

HELLGAT *ARF*

INSTRUCTION MANUAL



Wingspan: 36 in [915mm]
Wing Area: 254 sq in [16.4dm²]
Weight: 8.5 – 9.5 oz [240 – 270g]
Wing Loading: 4.8 – 5.3 oz/sq ft [15 – 16g/dm²]
Length: 25 in [635mm]
Radio: 4-channel minimum, 7A brushed ESC, 3 micro servos
and micro receiver

WARRANTY

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

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

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

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.



Champaign, Illinois
(217) 398-8970, Ext 5
airsupport@greatplanes.com

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INTRODUCTION

Thank you for your purchase of the Great Planes ElectriFly™ FlatOuts Hellcat ARF! Whether flying aerobatics by yourself, or challenging another flat fighter to combat using the tail streamers, this model is sure to provide you many hours of entertainment. These flat fighters can be assembled in as little as an hour, and their foam construction can be repaired on site to get you back into combat as quickly as it takes to top off the battery in your radio. The FlatOuts Hellcat ARF can comfortably fly in a gymnasium at slow speeds, or fly with authority outdoors on a light day. And the best feature, the economical price and quick build time of the FlatOuts Hellcat ARF will allow you to fly combat aggressively without the worry of damage to an expensive or time consuming model.

For the latest technical updates or manual corrections to the Great Planes FlatOuts Hellcat ARF visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes"

link, and then select the FlatOuts Hellcat ARF. If there is new technical information or changes to this model, a "tech notice" box will appear in the upper left corner of the page.

AMA

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below.



Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Tele: (800) 435-9262
Fax (765) 741-0057
Or via the Internet at:
<http://www.modelaircraft.org>

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. Your FlatOuts Hellcat ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the FlatOuts Hellcat ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
3. You must take time to **build straight, true and strong**.

4. You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air.

5. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.

6. If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

LITHIUM BATTERY HANDLING & USAGE

WARNING!! Read the entire instruction sheet included with this battery. Failure to follow all instructions could cause permanent damage to the battery and its surroundings, and cause bodily harm!

- ONLY use a LiPo approved charger. NEVER use a NiCd/NiMH peak charger!
- NEVER charge in excess of 4.20V per cell.
- ONLY charge through the "charge" lead. NEVER charge through the "discharge" lead.
- NEVER charge at currents greater than 1C.
- ALWAYS set charger's output volts to match battery volts.
- ALWAYS charge in a fireproof location.
- NEVER trickle charge.
- NEVER allow the battery temperature to exceed 150° F [65° C].
- NEVER disassemble or modify pack wiring in any way or puncture cells.
- NEVER discharge below 2.5V per cell.
- NEVER place on combustible materials or leave unattended during charge or discharge.
- ALWAYS KEEP OUT OF REACH OF CHILDREN.

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the FlatOuts Hellcat ARF that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Radio Equipment & Electronics

The FlatOuts Hellcat ARF requires a 4-channel or greater transmitter, a micro receiver, and three micro servos (9g or less). If you already have a transmitter you are going to use to fly the FlatOuts Hellcat ARF, you can get the receiver and servos separately:

- Futaba® R114F 4-channel FM micro receiver w/o crystal (low band – FUTL0442, high band – FUTL0443)
- Futaba FM single conversion receiver crystal for R114F (low band – FUTL62**, high band – FUTL63**)
- Futaba S3110 micro servo 7.7g (FUTM0046)

Or, you can purchase a complete system (including transmitter) specially packaged for park flyers. If purchasing a complete system, the Futaba 4YF Skysport FM radio is suitable. It comes with a micro receiver and two Futaba S3108 micro servos. One additional servo will need to be purchased. The transmitter is also equipped with a rechargeable NiCd battery pack:

- Futaba 4YF Skysport FM radio system including transmitter, receiver, and servos (FUTJ36**)
- Futaba S3114 micro servo 7.7g (FUTM0414)

An 11.1V 350mAh or 11.1V 640mAh LiPo battery pack and suitable charger are also required. Although there are different battery packs and chargers available that will work with the FlatOuts Hellcat ARF, the economical choices recommended by Great Planes are:

- Great Planes 11.1V 350mAh 3S 20C discharge 2-pin LiPo (GPMP0801) (**Note:** When using with the C-7 Nano ESC, adapter required – GPMM3135)
- Great Planes 11.1V 640mAh 3S 15C discharge micro LiPo (GPMP0805)
- Great Planes 11.1V 640mAh 20C discharge with balance LiPo (GPMP0601) (**Note:** This requires the Equinox™ Cell Balancer – GPMM3160)

A suitable LiPo charger is required:

- Great Planes PolyCharge4™ DC only 4 output LiPo charger (GPMM3015)

or

- Great Planes ElectriFly™ Triton™2 DC Peak Charger (GPMM3153)

Electronic Speed Control (ESC)

An electronic speed control (ESC) with BEC (Battery Eliminator Circuitry) is required. The BEC allows both the motor and the radio system to be powered by the same battery (thus eliminating the on-board receiver battery). The Great Planes ElectriFly C-7 Nano Brushed ESC (GPMM2005) is recommended.

