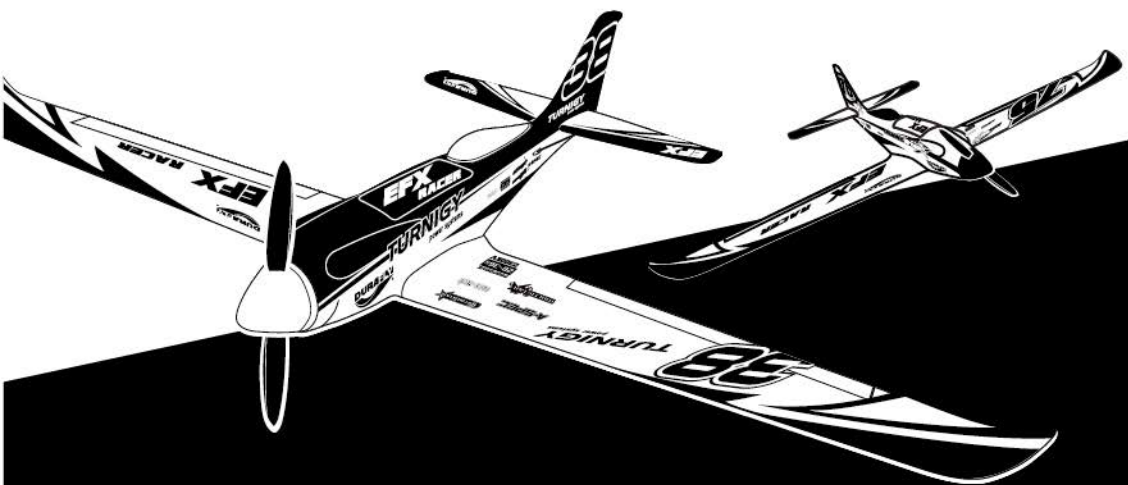# EFX RACER

(KIT)

INSTRUCTION MANUAL

DURAFLY®

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 the the assembly, safe operation and maintainence of this hobby product. It is highly reccommneded 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.
- Alway exersie 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 safty procedures.
- Never power up the model in confined spaces and always keep the props 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.

CONTENTS

INTRODUCTION:

Thank you for purchasing this EFX Racer from Durafly. The EFX Racers have been designed from the ground up to offer the speed (100mph) and strength normally reserved for high end full composite models together with the agility and stability you'd expect from any good sports model. In addition to this you of course get the convenience, quality and uniqueness only an EPO model from Durafly can offer. Your new EFX Racer gives you all this and more!

With a minimal part count and assembly time, the EFX Racer in kit form simply clips and screws together less than an evenings work. In the air the EFX Racer will reach 100mph (4S) and feel exceptionally stable and controlled whilst doing so. Yet unlike most speed machines, it also has exceptional slow speed handling and performance. With its 4 channel control the EFX Racers are also very aerobatic. BIG loops, fast rolls, incredibly locked in knife edges, snaps and spins, the EFX racers can do them all and more. Its only limit, is you!

With the EFX Racer you get a model that flies with precision and authority straight out of the box and one that will excite and awe pilot and spectator alike!
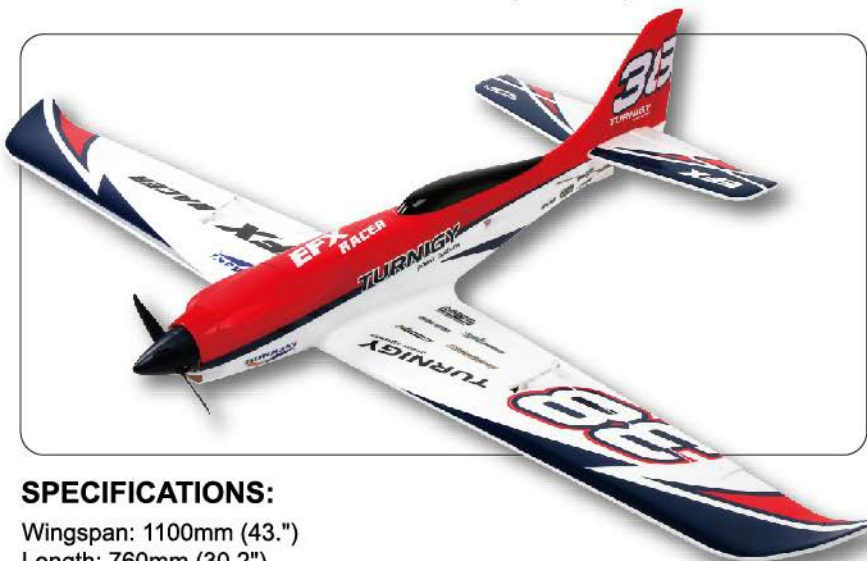
SPECIFICATIONS:

