2300mm FOX

Operating Manual

Specifications

Wingspan.....2300mm/90.5in
Flying Length.....1290mm/50.7in
Weight.....1150g(40.6oz)
Wing Area.....36.5dm²(565.8 in²)
Wing Load.....31.5g/dm²(0.07oz/in²)
Radio Controls.....4 Channel

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www.fmsmodel.com

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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 requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner 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 this manual prior to assembly, setup, or use, in order to operate correctly and avoid damage or serious injury.

Safety Precautions and Warnings

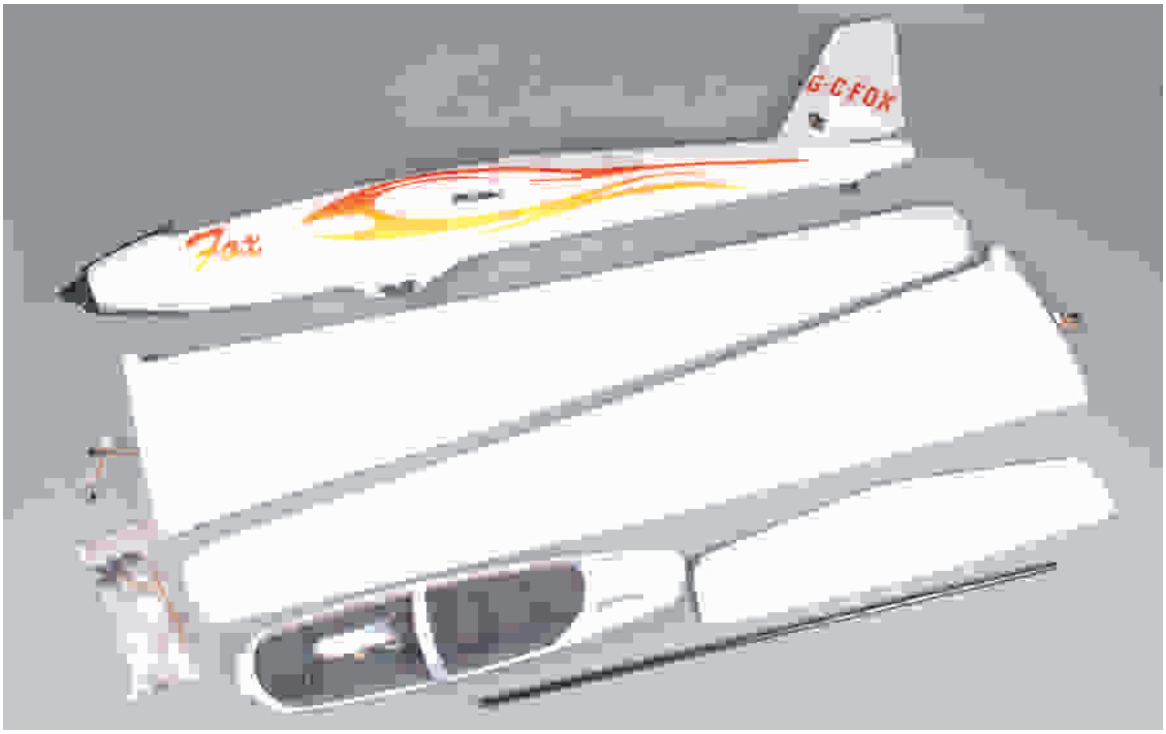
As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others. This model is controlled by a radio signal subject to interference from many sources outside your control. This interference 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 14years. 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 the street or in populated areas for any reason.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) you use.
- 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 place any portion of your model in your mouth as it could cause serious injury or even death.

FMS MODEL Friendly Reminder

Thank you for purchasing a FMS MODEL product. Our goal is to provide high quality products and offer great customer service. If you have any problems with your product or want to offer suggestions for improvements (such as plane design, packaging, building instructions, etc.) please feel free to contact us at info@fmsmodel.com

Table of contents



Kit contents

1. The fuselage assembly (With the motor, the canopy, the electronic parts, ESC)
2. Horizontal stabilizer
3. Propeller and spinner
4. Spare parts bag
5. Main wing tube
6. Main wing

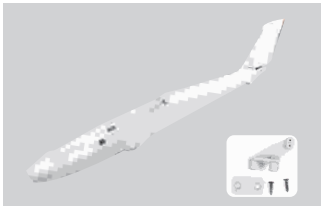
The spare parts list

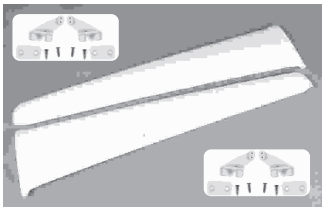
Replacement parts for the **FOX** are available using the order numbers in the Spare parts list that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company.

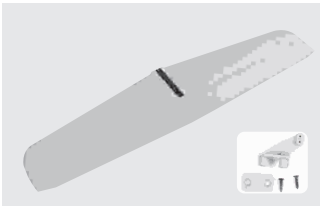
Spare parts list content

Spare parts list content
MT 101 Fuselage (With all the plastic parts and rudder installed)
MT 102 Main wing set (With the control horn in stored)
MT 103 Horizontal stabilizer (With the elevator connector installed)
MT 104 Spinner
MT 301 Propeller
MT 302 Canopy (one plastic canopy)
MT 303 Canopy (one foam canopy)
MT 304 Sticker
MT 305 Pipe
MT 306 Motor Board (V2)
MT 307 Linkage Rods
FMS-Motor 4018 KV900
FMS-ESC-30A (150mm input cable)
FMS-Battery-11.1V 1300mAh 35C
FMSSER9GP
Note: All of the parts are painted with no decal applied.

