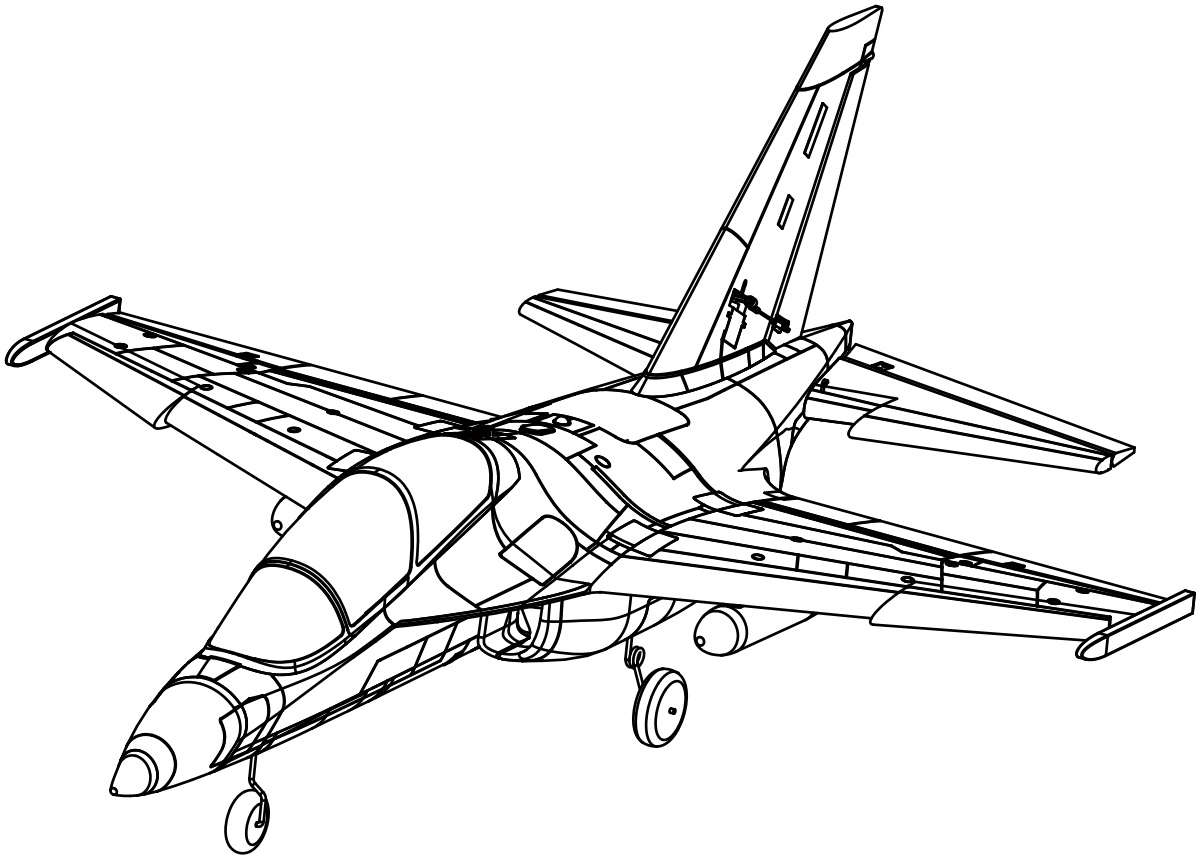
70MM YAK-130

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 place any part of 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 has been committed to the development and production of propeller aircraft for years, has never stopped enhancing the products from the year it was founded. Utilizing many of the new concepts from our propeller planes, FMS is embarking on upgrading and adding new and exciting Electric Ducted Fans to our lineup of planes.

The first is our NEW Yak130 featuring our new and improved 70mm fan unit. The craftsmanship that has gone into this model began with the initial concept prototype and as refinements were determined and implemented brings to you the most accurately defined Yak on the current market.

Some of the improvements and redesign include a plastic leading edge of the air inlet duct, providing a smooth flow or air into the duct while protecting the inlet for possible damage in a less than perfect landing. The panel lines, cockpit interiors, scale pilot down to the removable drop fuel tank are finely detail. Even assembly has been redesigned to make your time in getting ready for flight quick and easy. There is a main spar tube that runs through the fuselage and wing which helps strengthen the airframe which is then fastened with screws. The surface control horns and wires are preinstalled and utilize our ball link design making for very accurate flight control.

The overall performance has been a major consideration for the Yak and using our latest 12-blade 70mm ducted fan, Predator 2860-KV1850 motor, 70 AMP ESC has resulted in great power and speed with a 6S battery. The added bonus to this power system, is the sound this new 12 blade makes, you can hear the power it provides. The landing gear retract units uses a 3.5 strut wire for support and strength for those less than perfect landings. All servos are pre-mounted and are our digital design, making for precise maneuvers whether in high or low speed flight.

We have incorporated our new environmental friendly water-based paint. The water-based paint has provided better spread ability and a glossier appearance. From our testing it can protect the fragile foam parts under any condition.

Features:

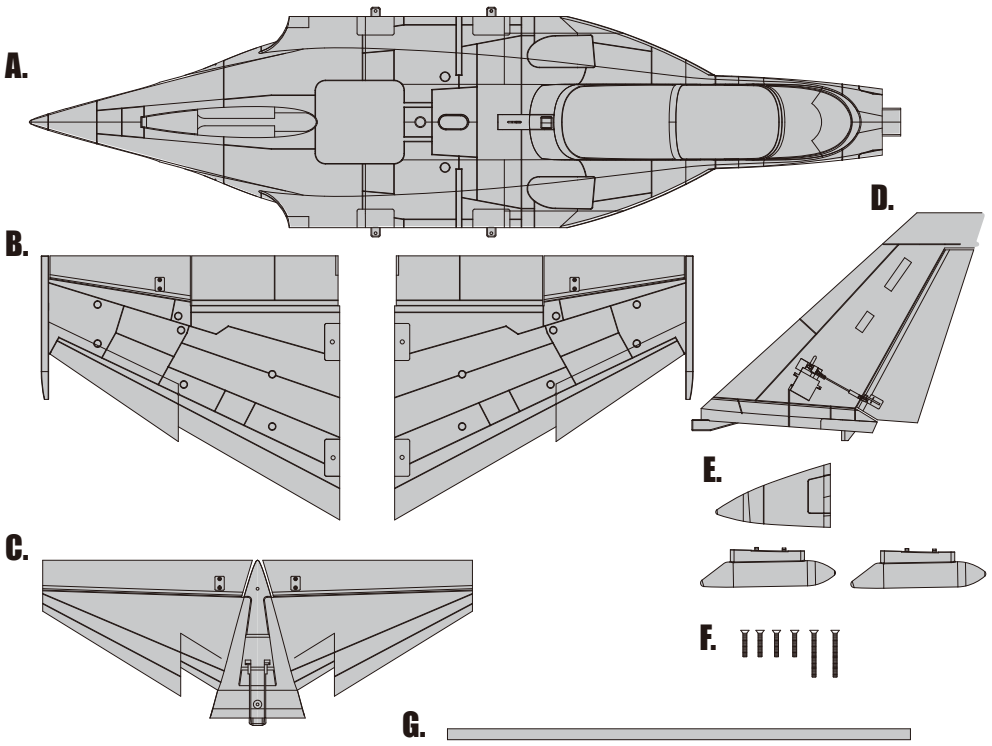
- Scaled appearance, with pilot, oil tank, retractable landing gear
- The latest 70mm 12 blade ducted fan plus the high quality Predator 70A ESC
- Metal digital servos for better controlling capacity
- Retractable front and rear landing gear
- Function Flaps
- Ball link design for removing clearace
- Button type canopy, set free from fall-off problem
- The simplified assembly structure of main wing set
- Water-based paint for better color and gloss

Specifications

Wingspan: 880mm (34.6in)
Overall Length: 1060mm (41.7in)
Flying Weight: Around 1850g (65.3oz)
Motor Size: Brushless 2860-KV1850
Wing Load: 100 g/dm² (0.23oz/in²)
Wing Area: 19 dm² (294.5 sq.in)
ESC: 70A
Servo: 9g 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: Main fuselage
B: Main wing(Left and Right)
C: Horizontal stabilizer
D: Vertical stabilizer
E: Nose cone and Drop tank
F: Screws (2-HKM3.0*32MM,4-HKM3.0*16MM)
G: Wing tube

Vertical Stabilizer Installation

1.Remove the top layer of the double sided tape on the rear of the fuselage as picture shows (fig1).
2.Connect the rudder servo connectors to the servo extensions in the fuselage (fig2).
3.Carefully slide the vertical tail assembly into the slot in the fuselage.
CAUTION: DO Not crush or damage the wiring when attaching the vertical tail assembly.

