

# DB+ v1.19 Installation Instructions

## for the 'Full Monty' Beta Tester Kit

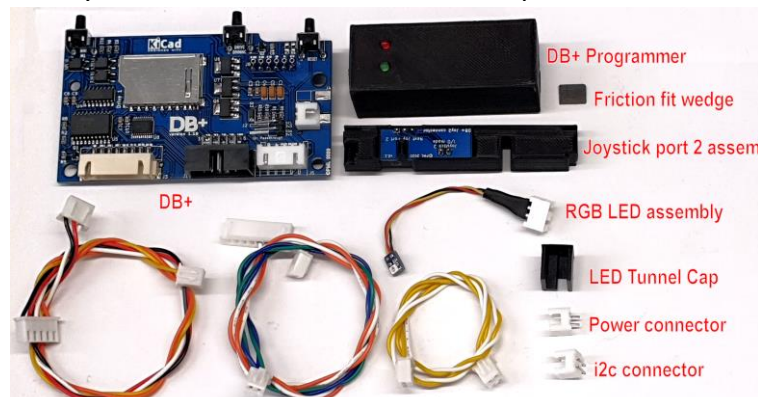
(All Optional extras – solder version)

Please report any errors or suggestions to [daxdevices@gmail.com](mailto:daxdevices@gmail.com)

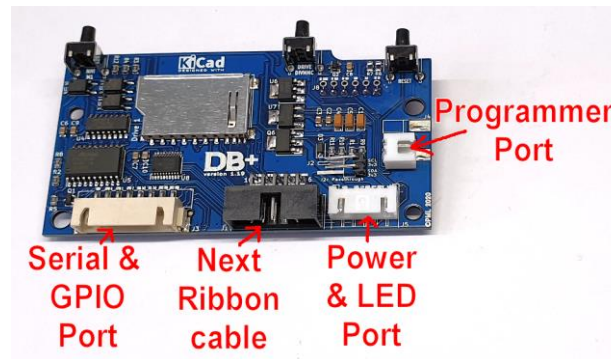
THESE ARE THE INSTRUCTIONS FOR THE FULL MONTY KIT THAT INCLUDES ALL THE OPTIONAL EXTRAS.  
THE BASIC DB+ ONLY REQUIRES THE POWER CONNECTOR FITTING AND EVERYTHING ELSE IS OPTIONAL.  
A SOLDER-FREE FRICTION-FIT VERSION WILL BE CREATED AFTER THE BETA HAS UNDERGONE SUFFICIENT TESTING.

Please take 5 minutes to read through the instructions carefully before proceeding with the installation of the *DB+ Beta Tester kit*. While the installation is relatively easy, it is always advantageous to have a 'cunning plan'!

One of the essential parts of the beta is to be able to test as much of the hardware as possible. To this end, the Full Monty Beta Tester Kit includes all the optional extras.



### DB+ connections



## Basic Requirements

- DB+ Beta tester kit.
- These DB+ installation instructions.
- Stanley, Exacto/X-Acto or similar craft knife with a new blade.
- Medium size Posidrive/Pozidrive screwdriver.
- Soft cloth to place the Next onto.
- A clean work area with ample space and light.
- An empty container for the screws.
- A magnifying glass or camera to zoom into small areas, for those of us with aging eyesight!

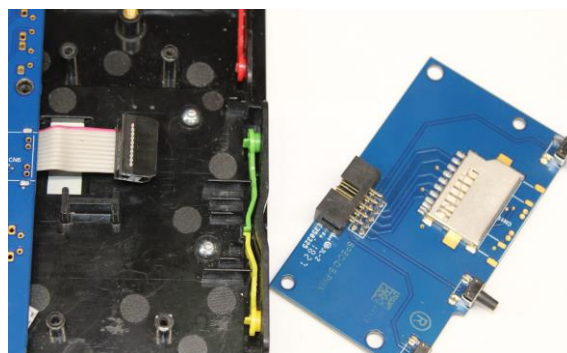
**1. Prepare to qualify!** Lay your Spectrum Next face down on a soft cloth to protect the case and keyboard from scratches. Remove the 6 screws from the rear of the case.



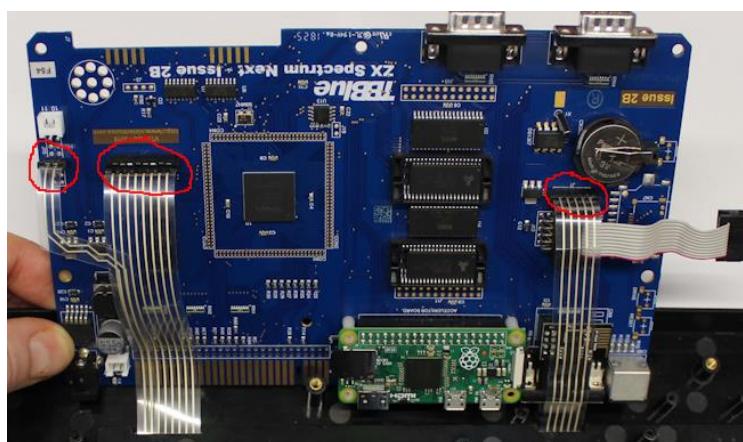
**2. Opening up.** Remove the back of the Next case. Remove the 4 screws from the mainboard (left) and 4 from the daughter board (right).



