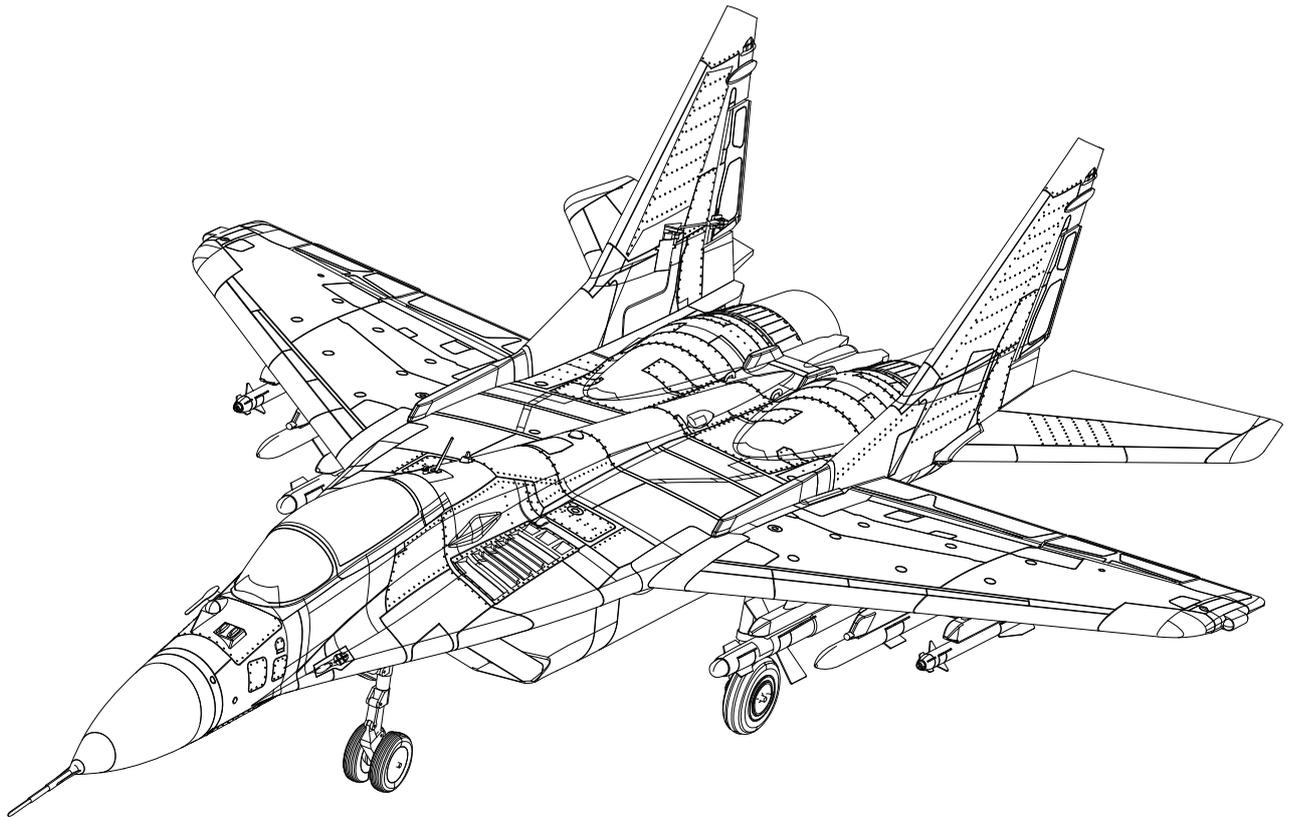


# Twin 64mm Mikoyan MiG-29



**WARNING:** This manual contains important information that will help you maintain and operate your model aircraft in a reliable and safe manner. Please read the instructions and warnings carefully prior to assembly, setup or use.

As this model aircraft is a sophisticated hobby product, it must be flown with safety and common sense in mind, failure in doing so may result in injury or property damage. This product is not intended for use by children without direct adult supervision.

## Safety precautions and Warnings

As the user, you are solely responsible for the safe operation and maintenance of this product. Follow the directions and warnings listed in this manual, as well as that of supporting equipment (chargers, batteries etc.) and always use common sense.

