PALAS

DIY Drone

[Greek mythology] Palas, other name used for Athena (goddess of justice).

ASSEMBLY INSTRUCTION MANUAL

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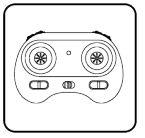
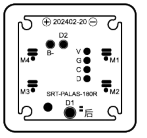
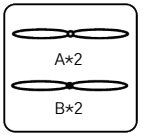
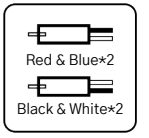
1. PREPARATION BEFORE ASSEMBLY 2


Remote Controller x1

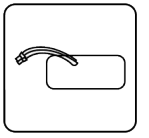

Flight Controller Board x1

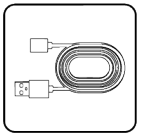


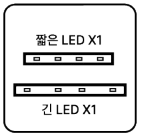
Propeller x4



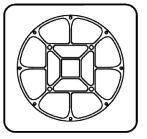
Motor x4

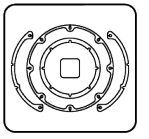

Lithium Battery x1

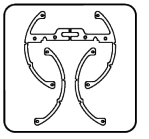

USB charger x1

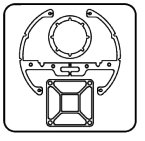


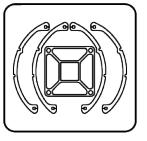
Line LED x2

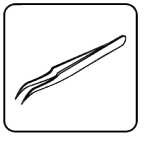

Magic Board 1 x1

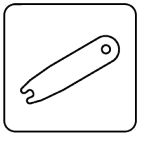

Magic Board 2 x1

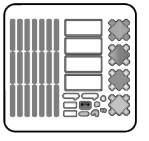

Magic Board 3 x1


Magic Board 4 x1


Spare Magic Boards x1

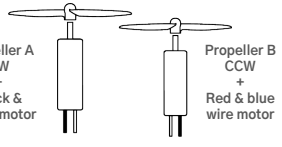

Tweezers x1


Propeller Remover x1


DIY stickers x2

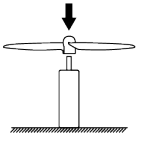
2. Assembly precautions 3

Propellers mounting method

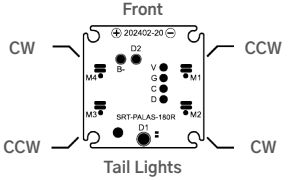


Black & white motor + Propeller A CW
Red & blue wire motor + Propeller B CCW

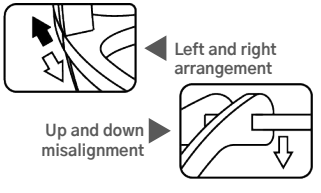
Precautions when installing the propellers



When pressing on the propeller motor shaft, you must support the bottom of the motor to prevent it from falling due to excessive force.

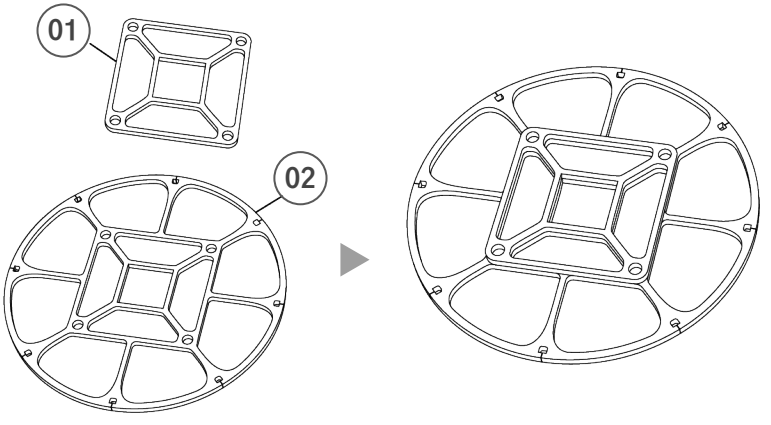


* The illustration above shows the view from above.
Check the orientation of the front and back of the flight control board and make sure the motors are connected in the correct locations as shown.



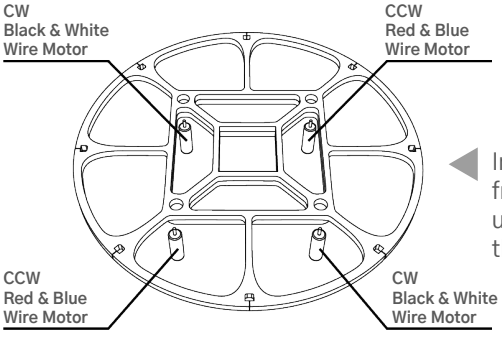
Be careful not to apply too much force when opening the buckle to prevent it from coming off. The slots can be opened left and right (or up and down).

3. ASSEMBLY (1) 4



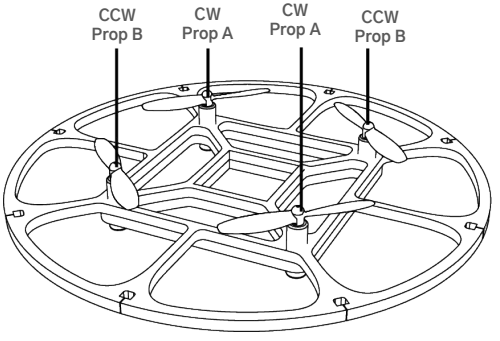
Overlap item “01” and “02” in the center and align the corners.

3. ASSEMBLY (2)

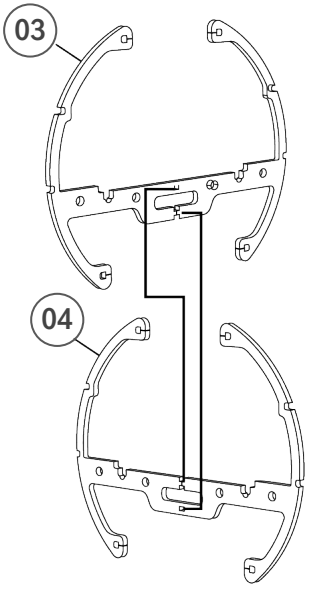


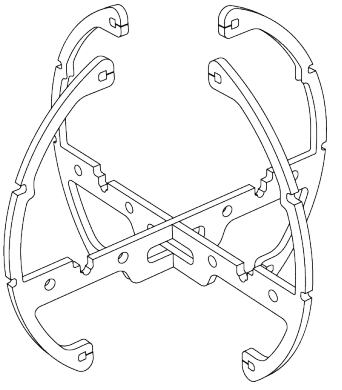
Insert the motor from the bottom up, as shown in the picture.