The illustration of the spare parts


MT101

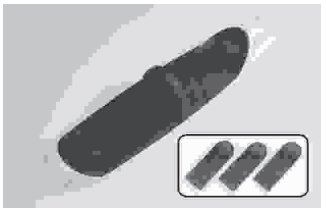

MT102 (V2)


MT103

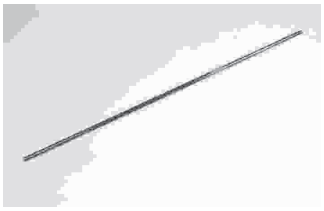

MT104

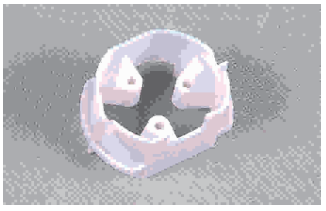

MT301

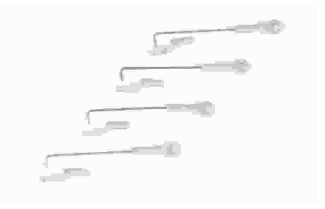

MT302


MT303

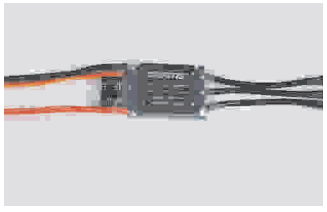
MT304


MT305


MT306(V2)


MT307


FMS-Motor
4018 KV900


FMS-ESC-30A
(150mm input cable)


FMS-Battery-11.1V
1300mah 35C


FMSSER9GP

Kit inspection

Before starting to build, inspect the parts to make sure they are acceptable quality. If any parts are missing or are not in good shape or acceptable quality, or if you need assistance with setup and assembly, please feel free to contact FMSteam. Please write down the name of the parts when you are reporting defective or missing of them.

FMSteam Product Support

ADDRESS: **3/F, Building B, 3rd Industry Zone, Matigang, Dalingshan Town, Dongguan City, P.R.C**

Ph: **0086-769-86976655**

Charging the Flight Battery

The Battery Charger is designed to safely charge the Li-Po battery,

Caution: All instructions and warnings must be followed exactly. Mishandling of Li-Po batteries can result in fire, personal injury, or property damage.

Battery warning:

By handling, charging or using the included 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!

Charging or discharging a swelling or ballooning battery can result in fire.

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 40-120°F. Do not store 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. Failure to charge the battery with a compatible charger may cause fire resulting in personal injury and property damage.

Never discharge Li-Po cells to below 3V.

Never leave charging batteries unattended.

Never charge damaged batteries.

Charging the flight battery

When charging the battery, make certain the battery is on a heat-resistent surface, charge the battery before assembly of the airplane. Install the fully charged battery to perform control tests and binding.

Charging the Flight Battery

Electrical Parameters

Parameter	Min	Type	Max	Unit
Working Voltage	9	12	16	V
Input Power	15			W
Work Temperature	– 20		45	℃
Store Temperature	– 20		65	℃
Charging Stop Voltage	4.19	4.20	4.21	V
Charging Current			1000	mA
Balancing Current	150		200	mA
Activate Current	80		120	mA

Using Steps:

1. Connect the charger to adapter with enough voltage and wattage, then the Power LED will turn on;
2. Connect 2S/3S battery pack to the corresponding balance port (**Do not connect two battery packs at the same time**), then the Charge LED will flicker (1Hz) and start charging.
3. When the Charge LED stops flickering, charging is complete, and the batteries can be unplugged.

Charging Function Description

1. If all voltage of the installed battery pack is higher than 4.18V, charging will not start and the charge LED will shine.
2. If the voltage of one battery or some batteries is lower than 0.7V, charging will not start. If the voltage of the first battery of a 3S battery pack is lower than 0.7V, the charger will charge the battery pack as if it was a 2S battery pack.
3. If the voltage of one battery or some batteries is lower than 2.8V, the charger will activate the battery pack with a small current. If the voltage can't be increased above 2.8V after half an hour, the charger will judge the battery pack as bad. The charge LED will then flicker rapidly (0.5Hz), and charging will stop.

Self Checking Function

1. Charger will perform a self test before each charge. The charge LED will rapidly flicker (0.5Hz) if the charging function is abnormal;
2. Accuracy checking Function: Connect a fully charged 3S battery pack (all voltage at least 4.2V), the charge LED will flicker twice then shine always. This means that the accuracy is normal.

Charging the Flight Battery

Protection Function

1. Reverse connection protection of input
2. Reverse connection protection of output
3. Short circuit protection of output
4. Over voltage protection of output

Troubleshooting

1. ***Power LED does not shine*** – Adapter isn't connected correctly. Please check the polarity and reconnect adapter.
2. ***Charging abruptly stops and tries to restart constantly during charging*** – Output power of the adapter is not sufficient, please replace the adapter.
3. ***Charge LED does not shine*** – Reconnect the battery pack; Check the voltage of batteries.
4. ***Charge LED rapidly flickers*** – Battery is bad or charging function is abnormal. Replace battery or contact technical support.

