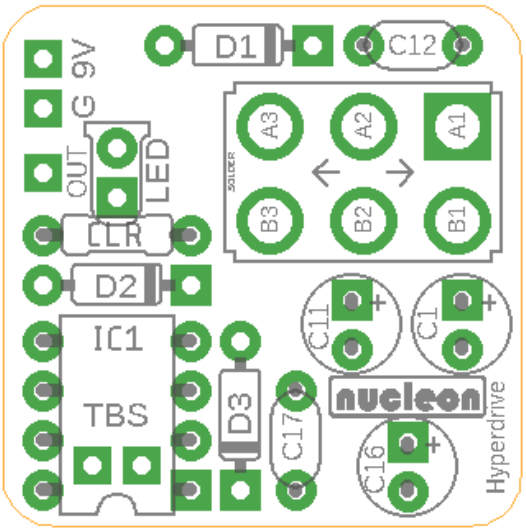
Hyperdrive doubler

Last modified: August 4 2018

The Hyperdrive is a utility PCB that can be used to switch a circuit between 9V and 18V. Usually this is done to increase headroom. Both the 9V and 18V sounds can be of use, hence there is room for a switch on the PCB. An indicator LED switches on when 18V is selected. If 18V is all that is required, by all means hotwire the switch and omit the LED. There are two caveats:

- The Hyperdrive will *not* work with split rail designs (but those are usually 18V already)
- Current draw is limited by the chip used, usually to about 30 mA max. This is no problem for most analog effects but digital pedals are out of the question.



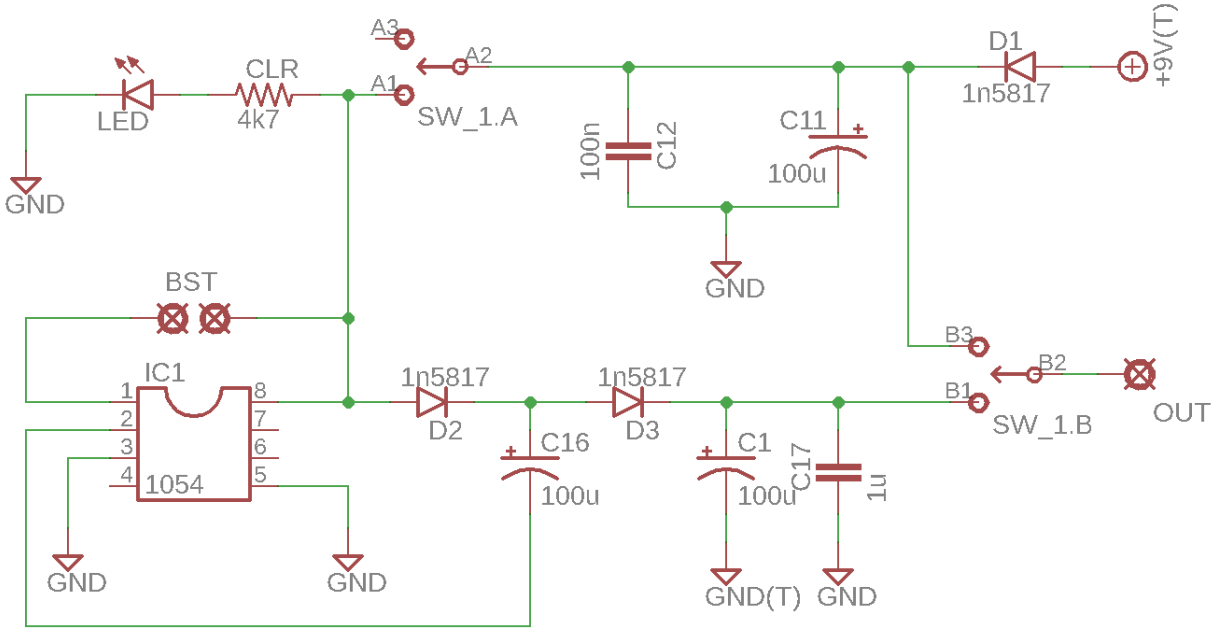
BOM

Resistors	
D1	1N5817
D2	1N5817
D3	1N5817
CLR	3k3
IC1	See notes

Capacitors	
C1	100u
C11	100u
C12	100n MLCC
C16	100u
C17	1u
SW1	DPDT Toggle

(Apologies for the weird numbering of the capacitors)

Schematic



NOTES

IC1 – Charge pump

This IC generates a -9V supply for the split rail design. I suggest using a socket here also. Pick one of the ICs below. I've not found a bullet proof recipe. I've had seemingly identical builds where one worked well with the 7660S while the other one needed the 1054. In other words: YMMV.

Chip	BST pads	Comments
ICL7660S	Jumper	Cheap and confirmed to be silent in this circuit
TC1044	Jumper	Use as improvement over 7660S if that generates audible whine
LT1054	Leave open	Best performance, highest current consumption and expensive

I recommend to NOT socket IC1 to keep the board as low profile as possible.

Wiring

Run a 9V wire from the power jack to the Hyperdrive board. Attach the pad labeled OUT to the power input of your effect. Solder two ground wires from the power jack ground tab. One attaches to the effect, the other to the Hyperdrive.

Mounting and orientation

You can use the switch to mount the board to the enclosure. If you omit the switch (see below) you can use some double sided foam tape (the stuff used for hanging mirrors) to stick it to the enclosure wall. Maybe also add a little dab of hot glue for extra security (you don't want the board go roaming around in your enclosure).

One thing to be aware of is that charge pumps are prone to induce noise (usually a high pitched whine). There's a bit of voodoo involved that makes it hard to predict if and when there will be audible effects. One thing that helps is that the Hyperdrive is a separate board that only shares ground at one point with your effect. Another thing that can help is to mount the Hyperdrive to the side of the enclosure instead of the top. It is then at a 90 degree angle from the main pcb. I've found this can be really useful. In any case, I suggest you test the circuits and their relative orientation before drilling the enclosure to see if noise is a problem and can be prevented.

Omitting the switch

If you only want 18V operation you can 'hotwire' the switching:

- Connect pads A1 and A2 with a jumper wire
- Connect pads B1 and B2 with a jumper wire