high humidity, or heat sources.
- Use only the included power supply or one with identical specifications.
- Unplug the synthesizer if it will not be used for an extended period.
- In case of malfunction, do not attempt to open or repair the unit. Contact GS Music technical support.
- Avoid exposing the synthesizer to direct sunlight for prolonged periods.

# INSIDE THE BOX

Inside the Bree6 package, you will find the following:

- Bree6 synthesizer (desktop version)
- 12V DC power supply
- User manual

Please ensure all items are present. If anything is missing, contact GS Music immediately.

# SETUP AND CONNECTIONS

## CONNECTIONS DIAGRAM

The following diagram illustrates the typical connections for the Bree6 synthesizer:

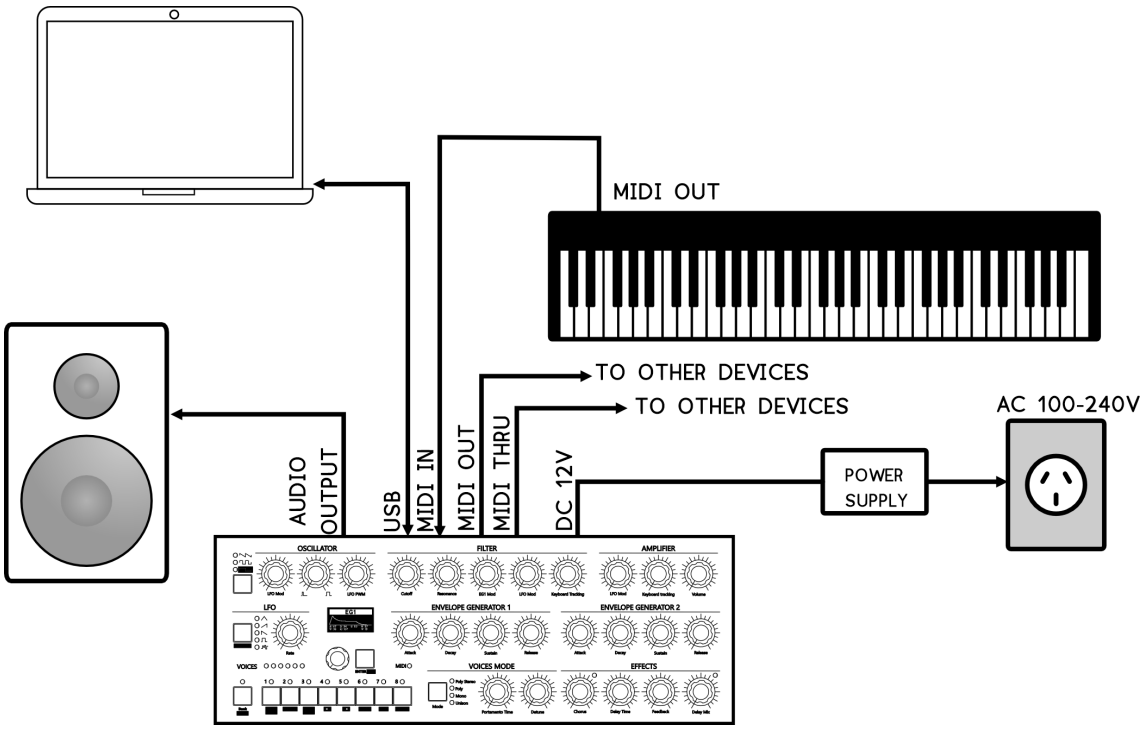



Figure 1: **Bree6 Connections Diagram**

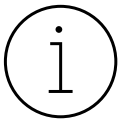
## POWERING THE SYNTHESIZER

Connect the included **12V DC power supply** to the power input on the rear panel of the Bree6. Ensure the power source matches the specifications: **100-240V AC, 50-60 Hz**.

## AUDIO CONNECTIONS

The Bree6 features **stereo audio outputs**. Use two **TS or TRS cables** to connect the left and right channels to your audio interface, mixer, or speakers. If you are using the synthesizer in **mono**, connect only the **L/Mono** output.

Alternatively, you can use the **headphone output**, which provides a stereo signal for direct monitoring.



**Balanced TRS cables** offer improved noise immunity, particularly over longer cable runs exceeding **15-20 feet (4.5-6 meters)**. Additionally, they provide a signal that is **6 dB louder** compared to unbalanced TS cables, ensuring a cleaner and stronger audio output.

## MIDI CONNECTIONS

The Bree6 provides three **MIDI ports** for flexible integration with other MIDI equipment:

- **MIDI In**: Receives MIDI data from external controllers, sequencers, or computers, allowing you to play the synthesizer using an external keyboard or software.
- **MIDI Out**: Sends MIDI data generated by the Bree6, such as parameter changes, to external devices.
- **MIDI Thru**: Passes incoming MIDI data unchanged to other MIDI devices. This allows multiple MIDI instruments to be connected in series (**daisy-chaining**), ensuring all devices receive the same MIDI signal.

To control the Bree6 via MIDI, connect a **DIN-5 MIDI cable** from your MIDI controller or keyboard to the synthesizer's **MIDI In** port. If using a computer, connect a **USB cable** to the Bree6's **USB port** for MIDI communication.

## USB CONNECTION

The Bree6 features an **isolated USB port**, which prevents ground loops and ensures noise-free operation. It uses a **USB Type-B connector**, chosen for its **robustness** compared to other standard USB connectors. The USB connection allows MIDI data transfer between the synthesizer and a computer but **does not provide power** to the synthesizer.

## QUICK START

1. Connect the **power supply** and turn on the synthesizer.
2. Connect your **MIDI controller or computer** via **MIDI In** or **USB**.
3. Plug in your **audio output cables or headphones**.
4. Select a **preset** or adjust the **panel settings** to start creating sounds.

# OVERVIEW AND FEATURES

The Bree6 synthesizer is a **six-voice analog polyphonic synthesizer** designed for rich, expressive sound creation. It features:

- **6 voices of polyphony** with an all-analog signal path.
- **1 voltage-controlled oscillator (VCO) per voice**, offering **sawtooth** and **pulse waveforms**.
- **Suboscillator** that can be **turned on or off**, generating a **square wave** one octave below the main oscillator, adding depth and warmth to the sound.
- **Pulse width modulation (PWM)** ranging from **0% to 100%**, allowing for dynamic tonal shaping.
- A **4-pole low-pass voltage-controlled filter (VCF)** with **resonance control**, providing smooth and musical filtering.
- Built-in **stereo effects**, including **chorus** and **delay**, for added spatial depth and movement.
- **Comprehensive MIDI and USB MIDI implementation**, ensuring seamless integration with modern setups.
- **Compact and lightweight desktop form factor**, making it highly portable and easy to integrate into any workspace.

