www.freewing-model.com

F-22 RAPTOR

User Manual

70mm EDF JET

Wingspan:816mm
Length:1150mm
Empty Weight:1740G[w/o Battery]

Freewing F-22 introduction www.freewing-model.com

Thank you for purchasing our Freewing 70mm EDF super scale jet, F-22 Raptor. Before you assemble this F-22 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.

The F-22 Raptor is a single seat, twin engine, high stealth, supersonic fighter jet launched by Lockheed Martin in the United States. It is the world's first fifth generation fighter jet to enter service. This Freewing 1/16.5 scale F-22 Raptor 70mm EDF electric model jet uses EPO material, length is 1150mm, wing span is 817mm and uses the plastic structure and carbon tubes to strengthen.Standard grey camouflage color scheme used silver and grey color with a good metallic texture. The mold uses a concave convex pattern production process to make the surface of the aircraft appear more three-dimensional, presenting the concave convex details of the real fighter maintenance hatch. The vulnerable parts such as the fuselage and wings are protected with plastic covers to prevent damage. From a visual perspective, the edges appear sharper.

The PNP version can be assembled without glue. Among them, the main wing adopts the screw-less "QUICK" portable install structure. It makes the use and storage of the aircraft more convenient. The Freewing F-22 Raptor model jet uses electric retractable landing gear, while further improving the quality of the landing gear structure, with overall higher strength and smoother damping. In addition, it also includes front landing gear doors controlled by the servo, further reducing drag during flight. This model jet includes the rudder, aileron, flap and full elevator. When PNP at factory, it pre-installed with a 70mm 12 blade duct fan, a 2957-2210KV brushless in-runner motor, and an 80A ESC. Under this configuration, the maximum level flight speed reaches 170KM/H, and the powerful power brings a more enjoyable flying experience!

From the actual flying experience, the F-22 Raptor 70mm EDF model jet is very suitable as a beginner model jet. It has excellent flight stability, even in a low-speed cruising state at 30% throttle, still with excellent performance. Powerful power and fast power response make it very easy to complete various routine flight maneuvers. With the use of flaps, the aircraft can land at a slower speed and shorten the landing distance.

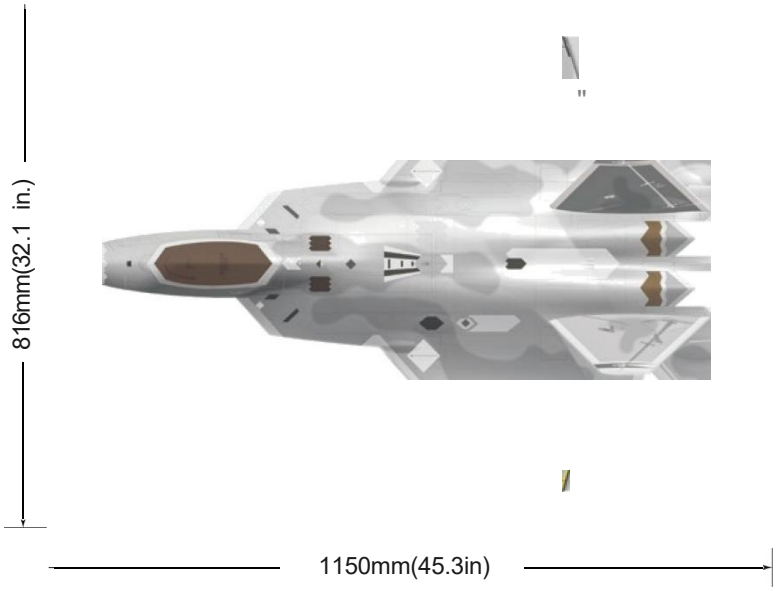
Thank you again. I hope this new F-22 Raptor model jet can bring you a better experience. I wish you a successful flight!

Note: www.freewing-model.com

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 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.

Product Basic information

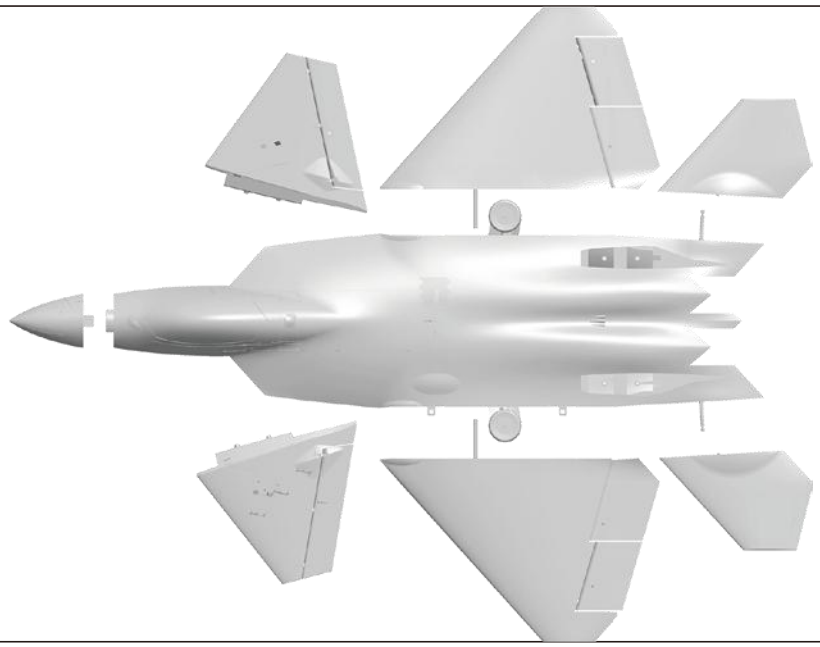


Wingload : 150 g/dm*
Wing Area: 15.2dm^2
Servo: 9gHybrid digital servo(9pcs)
9gDigital plastic servo(1pcs)
Motor: 2957-2210KV I/R Motor
Ducted fan: 70mm 12-blade fan
ESC : 80A Brushless(7A UBEC)
Weight: 1740g(w/o Battery)

Landing gear: Electric landing gear
Li-Po Battery: 6S 3500-5000mAh

N Ote. The paran3eters n here are derived fram test resu t us ng ou accessories
If use other accessories. the test result will be dillerent. Any problem since of risiil g other accessories. we are not able to piovide technical support.