Low voltage cut off (LVC)

When a Li-Po is discharged below 3V per cell, it will not hold a charge. The ESC protects the flight battery from over-discharge using Low Voltage Cutoff. Before the battery charge decreases too much, LVC removes power from motor in two ways: (1) Reduces power - ESC reduces motor power (recommended), (2) Hard cutoff - ESC instantly cuts motor power when the pre-set Low Voltage Protection Threshold value is reached. These settings can be changed using the ESC programing guide (available on-line).

Assemble the plane

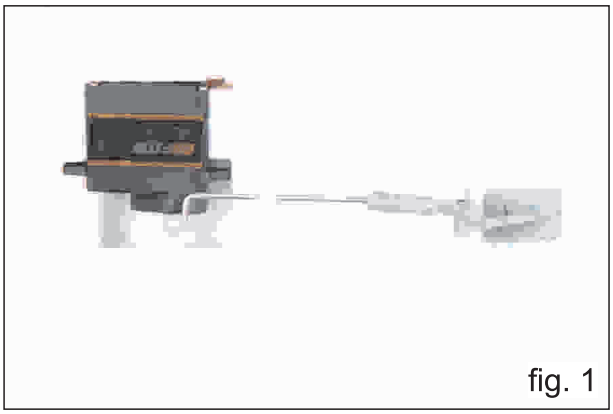


fig. 1

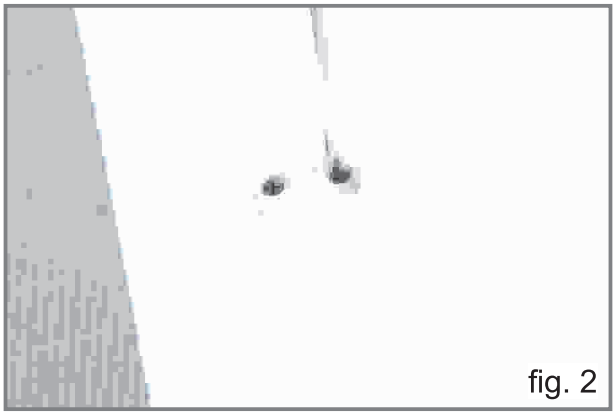


fig. 2

Connect the aileron control rod linkages

- 1) Slide the provided piece of fuel tubing over the control rod linkage and then insert the control rod linkage thru the desired hole in the aileron servo arm (fig. 3). Note: For a single rate transmitter use the first hole to achieve a high rate setting. Use the third hole nearest the servo to achieve a low rate setting.

- 2) Press the hole in the clevis over the end of the control rod linkage, rotate it and snap the base of the clevis over the control rod linkage (fig. 4).

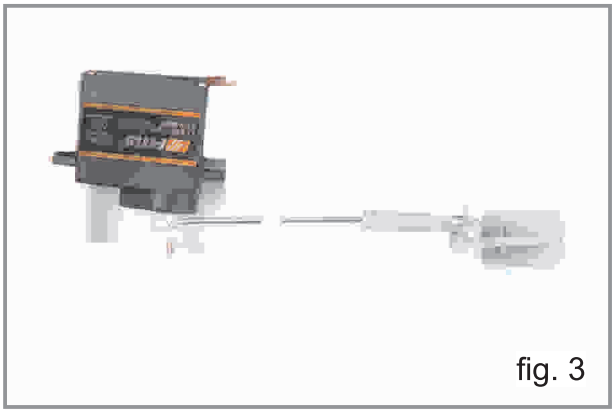


fig. 3

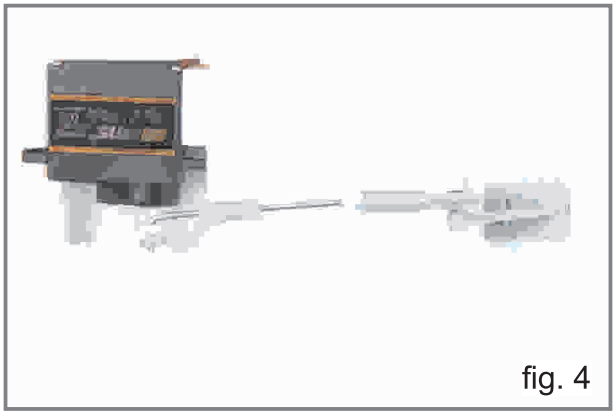


fig. 4

- 3) Slide the fuel tubing over the clevis to secure it (fig. 5). Note: Do not slide the fuel tubing too far or binding of the servo arm could result (fig. 6). Repeat steps 3-5 for the other aileron control rod linkage.