### **This is not a toy. Not for children under 14 years of age.**

- ★ Always operate your model in an open area away from buildings, cars, traffic or people. Never operate near people-especially children who can wander unpredictably. Never operate in populated areas for any reason, where injury or damage can occur.
- ★ Always keep a safe distance in all directions around your model to avoid collisions or injury. This model is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
- ★ Never catch the aircraft while it is in flight, the structure of the fuselage was not designed and protected for this purpose.
- ★ Never operate your model in bad weather, including in excessively windy or precipitating conditions.
- ★ Never operate your model with low transmitter batteries.
- ★ Keep your throttle quadrant in its lowest position prior and after every flight. Use the throttle cut function if able.
- ★ Always use fully charged batteries and move batteries before disassembly.
- ★ Avoid water exposure to all equipment not specifically designed and protected for this purpose.
- ★ Avoid cleaning this product with chemicals.
- ★ Never lick or place any part of your model in your mouth as it could cause serious injury or even death.
- ★ Keep all chemicals, small parts and anything electrical out of the reach of children.

## Introduction

The Russian Mikoyan MiG-29 (NATO reporting name: Fulcrum) is a fourth-generation, twin engined air-superiority fighter. Developed in the 1970s by the Mikoyan design bureau (now the Russian Aircraft Corporation MIG), the legendary MiG-29 and the larger Sukhoi Su-27 were developed to counter American F-15 and F-16 fighter aircraft.

Arrows hobby has once again utilized all of its engineering and testing experience in developing the dual-64mm EDF MiG-29; confident that this is a MiG-29 that will surpass the performance and features of any other R/C MiG-29 on the market today.

Performance- dual 12-bladed 64mm EDFs and dual- 40 amp ESCs provide ample thrust for the Arrows MiG-29. With exhilarating high-speed and vertical performance along with the turbine-like sound wave, this is certainly the cutting edge of R/C aviation.

Scale features: Functional LEDs, full flying horizontal stabilizer and full-metal shock-absorbing undercarriage provide functional realism; while a detailed cockpit, panel lines, removable armaments, pilot figure and scale trim scheme allow the aircraft to look like the real thing up close.

Despite the complex structure of the Arrows MiG-29, the aircraft comes prebuilt from the factory. Experienced pilots will find that the assembly process is easy and straight-forward, taking as little as 15 minutes to complete.

For pilots that have mastered the Marlin and are looking for something in the scale-department, the aggressive MiG-29 is not to be missed!

### Features:

- Ample thrust courtesy of dual out-runner 64mm 12-bladed fans, dual 40A ESCs and 6S power.
- Highly realistic functional and scale features.
- CNC machined-metal shock-absorbing undercarriage.
- Electric retracts with over-current protection
- High-quality rubber tires
- Bearing-equipped full-flying horizontal stabilizer
- Preinstalled ball-linked linkages for precise surface movements

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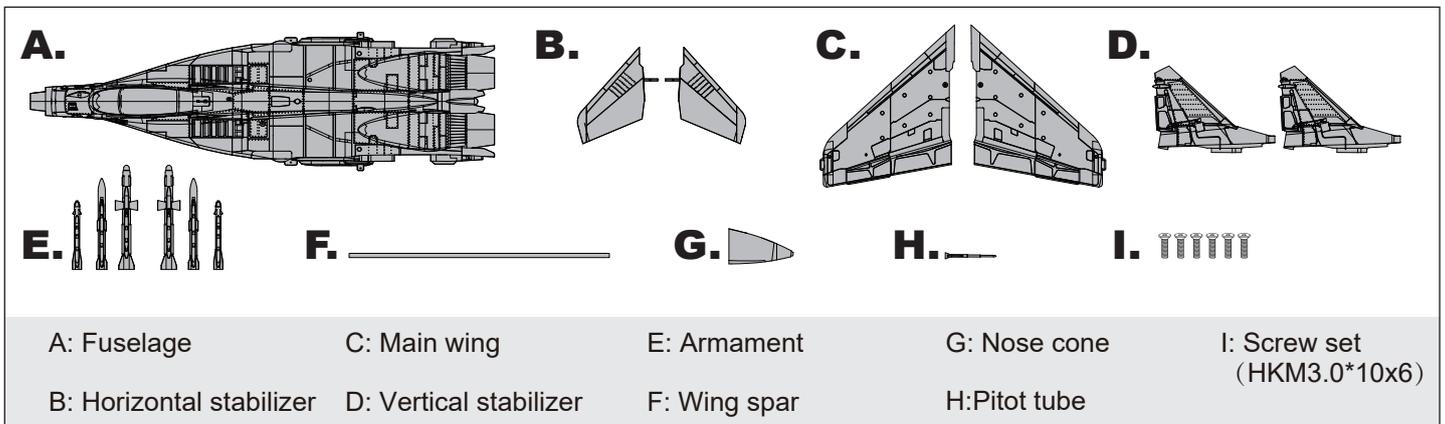
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## Specifications

