# PT80 Digital Delay
# Instructions

This is the famous DIY PT-80 Digital Delay by Scott Swartz.  The idea here is to emulate the "old-time" analog delay unit, in this case the Ibanez AD-80 vintage stompbox, with a modern digital delay IC.  The results are excellent and you won't be able to tell that it's not 100% analog.  The general design of this circuit is almost the same as the AD-80 except the bucket brigade ICs are replaced with a Princeton Technologies PT2399 delay/echo IC and the electronic switching is replaced by a 3PDT stomp switch.  The compander IC gives it excellent noise specs and also contributes to the great analog-like sound.  A charge pump is on board so that it has plenty of headroom being powered from a typical nine volt power supply.  The charge pump was not part of the original AD-80, but is a modern bonus in this project enable it to use a typical 9v Boss style stompbox wallwart power.  **It is not feasible to use a 9v battery, unless you just want to run it for about 10 minutes or less before the new battery goes dead.**  Note that since there is no battery, the input jack is a typical mono jack.

Use the project documents provided, starting with the General Build Instructions. There are some options for power,  if you have a 15 or 18 volt DC power supply and want to use it to power the PT80, you don't need the charge pump and it can be omitted.  There is a parts diagram listed on the site if you want to build it without the charge pump circuit and plug 15 to 18 V DC directly into it.

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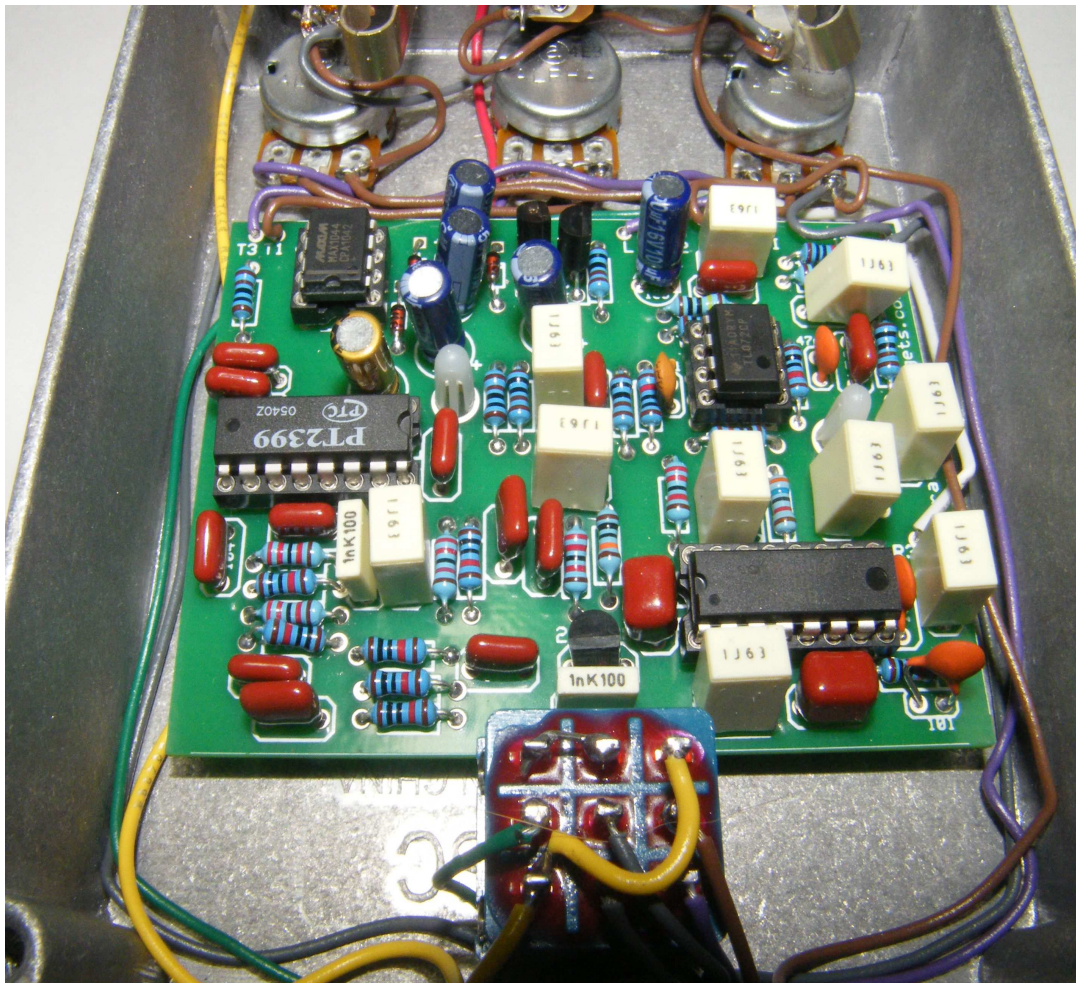The kit comes with the MAX1044 Charge Pump IC.  This unit will also run on 9v without the charge pump and if you put a jumper in place of the 12 volt regulator.  **We don't recommend this.**  It sounds "okay"  running on 9 volts, but it really should run above 12v for the best sound.   The AD-80 runs at 12v and has a 2-battery compartment, so to retain the "80" in the name, 9 volts power into the circuit is not quite right!

