

ARES 3D

90mm EDF Jet USER MANUAL

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



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Note:

- 1.This is not a toy! Operator 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 combustion and 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[®], 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

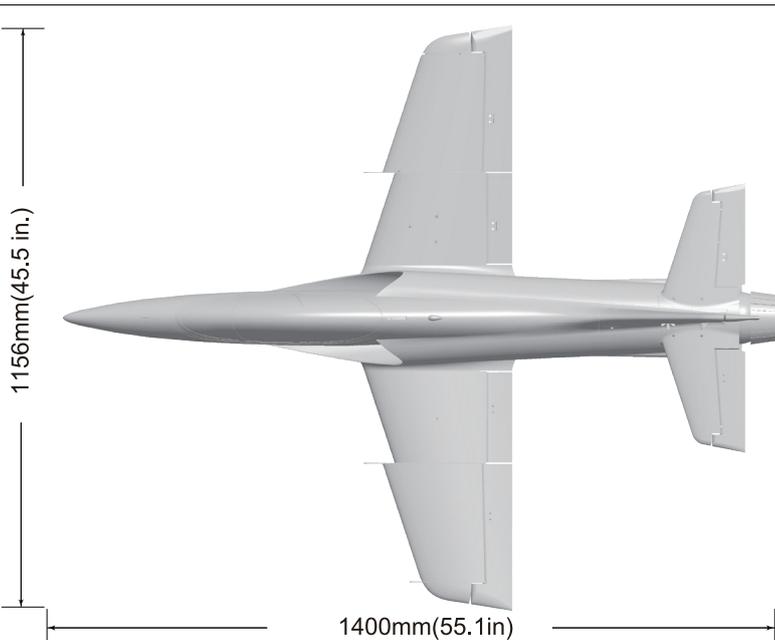
8S PNP

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)

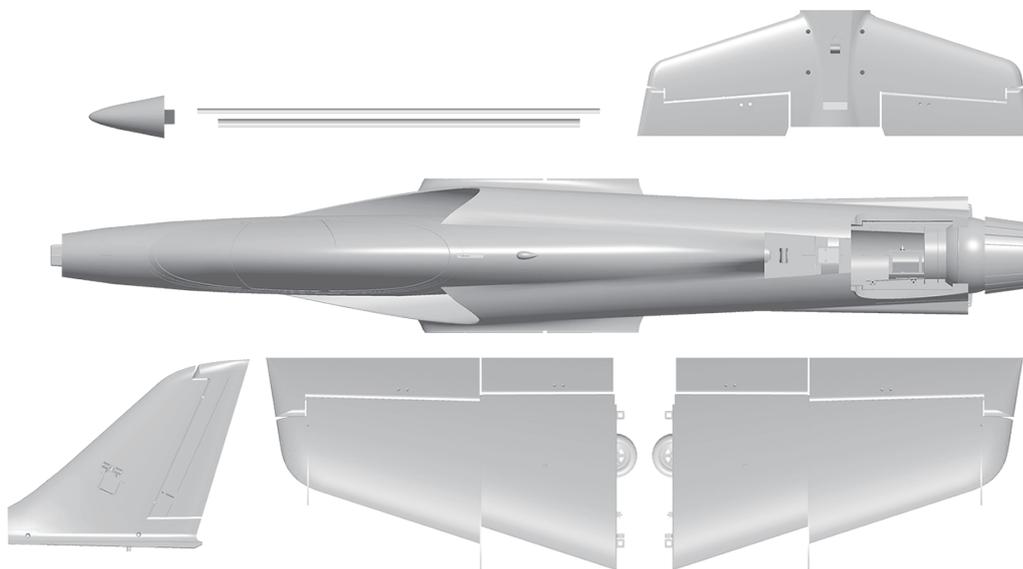
Other Notes

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.

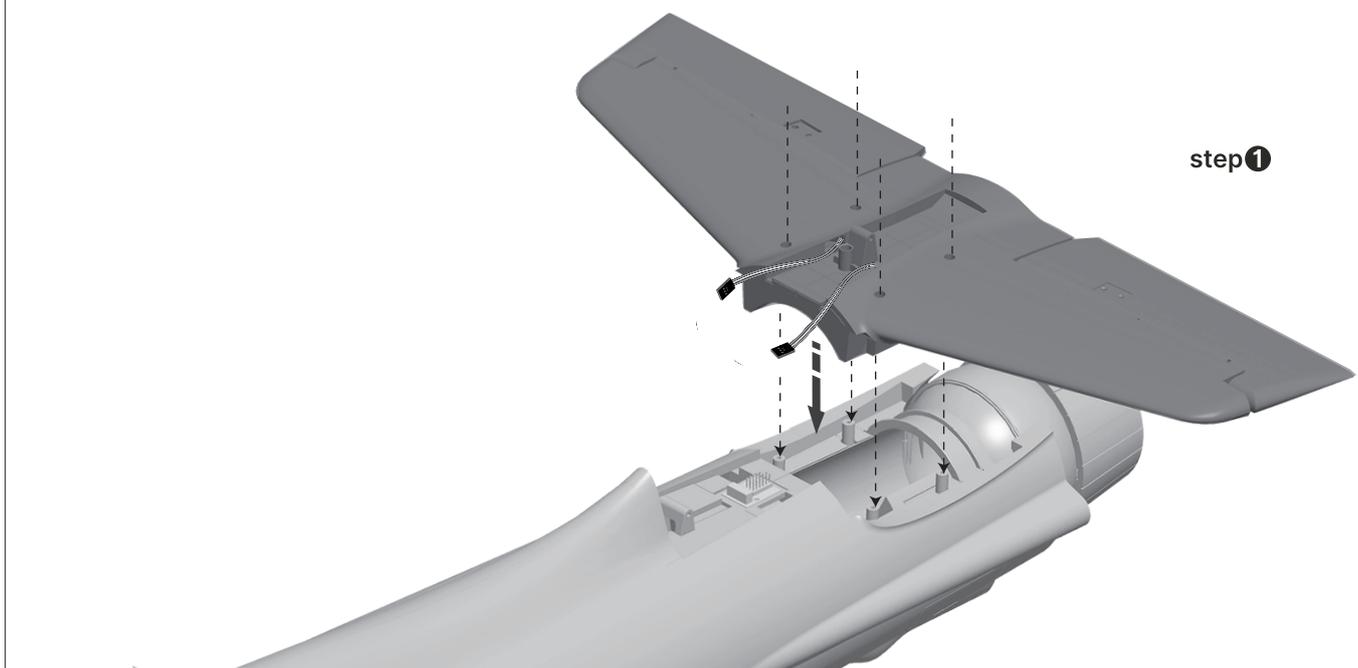
No.	Name	PNP	ARF Plus
1	Fuselage	Pre-installed all electronic parts	Pre-installed servo
2	Horizontal tail	Pre-installed all electronic parts	Pre-installed servo
3	Main wing	Pre-installed all electronic parts	Pre-installed servo
4	Vertical tail	Pre-installed all electronic parts	Pre-installed servo
5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

