

### Why match JFETs?

Matched JFETs are required for many guitar related effects circuits as linear amplifiers or phaser pedals (Phase 90 for example). Perhaps the best resource for learning more about matching JFETs is from one of the most knowledgeable in the business – Mr. R.G. Keen. His page at Geofex is a wealth of information regarding the subject:

[http://www.geofex.com/article\\_folders/fetmatch/fetmatch.htm](http://www.geofex.com/article_folders/fetmatch/fetmatch.htm)

JFETs do not have a published exact off state ( $V_{gs}$  OFF) therefore when using multiples in a circuit, matching them is crucial to best performance when using in phasers and other effects which rely on match  $V_{gs}$  OFF voltages.

## Operation:

The Rullywow JFET Matcher PCB is really simple to use.

- Connect 9VDC either by the DC mount (center negative) jack or to the “+” and “-” pads on the PCB.
- Insert your JFET into the sockets, paying attention to the pinout (D/G/S)
- Measure voltage with your multimeter at the “DMM” test points
- Sort and label your JFETs by voltage (yay!)

## Assembly:

The PCB is designed to be either etched at home or can be ordered through OSH Park. In either case, you will find four 4-40 mounting holes which you can use to mount the PCB to a backing plate, block of wood etc. to prevent shorts while in use. Or just slap some tape on the backside to prevent shorts.

## OshPark Link to Order Fabled PCBs:

[https://oshpark.com/shared\\_projects/tG4sSkqf](https://oshpark.com/shared_projects/tG4sSkqf)

## Bill of Materials:

3qty – 10k resistor (1/4w)

1qty – 10 to 47uF electrolytic capacitor

1qty – 0.100” header SIL socket (strip of 5)

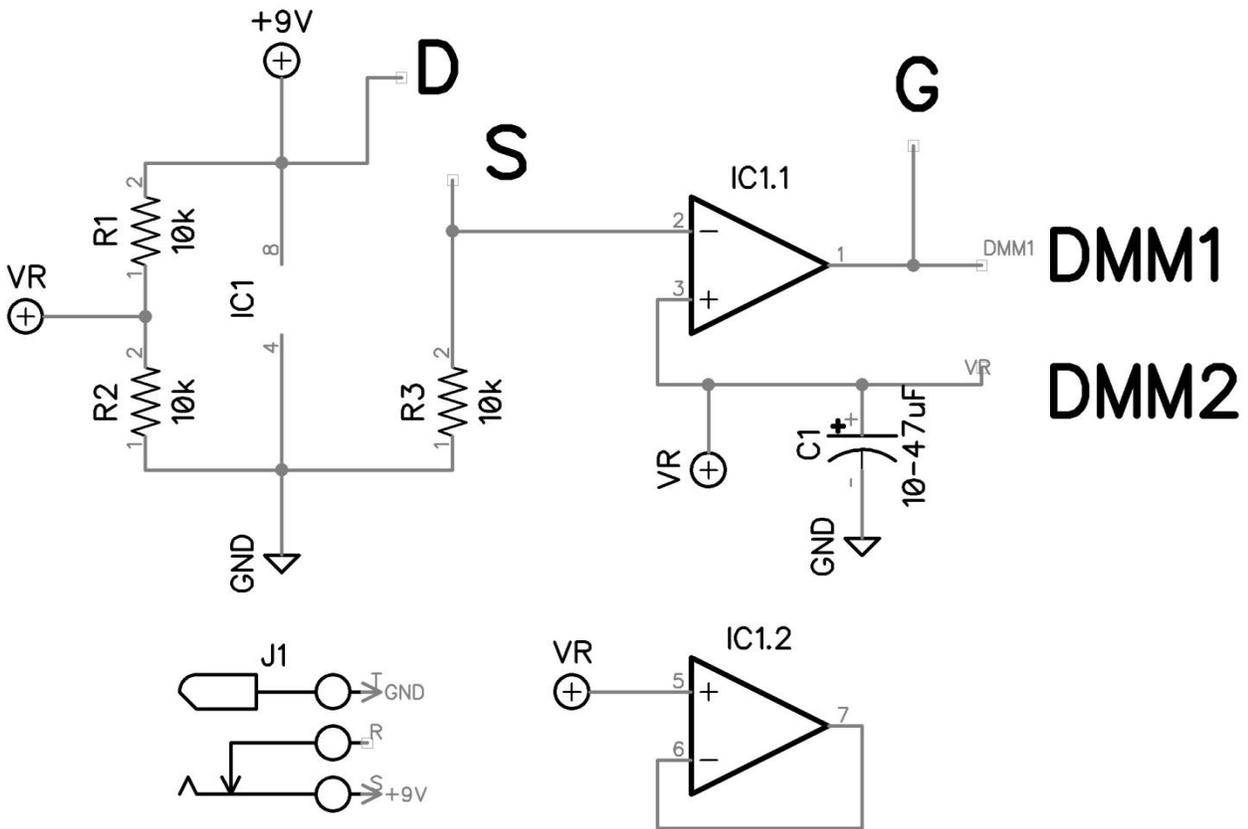
1qty – DIL8 Dual Op Amp (any 4558, TL072 etc will work great)

