VTBIRD VTOL Version

User Manual

V4

Manual updating version

Building instructions of 4+1 and Tilt Rotor

Finwinghobby

Finwinghobby

WWW. FINWINGHOBBY. COM

FINWING TECHNOLOGY

PATENT OWNER: FINWINGHOBBY

Please read through the manual before installation and flying

This manual is an introductions to user on how to building the plane.
Please visit the www. finwinghobby. com official website for more information.

Warning:

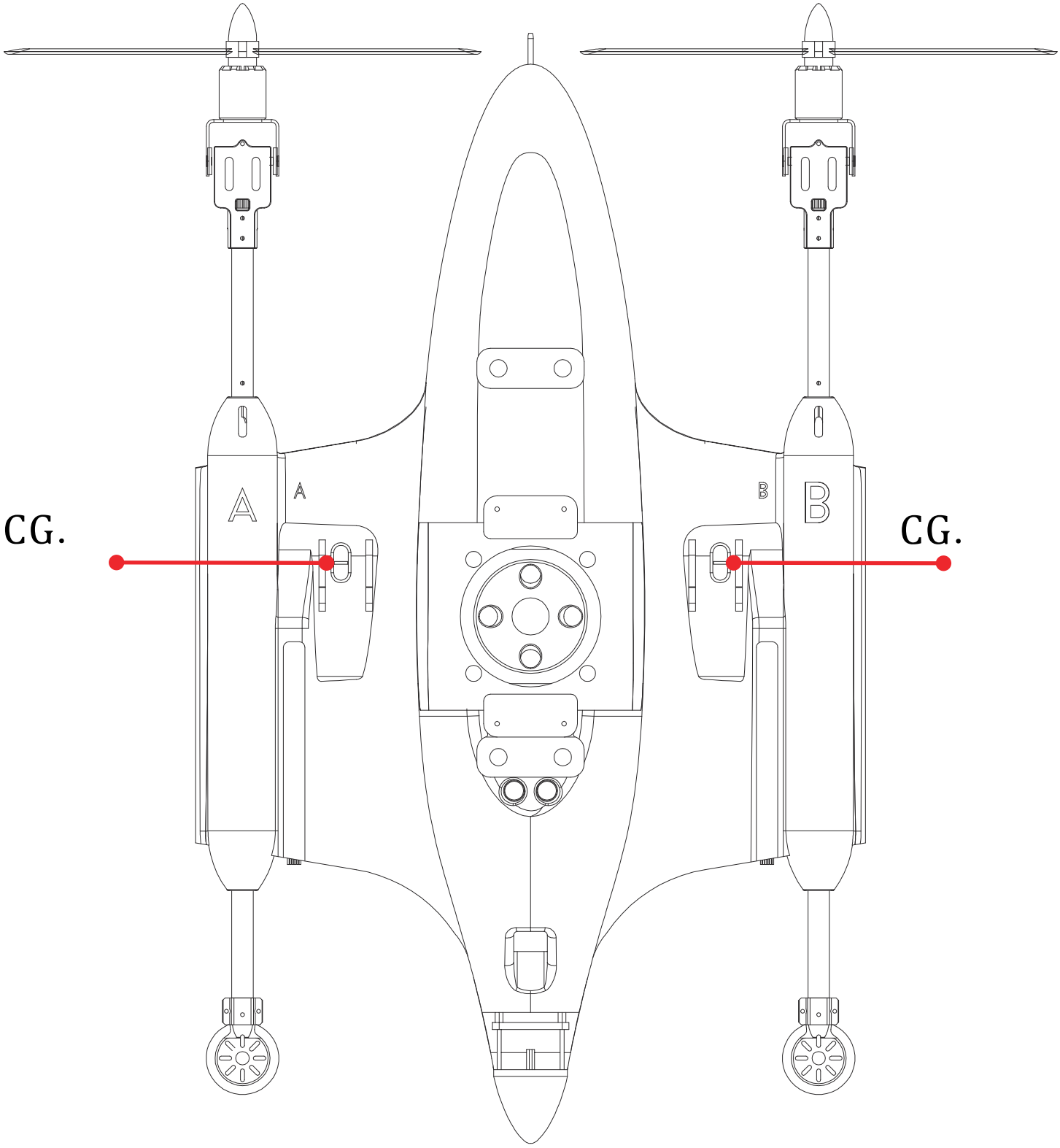
1. This model airplane is not a toy, don't recommended for anyone under 18 years old,
2. Be cautious and prepared while flying this plane as a range of issues could lead to a crash including the environment/weather, speed, pilot error, improper building/testing, interference or other component failures.
3. Flying field: Choose an adequate flying space at least 100 meters long/wide and in an unpopulated and non-built up area for safe flying. This includes avoiding flying over cities or other populated areas.
4. Please don't fly this model airplane in bad weather including rainy and/or windy environments.
5. Remember to unplug your flight/video battery when not in use to avoid any interference to others who might be on similar channels.
6. Please remember switch on the transmitter first before connecting the battery, and disconnect the battery first before switching off your transmitter.
7. Keep away from the propeller when the Airplane is powered as it can be dangerous and could lead to injury. Keep the powered plane away from children at all times to avoid any accidents or injury.

Welcome Join Facebook Groups Sharing, discussing building and fly

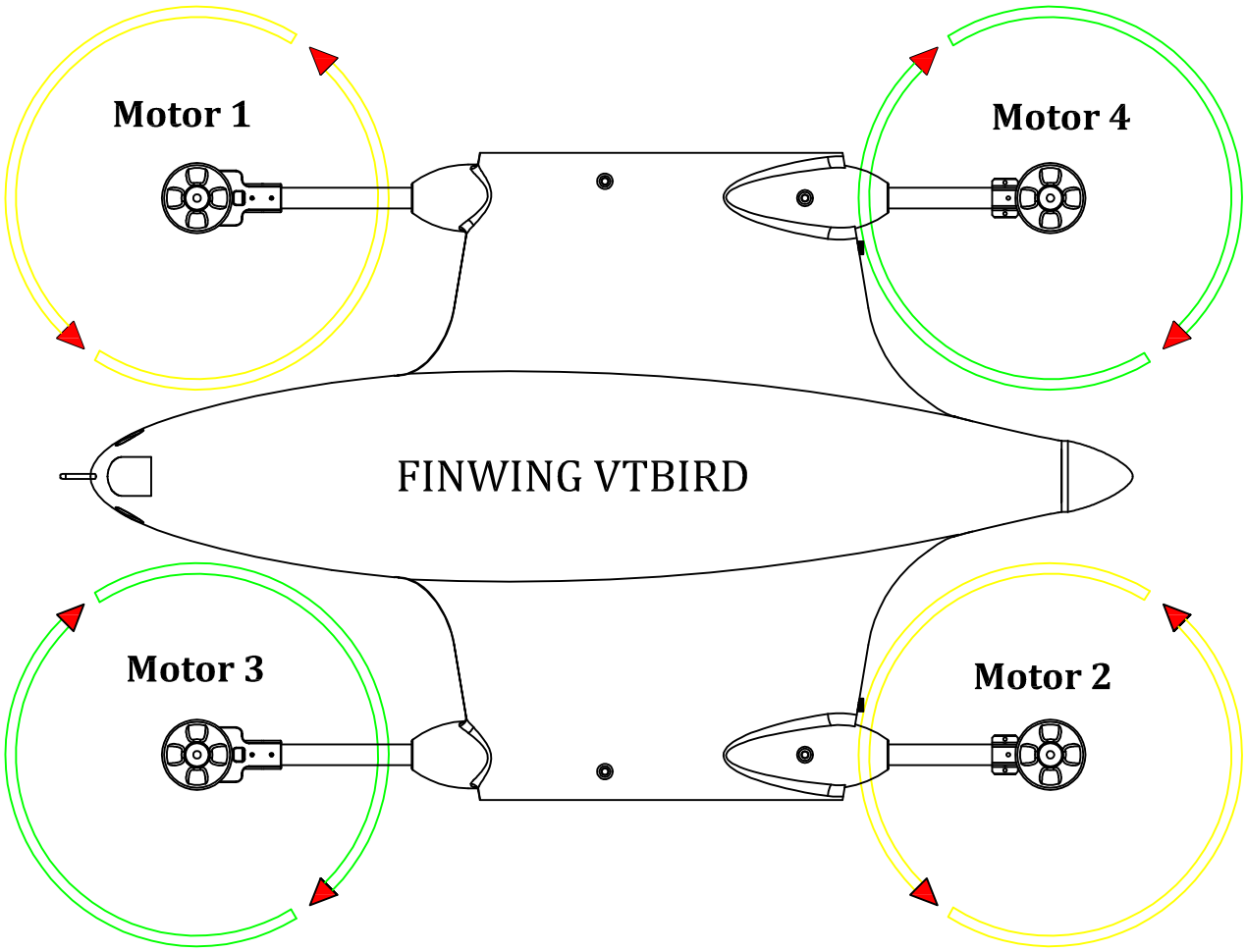
VTBIRD Center of Gravity

*CG. is exactly the same location no matter 4+1, Tilt Rotor, Fixed-wing Dual motors and Pusher