Package List



Different equipment include different spareparts. Please refer to the foilowing contents to check your sparep art list.

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

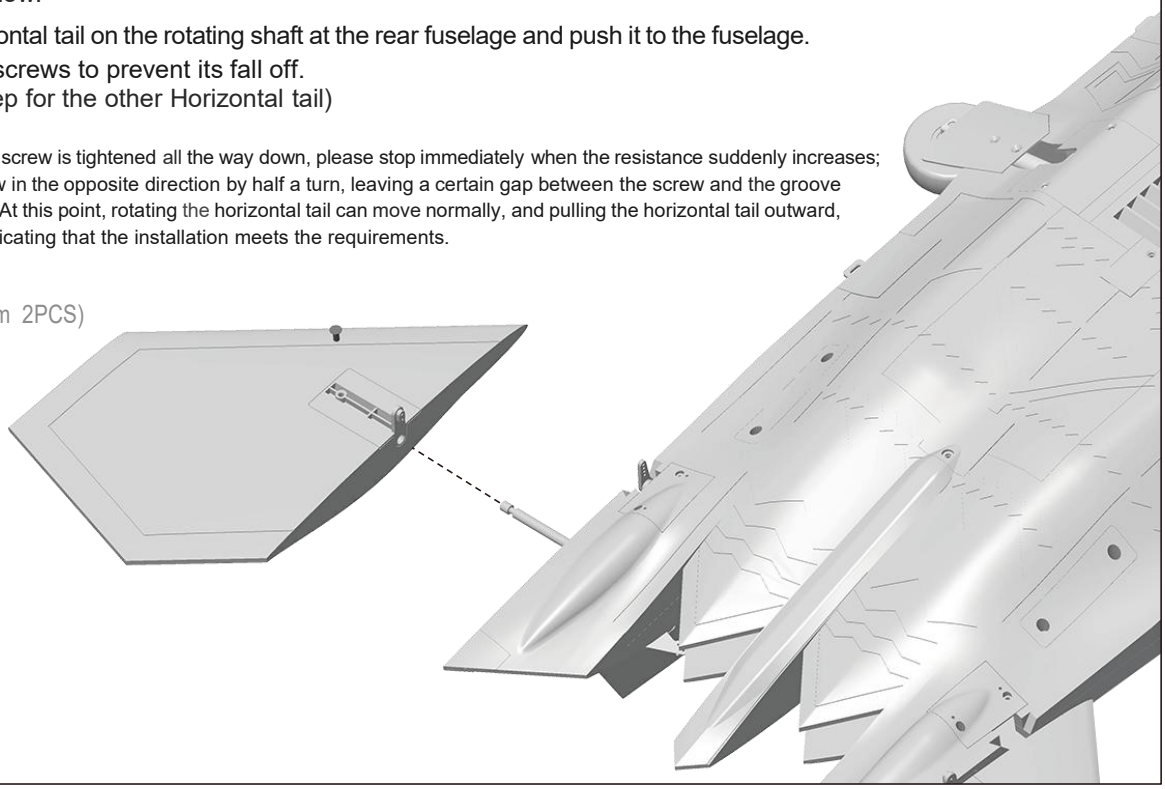
Install Horizontal Tail

As the photo show:

I.Place the horizontal tail on the rotating shaft at the rear fuselage and push it to the fuselage.
Then fix with screws to prevent its fall off.
(Repeat this step for the other Horizontal tail)

Attention: When the screw is tightened all the way down, please stop immediately when the resistance suddenly increases; Then twist the screw in the opposite direction by half a turn, leaving a certain gap between the screw and the groove of the rotating shaft.At this point, rotating the horizontal tail can move normally, and pulling the horizontal tail outward, it will not fall off, indicating that the installation meets the requirements.

Screw (KM 3*6mm 2PCS)



Install Main Wing

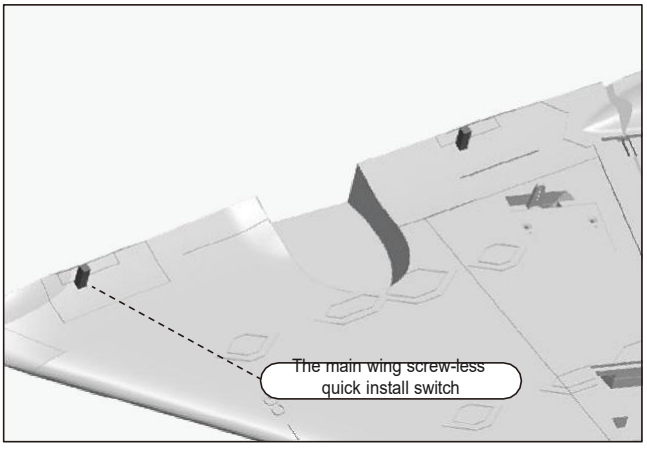
As the photo show:

1. Press the main wing screw-less quick install switch to unlock it ,

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)

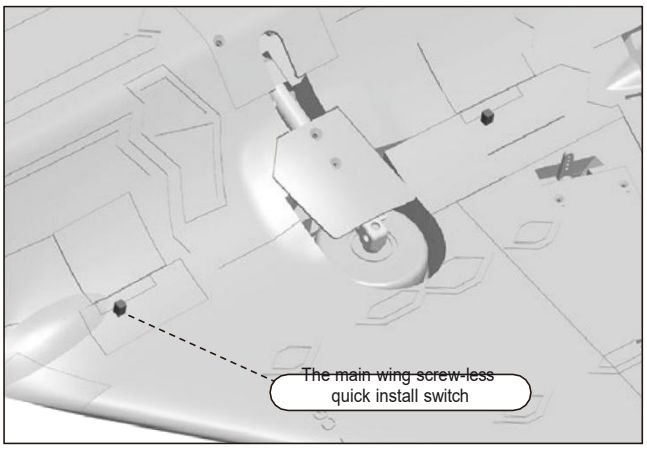
Unlock status

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.



