Help! I've bricked my Remote Control and/or Aircraft and it won't get back up

So you tried to mod your WiFi Power Transmit, Channel Settings, etc. and now your RC and/or Aircraft are very expensive paperweights. Fear not! Through the collaborative efforts of many smart P3S owners, there is a way to "unbrick" your expensive paperweights and get them back into the air. I have tried to compile everything that has been documented to date from many sources and validate every step with my own expensive paperweights. This document is provided as proof of that effort and hopefully helps some folks get a good night sleep.

As with anything, read through this procedure a couple times and practice the steps before actually removing or soldering anything. The old adage "measure twice, cut once" applies. It's not a race and you want to make sure you have everything you need handy before you begin. The idea is to get this bird back online and not cripple it permanently. Patience is the key. If you get in a bind, STOP, step away and remain calm. Use the forums to help you through this or any other problems you encounter. There are a lot of smart people who have done this already. Remain calm, all is well. Now let's get to it!

Cheers

vadar007

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Purpose

So the overall objective of this procedure is to:

1) Gain access to the Remote Control (RC) and/or Aircraft (AC) via the serial TTL connections located on their respective motherboards. It is assumed you have lost WiFi access.
2) Boot the RC/AC off a known good backup/recovery partition on the RC/AC.
3) Examine, edit the default boot partition files and/or replace the files with known good files from the backup/recovery partition, if necessary.

Reference Equipment Used:

Phantom 3 Standard Remote Control (Firmware Version 1.6.8) with Itelite DBS Mod and Aircraft (unmodified)

Windows 10 Laptop with WiFi

Materials Required:

- Phillips Head Screwdriver
- Soldering Iron with a point tip
- .032 Diameter Solder (60/40)
- Tweezers
- Electrical Tape
- Clamp with rubber edges
- Terminal Software, e.g. Tera Term, Putty, etc.
- Quality CP2102 USB to TTL USB UART Module Serial Converter - (http://www.miniinthebox.com/cp2102-usb-to-ttl-usb-uart-module-serial-converter-red-silver-black_p4295219.html)
- Female to Male Breadboard Wires for Electronics 22cm (jumper wires)
- Sharp thin plastic knife or plastic card with sharp edge
- This document open on your laptop/computer for reference

Preparation:

Review online videos demonstrating how to remove back cover of the Remote Control and remove the camera gimbal from the Aircraft (if necessary).
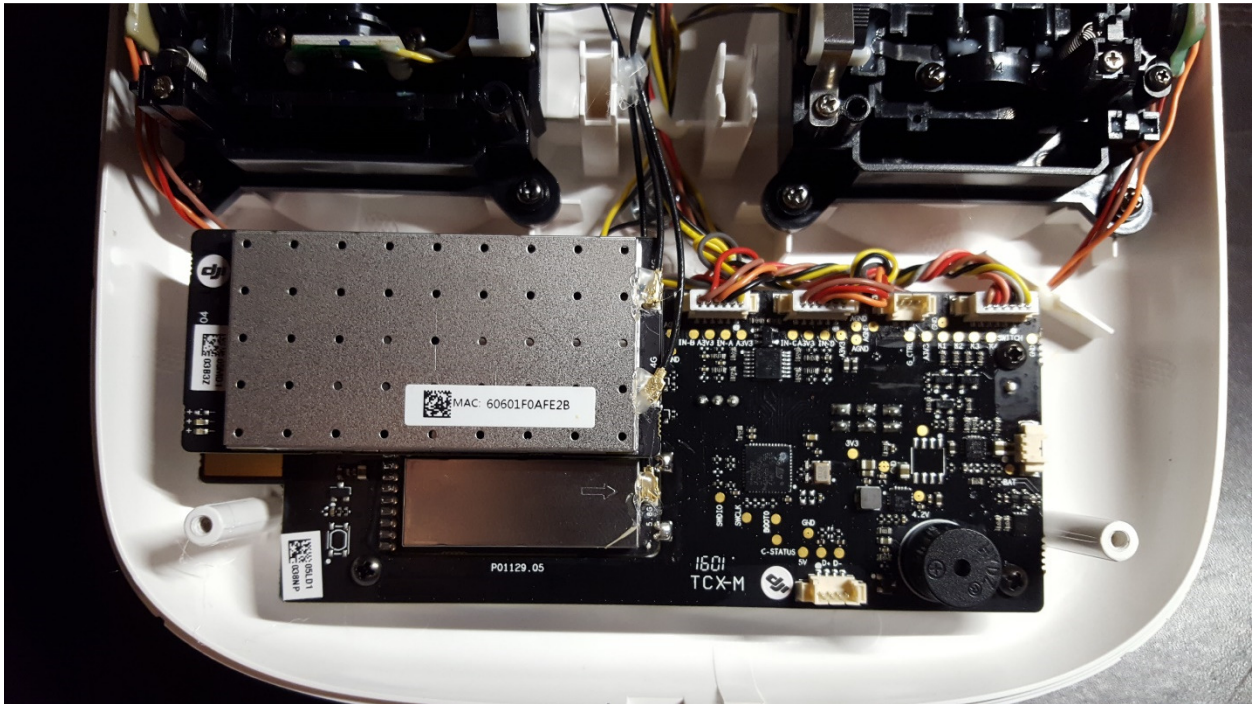
Review online videos covering basic soldering if you not familiar. The soldering required is delicate so I highly recommend you view a couple videos to get familiar and comfortable before starting. Practice on some old circuits boards first. Trust me, you'll be glad you did.

