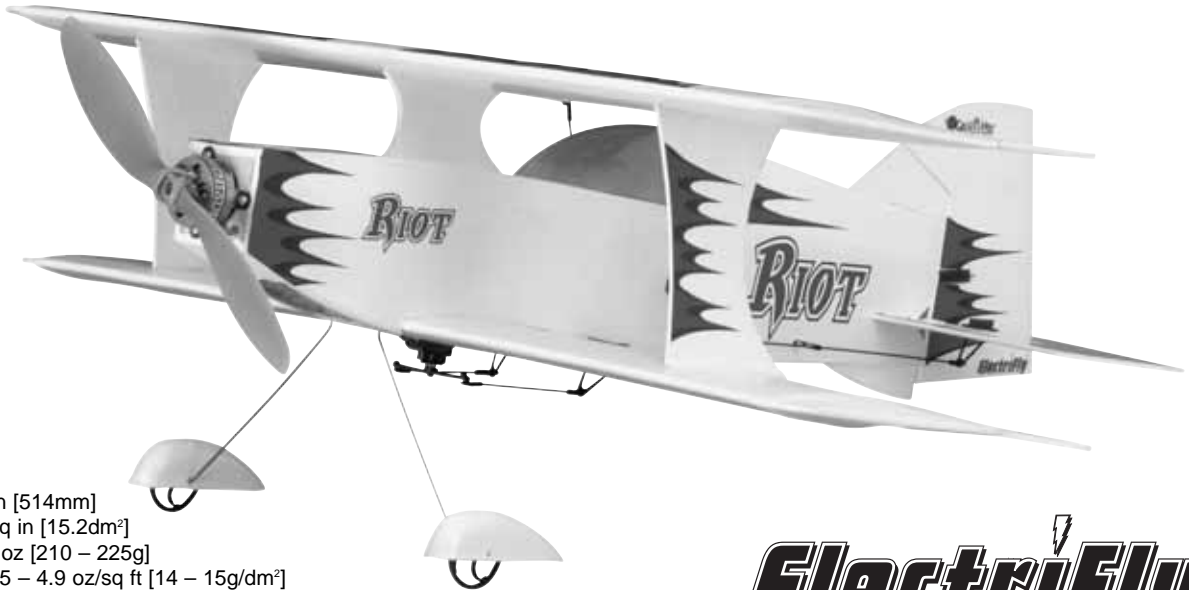


RIOT 3DTM ARF

INSTRUCTION MANUAL



Wingspan: 20.5 in [514mm]
Wing Area: 235 sq in [15.2dm²]
Weight: 7.4 – 8.0 oz [210 – 225g]
Wing Loading: 4.5 – 4.9 oz/sq ft [14 – 15g/dm²]
Length: 22.75 in [580mm]
Radio: 4-channel with 3 micro servos
Motor: RIMFIRETM 28-22-1380kV brushless out-runner

ElectriFLYTM

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

That's a RIOT! That's exactly what the people at the flying field will say when this little biplane rockets skyward. With incredibly fast rolls, unlimited vertical, and amazing acrobatics the Riot 3D ARF is sure to impress all who see it. **Note:** There are two versions of the Riot 3D ARF available – Transparent Yellow (GPMA1570), White (GPMA1571).

For the latest technical updates or manual corrections to the Riot 3D ARF visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, and then select the Riot 3D 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 Riot 3D 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 Riot 3D 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 use an R/C radio system that is in first-class condition, and a correctly sized motor and components (batteries, wheels, etc.) throughout the building process.

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

6. 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.

7. 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.

8. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high-stress flying, such as racing, or if a motor larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high-stress points and/or substituting hardware more suitable for the increased stress.

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!! 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.

RADIO EQUIPMENT

- 4-channel radio with 3 micro servos such as the Futaba® S3110M with micro plugs (FUTM0702)
- R124F Micro Receiver (FUTL0438 for Low Band, FUTL0439 for high band) with single conversion crystal (FUTL62**) ** selects the channel for your receiver. For example, if you wish to order a channel 35 crystal, you would order FUTL6235
- 8A Micro Brushless ESC, such as Silver Series 8A Brushless (GPMM1800)
- RIMFIRE™ 28-22-1380kV Brushless Out-runner Motor (GPMG4505)
- APC 8x3.8 Slo-Flyer prop (APCQ5000)
- 350-640mAh 3-cell LiPo battery (GPMP0801 – 350mAh 3-cell, GPMP0805 – 640mAh 3-cell)

ADDITIONAL ITEMS REQUIRED

Adhesives & Building Supplies

This is the list of adhesives and building supplies that are required to finish the Riot 3D ARF.

- Great Planes Pro™ thin CA (GPMR6002)
- Great Planes Pro medium CA (GPMR6008)
- Hobbico® builder's triangle (HCAR0480)
- Hobbico hobby knife (HCAR0100)
- #11 Blades for hobby knife (HCAR0211)
- Top Flite® panel line pen (TOPQ2510)
- Drill bits: 1/16" [1.6mm], 3/16" [4.8mm]
- 1/2" [13mm] Double-sided foam mounting tape (GPMQ4440)
- 1" [25mm] Double-sided foam mounting tape (GPMQ4442)

Optional Supplies & Tools

Here is a list of optional tools mentioned in the manual that will help you build the Riot 3D ARF.

- Hobbico covering iron (HCAR8000)
- 21st Century® trim seal iron (COVR2750)
- Hobbico heat gun (HCAR7000)
- Curved-tip canopy scissors for trimming plastic parts (HCAR0667)
- 4 oz. [113g] Aerosol CA activator (GPMR634)
- Stick-on segmented lead weights (GPMQ4485)
- Small T-pins (100, HCAR5100)
- 2 oz. [57g] Spray CA activator (GPMR6035)
- R/C-56 canopy glue (JOZR5007)
- CA applicator tips (HCAR3780)
- CA debonder (GPMR6039)
- Hook & loop material (1" x 6" [25 x 150mm], GPMQ4480)
- AccuThrow™ deflection gauge (GPMR2405)
- Precision Magnetic Prop Balancer (TOPQ5700)

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.

