FlightLine RC.com

# SUPERMARINE Spitfire MK IXc

# User Manual

**Wingspan : 1200mm**
**Item No.: FLW203**



MADE IN CHINA

www.sz-freewing.com

Page

## Introduction



Introducing FlightLineRC, the new brand from Freewing Models! FlightLineRC will bring you a new series of propeller driven aircraft at the same level of quality and value you trust from Freewing. Flightline brings to you the outstanding innovation, exquisite design, high quality, unbeatable value, and dependable performance you come to expect from Freewing. Thank you for purchasing the FlightLineRC 1200mm Spitfire Mk. IXc!

### Overview:

The Supermarine Spitfire is one of the most popular warbirds in history. This British single-seat fighter was used by the Royal Air Force and the Allies, earning distinction during the Battle of Britain and throughout World War II. Over 20,300 aircraft were produced with more than 24 variants. The Spitfire's versatility and maneuverability made it a lethal aircraft against Axis forces, such as the Focke Wulf FW-190. The Spitfire continues to fly in modern times as a tribute to aviation history and military veterans.

### Features:

FlightLineRC's Spitfire is the popular Mk. IXc variant. Over 5,000 of this variant were built in World War II. The classic Spitfire colors are factory painted and included with the kit are two decal sets so you can choose which scheme you want to install on your Spitfire. The first decal set is for MK392, flown by the RAF Ace, James Edgar “Johnnie” Johnson in August 1944. The second decal set is for MJ586, flown by the French Ace, Pierre Clostermann in October 1943.

This Spitfire Mk. IXc is approximately 1/9.5 scale, with a 1200mm wingspan. Molded from EPO foam, the main wing and horizontal tail are attached with screws, allowing these parts to be easily removed for transport. Only a few parts require glue and assembly is less than one hour! The battery bay is large and uses a magnetic hatch to close it securely. Servos are easily accessible for maintenance or replacement and proper ventilation has been designed to keep the electronics cool. The electronic retracts use metal reinforcement plates and the split flaps, plastic parts, and surface details give your Spitfire lots of scale realism.

### Power System:

The stock PNP version is equipped with a 3748-580KV brushless outrunner motor and scale 4-blade propeller. With the recommended 4s 14.8v 4000mAh lipo battery, the Spitfire Mk. IXc is very agile and has a level top speed of 135kph / 83mph. An optional “High Power Upgrade Set” can be purchased separately to obtain a level top speed of 150kph/93mph. This Upgrade Set includes one 3648-880KV motor, a 12x8 2-blade propeller, and a 2-blade spinner.

**( Conversion kit is sold separately, please contact MotionRC.com)**

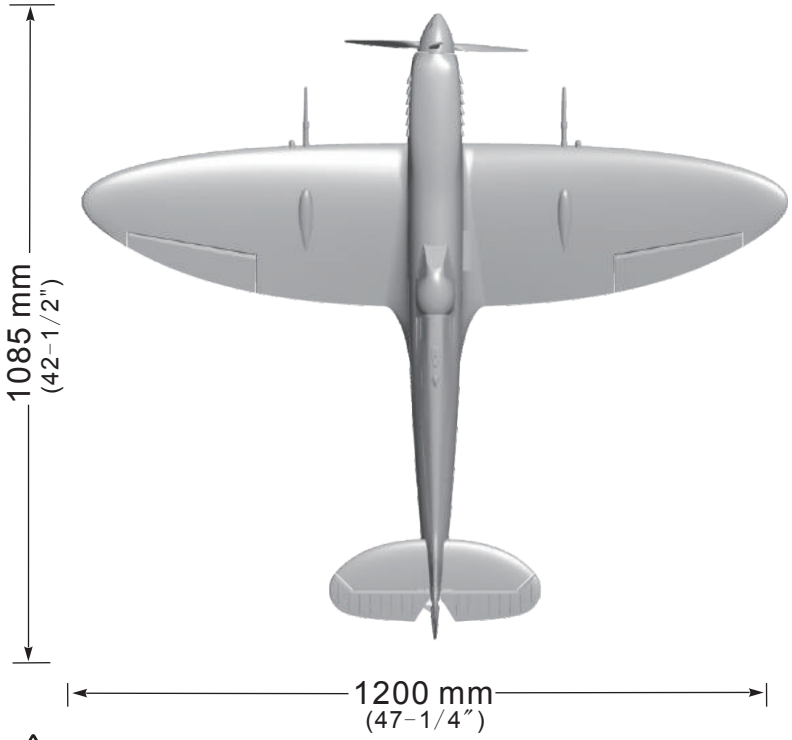
⚠ **NOTE:** This is not a toy. Not for children under 14 years. Young people under the age of 14 should only be permitted to operate this model under the instruction and supervision of an adult. Please keep these instructions for further reference after completing model assembly.

## Note:

1. This is not a toy! Operators should have some basic experience. Beginners should operate only under the guidance of a professional instructor.
2. Before beginning assembly, please read through the instructions and carefully follow them through the build.
3. Freewing and it's vendors will not be held responsible for any losses due to improper assembly and operation.
4. Model airplane operators must be at least 14 years of age.
5. This airplane is made of EPO foam material, covered with surface spray paint. Don't use chemicals to clean as it may cause damage.
6. You should avoid flying in areas such as public places, areas with high viltage power lines, nearby highways or airports or an other areas where laws and regulations clearly prohibit flight.
7. Do not fly in bad weather conditions, including thunderstorms, snow, etc...
8. Lipo batteries should be properly stored in a fire safe container and be kept at a minimum of 2M distance away from flammable or explosive materials.
9. Damaged or scrap batteries must be properly discharged before disposal or recycling to avoid spontaneous combustion and fire.
10. At the Flying Field, properly dispose of any waste you have created, don't leave or burn your waste.. Ensure that your throttle is in the low position and that your radio is turned on before connecting the Lipo battery.
11. Do not try to catch the airplane when flying low or landing. Wait for the airplane and its propeller to come to a complete stop.

## Product basic information






Wing loading:68g/dm²
Motor:3748-580KV brushless motor
Propeller:4-blade 12×7
ESC: 60A brushless ESC
Servo:9g MG×2， 9g plastic×4
Weight: 1400g (w/o battery)

Aileron: Yes
Elevator: Yes
Rudder: Yes
Flap: Yes
Landing gear: retract landing gear
Cabin door
Material: EPO

***High speed DIY spare-part***

*(The following is DIY spare-part, please contact distributor to purchase separately.)*

*2-blade propeller spinner*
*2-blade propeller fixed plate*
*3648-880KV brushless motor*
*2-blade 12×8 propeller*

⚠ Note:The parameters stated here are derived from test results using our accessories.If you use other accessories, the test results will differ. We cannot provide technical support if you have a problem when using other accessories.

## Package list

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

| No. | Name | PNP | ARF Plus | ARF |
|---|---|---|---|---|
| 1 | Fuselage | Pre-installed all electronic parts | Pre-installed servo | No electronic equipment |
| 2 | Main wing | Pre-installed all electronic parts | Pre-installed servo | No electronic equipment |
| 3 | Tail wing set | Pre-installed all electronic parts | Pre-installed servo | No electronic equipment |
| 4 | Foam parts | ✓ | ✓ | ✓ |
| 5 | "Y" wire | ✓ | ✓ | ✓ |