<b>Wingspan</b>	<b>906mm(35.7in)</b>
<b>Overall length</b>	<b>1358mm(53.5in)</b>
<b>Flying weight</b>	<b>~ 2500g</b>
<b>Motor size</b>	<b>2840-kv2280</b>
<b>Wing load</b>	<b>111g/dm<sup>2</sup></b>
<b>Wing area</b>	<b>22.5dm<sup>2</sup></b>
<b>ESC</b>	<b>Twin 40A ESC with 5.5V 5A BEC</b>
<b>Servo</b>	<b>9g plastic servo x6 9g metal servo x3</b>
<b>Recommended battery</b>	<b>22.2V 3300mAh 35C</b>

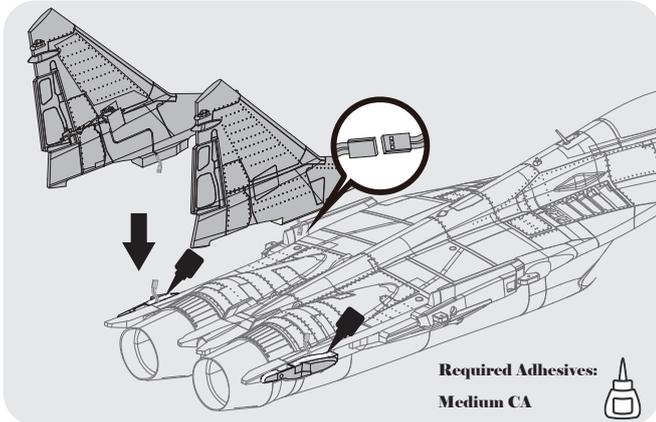
## Kit contents

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

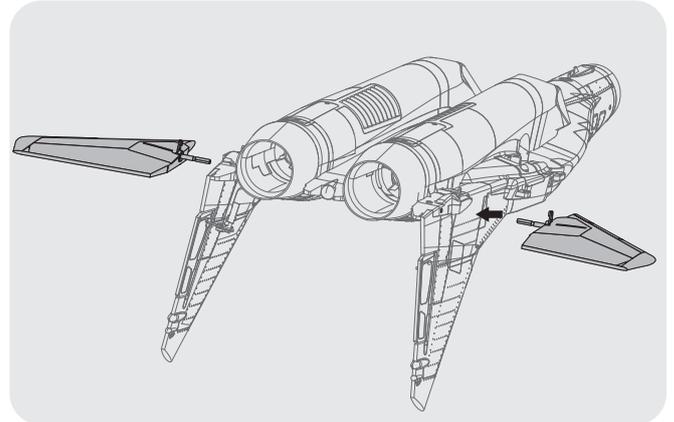