With its **powerful analog architecture** and **intuitive control layout**, the Bree6 is an ideal synthesizer for musicians looking for **warm analog tones, deep modulation capabilities, and a compact design** suited for both studio and live performance.

# FRONT PANEL

The Bree6 front panel is designed for intuitive operation, featuring clearly labeled controls for quick access to its powerful features. A visual representation of the front panel layout is shown in Figure 2.

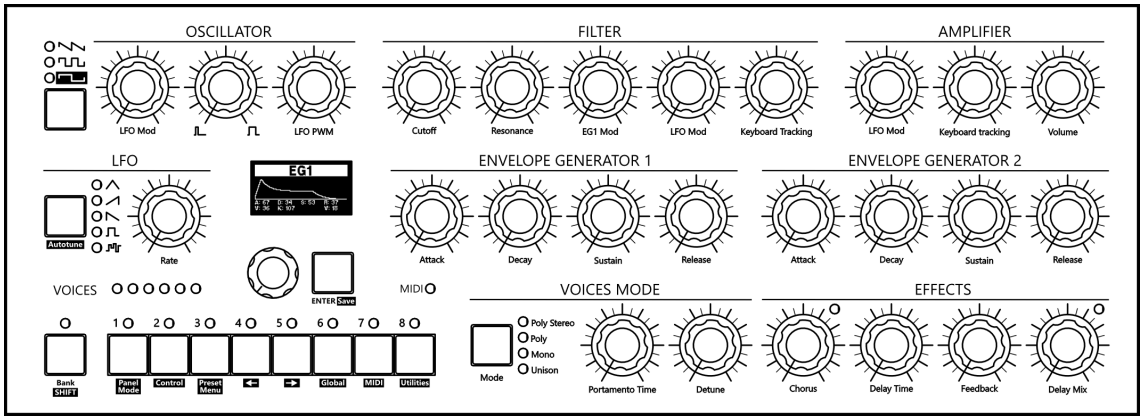



Figure 2: The front panel of the Bree6 synthesizer.

Below is an overview of the main components:

- **Oscillator (VCO)**: A single voltage-controlled oscillator per voice, capable of generating sawtooth and pulse waveforms with adjustable pulse width modulation.
- **Filter (VCF)**: A 4-pole low-pass filter with controls for cutoff frequency, resonance, and modulation sources.
- **Amplifier (VCA)**: Controls for amplitude dynamics.
- **Envelope Generators (EGs)**: Two ADSR-type envelope generators for shaping the filter and amplitude.
- **Low-Frequency Oscillator (LFO)**: A single LFO for modulating various parameters.
- **Effects Section**: Built-in chorus and delay for adding spatiality and depth to your sound.
- **Graphic OLED Display and Rotary Encoder**: Provides clear parameter visualization and intuitive menu navigation.
- **Additional Controls**: Includes a shift button for secondary functions and preset navigation buttons for quick access.

This streamlined layout ensures that the Bree6 remains simple to use while offering deep control over its sound.

## BACK PANEL

The back panel of the Bree6 synthesizer provides all the necessary connections for power, audio output, and MIDI communication. A visual representation of the back panel layout is shown in Figure 3.

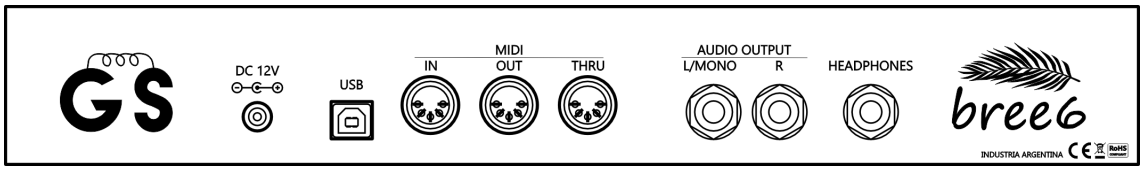



Figure 3: The back panel of the Bree6 synthesizer.

Below is an overview of the available ports and connectors:

- **Power Input**: Connect the included 12V DC power supply to this input. Ensure the power source matches the specifications: 100-240V AC, 50-60 Hz.
- **Audio Outputs (L and R)**: Two 1/4" TRS or TS jacks for stereo audio output. For mono operation, use only the Left output. Balanced outputs help reduce noise and interference, making the Bree6 suitable for both studio and live performance environments.
- **Headphone Output**: A 1/4" TRS jack for stereo headphones. This output mirrors the main audio output.
- **MIDI Ports**:
  - **MIDI IN**: Receives MIDI data from an external controller or sequencer.
  - **MIDI OUT**: Sends MIDI data generated by the Bree6.
  - **MIDI THRU**: Passes incoming MIDI data unchanged to another MIDI device.
- **USB Port**: Enables MIDI communication with a computer or compatible USB MIDI device. The USB port uses a Type-B connector, chosen for its robustness and reliability compared to other USB standards, ensuring durability in both studio and live environments. The USB port is also electrically isolated to avoid ground loop issues, providing a clean and noise-free connection.

The back panel of the Bree6 is designed for simplicity and versatility, ensuring seamless integration into any studio or live performance setup.

# SIGNAL PATH

The Bree6 synthesizer features a streamlined and powerful signal path designed to deliver high-quality analog sound. The signal begins at the **Voltage-Controlled Oscillator (VCO)**, which generates the raw waveforms. From there, it flows through the **Voltage-Controlled Filter (VCF)** to shape the harmonic content and into the **Voltage-Controlled Amplifier (VCA)** to control the amplitude.

After passing through the VCA, the signal enters the **effects section**, where the dry signal remains fully analog and is mixed with the wet signal, which is processed digitally by the built-in **chorus and delay**. This hybrid approach preserves the integrity of the analog sound while offering rich, spatial effects.

Finally, the processed signal is routed through the **master volume control** to the audio outputs. Modulation is applied throughout the signal path via the **Envelope Generators (EGs)** and **Low-Frequency Oscillator (LFO)**, enabling dynamic and expressive sound shaping.

This intuitive signal flow ensures seamless interaction between components, giving users the tools to craft rich and inspiring sounds.

