

Duraflly 1100mm Supermarine

# SPITFIRE MK2A

PLUG AND FLY



## INSTRUCTION MANUAL



Please read this manual carefully before operating this plane.



## WARNING:

Read this instruction manual fully so as to 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.

- This is a radio controlled flying model and as such must always be flown with caution and care. This is not a toy.
- This model is designed for intermediate to advanced pilots.
- Always exercise great caution when using the recommended battery to power this product. For full safety notes and operating procedures, please see information provided by your battery supplier.
- Take great care when connecting/disconnecting the battery. See battery supplier for full safety procedures.
- Never power up the model in confined spaces and always keep the prop clear of obstructions.
- This product is not a toy. Children must be accompanied by an adult at all times if operating this product.
- Only fly this model in an open area away from crowds, people, buildings, tree's, power lines and obstructions.
- Always put safety first when operating this model and consider the warnings stated above.
- The supplier/manufacturer accepts no responsibility for damage or injury caused through the use of the product. Not suitable for children under the age of 14. THIS IS NOT A TOY.

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## INTRODUCTION:

The Supermarine Spitfire is THE defining aircraft of WW2, the Mk2a was one of the early versions that defined this incredible airplane. The Mk2a was equipped with the new Merlin XII engine and either a De Havilland or Rotol propeller which together produced an extra 120hp over the the Mk1a set-up. During the darkest days of the war, the Spitfire, more than any other aircraft then or since, along with the pilots that flew it, came to symbolize the struggle and triumph of a nation over adversity. This struggle was the "Battle of Britain", those pilots were "The Few" and the triumph was the Spitfire!

Duraflly's Mk2a Spitfire P7308 represents a Spitfire that was flown by Squadron No 71, this was one of the Eagle Squadrons that were formed in the early days of WWII. These fighter squadrons were formed using volunteer pilots from the United States prior to America's entry into the war in December 1941. Spitfire P7308 is now operated under the care of "The Fighter Collection" based at Duxford in England, and its other claim to fame is that it flew in the making of the 1969 film "Battle of Britain". The attention to detail in this PNF model is matched only by its superb performance and grace in the air. The Mk2a is designed purely for a 4S set-up unlike previous marque's, but it still boasts a range of features you have come to expect from Duraflly. These features include, retractable landing gear, faithfully reproduced split flaps, scale outline, fine surface detail and finish, LED lighting system, and authentic scale decals.

Very simply, you will not find a better rendition of a Spitfire Mk2a at this scale from anyone other than Duraflly. It will appeal to both British and American model airplane pilots for its tribute of a Spitfire flown by one of the extraordinary Eagle Squadrons that were formed using eager, young Americans, who wanted to help make a difference, particularly during the "Battle of Britain".

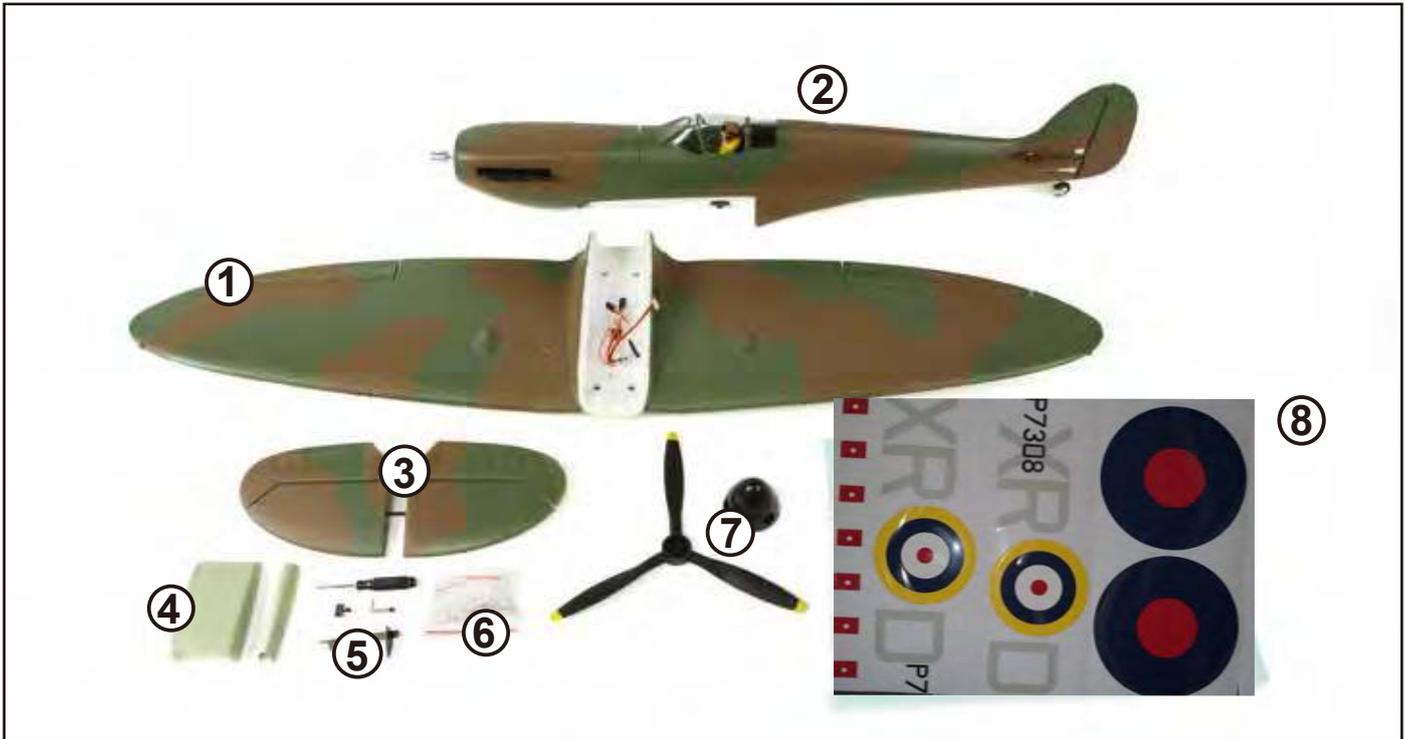


## SPECIFICATION:

- Wingspan: 1100mm (43.3")
- Length: 1000mm
- Flying weight: 1600g (56.4 oz)
- Motor: Aerostar 3636 770Kv brushless outrunner
- Battery: 2200mah 4S 40C
- Radio: 5-6 channel RC required
- Flying weight: 1300g (45oz)
- Servos: 6 x 9g
- Prop: 3 blade 11.25x7