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

Install Horizontal tail

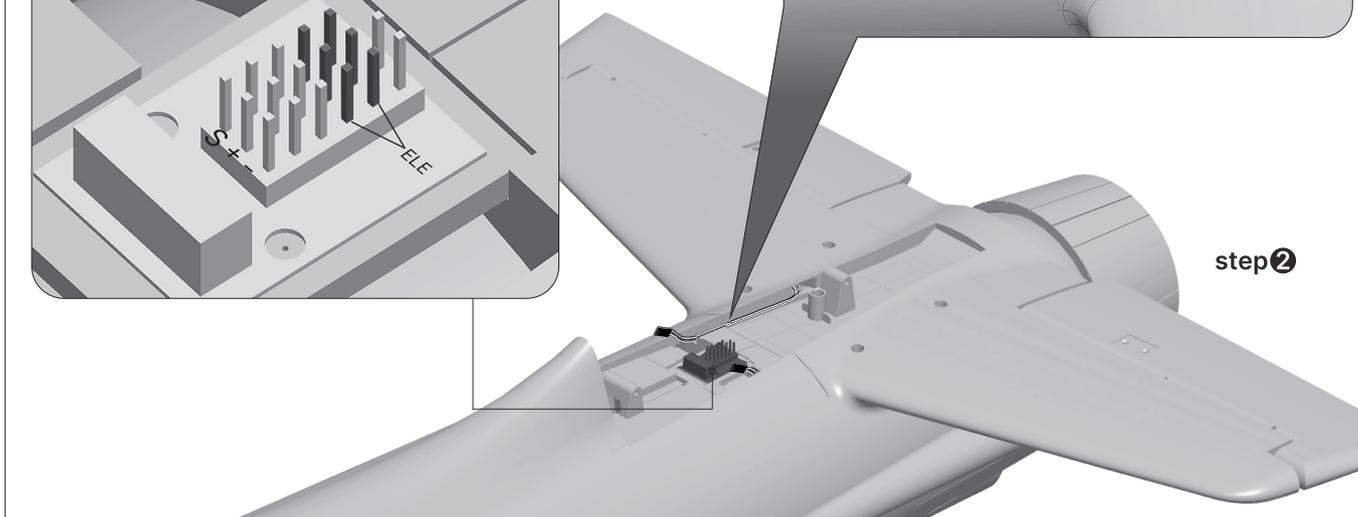
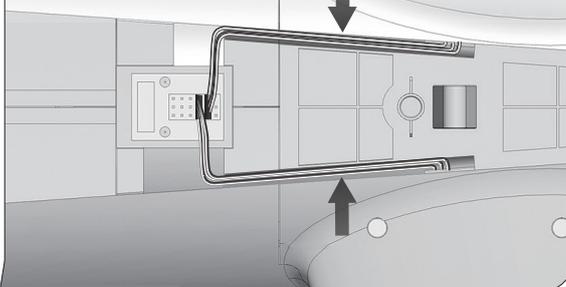
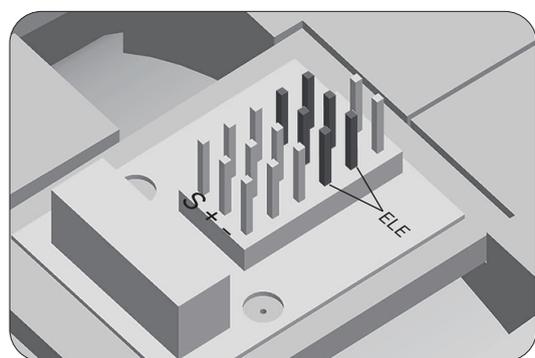
As the photo show:

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;

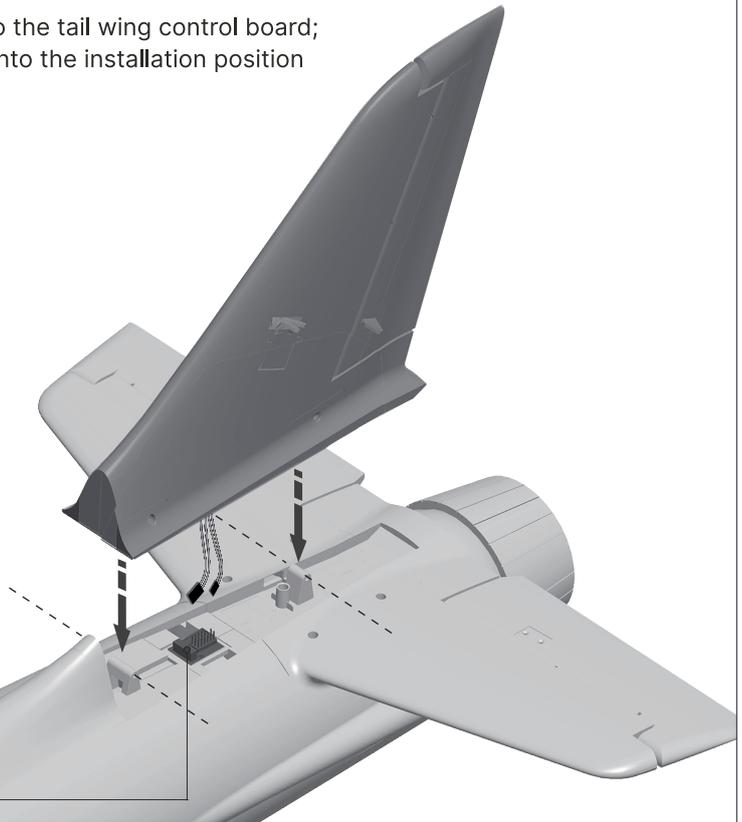
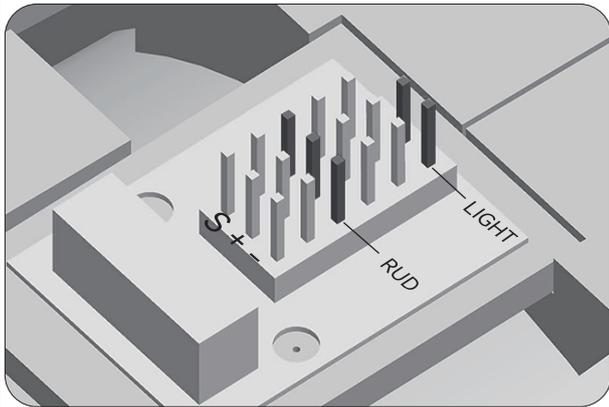
Arrange the horizontal servo wires and install them into the cable tray for easy installation of vertical tail.



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:

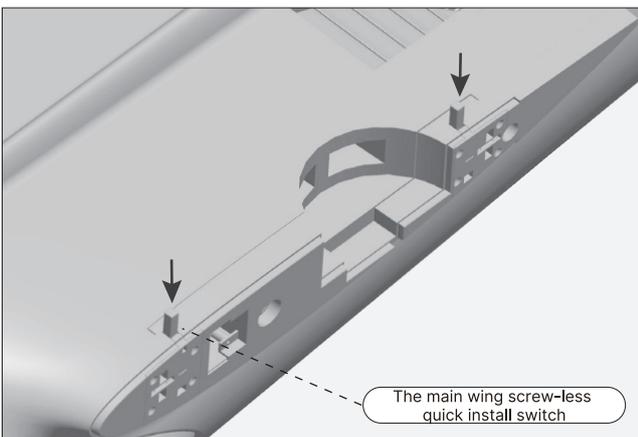
1. Press the fuselage screw-less quick install switch to unlock it ^①

- ① 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:

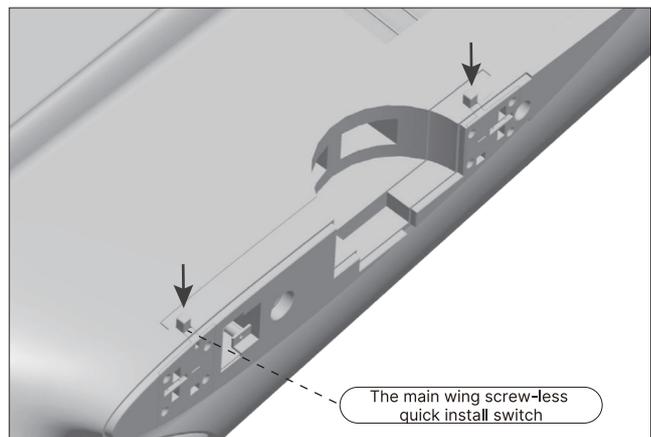
Press the main wing screw-less quick install switch to the bottom and release it. The button pops up to the highest position, indicating that the main wing has been unlocked and can be easily removed and installed.