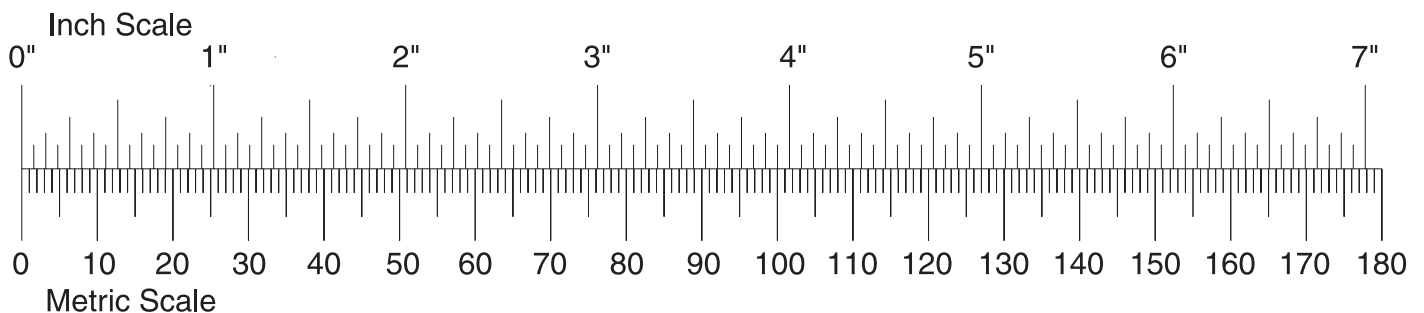
COMMON ABBREVIATIONS

Fuse = Fuselage
 Stab = Horizontal Stabilizer
 Fin = Vertical Fin
 LE = Leading Edge
 TE = Trailing Edge
 LG = Landing Gear
 Ply = Plywood
 " = Inches
 mm = Millimeters
 ESC = Electronic Speed Control

METRIC CONVERSIONS

1" = 25.4mm (conversion factor)

1/64"	=	.4mm	3/4"	=	19.0mm
1/32"	=	.8mm	1"	=	25.4mm
1/16"	=	1.6mm	2"	=	50.8mm
3/32"	=	2.4mm	3"	=	76.2mm
1/8"	=	3.2mm	6"	=	152.4mm
5/32"	=	4.0mm	12"	=	304.8mm
3/16"	=	4.8mm	18"	=	457.2mm
1/4"	=	6.4mm	21"	=	533.4mm
3/8"	=	9.5mm	24"	=	609.6mm
1/2"	=	12.7mm	30"	=	762.0mm
5/8"	=	15.9mm	36"	=	914.4mm

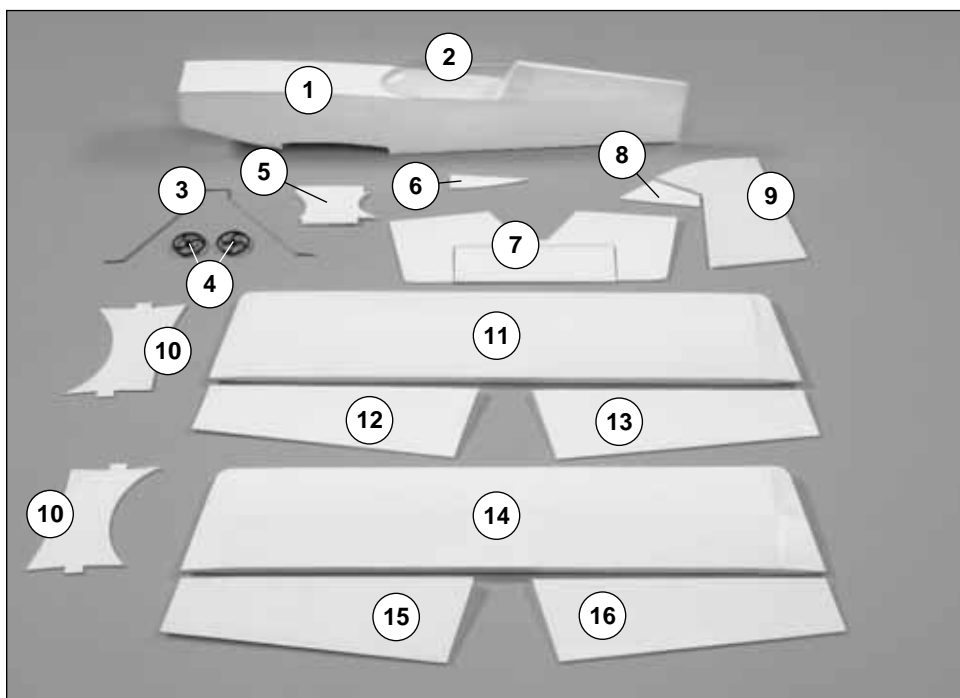


KIT INSPECTION

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

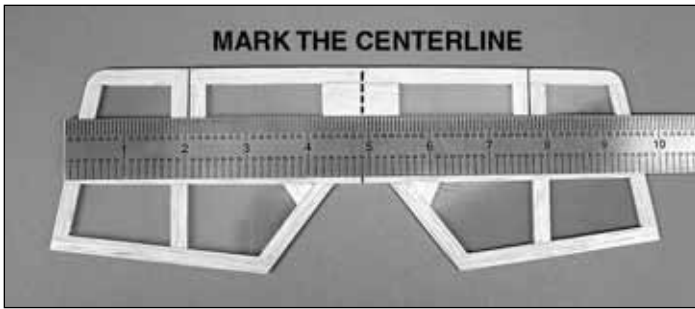
1. Fuselage
2. Canopy
3. Landing Gear
4. Wheels (2)
5. Center Cabane
6. Tail Skid
7. Horizontal Stab & Elevator
8. Fin
9. Rudder
10. Wing Struts (L&R)
11. Bottom Wing
12. Left Bottom Wing Aileron
13. Right Bottom Wing Aileron
14. Top Wing
15. Left Top Wing Aileron
16. Right Top Wing Aileron

Kit Contents (Not Photographed)

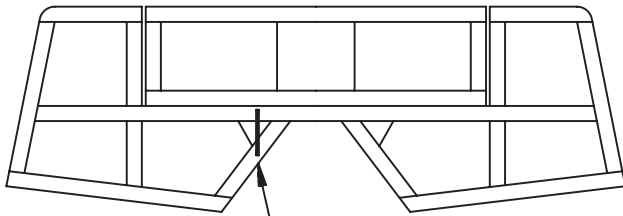
- (1) Hardware Bag
- (2) 12" [305mm] Carbon Rods
- (4) 6" [153mm] Carbon Rods
- (3) #2 x 3/8" [9.5mm] Self-tapping Screws
- (3) #2 Flat Washers
- (15) CA Hinges
- (2) Wheel Pants

ASSEMBLE THE FUSELAGE

Install the Tail Surfaces

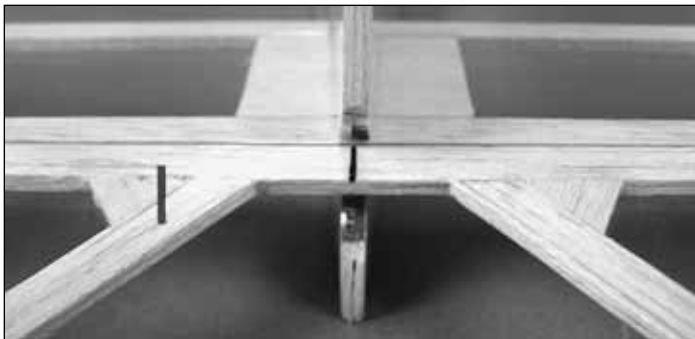


- ❑ 1. Locate the pre-hinged **horizontal stab** and **elevator**. Measure and mark the center of the stabilizer as shown.