# CONTENTS:



1. Main wing.

2. Fuselage.

3. Horizontal Stabilizer/Spar

4. Wing Radiators

5. Scale Plastic Parts

6. Control Accessories/Hardware.

7. Prop/Spinner.

8. Decal Sheet.

# REQUIRED TO COMPLETE MODEL:

In its 'Plug n Fly' format the Spitfire Mk2a will still require some additional electronic components to get it 'flight ready'. Durafly recommends the products below for optimum performance and great value. Available at [hobbyking.com](http://hobbyking.com)



OrangeRx Tx10i 10ch  
2.4GHz DSM2/DSMX  
Compatible Radio System  
SKU: 9171001400-0



OrangeRx R820X V3 8Ch  
2.4GHz DSMX/s.Link  
Compatible Full Range  
Receiver  
SKU: 9171001405-0



Turnigy Graphene  
Panther 2200mAh 4S 75C  
Battery Pack  
SKU: 9067000372-0



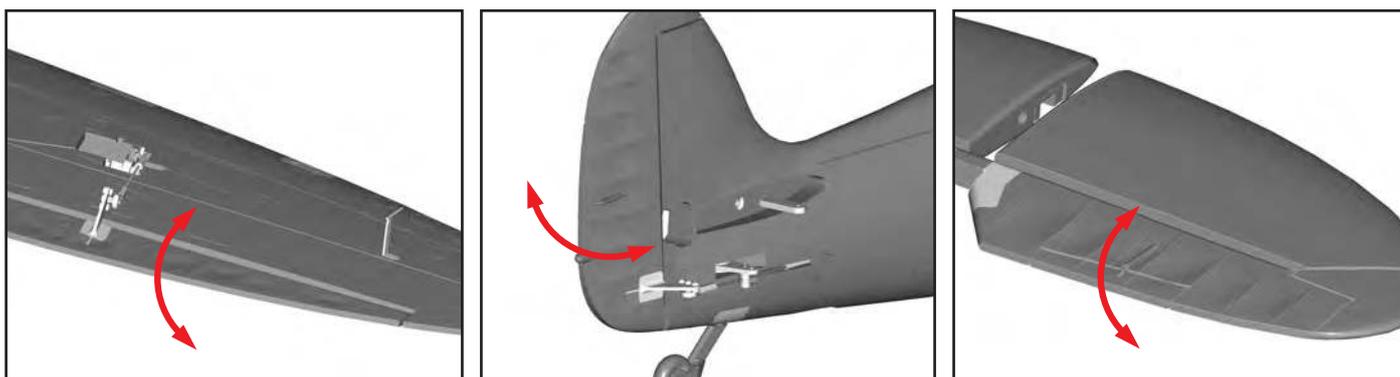
Rhino 2200mAh 4S 50C  
Lipo Battery Pack w/XT60  
SKU: 9952000026-0



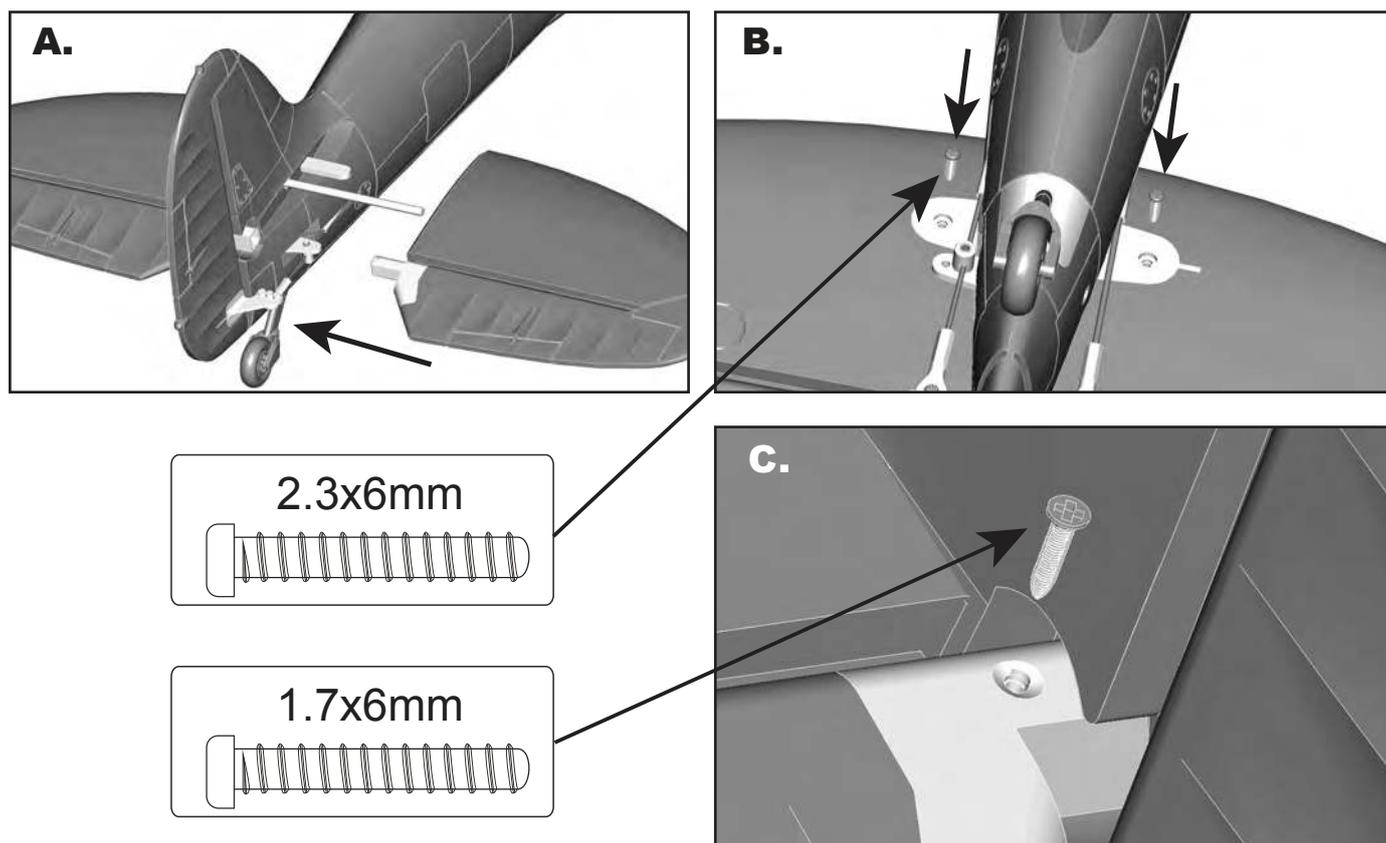
**NOTE:** Your Spitfire Mk2a is supplied with a set of high quality scale decals. We recommended that you apply these decals **BEFORE** you begin assembly of the model. Please refer to 'Decal application' on pages 14-16 of this manual for an illustrated guide on how to apply, and the separate guide for their positions.

