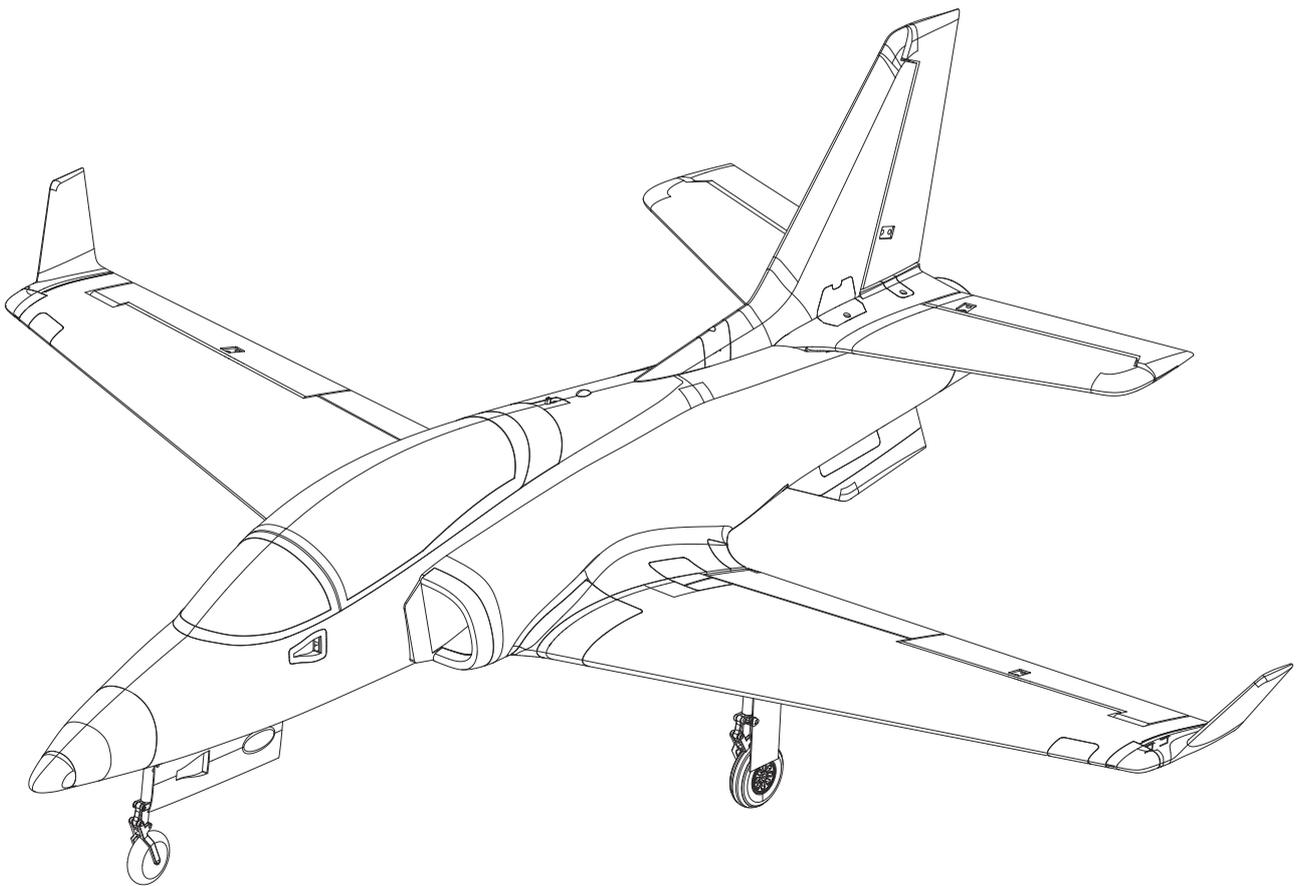




90mm Viper



Instruction Manual

操作手册

REALISTIC
• Retract & Flaps Installed

RIGID
• Strong durable EPO

STABLE
• Smooth flying performance

FMSMODEL.COM

WARNING

WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product and NOT a toy. It must be operated with caution and common sense and failure to do so could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision.

This manual contains instructions for safety operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual prior to assembly, setup or use, in order to operate and avoid damage or serious injury.

Safety precautions and warnings

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others. This model is controlled by a radio signal subject to interference from many sources outside your control. This interference can cause momentary loss of control so it is advisable to always keep a safe distance in all directions around your model, as this margin will help avoid collisions or injury.

Age Recommendation: Not for children under 14 years. This is not a toy.

- Never operate your model with low transmitter batteries.
- Always operate your model in an open area away from cars, traffic or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model in populated areas for any reason.
- Carefully follow the directions and warnings for this and any optional support equipment you use (chargers, rechargeable battery packs, etc.)
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.
- Never lick or any place of any your model in your mouth as it could cause serious injury or even death.

Safety**Lithium Polymer (Li-Po) Battery Warning**

CAUTION: Always follow the manufacturer's instructions for safe use and disposal of batteries. Fire, property damage, or serious injury can result from the mishandling of Li-Po batteries.

- By handling, charging or using a Li-Po Battery you assume all risks associated with lithium batteries.
 - If at any time the batteries begin to swell or balloon, discontinue use immediately!
 - Always store the batteries at room temperature in a dry area to extend the life of the battery. Always transport or temporarily store the battery in a temperature range of 40-120F. Do not store the battery or model in a car or in direct sunlight. If stored in a hot car, the battery can be damaged or even catch fire.
 - Never use a Ni-Mh Charger to charge Li-Po Batteries. Failure to charge the battery with a Li-Po compatible charger may cause fire resulting in personal injury and property damage.
 - Never discharge Li-Po Cells below 3V.
 - Never leave charging batteries unattended.
 - Never charge damaged batteries.
- Charging the Flight Battery Warning**
- Use a battery charger that is designed to safely charge the Li-Po Battery. Read the charger instructions carefully before use. When charging the battery, make certain the battery is on a heat resistant surface. It is also highly recommended to place the Li-Po Battery inside a fire resistant charging bag readily available at hobby shops or online.

Introduction

The FMS 90mm Viper is an upgrade from the best-selling 70mm Viper, designed to provide the look and performance of a jet fighter with the stability of a low-wing sport aircraft, so that more pilots of all levels can enjoy the fun of EDF aircraft.

The combination of FMS high-efficiency 90mm 12-blade EDF unit, high-power 3670-KV1950 inner running motor and high-quality 120A ESC provides unparalleled performance to the aircraft, and the throttle can respond instantly, making the sound very immersive. When paired with 6S 5000- 6000mAh 45C battery, the top speed could hit 120+ MPH.

The 90mm Viper has a superior structure, which complements the power system, enabling it to perform well in both high-speed and low-speed flight. It can fly leisurely, fly fast, and even aerobatics - the 90mm Viper is extremely manoeuvrable and can effortlessly perform most aerobatic maneuvers such as rolls, somersaults, and side spins

The 90mm Viper adopts the latest assembly structure and techniques, such as screw-together airframe, ball-linked control surfaces, high strength spars, multi-connector, so that it can be assembled in a very short time. In addition, the electronic retracts in the locked-rotor mode and the CNC-processed kneeling structure metal landing gear set are used to effectively resist violent landing; the large-sized durable tires are used to facilitate the take-off and landing on various grounds such as cement roads, grass, sand, etc.

No matter whether you have collected Vipers before, this newly launched FMS 90mm Viper EDF is very worth looking forward to. It can give you a refreshing experience in terms of details and performance. It is the best choice for players to experience large-scale aircraft.

