How to Build Quadditch Drones

Naveed Nekoo https://github.com/Quadditch/quadditch-hardware

1) Gather Parts

Flamewheel f450 frame
Don't need top plate

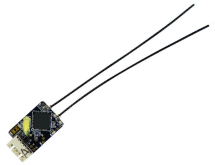
Pixhawk 4 with Power Distribution Board

DJI 2312E Motors (4)

DJI 430 Lite ESC (4)

Here3 RTK GPS

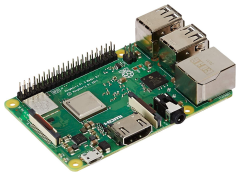
RFD 900X Telemetry Radio
With wire to Telem1 port



FrSky RXSR Receiver
With wire to DSM/SBUS port

Caddx FPV Camera

RDQ Mach3 Video Transmitter



Raspberry Pi

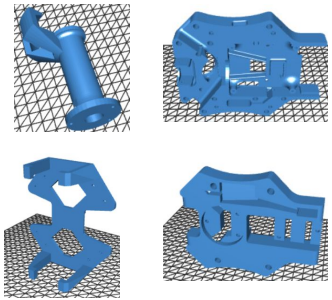
Screws:

M3 Heated Insert (10)
M3 Socket Screw (10)
DJI Screws (24)

5V BEC

DJI Legs

Micro USB Cable (2)



3D Printed Parts:

Bottom Plate, Top Plate, Battery Holder, GPS Holder
Available at https://github.com/Quadditch/quadditch-hardware/tree/main/STL

2) Assemble Frame

- Use DJI Screws for motors
- Connect motors to ESC and use zip tie to attach to frame
- Using double sided sticky tape, attach Pixhawk to front of bottom plate and PDB behind it
- Solder ESC wires onto PDB (4 wires per ESC)
- Use cables to connect power and I/O PWM from PDB to Pixhawk

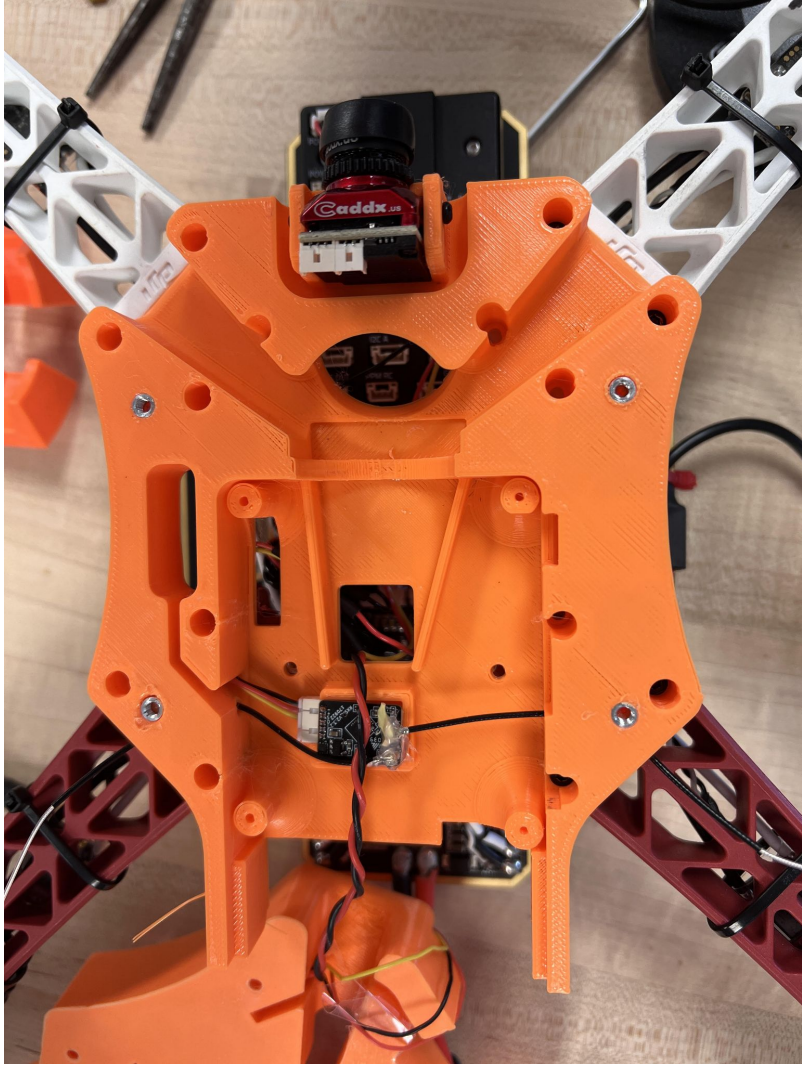
3) Add Extra Wires to PDB

- Connect 5V BEC to any positive and negative port on PDB
- Strip Micro USB cable and connect to output of 5V BEC
- Cover BEC in heat shrink

- Add another positive and negative wire to any power out on PDB for video transmitter
- Make this one longer as it needs to reach transmitter on top plate