Wingspan: 1100mm (43.")
Length: 760mm (30.2")
Flying weight: 720g (25.3oz)
Controls: 4 Channel (Throttle, Ailerons, Elevator, Rudder)
ESC: 50 amp minimum
Motor: 28-36 2300kv NTM outrunner recommended.
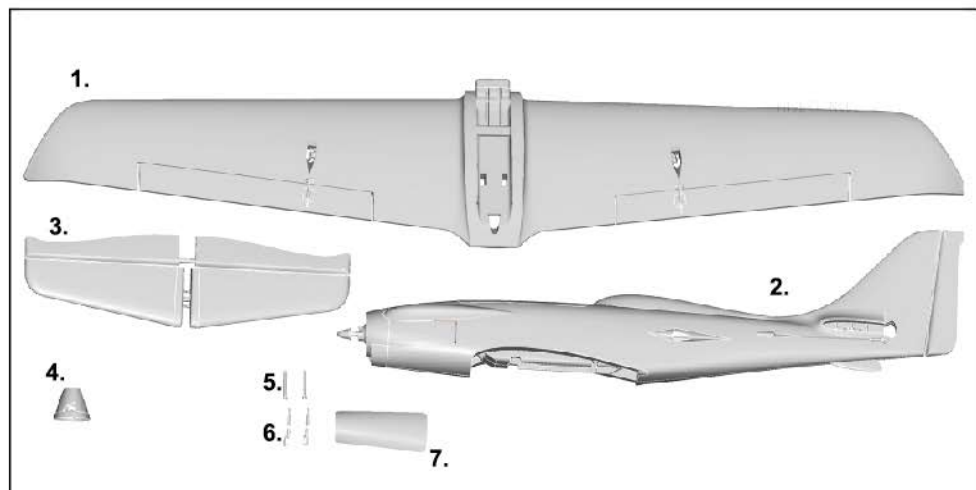Prop: 6x5 (3S), 5x5 (4s), 5.5x4.5 (4S 100mph+)
Battery: 1800 mAh 14.8v 4S lipo (30c min) on 5" prop
         2200 mAh 11.1v 3S lipo (30c min) on 6" prop
Servos: 4 x 9g metal geared, high torque.
Receiver: 4-6 channel full range Rx.

CONTENT OF BOX:

1. Wing
2. Fuselage
3. Horizontal stabilizer
4. Spinner

5. Aileron linkages
6. Wing bolts
7. Lower fuselage protective PVC sheet.

REQUIRED TO COMPLETE MODEL:

In the 'Kit' format the EFX will still require some additional electronic components to be ready for flight. Durafly recommends the products below for optimum performance and great value. Available at *hobbyking.com*

OrangeRx T-SIX 2.4GHz 6CH
Programmable Tx:
Part No. 9403000001 Mode 1
9403000002 Mode 2

OrangeRx R620 6Ch 2.4Ghz
Receiver R620:
Part No. R620

Nano-tech A-SPEC G2
2200mah 3S 65~130C:
Part No. 9472000003-0

Nano-tech A-SPEC G2
1800mah 4S 65~130C:
Part No. 9472000002-0

NTM 2836S 2300KV
brushless outrunner:
Part No. 9171000498-0

Durafly 50amp EFX
brushless ESC:
Part No. 9164000017-0

Turnigy TSS-10HM
digital micro servo:
Part No. 9378000002

Electronics installation:

Note: Install all electronics of choice into the model prior to the main assembly.

1. 9g, high torque, metal geared servos are recommended for use on all control surfaces. Before gluing into the model, install the supplied push rod wire connectors on the outter most hole of your servo horn. Use thread lock on each connectors threaded/nut end to ensure all are permanently secured. If the hole of you servo horn is too small for the connector, enlarge by hand using a 1.5mm drill bit.
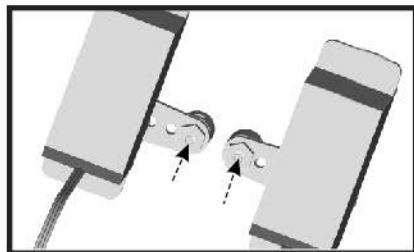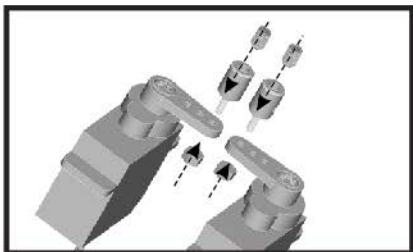

2. Ensuring all servos are centered, attach a servo horn to each of your four servos and screw down firmly. Note that each horn should be at 90 degrees to the servo.
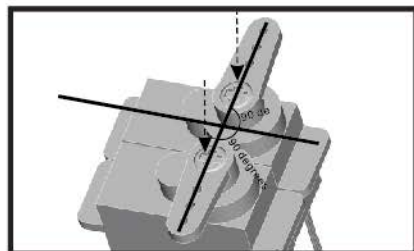

3. All servos can now be glued into the model. Contact type glue is reccomended, applied to each surface 2-3 minutes before installing in place. *Note:* Allow 24hrs for the glue to cure before flying your EFX.