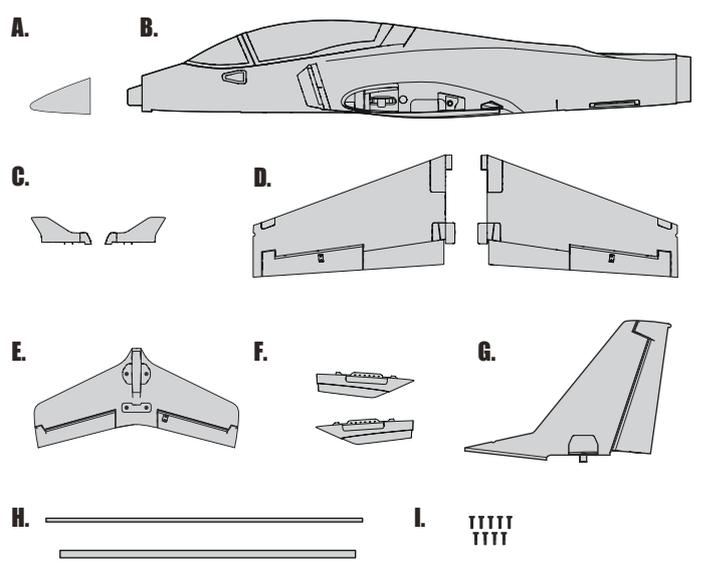
Features :

- Electronic configuration: high-quality 120A ESC, high-power 3670 KV1950 inner running motor, high-efficiency 90mm 12 -blade EDF unit, high-precision metal digital servos.
- The extremely wide performance range and speed range can be used for leisure flying and aerobatics, and the overall take-off, flight and landing process is easy and smooth.
- The locked-rotor mode electronic retracts with overcurrent protection function and the CNC-processed kneeling structure metal landing gear set, effectively resist violent landing
- Functional navigation lights.
- Functional flaps
- The buckle structure design effectively prevent the cockpit from falling off during flight.
- The large size battery compartment is convenient for placing batteries of different sizes from different manufacturers.
- Large size durable tires for taking off and landing on rough ground.
- Preinstalled ball-linked control horns for accurate and precise movements.
- Screw assembly structure, , eliminating the trouble of applying glue

Kit contents

Before assembly, please inspect the contents of the kit. The photo below details the contents of the kit with labels. If any parts are missing or defective, please identify the name or part number (refer to the spare parts list near the end of the manual) then contact your local shop or email us: support @fmsmodel.com.

Specifications
Wingspan: 1400mm /55in
Overall Length: 1280mm /50.4 in
Flying Weight: Around 3250g
Motor Size: 3670 KV1950
Wing Load: 107.6g/dm²
Wing Area: 30.2dm²
ESC: 120A
Servo: 13g X 8
Recommended Battery: 22.2V 5000-6000mAh 45c

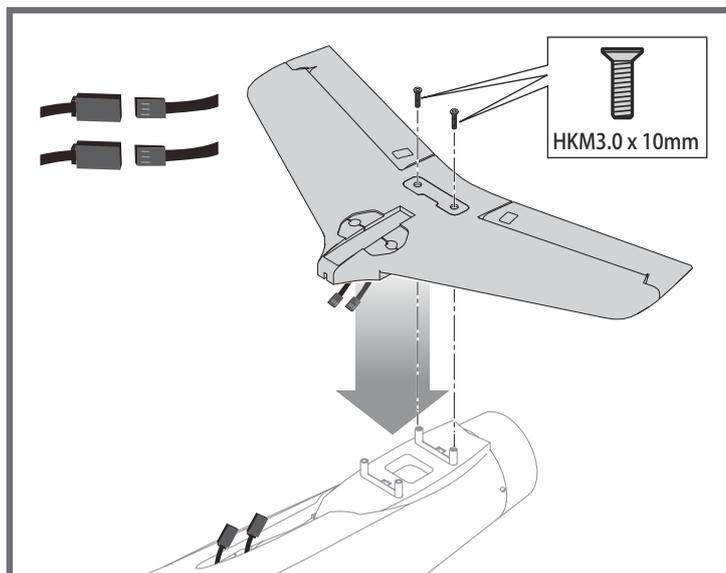


- A: Nose Cone
- B: Fuselage
- C: Winglet Set
- D: Main Wing
- E: Horizontal Stabilizer
- F: Ventral Fin Set
- G: Vertical Fin
- H: Wing Tubes
- I: Screw Set

Model assembly

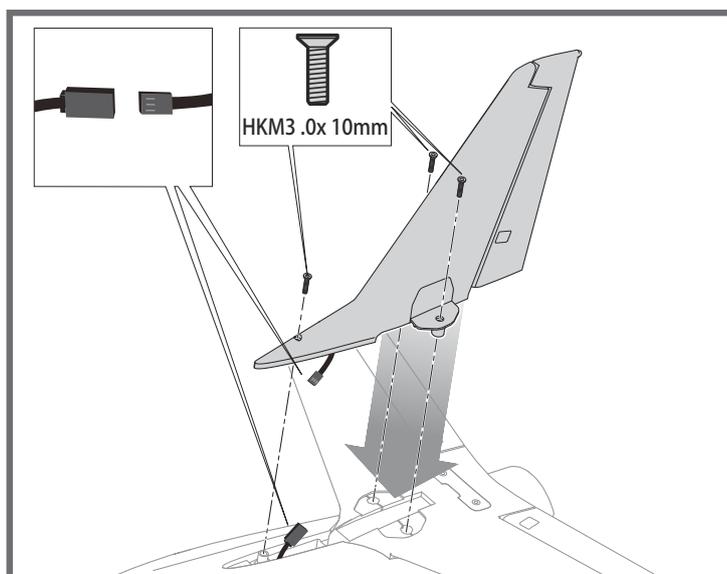
Horizontal stabilizer installation

1. Attach the horizontal stabilizer to the fuselage as shown.
2. Insert the included two screws (HKM 3.0*10) into the circular aluminum part. Do not lock the screws. And then put the aluminum part into the slot shown in the figure.
3. Lock the horizontal stabilizer to fuselage by tightening the screws on the circular aluminum part.



Vertical stabilizer installation

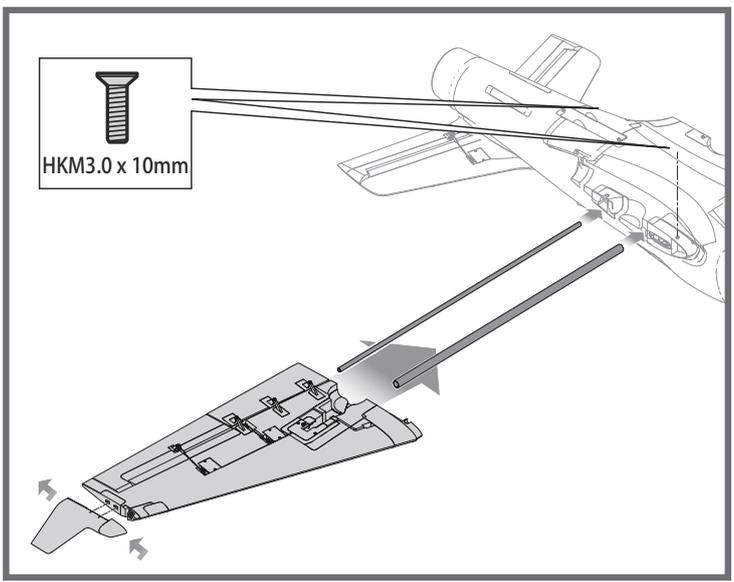
1. Connect the rudder servo connectors to the servo extensions in fuselage. Note the corresponding wire color.
2. Attach the vertical stabilizer to the corresponding slot at the rear of the fuselage as shown, and then use three included screws (HKM 3.0*10) to fix it from the both sides of fuselage.



Model assembly

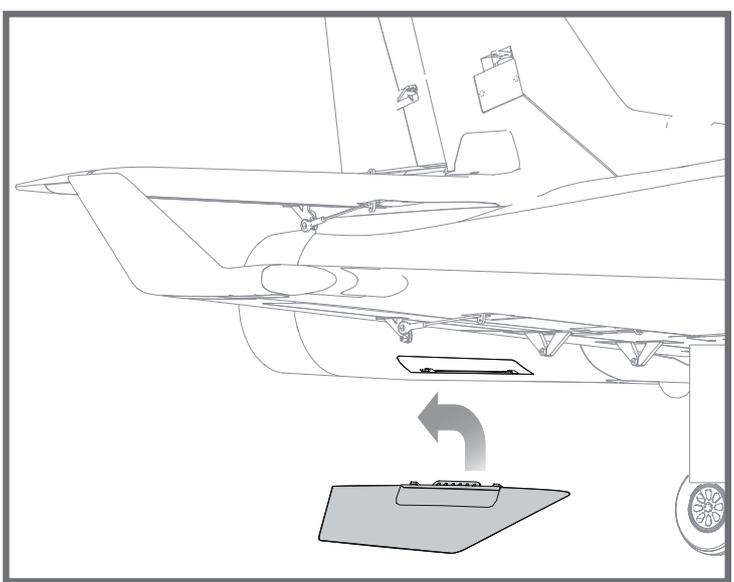
Main wing installation

1. Slide the wing spars into the fuselage as shown.
2. Install the left and right wing halves over the wing spars and into the wing slots. Be sure the connectors on both sides are attached precisely and firmly.
3. Secure the left and right wings to the fuselage using four screws included (HKM 3.0*10)
4. Attach the winglet to the corresponding slot on main wing, then slide toward the rear of the fuselage to lock in place.