*Front motors should be Tilt Down forward if balance CG, for Tilt Rotor Version



Learn how to install VTOL Motors, Propellers
4+1 and Tilt Rotor is the same



Learn how to setting:

For example if you want to setting flight cotroller channel 7.8.9.10 for VTOL Motor 1.2.3.4, then go to GCS parameter find our servo 7.8.9.10 setting function to 33.34.35.36 if fine

GCS	Servo_Function	33	34	35	36
		⇩	⇩	⇩	⇩
	VTOL Frame Motors	1	2	3	4
		⇧	⇧	⇧	⇧
if flight cotroller channel		7	8	9	10

For VTOL Motors you can also use other chanel for VTOL Motors

4+1 VTOL motors setting is the same, difference is 4+1 has one Pusher motor, setting pusher motor to Channel 3 (Throttle) exactly the same as what we did to Fixed-wing

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VTBIRD TiltRotor Power Configurations

Tilt Servo Wires Required: 750MM,
VTBIRD Customized Tilt Servo Wires is 750MM
Tilt Servo Size: 40*40*20MM (+/-0. 15MM)
VTOL Front Motor Wires Required: 520MM 16AWG
VTOL Rear Motor Wires Required: 360MM 16/18AWG
VTOL ESC X-Rotor 40A*4 2-6S
BEC Recommend 5. 5-6V 6A

AUW	Front*2	Rear*2
5. 0-6. 0kg	U3515 Kv400 Motor Hole Distance should be 25MM	X4112S Kv400
Propellers	1580	1555 1655/1660

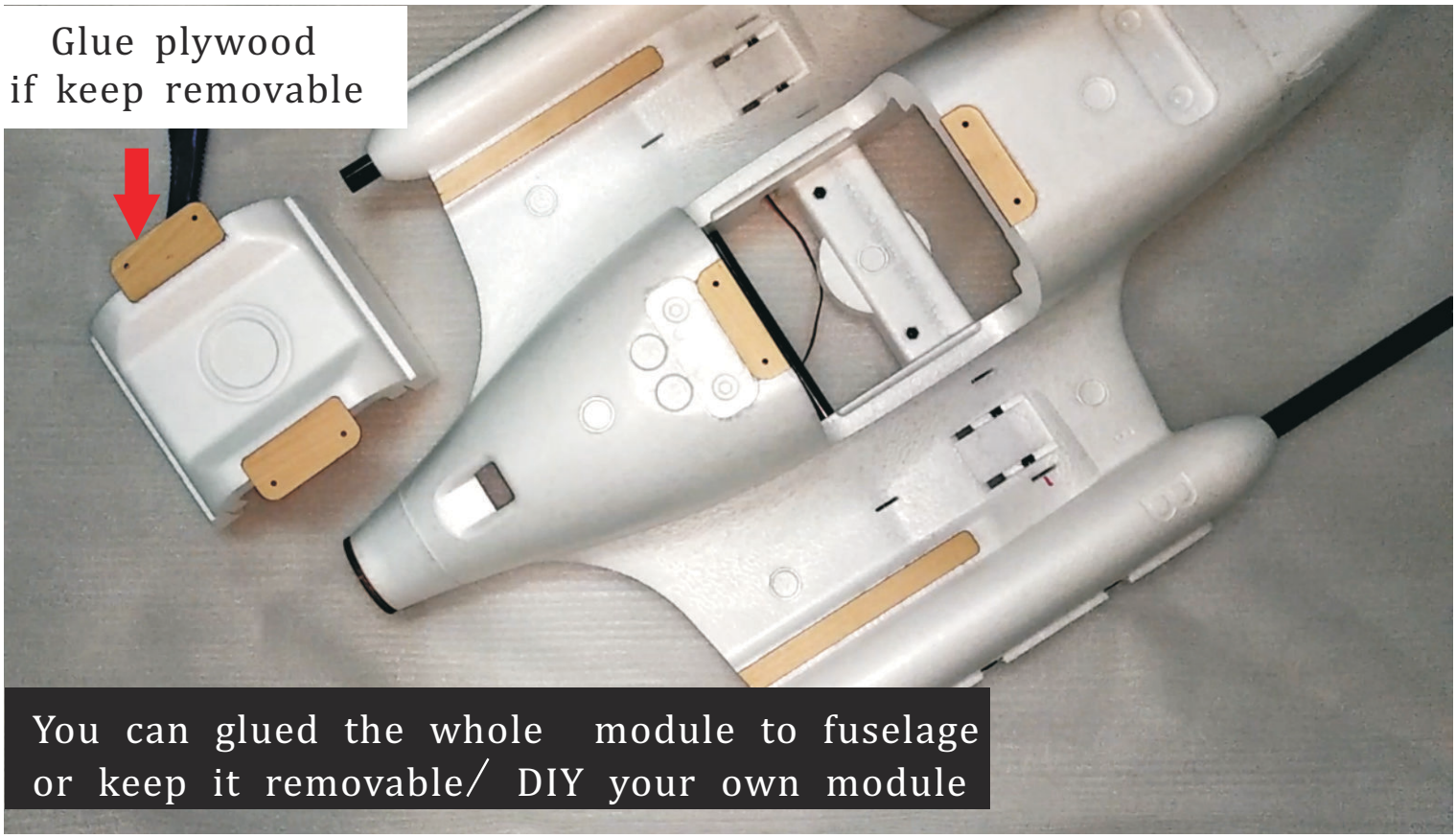
VTBIRD 4+1_Power Configurations

VTOL Front motor wires: 430MM (including Bullet) 16/18AWG
VTOL Front motor wires: 280MM (including Bullet) 16/18AWG
VTOL ESC 3. 5MM Bullet, 4+1 pusher motor 4. 5MM
VTOL ESC X-Rotor 40A*4 2-6S/ Tail pusher 60A ESC

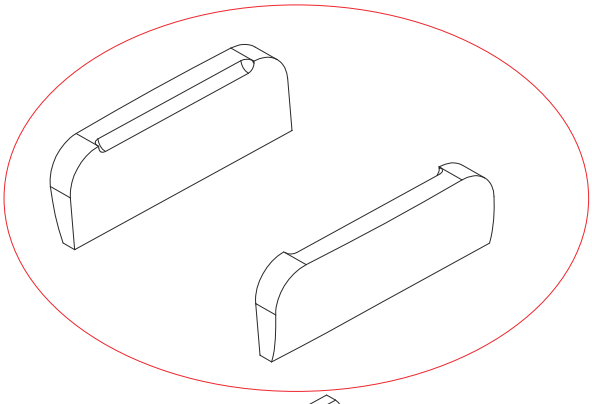
AUW	VTOL*4	Pusher Motor
4. 6-5. 5kg	X4112S Kv485	X3520III Kv560 Motor Outer Diameter Motor Diameter 42. 5MM
Propellers	1350 Newly upgraded After 1/9/2020	1480

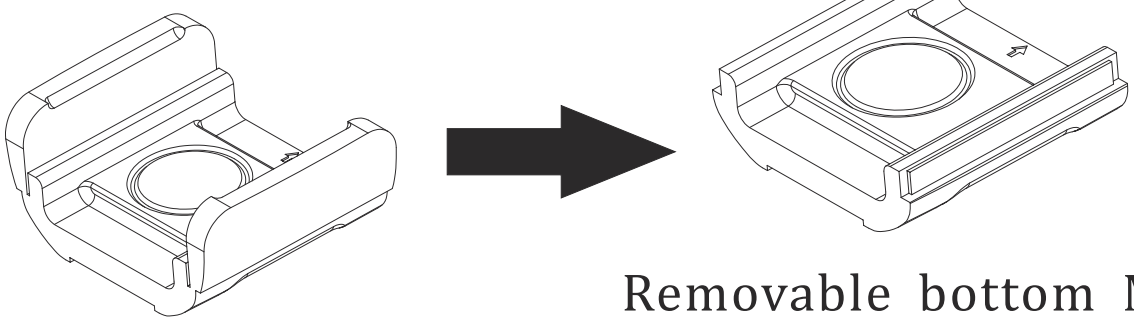
VTBIRD Camera Module

The whole plane was almost all pre-glued&assembled
Just install the camera module per your requirements



Top parts glued to fuselage
(Pre-glued in the factory)