Reference for connecting the propellers



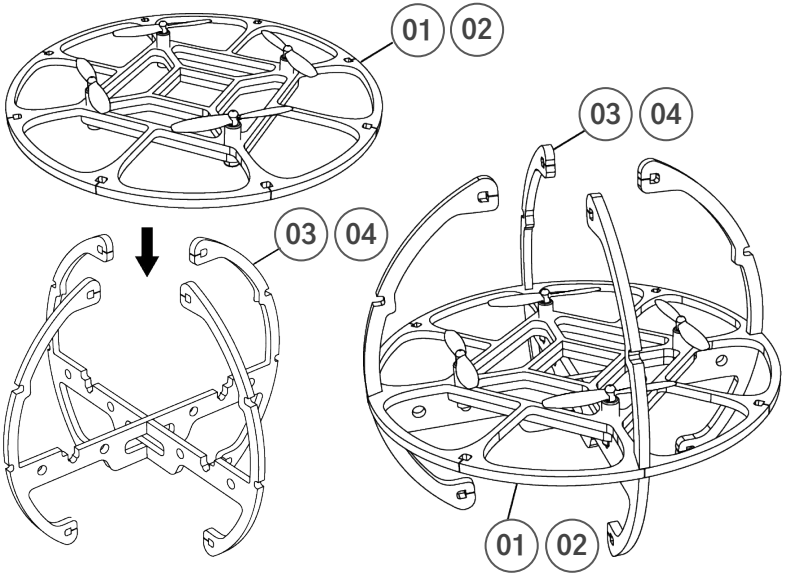
3. ASSEMBLY (3)





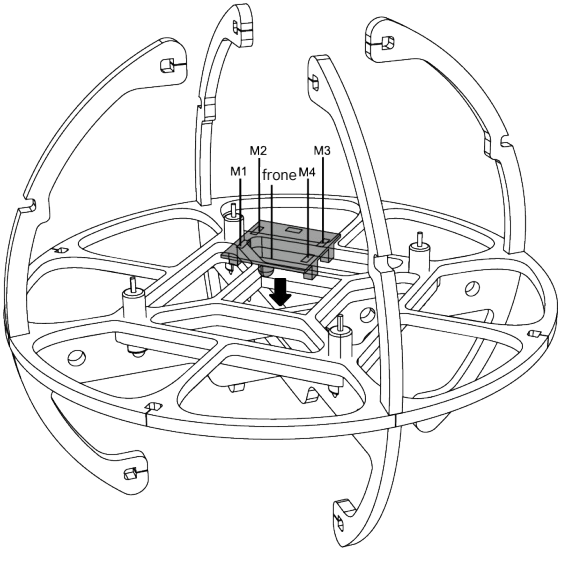
Assemble item “03” with the item “04” by crossing them and forming an X shape.

3. ASSEMBLY (4)



Insert the frame body (Assembly 2) into the corresponding position of the X-shaped frame (Assembly 3). Do not forget to fit the motor into place.

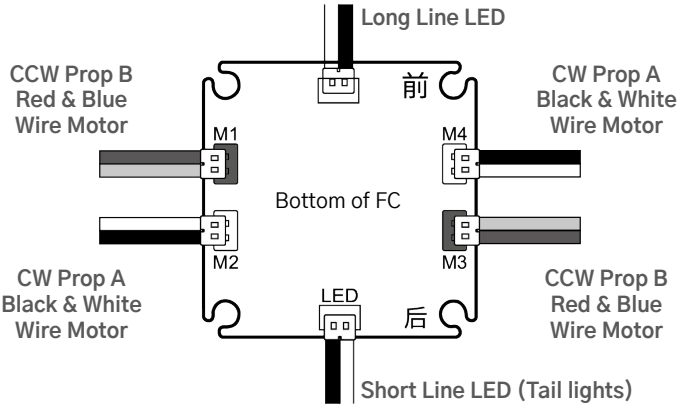
3. ASSEMBLY (5)



Arrange the antenna, power cable and LED at the bottom of the flight control board and insert them into the mounting space.

* Double check that the arrows on the flight control board are in the correct position.

3. ASSEMBLY (6)



* The figure above shows the FC from the bottom.
Connect the motor and line LED connectors as shown above.
Connect the CCW red and blue wire motors to the red socket.
Connect the CW black and white wire motors to the white socket.
Connect the long line LED to the socket on the front of the FC.
Connect the short line LED to the socket on the back of the FC.