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

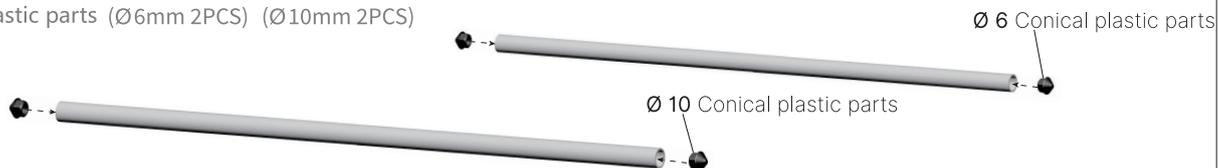
As the photo show:

step 1

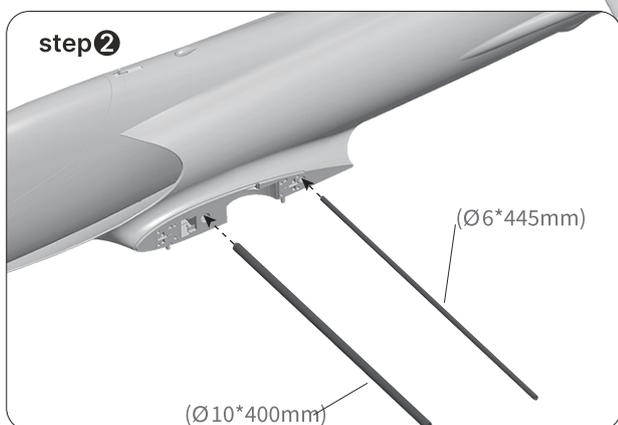
1. Use glue to fix the **Conical plastic part** on two carbon tubes respectively;

Carbon tube ①(Ø10*400mm 1PCS) ②(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)

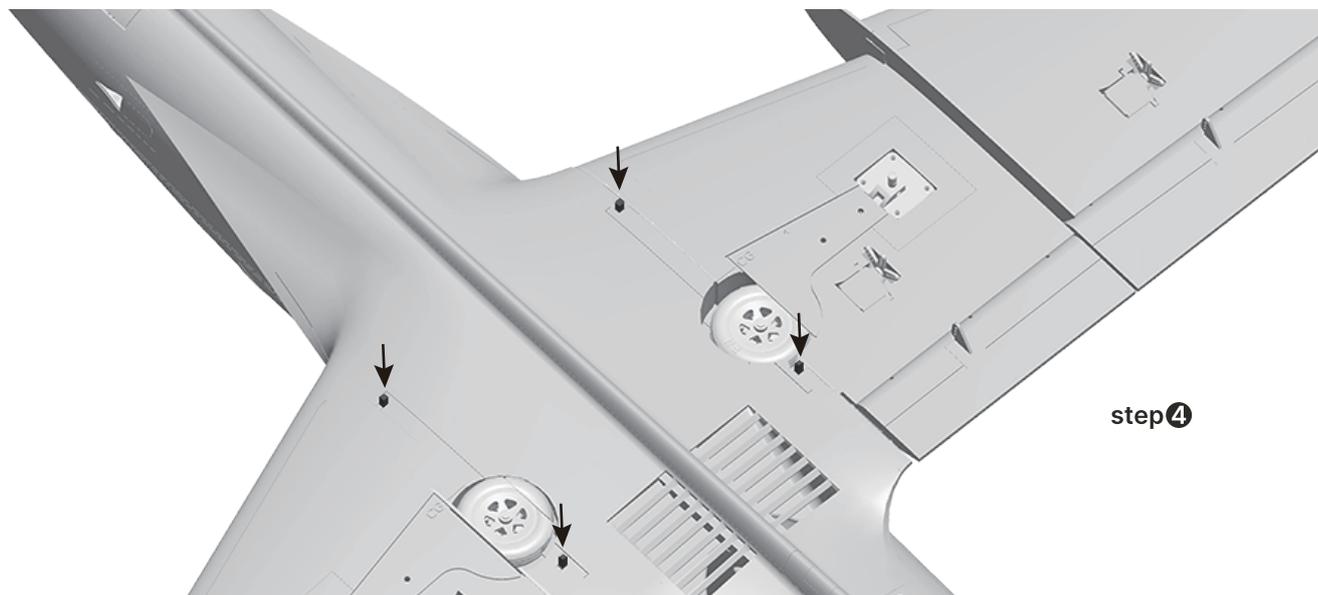


step 2

step 3



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

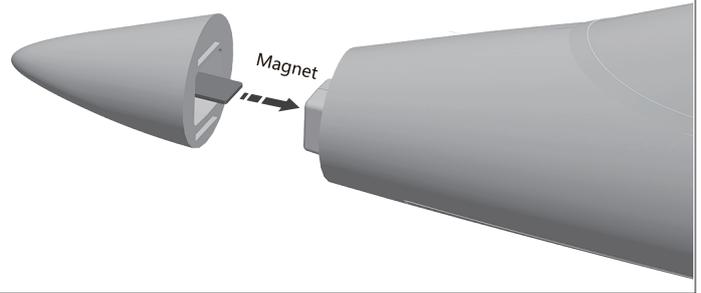


step 4

Install nose cone

As the photo show:

1. Install the nose cone onto the fuselage

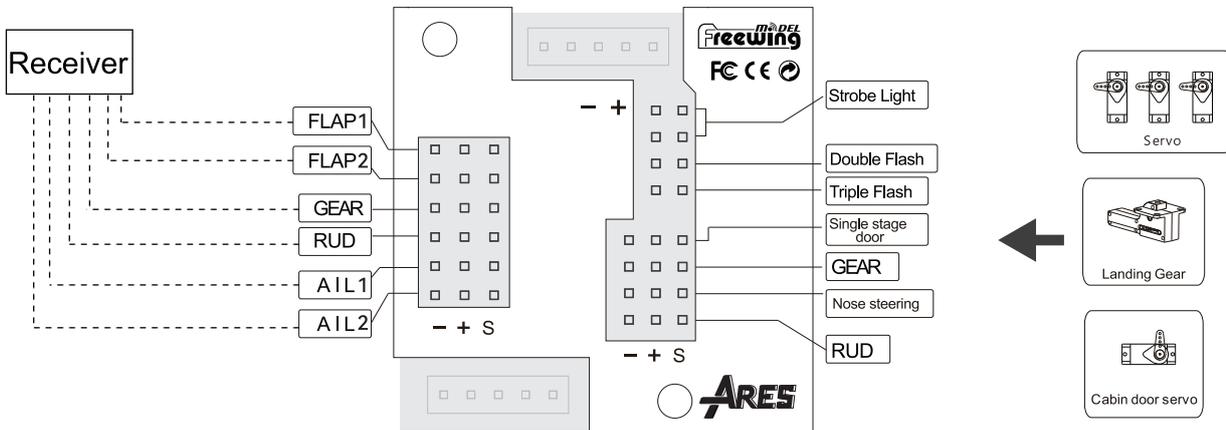


Control Board Introduction

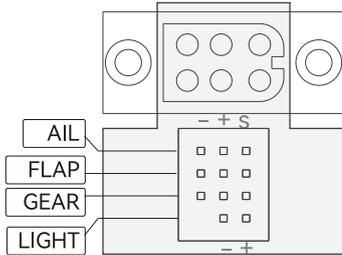
Please refer to the diagram, connect the servo cables to the control board, and connect to the receiver correctly.

- 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;

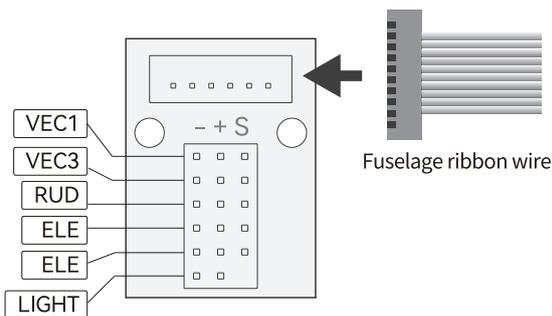
Control Board



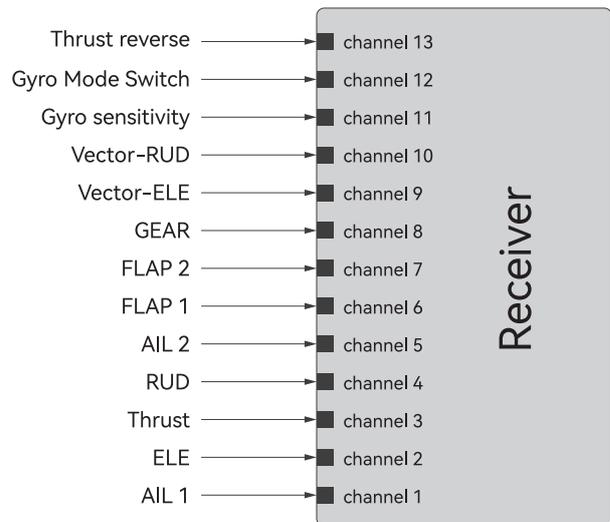
Main wing control board



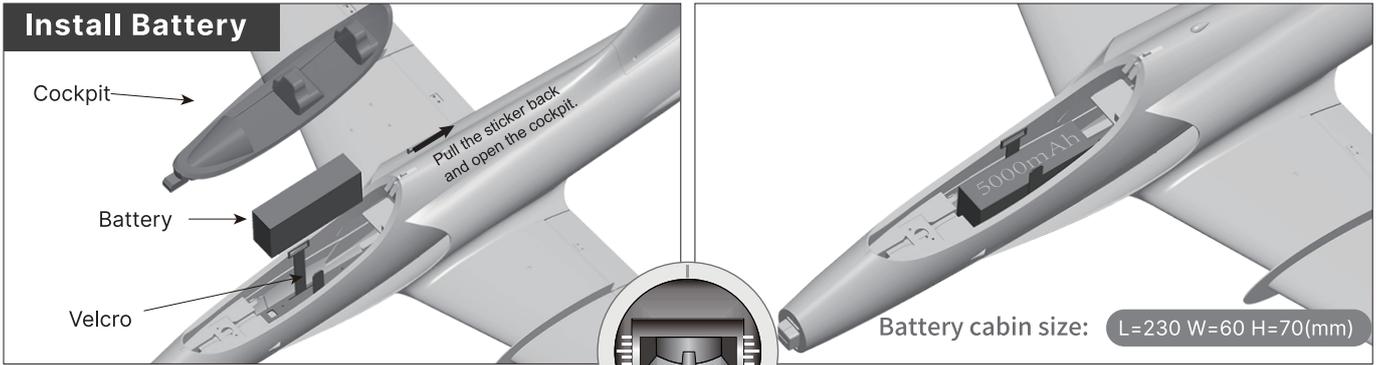
Tail wing control board



Receiver Connection Diagram



Install Battery

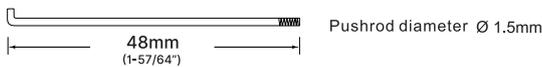


Before connecting the battery and receiver, please switch on the transmitter power and make sure the throttle stick is in the lowest position. Bind your receiver to your transmitter according to your transmitter's instruction manual.

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

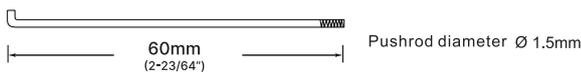
Aileron pushrod length



Aileron pushrod mounting hole



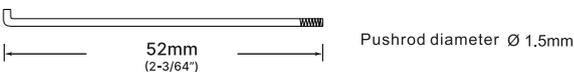
Flap pushrod length



Flap pushrod mounting hole(Inside)



Elevator pushrod length



Elevator pushrod mounting hole



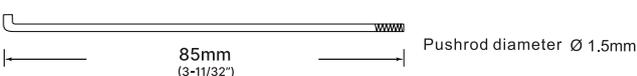
Rudder pushrod length



Rudder pushrod mounting hole



Vector-elevator pushrod length



Vector-elevator pushrod mounting hole



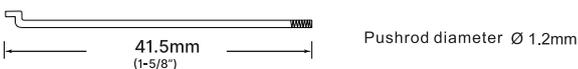
Vector-rudder pushrod length



Vector-rudder pushrod mounting hole



Nose Cabin door pushrod length



Nose cabin door pushrod mounting hole



Nose gear steering pushrod length



Nose gear steering pushrod mounting hole



Center of Gravity

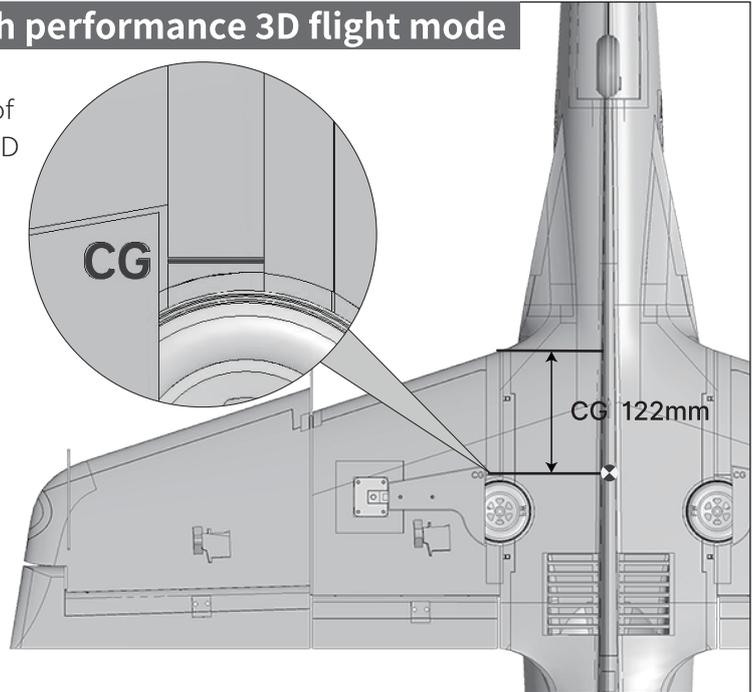
Correct Center of Gravity ("CG") is critical for enabling safe aircraft stability and responsive control. Please refer to the following CG diagram to adjust your aircraft's Center of Gravity.

