

XUWING DB2200 VTOL PNP User Manual



Patent owned



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...

DB2200 Functions/structures illustration

备注:
该图为设计功能展示图, 所示的吊
舱, 相机, RTK, 数传, 飞控等
所售的PNP版本不包含这些设备!

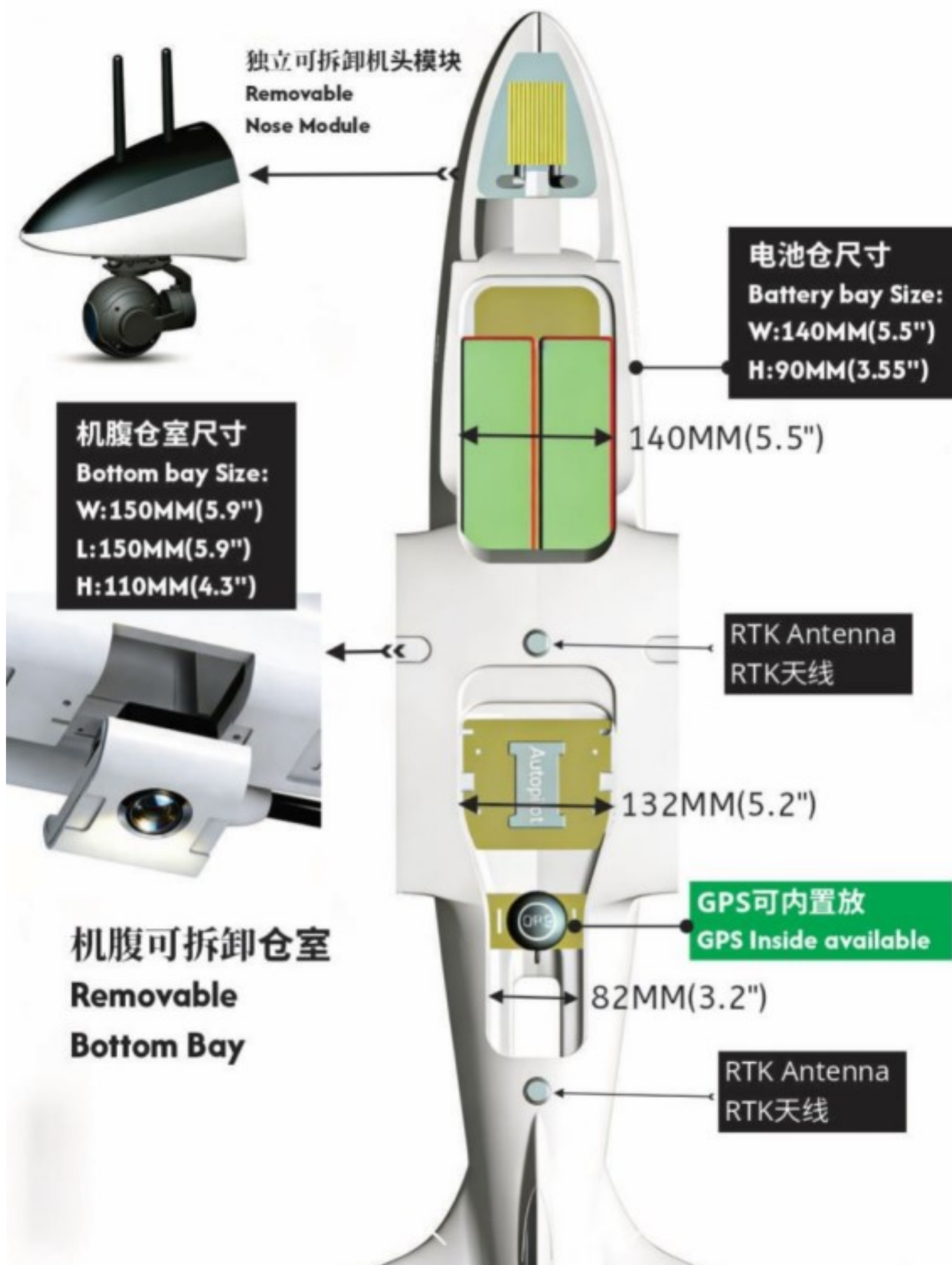
5010电机配上18寸螺旋桨
动力更大, 悬停耗电更小

Rotor Motors: 5010
Propeller: 1855

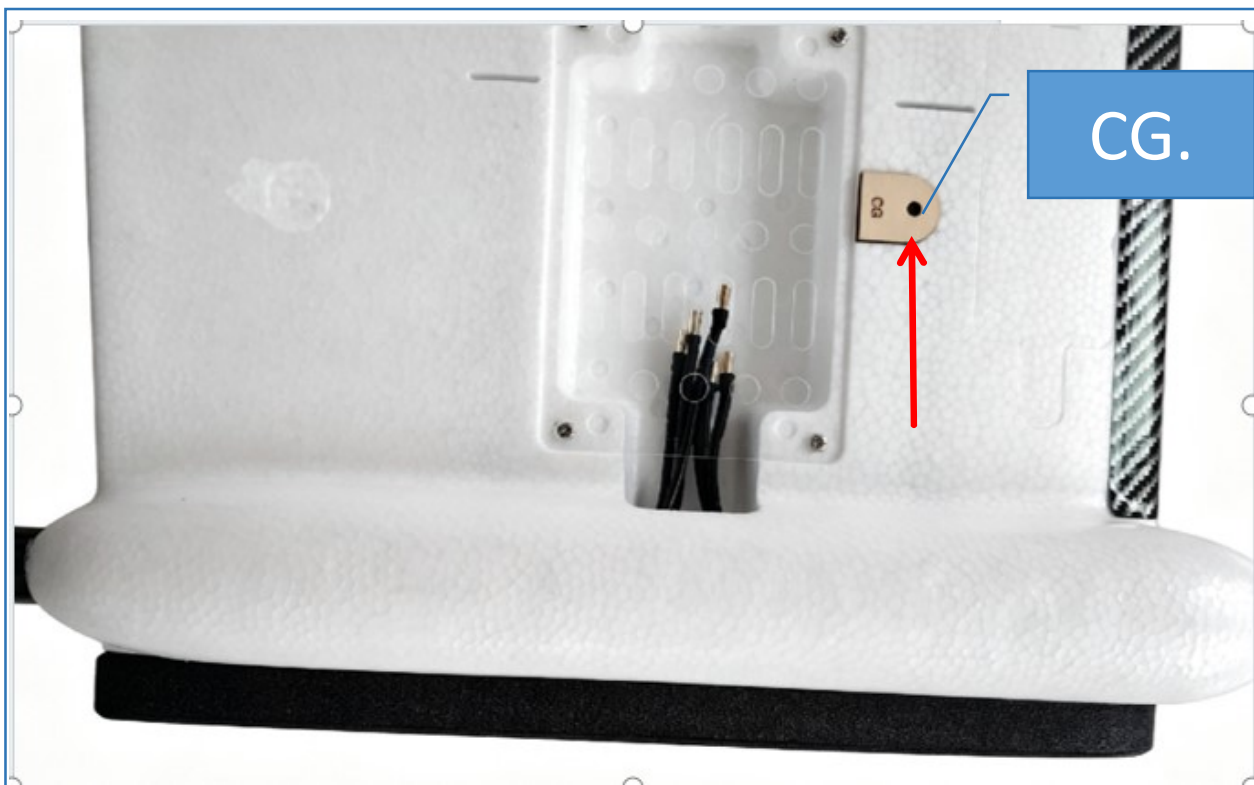
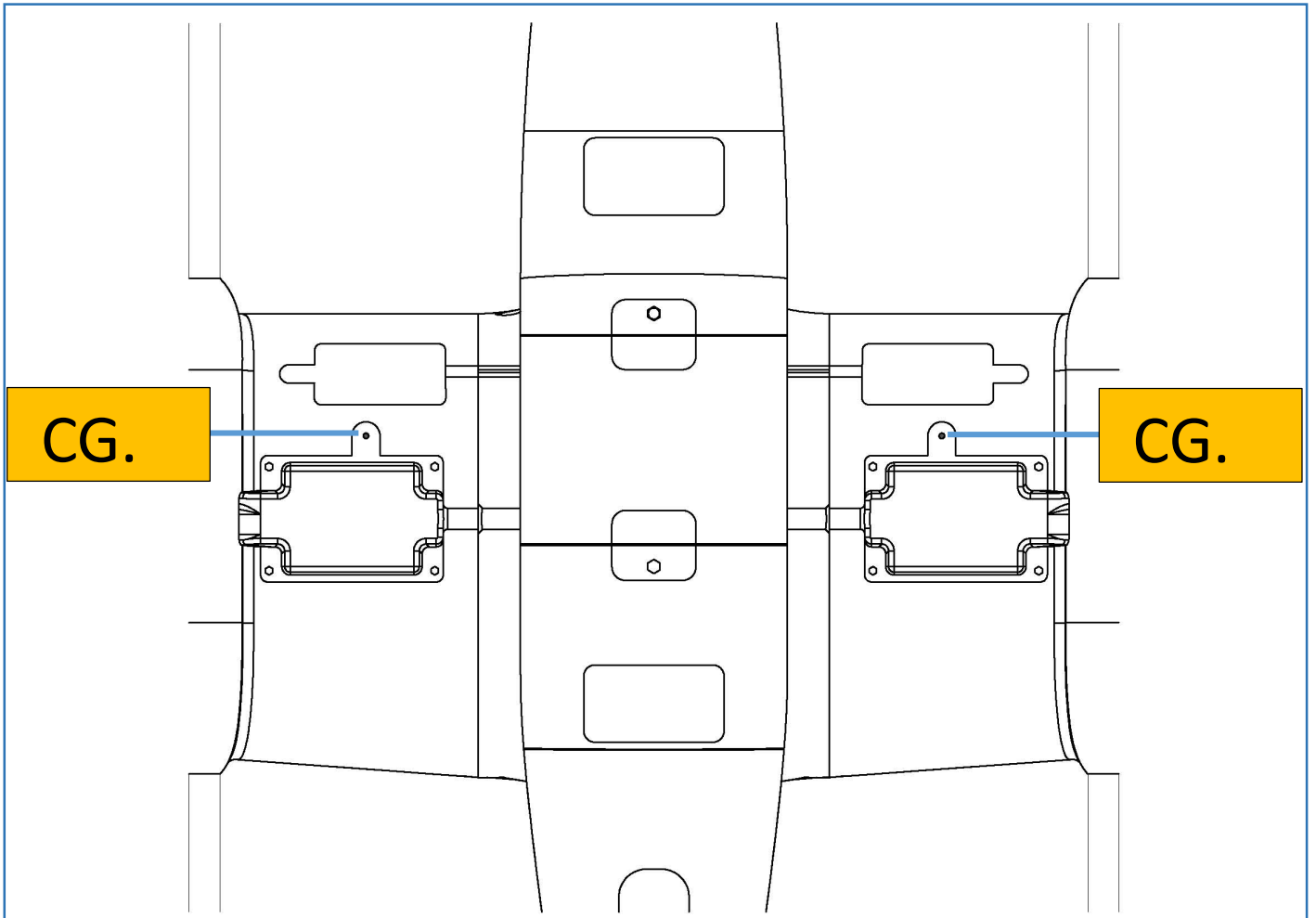
Reserved bay inside
for Telemetry radio
内预留有装数传的槽



DB2200 Functions/structures illustration

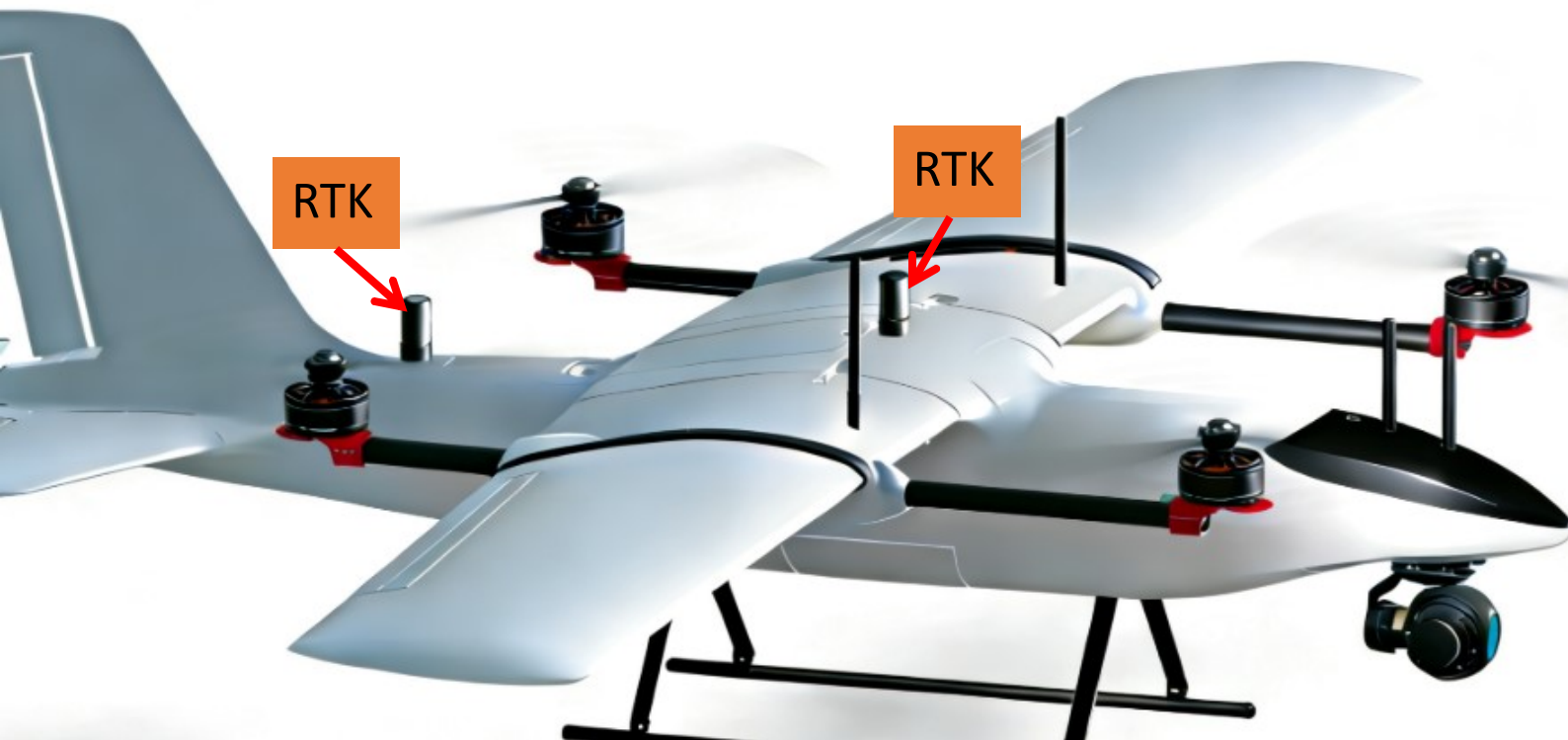
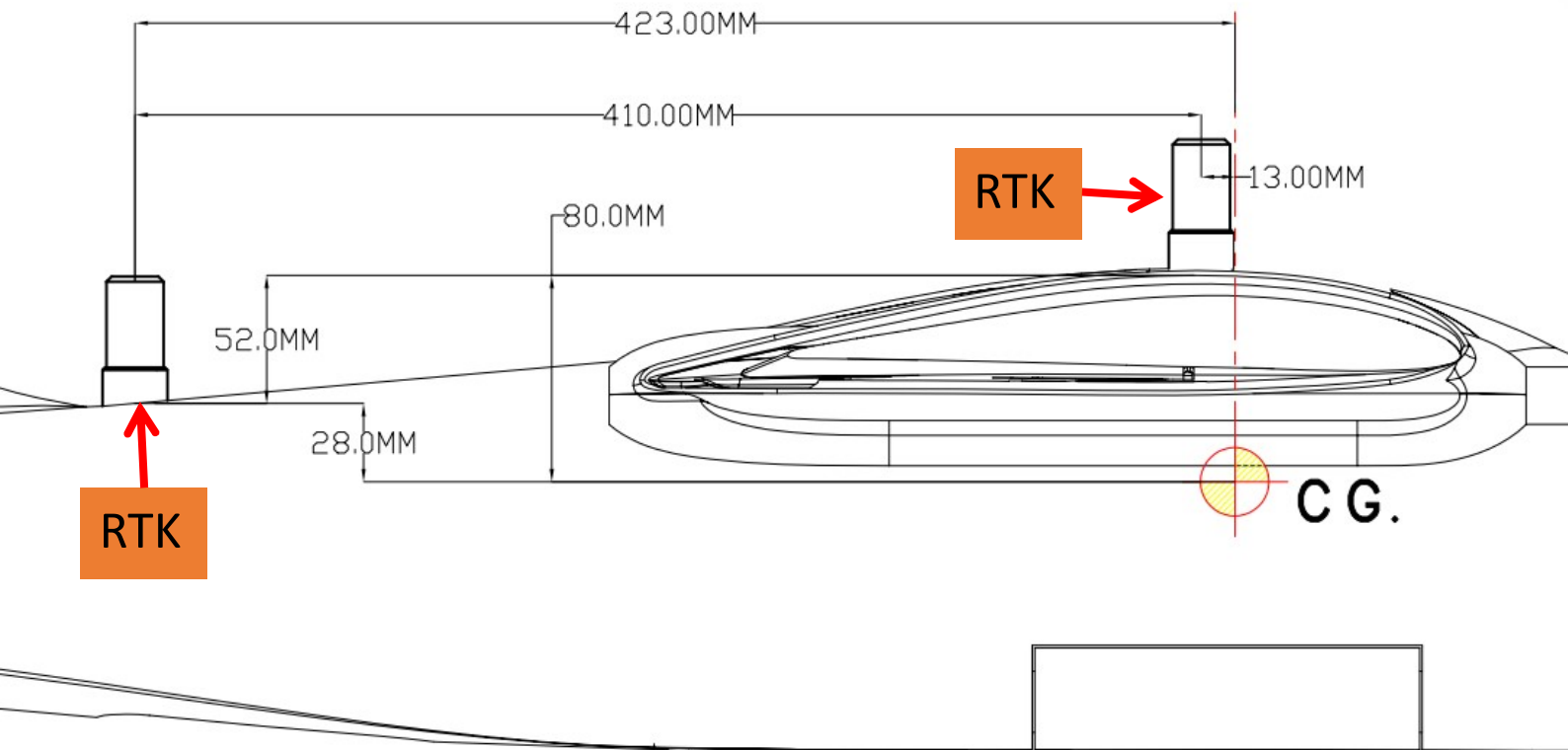


DB2200 CG.