**3. Out with the old.** Remove your SD card. Unplug the daughterboard ribbon cable and remove the daughter board.



**4. Unplug Keyboard.** Gently pull each of the 3 keyboard ribbon cables to release them from the connector.



**5. The power switch connector.** J16 was provided originally to enable the Next to have a power switch fitted. The track between the two pads on J16 was designed to be cut. DB+ utilises this unused connection.

Locate J16 near the power connector on the top of the mainboard. Turn the mainboard over and locate the same J16 on the bottom of the board.

Mainboard Top



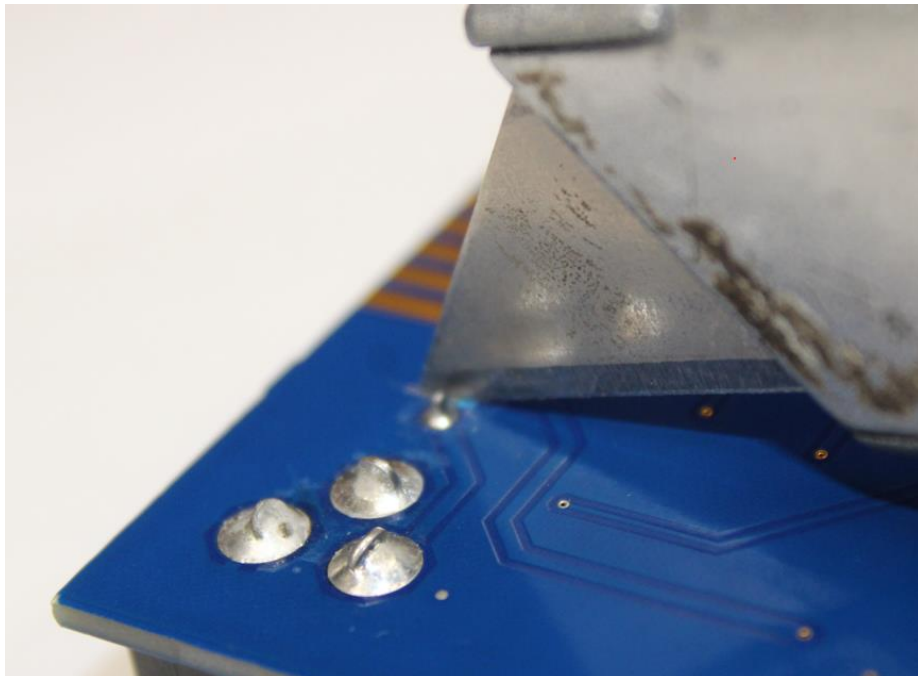
Mainboard bottom



Similar pads show the track a little clearer.



**6. Make it so.** Cut the track between the J16 pads with a craft/Stanley knife.

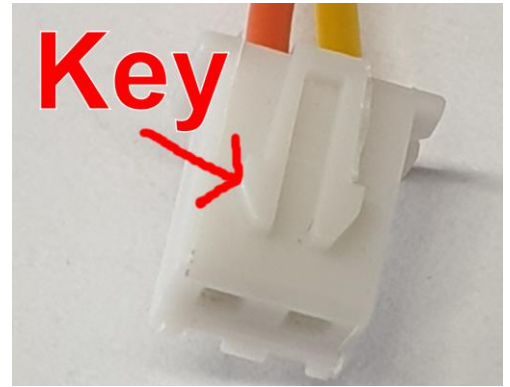
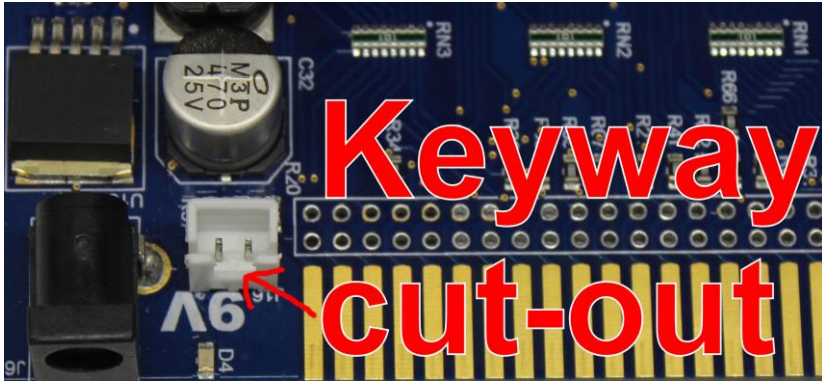


**7. Testing cut track.** Use a multimeter to test if the track has been successfully cut. If you do not have a multimeter, you can plug the Next power supply back into the board. The red power LED should no longer illuminate if you have been successful.