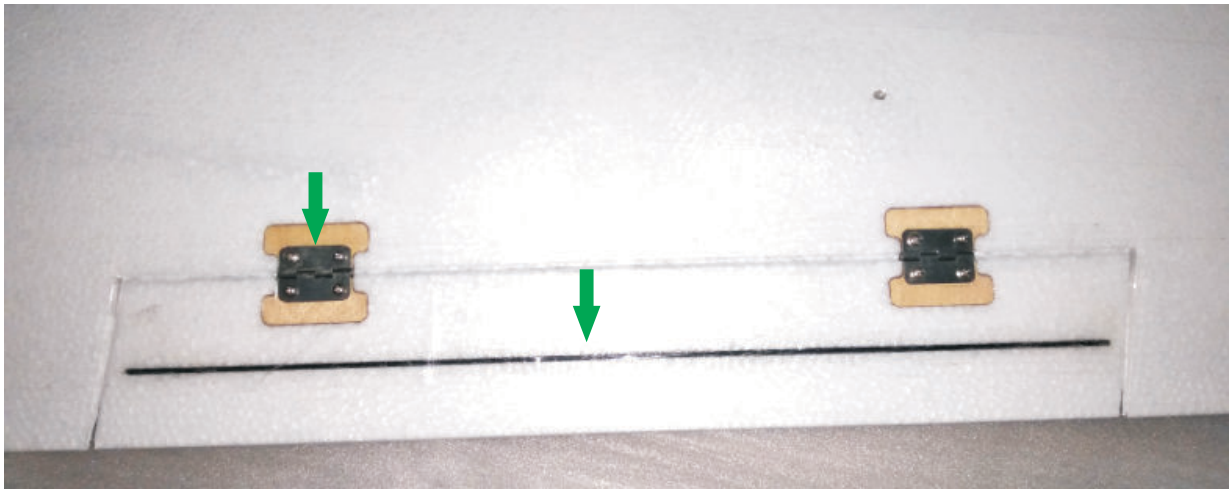


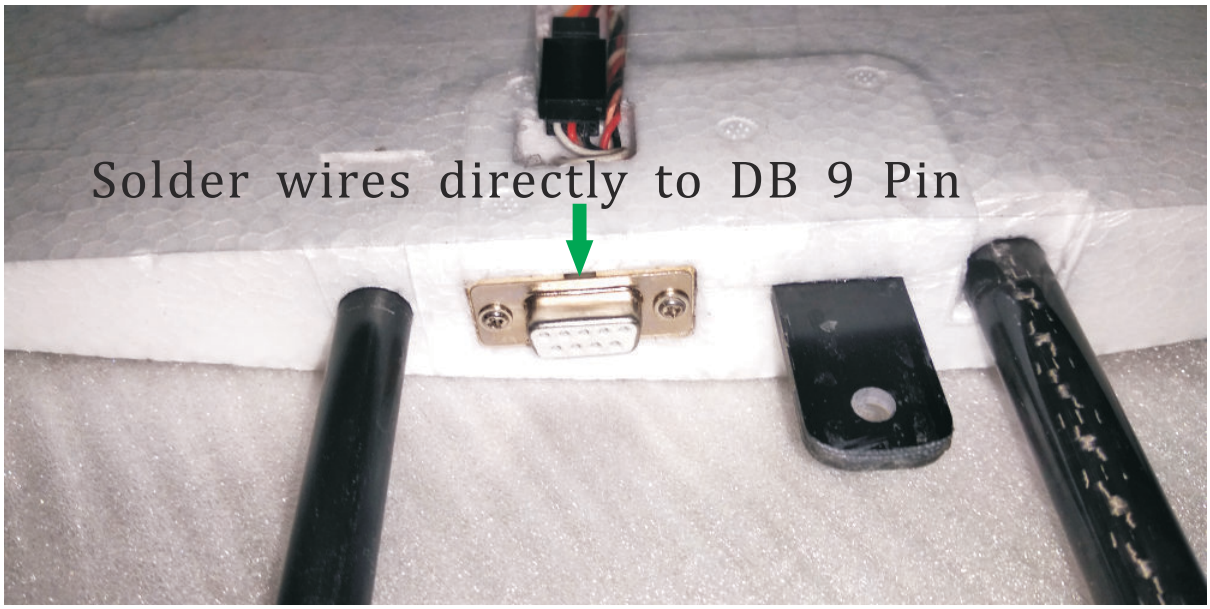


Removable bottom Module

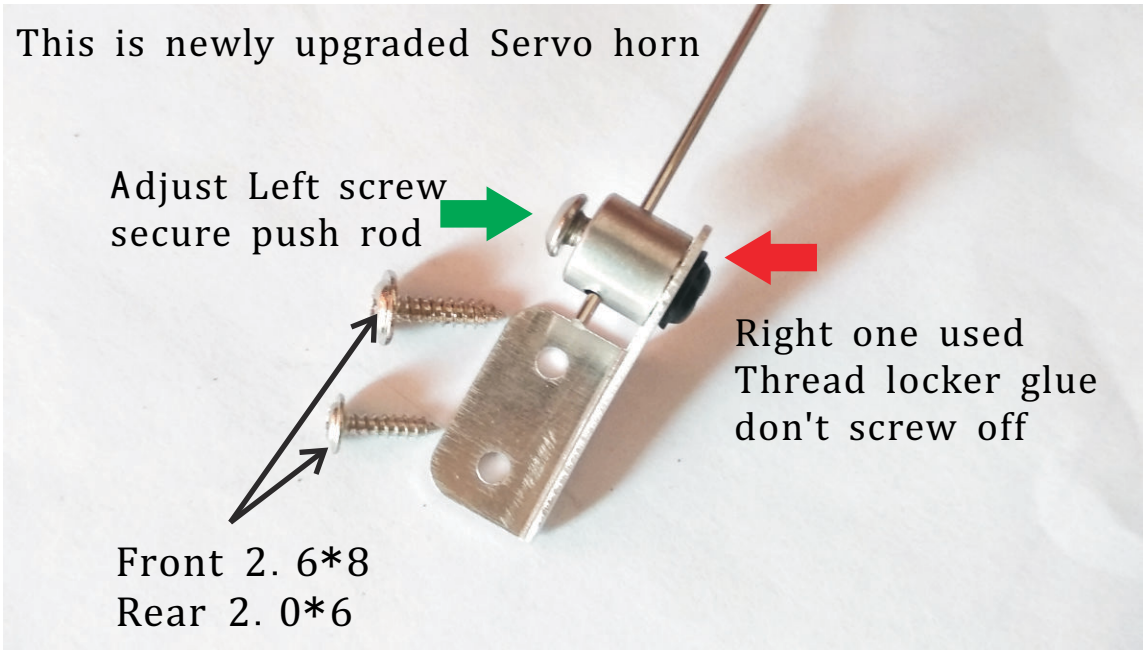
VTBIRD Wings

Install the metal hinge(it's only 2.0g but reliable)



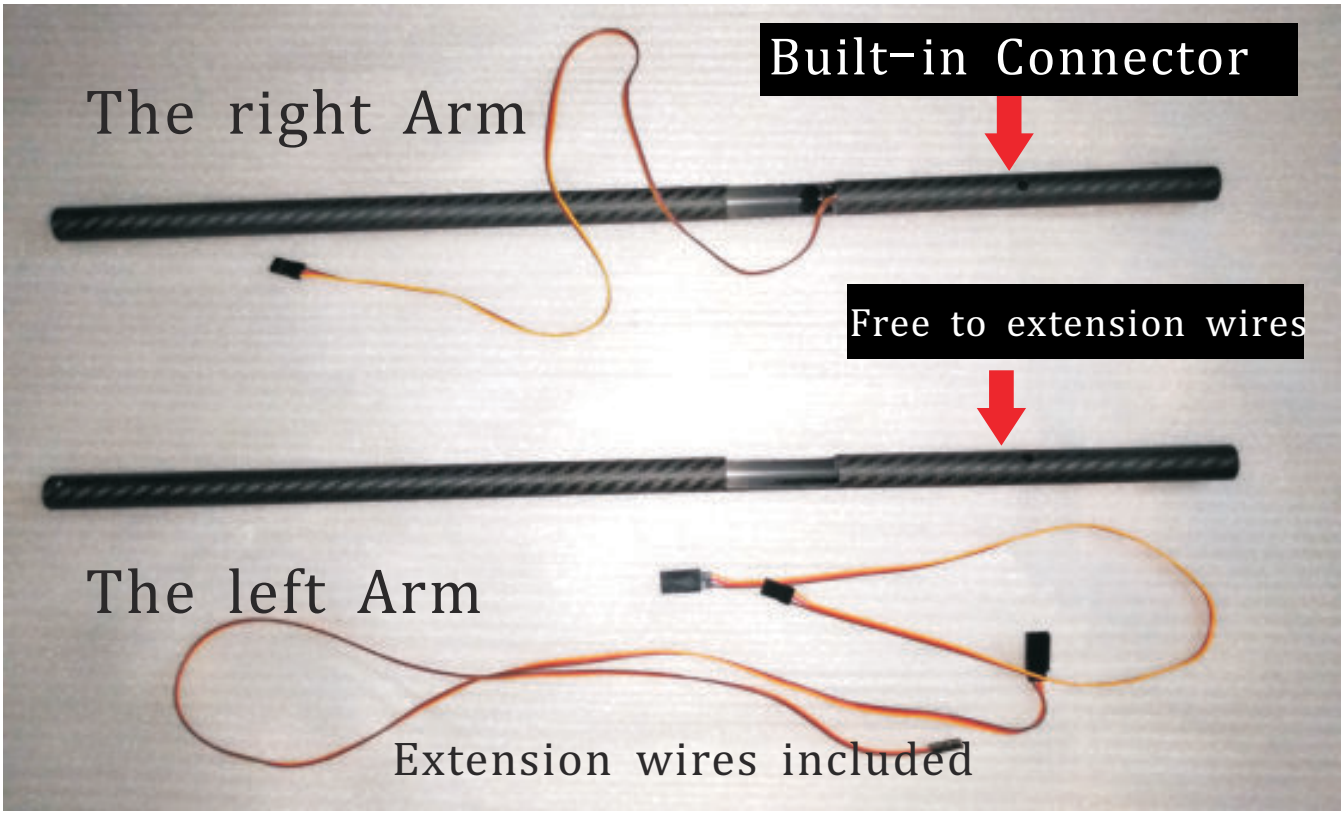


Servo Horn and tail connection



Concerned about Elevator Connection

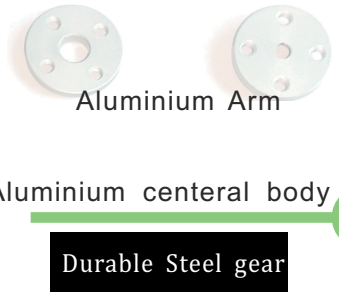
There is a built-in plug&fly connection design
all was pre-installed in the factory after more than Double quality inspections
Perhaps you would doubt by first impression because of feeling or previously other factory's unsuccessful design, but this one was proved to be good by lots of testing and improved production technology.
Anyway for anyone who don't trust, there is a options as well
another arm is free, you can use extension wires as traditionally did