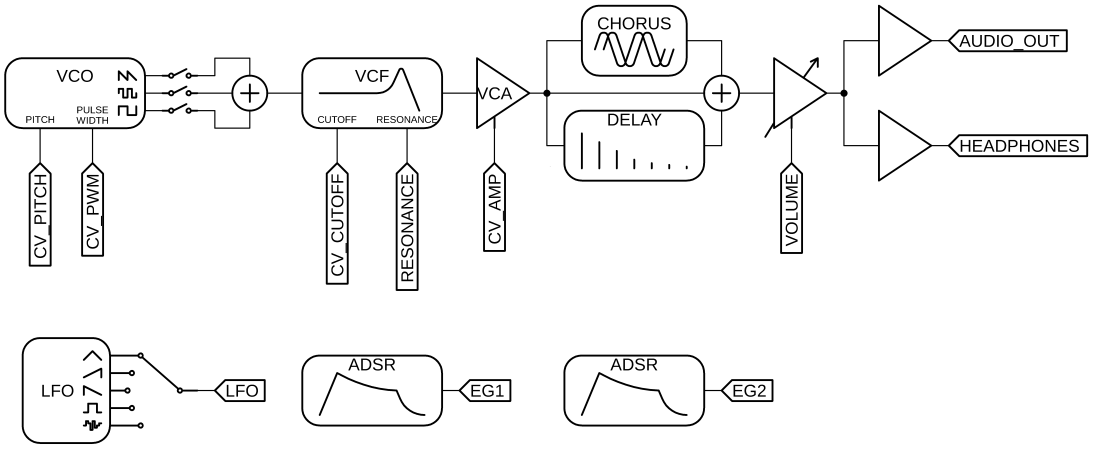



Figure 4: Bree6 Signal Path

## OSCILLATOR MODULATION

The oscillator modulation section determines how different control sources affect the pitch and pulse width of the **Voltage-Controlled Oscillator (VCO)**.

- **LFO Modulation**: Allows the LFO to apply vibrato or PWM effects.

- **Pulse Width Modulation (PWM)**: The pulse wave's width can be modulated dynamically by the LFO.

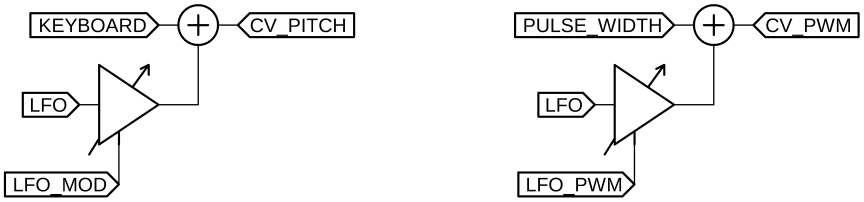



Figure 5: Oscillator Modulation

## FILTER MODULATION

The filter section shapes the harmonic content of the sound by attenuating certain frequencies. Several modulation sources influence the **Voltage-Controlled Filter (VCF)**:

- **Envelope Generator 1 (EG1)**: Modulates the cutoff frequency over time.
- **LFO Modulation**: Creates filter sweeps and rhythmic effects.
- **Keyboard Tracking**: Adjusts the cutoff frequency based on the played note.
- **Velocity Sensitivity**: The filter response varies depending on the playing velocity.
- **MIDI Modulation (MPE, Aftertouch, Mod Wheel)**: External controls can also shape the filter.

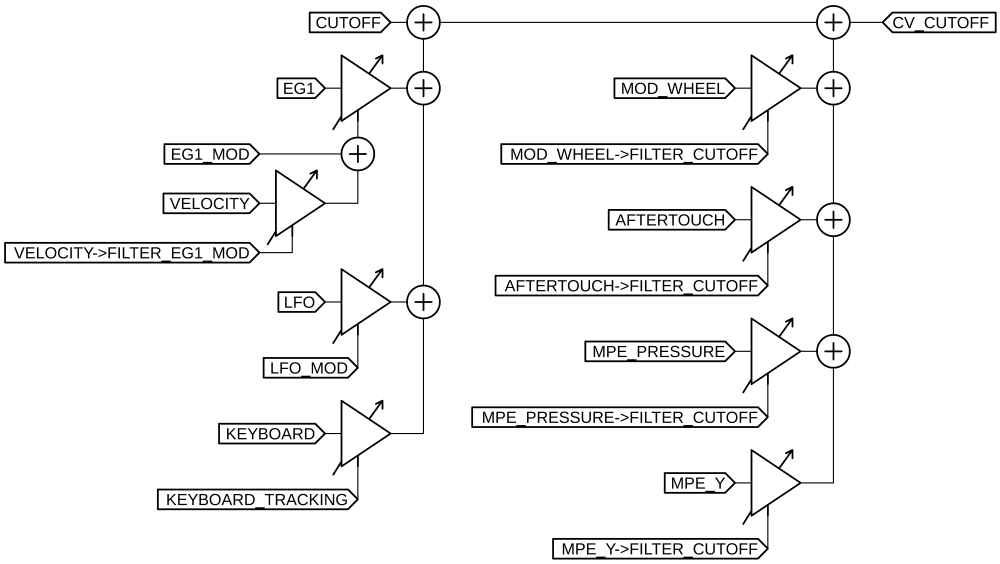



Figure 6: Filter Modulation

## AMPLIFIER MODULATION

The **Voltage-Controlled Amplifier (VCA)** is responsible for shaping the final amplitude of the signal. Several sources influence the VCA's behavior:

- **Envelope Generator 2 (EG2)**: Defines the volume shape over time.
- **LFO Modulation**: Allows tremolo effects by modulating amplitude cyclically.
- **Velocity Sensitivity**: Adjusts volume based on how hard a key is pressed.
- **MIDI Modulation (MPE, Aftertouch)**: External controllers can dynamically affect amplitude.

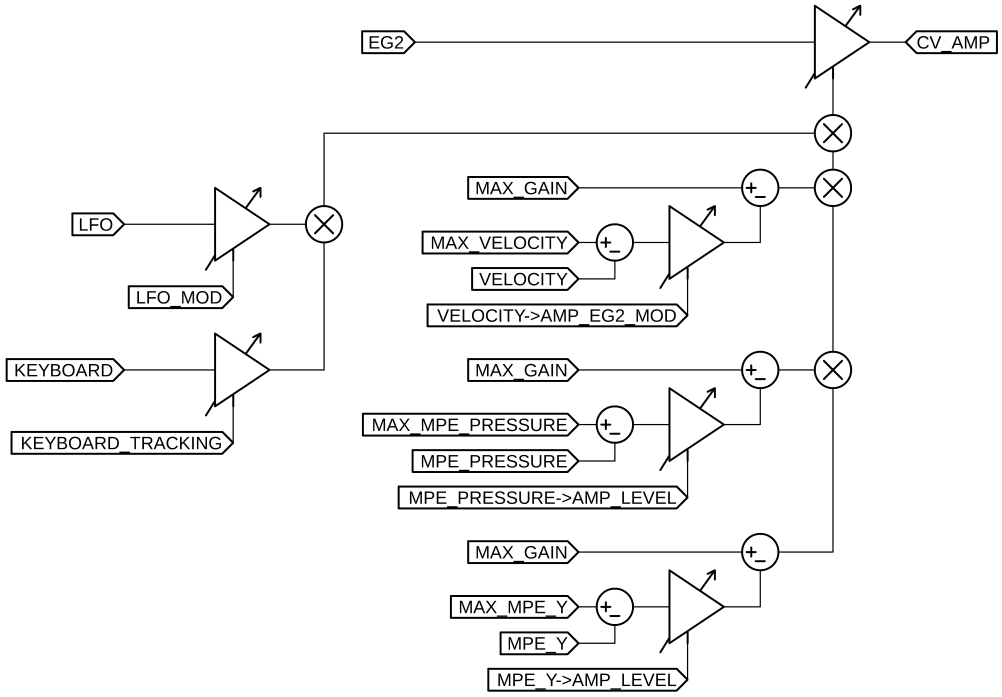



Figure 7: Amplifier Modulation

This modular and flexible signal path allows for a vast range of dynamic and expressive sounds, combining both **analog richness** and **modern modulation possibilities**.