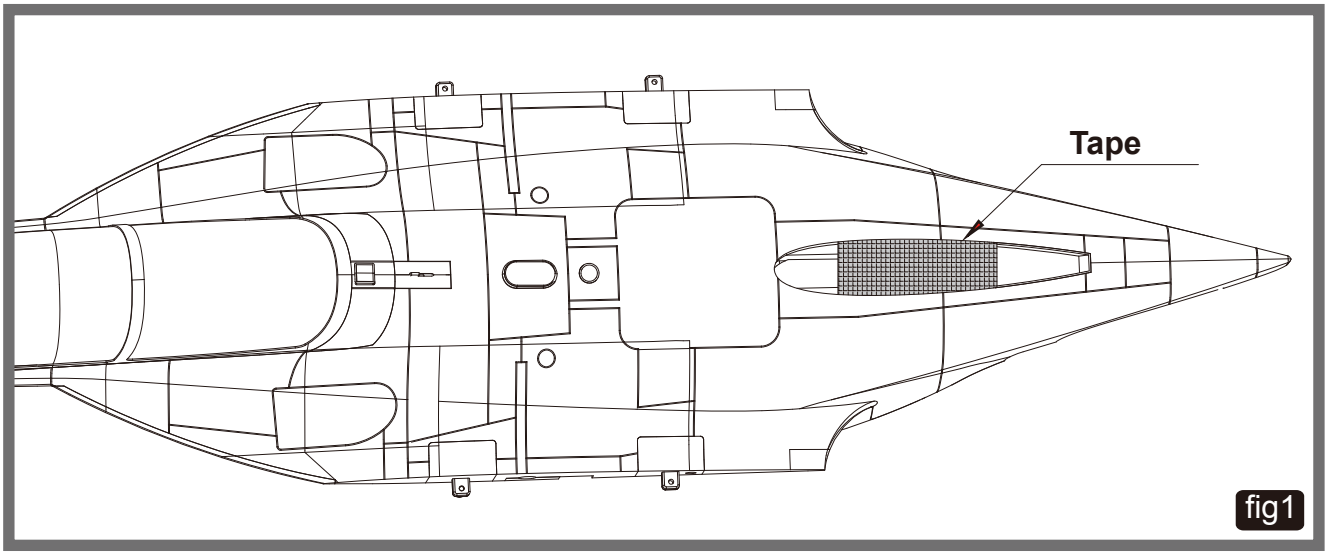
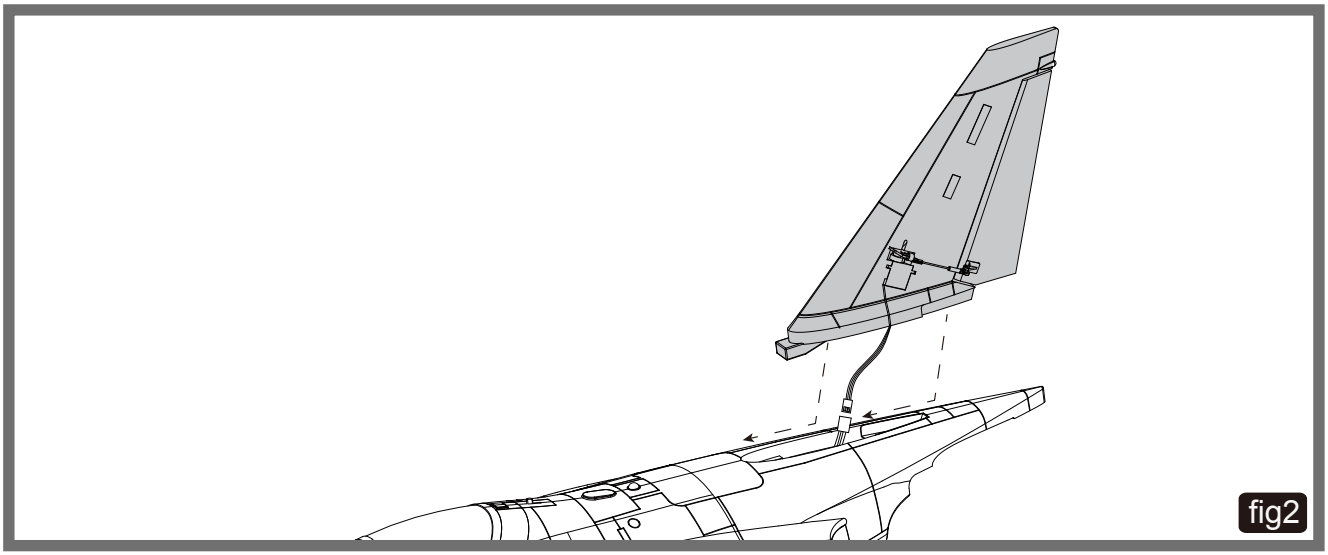
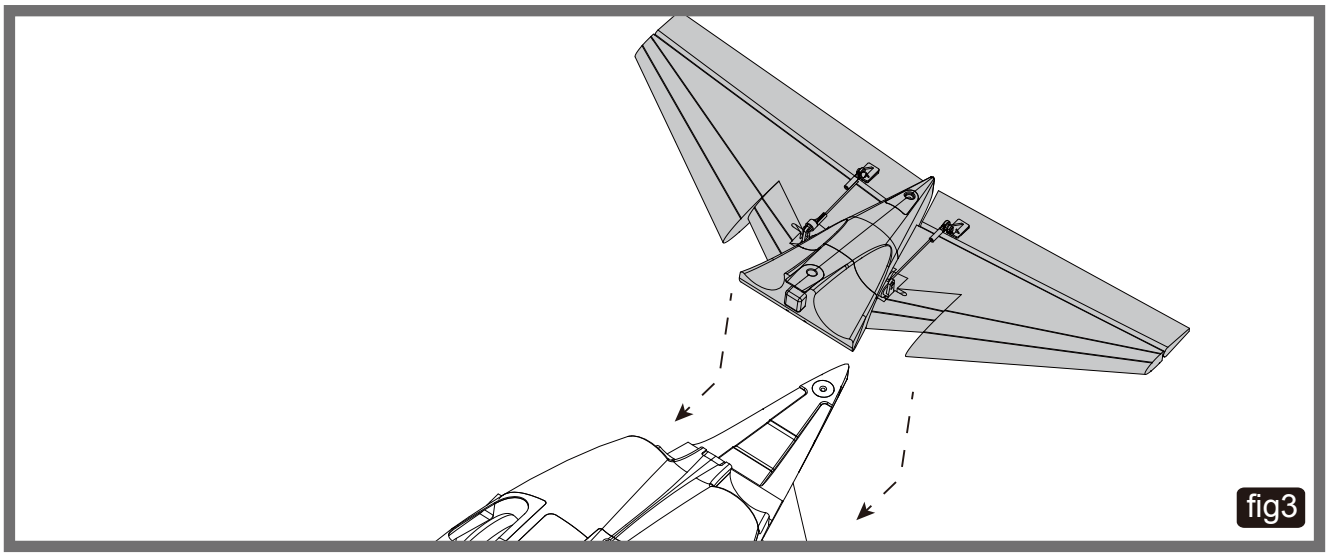


