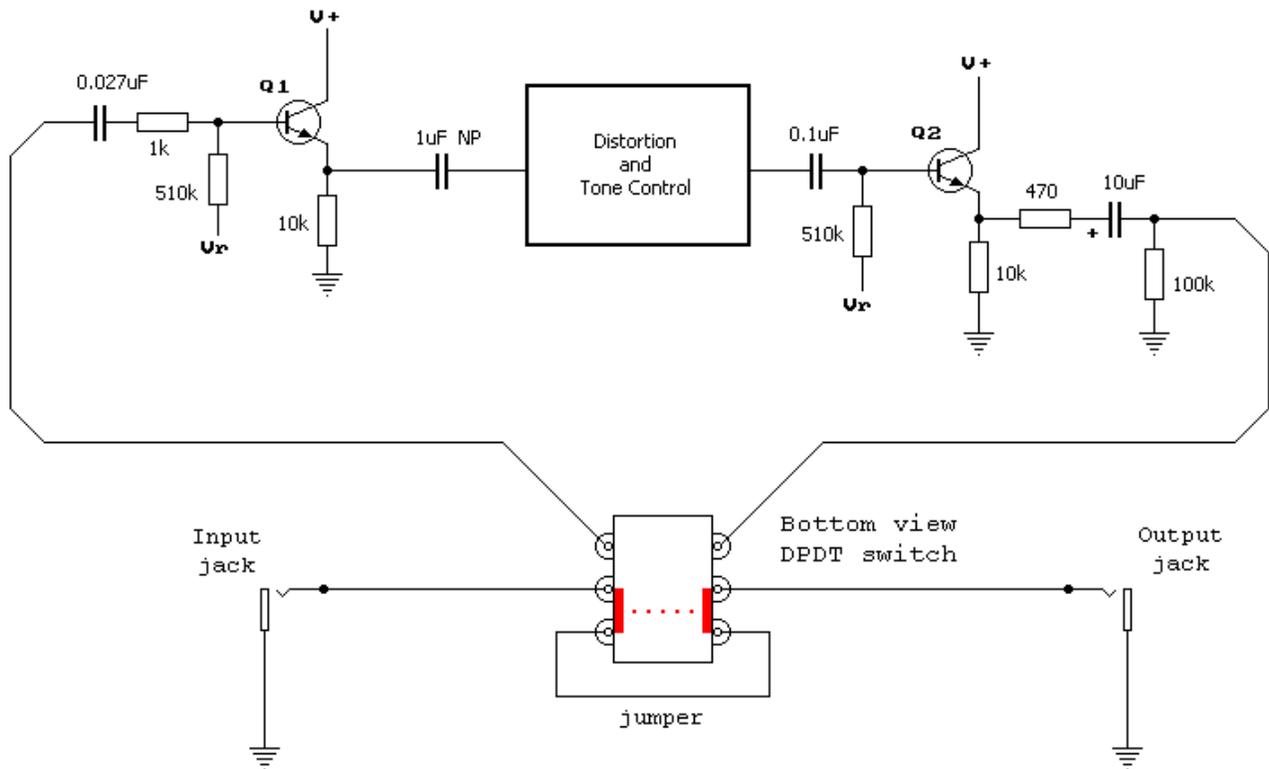


Adding a Buffered Output

Easy Mod for Your TS clone



The typical clone of the Tube Screamer, as found on numerous pedal sites on the Internet, will have the switching wired in the classic true bypass configuration as shown here. The circuitry across the top, including the input buffer, distortion, tone control and output buffer, is all on the pc board. The input and output of the board are wired to a footswitch as shown here for a DPDT.