Ventral Fin installation

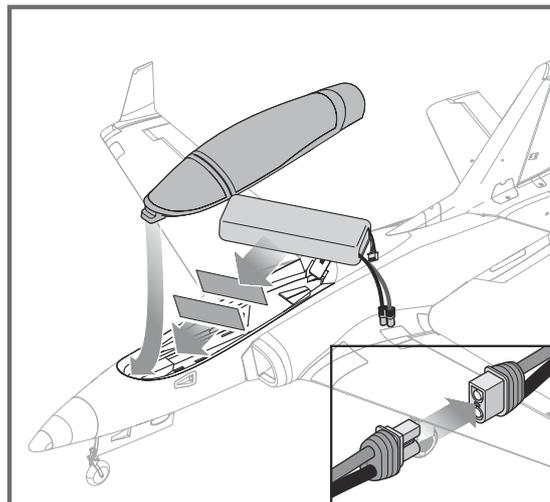
Attach the left and right ventral fins to the slots at the bottom of fuselage, then slide toward the rear of the fuselage to lock in place.



Battery installation

1. Pull back on the latch and remove the battery hatch.
2. Apply the hook tape to the cable end of the battery.
3. Slide the full charged battery into the battery compartment with the power supply cable toward the rear end of the plane.

Note: The center of gravity can be adjusted by moving the battery forward or aft. Having the correct center of gravity is critical to achieving proper flight characteristics.



Receiver diagram

The cables from the servo connector board should be connected to your receiver in the order shown. Note that the LEDs can be powered by any spare channel on the receiver. Tuck the wire leads into the recessed cavity towards the rear of the battery hatch.

		Receiver
Aileron	1	Channel-1 — Aile
Elevator	2	Channel-2 — Elev
Throttle	3	Channel-3 — Thro
Rudder	4	Channel-4 — Rudd
Gear	5	Channel-5 — Gear
Spare	6	Channel-6 — Spare

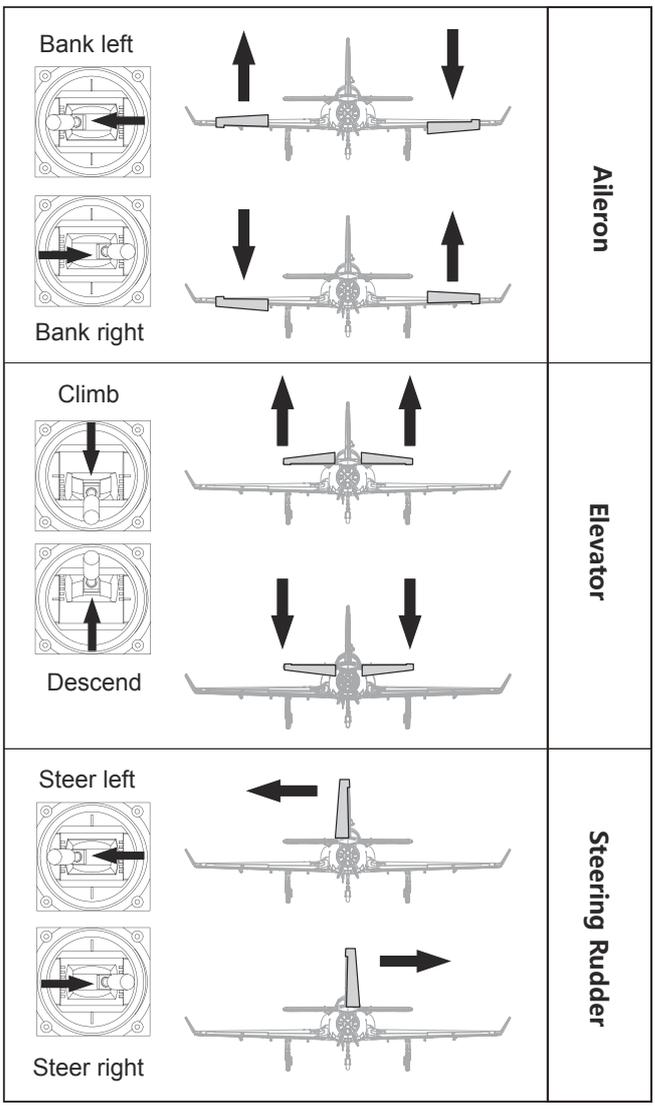
Get your model ready to fly

Important ESC and model information

1. The ESC included with the model has a safe start. If the motor battery is connected to the ESC and the throttle stick is not in the low throttle or off position, the motor will not start until the throttle stick is moved to the low throttle or off position. Once the throttle stick is moved to the low throttle or off position, the motor will emit a series of beeps. Several beeps with the same tune means the ESC has detected the cells of the battery. The count of the beeps equals the cells of the battery. The motor is now armed and will start when the throttle is moved.
2. The motor and ESC come pre-connected and the motor rotation should be correct. If for any reason the motor is rotating in the wrong direction, simply reverse two of the three motor wires to change the direction of rotation.
3. The motor has an optional brake setting. The ESC comes with brake switched off and we recommend that the model be flown with the brake off. However, the brake could be accidentally switched on if the motor battery is connected to the ESC while the throttle stick is set at full throttle. To switch the brake off, move the throttle stick to full throttle and plug in the motor battery. The motor will beep one time. Move the throttle stick to low throttle or the off position. The motor is ready to run and the brake will be switched off.
4. Battery Selection and Installation. We recommend the 22.2V4000mAh-5000mAh 45c Li-Po battery. If using another battery, the battery must be at least a 22.2V4000mAh-5000mAh 45c battery. Your battery should be approximately the same capacity, dimension and weight as the 22.2V4000mAh-5000mAh 45c Li-Po battery to fit the fuselage without changing the center of gravity significantly.

Transmitter and model setup

Before getting started, bind your receiver with your transmitter. Please refer to your transmitter manual for proper operation.
CAUTION: To prevent personal injury, DO NOT install the propeller assembly onto the motor shaft while testing the control surfaces. DO NOT arm the ESC and do not turn on the transmitter until the Transmitter Manual instructs you to do so.
 Tips: Make sure all control sticks on your radio are in the neutral position (rudder, elevator, ailerons) and the throttle is in the OFF position. Make sure both ailerons move up and down (travel) the same amount. This model tracks well when the left and right ailerons travel the same amount in response to the control stick. Move the controls on the transmitter to make sure the aircraft control surface moves correctly. See diagrams right.



Control throws

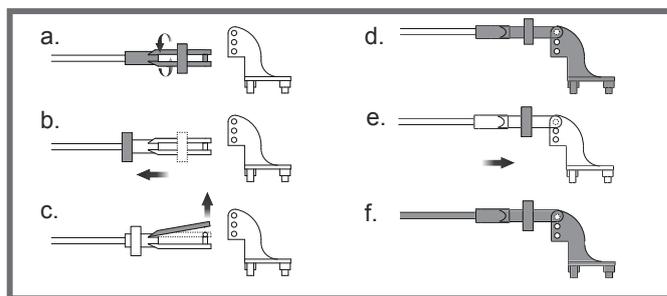
The suggested control throw setting for the 80mm Dassault Rafale are as follows (dual rate setting):

Tips: On the first flight, fly the model in low rate. The first time you use high rates, be sure to fly at low to medium speeds. High rate, as listed, is only for EXTREME maneuvering.

	High Rate	Low Rate
Elevator	16mm up / down	12mm up / down
Aileron	12mm up / down	8mm up / down
Rudder	11mm left / right	7mm left / right

Clevis installation

1. Pull the tube from the clevis to the linkage.
2. Carefully spread the clevis, then insert the clevis pin into the desired hole in the control horn.
3. Move the tube to hold the clevis on the control horn.



Control horn and servo arm settings

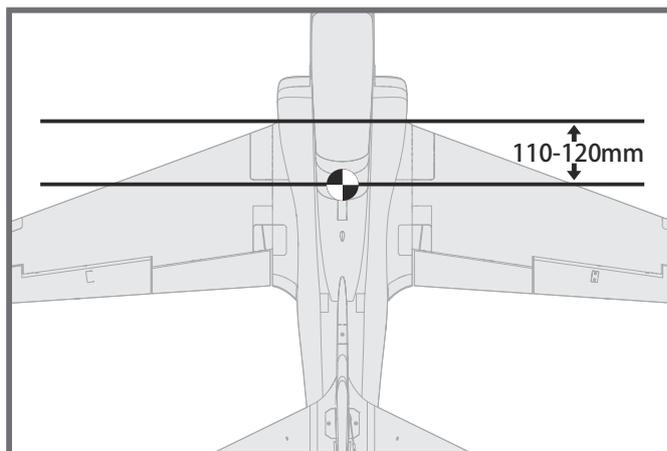
The table shows the factory settings for the control horns and servo arms. Fly the aircraft at the factory settings before making changes. After flying, you may choose to adjust the linkage positions for the desired control response.