## ASSEMBLY:

1. Out of the box your Spitfire comes with reinforced foam hinges. However before assembly can begin, each hinge line must be flexed back and forth 5-6 times to reduce tension and load on the servo. Do this for all control surfaces before continuing.

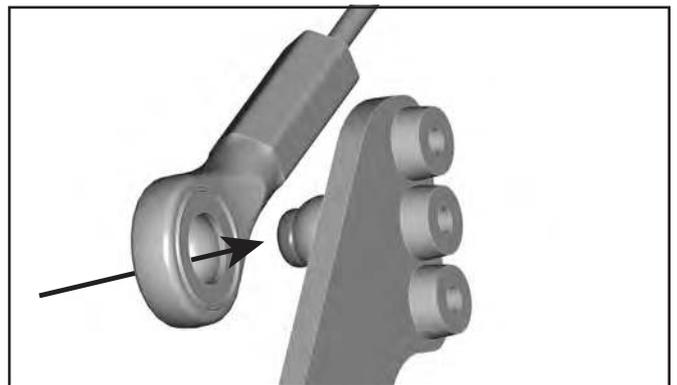
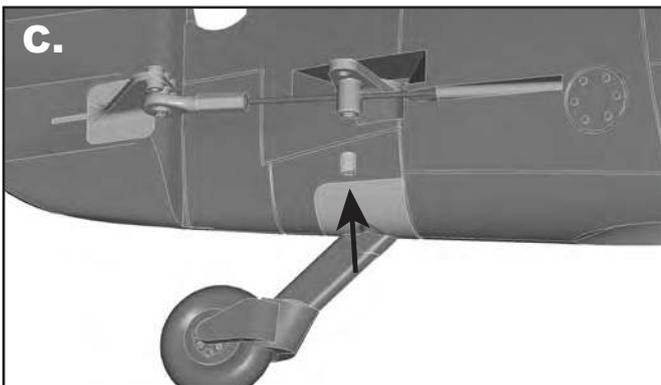
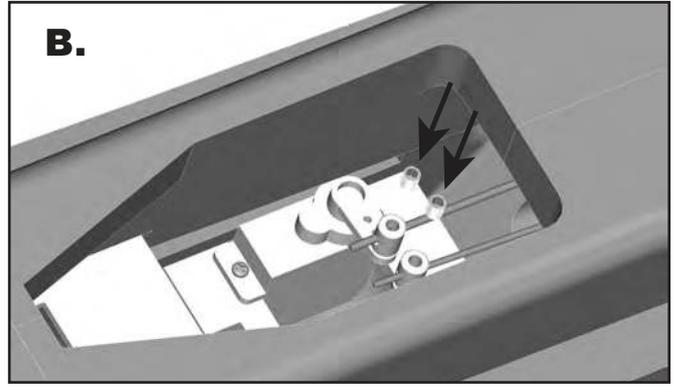
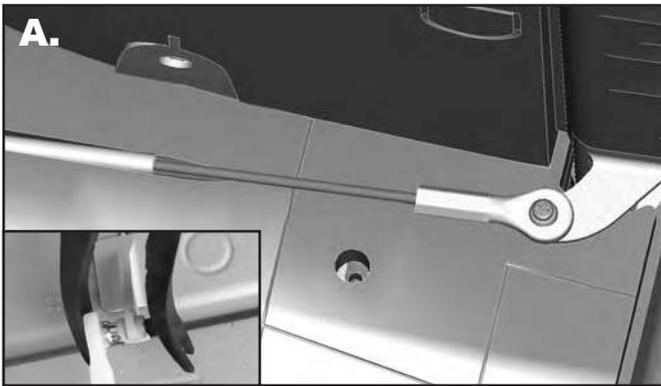


2. Insert one half of the carbon tail spar into one of the horizontal tail pieces before sliding this half into the tail slot of the fuselage. Now install the remaining tail piece (A). Secure both halves in place with the supplied 2.3x6mm screws (B) and the elevator join with the single 1.7x6mm screw (C). This installation is self aligning, but do double check to ensure equal alignment to the vertical tail and wing.