- Depending on the capacity and weight of your chosen 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.

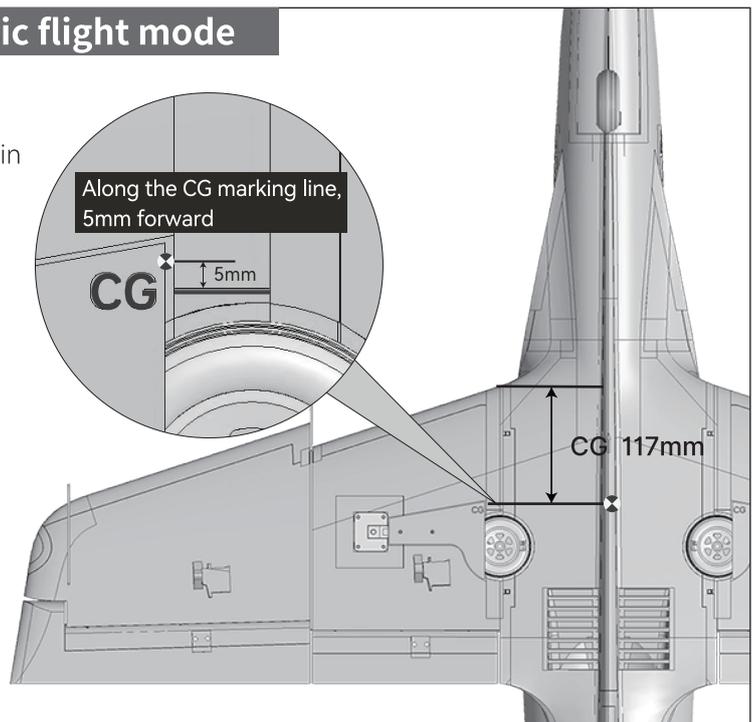
Suggested center of gravity for high performance 3D flight mode

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

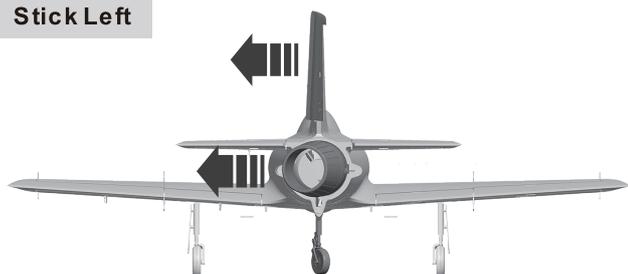


Stick Right

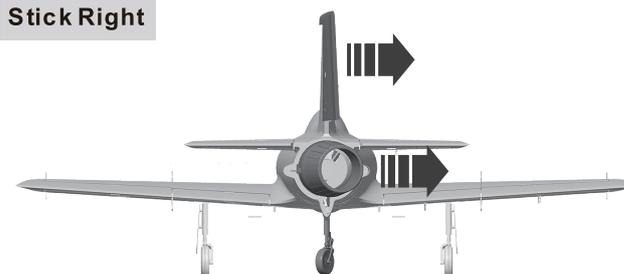


Rudder

Stick Left

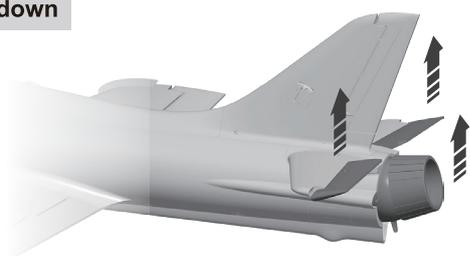


Stick Right



Elevator

Stick down

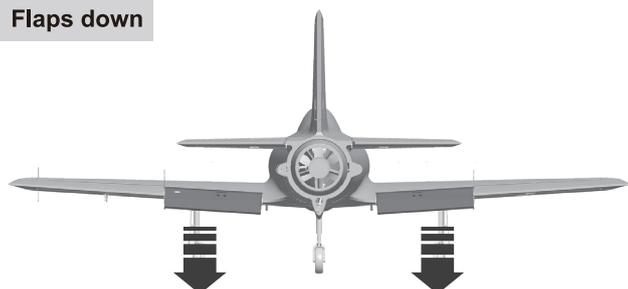


Stick up



Flaps

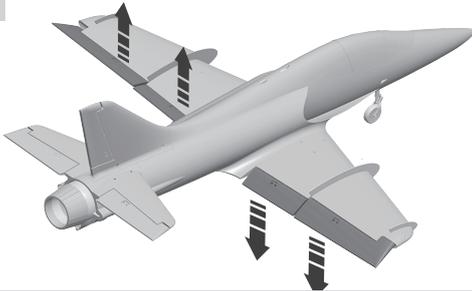
Flaps down



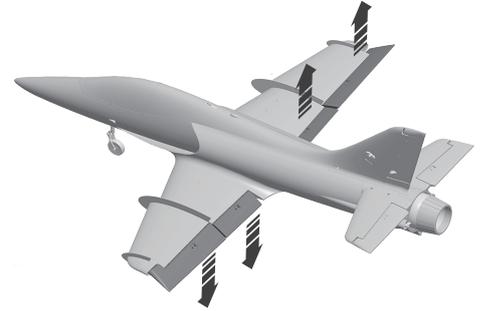
Control surface diagram for high performance 3D flight mode