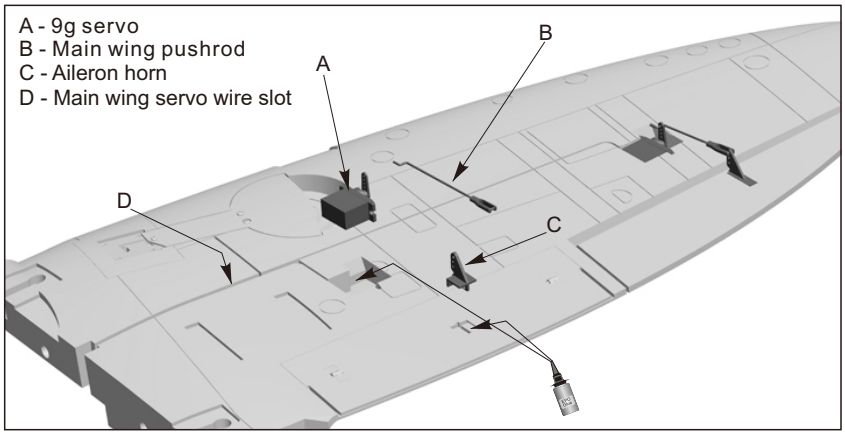
| No. | Name | PNP | ARF Plus | ARF |
|---|---|---|---|---|
| 6 | Propeller | ✓ | ✓ | ✓ |
| 7 | Spinner & fixed part | ✓ | ✓ | ✓ |
| 8 | Installed part & screw | ✓ | ✓ | ✓ |
| 9 | Fiberglass tube & glue | ✓ | ✓ | ✓ |
| 10 | Manual | ✓ | ✓ | ✓ |

# Assembly

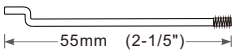
## Main wing

### Installing main wing servos

1.Use a servo tester or radio to center the servo.
2. Use glue to install the servo and aileron horn on the main wing.
3. Feed the servo wires into the slot, after installing all the servos, apply the decal over the wire slot.
4. Insert one side of the pushrod into the servo arm, adjust its length. And insert the clevis to the aileron horn. Slide the rubber retainer over the clevis
5. Repeat the above four steps for the other wing aileron and flap servos

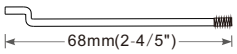



**Aileron pushrod size**



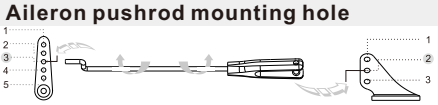

Pushrod diameter : Ø 1.2mm

**Flap pushrod size**

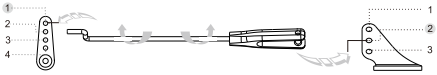



Pushrod diameter : Ø 1.2mm

**Aileron pushrod mounting hole**

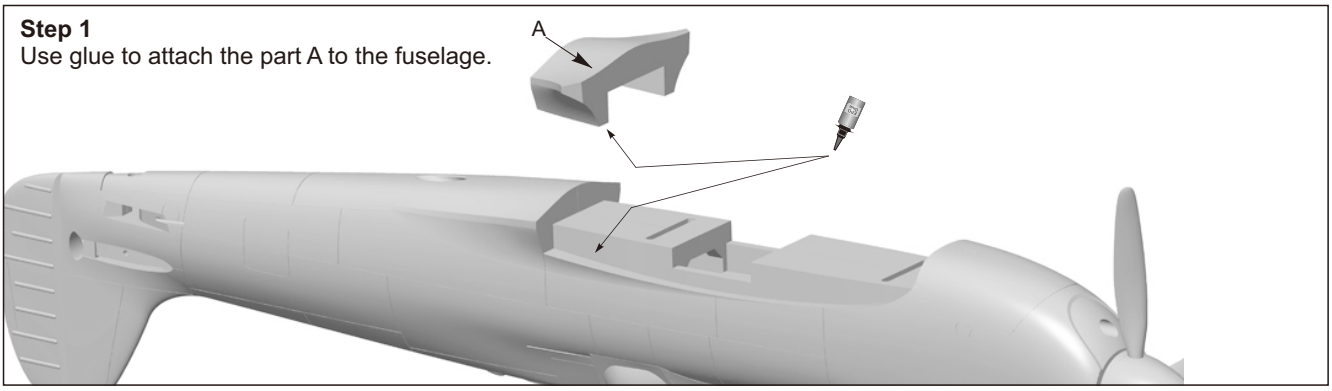


**Flap pushrod mounting hole**



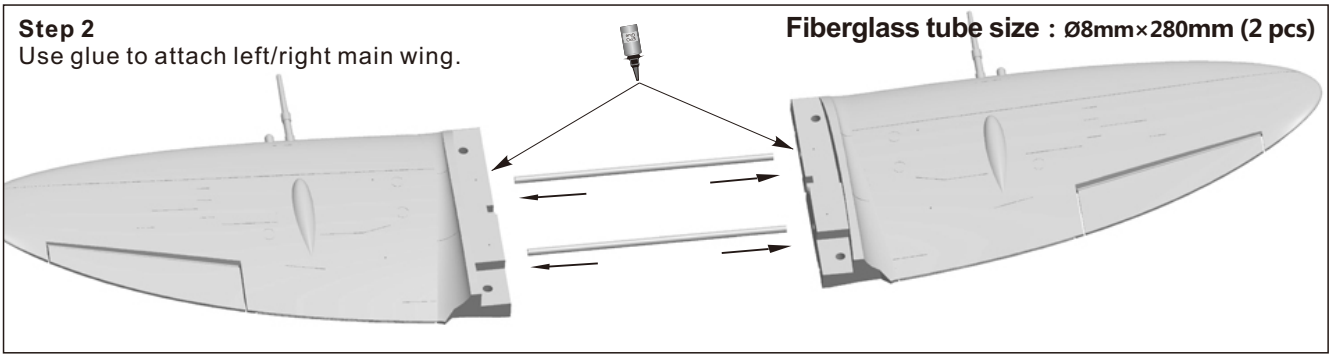
### Installing the main wing

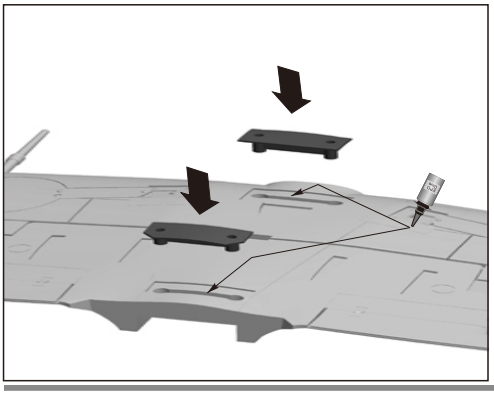
**Step 1**
Use glue to attach the part A to the fuselage.

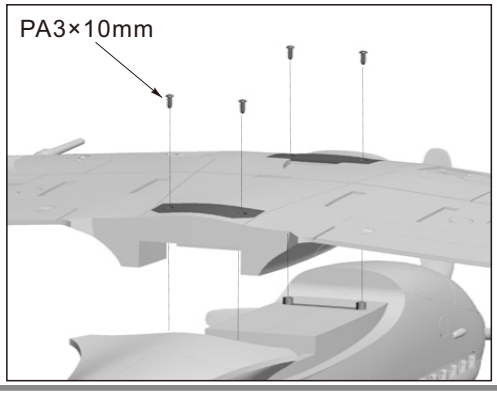



**Step 2**
Use glue to attach left/right main wing.

**Fiberglass tube size : Ø8mm×280mm (2 pcs)**








**Step 3**
Use glue to attach the main wing fixed plastic part B,C on the main wing.

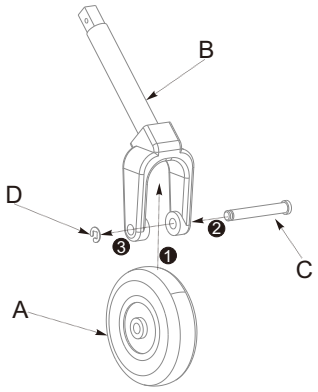
**Step 4**
Use 4pcs screws to fix the main wing.

**Note:** There is EPO glue in the kit, please use it for assembly. For best results, glue should be spread evenly, then wait for 90 seconds before joining.