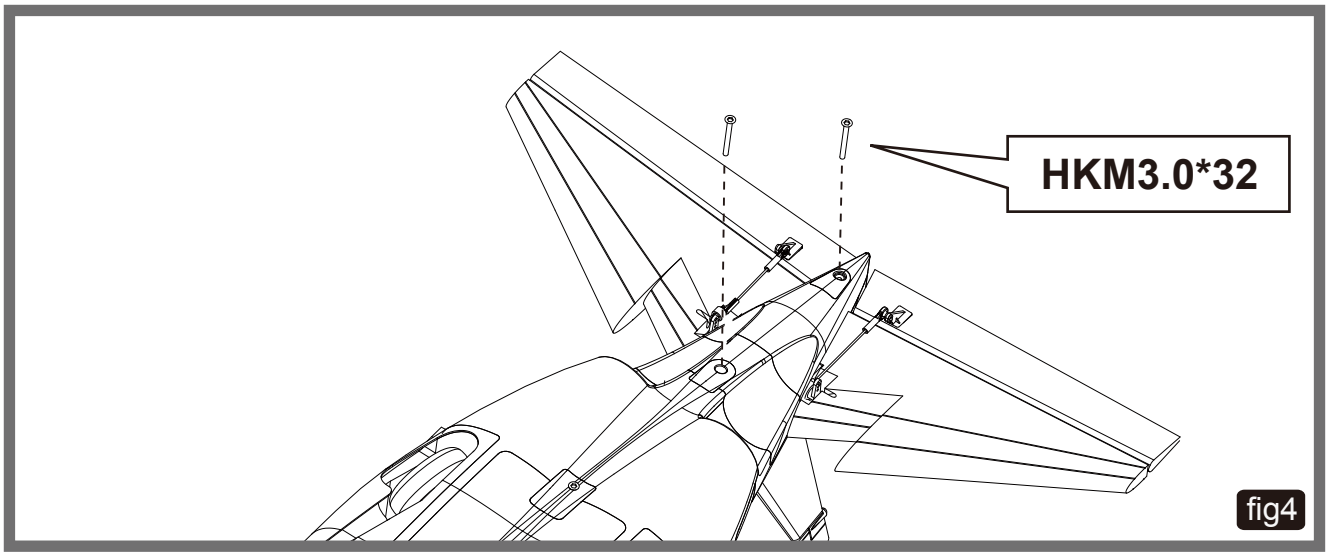
fig1


fig2

Horizontal Tail Installation

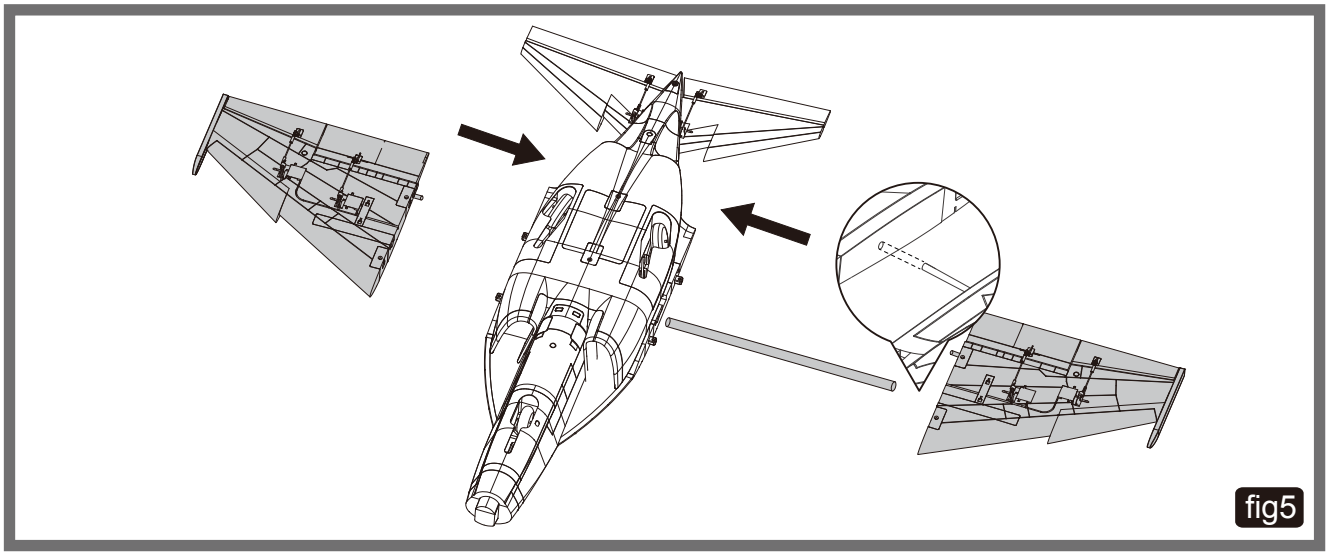
1. Slide the horizontal tail in the rear of the fuselage. Ensure the control horn faces up as picture shows (fig3).
2. Secure the horizontal tail pieces in the place using the included two screws. Use caution to avoid over-tightening the screw (fig4).