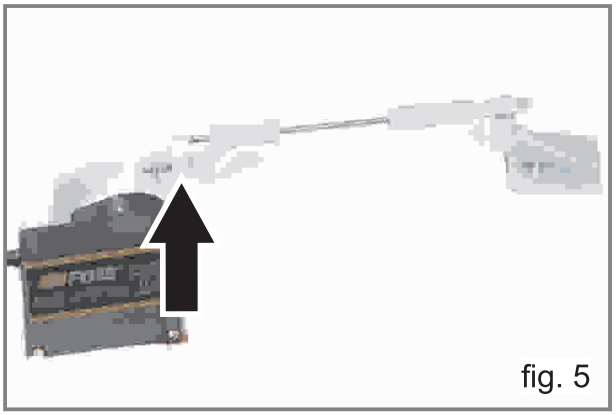


fig. 5

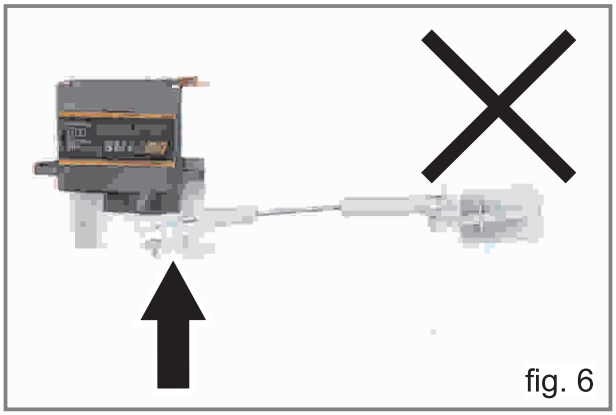
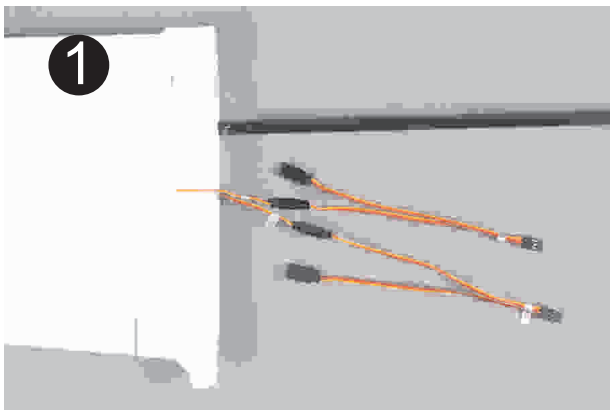


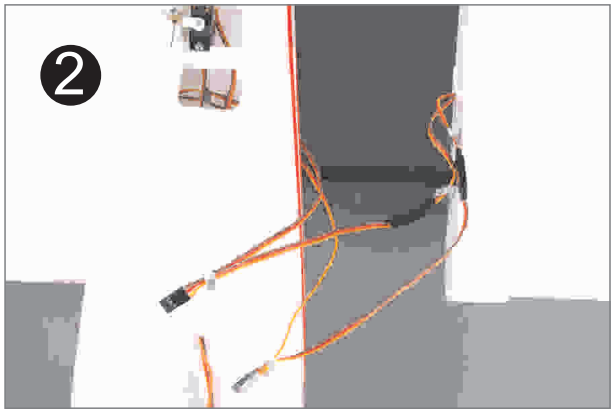
fig. 6

Install the main wing

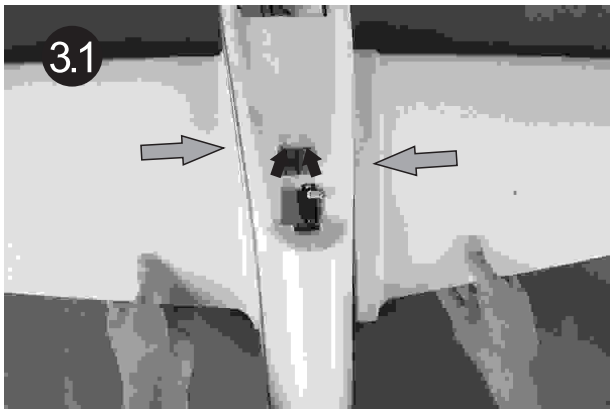
1. Insert the pipe into the wing, Connect the Y cable

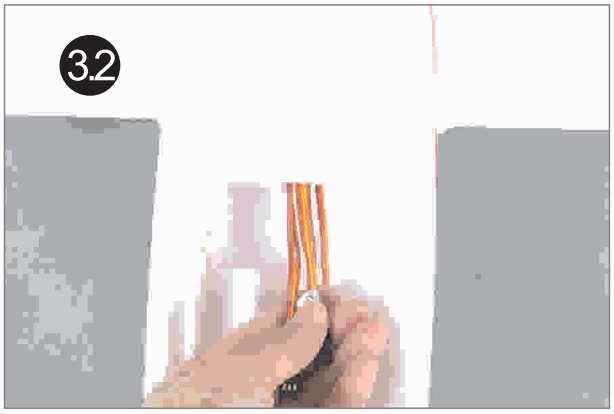


2. Assemble the wing. Connect the opposite end of Y cable.

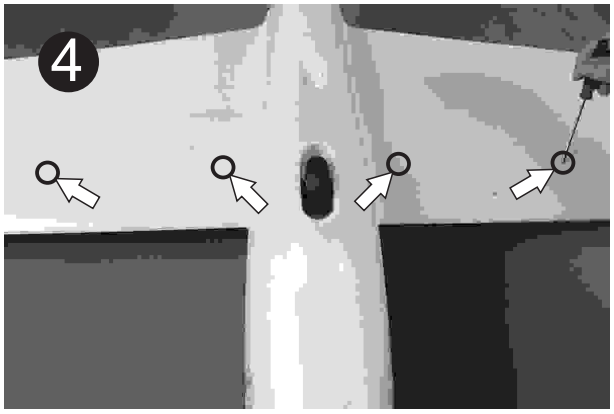


3. Assemble the full wing. Insert the wings at the both sides of fuselage. Insert the Y cable of aileron from the bottom front