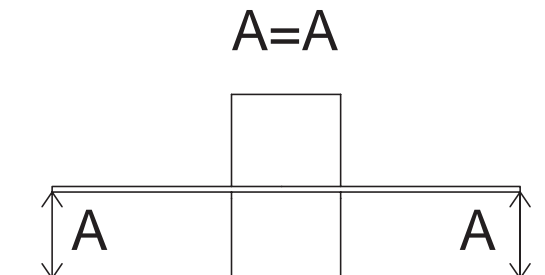


3/4" [19mm] long
1/16" [1.6mm] wide
slot cut here

- ❑ 2. Carefully cut a slot for the **elevator control horn** in the area marked on the sketch.

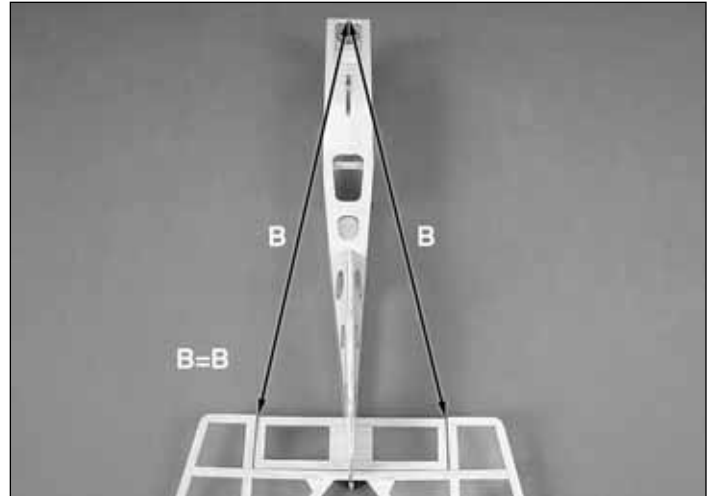


- ❑ 3. Insert the stab into the fuselage. Align the mark with the centerline of the fuselage.



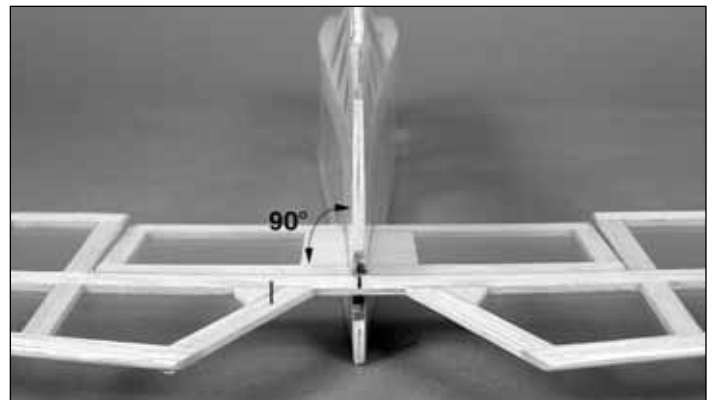
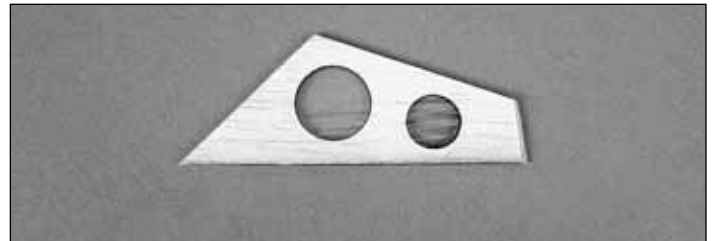
- ❑ 4. With the model sitting on a flat surface, measure the distance from each stab tip to the surface. The measurements

should be equal. Sand the slot in the rear of the fuse as needed for a proper fit.

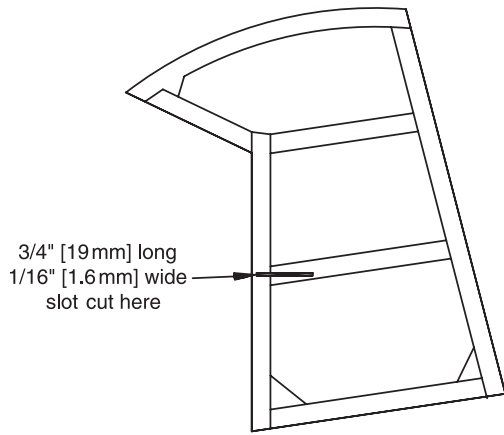


- ❑ 5. Using a piece of string, measure the distance from the center of the nose of the fuselage to each of the stab tips. These distances must be equal. Mark the stab where it enters the fuselage. Trim the covering from the stab inside the marks.

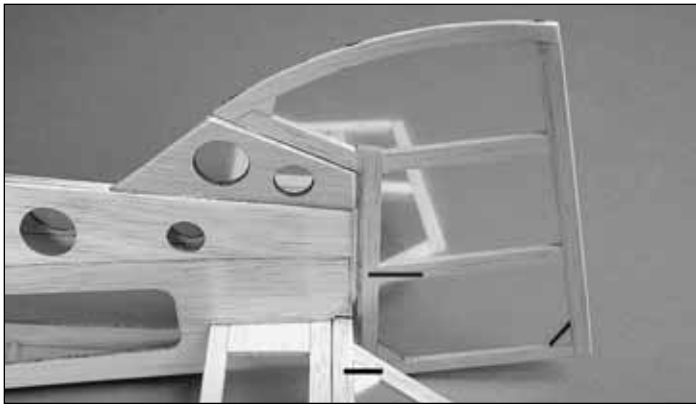
- ❑ 6. Glue the stab in place once it is aligned with thin CA.



