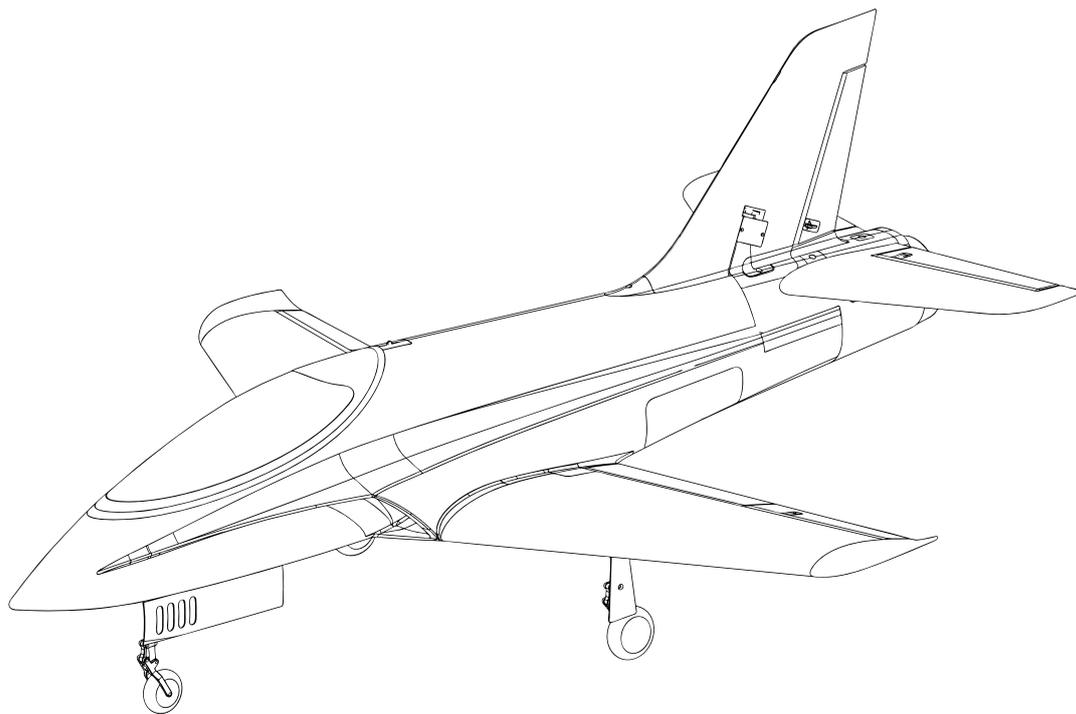




# 80MM FUTURA Operating Manual



**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.

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## Introductions

### FMS Futura

With the increased interest and development of Electric Ducted Fans (EDF), FMS is proud to announce their 1060 mm(41.7 in) wingspan 80mm EDF version of the famous Futura. This EPO foam version of this quick flying aerobatic jet is another example of the FMS quality. Equipped with the new and improved 80mm fan unit, the Futura is capable of producing 3400 grams of force (7.5 LBF) of thrust. Coupled that with CNC-processed shock-absorbed metal landing gear set, optional vibrant color schemes (bright purple & golden, red & black), digital metal gear servo throughout, the coming Futura is absolute a must have for the pilot that “Feels the need for Speed”.

### Key features:

- 1.Powerful3270-KV2000motor
- 2.80mm 12 Blade Fan unit
- 3.High-quality Predator 100A ESC
- 4.EPO40 foam material
- 5.Digital metal gear servos throughout for better controlling capabilities
- 6.New CNC-processed shock-absorbed metal landing gear set (Worm Dia. 10mm) helps to withstand those less-than-perfect landings
- 7.Function Flaps
- 8.Multi-connector for one-step installation (With the latest multi-connect technology, FMS has streamlined the wiring system, making it easier to install and eliminating wiring problems.)
- 9.Oversized battery compartment
- 10.Button-type canopy hatch
- 11.No glue required, screw-together construction
- 12.Environmentally friendly water-based paint for better color and gloss

