www.freewing-model.com

ARES 3D 90mm EDF Jet
USER MANUAL

WINGSPAN:1156MM(45.5") LENGTH:1400MM (55.1") EMPTY WEIGHT:2626G-6S/2721G-8S (W/O BATTERY)

EN 1~16

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Catalog

EN

Note:

1.This is not a toy! Operater should have a certain experience, beginners should operate under the guidance of professional players.
2.Before install, please read through the instructions carefully and operate strictly under instructions.
3.Cause of wrong operation,Freewing and its vendors will not be held responsible for any losses.
4.Model planes' players must be on the age of 14 years old.
5.This plane used the EPO material with surface spray paint, don' t use chemical to clean, otherwise it will damage.
6.You should be careful to avoid flying in areas such as public places,high-voltage-intensive areas,near the highway, near the airport or any other place where laws and regulation clearly prohibit.
7.You cannot fly in bad weather conditions such as thunderstorms,snows....
8.Model plane's battery, don't allowed to put in everywhere. Storage must ensure that there is no inflammable and explosive materials in the round of 2M range.
9.Damaged or scrap battery should be properly recycled, it can't discard to avoid spontaneous combustionand fire.
10.In flying field, the waste after flying should be properly handled,it can't be abandoned or burned.
11.In any case, you must ensure that the throttle is in the low position and transmitter switch on, then it can connect the lipo-battery in aircraft.
12.Do not try to take planes by hand when flying or slow landing process. You must wait for landing stop, then carry it.

⚠ **NOTE:** This is not a toy. Not for children under 14 years. Young people under the age of 14 should only be permitted to operate this model under the instruction and supervision of an adult. Please keep these instructions for further reference after completing model assembly.

Thank you for purchasing our Freewing 90mm EDF new 3D high-performance sports jet, the Ares 90! Before you assemble this Ares 90 model jet, please carefully read the instructions and follow the correct process for assembly and adjustment. If you encounter problems during assembly and debugging, please first resolve them by referring to the instructions. If the problem persists, please contact the distributor or directly contact us.

This product has been authorized by Silvestri Sebastiano, SebArt brand owner and designer. At the same time, Seba, renowned 3D pilot also participated in the entire product testing process.

Freewing 90mm Ares 3D sports model jet has a wingspan of 1156mm, a length of 1400mm, and a net weight of 2542g (excluding batteries). There are two color schemes available, mainly red or yellow. The model jet contains 7 LED lights, distributed on the left and right of the fuselage, the upper and lower of fuselage, the right and left of the main wings, and the top of the vertical tail. In low light environments, the all-round lighting arrangement makes it easier to determine the jet's attitude in the air.

The product structure design is excellent, balancing weight control and ease of use while ensuring strength. The main wing adopts QUICK II second-generation screw-less portable install structure design ③, and the tail wing continues to be installed with screws. By wrapping the edges of the battery compartment with plastic material, not only can it prevent collision problems during use, but it also serves as the side reinforcement. All control surfaces are connected and transmitted using hidden plastic hinge chains, screw fixed control surface servo arms, and metal universal ball heads, ensuring smooth and precise control surface movements.

The Freewing Ares 3D sports jet has a nose landing gear door and a follow-up rear landing gear door. CNC precision machined aluminum landing gear support rods have high assembly accuracy and no virtual position sensation when turned. The nose landing gear compartment is designed with a U-shaped reinforced support frame, which can further protect the landing gear during takeoff and landing. We have provided an additional set of non-retractable simplified landing gear as an optional accessory ②. Compared to the standard retractable landing gear, it reduces the weight by 178g, allowing the aircraft to achieve a greater thrust to weight ratio.

This product is divided into two types: 6S PNP and 8S PNP, designed to meet different customer needs. The indoor thrust to weight ratio test for two configurations is as follows:

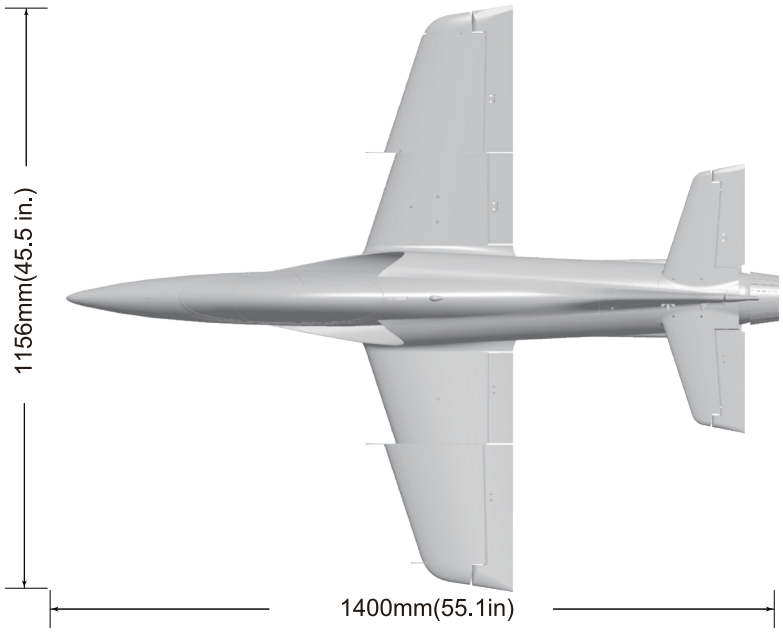
6S PNP
6S 5000mAh 50C Admiral lipo battery（765g）
Standard retractable landing gear
Static thrust: Instantaneous 4000g, continuous 3600g
take-off weight：3300g
Weight ratio：1.09

8S PNP
8S 5000mAh 50C Admiral lipo battery（1010g）
Standard retractable landing gear
Static thrust: Instantaneous 4500g, continuous 4400g
take-off weight：3671g
Weight ratio：1.198

The Freewing Ares 3D sports jet adopts a new second-generation vector nozzle structure ①, which reduces its thrust loss from 35% to less than 6% compared to the first generation. The PNP version includes two gyros, which assist in controlling the conventional control surface and vector nozzle respectively, reducing the difficulty of control while improving the flight performance. On the premise of fully mastering flight skills, Ares 90 is able to perform most professional level 3D stunt actions such as hovering, snake rolling, flat spiral, cobra, hitting walls, rotating in place from various angles, etc.

NOTE:

1. The second generation vector nozzle structure is a patented Freewing Model product, patent number: 202422841634.1
2. This accessory is not included in package at factory and you need to purchase separately.
3. QUICK II second-generation screw-less portable install structure is a patented Freewing Model product, patent number：ZL 2023 2 1276309.4



6S Standard Version

Wingload：117g/dm²
Wing Area：28dm²
Servo：9g Digital Plastic Gear Servos(1pcs)
9g Hybrid Digital Servos (8pcs)
17g MG Digital Servo (Vector version:2pcs)
ESC：120A Brushless ESC
Motor：3668-1960KV I/R Motor
Ducted fan：90mm 12-blade fan
Weight：2626g(w/o Battery)

8S Upgrade Version

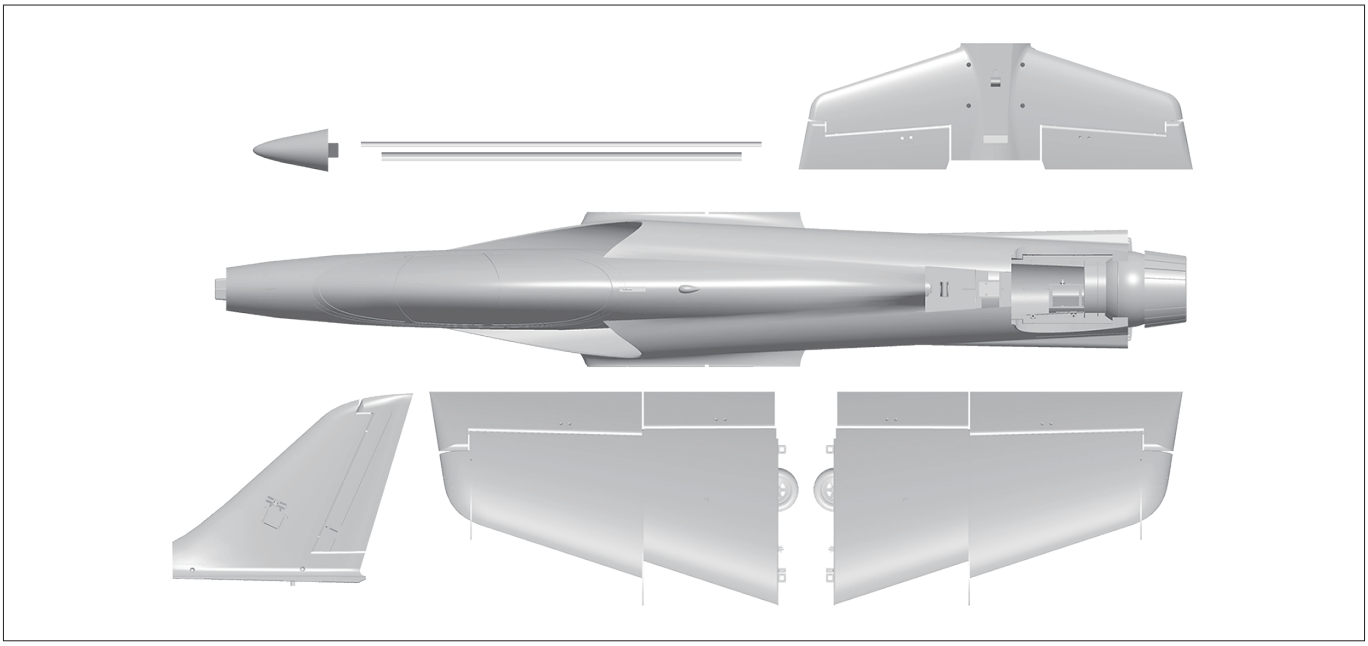
Motor：4075-1350KV I/R Motor
Ducted fan：90mm 12-blade fan
Weight：2721g(w/o Battery)

Other Notes

Landing gear：Electric landing gear
Li-Po Battery：6S 5000-7000mAh
8S 5000-6000mAh
Cabin doors: nose complete cabin door, servo control、rear follow-up cabin door

⚠ Note: The parameters in here are derived from test result using our accessories.
If use other accessories, the test result will be different. Any problem since of using other accessories, we are not able to provide technical support.