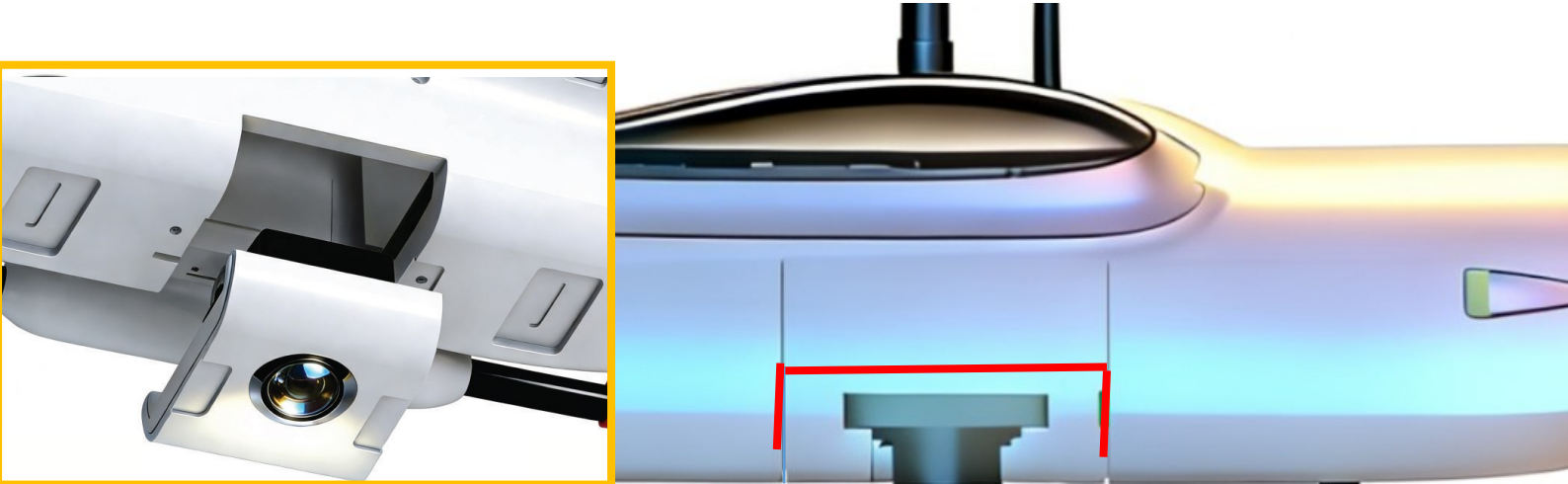


RTK Antenna mount position drawing

If RTK is required for your plane, please fill in the relevant parameters based on the data in this drawing, otherwise (no need RTK) please ignore and skip to the next page.



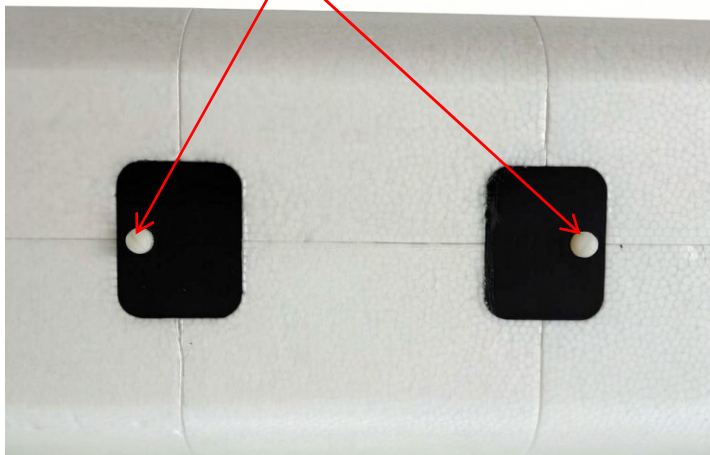
Belly Camera Module 150MM*150MM



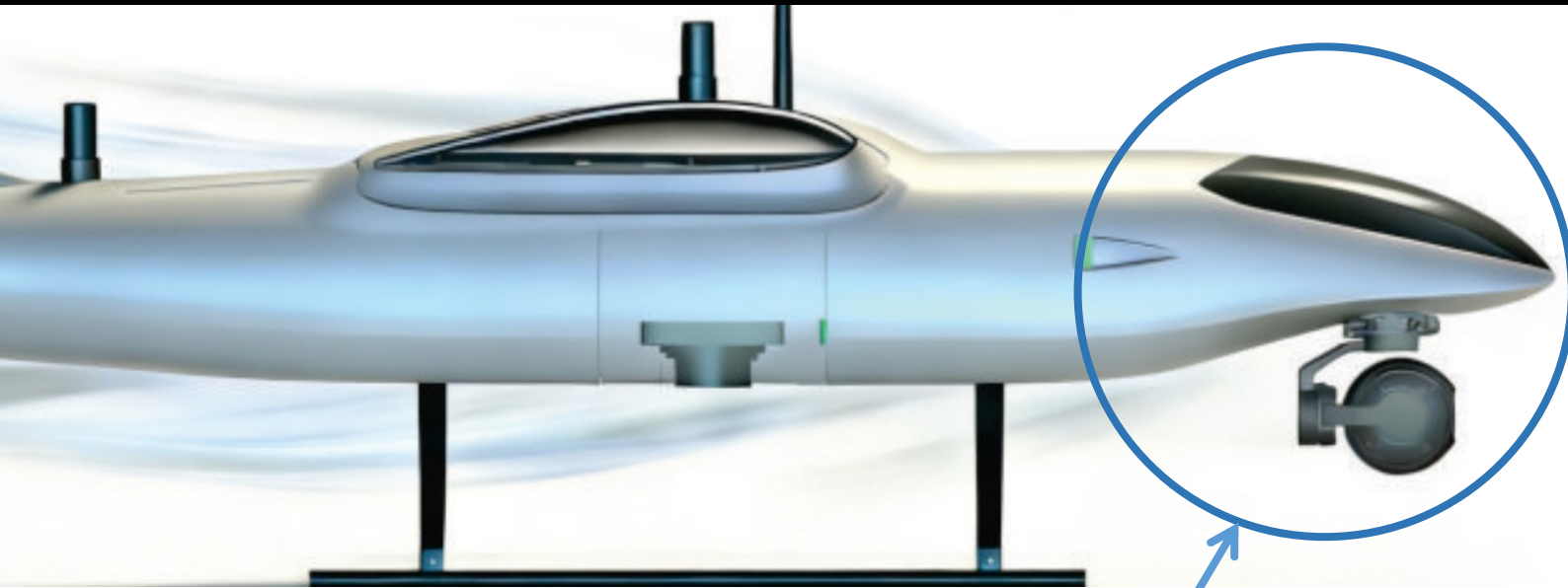
The bottom of the camera module is pre-cut, while the top and side remains uncut, if this feature is not required , you can remain it sealed. if needed, simply cut along the red guide slot to detach the individual module piece.



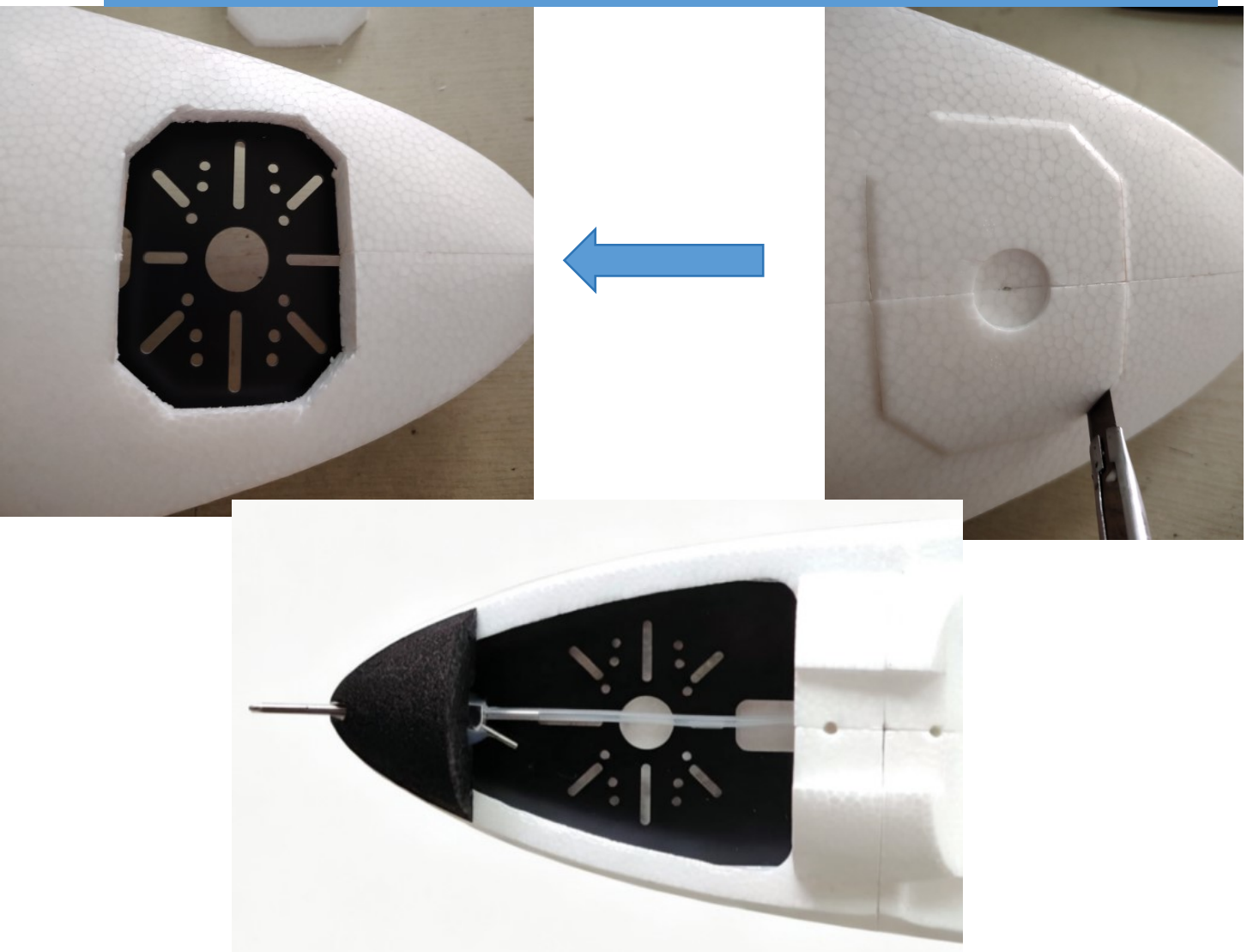
after cutting, secure the module with two shortest screws, if uncut, no screws are required



Nose Module



if need to install a gimbal, cut an opening below to fit its size. if no gimbal and unused just simply remain it sealed.