# BASIC OPERATION

The Bree6 synthesizer is designed for ease of use, providing a straightforward workflow to help you quickly create and explore sounds. Below are the key steps for operating the Bree6:

## POWERING ON

Connect the included 12V DC power supply to the power input on the back panel and plug it into a power outlet. The synthesizer powers on automatically when connected to the power supply.

## CONNECTING AUDIO OUTPUTS

The Bree6 features two balanced 1/4" TRS outputs (Left and Right) for stereo audio. For mono operation, use only the Left output. Balanced outputs help reduce noise and interference, making the Bree6 suitable for both studio and live performance environments. Alternatively, you can use the 1/4" stereo headphone output on the back panel for private monitoring.

## CONNECTING A MIDI CONTROLLER

To control the Bree6, connect a DIN-5 MIDI cable from your MIDI controller to the MIDI IN port. If you're using a computer, connect a USB cable to the USB port for MIDI communication. The Bree6 defaults to receiving MIDI data on channel 1.

## SELECTING A SOUND

When powered on, the Bree6 starts in **Panel Mode**, where the sound reflects the current positions of the front panel controls. You can also access stored sounds by switching to **Preset Mode**, which allows you to load and play pre-configured patches.

## PLAYING THE SYNTHESIZER

Once connected to a MIDI controller and audio outputs, play the synthesizer by sending MIDI notes. Adjust the controls on the front panel to shape your sound in real time.

## MODIFYING SETTINGS

The graphic OLED display and rotary encoder make it easy to access and modify advanced settings. Use the encoder to navigate menus and parameters, and press ENTER to confirm your selections.

## USING THE EFFECTS

The built-in effects (chorus and delay) are integrated into the signal path. Adjust the effect parameters to enhance your sound. Remember that the dry signal remains analog, and only the wet signal is digitally processed, ensuring the integrity of the core sound.

## SAVING YOUR WORK

If you've created a sound you want to save, use the **Preset Mode** to store it in one of the available memory slots. Consult the **Preset Mode** section for detailed instructions.

The Bree6's simple and intuitive operation ensures a seamless workflow, making it easy to explore and create inspiring sounds.

# COMPONENTS AND CONTROLS

The Bree6 synthesizer provides a comprehensive set of controls for shaping your sound. Each control is designed for intuitive operation, allowing users to quickly explore the full potential of the synthesizer. Below is a detailed explanation of each component and its controls.

## OSCILLATOR (VCO)

The oscillator is the primary sound source of the Bree6. Below is a detailed explanation of its controls:


Figure 8: Oscillator waveforms: Sawtooth wave alone, mixed with pulse, or with suboscillator.

### WAVEFORM

The waveform button allows you to select the primary waveform generated by the oscillator. Press the button to cycle through the available waveforms:

- **Sawtooth Wave**: Produces a rich, harmonically complex sound, ideal for basses, leads, and pads.
- **Pulse Wave**: Allows pulse width modulation (PWM) from 0% to 100%, offering dynamic tonal variation.
- **Suboscillator**: Generates a square wave at half the frequency of the main oscillator, providing a sound one octave lower. This adds depth and richness to the overall sound.

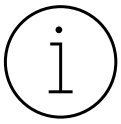
When the waveform button is pressed while holding **SHIFT**, the suboscillator is toggled on or off.

### LFO MOD

Adjusts the amount of modulation applied to the oscillator pitch by the LFO. This can create vibrato effects or more complex pitch modulations.

### LFO PWM

Sets the depth of pulse width modulation by the LFO. Use this to create evolving textures or rhythmic modulations in your sound.



When the **Pulse Width** reaches **0% or 100%**, the oscillator produces no sound as no pulses are generated. This can happen by turning the **Pulse Width knob** to its extremes or if **Pulse Width Modulation (PWM)** pushes the waveform beyond its limits.

## FILTER (VCF)

The 4-pole low-pass ladder filter shapes the harmonic content of the oscillator by attenuating high frequencies. It is capable of self-oscillation at higher resonance settings, adding distinct tonal character and versatility.

### CUTOFF

Sets the cutoff frequency, determining the brightness of the sound by removing higher frequencies.


Figure 9: Filter response visualization: Cutoff and Resonance settings.

## RESONANCE

Increases the emphasis around the cutoff frequency and allows for self-oscillation at higher levels.

## EG1 MOD

Controls how much the filter cutoff is modulated by Envelope Generator 1, adding dynamic tonal shaping.

## LFO MOD

Adjusts the amount of modulation applied to the filter cutoff by the LFO, enabling rhythmic or evolving filter sweeps.

## KEYBOARD TRACKING

Sets how the cutoff frequency changes relative to the pitch of played notes, allowing the filter to follow the melody. When set to maximum, the filter cutoff will track the keyboard scale precisely, maintaining consistent tonal relationships across the range.


Figure 10: Filter keyboard tracking visualization.

Setting the resonance and keyboard tracking to their maximum values, with the cutoff set to 64, causes the filter to oscillate one octave higher than the played notes. In this condition, adjusting the cutoff will shift the oscillation pitch in semitone steps, allowing you to experiment with different harmonic intervals.

## AMPLIFIER (VCA)

The amplifier controls the final amplitude of the signal.

### LFO MOD

Modulates the amplitude using the LFO, enabling tremolo effects or dynamic amplitude changes.

### KEYBOARD TRACKING

Adjusts the amplitude dynamics based on the pitch of played notes, useful for expressive sound design.


Figure 11: Amplifier keyboard tracking: This setting adjusts the amplitude response based on the pitch of the played notes, allowing higher notes to be louder or softer relative to lower notes.

### VOLUME

This is the master volume, controlling the overall output level of the synthesizer.