### Installation of the vertical and horizontal stabilizers

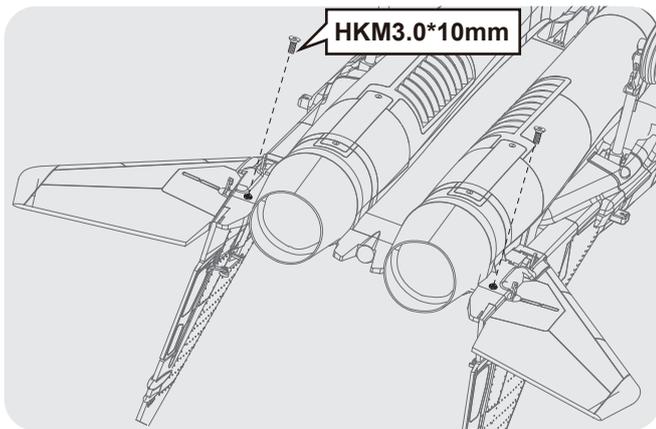
1. Connect the rudder servo leads to the servo extension located in the aft fuselage. Apply glue to the illustrated location and adhere the vertical stabilizer to the fuselage as shown.



2. Slide the horizontal stabilizer spar into the fuselage.

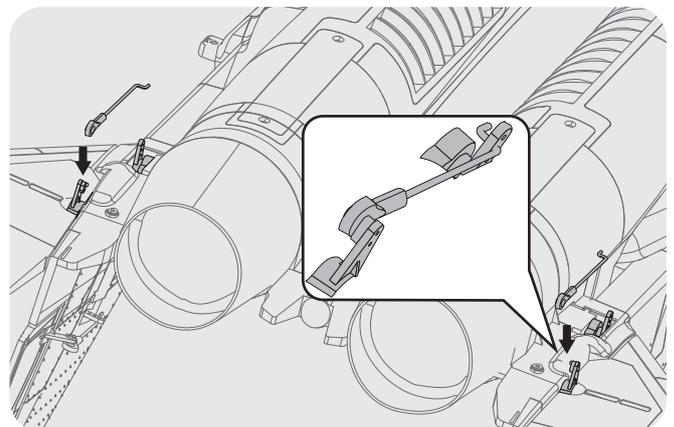


3. Use the included screws to secure the horizontal stabilizers.



### Pushrod connection

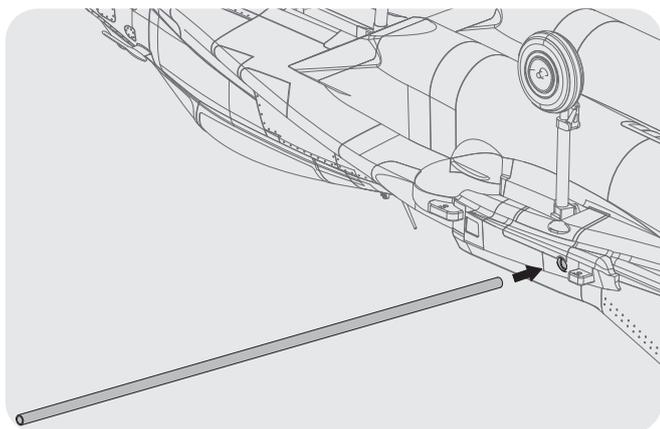
1. With the servo at its neutral position, connect the pushrod to the control arms as shown.