## Specifications

**Wingspan: 1060mm (41.7in)**

**Overall Length: 1170mm (46.1in)**

**Flying Weight: Around 2500g (88.18oz)**

**Motor Size: Brushless 3270-KV2000**

**Wing Load: 113.6 g/dm<sup>2</sup> (0.26oz/in<sup>2</sup>)**

**Wing Area: 22 dm<sup>2</sup> (341 sq.in)**

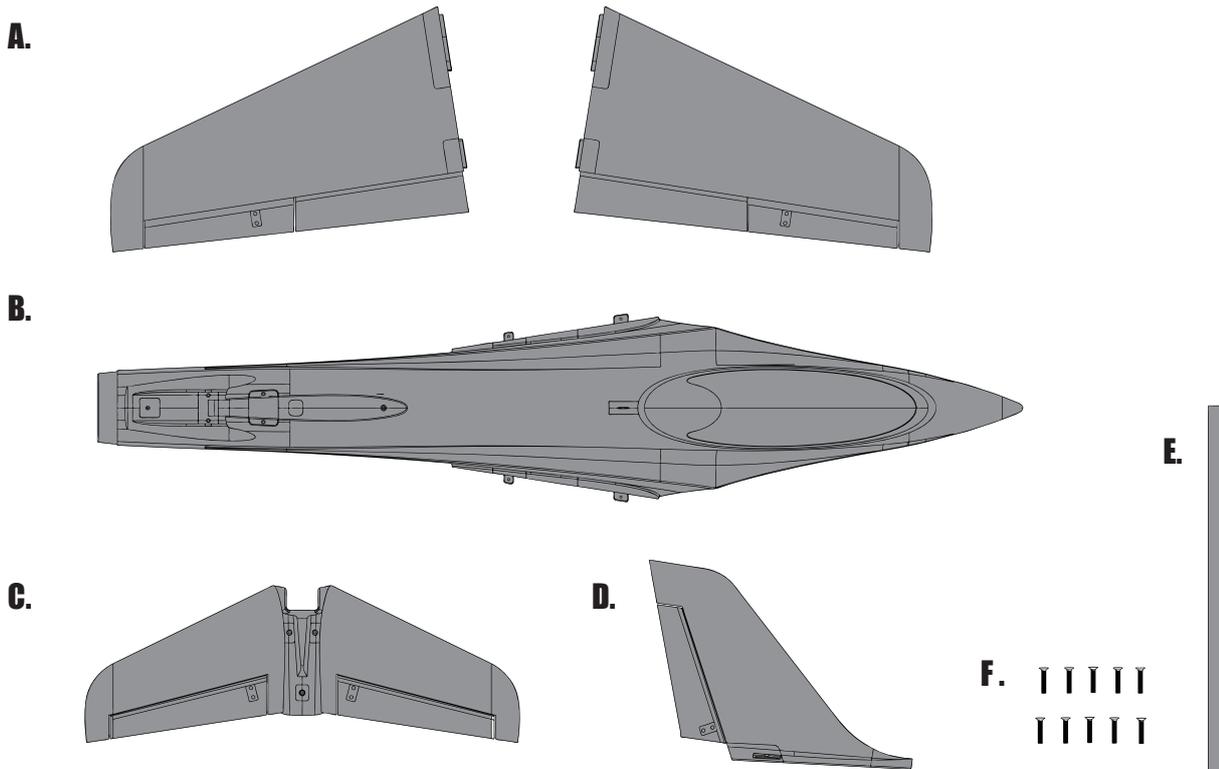
**ESC: 100A**

**Servo: 9g metal digital Servo x 8**

**Recommended Battery: 22.2V 4000mAh 35C**

## Contents of Kit

Before assembly, please inspect the contents of the kit. The photo below details the contents of the kit and 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](mailto:support@fmsmodel.com)



A: Main wing(left and right)  
B: Fuselage  
C: Horizontal Stabilizer

D: Vertical Stabilizer  
E: Fiber Pipe  
F: Screws(10-HKM3.0\*16)

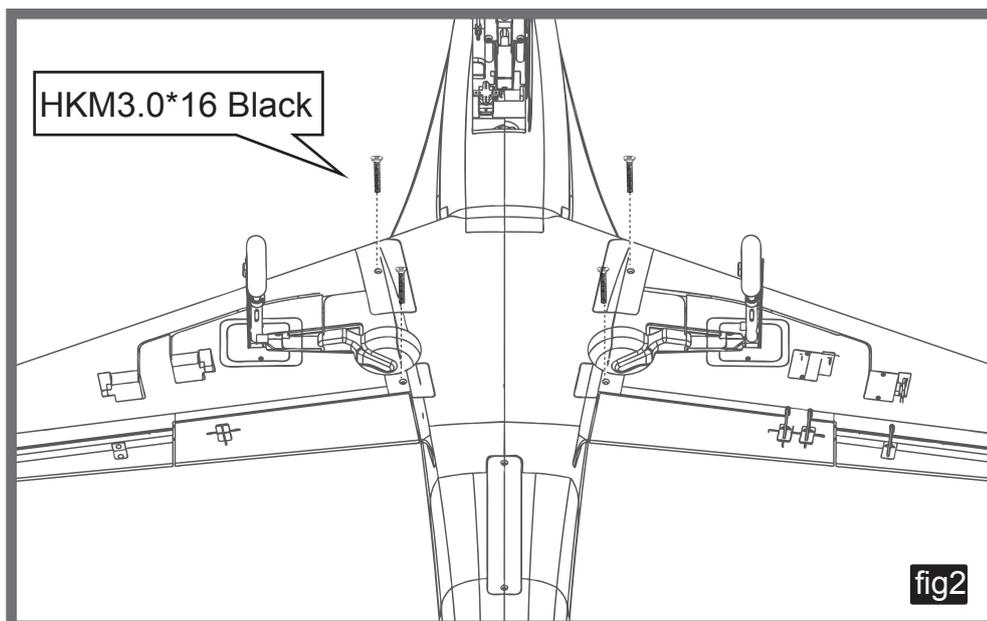
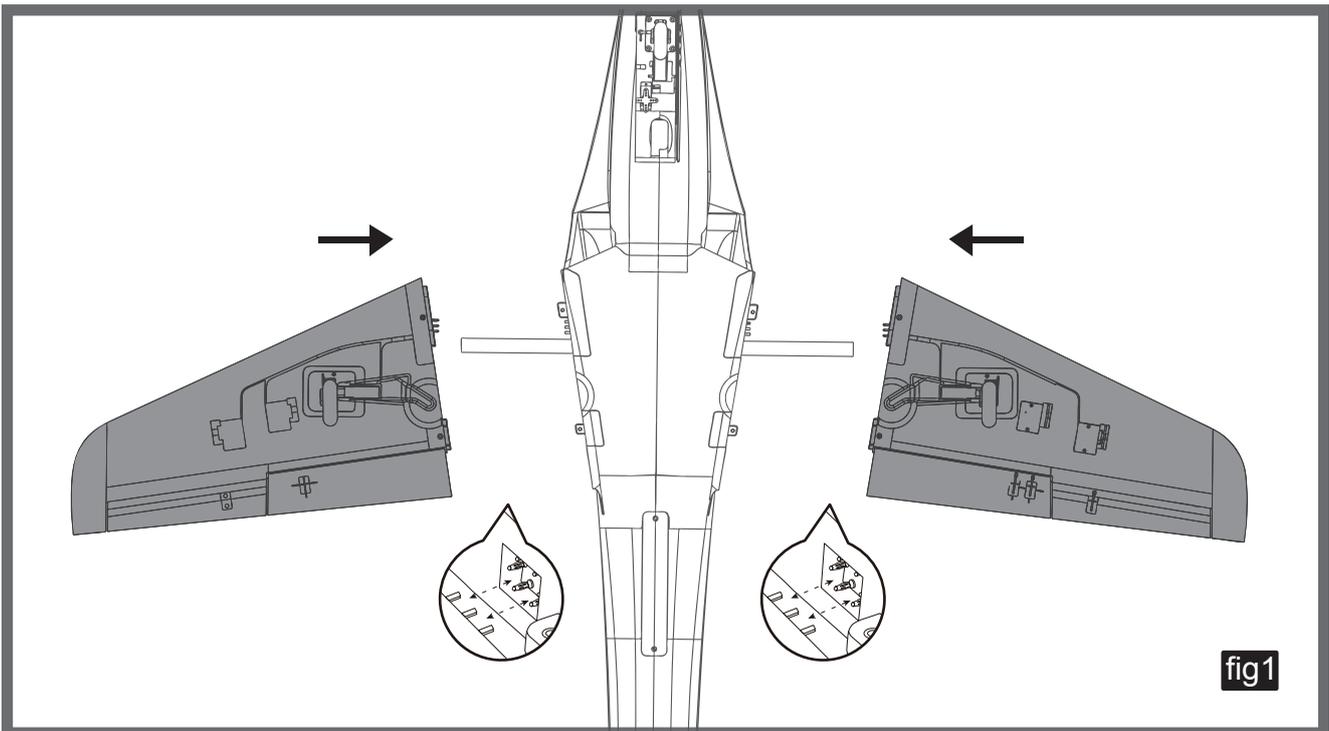
## Model Assembly