3. ASSEMBLY (7)

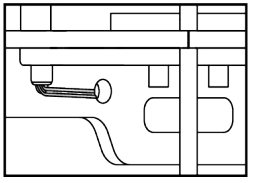


Figure 1

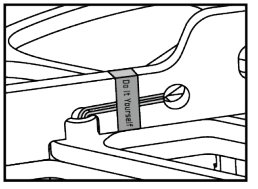
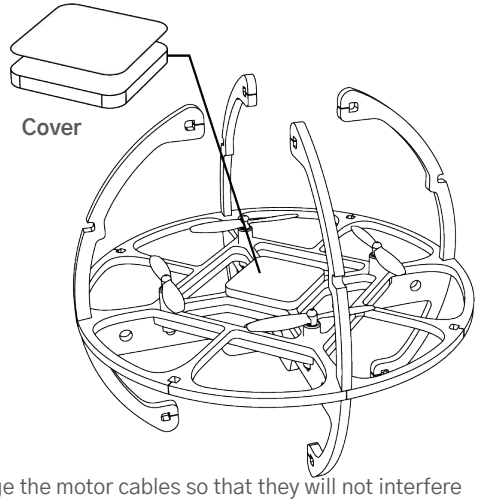
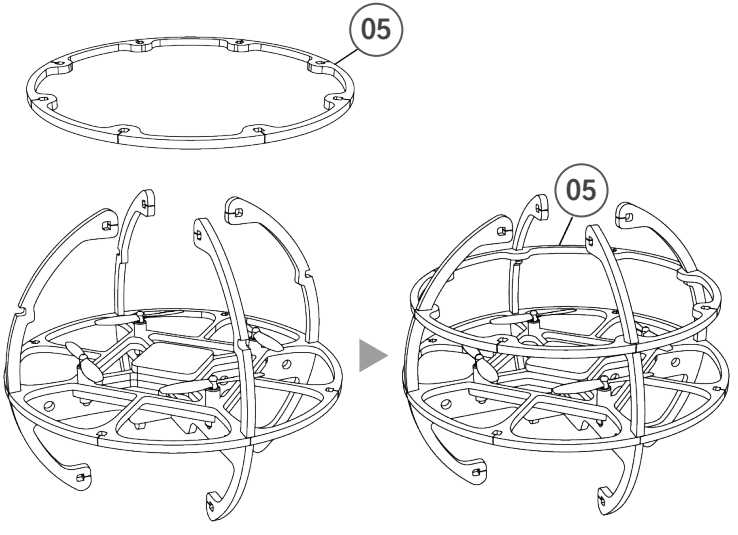


Figure 2



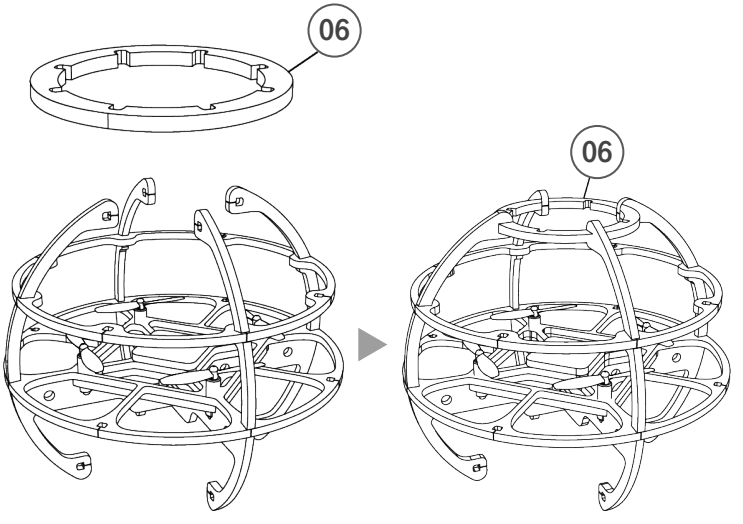
As shown in Figure 1, arrange the motor cables so that they will not interfere with the placement of the battery.
As shown in Figure 2, secure the center stand, motor wires and X-shaped frame with band stickers.
Position the flight control board antenna so that it does not interfere with the insertion of the battery into the battery tray.
Fold the tail lights of the flight control panel appropriately so that they do not interfere with the insertion of the battery.
Cover the flight control cover plate and attach the square sticker above it.

3. ASSEMBLY (8)



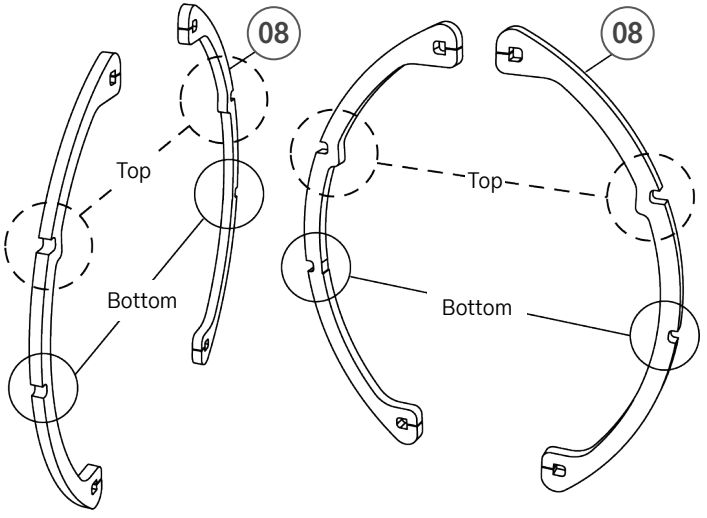
Insert the item “05” into the corresponding holes and secure it tightly.

3. ASSEMBLY (9)



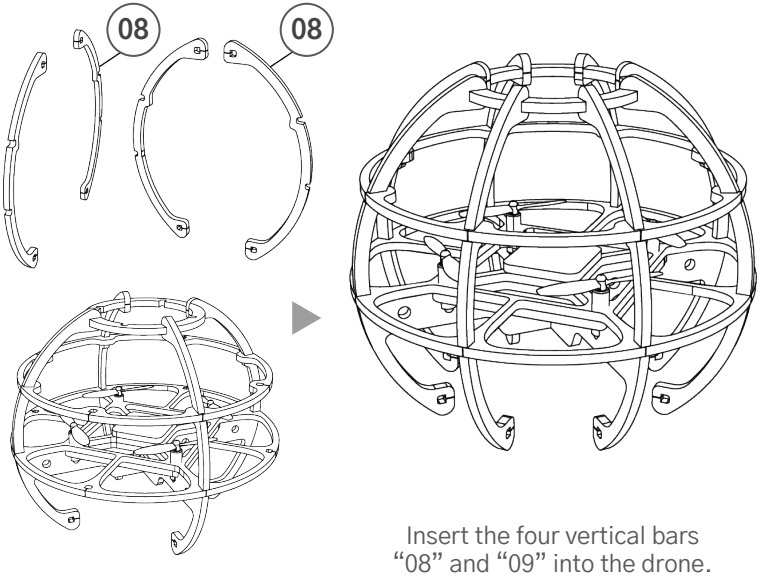
Insert the item “06” into the corresponding holes and secure it tightly.