VTBIRD Tilt Gears

Customized full steel Tilt Servo

4. 8V 22kg. cm 0. 16s/60°
6. 0V 25kg. cm 0. 15s/60°
7. 2V 27kg. cm 0. 14s/60°



1. Max. 180°, 500-2500 Pulse width
you can adjust what angle you want by changing Pulse Width(PWM) on the ground control station

2. Voltage recommend 5. 5-6V

3. Customized wires 750MM, no need extra extention wires

*Tilt servo wire rquired 750MM, need extension wire if your own servo (Finwing Customized Tilt servo don't need extension wire anymore)

*Voltage max. 6. 5V and recommended is 5. 5V-6V is good
Don't use 7V or 5V

Note:

Must use foam glue spreading to the 3K carbon arm before install red pillar let glue drying at least 12 hours prior to installing motors and servo
This is good to prevent it from loosing

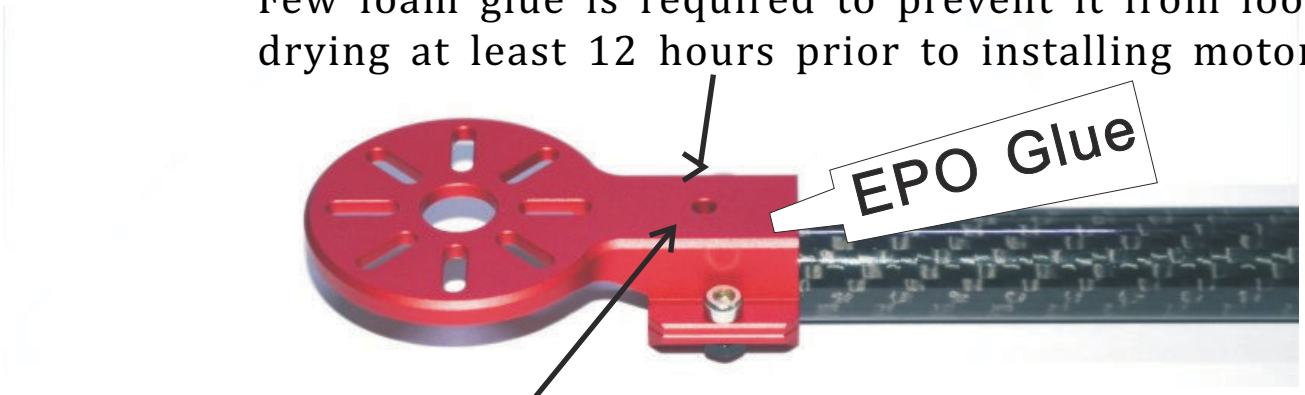
This is newly upgraded (Since 1/9/2020)
Originally was VTOL 12", Tail pusher 13"
Motors and KV is the same
Propellers is bigger than before

4+1

Upgraded to VTOL 13" Tail Pusher 14"
***How to do please* refere to the next page**

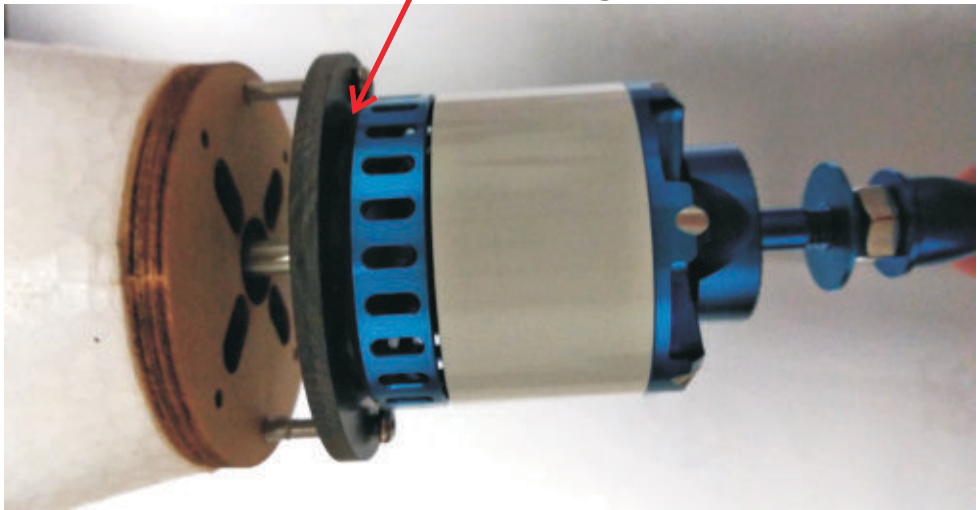
It's exactly the same method to install 4+1 and Tilt rotor for this parts

Few foam glue is required to prevent it from loosing
drying at least 12 hours prior to installing motors



The hole was designed for you to find the right position

4pcs Metal shims between
Fibre glass and motor is required



4+1 Propellers Upgrading

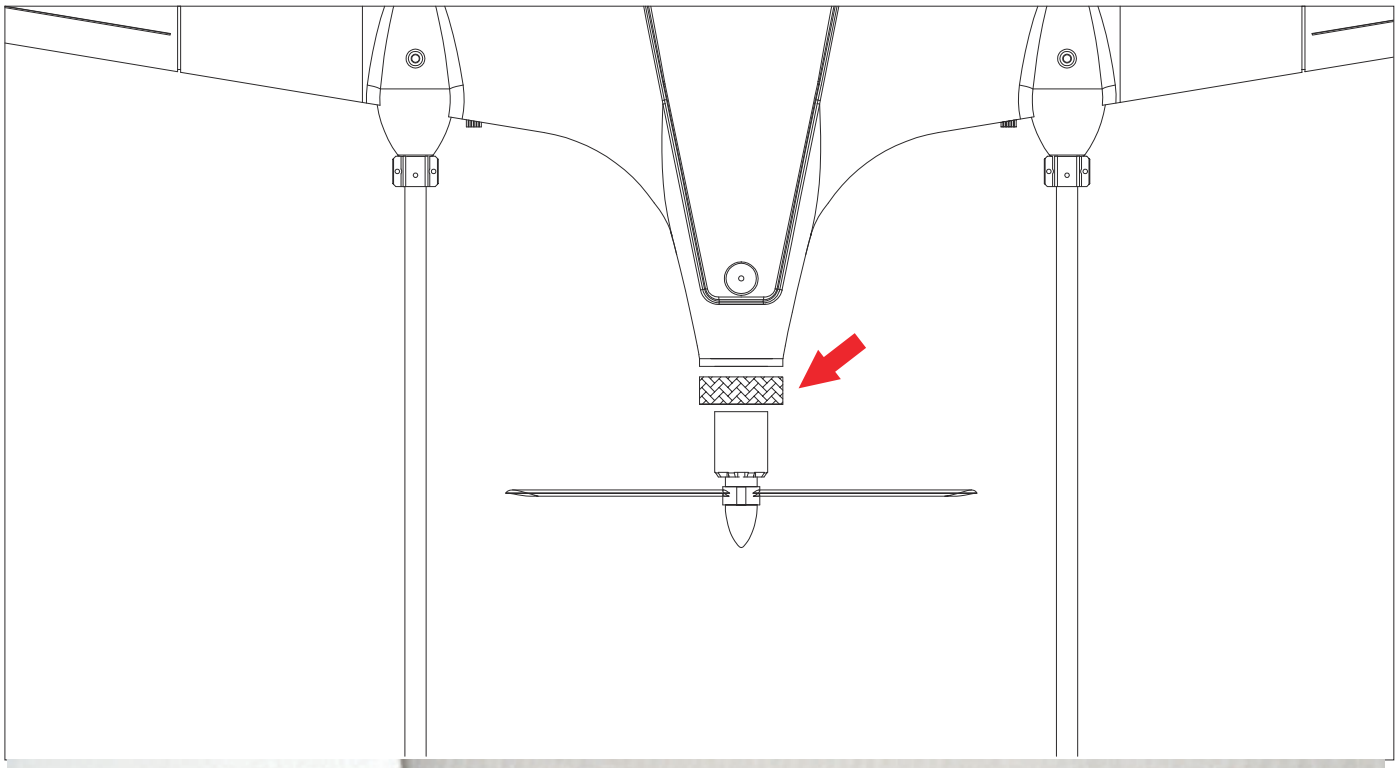
*Original Desing is VTOL Propeller 1245, Tail Pusher Propellers 13*7