### Main Wing Installation

1. Slide the tube into the fuselage then install both wings over the wing tube and into the wing slot of the fuselage. (fig1)

Note: The connectors on both sides should be attached precisely and firmly.

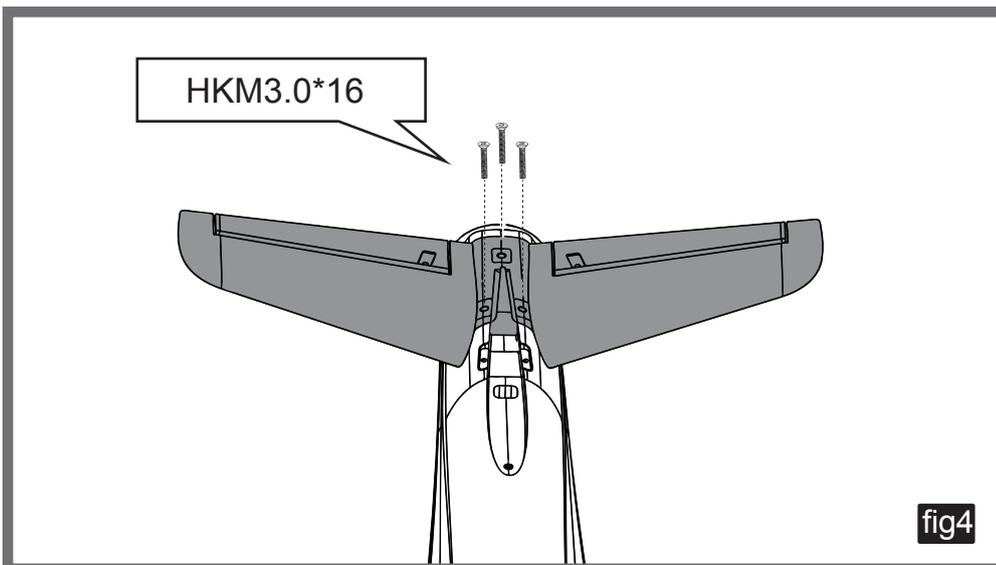
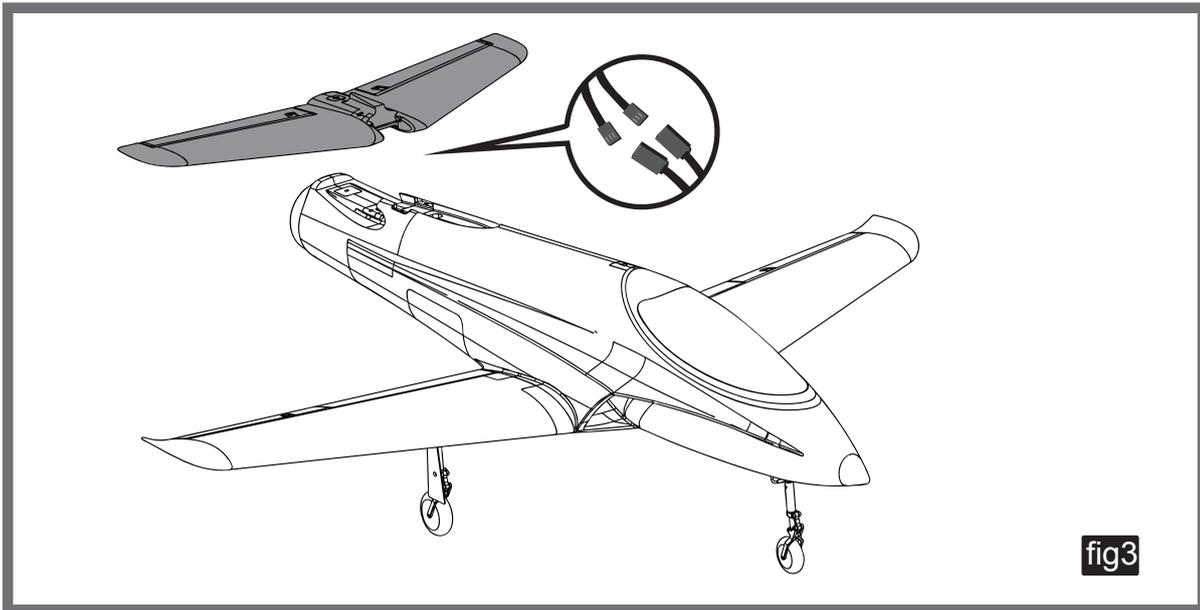
2. Secure the both wings into the fuselage using the included 4 screws.(fig2)



