

# WARGO 3D



## INSTRUCTION MANUAL

# EDGE 540T

H-KING WARGO EDGE 540T 38"  
3D AEROBATIC PLANE (ARF VERSION)

**H·KING**

## **WARNING**

Please read this instruction manual fully and become completely familiar with the features of this product before operating. Failure to operate this product correctly could result in damage to the product, personal property and cause serious injury. This is a sophisticated hobby product and is NOT a toy. It must always be operated with caution, common sense and some basic mechanical ability. This manual provides instructions as to the assembly, safe operation and maintenance of this hobby product. It is highly recommended that you follow and read fully the instructions and warnings stated in this manual including safety, assembly, set-up and flying guidelines in order to operate this product correctly and avoid damage or serious injury.

## **SAFETY PRECAUTIONS**

As the user of this product you and you alone are responsible for operating it in a manner that does not endanger yourself and others around you or result in damage to the product or property of others. This product is operated via a radio controlled system that in some cases can be subject to interference from sources outside of your control. Interference may result in a momentary loss of control so it is always recommended that this product be used in a suitably open outdoors space.

1. Please read this manual carefully and follow the instructions before you use this product.
2. This airplane is not a toy, due to its advanced flying qualities it is only suitable for pilots with intermediate or higher experience. If you are a novice then please only operate with the assistance of an experienced pilot.
3. Not recommended for children under 14 years old.
4. Please set up this plane according to the instructions and make sure you keep your hands and other parts of your body out of the way of the rotating propellers at all times. Failure to do so will result in damage to yourself and to the airplane.
5. Do not fly in thunderstorms, strong winds or wet weather.
6. Never fly R/C planes where there are overhead power lines, automobiles, airports, railway lines or near a highway.
7. Never fly R/C planes where there are crowds of people or over organised games. This airplane requires a very flat landing and take-off area or lake that is clear of tree's and other obstacles. Remember safety is the responsibility of the pilot.
8. Do not attempt to catch the plane when you are flying it.
9. The operator will bear the full responsibility of flying and the proper operation and usage of this model. We at Hobbyking will not be responsible for any liability or loss due to improper use of this model.



### My Opinions on this airframe

The plane itself is a fantastic overall performer. On 4s it is very agile and athletic. If you like high energy and tumbling, it is the best setup. I fly it mostly on 3S, the lighter setup is a bit better suited for low and slow 3D. The plane is surprisingly solid with no wing rock in a harrier and loves most 3D maneuvers. The ailerons are super fast and may need to be toned down for rolling harriers and the like. Also, the rudder and elevator are also very effective so be careful to add enough expo and set your rates properly. It has a short moment, so it tumbles like crazy and the rudder is really sensitive.

It is easy to land and easy to harrier both inverted and upright. You will love this aircraft even if you are just learning 3D or aerobatics. It flies very straight lines, and if you set a really good conservative low or precision rate, you will be able to perform any IMAC-type maneuver and look great doing it. Knife edge flight is also very precise with this model. Overall, I am thrilled with its performance in every style of aerobatics making it a perfect all around aircraft. It is relatively small, but it is a benefit as well because it is easily transported. I hope you enjoy flying it as much as I do.

A handwritten signature in black ink, which appears to read 'M. Wargo'.

Michael Wargo





# INTRODUCTION

The Wargo Signature Edge 540T is the next step of my goal to provide a line of perfect 3D and aerobatic training aircraft. I have dedicated a lot of my flying career to teaching 3D aerobatics and helping pilots learn how to become better pilots. I have also dedicated myself to trying to develop the ideal transition and training 3D plane. I am proud to offer you the Wargo Edge 540t. It is a foam aircraft that is stiffer and precise with a short moment to improve your 3D, tumbling and precision flying. The Wargo Edge 540T is perfect to take a pilot from sport flying to confidently flying 3D aerobatics as well. The result is a phenomenal plane that will hover, harrier and tumble incredibly well. Any accomplished 3D pilot will love this plane because it will satisfy the most discriminating pilot. It will perform maneuvers ultra-light foamies cannot because it has a bit better ability to carry momentum and perform more high-energy and tumbling type of maneuvers. The Wargo Edge 540T is a blast to fly, and is small and light enough to fly anywhere and transport easily.

