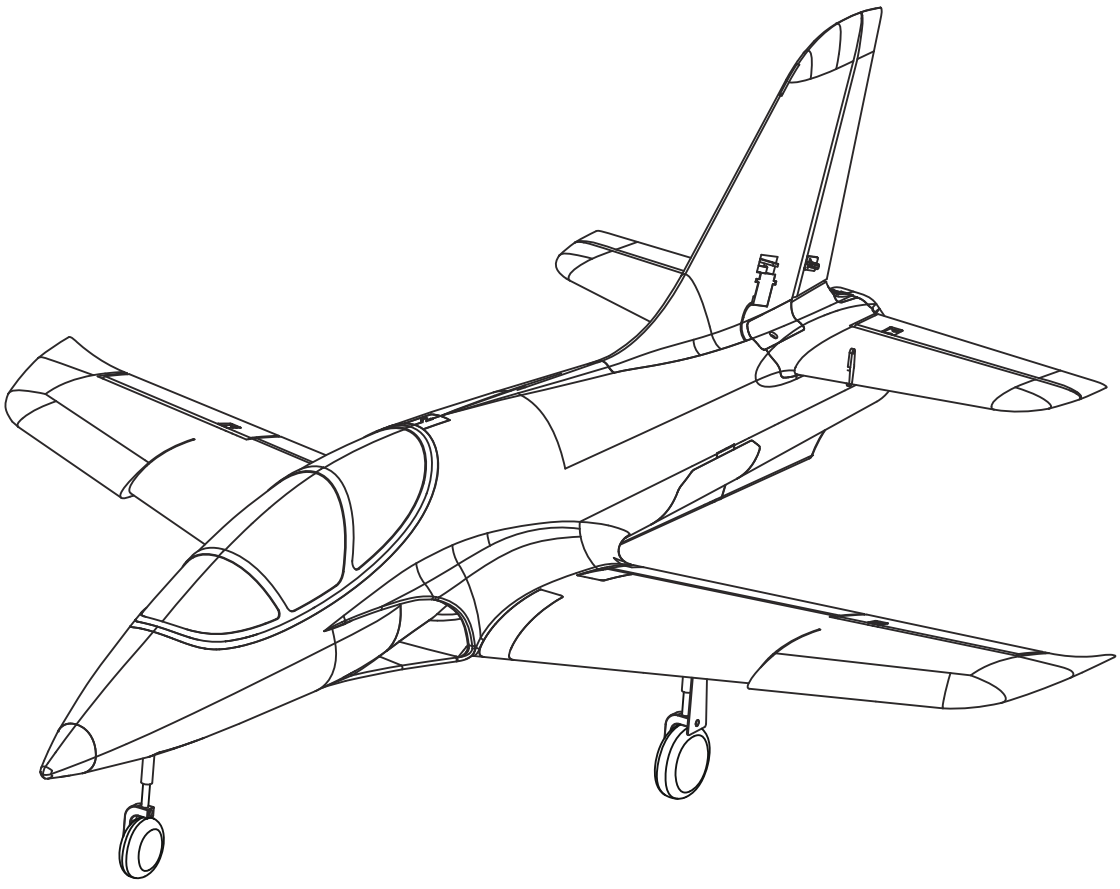
70MM AVANTI

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 care fully 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

The fantastic 70mm EDF Avanti is coming! Avanti is a mutual-developed airplane made by FMS team from China and Sebart Team from Italy. The original design and authorization are from Sebart, with the additional FMS advanced production concept, it is finally being a promised finest work.

Utilizing many new concepts and technologies from existing planes, this highly anticipated Avanti has the inherent ability to offer a rip-roaring flight.

We have optimized the airframe structure markedly to make your time in getting ready for flight quick and easy. The assembly is very straightforward: 7 screws and a carbon fiber wing spar and you are finished. The Avanti features the latest FMS locked-rotor mode E-retract with overcurrent protection, the CNC-processed shock-absorbed front and rear metal landing gear set (Worm Dia. 8mm), a 50mm diameter front wheel and 55mm rear wheels. These are excellent for taking off and landing on both paved and grass surface airfields.

The power system, which provides tremendous thrust and speed, utilizes our new and improved 70mm 12-blade EDF V2, KV1850 motor system. This brawny system, when coupled with a 6S battery, provides a resonating turbine engine sound. Moreover, to meet different needs, we have optional KV2750 motor system with Sebart design color scheme, which coupled with 4S battery for the customers who pay more attention on aerobatic flight.