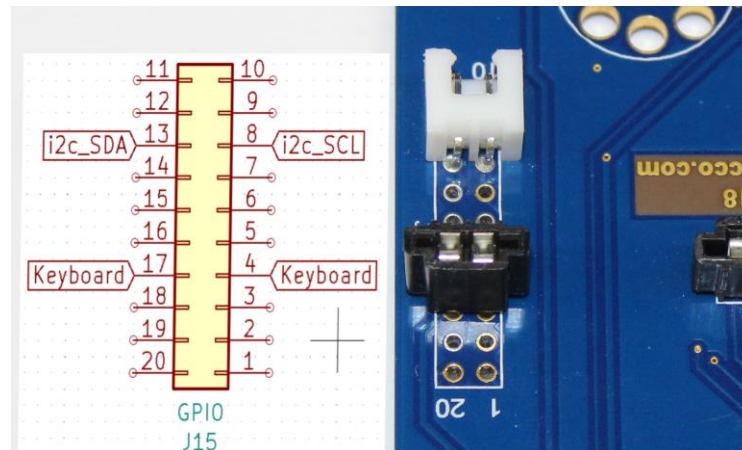
**8. Power connector.** Insert and solder the *Straight 2 way JST XH* connector with the keyway (cut-out) facing the back (expansion Bus side).

Mainboard back



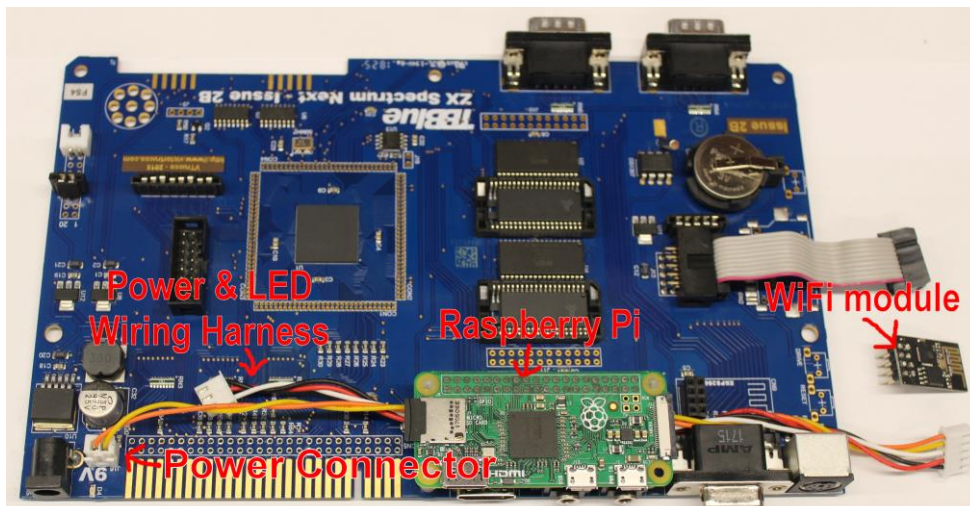
**9. i2c connector.** Locate J15 and insert the *Angled 2 way JST XH* connector into pads 8 & 13, with the JST connector facing the front of the board (joystick side). Solder the connector in place.

Mainboard front



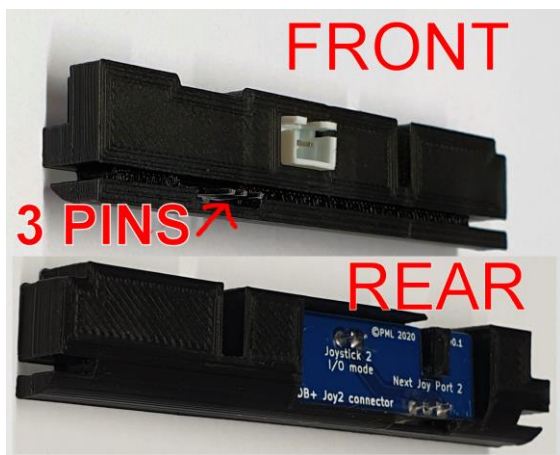
**10. Power and LED wiring.** Remove the WiFi module. Feed the *Power & LED wiring harness* carefully under the Raspberry Pi. Plug the two way connector on the wire, into the new power connector on the mainboard. When fitting the power connector, make sure to orientate the key on the connector to the back of the board. Refit the WiFi module.