## SPECIFICATIONS

- Wingspan: 965mm
- Length: 980mm
- Wing area: 20.4 dm<sup>2</sup>
- All Up Weight: 660g with 4S set-up
- All Up Weight: 630g with 3S set-up

## REFERENCE POWER TRAIN

Servo: 12g digital metal gear  
Motor: 2836 1040Kv  
ESC: 30~40A ESC with BEC  
Prop: 10x4.7~11x5.5  
Radio: 2.4Ghz with 4 or more channels  
Battery: 3~4S 1300mAh 25-60C battery pack

# CONTENTS



1: Fuselage

2: Wing set

3: Elevator

4: Rudder

5: Landing gear fairings

6: Wheel spats

7: Side force generator(L+R)

9: Landing gear and wheel  
set assembly

10: Hardware accessories

11: Aileron extension cord

12: Pushrod

13: Hook and Loop tape

14: Spinner

15: Zip ties

# ASSEMBLY

Install the rudder servo as shown.



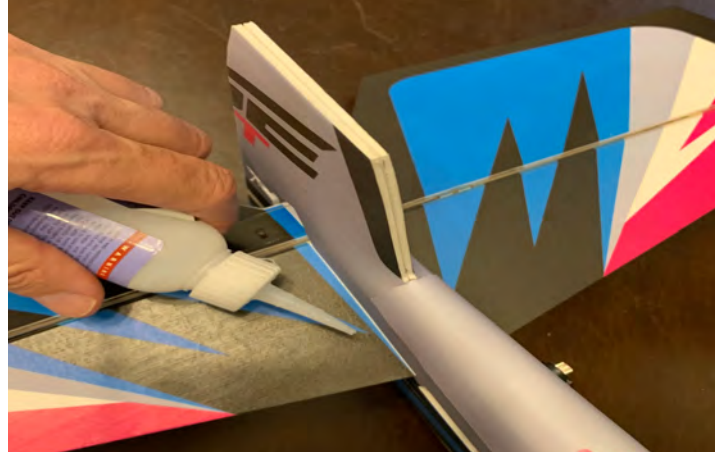
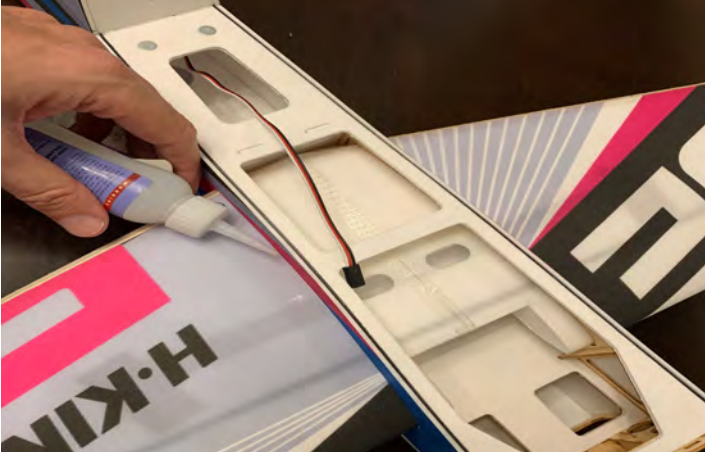
Insert the landing gear and landing gear plate into the slot as shown. Use slow curing CA glue for the strongest bond.



