SBitx Upgrade Notes
Use at your own risk!
Gordon Gibby KX4Z

Reference for 5VDC (5.4VDC) Switching Supply Upgrade (removal of LM338)

Upgrading to switching regulator (Development Edition)

From Anthony Good, K3NG, Anil Rayporula, VU2DXA

Available at: http://www.sbitx.net/

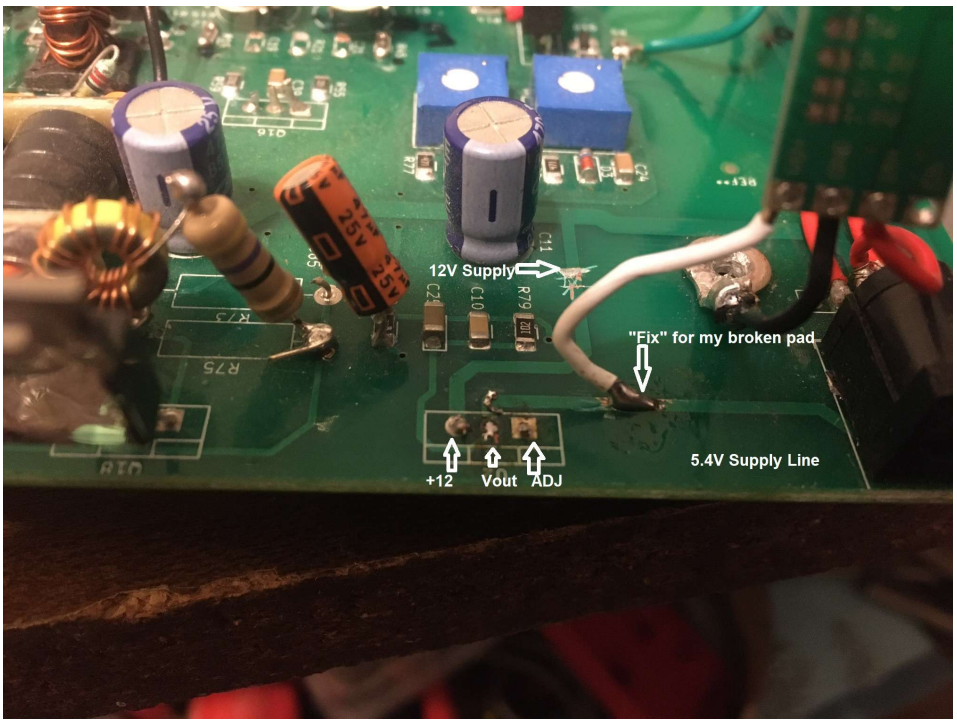


Figure: my repaired installation of the new switching regulator. View is from the TOP of the board. Note the intentional cut in the 12V supply line to the no-longer-utilized LM338 regulator pads.

- The incoming +12 line is dangerously close to the soldering you might be doing to connect the WHITE output wire of the new switching regulator. An accidental short between these two pads at the site of the previous LM338 regulator would be disastrous for the Raspberry Pi and digital board. I chose to use an exacto knife to CUT the +12 supply going toward the LM338 pads.

- Soldering the new RED lead from the new switching supply on top of the existing red lead at the power supply connector (going to the power switch) was problematic for me. I ended up removing the previous red wire and using a small single strand of tiny wire to lash these two RED wires together, and then managed to solder them back to the proper pad from the incoming power connector.

- The WHITE wire from the new switching regulator tends to be in the way of one of the screws holding the bar, pressing the final amplifier MOSFETs to the heatsink. In the process of moving the wire out of the way, I *cracked* the solder pad to which I had soldered the white wire, and this broke the +5 supply to the Raspberry Pi.....which took me a couple of hours to figure out. There are two traces from this pad; one goes to a previous network of resistors, capacitors of the previous LM338 regulator; the important thicker trace proceeds along the upper left edge of the board, the crosses the entire board from left to right to reach the Digital 40-pin connector. I was able to scrape off a bit of masking from this trace and re-solder the new switching regulator output there.

Upgrade to the T/R Switching

Link for Farhan's Instructions:
https://docs.google.com/document/d/1jWkgISG9JqwB1tDC3_ONAGIGfjSqxmNEtBxnI8Dyjyg/edit

This is a LARGE document and printing it was very slow on my home printer. The photos are high resolution. They were also GREAT for showing me exactly what needed to be done!

I have a long pair of tweezers that once again were incredibly helpful in removing all the surface mount devices that needed to be removed.