Key Features:

1. Powerful motor with the latest 70mm 12-blade EDF
2. With Predator 70A ESC, 6S power system ensures a record speed of more than 130km/h, 4S power system ensures excellent aerobatic flight
3. The latest Metal CNC locked-rotor mode E-retract with overcurrent protection
4. No glue required, screw-together construction
5. Multi-connector for one-step installation
6. Metal digital servos for excellent controlling capacity
7. Button Type canopy hatch
8. Large battery compartment
9. Pre-installed, newly designed ball link style control horns for more throw.
10. 50mm front wheel and 55mm rear wheels

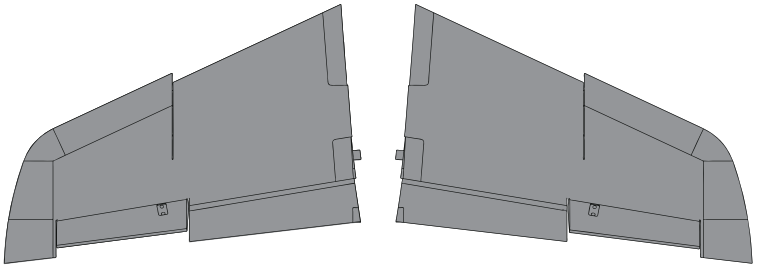
Specifications

Wingspan: 900mm (35.4in)
Overall Length: 1050mm (41.3in)
Flying Weight: Around 1750g
Motor Size: Brushless 2860-KV1850 or 2845-KV2750
Wing Load: 101.7 g/dm² (0.23oz/in²)
Wing Area: 17.2 dm² (266.6sq.in)
ESC: 70A
Servo: 9g metal digital Servo x 8

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 indentify 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

A.



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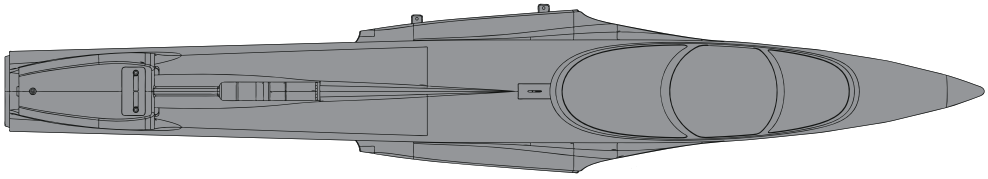
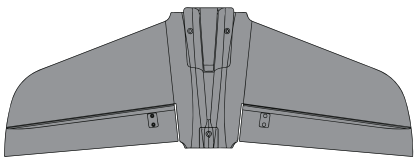
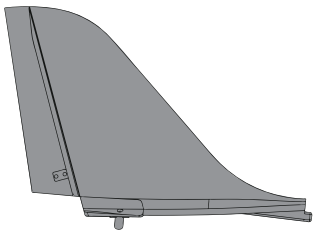


E.

C.



D.



F.

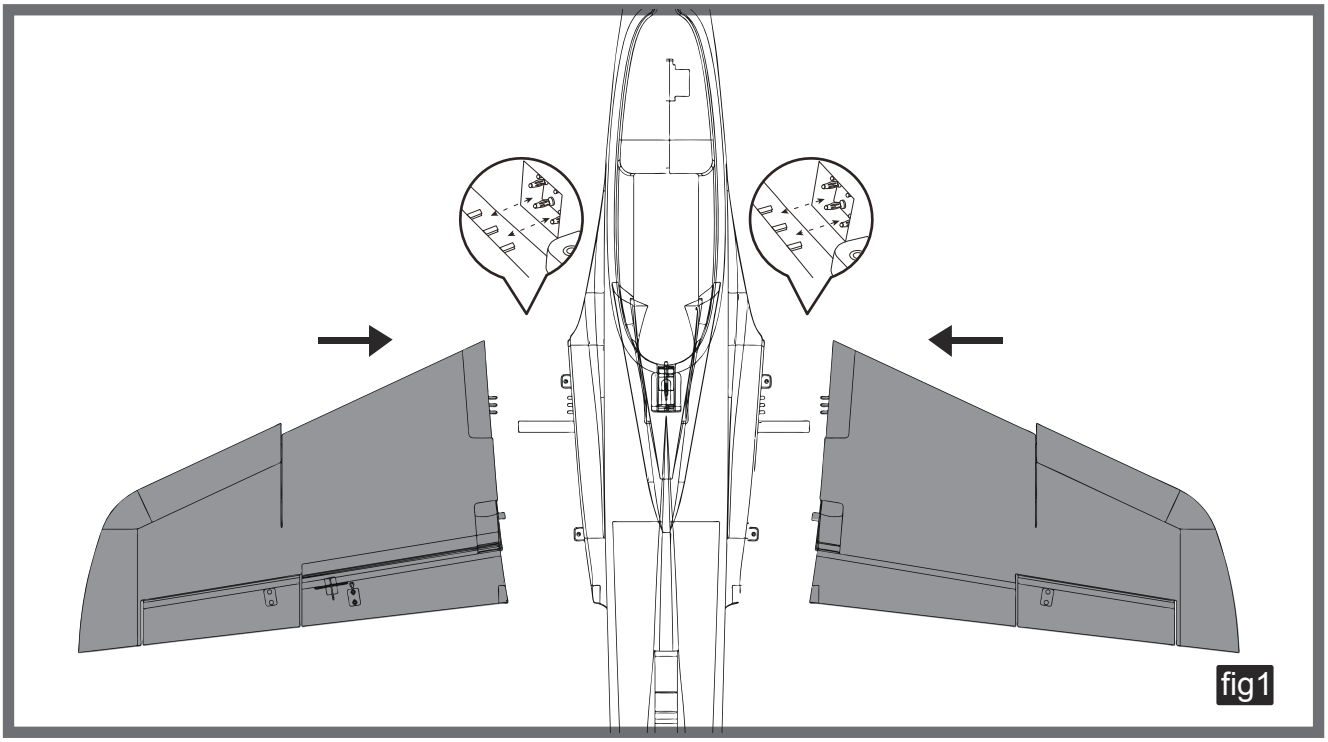
A: Main Wing
B: Fuselage
C: Horizontal Stabilizer