Introductions to Related Accessories

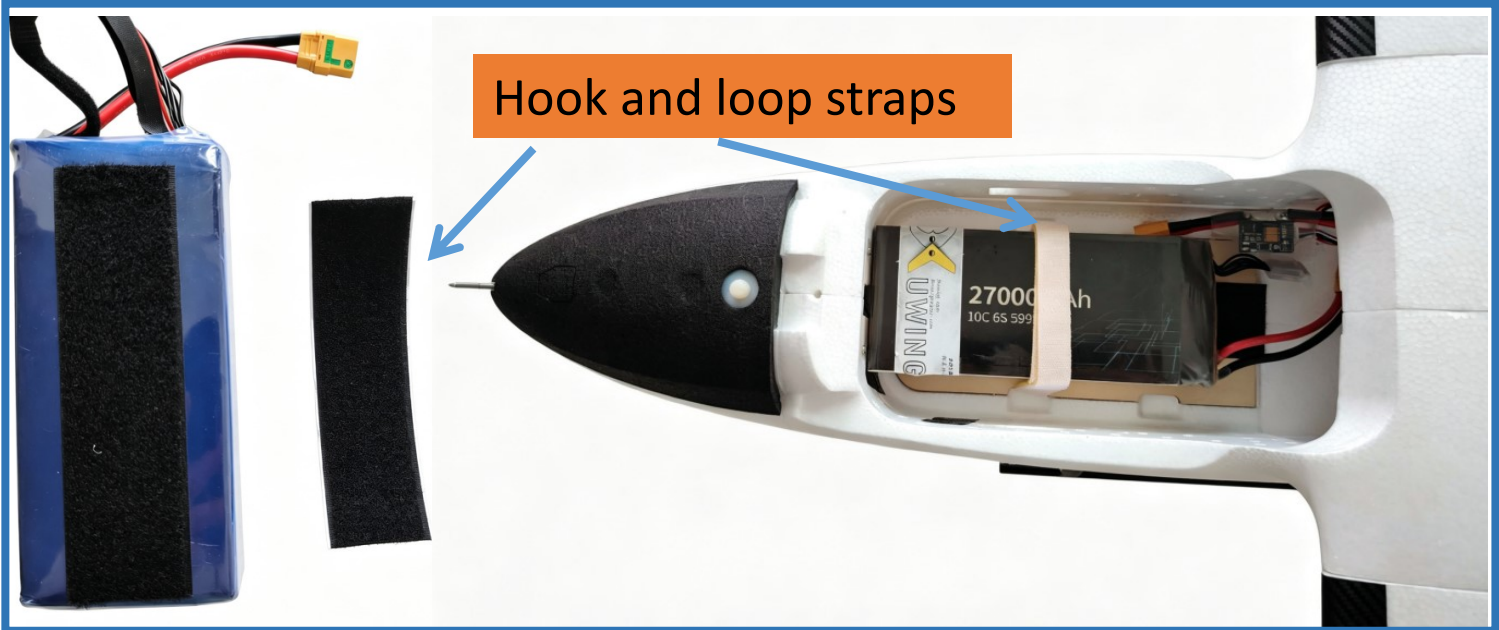
Servo Horn



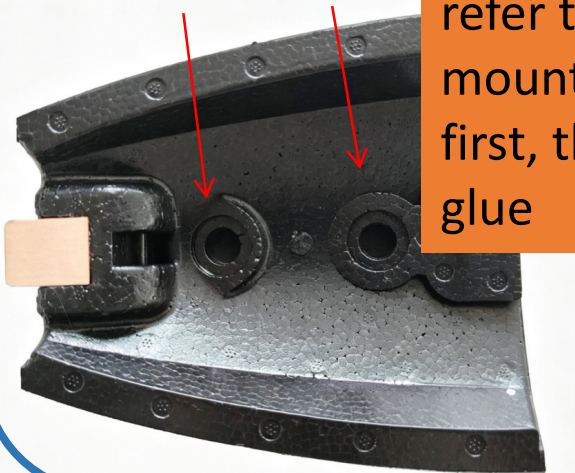
Rubber to secure Propellers



Hook and loop straps

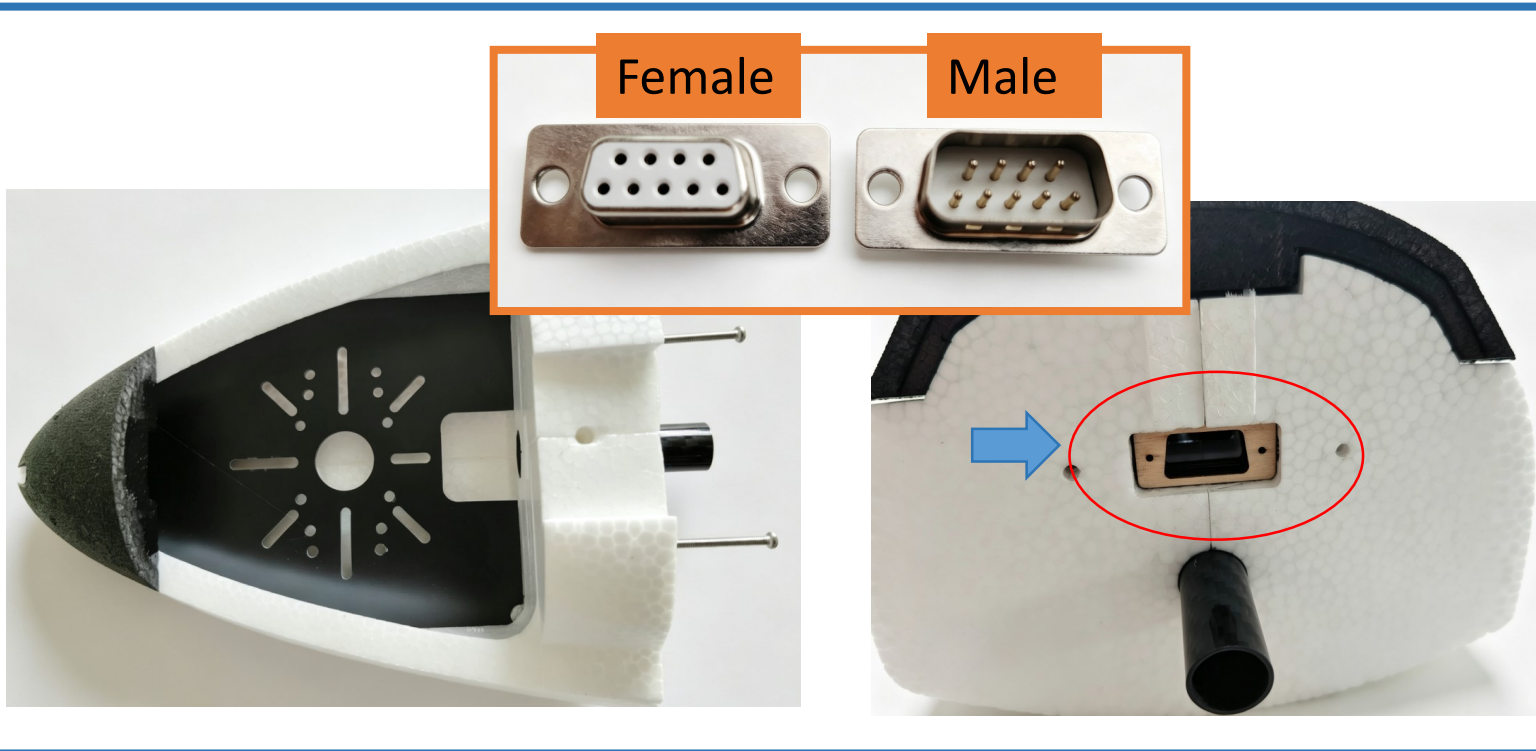


For Nose-mount antennas, use this washer to assist installation. refer to RTK antenna mount. mount antenna first, then secure with glue

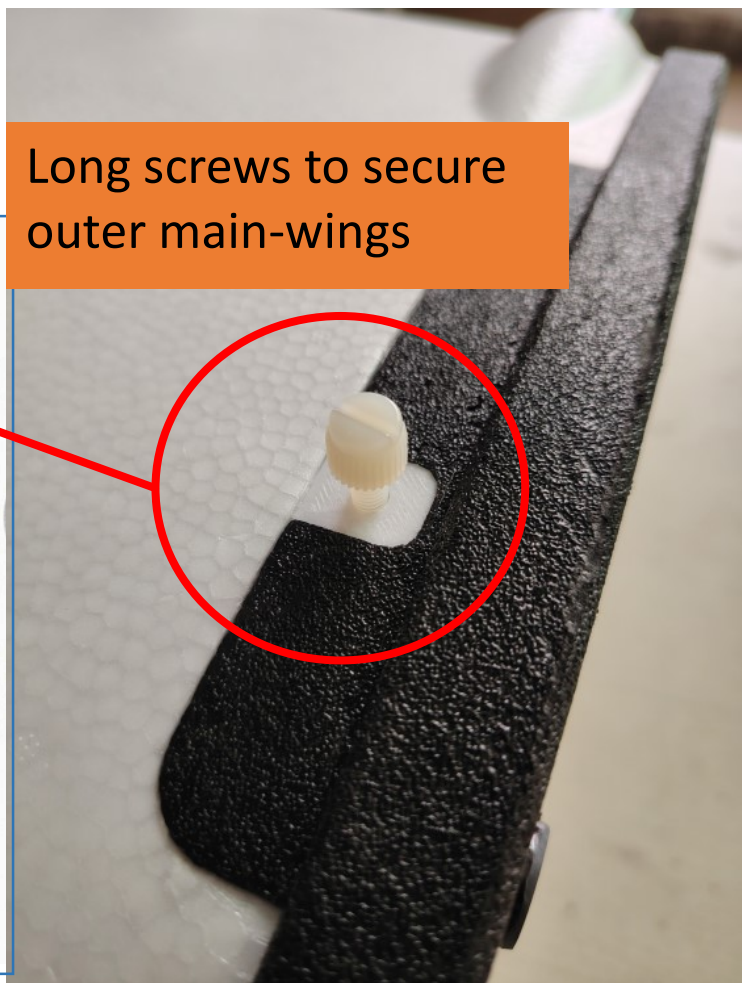
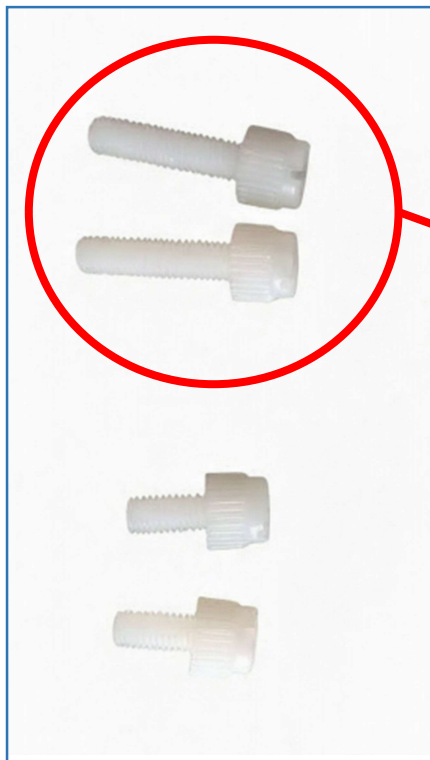


Introductions to Related Accessories

The nose is removable and compatible with this quick-release connectors. this is optional function, based on your needs.



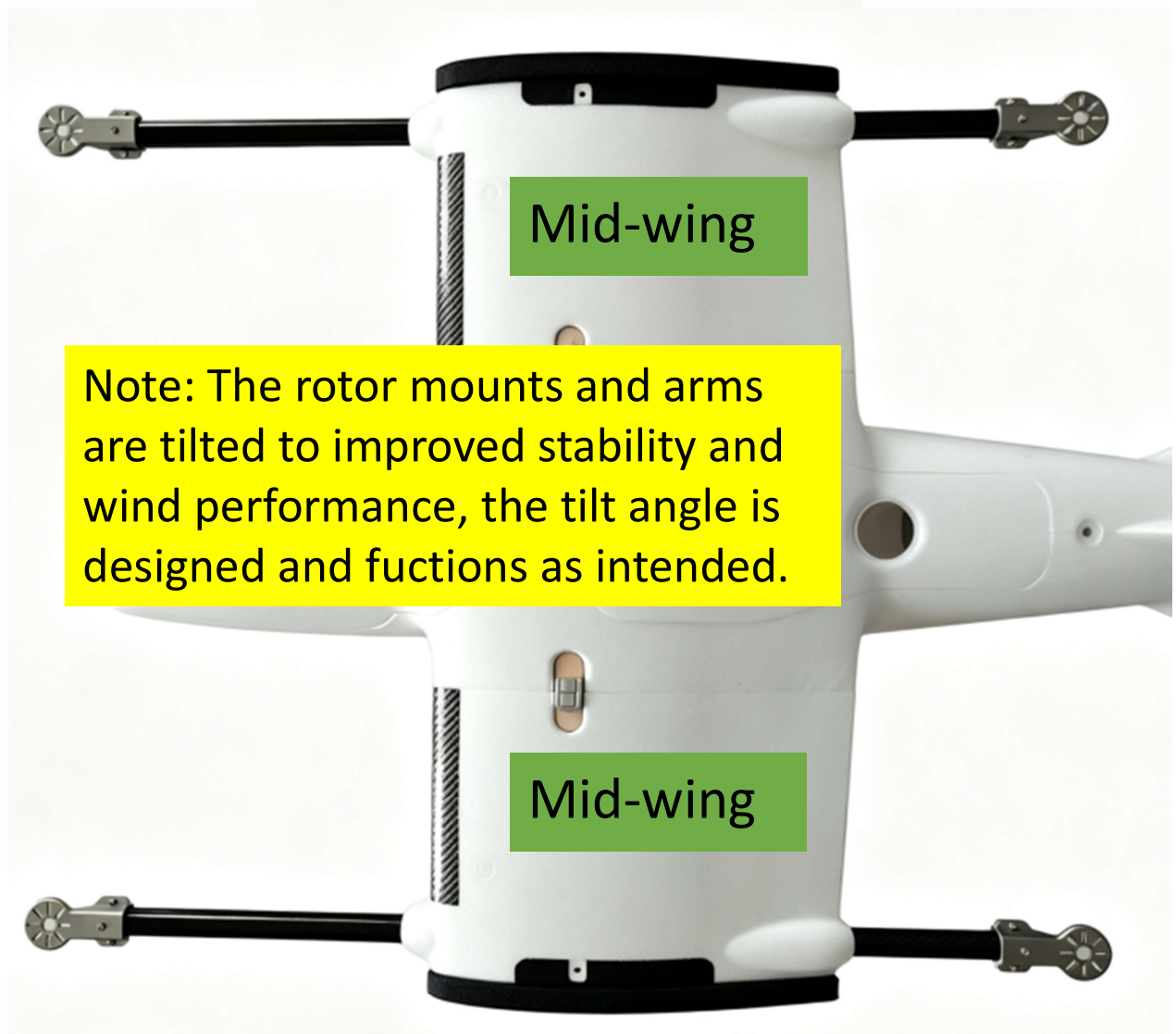
To secure
Vertical
stabilizer



Long screws to secure
outer main-wings

DB2200 Airframe parts are pre-installed except for the CNC Aluminium parts and landing gear (due to shipping box space limitations) no need to hurry with airframe assembly. Prioritize the power system and wiring preparations,

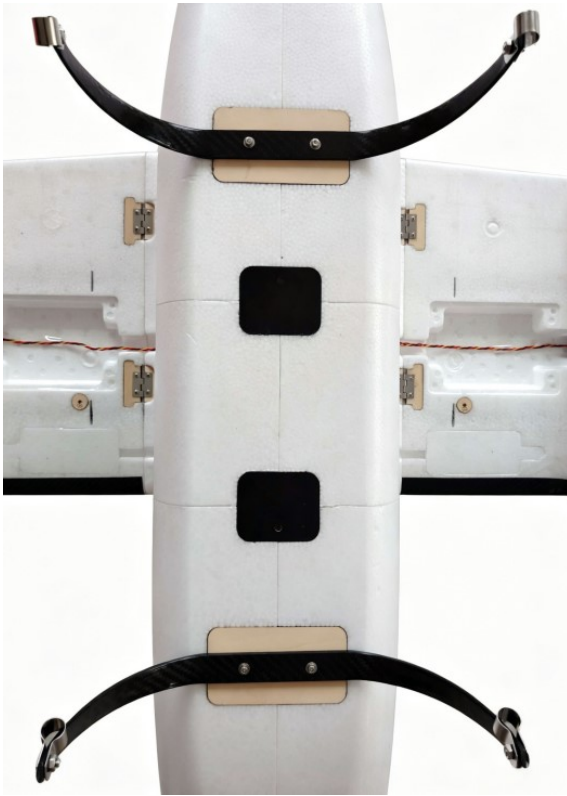
1. CNC Rotor mount assembly



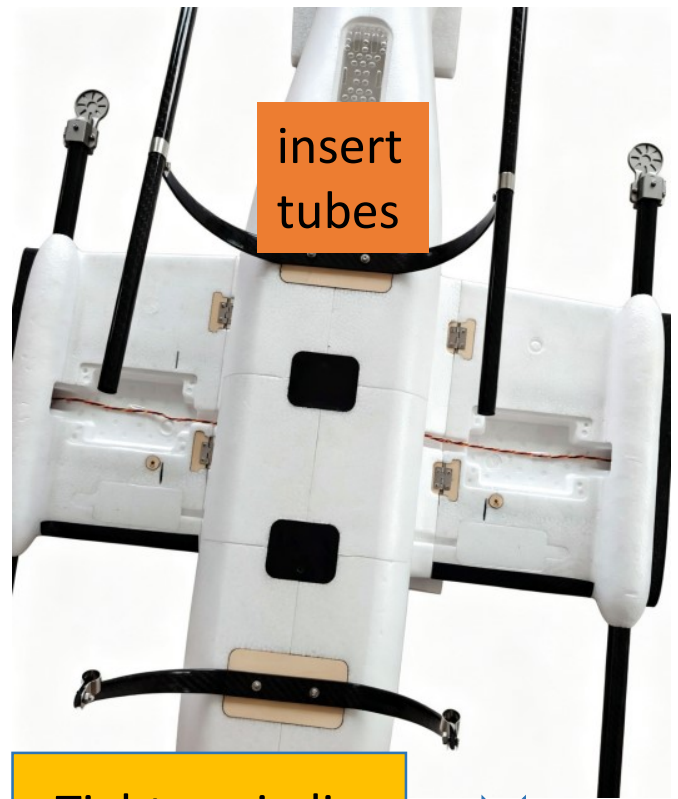
Note: The rotor mounts and arms are tilted to improved stability and wind performance, the tilt angle is designed and functions as intended.

2. Landing gear

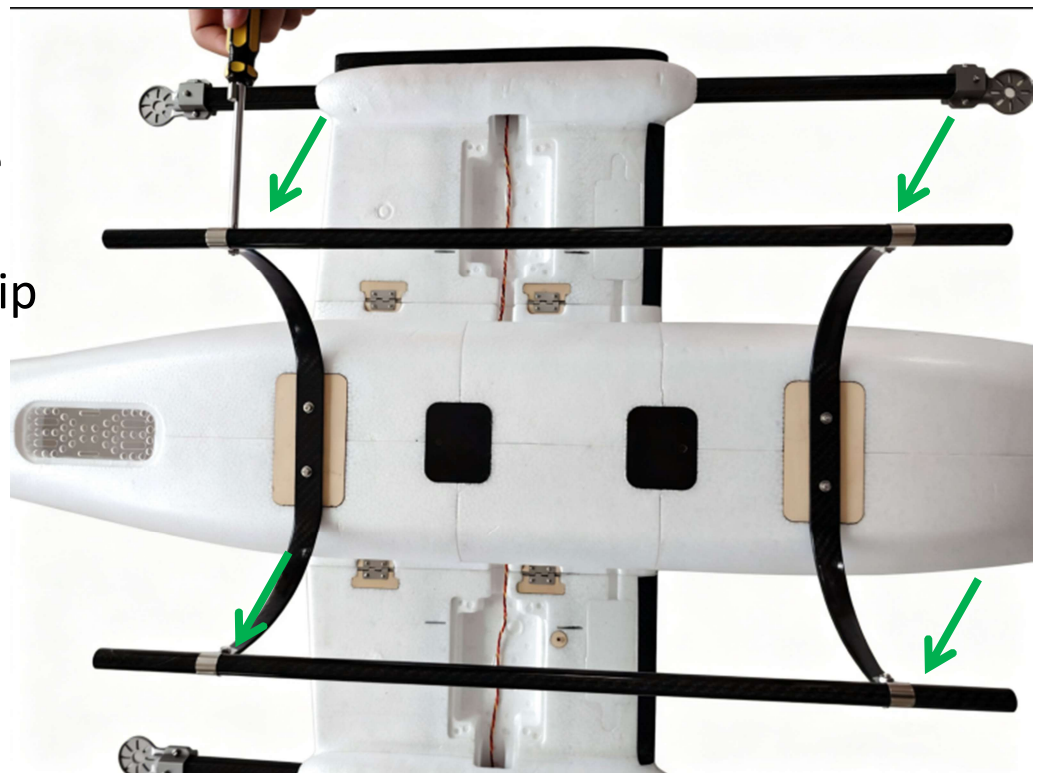
start by installing the 3K carbon fiber bracket first