Restoring Access via TTL-USB Adapter to the Remote Control

1) (Optional) Place tape over the power switch of the Remote Control (RC) to prevent accidentally energizing of the unit while you are working on it.
2) Remove the four screws from the back of the RC.
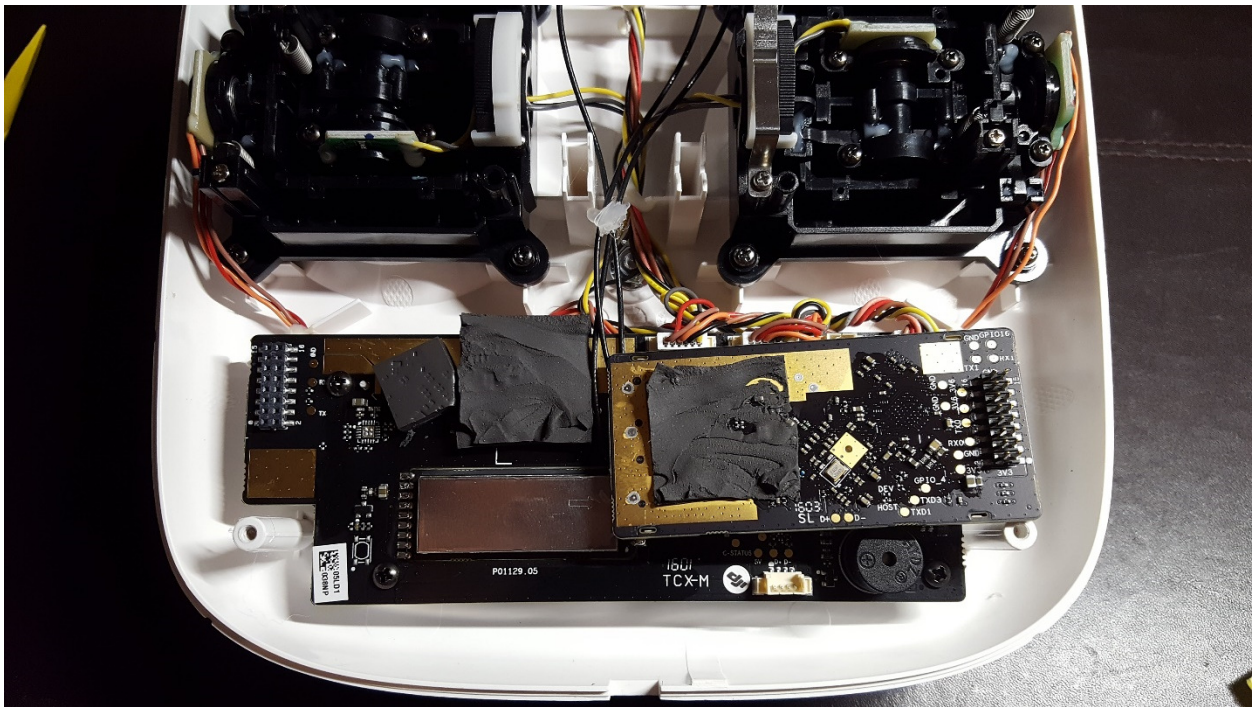3) Carefully disconnect the cables attaching the back cover to the front cover (3 total). Remove back cover.

