JCM 800 Emulator

Based on:
JFET Conversion

Amount of parts:
Low, total 22 components

Enclosure type:
125B

Effect type:
Overdrive/Pre-amp

Technology:
JFET J201 cascade

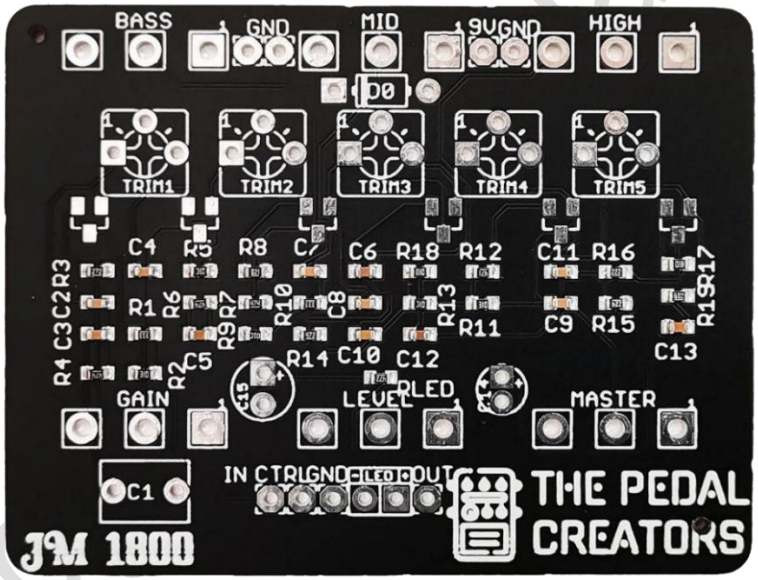
Get your board at:
JCM-800 Emulator SMD

Build difficult:
Easy

Power consumption:
4mA (9v) / 10mA (18v)

Get your kit at:
Das Musikding (Europe)

Project overview:
The JCM 800 pre-amp emulates the tone of the classic Marshall's JCM 800, using the same circuit schematic that you will find in the most famous British Amps from the 80's, using JFET transistors instead of vacuum tubes.



About The Pedal Creators

Everyone can build excellent boutique guitar **pedals**.
Everything **we do** is to make that **experience** more accessible and **user-friendlier.**
The **Pedal Creators** series are the **best and easiest to build PCB**s ever. Including most **resistors** and **capacitors** already **soldered** on board as SMD components, leaving the key values for you to **experiment** and craft **your own tone**.
Now you can **build** a pedal you are **proud** of in **less than an hour** without any previous experience.
What are you waiting for to **become a Pedal Creator?**

The Pedal creators - key features:

- **Easy to build,** no previous experience required. It's like Lego for musicians.
- **Fast assembly** finish a pedal in less than an hour. Play your favorite record and enjoy the ride along.
- **100% mistake-proof**. Even my grandma can build one while she cooks.
- **Build** your own boutique pedal. Experiment with different values and make the **pedal you always dreamed of.**
- Easy to scale. **Turn your passion into a money-making machine**.

Index

Introduction

This circuit has been developed to recreate all the gain and tone from the famous Marshall's JCM 800 Pre-amps, replacing the vacuum tubes for the JFET J201.

The origin of this design goes back to 2004, by an schematic published by Electric, following the same conversion style as the ROG designs as the Azabache, Britania, Thunderbird,etc.

This version includes five trimmers to bias the JFET at taste. Also features pads to use standard through hole J201 or the more available and reliable SMD version.

Controls

The JCM-800 Emulator features a six controls, Gain and Volume control, Master to control the output of the Pre-amp stage and a 3 band Marshall tone stack.

- Bass – Tonefor the bass frequencies.
- Mids – Tone for the mids frequencies.
- Treble – Tone for the treble frequencies
- Master – Controls the output of the preamp.
- Level – Controls the output volume
- Gain – Controls the preamp gain

Bill of materials

Capacitors	
Part	**Value**
C1	680n
C14	1uf
C15	100uf

Transistors	
Part	**Value**
Q1	J201
Q2	J201
Q3	J201
Q4	J201
Q5	J201
Q6	J201

Diode	
Part	**Value**
D1	1n4001
D2	3mm Led

Trimpots	
Part	**Value**
TRIM1	100k
TRIM2	100k
TRIM3	100k
TRIM4	100k
TRIM5	100k

Pots	
Part	**Value**
GAIN	1M A
HIGH	250K B
BASS	1M A
LEVEL	100K A
MASTER	1M A
MID	25K B

Shopping list

Electrolytic Capacitors		
Qty	**Value**	**Parts**
1	680n	**C1**
1	1uf	**C14**
1	100uf	**C15**