	Horns	Arms	More control throw
Elevator			
Rudder			
Ailerons			
Canard			
			Less control throw

Check the C.G. (Center of gravity)

When balancing your model, adjust the battery as necessary so the model is level or slightly nose down. This is the correct balance point for your model. After the first flight, the CG position can be adjusted for your personal preference.

1. The recommended Center of Gravity (CG) location for your model is (110-120mm) from the leading edge of the main wing (as shown) with the battery pack installed. Mark the location of the CG on top of the wing.
2. When balancing your model, support the plane at the marks made on the bottom of the main wing with your fingers or a commercially available balancing stand. This is the correct balance point for your model. Make sure the model is assembled and ready for flight before balancing.



Before flying the model

Find a suitable flying site

Find a flying site clear of buildings, trees, power lines and other obstructions. Until you know how much area will be required and have mastered flying your plane in confined spaces, choose a site which is at least the size of two to three football fields - a flying field specifically for R/C planes is best. Never fly near people - especially children, who can wander unpredictably.

Perform the range check for your plane

As a precaution, an operational ground range test should be performed before the first flight each time you go out. Performing a range test is a good way to detect problems that could cause loss of control such as low batteries, defective or damaged radio components, or radio interference. This usually requires an assistant and should be done at the actual flying site you will be using.

First turn on the transmitter, then install a fully-charged battery into the fuselage. Connect the battery and install the hatch.

Remember, use care not to bump the throttle stick. Otherwise, the propeller/fan will turn and possibly cause damage or injury.

Note: Please refer to your Transmitter Manual that came with your radio control system to perform a ground range check. If the controls are not working correctly or if anything seems wrong, do not fly the model until you correct the problem. Make certain all the servo wires are securely connected to the receiver and the transmitter batteries have a good connection.

Monitor your flight time

Monitor and limit your flight time using a timer (such as on a wristwatch or in your transmitter if available). When the batteries are getting low you will usually notice a performance drop before the ESC cuts off motor power, so when the plane starts flying slower you should land. Often (but not always) power can be briefly restored after the motor cuts off by holding the throttle stick all the way down for a few seconds. To avoid an unexpected dead-stick landing on your first flight, set your timer to a conservative 4 minutes. When your alarm sounds you should land right away.

Flying course

Take off

While applying power, slowly steer to keep the model straight. The model should accelerate quickly. As the model gains flight speed you will want to climb at a steady and even rate. It will climb out at a nice angle of attack (AOA).

Flying

Always choose a wide-open space for flying your plane. It is ideal for you to fly at a sanctioned flying field. If you are not flying at an approved site always avoid flying near houses, trees, wires and buildings. You should also be careful to avoid flying in areas where there are many people, such as busy parks, schoolyards, or soccer fields. Consult laws and ordinances before choosing a location to fly your aircraft. After takeoff, gain some altitude. Climb to a safe height before trying technical manoeuvres, including high speed passes, inverted flight, loops, and point rolls.

Landing

Land the model when you hear the motor pulsing (LVC) or if you notice a reduction in power. If using a transmitter with a timer, set the timer so you have enough flight time to make several landing approaches. The model's three point landing gear allows the model to land on hard surfaces. Align model directly into the wind and fly down to the ground. Fly the airplane down to the ground using 1/4-1/3 throttle to keep enough energy for proper flare. Before the model touches down, always fully decrease the throttle to avoid damaging the propeller or other components. The key to a great landing is to manage the power and elevator all the way to the ground and set down lightly on the main landing gear. After a few flights you will find the model can be set down lightly on the mains and you can hold the nose wheel off balancing the model on the mains until it slows and gently settles the nose.

Maintenance

Repairs to the foam should be made with foam safe adhesives such as hot glue, foam safe CA, and 5min epoxy. When parts are not repairable, see the Spare Parts List for ordering by item number. Always check to make sure all screws on the aircraft are tightened. Pay special attention to make sure the spinner is firmly in place before every flight.

Trouble shooting

Problem	Possible Cause	Solution
Aircraft will not respond to the throttlebut responds to other controls.	-ESC is not armed. -Throttle channel is reversed.	-Lower throttle stick and throttle trim to lowest settings. -Reverse throttle channel on transmitter.
Extra propeller noise or extra vibration.	-Damaged spinner, propeller, motor or motor mount. -Loose propeller and spinner parts. -Propellor installed backwards.	-Replace damaged parts. -Tighten parts for propeller adapter, propeller and spinner. -Remove and install propeller correctly.
Reduced flight time or aircraft underpowered.	-Flight battery charge is low. -propeller installed backward. -Flight battery damaged.	-Completely recharge flight battery. -Replace flight battery and follow flight battery instructions.
Control surface does not move, or is slow to respond to control inputs.	-Control surface, control horn, linkage or servo damage. -Wire damaged or connections loose.	-Replace or repair damaged parts and adjust controls. -Do a check of connections for loose wiring.
Controls reversed.	Channels are reversed in the transmitter.	Do the control direction test and adjust controls for aircraft and transmitter.
-Motor loses power -Motor power pulses then motor loses power.	-Damage to motor, or battery. -Loss of power to aircraft. -ESC uses default soft Low Voltage Cutoff(LVC).	-Do a check of batteries, transmitter, receiver, ESC, motor and wiring for damage(replace as needed). -Land aircraft immediately and recharge flight battery.
LED on receiver flashes slowly.	Power loss to receiver.	-Check connection from ESC to receiver. -Check servos for damage. -Check linkages for binding.

Spare parts list content

FMSTB101	Fuselage	FMSTB115	Wing Tubes
FMSTB102	Main Wing Set	FMSTB116	Lighting Set
FMSTB103	Vertical Stabilizer	FMSTB117	Pilot
FMSTB104	Horizontal Stabilizer	FMSTB118	Nose Gear Strut
FMSTB105	Canopy	FMSTB119	Main Gear Struts
FMSTB106	Nose Cone	FMSTB120	Front Landing Gear System
FMSTB107	Winglet Set	FMSTB121	Main Landing Gear System
FMSTB108	Linkage Set	FMSRE064	Electronic Retract
FMSTB109	Control Horn Set	FMSRE065	Electronic Retract
FMSTB110	Wheel Set	FMS90MM	90MM Ducted Fan (12-blade)
FMSTB111	Screw Set	FMSDF011	Ducted Fan With
FMSTB112	Ventral Fin Set		Motor3670-1950KV (plastic) 6S
FMSTB113	Decal Set	PRESC039	120A ESC
FMSTB114	Front Landing Gear Door	PR13MGDP	Predator 13g digital metal gear servo positive
FMSTB114-1	Main Landing Gear Door	PR13MGDR	Predator 13g digital metal gear servo reverse

Visit our website: www.fmsmodel.com to see photo of this product. Enter the key word "ESC" in the search bar for the stock ESC instruction manual.

User Manual of Brushless Speed Controller

Thanks for purchasing our Electronic Speed Controller (ESC). High power system for RC model is very dangerous, please read this manual carefully. In that we have no control over the correct use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of the product. Any claims arising from the operating, failure or malfunctioning etc. will be denied. We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation to compensation is limited to the invoice amount of the affected product.

Specifications

Model	Cont Current	Burst Current (≤10)	BEC Mode	BEC Output	BEC Output Capability				Battery Cell		Weight	Weight
					2S Lipo	3S Lipo	4S Lipo	6S Lipo	Lipo	NiMH		L*W*H (mm)
6A	6A	8A	Linear	5V/0.8A	3servos				2S	5-6 cells	5.5	32*12*4.5
12A	12A	15A	Linear	5V/1A	3servos	2servos			2-3S	5-9 cells	9g	38*18*6
12AE	12A	15A	Linear	5V/2A	5servos	4servos			2-3S	5-9 cells	10g	38*18*7
15A	15A	20A	Linear	5V/2A	5servos	4servos			2-3S	5-9 cells	16.5g	48*22.5*6
20A	20A	25A	Linear	5V/2A	5servos	4servos			2-3S	5-9 cells	19g	42*25*8
30A	30A	40A	Linear	5V/2A	5servos	4servos			2-3S	5-9 cells	37g	68*25*8
40A	40A	55A	Linear	5V/3A	5servos	4servos			2-3S	5-9 cells	39g	68*25*8
40A-UBEC	40A	55A	Switch	5V/3A	5servos	5servos	5servos		2-4S	5-12 cells	43g	65*25*12
50A-UBEC	50A	65A	Switch	5V/5A	8servos	8servos	6servos	6servos	2-4S	5-12 cells	41g	65*29*10
60A-UBEC	60A	80A	Switch	5V/5A	8servos	8servos	6servos	6servos	2-6S	5-18 cells	63g	77*35*14
60A-UBEC	60A	80A	N/A	N/A					2-6S	5-18 cells	60g	86*38*12
80A-UBEC	80A	100A	Switch	5V/5A	8servos	8servos	6servos	6servos	2-6S	5-18 cells	82g	86*38*12
80A-UBEC	80A	100A	N/A	N/A					2-6S	5-18 cells	79g	86*38*12