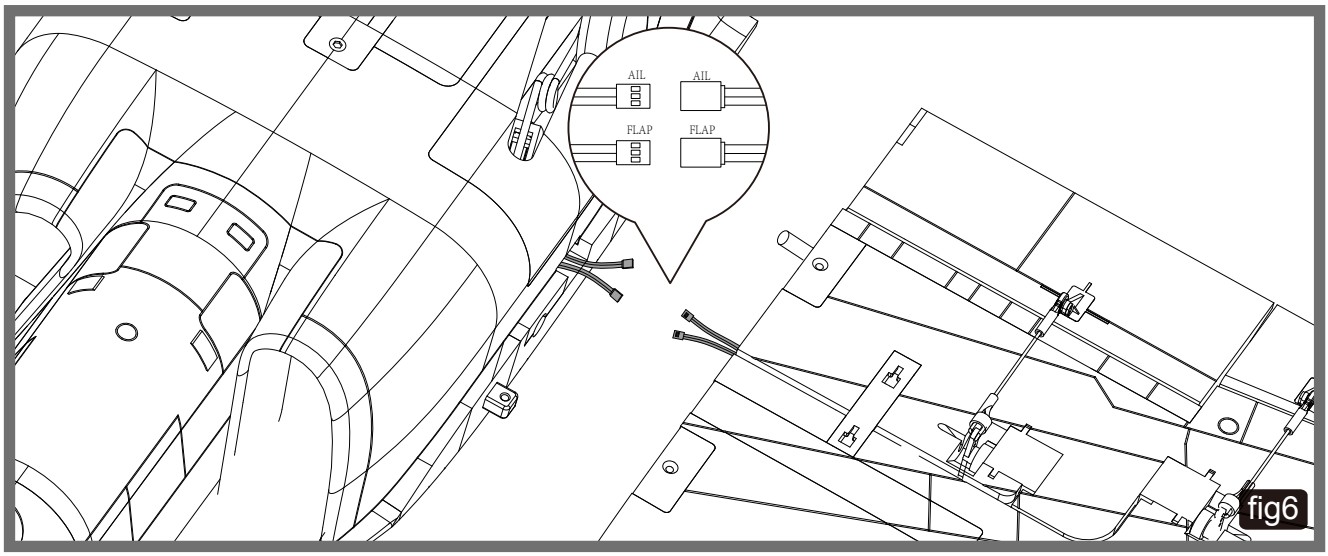


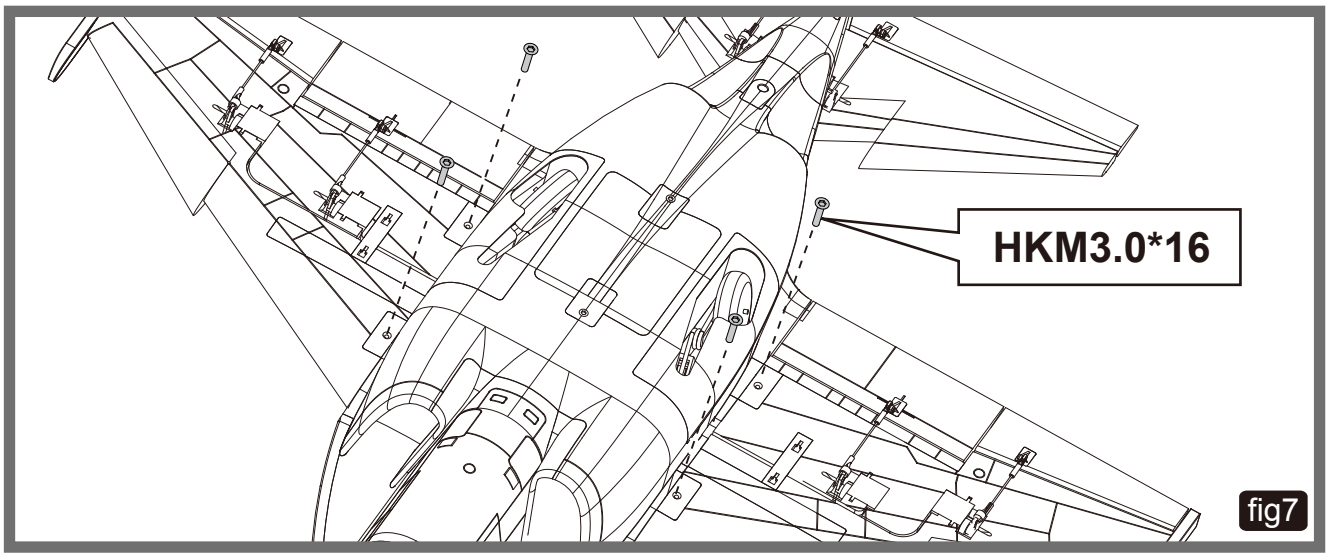


Wing Installation

1. Connect the Aileron servo connectors to the servo extensions in the fuselage.
2. Slide the tube into the fuselage then install both wings over the wing tube and into the wing slow of the fuselage (fig5).
3. Secure the left and right wings into the fuselage using the included 4 screws (fig7).

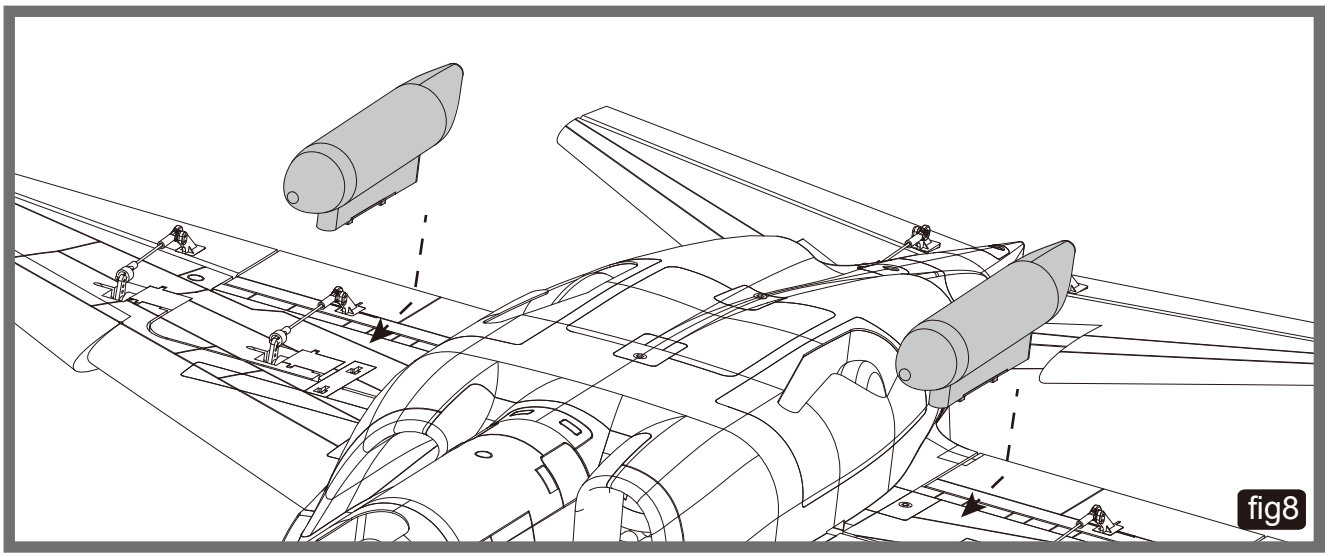






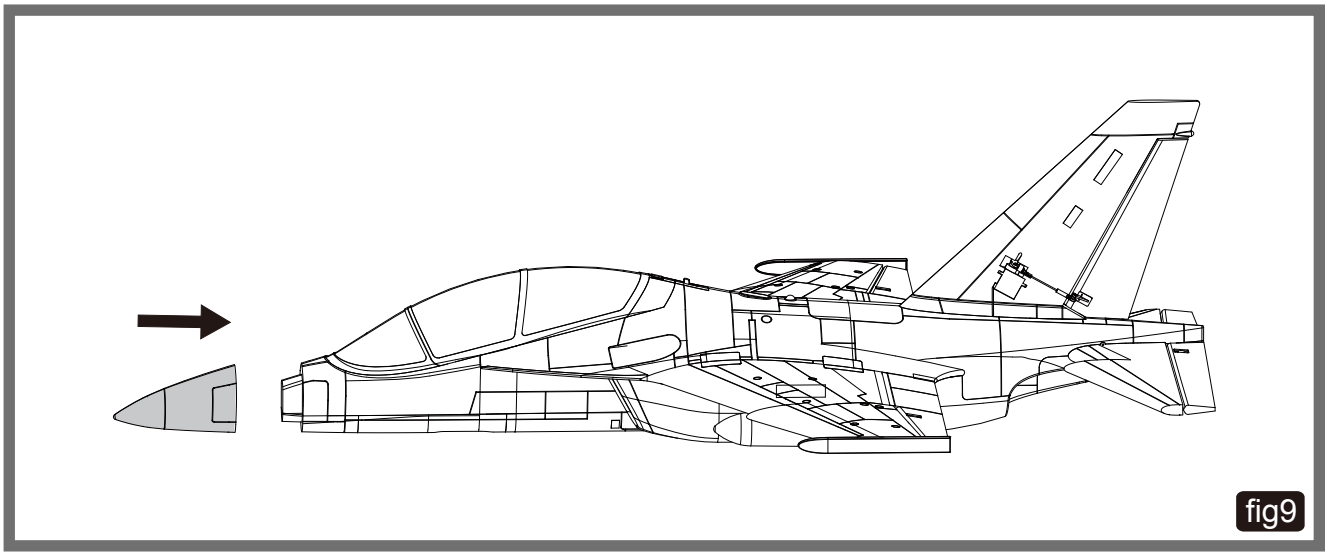
Drop Tank

1. Slide the optional drop tanks into the rails on each wing.
2. Check the Center of Gravity with the drop tanks installed.