Potentiometers		
Qty	**Value**	**Parts**
3	1M A	**GAIN, BASS, MASTER**
1	250K B	**HIGH**
1	100K A	**LEVEL**
1	25K B	**MID**

Diodes		
Qty	**Value**	**Parts**
1	1n4001	**D1**
1	3mm Red LED	**D2**

Trimpots		
Qty	**Value**	**Parts**
5	100k	**TRIM1, TRIM2, TRIM3, TRIM4, TRIM5**

Transistors		
Qty	**Value**	**Parts**
5	**J201***	**Q1, Q2, Q3, Q4, Q5, Q6**

Components Recommendations

For this project is a must to use **JFET J201*** from a trusted source such as Das Musikding, Small bear, and many other pedal related suppliers. DO NOT trust non verified vendors, as are many counterfeits out there, and they won't work properly on your build.

This board features the possibility of use the SMD (Surface mounted device) J201, as well as the classic format TO-92 (regular transistor) now discontinued; place either the SMD version or the standard one per transistor position.

As many people like to experiment some pedals with higher voltage, always ensure the max tolerance of your **electrolytic capacitors**** is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf, and ceramics discs for the ones under 1nf. However, high quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance.

All the resistors used for testing this project are 1/4W Metal Film.

This board features five trim pots to bias the JFET J201.

The BOM and Shopping list are exclusively regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

Build Notes

If this is one of your first projects I recommend you to take a look on our Pedal Building Guide

For a successful and tidy build it's recommended the following order:

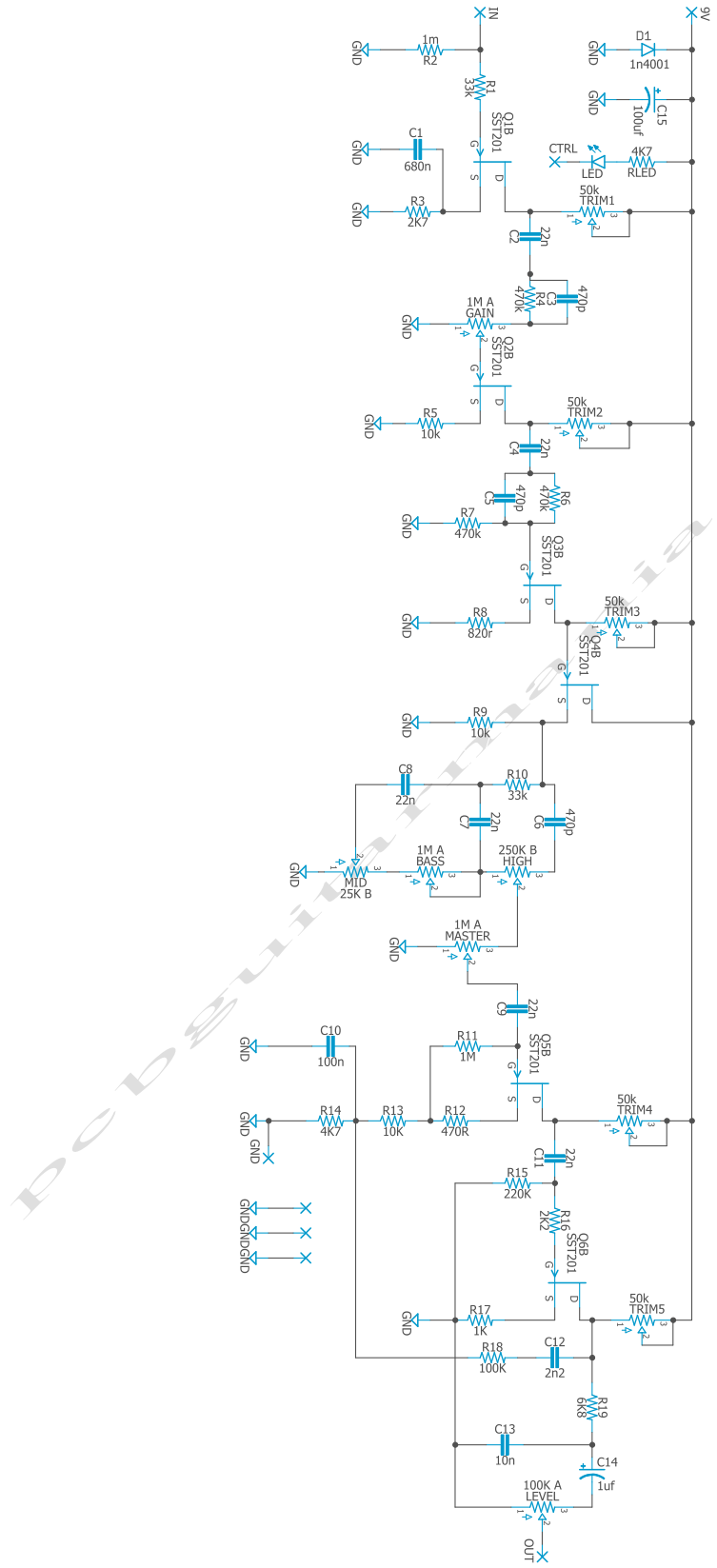
1. SMD Transistors
2. Resistors & diodes
3. Capacitors, starting with the smaller ones and the ceramic ones.
4. Electrolytic capacitors (always check the polarity)
5. Transistors
6. Wires
7. Potentiometers and switches
8. Off board wiring
9. Transistor bias