1qty – DC PCB Mount Jack (Kobiconn style) [optional]

1qty - PTH Test point 534-5010 [optional]

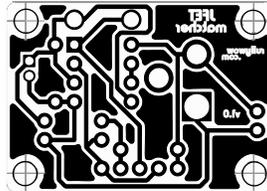
1qty - PTH Test point 534-5011 [optional]

Schematic:



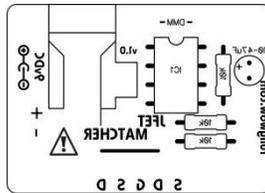
## PCB Etching Layout:

**PCB dimensions = 1.4" x 1.0"**



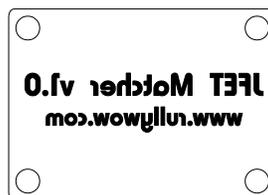
## PCB Top Silk Screen Layout (optional):

**PCB dimensions = 1.4" x 1.0"**



## Acrylic Backplate (optional):

**Plate dimensions = 1.4" x 1.0"**



## Tips:

- Don't forget the jumper (in red) on the top side if using the etched layout! You can use a piece of wire or a zero-ohm resistor for extra style points.
- You can use just about any dual op-amp you have kicking around. Most pedal builders seem to have a lot more duals floating around than singles, hence why this PCB is designed for a dual op amp.
- The DC jack is a standard 2.1 Barrel Type PCB Mount. This is the same type used in many guitar effects pedals and the center tip is negative (just like most guitar pedals). Tayda Electronics has these jacks as part number A-4118.
- The top silkscreen art is provided. Simply etch and drill the board as normal first. Then align this toner transfer on the top of your PCB and transfer it with your iron or laminator to the top side of your board. Spray some clear acrylic clear coat to protect the toner transfer. This is helpful to locate the D/S/G sockets during use. Or you can just label the sockets yourself with a pen, fine tip marker etc.
- The artwork for an acrylic backplate is provided if you have access to a laser engraver.
- You don't have to use the 9V DC jack if you don't want to, just use the DC pad hookups. The pads are spaced 0.100" so you can use many different types of PTH connectors like JST or Molex style.
- Any capacitor from 10uF to 47uF will work fine. 5mm diameter preferred and 16v or higher rating.
- The holes for the DMM connection are designed to work great with Mouser part number 534-5010 and 534-5011 DMM test connectors in red & black. These are about \$0.30 each next time you place an order with Mouser. Or you can roll your own with a loop of solid wire for your DMM to grab on to your DMM test lead hooks (as seen in the picture).
- Instead of a SIL socket, you may wish to attach leads with alligator clips – totally your call. SIL sockets keep it self-contained and neater but it's up to you.

## Terms of Use:

- PCBs from [www.rullywow.com](http://www.rullywow.com) are intended for DIY use and are not allowed for commercial resale. Share and share alike, this is intended to help those in the DIY pedal community match their JFETs.