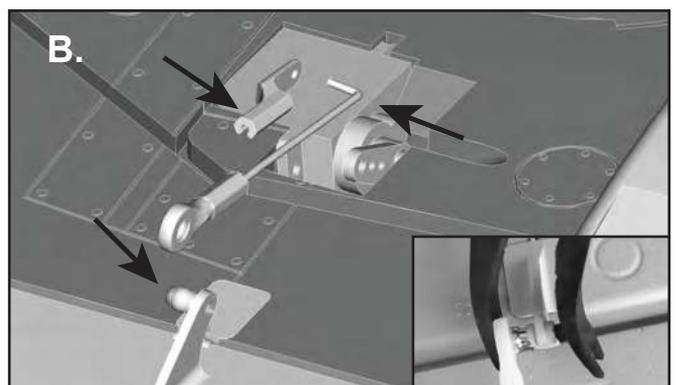
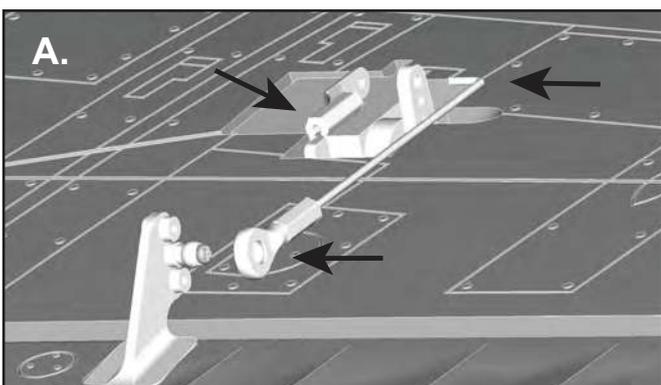


3. Using a pair of pliers (ball link pliers preferably) connect the elevator push rod to the elevator control horn (A). To ensure both the elevator and rudder are neutral (with the servos centered) loosen the grub screw of the piano wire fastener until both surfaces and slide the push rods until both are neutral if required (B). The steerable tail wheel can be adjusted the same way (C). Tighten all firmly when done.



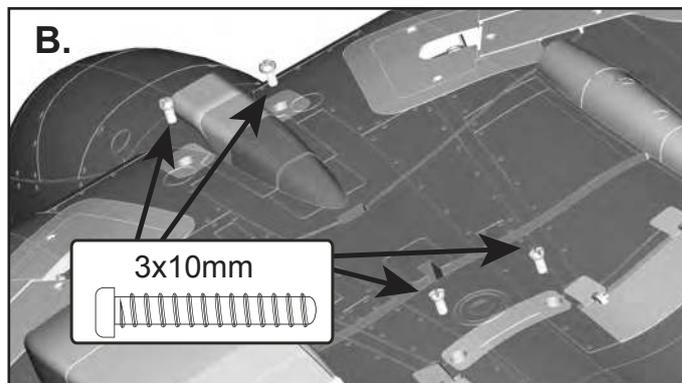
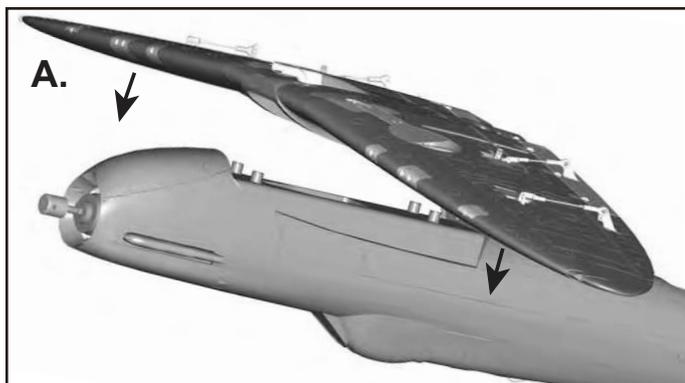
*Note: Each ball link has a faint circle molded on one side. This denotes the side that should be connected to the ball joint.*

4. With the aileron control horns at 90 degrees to the wing surface (neutral) insert the aileron push rod into the top hole of the control horn. Secure in place with the plastic keeper and then connect the ball link to the ball joint using pliers (A). Repeat this same process for the flaps, the exception being that the flap servo horns must be positioned as far rearwards as possible. This will give a flap neutral position with the push rods connected (B).

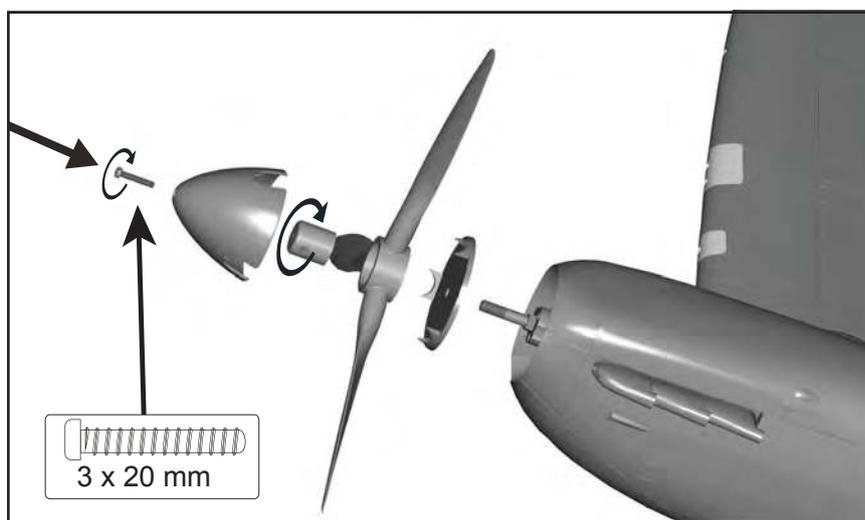




- Offer the wing up to the fuselage and ensure the servo wires pass through into the battery area of the fuselage (A). Check again that no servo wires are caught between the wing and fuselage before securing in place using the four 3x10mm bolts supplied (B)