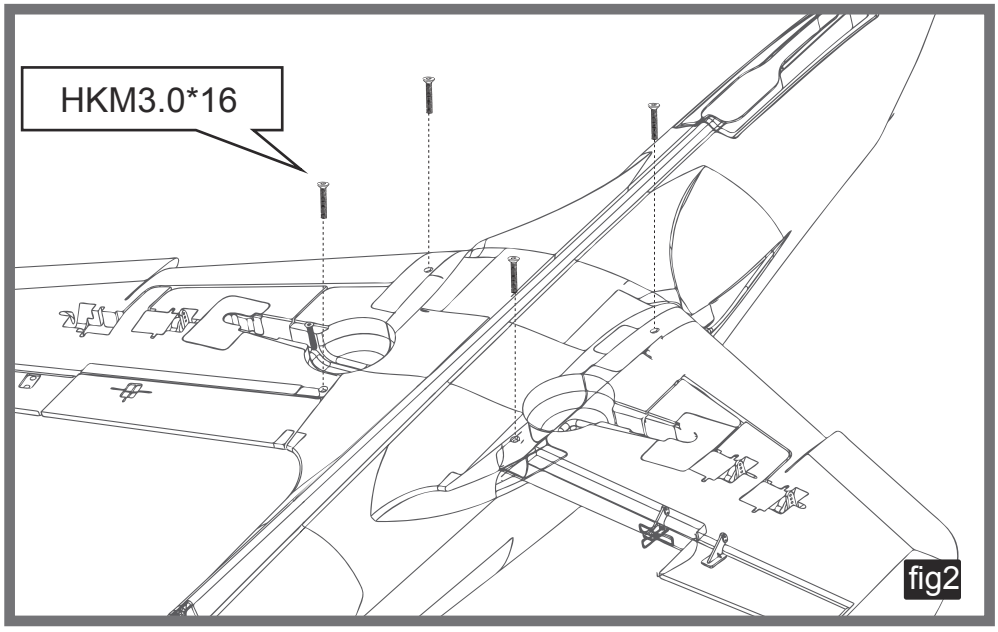
D: Vertical Stabilizer
E: Fiber Pipe
F: Screws(7-HKM3.0*16)

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.

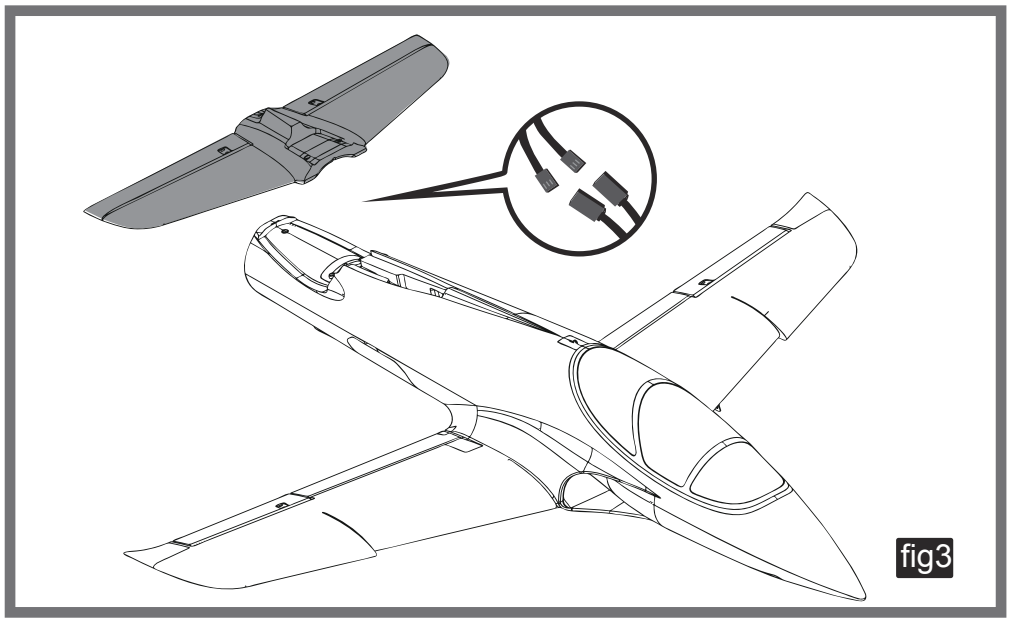
2.Secure the both wings into the fuselage using the included 4 screws. (fig2)