Package List



Different equipment include different spareparts. Please refer to the following contents to check your sparepart list.

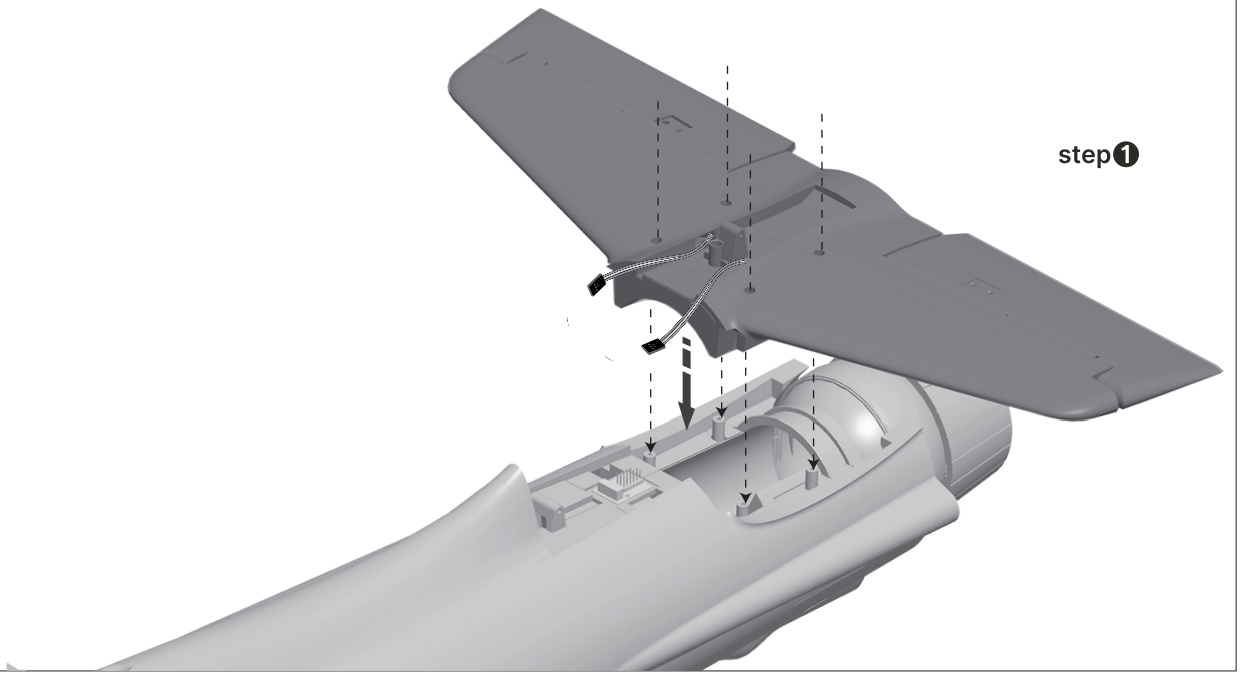
No.	Name	PNP	ARF Plus
1	Fuselage	Pre-installed all electronic parts	Pre-installed servo
2	Horizontal tail	Pre-installed all electronic parts	Pre-installed servo
3	Main wing	Pre-installed all electronic parts	Pre-installed servo
4	Vertical tail	Pre-installed all electronic parts	Pre-installed servo
5	Nose cone	√	√

No.	Name	PNP	ARF Plus
6	Cockpit	√	√
7	Landing gear	√	√
8	Annex bag	√	√
9	Manual	√	√

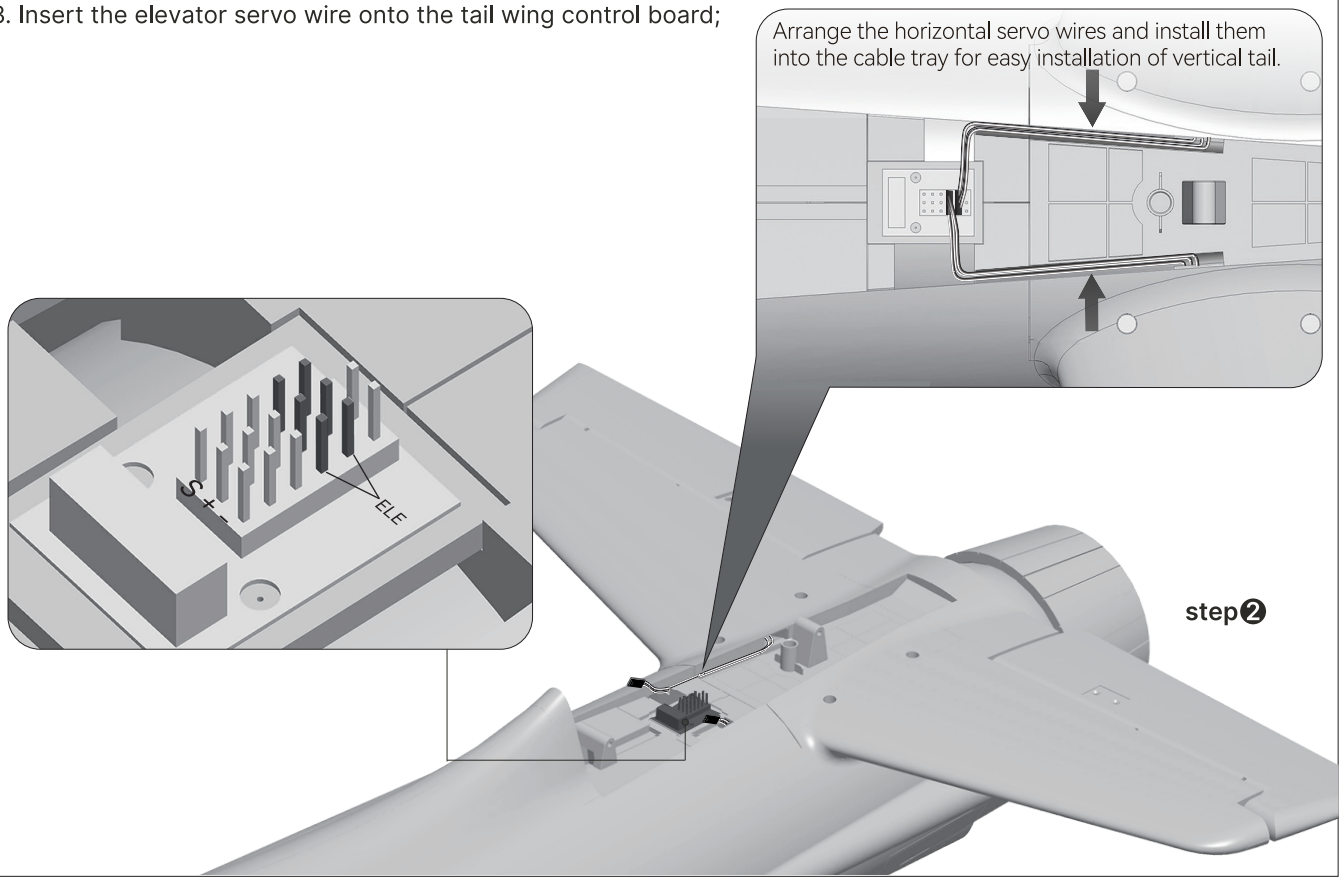
Install Horizontal tail

As the photo show:

1. Align the Horizontal tail with the fuselage and push it into the installation position on the fuselage
2. Then tighten with screws;



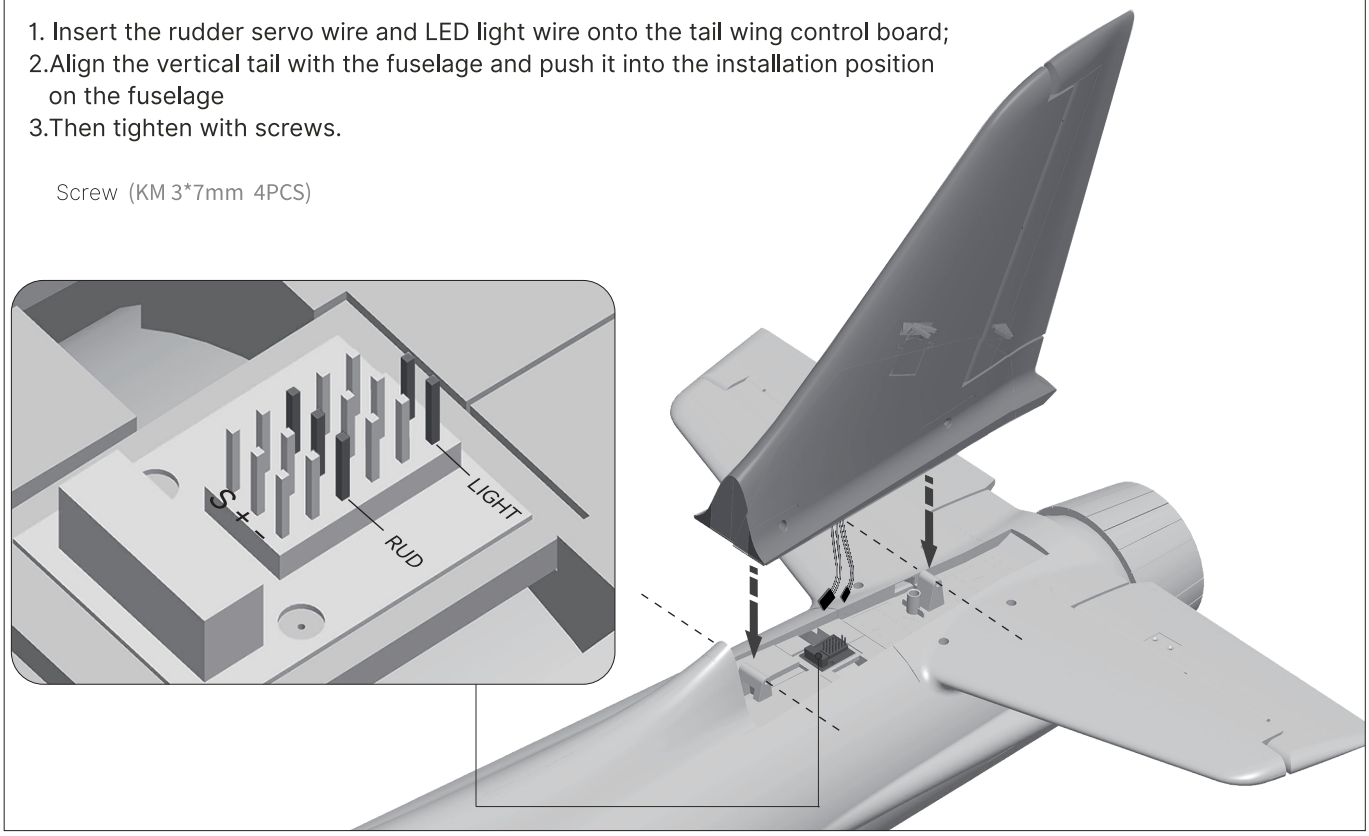
3. Insert the elevator servo wire onto the tail wing control board;



Install Vertical tail

1. Insert the rudder servo wire and LED light wire onto the tail wing control board;
2. Align the vertical tail with the fuselage and push it into the installation position on the fuselage
3. Then tighten with screws.