Here's an inside view of the unit we built to to show the completed stompbox.    The kit includes the charge pump and regulators so that you can run at 12 volts from 9v power.  Note that the capacitors in your kit may not match exactly to the photo.   The Kit comes with IC sockets for all the ICs.

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Here are some voltage readings in case you have any problems and need to check.

To check if the charge pump is working correctly, the voltage on the "top legs" (leg near the top edge of the PCB) of both regulators should be at about 16 volts. The "bottom legs" of the regulators should be 12 volts and 5 volts.

| Component | Location | Voltage |
|---|---|---|
| 9 volt power supply | | 9v |
| TL072 IC | IC Pin 1 | 6v |
| | IC Pin 2 | 6v |
| | IC Pin 3 | 6v |
| | IC Pin 4 | 0v |
| | IC Pin 5 | 5.5v |
| | IC Pin 6 | 6v |
| | IC Pin 7 | 6v |
| | IC Pin 8 | 12v |
| PT2399 IC | IC Pin 1 | 5v |
| | IC Pin 2 | 2.5v |
| | IC Pin 3 | 0.015v |
| | IC Pin 4 | 0.015v |
| | IC Pin 5 | 2.8v |
| | IC Pin 6 | 2.5v |
| | IC Pin 7 | 0.9v |
| | IC Pin 8 | 0.9v |
| | IC Pin 9 | 2.5v |
| | IC Pin 10 | 2.5v |
| | IC Pin 11 | 2.5v |
| | IC Pin 12 | 2.5v |

|  | IC Pin 13 | 2.5v |
|---|---|---|
|  | IC Pin 14 | 2.5v |
|  | IC Pin 15 | 2.5v |
|  | IC Pin 16 | 2.5v |
| SA571 IC (NE571, etc) | IC Pin 1 | 1v |
|  | IC Pin 2 | 1.8v |
|  | IC Pin 3 | 1.8v |
|  | IC Pin 4 | 0.003v |
|  | IC Pin 5 | 1.8v |
|  | IC Pin 6 | 6.5v |
|  | IC Pin 7 | 6.5v |
|  | IC Pin 8 | 1.8v |
|  | IC Pin 9 | 1.8v |
|  | IC Pin 10 | 6.0v |
|  | IC Pin 11 | 1.8v |
|  | IC Pin 12 | 1.8v |
|  | IC Pin 13 | 12.0v |
|  | IC Pin 14 | 1.8v |
|  | IC Pin 15 | 1.8v |
|  | IC Pin 16 | 1.0v |

Comments and questions are welcome and can be sent to
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