## LOW-FREQUENCY OSCILLATOR (LFO)

The LFO generates periodic waveforms for modulation purposes.

### WAVEFORM SELECTOR

Chooses between different waveforms, including triangular, square, and random (Sample & Hold), for diverse modulation effects.

### RATE

Sets the frequency of the LFO, controlling the speed of modulation. The range is from 0.1Hz to 100Hz.

## ENVELOPE GENERATORS (EG1 AND EG2)

The Bree6 features two ADSR envelope generators for shaping sound dynamics. EG1 modulates the filter and EG2 modulates the amplifier.

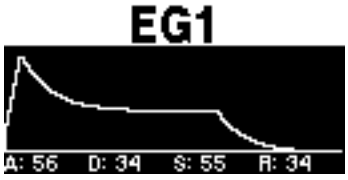



Figure 12: Graphical representation of Envelope Generator 1 (EG1), showing the Attack (A), Decay (D), Sustain (S), and Release (R) stages.

### ATTACK

Determines the time it takes for the envelope to reach its peak value after a note is triggered. The attack is linear.

### DECAY

Sets the time it takes to reach the sustain level after the attack phase. The decay is exponential.

### SUSTAIN

Sets the level maintained while a key is held, defining the body of the sound.

### RELEASE

Determines the time it takes for the envelope to return to zero after the key is released. The release is exponential.

# EFFECTS

The Bree6 synthesizer includes built-in digital effects to enhance the sound while preserving the integrity of the analog signal. The **effects processor operates at a sampling rate of 48 kHz and utilizes a 32-bit DSP**, ensuring high-quality processing. The **analog-to-digital (ADC) and digital-to-analog converters (DAC) have a 24-bit resolution**, providing a clean and transparent signal path.

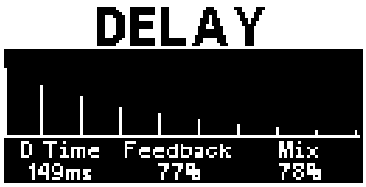



Figure 13: Delay effect settings.

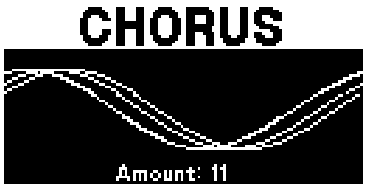



Figure 14: Chorus effect settings.

## CHORUS

**Chorus:** Adds richness and spatial depth by slightly detuning and delaying the sound. The chorus effect utilizes **four independent delays**, each modulated by **four independent low-frequency oscillators (LFOs)**. Two of these delays are applied to the **left channel**, while the other two affect the **right channel**, creating a wide and immersive stereo effect. This design enhances the movement and depth of the sound, making it ideal for lush pads, leads, and complex textures.

## DELAY

**Delay:** Creates echo effects with adjustable time, feedback, and mix levels, adding space and dimension to your sound. The delay time is adjustable up to **1 second**, allowing for anything from **tight slapback echoes** to **long ambient repetitions**. The feedback control determines the number of repeats, and it can be set up to **100%**, allowing for **infinite sustain** or **self-oscillating feedback loops**. This makes it useful for creating ambient soundscapes, rhythmic echoes, or experimental feedback effects.

## CHORUS (DEPTH AND RATE)

Adjusts the intensity of the modulation applied to the delayed signals. Higher values increase the amount of pitch variation, resulting in a more pronounced chorus effect.

## DELAY TIME

Adjusts the timing of echoes, determining the interval between repetitions. - Shorter times (e.g., below 100ms) produce **tight, slapback echoes**, useful for doubling effects or thickening sounds. - Medium settings (e.g., 200-500ms) create **classic rhythmic delays**, often used in lead melodies and arpeggiated patterns. - Longer times (e.g., 500ms to 1 second) allow for **spacious ambient effects** or evolving textures.

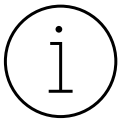
## FEEDBACK

Controls the number of repetitions of the delay effect. - **Low feedback settings** (e.g., below 30%) produce subtle echoes that fade out quickly. - **Mid-range feedback** (e.g., 30-70%) results in rhythmic repetitions that gradually decay. - **High feedback settings** (above 70%) can create sustained echoes or near-infinite loops, useful for experimental or drone-like effects. - **At 100% feedback**, the delay enters **self-oscillation**, where echoes continue indefinitely and may even build in intensity, allowing for sound layering and feedback-based sound design.

## DELAY MIX

Controls the level of the wet (processed) signal while keeping the dry (unprocessed) signal at a constant level. The mix parameter adjusts the intensity of the delay effect without affecting the original sound's volume.

- A **low mix setting** results in a subtle delay effect, where the original sound remains dominant, and only faint echoes are heard in the background. - A **mid-level mix** creates a balanced combination of the original sound and delay effect, ensuring that the echoes are clearly audible but do not overpower the dry signal. - A **high mix setting** increases the presence of the delay effect, making the echoes more prominent and sometimes as loud as the original sound. - **At 100% mix**, the wet signal level matches the dry signal level, providing a strong delay effect without any attenuation of the original sound. This is useful for rhythmic delay textures or creating spacious, ambient echoes.



The dry and wet signals are combined using an analog mixer. This ensures that if no effects are applied, the audio signal remains entirely in the analog domain, preserving its original quality.

# VOICES AND MODES

## MODE (POLYPHONY MODE)

Allows you to switch between Poly Stereo, Poly, Mono, and Unison modes, providing flexibility for different playing styles:

- **Poly Stereo**: Distributes voices across the stereo field, creating a wide and immersive soundscape for polyphonic playing.
- **Poly**: Provides traditional polyphonic playback, allowing you to play multiple notes simultaneously with all voices centered in the stereo field.
- **Mono**: Produces a monophonic output, where only one note is played at a time, making it ideal for bass lines or lead melodies.
- **Unison**: Stacks all voices onto a single note, resulting in a thick, powerful sound with enhanced detuning for added richness and character.

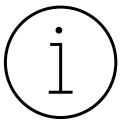
## PORTAMENTO TIME

Adjusts the glide time between notes, creating smooth pitch transitions. While commonly used in **Mono** and **Unison** modes, **Portamento** also functions in **Polyphonic** mode, allowing for expressive legato-style playing across multiple voices.

## DETUNE

Controls the detuning of voices in Unison mode, creating a thicker and richer sound. The Detune control is primarily designed for Unison mode, where it spreads the tuning of stacked voices to create a richer, thicker sound. However, it also functions in Poly mode, affecting each voice independently. This can introduce tuning inconsistencies, which may result in an out-of-scale or detuned sound—useful for experimental textures but not always musically conventional.


Figure 15: Detune setting: Adjusts pitch spread for a thicker sound.