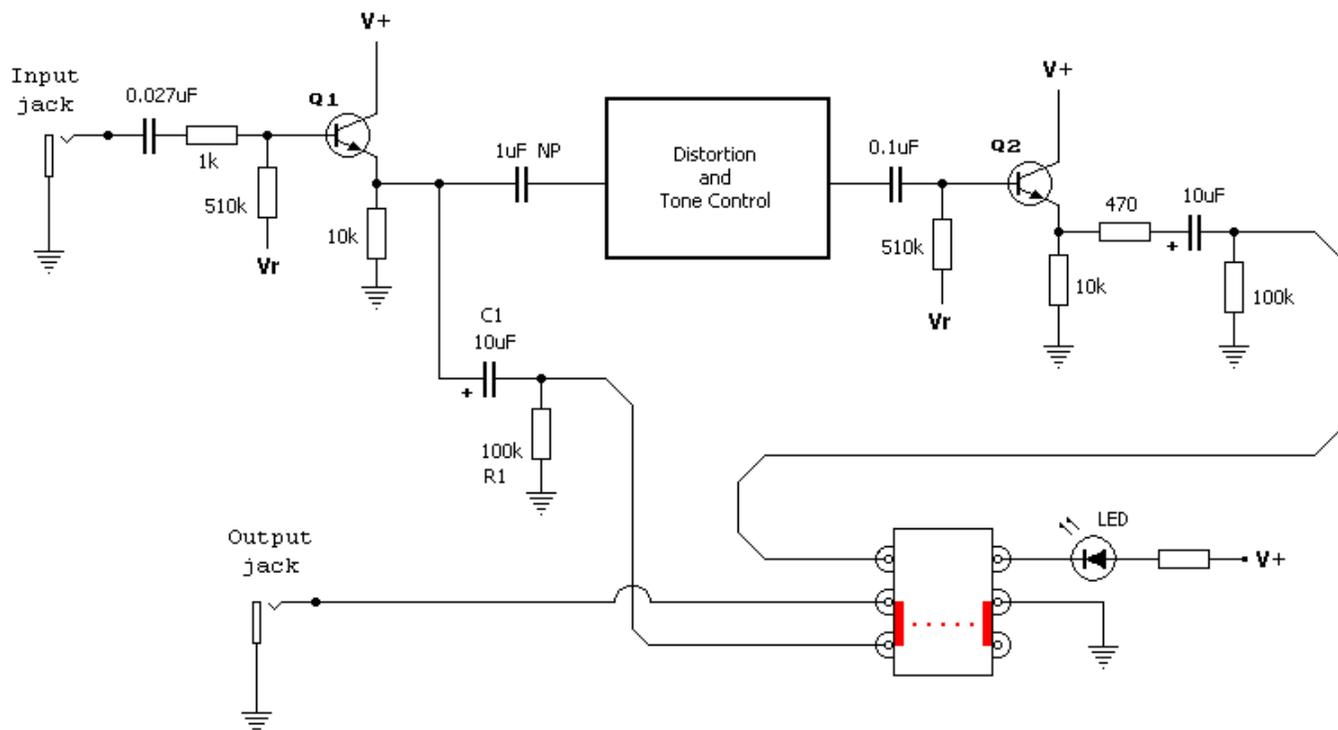
The drawing has the internal switch contacts on the DPDT illustrated in red, and it is in the bypass position in the drawing. The signal enters on the left, passes through the jumper and to the output jack on the right. There is no connection with the pc board when bypassed. (The dotted red line is not a connection but merely indicates that the switch contacts move in unison.)

When activated, the red contacts move up to connect the center switch lugs with the top set. The guitar signal will then come in to the left center lug of the switch, up to the top left contact which connects to the distortion circuit's input buffer built around Q1. After being processed by the distortion stage and tone control, the signal is buffered by Q2 and sent to the switch which connects it now to the output jack.

An advantage of true bypass switching is that when the circuit is not activated, there is nothing but a wire connection between the input and output jacks so the sound is not altered in any way. This preserves the pure tone of the guitar when the pedal is not being used.

While true bypass is a feature desired by many pedal buyers (or builders), the original TS had a buffered bypass, where the signal was processed by a transistor buffer even when bypassed. The advantage of this method is that the output is a low impedance drive circuit that is capable of driving long cables without significant tone loss.

It is easy to convert a clone Tube Screamer board to have a buffered bypass. Only two components are required for the mod; a resistor and a capacitor.



The modified switching method is shown above. A capacitor (C1) and a resistor (R1) have been added to produce a new output signal from the Q1 buffer. The switch is toggling the output jack's connection between the buffered output of Q1 and the buffered distortion signal from Q2.

To make this mod, find Q1 on the pc board. The emitter will be the pin connected to the 10k resistor and you will have to drill a small hole on the pcb so that a wire can be added. The new capacitor and resistor will have to be external to the board and a good place to add them is at the switch - the new wire from the pcb goes to the plus side of the 10uF and the negative side of C1 goes to the bottom left switch lug. R1 can be mounted on the switch by wiring it from the bottom left switch lug to the center right lug. Connect the pcb output and the output jack to the switch and mod is complete.

Because only one set of contacts is now required to manage the audio signal, the second set of lugs on the DPDT can be put to use for switching an LED indicator. In the original true bypass version, an extra set of contacts (and a 3PDT) are required if you want an indicator light. Make the connections as shown above to add the LED. A suggested value for the current limiting resistor on the LED is 2.2k to 4.7k. The [AMZ LED resistor calculator](#) is a good tool to quickly work out the value of the resistor.

The output will work without R1 but it is included to prevent pops when the switch is toggled.

Since a similar buffer arrangement is used in the Boss SD-1, DS-1 and many other pedals in the Ibanez and Boss lines, this mod will work equally well for those clones.



For comparison, a 3PDT and DPDT are shown in this photo. The 3PDT is the pair of switches on the left and the DPDT is the smaller pair on the right. The DPDT is Mouser part number 107-SF12020F-L or they are available at [Small Bear Electronics](#).

This is an easy modification to make to your next project and allows the pedal to perform double-duty as a line drive/buffer when bypassed. Try it!

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