Aileron

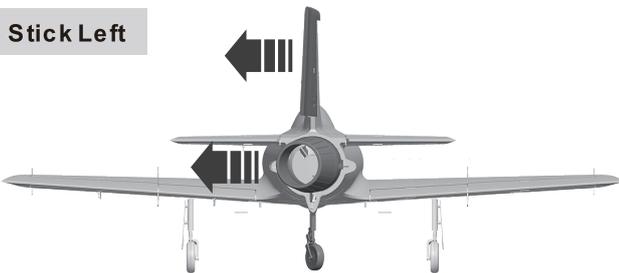
Stick Left



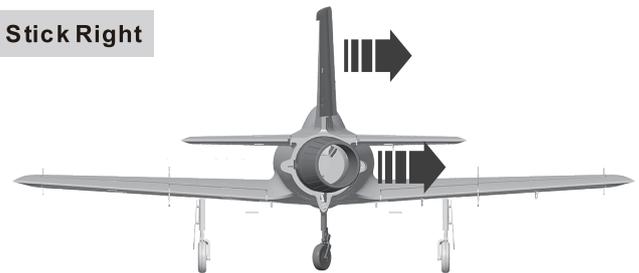
Stick Right

**Rudder**

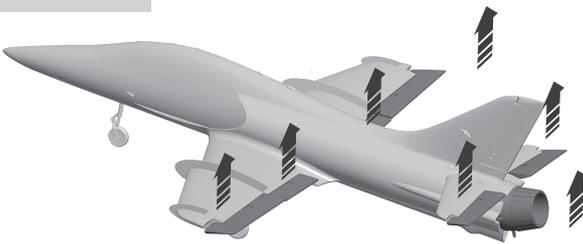
Stick Left



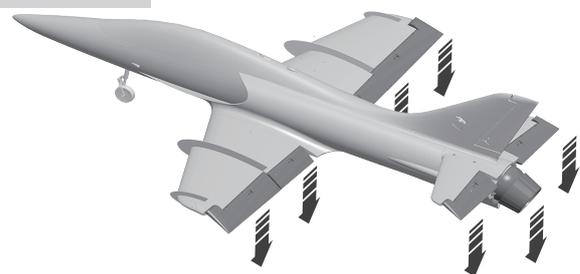
Stick Right

**Elevator**

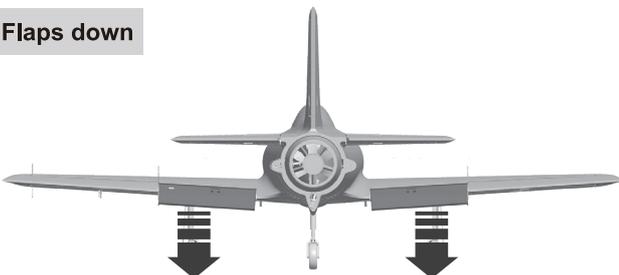
Stick down



Stick up

**Flaps**

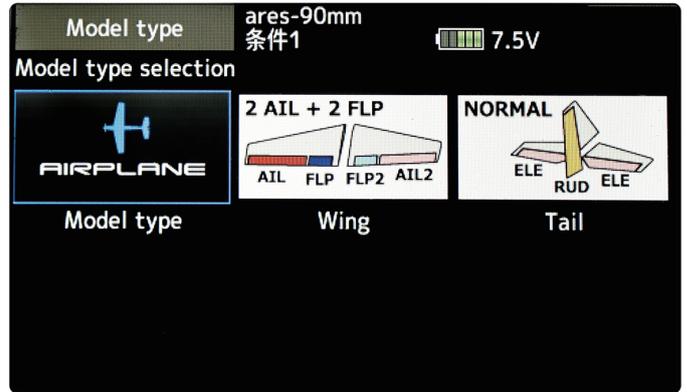
Flaps down

**(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)

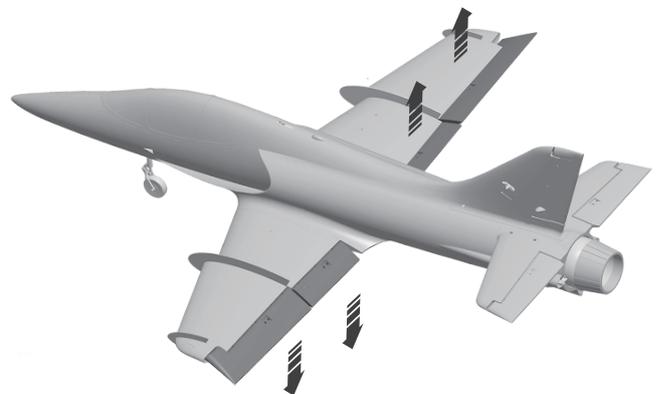
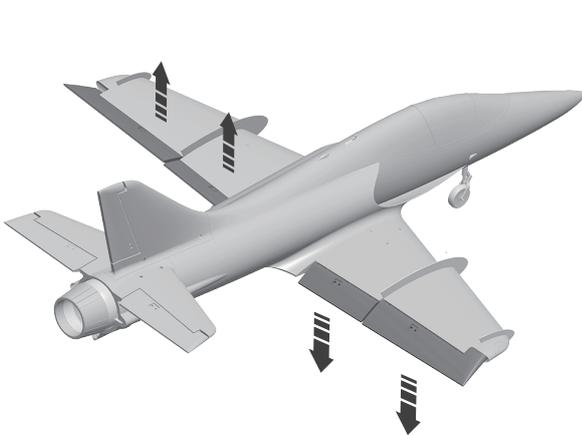


Aileron —mix flap

• Interface Settings



• Control surface feedback



Elevator—mix aileron and flap

• Interface Settings

Elevator → Camber ares-90mm 条件1 7.5V 1/3

Pos. +0 Rate +0

EXP 1 Separ.

Offset 0.0

Rate A +110.0 Rate B +110.0

EXP A 0.0 EXP B 0.0

Elevator → Camber ares-90mm 条件1 7.5V 2/3

	AIL	AIL2
Rate 1	-100	-100
	(-100)	(-100)
Rate 2	-100	-100
	(-100)	(-100)
	FLAP	FLP2
Rate 1	-100	-100
	(-100)	(-100)
Rate 2	-100	-100
	(-100)	(-100)

Elevator → Camber ares-90mm 条件1 7.5V 3/3

Status ON

Group

Switch SD

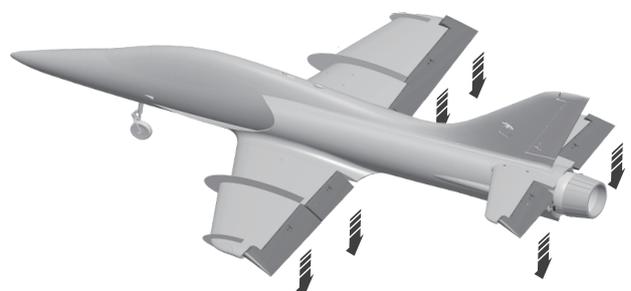
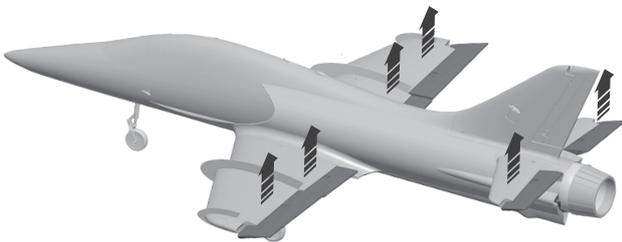
Fine tuning

Control --

Mode

Rate +0 (+0)

• Control surface feedback



Elevator—mix vector-elevator

• Interface Settings

Program. mixes ares-90mm 条件1 7.5V 1/2

Pos.	+0	Rate	+0
------	----	------	----

EXP 1 Separ.