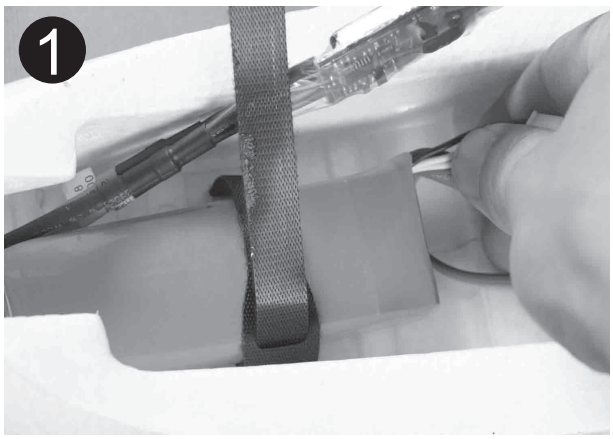


4. Fix the wing and pipe provided screws. Do not over tighten the screws but make sure it's tight enough.

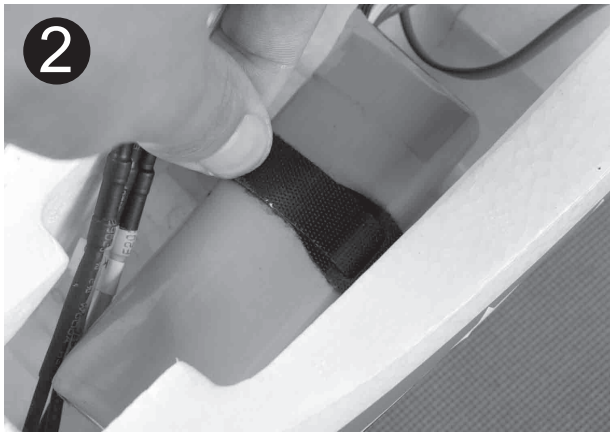


Install the battery

1. Slide the battery into the hook and loop ring from the back of the battery compartment with the cable toward the rear side of the hatch.

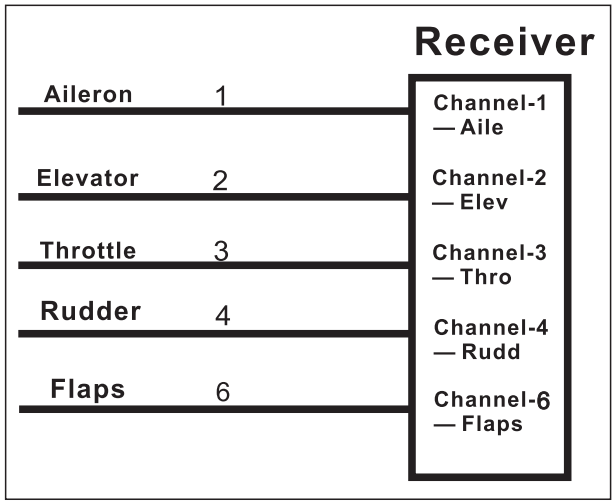


2. Secure the battery into place using the hook strip.
Note: Do not arm the ESC while placing the battery into the compartment.



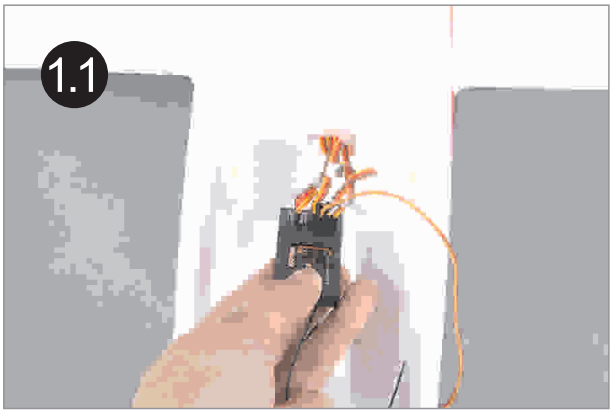
The receiver connection

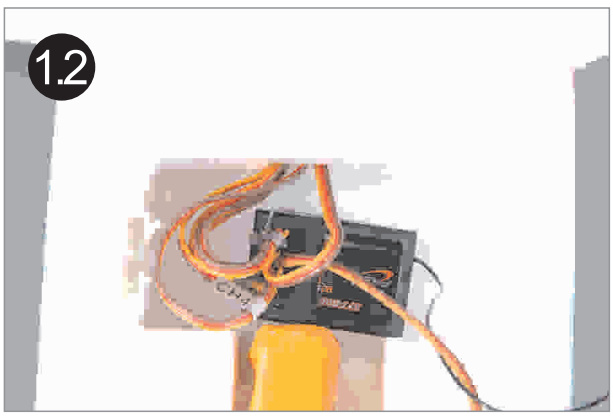
Attach right v-tail to the elevator channel of your receiver. The left v-tail goes to the rudder channel of your receiver. You will need to activate the V-tail configuration of your transmitter.
Attach the ESC connector to the throttle channel of the receiver.