ADDITIONAL ITEMS REQUIRED

Adhesives & Building Supplies

- Great Planes Pro™ Foam Safe CA- Thick Glue
1 oz. (GPMR6072)
- Drill bits: 3/64" [1.2mm] or #60
- #1 Hobby knife (HCAR0105)
- Hobbico® soldering iron 60 Watt (HCAR0776)
- Denatured alcohol
- Fine grit sandpaper (320-grit)

Optional Supplies & Tools

Here is a list of optional tools that will help you build the FlatOuts Hellcat ARF.

- 2 oz. [57g] Foam Safe spray CA activator (GPMR6035)
- 4 oz. [113g] Foam Safe aerosol CA activator (GPMR6034)
- CA applicator tips (HCAR3780)
- CA debonder (GPMR6039)
- Hobbico Pin Vise 1/16" collet w/6 bits (HCAR0696)
- Hobbico High Precision diagonal cutter 5" (HCAR0630)
- Pliers with wire cutter (HCAR0625)
- AccuThrow™ deflection gauge (GPMR2405)
- CG Machine™ (GPMR2400)
- Hobbico flexible 18" ruler stainless steel (HCAR0460)

IMPORTANT BUILDING NOTES

- When you see the term **test fit** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.
- Whenever the term **glue** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.
- **Photos** and **sketches** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes FlatOuts Hellcat ARF are available using the order numbers in the **Replacement Parts List** that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company. To locate a hobby dealer, visit the Hobbico web site at **www.hobbico.com**. Choose "Where to Buy" at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

Parts may also be ordered directly from Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax. If ordering via fax, include a Visa® or MasterCard® number and expiration date for payment.

Mail parts orders and payments by personal check to:

Hobby Services
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822

Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason contact Product Support by e-mail at **productsupport@greatplanes.com**, or by telephone at (217) 398-8970.

Description

Missing pieces
Instruction manual
Full-size plans
Kit parts listed below

How to Purchase

Contact Product Support
Contact Product Support
Not available
Hobby Supplier

Replacement Parts List

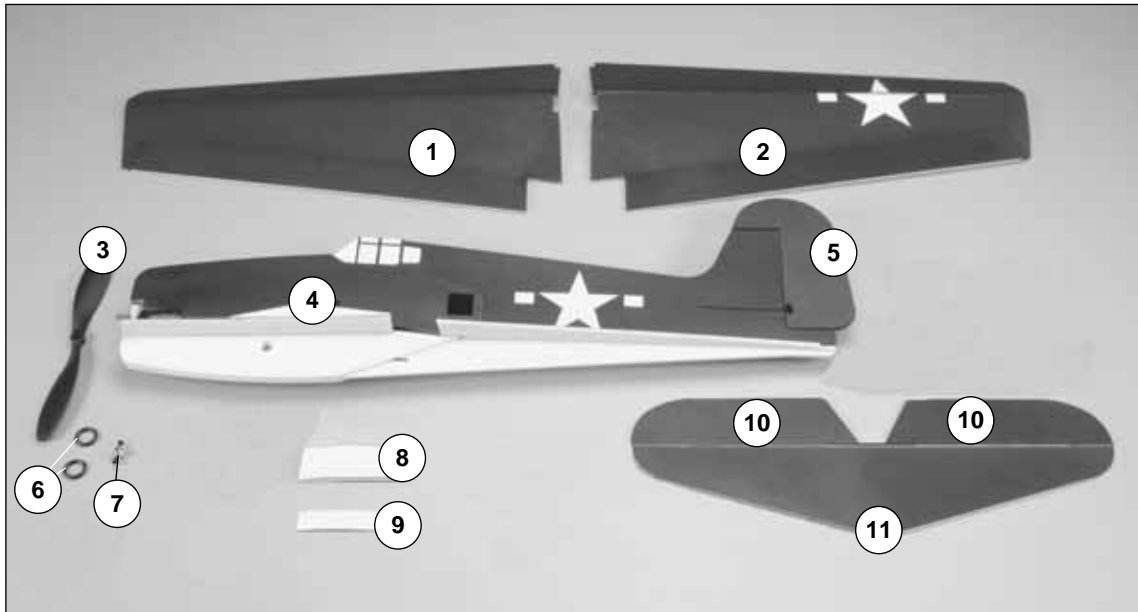
GPMG0420180 Motor & 5:1 Ratio Gearbox
GPMG0292180 Motor with Leads & Connectors
GPMG0182Gearbox with Spur Gear/Shaft 5:1 Ratio
GPMG0863Spur Gear/Shaft
GPMQ4619Prop Saver O-ring
GPMQ4620Prop Saver

KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete, and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list on this page.

Great Planes Product Support
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970, ext. 5
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com

KIT CONTENTS



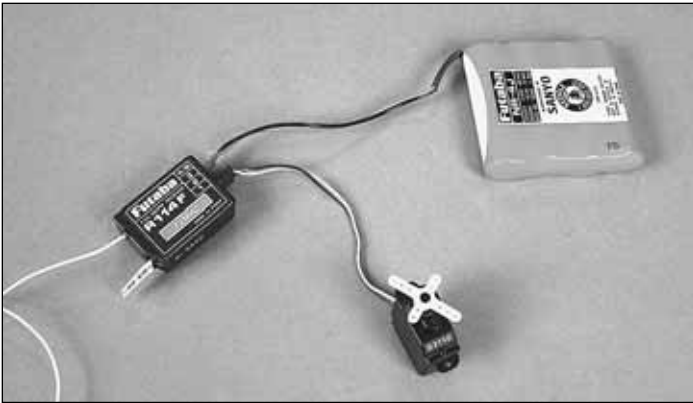
Kit Contents

1. Left Wing Panel
2. Right Wing Panel
3. Propeller
4. Fuselage
5. Rudder
6. Prop Saver O-rings (2)
7. Prop Saver
8. Hook & Loop Material
9. Double-sided Tape