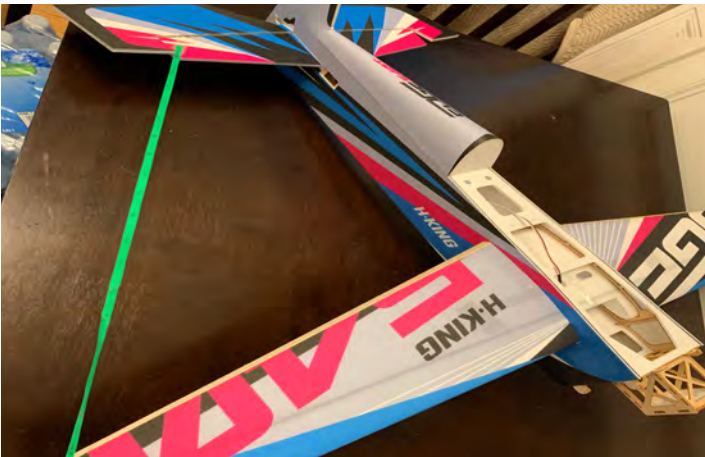
Dry fit the main wing set and stabilizer onto the fuselage. Use a straight edge to ensure the measurement for both left and right side of the wing tip to the stabilizer are equal as shown.



Once you are satisfied with the fit and the measurements, apply a few drops of foam safe CA glue to the joints between the fuselage and the wing just to hold them in position. Repeat this process for the horizontal stabilizer.



Check the measurements once again to ensure they are correct. If the measurements are correct for both wing and stabilizer, and these are level to each other, you can then apply a foam safe glue to all the joints for a permanent bond.



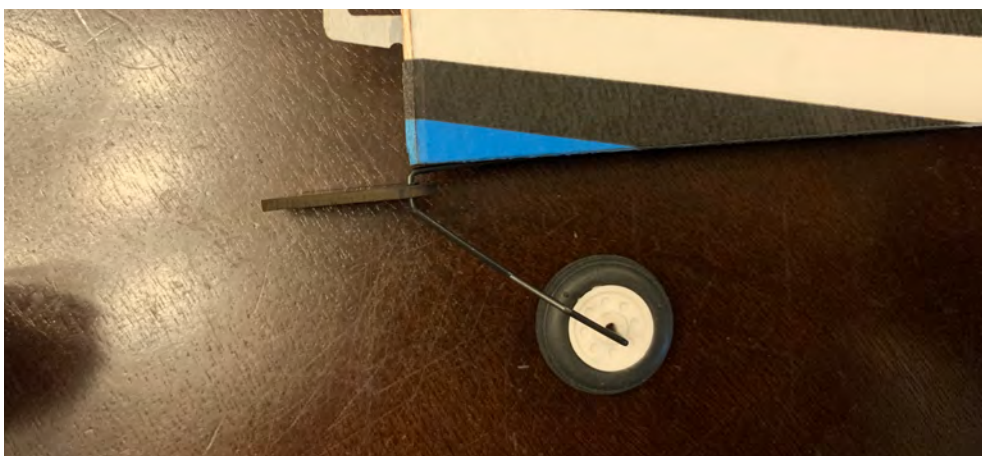
Adjust the elevator so that there is a hinge gap of about 1mm, and that it is evenly spaced on both sides of the fuselage. Use foam safe CA to glue the hinges into both the stabilizer and elevator hinge slots.



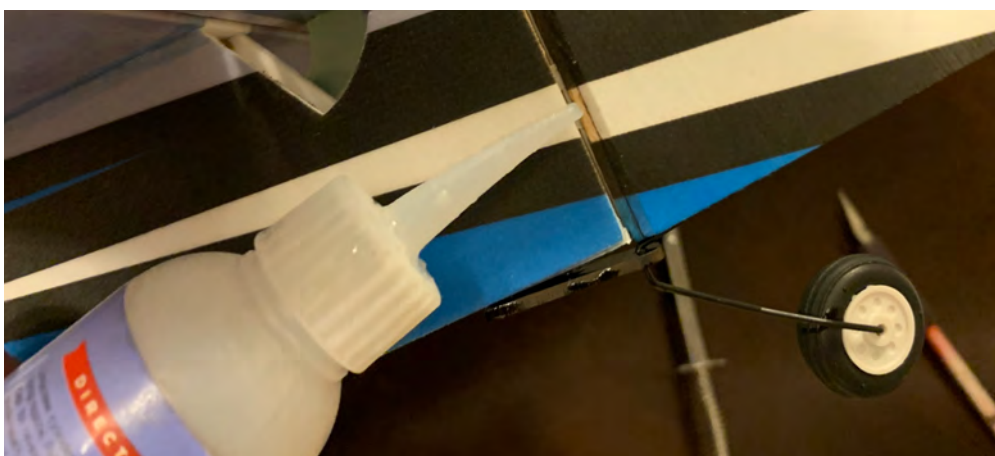
Use thin foam CA glue to attach the elevator control horn.  
Install the control horn plate on the other side of the elevator.