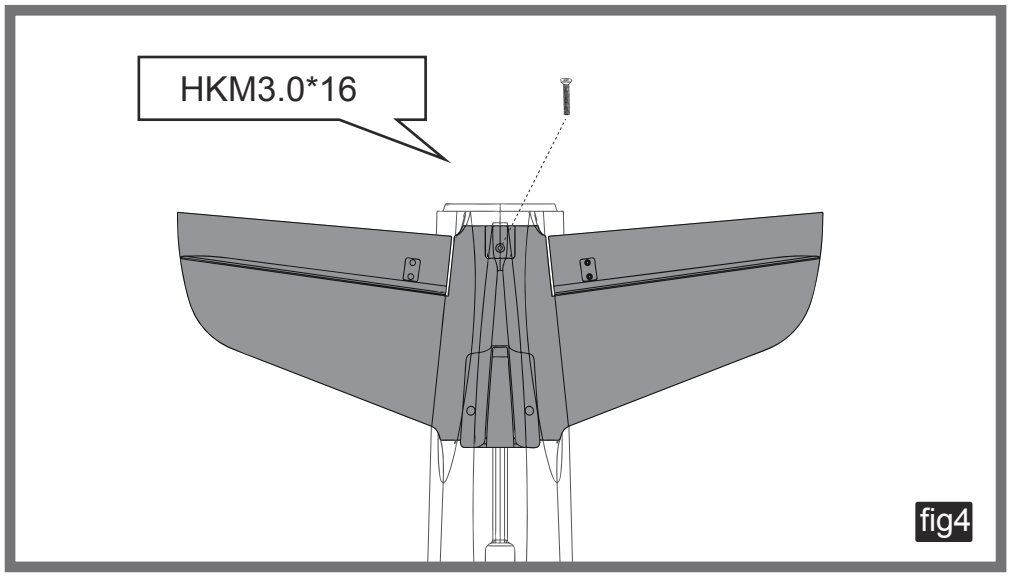




Horizontal Stabilizer Installation:

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 screw. (fig4)





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 2 screws. (fig6)