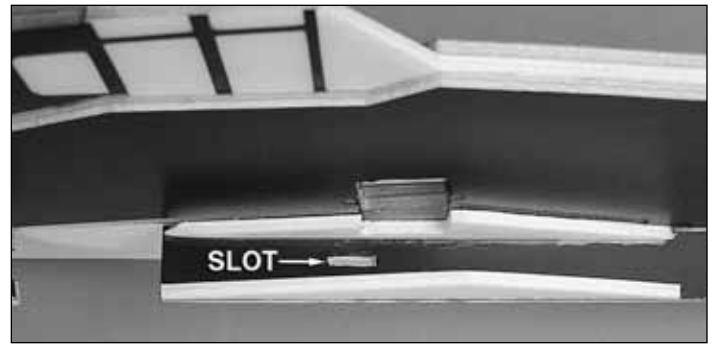
10. Elevator Halves (L&R)
11. Horizontal Stabilizer

ASSEMBLE THE AIRPLANE

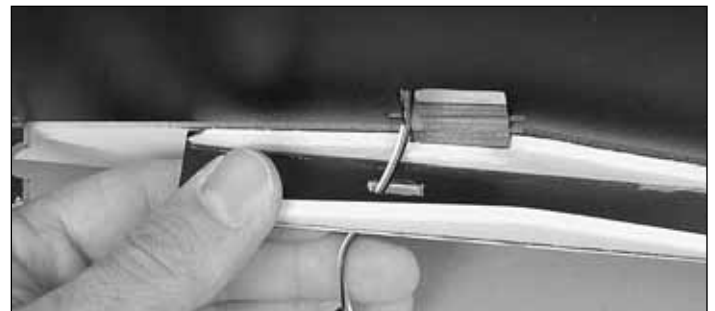
Install the Aileron Servo



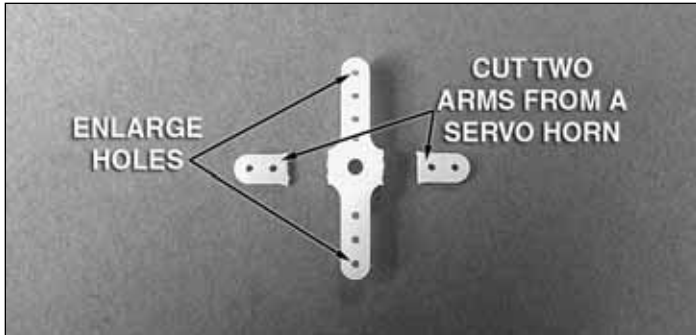
1. Connect the aileron servo to the receiver. Use your ESC or a receiver pack to power the receiver. Turn on your transmitter and center the aileron servo. Do not skip this step, as the aileron servo must be installed into the **fuselage** with the servo horn attached to it.



4. Cut a slot in the fuse on the right side large enough to accommodate the servo connector in the location shown in the picture. The exact placement will depend on the servo manufacturer and where the servo lead wire exits out of the aileron servo being used.



5. Feed the aileron servo lead through the slot you cut into the fuse.



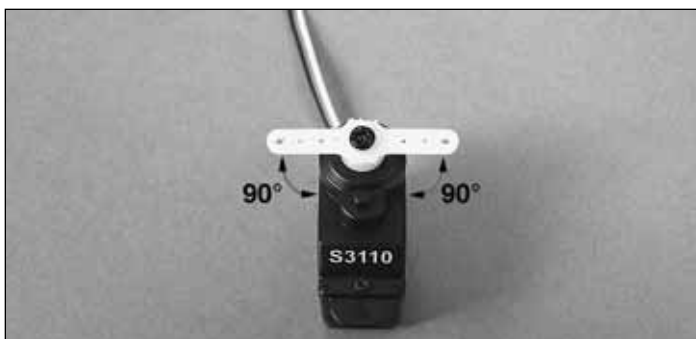
2. Cut two arms from a four-arm servo horn as shown. Enlarge the outer holes in the remaining servo arms with a 3/64" [1.2mm] drill bit.



6. Fit the aileron servo into the **aileron servo bay** with the servo spline towards the aft end of the plane.



7. With the servo centered in the aileron servo bay, apply a couple of drops of thick foam safe CA glue to each servo case tab, securing the servo to the fuse. Add a couple of drops of CA glue near the base of the servo case as well. It does not require much CA glue to secure the servo to the fuse. Excess glue will simply make it difficult to remove the servo in the future.



3. Install the servo horn perpendicular to the servo case.

Install the Wing Panels



1. For the best adhesion on the painted surfaces, we recommend roughing up the painted surfaces to be glued with fine grit sandpaper such as 320-grit. Wiping the areas to be glued with a paper towel dampened with denatured alcohol will reduce the gloss of the paint and also improve adhesion. If using alcohol, we recommend only making one pass with the towel. Excessive wiping will completely remove the paint from the foam.



2. Apply a bead of thick CA glue to the tops of the **wing supports** on the right side of the fuse. We recommend using CA accelerator to speed the assembly time.