Pass the two tubes through, don't tighten circlip screws before inserting



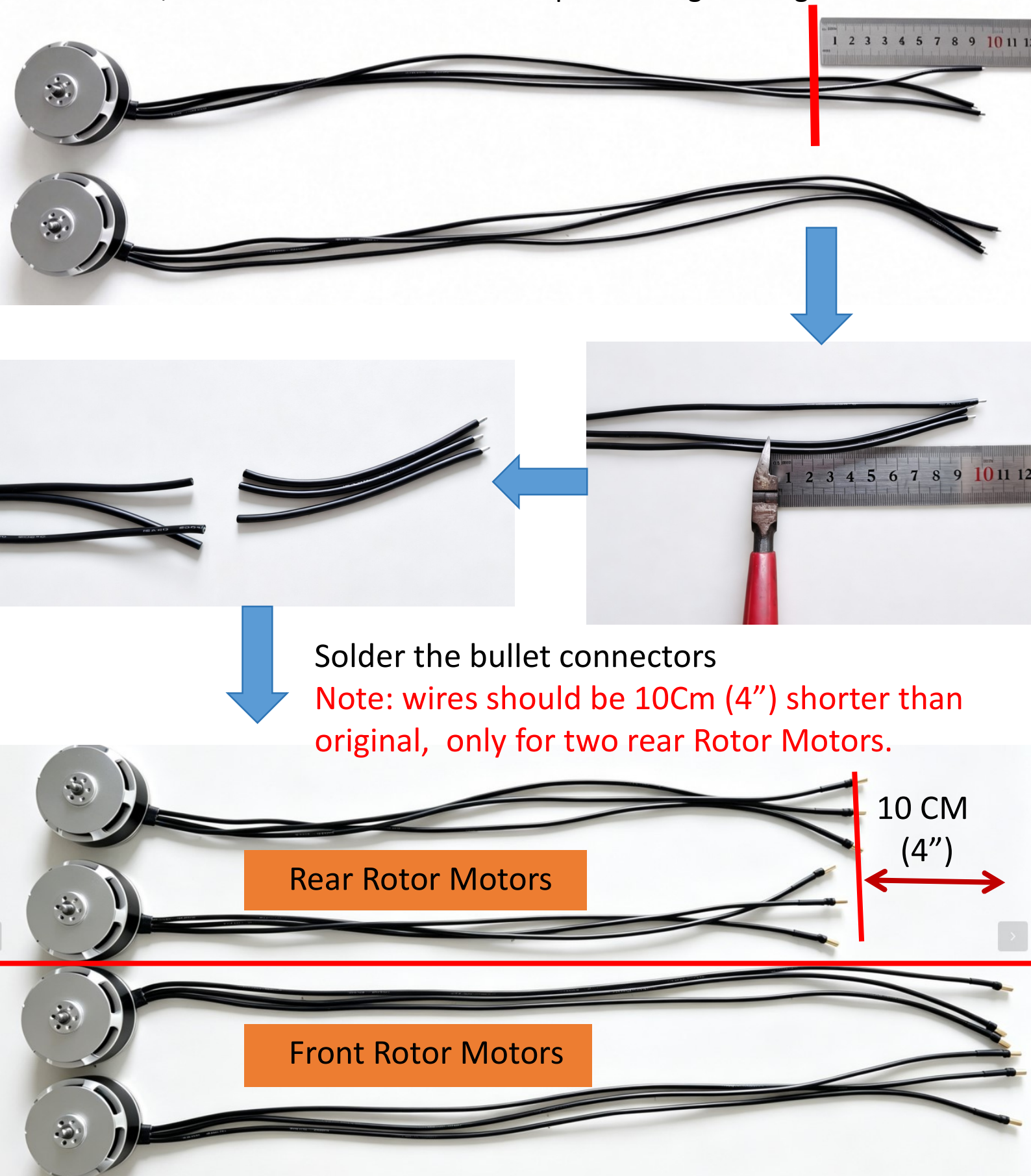
Tighten circlip screws



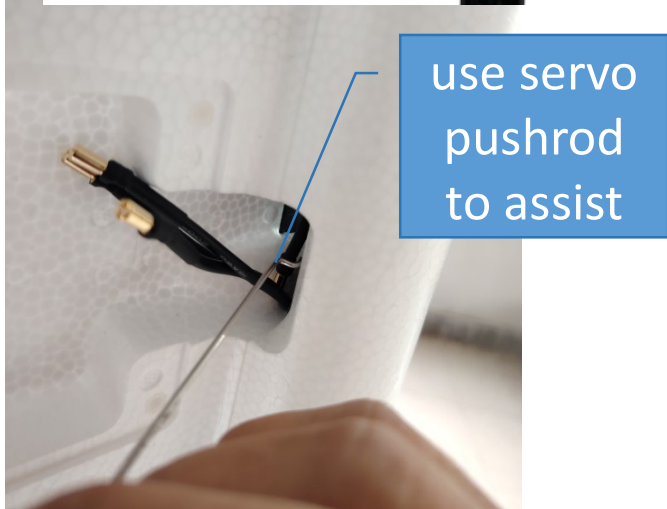
Once aligned to the correct position, tighten all four circlip screws

Next, install Motors, servos, ESC and Power boards

Take out motors, cut wires 10CM (4") shorter for two rear rotor motors, Another two front motors keep wires original length



Route Motor wires through mid-wing slot (ESC Bay)
Use servo push rod to assist in pulling the wires out.



Caution: No mid-wing removal needed for wiring, hinge is locked tight-DO NOT remove screws or disassemble!



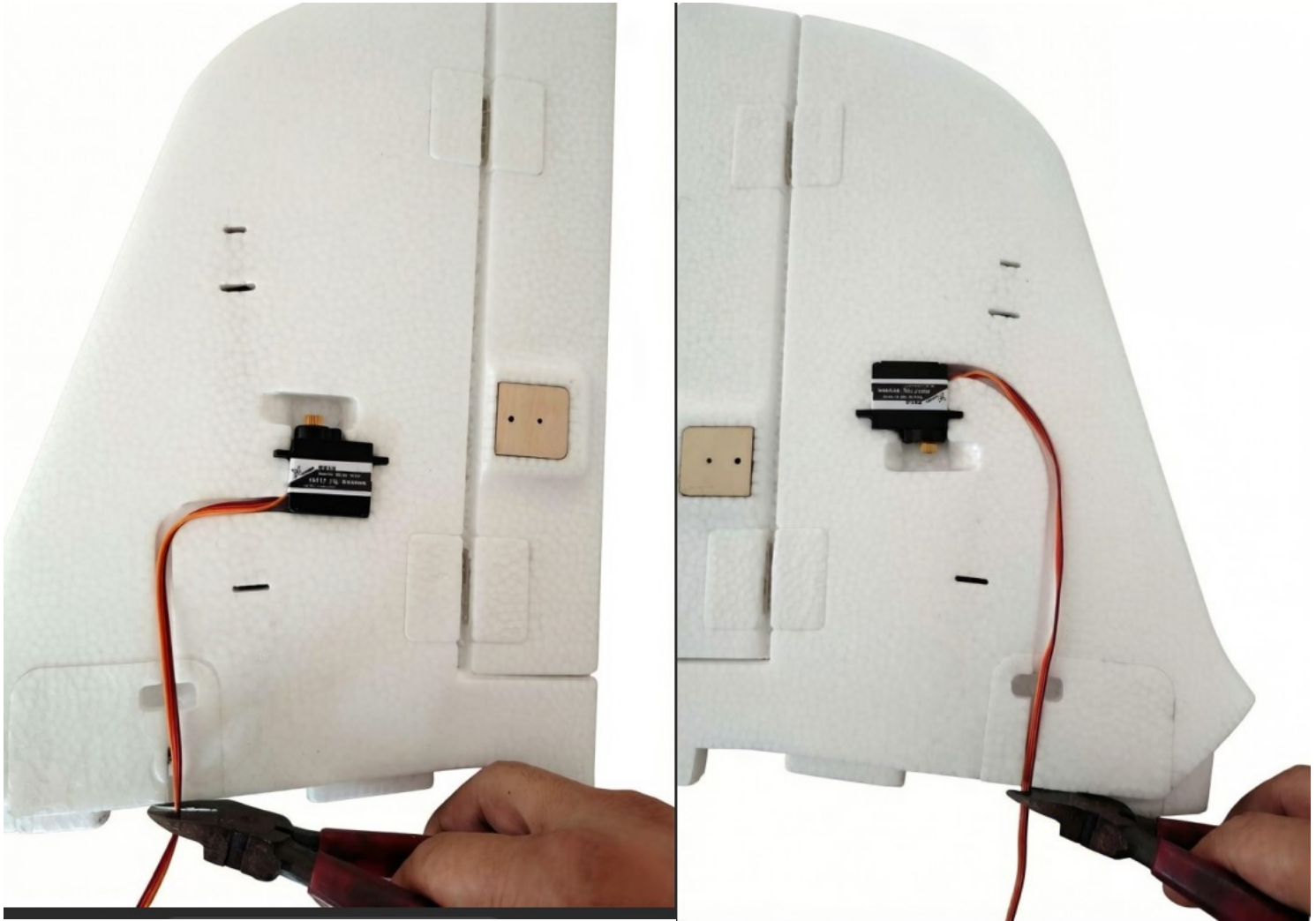
Install
Motors

Mid-wing

Mid-wing

Elevator servo installation

Note: Before installing the servos, neutralized&testing all servos first.

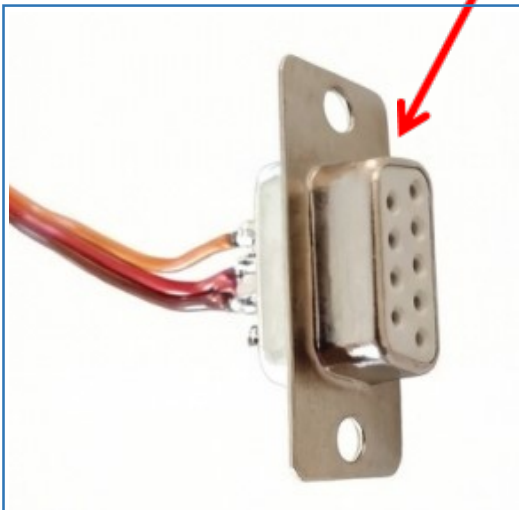
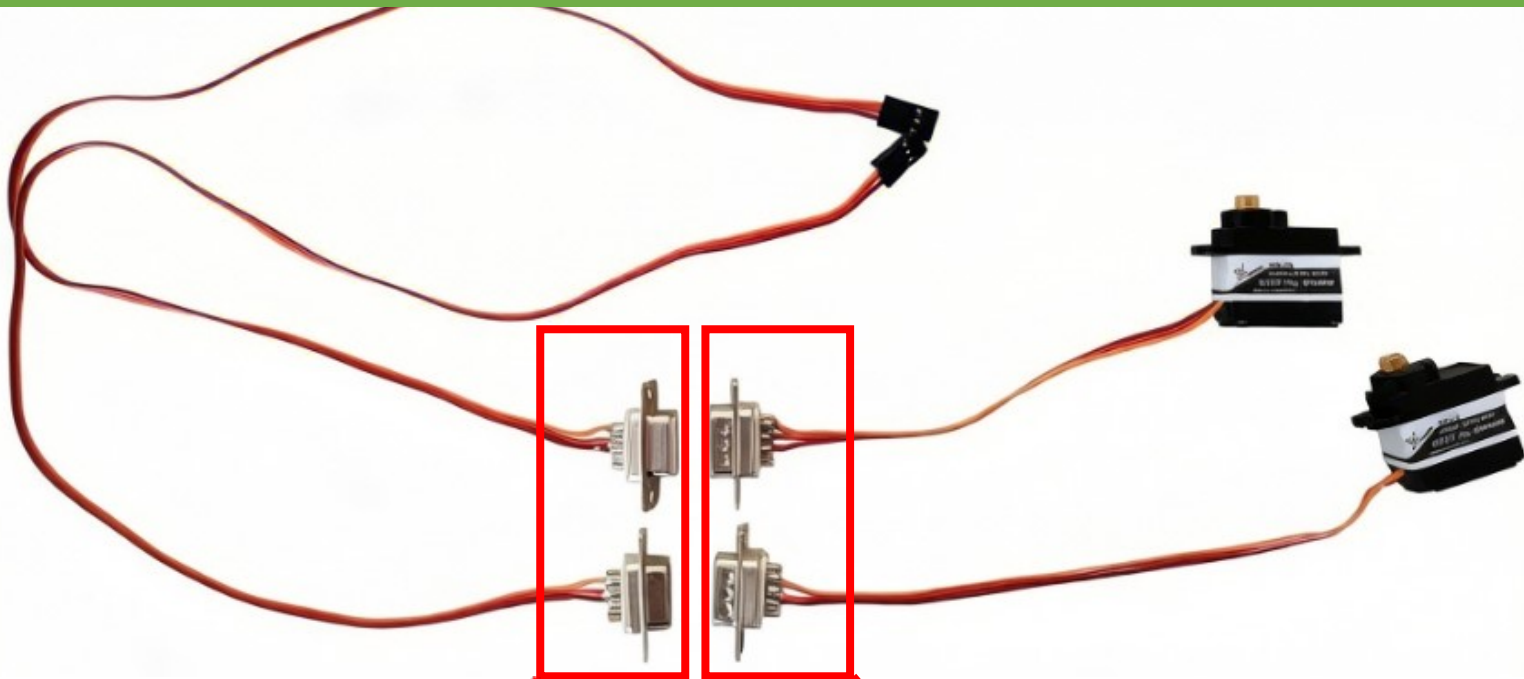


Elevator Servos are DM17

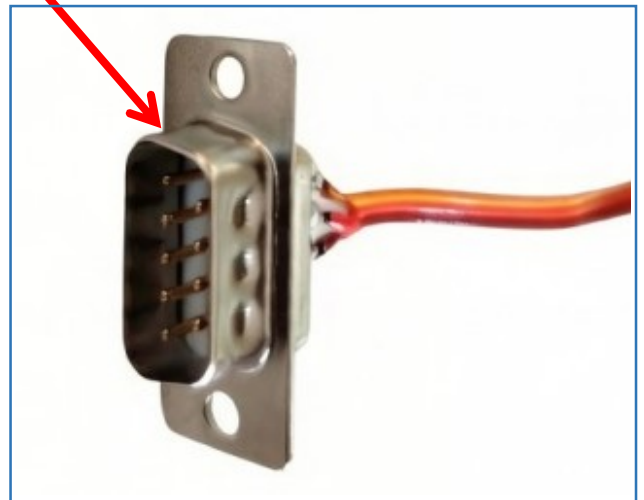
Since we need to solder wires to the quick-release connectors, the first step is to measure appropriate wire length. Note that wire's length for left and right stabilizer are differently. so each one must be measured separately. As shown in the pictures, insert wires and cut the wires。

Next, solder wires to quick-release connectors

There is no fixed wiring order, you can define it yourself. Just make sure the males and females wired correctly to match each other



Female
Mounted by the side
of fuselage



Male
Mounted on the
horizontal stabilizer



You can apply some hot glue for reinforcement after soldering.

Note: Connector has a trapezoidal shape, pay attentions to the installation orientation.

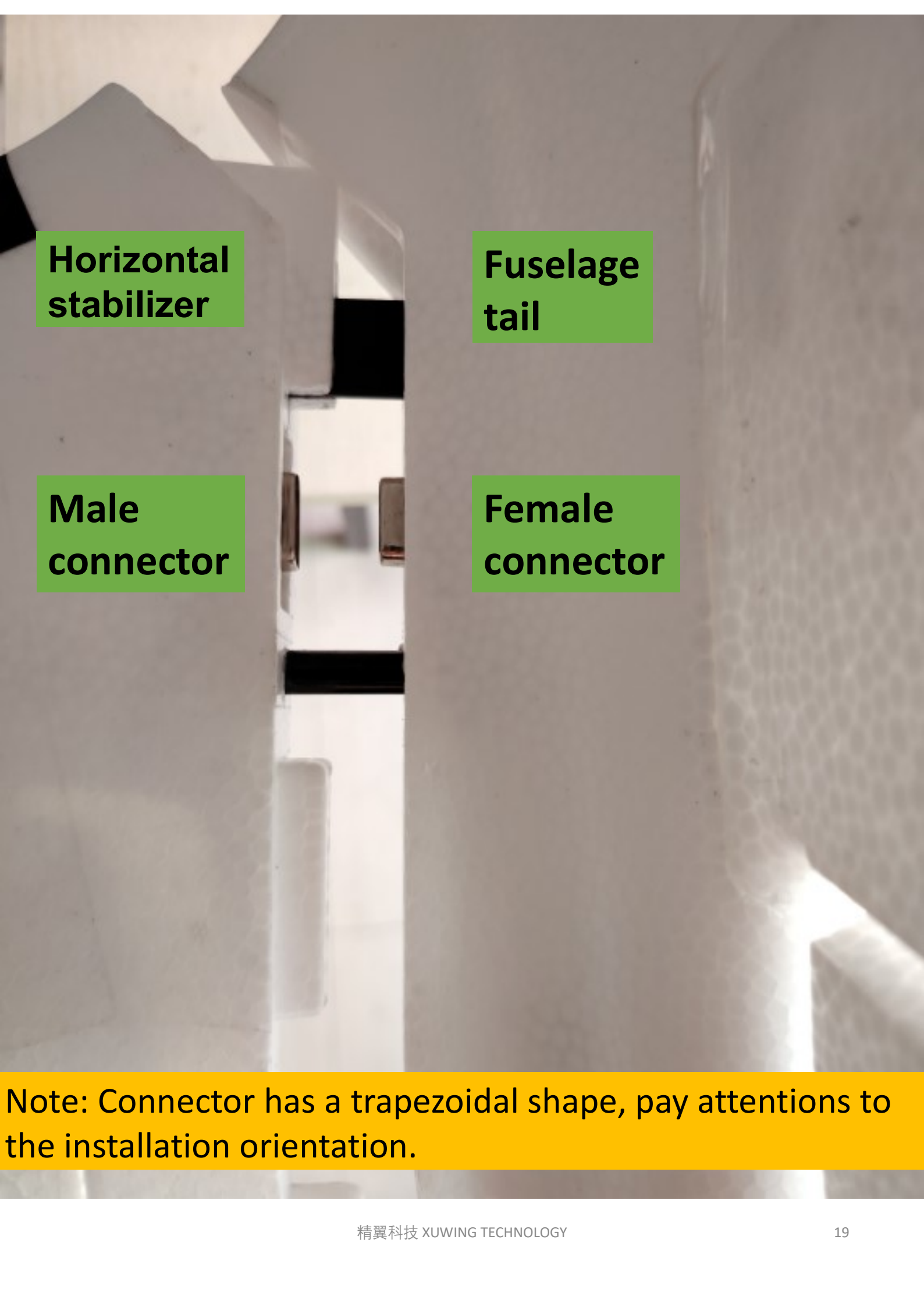
Testing: after soldering, power on to test before installation.



