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Behringer 110

Behringer 110 VCO/VCF/VCA Eurorack Module User Manual

Model: 110

1. INTRODUCTION

The Behringer 110 VCO/VCF/VCA is a comprehensive Eurorack module designed to provide a full analog synth voice within a single 16HP unit. It integrates a Voltage Controlled Oscillator (VCO), a Voltage Controlled Filter (VCF), and a Voltage Controlled Amplifier (VCA), offering essential sound generation and shaping capabilities for modular synthesis systems. This module is ideal for users seeking a compact and versatile core voice for their Eurorack setup.



Image 1.1: Front panel view of the Behringer 110 VCO/VCF/VCA Eurack Module, showing its various controls and patch points.

2. SAFETY INSTRUCTIONS

Please read and follow these safety instructions carefully to ensure safe operation and to prevent damage to the module or your Eurorack system.

- **Power Supply:** Only connect the module to a Eurorack power supply that meets the specified voltage requirements (+12V, -12V, +5V if applicable) and provides sufficient current. Incorrect power can damage the module and other components.
- **Installation:** Ensure the module is correctly oriented before connecting the power ribbon cable. The red stripe on the ribbon cable typically indicates -12V and should align with the corresponding pin on the module and your Eurorack bus board. Refer to your Eurorack case and bus board documentation for proper connection.
- **Environment:** Operate the module in a dry environment, away from moisture, extreme temperatures, and direct sunlight.
- **Servicing:** Do not attempt to service the module yourself. Refer all servicing to qualified personnel.
- **Connections:** Always power down your Eurorack system before installing or removing modules or making significant changes to power connections.

3. SETUP

3.1. Physical Installation

1. **Power Down:** Ensure your Eurorack case is completely powered off and unplugged from the mains.
2. **Locate Space:** Find an available 16HP space in your Eurorack case.
3. **Connect Power:** Carefully connect the 10-pin power ribbon cable to the header on the back of the 110 module. Ensure the red stripe on the ribbon cable aligns with the -12V pin on the module's power header. The -12V pin is usually marked with a white stripe or "RED STRIPE" indicator on the PCB.
4. **Connect to Bus Board:** Connect the other end of the ribbon cable to an available 10-pin header on your Eurorack bus board, again ensuring the red stripe aligns with the -12V rail.
5. **Mount Module:** Place the module into the desired position in your case and secure it with Eurorack screws. Do not overtighten.
6. **Power On:** Once securely installed, you can power on your Eurorack case. The module should illuminate if it has an indicator LED.

3.2. Initial Connections

To begin using the 110 module, you will typically need to make the following basic connections:

- **VCO CV Input:** Connect a 1V/Octave CV source (e.g., from a keyboard controller or sequencer) to the **VCO CV IN 1** or **VCO CV IN 2** jack to control the pitch of the oscillator.
- **VCA Output:** Connect the **VCA HIGH OUT** or **VCA LOW OUT** to an audio mixer or output module to hear the sound.
- **Gate/Envelope:** To control the VCA's amplitude over time, connect an envelope generator's output to the **VCA CV IN**.

4. OPERATING THE BEHRINGER 110

4.1. Voltage Controlled Oscillator (VCO)

The VCO generates the primary sound source. It features two waveforms and multiple control voltage inputs for pitch and pulse width modulation.

- **RANGE Switch:** Selects the octave range of the oscillator (e.g., 32', 16', 8', 4').
- **TUNE Knob:** Fine-tunes the pitch of the oscillator.
- **PULSE WIDTH Knob:** Adjusts the width of the square wave output.
- **PWM CV IN Jack:** Input for an external control voltage to modulate the pulse width.
- **VCO CV IN 1 & 2 Jacks:** Inputs for control voltages (typically 1V/Oct) to control the pitch. These inputs are summed.
- **SAW OUT Jack:** Outputs the sawtooth waveform.
- **SQUARE OUT Jack:** Outputs the square waveform.

4.2. Voltage Controlled Filter (VCF)

The VCF shapes the timbre of the sound by attenuating frequencies above a certain cutoff point. It is a low-pass filter.