Install the tailwheel bracket and glue to the rudder as shown.

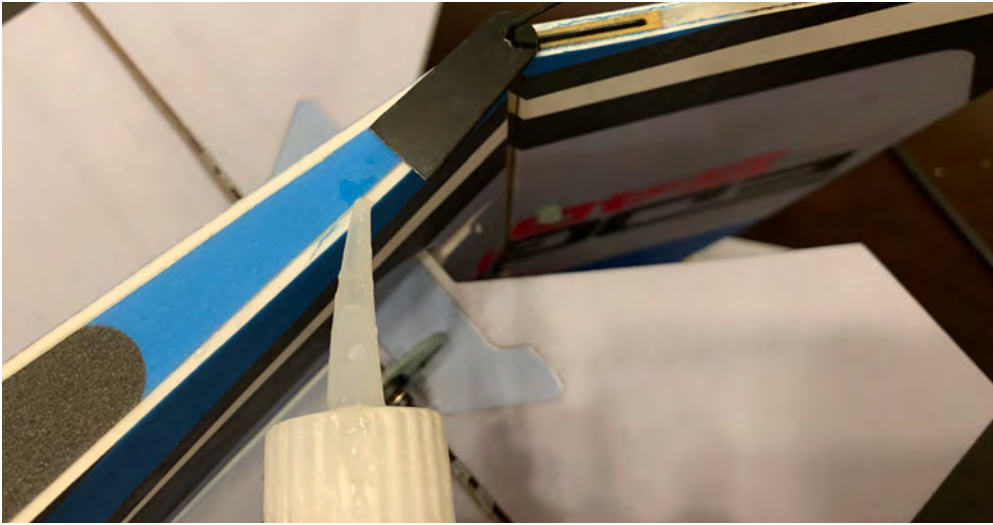


Adjust the rudder so there is a hinge gap of about 1mm space in between. Use a foam safe CA to glue the hinges into both the rudder and vertical fin hinge slots.