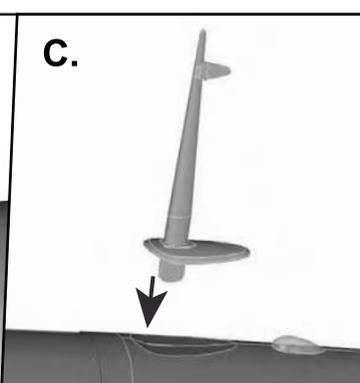
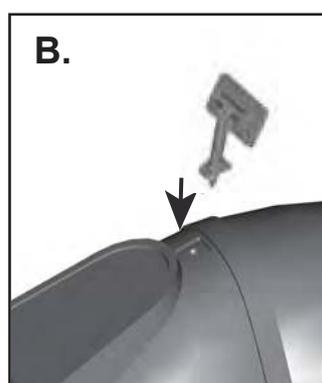
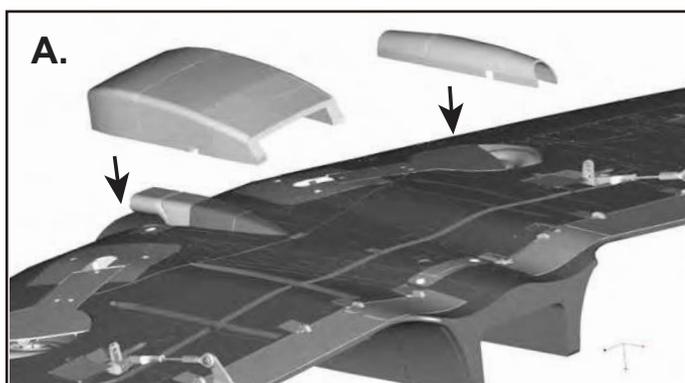


- Slide the spinner back plate onto the motor shaft making sure the 'hex' shape opening at the rear of the plate fits over the 'hex' on the base of the shaft. This is followed by the prop and prop nut. Tighten the prop nut then finally screw the spinner in place.



*Note: It is recommended that you balance the prop and spinner before installing for optimum performance and efficiency.*

- With a small amount of contact glue, secure the under wing radiators in place (A), along with the cockpit mirror and fuselage aerial (B and C).

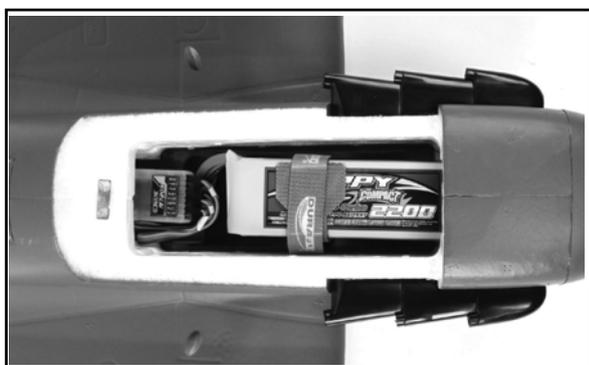




8. Glue into position the fish tail exhaust stacks onto either side of the fuselage.



9. Install you choice of 6 channel receiver (Orange X620 shown) in approximately the area shown below. Ensure all wires are held away from the servo horns. Also shown is the exact location of a 40C 2200mah 4S lipo (as far forwards as possible) to achieve the correct CG as detailed in the following pages.



**Note:** The fuselage LED shares a Y-lead with the gear servo from the wing. Be sure to connect the LED lead before attaching the wing.

**Congratulations, basic assembly of your Spitfire Mk2a is now complete. Please perform a final check on all screws, bolts and components, ensuring all are secure and firmly in place.**

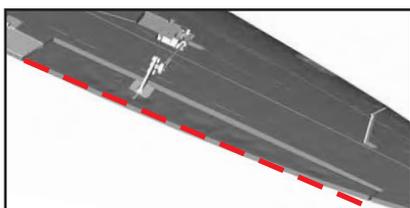




## SETTING UP YOUR MODEL:

1. With your receiver installed and all servos plugged into their corresponding channels, connect the flight battery to the ESC to power up the electronics. With the model now armed, ensure all servos are centered and all control surfaces are level. If not, adjust by turning the control clevis's by hand accordingly until the control surfaces are level as shown.

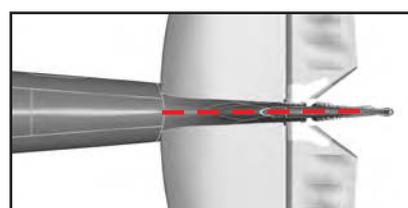
**Note:** For safety reasons, it is advised that this is done with the prop removed from the model.



Ailerons

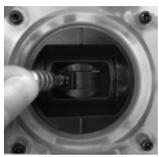
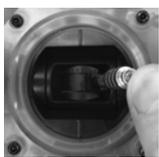
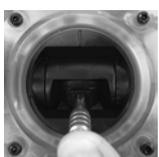
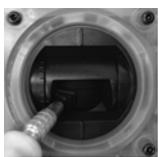
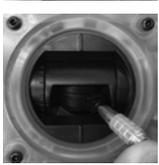


Elevator



Rudder

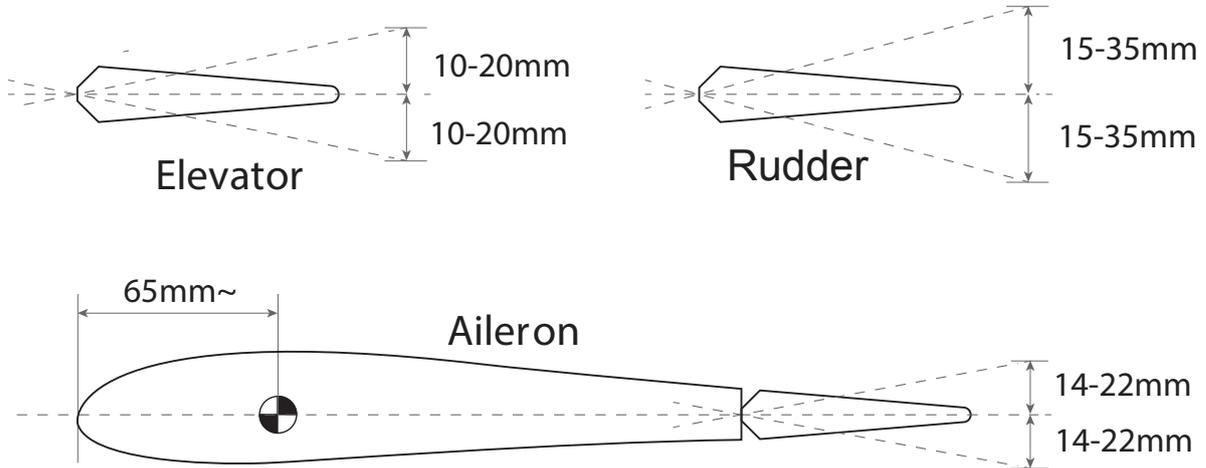
2. Check all control surfaces are moving in the correct direction with the applicable stick input (see below)