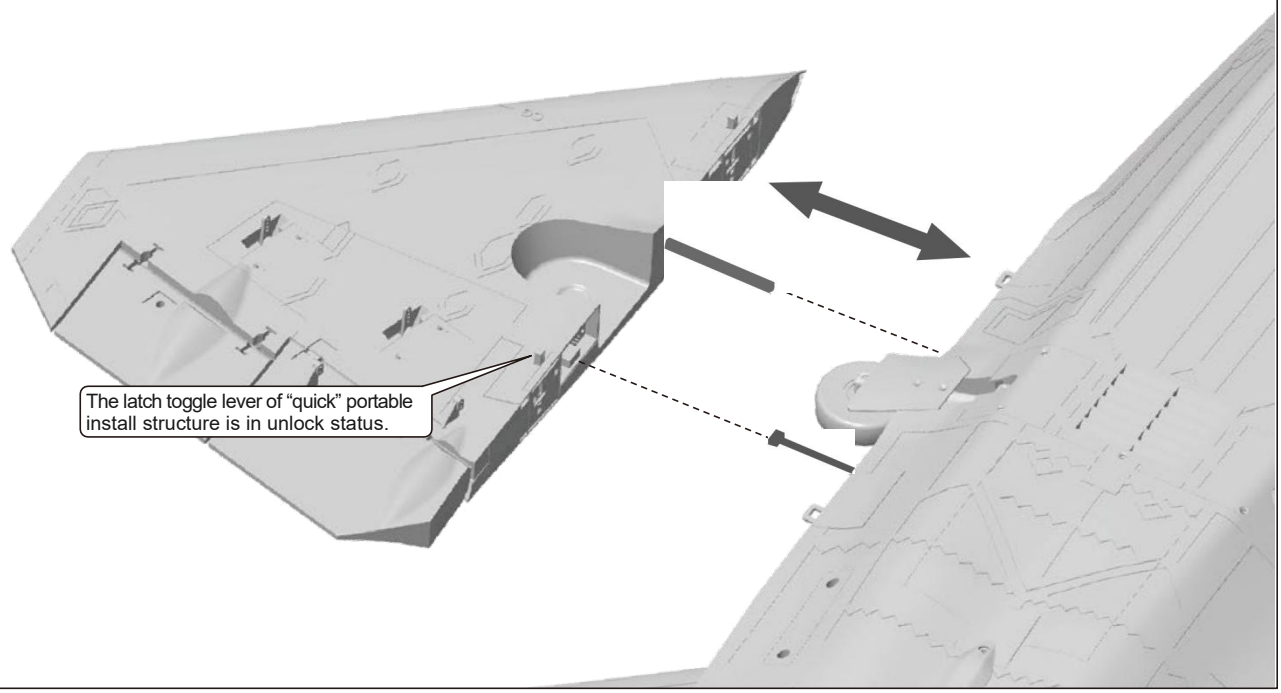
Lock status

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.



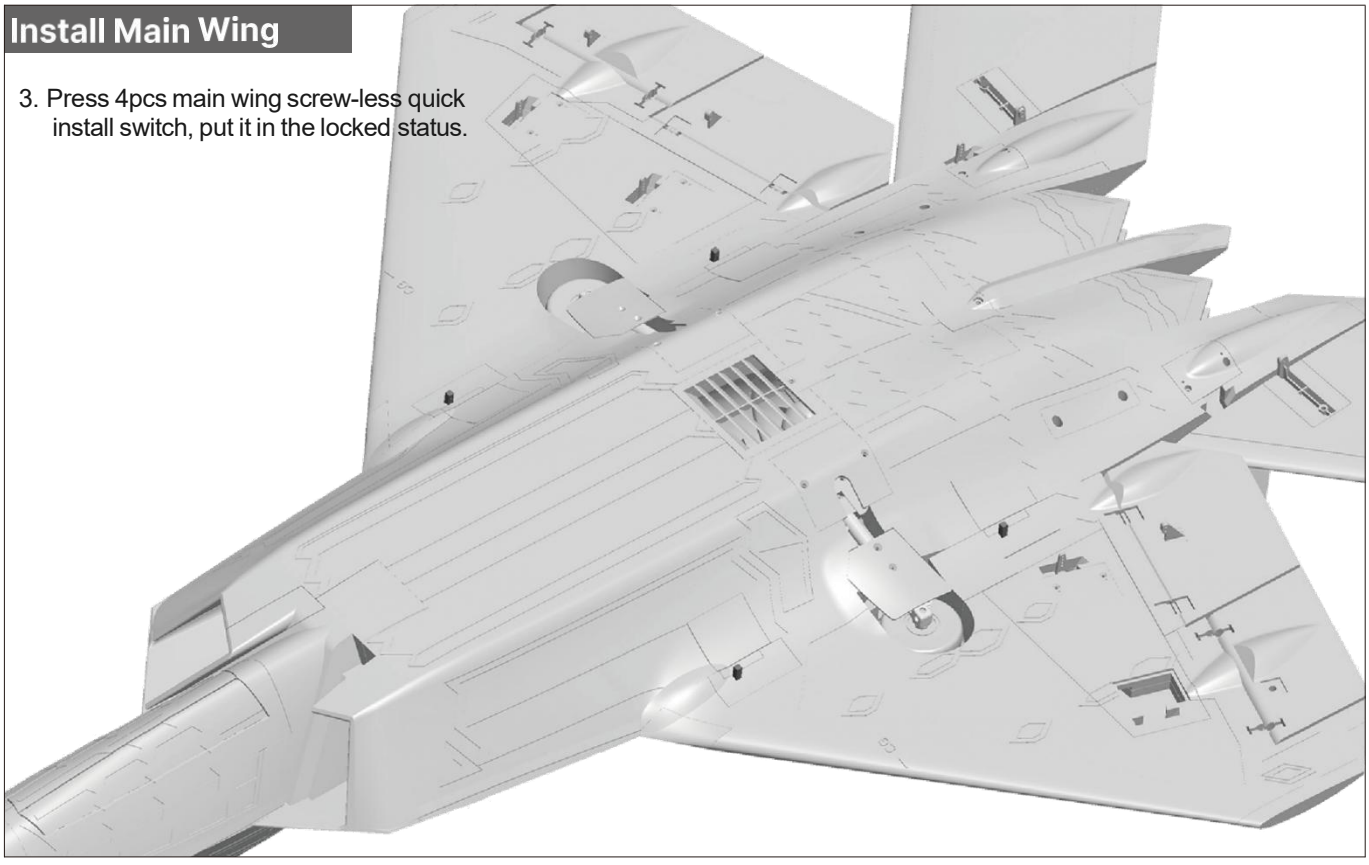
Install Main Wing

2. Align the main wing carbon tube with the fuselage, remove the ribbon cable from one end of the fuselage, connect it to the main wing slot, and push the main wing into the installation position of the fuselage; (Repeat this step for the other main wing)