3A. Rudder and elevator servos should be installed with the servo arms to the rear and with the horns facing in towards one another as illustrated.
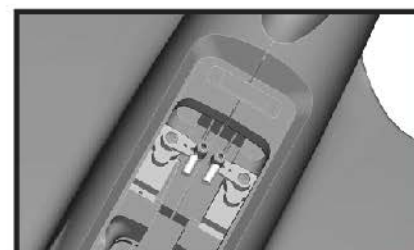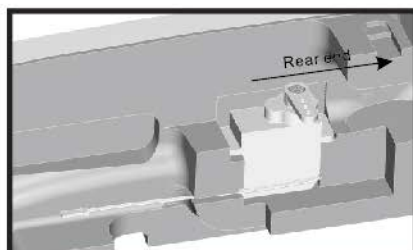

3B. Aileron servos should be orientated so that when installed, the servo horn is showing up through the wing and towards the trailing edge as shown in the next set of images.

Bottom view.

Top view.
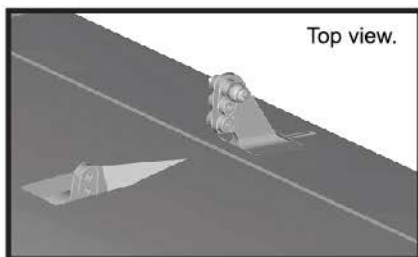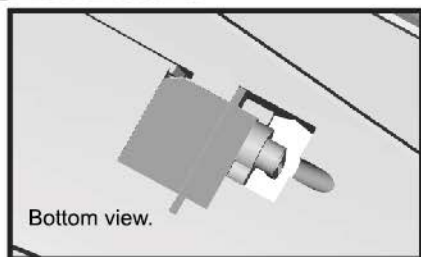
4. A 2836 class 2000-2500kv outrunner motor is suggested for use in the EFX. Before installing, attach 'X' mount and prop shaft to the motor and use thread lock. Install your motor using 2.6x12mm self tapping screws provided as shown. Be sure to guide the motor wires through the lower channel of the firewall and connect to your ESC.

Note: Confirm the direction of rotation for your motor is correct BEFORE you mount the motor to the firewall. The motor should rotate in a counter-clockwise direction.
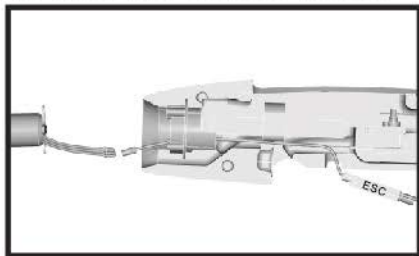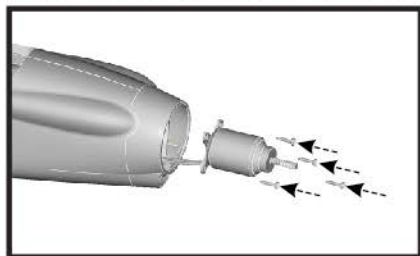
5. Due to the slender design of the EFX, the ESC needs to be mounted in the rear of the fuselage behind the servos and under the control rods as shown. Run the ESC motor and battery wires through the lower channel of the fuselage and secure in place with some clear sticky tape. Ensure when installed that the heat sink of the ESC is facing down towards the wing and in the flow of air from the wing duct.
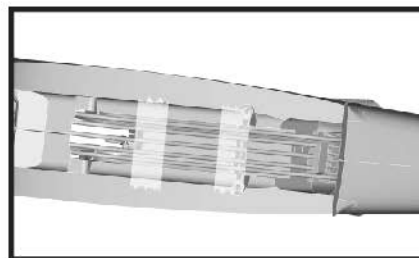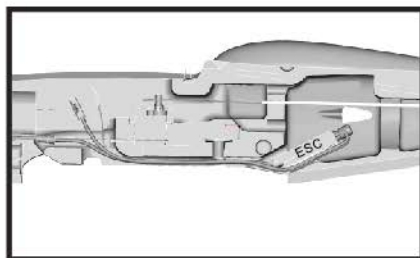
Note: Unless you have bought the Durafly EFX 50amp ESC, you will need to customise the lengths of your chosen ESC wires. Approximate lengths are given below, true lenghths may vary depending on ESC used:

*Motor wires (including 3.5mm connectors) = 223mm ~
*Battery lead (including connector) = 300mm ~
*Reciever wire (including servo plug) = 334mm ~

ASSEMBLY :

1. Install the spinner back plate on to the motor shaft ensuring the notches on the rear of the back plate align with the shafts base. Secure your supplied prop of choice (6x5 for 3S, 5x5 for 4S) with the prop nut and then secure the spinner as shown below using self tapping screws (3x10mm) provided.