While in Poly mode, a small amount of detune can add a subtle vintage character, excessive detuning could make the synth sound unstable or out of tune in most scenarios.

## SECONDARY FUNCTIONS

Certain secondary functions can be activated by holding **SHIFT** and pressing any button labeled with inverted text.

### AUTOTUNE [SHIFT + LFO WAVEFORM]

The Autotune function ensures precise tuning of all voices by automatically calibrating the oscillators. Thanks to the excellent tuning stability of the oscillators, this feature is rarely needed, except in cases of significant temperature changes. The synthesizer requires no warm-up time and is in tune within seconds of powering on, making Autotune a quick and convenient option when necessary.

### PANEL MODE [SHIFT + 1]

Panel Mode reflects the current positions of the front panel controls, allowing you to hear and modify sounds directly without relying on saved presets. This mode is ideal for real-time sound design and experimentation.

### CONTROL MENU [SHIFT + 2]

The Control Menu provides access to parameters that fine-tune the behavior of the synthesizer's controls. This menu allows you to adjust the response to modulation wheel changes, velocity sensitivity, aftertouch, and MPE (MIDI Polyphonic Expression) controls, enabling precise and expressive performance adjustments.

### PRESET MENU [SHIFT + 3]

The Preset Menu allows you to adjust additional preset parameters, such as transpose, pitch bend range, level and unison interval.

### GLOBAL CONFIGURATION [SHIFT + 6]

The Global Configuration menu contains system-wide settings, such as tuning and other options that affect the overall behavior of the synthesizer.

## MIDI CONFIGURATION [SHIFT + 7]

The MIDI Configuration menu lets you adjust MIDI settings, such as channel assignment and control messages, ensuring seamless integration with your setup.

## UTILITIES [SHIFT + 8]

The Utilities menu provides access to additional tools and features, such as presets dumping, factory resets, and filter calibration, for maintaining and optimizing the synthesizer.

## SAVE [SHIFT + ENTER]

The Save function allows you to store your current sound into a preset slot for future recall. This ensures that your custom creations are preserved and easily accessible.

## PANEL MODE [SHIFT + 1]

Panel Mode reflects the current positions of the front panel controls, allowing you to hear and modify sounds directly without relying on saved presets. When activated, the synthesizer disregards any preset settings and uses the real-time values of the knobs on the panel.


Figure 16: Panel Mode screen as displayed on the synthesizer.

This mode is ideal for:

- Real-time sound design and experimentation.
- Quickly creating new sounds without the influence of saved parameters.
- Exploring how parameter changes affect the sound.

To activate Panel Mode, hold **SHIFT** and press the **1** button. While in this mode, any adjustments made to the controls will immediately affect the sound, making it a hands-on and intuitive way to craft your patches.

While in Panel Mode, pressing any of buttons 1 to 8 will initiate Preset Mode.

# PRESETS

The Bree6 synthesizer offers a versatile preset system, allowing you to save, load, and manage your custom sounds with ease. With its intuitive design, the preset system ensures that your creations are always accessible for performances, production, or experimentation.


Figure 17: Preset selection screen displaying the bank, sub-bank, slot, and preset name.

## PRESET MANAGEMENT

The preset system in the Bree6 is designed for efficient organization and intuitive navigation of your sounds. Presets are structured into a hierarchy of banks, sub-banks, and slots, providing a total of 512 presets (8 banks × 8 sub-banks × 8 slots).

### PRESET ORGANIZATION

Presets are organized as follows:

- **Banks**: There are 8 banks, each serving as a primary category for organizing presets.
- **Sub-banks**: Each bank is divided into 8 sub-banks, allowing for finer categorization.
- **Slots**: Each sub-bank contains 8 preset slots where individual patches are stored.

Most of the banks are preloaded with factory presets showcasing the synthesizer's capabilities. All presets, including factory and user presets, can be restored to their original factory state when needed. This restoration can be performed for a single preset, an entire bank, or all presets, ensuring flexibility in managing your library. Further details about this functionality are provided in the Utilities section.

## NAVIGATING BANKS, SUB-BANKS, AND SLOTS

Buttons 1 to 8 allow you to directly change the Position within the currently selected sub-bank. For example, to access a preset located at Address 1.1.6, simply press button 6.

To navigate to a preset in a different Bank, press **SHIFT**, and then enter the Address of the desired preset. For instance, to access a preset located at Address 1.3.5, press **SHIFT**, followed by buttons 1, 3, and 5.

This intuitive navigation system allows for quick access to any of the 512 presets available on the Bree6.

## SAVING PRESETS

To save a preset on the Bree6, follow these steps:

1. Hold **SHIFT** and press **ENTER** to begin the save process.
2. Enter the desired **Bank**, **Sub-bank**, and **Slot** where you want to save the preset using the corresponding buttons.
3. After selecting the save location, you can rename the preset:
    - A cursor will appear under the first character of the name.
    - Use the **rotary encoder** (below the display) to change the selected character.
    - To move to the next character, press **Button 5** (marked with a right arrow).
    - To move to the previous character, press **Button 4** (marked with a left arrow).
4. Once the name is set, press **ENTER** to confirm and save the preset.
5. If you wish to cancel the save operation at any point, press **SHIFT**.

This intuitive process ensures your custom sounds are stored exactly where you want them, with a name that reflects their purpose or characteristics.

## PRESET CAPACITY

The Bree6 supports a total of 512 presets, structured into 8 banks, each containing 8 sub-banks with 8 slots per sub-bank. This organization ensures quick and intuitive access to your sounds, whether you're performing live or designing patches in the studio.

## CONTROL MENU

The Control Menu allows you to fine-tune how the synthesizer responds to aftertouch and MIDI Polyphonic Expression (MPE) messages. All parameters in this menu range from 0 to 127, offering precise control over modulation and dynamic expression.

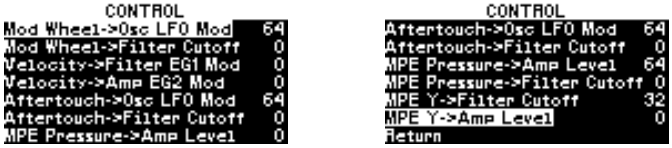



Figure 18: Screenshots of the Control Menu.