## Install the tail wheel gear assembly

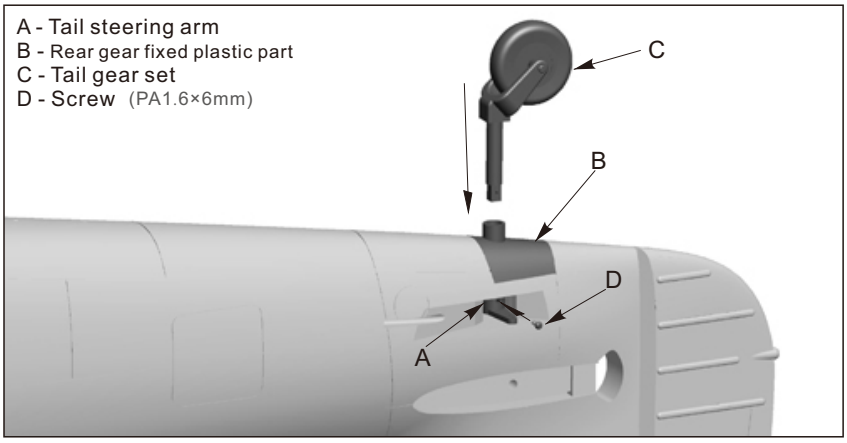
1.Refer to the photo at right, for proper tail wheel assembly installation.

A - Rear wheel (Ø35×10mm)
B - Rear gear supporting rod
C - Rear wheel shaft
D - E-buckle (Ø5×Ø2mm)




2.Insert the tail gear set C to the fixed plastic part B, then insert tail steering arm A
3.Use screw D to fix the tail steering arm.

A - Tail steering arm
B - Rear gear fixed plastic part
C - Tail gear set
D - Screw (PA1.6×6mm)

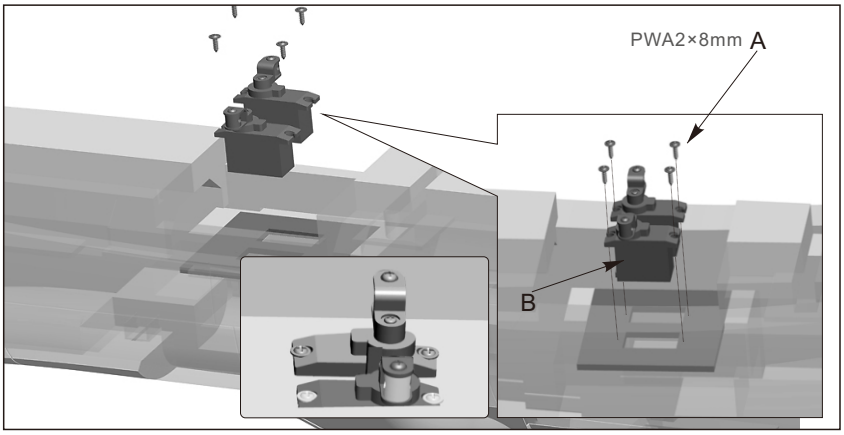



## Elevator, Rudder

### Install the Elevator/rudder servos.

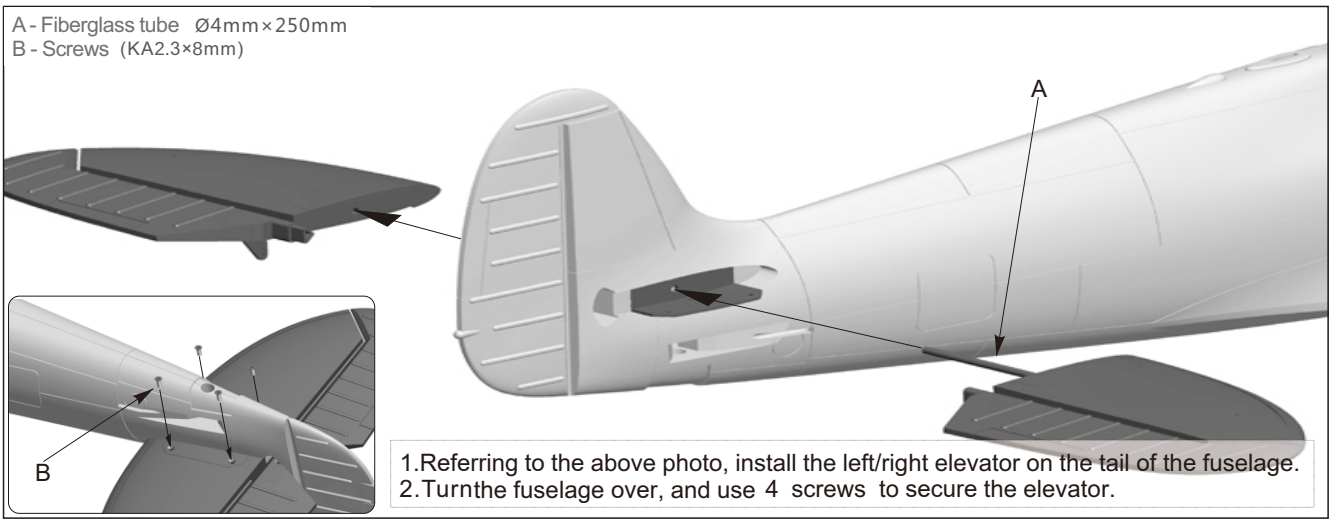
1.Use servo tester or radio to center the servo.
2.Use screw A to fix the 9g servo to the wooden piece.
3.Insert the servo cable under the wooden piece, and feed it to the battery compartment.

⚠ **Note:** If you choose not to use the factory servo, the chosen servo may be larger. If that is the case, you need to remove the fixed wooden piece and glue the servo into position in the fuselage.



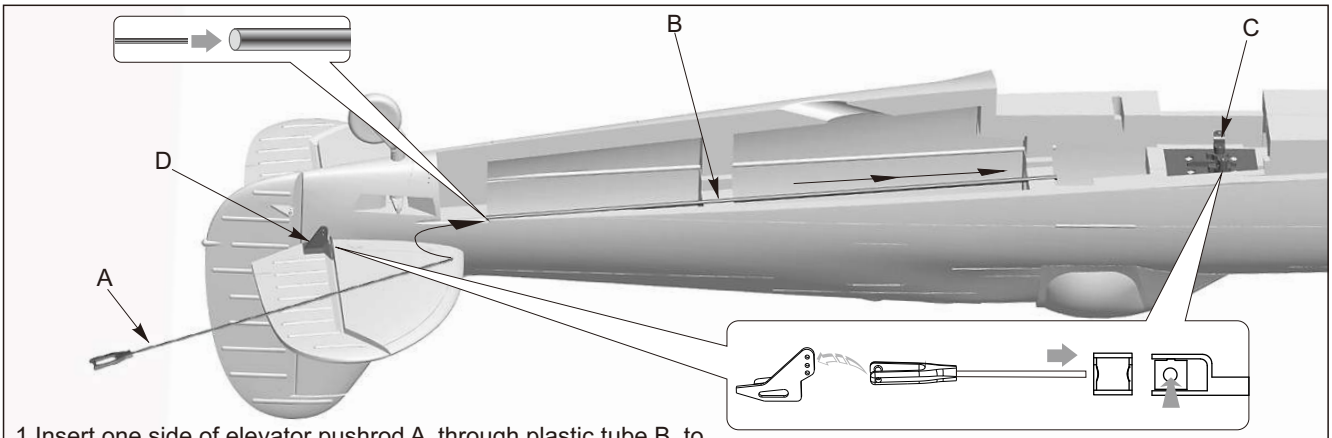

### Install elevator

A - Fiberglass tube Ø4mm×250mm
B - Screws (KA2.3×8mm)