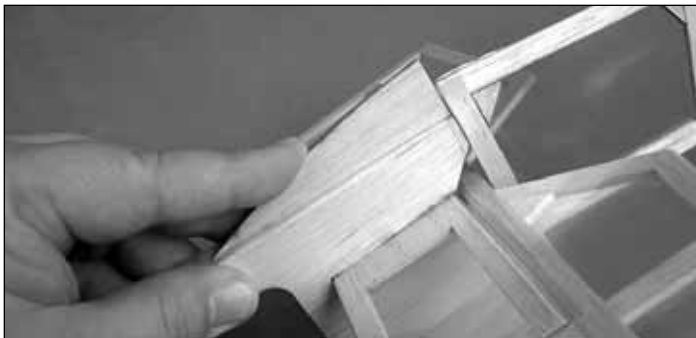
- ❑ 7. Locate the **fin**. Glue it in place along the centerline of the fuselage as shown. The fin must be perfectly straight up and down and at a 90° angle to the stabilizer.



❑ 8. Carefully cut a slot for the rudder control horn in the area marked on the sketch.



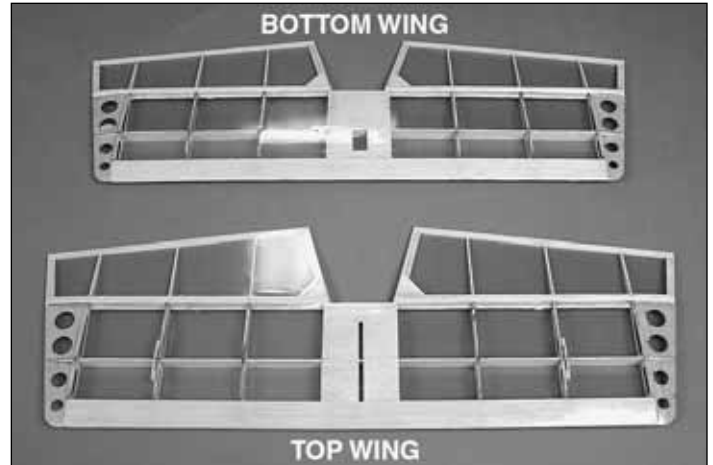
❑ 9. Using three CA hinges, attach the **rudder** to the fin and fuselage. Use three (3) drops of thin CA on each side of the hinges. Wipe up any excess glue. **DO NOT** use accelerator on the CA. This will cause the hinges to be very stiff and possibly break.



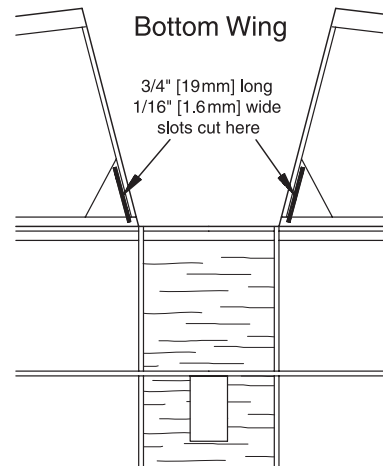
❑ 10. Glue the **tail skid** in place along the centerline of the fuselage as shown.

❑ 11. It is easiest to attach the **canopy** at this time. Later, the wings may make canopy installation a little more difficult. Attach the canopy using clear strips of tape or use canopy glue. Do not use CA as this will distort the plastic or cause it to "fog" over.

Mount the Wings



❑ 1. Attach each of the **aileron** to the wings using three CA hinges.



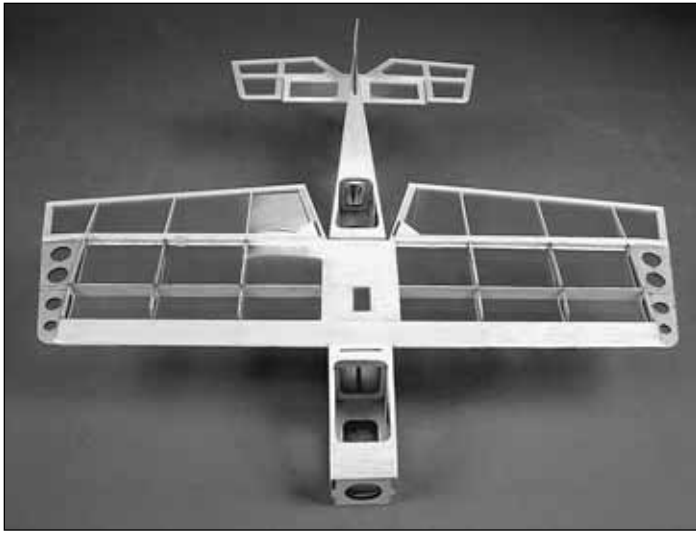
❑ 2. On the bottom wing ailerons **ONLY**, carefully cut a slot in the aileron for the control horn in the location shown in the sketch.



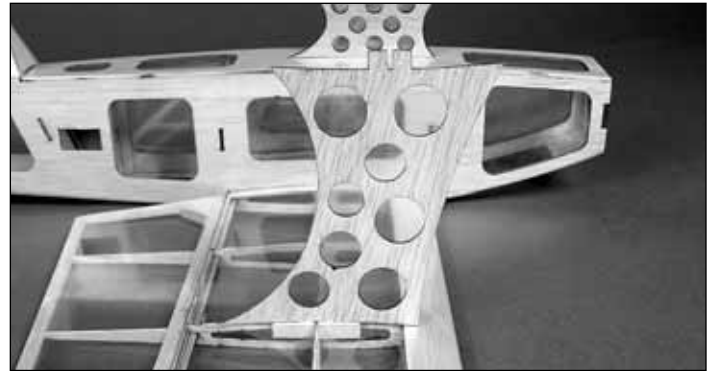
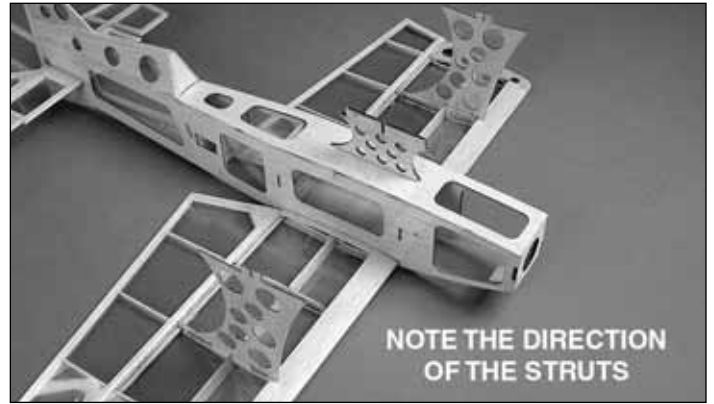
HOW TO CUT COVERING FROM Balsa

Use a soldering iron to cut the covering from the fin. The tip of the soldering iron doesn't have to be sharp, but a fine-tip does work best. Allow the iron to heat fully.

