

# Mini Ultra Stick



Assembly Manual

Available from: [www.modelflight.com.au](http://www.modelflight.com.au)

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## Introduction

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Thank you for purchasing the E-flite™ Mini Ultra Stick ARF. The Mini Ultra Stick is an electric park flyer version of the popular Hangar 9® Ultra Stick™ series and has similar flight characteristics as the larger version. It is ideal for those transitioning into aerobatic park flyers who do not want a higher performance 3D airplane. We include two firewall options for you to decide if you want to install a brushless outrunner motor or an inrunner motor.

## Specifications

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Wingspan:	38.75 in (985mm)
Length:	34 in (865mm)
Wing Area:	325 sq in (21 sq dm)
Weight w/o Battery:	19–20 oz (540–565 g)
Weight w/ Battery:	22–25 oz (625–710 g)

## Contents of Kit/Parts Layout

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### *Large Replacement Parts:*

EFL2251	Wing w/Ailerons
EFL2252	Fuselage
EFL2253	Tail Set
EFL2255	Landing Gear w/Wheels
EFL2256	Firewall Set
EFL2257	Hatch

### *Small Replacement Parts*

EFL2254	Pushrod Set
EFLA200	Micro Control Horns
EFLA201	Micro Pushrod Keepers
EFLA203	Micro Control Connectors
EFLA213	E-flite/JR/Horizon Decals



## Required Radio Equipment

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You will need a minimum 4-channel transmitter, crystals, micro receiver, and four sub-micro servos. You can choose to purchase a complete radio system that includes all of these items or, if you are using an existing transmitter, just purchase the other required equipment separately.

You may wish to install the optional quad flaps, in which case you will need a 7-channel radio and receiver on 72 MHz with mixing and six sub-micro servos.

The Spektrum radio system listed below will not work for the quad flap option.

### *Complete Radio System*

SPM2460      DX6 DSM 6CH Park Flyer w/4-S75

*Note:* We recommend the crystal-free, interference-free Spektrum DX6 2.4GHz DSM 6-channel System, which includes a micro receiver and 4 sub-micro servos.

### *Or Purchase Separately*

JSP30610      6-Channel UltraLite Rx w/o Crystal,  
Positive Shift JR/Air (72 MHz)

Or

JSP30615      6-Channel UltraLite Rx w/o Crystal,  
Negative Shift Fut/HRC (72 MHz)

JRPXFR\*\*      FM Receiver Crystal

EFLRS75      7.5 Gram Sub-Micro Servo (4)

JSP98020      Y-Harness, Standard 6"

JSP98100      Servo Extension, 3"

### *Optional Quad Flaps*

EFLRS75      7.5 Gram Sub-Micro Servo (6)

JSP98100      Servo Extension, 3" (6)

JSP98030      Servo Extension, 12" (2)

JRPR700      R700 7CH Slimline FM Rx

## Important Information About Motor Selection

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The Mini Ultra Stick does not include a gearbox or propeller. However, we do include two different firewalls for attaching to the nose of the plane. You need to first determine what power system you will be using, an inrunner with a gearbox, or an outrunner. We even include a firewall stick mount, which attaches to the Stick Mount Firewall. The Outrunner Firewall can accommodate small and larger outrunners, with options of mounting your outrunner on the outside with your aluminum mount or inside of the nose directly to the firewall.

We are recommending the Park 450 Brushless Outrunner Motor, 890Kv (EFLM1400) with a 10x7 propeller (EFLP1070). This will provide you with excellent aerobatic power for sport pilots and a worry-free Outrunner motor.

For a geared alternative, try the Park 400 Brushless Inrunner Motor, 4200Kv (EFLM1100) with a 6.5:1 gearbox (new HD EFLM240), 11x7 propeller (EFLP1170), and a 2100mAh 3-cell Li-Po battery. This setup will provide more power for extreme flights.

It is very important to monitor gearbox wear and motor temperature when using the 4200Kv motor. Lack of proper throttle management using this motor and a 3-cell Li-Po battery may result in damage to the motor, gearbox, ESC, and battery. Adequate motor cooling is also very important, so make sure the motor is cooled properly in the cowl.

## Sport Setup

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EFLM1400	Park 450 Brushless Outrunner Motor, 890Kv
EFLA311B	20-Amp Brushless ESC (V2)
EFLP1070	10 x 7 Slow Flyer Prop (2)
THP21003SPL	2100mAh 3-Cell 11.1V Li-Po, 16GA
or	
EFLB1035	11.1V 2100mAh 3-Cell Li-Po, 16GA
WSD1300	Ultra Plug, Male/Female Set
EFLC3005	Celectra™ 1–3 Cell Li-Po Charger

This is a sport flyer setup for smooth and stable flights.