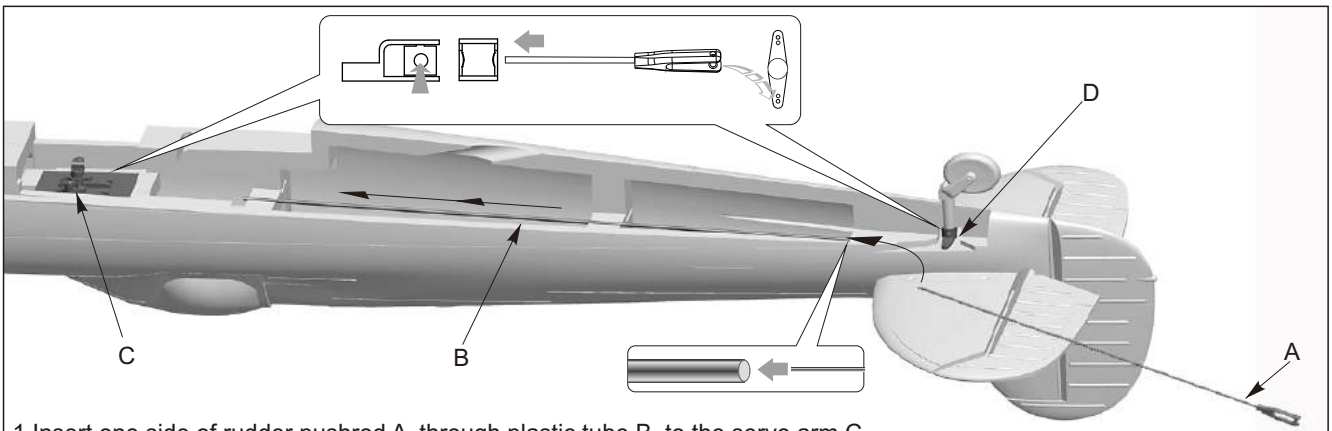



1.Referring to the above photo, install the left/right elevator on the tail of the fuselage.
2.Turnthe fuselage over, and use 4 screws to secure the elevator.

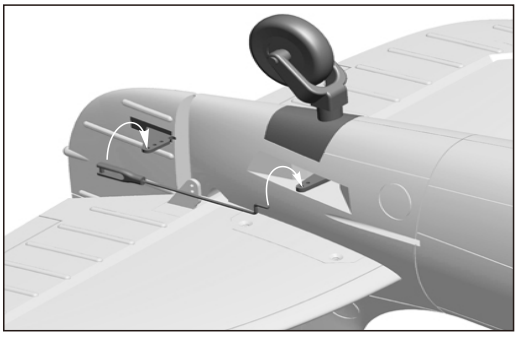
## Install elevator/rudder pushrods




1.Insert one side of elevator pushrod A ,through plastic tube B, to the servo arm C.
2.Snap the clevis of elevator pushrod to the rudder horn D.



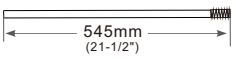

1.Insert one side of rudder pushrod A ,through plastic tube B, to the servo arm C.
2.Snap the clevis of rudder pushrod to the rudder horn D.



⚠ **Note:** When installing the rudder pushrod, make sure the tail gear is centered, then install the rudder pushrod and adjust the plastic clevis to center the rudder.

1.Use glue to attach the rudder horn on the rudder.(as the left photo shown).
2.Use rudder pushrod to connect the tail gear steering arm and rudder horn.

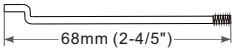
**Steering pushrod size**




Pushrod diameter : Ø 1.2mm

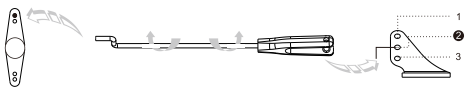
**Steering pushrod mounting hole**

**Rudder pushrod size**

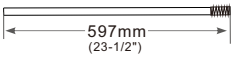



Pushrod diameter : Ø 1.2mm

**Rudder pushrod mounting hole**




**Elevator pushrod size**

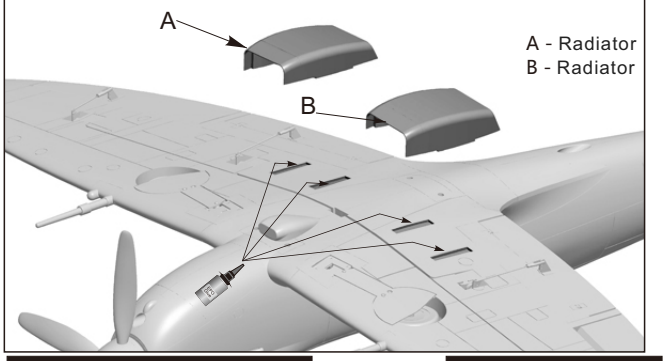



Pushrod diameter : Ø 1.2mm

**Elevator pushrod mounting hole**

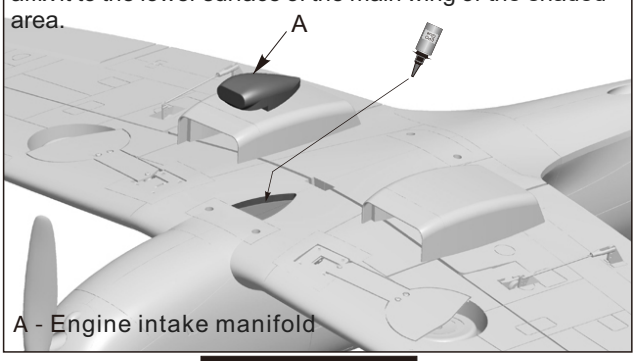
## Install radiators

Glue the Radiator A and B to the main wing surfaces, as shown.

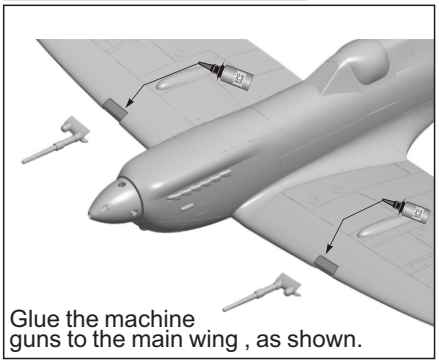



## Install the intake scoop.

Use the glue to secure the engine intake manifold (A), and affix it to the lower surface of the main wing of the shaded area.



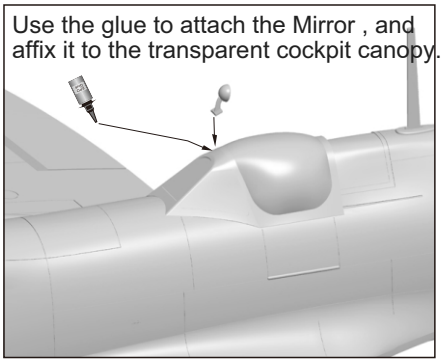

## Install machine guns



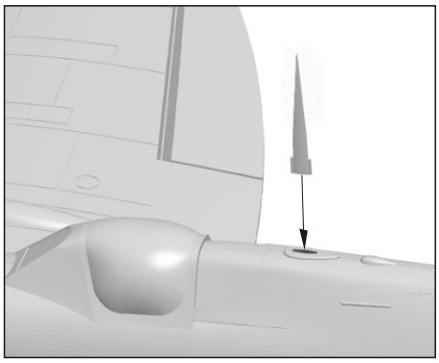
Glue the machine guns to the main wing , as shown.

## Install mirrors

Use the glue to attach the Mirror , and affix it to the transparent cockpit canopy.