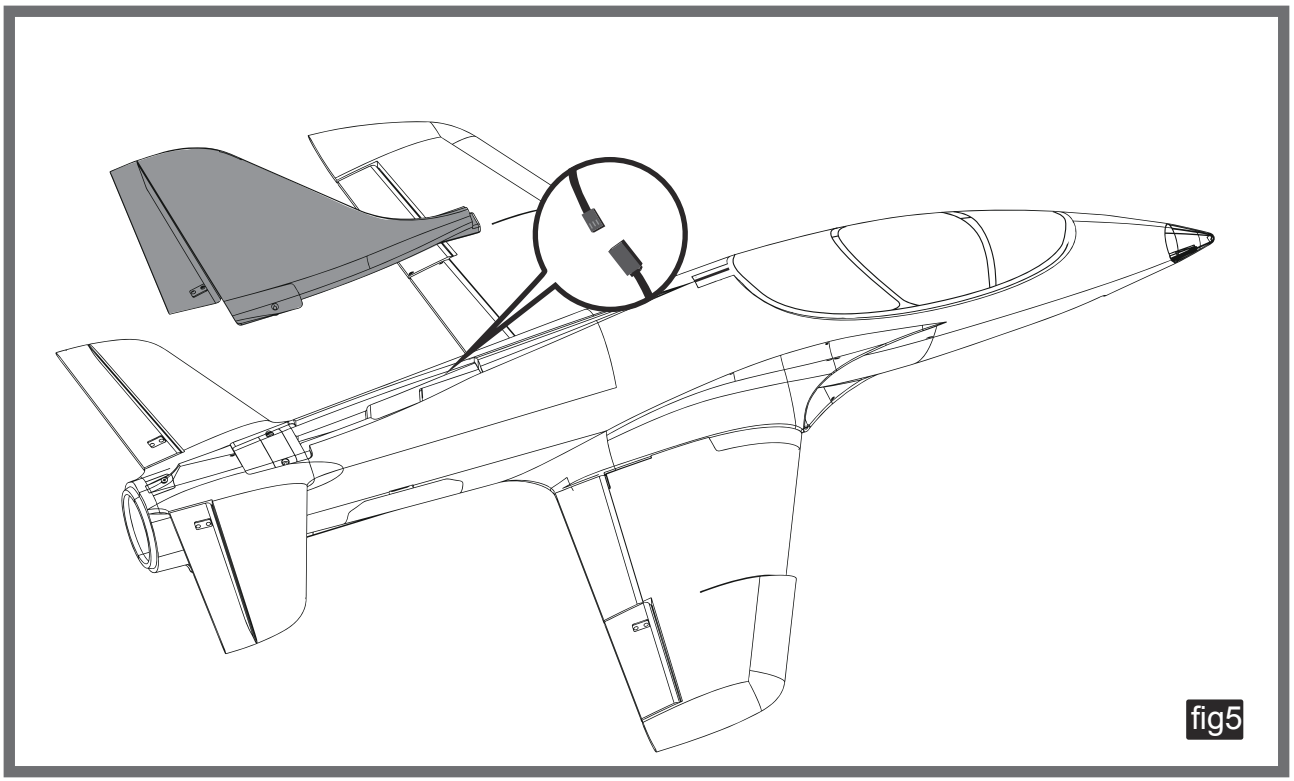


fig5

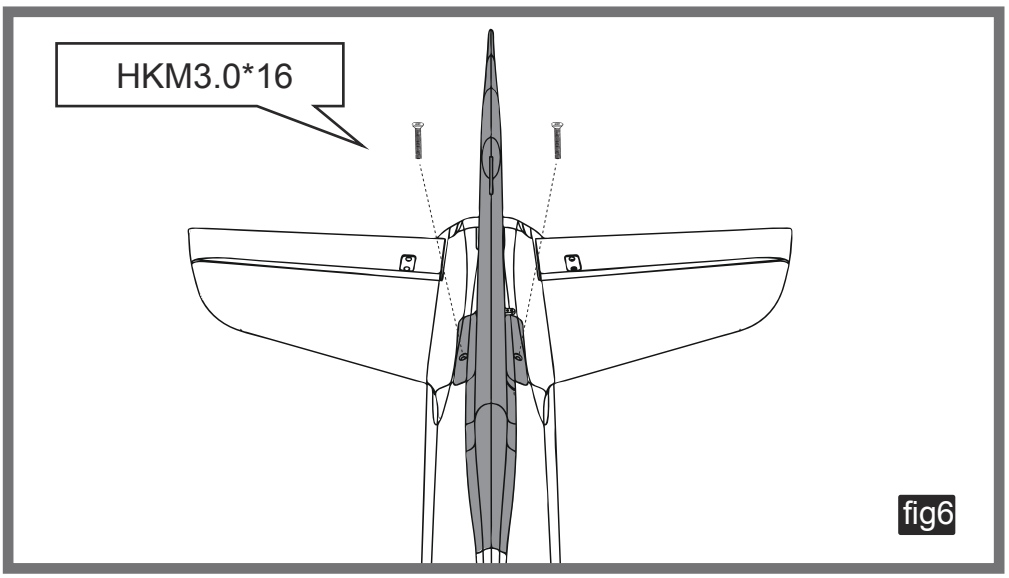
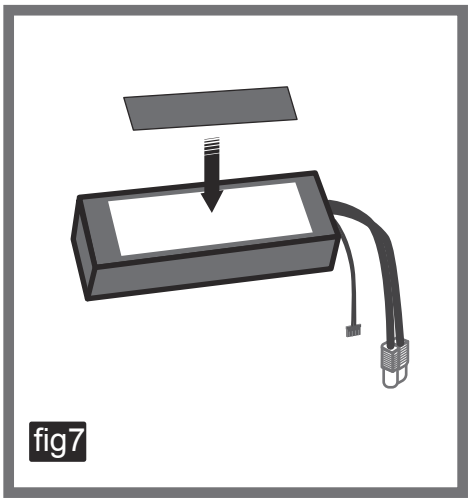