The placement of the receiver

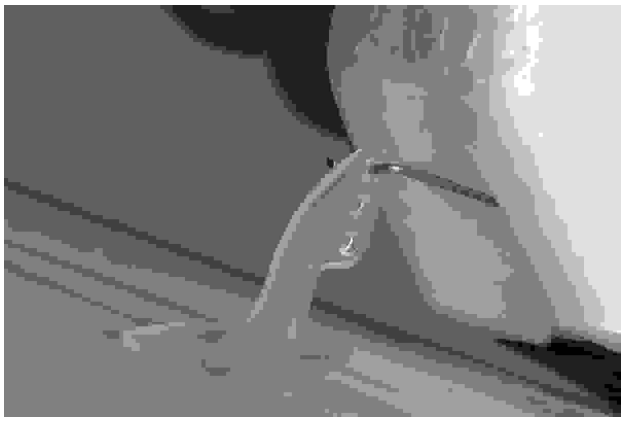
1. Place the receiver in the fuselage cavity on the rear end of the canopy hatch.



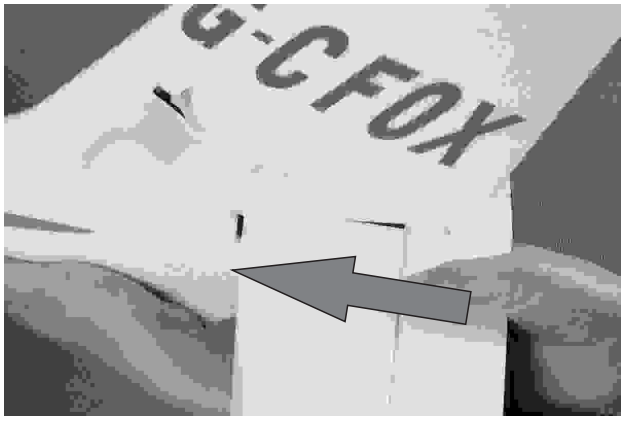


Install the elevator

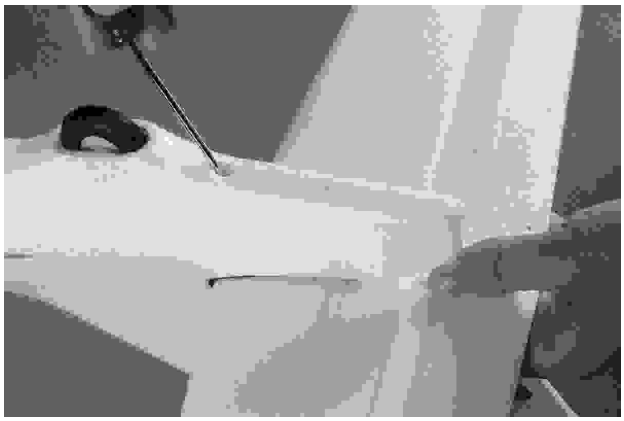
1. Install the linkage rod of the elevator.



2. Insert the Horizontal stabilizer half into the tail mounting slot



3. Secure the rudder using the provided screws **PM 3.0*35(2PCS)**.
Note: Do not over tighten the screws but make sure it is tight enough.



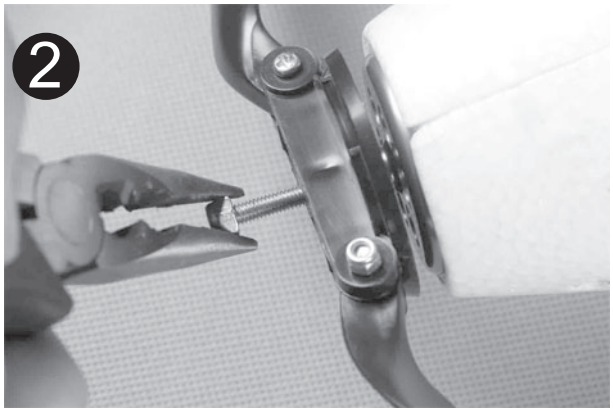
4. Loosen the screws on the control connectors which hold the control rods in place

Assemble the plane

Disassembly

1. The spinner is snapped into the propeller backplate. To remove, hold the spinner near the root of the propeller and squeeze gently.

2. Remove the nut using a nose needle plier or a socket wrench while holding the propeller set into place.



3. Remove the propeller set from the motor shaft.

4. Always check that the foldaway propeller blades are attached properly. Make sure that the bolts are on completely, but not too tight or they will prevent the blades from spinning freely.