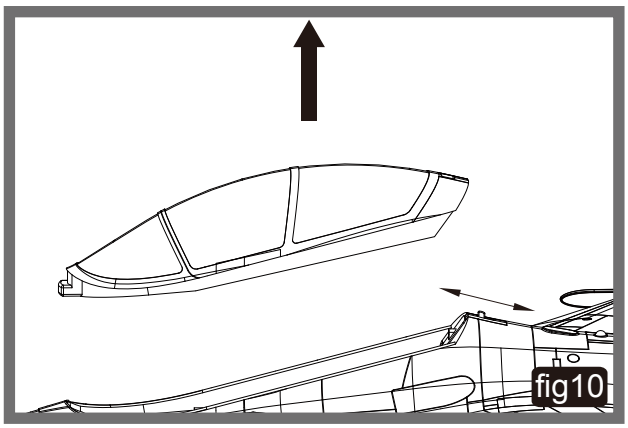
Nose cone

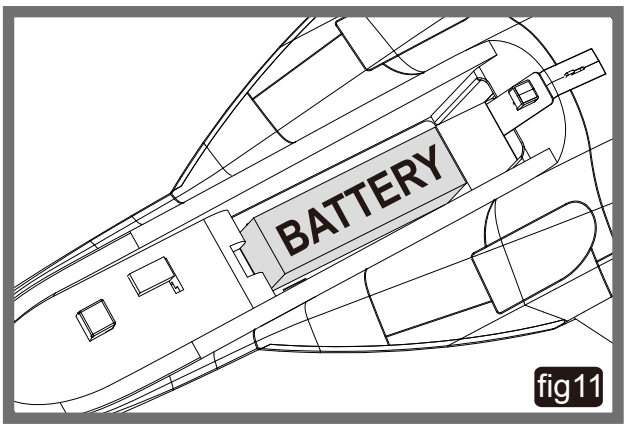
Install the nose cone on the fuselage.



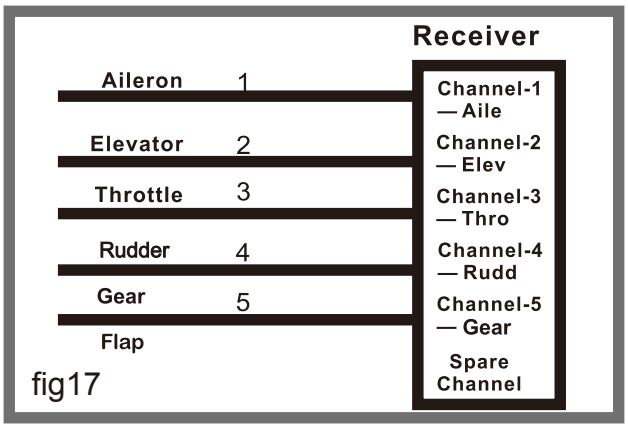
Battery and radio installation

1. Pull back on the release button and remove the battery hatch
2. Apply the hook tape to the cable end of the battery (fig**11**).
3. Make sure the battery is secured using the hook. Note: you may need to relocate the battery position to achieve the correct CG for your model.





4. Check the connection diagram below for more information.



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 2600-3300mAh 35C Li-Po battery. If using another battery, the battery must be at least a 22.2V 2600-3300mAh 35C battery. Your battery should be approximately the same capacity, dimension and weight as the 22.2V 2600-3300mAh 35C Li-Po battery to fit the fuselage without changing the center of gravity significantly.