Note: Connector has a trapezoidal shape, pay attentions to the installation orientation.

Elevator servo installation and tune Elevator



A close-up photograph of a white drone's internal structure. The image shows a central vertical slot where various components are mounted. Labels in green boxes point to specific parts: 'Horizontal stabilizer' at the top left, 'Fuselage tail' at the top right, 'Male connector' on the left side of the slot, and 'Female connector' on the right side of the slot. The drone's body has a honeycomb texture.

**Horizontal
stabilizer**

**Fuselage
tail**

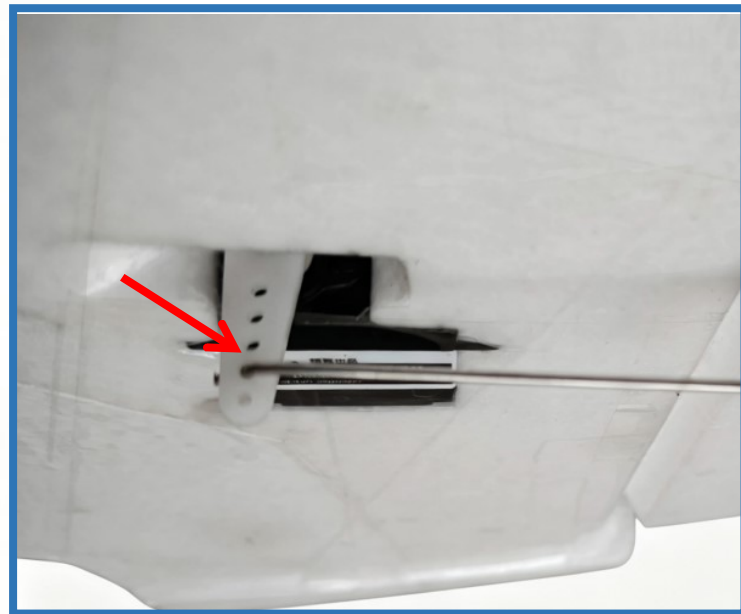
**Male
connector**

**Female
connector**

Note: Connector has a trapezoidal shape, pay attentions to the installation orientation.

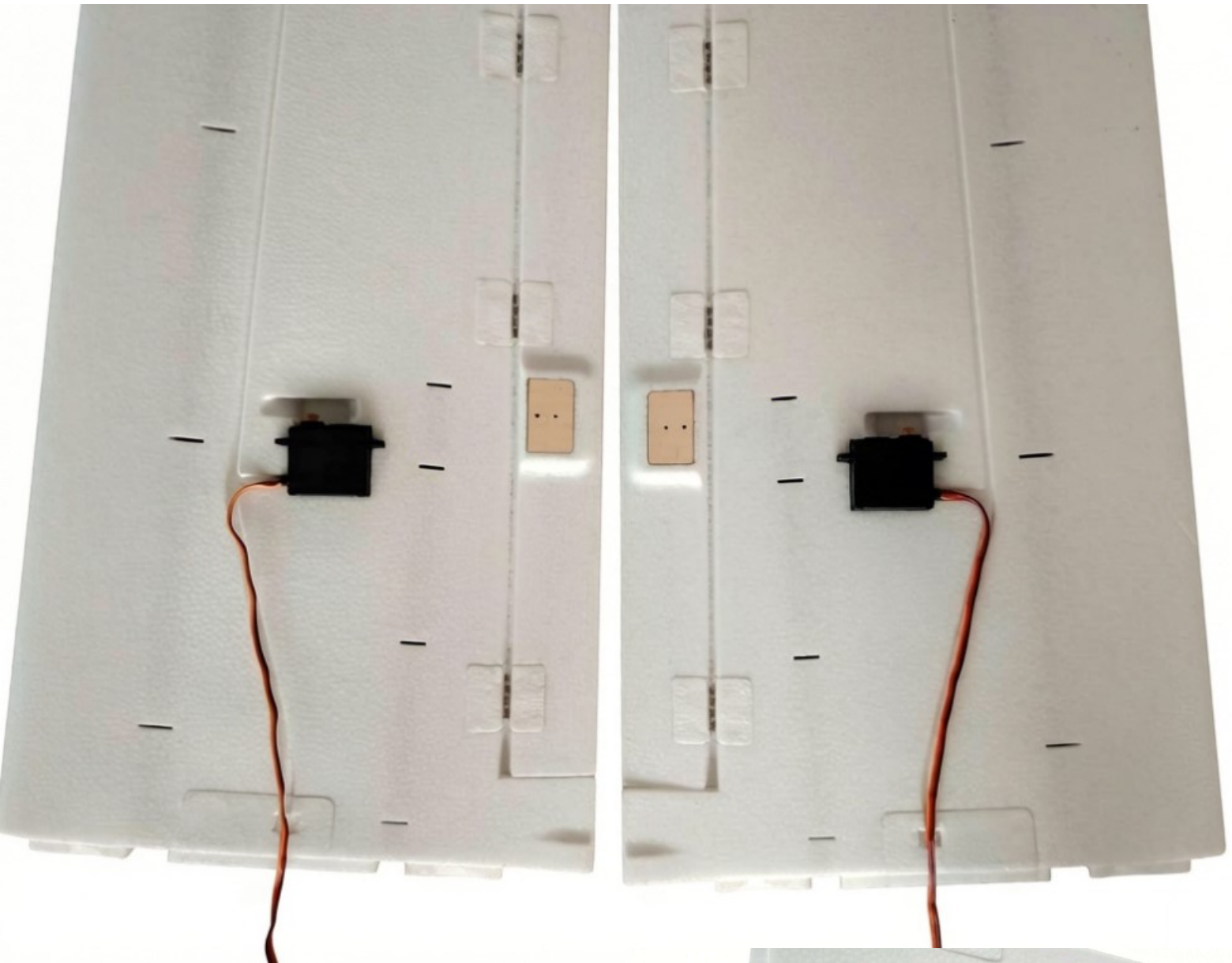
Rudder servo installation

Neutralized servo first. No quick-release connector needed for the vertical stabilizer. installation is simple and no further instructions. finished photos shown below.

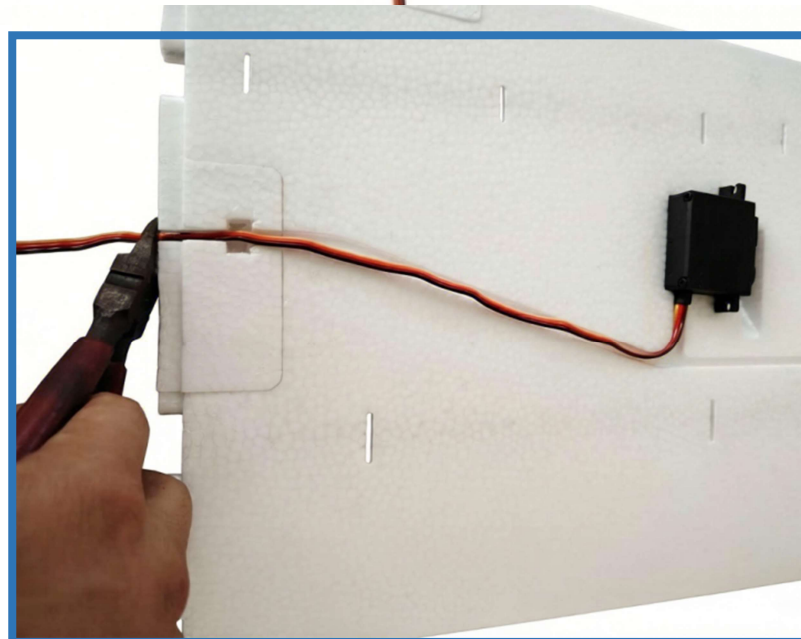


Main-wing Aileron servos installation

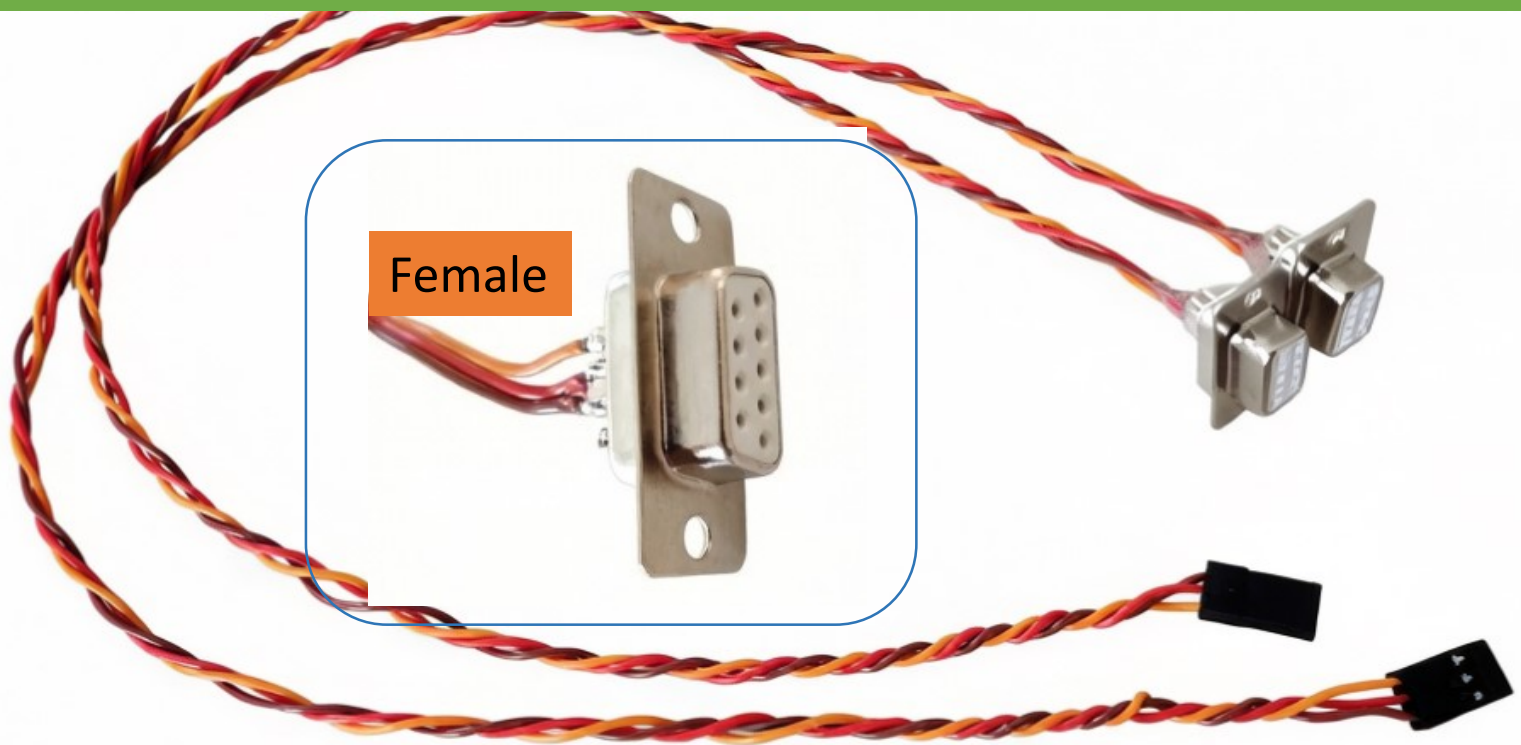
Aileron servos are S0090



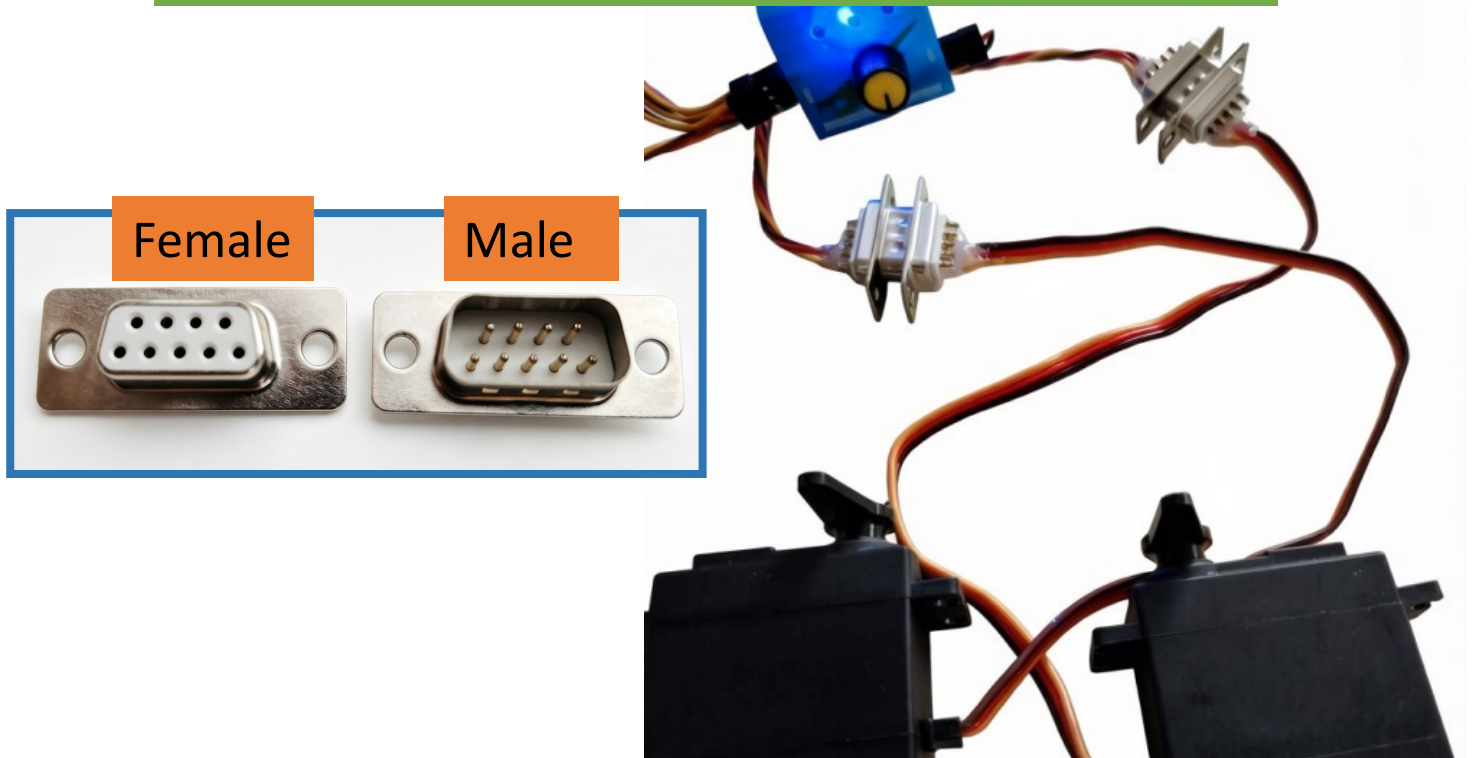
Step 1: Neutralized servos
Step 2: Measure the actual wire length then solder onto the quick-release connectors.



made the wires into spiral as shown below, it's good for interference resistance. Female connectors installed on the center wing section near the fuselage.