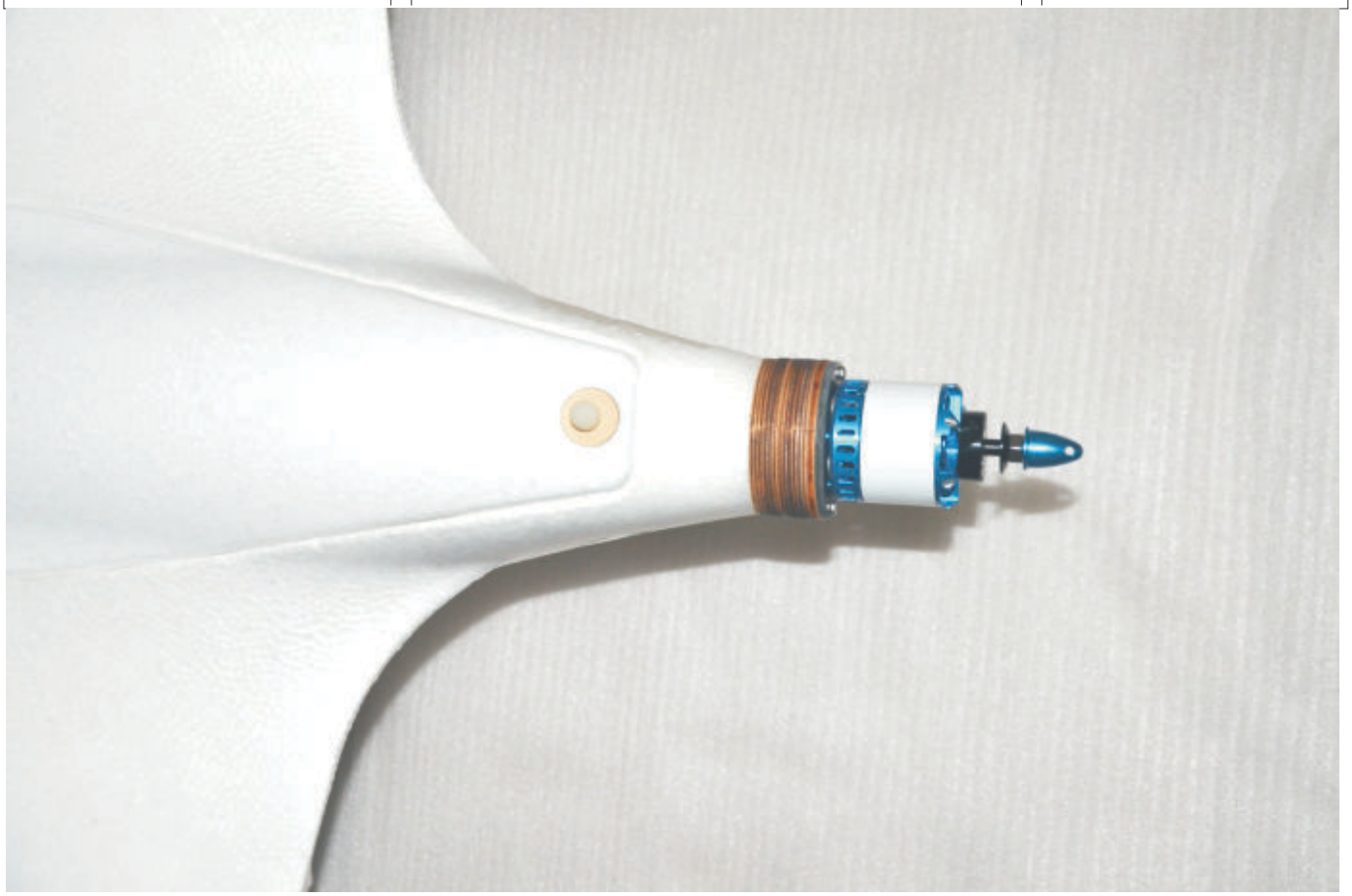
*Upgrading To VTOL Propeller 1350, Tail Pusher Propellers 14*8

*Better efficiency and more thrust after upgraded

*Assembly is the same except the rear motors are differently

1. First step pusher motor has been moved backward 18MM,
All order after 1/9/2020 including all those parts)
Buyers' order before 1/9/2020 can ask for free offer (except shipping cost)

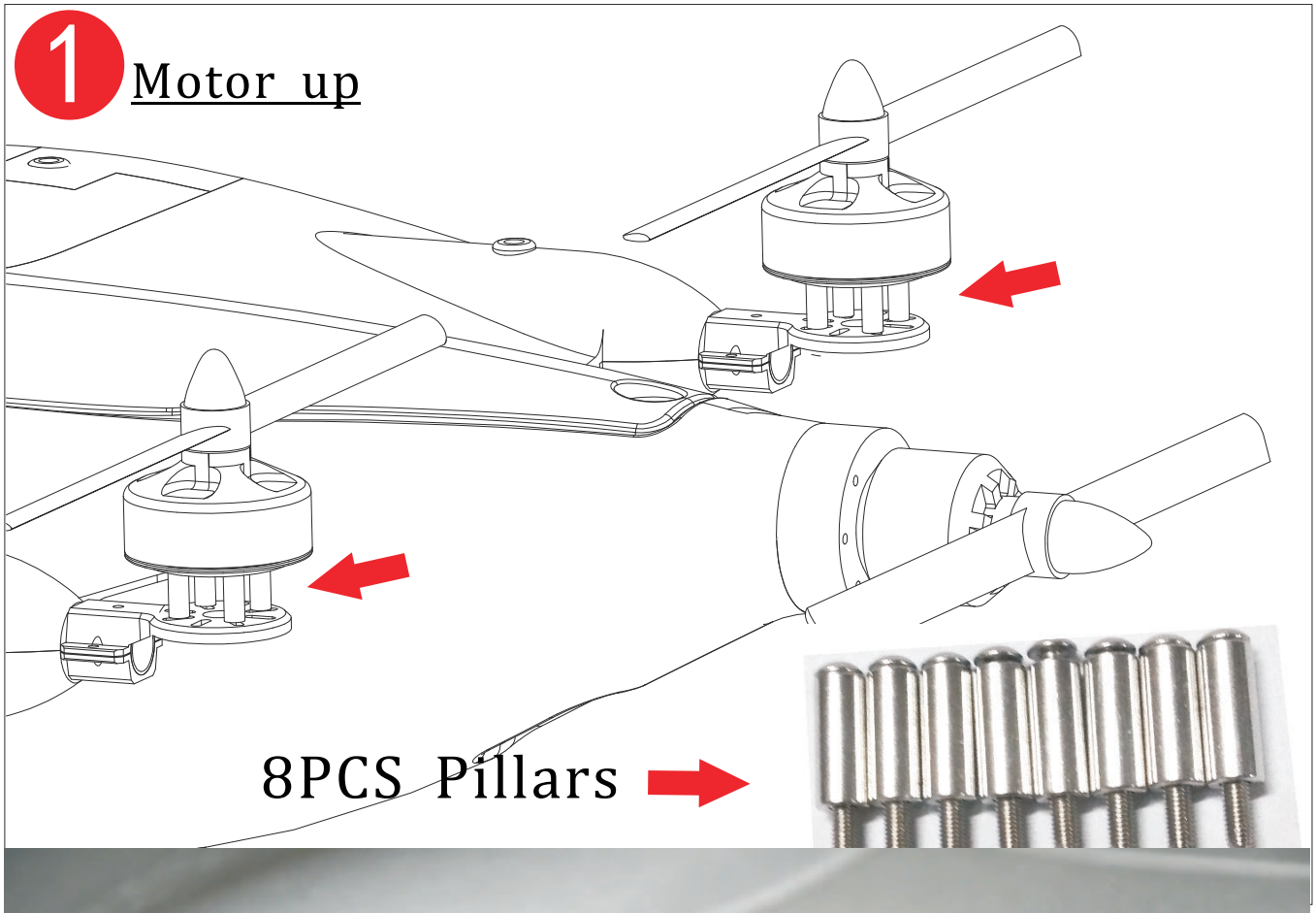




4+1 Propellers Upgrading

2. Second step added 4PCS Aluminum Pillars per motor
All order after 1/9/2020 including all those parts)
Buyers' order before 1/9/2020 can ask for free offer (except shipping cost)

