Phi Mangler

user manual v.1.0

bardsynthesizers.com

Introduction

Thank you for ordering BARD product!

Phi Mangler is a four-stage Vactrol-based phaser that utilizes pentode VCA for controlling feedback amount. Providing wide frequency response and non-linearity of the vacuum tube, this module is capable of creating very distinctive phasing sounds.

Besides being a phaser, Phi Mangler can be used as a vacuum tube VCA channel.

Autogain feature provides limiting to the VCA signal that can decrease dynamic range and create another dimension for saturated feedback oscillation sounds. Send-return of the feedback signal is possible.

Since both frequency and resonance can be controlled by control voltages, it is easy to create drum sounds and complex waveforms with the unit.

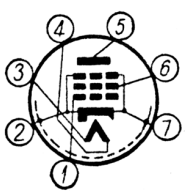
On top of all of that, Phi Mangler can be used as a envelope follower which is internally utilized in feedback path autogain functionality. It can be patched back to frequency control to create "Envelope Filter" effect.

Having 28mm in depth, the module is skiff friendly.

Tube protrudes 41mm from the panel surface.

Module Specification

Current draw	
+12V	20mA
-12V	18mA
+5V (startup)	320mA
+5V (running)	170mA
Dimensions	
Width	10HP (50.5 mm)
Depth	28 mm
Height (Tube)	41 mm
Weight	141 g
Vacuum Tube	
Type	6J1P (6Ж1П)
Service life	>3000 hrs.



Built & designed in E.U

Component fuctions

1 Resonance / VCA offset amount

2 6J1P (6Ж1П) vacuum pentode

3 Phasing frequency manual control

4 Phasing frequency indicator LED

5 Non-inverting input attenuator

6 Frequency CV attenuverter
This input alters CV amount from the 11 FREQ jack.

7 Non-inverting audio input

8 Inverting audio input
Connecting signal to this input breaks feedback path and converts the module to non-resonant phaser / tube VCA

9 Envelope Out
This outputs internal Envelope Follower voltage. Can be patched back to 11 FREQ input for a “wah” effect or used with other modules.

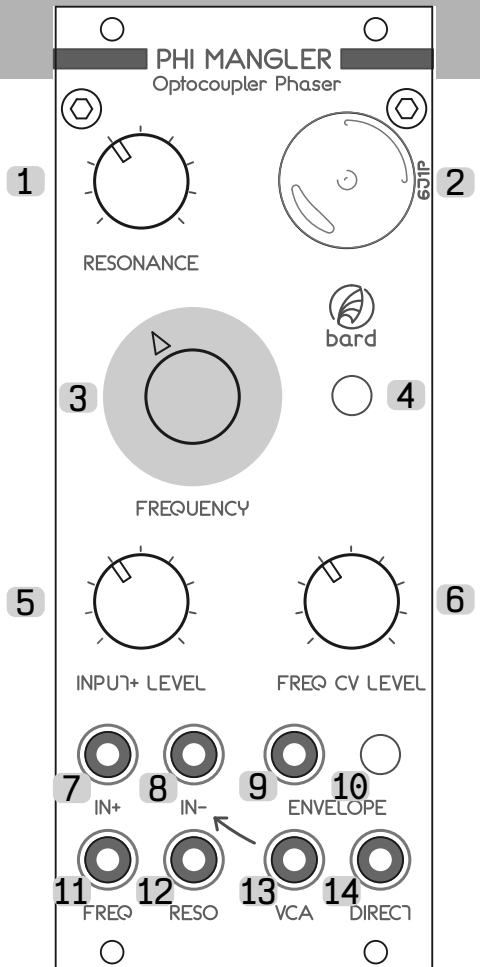
10 Envelope Amount indicator LED

11 Frequency control input CV
Patch your LFOs, Envelopes, Gates or Triggers here!

12 Resonance control input CV
Alters Resonance / VCA Gain amount

13 VCA Output
Audio output taken from tube VCA stage.

14 Direct Output
Audio output taken from phase shifter stage.



Function Overview

Phi Mangler is an optocoupler type 4-stage phase shifter with a tube VCA for the feedback control. Thanks to its architecture it can be used as a resonant phaser or tube VCA with non-resonant phasing.