## Model Assembly

### Horizontal Stabilizer Installation:

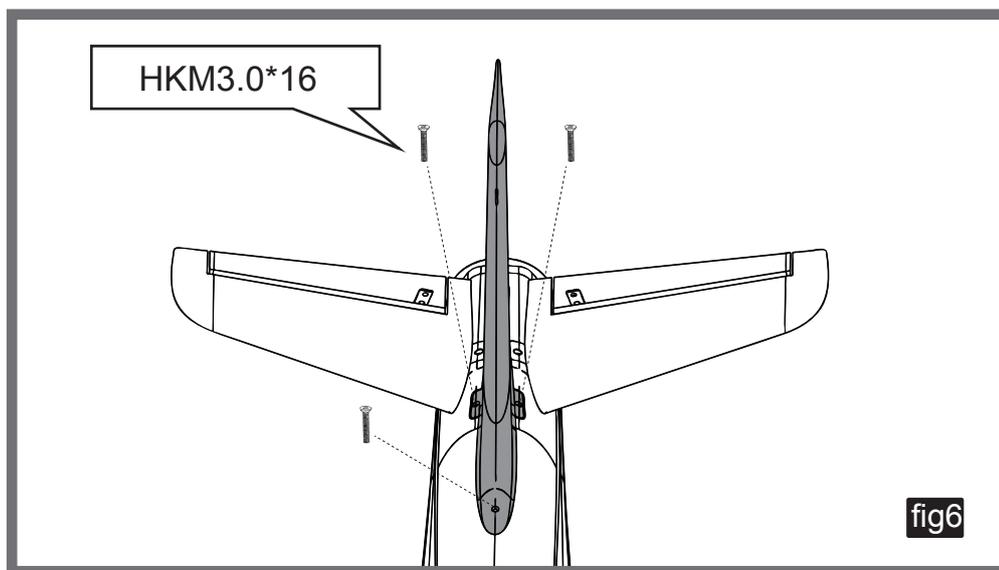
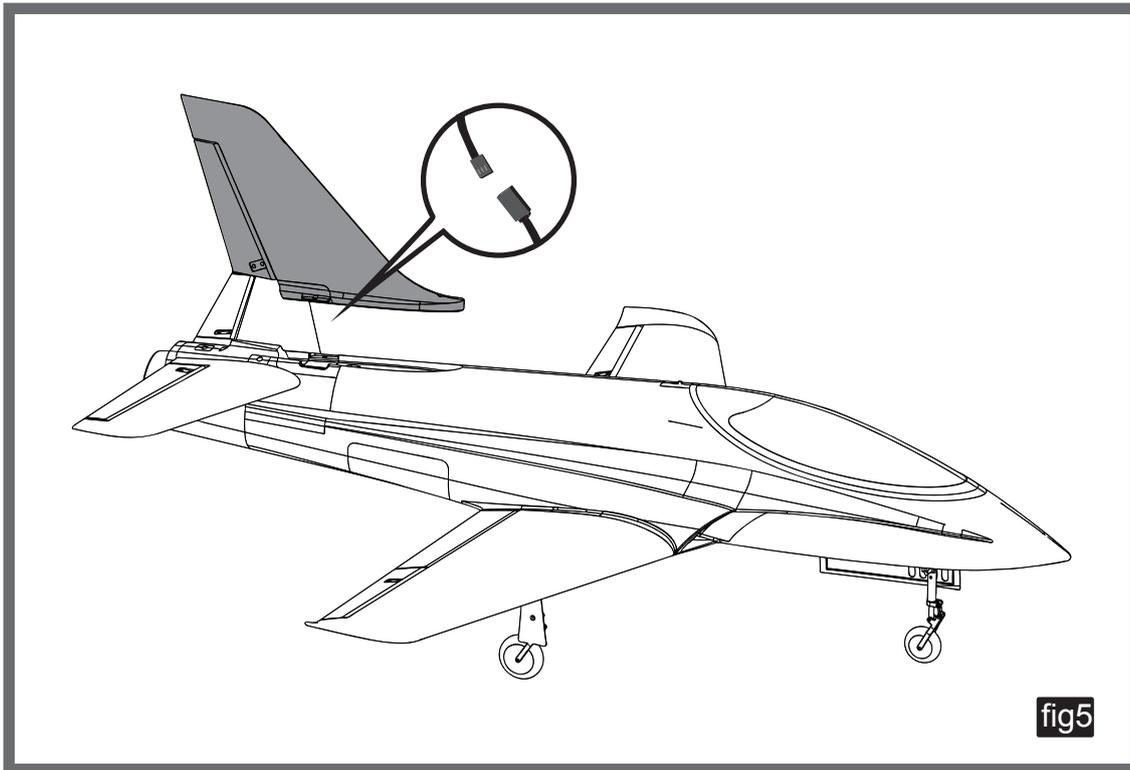
1. Connect the elevator servo connectors to the servo extensions in the fuselage.
2. Slide the horizontal tail in the rear of the fuselage. Ensure the control horn faces down as shown. (fig3)
3. Secure the horizontal tail in place using the included 3 screws.(fig4)