Screw (KM 3*7mm 4PCS)



Install Main Wing

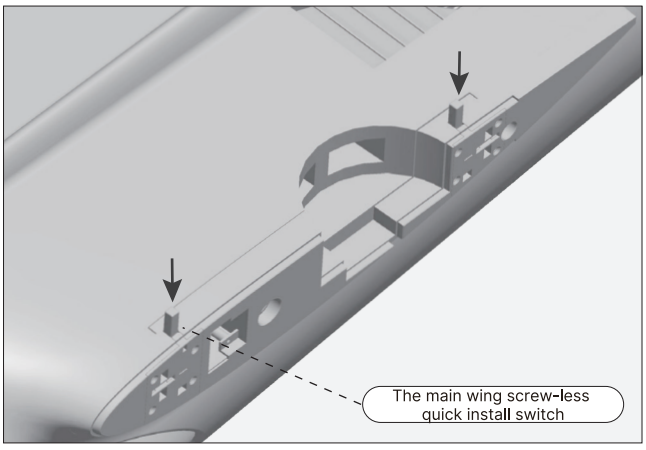
As the photo show:

1. Press the fuselage screw-less quick install switch to unlock it ;❶

❶ Two different status diagrams of the main wing screw-less quick install switch: (The working mode is to press the button to the bottom and release it. The button pops up to the highest position, which is the unlocked status.Once the button is pressed to the bottom again and released, but the button does not pop up, which is the locked status)

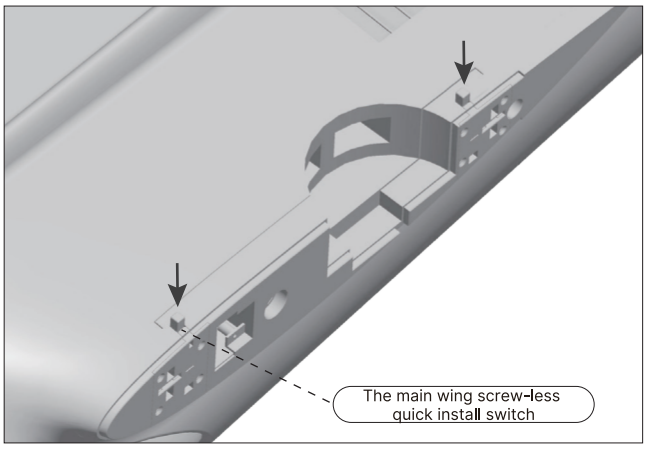
Unlock status

As shown in the following photo:
Press the main wing screw-less quick install switch to the bottom and release it. The button pops up to the highest position, indicating that the main wing has been unlocked and can be easily removed and installed.



Lock status

As shown in the following photo:
After installed the main wing, press again the main wing screw-less quick install switch to the bottom and release it. If the button does not pop up, it is the locked status. At this point, pull the main wing outward and can not remove it.



Install Main Wing

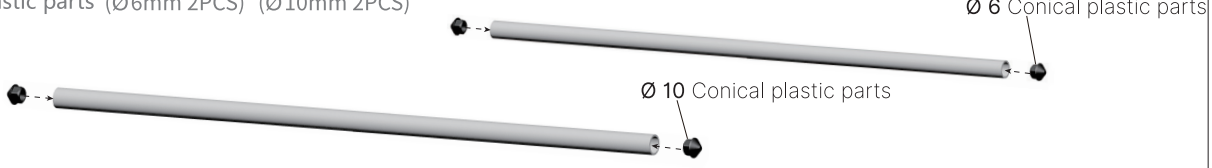
As the photo show:

step❶

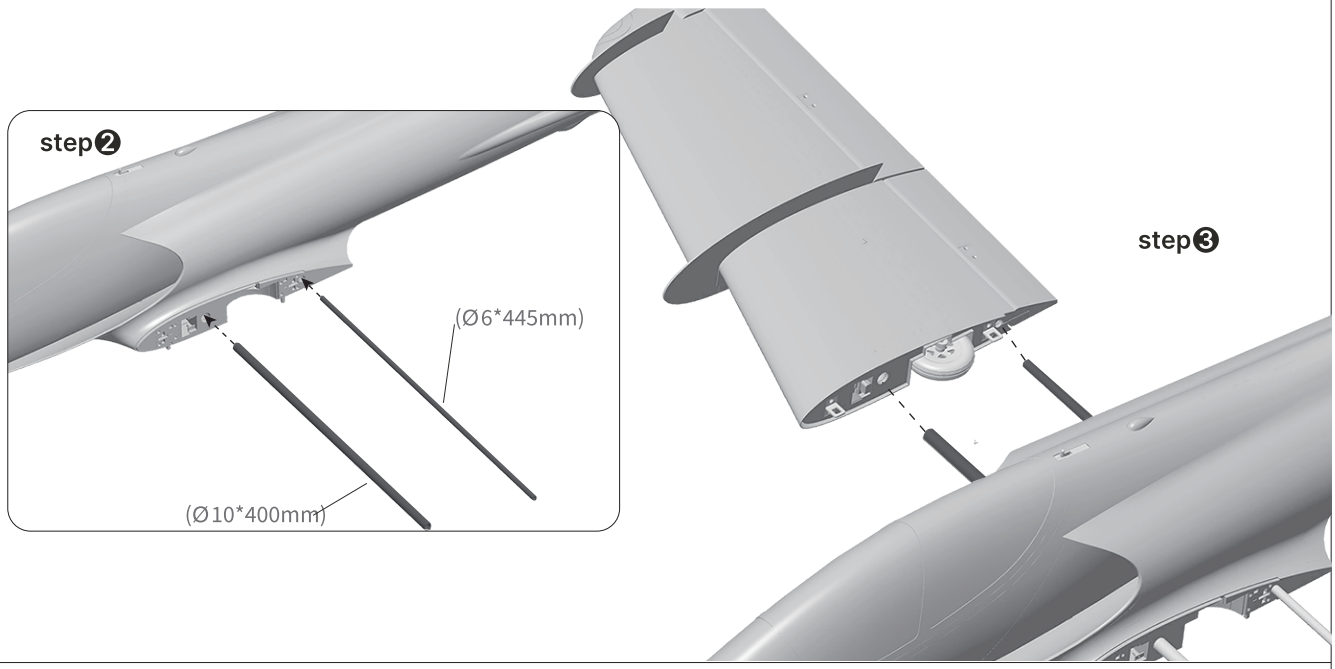
1. Use glue to fix the【 Conical plastic part 】on two carbon tubes respectively;

Carbon tube ❶(Ø10*400mm 1PCS) ❷(Ø6*445mm 1PCS)

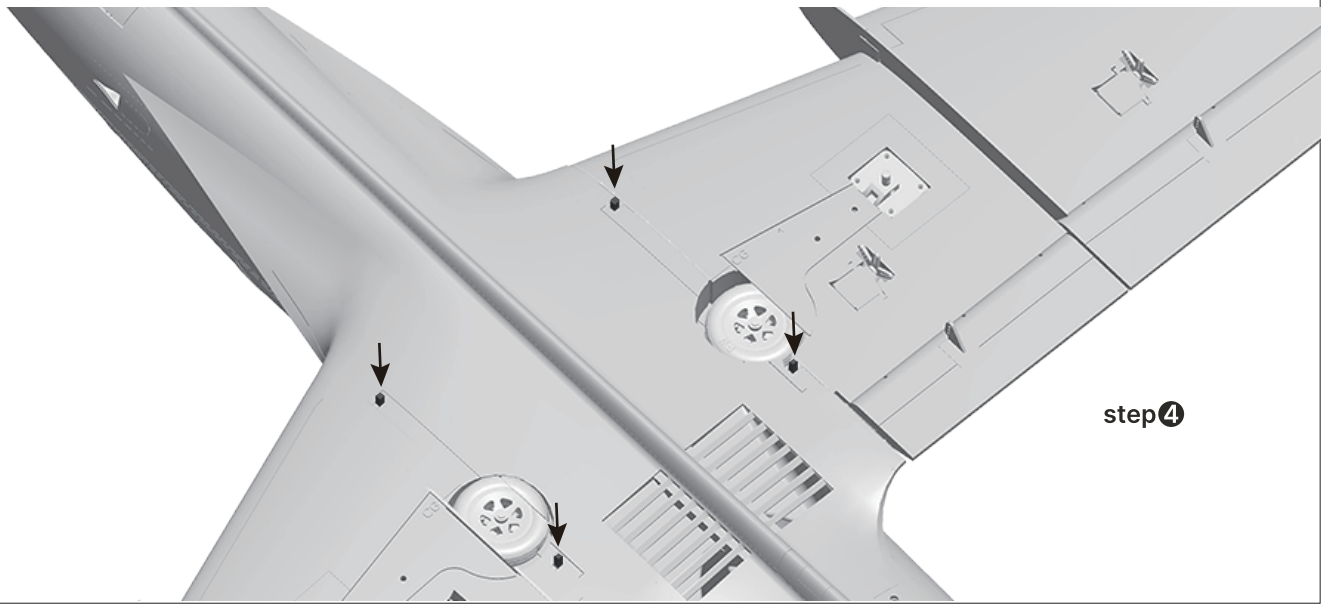
Conical plastic parts (Ø6mm 2PCS) (Ø10mm 2PCS)



2. Install the carbon tube on the fuselage;
3. Align the carbon tube on both sides with the main wing, and push the main wing into the installation position on the fuselage;
(Repeat this step for the other main wing)



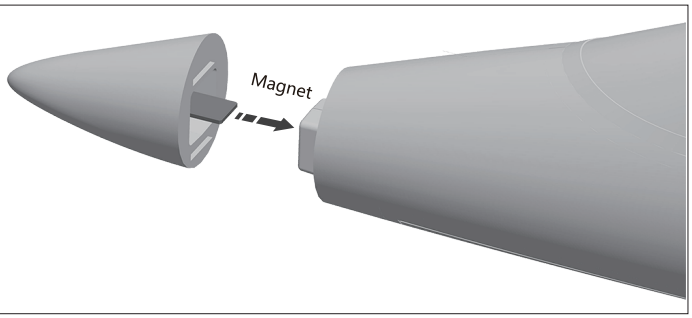
4. Press 4pcs main wing screw-less quick install switch, put it in the locked status.