It accepts two audio inputs, of which one is inverting. One of them is being attenuated by "INPUT+LEVEL" control. The audio inputs are DC Coupled, which means that slow modulation sources can be mixed together with audio signals to create offsets inside the circuitry for saturation / distortion effects.

Module has two outputs - the Direct Out is connected directly after the 4-stage Phase Shifter and the VCA Out is connected after the Tube VCA.

RESO Control voltage input enables gain adjustments for tube VCA. Bipolar envelopes or modulation sources are accepted, but these will be clipped to unipolar output.

The TUBE BIAS and Reso CV Reject trimmer controls on the back should be used to adjust resonance ranges if the new tube is installed. In other cases, there is no need for the adjustments to be made.

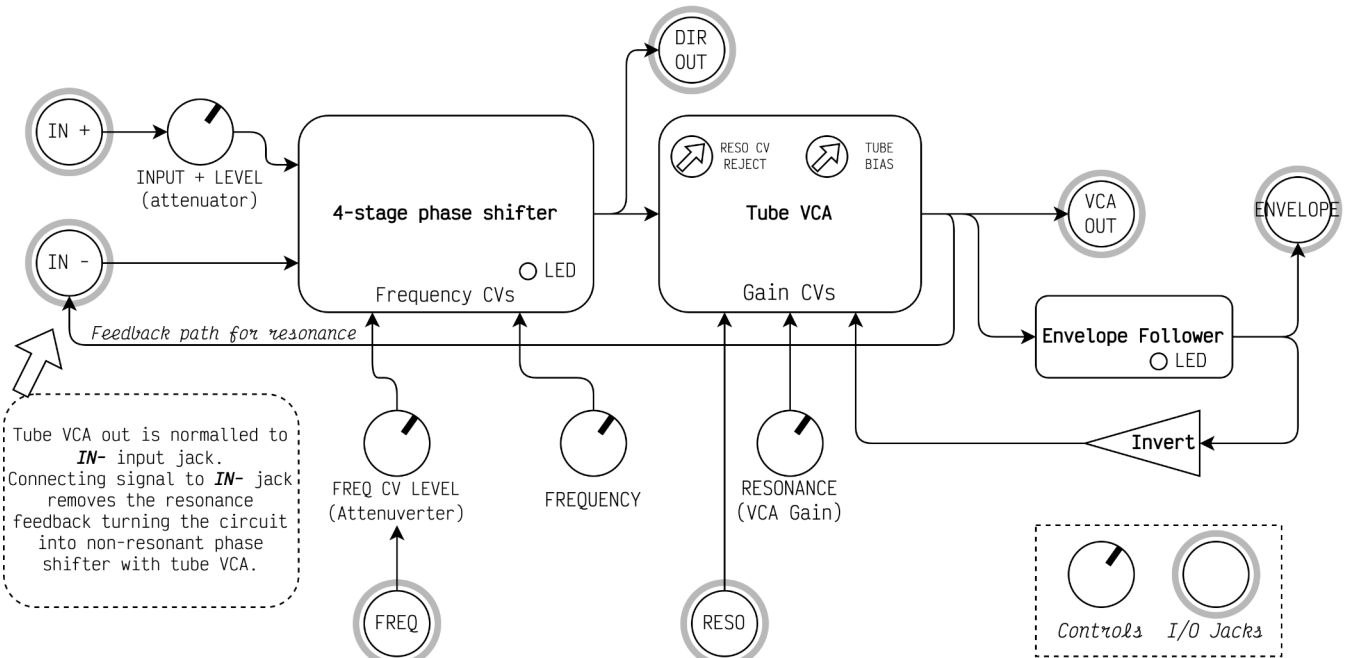
The Frequency LED Display shows current voltage level going into the optocouplers - the brighter, the higher is the frequency.

Module can accept wide dynamic range of signals and easily handles amplitudes as big as 25V peak-to-peak. The output is typically in ranges of 12V peak-to-peak. The output voltage and saturation characteristics will vary significantly over different settings and the user is encouraged to experimwnt with different amplitude settings.

Due to the nature of the optical cells used in the module, it is not capable of V/oct tracking - although its quasi-exponential response is still finds practical use.

The Envelope Follower in the module is used to limit the oscillation amount when the resonance is set very high - this limiting behaviour together with tube VCA distortion creates unique sound stamp and makes resonance control more feasible. The Envelope Output is available to external use.