Mainboard front

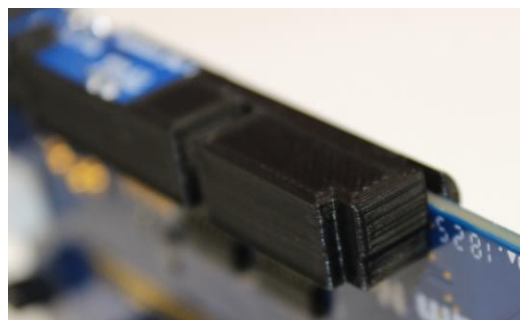


**11. Joystick port 2 I/O PCB & mount guide.** The *Joystick port 2 I/O connector and mount guide* is designed to fit in the gap between the right hand side joystick edge connections.

Joystick port 2 I/O PCB & mount guide



Mainboard top-front

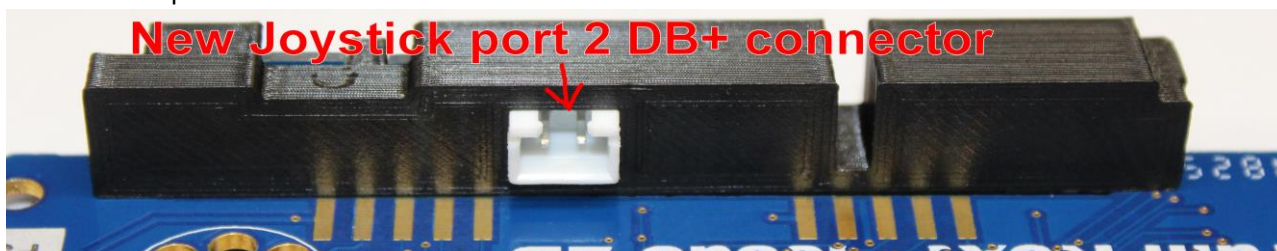


The 3 pins align with the gold contacts on the bottom of the Next mainboard Port 2 (see picture above)

Mainboard bottom-front

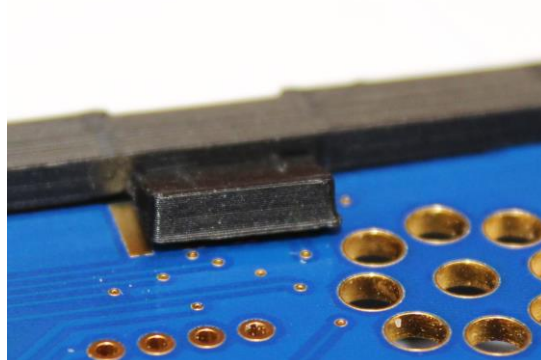
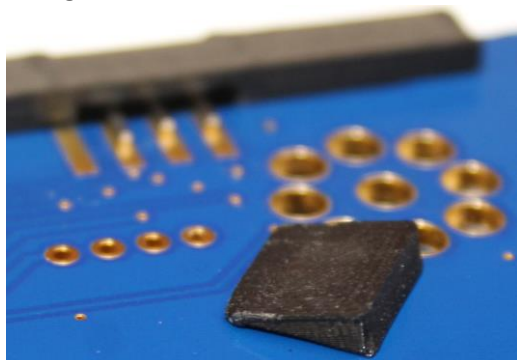


Mainboard top-front



The pins can be soldered to the gold contacts or fitted with the supplied wedge to push down on the pins.

Wedge





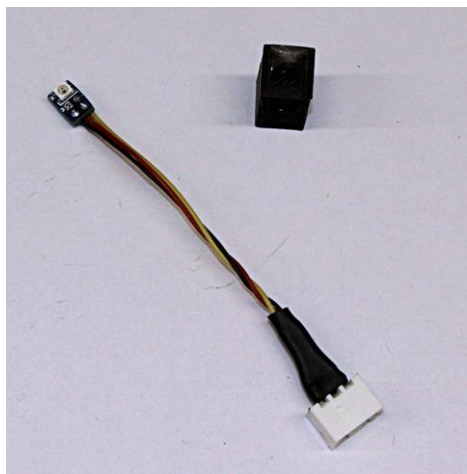
**12. Joystick port 2 and i2c wiring.** The Joystick port 2 and i2c wiring harness can now be fitted to the mainboard and the DB+ board can be connected to all 3 cables. Take note of the keys on each connector to orientate the connectors in their respective sockets correctly.