## Model Assembly

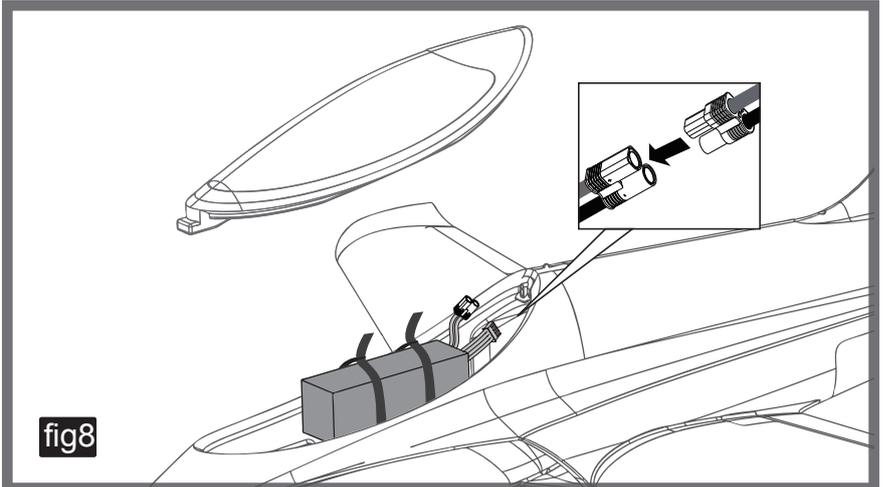
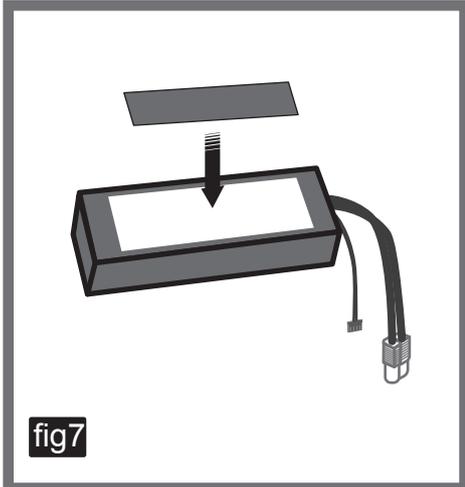
### Vertical Stabilizer Installation:

1. Connect the rudder servo connectors to the servo extensions in the fuselage.
2. Slide the vertical tail into the slot in the fuselage.(fig5)
3. Secure the vertical tail in place using the included 3 screws.(fig6)

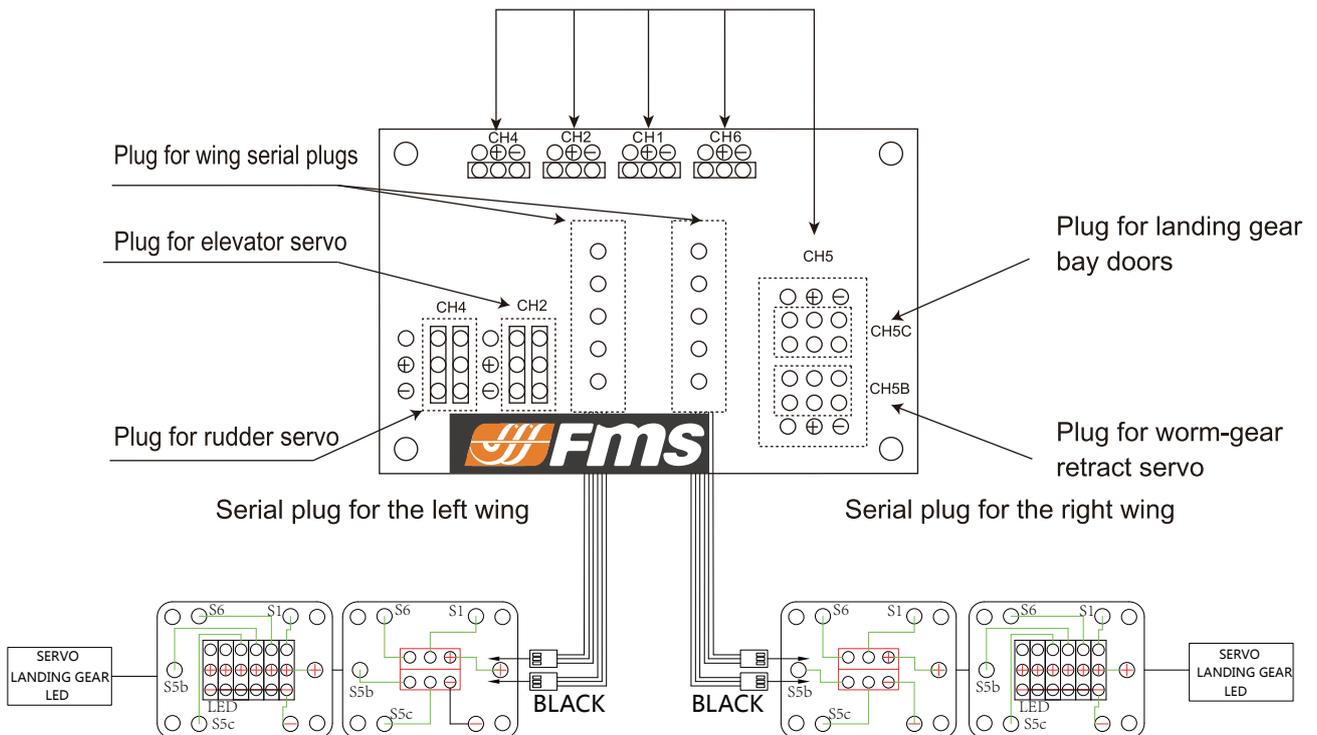


## Battery and radio installation

1. Apply the loop side (soft side) of the hook and loop tape to the bottom of the battery and the hook side to the battery tray.
  2. Install the fully charged battery in the battery compartment with the power supply cable toward the rear end of the plane, and secure using the hook and loop straps.
- Note: you may need to relocate the battery position to achieve the correct CG for your model.