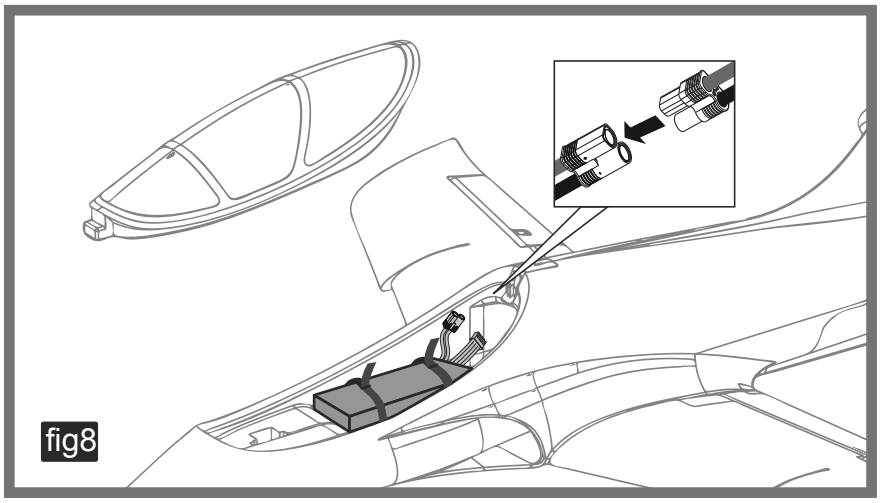
fig6

Battery and radio installation

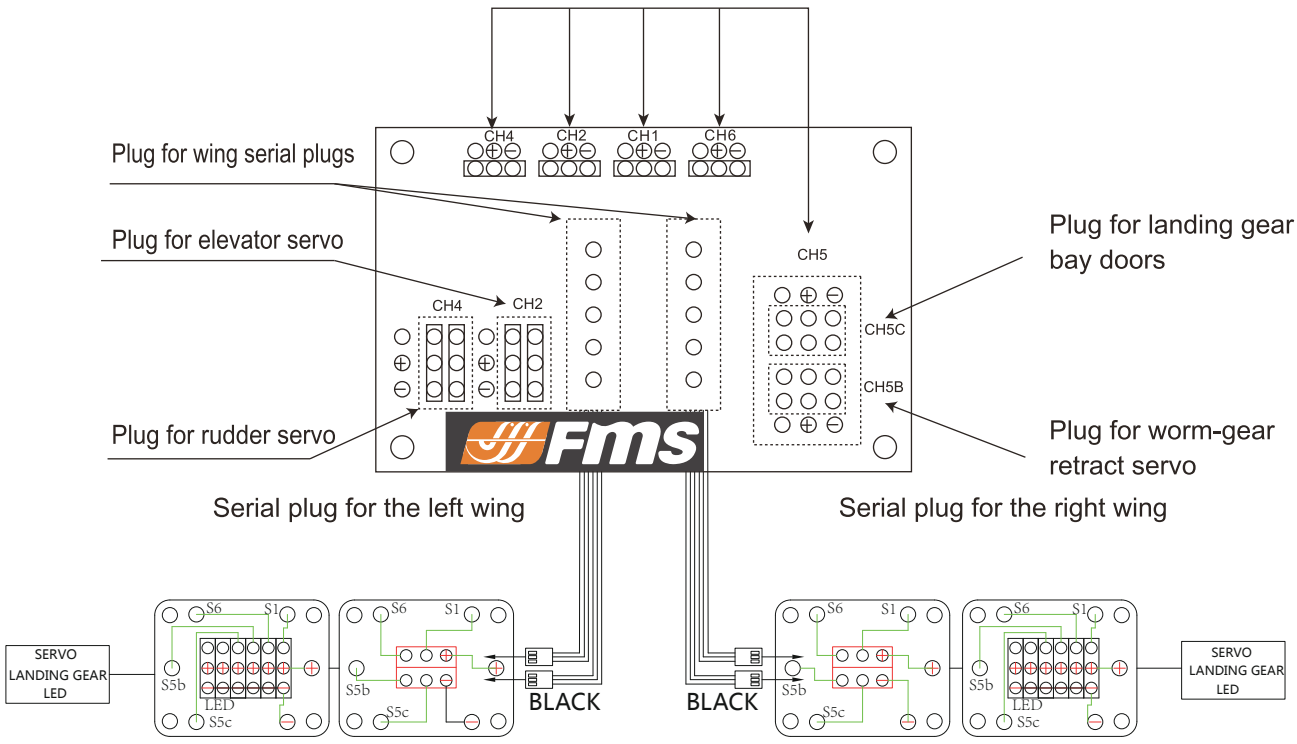
1. Apply the loop side (soft side) of the hook and loop tape to the bottom of the battery and the hook side to the battery tray.
2. Install the fully charged battery in the battery compartment with the power supply cable toward the rear end of the plane, and secure using the hook and loop straps.

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 2600-3300Ah 35c Li-Po battery for inner running motor power and 14.8V 2600-3300Ah 35c Li-Po battery for outer running motor power. Your battery should be approximately the same capacity, dimension and weight as the recommended battery to fit the fuselage without changing the center of gravity significantly.