3. Insert the **right wing panel** into the slot. The notch at the inside LE of the wing panel will contact the fuse when fully seated. The TE of the wing panel must be aligned with the center of the fuse.



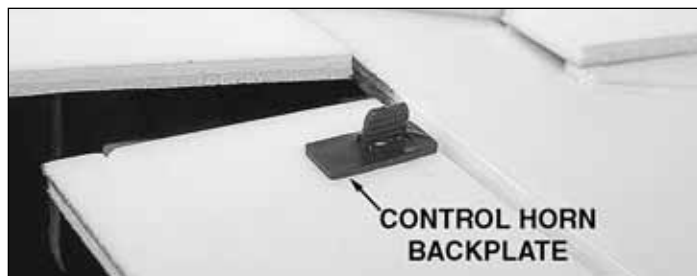
4. Apply a bead of CA around the joint between the wing and the fuse on both the top and bottom of the wing.

5. Repeat this procedure for the **left wing panel**.

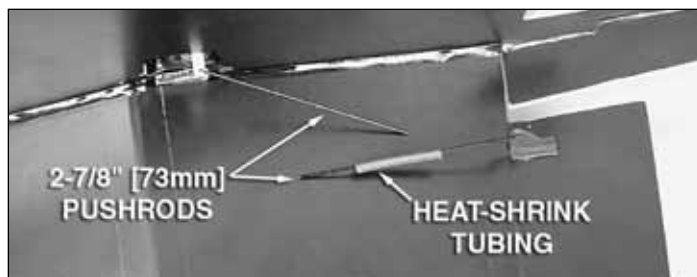
Assemble the Aileron Pushrods



1. Enlarge the outer holes of two **control horns** with a 3/64" [1.2mm] drill bit. Apply a couple drops of CA glue to the underside of the **control horn backplates**. Push the control horn tabs through the slots in the ailerons as shown.



2. Press the control horn backplates onto the tabs to secure the control horns to the ailerons. Glue the backplates to the control horn tabs with a drop of CA.



3. Locate the four 2-7/8" [73mm] pushrods and hook the Z-bends into the outer holes of the servo horn and the outer holes in the control horns. Slide a piece of 1" [25mm] heat-shrink tubing onto one of the pushrods for each wing panel.

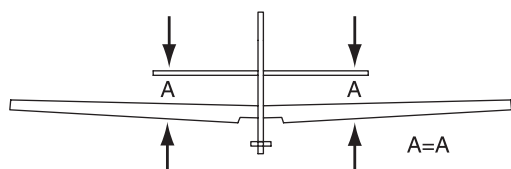
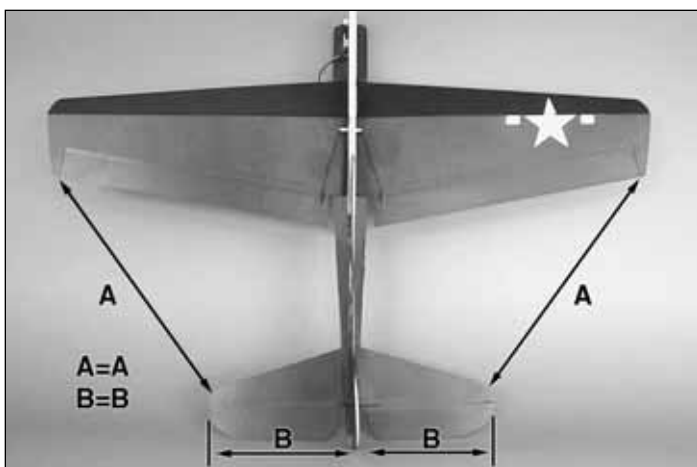


4. Overlap the pushrod ends and join them with the heat-shrink tubing. Position the ailerons in the neutral position. Use tape to hold them in place. **Carefully** use a soldering iron to shrink the tubing around the pushrods. Keep the iron away from the foam and move it quickly back and forth across the heat-shrink tubing until the pushrods are joined together tightly. **We do not suggest using a heat gun or micro torch to shrink the tubing as this will melt the foam that is close to the pushrods.** If necessary, adjust the ailerons so that they are in the neutral position. When satisfied, apply a couple drops of CA glue to each end of the heat-shrink tubing.

Install the Horizontal Stabilizer



1. Roughen a 1/8" [3mm] strip down the center of the top and bottom of the **horizontal stabilizer**. Use alcohol to dull the paint at the area to be glued. Do the same to the area around the horizontal stabilizer slot in the fuse.



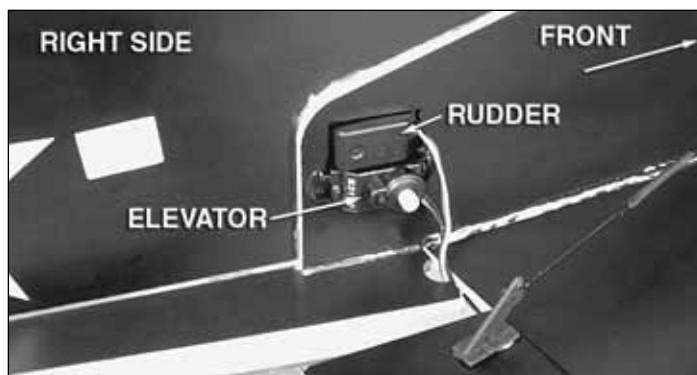
2. Slide stabilizer the into the slot at the TE. Center the stabilizer left and right in the fuse. Make sure that the stabilizer

is square to the fuse by measuring the distance between the wing tips and stabilizer tips and setting them equal to each other as shown in the photo. Before gluing, stand back several feet and view the model from behind. The stabilizer should be parallel to the wing. If not, you will need to hold the stabilizer in the correct position as you glue it to the fuse.