*\*Note: The i2c wire has been intentionally made longer to enable fitting to other 3<sup>rd</sup> party boards such as the 'Blinkenator' by Dean Woodyatt, that take over the GPIO connector. Bespoke cable clips will also be designed at some point in the future to help keep the wiring tidy and clipped to the board.*

**13. RGB LED preparation.** The whole DB+ project has been a constant fight for 0.1mm here and there in almost every area of the Next case. While frustrating, it is also testament to the quality of design done by Rick Dickinson. The RGB LED fitment is no different. The RGB LED sits in the tunnel above the existing red LED which is just shielded from illuminating the light pipe by a plastic tunnel cap. The top of the tunnel cap is very thin and is designed to flex to allow the on-board red power LED to sit comfortably against it.

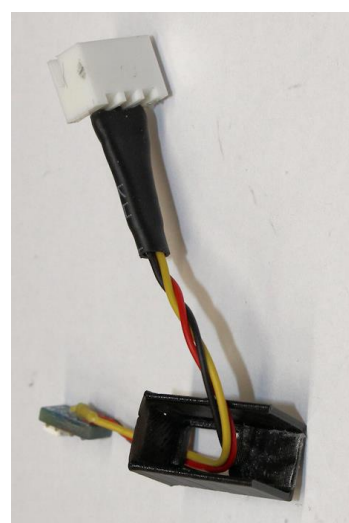
RGB LED assembly and Tunnel Cap



Tunnel Cap with double sided tape



Fit the cable through the Cap



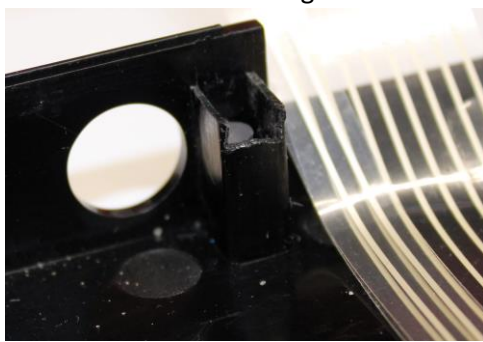
Remove the backing paper from the double sided tape on the Tunnel Cap and thread the LED wire harness through, as illustrated above, noting the correct orientation.

**14. Trimming the LED tunnel – easy does it.** A small 5mm section needs to be removed from the front of the LED tunnel to fit the RGB LED. As the case plastic in the area is only 1mm thick, it can easily be done with a craft/Stanley knife. Cut down the edges first then remove the middle in a couple of cuts.

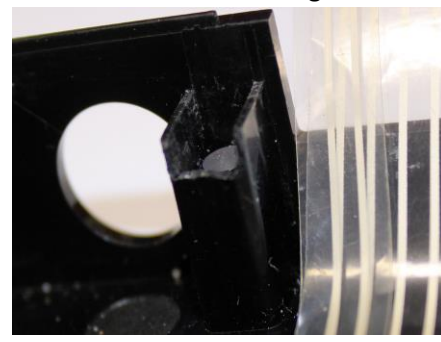
LED tunnel before trimming



LED tunnel after trimming



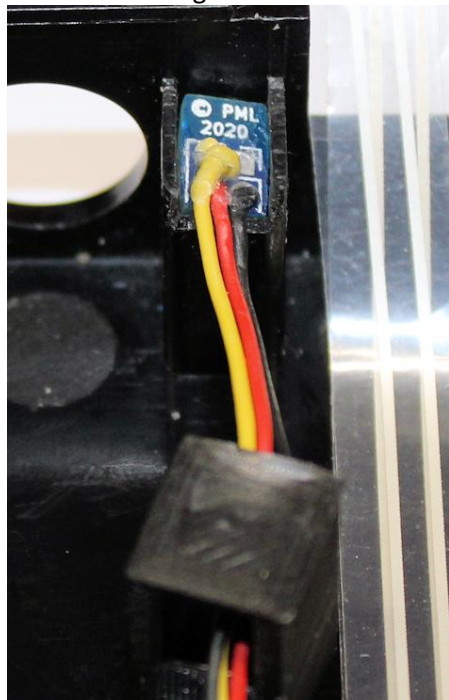
LED tunnel after trimming



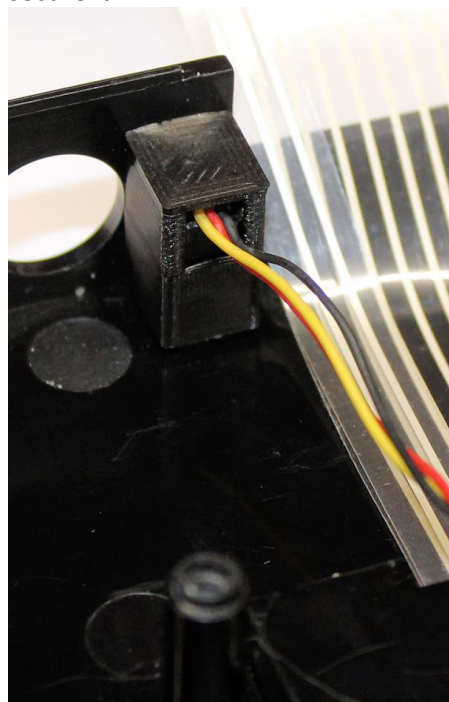
*\*Note: The trimming of the LED tunnel does not affect the function of the original Spectrum Next red power LED, if the DB+ were to be removed and the Next returned back to its original 'stock' condition.*

## 15 Fitting the RGB LED.

Fit the RGB LED board with the '© PML 2020' text facing outwards.



