



DIST (Distortion Plus, DOD 250 Overdrive or Ross Distortion Replica) Instructions

Version 2021October03

Copyright 2014, 2021 JD Sleep

Permission refused for posting/serving this file from any site other than www.generalguitargadgets.com

Trademarks are property of their owners

This is the Build Instructions for: a replica of any of these:

MXR Distortion Plus
DOD 250 Overdrive
DOD 250 Overdrive ('77 Gray Version)
Ross Distortion

The Kit is referred to as **DIST** in these documents. These distortion units are very similar, differing in only a few part values, circuits being almost identical. For that reason, we have the same circuit board and we have one set of instructions that apply to all units. The Ross Distortion should be mentioned here as well, since it is an almost identical circuit, but uses half of a dual IC instead of the 741 IC.

About the Part Values

There have been variations on part values for both the Distortion Plus and the 250 Overdrive over the years, and both have been discontinued at one point and reissued after several years of absence on the new pedal market.

When we speak of the "741" IC in this project we are referring to an of the manufactured versions: UA741, LM741 or JRC741 with various suffix letters possibly tagging on to the part number.

The Ross Distortion originally used a dual opamp. Also some of the reissues use dual opamps. If you are looking for an absolute part-for-part replica of the Ross, you'll have to look elsewhere since the layout of the PCB is for a single opamp, not a dual. We believe that the 741 will sound wonderful even in the Ross.

All Units

- We cannot over-emphasize the importance of using the "741" IC for this unit. There are lots of pin-compatible single-opamps available with much better quality and better specs. It may be tempting to use something else, but this distortion "plays" off the specs of the 741 to some extent. It is highly recommended to stick with the 741.
- The diodes vary from unit to unit. See the Bill of Materials for the unit you are building. The Ross Distortion used germanium diodes with very good results. Also, red LEDs have an excellent sound in this distortion (Kits do not contain



DIST (Distortion Plus, DOD 250 Overdrive or Ross Distortion Replica) Instructions

Version 2021October03

Copyright 2014, 2021 JD Sleep

Permission refused for posting/serving this file from any site other than www.generalguitargadgets.com

Trademarks are property of their owners

red LEDs though).

- There are three jumpers that are built in to the top layer of the PCB. They are sort of violet color on the layout/wiring diagrams. If you are using one of our PCB, you do not need to install jumpers there.

The Distortion Plus

The Volume Control potentiometer has been traced as 10k log or 50k log on some versions, The reissue has a 100k log potentiometer. For best results in output volume, use the 100k log potentiometer. It won't change the sound characteristics, but will give a better output volume control.

The 250 Overdrive

This project covers two of the versions, an early version in a gray painted box and the later yellow box version, Here's some notes on some part value variations.

- Some versions had **R12** (100 ohm resistor) and some didn't. If you use strictly battery power, you probably don't need it. If you want to include it, it will have to be solder tacked on to the DC jack or off the PCB power pad.
- Some versions have **C5** of 25pF and some versions don't have it. If you don't use it, just omit it and don't use a jumper. If you use a 741 IC, you probably won't need it. For other pin-compatible ICs that you might use, it may be useful to smooth down the high end.
- Some schematics on the web list **R6** in the DOD 250 Overdrive as a 47k resistor. The gray version had a 47k value. The 47k value should raise the minimum level of overdrive to some extent, which is probably not a bad thing since the minimum level with a 4k7 is very weak. Consider using the 47k value for **R6** for any version you build.

Building

- Use the project documents provided, starting with the General Build Instructions. Follow the layout diagrams to add components to the PCB and the wiring diagrams to hook it all up. There are photos in this document to give some ideas of the overall layout and wiring.
- Note that there are two jumpers on the diagrams, if you look at the PCB that comes with the kit, you can see that these jumpers are already on the top layer of the PCB, there is no need to install a jumper in those positions. There is a



DIST (Distortion Plus, DOD 250 Overdrive or Ross Distortion Replica) Instructions

Version 2021October03

Copyright 2014, 2021 JD Sleep

Permission refused for posting/serving this file from any site other than www.generalguitargadgets.com

Trademarks are property of their owners

jumper included in the kits that can be used for D3 if you don't do asymmetrical clipping arrangement.

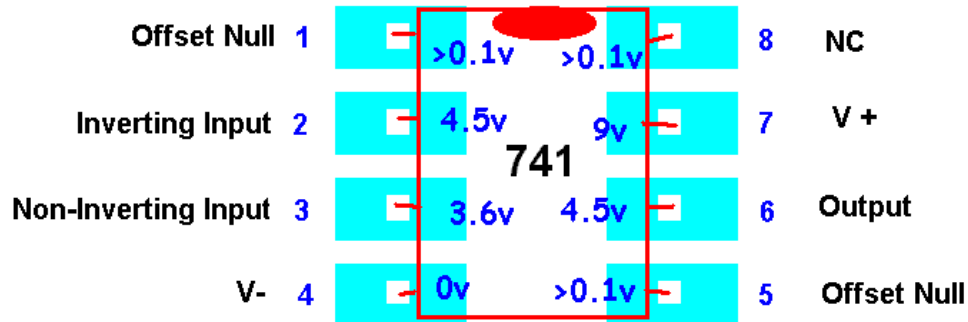
- There is lots of room on the PCB for mods. Extra clippers can be put in the feedback loop in D4 through D7. This will give more distortion as you would expect. D1 and D2 have extra holes so that you could add extra diodes there (standing on end) for a more "over drivey" sound. C9 is normally not used and is jumpered, but if you added a tone control you can cut the jumper and add an output capacitor there.

Comments and questions are welcome and can be sent to info@generalguitargadgets.com

Here is a chart of voltages taken at the IC pins. This information can be used to help you find and fix problems if your **DIST** doesn't work when you test it.

This is the layout representation of the "741" IC that is at the heart of the Distortion + and DOD250. This can be part number LM741N, JRC741D, etc. This is the top view of the IC as it sits on the circuit board. The red oval represents the "dot" on top of the IC that shows the orientation of the pins.

Dual-in-line Package



Pin Numbers are shown in blue. Pins 1, 5 and 8 are not used or connected to anything in this circuit. "V - " is connect to ground and "V +" is connected to the + 9 volt power source.

Blue numbers inside IC diagram are the approximate voltage readings in the Distortion + or 250 Overdrive circuit



DIST (Distortion Plus, DOD 250 Overdrive or Ross Distortion Replica) Instructions

Version 2021October03

Copyright 2014, 2021 JD Sleep

Permission refused for posting/serving this file from any site other than www.generalguitargadgets.com

Trademarks are property of their owners