

## GRO (Dan Armstrong™ Green Ringer™ Replica) Instructions

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This is a replica of the **Dan Armstrong**<sup>™</sup> **Green Ringer**<sup>™</sup> **Octave** (pseudo Ring Modulator) referred to as **GRO** in these documents. This Octave effect does not have any control knobs or switches, it doesn't need any, it's got a very nice octave sound somewhat unique from the other octave effects we have played.

Use the project documents provided, starting with the General Build Instructions. You should use a very low gain transistor for Q2, we believe the octave effect is more pronounced with a low gain transistor here. Q1 and Q3 type and selection is not critical to the sound. D1 and D2 can be just about any type of diode. Please Note: the PCB shows a 470k resistor value in the bottom right area of the PCB, this should be 47k.

Here's an inside view of the unit we built to give you some general ideas if needed.



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

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

Component	Location	Voltage	
9 volt power supply		8.8	
Q1	Collector	5.5	
	Base	1.8	
	Emitter	1.1	
Q2	Collector	2.6	



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	Base	5.5
	Emitter	6.2
Q3	Collector	8.8
	Base	4.0
	Emitter	3.4