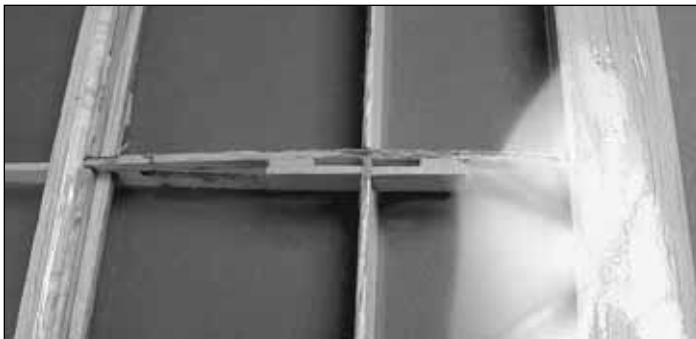
Use a straightedge to guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut. Peel off the covering.



❑ 3. Center the bottom wing in the **wing saddle area** as shown using the same measuring technique as the stabilizer. It may assist you to mark the centerline on the fuselage and bottom wing with a felt-tip pen. Mark on the wing where it meets the fuselage. Trim the covering inside the marks, and then, glue the wing in place using medium CA. Be very careful not to cut into the balsa.



❑ 5. Test fit the wing struts and center cabane as shown in the photos above. Glue the wing struts in place as shown using medium CA. Note the direction of the wing struts. Insure the struts are parallel to the fuse.



❑ 6. Test fit the the top wing on the struts and center cabane. Glue the top wing to the wing struts using medium CA. Check that the top wing is parallel to the bottom wing.

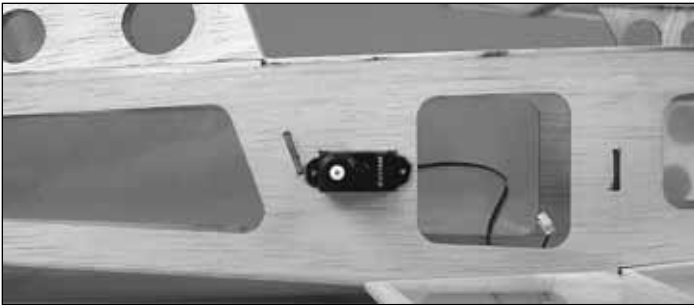


❑ 4. Locate the two **wing struts** and **center cabane**. There are slots in the top of the bottom wing, and the bottom of the top wing for these wing struts to slide into. Carefully remove the covering from these slots using a sharp hobby knife.

RADIO SYSTEM INSTALLATION

In the following sections, the hardware you will be using will come from the included plastic parts trees. Whenever possible, the part will have a number associated with it and that number will be in parentheses. For example, the Z-bend clevis part number is A1 on the parts tree.

Install the Servos & Pushrods



1. Carefully remove the film covering the **servo bays** just behind the wings. Insert a servo with the spline toward the tail as shown on both sides of the fuselage.

2. Glue the servo in place using medium CA.



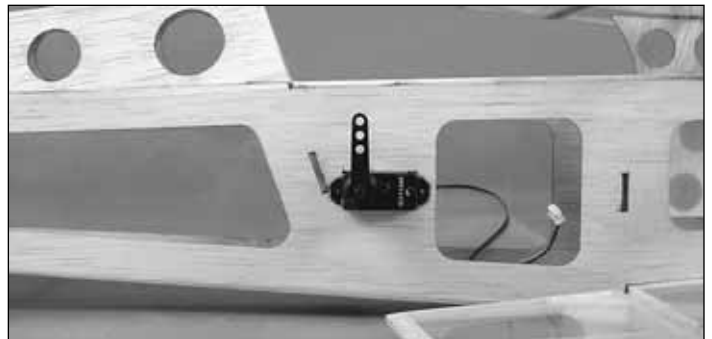
3. Insert a **Z-bend clevis (A1)** into a **control horn (B1)** as shown. It may be necessary to slightly enlarge the hole in the control horn (B1) to allow the Z-bend clevis (A1) to rotate freely. If necessary, use a sharp hobby knife to enlarge the hole.



4. Glue the control horn (B10) in place using medium CA as shown. Press a **backplate (B2)** onto the back side of the control horn (B1).

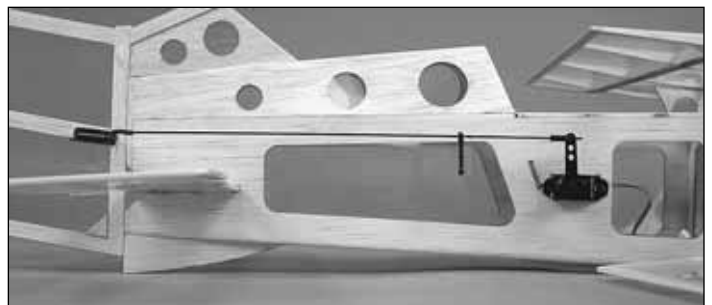


5. Install a Z-bend clevis (A1) in the last hole out on the servo arm. If needed, enlarge the hole in the servo arm slightly with a sharp hobby knife prior to attaching it to the servo.

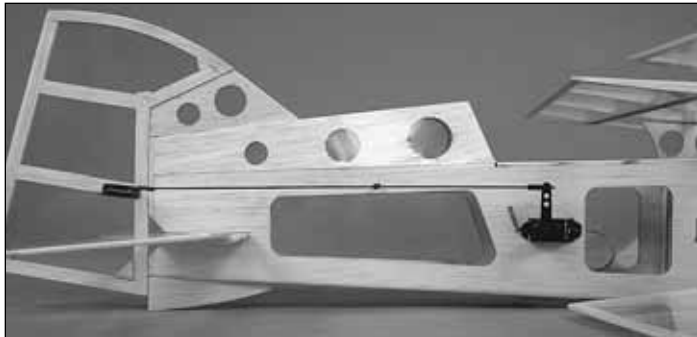
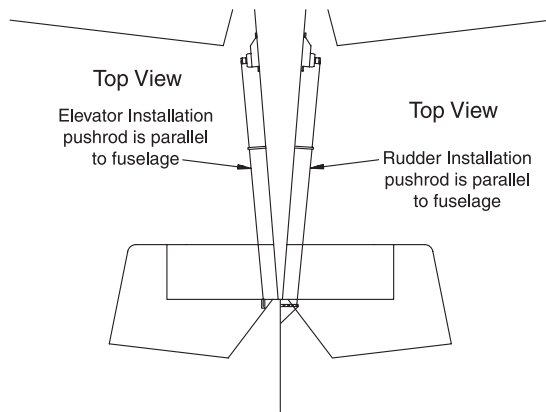


6. Center all trims on your radio system and connect the rudder servo to the rudder channel to center the servo. Attach a **servo arm (G6)** as shown.