Programmable Items (The option written in bold font is the default setting)

1. Brake Setting: Enabled / **Disabled**
2. Battery Type: **Lipo** / NiMH
3. Low Voltage Protection Mode(Cut-Off Mode): **Soft Cut-Off (Gradually reduce the output power)** /Cut-Off (Immediately stop the output power).
4. Low Voltage Protection Threshold(Cut-Off Threshold): Low / **Medium** / High
 - 1) For lithium battery, the battery cell number is calculated automatically. Low / medium / high cutoff voltage for each cell is 2.85V/3.15V/3.3V. For example: For a 3S Lipo, when "Medium" cutoff threshold is set, the cut-off voltage will be:3.15*3=9.45V.
 - 2) For NiMH battery, low / medium / high cutoff voltages are 0%/50%/65% of the startup voltage (i.e. the initial voltage of battery pack), and 0% means the low voltage cut-off function is disabled. For example: For a 6 cells NiMH battery, fully charged voltage is 1.44*6=8.64V, when "Medium"cut-off threshold is set, the cut-off voltage will be: 8.64*50%=4.32V.
5. Startup Mode: **Normal** /Soft /Super-Soft (300ms / 1.5s / 3s)
 - a) Normal mode is suitable for fixed-wing aircraft. Soft or Super-soft modes are suitable for helicopters. The initial acceleration of the Soft and Super-Soft modes are slower, it takes 1.5 second for Soft startup or 3 seconds for Super-Soft startup from initial throttle advance to full throttle. If the throttle is completely closed (throttle stick moved to bottom position) and opened again (throttle stick moved to top position) within 3 seconds after the first startup, the re-startup will be temporarily changed to normal mode to get rid of the chance of a crash caused by slow throttle response. This special design is suitable for aerobatic flight when quick throttle response is needed.
6. Timing: **Low** / Medium / High,(3.75°/15°/26.25°) Usually, low timing is suitable for most motors. To get higher speed, High timing value can be chosen.

User Manual of Brushless Speed Controller

Begin To Use Your New ESC

IMPORTANT! Because different transmitter has different throttle range, please calibrate throttle range before flying.

Throttle range setting (Throttle range should be reset whenever a new transmitter is being used)

1. Switch on the transmitter, move throttle stick to the top position.
2. Connect battery pack to the ESC, and wait for about 2 seconds.
3. The "Beep-Beep-" tone should be emitted, means the top point of throttle range has been confirmed.
4. Move throttle stick to the bottom position, several "beep-" tones should be emitted to present the amount of battery cells.
5. A long "Beep-" tone should be emitted, means the lowest point of throttle range has been correctly confirmed.

Normal startup procedure

1. Move throttle stick to bottom position and then switch on transmitter.
2. Connect battery pack to ESC, special tone like "♪ 123" means power supply is OK.
3. Several "beep-" tones should be emitted to present the amount of lithium battery cells.
4. When self-test is finished, a long "beep-----" tone should be emitted.
5. Move throttle stick upwards to go flying.

Protection Function

1. Start up failure protection: If the motor fails to start within 2 seconds of throttle application, the ESC will cut-off the output power. In this case, the throttle stick **MUST** be moved to the bottom again to restart the motor. (Such a situation happens in the following cases: The connection between ESC and motor is not reliable, the propeller or the motor is blocked, the gearbox is damaged, etc.)
2. Over-heat protection: When the temperature of the ESC is over about 110 Celsius degrees, the ESC will reduce the output power.
3. Throttle signal loss protection: The ESC will reduce the output power if throttle signal is lost for 1 second, further loss for 2 seconds will cause the output to be cut-off completely.

Trouble Shooting

Trouble	Possible Reason	Action
After power on, motor does not work, no sound is emitted	After power on, motor does not work, no sound is emitted	Check the power connection. Replace the connector.
After power on, motor does not work, such an alert tone is emitted: "beep-beep-, beep-beep-,beep-beep-" (Every "beep-beep-" has a time interval of about 1 second)	Input voltage is abnormal, too high or too low	Check the voltage of battery pack
After power on, motor does not work, such an alert tone is emitted: "beep-, beep-, beep- "(Every "beep-" has a time interval of about 2 seconds)	Throttle signal is irregular	Check the receiver and transmitter Check the cable of throttle channel
After power on, motor does not work, such an alert tone is emitted: "beep-, beep-, beep- "(Every "beep-" has a time interval of about 0.25 second)	The throttle stick is not in the bottom (lowest) position	Move the throttle stick to bottom position
After power on, motor does not work, a special tone "♪56712" is emitted after 2 beep tone (beep-beep-)	Direction of the throttle channel is reversed, so the ESC has entered the program mode	Set the direction of throttle channel correctly
The motor runs in the opposite direction	The connection between ESC and the motor need to be changed	Swap any two wire connections between ESC and motor

Program the ESC with your transmitter (4 Steps)

Note: Please make sure the throttle curve is set to 0 when the throttle stick is at bottom position and 100% for the top position.

NO.1 Enter program mode

- 1.Switch on transmitter, move throttle stick to top position, connect the battery pack to ESC
- 2.Wait for 2 seconds, the motor should emit special tone like "beep-beep-"
- 3.Wait for another 5 seconds, special tone like "♪56712" should be emitted, which means program mode is entered.

NO.2 Select programmable items

After entering program mode, you will hear 8 tones in a loop with the following sequence. If you move the throttle stick to bottom within 3 seconds after one kind of tones, this item will be selected.

Prompt tone	Selected item
"beep"(1 short tone)	brake
"beep-beep-(2 short tone)	battery type
"beep-beep-beep-(3 short tone)	cutoff mode
"beep-beep-beep-beep-(4 short tone)	cutoff threshold
"beep——"(1 long tone)	startup mode
"beep——beep-(1 long 1 short)	timing
"beep——beep-beep-" (1 long 2 short)	set all to default
"beep——beep——"(2 long tone))	exit

Note: 1 long "beep-----" = 5 short "beep-"

NO.3 Set item value (Programmable value)

You will hear several tones in loop. Set the value matching to a tone by moving throttle stick to top when you hear the tone, then a special tone "♪1515" emits, means the value is set and saved. (Keeping the throttle stick at top, you will go back to Step 2 and you can select other items; or moving the stick to bottom within 2 seconds will exit program mode directly) .

Tones	"beep-" 1 short tone	"beep-beep-" 2 short tones	"beep-beep-beep" 3 short tones
Brake	Off	On	
Battery type	Lipo	NiMH	
Cutoff mode	Soft-Cut	Cut-Off	
Cutoff threshold	Low	Medium	High
Start mode	Normal	Soft	Super soft
Timing	Low	Medium	High

NO.4 Exit program mode

There are 2 ways to exit program mode:

1. In step 3, after special tone " ", please move throttle stick to the bottom position within 2 seconds.
2. In step 2, after tone "beep-----beep-----"(that is: The item #8),move throttle stick to bottom within 3 seconds.

警告



警告:在组装、调整及飞行前请务必认真阅读产品说明书以熟知产品的特性。请严格按照说明书提示进行飞机的组装、调整及飞行。如操作不当会造成产品本身损坏及其它财产损失,甚至造成严重的人身伤害。

声明:模型不是玩具,具有一定的危险性,操作者需要具备一定的飞行经验,初学者请在专业人士指导下操作。

禁止十四岁以下儿童操作、飞行。

安全须知

本产品飞行由无线电遥控器控制,在飞行过程中可能会受到外界强信号源干扰而导致失控,甚至坠机。因此,在飞行过程中务必始终与飞机保持一定的安全距离,避免意外碰撞、受伤。

- ☒ 请勿在发射器电池低电量的情况下操纵模型飞机。
- ☒ 请勿在公路、人群、高压线密集区、机场附近及其它法律法规明确禁止飞行的场合飞行。
- ☒ 请勿在雷雨、大风、大雪或者其它恶劣气象环境下飞行。
- ☒ 请严格遵照产品指导说明及安全警告操作本产品及其相关配置(例如充电器、电池等)。
- ☒ 请勿将相关化工类产品、零部件、电子部件等置于儿童可触及的范围。
- ☒ 请勿将电子件暴露于潮湿的环境中,以免造成损坏。
- ☒ 请勿将本品任意处置于口中,以免造成人身伤亡。