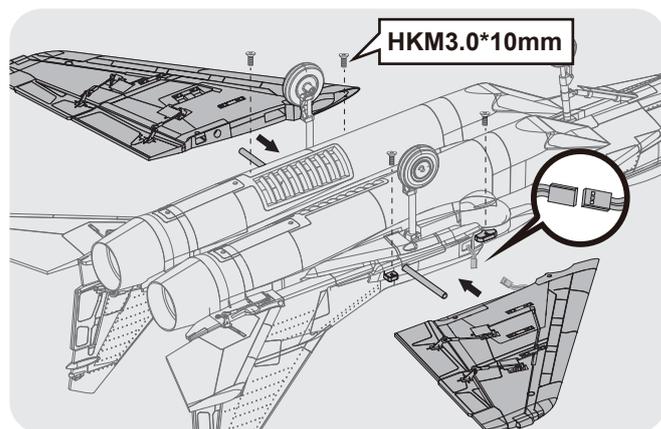


## Installation of the main wing

1. Slide the wing spar into the fuselage pass-through.

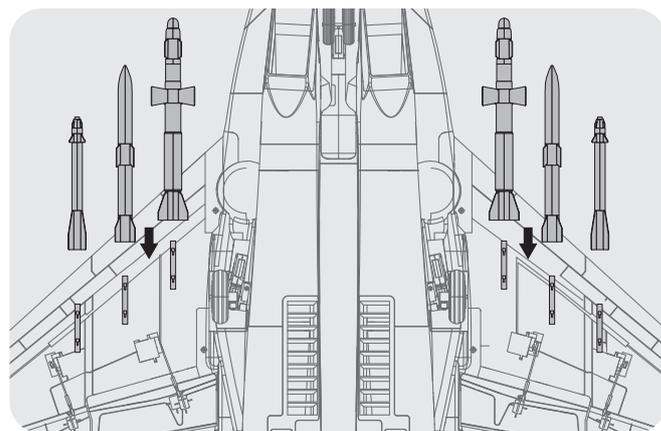


2. Connect the wing servo leads to the servo leads located on the fuselage. Slide the wing halves over the spar and secure using the included screw.



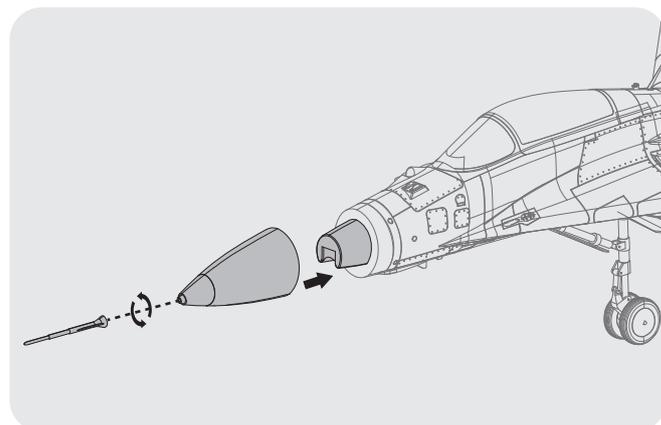
## Installation of armaments

1. The included missiles slide fore-aft onto the wings as shown.



## Installation of the nose cone and pitot tube

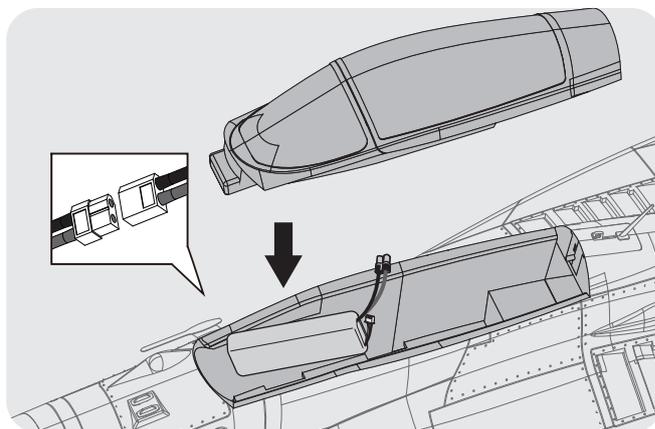
1. The pitot tube is secured onto the nose cone by rotating it in a counter-clockwise direction. The nose cone slides onto the front of the fuselage as shown.



## «— Battery installation

1. Remove the battery hatch.
2. Remove the hook and loop tape from the fuselage. Apply the looped surface to the battery.
3. Install the battery into the fuselage- securing it with the preinstalled battery straps.

*Note: The weight of each battery may vary due to different manufacturing techniques. Move the battery fore or aft to achieve the optimal center of gravity.*



## Receiver diagram

The cables from the servo connector board should be connected to your receiver in the order shown. Note that the LEDs can be powered by any spare channel on the receiver.

Tuck the wire leads into the recessed cavity towards the rear of the battery hatch.