## Install antenna

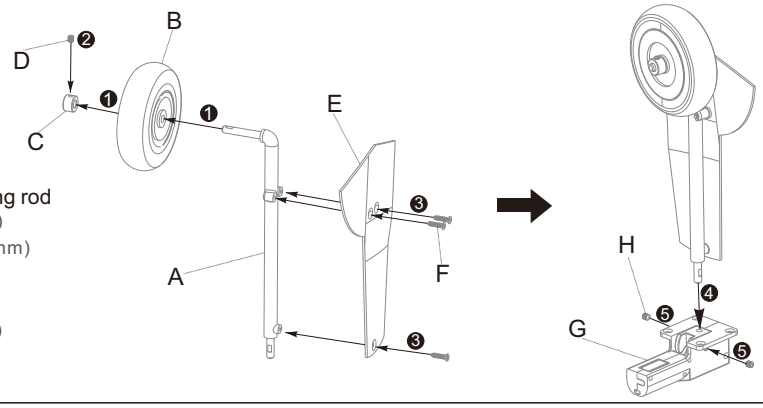


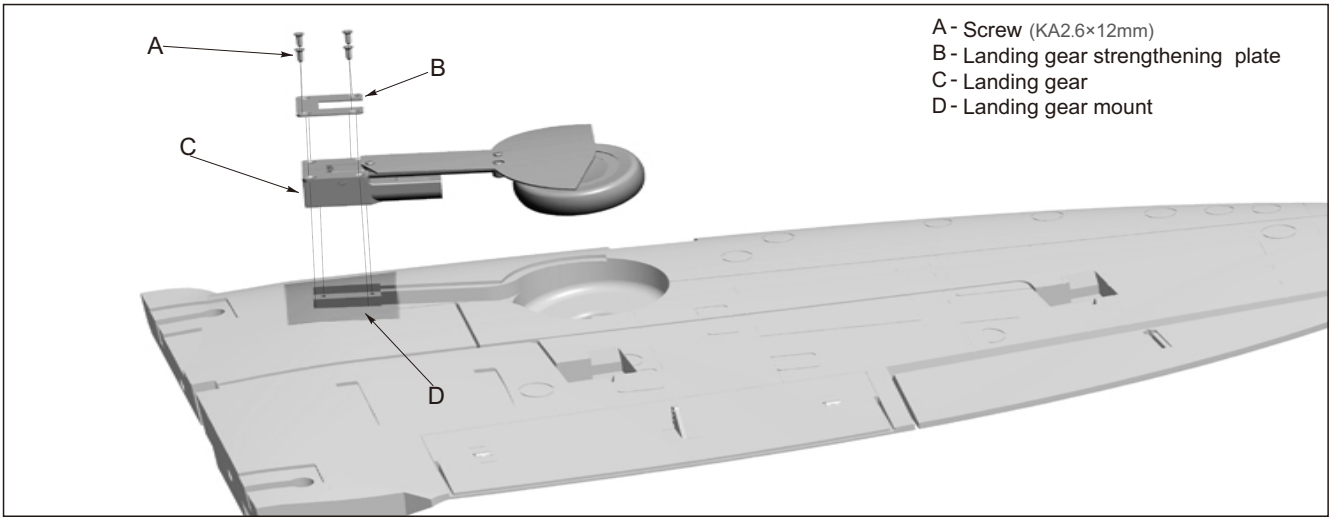
## Main Landing Gear Assembly

Follow the diagram to assemble/disassemble the landing gear.

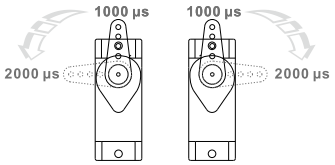
**Accessories**

A - Main landing gear supporting rod
B - Wheel (Ø65×16mm)
C - Wheel locks (Ø5.5×Ø4.2mm)
D - Jimi screw (M3×3mm)
E - Main gear door
F - Screw (PB2.3×4mm)
G - Retract servo
H - Jimi screw (M3×3mm)

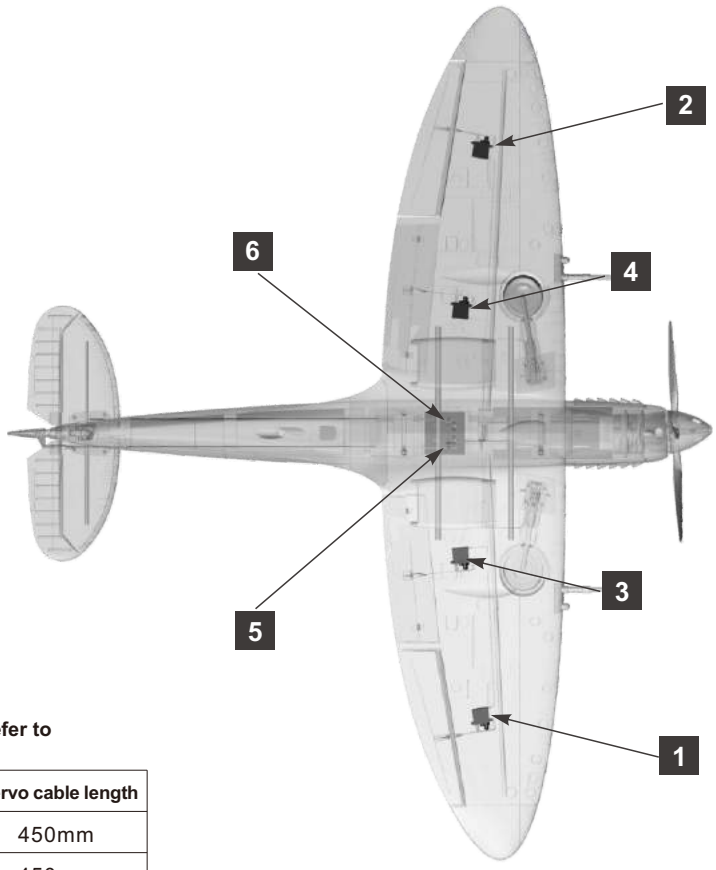


## Servo introduction




A servo or reversed servo is defined as follows:
When the servo input signal changes from 1000μs to 2000μs, The servo arm rotates clockwise, its a positive servo. If it rotates counter clockwise, its a reversed servo



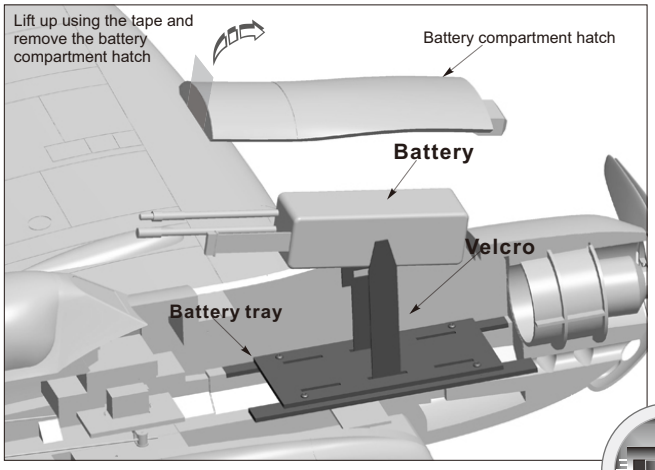

**If you want to use another brand of servo, please refer to the following list to choose correct size.**

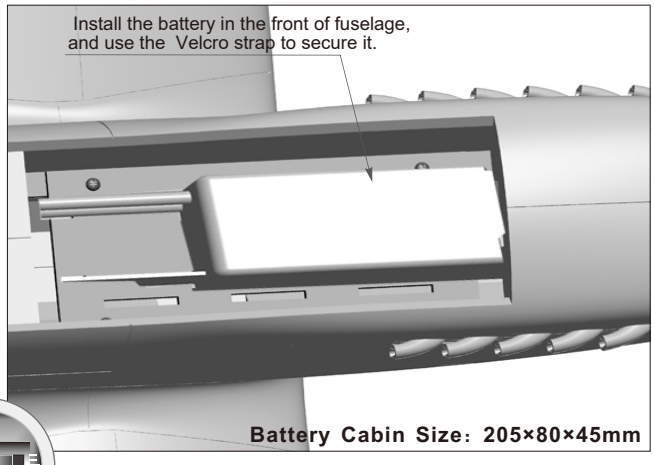
| Servo installing position | No. | Pos./Rev. | Servo cable length |
|---|---|---|---|
| Aileron servo (Left 9g plastic) | 1 | Positive | 450mm |
| Aileron servo (Right 9g plastic) | 2 | Positive | 450mm |
| Flap servo (Left 9g plastic) | 3 | **Reverse** | 250mm |
| Flap servo (Right 9g plastic) | 4 | Positive | 250mm |
| Rudder servo (9g MG) | 5 | Positive | 200mm |
| Elevator servo (9g MG) | 6 | Positive | 200mm |

### Servo connection

1. Use a Y-cable to connect these two servos, then insert the cable end into the aileron channel in the receiver.
2. Use a Y-cable to connect these two servos, and insert the cable end into the flap channel in receiver.
3. Use a Y-cable to connect the left/right landing gear, and insert the cable into the landing gear channel in receiver.