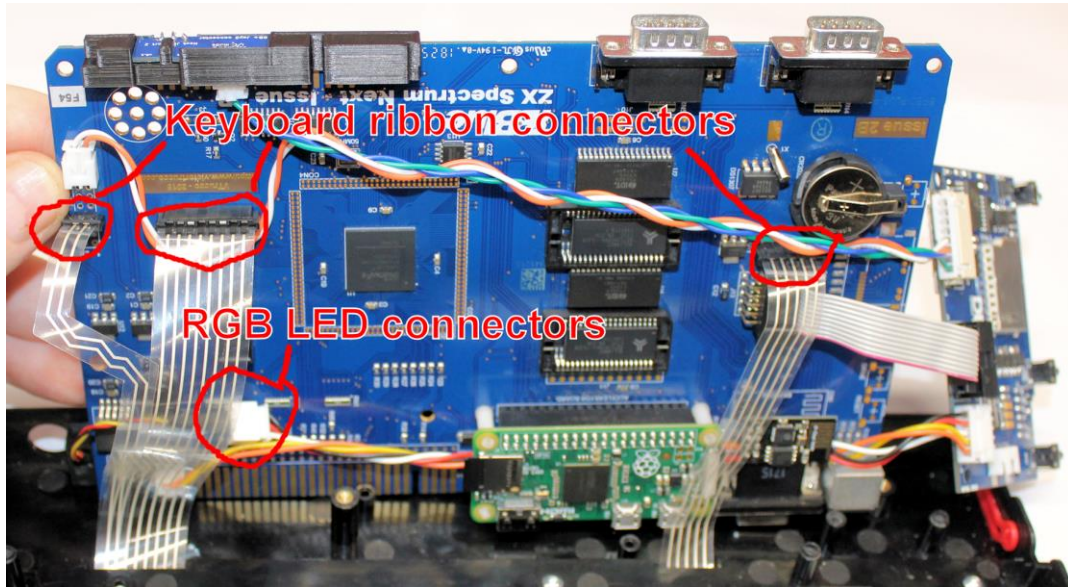
Carefully fit the Tunnel Cap, pressing firmly on the double sided tape area to secure it.



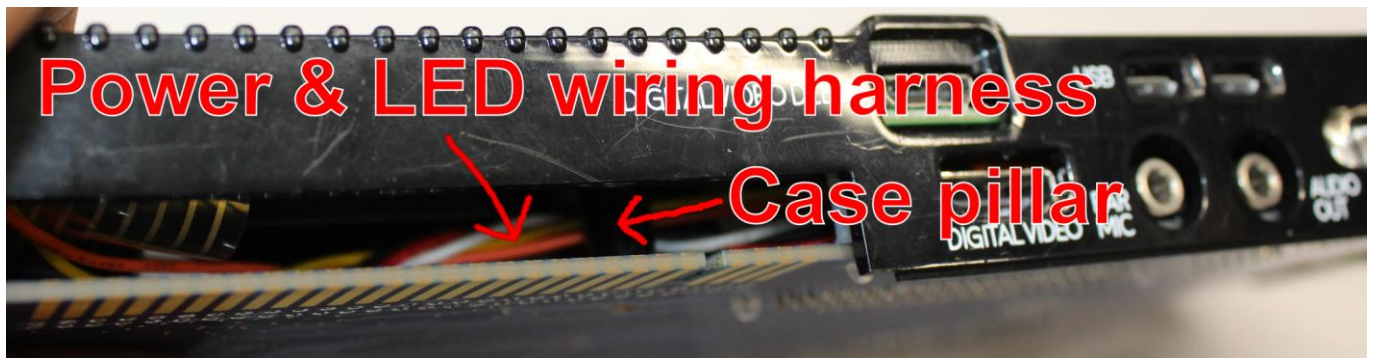


**16. Final assembly – Take your time.** The final assembly of the boards into the case may be easier with help from someone else to hold the Next PCB while you plug the cables into the connectors. Connect the RGB LED to its respective 3 way connector on the wiring harness. Connect the keyboard ribbon cables into their sockets on the mainboard.