3. ASSEMBLY (10)



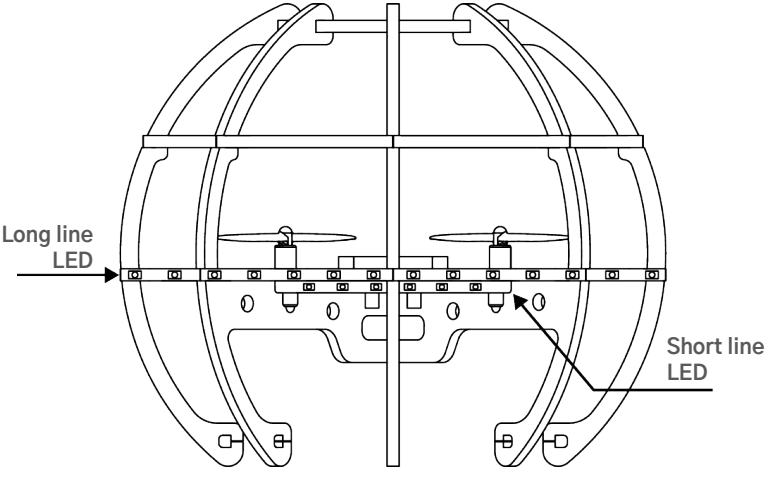
Please check the top and bottom of the items “08” and “09”.
On the top, there is a pointed part.

3. ASSEMBLY (11)



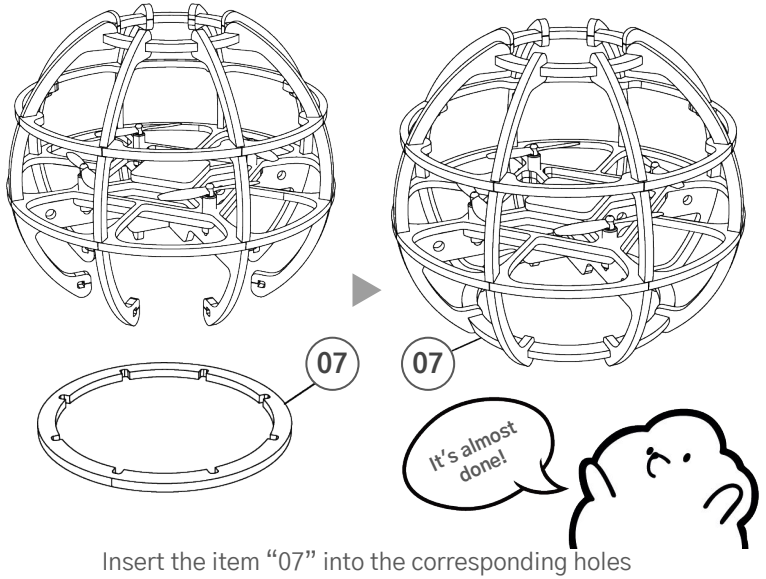
Insert the four vertical bars
“08” and “09” into the drone.

3. ASSEMBLY (12)



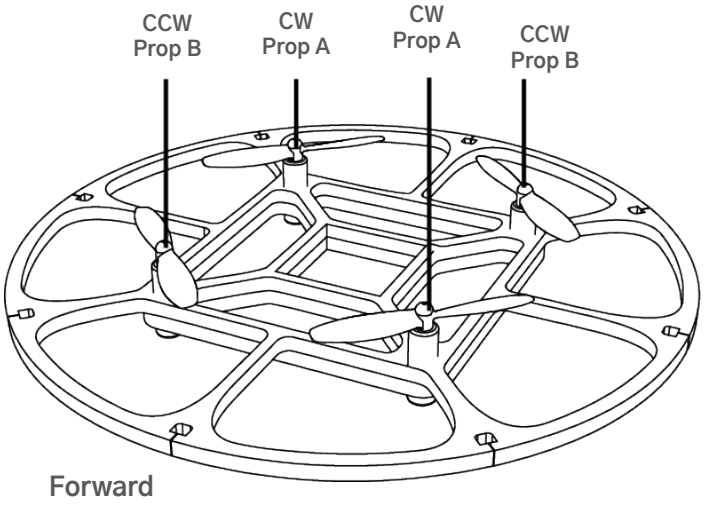
Remove the sticker from the Line LED and stick it to the drone as shown. Wrap the long Line LED around the entire drone.
The short Line LEDs should be glued to the rear of the fuselage.

3. ASSEMBLY (13)



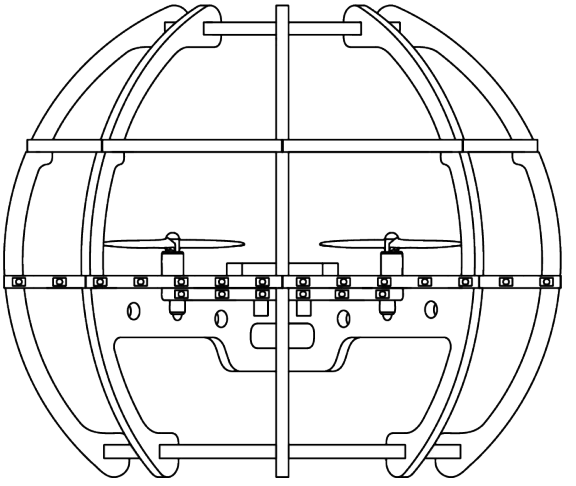
Insert the item “07” into the corresponding holes
and secure it tightly.

4. Inspection After Assembly (1) 17



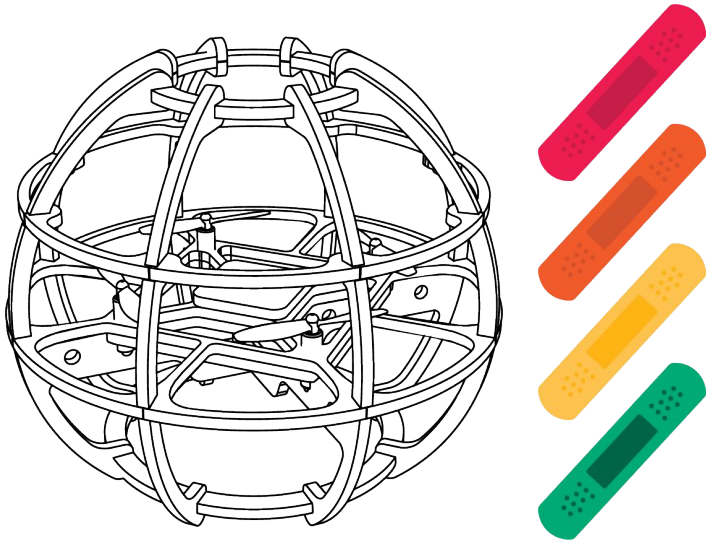
Please check if the propellers are installed properly.
Incorrect orientation or loose assembly of the propellers may cause problems related to flight performance or a propeller may fall out.