7. Locate a 12" [305mm] carbon rod and one **pushrod standoff (E3)**.

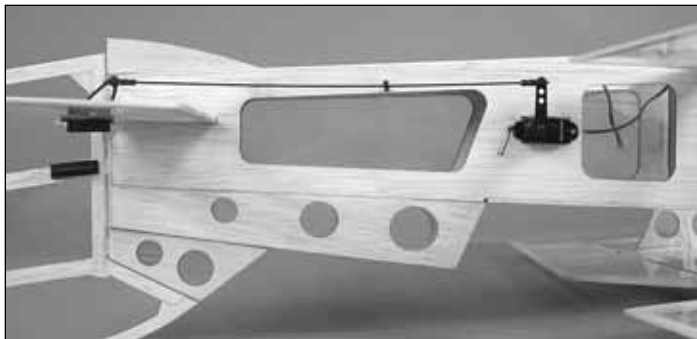


8. Slide one pushrod stand off onto the 12" [305mm] carbon rod. Insert the pushrod into both Z-bend clevises (A1) as shown. If necessary, lightly sand the carbon rod. Be careful when inserting it into the clevis.

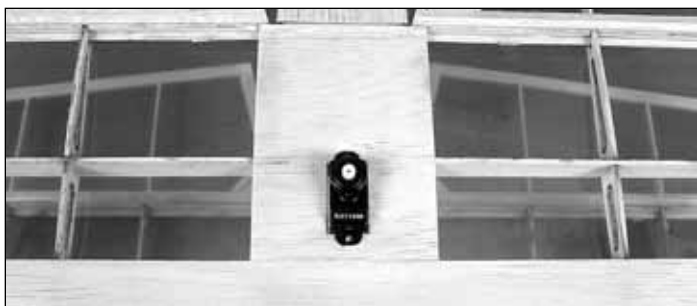


□ □ 9. Drill a 3/32" [2.4mm] hole and glue the pushrod standoff (E3) in place as shown.

□ □ 10. Align the rudder at neutral with the servo arm centered. Apply a small drop of thin CA where the pushrod enters each clevis.



□ □ 11. Repeat steps 1-10 for the elevator pushrod. Final installation should resemble the photo above.



□ 12. Glue a servo in place in the bottom wing as shown.

□ 13. Install two Z-bend clevises (A1) into the outer holes on the double servo arm (G4).



□ 14. Attach a **double servo arm (G4)** that fits your servo. Enlarge the outer holes in the double servo arm (G4) before installing the arm on the servo.



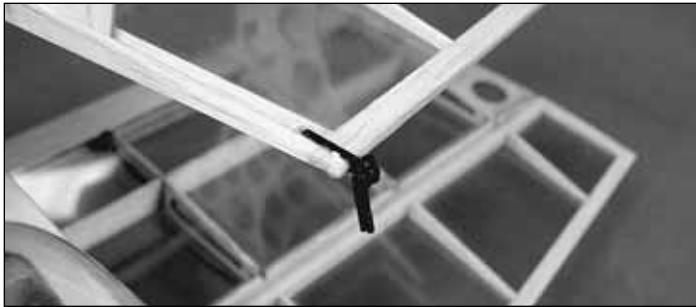
□ 15. Install Z-bend clevises (A1) into two control horns (B1) and glue them in place as shown. Press a backplate (B2) onto the back side of the control horn (B1). The Z-bend clevises (A1) should be installed on the outer side of the control horn (B1).



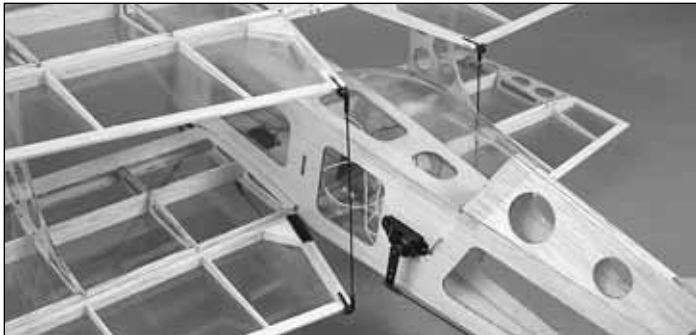
□ 16. Locate the two 6" [153mm] carbon pushrods. Insert the pushrod into the Z-bend clevises (A1) as shown. **Using your radio, center the servos** and align the ailerons at neutral. Adjust the pushrods as needed. Secure in place with a drop of thin CA where the pushrods enter the Z-bend clevises (A1).



□ 17. Insert a Z-bend clevis (A1) into four **closed ended hinge points (C4)** as shown.



□ 18. Cut a slot in the aileron and insert the closed ended hinge points (C4) with the Z-bend clevis (A1) facing the fuselage as shown. Glue in place with CA.

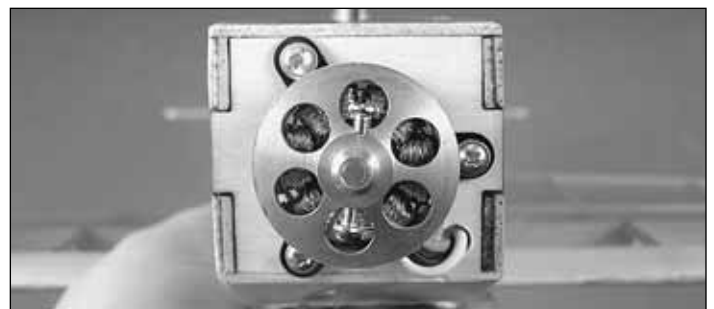
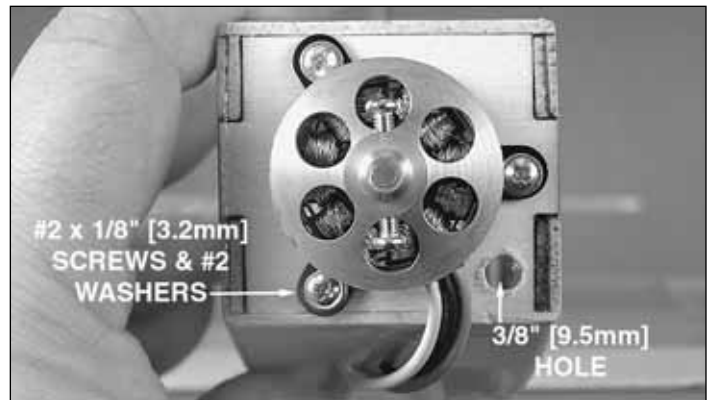


□ 19. Insert a 6" [153mm] carbon pushrod between the Z-bend clevises (A1). Align both ailerons at neutral and glue the carbon pushrod in place. Trim the carbon rod as needed. **Be careful as you get only one chance for proper alignment before the glue sets.**

Motor & ESC Installation



□ 1. The power system recommended for the Riot 3D ARF is the ElectriFly RimFire™ 28-22-1380kV out-runner motor, 8x3.8 APC Slo-Flyer prop, and Silver Series SS-8 Amp ESC. This is the power system that will be illustrated in the manual. If you choose another power system for your Riot 3D ARF, use the manual as a general guide for your installation.