## Installing a Battery



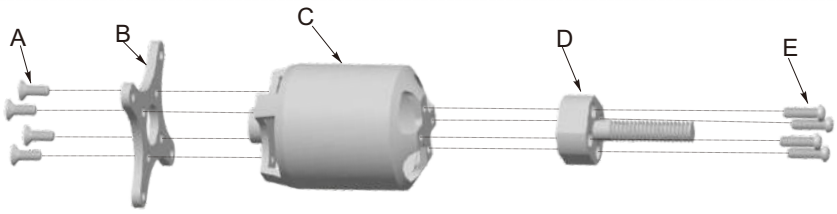




Before connecting the battery to the ESC, please power up the transmitter and make sure the throttle stick is in the lowest position.
Once the battery is connected and signal is confirmed, make sure there is nothing in front of the airplane or within the diameter of the propeller to avoid accidents and injury.

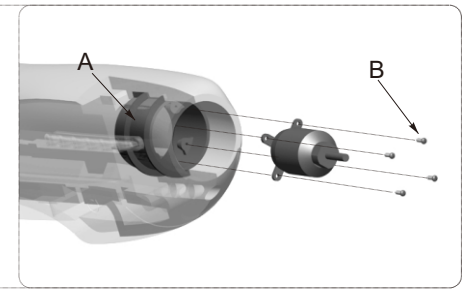
The battery capacity and discharge rate we advise is in the following:
4S 14.8V 2500mAh ~ 4S 14.8V 4000mAh
**Discharge rate of C ⩾ 30C**

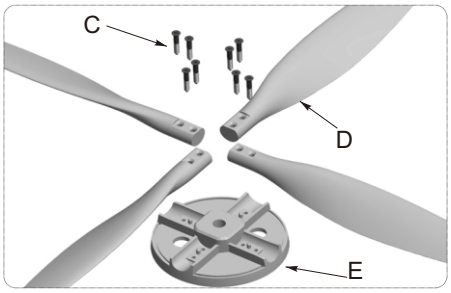
## Power System Installation

A-Screw (KM3×5mm 4pcs)
B-Motor X-fixed base
C-3748-580KV out-runner motor
D-Propeller folder
E-Screw (HM2.5×10mm 4pcs)

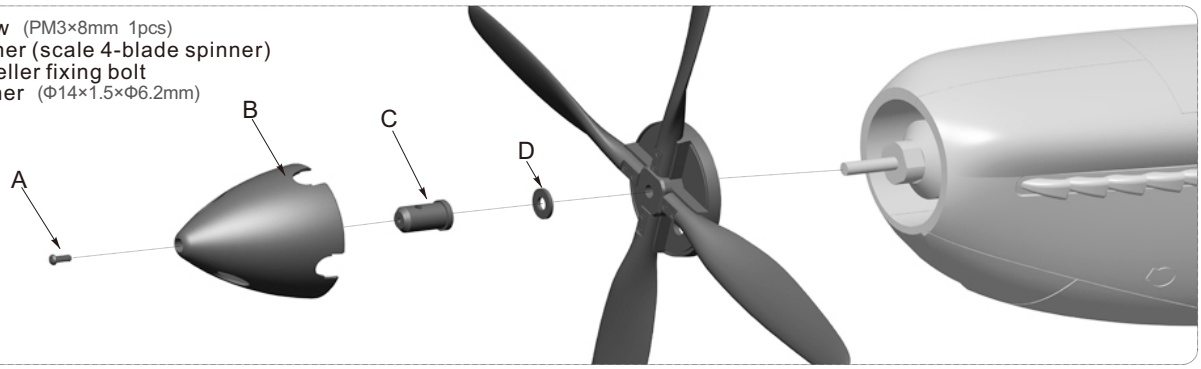



A-Motor fixed mount
B-Screw (PA3×10mm 4pcs)
C-Screw (PA2.3×16mm 8pcs)
D-Scale propeller (12x7, 4-blade )
E-Scale propeller fixed plate



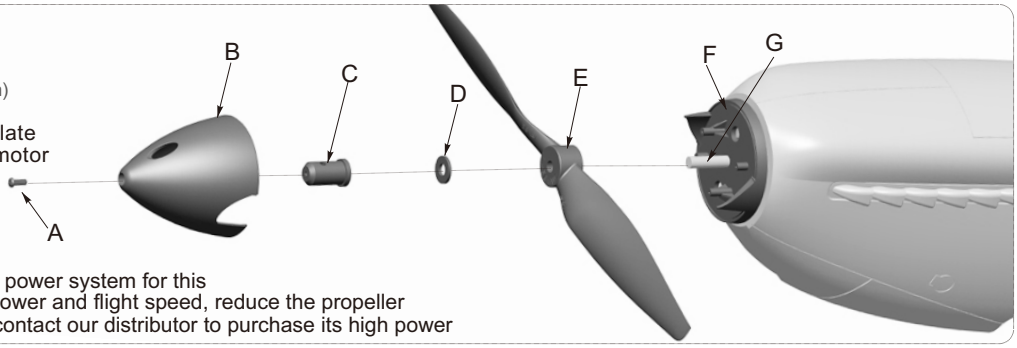




A-Screw (PM3×8mm 1pcs)
B-Spinner (scale 4-blade spinner)
C-Propeller fixing bolt
D-Washer (Φ14×1.5×Φ6.2mm)



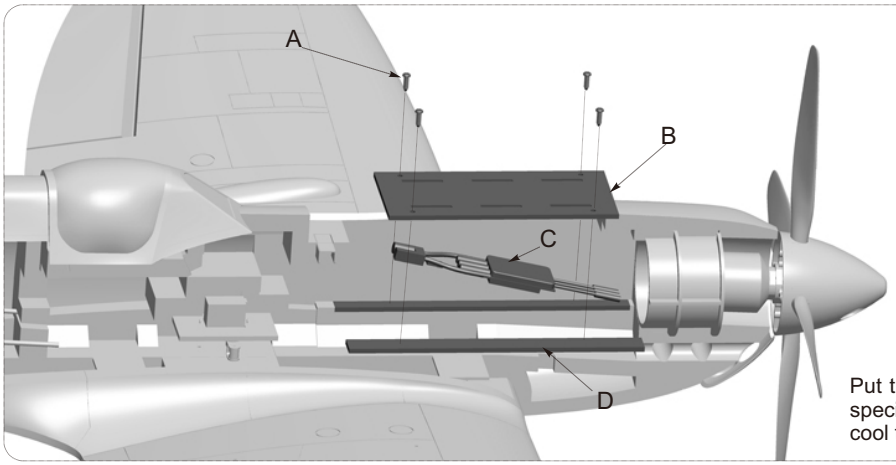

## Install 2-blade propeller high power system

A-Screw (PM3×8mm 1pcs)
B-2-blade spinner
C-Propeller fixing bolt
D-Washer (Φ14×1.5×Φ6.2mm)
E-2-blade propeller (12×8)
F-2-blade propeller fixed plate
G-3648-880KV brushless motor




We prepared a 2-blade high power system for this airplane, it can improve its power and flight speed, reduce the propeller replacement cost! You can contact our distributor to purchase its high power system.

## Installing the ESC



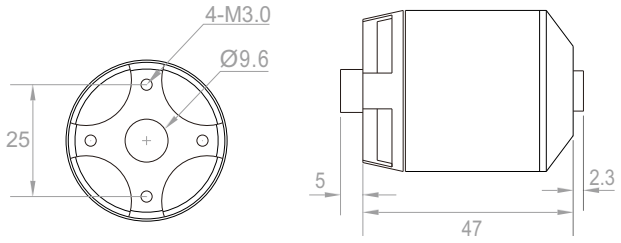

A-Screw (PWA3×8mm 4pcs)
B-Battery tray
C-ESC
D-Tray holder

Put the ESC under the battery tray There are specially designed ventilation ducts that will cool the electric equipment effectively.