Install Main Wing

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

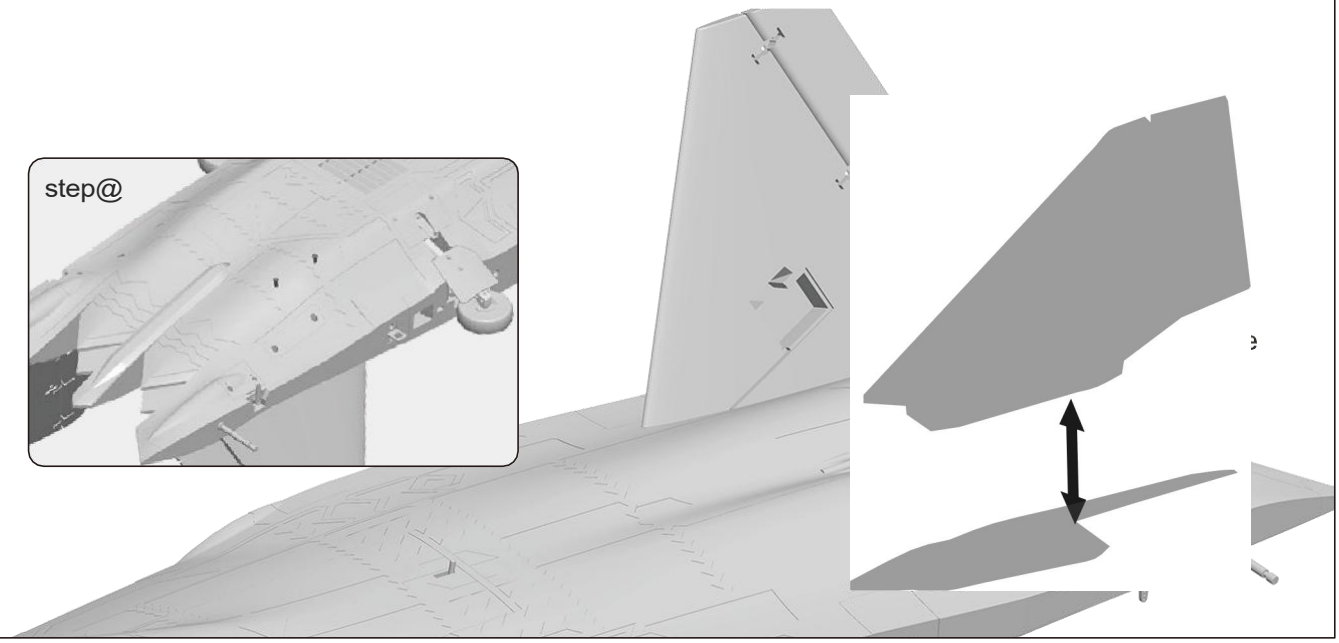


Install Vertical Tail

As the photo show:

1. Connect the vertical tail servo cable to the servo extension cable, ensuring that the extension cable clamp is fully hooked onto the servo cable plug;
2. Insert the vertical tail into the fuselage, turn over the fuselage, and then tighten it with screws. (Repeat this step for the other vertical tail)

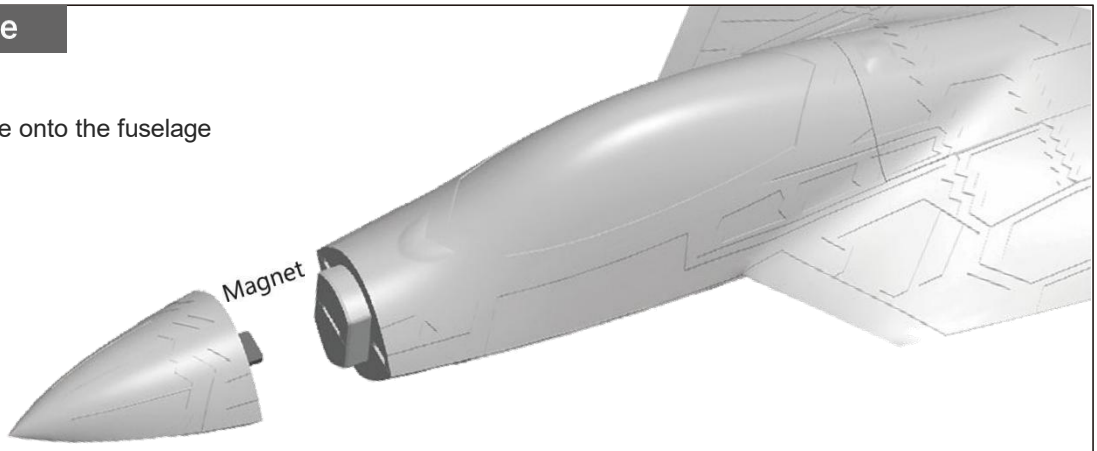
Screw (KM3*6mm 4PCS)