## Connectors Diagram



**CAUTION:** When connecting the single plug, make sure the positive and negative terminals are in the right direction. An incorrect connection will burn the electronic equipment.

## 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 22.2V 4000mAh 35C Li-Po battery. If using another battery, the battery must be at least a 22.2V 4000mAh 35C battery. Your battery should be approximately the same capacity, dimension and weight as the 22.2V 4000mAh 35C Li-Po battery to fit the fuselage without changing the center of gravity significantly.

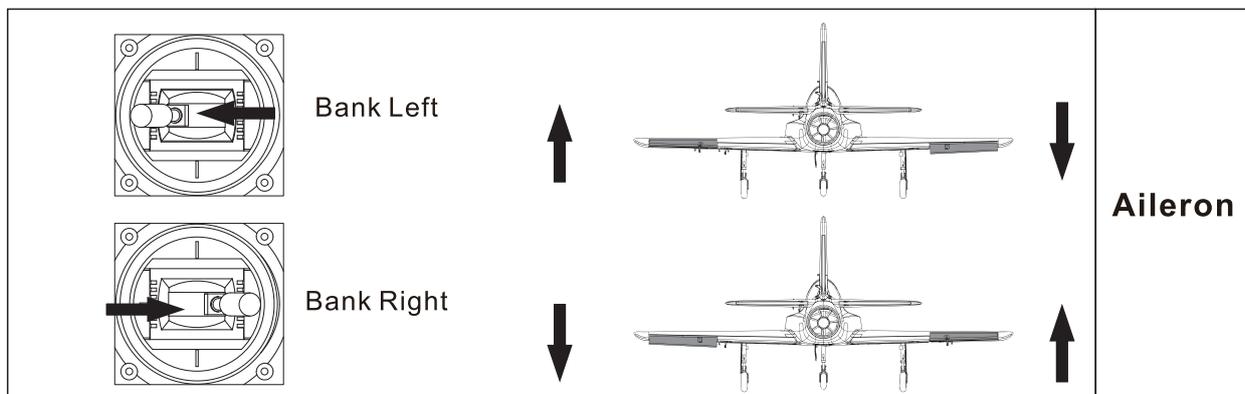
### The transmitter and model setup

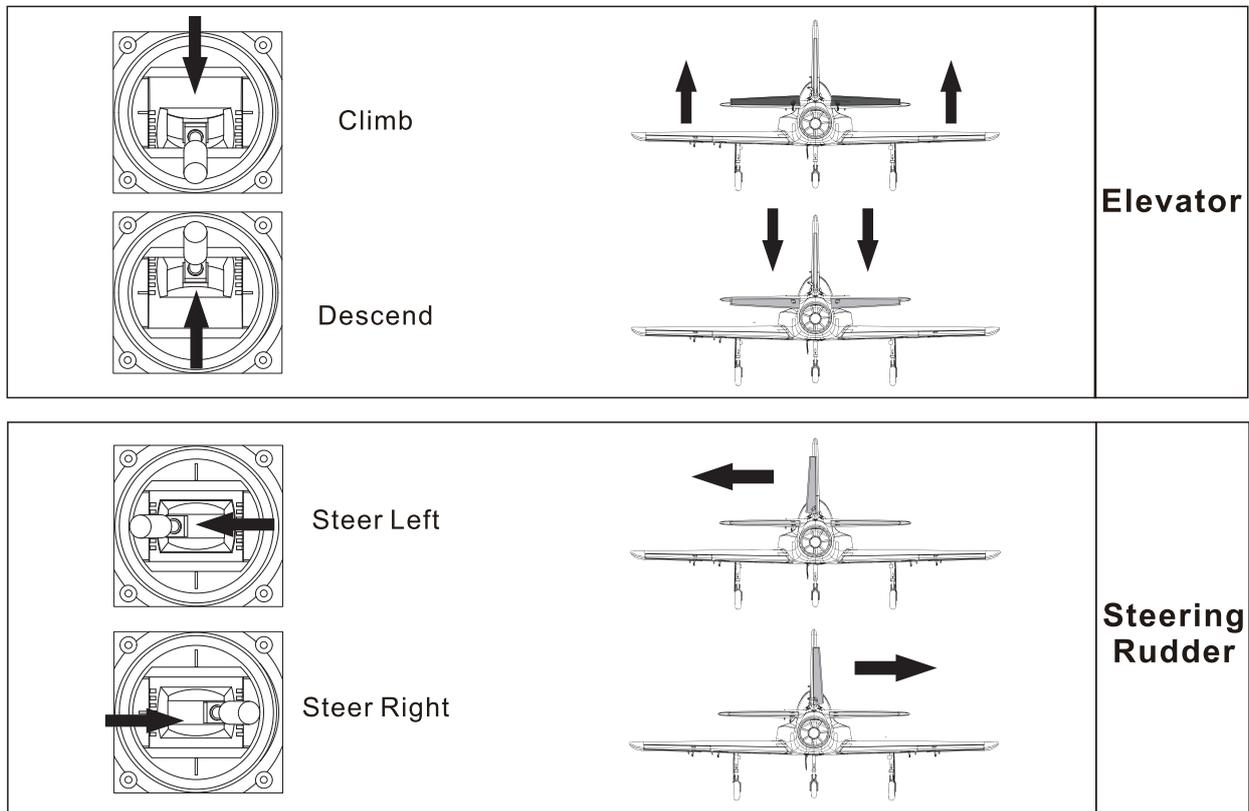
Before getting started, bind your receiver with your transmitter. Please refer to your Transmitter Manual for proper operation

**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.

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.