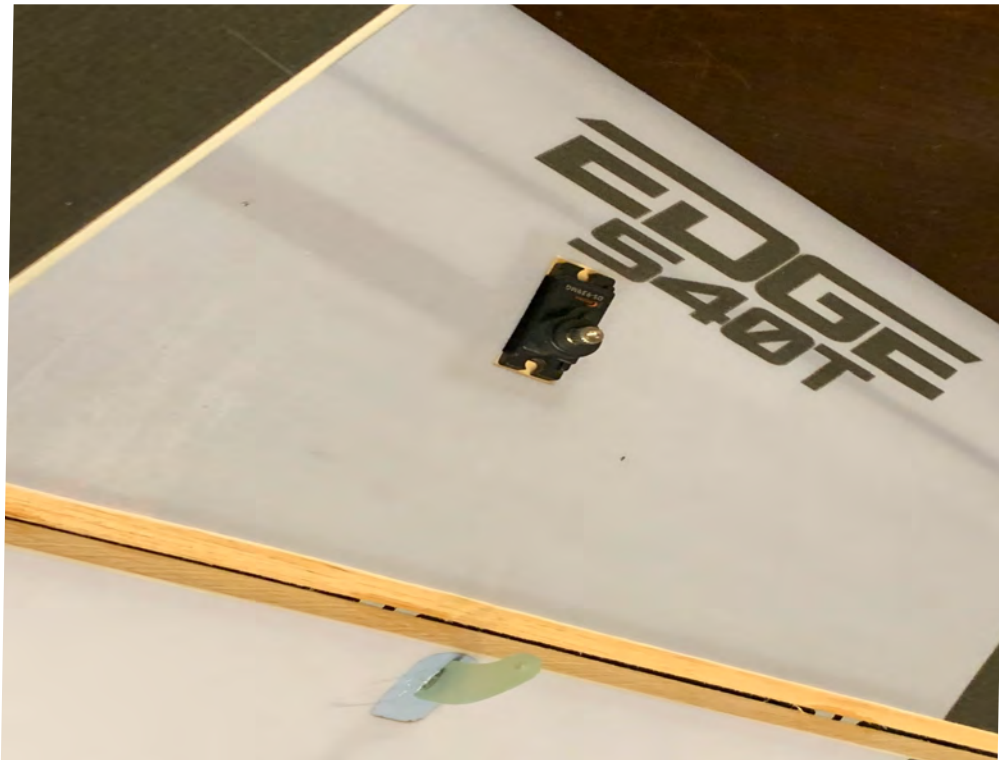




Apply foam safe glue to the tailwheel bracket holding plate and glue it to the tail as shown.



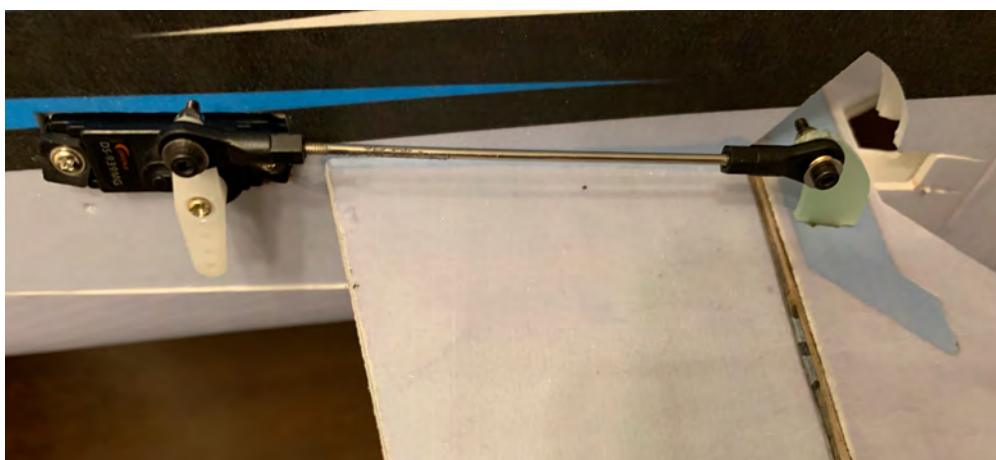
Connect one of the supplied extension servo leads to an aileron servo and install it into one of the wing servo cut-outs as shown. Adjust the aileron control surface so there is a hinge gap of about 1mm gap in between the aileron and the wing. Use a foam safe CA to glue the hinges into both the wing and aileron control surface hinge slots. Repeat this process for the other wing.



Install the supplied ball link socket to the servo arm as shown. Use a servo controller to adjust your servo arm setting in the neutral position and the pushrod must be positioned perpendicular to the servo arm. Adjust the ball link socket by turning clockwise or anti-clockwise to get the aileron control surface level to the wing.