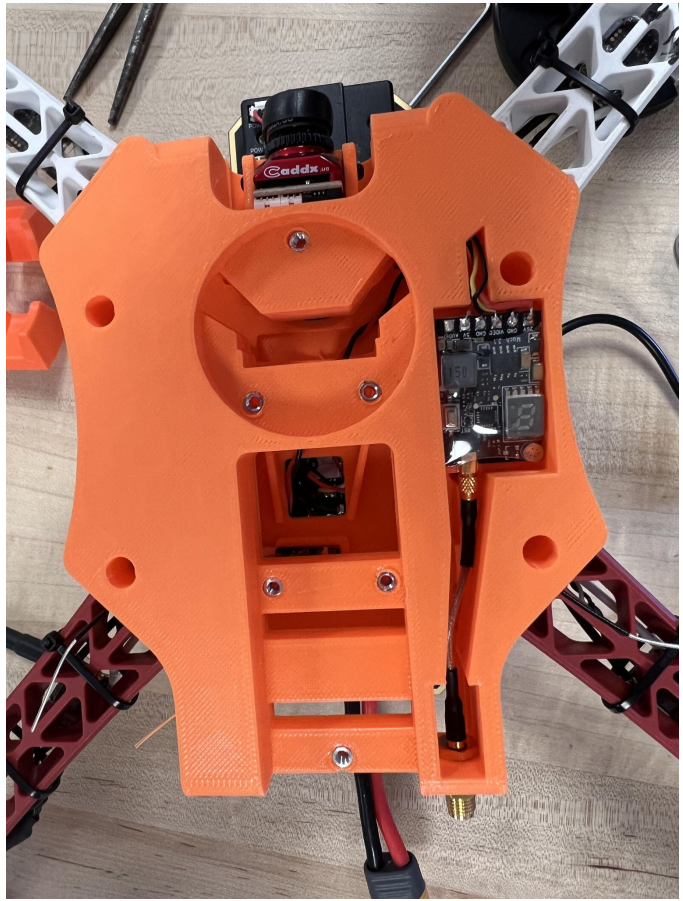
4) Assemble Bottom Plate

- Use solder tip to add 4 3M Alunimum inserts to set holes on bottom plate
- Attach Caddx FPV Camera using included screws
- Insert FrSky RXSR Receiver into slot
    - Need to use knife to remove antenna adhesive and rotate one antenna wire 180*. Add super glue to hold into place
    - Feed antenna wires through designated holes, and feed connector to Pixhawk 4 DSM/SBUS port
    - Bind to transmitter (look up how to do this)
- Insert raspberry pi (pressure fit) so no need for screws
- Screw in bottom plate using 16 DJI screws



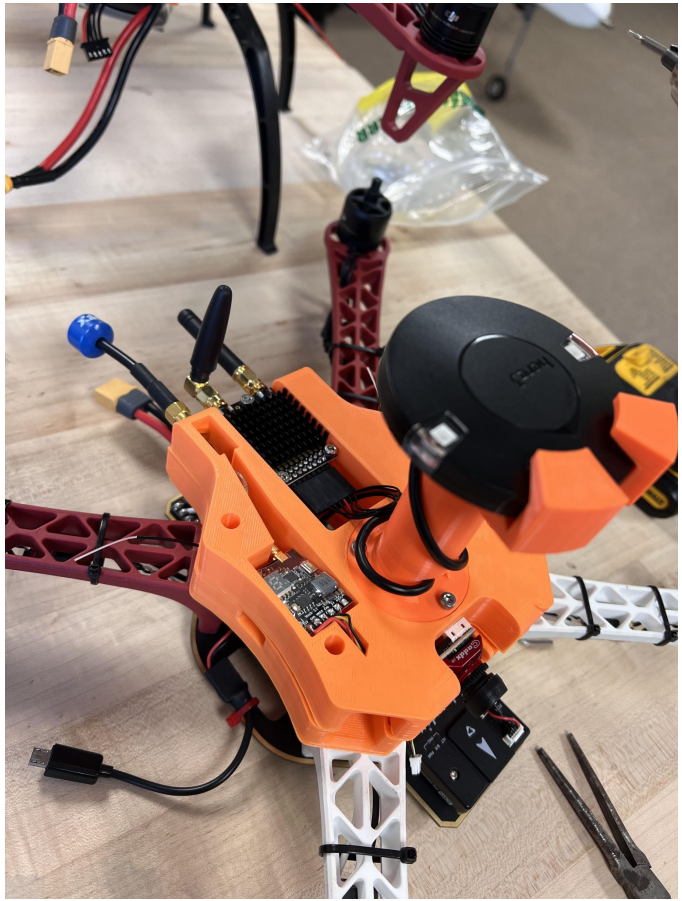
5) Assemble Top Plate

- Use solder tip to add 6 3M Inserts to desired holes
- Insert video transmitter
  - 5V, GND, and Video go connect to camera
  - 26V and GND go to PDB (wire added in step 3)
- Use 4 M3 socket head screws to attach top plate to bottom plate



6) Finish top plate

- Screw in 3d Printed GPS holder using socket screws
    - Pressure fit Here3 into place and feed wire through hole to Pixhawk4 CAN port
- Screw in RFD900x telemetry radio (heat sink side up) and feed wire to Pixhawk4 Telem1 port
- Connect video transmitter wire to FPV camera
- Add video transmitter antenna



7) Battery Holder and Legs

- Place battery holder beneath bottom aluminum plate and legs beneath that, screw into place using socket screws
- Add micro usb cable from Pixhawk to Raspberry Pi

Tips

- After soldering, use a multimeter under continuity setting to check for any shorts before plugging in battery
- Set up wires first, as they can be hard to manage once top and bottom plate are screwed in
- Use QGroundControl to ensure all parts working as expected