## Motor Parameters

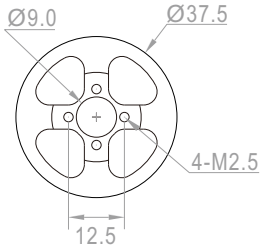
### Motor size

Unit: mm

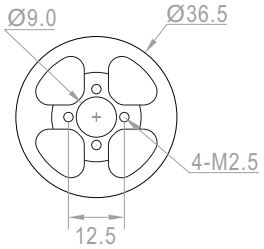



3748-580KV / 3648-880KV

Unit: mm



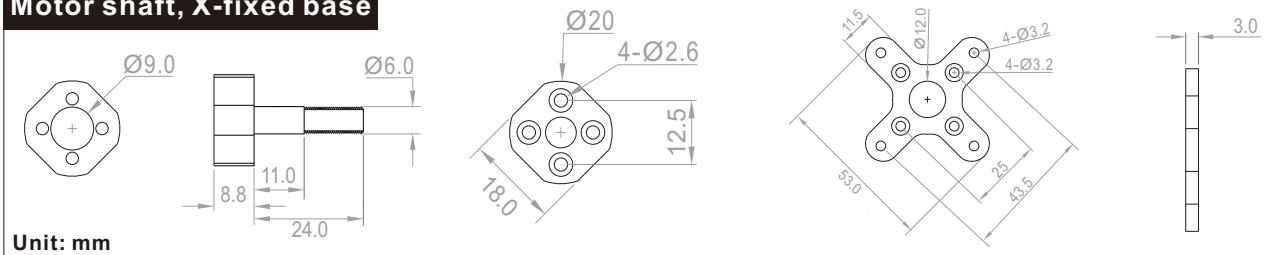

3748-580KV




3648-880KV

| Item No. | KV Value | Volate (V) | Current (A) | Pull (g) | Motor Resistance | Weight (g) | No Load Current | Propeller | ESC |
|---|---|---|---|---|---|---|---|---|---|
| MO137481 | 580RPM/V | 14.8 | 41 | 2500 | 0.02 Ω | 170 | 2.3A/10V | 4-Blade12×7 | ⩾60A |
| MO136484 | 880RPM/V | 14.8 | 53 | 2600 | 0.02 Ω | 165 | 2.3A/10V | 2-Blade12×8 | ⩾60A |

### Motor shaft, X-fixed base



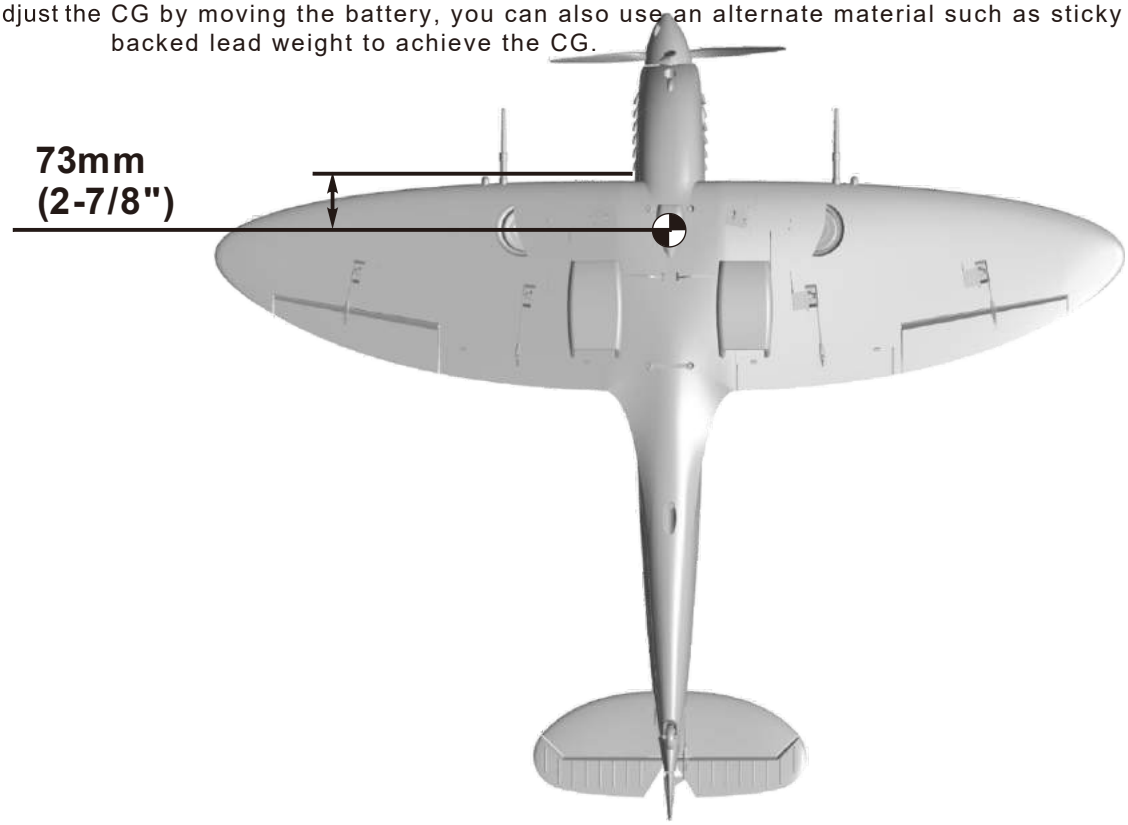

Unit: mm

## Center of Gravity

Correct center of gravity is directly related to the success of the flight, please refer to the following CG diagram to adjust your plane's center of gravity.

- You can move the battery forward or backward to adjust the center of gravity.

- If you can not adjust the CG by moving the battery, you can also use an alternate material such as sticky backed lead weight to achieve the CG.



## Control direction test

**After the build is complete with the propeller removed, power up the radio and connect a fully charged battery to the ESC. Use the radio to ensure proper control direction as shown in the diagrams below:**