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

## «— Preflight check

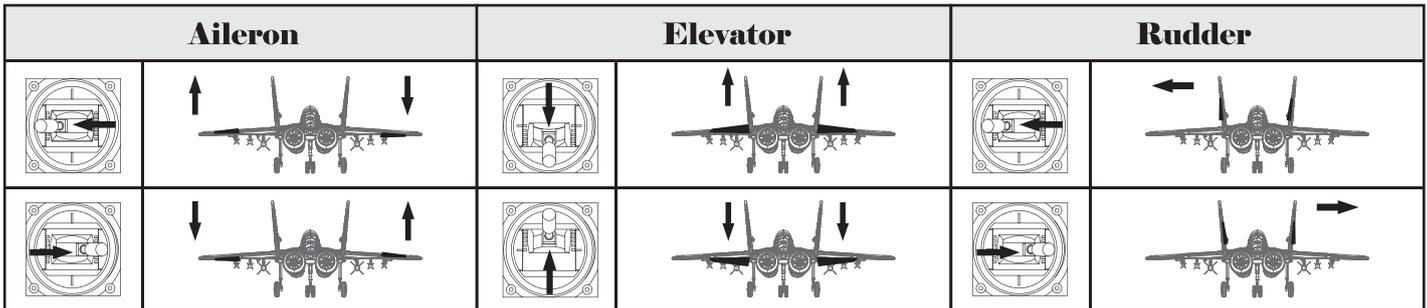
### Important ESC and model information

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



## transmitter and model setup

After assembly and prior to your first flight, make sure all control surfaces respond correctly to your transmitter by referring to the diagram below.



## Control throws

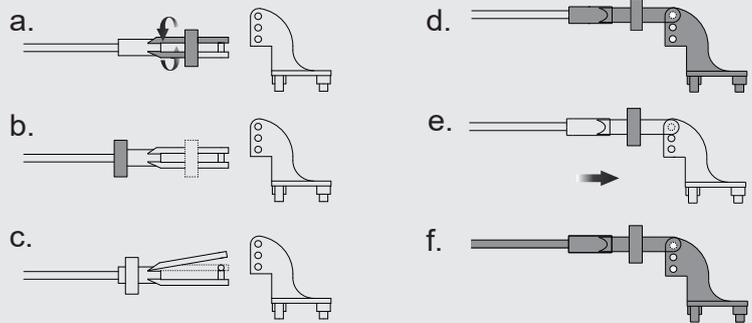
The suggested control throw setting for the Twin 64mm Mikoyan MiG-29 are as follows (dual rate setting):

Tips: The maiden flight should always be flown using low rates, fly the aircraft until you are familiar with its characteristics prior to trying high rates. Make sure the aircraft is flying at a decent altitude and speed prior to using high rates, as the aircraft will be sensitive to control inputs with the larger control surface movements.

	High Rate	Low Rate
<b>Elevator</b>	35mm up / down	30mm up / down
<b>Aileron</b>	20mm up / down	15mm up / down
<b>Rudder</b>	25mm left / right	20mm left / right

## Clevis installation

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



## Control horn and servo arm settings

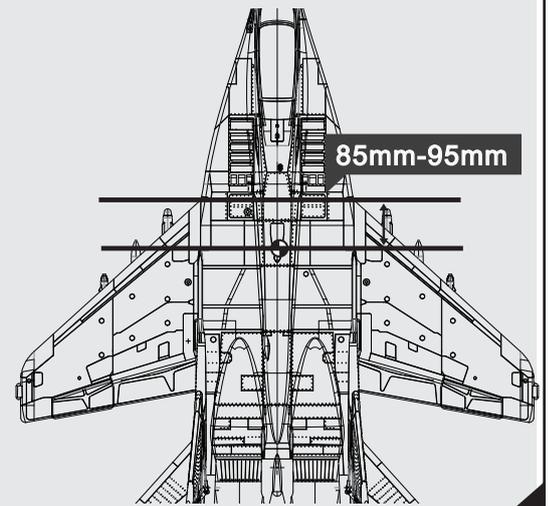
1. The table shows the factory settings for the control horns and servo arms. Fly the aircraft at the factory settings before making changes.
2. After flying, you may choose to adjust the linkage positions for the desired control response.

	Horns	Arms	More control throw
Elevator			
Rudder			
Allerons			
			Less control throw

## Finding the center of gravity

Finding the correct center of gravity is critical in ensuring that the aircraft performs in a stable and responsive manner. Please adjust the weight distribution so the aircraft balances in the range stated on the diagram.