□ 2. Attach the motor to the **firewall** as shown using three #2 x 1/8" [3.2mm] screws and #2 washers. Remove the screws and harden the mounting holes by applying thin CA. Reinstall the #2 x 1/8" [3.2mm] screws and #2 washers. Drill a 3/8" [9.5mm] hole in the lower right corner of the firewall as shown for routing the motor leads.



❑ 3. Attach the ESC to the inside wall of the fuselage as shown using hook and loop material or double-sided tape.

❑ 4. Connect the motor leads to the ESC. **Check for the proper direction of rotation. If the motor operates in the wrong direction, disconnect and swap any TWO motor leads.**



❑ 3. Drill two 1/16" [1.6mm] holes approximately 1/4" [6.4mm] apart. Route the antenna from the receiver out of the bottom of the airplane and "thread" it into the tail skid as shown.

ATTACH THE MAIN GEAR

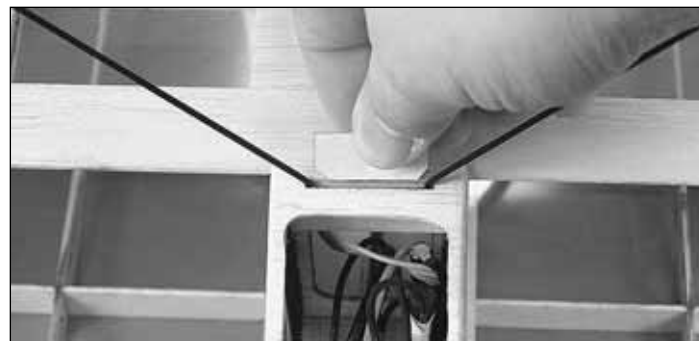
Battery & Receiver Installation



❑ 1. Connect all servo leads and the ESC at this time. Attach the receiver to the inside of the fuselage behind the main wing using hook and loop material or double-sided tape as shown.



❑ 2. Place a small length of the "hook" (rough) side of hook and loop material on the inside of the fuselage near the nose of the aircraft as shown. The "loop" (soft) side of the hook and loop material is attached to the battery. Do not connect the battery to the ESC until ready to fly.

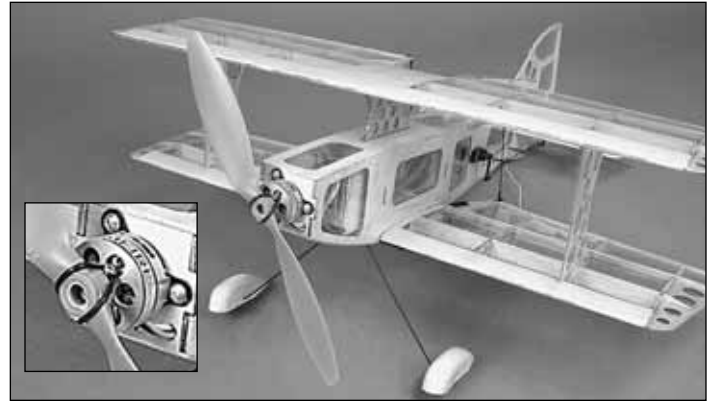


❑ 1. Insert the **pre-bent landing gear wire** into the slot in the fuselage. Locate the **small gear retainer block** and press it into the slot with your thumb after the pre-bent landing gear wire is in place as shown. Glue the block into place with thin CA.



❑ 2. Trim the **wheel pants** along the cut lines to match the shape above.

ATTACH THE PROPELLER



1. Connect the propeller to the motor as shown using the rubber O-rings supplied with the motor. Be sure the screws holding the O-rings are held in place with Threadlocker. Propeller installation will resemble the inset photo shown above.

APPLY THE DECALS

1. Use scissors or a sharp hobby knife to cut the decals from the sheet.
2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water—about one teaspoon of soap per gallon of water. Submerge the decal in the soap and water and peel off the paper backing. **Note:** Even though the decals have a “sticky-back” and are not the water transfer type, submersing them in soap & water allows accurate positioning and reduces air bubbles underneath.
3. Position the decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.
4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

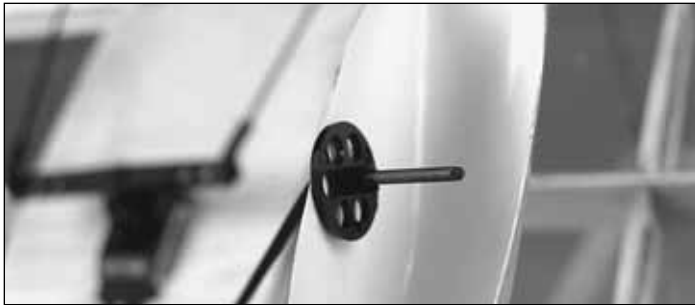
GET THE MODEL READY TO FLY

Check the Control Directions

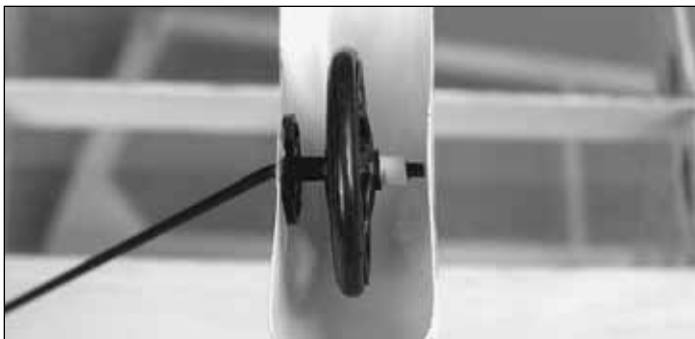
1. Turn on the transmitter and receiver and center the trims. If necessary, remove the servo arms from the servos and reposition them so they are centered. Reinstall the screws that hold on the servo arms.
2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.