Install Nose Cone

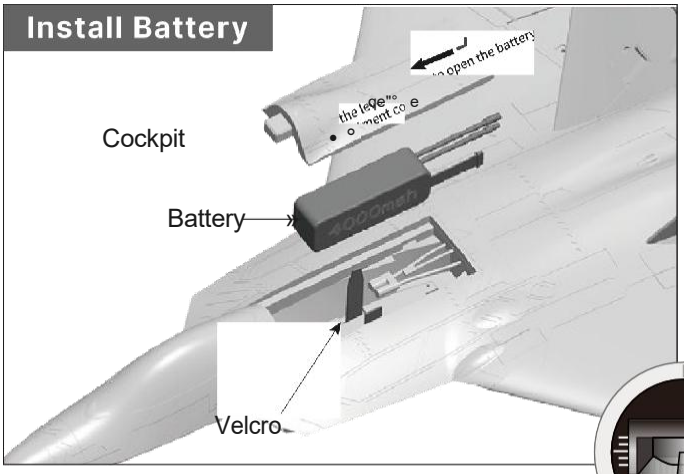
As the photo show:

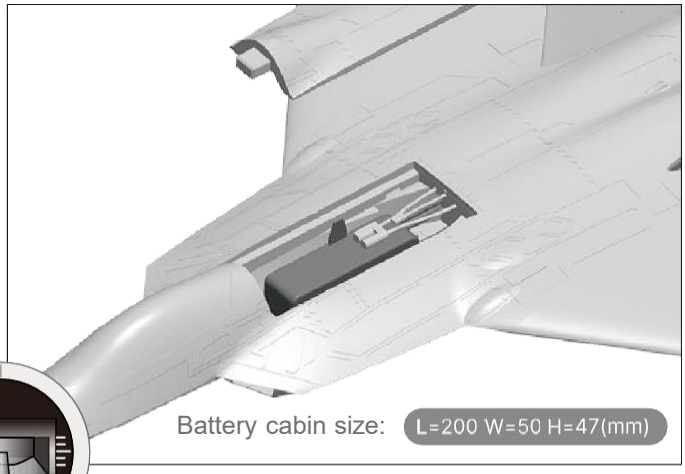
1. Install the nose cone onto the fuselage



PNP Assembly Instructions

Install Battery



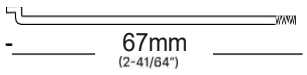


Before connecting the battery and receiver, please switch on the transmitter power and make sure the throttle stick is in the lowest position. Bind your receiver to your transmitter according to your transmitter's instruction manual.

We recommend the following LiPo battery:
6S 22.2V 3500mAh-6S 22.2V 5000mAh (1pcs)
Discharge rate of C z35C

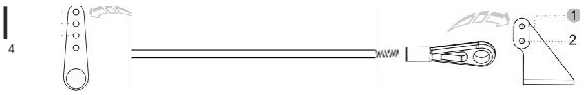
Pushrod Instructions

Aileron pushrod length

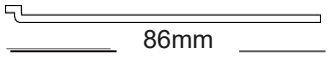


Pushrod diameter 0 1.2mm

Aileron puehrod mounting hole



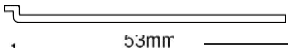
Rudder puehrod length



Pushrod diameter 0 1.2mm

Rudder puehrod **mounting hole**

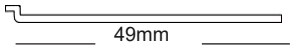
Flap pushrod length



Pushrod diameter B 1.2mm

Flap pushrod **mounting** hole(Inside)

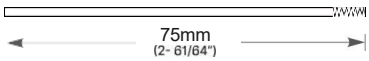
Elevator puahrod length



Pushrod diameter 0 1.2mm

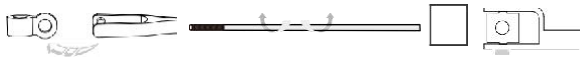
Elevator puahrod mounting hole

Noae gear steering puehrod length

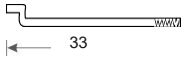


Pushrod diameter 0 1.2mm

Noae gear steering puahrod mounting hole



Nose Cabin door pushrod length



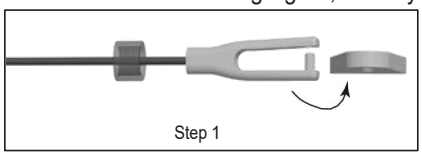
Pushrod diameter 0 1.2mm

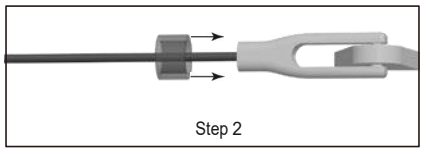
Nose **cabin door** pushrod **mounting** hole

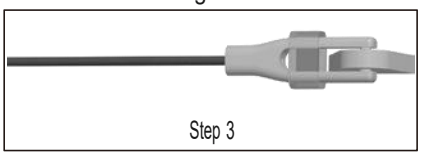
Important additional notes

The Y-type clevis used in this product is equipped with a transparent silicone ring for secondary reinforcement, which can effectively prevent the clevis from accidentally loosening.

As shown in the following figure, when you buckle the clevis into the control surface horn, use the silicone ring to cover the clevis.