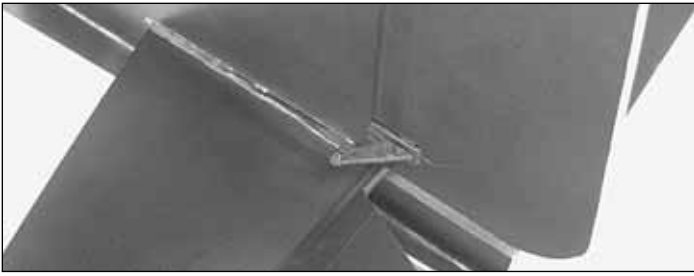


3. When satisfied, run a bead of thick foam safe CA glue along the top and bottom of the stabilizer where it meets the fuse on both sides.

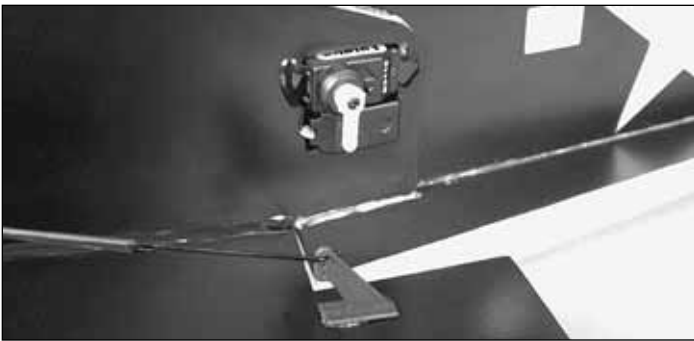
Install the Tail Servos & Linkages



1. Glue the rudder and elevator servos into the cutout in the fuse with the output splines both facing the front of the plane. The servo in the bottom of the slot is the elevator servo and should be installed with the splines on the **right side** of the fuse. The servo in the top of the slot is the rudder servo and should be installed with the splines on the **left side** of the fuse. Both servo leads should exit out of the right side. There is a small half-circle cutout in the fuse to wrap the servo leads to the underside of the horizontal fuse section.



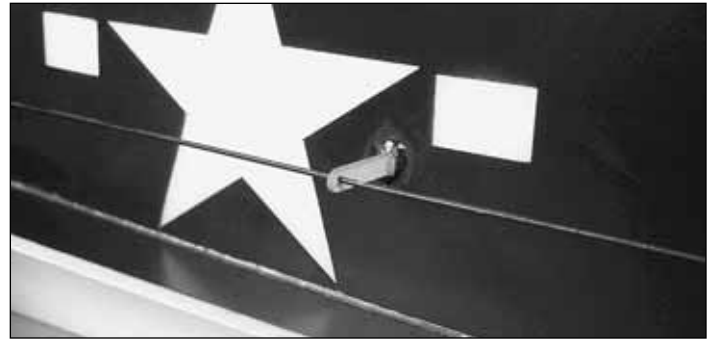
❑ 2. Enlarge the outer hole of a control horn using a 3/64" [1.2mm] drill bit. Install this control horn onto the left side of the **rudder**. Enlarge the **inner** hole (closest to the control horn base) of another control horn and install it on the bottom of the right **elevator half**.



❑ 3. Use your radio system to center the elevator and rudder servos. Cut three arms from two four-arm servo horns and install them onto the elevator and rudder servos, both pointing downward. Enlarge the outer holes of the servo horns with a 3/64" [1.2mm] drill bit.



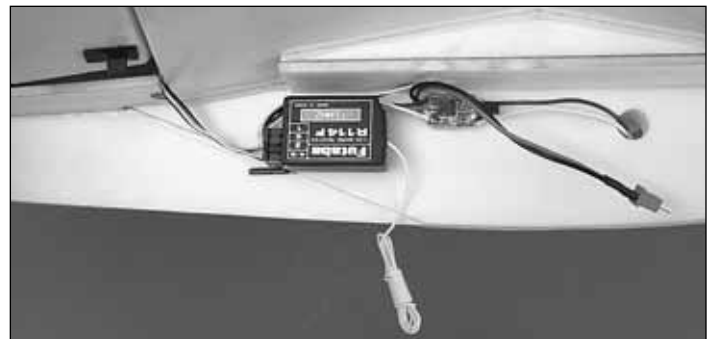
❑ 4. Hook the remaining two 2-7/8" [73mm] pushrods onto the inner hole of the elevator control horn and outer hole of the rudder control horn. Slide the two pushrod supports onto the 11-1/8" [282mm] pushrods and connect the pushrods onto the outer holes of the elevator and rudder servo horns. If necessary, enlarge the holes in the pushrod supports to prevent binding. Join them together with a 1" [25mm] piece of heat-shrink tubing while centering the control surfaces. Apply a drop of CA to the ends of the heat-shrink tubing.



❑ 5. Position the pushrod supports in the middle of the pushrods and lightly press them into the fuse creating indentations in the foam. Use a sharp hobby knife to cut a hole in the foam at the indentations you made. Insert the pushrod supports into the holes and glue them in place. Be sure that the position of the pushrod supports do not cause the pushrods to bind.