## High Power Setup (Using Gearbox)\*

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EFLM1100	Park 400 Brushless Inrunner Motor, 4200Kv
EFLM240	400 Gearbox, 6.5:1 0.5 Module w/2 Pinions
EFLA311B	20-Amp Brushless ESC (V2)
EFLP1170	11 x 7 Slow Flyer Prop
EFLA270	Spinner, 1-3/4" Red (optional)
or	
EFLA204	Micro Rubber Spinner (optional)
THP21003SPL	2100mAh 3-Cell 11.1V Li-Po, 16GA
or	
EFLB1035	11.1V 2100mAh 3-Cell Li-Po, 16GA
WSD1300	Ultra Plug, Male/Female Set
EFLC3005	Celectra 1-3 Cell Li-Po Charger

Proper throttle management is required when using high performance setups. Using this setup with 3 cells will give you plenty of power for zippy flights.

## Required Tools and Adhesives

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### *Tools & Equipment*

EFLA250 Park Flyer Tool Assortment, 5-piece

### *Or Purchase Separately*

EFLA257 Screwdriver, #0 Phillips (or included with EFLA250)

EFLA255 Nut Driver, 5.5mm (or included with EFLA250)

EFLA251 Hex Wrench: 3/32" (or included with EFLA250)

Hobby knife

Square

Ruler

Felt-tipped pen

### *String Adhesives*

Medium CA

Thick CA

HAN8000 6-Minute Epoxy (option for attaching firewall)

Threadlock (for mounting motor to gearbox)

## Optional Accessories

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EFLA110 Power Meter

EFLA212 Gear Puller: 1mm–5mm Shaft

## Using the Manual

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This manual is divided into sections to help make assembly easier to understand, and to provide breaks between each major section.

Remember to take your time and follow the directions.

## Warning

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An RC aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably at AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio.

Keep loose items that can get entangled in the propeller away from the prop, including loose clothing, or other objects such as pencils and screwdrivers. Especially keep your hands away from the propeller.

## **Before Starting Assembly**

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Before beginning the assembly of your Mini Ultra Stick, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

## **Note on Lithium Polymer Batteries**

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Lithium Polymer batteries are significantly more volatile than alkaline or Ni-Cd/ Ni-MH batteries used in RC applications. All manufacturer's instructions and warnings must be followed closely. Mishandling of Li-Po batteries can result in fire. Always follow the manufacturer's instructions when disposing of Lithium Polymer batteries.

## Warranty Information

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Horizon Hobby, Inc. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any parts damaged by use or modification. In no case shall Horizon Hobby's liability exceed the original cost of the purchased kit. Further, Horizon Hobby reserves the right to change or modify this warranty without notice.

In that Horizon Hobby has no control over the final assembly or material used for the final assembly, no liability shall be assumed nor accepted for any damage of or caused by the final user-assembled product. By the act of using the product, the user accepts all resulting liability.

Once assembly of the model has been started, you must contact Horizon Hobby, Inc. directly regarding any warranty question that you have. Please do not contact your local hobby store regarding warranty issues, even if that is where you purchased it. This will enable Horizon to better answer your questions and provide service in the event that you may need any assistance.

If the buyer or user is not prepared to accept the liability associated with the use of this product, they are advised to return this kit immediately in new and unused condition to the place of purchase.

For any additional questions please contact:

Horizon Hobby Product Support  
4105 Fieldstone Road  
Champaign, Illinois 61822  
(877) 504-0233  
*[www.horizonhobby.com](http://www.horizonhobby.com)*

## Landing Gear Installation

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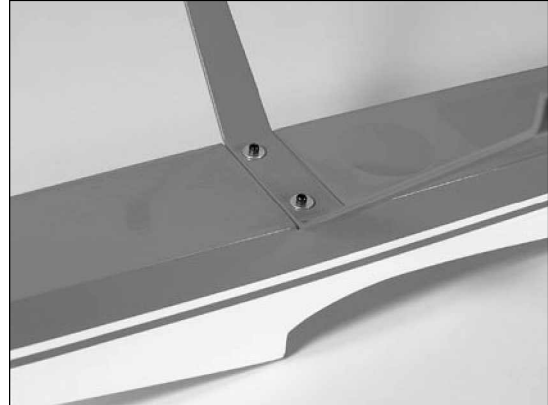
### Required Parts

- Fuselage
- Landing gear assembly with wheels
- 4-40 x 1/2" socket head screw (2)
- #4 washer (2)

### Required Tools

- Hex wrench: 3/32"

1. Locate the landing gear assembly. Attach the landing gear assembly to the fuselage using two 4-40 x 1/2" socket head screws and two #4 washers.