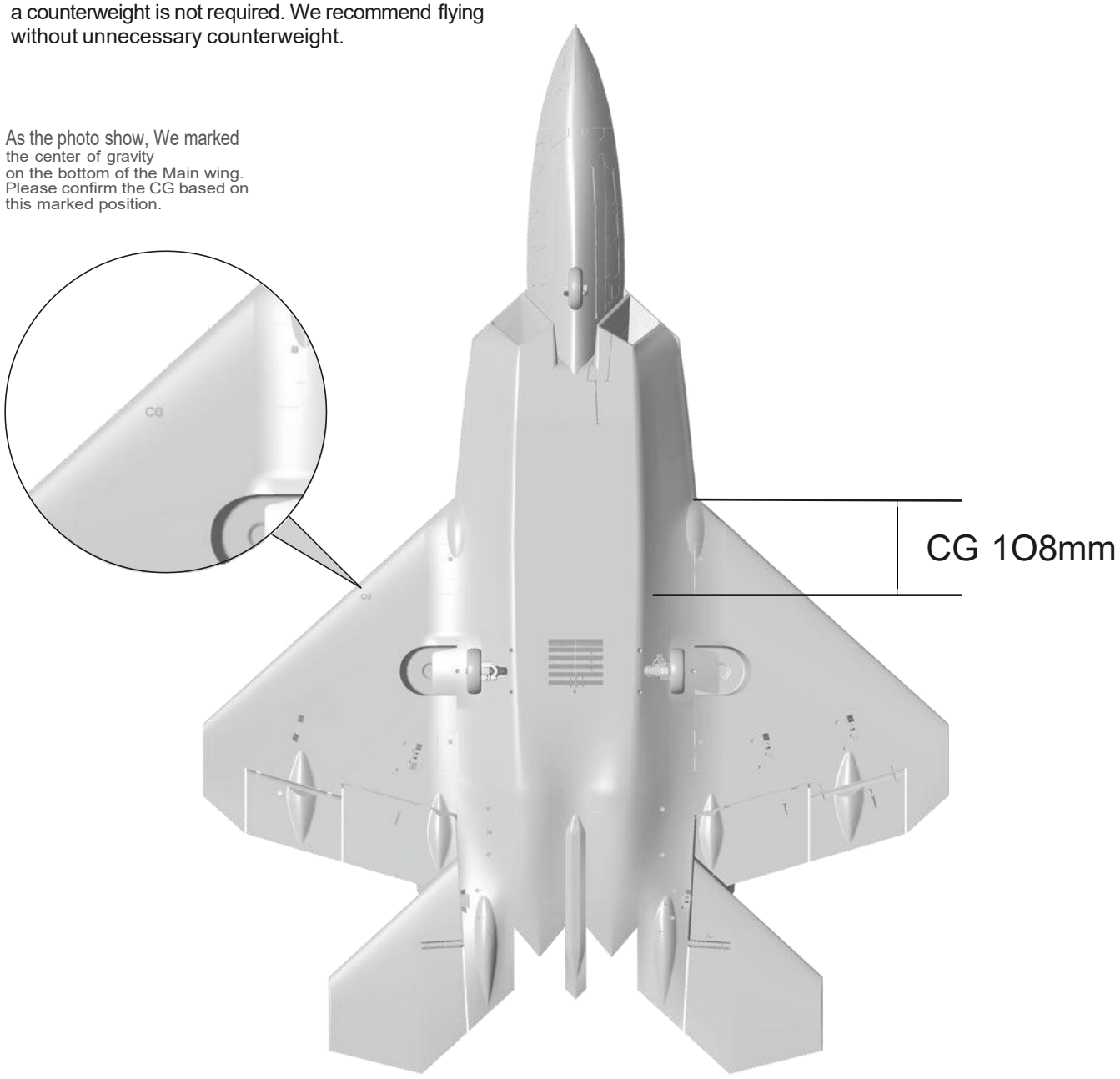


Center of Gravity

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.



PNP Parameter Setting

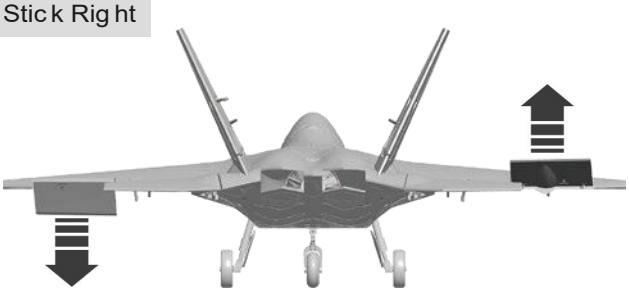
After installed this F22 model plane, please connect to the receiver and power on, then adjust it.

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.