1. Move the controls on the transmitter to make sure the aircraft control surface moves correctly. See diagrams below.





### Check the control throws

The suggested control throw setting for FMS MODEL are as follows (dual rate setting):

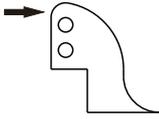
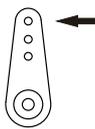
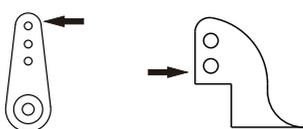
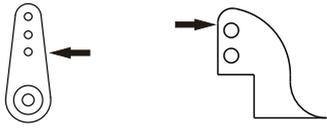
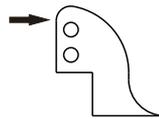
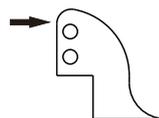
	High Rate	Low Rate
Elevator	17mm up/down	12mm up/down
Aileron	15mm up/down	10 mm up/down
Rudder	30 mm left/right	20 mm left/right

Tips: On 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.

## 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.

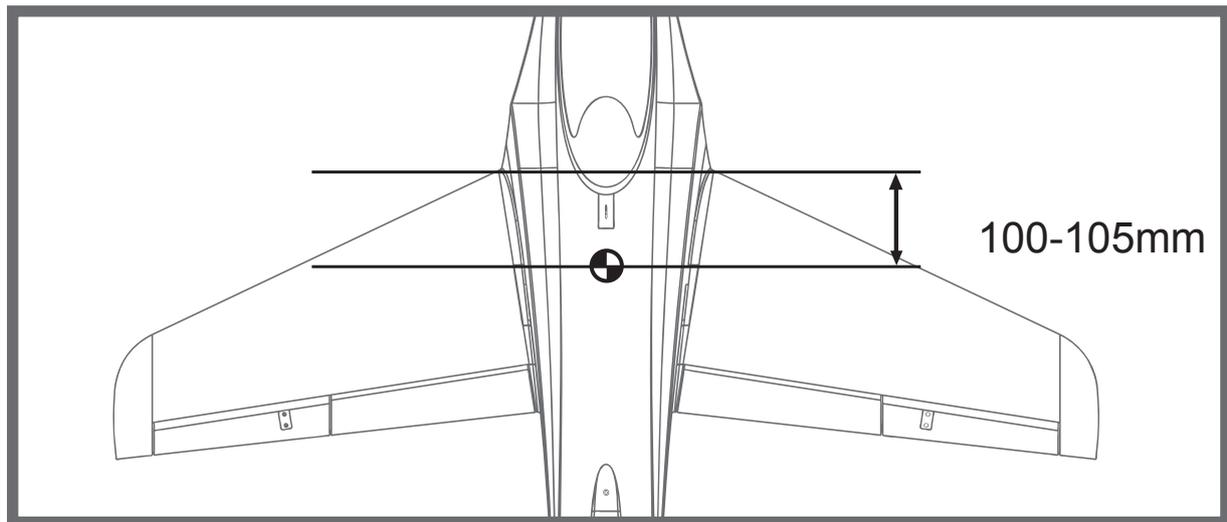
After flying, you may choose to adjust the linkage positions for the desired control response. See the table to the below

	Horns	Arms	
Elevator			<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">More control throw</p> <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <hr/> <p style="text-align: center;">Less control throw</p> <div style="display: flex; justify-content: space-around; align-items: center;">  </div> </div>
Rudder			
Ailerons			

### Check the C.G. (Center of Gravity)

When balancing your model, adjust the motor battery as necessary so the model is level or slightly nose down. This is 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 (100-105mm) 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.



## **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.

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 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 throttle but responds to other controls.	<ul style="list-style-type: none"> <li>- ESC is not armed.</li> <li>- Throttle channel is reversed.</li> </ul>	<ul style="list-style-type: none"> <li>- Lower throttle stick and throttle trim to lowest settings.</li> <li>- Reverse throttle channel on transmitter.</li> </ul>
Extra propeller noise or extra vibration.	<ul style="list-style-type: none"> <li>- Damaged spinner, propeller, motor, or motor mount.</li> <li>- Loose propeller and spinner parts.</li> <li>- Propellor installed backwards.</li> </ul>	<ul style="list-style-type: none"> <li>- Replace damaged parts.</li> <li>- Tighten parts for propeller adapter, propeller and spinner.</li> </ul>
Reduced flight time or aircraft underpowered.	<ul style="list-style-type: none"> <li>- Flight battery charge is low.</li> <li>- Propeller installed backward.</li> <li>- Flight battery damaged.</li> </ul>	<ul style="list-style-type: none"> <li>- Remove and install propeller correctly.</li> <li>- Completely recharge flight battery.</li> <li>- Replace flight battery and follow flight battery instructions.</li> </ul>
Control surface does not move, or is slow to respond to control inputs.	<ul style="list-style-type: none"> <li>- Control surface, control horn, linkage or servo damage.</li> <li>- Wire damaged or connections loose.</li> </ul>	<ul style="list-style-type: none"> <li>- Replace or repair damaged parts and adjust controls.</li> <li>- Do a check of connections for loose wiring.</li> </ul>
Controls reversed.	Channels are reversed in the transmitter.	Do the Control Direction Test and adjust controls for aircraft and transmitter.
<ul style="list-style-type: none"> <li>- Motor loses power.</li> <li>- Motor power pulses then motor loses power.</li> </ul>	<ul style="list-style-type: none"> <li>- Damage to motor, or battery.</li> <li>- Loss of power to aircraft.</li> <li>- ESC uses default soft Low Voltage Cutoff(LVC).</li> </ul>	<ul style="list-style-type: none"> <li>- Do a check of batteries, transmitter, receiver, ESC, motor and wiring for damage (replace as needed).</li> <li>- Land aircraft immediately and recharge flight battery.</li> </ul>
LED on receiver flashes slowly.	Power loss to receiver.	<ul style="list-style-type: none"> <li>- Check connection from ESC to receiver.</li> <li>- Check servos for damage.</li> <li>- Check linkages for binding.</li> </ul>