*Note:* The landing gear will only fit one direction for the holes to line up properly. Also, check that the wheel will rotate freely. If not, loosen the nuts and retighten.

# Firewall Installation

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## Required Parts

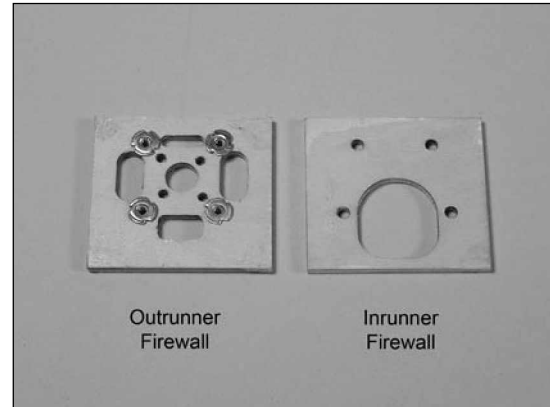
- Outrunner firewall or Stick Mount firewall
- 4-40 blind nut (4)

## Required Tools and Adhesives

- 6-minute epoxy
- or
- Thick CA

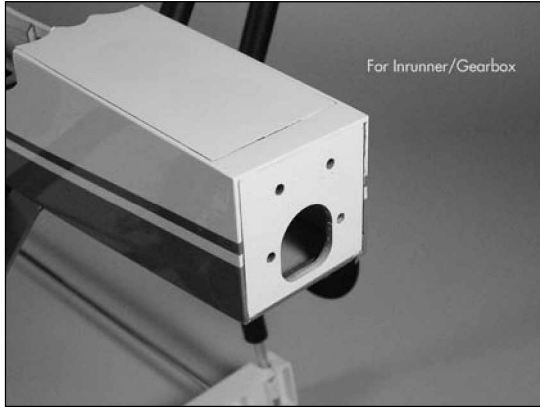
1. The Mini Ultra Stick does not include a gearbox or propeller. However, we do include two different firewalls for attaching to the nose of the plane. You need to first determine what power system you will be using, an inrunner with a gearbox, or an outrunner. We even include a firewall stick mount, which attaches to the Stick Mount firewall. The Outrunner firewall can accommodate small and larger outrunners, with options for mounting your outrunner on the outside of the aircraft with your aluminum mount or inside of the nose directly to the firewall.

Choose the firewall that fits best with the motor you have selected to use. Install the 4-40 blind nuts to the firewall as shown. This will be the back-side of the firewall.



*Note:* White UltraCote® is on the front side (outside) of the firewall and the blind nuts should be inserted on the inside of the firewall.

2. Attach the firewall to the sub-firewall structure on the front of the fuselage nose at this time using 6-minute epoxy or thick CA.



*Note:* Make sure to install the firewall as shown for the correct orientation.

# Outrunner Motor Installation

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## Required Parts

- Fuselage
- Brushless motor
- Brushless speed control
- 4-40 x 1/4" socket head screw (4)
- Prop adapter
- Propeller

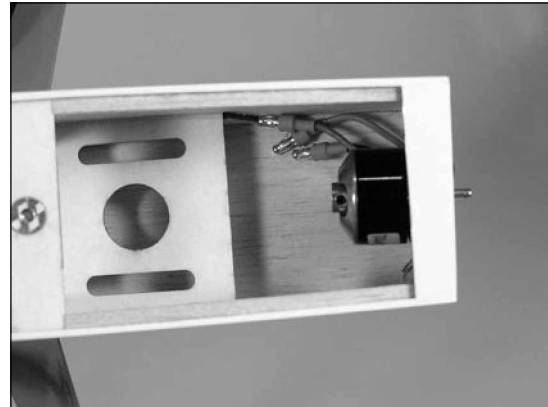
## Required Tools and Adhesives

- Hex wrench: 3/32"

Skip to page 16 for setup of an inrunner motor with gearbox.

*Note:* This section covers the installation of a brushless outrunner motor with attachment to the outside. You do have the option of installing your outrunner inside the fuselage as well. If using our recommended E-flite™ Outrunner, it may be necessary to reverse the direction of your shaft to install the motor inside the fuse. See photo below for reference.

## Option 1: Motor Installation Inside Fuselage



1. Install the outrunner motor using the hardware provided with the motor. The screws go through the front of the firewall and into the motor.