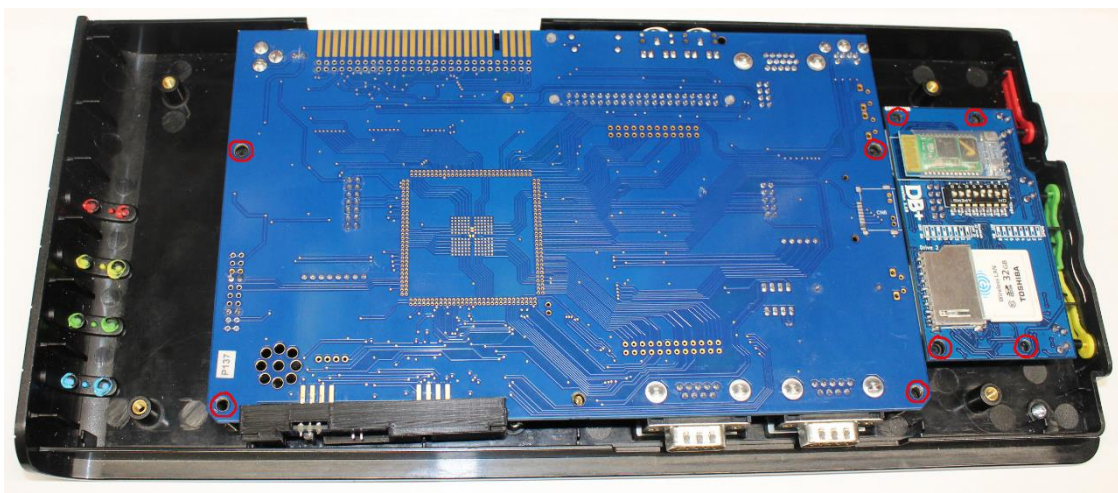
*\*Note: If you also wish to install the programmer cable (recommended for Beta Testers) please see the The DB+ Programmer section, 'Routing the cable' near the end of the instructions on how to route the cable.*



Take care to locate the *Power & LED wiring harness* to the inside of the case pillar. A pencil or similar makes a good tool to guide the harness away from the pillar.



Refit the 8 PCB mounting screws and insert an SD card into SD Drive 2.





Refit the remaining 8 case screws.



**17. Powering Up.** Plug the power lead into your Next. The Next should not turn on as it will be in Standby mode. Hold down the *Reset* button, press the *M1* button once and then release both buttons. The Next will power-up and show the Next colour fade LED sequence, flash a few times when the SD cards are being accessed and finally finish illuminated white. Congratulations, you made it!