4) (Optional) Remove the antenna connections to the WiFi Repeater Module (WRM). It will make it easier to clamp and solder the wires on the WRM, but you do run the risk of damaging the antenna connections trying to get them off and put them back on again. I decided to forgo this step.

5) The WRM has a 16 pin (2 rows x 8 pin) male socket that plugs into the female 16 pin socket strip on the motherboard as well as doubled sided foam/putty that holds the WRM in place on the motherboard.

6) Trying to pull the WRM directly off forcefully is risky. I used a sharp thin edged piece of plastic to gently slice through the foam/putty enough to allow me to easily pull the WRM straight up and off.

7) Flip the WRM over and identify the TX0, RX0 and GND solder pads on the bottom of the WRM. If you left the antenna connections on the WRM, place some non-conductive material underneath the WRM to avoid contact with the motherboard while soldering.
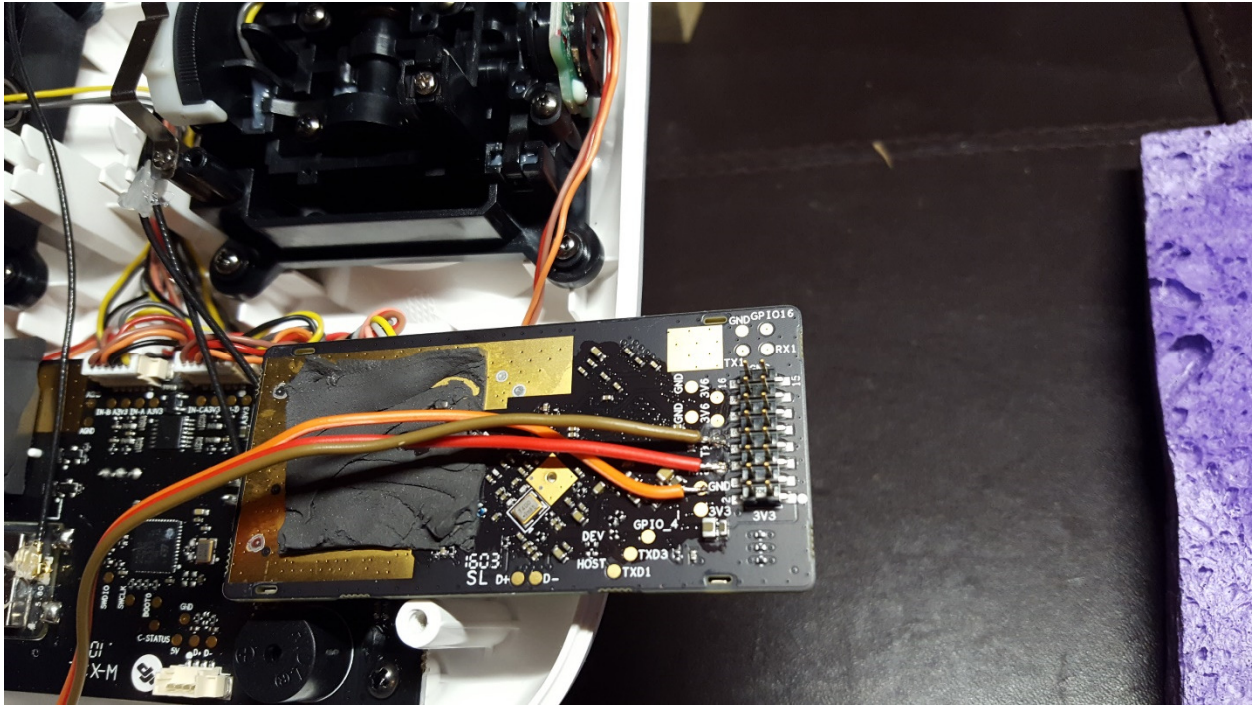
8) Tin the tips of the bare wire you want to solder to the WRM and trim to less than ¼ inch length so as to not have too much excess exposed wire.
9) Clamp the WRM down so it won't move during the soldering process.
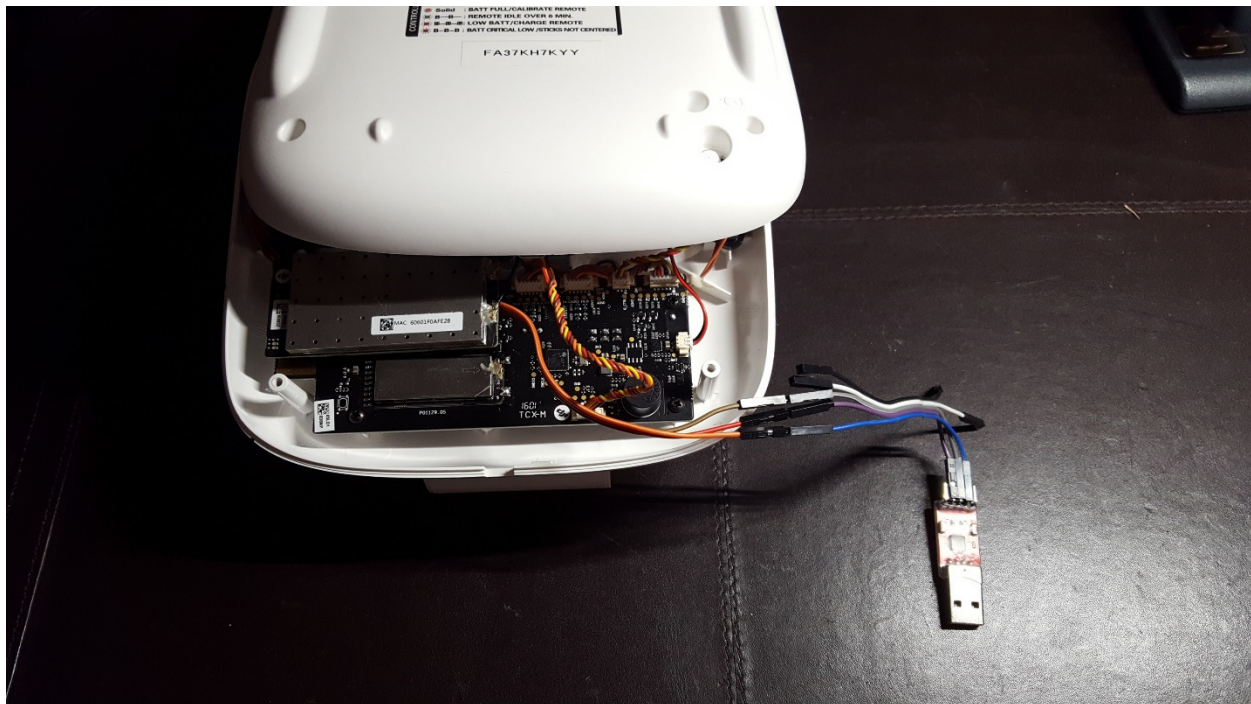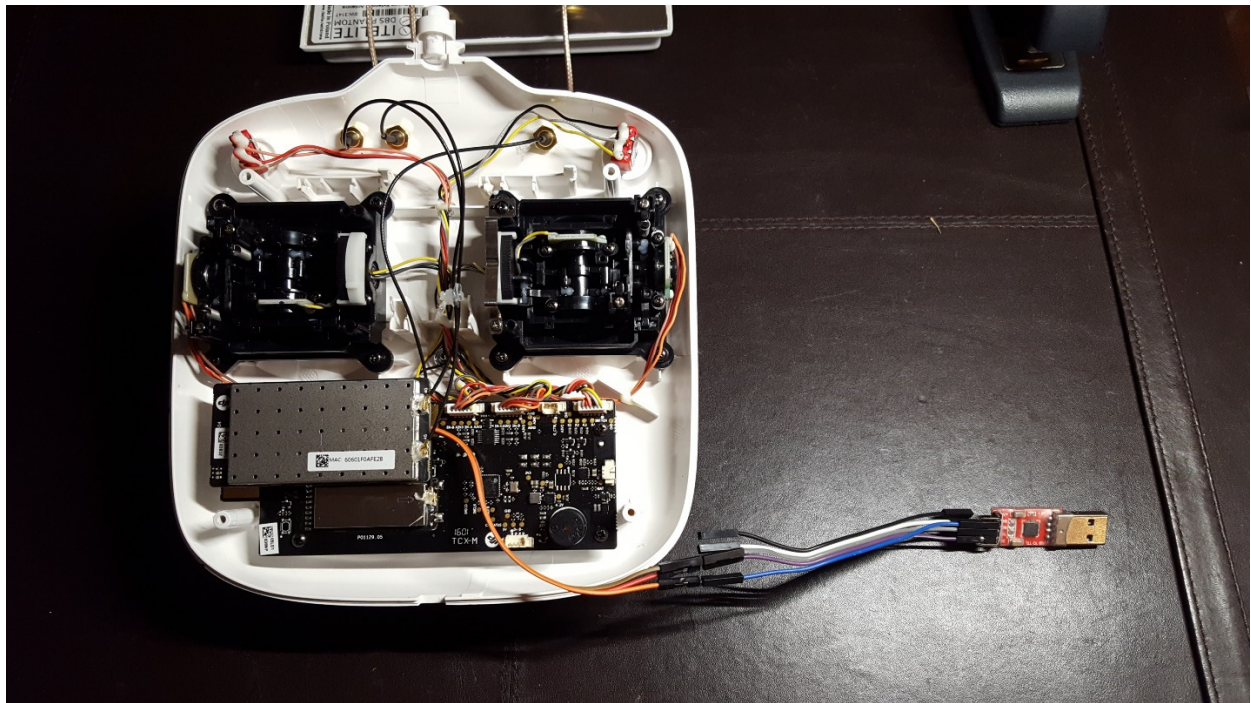10) Carefully place a small amount of solder on each solder pad.