## Option 2: Motor Installation Outside Fuselage

1. It may be necessary to attach motor mount or other accessories to your particular motor at this time.



2. Attach the Outrunner motor to the front of the firewall using four 4-40 x 1/4" socket head screws.



*Note:* The mount is attached to the front (white side) of the firewall.

*Important Information About Your Brushless ESC*  
Make sure your ESC brake is programmed to Off. Also, be sure to use an ESC with the proper 9V cutoff when using 3-cell Li-Po packs, or 6V cutoff when using 2-cell Li-Po packs.

3. Connect the ESC to the motor and secure it to the inside of the fuselage using hook and loop material. Actual ESC location may vary.



4. Slide the propeller adapter onto the motor. Place the propeller onto the adapter, then a spinner cone onto the adapter and secure.



*Note:* It is very important that you check to be sure the propeller is balanced before installing onto the shaft. An unbalanced propeller will cause performance issues. E-flite™ propellers will need the center hole drilled out to fit the shaft size of your outrunner. It is very important the hole is drilled concentric.

# Inrunner Motor Installation

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## Required Parts

- Fuselage
- Brushless motor
- Brushless speed control
- #2 x 8mm screw (3)
- 4-40 x 3/8" socket head screw (4)
- EFLM1916 Firewall Stick Mount (included)
- EFLM1900 Pinion Gear, 10T 0.4 Module 6mm w/2mm ID (included with E-flite™ motor)
- EFLM240 400 Gearbox, 6.5:1 0.5 Module w/ 2 Pinions (required to purchase)
- EFLP1170 11x7 Slow Flyer Propeller
- EFLA 270 Spinner, 1 3/4" Red (optional)
- or
- EFLA204 Micro Rubber Spinner (optional)

## Required Tools and Adhesives

- Hex wrench: 3/32"
- Nut driver: 5.5mm
- Screwdriver, #0 Phillips
- Medium CA
- Threadlock

*Note:* This section covers the installation of an inrunner motor and gearbox. Refer back to Page 13 for outrunner installation.

1. It may be necessary to attach motor adapters or other accessories to your particular motor at this time.

*Note:* Use the instructions provided with the motor to install any accessories. Follow the instructions provided with the gearbox for some helpful hints for installing the motor. When installing your motor into the E-flite gearbox, it is very important that the gear mesh is set correctly and is smooth with no binding. The E-flite gearbox features adjustable slotted mounting holes to ensure your gear mesh is correct. Remember, if the gear mesh is too loose or too tight it may strip the gears. To extend the life of your gearbox, we also recommend using a small amount of grease, such as lithium grease, on the spur gear.

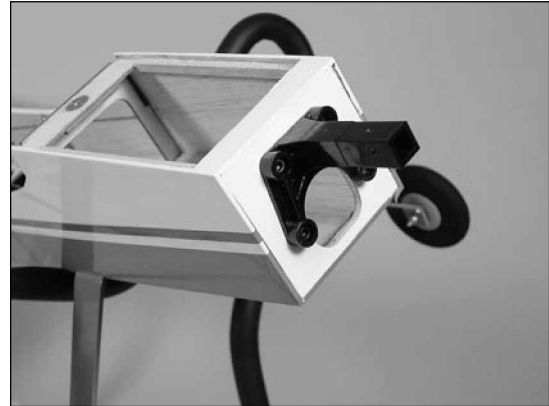
It is also very important to check to be sure the propeller is balanced before installing onto the shaft. An unbalanced propeller may strip the gears. When installing the propeller, please be sure not to over-tighten the 3mm locknut. The use of the locknut will prevent the propeller from coming loose.

2. Attach the motor to the gearbox using the screws provided with the motor and blue threadlock.



*Hint:* The gearbox is in two pieces. Apply a bead of medium CA where the two pieces join to stiffen the mount for extreme aerobatics.

3. Attach the firewall stick mount to the inrunner firewall using four 4-40 x 3/8" socket head screws.



- Slide the gearbox into position on the motor mount. Use a 1/16" drill to drill a hole on each side of the gearbox and into the mount. Stagger the holes so the screws will not interfere with each other. Secure the gearbox using three #2 x 8mm screws.