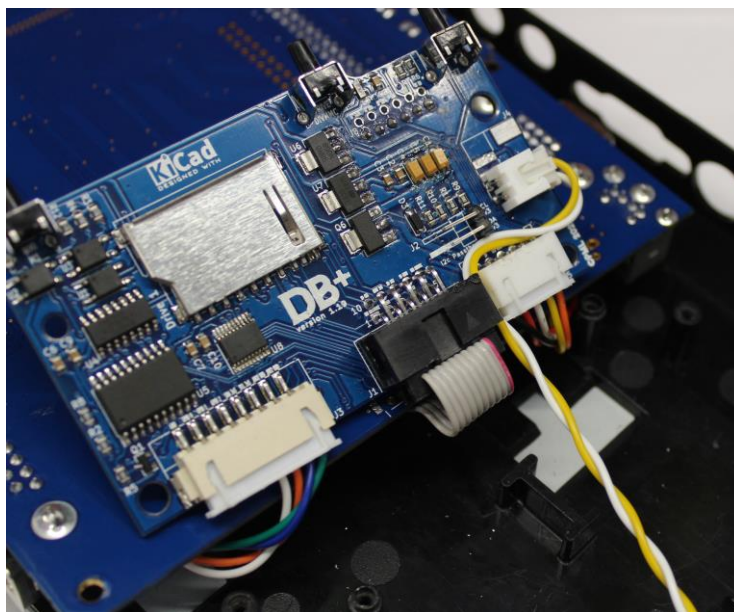


*Please see the DB+ User Guide for more information on how to use DB+.*

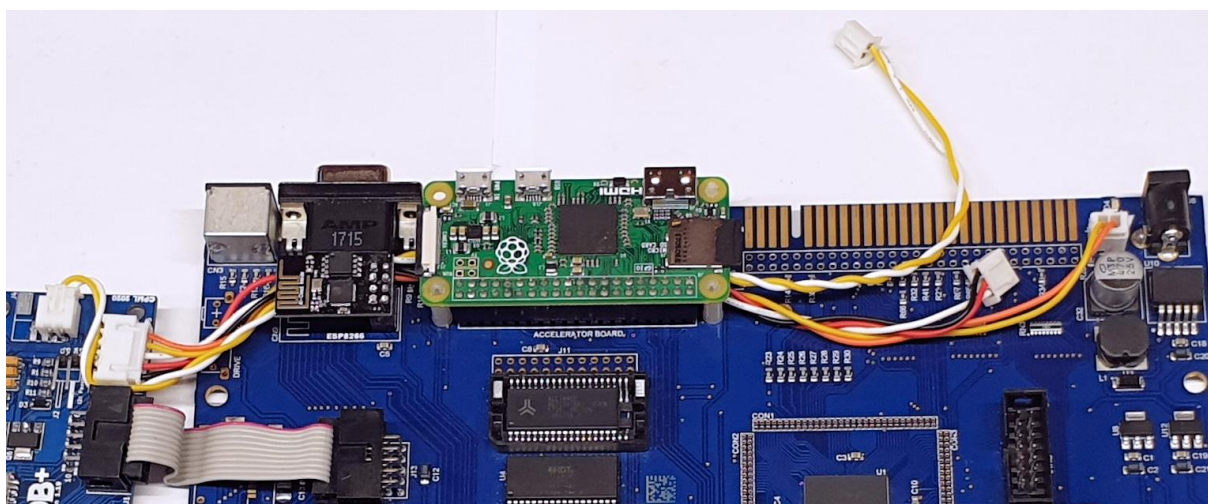
## The DB+ Programmer

While the DB+ is in beta testing, there will be several firmware upgrades to improve existing features, add new features and squash any bugs that may arise. This is the whole point of beta testing before a general release. With this in mind, it may be convenient to leave the programmer cable fitted in the short term and route it out of the rear ZX expansion bus opening. This will save time removing the back of the case each time a firmware upgrade is released. In the longer term, firmware upgrades will be much less frequent and will generally only happen when new features have been added to DB+.

**Routing the programmer cable.** Plug the programmer cable into the DB+ programmer port and route it between the LED & Power connector and the grey Spectrum Next ribbon cable.



Feed the *Programmer cable* carefully under the Raspberry Pi and bend it to exit the rear ZX Expansion bus.



Refer back to **section 16** to reassemble your Spectrum Next.



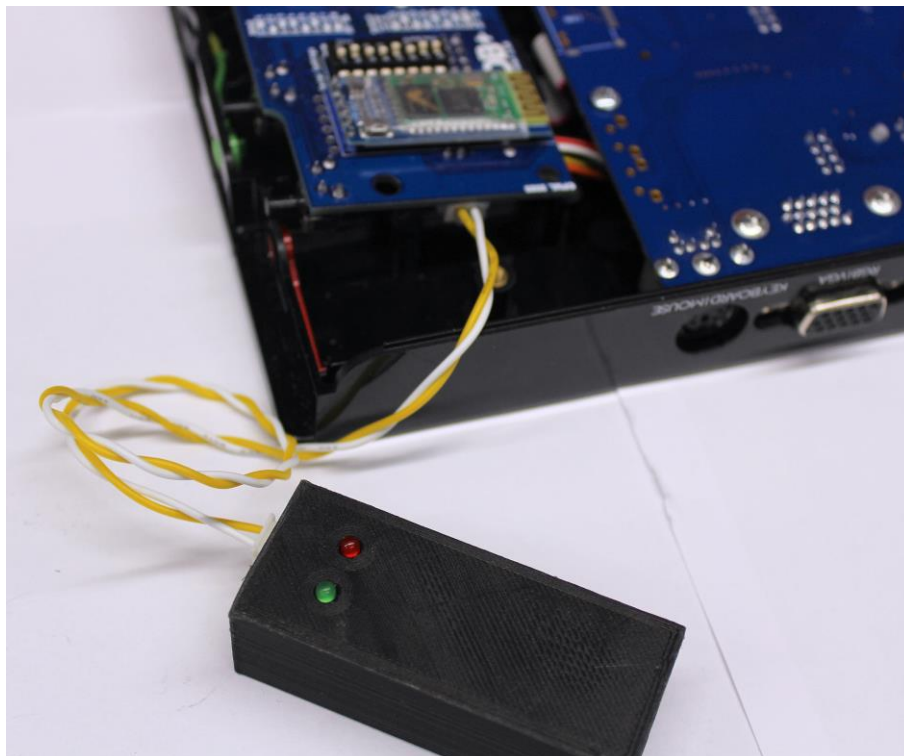
The ideal *DB+ Beta Kit* setup!



### Alternative non routed programmer cable

If you prefer not to route your programmer cable through the rear of the ZX expansion bus, you can plug in the programmer on an 'ad hoc' basis.

Remove the 6 screws from the rear case of your Next (see section 1). Remove the 4 screws from the DB+ board and lift it partially to plug-in the programmer cable. Update the DB+ firmware, remove the programmer and reassemble.



*Please see the DB+ User Guide for more information on programming and how to use DB+.*