Note: For improved cooling on 4S the spinner tip is removable. If running 3S you may glue the spinner tip to the spinner. (See page 5 'EFX Options' for more details).

5x5 4S spinner configuration.

6x5 3S spinner configuration.
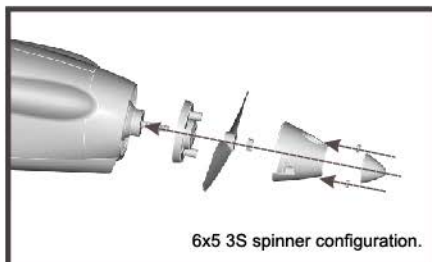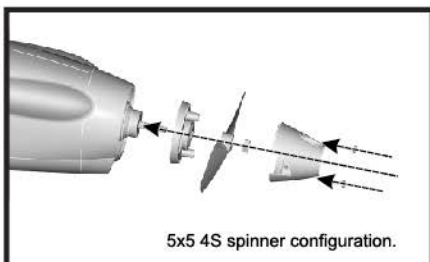
2. Locate the two horizontal tail halves and slide the left hand portion of the tail firmly into the plastic housing at the rear of the fuselage as shown. Install the other half of the tail and ensure both pieces lock into the fuselage and each other. Push both firmly together from the tips and center to ensure good firm fit.
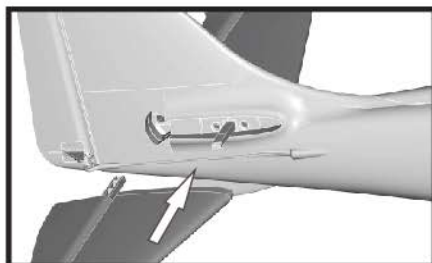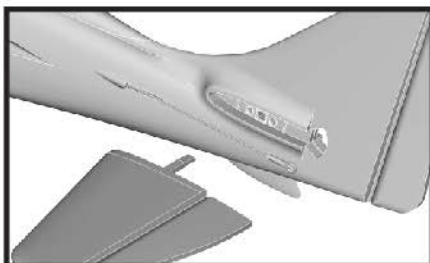
3. Using a pair of pliers (ball link pliers preferably) connect the elevator push rod to the elevator control horn as shown. To ensure both the elevator and rudder are neutral (with the servo's centered) you may loosen the grub screw of the piano wire fastener until both surfaces are neutral if required. Tighten firmly when done.
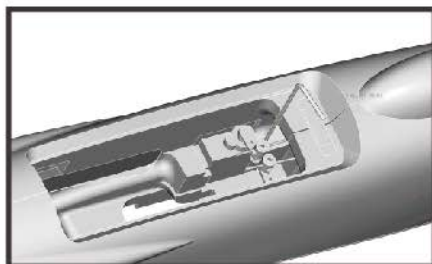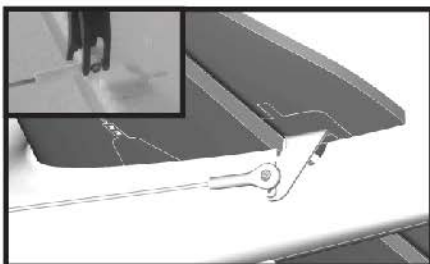
4. Locate the aileron push rods and temporally remove the plastic swing keepers from the rods. With the swing keeper removed you can now insert the bent end of the rod into the top hole of the servo horn. Make sure the servo arm is at 90 degrees to the wing (centered) before you connect the push rod. Re-attach the swing keepers to secure the push rods to the servo then connect the ball link to the aileron control horn with pliers.
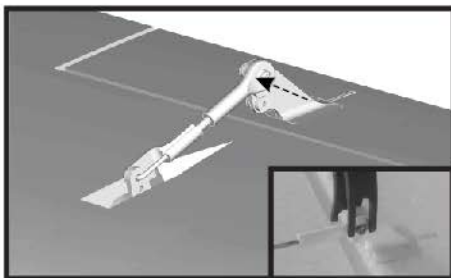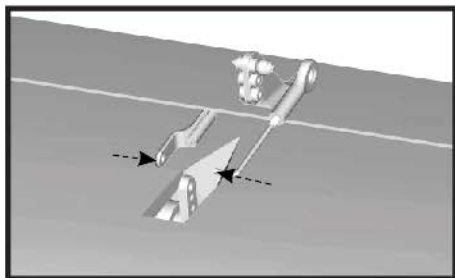
5. Connect the supplied Y-lead to the ends of the aileron servos then mount the wing to the fuselage, inserting the wing from the leading edge (L/E) as shown. Using the two 3x20mm bolt, screw the wing firmly to the fuselage ensure no servo wires are caught between the wing and fuselage as it closes
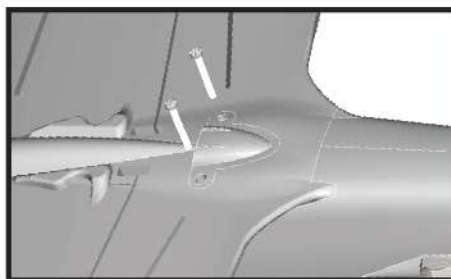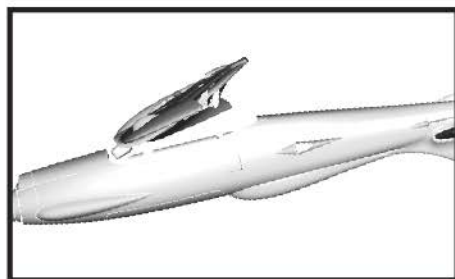
6. Install your receiver in the fuselage between the servos as shown and connect all servo wires. This space is tailor made for the recommended ORX R620 receiver (shown) and is the most convenient to install. Other receivers can be used at your own discretion. Battery and battery wire locations are also highlighted below.
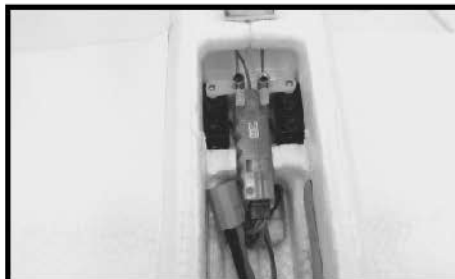
EXF Options:

Your EFX Racer comes with certain 'options' available to you during assembly. The first option is your choice of propeller and the second refers to the PVC protective sheet supplied in the box. Both are detailed below:

What prop?:

The EFX racer can run happily a 5" or 6" prop depending on your set-up. If you wish to have good flying sports model with respectful speeds and wish only to use a 3S lipo, then please use a 6" prop (6x5 ideally). You may also glue the spinner tip to the spinner as the 3S set-up doesn't require as much cooling.

However if you have a 4S 1800mah and experience in flying FAST, then a 5" prop is recommended (5x5 for fast, 5.5x4.5 for 100mph+) In this instance the spinner tip must be left off the spinner to allow sufficient cooling for this high demand 4S set-up.

Note: 3S 6x5 set-up recommended for intermediate pilots/pilots with less experience. 4S 5x5 / 5.5x4.5 set-up recommended or experienced pilots only.

5x5 4S spinner configuration.

6x5 3S spinner configuration.
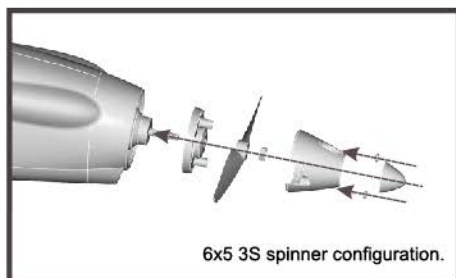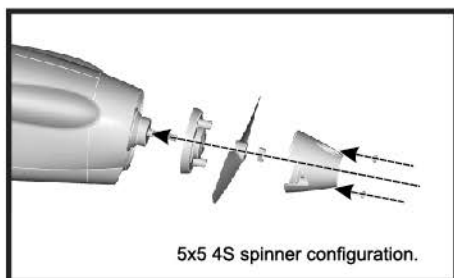
PVC protective sheet:

Depending on the surface from which you fly, you may or may not wish to use the supplied PVC protection sheet. If you fly only from a smooth grass flying site then there should be no need to install. However if you fly from an unkept or rough surface then we recommend that you attached the PVC sheet.

To attached the sheet, simply remove the paper backing to the already applied double sided tape and stick in place between the plastic cowl and L/E of the wing on the underside of the fuselage as illustrated below. Do a dry run first (without the backing removed) to confirm the correct orientation.