## Spare parts list content

FMSPW101PUR	Fuselage
FMSPW102PUR	Main Wing Set
FMSPW103PUR	Vertical Stabilizer
FMSPW104PUR	Horizontal Stabilizer
FMSPW105PUR	Cockpit
FMSPW106	Front Landing Gear Door
FMSPW107	Wheel Set
FMSPW108	Pipe
FMSPW109	Linkage Rod
FMSPW110	Screw Set
FMSPW111PUR	Control Horns
FMSPW112	Front Landing Gear Set
FMSPW113	Main Landing Gear Set
FMSPW114	Front Landing Gear System
FMSPW115PUR	Main Landing Gear System
FMSPW116PUR	Decal Sheet
FMSRE030	Electronic Retract
FMSRE011	Electronic Retract
FMSCON003	Multi Connector System
FMS80MM12B	Ducted fan (12-blades)
PRKV2000	3270-KV2000 motor
PRESC014	100A ESC
FMSSER9MGDP	9g digital metal gear servo positive
FMSSER9MGDR	9g digital metal gear servo reverse

FMSPW101RED	Fuselage
FMSPW102RED	Main Wing Set
FMSPW103RED	Vertical Stabilizer
FMSPW104RED	Horizontal Stabilizer
FMSPW105RED	Cockpit
FMSPW106	Front Landing Gear Door
FMSPW107	Wheel Set
FMSPW108	Pipe
FMSPW109	Linkage Rod
FMSPW110	Screw Set
FMSPW111RED	Control Horns
FMSPW112	Front Landing Gear Set
FMSPW113	Main Landing Gear Set
FMSPW114	Front Landing Gear System
FMSPW115RED	Main Landing Gear System
FMSPW116RED	Decal Sheet
FMSRE030	Electronic Retract
FMSRE011	Electronic Retract
FMSCON003	Multi Connector System
FMS80MM12B	Ducted fan (12-blades)
PRKV2000	3270-KV2000 motor
PRESC014	100A ESC
FMSSER9MGDP	9g digital metal gear servo positive
FMSSER9MGDR	9g digital metal gear servo reverse

Visit our website to see photos of this product: [www.fmsmodel.com](http://www.fmsmodel.com)

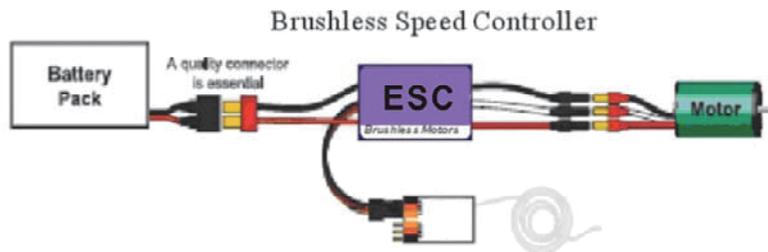
# ESC instruction

## Wires Connection:

The electronic speed controller can be connected to the motor by soldering directly, or with high quality connectors.

Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tubes. The maximum length of the battery pack wires should be within 6 inches.

- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tubes.
- Plug the "JR" connector into the receiver throttle channel.
- Speed Controller Red and Black wires connect to battery pack Red and Black wires respectively.



## Programming Mode Audible Tones

Programming Mode Audible Tones	ESC Functions
<b>0</b> Throttle Calibration (within the first 4 Sec) ● ● ● ●	
<b>1</b> Brake * * * *	Brake On /Off
<b>2</b> Battery type ~ ~ ~ ~ ~ ~ ~ ~	NiCad LiPo
<b>3</b> Low Voltage Cutoff Threshold *	Low 2.8V/50% Medium 3.0V/60% High 3.2V/65%
<b>4</b> Restore Factory Setup Defaults - - - - -	Restore
<b>5</b> Timing Setup - - - - - - - - - - - - - - -	Automatic (7-30°) Low (7-22°) High (22-30°)
<b>6</b> Soft Acceleration Start Ups ∨	Very Soft Soft Acceleration Start Acceleration
<b>7</b> Governor Mode * * * * ** ** ** ** *** ** ** **	Rpm off Heli first range Heli second range
<b>8</b> Motor Rotation W W W W	Positive/Reverse
<b>9</b> Switching Frequency // // // // \\ \\ \\ \\	8kHz 16kHz
<b>10</b> Low Voltage Cutoff Type _ X X X X X _ X X X	Reduce Power Hard Cut Off





**MADE IN CHINA**