Install nose cone

As the photo show:

1. Install the nose cone onto the fuselage

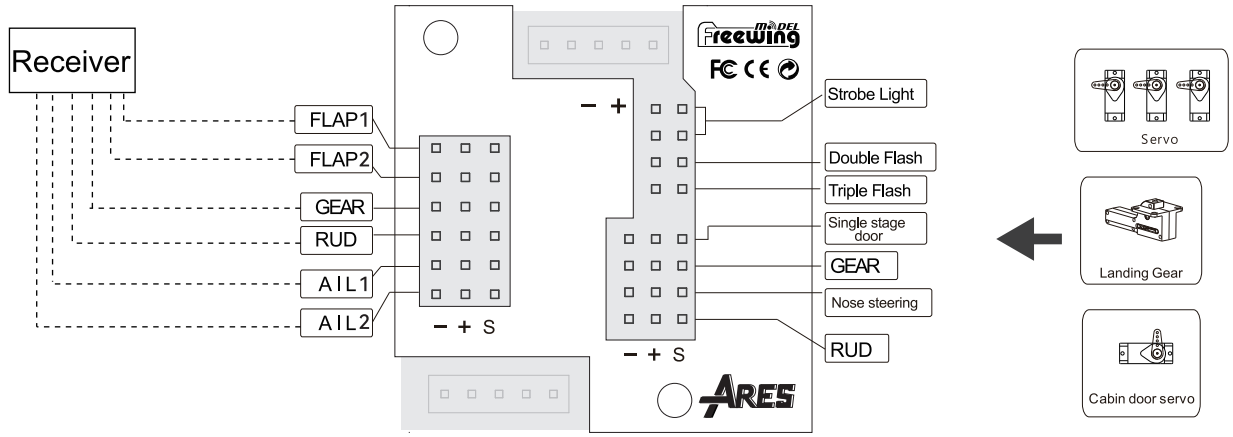


Control Board Introduction

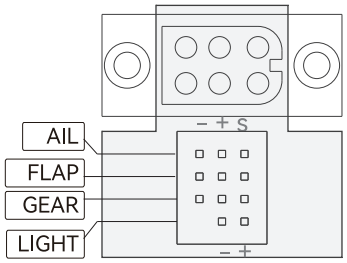
Please refer to the diagram, connect the servo cables to the control board, and connect to the receiver correctly.

⚠ **Note:** 1. Ensure that each connecting cable is connected in the correct positive and negative directions;
2. Ensure that the connecting cable is fully inserted into the row pin without loose;

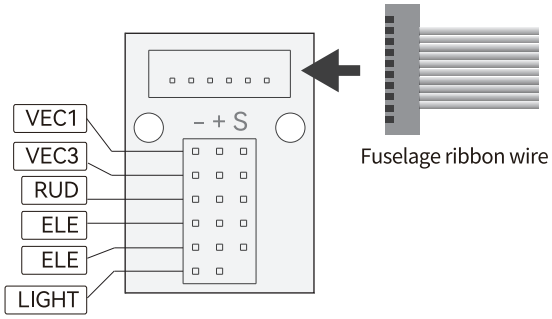
Control Board



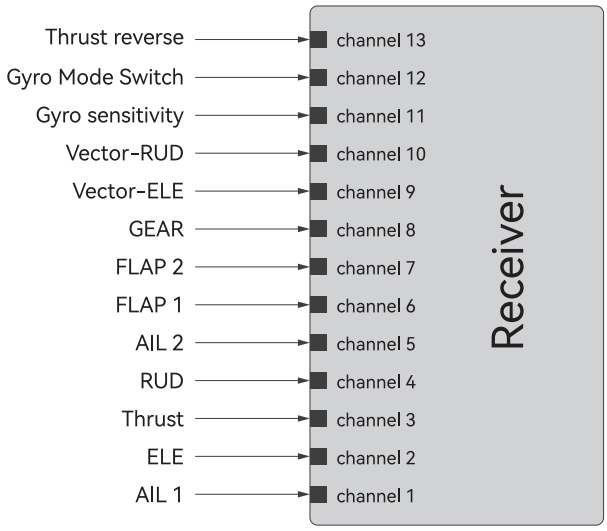
Main wing control board



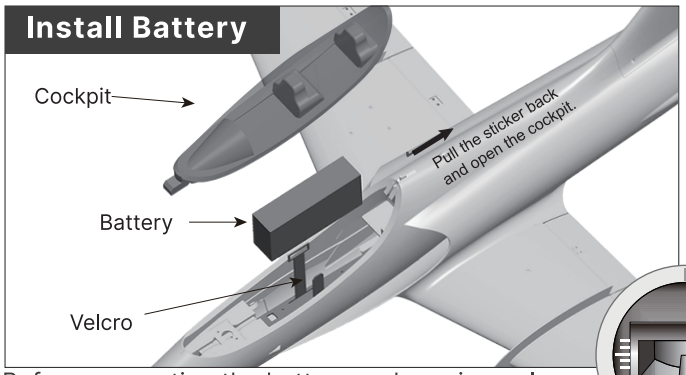
Tail wing control board

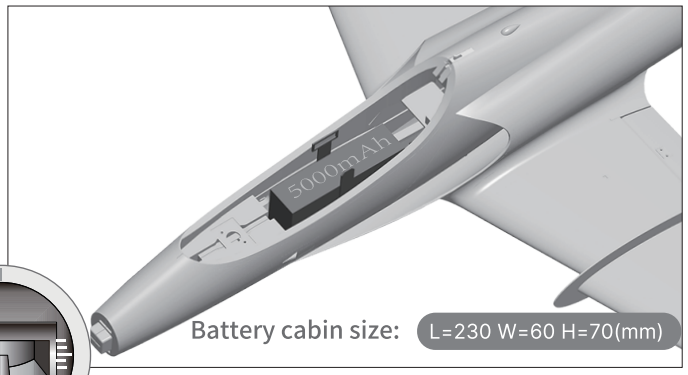


Receiver Connection Diagram



Install Battery



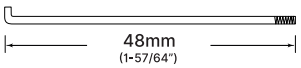


Before connecting the battery and receiver, please switch on the transmitter power and make sure the throttle stick is in the lowest position. Bind your receiver to your transmitter according to your transmitter's instruction manual.

We recommend the following LiPo battery:
6S 22.2V 5000mAh~6S 22.2V 7000mAh (1pcs)
8S 29.6V 5000mAh~6S 29.6V 6000mAh (1pcs)
Discharge rate of C ≥50C

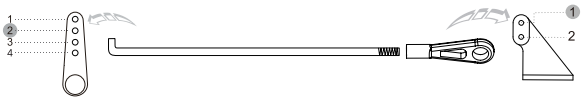
Pushrod Instructions

Aileron pushrod length

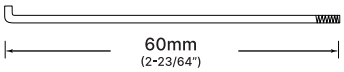


Pushrod diameter Ø 1.5mm

Aileron pushrod mounting hole

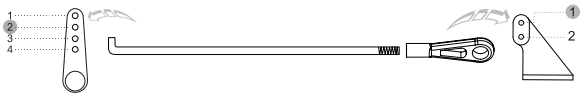


Flap pushrod length

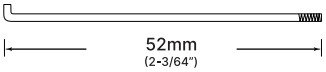


Pushrod diameter Ø 1.5mm

Flap pushrod mounting hole(Inside)

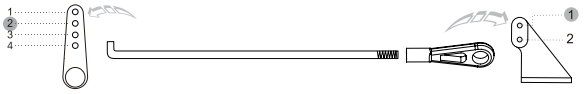


Elevator pushrod length



Pushrod diameter Ø 1.5mm

Elevator pushrod mounting hole



Rudder pushrod length

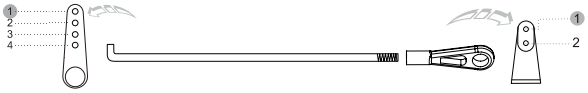
Pushrod diameter Ø 1.5mm

Rudder pushrod mounting hole

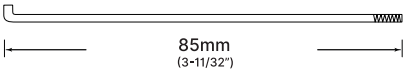
Vector-elevator pushrod length

Pushrod diameter Ø 1.5mm

Vector-elevator pushrod mounting hole



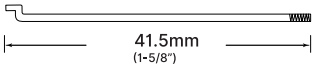
Vector-rudder pushrod length



Pushrod diameter Ø 1.5mm

Vector-rudder pushrod mounting hole

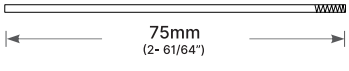
Nose Cabin door pushrod length



Pushrod diameter Ø 1.2mm

Nose cabin door pushrod mounting hole

Nose gear steering pushrod length



Pushrod diameter Ø 1.5mm

Nose gear steering pushrod mounting hole

Center of Gravity

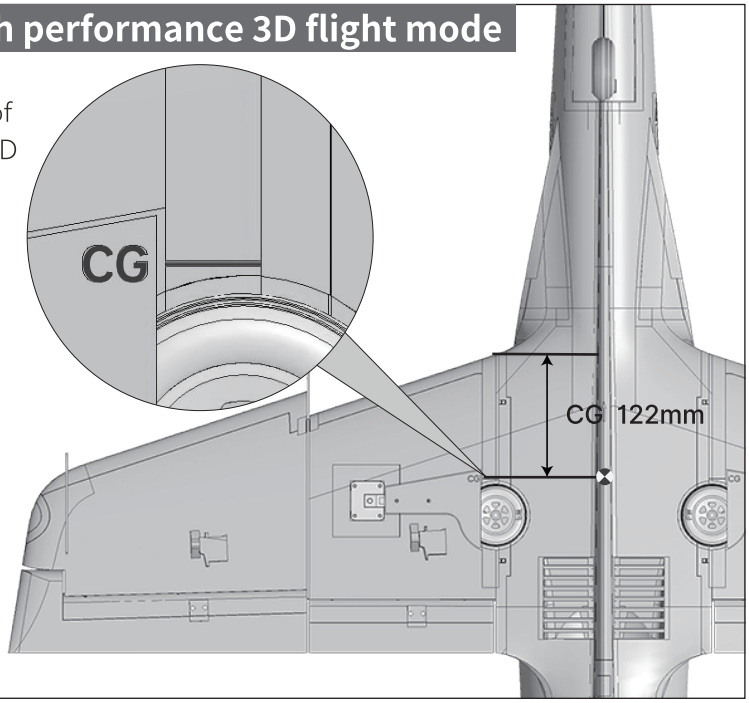
Correct Center of Gravity ("CG") is critical for enabling safe aircraft stability and responsive control. Please refer to the following CG diagram to adjust your aircraft's Center of Gravity.