The PVC sheet will protect the foam of the underside of the fuselage from damage when landing on rough, paved or unprepared surfaces and perhaps even during those unexpected arrivals!
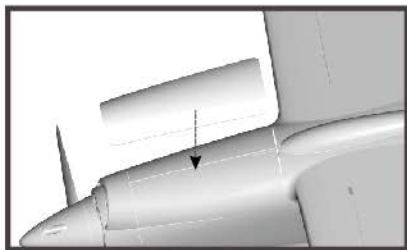
**Basic assembly of your EFX racer is now complete.
Please perform a final check on all screws, bolts and components
ensuring all are secure and firmly in place.**

SETTING UP YOUR MODEL:

1. Before getting started, bind your receiver to your transmitter. Please refers to your Transmitter Manual for the operation procedures. Make sure all the control sticks are in neutral position(Rudder, elevator andailerons) and the throttle in the OFF position. Turn on the transmitter make sure all the trims and the sub trims (For computerized TX) are in neutral position, and then power on the ESC for the control system testing. For safety reasons, it's advised that this is done with the propeller removed.
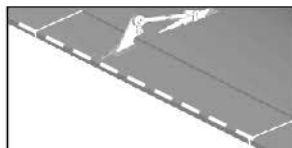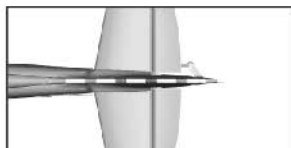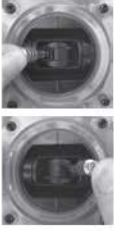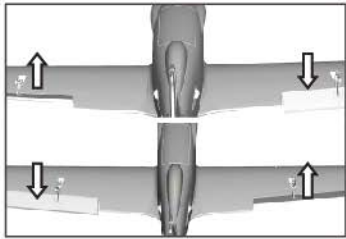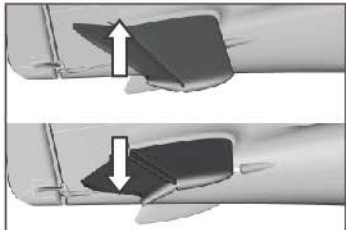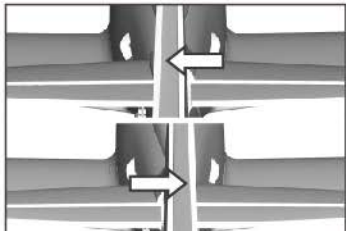
Aileron　　　　**Elevator**　　　　**Rudder**

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

Roll left		Aileron (Roll)
Roll right		

Pitch up		Elevator (Pitch)
Pitch down		

Yaw left		Rudder (Yaw)
Yaw right		

3. The **EFX** handles very well in flight but needs setting up beforehand. Please follow the recommended settings below for good all round performance.

Control throws:

6-10mm
6-10mm
Elevator

8-14mm
8-14mm
Rudder

50-55 mm ~
Aileron
12-16mm
12-16mm
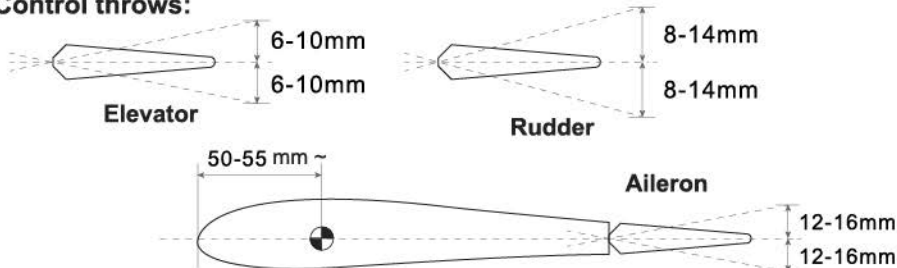
* Elevator 'low rates' 6 mm 'high rates' 10mm in either direction from neutral.
* Rudder 'low rates'   8 mm 'high rates' 14 mm in either direction from neutral.
* Aileron 'low rates' 12mm 'high rates' 16 mm in either direction from neutral

4. The recommended center of gravity (CG) for the EFX Racer is approximately 50-55mm from the leading edge of the wing. With either a 2200mah 3S or 1800mah 4S installed and pushed as far forwards as possible, your EFX should balance out at this point. To adjust the CG weight can be added or taken away from the nose or tail respectively. Be sure to perform the balance check with the model up side down.

CG Location:

50-55mm

CG 50-55mm from leading edge
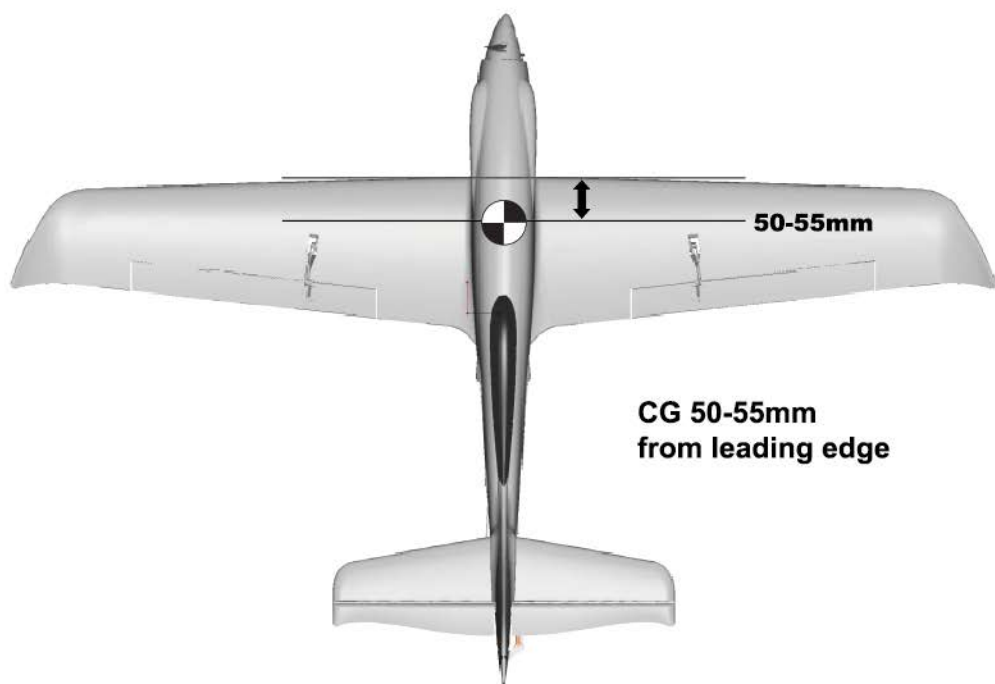
With assembly and set-up now complete your Durafly EFX Racer should now be ready for flight. However we recommend you read and follow the advice given in the following stages of this manual before flying your model.

MODEL FLYING PRECAUTIONS:

- Select your flight area carefully. Always choose an open space that is unobstructed from trees and buildings and away from crowed area's. Avoid flying in area's 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/others and risks damage to the model.

- This model is recommended for children no younger than 14 years old. All children, not 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.

- Please 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 battery first then turn off your radio 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 flight (especially when flying a new model for the first time). Follow your radio manufacturers 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 surface 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 is 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 THE EFX Racer:

Durafly's EFX Racers deliver stunning looks and performance and go far beyond all expectations for an EPO model of this class, especially when in the air.

Out of the box you have on offer 100mph performance if desired, yet very reassuring stability and handling at low speeds too. For this reason an EFX Racer can be flown by both intermediate and experienced pilots alike. If you are an intermediate pilot it is suggested you start with a 6x5 prop and fly on a 3S 2200mah lipo. If however you are an experienced pilot, a 5x5 or 5.5x4.5 prop running on 1800mah 4S should be your set-up of choice.

Getting airborne with the EFX takes very little effort. On both 3 and 4S set-ups your EFX will soon be flying from a simple yet firm underarm hand launch. When launching, power-up the motor to 3/4 throttle and launch your EFX whilst holding in some up elevator. As soon as you release the EFX, advance the throttle to full quickly and maintain a now reduced amount of up elevator. Very soon after launching you will see just how rock solid the EFX is in flight, but keep in mind the EFX gets small quickly at full throttle!

The EFX is built for speed and nothing is more impressive than a full throttle dive from upon high right down the center of the flight line at 100mph followed by a full power rolling climb. Equally as impressive is the EFX's aerobatic ability thanks to the powerful elevator, ailerons and rudder. BIG loops, fast rolls, snaps and spins look great and are a lot of fun. However one of the most impressive aerobatic maneuvers for the EFX is the knife edge. You will be amazed just how well the EFX performs in a knife edge, so try it! Your EFX model is also incredibly strong and handles with ease high G maneuvers such as high speed turns rolls and snaps.

A true testament to the EFX's design however is its slow flying ability and how well it handles even with out power. This is in no way more apparent than when landing. Though the EFX Racer does have a relatively high glide rate, it benefits from a very low stall speed, so you can comfortably increase elevator input at slow speeds without the risk of a stall. With the higher demand 4S set-up, flight times are typically 4-5 minutes with mixed throttle use. On 3S 2200mah you can expect flight times in excess of 6 minutes with varied throttle use.

What ever set-up you choose and however you prefer to fly, your EFX Racer will perform and deliver time and time again. The only thing better than flying an EFX Racer is flying with other EFX Racers at the same time, so get them up!

Happy flying and thank you for choosing Durafly.

EFX Racer tips:

1. If running the 4S set-up make sure you DO NOT attach the spinner tip. Optimum cooling is required for the 4S set-up.

2. A 5x5 propeller will give 100mph speeds on a fresh 4S pack. However for 100mph+ performance on 4S, we highly recommend using a 5.4x4.5 electric prop.