Install the Electronics & Propeller

Consult the directions that came with the ElectriFly ESC for proper operation.



❑ 1. Cut a piece of the included double-sided tape to fit your receiver and stick it to the underside of the receiver case. Connect the aileron, rudder, and elevator servos to the receiver. Connect the ESC to the receiver. Feed the ESC motor leads through the hole in the fuse and connect them to the motor. Peel the backing from the double-sided tape and secure the receiver to the fuse in the location shown in the picture. Secure the ESC to the fuse as far forward as it will go with double-sided tape.



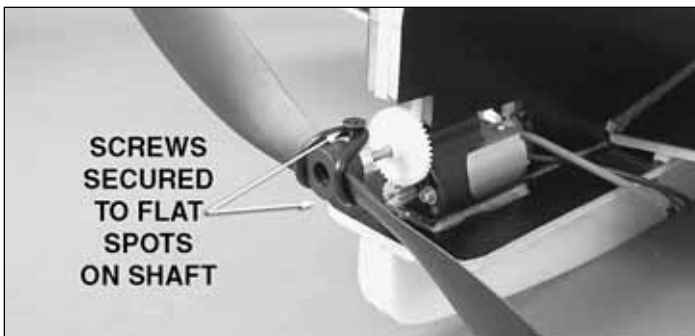
❑ 2. In order to balance the FlatOuts Hellcat ARF without the addition of weight, the battery pack must be secured above the motor. Use the included hook and loop material to do so with the “loop” side on the battery. Before applying the “hook” side to the fuse, wipe the area above the motor with alcohol to improve adhesion.



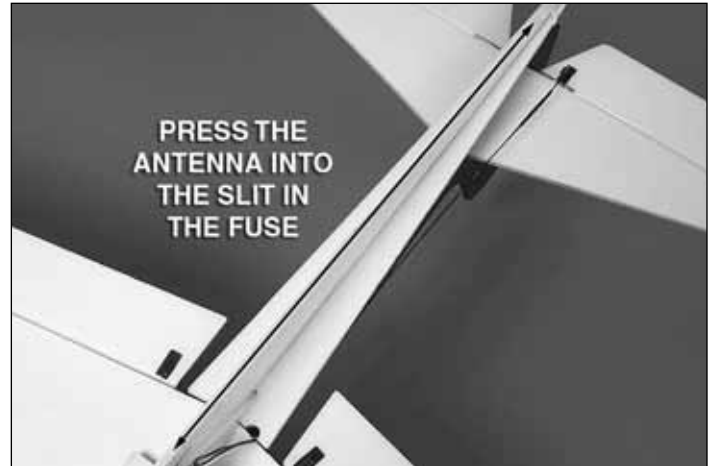
❑ 3. A hole is precut on the right wing panel. This can be used for routing the battery leads to the ESC if short wire length makes this necessary. Use the hole as a guide to cut another hole through the horizontal fuselage below it.



❑ 4. Loop the **prop saver O-ring** around one of the screws and over the prop hub. Hook the O-ring onto the other screw to secure the propeller to the prop saver. Long nose pliers may make it easier to stretch the O-ring onto the screws.



❑ 5. Attach the **prop saver** by tightening the two screws against the flat spots on the prop shaft.



❑ 6. The receiver antenna can be taped to the side of the fuse. However, be sure not to let excess wire hang free of this airplane if you plan to fly combat. To improve the adhesion of the tape to the painted surfaces, use alcohol to dull the surface where the tape will be applied. Due to the nature of combat fighting with planes such as the FlatOuts Hellcat ARF, we suggest embedding the antenna into the fuse. Cut a 1/4" [6mm] deep slit on the bottom of the fuse from the position of the receiver to 1" [25mm] from the back of the airplane. If your antenna is longer than this length, make another slit along the side of the fuse long enough to accommodate the rest of the antenna wire. Use a small flat blade screwdriver to press the antenna into the slit. Add a drop of thick CA glue every few inches on the slits you cut to prevent the antenna from coming out in flight. Be sure that none of the antenna is exposed on the underside of the airplane, as it could become damaged on landing.

Combat Setup

The Great Planes FlatOuts Hellcat ARF was designed so that two or more of these models can be flown together in classic dogfight style. Paper streamers are included with the model to be taped to the rear of the fuse. Rubber bands are also included to attach the streamer. To use the rubber band, drill a small hole in the tail of the plane and loop a rubber band through the hole and around the streamer. During combat, use the propeller on your fighter to cut the streamer on the enemy.

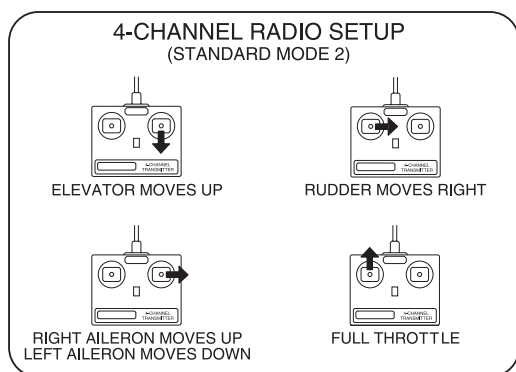


❑ 1. Damage to your plane is inevitable during this kind of combat. However, the simplicity of this model allows it to be repaired quickly at the flying site. Be sure to put some thick foam safe CA glue and CA activator in your field box, and you will be able to be back in flight in a matter of minutes should repair be necessary.