This is good for Propeller Airflow

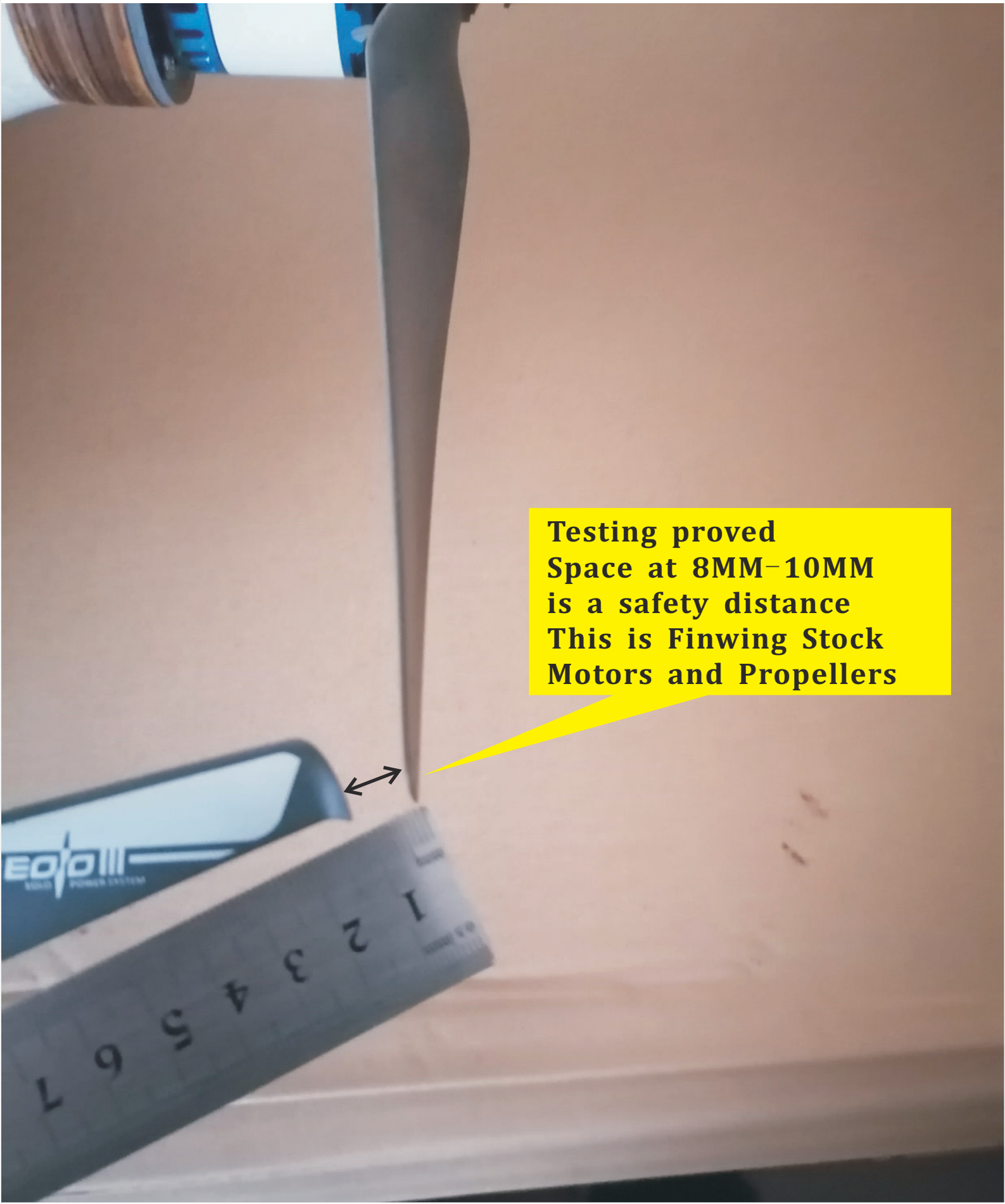


4+1 Rear Propeller's Space

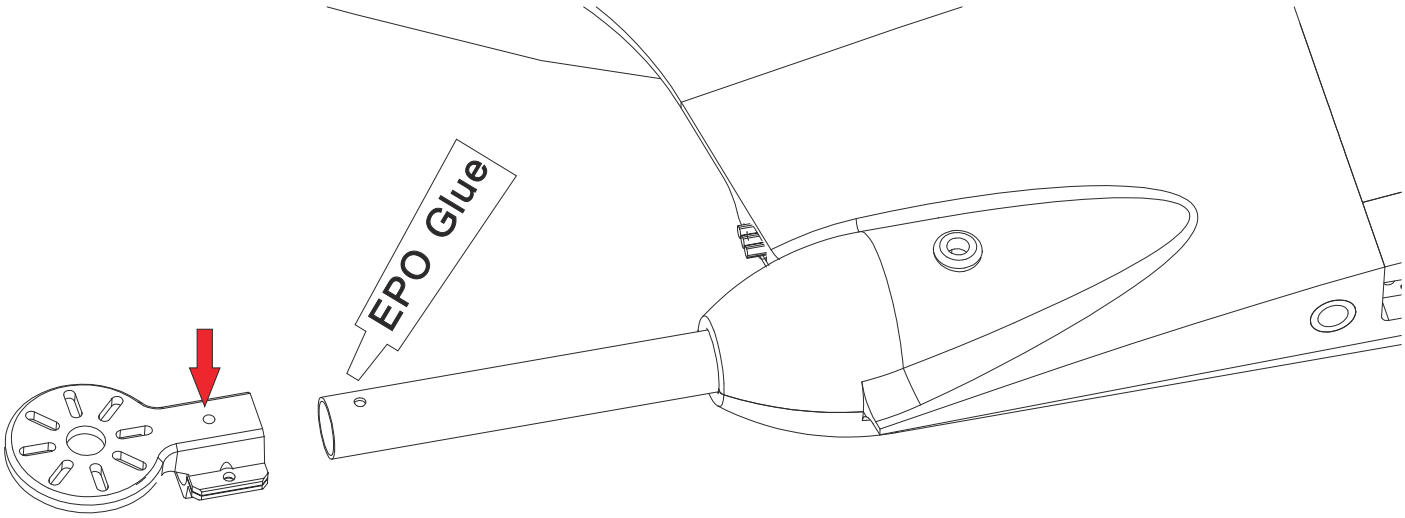
Install directly if yours are Finwing Stock motors and Propeller
But if buying other motors and Propellers please refer to the following introductions.

Note:

Don't move it away too much, keep 8MM-10MM is enought instead of the more the better because moving backward is negative to balance CG. (Tail heavy)