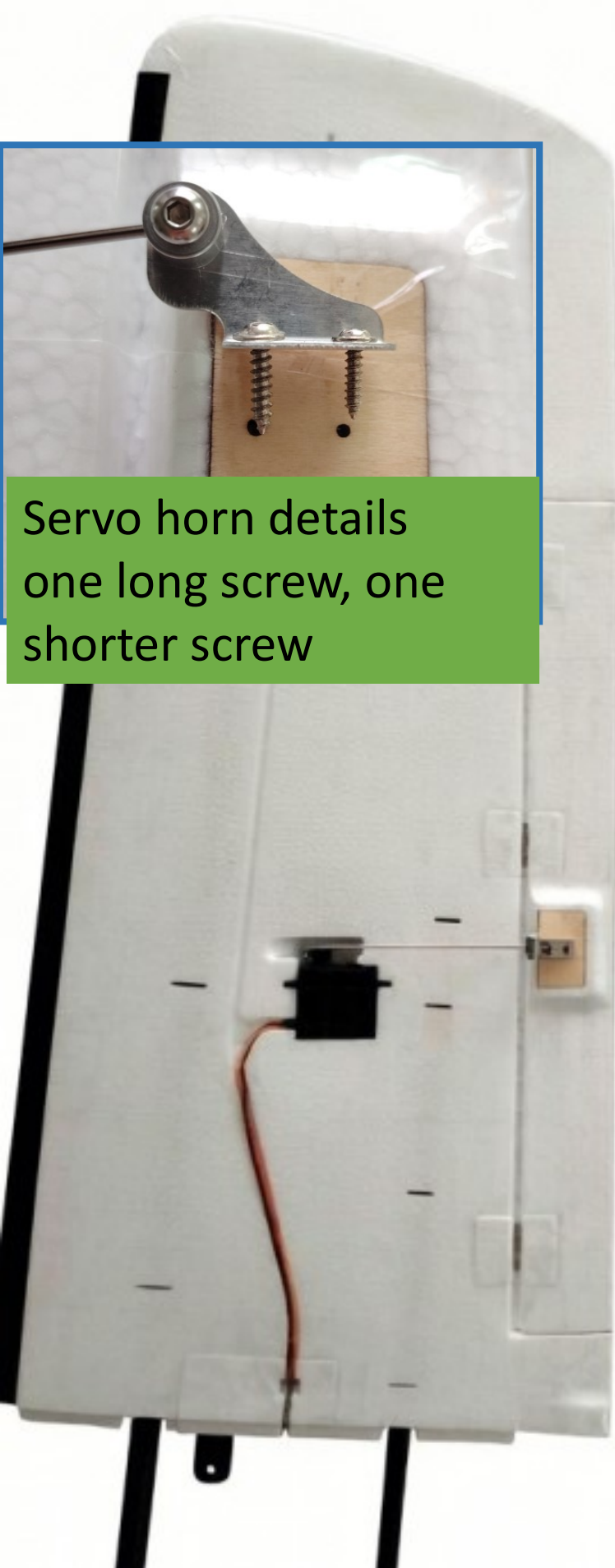


Test the soldered servos prior to wing installation

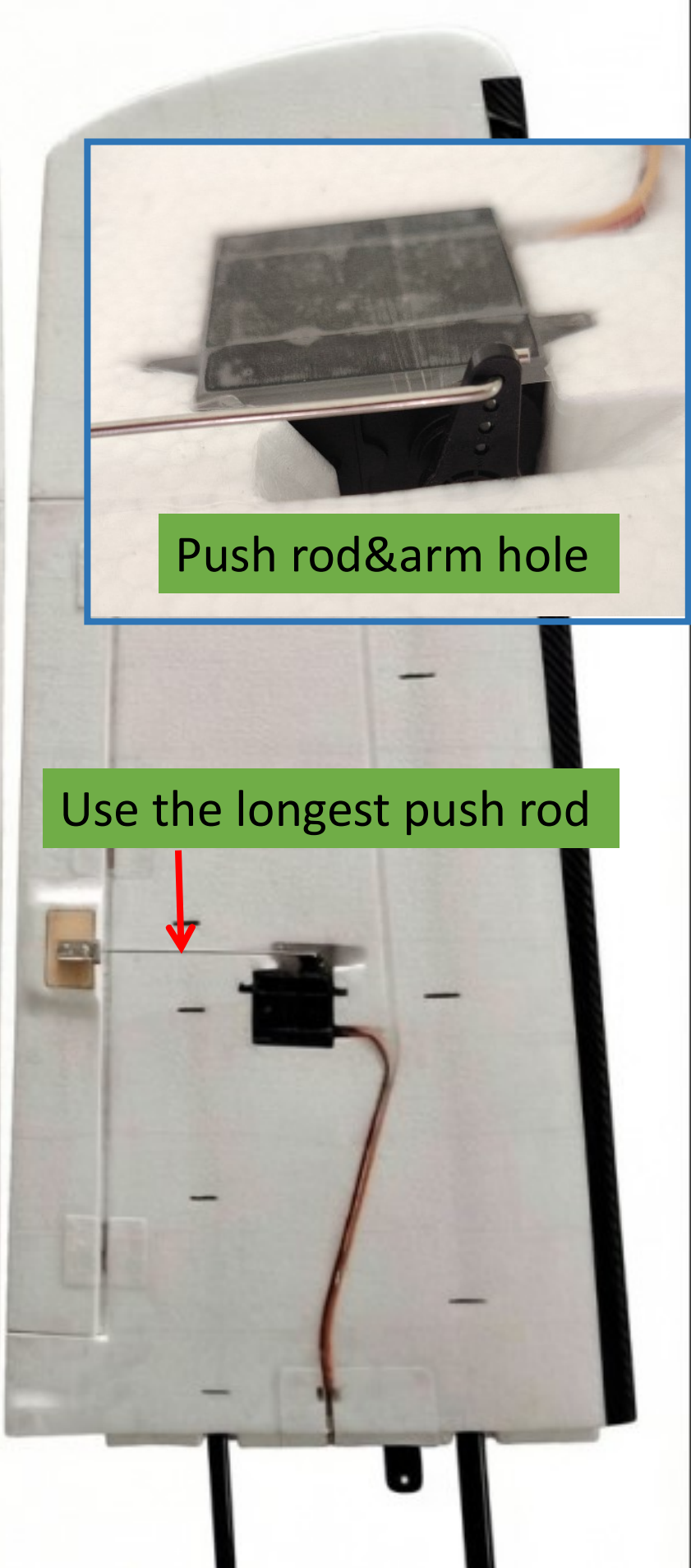


Note: Connector has a trapezoidal shape, pay attentions to the installation orientation.