GET THE MODEL READY TO FLY

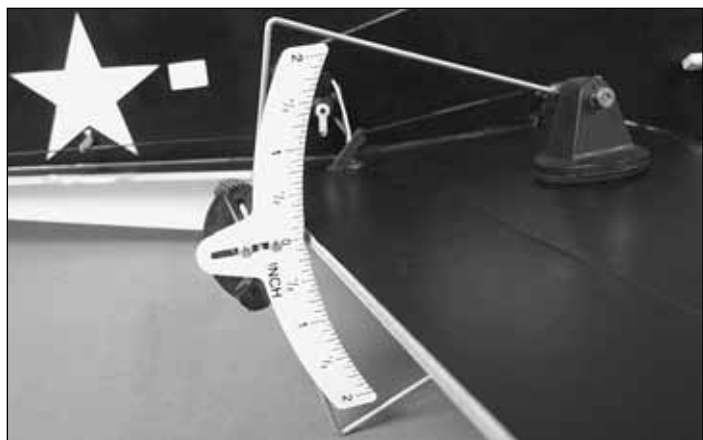
Check the Control Directions

- ❑ 1. Turn on the transmitter and receiver and center the trims.
- ❑ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If the lengths of the pushrods need to be adjusted to center the control surfaces, break the glue bond at the ends of the heat-shrink tubing and make your adjustments. Be sure to re-glue the ends of the heat-shrink tubing to the pushrod wires when you are satisfied.



❑ 3. Make certain that the control surfaces and the throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered.

Set the Control Throws



Use a Great Planes AccuThrow (or a ruler) to accurately measure and set the control throw of each control surface as indicated in the chart that follows. If your radio does not have dual rates, we recommend setting the throws at the **low rate** setting.

Note: The throws are measured at the **widest part** of the elevator, rudder and ailerons.

These are the recommended control surface throws:		
	High Rate	Low Rate
ELEVATOR:	1-1/4" [32mm] up 1-1/4" [32mm] down	3/4" [19mm] up 3/4" [19mm] down
RUDDER:	1-1/4" [32mm] left 1-1/4" [32mm] right (or max. deflection)	1-1/4" [32mm] left 1-1/4" [32mm] right
AILERONS:	3/4" [19mm] up 3/4" [19mm] down	1/2" [13mm] up 1/2" [13mm] down

IMPORTANT: The FlatOuts Hellcat ARF has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the FlatOuts Hellcat ARF flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

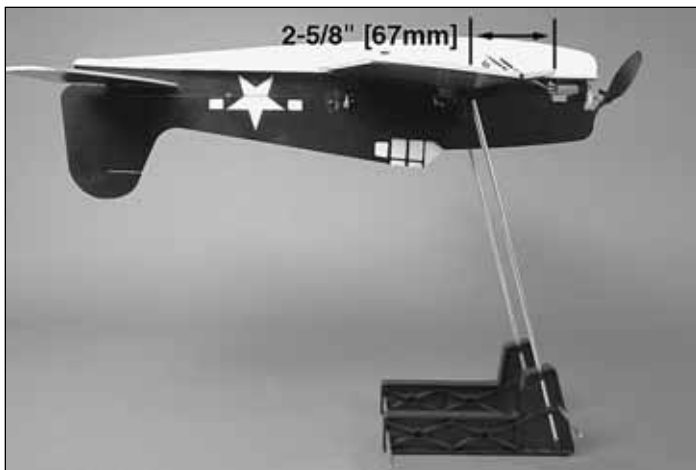
Balance the Model (C.G.)

More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that is not properly balanced will be unstable and possibly unflyable.

At this stage the model should be in ready-to-fly condition with all of the systems in place including the receiver, ESC.

1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing on both sides of the fuse. The C.G. is located 2-5/8" [67mm] back from the LE of the wing at the fuse.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/8" [3mm] forward or 3/8" [9.5mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



2. With all parts of the model installed (ready to fly), place the model upside-down on a Great Planes CG Machine, or lift it upside-down at the balance point you marked.
3. If the tail drops, the model is "tail heavy" and the battery pack must be shifted forward to balance. If the nose drops, the model is "nose heavy" and the battery pack must be shifted back to balance. This model is very weight sensitive. Do not add any weight to achieve the suggested balance point. Instead, shift the battery pack forward or aft to alter the C.G.

PREFLIGHT

Identify Your Model

No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 15 and place it on or inside your model.

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries. You should always charge your transmitter and motor batteries the night before you go flying, and at other times as recommended by the manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter batteries should be done for 15 hours **using the slow-charger that came with the radio system.** This will "condition" the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger, the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Range Check

Ground check the operational range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test **with the motor running** at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash.

AMA SAFETY CODE (excerpts)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to *Model Aviation* magazine, the AMA web site or the Code that came with your AMA license.

General

1) I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.

2) I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. **Note:** This does not apply to models while being flown indoors.

7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

Radio Control

1) I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.

2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.

4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.

5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** [in the complete AMA Safety Code].

9) Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing.**

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a check list is provided to make sure these important areas are not overlooked. Many are covered in the instruction manual, so where appropriate, refer to the manual for complete instructions. Be sure to check the items off as they are completed.