Block Diagram

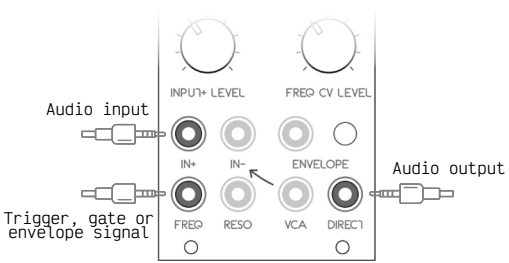


Phaser - resonant

In this setting module operates as a classic phaser with resonance.

Audio signal is inserted into IN+ input, the LFO or other modulation source is being inserted into FREQ input and the processed signal is retrieved on the DIRECT output.

User can create send/return using VCA output as a send and IN- as a return for feedback path. Otherwise, The IN- should be left unused in this mode since plugging anythting here will disconnect resonance path.



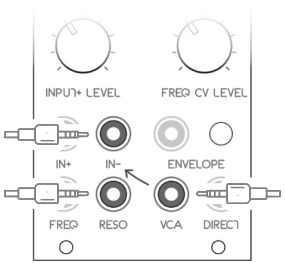
Tube VCA

In this mode module operates as a non-resonant phase shifter followed by a tube VCA.

Audio signal is inserted into IN- input, Gain CV should go into RESO input and the output signal should be retrieved from VCA output.

In this mode Resonance knob creates fixed offset on VCA gain, which can be used as a dynamic tool for "trimming" or "expanding" input envelopes. The internal envelope follower creates compression effect when the higher control voltages and input signal amplitude are present.

Additionally, another modulation source can be used on FREQ input for simultaneous vibrato effect and IN+ can be used as a secondary audio input.

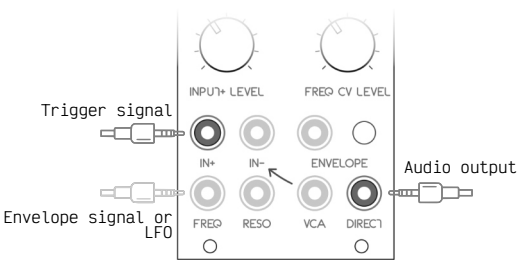


Pingable drum

In this mode trigger signal is being converted to drum sound utilizing resonant phasing - this can be used to create kick drums, toms, conga sounds or other. Processed audio is available on the DIRECT output.

Control voltage for pitch manipulation can be connected to FREQ input.

RESO input, depending on the RESONANCE control setting, can act as an accent input or decay CV control input - the amount of that control should be set in the preceeding module in chain.



Additional configurations

ENVELOPE output can be plugged back into FREQ input to create "auto-wah" effect on signals. This can animate the phasing sound without the need for external LFO / envelope source.

Both IN+and IN- inputs can accept signals, creating simple 2-channel mixing.

VCA and DIRECT outputs can be used together with external mid-side decoder to create stereo effects - in that case Resonance control will adjust stereo width.

Warranty

Disclaimer: This Warranty applies to products purchased directly from BARD Synthesizers. For products purchased from distributors, the warranty terms and conditions may be different. Please check the warranty terms and conditions with the distributor from whom the products were purchased.

This BARD Product has Limited Warranty that covers any defects in material or workmanship under normal use during the Warranty Period.

During the Warranty Period, BARD will repair or replace, at no charge, products or parts of a product that proves defective because of improper material or workmanship, under normal use and maintenance.

The Warranty Period for Eurorack series products purchased directly from BARD Synthesizers is 3 years from the date of original purchase.

A replacement of product or part assumes the remaining warranty of the original product or 180 days from the date of replacement or repair, whichever is longer.

If you do have an unit that has problems, please contact me, we'll solve them. In some cases, I reserve the right to charge for labour, parts and transit expenses where applicable.

About BARD

BARD is an one-man operation focusing on incorporating old technology into a modern musical world. I utilize vacuum tubes in creation of synthesizer circuits, embracing simplicity of their design and extracting yet unexplored sonic qualities.

BARD is an acronym that expands to Brain Aided Radical Designs.

All devices are hand-built and carefully tested, and so they should be played with heart.

Visit `bardsynthesizers.com` for more information about products and projects.

Feedback, suggestions, questions:

`bardsynthesizers@gmail.com`