### Aileron

Stick Left

Stick Right

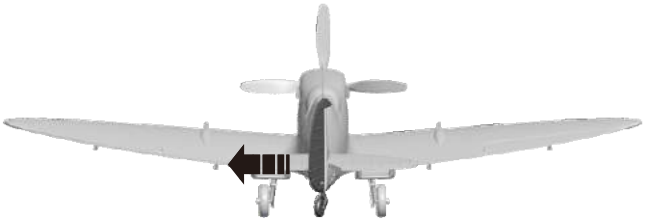
### Elevator

Up Elevator

Down Elevator

### Rudder

Stick Left



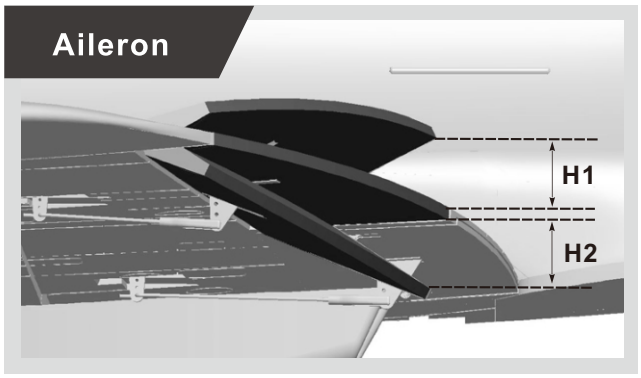
Stick Right

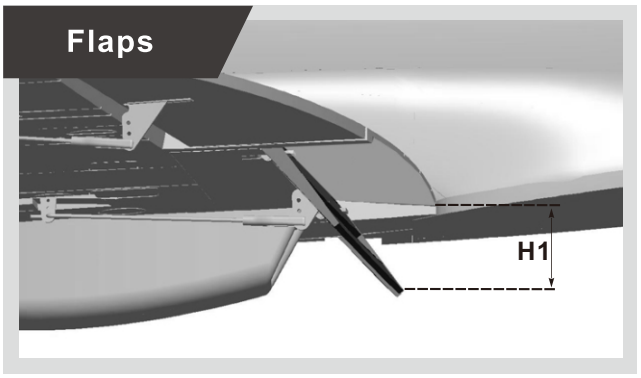
### Optional Flaps

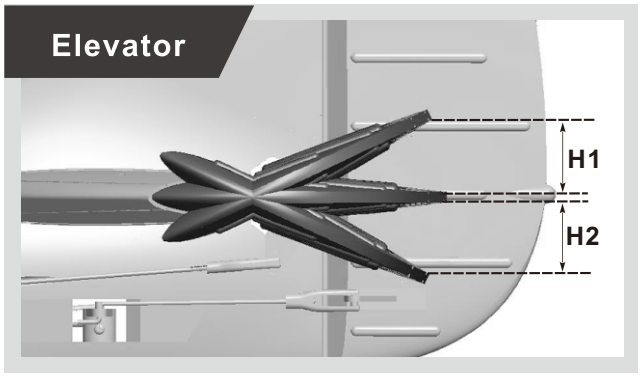
Flaps down

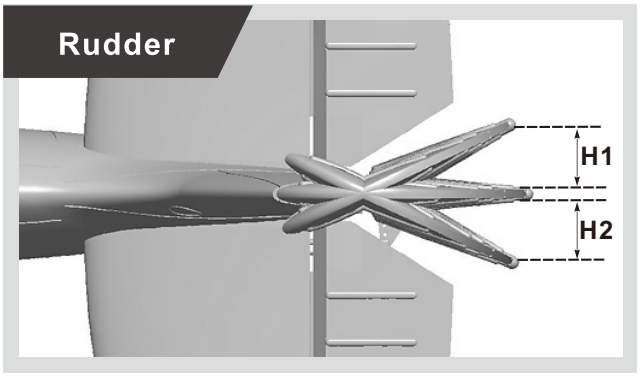
## Dual Rates

**According to our test results, the following rates proved to be a good starting point. Low rates are good for initial flights or less experienced pilots. Adjust rates to suit you own style.**



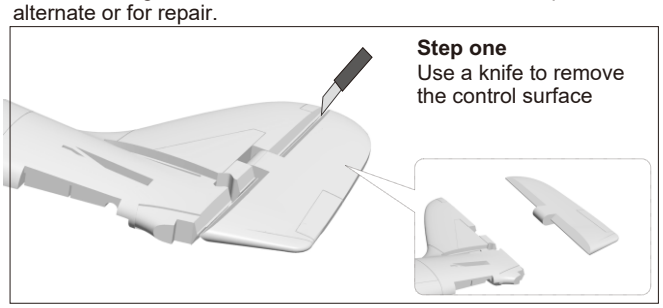



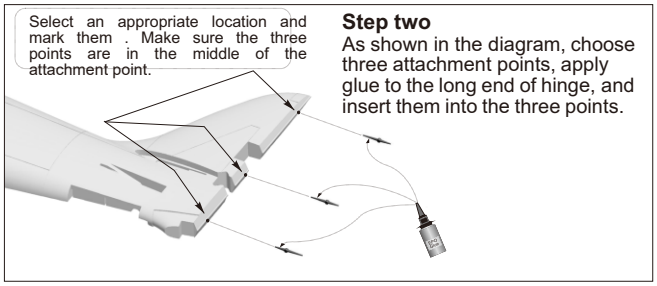

| | Aileron | Elevator | Rudder | Flaps |
|---|---|---|---|---|
| **Low Rate** | H1/H2 18mm/18mm<br>D/R Rate : 65% | H1/H2 13mm/13mm<br>D/R Rate : 65% | H1/H2 15mm/15mm<br>D/R Rate : 65% | H1 15mm |
| **High Rate** | H1/H2 28mm/28mm<br>D/R Rate : 100% | H1/H2 18mm/18mm<br>D/R Rate : 100% | H1/H2 22mm/22mm<br>D/R Rate : 100% | H1 28mm |

## Installing Plastic Hinges

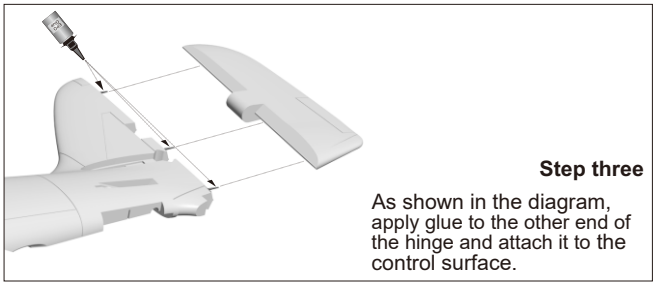
The control surfaces of this airplane use a no-hinge connection design. Although proven reliable, these type of hinges can be damaged due to errors, causing the control surface to become loose or separate. Included with this kit is a set of plastic hinges if you wish to use them as an alternate or for repair.



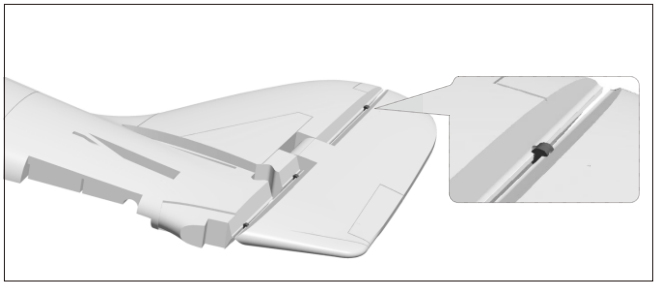
**Step one**
Use a knife to remove the control surface




**Step two**
As shown in the diagram, choose three attachment points, apply glue to the long end of hinge, and insert them into the three points.



**Step three**
As shown in the diagram, apply glue to the other end of the hinge and attach it to the control surface.



# Build Notes

Hey guys!
I've taken the time to check out both the build video and the Flight Video by Ryan Ramsay of Motion R/C as well as go through the posts on Hobby Squawk to try to gather any build/ flight tips that may help you  get through both successfully, with a minimum of trouble.
First off, most people, including Ryan are using the recommended factory CG and seem to be happy with it.  The go to battery would seem to fall between 3600 and 4000 positioned all the way forward.  When using a different battery, always check the airplane out on a CG machine to ensure that the CG hasn't changed. Also, ensure that your control surfaces are neutral.  Being off even a bit will cause the plane to pitch or roll.
When building the airplane, it is recommended that you skip steps one and two until the wing is secured to the fuselage. Also, bind the receiver to the radio and set your rudder and elevator neutral positions before installing the wing.  It has been noted on Hobby Squawk that the radiators and guns are side specific, so ensure that you have the correct gun and radiator  for the correct side before gluing. It's also recommended that you use 30% expo for the first flight and then adjust to your personal taste.
For the build video, go to:
https://www.youtube.com/watch?v=FwdesiWtOSU&feature=youtu.be
and check out Hobby Squawk for the latest updates.

Happy Landings!

Dan

**Dongguan Freewing Electronic Technology Ltd**
**HK Freewing Model International Limited**

Add.:FeiYi Building,face to Labor Bureau, Fumin Middle Road, Dalang Town,
Dongguan City，Guangdong Province, China
Web: http://www.sz-freewing.com
Email:freewing@sz-freewing.com
Tel: 86-769-82669669 Fax:86-769-82033233

东莞市飞翼电子科技有限公司
香港飞翼模型国际有限公司
地址：广东省东莞市大朗镇富民中路402-408号飞翼楼四楼
Web: http://www.sz-freewing.com
Email:freewing@sz-freewing.com
Tel: 86-769-82669669 Fax:86-769-82033233