- Depending on the capacity and weight of your choosen flight batteries, move the battery forward or backward to adjust the Center of Gravity.
- If you cannot obtain the recommended CG by moving the battery to a suitable location, you can also install a counterweight to achieve correct CG. However, with the recommended battery size, a counterweight is not required. We recommend flying without unnecessary counterweight.

As the photo show, We marked the center of gravity on the bottom of the Main wing.Please confirm the CG based on this marked position.

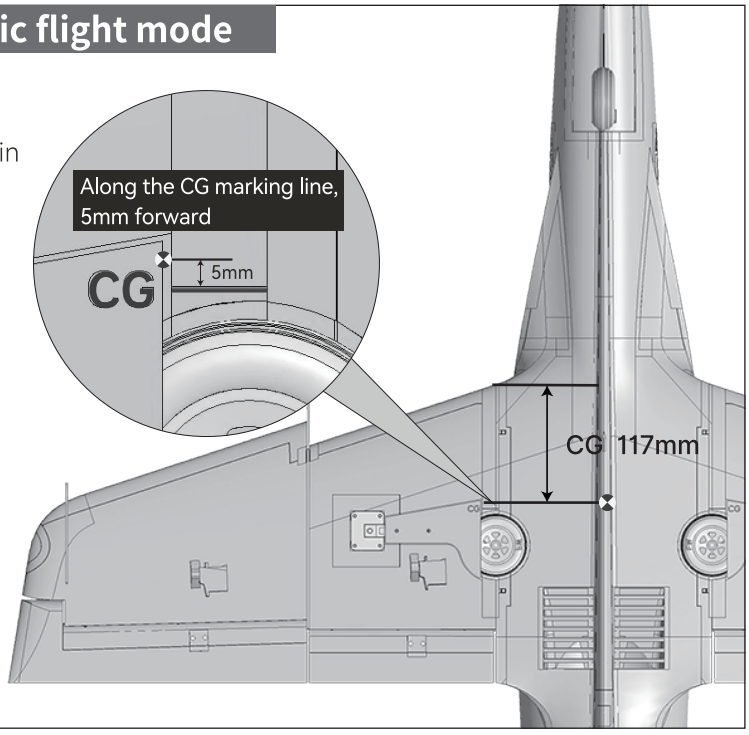
Suggested center of gravity for high performance 3D flight mode

The center of gravity mark on the lower surface of the main wing is suitable for high-performance 3D flight mode, and the pitch will be very sensitive.



Suggested center of gravity for basic flight mode

If you do not have 3D flight experience, please refer to the center of gravity flight shown in the figure below.



After installed this Ares model plane, please connect to the receiver and power on, then adjust it.

1.When all channels of radio are fine tuned to zero and the control stick is centered: check whether each control surface on the aircraft is in the center position. If it is found that the control surface is not in the center position, please adjust the control rod to center it;

2.Please refer to the diagram below and use the radio to test each control surface to ensure that its movement direction matches the diagram. If the opposite movement occurs, first check whether the relevant channel in the radio has enabled the reverse function; If the problem persists, please contact us for assistance in resolving it.

Control surface diagram for basic flight mode

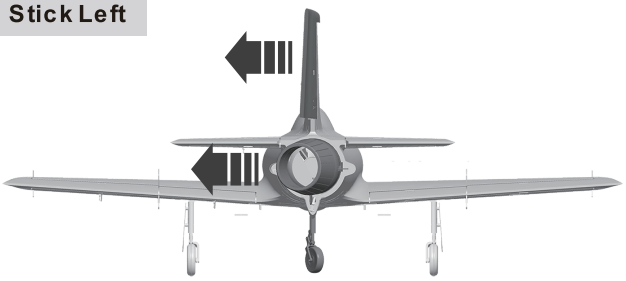
Aileron

Stick Left

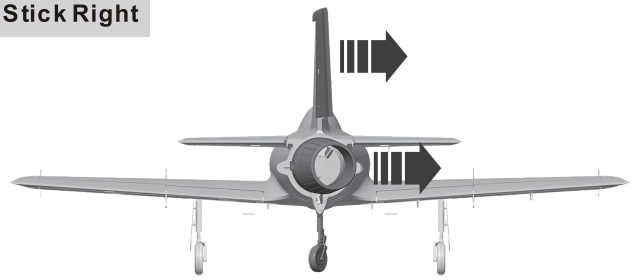
Stick Right

Rudder

Stick Left

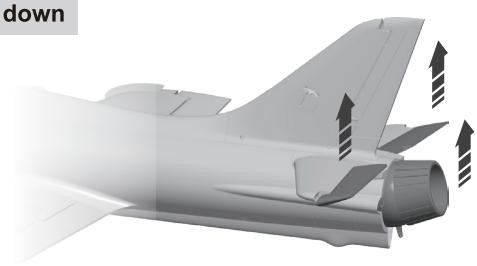


Stick Right

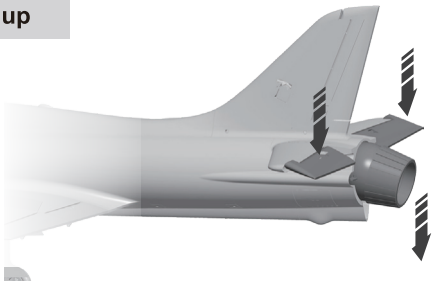


Elevator

Stick down

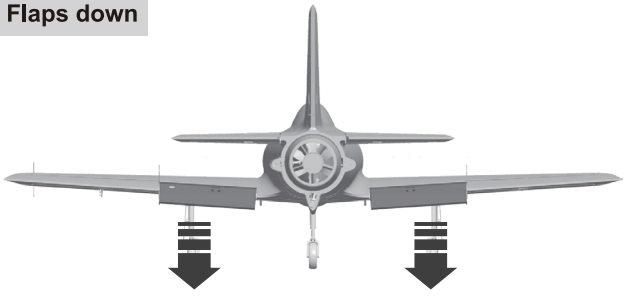


Stick up



Flaps

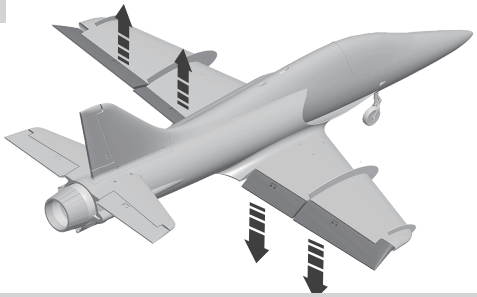
Flaps down



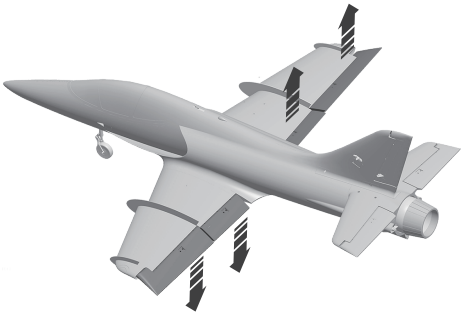
Control surface diagram for high performance 3D flight mode

Aileron

Stick Left

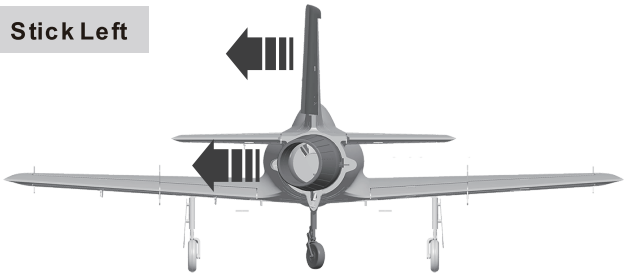


Stick Right

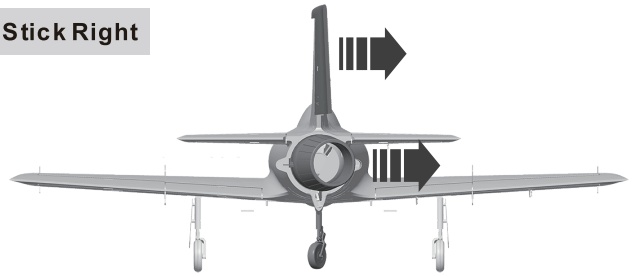


Rudder

Stick Left

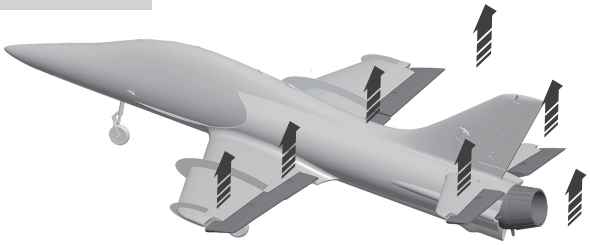


Stick Right

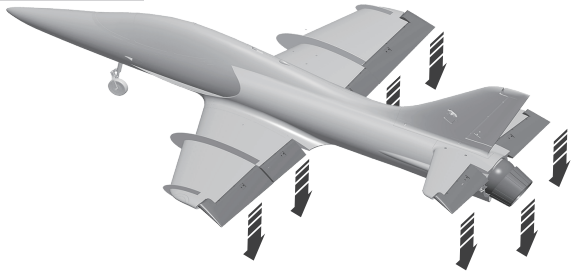


Elevator

Stick down



Stick up



Flaps

Flaps down

(3) Attention:

1.The 3D flight mode requires programming and mixed control implementation in the remote control. It is recommended to set a switch to switch between 3D flight mode and standard flight mode

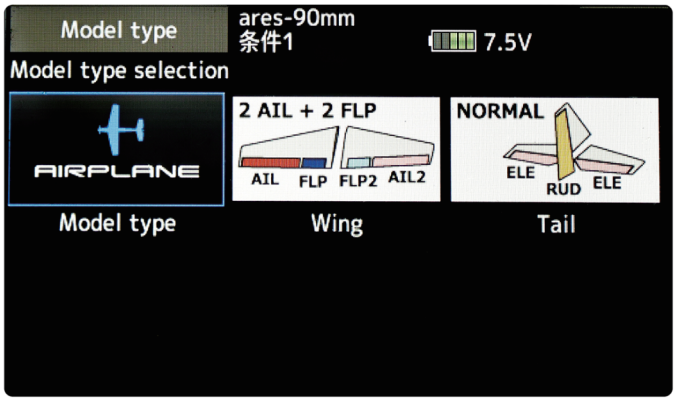
2.If you need to fly the inverted flight, it is recommended to switch to the basic flight mode for better flight. If using high-performance 3D flight mode to fly the inverted flight, it is easy to output too much rate of elevator and rudder, causing the main wing tip to stall.

Ares 3D Flight Mix Settings

1.ARES achieves its 3D flight by setting up mixed control on the remote control,
(Example: Futaba T16IZ SUPER)

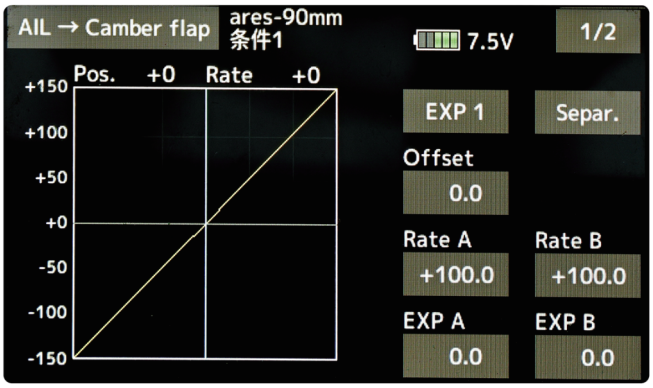
2.Before setting up the mix control operation,
you need to select the model type on the remote control.
(As shown in the right photo)

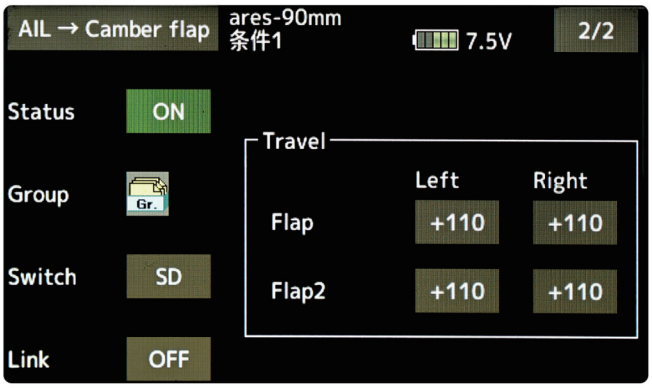
3.Please refer to page 6 for Receiver Connection Diagram
(Introduction to Control Board - Receiver Connection Diagram)