11) Solder the jumper wires to the solder pads. Important: Make note of what color wire goes to what solder pad.

12) Use a magnifying glass to inspect the solder joints. Re-solder anything that looks questionable. You'll save yourself a lot of grief ensuring these connections are good from the start. Try not to drown the connection in solder. You don't need much.
13) Place electrical tape over the jumper wires to hold them in place when you re-attach the WRM.
14) Flip the WRM back over and carefully reconnect to the motherboard.
15) Attach the jumper wires to the USB to TTL USB UART adapter. Make sure to follow this pattern:
    - TX0 > RX
    - RX0 > TX
    - GND > GND

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Restoring Access via USB to TTL USB UART Adapter to the Aircraft

While I did not have to go this this extent, the process will be similar to the RC. You'll need to:

1) Gain access to the camera gimbal mother board
2) Identify the TX0, RX0 and GND solder pads on the motherboard
3) Tin the tips of the bare wire you want to solder to the AC and trim to less than ¼ inch length so as to not have too much excess exposed wire
4) Secure the camera gimbal motherboard so it won't move during the soldering process
5) Carefully place a small amount of solder on each solder pad
6) Solder the jumper wires to the solder pads. Important: Make note of what color wire goes to what solder pad.
7) Use a magnifying glass to inspect the solder joints. Re-solder anything that looks questionable. You'll save yourself a lot of grief ensuring these connections are good from the start
8) Reconnect/remount to the camera gimbal motherboard
9) Attach the jumper wires to the USB to TTL USB UART adapter. Make sure to follow this pattern:
   - TX0 > RX
   - RX0 > TX
   - GND > GND

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Unbricking the RC and Aircraft (AC)

1) Plug in the USB to TTL USB UART adapter into the computer/laptop USB port. Laptop with WiFi is preferable as you can quickly verify if the WiFi has been restored from its WiFi connection manager.
2) Start up your terminal emulation software and connect to the COM port associated to the USB. Make sure the Baud Rate is set to 115200.
3) Energize the RC or AC
4) You should see the boot sequence of the RC or AC. That's a great indicator that everything is working as intended!
5) Let the boot sequence run through the whole process. At some point you should see some error messages associated to the loading of the rcS file. That's what we want to see. If it's something different, post on the forums for further guidance.
6) Restart the RC or AC and quickly press ESC key as soon as you see:

```
Press ESC to abort autoboot in 1 seconds
```

7) You should see a prompt like this:

```
ar7240>
```

8) Enter the following commands:

```
setenv bootargs board=DJI-WM305 console=ttyS0,115200
root=/dev/mtdblock5 init=/sbin/init mtdparts=ath-nor0:256k@0k(u-
boot),64k@256k(u-boot-
env),896k@320k(kernel1),3008k@1216k(rootfs1),896k@4224k(kernel2),300
8k@5120k(rootfs2),64k@8128k(art),3904k@320k(firmware1),3904k@4224k(f
irmware2),8192k@0k(all)

bootm 0x9f420000

mkdir /tmp/flash

mount -t jffs2 mtd3 /tmp/flash

cd ./tmp/flash/etc/init.d/      <-Only edit files in this location. This is the default
```
boot location

9) At this point you have two options. You can try and edit the rcS file using vi or vim, correct any corrupted entries and save the file. Reboot and see if that fixes the issue.

```
vi ./rcS

vim ./rcS
```

10) Alternatively, you can copy a known good version of the rcS file over the version resident in the /tmp/flash directory. This will wipe out any modifications you had in the modified version of the rcS file.

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```
cd /tmp/flash/ && rm –rf ./etc/init.d/rcS && cp –r /etc/init.d/rcS
./etc/init.d/ && chmod +x ./etc/init.d/rcS
```

11) Once completed. Restart the RC or AC and watch the boot sequence. You should see no error messages related to the rcS file. For the RC you should also see the WiFi SSID being broadcast and be able to connect to it. If you are really lucky you'll also be able to connect to the AC and confirm everything is good via DJI GO App.

Post Mortem

Hopefully you have everything up and running. On the WRM, the foam/putty is pretty sticky so you can simply reinstall the WRM and press down on the foam/putty to secure it. I actually left my jumper wires on the WRM unit in case I ever need to get direct access again. I just cut some of the foam/putty material away to make a channel for the jumper wires, taped off the ends and laid them out of the way.

If you decide to de-solder the wires, make sure to not pull too hard on the wires when trying to melt the solder. You could pull the solder tabs off the motherboard. RC/AC will still work but if you ever have to go back in, you are going to have a problem.

Credits

I pulled from a lot of sources for this so don't be offended if I didn't get everyone:

Anyone and everyone who was involved in the multiple un-bricking threads on the PhantomPilots forum including: beshanoe, sparkymarky, Ojcze Nasz, TDKUK, ElMalo, BaDvs3viL, PapaTita, garrock, HappyStandardOwner

Jackhadrill whose original PDF spawned this document

And Corvinus for getting me over the finish line