- **CUTOFF Knob:** Sets the filter's cutoff frequency. Frequencies above this point are attenuated.
- **RESONANCE Knob:** Adds a peak at the cutoff frequency, emphasizing it. High resonance can lead to self-oscillation.
- **ENV MOD Knob:** Controls the amount of modulation applied to the cutoff frequency from the VCF ENV IN.
- **VCF CV IN Jack:** Input for an external control voltage to modulate the cutoff frequency.
- **VCF ENV IN Jack:** Input for an envelope generator to dynamically control the filter cutoff.
- **VCF IN Jack:** Audio input for the filter. Connect the VCO SAW OUT or SQUARE OUT here.
- **VCF OUT Jack:** Outputs the filtered audio signal.

4.3. Voltage Controlled Amplifier (VCA)

The VCA controls the overall amplitude (volume) of the sound. It is typically modulated by an envelope generator to create dynamic sounds.

- **GAIN Knob:** Sets the initial gain (volume) of the VCA.
- **VCA CV IN Jack:** Input for an external control voltage (typically an envelope) to modulate the VCA's gain.
- **VCA IN Jack:** Audio input for the amplifier. Connect the VCF OUT here.
- **VCA HIGH OUT Jack:** Outputs the amplified audio signal at a higher level.
- **VCA LOW OUT Jack:** Outputs the amplified audio signal at a lower level, suitable for certain mixers or effects.

5. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your Behringer 110 module.

- **Cleaning:** Use a soft, dry cloth to clean the module's front panel. Avoid abrasive cleaners, solvents, or excessive moisture, which can damage the finish or internal components.
- **Storage:** When not in use for extended periods, store the module in a stable environment, protected from dust, extreme temperatures, and humidity. If removed from the case, consider using an anti-

static bag.

- **Jacks and Knobs:** Periodically check patch cables and connections for wear. Ensure knobs and switches operate smoothly. Do not force controls.

6. TROUBLESHOOTING

If you encounter issues with your Behringer 110 module, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No sound output.	<ul style="list-style-type: none">◦ Incorrect power connection.◦ VCA GAIN knob set to minimum.◦ No audio signal patched to VCF IN or VCA IN.◦ No envelope signal to VCA CV IN.◦ Output patched incorrectly.	<ul style="list-style-type: none">◦ Check power ribbon cable orientation (red stripe to -12V).◦ Increase VCA GAIN.◦ Ensure VCO output is patched to VCF IN, and VCF OUT to VCA IN.◦ Patch an envelope generator to VCA CV IN.◦ Verify VCA HIGH OUT or LOW OUT is connected to an audio output.
VCO pitch is incorrect or unstable.	<ul style="list-style-type: none">◦ Incorrect CV input.◦ TUNE knob setting.◦ Module not warmed up.	<ul style="list-style-type: none">◦ Ensure 1V/Oct CV source is connected to VCO CV IN.◦ Adjust the TUNE knob.◦ Allow 15-20 minutes for analog circuits to stabilize after power-on.
Filter not affecting sound.	<ul style="list-style-type: none">◦ CUTOFF knob set too high.◦ No audio signal to VCF IN.	<ul style="list-style-type: none">◦ Lower the CUTOFF knob.◦ Ensure VCO output is patched to VCF IN.

7. SPECIFICATIONS

Feature	Detail
Module Type	VCO/VCF/VCA (Synth Voice)
Eurorack Width	16 HP
Power Consumption	+12V, -12V (specific current draw not provided, refer to module for exact values)
VCO Waveforms	Sawtooth, Square
VCF Type	Low-Pass
Connectivity Technology	Auxiliary, 3.5mm Jack
Finish Type	Matte
Manufacturer	Behringer
Model Name	110

8. WARRANTY AND SUPPORT

For detailed warranty information, product registration, and technical support, please visit the official Behringer website. You can find up-to-date information regarding service centers, FAQs, and contact options there.

Official Behringer Website: www.behringer.com

Keep your purchase receipt as proof of purchase for any warranty claims.