 	<p>Roll left</p> <p>Roll right</p>		<p>Aileron (Roll)</p>
 	<p>Pitch up</p> <p>Pitch down</p>		<p>Elevator (Pitch)</p>
 	<p>Yaw left</p> <p>Yaw right</p>		<p>Rudder (Yaw)</p>



3. The Spitfire Mk2a handles very well in flight and that's not down to good design alone, but a good pre-flight set-up too. Before you fly your Spitfire please follow the recommended settings below for optimum handling and performance.

Control throws:

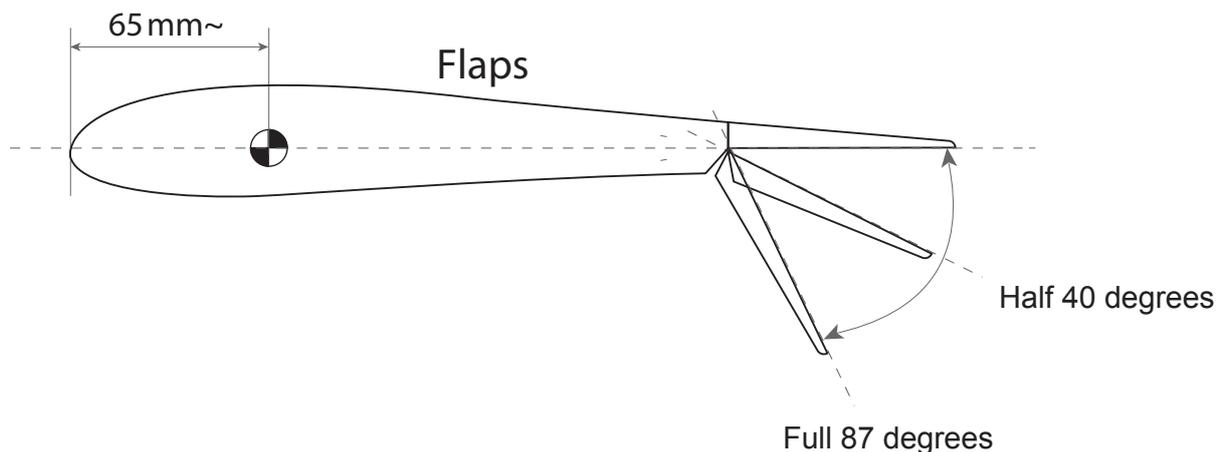


\*Elevator 'low rates' 10mm 'high rates' 20mm in either direction from neutral.

\*Rudder 'low rates' 15mm 'high rates' 35mm in either direction from neutral.

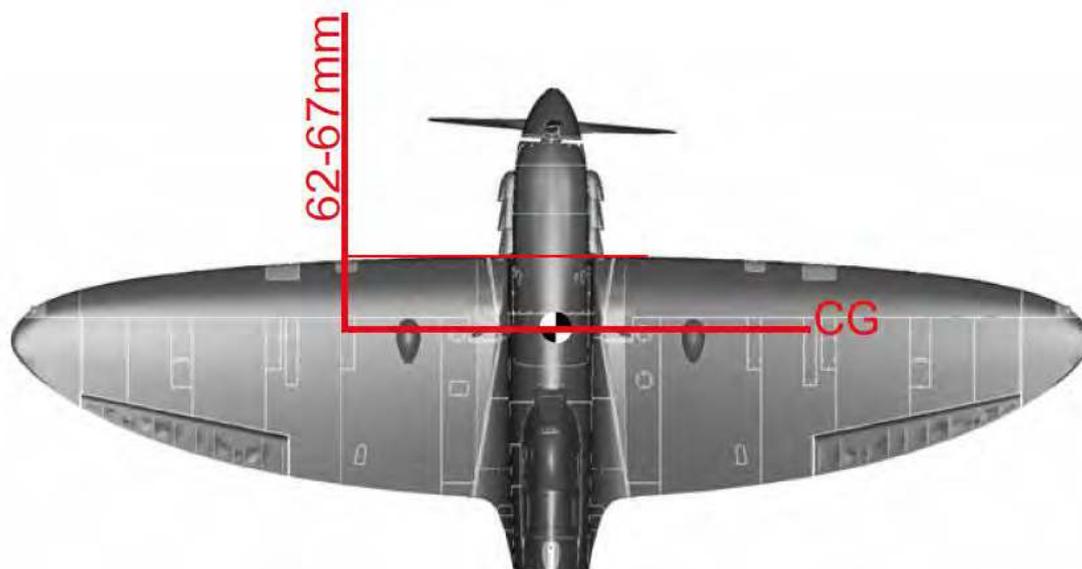
\*Aileron 'low rates' 14mm 'high rates' 22mm in either direction from neutral.

4. Flaps on the Spitfire should be set for 3 stages (up/no flap, mid flap and full flap). Either via your radio or mechanically by turning the clevis's on the flap control rod (or via both in most cases), set mid flap to approximately 40° degrees and full flaps to approximately 87° degrees to the wing. In the 'up/no flap' position ensure the flaps close fully without straining either servo. Also ensure that both flaps deploy equally at every stage.





5. The center gravity (CG) for the Spitfire is approximately 62-67mm from the leading edge of the wing. Using a 2200mah 4S LiPo, the correct CG should easily be attainable simply by putting the LiPo as far forward as possible. If for any reason you cannot obtain the correct C of G then please add some weight as necessary, do not fly the model outside of the recommended limits.