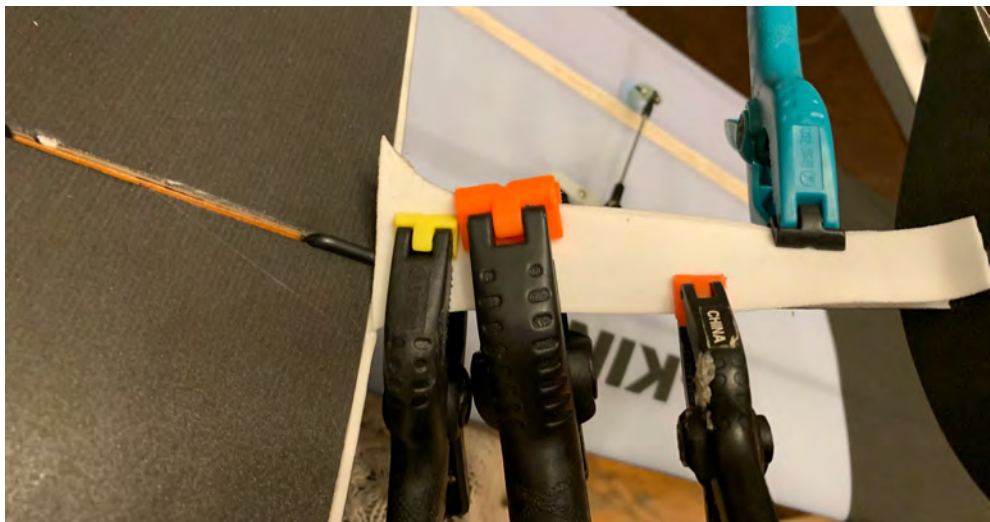
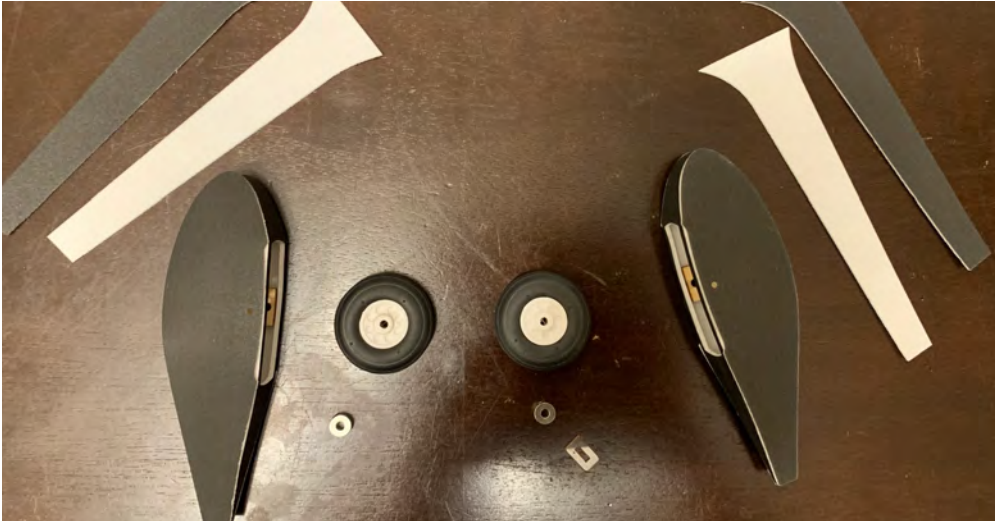


Repeat the above steps for the elevator and rudder control surfaces.





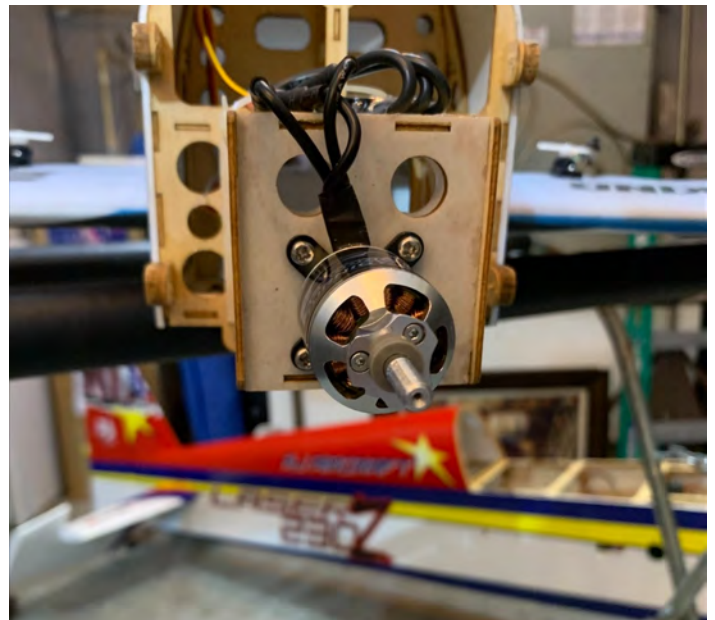
Locate the landing gear parts and install the wheel and wheel spats as shown. Glue the foam fairings to the landing gear with foam safe glue, use mini clamps to hold them in position until the glue dries.