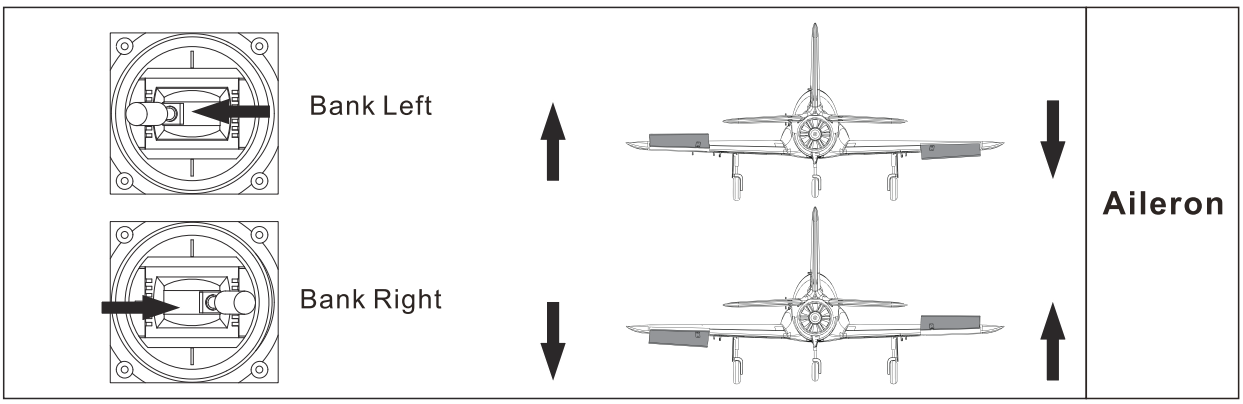
The transmitter and model setup

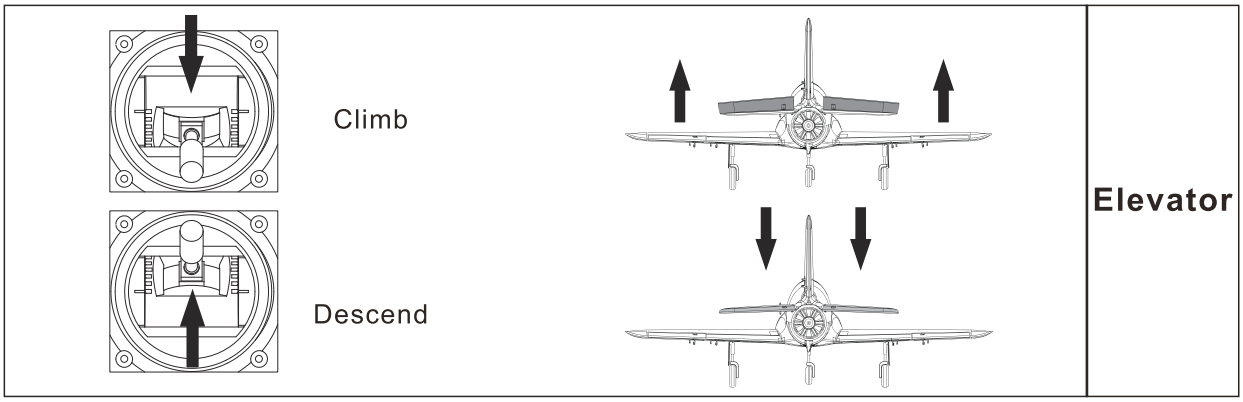
Before getting started, bind your receiver with your transmitter. Please refer to your Transmitter Manual for proper operation

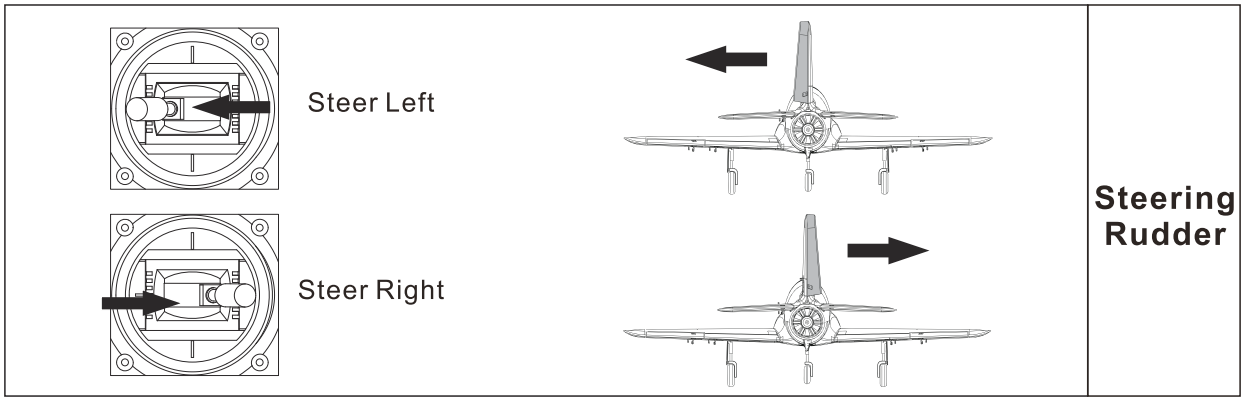
CAUTION: To prevent personal injury, DO NOT install the propeller assembly onto the motor shaft while testing the control surfaces. DO NOT arm the ESC and do not turn on the transmitter until the Transmitter Manual instructs you to do so.

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

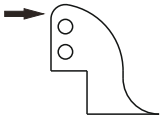
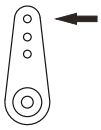
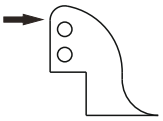
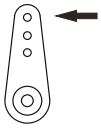
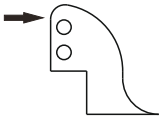
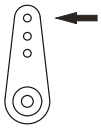
The suggested control throw setting for FMS MODEL are as follows (dual rate setting):

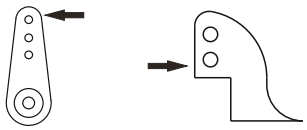
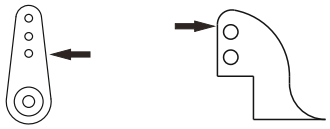
	High Rate	Low Rate
Elevator	17mm up/down	12mm up/down
Aileron	15mm up/down	10mm up/down
Rudder	30mm left/right	20mm left/right