*CG 62-67mm when measured from the leading edge of the wing at the root. Measure with the gear retracted and the model inverted.*

**With assembly and set-up now complete, your Duraflly Mk2a Spitfire should now be ready for flight. However we recommend you read and follow the advice given in the following pages of this manual before flying.**





## MODEL FLYING PRECAUTIONS:

- Select your flight area carefully. Always choose an open space that is unobstructed from trees and buildings and away from crowded areas. Avoid flying in areas with roads, electric/telephone poles/wires and water near by or within close proximity to full size air traffic.
- Do not fly this model in poor weather. High winds, low visibility, inclement temperatures, rain and storms are to be avoided.
- Never attempt to catch this model whilst in flight. Even a slow moving model can cause harm to yourself and/or others and risks damage to the model.
- This model is recommended for children no younger than 14 years old. All children, no matter what age, should always 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.
- Remember to keep clear of the propeller 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 flight battery first then turn off your radio transmitter.
- Exercise caution when charging your batteries and follow in full your battery manufacturer's safety guideline when doing so.

## PRE-FLIGHT CHECKS:

1. Always range check your model before any flight (especially when flying a new model for the first time). Follow your radio manufacturer's guidelines for performing this check.
2. Check all screw/bolts and mounting points are firmly secured, including control horns and clevises.
3. Only fly with fully charged batteries (both in your radio and model). Failure to do so could result in loss of control, damage to the model and/or persons/property around you. Check your batteries are fully charged.
4. With the model powered up (transmitter on first, then receiver/model) check that all surfaces are free from damage/obstructions, moving in the correct directions and freely with stick input.
5. Inspect the model and prop for any damage that may have occurred during transit and 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 prop free of obstructions, increase the throttle just slightly to confirm the rotations of the prop are correct. The model should want to pull straight forward with throttle.
7. If this is your first flight with the model double check the C/G is at the correct position. If not adjust battery position inside model accordingly.
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.



## FLYING YOUR SPITFIRE MK2a:

Before flying make sure you have followed closely the set-up guidelines on pages 7 through 9. Start by taxiing on the ground a little to get use to the handling. Be sure to always taxi with full up elevator held in, flaps retracted and gentle use of throttle. This will keep the model tracking steady and true plus has the added bonus of looking far more scale. For take off you'll want to hold in some right rudder to counter the rotational torque on the initial roll out. Slowly advance the throttle whilst holding in just a little up to keep the tail down as you begin to build up speed, correcting direction with rudder as needed. As speed builds, ease off the amount of up elevator you have held in, then as soon as you reach 3/4 throttle you'll start to see the Spitfire lift of the ground.

Once in the air retract the landing gear as soon as you are comfortable and start exploring. On the 4S set-up a throttle setting of around 50-60% is sufficient for scale paced flying. Of course opening up to full throttle is very exciting, but generally you only need to use full throttle as required in vertical maneuvers. A full 'airshow' routine can be performed including loops, rolls, low banked passes, Split-S's etc, all vertical maneuvers being as large as you wish with the 4S set-up. Flight times vary according to set-up and throttle use. An average flight of mixed throttle flying will give you an incredible flight time of approximately 7 minutes, this is because a 4S set-up requires less throttle most of the time. Your Spitfire may drop a wing if really pushed into a stall, that said once it does stall its quite benign and easily recovered from at height by centering all sticks and application of power thereafter.

Landing the Spitfire Mk2a is a pleasure and a real treat for those who like to practice 'scale' type approaches, as the Spitfire will need to be 'flown' onto the deck through a powered decent. Bringing the retracts down shows no noticeable effect on the model, nor does selecting mid flaps. Once you have the Spitfire fully lined up to the runway, and no more than 8ft high full flaps can be deployed if desired (be sure to maintain good throttle management). As soon as the Spitfire settles onto the ground hold in full up elevator to prevent the model from nosing over. Flaps should be retracted before taxiing back to the pits.





## **SPITFIRE MK2A TIPS:**

- For optimum flight performance and model longevity, it is highly recommend that you always fly with a balanced prop. The supplied prop should be balanced, but it is always good to check first.
- Keep all leads within the fuselage area as tidy as possible. Tidy wires look better, allow for easier access to all internal components, better battery installation, increased airflow around electronics and a reduction in potential electronic signal interference (noise).
- Inspect the propeller frequently, especially if you have suffered a hard landing or the prop has been knocked. If the prop is in any way damaged it must be replaced and any loose fixings must be tightened.
- It is very important that your flight battery be as far forward as possible to prevent the Spitfire from flying tail heavy. Ensure you follow exactly the guidelines for CG, and set-up, shown on pages 7, 8, and 9 before flying your Spitfire.
- A 4S 2200mah 40C or greater C rating is ideal for the Mk2a Spitfire.
- Do not use full flaps on a windy day or in a crosswind. Full flaps should generally only be used on calmer days and only then with considered use of throttle to prevent the model from stalling.
- To further avoid any chance of your Spitfire tipping over onto its nose on landing, switch to 'high' rates on the elevator as soon as the model settles onto the ground after landing and hold full up elevator.
- Do not leave your model in direct sunlight for prolonged periods of time. This will have an adverse effect on the foam surface of the model.

**Thank you again for purchasing the Duraflly Spitfire Mk2a. We hope you'll have many happy days of flying and look forward to bringing you more Duraflly models in the future.**

**Don't forget, spare parts are available for this model,  
please see the next page for details.**



## SPARE PARTS:



Prop Adapter  
SKU:  
9499000090-0



Motor  
SKU: 9499000093-0



Retracts  
SKU:  
9499000109-0



Propeller  
SKU:  
9499000095-0



Linkage Set  
SKU:  
9499000091-0



Motor Mount  
SKU:  
9499000096-0



Fuselage  
SKU:  
9499000080-0



Wing set  
SKU:  
9499000081-0



Horizontal Stabilizer  
SKU:  
9499000082-0



Battery Hatch  
SKU:  
9499000083-0



Canopy  
SKU:  
9499000084-0



Main Landing Gear  
SKU:  
9499000085-0



Tail Wheel Set  
SKU:  
9499000086-0



Spinner Set  
SKU:  
9499000417-0



Cowl  
SKU:  
9499000088-0



Scale Parts  
SKU:  
9499000418-0



Decal Set  
SKU:  
9499000419-0



## DECAL APPLICATION GUIDELINES:

Applying the supplied decals will take you longer than assembling the model. This is because great care must be taken when doing so. Please follow carefully the guidelines below to achieve the best possible finish on your Spitfire Mk2a.