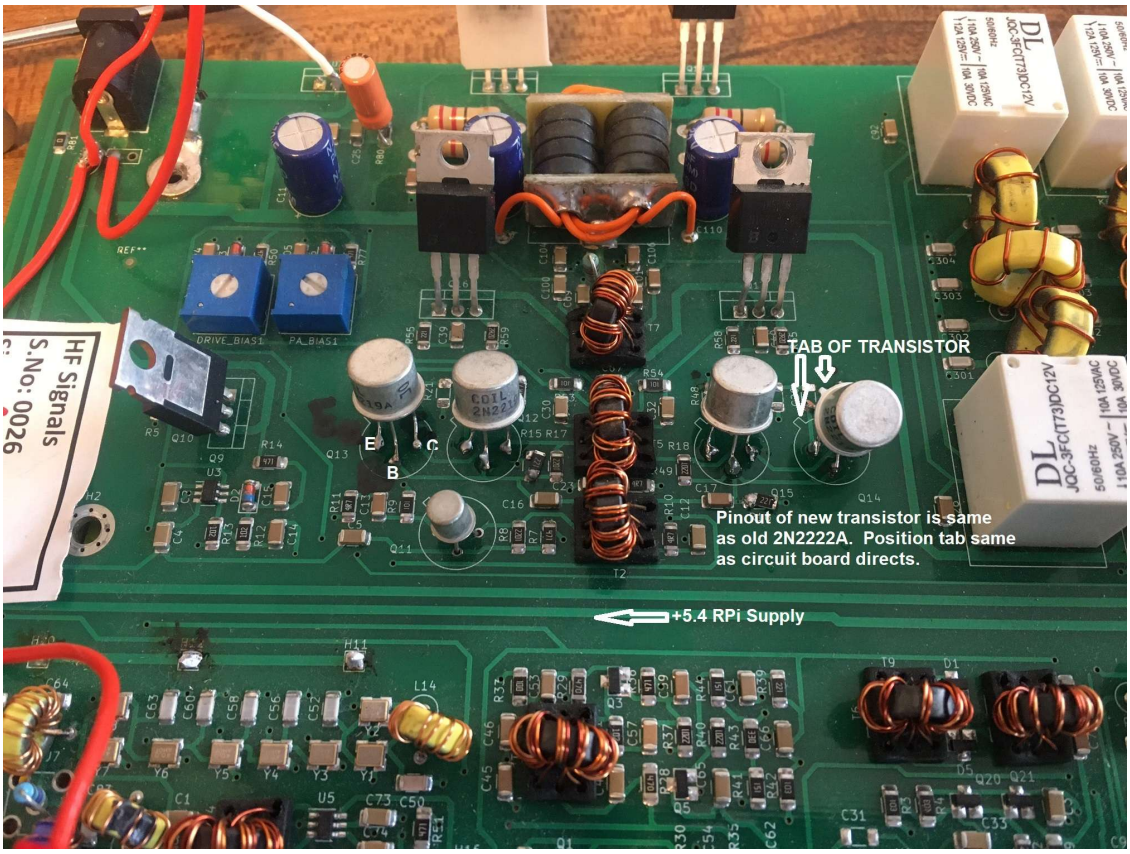
THANKFULLY, Farhan's upgrade kit included an EXCESS of both the resistors that needed to be soldered back in.

- I attempted the suggested "pin hole cleaning out" of the old 2N222A holes. This was a fruitless disaster for me -- trying to get the new 2N2219A leads to match and go in, if I hadn't gotten EVERY pinhold cleared, was impossible. So my solution was to simply first desolder the old transistors (or cut their leads); remove the old leads one at a time if needed, and not worry about cleaning the pinholes.

- Instead I used Farhan's suggested 90 degree bends in the shortened legs of the 2N2219A transistor and was easily able to pre-tin the transistor and the pinhole, and then easily spot solder each transistor lead properly.

- I'm left-handed so my directions favor the soldering iron coming in from the LEFT. I found it easier to make the 90 degree bends toward the PERIPHERY of the transistor so that I didn't have to solder underneath the transistor to get to the BASE lead. I found it easier to bring in the iron from the "bottom" end of the board at the new transistors' bent legs.

- Before beginning, I carefully checked that the PINOUT of the new transistor is identical to the PINOUT of the older 2N2222A transistor. Therefore, all you need to do is orient the metal can tab exactly the same way as the screenprint of the board illustrates.



PA Transistor Biasing

Rememeber to turn the PA biasing potentiometer fully COUNTERclockwise before beginning.

The sBitx power on/off switch provided a very easy point to pull off one of the wires and insert a VOM ammeter function in series. My quiescent current was about 0.75A (switching regulator installed) so I adjusted the PA bias potentiometer slowly clockwise until I got to about 1.0 Amps. Nothing at all happened for quite a bit of rotation, and then suddenly it started going up quickly, so be patient when making this adjustment.