- Depending on the capacity and weight of your chosen flight batteries, move the battery forward or backward to adjust the center of gravity.
- If you cannot obtain the recommended CG by moving the battery to a suitable location, you can also install a counterweight to achieve correct CG. However, with the recommended battery size, a counterweight is not required. We recommend flying without unnecessary counterweight.



## 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.

### Performing a range check

A radio range check should be performed prior to the first flight of the day. This test may assist you in detecting electronic problems that may lead to a loss of control- problems such as low transmitter batteries, defective or damaged radio components or radio interference. This usually requires an assistant and should be done at the flying site.

## « — Before flying the model — »

Always turn your transmitter on first. Install a fully charged battery in the battery bay, then connect it to the ESC. In this process, make sure that the throttle cut functionality is on, and that the throttle stick is secured in its lowest position- otherwise, the propeller/fan will engage and possibly cause bodily harm.

**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 a stopwatch or on the transmitter, if available). As modern Lithium Polymer batteries are not designed to discharge completely, when the battery runs low, the ESC will lower then completely cut the power to the motors to protect the battery. 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

Point the aircraft into the wind while slowly applying power until the aircraft starts to track straight, use the rudder when necessary. When the aircraft reaches takeoff speed, ease back on the elevator stick until the aircraft is climbing at a constant rate without decelerating. Climbing at too steep of an angle at the relatively low speeds of a takeoff-climb may result in an aerodynamic stall.

### 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.

### Landing

Land the aircraft when you start to feel sluggish motor response. If using a transmitter with a timer, set the timer so you have enough flight time to make several landing approaches. The model's three point landing gear allows the model to land on hard surfaces. Align model directly into the wind and fly down to the ground. Fly the airplane down to the ground using 1/4-1/3 throttle to keep enough energy for proper flare. Before the model touches down, always fully decrease the throttle to avoid damaging the propeller or other components. The key to a great landing is to manage the power and elevator all the way to the ground and set down lightly on the main landing gear. With some practice, you will be able to set the aircraft gently on its main gear and hold it that way until the speed reduces enough where the nose wheel (tricycle landing gear aircraft) or tail wheel (tail draggers) settles onto the ground.

### 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

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
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>
Excessive vibration or propeller noise.	<ul style="list-style-type: none"> <li>• Damaged spinner, propeller, motor or motor mount.</li> <li>• Loose propeller and spinner parts.</li> <li>• Propeller 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> <li>• Remove and install propeller correctly.</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>• Completely recharge flight battery.</li> <li>• Replace flight battery and follow flight battery instructions.</li> </ul>
Control surfaces unresponsive or sluggish.	<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.	<ul style="list-style-type: none"> <li>• Channels are reversed in the transmitter.</li> </ul>	<ul style="list-style-type: none"> <li>• Do the control direction test and adjust controls for aircraft and transmitter.</li> </ul>
Motor loses power Motor power pulses then motor loses power.	<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.	<ul style="list-style-type: none"> <li>• Power loss to receiver.</li> </ul>	<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

AHAK101	Fuselage	AHAK117	Landing gear cover
AHAK102	Mainwing set	AHAK118	Front landing gear set
AHAK103	Horizontal stabilizer	AHAK119	Main landing gear set
AHAK104	Vertical stabilizer	AHAK120	Front landing gear system
AHAK105	Cockpit	AHAK121	Main landing gear system
AHAK106	Cowl	AHRE004	EL Retract
AHAK107	Wing tube	AHRE005	EL Retract
AHAK108	Airspeed head	AHESC40A-Twin	Twin 40A ESC
AHAK109	Linkage rods	AHBEC5A	5A BEC
AHAK110	Wheel set	AH9GP	9g gear servo positive
AHAK111	Screw set	AH9MGP	9g metal gear servo positive
AHAK112	Decal set	AH9MGR	9g metal gear servo reverse
AHAK113	Control horn set	AH64MM12B	64mm Ducted Fan(12-blade)
AHAK114	Dummy armament set	AHKV2280	2840-KV2280 Motor
AHAK115	LED set		
AHAK116	Supporting rod		



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