### **Note:**

***\* The decals supplied are vinyl type decals and are supported on a clear adhesives fronting film. These require care and attention when applying so please follow the below guidelines and the techniques outlined for the best results.***

1. You can study the photographs in this manual for the larger markings, but also see the separate guide that is attached under the "Manuals/Files" tab on the HobbyKing website for the Duraflly Spitfire Mk2a, this will help with the smaller ones.
2. Separate the decal you wish to apply (decals are grouped according to their layout on the model) from the main sheet. The entire decal sheet (including the paper backing) is pre-cut for you so you can separate each group of decals as required.
3. Before lifting from the paper, rub the surface of the clear protective film/fronting to ensure all of the decal sticks to it. This will ensure the marking lifts fully off the backing paper intact.
4. Peel the front decal carrier off of the sheet ensuring the entire decal lifts with it.
5. Position the decals/carrier carefully on the model, then gently rub (using a dry cloth) the decal in place, rubbing from the center of the decal outwards, to avoid wrinkles and air bubbles.
6. If air bubbles are present, use the tip of a sharp blade to make a small hole in the bubble then rub over it again to push the air out.
7. Once the decal is firmly rubbed down and any air bubbles are removed, you can slowly remove the front clear protective film. DO NOT pull this clear film upwards to remove it, instead pull the film slowly off to the side. This will ensure the decal doesn't lift up from the surface of the model when you remove the clear film. See picture A.
8. Very gently rub the decal again with a cloth now that the clear film is removed to ensure all edges are firmly stuck down.



9. Finally the use of a covering iron is **STRONGLY** recommended to seal the decals to the painted foam surface and prevent them from lifting at the edges over time. Set the iron to a low temperature and gently run the iron lightly over the surface of the decal as illustrated on the following page. Use of a cloth to cover the head of the iron is recommended to help prevent damage to the foam and the decal. A household iron can be used if no covering iron is available. See picture B.



## DECAL TIPS:

- Rub the clear front film before you remove the decal from the paper back to ensure it lifts fully from the backing.
- Remove the clear carrier film by pulling it off to the side once positioned, **DO NOT** pull this film directly upwards, this could cause the decal to rip.
- To avoid bubbles under the larger decals, use a sharp blade to remove the small molding marks from the surface of the foam where the decal is to be applied.
- Position all decals carefully. Once applied, they can not be removed without lifting the paint from the model.
- Be patient and take your time applying the decals and you will be left with a perfect finish.
- It is strongly recommended that a covering iron be used to seal the edges of the decals. If not, changes in temperature can result in lifting at the edges.

## DECAL POSITIONS:

A full guide for the positions of the **ALL** the decals is available under the "Manuals/Files" tab on the HobbyKing website for the Durafly Spitfire Mk2a listing.



## TROUBLE SHOOTING:

Problem	Cause	Solution
Motor does not turn	<ol style="list-style-type: none"> <li>1. Battery is not fully charged.</li> <li>2. Transmitter battery low.</li> <li>3. Motor not connected.</li> <li>4. The motor is damaged.</li> <li>5. Receiver is not bound to Tx.</li> <li>6. ESC in set-up mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge the batteries.</li> <li>2. Install a full charged battery.</li> <li>3. Check for connection between the ESC and motor.</li> <li>4. Replace motor.</li> <li>5. Consult Radio manual and go through bind procedure again.</li> <li>6. Hold model and move throttle to full position then back down to idle.</li> </ol>
<u>Motor turns in reverse direction</u>	<ol style="list-style-type: none"> <li>1. Motor/esc connection error</li> </ol>	<ol style="list-style-type: none"> <li>1. Swap around any 2 of the 3 ESC/motor wire connections</li> </ol>
<u>Control surfaces not moving with stick input</u>	<ol style="list-style-type: none"> <li>1. The servo lead is connected to Rx incorrectly.</li> <li>2. The servo is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Make sure the servo leads are connect properly.</li> <li>2. Replace servo.</li> </ol>
<u>Model does not fly straight</u>	<ol style="list-style-type: none"> <li>1. Control surfaces not centered.</li> <li>2. CoG is not in the correct position.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust the trims on the transmitter.</li> <li>2. Re-position LiPo as suggested.</li> </ol>
<u>Model does not climb well</u>	<ol style="list-style-type: none"> <li>1. The battery is not fully charged.</li> <li>2. Elevator servo is reversed.</li> <li>3. CG too far backwards.</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge the battery.</li> <li>2. Change servo direction via Tx.</li> <li>3. Move battery forwards.</li> </ol>
<u>Limited Radio Range</u>	<ol style="list-style-type: none"> <li>1. Transmitter/Receiver batteries are flat.</li> </ol>	<ol style="list-style-type: none"> <li>1. charge/replace batteries.</li> </ol>



## CONTACT:

For more information on this model and the entire range from Duraflly please visit us at:

- [Duraflly.com](http://Duraflly.com)

Or see our Facebook page at:

- [Facebook.com/duraflly](https://Facebook.com/duraflly)

And don't forget you can see the product video for this model and the entire Duraflly range at:

- [youtube.com/hobbykinglive](https://youtube.com/hobbykinglive)

For your next Duraflly purchase be sure to visit:

- [hobbyking.com](http://hobbyking.com)

If you wish to contact us directly please email:

- [duraflly@hobbyking.com](mailto:duraflly@hobbyking.com)

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## NOTES:

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**APEX CE SPECIALISTS LIMITED**

89 Princess Street, Manchester,  
M1 4HT, UK



**APEX CE SPECIALISTS LIMITED**

Unit 3D North Point House,  
North Point Business Park,  
New Mallow Road, Cork, T23 AT2P, Ireland



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