4. Inspection After Assembly (2) 18



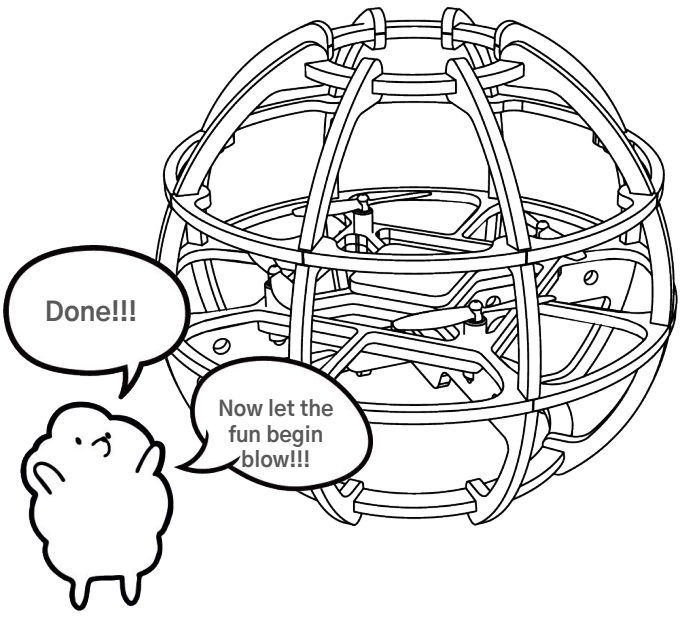
Please make sure the motor is installed vertically.
If it is tilted, there may be some issues during the flight.

4. Inspection After Assembly (3) 19



Please check if there are any broken parts during assembly.
If there is a broken part, use the band sticker included to fix it firmly.

Assembly Completed 20



PALAS

DIY Drone

[Greek mythology] Palas, other name used for Athena (goddess of justice).

USER MANUAL

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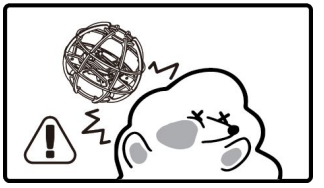
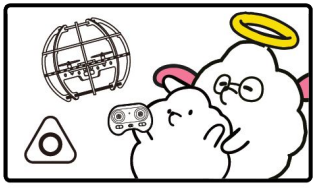
HELSEL

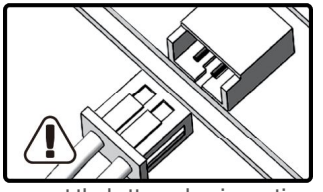
1. Safety Information



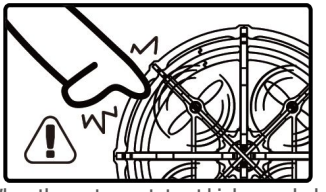
Do not fly towards people's heads.



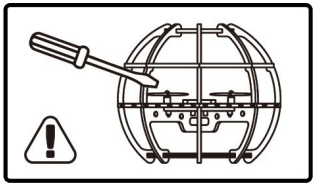
Be careful not to get your hair tangled in the spinning motors.



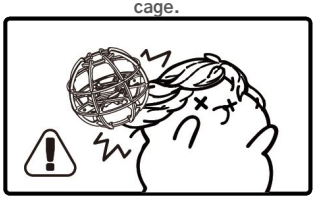
Disconnect the battery when inspecting and servicing the drone.



When the motors rotate at high speed, do not put your hands inside the protective cage.



Inserting sharp objects inside the protective cage may cause damage to the propellers.



Children must use the drone under parental supervision.

2. Battery Precautions

If the battery is used for too long, it can overheat and become easily damaged. Prolonged or high current charging may cause swelling and damage to the battery. Long-term storage of the battery in a fully charged or discharged state may cause damage to the battery. Using the battery for a prolonged time may reduce the battery's voltage and shorten the battery's life. Please be careful when charging the battery and stop charging when going out. Please store and dispose of the batteries properly.

Must read

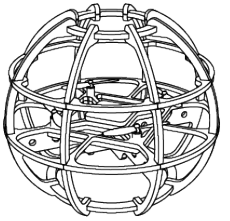
Battery Precautions

3. Charging Precautions

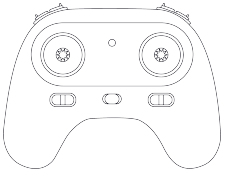
Charging requires the use of the original charger.
Do not use a damaged charger or a charger from another brand.
Do not charge damaged batteries which are swollen or leaking.
When the battery is fully charged, disconnect the battery from the charger. Do not charge near inflammable materials (carpet, wooden floor or furniture,...) or on electrically conductive surfaces. To protect the battery ahead of charging, allow it to cool for 10 to 15 minutes.
The temperature at which the battery can be charged must be between 0° C and 40°C. Do not leave the battery unattended while charging.

4. Preflight preparation

Attention: Before using the product, make sure to charge the battery in advance and be familiar with the safety information to ensure a safe flight.