Main-wing Aileron servos installation



Servo horn details
one long screw, one
shorter screw

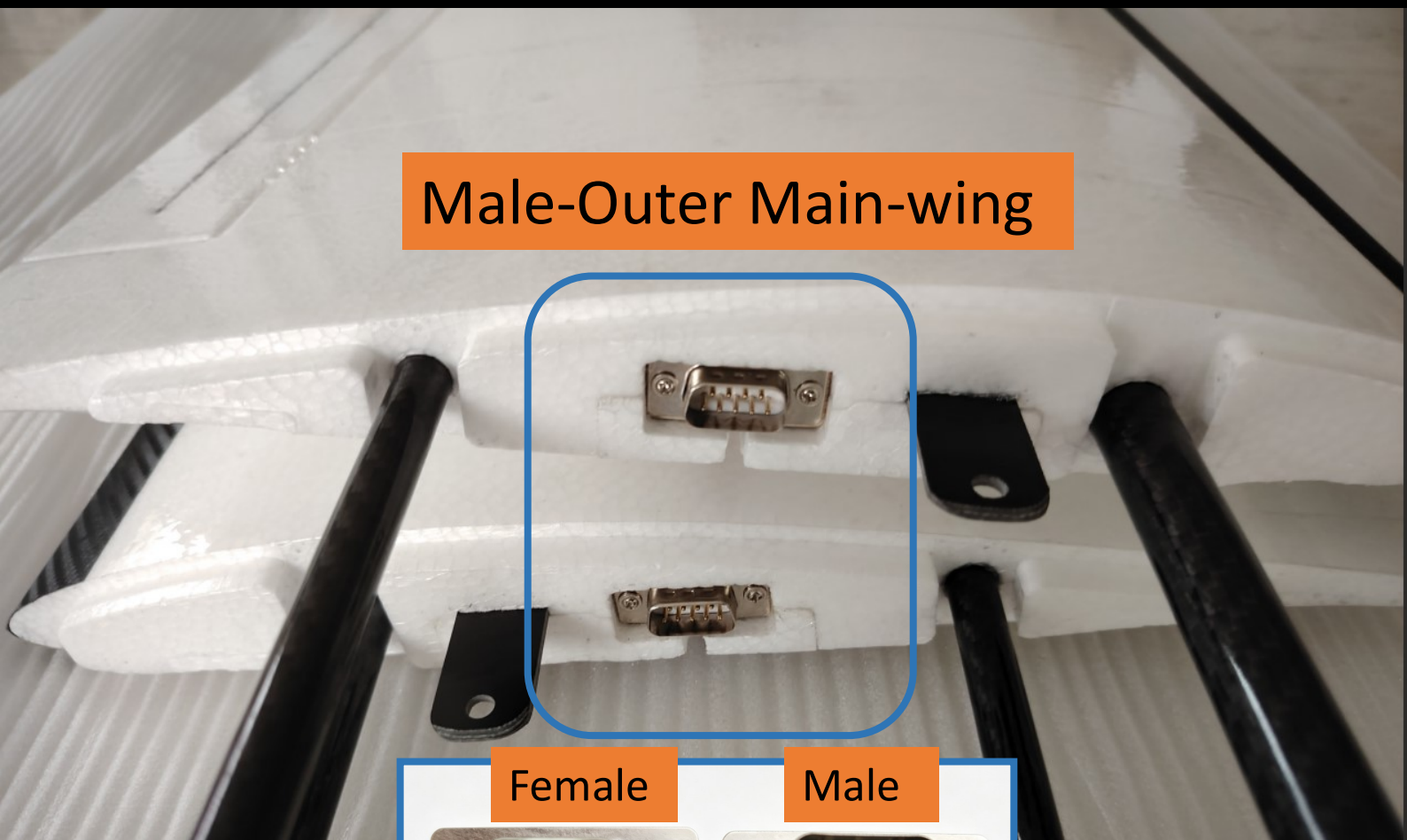


Push rod&arm hole

Use the longest push rod

Final assembly Main-wings and Mid-wings

Male-Outer Main-wing

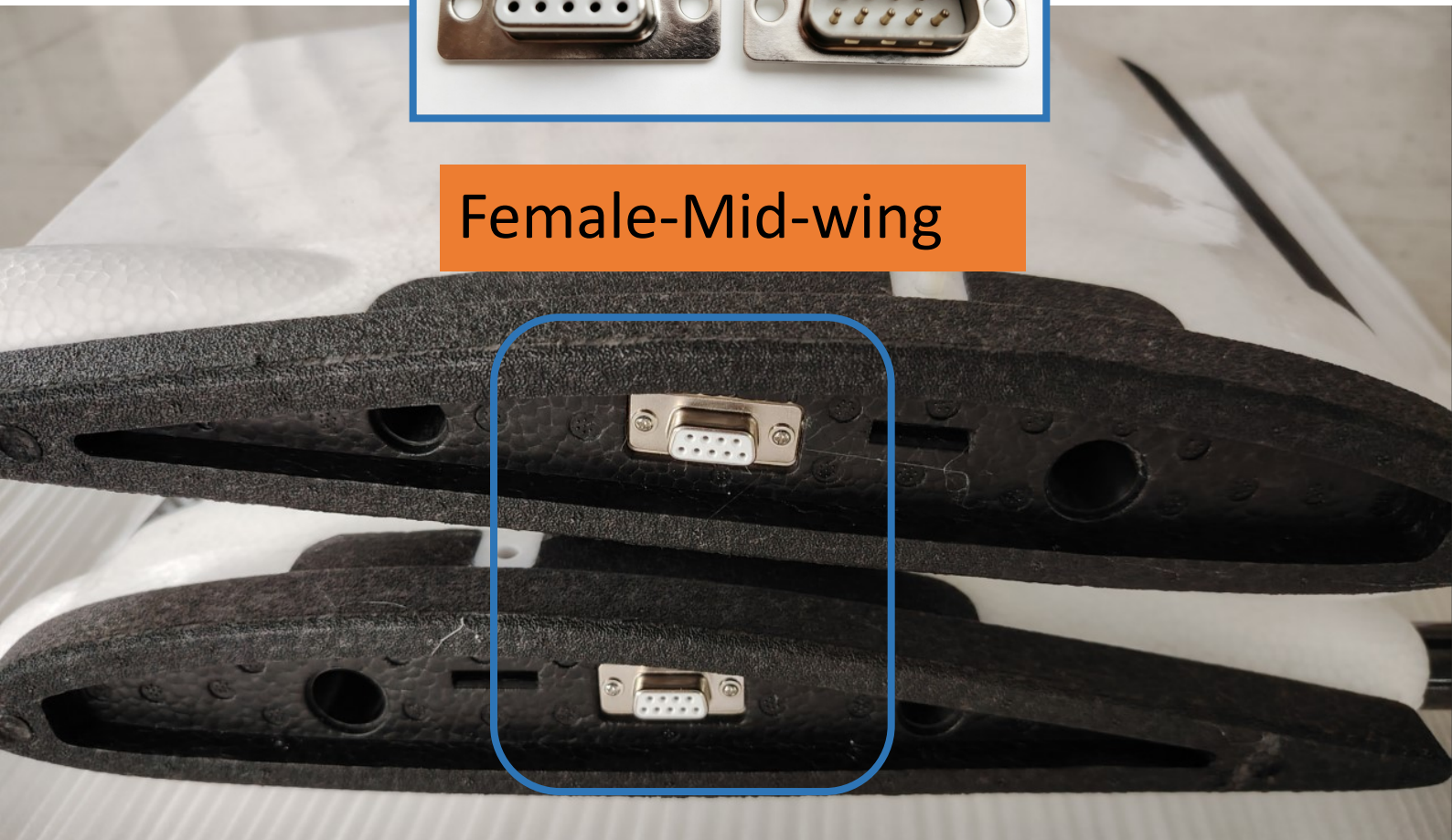


Female

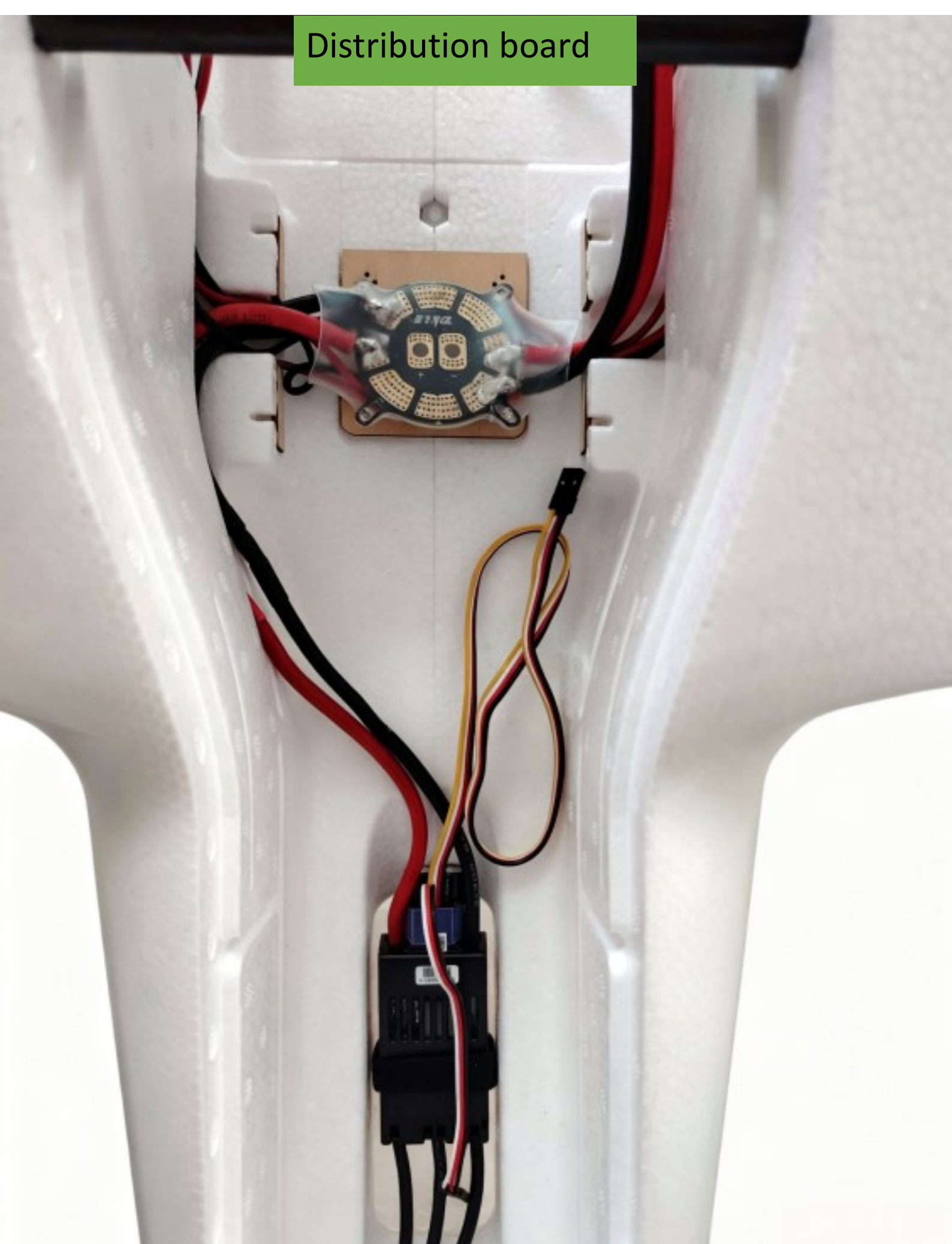
Male



Female-Mid-wing

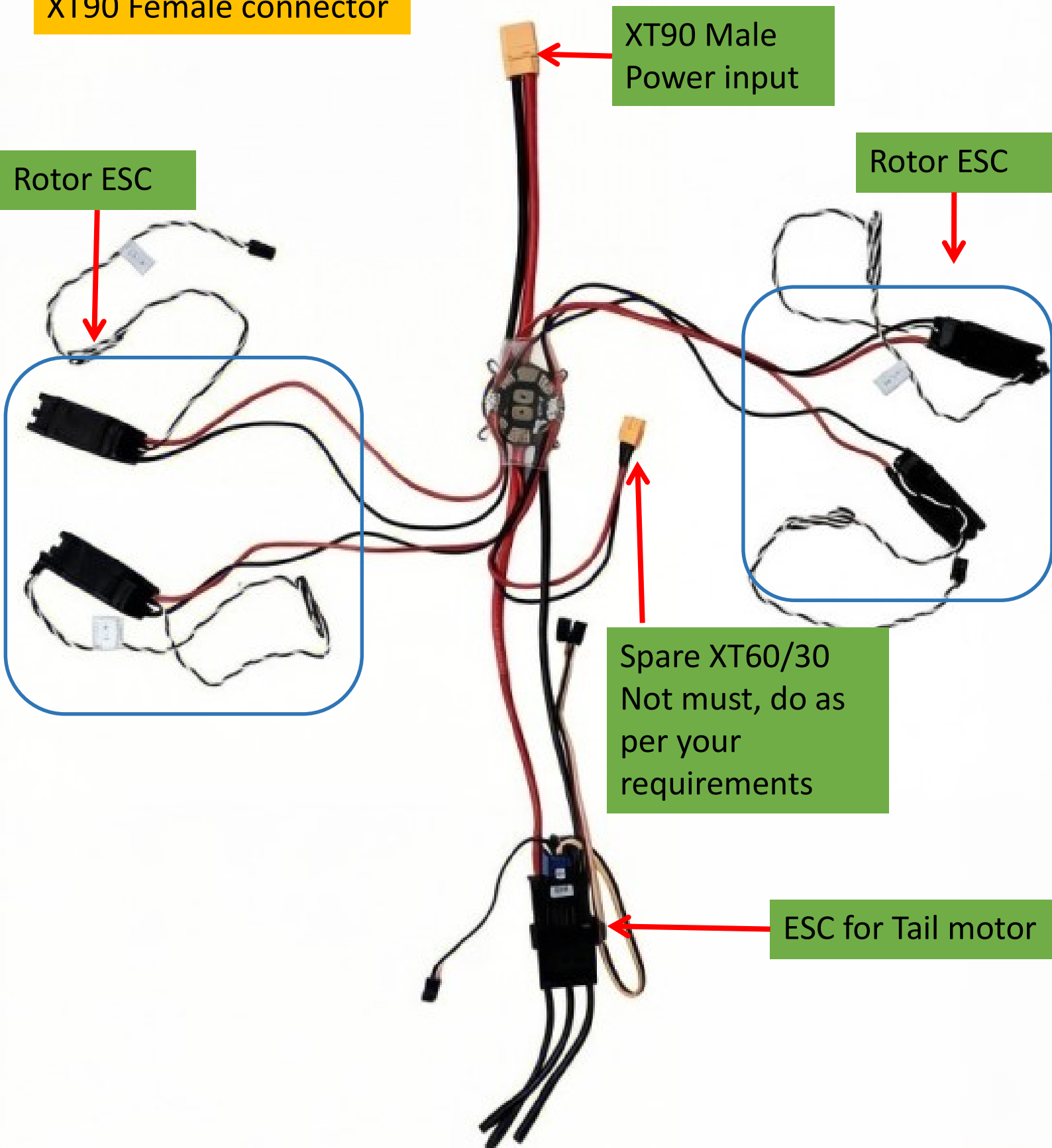


Distribution board



ESC, Power Distribution board

Note: battery need
XT90 Female connector



ESC, Power Distribution board

Step 1: Solder Power input and Tail ESC wires

*For your
Reference only*



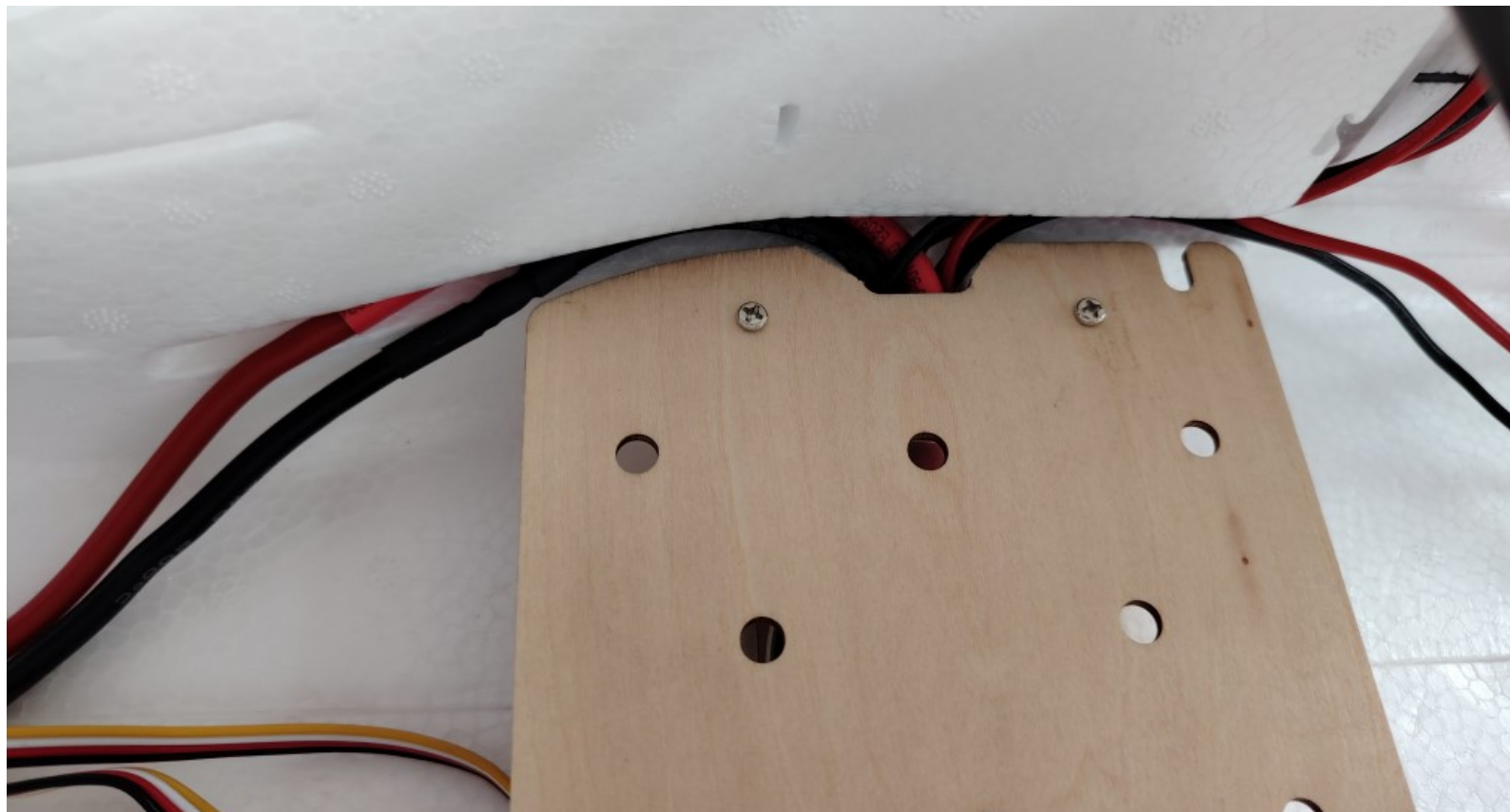
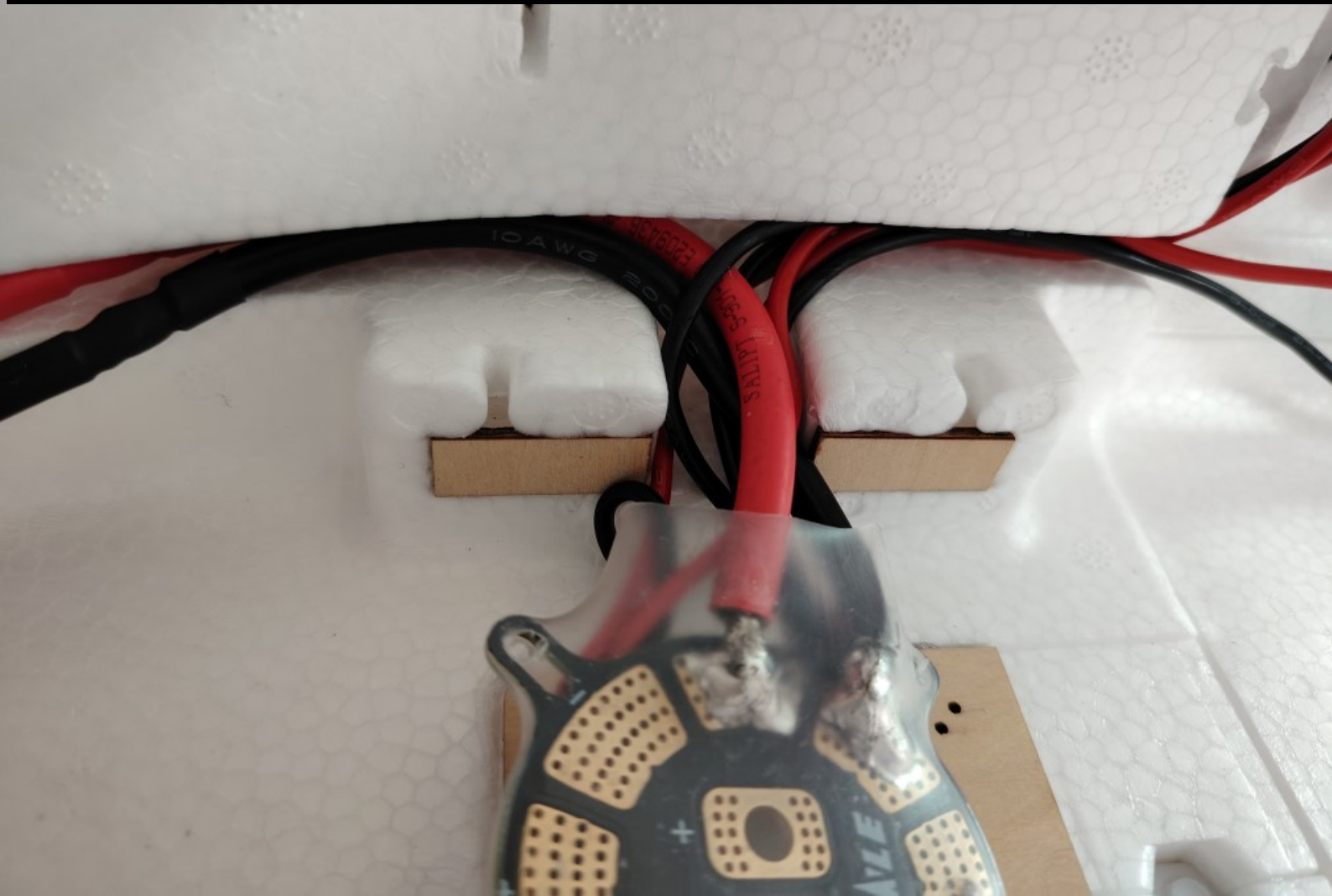
Step 2: Turn over the board. Solder the Rotor ESC wires to the opposite side



