

Twins  
user manual v.1.0

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# Introduction

Thank you for ordering BARD product!

The Twins is an dual channel, single output wavefolding cell intended for extreme saturation and cross-modulation experiments. It uses two 6N3P double triodes configured as single differential wavefolding stage, preceded by two independent photoresistive gain cells, enabling mixing and modulating two audio sources together.

Twins merges two signals together, causing both of them to act as an source and modulation. With addition of two gain cells it can alter the dynamic of your sound sources, act as an double, wavefolding LPG and do many more.

Diverse applications from oscillator waveform shaping to processing entire tracks are possible.

The module is skiff friendly.

# Module Specification

## Current draw

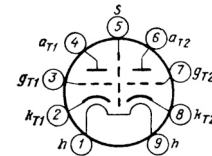
+12V	18mA
-12V	18mA
+5V (startup)	1200mA
+5V (running)	590mA

## Dimensions

Width	10HP (50.5 mm)
Depth	38.7 mm
Height (Tube)	48 mm
Weight	145 g

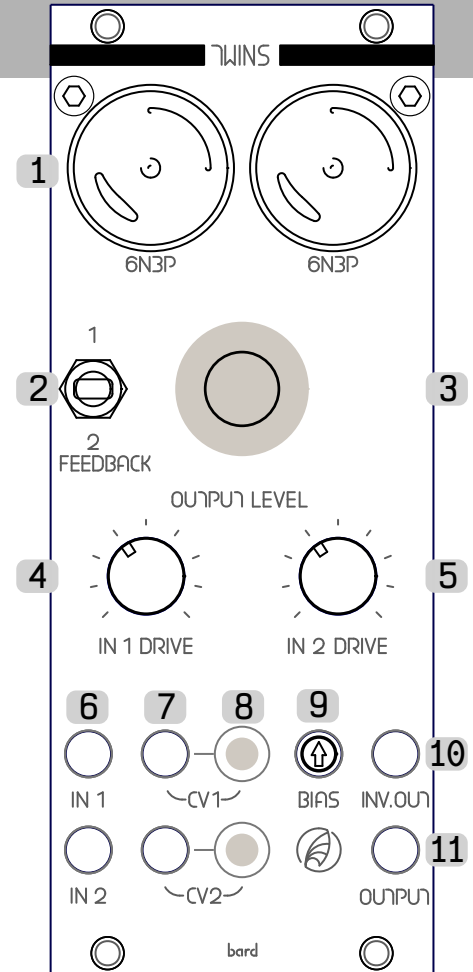
## Vacuum Tube

Type	6N3P (6H3Π) x2
Service life	>3000 hrs.



# Component functions

- 1 6N3P(6H3Π) double triode
- 2 Feedback direction switch (Output to CH1 / none / CH2)
- 3 Output level control
- 4 Input level control
- 5 This control sets the amount of energy put from the IN jack. Input drive affects feedback amount.
- 6 Audio inputs  
This input receives 5V DC when nothing is connected to it.
- 7 Control voltage input
- 8 Control voltage indicator
- 9 Bias trim - zero offset  
Sets the zero offset for the CV / photoresistive gain cells.
- 10 (Inverted) Audio output  
Direct output after the triode amplifier. This output is unaffected by the Output Level control.
- 11 Audio Output  
This output is affected by the Output Level control.



# Function Overview

The Twins uses two 6N3P double triodes configured as single differential wavefolding stage. It accepts two inputs, of which one is inverting. Both of them are attenuated by "IN DRIVE" control. The audio inputs are DC Coupled, which means that slow modulation sources can be mixed together with audio signals to create offsets inside tube amp. Signals from the gain cells are optionally mixed with the output of the amplifier (using Feedback switch), creating either positive feedback (when fed back to Non-inverting input) or negative one (when fed back to Inverting input).

+5V constant voltage is applied by default to both of the CV Inputs and to the second audio input That enables use of the module without CV Inputs connected and enables use of IN 2 DRIVE control as DC offset for wavefolding operation. Plugging control signal into CV Input overrides the constant +5V. Signal is AC-Coupled after the Tube amp.