锂聚合物电池使用安全须知

- 使用锂聚合物电池时,须严格遵守制造商说明、要求并了解相关风险,使用不当会导致锂聚合物电池起火,从而造成严重的财产损失甚至人身伤害。
- 禁止使用变形、胀气的锂聚合物电池。
- 禁止使用过充、放电的锂聚合物电池,避免发生危险。长时间不使用须将锂聚合物电池放电至存储电压(3.8~3.85V/节)。锂聚合物电池须储存在室内干燥区域(4.5~48.5°C),禁止将锂聚合物电池置于阳光下暴晒或车内,高温可能会导致锂聚合物电池起火,造成财产损失和人身伤害。
- 请使用专用充电器对锂聚合物电池进行充放电,禁止使用其它如:镍氢电池充电器。充放电时,禁止将锂电池放置于高温物体表面,建议使用锂电池防爆袋。不正确的充放电操作会对锂聚合物电池造成损伤,甚至会引起火灾,造成财产损失和人身伤害。
- 禁止将锂聚合物电池单节电压放至低于 3V,禁止给已损坏的锂聚合物电池充电。
- 锂聚合物电池充放电须在有人看管的情况下进行,避免发生意外造成不必要的损失。

飞机电池充电警告:

请确保使用合格的电池充电器给锂电池充电。在使用充电器前,请认真阅读充电器说明书。充电过程中,请确保把电池置于耐热的表面。建议把锂电池置于防火充电袋内充电,防火充电袋可在相关模型实体店或网上买到。

产品特点

FMS 90mm EDF毒蛇由当下畅销的70mm EDF毒蛇升级而来，旨在提供战斗机的外观和性能以及低翼运动飞机的稳定性，以使更多的飞行员可以享受驾驶涵道机的乐趣。

90mm EDF毒蛇单其“90mm”级别就足以振奋人心。FMS 高效率90mm 12叶涵道组、高动力内转 3670 - KV1950 电机和高品质 120A电调的搭配组合，给整架飞机提供无与伦比的性能，油门几乎瞬间相应，声浪极具临场感，搭配6S 22.2V 5000 \times 6000mAh 45C电池，最高速度可达 120+ MPH。

90mm EDF毒蛇机型结构优越，与动力系统相辅相成，使其不管高速飞行还是低速飞行都有出色的表现。它可以四平八稳地悠闲飞行，大开大合地疾速飞行，甚至也可以炫技飞行 \times 90mm EDF毒蛇具备极强的操控性，能毫不费力地完成绝大多数的特技动作，如各种滚翻、筋斗、侧飞自旋等。

此外，90mmEDF毒蛇采用最新的结构和组装技艺，如螺丝组装结构、球头舵面链接、重载对接管、多功能排插，使其可以在很短的时间内完成组装步骤蓄势待发；采用堵转模式的电子收放系统和CNC加工的跪形结构金属起落架，有效抵抗暴力降落；采用大尺寸轮胎，便利各种地面例如水泥路、草地、沙地等的起降。

不论你之前是否收藏过毒蛇，这款最新上市的FMS 90mmEDF毒蛇都是非常值得期待的，它不论在细节上还是性能上，都能给你耳目一新的体验，是玩家体验大级别涵道机的优选之作。

特征：

- 电子配置：高品质120A电调，高动力内转3670 KV1950电机，高效率90mm 12叶涵道组，高精度金属数码舵机。
- 极宽的性能范围和速度范围，可进行运动休闲飞行和特技飞行，整体起飞、飞行和降落过程轻松流畅。
- 带过流保护的堵转模式电子收放和CNC加工跪形结构金属起落架，有效抵抗暴力降落。
- 功能性航灯。
- 功能性襟翼。
- 卡扣结构座舱，有效避免飞行中座舱脱落现象。
- 大尺寸电池舱，便于安放不同厂家不同尺寸电池。
- 大尺寸轮胎，便利粗糙地面起降。
- 出厂预安装球头舵角，有效减小结构虚位，增大舵面行程。
- 零胶水设计，螺丝组装结构。

产品组成

在组装产品之前，请仔细检查以下配件，如有缺失或者损坏，请及时联系当地店面或者邮件至厂家（support@fmsmodel.com），告知缺失或损坏的配件名称及编码（请在本说明书尾页查看相应的配件编码）。请注意，不同配置，包装盒内部物品不同。

产品参数

翼展: 1400mm(55in)

机身长: 1280mm (50.4in)