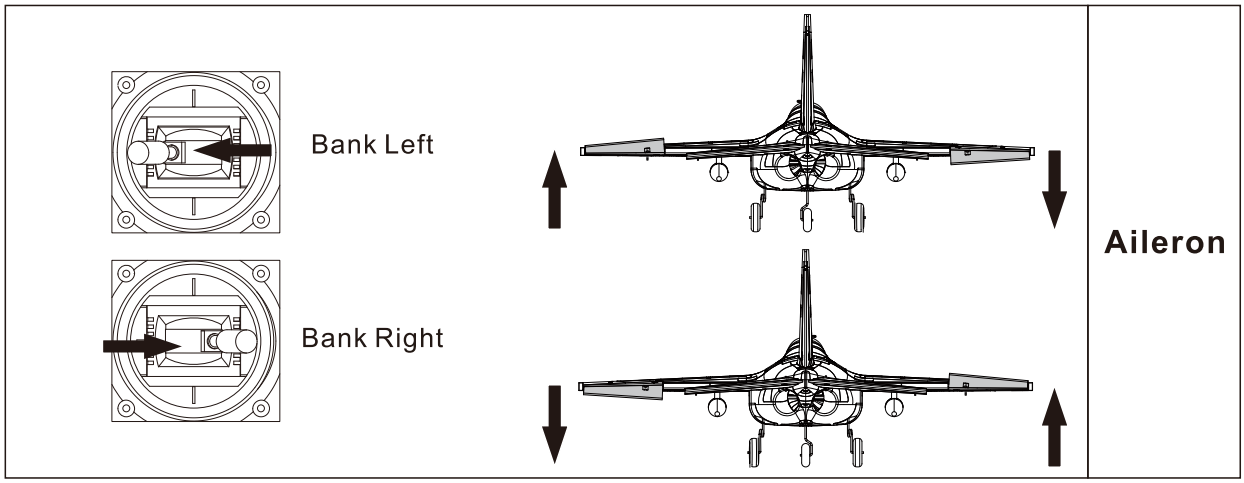
The transmitter and model setup

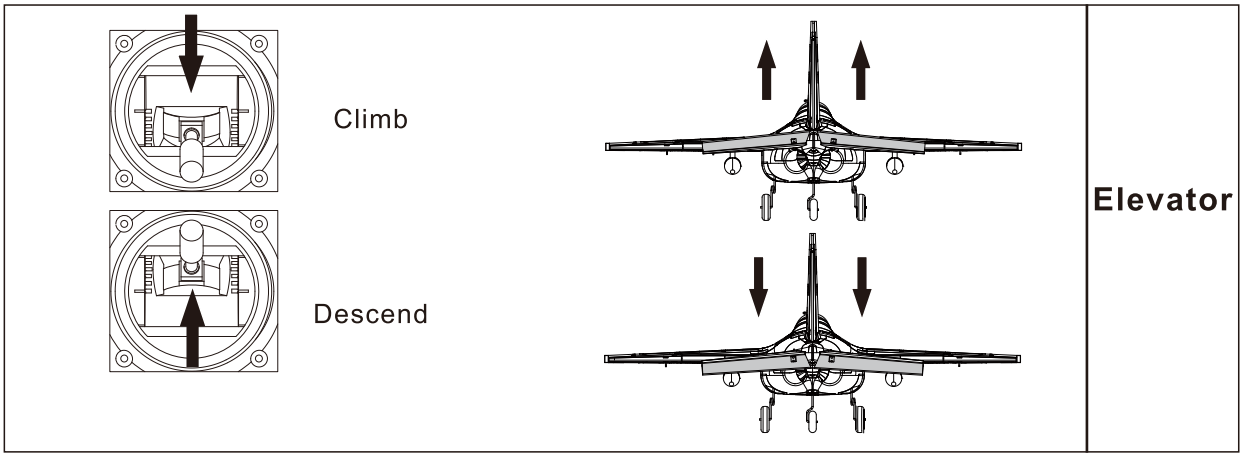
Before getting started, bind your receiver with your transmitter. Please refer to your Transmitter Manual for proper operation

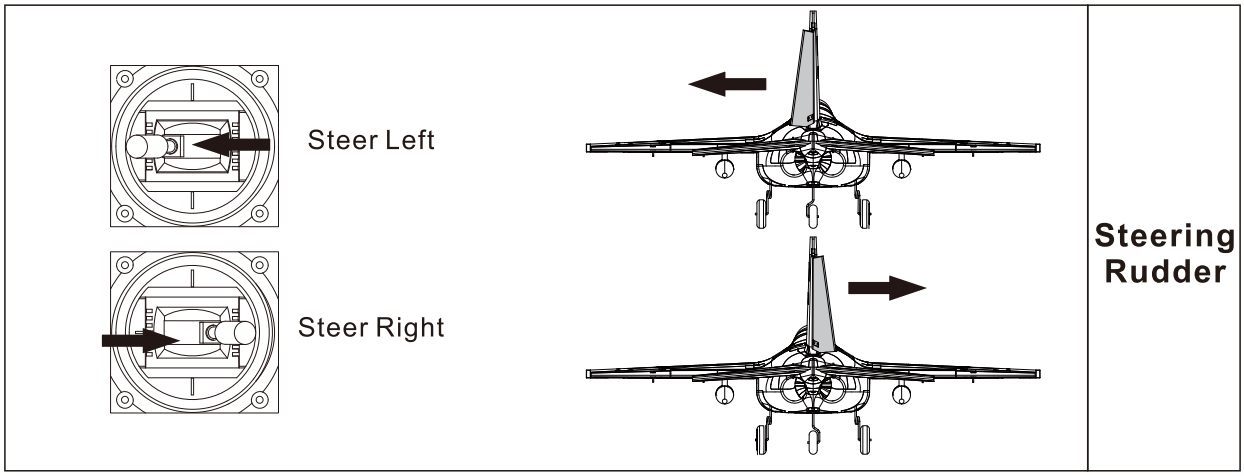
CAUTION: To prevent personal injury, DO NOT arm the ESC and do not turn on the transmitter until the Transmitter Manual instructs you to do so.

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

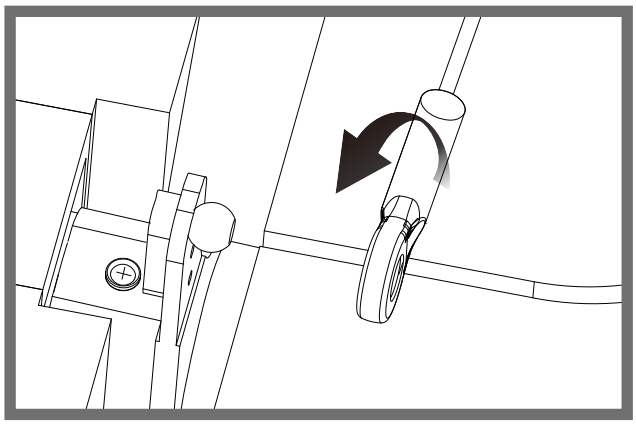
The suggested control throw setting for FMS MODEL are as follows (dual rate setting):

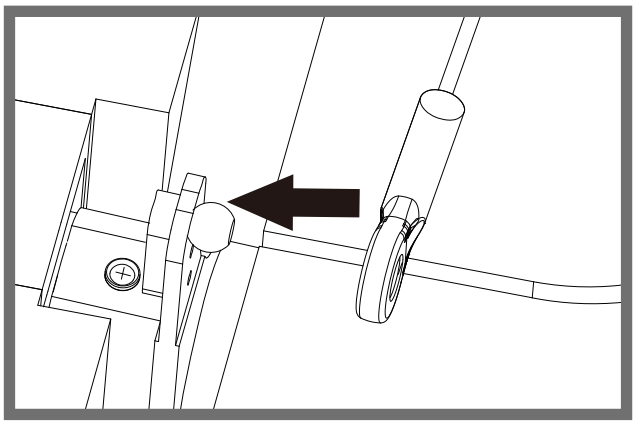
	High Rate	Low Rate
Elevator	15mm up/down	10mm up/down
Aileron	12mm up/down	8 mm up/down
Rudder	20 mm left/right	15 mm left/right

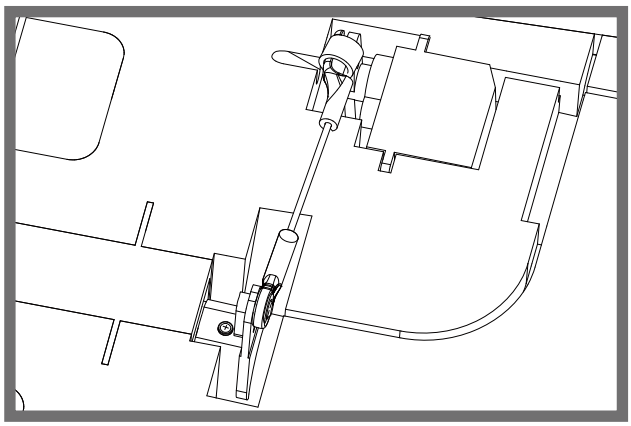
Tips: On first flight, fly the model in low rate. The first time you use high rates, be sure to fly at low to medium speeds. High rate, as listed, is only for EXTREME maneuvering.