Offset 0.0

Rate A +130.0 Rate B +130.0

EXP A 0.0 EXP B 0.0

Program. mixes ares-90mm 条件1 7.5V 2/2

ON -- Trim OFF

Function,H/W Link

Master Elevator OFF

Slave Auxiliary5 OFF

Servo speed Linear

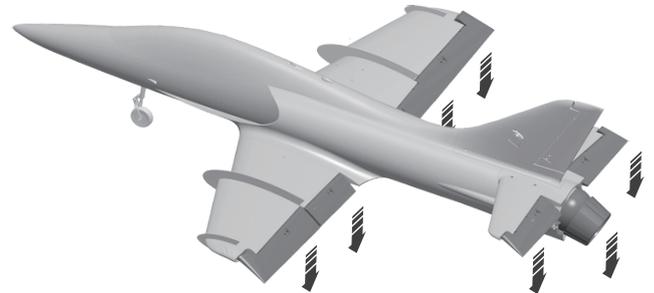
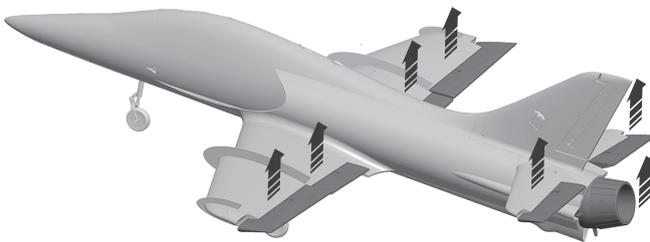
In 0 Out 0 Slave

Delay Start 0.0sec. Stop 0.0sec.

Fine tuning --

+0 (+0)

• Control surface feedback



Rudder—mix vector-rudder

• Interface Settings

Program. mixes ares-90mm 条件1 7.5V 1/2

Pos.	+0	Rate	+0
------	----	------	----

EXP 1 Separ.

Offset 0.0

Rate A -130.0 Rate B -130.0

EXP A 0.0 EXP B 0.0

Program. mixes ares-90mm 条件1 7.5V 2/2

ON -- Trim OFF

Function,H/W Link

Master Rudder OFF

Slave Auxiliary4 OFF

Servo speed Linear

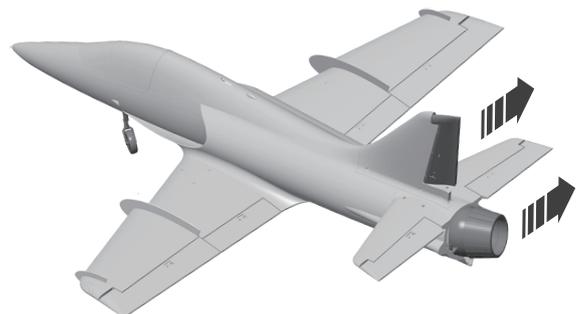
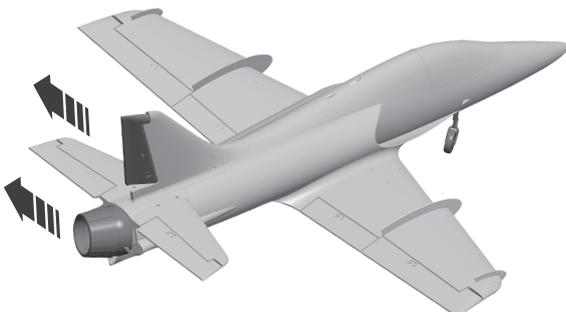
In 0 Out 0 Slave

Delay Start 0.0sec. Stop 0.0sec.

Fine tuning --

+0 (+0)

• Control surface feedback



Flap-to-Elevator Mix setting

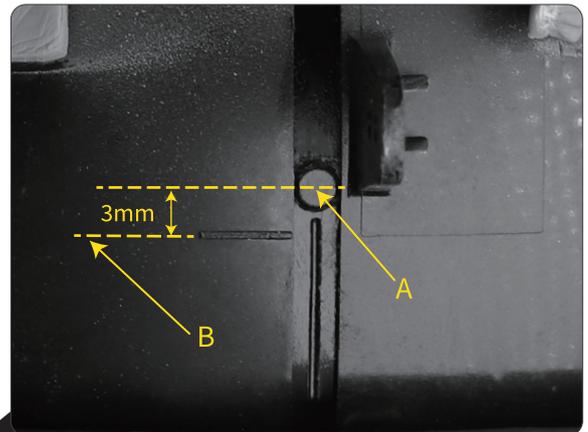
A Flap-to-Elevator Mix is required to maintain level flight when the flaps are developed.
The detail settings are as below:

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

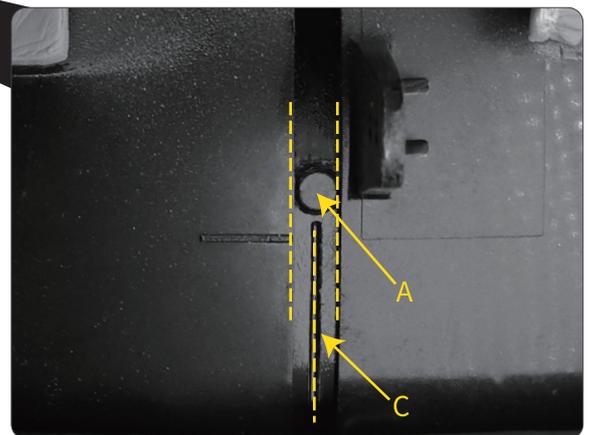
Based on the direction of the nose, the center of the convex point (A) is about 3mm away from the marked line (B)
At this point, the vector nozzle is in the center position on the pitch axis.



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.



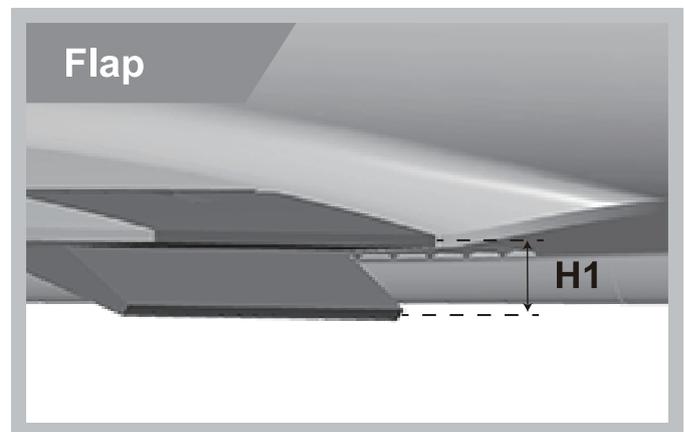
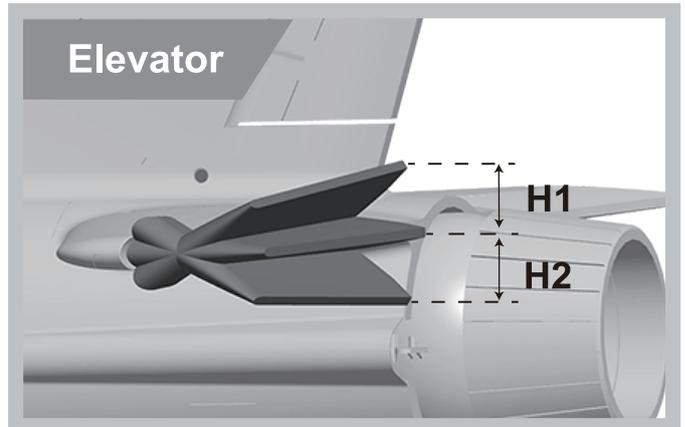
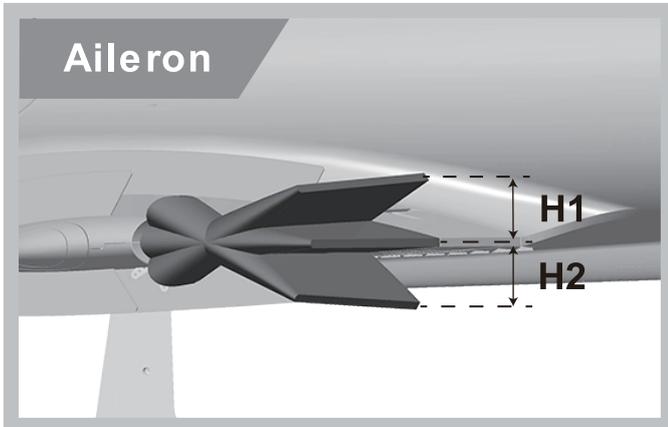
Y-wires use instructions:

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

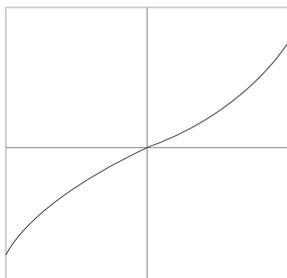
According to our testing experience, use the following parameters to set Aileron/Elevator Rate. Program your preferred Exponential % in your radio transmitter. We recommend using High Rate for the first flight, and switching to Low Rate if you desire a lower sensitivity. On successive flights, adjust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

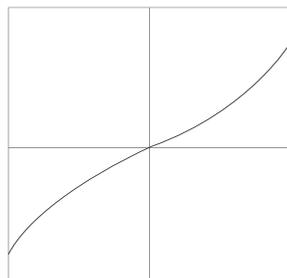
1. Aileron EXP curve is shown as below :



Futaba brand Remote Control : EXP A -30
EXP B -30

Spektrum brand Remote Control : EXPO 30% 30%

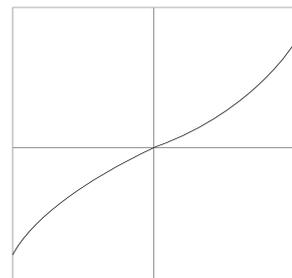
2. Elevator EXP curve is shown as below :



Futaba brand Remote Control : EXP A -30
EXP B -30

Spektrum brand Remote Control : EXPO 30% 30%

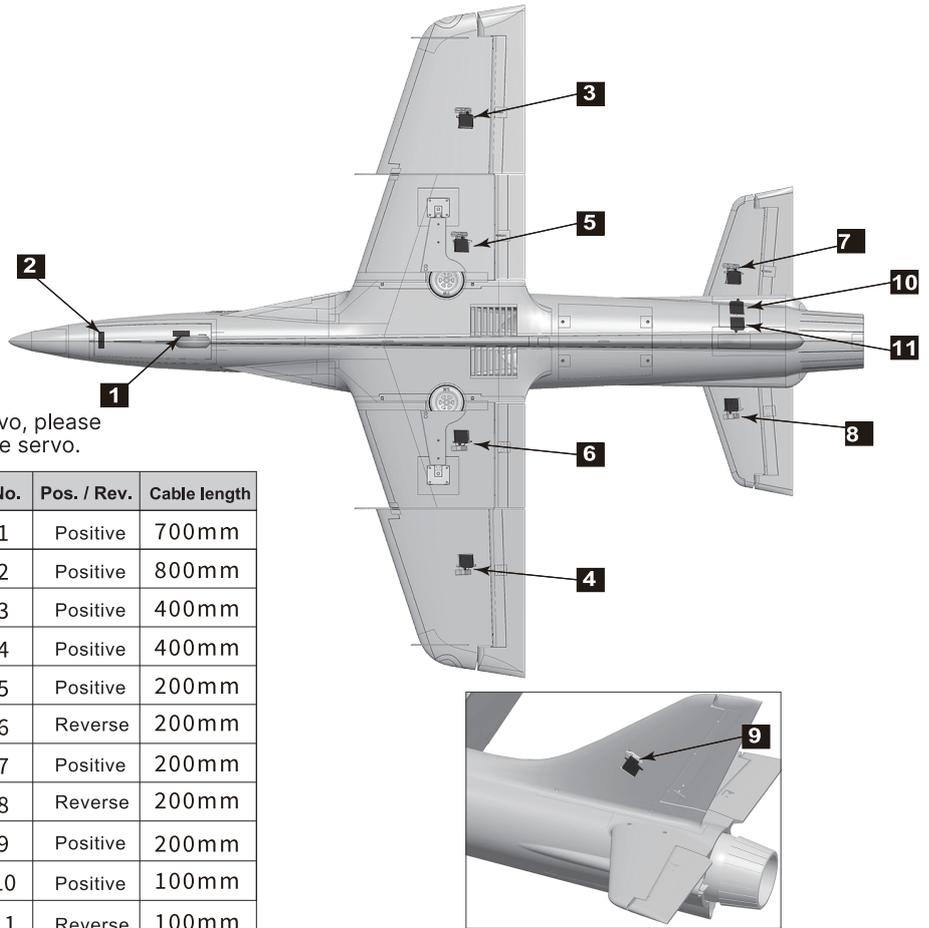
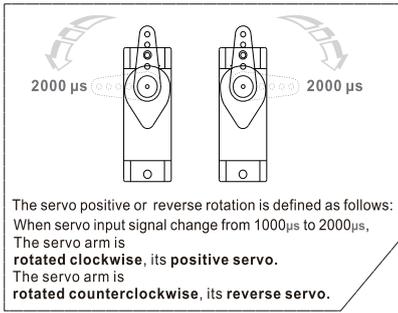
3. Rudder EXP curve is shown as below :



Futaba brand Remote Control : EXP A -30
EXP B -30

Spektrum brand Remote Control : EXPO 30% 30%

Servo Direction

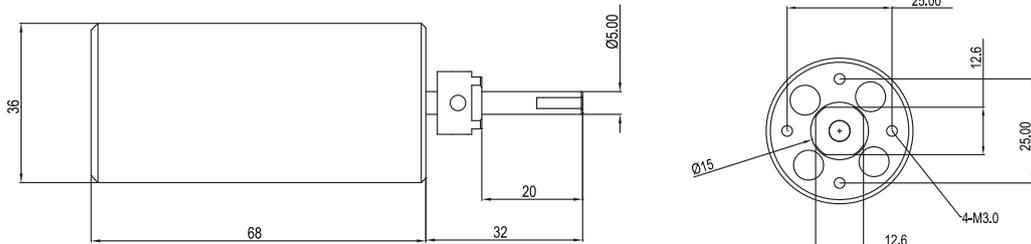


If you need to purchase another brand's servo, please refer to the following list to choose a suitable servo.

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

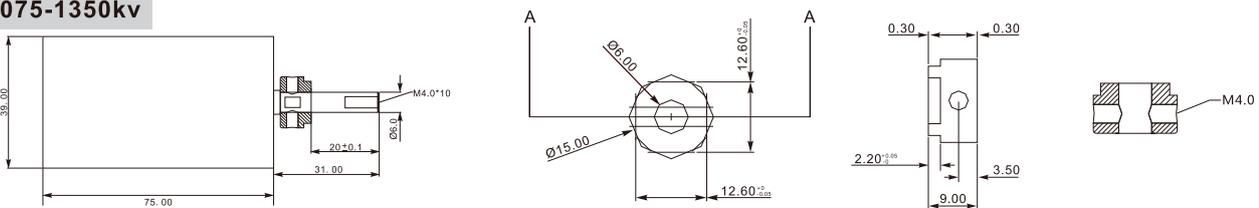


Unit :mm

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



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