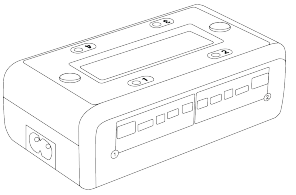


Drone x1



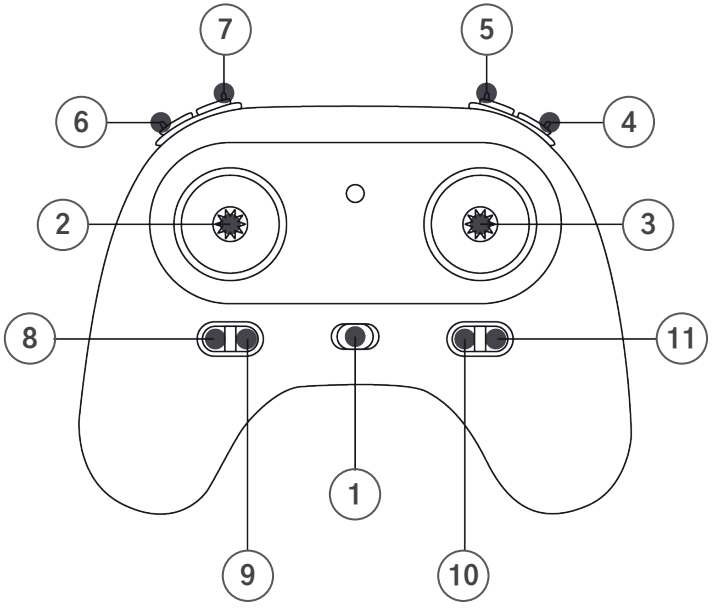
Remote Controller x1

Battery x1



DAGAN 30Q Charger
* Purchased separately

5. Controller Button Descriptions and Functions 5



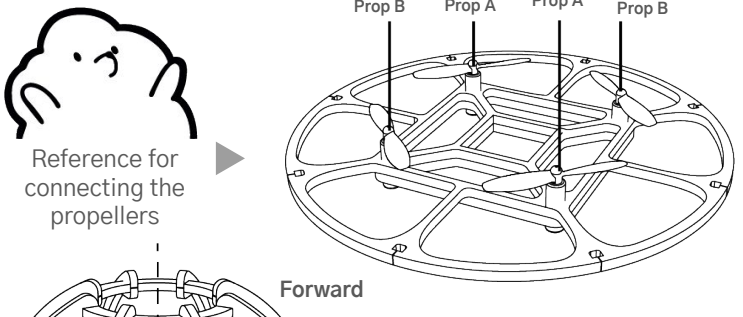
No.	Function	Description
1	Power button	Power on/off

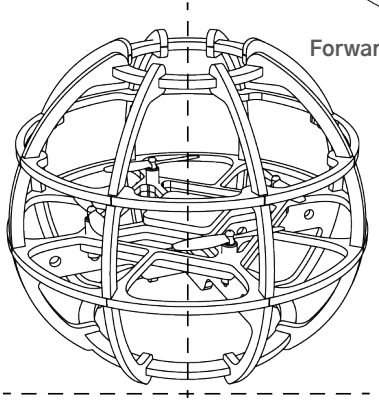
5. Controller Button Descriptions and Functions 6

No.	Function	Description
2	Left stick	Go up/ down, Turn left/ right
3	Right stick	Move forward, backward, left
4	One Touch Take / Land	Auto take-off / landing (used after motor startup)
5	Adjusting the speed	1 to 3 speed adjustments
6	Motor Start/Emergency Stop	Short press to start motor, long press for 2 seconds to stop
7	Flip	Rotate 360°
8+3	Adjust trim	Press button 8 and move stick 3 at the same time.
9	Turn altitude hold on/off	Altitude hold on/off (default on)
10	Rotation recovery mode	Turn rotation recovery mode on/off (home on crash)
11	LED color	Change the LED color
5+1	Change modes	Holding down button 5 to change to mode 1
2+6	Emergency stops	Hold the throttle at the lowest position and press button 6 to emergency stop

6. Pre-Flight Inspection 7

Tip : Short press to start motor, long press for 2 seconds to stop

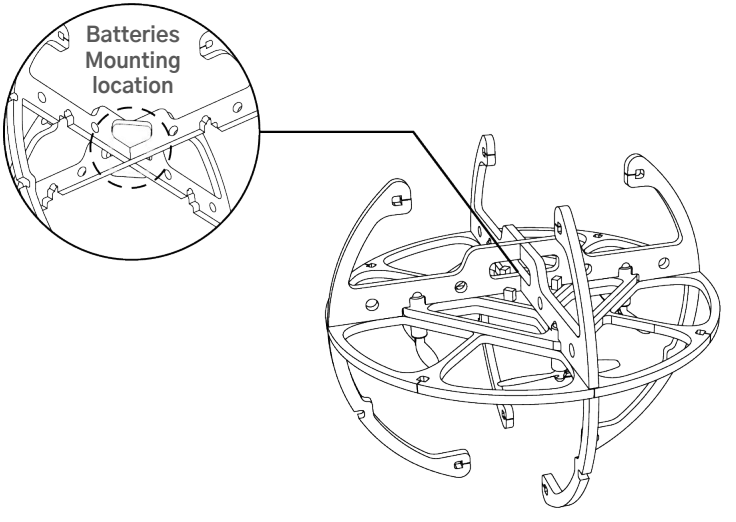




Pre-Flight Checklist
1. Is the shape of the ball intact?
2. Do the propellers have any broken parts?
3. Are there any broken or disconnected parts in the protective cage?
4. Is the battery connected properly?
5. Is the motor correctly mounted vertically?

7. Flight Preparation 8

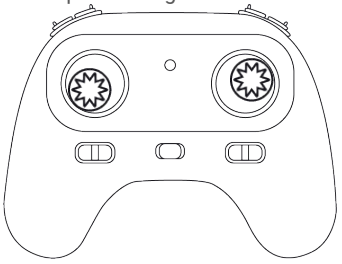
Attention: Check if the battery is swollen or too hot.

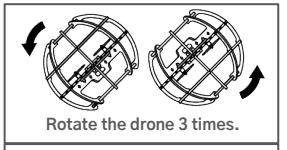


Insert the battery into the corresponding position of the X-shaped frame (Assembly 3) that was assembled in the Pre-flight assembly instructions. You may insert it without disassembling it. After that, power on the controller “First” and connect the battery cable.

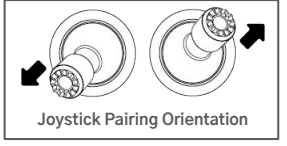
8. Pairing

Attention: When pairing, please turn off the other nearby controllers before proceeding.





