Apprentice Pre-Flight Checks & Arming Procedures

Electronics Onsite Preflight Checklist

Wiring Checks

- ❏ 5v Power Cable runs from Power Distribution Board to either Pixhawk Power ports
- ❏ 12v power cable runs from Power Distribution Board into ESC
- ❏ Telemetry Radio plugged into "UART & I2C B" port
- ❏ Transceiver radio plugged into "Telem 1" port
- ❏ GPS plugged into "GPS module" Port
- ❏ PWM breakout Board plugged into "I/O PWM OUT" Port
- ❏ Airspeed Sensor plugged into I2C port

- ❏ Aileron Servos plugged into Channels 1 and 2 on PWM breakout Board
- ❏ Elevator Servo plugged into Channel 3 on PWM breakout Board
- ❏ Rudder servo plugged into Channel 4 on PWM breakout Board
- ❏ ESC cable plugged into Channel 5 on PWM breakout Board

- ❏ Ensure all electrical components (excluding the battery) are secured to their respective velcro strips

Battery Check

- ❏ Plug voltage Alarm into Battery
- ❏ Verify Each cell is at 4 volts

Software Check

- ❏ Locate and verify ESC power switch is powered off
- ❏ Plug battery into PDB
- ❏ Verify pixhawk gives a startup Beep via the GPS buzzer
- ❏ Verify a connection is established between the pixhawk and QGroundControl
- ❏ Verify a connection is established between the Taranis and the pixhawk
- ❏ Verify a GPS lock on QGroundControl
- ❏ Secure battery into battery compartment via two velcro straps
- ❏ Close battery compartment, flip the battery latch, locking the door

Calibrations

- ❏ Navigate to the sensors tab on QGroundControl
- ❏ Complete any calibrations marked as incomplete
    - ❏ If not already completed, complete the accelerometer calibration
    - ❏ If not already completed, complete the compass calibration
    - ❏ If not already completed, complete the level horizon calibration

Pre-Arm Procedure

Servo Check

- ❏ Press and hold the pre-arm switch on the pixhawk gps until a beep is heard
- ❏ Flip the ESC power switch to the on position
    - ❏ Note: The pixhawk should now be pre-armed. This means the servos can be moved by the controller but the motor should not be armed. If the motor somehow becomes armed at this step, Disarm the pixhawk using QGroundControl, flip the ESC switch to the off position and repeat the last two steps
- ❏ Test all control surfaces move free and correct
    - ❏ Test Ailerons via moving the right stick on the Taranis left, then right
        - ❏ If ailerons move in the opposite direction,
            - ❏ Flip the ESC switch off
            - ❏ Disconnect the battery
            - ❏ flip the PWM cables for channels 1 and 2 on the breakout board. Repeat the software check then jump to the pre-arm procedure
    - ❏ Test Elevators by moving the right stick on the Taranis up and down, then back to neutral
    - ❏ Test the rudder by moving the right for no more than 1 second, and then left

Motor Arm & Test

- ❏ Declare clearly that the UAS is being armed, keep people clear of the prop
- ❏ Arm the UAS via moving the left stick on the rudder to the right for 3 seconds.
    - ❏ A long low arming tone should play from the buzzer, and QGroundControl should audibly say armed
- ❏ Have one person wearing safety glasses and gloves hold the plane such that the motor is facing out and away from any people or buildings.
- ❏ Audibly and visually confirm that the individual has a finger on on the ESC power switch
    - ❏ Verify audibly that at any time during the test, the individual feels uncomfortable or looses their grip they will flip the ESC power switch off
- ❏ Audibly and visually confirm that the individual has a secure grip on the UAS
- ❏ Declare that you are powering the motor up
- ❏ Move the left stick up to ~ ½ throttle to verify the motor works
    - ❏ Listen for audio queues that the motor is not working

- ❏ Move the stick down
- ❏ Perform a full power run-up with the aircraft suitably secured
  - ❏ Aircraft may be held by team member wearing appropriate PPE, set on the ground and held by the tail, or set on a suitable test-stand
  - ❏ Verify audibly that the motor has full power
- ❏ Move the throttle stick down
- ❏ Disarm the motor by holding the prearm switch on the GPS

Arm Procedure

- ❏ Bring UAS to take off area
- ❏ Hold the prearm switch until a beep tone is heard
- ❏ Declare clearly that the UAS is being armed, keep people clear of the prop
- ❏ Arm the UAS via moving the left stick on the rudder to the right for 3 seconds.
  - ❏ A long low arming tone should play from the buzzer, and QGroundControl should audibly say armed
- ❏ Verify control surfaces are free and correct