Get your model ready to fly

Important ESC and model information

1. The ESC included with the **FOX** 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 detect the cells of the battery. The count of the beeps equal 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 the brake switched off and we recommended that the **FOX** 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 11.1V 1300mAh 35C Li-Po battery. If using another battery, the battery must be at least a 11.1V 1300mAh 35C battery. Your battery should be approximately the same capacity ,dimension and weight as the 11.1V 1300mAh 35C Li-Po battery to fit in the fuselage without changing the center of gravity significantly.
5. The specification of the model list as fellow:
   Wing span: 2300mm/90.5in
   Length: 1290mm/50.7in
   Motor : 4018-KV900
   ESC : 30A
   Battery : 11.1V 1300mAh 35C
   Servo : 9g*6
   Approx flying weight: 1150g
   Wing area: 36.5dm²
   Wing loading: 31.5 g/dm²

The transmitter and model setup

Before getting started, bind your receiver with your transmitter. Please refer to your **Transmitter Manual** for proper operation.

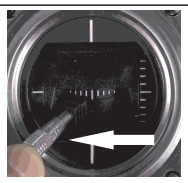
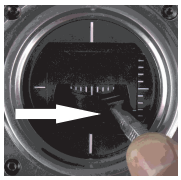
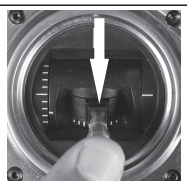
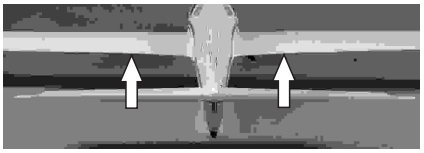
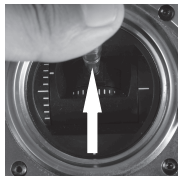
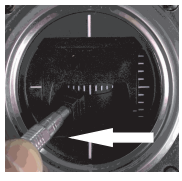
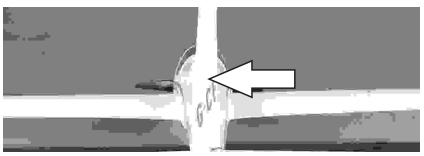
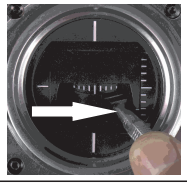
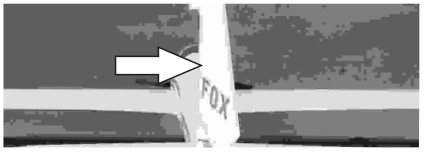
CAUTION: To prevent personal injury, DO NOT install the propeller assembly onto the motor shaft while testing the control surfaces . DO NOT arm the ESC and do not turn on the transmitter until the **Transmitter Manual** instructs you to do so.

Get your model ready to fly

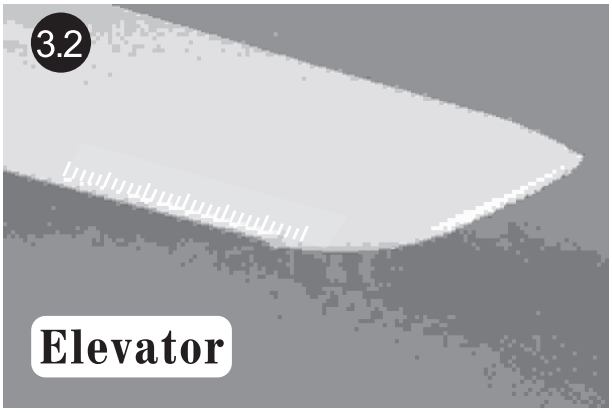
Tips: Make sure all control sticks on your radio are in the neutral position (rudder, elevator, ailerons) and the throttle in the OFF position. Make sure both ailerons move up and down (travel) the same amount. This model tracks well when the left and right ailerons travel the same amount in response to the control stick.

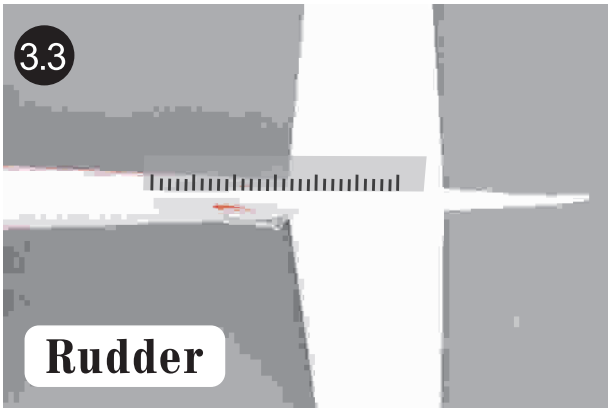
1. Move the controls on the transmitter to make sure aircraft control surface move correctly. See diagrams below. If controls respond in the opposite direction reverse the direction for operation of flight controls. Refer to your transmitter's instructions for changing direction of transmitter flight controls.

2. Adjust the servo arms mechanically make sure all servo arms are fully vertical. If not, adjust the servo arm by using the trim function on your radio.
Note: For computerized transmitters, use the servo/channel sub-trim feature to make each servo arm fully vertical. Make sure the trims and the sub trims in neutral position before making some mechanically trim.

	Bank Left		**Aileron**
	Bank Right		
	Climb		**Elevator**
	Descend		
	Yaw Left		**Rudder Steering**
	Yaw Right		

3. Align the control surfaces well by adjusting the linkage rod in the control connector. The ailerons align with the wing root fillet, the counterbalance leading edge of the elevator aligns with the horizontal stabilizer leading edge and the counterbalance leading edge of the rudder with the vertical stabilizer leading edge.
Note: Use a drop of thread lock on the grub screws before securing the linkage rod.