Rotate the drone 3 times.



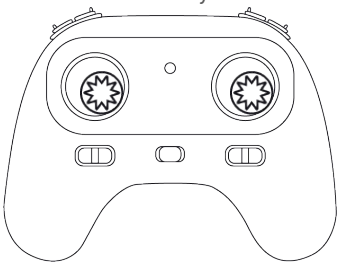
Joystick Pairing Orientation

The product is paired at the factory, and under normal circumstances, it does not need to be paired every time it is powered on. However, the following conditions may cause it to become unpaired and require re-pairing
A) If the transmitter or receiver has been replaced
B) the drone is paired with a different controller

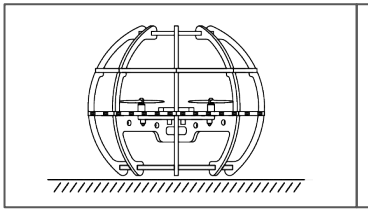
How to pair	
1	First, turn on the controller switch, then connect power to the drone.
2	Flip the drone quickly three times in a row and the LED indicator will start blinking rapidly.
3	Keep the drone still and move the joystick pairing direction as shown in the image above.
4	The LED light stops blinking and the pairing is successful.
5	Check the pairing status via the indicator light or the start key.

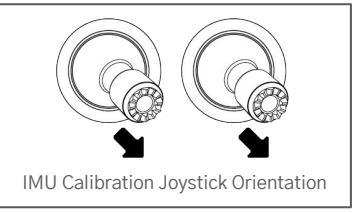
9.IMU Calibration

Attention: After replacing the battery, place the drone on a flat surface and calibrate it every time before take-off.



The calibration is successful when the drone's tail lights stop blinking, after having blinked.



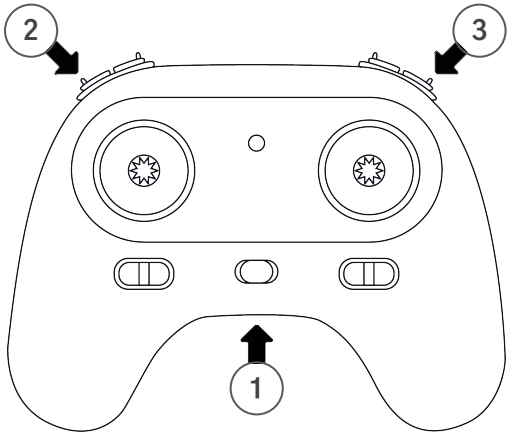


IMU Calibration Joystick Orientation

The IMU calibration is the initial calibration of the sensors which detect the orientation and inclination on the ground before take-off to ensure that the drone maintains a horizontal position in the air. If the calibration is performed in a non-horizontal state, the drone will continue to fly in a specific direction and it may not be possible to compensate for it through fine adjustments.

10. Start Flight (1)

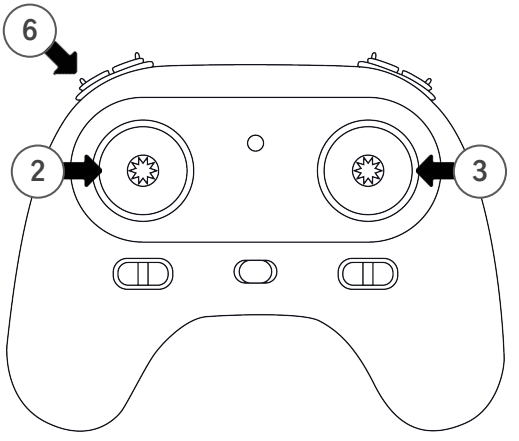
Attention: Please follow the order. Please reverse the order when you finish the flight.



① Power on the controller first.
② Press the motor start button. The propellers will start spinning.
③ Press the one-touch take-off and landing button, and the PALAS will take off.

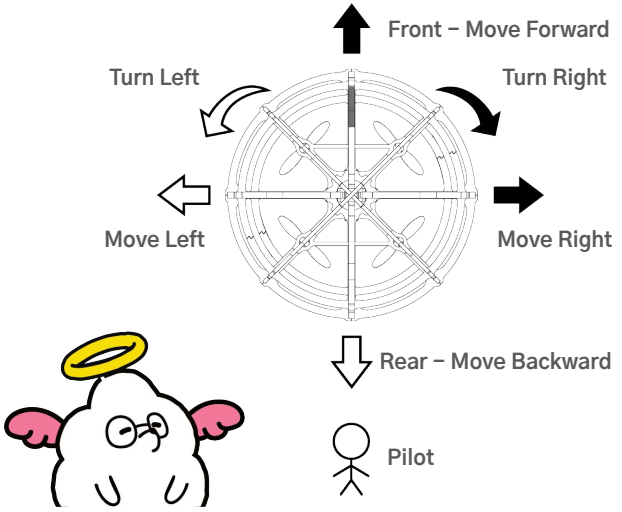
10. Start Flight (2)

Attention: Many flights heat the motors. Do not touch the motors with your hands after a flight, as you may get burned



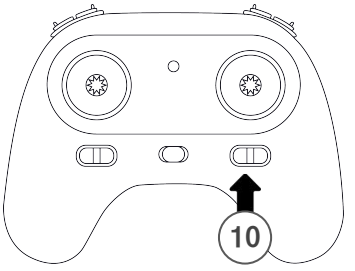
Use the [2-Left] and [3-Right] sticks to steer the Palas.
If you use a lot of force when moving the sticks, or move them quickly and sharply, the Palas will rise, fall, move forward, backward, and may crash or get stuck somewhere.
If this happens, you can immediately press and hold the [No. 6] Motor Start, Stop button to end the flight.

11. Determining The Flight Direction 13



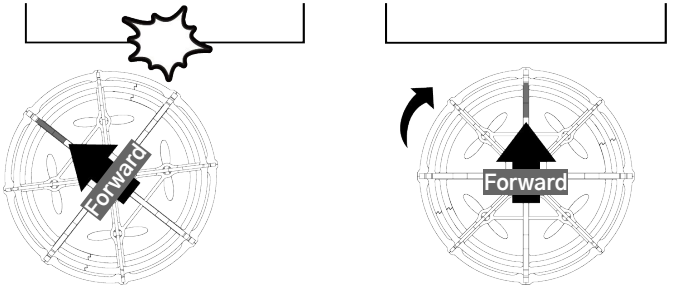
If the front of the body is determined to be forward, the remaining directions are also based on the forward direction. Please check the front and rear of the drone before the flight. The rear side is where the tail lights are located. Usually, the pilot stands at the rear of the drone.