### Parameters Explained:

- **Mod Wheel → Osc LFO Mod**: Controls how much the modulation wheel affects the oscillator's LFO modulation depth. Higher values result in a stronger vibrato effect when using the mod wheel.
- **Mod Wheel → Filter Cutoff**: Adjusts how much the modulation wheel affects the filter's cutoff frequency. Higher values enable more significant tonal sweeps.
- **Velocity → Filter EG1 Mod**: Determines how the note velocity modulates the intensity of Envelope Generator 1's effect on the filter. Higher values produce more pronounced dynamic changes.
- **Velocity → Amp EG2 Mod**: Adjusts how the note velocity modulates the intensity of Envelope Generator 2's effect on the amplifier. Higher values result in greater dynamic range based on playing velocity.
- **Aftertouch → Osc LFO Mod**: Controls how much aftertouch (pressure applied to the keys after pressing) modulates the oscillator's LFO depth. Higher values create a stronger vibrato effect.
- **Aftertouch → Filter Cutoff**: Adjusts how much aftertouch modulates the filter's cutoff frequency. Higher values result in more dramatic tonal shifts when applying pressure.
- **MPE Pressure → Amp Level**: Determines how MPE pressure modulates the amplifier's volume. Higher values provide greater dynamic changes in response to pressure. The modulation is relative to the maximum amplitude:
  - At a parameter value of 127, the amp level starts at 0 for 0 input and increases to the maximum for 127 input.

  - At a parameter value of 64, the amp level starts at 50% (halfway) for 0 input and increases to the maximum for 127 input.
  - At a parameter value of 0, the amp level remains at its maximum regardless of input.

- **MPE Pressure → Filter Cutoff**: Controls the extent to which MPE pressure modulates the filter's cutoff frequency. Higher values allow for expressive tonal adjustments based on pressure.

  - When the input value is 64, the filter cutoff remains unaffected.
  - For inputs below 64 (0–63), the filter cutoff decreases. The parameter value sets the amount of decrease.
  - For inputs above 64 (65–127), the filter cutoff increases. The parameter value sets the amount of increase.

- **MPE Y → Filter Cutoff**: Adjusts how the Y-axis movement of an MPE controller (e.g., sliding motion) affects the filter's cutoff frequency. Higher values enable more extensive tonal sweeps along the Y-axis.

  - When the input value is 64, the filter cutoff remains unaffected.
  - For inputs below 64 (0–63), the filter cutoff decreases. The parameter value sets the amount of decrease.
  - For inputs above 64 (65–127), the filter cutoff increases. The parameter value sets the amount of increase.

- **MPE Y → Amp Level**: Controls how the Y-axis movement of an MPE controller modulates the amplifier's volume. Higher values produce greater dynamic variation based on movement. The modulation is relative to the maximum amplitude:

  - At a parameter value of 127, the amp level starts at 0 for 0 input and increases to the maximum for 127 input.
  - At a parameter value of 64, the amp level starts at 50% (halfway) for 0 input and increases to the maximum for 127 input.
  - At a parameter value of 0, the amp level remains at its maximum regardless of input.

To exit the Control Menu, select "Return" from the list or press SHIFT button.

## PRESET MENU

The Preset Menu allows you to adjust specific settings related to the currently loaded preset. These settings are saved with the preset, making it possible to customize individual sounds without affecting global configurations.


Figure 19: Preset Menu screen.

Parameters in the Preset Menu:

- **Transpose**: Adjusts the pitch of the preset in semitone steps. The range is from -48 (four octaves down) to +48 (four octaves up), allowing you to transpose the sound as needed.
- **Pitch Bend Range**: Sets the range of the pitch bend wheel in semitones. A value of 2, for example, means the pitch will bend up or down by two semitones when the pitch bend wheel is used. The maximum value is 12.
- **Level**: Adjusts the overall volume of the preset. The value ranges from 0 (silent) to 127 (maximum volume), allowing you to balance the levels of different presets. The default value is 100.
- **Unison Interval**: Defines the interval between voices when the Unison mode is enabled. The range allows for creating harmonically rich unison sounds by offsetting the pitch of each voice. The range is from -12 (one octave down) to +12 (one octave up).
- **Return**: Exits the Preset Menu and returns to the previous screen.

The Preset Menu provides fine-grained control over preset-specific settings, ensuring that each sound can be tailored to your preferences and performance needs.

# GLOBAL CONFIGURATION

The Global Configuration menu allows you to adjust system-wide settings that affect the overall behavior and operation of the synthesizer. These settings are not tied to individual presets and remain consistent across all patches.

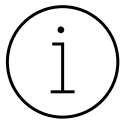

Figure 20: Global Configuration menu.

Parameters in the Global Configuration Menu:

- **Transpose**: Adjusts the global pitch of the synthesizer in semitone steps. The range is from -48 (four octaves down) to +48 (four octaves up). This transposition applies to all presets.
- **Master Tune**: Fine-tunes the global pitch of the synthesizer in small increments. The range spans ±1 semitone, allowing you to match the tuning of external instruments or ensembles with precision.
- **LED Intensity**: Sets the brightness of the synthesizer's LEDs. The range is from 1 (lowest brightness) to 10 (maximum brightness), enabling customization based on ambient lighting conditions.
- **Knob Mode**: Determines how the synthesizer's knobs interact with parameter values when adjusted. The available modes are:
  - **Jump**: The parameter value instantly jumps to match the knob's current position.
  - **Passthru**: The parameter changes only after the knob passes through its current value.
  - **Relative**: Adjusts the parameter incrementally, based on the knob's movement rather than absolute position.
  - **Ignore**: The knob input is ignored, preventing unintended adjustments.
- **Knob Smoothing**: This setting controls the response smoothness of the knobs. A value of 0 disables smoothing, providing an immediate and raw response to knob movements. Higher values apply gradual smoothing, reducing abrupt changes and making adjustments feel more fluid.

- **Noise Gate**: Toggles the built-in noise gate on or off. When enabled, the noise gate reduces unwanted background noise during operation, making it particularly useful in live or studio settings.
- **Return**: Exits the Global Configuration menu and returns to the main interface.

The Global Configuration menu provides essential controls for tailoring the synthesizer's overall behavior to your specific needs and performance environment.



Global and Preset Transpose values are summed. For example, +12 and -12 cancel out, resulting in no transposition.

## MIDI CONFIGURATION

The MIDI Configuration menu allows you to adjust settings related to MIDI communication. These settings ensure compatibility and optimal performance when connecting the synthesizer to external MIDI devices.


Figure 21: MIDI Configuration menu.

Parameters in the MIDI Configuration Menu:

- **Receive Channel**: Sets the MIDI channel on which the synthesizer receives MIDI messages. You can choose from the following options:
  - **1–16**: The synthesizer will respond to messages on the selected MIDI channel.
  - **Omni**: The synthesizer will respond to messages from all MIDI channels.
  - **Off**: Disables MIDI message reception.
- **Transmit Channel**: Sets the MIDI channel on which the synthesizer transmits MIDI messages. You can choose from the following options:
  - **1–16**: The synthesizer will transmit messages on the selected MIDI channel.

  - **Off**: Disables MIDI message transmission.