3. For optimum flight performance and component longevity it is highly recommended that you always fly with a balanced prop. This is especially true with your EFX Racer due to the high performance nature of the model and fast speeds at which it operates.

4. Flight packs of a 30C constant discharge rate or higher are the only lipo's we recommend you use in both 3 and 4S set-ups. Not only will a higher rated pack give better performance but it will also result in cooling running components and increased run times.

5. Because of the high current demands of the EFX, if you choose to fly your entire flight at full throttle, it is recommended that you allow time in between flights for the motor and ESC to cool.

6. Keep all leads within the fuselage area as tidy as possible. Tidy wires not only look better, but also allow for easier access to all internal components, better battery installation, increased airflow and a reduction in potential signal interference (noise).

7. Inspect the propeller and all mounting nut/bolts 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 before your next flight.

8. To reduce ware/surface damage to the painted area's on the EFX it is suggested that a clear acrylic, foam safe, spray can type varnish/lacquer be applied to the model. Be sure to test on a scrap piece of EPO first though to ensure there is no bad reactions.

Thank you for purchasing the Durafly EFX Racer. We hope you'll have many adrenaline filled days flying and look forward to bringing you more Durafly models in the future.

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

SPARE PARTS LISTING:

Fuselage(Bare):
Part No.
9499000022-0

Main Wing
Part No.
9499000023-0

Hatch Cover(Bare):
Part No.
9499000026-0

Horizontal Stab:
Part No.
9499000027-0

Cowl(Bare):
Part no
9499000030-0

Spinner set:
Part No
9499000031-0

PVC covers:
Part No.
9499000032-0

Hardware:
Part No.
9499000033-0

EFX motor:
Part No
9171000498-0

EFX ESC:
Part No.
9164000017-0

Sticker(Red):
Part No.
9499000034-0

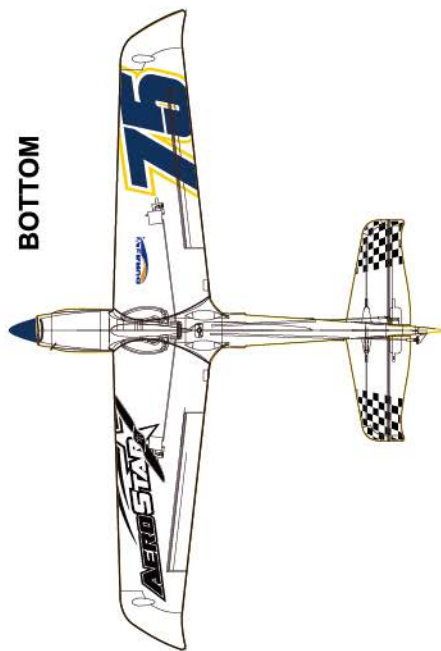Sticker(Yellow):
Part No.
9499000035-0

5.5x4.5 prop:
Part No.
221000014

TROUBLE SHOOTING:

Problem	Cause	Solution
Motor does not turn	1. Battery is not fully charged. 2. Transmitter battery low. 3. Motor not connected. 4. The motor is damaged. 5. Reciever is not bound to Tx. 6. ESC in set-up mode.	1. Charge the battery. 2. Install a full charged battery. 3. Check for connection between the ESC and motor. 4. Replace motor. 5. Consult Radio manual and go through bind procedure again. 6. Hold model and move throttle to full postion then back down to idle.
Model moves backwards	1. Prop installed backwards	1. Turn the prop around
Control surfaces not moving with stick input	1. The servo lead is connected to Rx incorrectly. 2. The servo is damaged.	1. Make sure the servo leads are connect properly. 2. Replace servo.
Model doesn't fly straight	1. Control surfaces not centered. 2. CoG is not in the correct position.	1. Adjust the trims on the transmitter. 2. Re-possition lipo as suggested.
Model does not climb well	1. The battery is not fully charged. 2. Elevator servo is reversed. 3. CG too far backwards.	1. Charge the battery. 2. Change servo direction via Tx. 3. Move battery forwards.
Limited Radio range	1. Transmitter/Receiver batteries are flat.	1. charge/replace batteries.

CONTACT:

For more information on this model and the entire range from Durafly please visit us at:
- *durafly.com*

Or see our Facebook page at:
- *facebook.com/durafly*

And don't forget you can see the product video for this model and the entire Durafly range at:
- *youtube.com/hobbykinglive*

For your next Durafly purchase be sure to visit:
- *hobbyking.com*

NOTES:

Decal reference if using EFX decal sheet.

BOTTOM

TOP

Right from the Rear view

Left from the Rear view

Decal reference if using EFX decal sheet.

TOP

BOTTOM

Left from the Rear view

Right from the Rear view

EFX RACER

DURAFLY ®