step 3: With heat-shrink sleeve for protection



Distribution board installation

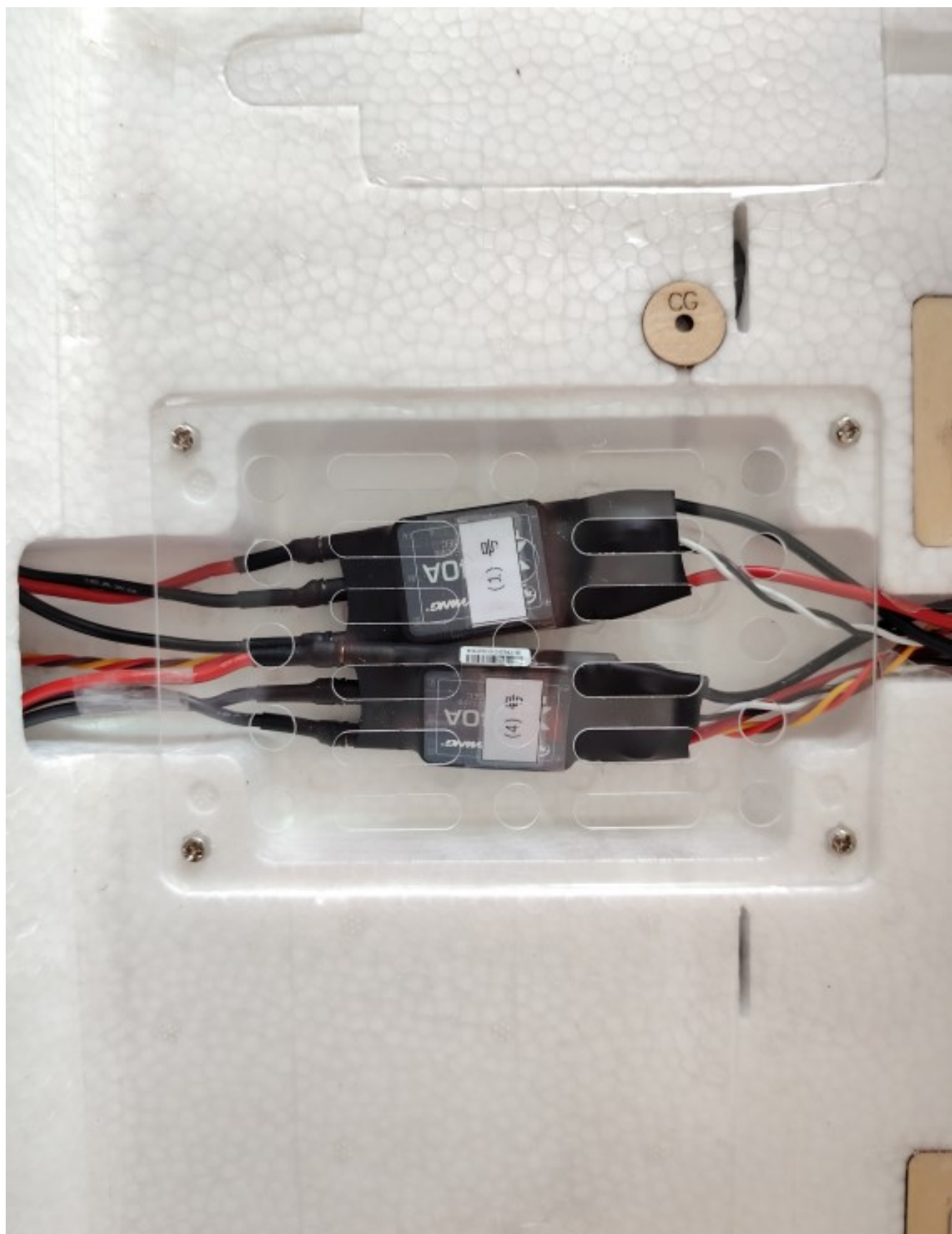




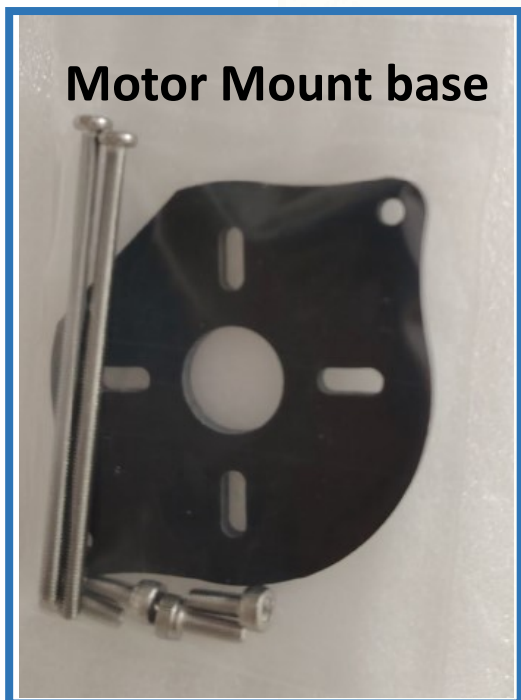
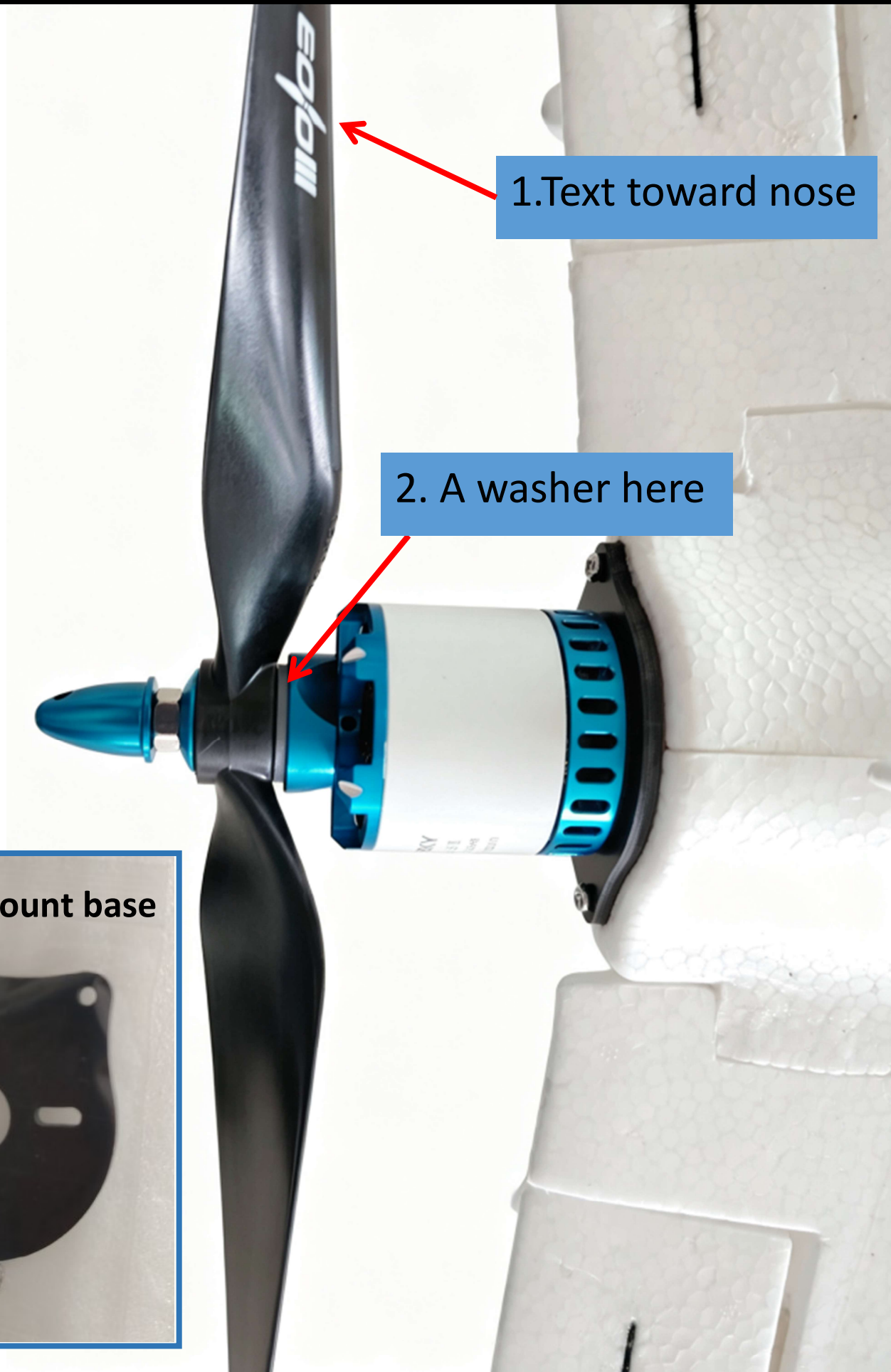
**Flight
controller
board**

GPS

Rotor ESC bay , Recommend label the ESC to avoid confusion

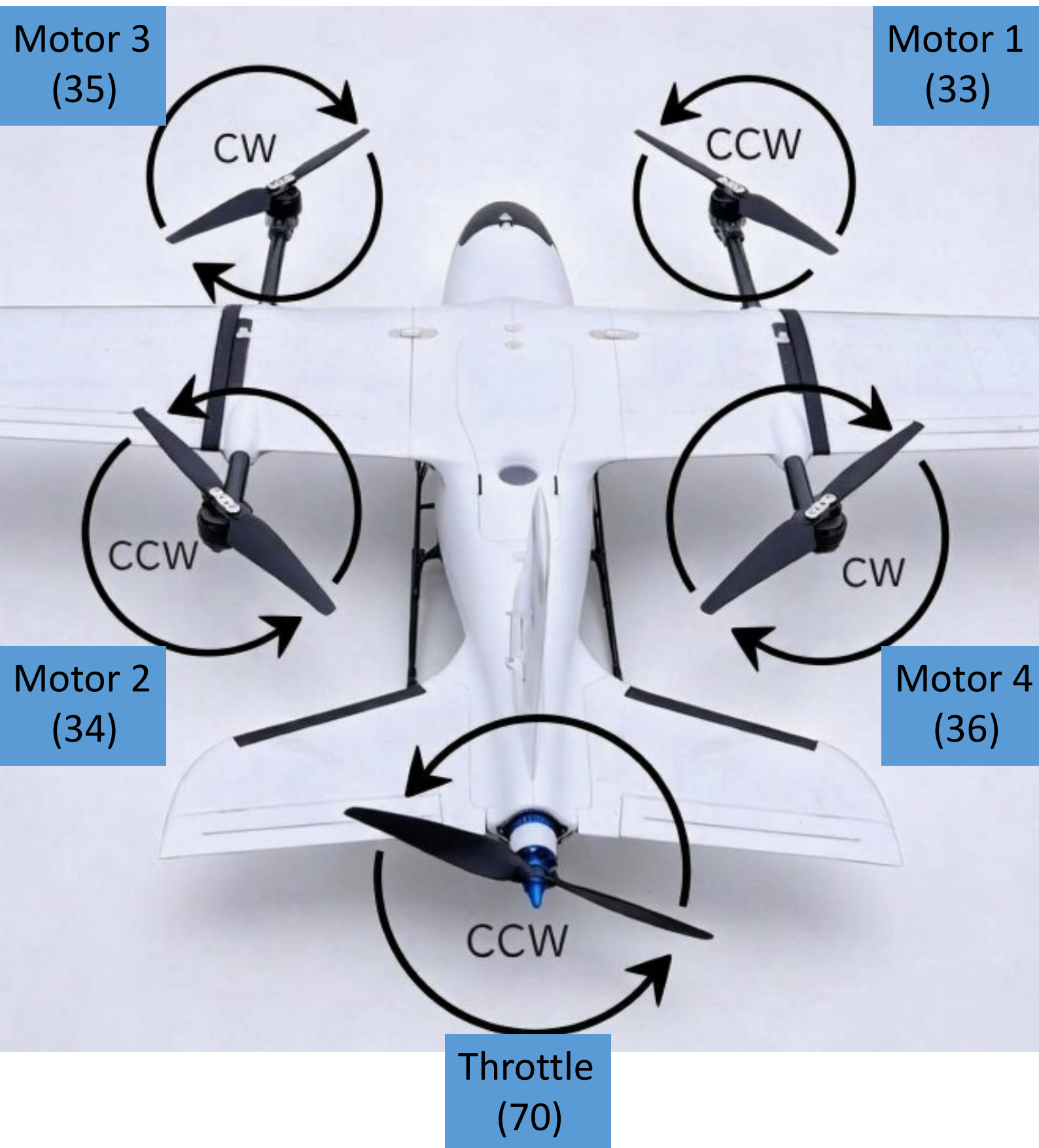


Tail pusher Motor and Propeller



Motor Mount base

1. Propeller rotation diagram, (Cautions: props are dangerous, only installed when completely prepared and ready to fly)
2. Servo Function code parameters for Ardupilot flight controller.

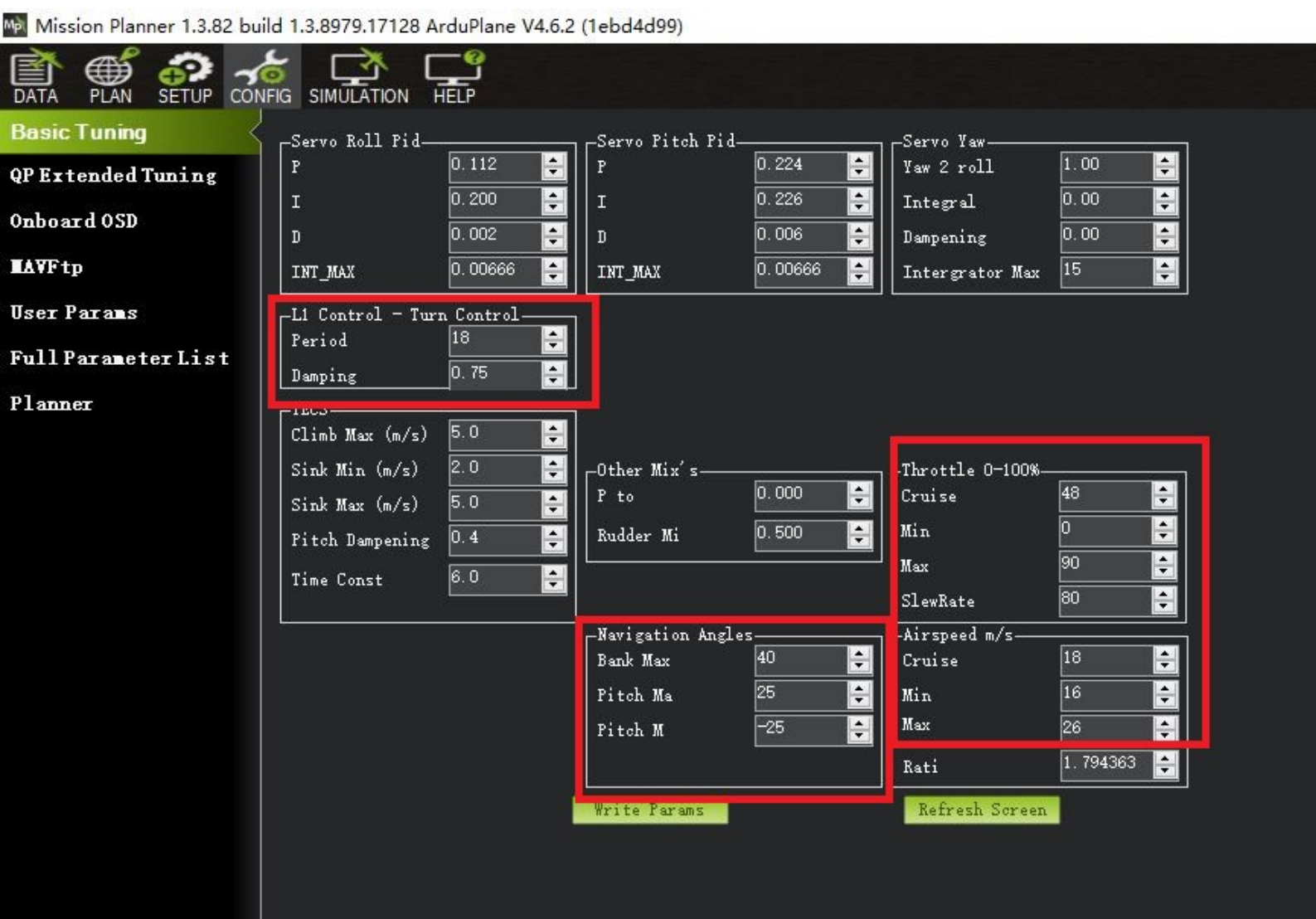


Appendix: Ardupilot FC parameters

The appendix of this manual provides FC parameters used during our testing for your reference, highlighted with red rectangle can be copied directly.

This is PNP version without FC, with this Appendix it's good for beginner to get started, while experts can tune their own.

Note: Never fully input other flyer's full parameters. you may use compare parameters and find out some of the parameters. Always reset the full parameters after flashing firmware, then write in the parameters below.



Cruising speed range 18M/S-20M/s according to your plane's actual weight (AUW)

Firstly set Q_enable to 1 in the full parameters, then reboot the FC. otherwise this page parameters would be grayed out and read only.

Mission Planner 1.3.82 build 1.3.8979.17128 ArduPlane V4.6.2 (1ebd4d99)

DATA PLAN SETUP CONFIG SIMULATION HELP

Basic Tuning

QP Extended Tuning

Onboard OSD

MAVftp

User Params

Full Parameter List

Planner

Stabilize Roll (Error to p te) 4.500

Stabilize Pitch (Error to p te) 4.500

Stabilize Yaw (Error to p te) 4.500

Position XY (Dist to p eed) 0.500

ACCEL MAX 55000

ACCEL MAX 55000

ACCEL MAX 4560

INPUT TC 0.200

☐ Lock Pitch and Roll Values

Rate Roll

P 0.450

I 0.500

D 0.010

IMAX 0.400

FLTE 0

FLTD 10.5

FLTT 11

Rate Pitch

P 0.360

I 0.380

D 0.008

IMAX 0.500

FLTE 0

FLTD 10.5

FLTT 11

Rate Yaw

P 0.506

I 0.200

D 0.010

IMAX 0.500

FLTE 2.5

FLTD 11

FLTT 11

Velocity XY (Vel to p cel)

P 0.7

I 0.350

D 0.170

IMAX 100

Basic Filters

Gyro 22

Accel 20

Inertial Accel (Accel to motor)

P 0.45

I 0.900

D 0.000

IMAX 80

Throttle Rate (VSpd to p cel)

5.000

Tune

Min 0.000 0.00

Altitude Hold (Alt to p imbrate)

1.000

RC6 Opt Do Nothing

RC7 Opt Do Nothing

RC8 Opt Do Nothing

RC9 Opt Do Nothing

RC10 Opt Do Nothing

WPNav (cm/s)

Speed 600

Radius 300

Speed Up 150

Speed Dn 200

Loiter 500

Filter Logs

Mask Options 0

Static Notch Filter

Enabled

Frequency 0

BandWidth 0

Attenuation 0

Harmonic Notch Filter

Enabled Disabled

Mode 0

Reference 0

Frequency 10

Attenuation 5

Bandwidth 5

Options 0

Harmonics 0

Write Params

Refresh Screen

The paramters below are what we used for our testing flight. Base tuning and extended tuning in the above pages (not all parameters in the full parameters need to setting, this is some of the basic parameters need setting)

Parameters	Value	Remarks
Q_Enable	1	Fistly change it to 1 then reboot FC.
AHRS_GPS_USE	1	
Arming_check		configure based on your specific requirements
Arming_Require	1	
Arming_Rudder	2	Rudder to Arm and Pre-Arm
Arspd_Autocal	1	
Arspd_Type		
BRD_Safety_Deflt	0	(0 disable, 1 Enable) we generally set to 0
FLTMODE_CH	5或者8	
FS_LONG_ACTN	0	
GPS_POS_X/Y/Z	X(-0.265)	
Q_ASSIST_ALT	15	
Q_ASSIST_ANGLE	65	
Q_ASSIST_SPEED	11	
Q_FRAME_CLASS	1	4+1 VTOL
Q_FRAME_TYPE	1	4+1 VTOL
Q_LAND_FINAL_ALT	5	
Q_LAND_FINAL_SPD	0.4	
Q_M_BAT_VOLT_MAX	25.2	
Q_M_BAT_VOLT_MIN	19.8	
Q_M_HOVER_LEARN	2	
Q_M_SPIN_ARM	0	configure based on your specific requirements
Q_M_SPIN_MAX	0.95	
Q_M_SPIN_MIN	0.15	
Q_M_THST_EXPO	0.72	
Q_M_THST_HOVER	0.45	
Q_A_THR_MIX_MAN	0.1	
Q_RTL_ALT	40	Configure reasonably according to your flying environment and needs

精翼科技 XUWING DB2200

Q_RTL_ALT_MIN	30	
Q_RTL_MODE	1	
Q_TRANS_DECEL	1.5	
Q_TRANSITION_MS	5000	(MS)
RTL_ALTITUDE	40	Configure reasonably according to your flying environment and needs
RTL_RADIUS	-100	Configure reasonably according to your flying environment and needs
WP_LOITER_RAD	-100	
WP_RADIUS	100	
SERVO1_FUNCTION	4	Aileron
SERVO2_FUNCTION	19	Elevator
SERVO3_FUNCTION	70	Tail motor Throttle
SERVO4_FUNCTION	21	Rudder
SERVO5_FUNCTION	33	Rotor Motor 1
SERVO6_FUNCTION	34	Rotor Motor 2
SERVO7_FUNCTION	35	Rotor Motor 3
SERVO8_FUNCTION	36	Rotor Motor 4
Tecs_Pich_Damp	0.4	
Tecs_Thr_Damp	0.6	
Tecs_TIME_CONST	6	
Tecs_RLL2THR	9	
TKOFF_THR_SLEW	50	