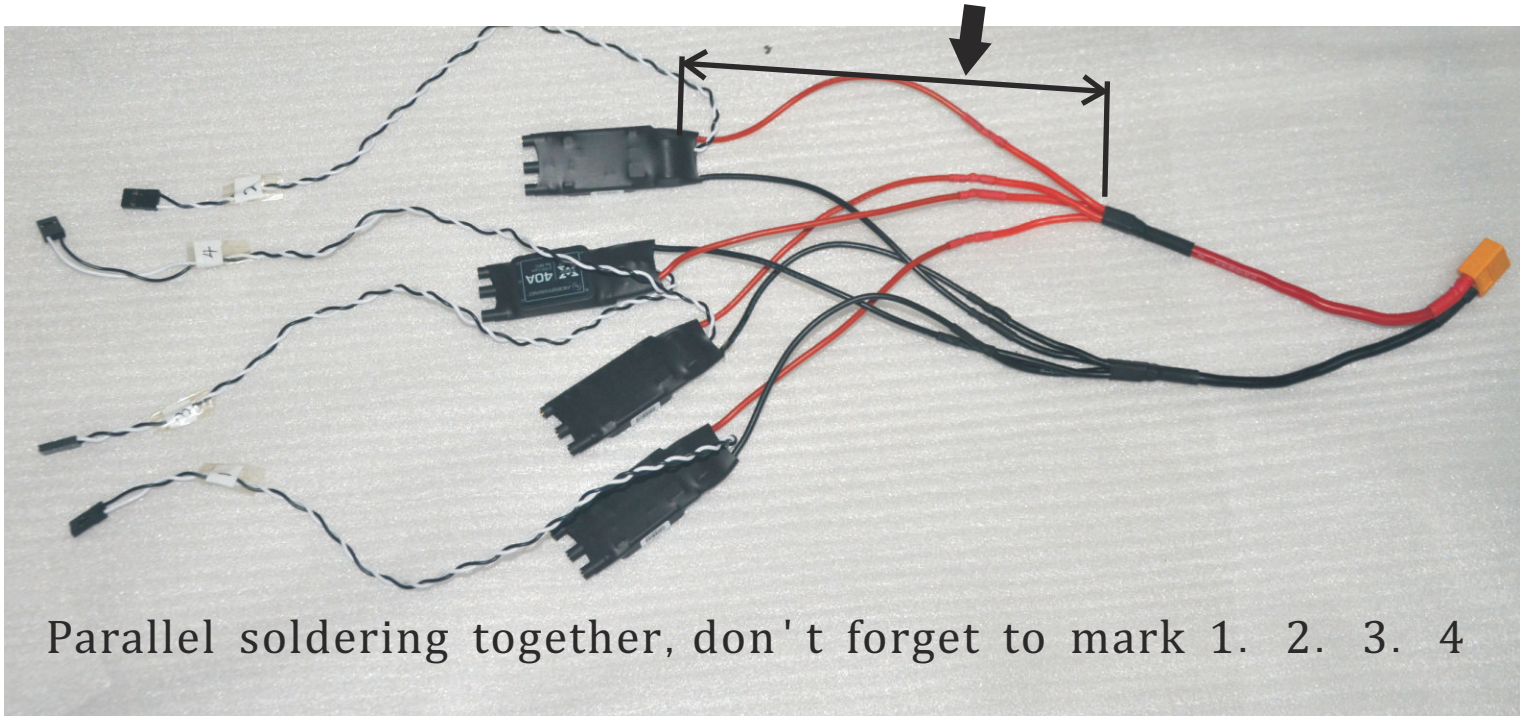
VTBIRD VTOL Motor Mount



Beware of the hole position (very important)
do it exactly as the drawing

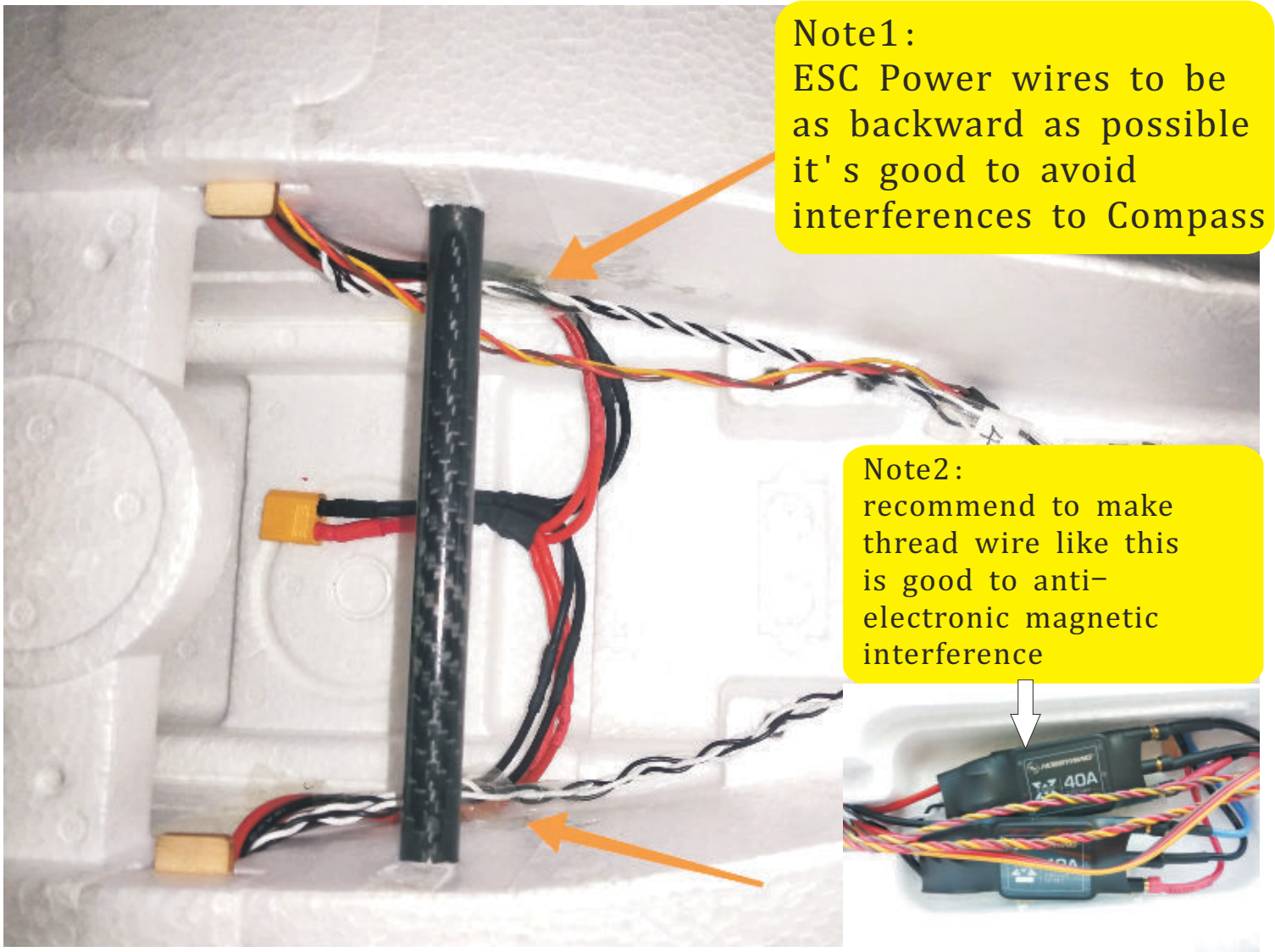
VTBIRD ESC

Recommend 280mm

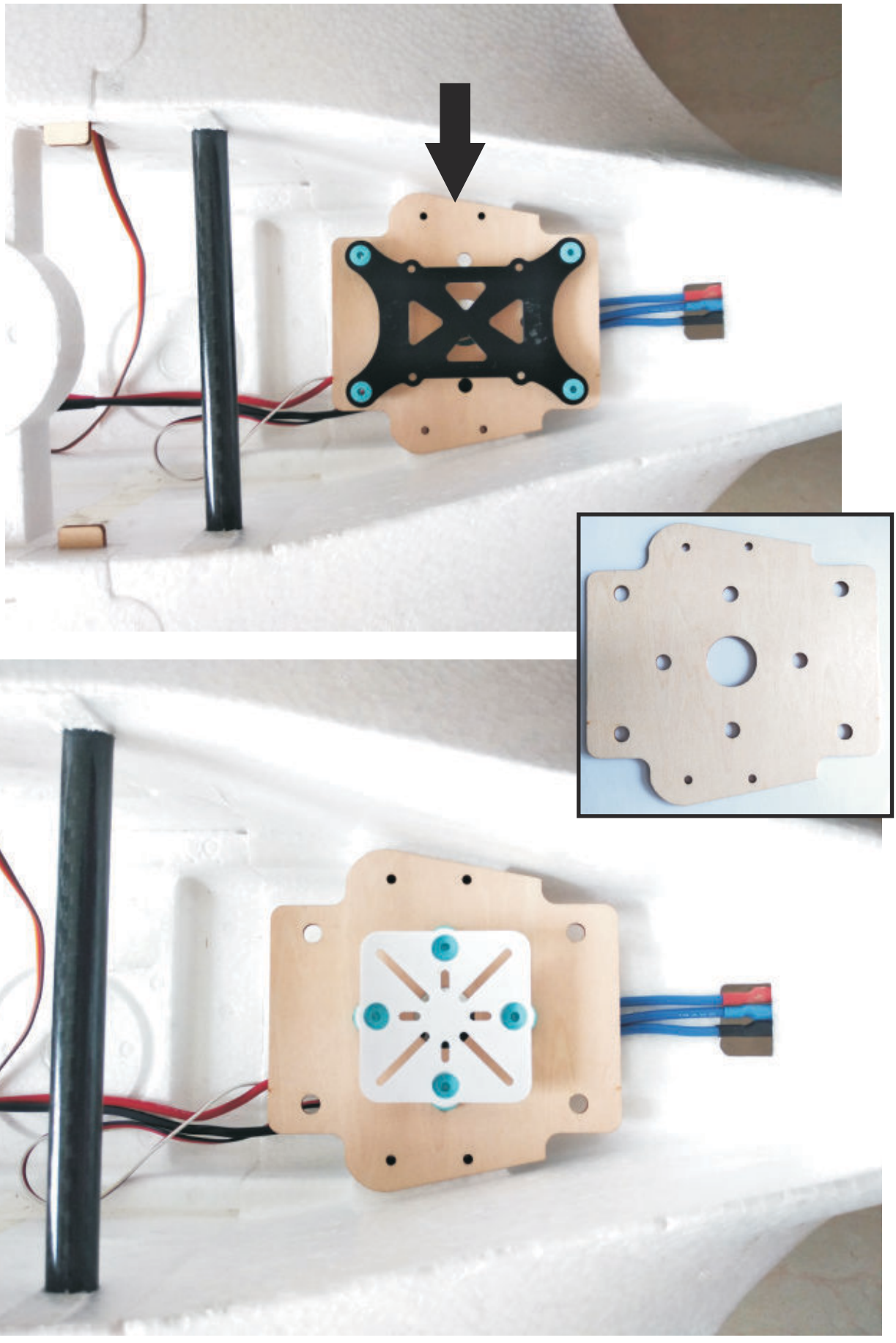


Parallel soldering together, don't forget to mark 1. 2. 3. 4

VTOL ESC for 4+1 and Tilt Rotor is the same



Pre-designed Flight controller location



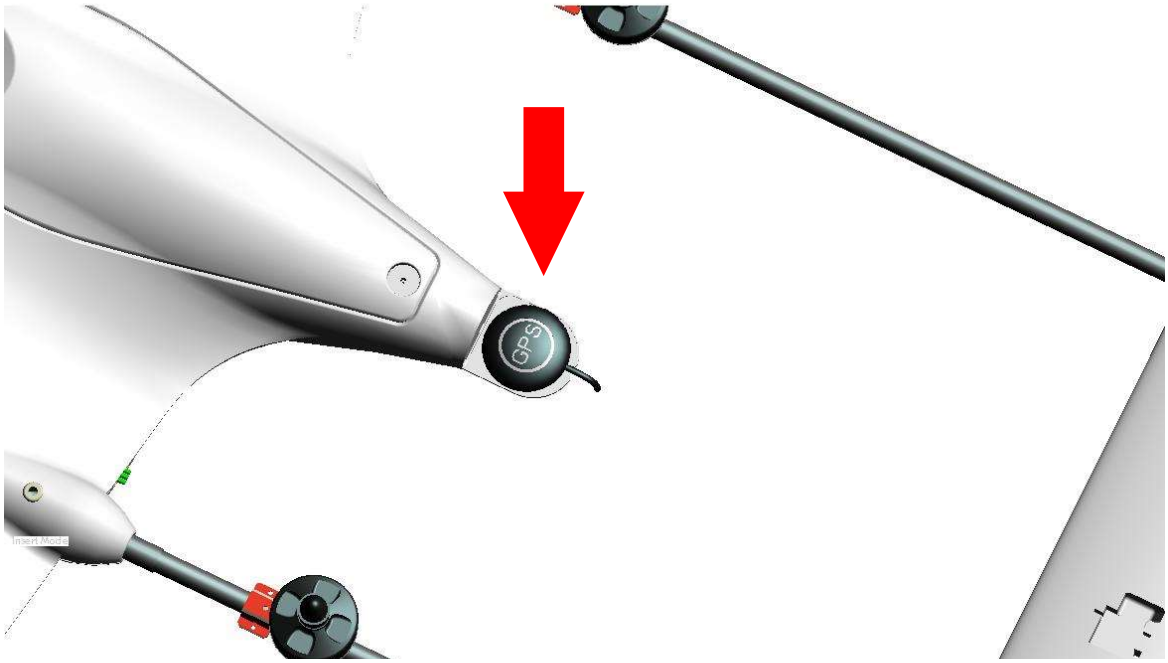
VTBIRD Tilt Rotor Upgrading

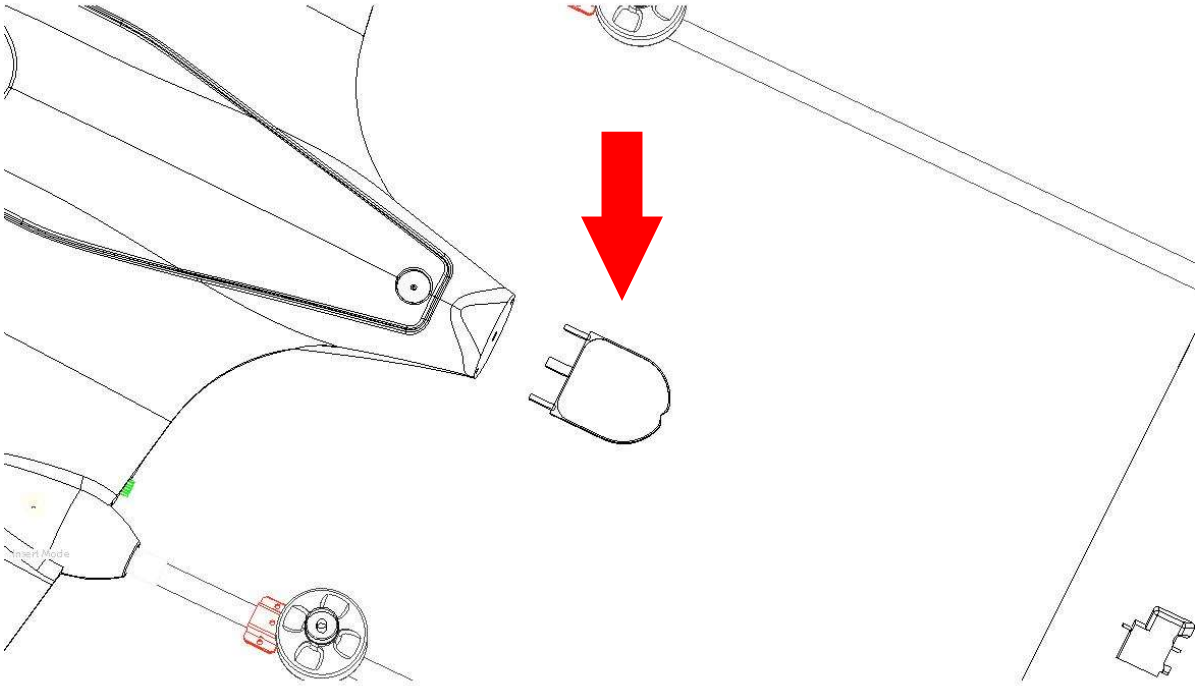
Newly added a GPS/Compass platform at the rear of the fuselage since Dec. 4th 2021.

What Benefits?

#1. less interference to compass

#2. Better to balance tail weight





Rudder or Not?

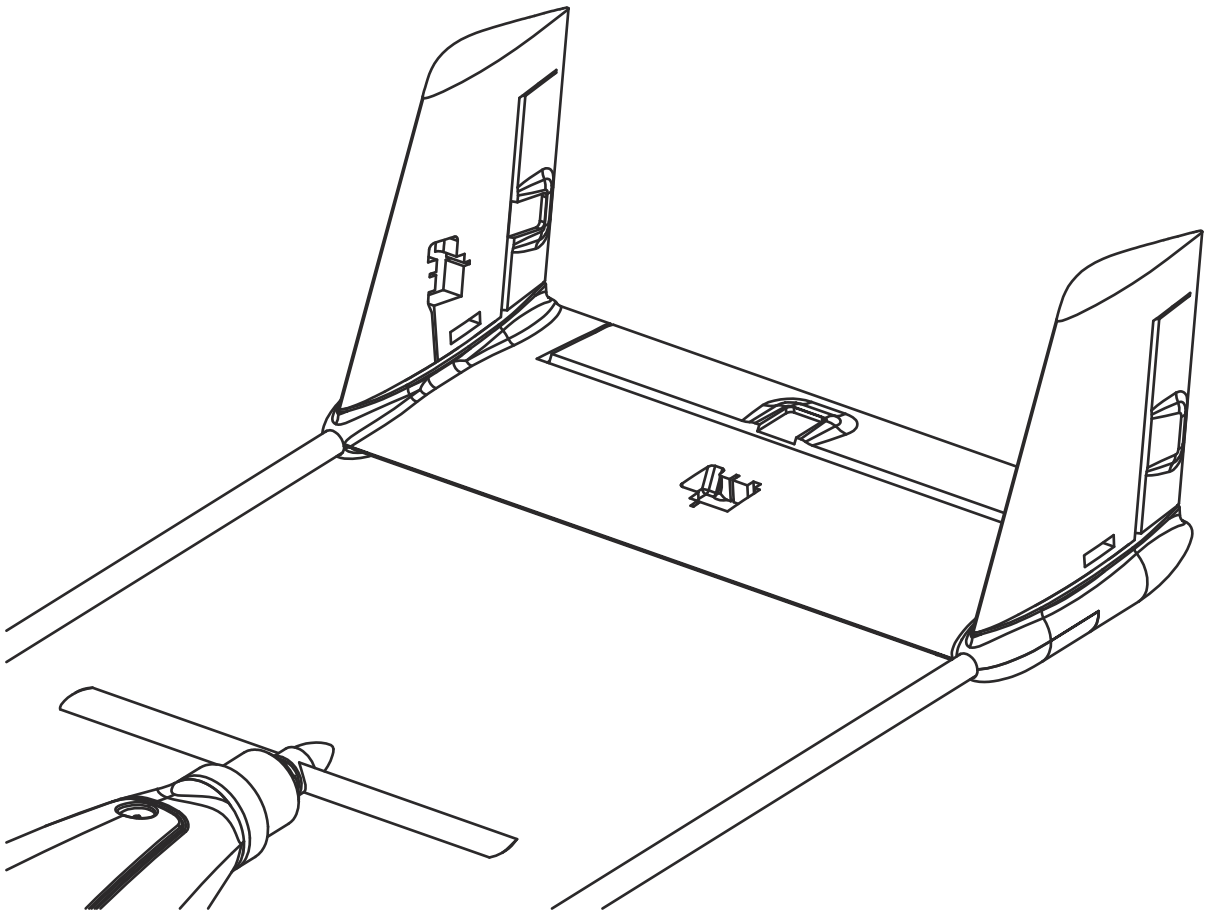
〈**Note: Standard kits and Electronic combo not including servo horn parts and servos for rudders**〉

Originally design for Twin tail-boom plane all without Rudder
(Non- Vtail) VTBIRD is also the same without rudder.
During all our testing we never use rudder.
But some of the user recommended to reserve a rudder options
below we have reserved servo bay and control surface position

Purpose of the design is not to use rudder
but no need you to DIY rudder bay and rudder controller surface
if someone do must to use rudder functions
You have to buy servo horn parts and servos separately

1. **VTOL Tilt Rotor**
   is do unnecessary to use rudder
   Because of FC has vector control function.

2. **VTOL 4+1**
   Testing proved Heading Stability is good without rudder
   Point is if install rudder is negative to balance CG. (tail heavy)



Tips and Warnning

技巧建议与警告

Recommend to take off the ESC cover when tunning PID or testing VTOL loiter, a closed space will cause ESC overheating
Reminder: landing to cool the ESC every 3-4 minutes after loiter

Closing cover only after you planned transit to Fixed-wing flying

建议在初期悬停测试和调式PID阶段时不要盖上盖子，打开盖子有利于散热
每次建议悬停时间超过3-4分钟后就下来冷却电调再上去飞
只有在准备正式转换成固定翼飞后才盖上盖子