飞行重量: 大约3250g

电机: 3670-KV1950

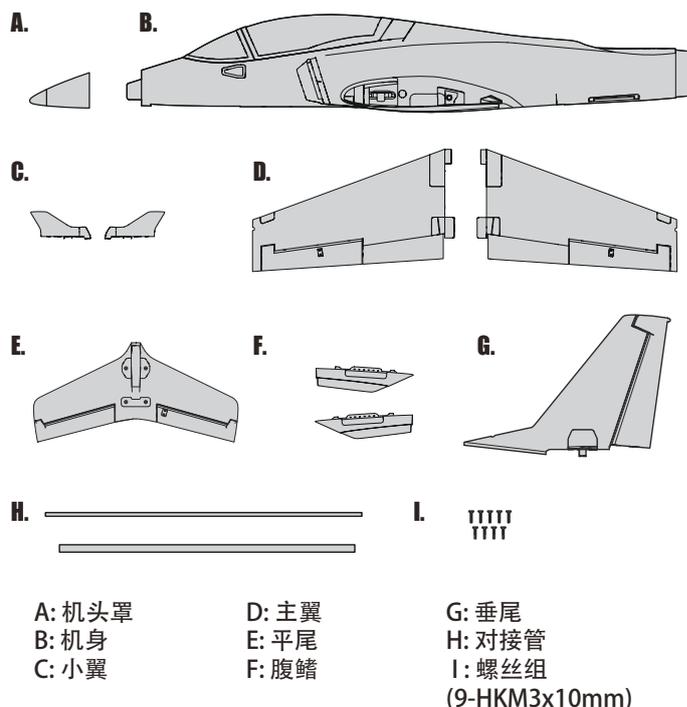
翼载荷: 107.6g/dm \times

翼面积: 30.2 dm \times

电调: 120A

舵机: 13g*8

电池: 6S 22.2V 5000 \times 6000mAh 45C



机体安装

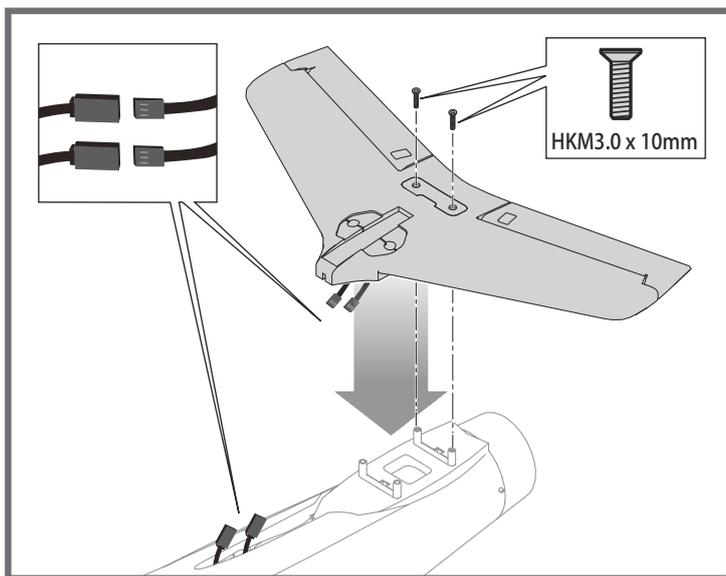
平尾安装

1. 连接平尾舵机至机身延长线。

注意: 连接时要对应相应的颜色。

2. 如图所示, 安装平尾至机身尾部相对应位置。

3. 使用所附螺丝 (HKM3.0x10) 固定平尾。

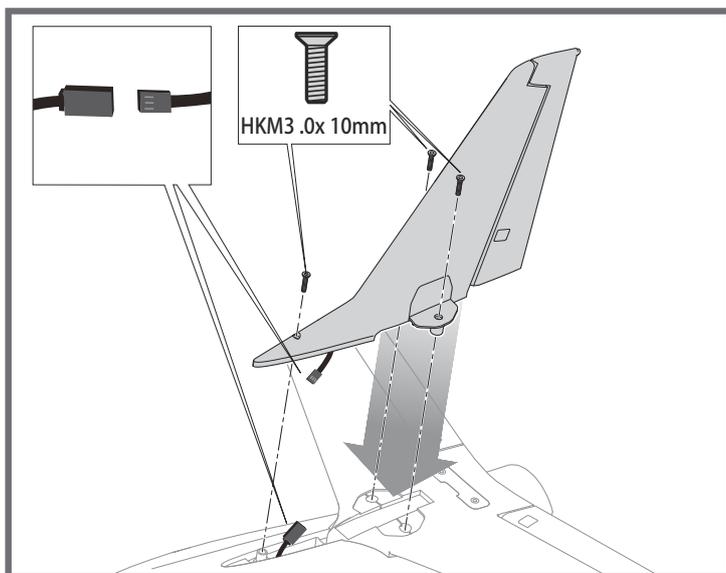


垂尾安装

1. 连接垂尾舵机和机身里的舵机延长线。

注意: 连接时要对应相应的颜色。

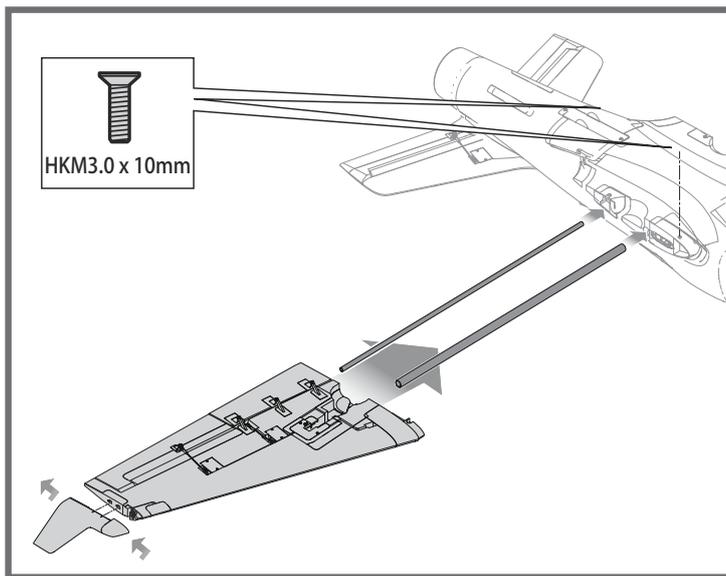
2. 如图所示, 安装垂尾至机身尾部相对应的凹槽, 使用所附螺丝 (HKM3.0x10) 固定垂尾。



机体安装

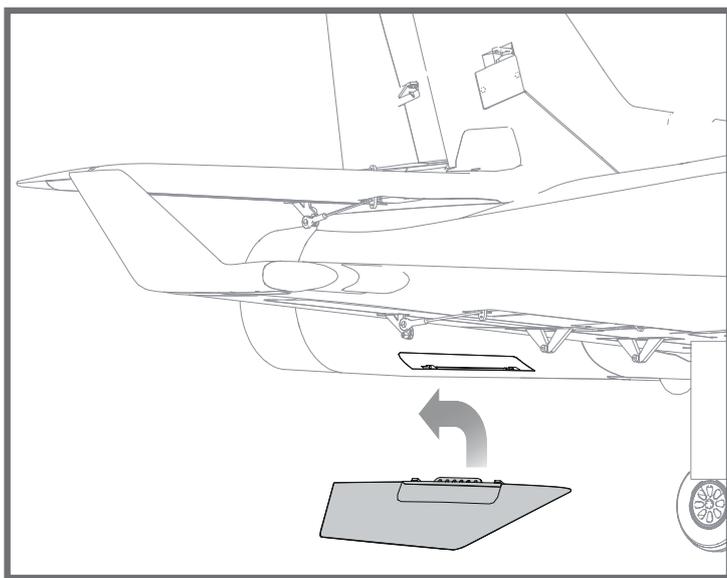
主翼安装

1. 如图所示, 把主翼对接管装入机身槽位。
2. 安装左右两侧机翼至机身, 确保插牢机翼和机身的对接插头。
3. 使用所附螺丝固定机翼。
4. 将小翼安装至主翼槽位并向机身尾部的方向滑动以固定。



腹鳍安装

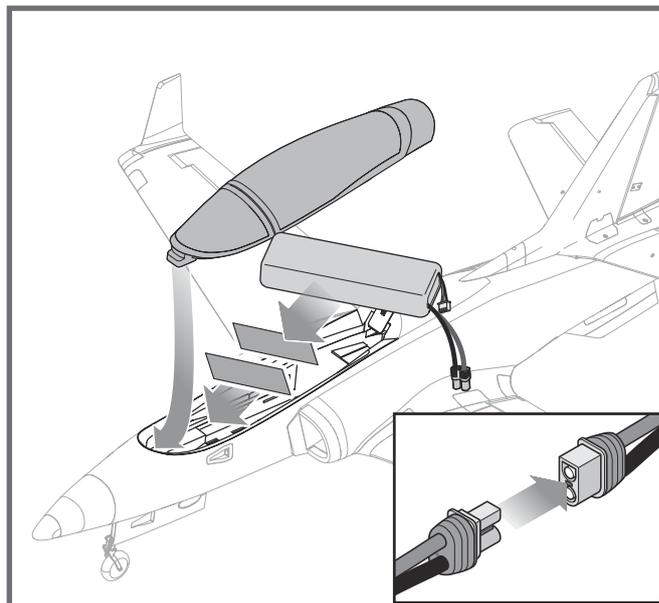
如图所示, 将左、右腹鳍分别安装至机身底部槽位, 并向机身尾部的方向滑动以固定。



电池安装

1. 移开座舱。
2. 取下电池板上的魔术贴(毛面)贴于电池表面。
3. 如图所示, 将电池置于电池舱内, 用魔术带绑紧, 使有电源线的那端朝向飞机的尾部。

注意: 由于不同电池厂家生产的电池重量有轻微的差异, 需要调整电池的前后位置来平衡飞机的重心位置。



接收机连接示意图

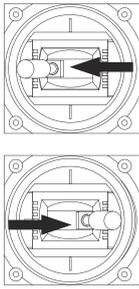
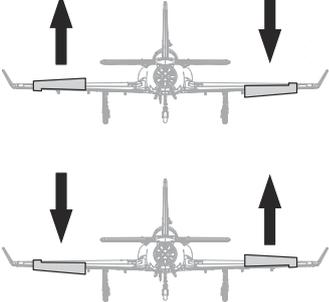
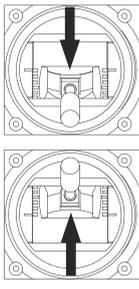
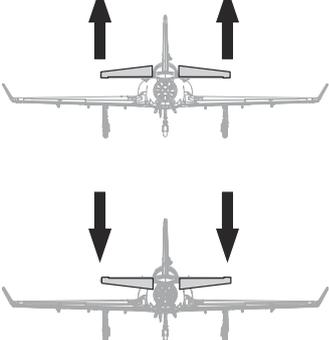
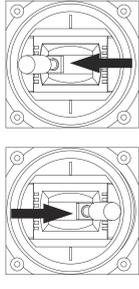
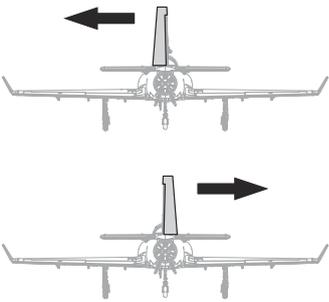
如图所示, 以 Futaba 遥控器为例, 将副翼舵机信号线插入接收机副翼通道、升降舵舵机信号线插入接收机升降舵通道、方向舵舵机信号线插入接收机方向舵通道、电调信号线插入接收机电调通道。最后将所有连接线整理整齐并固定在电池仓后部的凹槽内, 随后固定好接收机。

		Receiver
副翼	1	Channel-1 — Aile
平尾	2	Channel-2 — Elev
油门	3	Channel-3 — Thro
垂尾	4	Channel-4 — Rudd
起落架	5	Channel-5 — Gear
襟翼	6	Channel-6 — Spare

遥控器设置

警告:为保证安全,在遥控器参数设置及舵面调整过程中,请务必拆下螺旋桨,以免电机意外启动发生事故。遥控器发射机开机前,确保油门杆在最低位置,其它摇杆在中立位置。开发射机并给接收机通电,随后听到电调初始化音(音符释义见后文“电子调速器说明书”)。观察所有舵面是否回中,如果没有回中,尽量通过调整舵机摇臂角度、连杆长度的方式来使舵面回中,若调整长度在安全范围内仍未回中,则使用遥控器通道微调或者菜单中的“SubTrim”选项来使舵面归中。如下图所示观察摇杆动作与舵面动作的对应关系,如发生舵面反向需要使用遥控器中的通道反向功能来纠正。