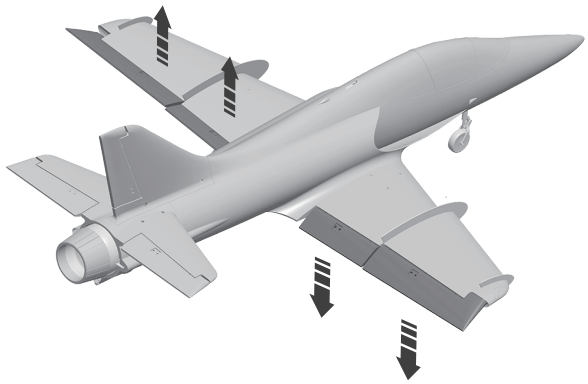
Aileron —mix flap

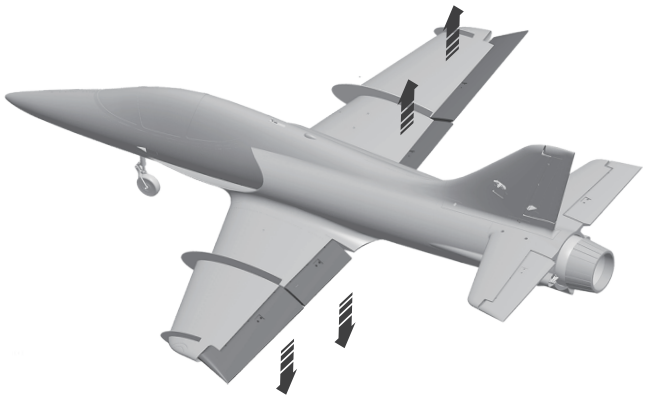
- Interface Settings





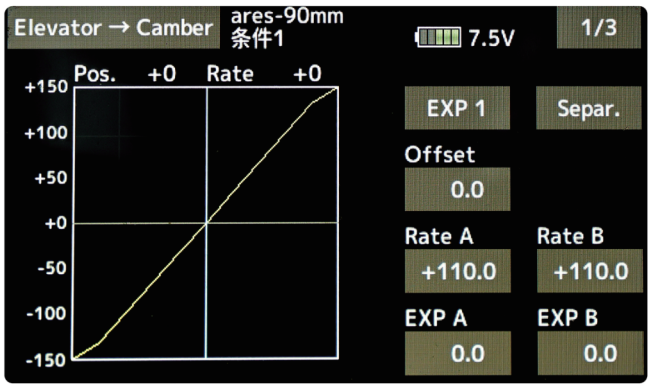
- Control surface feedback

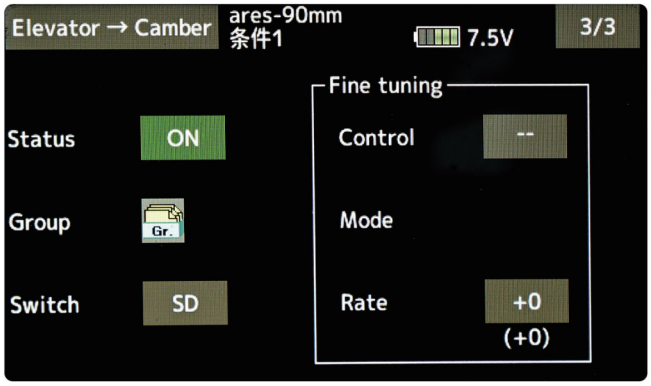




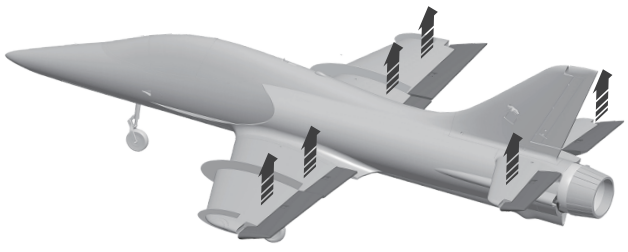
Elevator—mix aileron and flap

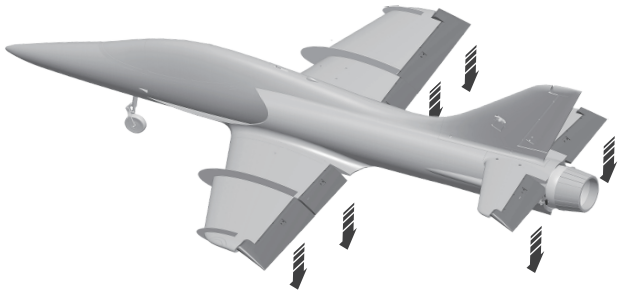
● Interface Settings





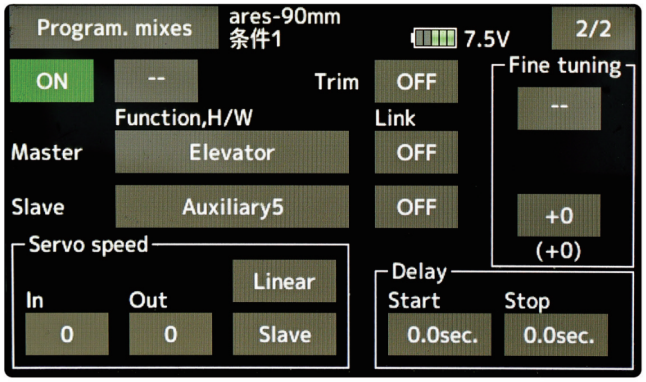
● Control surface feedback



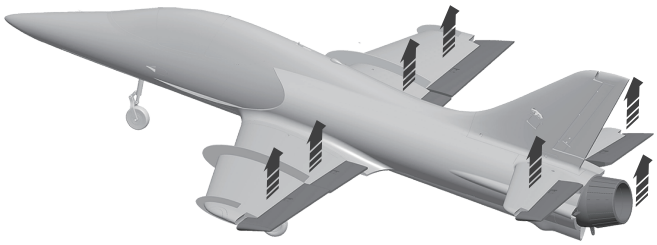


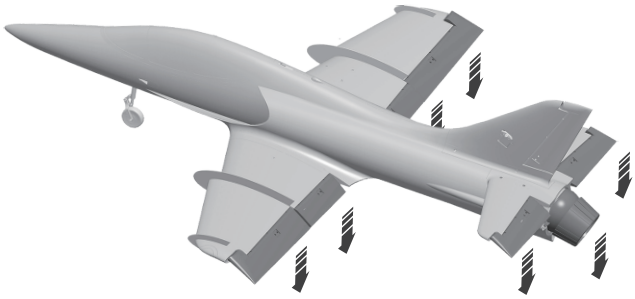
Elevator—mix vector-elevator

- Interface Settings



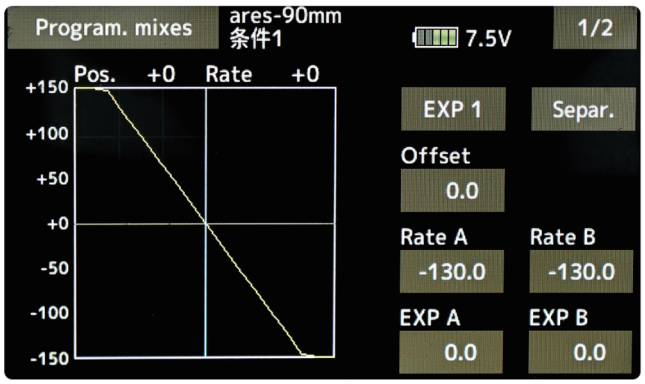
- Control surface feedback

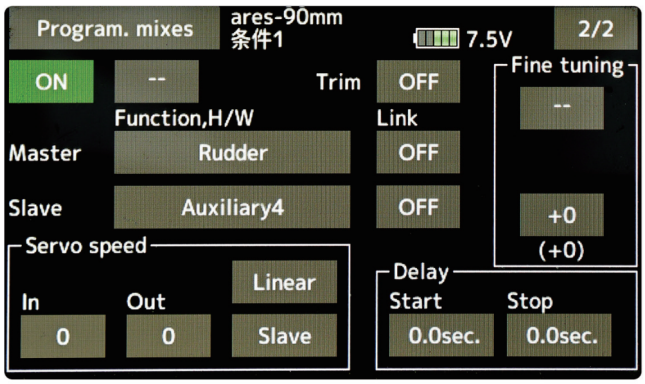




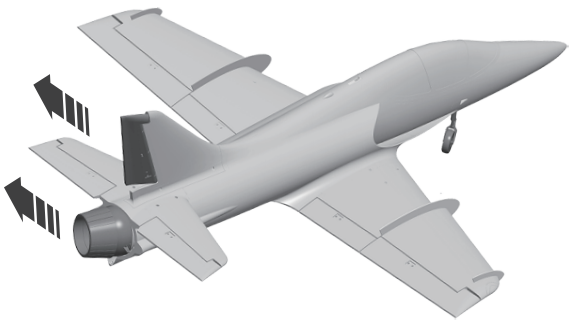
Rudder—mix vector-rudder

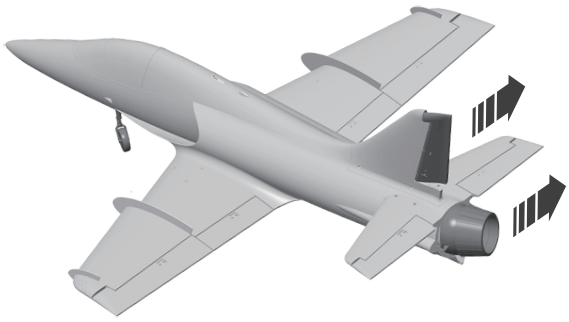
- Interface Settings





- Control surface feedback





Flap-to-Elevator Mix setting

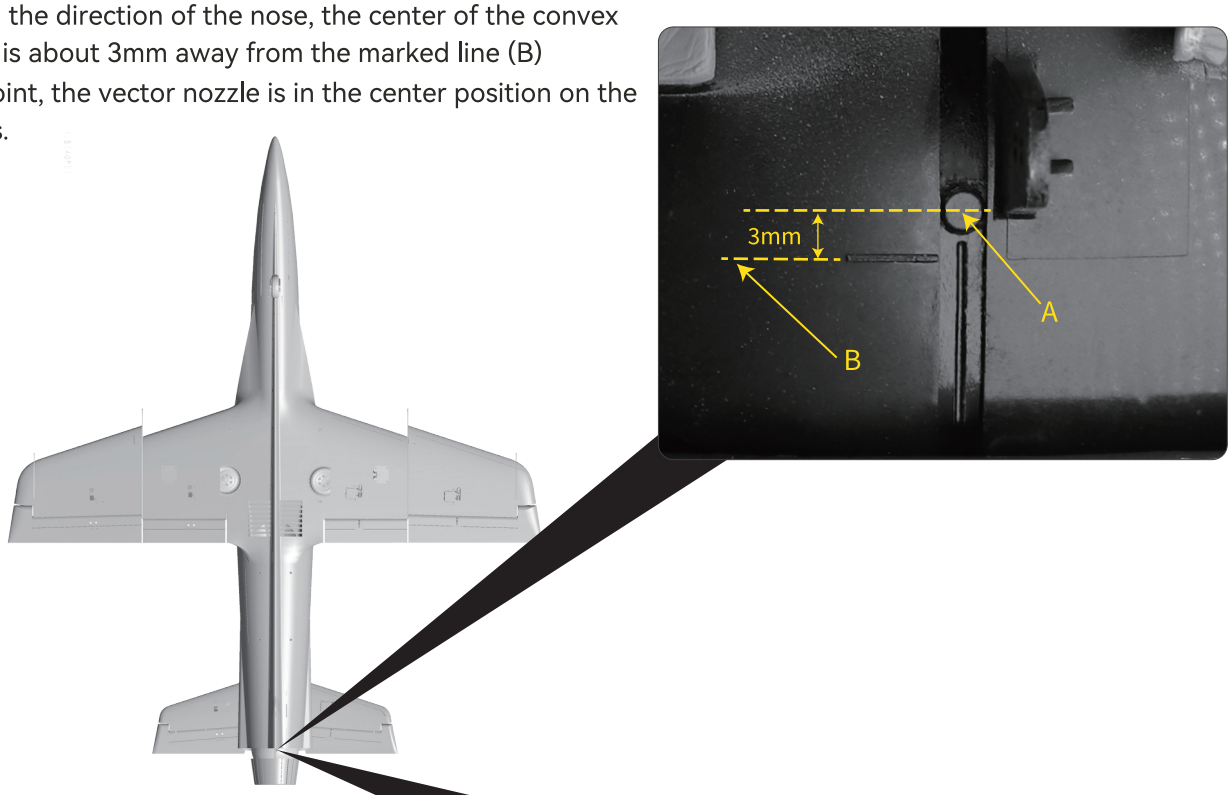
A Flap-to-Elevator Mix is required to maintain level flight when the flaps are developed.
The detail settings are as below:

When the flaps are developed, mix 2mm of DOWN elevator

You can increase or decrease the amount of elevator compensation according to your actual experience in the future.

Center position of vector nozzle – pitch/elevator axis

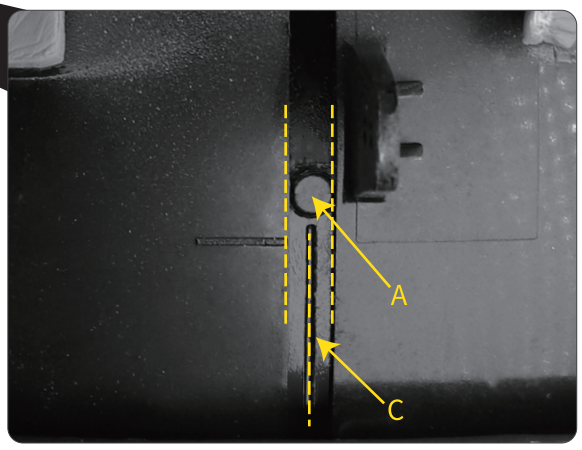
Based on the direction of the nose, the center of the convex point (A) is about 3mm away from the marked line (B)
At this point, the vector nozzle is in the center position on the pitch axis.



Center position of vector nozzle – yaw/rudder axis

As shown in the figure on the right,
The scale line (C) is aligned with the center of the convex point (A), and the scale line (C) is located in the center of the plastic groove and parallel.

At this point, the vector nozzle is in a centered position along the yaw/rudder axis.



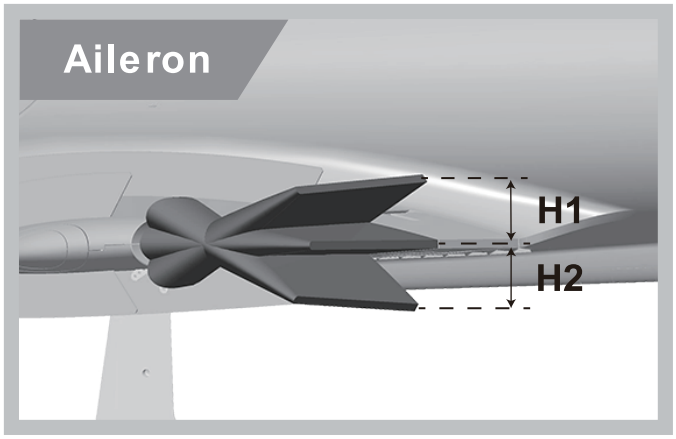
Y-wires use instructions:

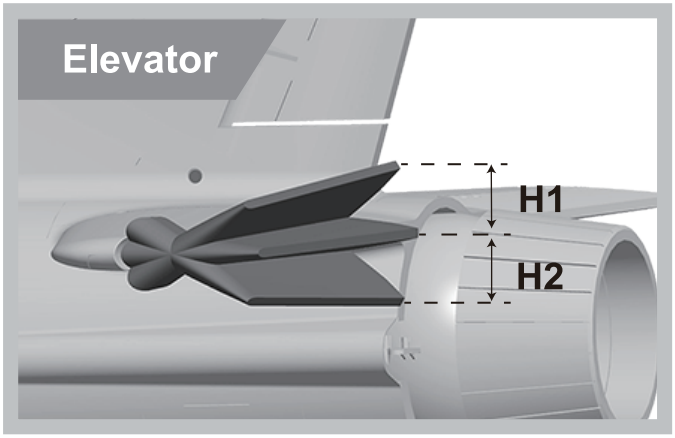
Y-wires pack in the part bag, when you do not want to use the remote control for flight mode programming, you can use two Y-wires to connect aileron 1 and aileron 2, and flap 1 and flap 2 respectively.