Aileron

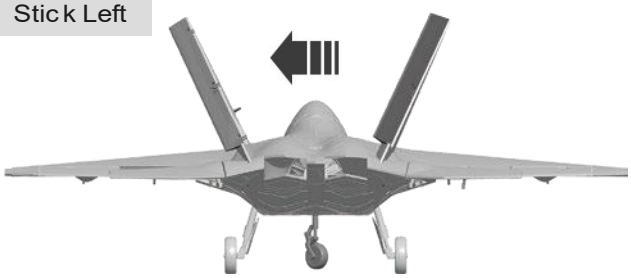
Stick Left

Stick Right

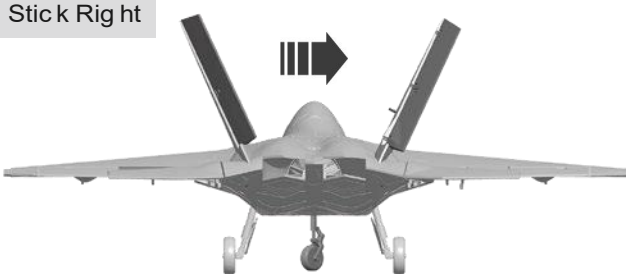


Rudder

Stick Left

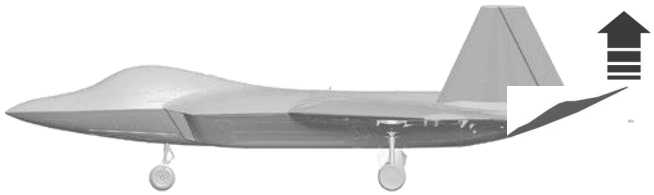


Stick Right

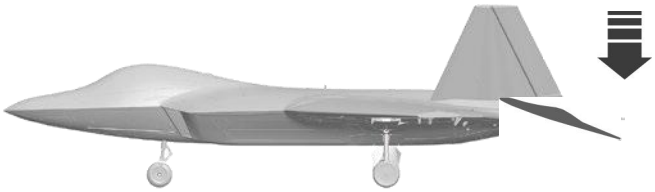


Elevator

Stick down

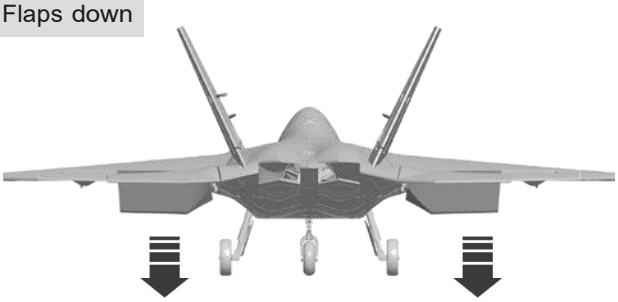


Stick up



Flaps

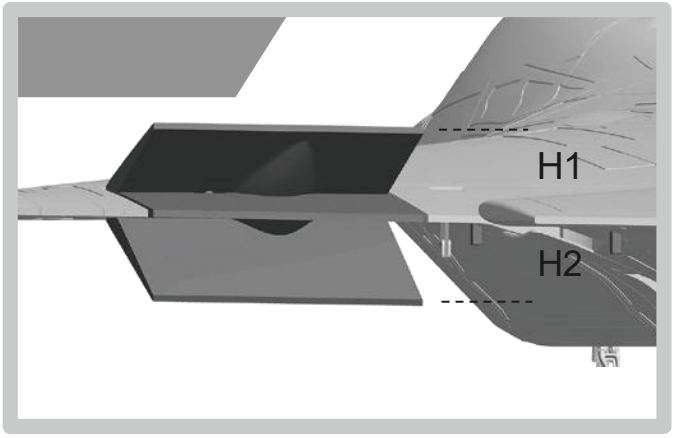
Flaps down

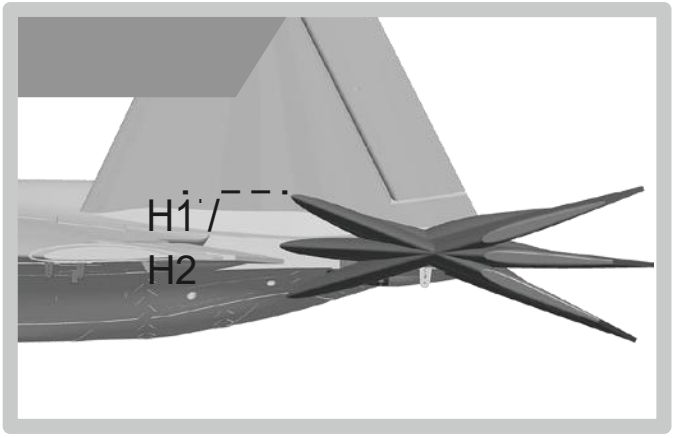


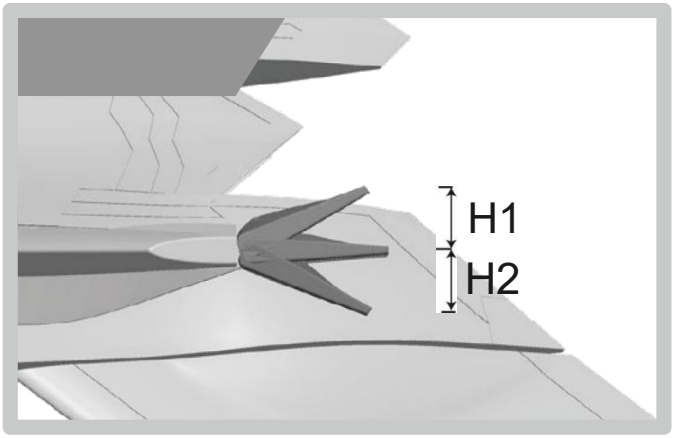
Control direction test

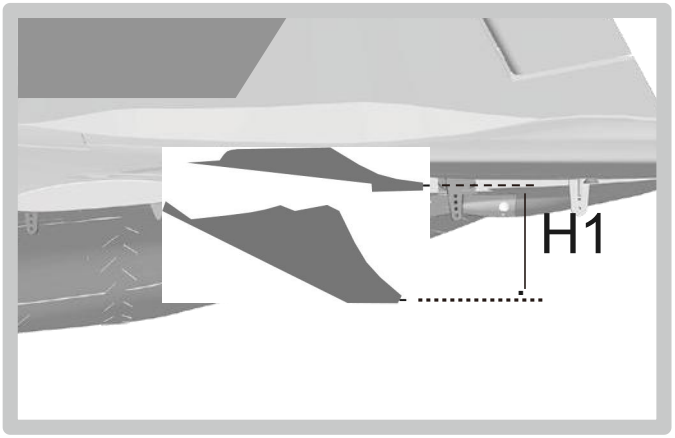
Dual Rates

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.





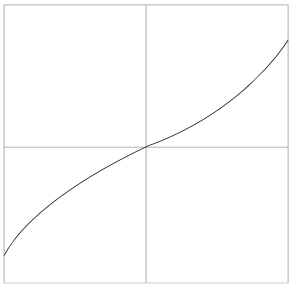




	Aileron (Measured closest to the fuselage)	Elevator (Measured closest to the fuselage)	Rudder (Measured from the bottom)	Flaps
Low Rate	H1/H2 25mm/25mm D/R Rate: 80%	H1/H2 23mm/23m m D/R Rate: 60%	H1/H2 16mm/16mm D/R Rate: 80%	H1 24mm
High Rate	H1/H2 30mm/30mm D/R Rate: 100%	H1/H2 29mm/29m m D/R Rate: 80%	H1/H2 23mm/23m D/R Rate: 100%	H1 33mm

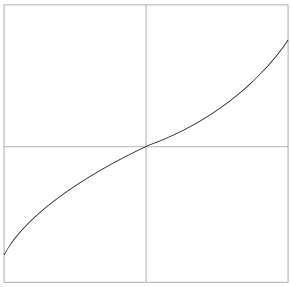
Remote Control EXP Setting Suggestion

1.Aileron EXP curve is shown as below : ,



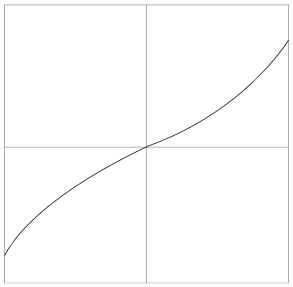
Futaba brand Remote Control : EXP A -30
EXPB -30
Spektrum brand Remote Control : EXPO 30% 30%

2.Elevator EXP curve is shown as below :,



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

3.Rudder EXP curve is shown as below :