- **MPE (MIDI Polyphonic Expression)**: Enables or disables MPE mode. When set to "On," the synthesizer responds to MPE messages, allowing for advanced expressive control using compatible controllers. When set to "Off," standard MIDI functionality is used.
- **MIDI Filter**: Opens the MIDI Filter menu, where you can configure which types of MIDI messages are processed by the synthesizer. See the subsection below for more details.
- **Return**: Exits the MIDI Configuration menu and returns to the main interface.

## MIDI FILTER MENU

The MIDI Filter menu allows you to enable or disable specific types of MIDI messages. This is useful for tailoring the MIDI input to your performance or studio setup.


Figure 22: MIDI Filter menu.

Parameters in the MIDI Filter Menu:

- **Control Change**: Toggles the reception of MIDI Control Change messages. When set to "Off," the synthesizer will ignore all incoming Control Change messages.
- **Program Change**: Toggles the reception of MIDI Program Change messages. When set to "Off," the synthesizer will ignore incoming Program Change messages, preventing unintended preset changes.
- **Pitch Bend**: Toggles the reception of MIDI Pitch Bend messages. When set to "Off," the synthesizer will ignore all incoming Pitch Bend data.
- **System Exclusive (SysEx)**: Toggles the reception of MIDI System Exclusive messages. When set to "Off," the synthesizer will ignore incoming SysEx messages, which are often used for advanced configuration or firmware updates.
- **Return**: Exits the MIDI Filter menu and returns to the MIDI Configuration menu.

The MIDI Filter menu provides precise control over the types of MIDI messages processed by the synthesizer, ensuring seamless integration with your setup.

# UTILITIES

The Utilities menu provides various system tools and functions to manage, diagnose, and restore your synthesizer. These tools allow you to maintain the instrument's performance, customize its operation, and ensure its longevity.


Figure 23: Utilities menu.

Parameters in the Utilities Menu:

- **SysEx Dump**: Opens the SysEx Dump menu, where you can save the current preset, bank, or all memory to an external device using System Exclusive (SysEx) messages. See subsection 16.1 for details.
- **Autotune Filters**: Initiates the autotuning process for the synthesizer's filters, ensuring optimal tuning accuracy.
- **Calibrate Wheels**: Allows you to calibrate the pitch bend and modulation wheels for accurate performance. [Reserved for keyboard version].
- **Initialize Current Preset**: Resets the currently selected preset to a blank state, providing a clean slate for sound design.
- **Factory Restore**: Opens the Factory Restore menu, where you can restore individual presets, banks, or all memory to factory defaults. See subsection 16.2 for details.
- **Return**: Exits the Utilities menu and returns to the main interface.

## SYSEX DUMP MENU

The SysEx Dump menu allows you to export specific data from the synthesizer to an external device using System Exclusive (SysEx) messages. This is useful for backing up presets or transferring data to another device.

Options in the SysEx Dump Menu:

- **Dump Current Preset**: Exports the currently selected preset as a SysEx message.


Figure 24: SysEx Dump menu.

- **Dump Current Bank**: Exports all presets in the currently selected bank as a SysEx message.
- **Dump All Memory**: Exports all presets, banks, and settings as a SysEx message.
- **Return**: Exits the SysEx Dump menu and returns to the Utilities menu.

## FACTORY RESTORE MENU

The Factory Restore menu allows you to reset specific parts of the synthesizer to their original factory settings. This is useful for troubleshooting or restoring the synthesizer to its default state.


Figure 25: Factory Restore menu.

Options in the Factory Restore Menu:

- **Restore Current Preset**: Resets the currently selected preset to its factory settings.
- **Restore Current Bank**: Resets all presets in the currently selected bank to their factory settings.
- **Restore All Presets**: Resets all presets in all banks to their factory settings.
- **Restore Configuration**: Resets all global configuration settings to their factory defaults.
- **Restore Calibration/Tuning**: Resets the synthesizer's calibration and tuning settings to their factory defaults.
- **Restore All**: Performs a full factory reset, restoring all presets, banks, configurations, and calibration settings.
- **Cancel**: Exits the Factory Restore menu without making any changes.

The Utilities menu offers powerful tools for managing and maintaining your synthesizer, ensuring it remains in top condition for performance and sound design.

## SPECIFICATIONS

| | |
|---|---|
| **Polyphony** | 6 voices |
| **Oscillator (VCO)** | Single analog oscillator per voice. |
| **Waveshapes** | Sawtooth, Pulse (0% to 100%). |
| **Filter (VCF)** | 24dB/Oct Low-pass ladder filter with resonance control. |
| **Envelope Generators (2)** | ADSR type |
| **LFO** | Triangular, Ramp up, Ramp down, Square, Sample and hold |
| **Effects** | Delay, Chorus (DSP: 32 bits, 48kHz, DAC/ADC: 24 bits) |
| **Presets** | 512 |
| **Connections** | MIDI In<br>MIDI Out<br>MIDI Thru<br>L/Mono Audio Output (Balanced, 1/4" TRS)<br>R Audio Output (Balanced, 1/4" TRS)<br>Headphone Output (Stereo, 1/4" TRS)<br>USB |
| **Power Supply** | Input: 100-240V 50/60 Hz 1.2 A<br>Output: DC 12V 3A |
| **Power Consumption** | 3 W |
| **Dimensions** | 360 mm x 126 mm x 67 mm<br>14.17" x 4.96" x 2.64" |
| **Weight** | 1.5 kg<br>3.31 lbs |
| **Dimensions (with packaging)** | 460 mm x 200 mm x 140 mm<br>18.11" x 7.87" x 5.51" |
| **Weight (with packaging)** | 2.1 kg<br>4.63 lbs |

# SUPPORT AND WARRANTY

## SUPPORT

At GS Music, we are committed to providing excellent support for our products. If you encounter any issues with your Bree6 synthesizer or have any questions about its operation, please feel free to contact us. Our support team is available to assist you with troubleshooting, repairs, or any other inquiries.

For assistance, you can reach us via email: **info@gsmusic.com**

## WARRANTY

The Bree6 synthesizer comes with a two-year limited warranty from the date of purchase. This warranty covers defects in materials and workmanship under normal use. During the warranty period, GS Music will repair or replace, at our discretion, any product found to be defective.

The warranty does not cover:

- Damage caused by misuse, abuse, or improper handling.
- Damage resulting from unauthorized modifications or repairs.
- Normal wear and tear, including cosmetic damage.
- Damage caused by external factors such as power surges or accidents.

To request warranty service, please contact us at **info@gsmusic.com**.

For products outside of the warranty period, repair services may still be available for a fee. Please contact our support team for more information.

Thank you for choosing the Bree6 synthesizer. We hope you enjoy creating music with it for years to come!