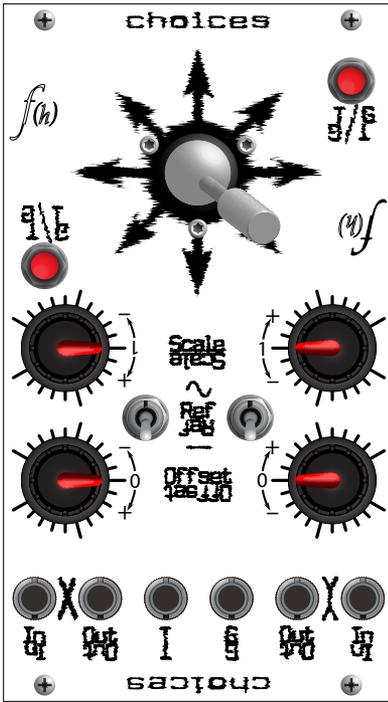


*flight of harmony*



Eurorack and Fractional-rack Modules  
~rev1.1~



### Specifications

Supply Voltage (min -> max)	$\pm 9V \rightarrow \pm 15V$
Supply Current (max draw @ $\pm 12V$ )	+12V: 14.1mA    -12V: 13.7m.A
Input Voltage (@ $\pm 12V$ )	$-V_{supply} \rightarrow +V_{supply}$
Max Output Voltage	$\pm 12V$
Input & Ouput (I/O) coupling	Direct
Output Impedance	1k $\Omega$
Scaling	0% -> 200% / $V_{supply}$
Offset range	$\pm 5V$
Gate output	Off: $-V_{supply}$ On: $+V_{supply}$
Trigger Output	Off: $-V_{supply}$ On: $+V_{supply}$
Trigger duration	1.5ms

## Components

1	Assembled Choices module
1	DC power cable – (euro) 9" Ribbon cable w/10-&16-pin 0.1" connectors (frac)18" 4-wire cable w/ 4-pin 0.156" connectors

## Overview

Well, it's a joystick, isn't it? A basic joystick is used to provide an easily-varied control voltage (CV) to other modules, often allowing the input of a DC CV that is then either amplified or attenuated by the joystick before being sent out to other modules.

The Choices joystick is designed to have as much utility as possible while keeping the price down. Offering only DC control seemed improper, so the Choices was configured to operate with AC input as well as DC. A brief rundown of the features:

- It can be oriented with joystick at the top or the bottom to best suit its location in your system.
- Separate Gate and Trigger outputs
- Two trigger buttons for ease of ambidextrous access, regardless of orientation.
- Toggle switches to select optimal reference level for either AC or DC inputs.

## Usage Details

Supply: This design has been tested from  $\pm 9V$  up to  $\pm 15V$  and works well in this range, although performance specifics will vary with supply voltage. All measurements, unless stated otherwise, assume  $V_{\text{supply}} = \pm 12V$ . All units have a polarized or shrouded power header to ensure proper connection. Supply polarity symbols are also silkscreened on the PCB in case of non-standard cables or supply bus.

Orientation: Choices is configured to operate with the joystick at the top by default. If you wish to rotate the unit, the output will be reversed in respect to the operation of the joystick - up will decrease, down increase, left increase, right decrease. To correct this, simply unplug the green connectors that are connected to the joystick, rotate them  $180^\circ$  and plug them back in.

Joystick tension/mobility: All joysticks have a clear silicon lubricant applied to the ball joint during assembly for ease of motion. If the motion becomes "dry" over time, lube it up baby. Electronic control lubricant is recommended.

Each joystick assembly is slightly different in its physical

dimensions, which affects the feel of the unit. Because of this, no fixative has been applied to the three machine screws that hold the assembly to the panel. The feel can be adjusted by tightening or loosening these screws with a T6 Torx® or equivalent Star-drive driver. In case a screw should become lost, they are M2x0.40 7mm button-head machine screws.

### Controls, I/O

X: Horizontal axis, left or right motion output

Y: Vertical axis, up or down motion output.

Scale: Controls the scaling/gain of the signal. Middle position is unity gain/1:1 scaling, counter-clockwise attenuates, clockwise amplifies.

Offset: Controls the offset or bias of the signal. Used to shift the output up or down.

Ref: Reference level for input. Put switch lever in direction of the wavy line if using an AC input signal, or toward the flat line for a DC signal.

In: Input signal goes here. When a plug is inserted, the unit automatically switched from internal DC source to the input signal.

Out: It's the output, where the new signal comes out.

I: Trigger output.

G: Gate output.

I/G: Pushbutton to initiate Trigger and Gate signals.

### Bias adjust

— fig. 1 —

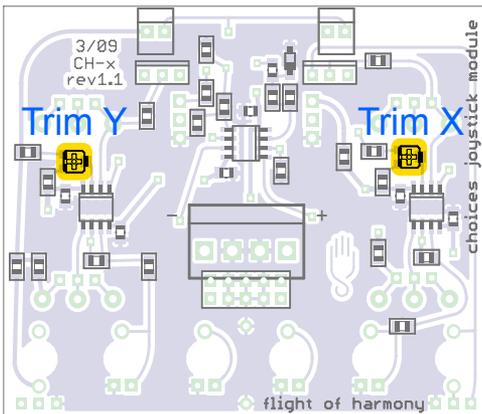


Figure 1 shows the rear of the PCB. The trim pots shown control the default amount of bias or offset of the output.

During testing, the unit is adjusted for minimal bias with an AC input signal. This will not satisfy all situations of course, so you may adjust the bias to suit your needs.

## Stuff

There is a lot of discussion about new and upcoming f(h) modules on the Muffwiggler forums, come check it out! People have posted some excellent demos on there. I haunt the forums as well, and new things are posted there long before they hit the f(h) website.

<http://www.muffwiggler.com/forum/index.php>

A big thank you to those who have sent in suggestions and comments, keep them coming!

Send samples to: [samples@flightofharmony.com](mailto:samples@flightofharmony.com)

Comments, suggestions, complaints to: [flight@flightofharmony.com](mailto:flight@flightofharmony.com)

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we miss them.

*f*(*h*)