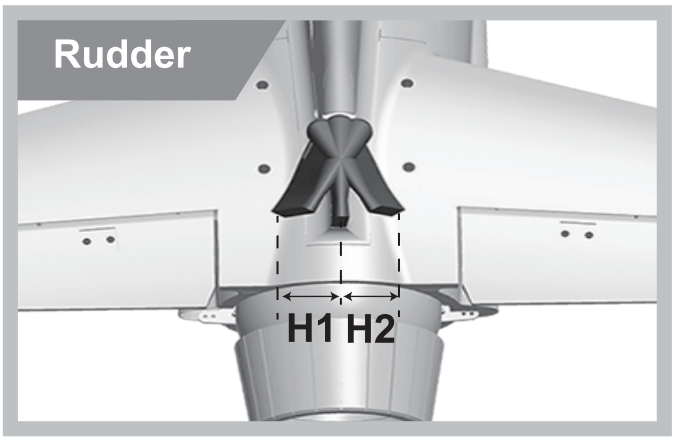
(Please refer to page 6 for the introduction of the control board for connection and usage)

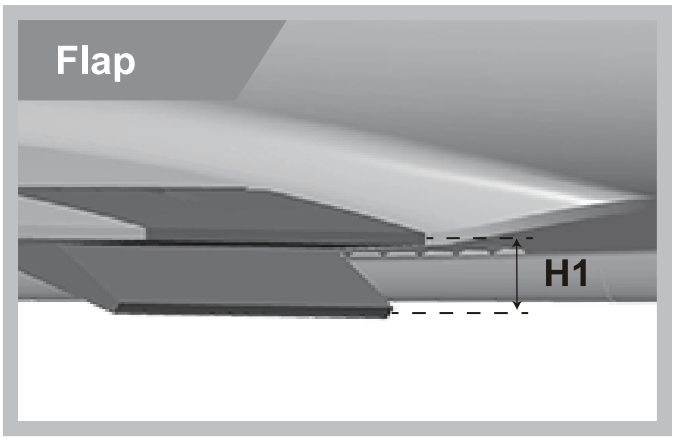
Dual Rates

According to our testing experience, use the following parameters to set Aileron/Elevator Rate. Program your preferred Exponential % in your radio transmitter. We recommend using High Rate for the first flight, and switching to Low Rate if you desire a lower sensitivity. On successive flights, adjust the Rates and Expo to suit your preference.





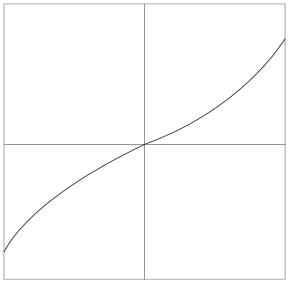




	Aileron (Measured closest to the fuselage)	Elevator (Measured closest to the fuselage)	Rudder (Measured from the bottom)	Flaps	Vector
Low Rate	H1/H2 21mm/21mm D/R Rate: 80%	H1/H2 29mm/29mm D/R Rate: 80%	H1/H2 31mm/31mm D/R Rate: 80%	/	D/R Rate: 80%
High Rate	H1/H2 27mm/27mm D/R Rate: 100%	H1/H2 35mm/35mm D/R Rate: 100%	H1/H2 38mm/38mm D/R Rate: 100%	31mm	D/R Rate: 100%

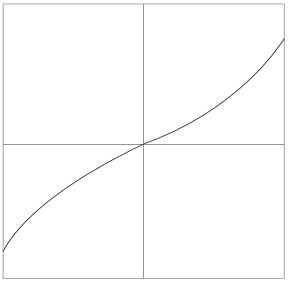
Remote Control EXP Setting Suggestion

1.Aileron EXP curve is shown as below :



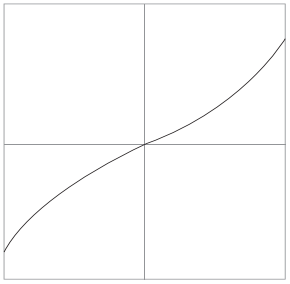
Futaba brand Remote Control : EXP A -30
EXP B -30
Spektrum brand Remote Control : EXPO 30% 30%

2.Elevator EXP curve is shown as below :



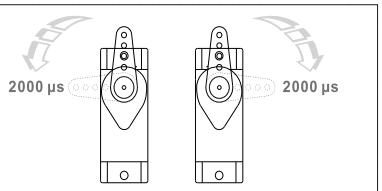
Futaba brand Remote Control : EXP A -30
EXP B -30
Spektrum brand Remote Control : EXPO 30% 30%

3.Rudder EXP curve is shown as below :

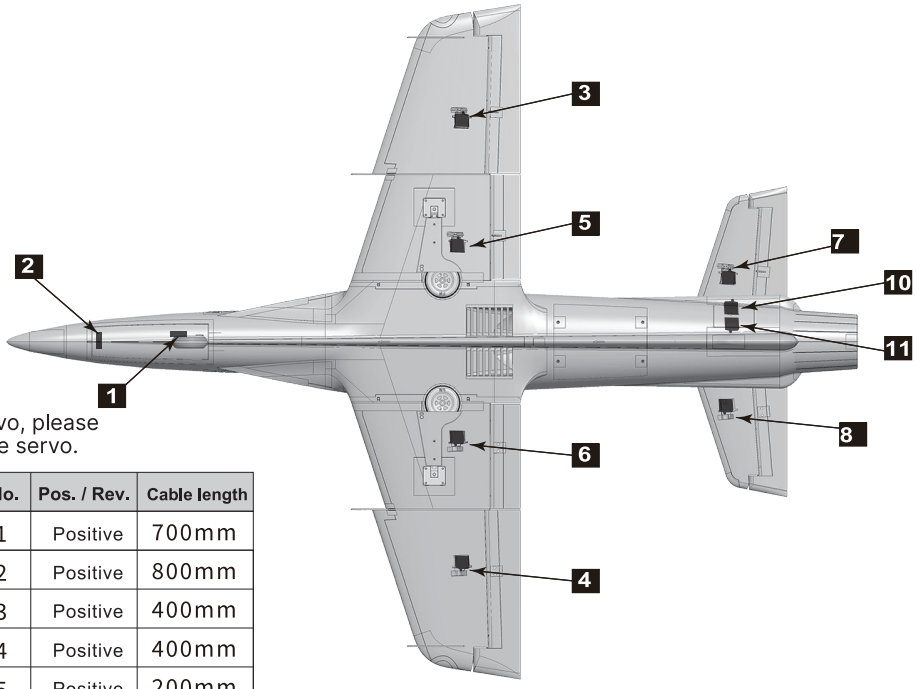


Futaba brand Remote Control : EXP A -30
EXP B -30
Spektrum brand Remote Control : EXPO 30% 30%

Servo Direction

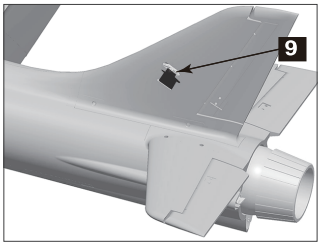


The servo positive or reverse rotation is defined as follows:
When servo input signal change from 1000μs to 2000μs,
The servo arm is
rotated clockwise, its **positive servo.**
The servo arm is
rotated counterclockwise, its **reverse servo.**



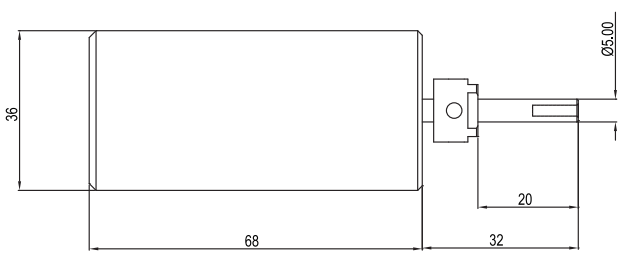
If you need to purchase another brand's servo, please refer to the following list to choose a suitable servo.

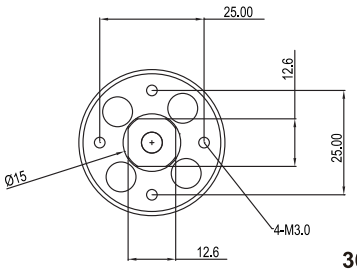
Position	Servo regulation	No.	Pos. / Rev.	Cable length
Nose gear steering servo	9g Digital-Hybrid	1	Positive	700mm
Nose cabin door	9g plastic servo	2	Positive	800mm
Aileron(L)	9g Digital-Hybrid	3	Positive	400mm
Aileron(R)	9g Digital-Hybrid	4	Positive	400mm
Flap(L)	9g Digital-Hybrid	5	Positive	200mm
Flap(R)	9g Digital-Hybrid	6	Reverse	200mm
Elevator(L)	9g Digital-Hybrid	7	Positive	200mm
Elevator(R)	9g Digital-Hybrid	8	Reverse	200mm
Rudder	9g Digital-Hybrid	9	Positive	200mm
Vector(Rudder)	17g Digital-MG	10	Positive	100mm
Vector(Elevator)	7g Digital-MG	11	Reverse	100mm



Motor Specification

3668-1960
Item No.:MI036681





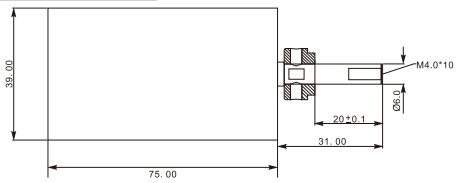
6S

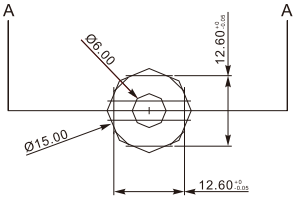
Unit :mm

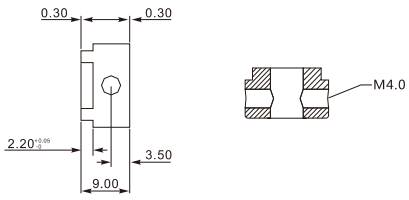
3668-1960KV

Item No.	EDF Fans	Use voltage (V)	Current(A)	Max power (W)	Thrust(g)	Efficiency (g/w)	Motor(KV)	Use ESC (A)	Weight (g)
E72216	90mm 12-Blade	22.2	120	2660	3700	1.4	3668-1960	120	454

Item No.:MI040754
4075-1350kv







8S

Unit :mm

Item No.	EDF Fans	Use voltage (V)	Current(A)	Max power (W)	Thrust(g)	Efficiency (g/w)	Motor(KV)	Use ESC (A)	Weight (g)
E72215	90mm 12-Blade	29.6	115	3400	4700	1.39	**MI040754** 4075-1350KV	120	558