Linkage rod Installation

Press the socket-style linkage connector over the corresponding ball end on the control horn.

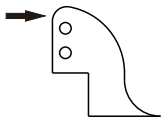
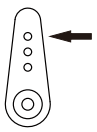
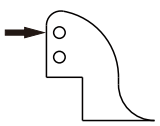
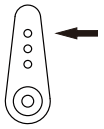
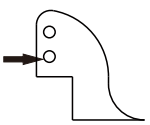
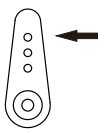


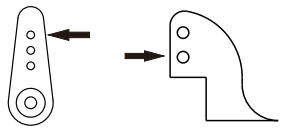
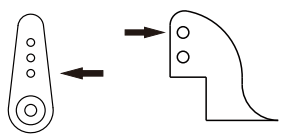




Control Horn and Servo Arm Settings

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.

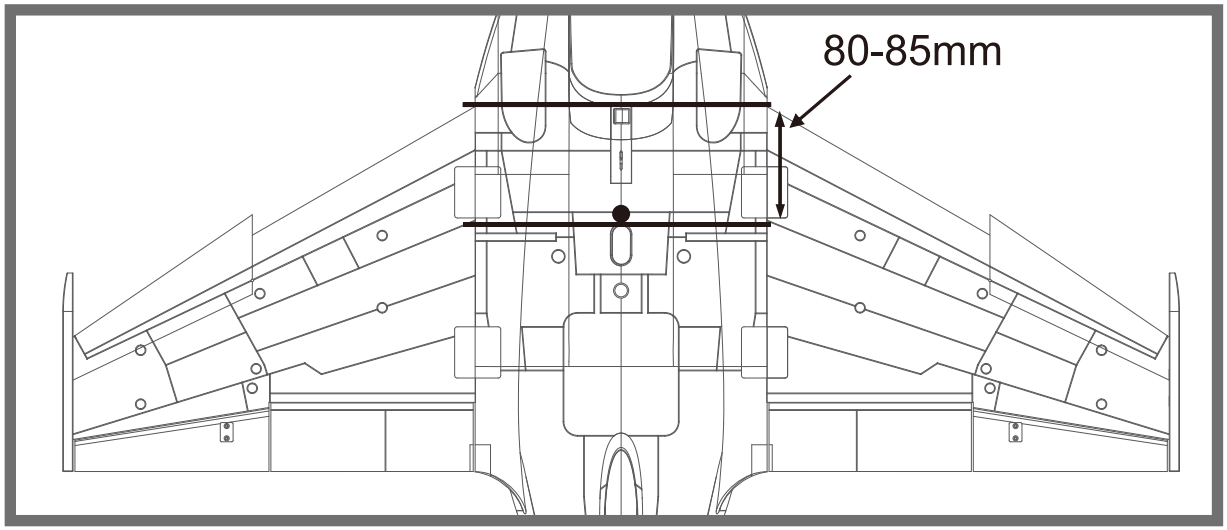
	Horns	Arms
Elevator		
Rudder		
Ailerons		

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 (80-85mm) 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 your model

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. YAK-130 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.

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 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

YAK-130 RED

FMSPS101RED	Fuselage
FMSPS102RED	Main Wing Set
FMSPS103RED	Vertical Stabilizer
FMSPS104RED	Horizontal Stabilizer
FMSPS105RED	Cockpit
FMSPS106RED	Cowl
FMSPS107	Linkage Rod
FMSPS108	Screw Set
FMSPS109	Landing Gear Set
FMSPS110	Main Landing Gear System
FMSPS111	Front Landing Gear System
FMSPS112	Pipe
FMSPS113RED	Decal Sheet
FMSDF12B70	Ducted fan (12-blade)
PRKV1850	2860-KV1850 motor
PRESC003	70A ESC
FMSSER9MGDP	9g digital metal gear servo positive
FMSSER9MGDR	9g digital metal gear servo reverse
FMSRE013	Electronic Retract

YAK-130 GREY

FMSPS101GRY	Fuselage
FMSPS102GRY	Main Wing Set
FMSPS103GRY	Vertical Stabilizer
FMSPS104GRY	Horizontal Stabilizer
FMSPS105GRY	Cockpit
FMSPS106GRY	Cowl
FMSPS107	Linkage Rod
FMSPS108	Screw Set
FMSPS109	Landing Gear Set
FMSPS110	Main Landing Gear System
FMSPS111	Front Landing Gear System
FMSPS112	Pipe
FMSPS113GRY	Decal Sheet
FMSDF12B70	Ducted fan (12-blade)
PRKV1850	2860-KV1850 motor
PRESC003	70A ESC
FMSSER9MGDP	9g digital metal gear servo positive
FMSSER9MGDR	9g digital metal gear servo reverse
FMSRE013	Electronic Retract

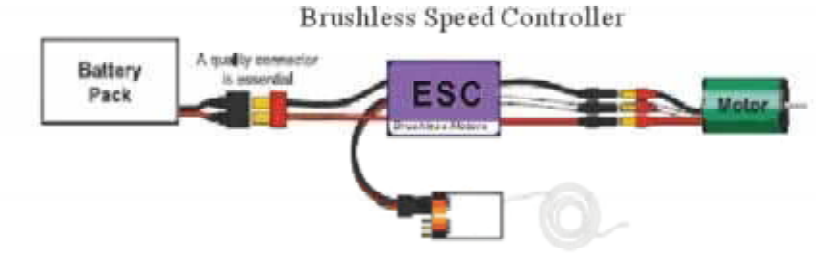
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ESC instruction

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
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