To bias correctly the transistors you must plug your finished build into the power supply first. With your tester on voltage mode (V20) plug the negative tip into the ground of the project, some alligators could be really helpful. With the positive tip touch the Drain leg of your transistor and it should appear the voltage on your tester screen. Tweak the trim pot till you read 4.5v if you are using a 9v power supply. Do the fine adjustment by ear, in order to bias at your own personal taste.

Recommended voltages:

- Q1: 3.9v
- Q2: 6.9v
- Q3: 4.0v
- Q4: No sensitive to Biasing by trimpots
- Q5: 5.6v
- Q6: 2.7v

Schematic

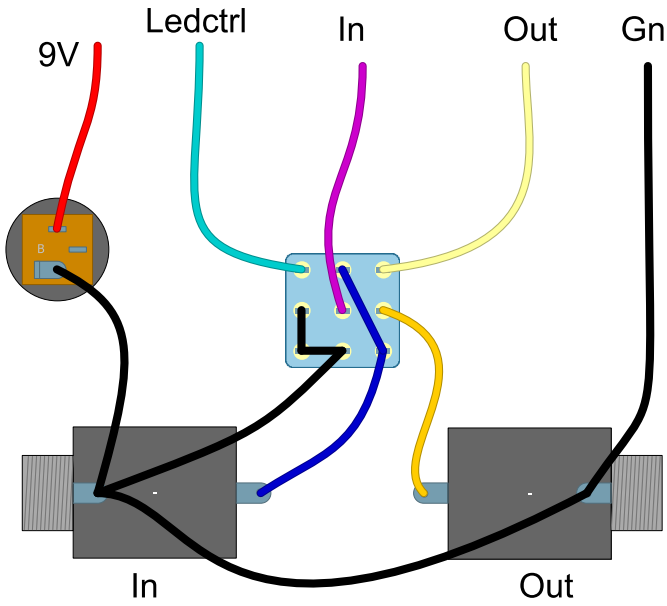


Wiring Diagram

All our projects include a free 3PDT Board to make the wiring easier and tidier. Also all of our PCBs feature the status LED on board.

The pad named “Ctrl” or “LED” is the one that controls the status of the led, wire it to the “LED”pad on the 3PDT board, or in control slug of your 3PDT.

You can take a look on the following diagram to understand the general connections. For further information check our Pedal Wiring guide.



Drill Template

This Project has been planned to fit into a 125B enclosure type (122x67x35mm approx.)

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print in a A4 page.

Licensing and Usage

We really appreciate your trust and support buying this PCB, as well as your will to dive into the DIY electronics world. That’s why for us is really important that you can make this project work properly and to enjoy not only the building process, but also to experiment and play with it on your rig.

We try to reply to every question we receive on our email or in our social media, but we try to encourage

all our customers to join our PCB Guitar Mania – Builders Grup on Facebook, in order to post all your doubts, issues, suggestions or request, as well to share your builds and have some feedback from us and other fellow builders!

All of our projects have been tested following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been tested. These are suggestions based on the schematic analysis, and on the experiences and opinions of others. Feel free to share with us your opinions and suggestions regarding the mods our your own personal experimentation.

These boards may be used for commercial endeavors in any quantity unless specifically noted. No attribution is necessary, though accreditation or a link back is always greatly appreciated.

If you are a builder planning to make your own run of pedals we also offer the service of custom made boards with your brand and logo, design according your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silk screen, or other way of trying to hide our logos and the source of the PCBs. Like its written above, if you want to have your own designs, with your brand and logo we could certainly reach an agreement.

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