- 1. Check the C.G. according to the measurements provided in the manual.
- 2. Be certain the battery and receiver are securely mounted to the fuse.
- 3. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- 4. Check the operation of the motor and gearbox prior to each flight.
- 5. Make sure that all servo arms are secured to the servos with the screws included with your radio.
- 6. Place your name, address, AMA number and telephone number on or inside your model.
- 7. If you wish to photograph your model, do so before your first flight.
- 8. Range check your radio when you get to the flying field.
- 9. Confirm that the hinge tape is properly secured.

FLYING

The FlatOuts Hellcat ARF is a great-flying model that flies smoothly and predictably. The FlatOuts Hellcat ARF does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice an alarming or unusual sound such as a low-pitched “buzz,” this may indicate control surface *flutter*. Flutter occurs when a control surface (such as an aileron or elevator) or a flying surface (such as a wing or stab) rapidly vibrates up and down (thus causing the noise). In extreme cases, if not detected immediately, flutter can actually cause the control surface to detach or the flying surface to fail, thus causing loss of control followed by an impending crash. The best thing to do when flutter is detected is to slow the model **immediately** by reducing power, then land as soon as safely possible. Identify which surface fluttered (so the problem may be resolved) by checking all the servo grommets for deterioration or signs of vibration. Make certain all pushrod linkages are secure and free of play. If it fluttered once, under similar circumstances it will probably flutter again unless the problem is fixed. Some things which can cause flutter are; Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of wire pushrods caused by large bends; Excessive free play in servo gears; Insecure servo mounting; and one of the most prevalent causes of flutter; Flying an over-powered model at excessive speeds.

Launch

For the first flight, it is a good idea to have a friend launch the airplane for you. This allows you to keep your hands on the radio sticks and correct any trim problems that are present. Have your friend hold the FlatOuts Hellcat ARF by the canopy. Throttle up to full power, and have your friend give the plane a gentle underhanded toss at about a 30° angle upward. Since the FlatOuts Hellcat ARF has a very high thrust to weight ratio, the plane will accelerate to flying speed almost instantly. Climb to a comfortable altitude and throttle back to a lower power setting. This plane flies great at about half-throttle when in standard forward flight.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff, most models fly more smoothly at reduced speeds. Take it easy with the FlatOuts Hellcat ARF for the first few flights, gradually getting acquainted with it as you gain

confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of battery power, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your battery power, but use this first flight to become familiar with your model before landing.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the landing area (into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches an altitude of about 10 feet, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing and the model is a foot or so off the deck, cut your throttle and smoothly increase up elevator until it gently touches down on its belly. Make sure that you cut your power completely before touchdown, or gearbox damage may result.

One final note about flying your model: Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills (*though it is never a bad idea!*), but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

GOOD LUCK AND GREAT FLYING!

This model belongs to:

Name

Address

City, State Zip

Phone number

AMA number

Make a copy of this identification tag and put it on or inside your model.

OTHER ITEMS AVAILABLE FROM GREAT PLANES



ElectriFly™ FlatOuts™ Zero

Enjoy solo sport flying or exciting combat with another flat fighter – indoors or out! Made of lightweight, precolored foam, the FlatOuts Zero indoor ARF demands little time, effort or expense – and its a perfect way to use your .40 glow trainer experience to learn indoor piloting skills. The Zero has a low parts count and factory-applied trim scheme, so you can have your Zero flight-ready in as little as 1 to 2 hours. Precut slots in the foam panels are ready for easy installation of linkages and radio gear. The wing has a Jedelsky-type airfoil design to improve lift and slow flight characteristics. It also incorporates a round carbon-fiber spar to keep weight low and increase strength. Includes prop, prop saver/adaptor, streamers, and factory-installed motor and gearbox. **GPMA1122**



ElectriFly C-7 Nano Brushed ESC

The compact, easy-to-use C-7 Nano ESC is LiPo/NiCd/NiMH compatible and offers BEC, fully proportional forward, factory-installed connectors, “Safe Start” system and low voltage cut-off, plus audible tones for easy set-up. **GPMM2005**



ElectriFly PolyCharge4™

For convenience with multiple LiPo packs, there's the DC PolyCharge4. Each of its four independent outputs can charge a one-to-four cell Lithium-Polymer pack. It's ideal if you don't have the time for one-at-a-time charging – and don't want the expense and hassle of multiple chargers. Each output can handle packs from 300 to 3000mAh. Set the capacity, and PolyCharge4 will automatically set the charge rate to get you started – and use light and sound cues to tell you when your pack is done. **GPMM3015**



ElectriFly Triton™2 DC Computerized Peak Charger, Discharger & Cycler

Like the popular original Triton charger, the Triton2 offers easy programming. But the adjustable charge current has been increased from 5.0A maximum to 7.0A, and the Triton2 can handle LiPo packs with up to 5 cells in series. A cool blue backlight on the 2 x 16 LCD screen makes for easier reading in any conditions, and the rotating dial has been raised for enhanced feel and more precise fingertip control. The Triton2 is more versatile too: you get alligator clips that mate onto the banana plugs, for quick connection to 12V batteries or power supplies. You'll still be able to charge 1 to 4 cell lithium-ion and lithium-polymer batteries, and peak 1 to 24 cell NiCd and NiMH packs at rates you set to peak detection values you choose – before discharging them at custom rates and then repeating the cycle up to 10 times. **GPMM3153**