12. Rotation Reinstate Mode 14



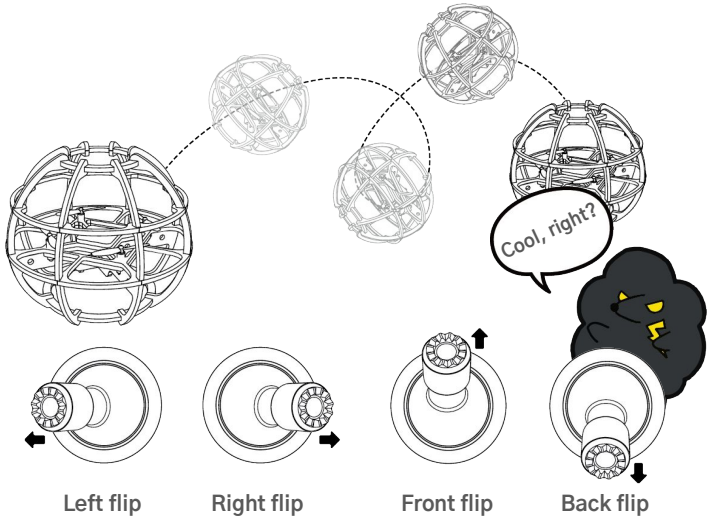
During flight, you can toggle the rotation recovery function on and off by pressing the [10] rotation reinstate mode button on the controller.

The default value is on, which means that if a crash occurs in flight when rotation reinstate is on, the head will automatically reposition itself.



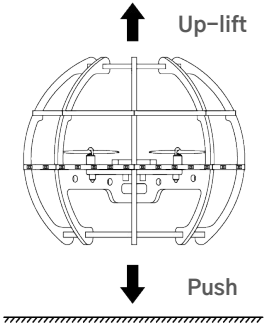
13. Flip 15

Attention: If the battery is low, it may not be possible to flip the drone or after the flip the drone may not have enough power to maintain its height.

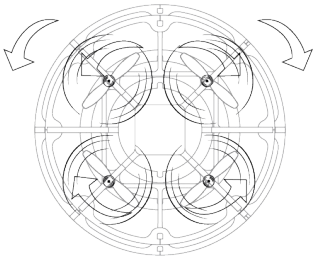


After pressing the [7]flip button, operate the right stick to create a flip.

14. Basic Principles of Multirotor Flight 16



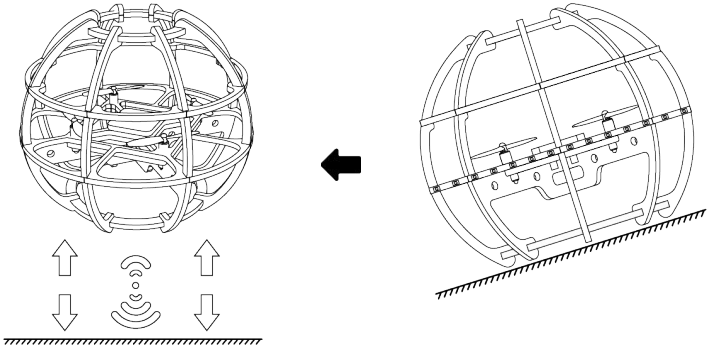
The motors rotate the propellers, generating vertical lift



The rotational inertia of the entire unit is offset by the forward and backward arrangement of the propellers.

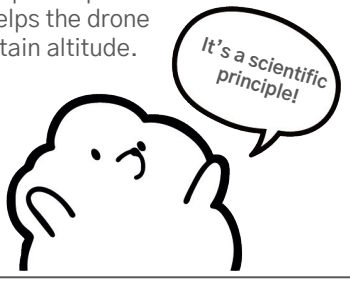
The 3-axis gyro sensor checks the flight posture of the drone and adjusts the lift of the multiple motors to maintain the balance of the drone.

14. Basic Principles of Multirotor Flight 17



The barometric altitude sensor detects changes in the atmospheric pressure and helps the drone maintain altitude.

By adjusting the speed of the four different motors, it is possible to change the lift and the flight posture to generate movement.



15. Basic Troubleshooting 18

Problem	Cause	Solution
The drone is constantly moving towards a certain direction after taking off.	Motors not mounted vertically, take-off from a non-level plane or loose assembly of flight control components that affect the external airflow.	1. Before take off, check the motor mount and the flight control components on a flat surface. Make small adjustments to compensate for the airflow effects. 2. Adjust the flight trim by pressing the [8] button and simultaneously moving the [3] stick.
The drone is rotating during flight.	The vibrations may be caused when the motor is not mounted vertically or when the frames are loosely assembled to the body.	Check how the motor is mounted and if there is any damage to the external protection frame.
The drone is vibrating significantly and the altitude is not stable.	The vibration is caused by the looseness of the outer frame of the drone or excessive vibration from the motors and propellers.	Check or replace the faulty external frame, motors or propellers.

15. Basic Troubleshooting 19

Problem	Cause	Solution
Drone flipping over in the air.	The position parameters are inaccurate due to low battery and drone vibrations.	Replace the battery and check for the cause of drone vibrations.
Drone cannot start.	Unpaired, low battery power.	Re-pairing the drone, checking the controller and drone battery.
The drone vibrates significantly and the altitude is unstable.	The motors may be assembled incorrectly or damaged, the propellers may be assembled incorrectly or loosely.	Inspect the motors and propellers.

Basic Troubleshooting 20

Go directly to product support.
Attention: Please read the user manual carefully before use.

Do not leave unattended while charging.
After charging, immediately unplug the charging cable.
Be careful with the propellers, as they may cause injury.
This manual will be continuously updated online.
For any future inquiries, please check the check the updated online documents or contact us for further support or consultation.

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