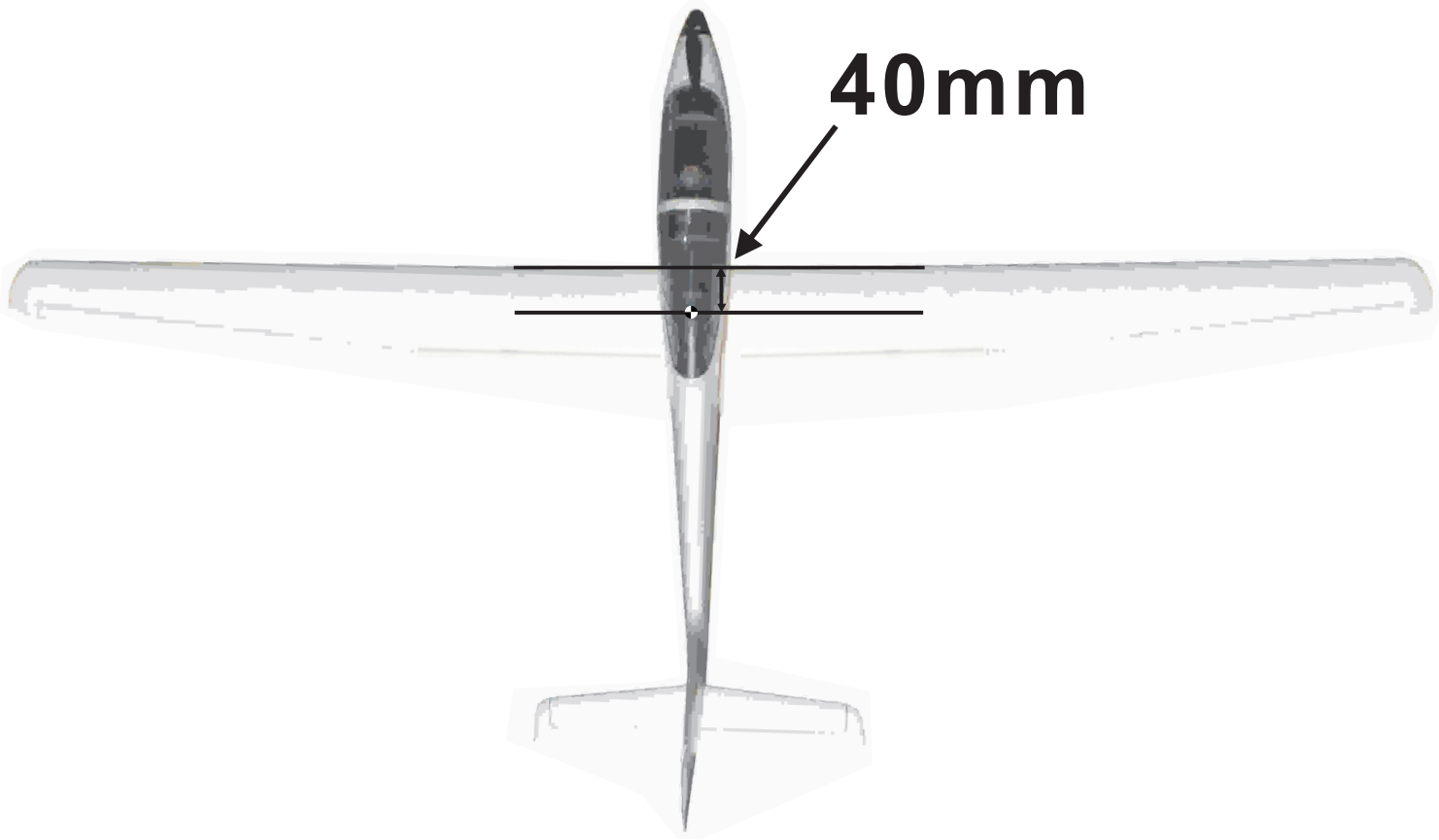


Check the motor rotating direction

1. The propeller should rotate clockwise when viewing the plane from the rear.
Note: Be careful not to accidently discard the propeller hub adapter.
CAUTION: Before testing the propeller, make sure the tail of the plane is firmly on the model stand and ensure there are no people or objects in the range of the propeller.

Check the C.G. (Center of Gravity)

Center of Gravity
When balancing your model, adjust the motor battery as necessary so the model is level or slightly nose down. This the correct balance point for your model. After the first flights, the **CG** position can be adjusted for your personal preference.
1. The recommended Center of Gravity (**CG**) location for your model is (**40mm**) forward 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.
Caution: Do not connect the battery to the ESC while balancing the plane.



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 of 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 one on a wrist watch 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. The **FOX** 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 altitude and begin to trim the model till it's tracks well through all aspects of flight, 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.

Recharge the battery and repair the model as needed. 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 till 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 5 min 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 bullet of the rotor adaptor is firmly in place before every flight.

Troubleshooting

Problem	Possible Cause	Solution
Aircraft will not respond to the throttle but 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.
Reduced flight time or aircraft underpowered.	- Flight battery charge is low. - Propeller installed backward. - Flight battery damaged.	- Remove and install propeller correctly. - Completely recharge flight battery. - Replace flight battery and obey 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.