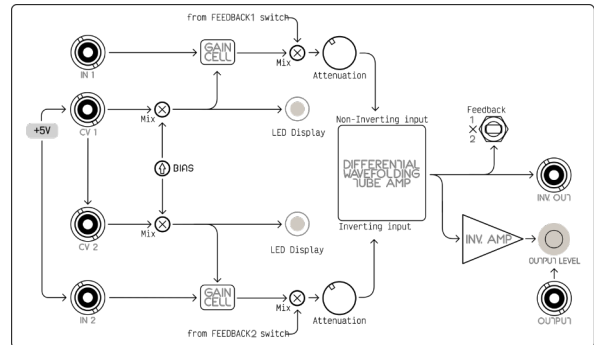
Control voltage inputs enable gain adjustments in Gain Cell stages. Unipolar envelopes or modulation sources are accepted.

The BIAS trimmer control on the front enables to shift the default operating point of the Gain Cells. It does simply mix offset voltage together with CV Inputs.

The LED Display shows current voltage level going into corresponding Gain Cell.

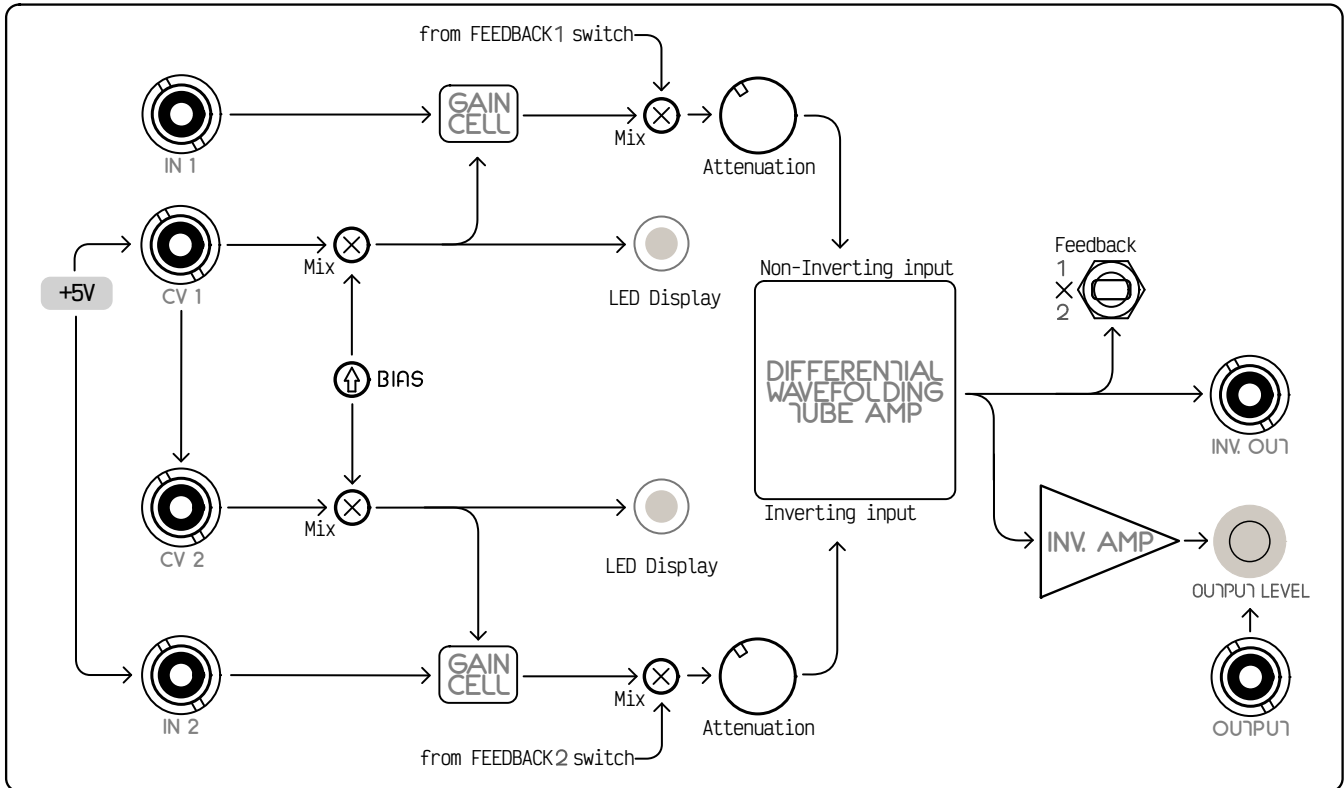
Module has two outputs - the Inverting Output is connected directly after Tube amp and the Output (non-inverting) is connected through the Output level control and can be attenuated.

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 will vary significantly over different settings, hence the output level adjustment control.



Block Diagram

# Block Diagram



# 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](http://bardsynthesizers.com) for more information about products and projects.

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