Install the side force generators as shown and glue them permanently to the wing tips with foam safe CA glue.



Install your preferred power train of motor, ESC and battery as shown.





Test fit the cowling onto the fuselage and install the spinner back-plate and propeller as shown. Align the cowling to the backplate carefully and use tape to secure the cowling to the fuselage. When satisfied with the fit and alignment, use the supplied self-tapping screws to secure the cowling, then fit the spinner cone.



## COMPLETE



## Center of gravity position: 95mm from the wing's leading edge





# SETUP

## TRAVEL SETTINGS

Each flight control must be set to its physical limits. This means as far as it will go, but no further than it has to. You set this by selecting the servo, fully deflect the surface with the transmitter, then increase (or occasionally decrease) the percentage to where the flight surface will not travel any further. Then simply back off a click or two and you are done. Then, simply deflect it in the opposite direction and repeat the process. This must always be done for rudder, ailerons, flaps and elevators. Your travel/end point settings must be above 100% to achieve full performance from each servo.

## RATES AND EXPONENTIAL

All rates at 100% for full 3D flying. I suggest your expo settings for full 3D will be 60% as a starting point. Adjust to your preference after flying to achieve full performance from each servo.

## MY PERSONAL SETTINGS

I use a little trick where I put the stick at one third and set to where when I switch between rates the surface hardly changes. Obviously at the end points it is an enormous difference.

My personal expo settings for low rates is in the 20% range for an aerobatic plane, and expo in the 60% to 70% range for high rates for 3D. Again, this is highly dependent on the plane and this is a general guideline only, and is my personal preference.

### 1. High Rate

Aileron	100%	Expo	65%
Elevator	100%	Expo	70%
Rudder	100%	Expo	75%

### 2. Snap Rate (precision or low rates with fast ailerons for quick rolling maneuvers and snap rolls)

Aileron	100%	Expo	65%
Elevator	22%	Expo	24%
Rudder	55%	Expo	35%

### 3. Slow 3D Rate (used for rolling harrier and other post-stall maneuvers)

Aileron	70%	Expo	48%
Elevator	60%	Expo	50%
Rudder	75%	Expo	55%

### 4. Tumbling Rate

Aileron	100%	Expo	60%
Elevator	100%	Expo	70%
Rudder	100%	Expo	70%

### 5. Low Precision Rate

Aileron	60%	Expo	35%
Elevator	22%	Expo	25%
Rudder	35%	Expo	20%

## Basic setup Quick Guide

This Quick guide is an easy way to develop a standard setup procedure guaranteeing accurate settings and a successful experience.

### 1. Basic Setup

- Servo Reversing. Just check the direction of movement, and reverse accordingly.
- Check that all servo arms are centered to 90 degrees.
- Sub trimming: Always sub trim to 90 degrees and mechanically center the flight control surface the best you can. Then sub trim to be perfectly centered.

### 2. Travel Adjust or endpoint adjustments

- Each Flight control must be set to its physical limits. This means as far as it will go, but no farther than it has to. You set this by selecting the servo, fully deflect the surface with the transmitter, then increase (or occasionally decrease) the percentage to where the flight surface will not travel any further. Then simply back off a click or two and you are done. Then, simply deflect it in the opposite direction and repeat the process.

### 3. Rates and Exponential Settings.

- The rates will accurately reflect the percentage of the full range of deflection after the travel adjust settings are correct. We must set at least 2 rates. High rates are full deflection (with more expo). And Low rates are usually in the 30% to 50% with little expo. I always take off and land on high rates in case of flight failures or in case I should need all I can get when flying slow.
- Exponential: With exponential you can make it so the stick movement at the center deflects very little and feel soft like low rates, and at the last part of the stick travel it deflects the surface dramatically. My personal settings are set to where I can hardly tell which rate I am on until I get the stick toward the end where the difference is dramatic. I use a little trick where I put the stick at one third and set to where when I switch between rates the surface hardly changes. Obviously at the end points it is an enormous difference.