1.移动发射器上的控制杆位置,确保舵面可以自如移动。

<p>左推</p>  <p>右推</p>		副翼
<p>爬升</p>  <p>降落</p>		升降
<p>转左</p>  <p>转右</p>		转向

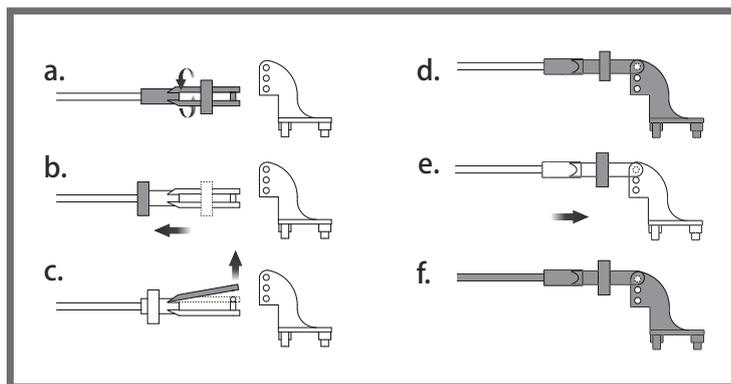
推荐舵面行程

温馨提示:首飞建议用小舵面行程。

	大	小
升降舵	16mm上/下	12mm 上/下
副翼舵	12mm上/下	8mm 上/下
方向舵	11mm左/右	7mm左/右

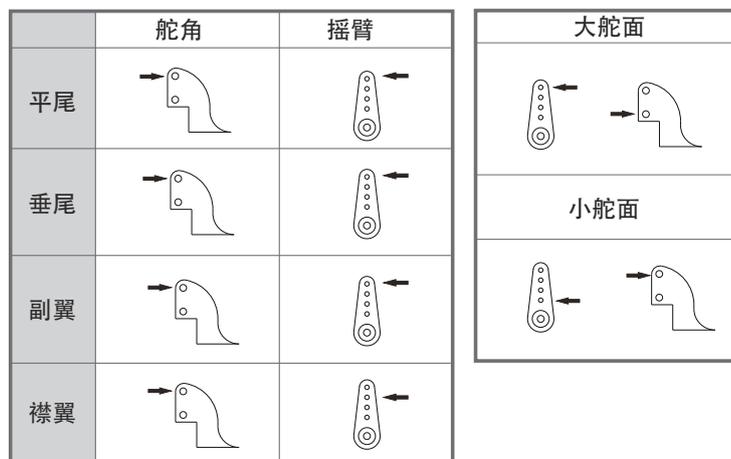
夹头安装方式

1. 保证舵机为回中状态, 将连接杆夹头调整到合适位置。
2. 将O型圈移开, 打开夹头, 将夹头安装到舵角孔位。
3. 将O型圈移回相应位置, 锁紧夹头。



舵角和舵机摇臂安装

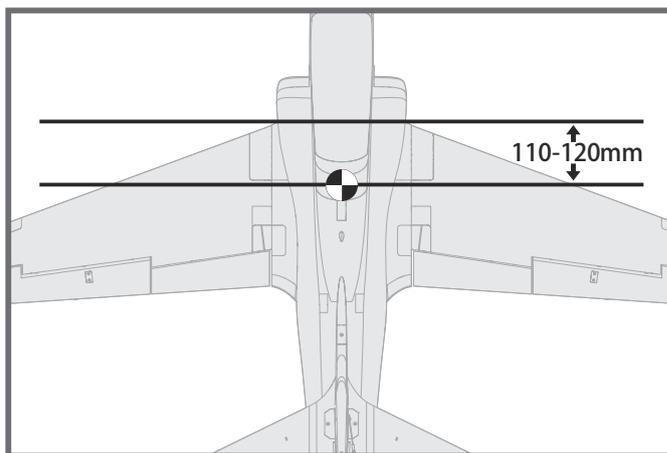
图示是舵角和舵面摇臂的出厂设置。首飞建议用出厂设置的舵角飞行。首飞后, 可按需自行调整舵角。



重心调整

通过移动电池在电池舱内的前后位置调整飞机的重心,使飞机保持水平或稍微头重的状态。首飞以后,重心位置可以根据你自己的飞行偏好再做更改。

- 1.如图所示,推荐重心位置是机翼前缘往后 110-120mm 处(安装电池以后)。推荐把食指放在机翼下面的重心位置来帮助调整重心。
- 2.在调整飞机重心的时候请确定飞机处于组装完毕待飞的状态。



飞行前准备

起飞前的检查

每次飞行前须做严格的地面检查,可有效避免飞行事故的发生。

1. 检查全机螺丝是否安装到位、舵角摇臂连接可靠。机翼快拆装置已锁紧。
2. 安装电池,并调整飞机重心到说明书推荐位置。
3. 动力电池、遥控器发射机电池等已充满电,处于可靠工作状态。
4. 发射机油门杆保持在最低位(推荐使用带有油门锁定功能的遥控设备),打开发射机,随后连接动力电池,待电调初始化完成后检查各个舵面是否回中,是否动作正确。
5. 轻推油门观察螺旋桨转向是否正确。

所有检查完成后,方可进行飞行,初学者首次飞行需要有经验的爱好者协助完成,避免因操作不当发生飞行事故。

合适的飞行场地

航模飞行须远离人群、建筑物、树木、高压线及禁飞区的空旷场地(至少 2-3 个足球场大小)。初学者飞行前需要向有经验的爱好者询问相关安全事宜。

关于飞行时间

厂家推荐的飞行时间是使用厂家推荐型号的电池,由有经验的爱好者在微风天完成飞行测试得到的飞行时间,该时间与电池参数、飞机全备重量、飞行条件以及飞行手法相关,不同飞行条件可能得到不同的飞行时间。

建议爱好者在飞行时使用遥控器的“计时功能”,建议初始飞行时间设定为 4 分钟,飞行时间倒计时告警后,降落飞机并测量电池电压,方可估算飞行时间并重新调整遥控器计时。如发射机没有计时功能,需要其他设备辅助测算飞行时间,以保证飞行安全。

在电池放电后期,禁止将飞机飞入下风区(风向指向的远端),防止动力不足而导致飞机不能安全返航。

故障检修指导

问题	问题原因	解决方式
油门推杆无响应，但舵机有响应	——电调未连接电机 ——油门通道反向	——降低油门推杆和油门微调设定 ——反过来重新装油门通道
桨的噪音过大或者震动过大	——桨罩、桨、电机、电机架坏了 ——桨或者桨罩的小部件松动了 ——桨装反了	——更换损坏的配件 ——把桨、桨夹和桨罩的小部件拧紧 ——反过来重新装桨
飞行时间变短，飞机无力	——电池电量低 ——桨装反了 ——电池坏了	——重新给电池充电 ——依照电池说明书更换新的电池
飞舵面不动，或者动作响应较慢	——舵面、舵角、连接杆、舵机坏了 ——连接线坏了或者接头松了	——更换或者维修坏了的配件 ——检查所有连接线，确保所有接头无松动现象
舵面反向	——遥控器发射机通道反向	——检查通道控制（舵面）方向，调试飞机舵面和遥控器的舵面控制杆
电机无力	——电机或电池坏了 ——电调用了不合适的低压保护装置	——检查电池、发射机、接收机、电调、电机是否有损坏（如有，请及时更换） ——立刻操控飞机降落，重新给电池充电
接收器的 LED 灯慢闪	——接收器低电量	——检查电调和接收器之间的连接 ——检查舵机是否受损 ——检查连接杆是否安装到位

配件列表

FMSTB101	机身	FMSTB115	主翼对接管
FMSTB102	主翼	FMSTB116	LED灯组
FMSTB103	垂尾	FMSTB117	飞行员
FMSTB104	平尾	FMSTB118	前起落架组
FMSTB105	座舱组	FMSTB119	主起落架组
FMSTB106	机头罩	FMSTB120	前起落架系统
FMSTB107	小翼	FMSTB121	主起落架系统
FMSTB108	连接杆	FMSRE064	电子收放（用于前起落架）
FMSTB109	舵面摇臂组	FMSRE065	电子收放（用于主起落架）
FMSTB110	轮胎组	FMS90MM	12叶90涵道
FMSTB111	螺丝组	FMSDF011	90MM涵道带内转电机（塑胶）6S
FMSTB112	腹鳍	PRESC039	120A 电调
FMSTB113	贴纸	PR13MGDP	捕食者13g 全金属数码正向舵机
FMSTB114	前起落架盖板	PR13MGDR	捕食者13g 全金属数码反向舵机
FMSTB114-1	主起落架盖板		

如需查找产品图片，请登录FMS官方淘宝店 <https://fmsmodel.taobao.com>。如需查找电调说明书，则在以上网址搜索栏中搜索关键词“电调”，即可在任何一款电调产品页面查看。



MADE IN CHINA