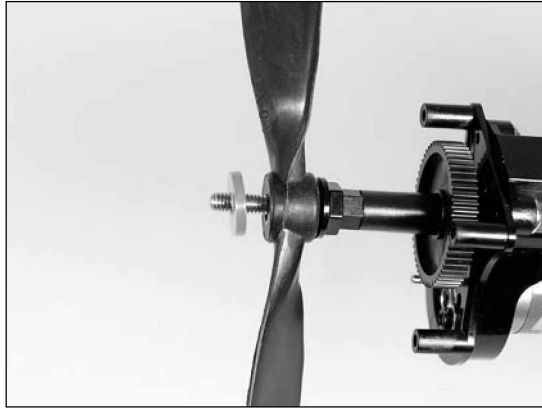
- Connect the ESC to the motor and secure the ESC to the inside of the fuselage using hook and loop material. Actual ESC location may vary.



*Important Information About Your Brushless ESC*

Make sure your ESC brake is programmed to Off. Also, be sure to use an ESC with the proper 9V cutoff when using 3-Cell Li-Po packs, or 6V cutoff when using 2-cell Li-Po packs.

- Slide the propeller onto the gearbox shaft. If using our E-flite™ 1 3/4" spinner, next slide on a spinner backplate spacer. If you are using a rubber spinner, you will slide it on after the propeller has been secured.



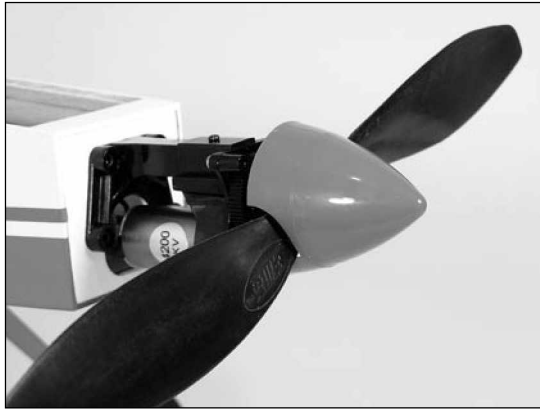
*Note:* Two spacers have been provided that are placed between the propeller and spinner backplate. Use the thin spacer for low-pitch propellers, the thick spacer for high-pitch propellers. This will prevent the blades of the propeller from contacting the spinner backplate.

- Slide the spinner backplate onto the gearbox shaft. Secure the propeller and spinner backplate using the supplied 3mm washer and 3mm locknut. Make sure not to over-tighten the 3mm locknut.



*Note:* It is very important that you check to be sure the propeller is balanced before installing onto the shaft. An unbalanced propeller may strip the gear. When installing the propeller, please do not over-tighten the 3mm locknut. The use of the locknut will prevent the propeller from coming loose.

8. Snap the spinner cone onto the spinner backplate.

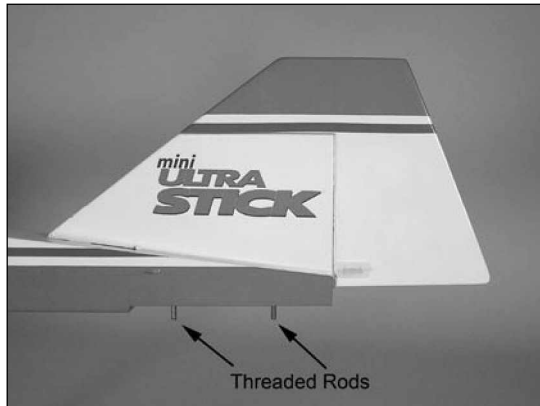


## Tail Installation

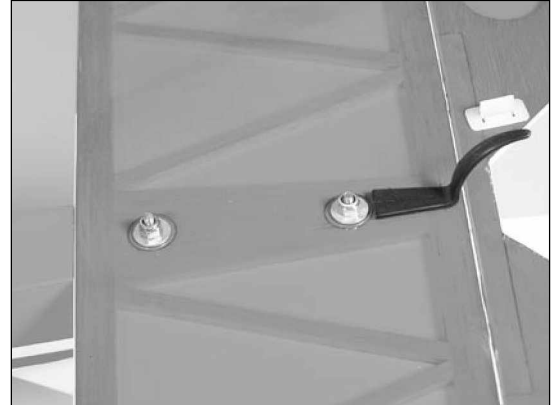
### Required Parts

- Fuselage
- Rudder/Fin
- Stabilizer/Elevator
- 3mm locknut (2)
- 3mm washer (2)

1. Slide the rudder into position on the fuselage. The threaded rods extend through the bottom of the fuselage.



2. Attach the stabilizer using two 3mm washers and two 3mm locknuts. Do not tighten the locknuts all the way until after the wing is installed and you check the alignment.



*Note:* The tail section is removable for easy transporting if needed. When re-attaching, always check your alignment before flight to make sure the tail is square with the wing before tightening the locknuts completely. See instructions on page 31.