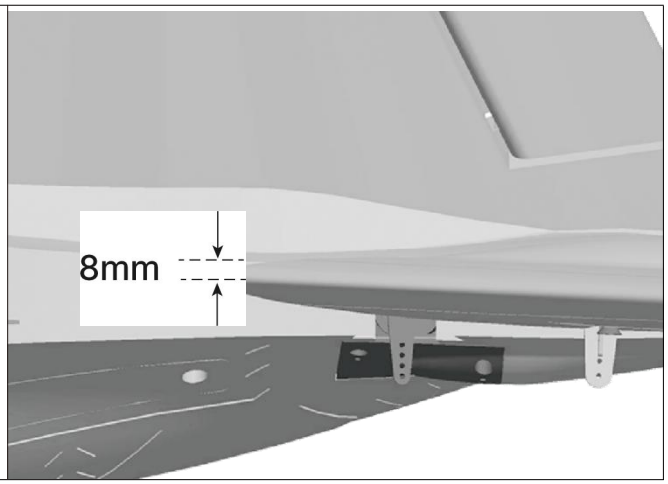


Futaba brand Remote Control : EXP A -30
EXPB -30
Spektrum brand Remote Control : EXPO 30% 30%

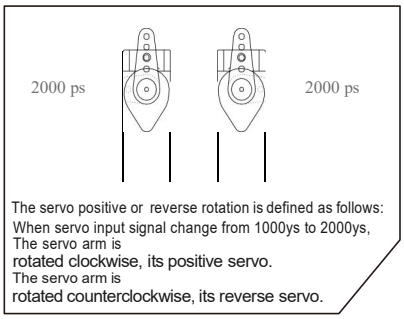
horizontal tail center position

1. Please refer to the image on the right and adjust the horizontal tail to the correct center position.

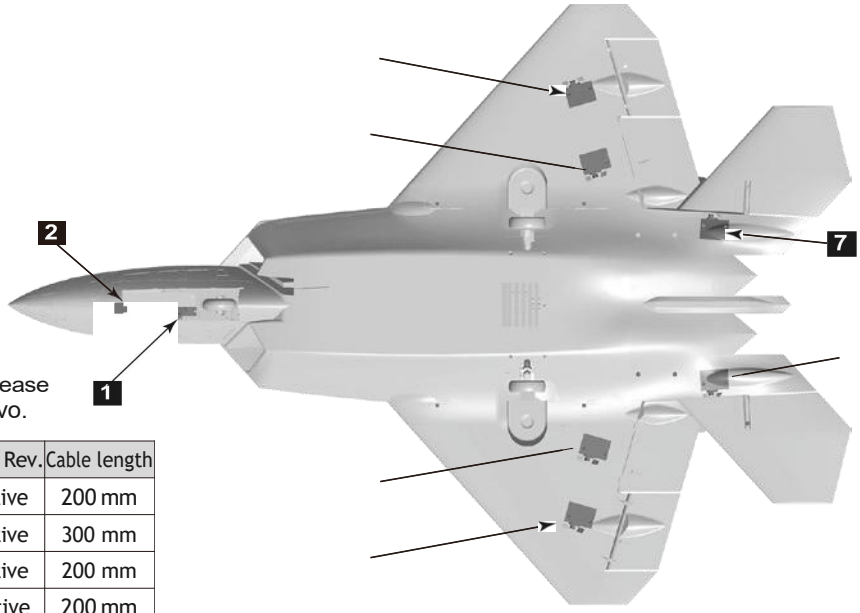
Distance from the leading edge of the horizontal tail wing root (at the forefront position) to the upper surface of the fuselage: 8mm



Servo Direction

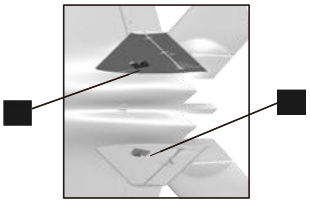


The servo positive or reverse rotation is defined as follows:
When servo input signal change from 1000ys to 2000ys,
The servo arm is
rotated clockwise, its positive servo.
The servo arm is
rotated counterclockwise, its reverse servo.



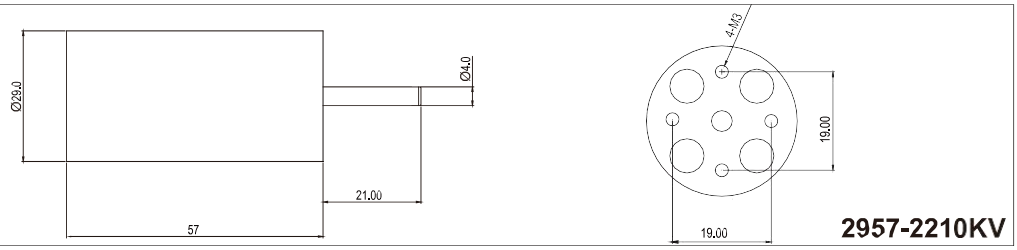
If you need to purchase another brand's servo, please refer to the following list to choose a suitable servo.

Position	Servo regulation	No.	Pos. / Rev.	Cable length
Nose gear steering servo	9g Digital-Hybrid	1	Positive	200 mm
Nose cabin door	9g plastic servo	2	Positive	300 mm
Aileron(L)	9g Digital-Hybrid	3	Positive	200 mm
Aileron(R)	9p Digital-Hybrid	4	POsitive	200 mm
Flap(L)	9p Digital-Hybrid	5	Positive	100 mm
Flap(R)	9g Digital-Hybrid	6	Positive	100 mm
Elevator(L)	9g Digital-Hybrid	7	POsitive	100 mm
Elevator(R)	9p Digital-Hybrid	g	Reverse	1 0 0ITI iTl
Rudder(L)	9p Digital-Hybrid	9	Positive	100 mm
Rudder(R)	9p Digital-Hybrid	10	Positive	100 mm



Motor Specification

Item No.MI029571
2957-2210KV



Item No.	Motor size	MOtOF(KV)	Thrust(g)	Current(A)	Use Voltage (V}	Use ESC (A)	EDF Weight (g)	Max power (W)	Efficiency (g/w)
E7218	2957-2210KV	2210KV	2600	70	22 2 (6S)	80	240	1550	1 68