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		
Rudder		
Ailerons		

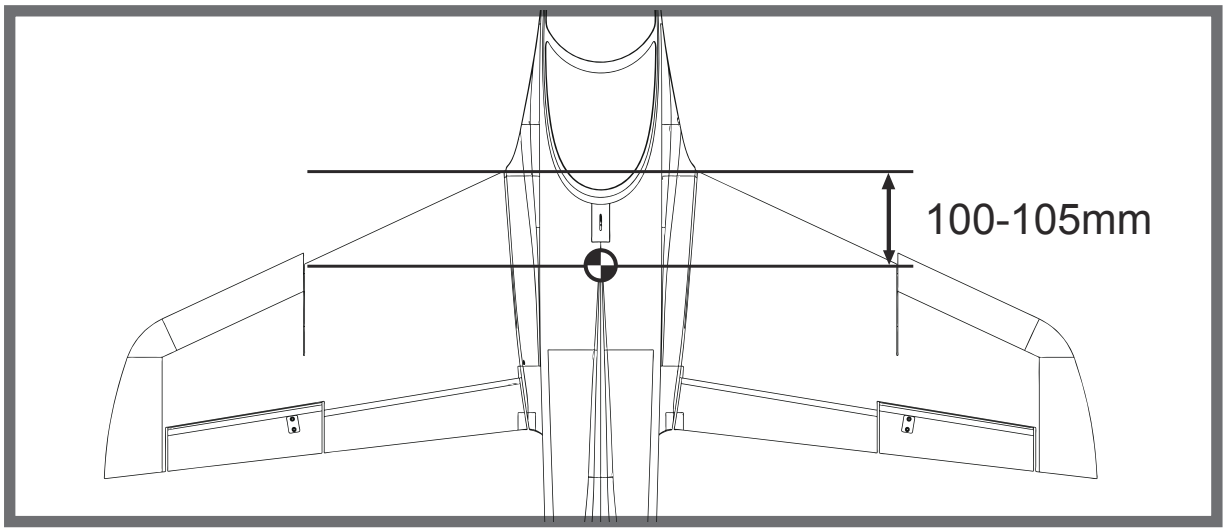
More control throw

Less control throw


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.	- 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 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

FMSPX101RED	Fuselage
FMSPX102RED	Main Wing Set
FMSPX103RED	Vertical Stabilizer
FMSPX104RED	Horizontal Stabilizer
FMSPX105RED	Cockpit
FMSPX106	Linkage Rod
FMSPX107	Screw Set
FMSPX108RED	Main Landing Gear Door
FMSPX109	Pipe
FMSPX110RED	Landing Gear Set
FMSPX111RED	Main Landing Gear System
FMSPX112RED	Front Landing Gear System
FMSPX113RED	Decal Sheet
FMSRE012	Electronic Retract
FMSRE015	Electronic Retract
FMSCON003	Multi Connector System
FMSDF12B70	Ducted fan (12-blade)
PRKV1850	2860-KV1850 motor
PRKV2750	2845-KV2750 motor
PRESC013	70A ESC
FMSSER9MGDP	9g digital metal gear servo positive
FMSSER9MGDR	9g digital metal gear servo reverse

FMSPX101BLUE	Fuselage
FMSPX102BLUE	Main Wing Set
FMSPX103BLUE	Vertical Stabilizer
FMSPX104BLUE	Horizontal Stabilizer
FMSPX105BLUE	Cockpit
FMSPX108BLUE	Main Landing Gear Door
FMSPX110BLUE	Landing Gear Set
FMSPX111BLUE	Main Landing Gear System
FMSPX112BLUE	Front Landing Gear System
FMSPX113BLUE	Decal Sheet

Visit our website to see photos of this product: www.fmsmodel.com

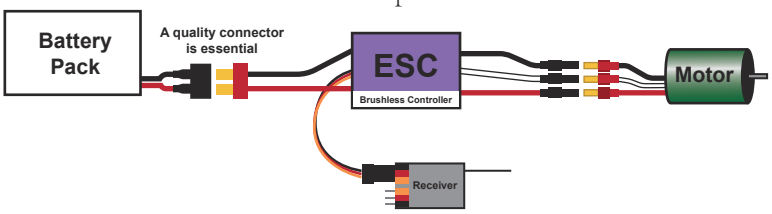
ESC instruction

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.

Brushless Speed Controller



Programming Mode Audible Tones

Programming Mode Audible Tones	ESC Functions
0 Throttle Calibration (within the first 4 Sec) ● ● ● ●	
1 Brake	
_ * _ * _ * _ *	Brake On /Off
2 Battery type	
~ ~ ~ ~	NiCad
~~ ~~ ~~ ~~	LiPo
3 Low Voltage Cutoff Threshold	
* _ * _ * _ * _ * _ * _ * _ * _	Low2.8V/50%
* _ * _ * _ * _ * _ * _ * _ * _	Medium3.0V/60%
* _ * _ * _ * _ * _ * _ * _ * _	High3.2V/65%
4 Restore Factory Setup Defaults	
— ———	Restore
5 Timing Setup	
– – – –	Automatic (7-30°)
– – – – – – – –	Low (7-22°)
– – – – – – – – – – – –	High (22-30°)
6 Soft Acceleration Start Ups	
V V V V V V V V	Very Soft
V V V V	Soft Acceleration
V V V V V V V V V V V V	Start Acceleration
7 Governor Mode	
* _ * _ * _ * _ * _	Rpm off
** _ ** _ ** _ ** _ ** _	Heli first range
*** _ *** _ *** _ *** _ *** _	Heli second range
8 Motor Rotation	
W W W W	Positive/Reverse
9 Switching Frequency	
// // // //	8kHz
\\ \\ \\ \\	16kHz
10 Low Voltage Cutoff Type	
_ ☒ ☒ ☒ ☒	Reduce Power
☒ _ ☒ _ ☒ _ ☒ _	Hard Cut Off

MADE IN CHINA