My personal expo settings for low rates is in the 20% range for an aerobatic plane and half that for a war bird, and in the 60% to 70% range for high rates for 3d and near 40% for warbirds. Again, this is highly dependent on the plane and this is a general guideline only, and is my personal preference.

**Note:** JR exponential is set to + and Futaba is -. i.e. +60% or Futaba -60% to achieve the same result. Setting Futaba radio to a plus number will result in a dangerously sensitive condition and vice versa for JR.

— Michael Wargo



## MODEL FLYING PRECAUTIONS:

- Select your flying area carefully. Always choose an open space that is clear and not obstructed by trees, poles, pylons, and buildings etc. Also ensure you are away from people and crowded areas. Avoid flying in areas with roads, near water, or within close proximity to full size air traffic.
- Do not fly this model in poor weather, for example: high winds, low visibility, inclement temperatures, and rain and storms are also to be avoided.
- Never attempt to catch the model whilst it is in flight, even a slow moving model can cause harm to yourself and risks damage to the model.
- This model is not recommended for children under the age of 14 years old. All children no matter what age, should be supervised by a capable and responsible adult when operating this model.
- Always unplug your model battery when not in use, never leave the battery installed in the model.
- Please remember to keep clear of the propellers at all times when your flight battery is connected.
- Before flying, always turn ON your transmitter first, then plug your flight battery into the model.
- After flying, always unplug your battery first in the model and then turn OFF your transmitter.
- Exercise caution when charging your batteries, and follow in full your battery manufacturers safety guideline when doing so.

## PRE-FLIGHT CHECKS:

1. Always range check your model before any flying. Follow your radio manufacturers guidelines for performing this check.
2. Check all screw and mounting points are firmly secure including control horns and clevises.
3. Only fly with fully charged batteries. Failure to do so could result in loss of control, damage to the model and possibly property around you. Make sure your batteries are fully charged.
4. With the model powered up check that all control surfaces are free from damage, moving in the correct directions and with no binding.
5. Inspect the model and props for any damage that may have occurred during transit to your flying site. Listen for any unusual sounds from the electronics when powered up, if in doubt, do not fly.
6. With the model held securely and the propellers free of obstructions, increase the throttle just slightly to confirm the rotation of the propellers is correct. The model should want to pull straight forward when the throttle is applied.
7. If this is your first flight with the model double check that the C of G is at the correct position. If not, adjust the battery position inside model as necessary.
8. If you are an inexperienced model pilot, seek the help and assistance of an experienced pilot to perform these final checks, and to test fly the model for you.

## TROUBLE SHOOTING:

### **Motors do not run:**

- 1. Battery is not fully charged (charge the battery).
- 2. Transmitter battery is low (charge or install a fully charged battery).
- 3. Motors are not connected properly (check the motor to ESC connections and the ESC to battery connections).
- 4. Receiver is not bound to the transmitter (consult your radio manual and go through the binding procedure).
- 5. ESC is in set-up mode (hold model and move throttle up to full then back to idle, or reverse the throttle channel on your transmitter. Switch everything off before doing this).

### **Model moves backwards:**

- 1. Propeller fitted on backwards (swap the propeller around).

### **Control surfaces not moving with stick input:**

- 1. The servo leads are not connected properly (check the servo connections).
- 2. The servo is damaged (replace the servo).

### **The model does not fly straight:**

- 1. Control surfaces are not at neutral (adjust the trims/sub trim on your transmitter).
- 2. C of G is not correct (re-position the battery to achieve correct balance).

### **3. Model does not climb well:**

- 1. The battery is not fully charged (charge the battery).
- 2. The elevator servo is reversed (change the direction via your transmitter settings).
- 3. C of G to far forwards making it nose heavy (move battery backwards or add weight to tail).





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