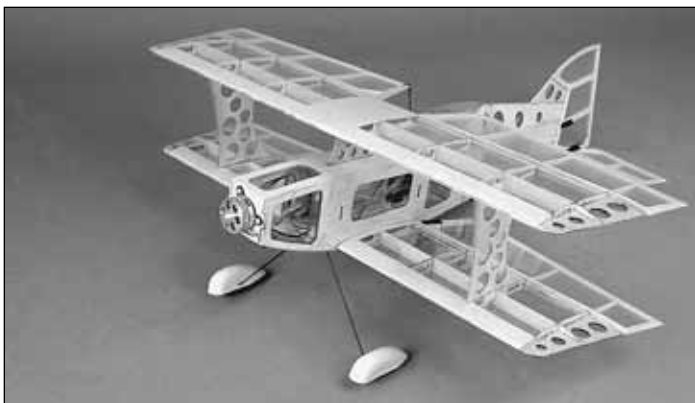
3. Temporarily attach a 1" [25mm] main wheel to the landing gear wire. Align a wheel pant as shown. Mark on the wheel pant where the landing gear wire enters the pant. Drill a 1/16" [1.6mm] hole in the wheel pant.



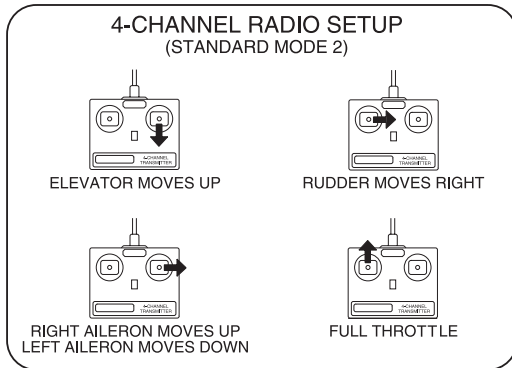
4. Slide the wheel pant onto the landing gear wire along with a **wheel retainer (D6)** as shown. Glue the wheel pant and wheel retainer (D6) in place using medium CA.



5. Attach a main wheel and center it in the wheel pant opening. Use the included **white plastic retainers** to hold the wheel in place. Secure the white plastic retainers with a drop of medium CA. **Be very careful NOT to glue the wheel to the wire.**



6. Final gear installation will resemble the photo above.



3. Make certain that the control surfaces and motor 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. Adjust if necessary.

These are the recommended control surface throws:

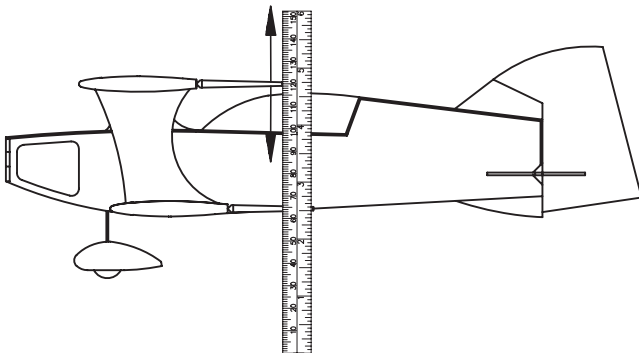
	High Rate	Low Rate
ELEVATOR:	1/2" [13mm] up 1/2" [32mm] down	3/8" [9.5mm] up 3/8" [9.5mm] down
RUDDER:	1-3/8" [35mm] right 1-3/8" [35mm] left	1" [25mm] right 1" [25mm] left
AILERONS:	5/8" [16mm] up 5/8" [16mm] down	3/8" [9.5mm] up 3/8" [9.5mm] down

3D RATES

3D ELEVATOR:	1-3/8" [35mm] up 1-3/8" [35mm] down
3D RUDDER:	2" [51mm] right 2" [51mm] left
3D AILERONS:	2" [51mm] up 2" [51mm] down

IMPORTANT: The Riot 3D 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 Riot 3D 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."

Set the Control Throws



Due to the size of the Riot 3D ARF and its control surfaces, we recommend the use of 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 **high rate** setting (not at the 3D rates).

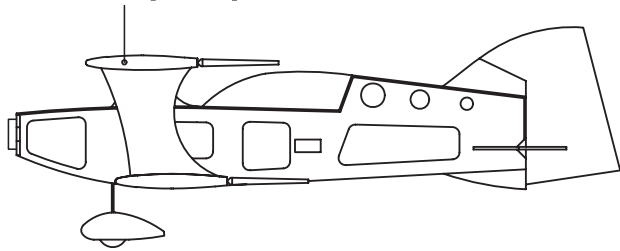
Note: The throws are measured at the **widest part** of the elevators, rudder and ailerons.

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 motor, battery, and the radio system.

CG is 2-5/16" [58mm] from LE



- ❑ 1. Use a felt-tip pen or 1/8" [3.2mm]-wide tape to accurately mark the C.G. on the bottom of the top wing near each wing tip. The C.G. is located 2-5/16" [58mm] back from the leading edge of the top wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 0.4" [10mm] forward or 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) and battery installed, lift the model right-side up at the balance point you marked.

- ❑ 3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. Use Great Planes (GPMQ4485) "stick-on" lead to add additional weight to the Riot 3D ARF if needed. A good place to add stick-on nose weight is to the bottom of the fuselage under the firewall. Begin by placing incrementally increasing amounts of weight on the bottom of the fuse over the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside. **DO NOT** attach tail weight to the stab, as it is not intended to support additional weight.

- ❑ 4. **IMPORTANT:** If you found it necessary to add any weight, recheck the C.G. after the weight has been installed.

Balance the Model Laterally

- ❑ 1. With the wing level, have an assistant help you lift the model by the engine propeller shaft and the bottom of the fuse under the TE of the fin. Do this several times.
- ❑ 2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. An airplane that has been laterally balanced will track better in loops and other maneuvers.

PREFLIGHT

Identify Your Model

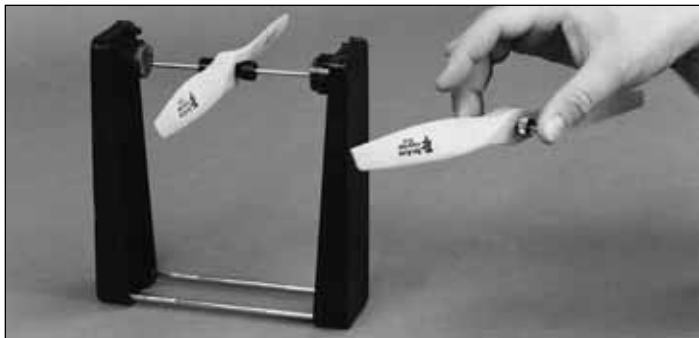
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 18 of this manual 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 receiver batteries the night before you go flying, and at other times as recommended by the radio manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter and receiver 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.

Balance the Propellers



Carefully balance your propeller and spare propellers before you fly. An unbalanced prop can be the single most significant cause of vibration that can damage your model. Not only will motor mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery.

We use a Top Flite Precision Magnetic Prop Balancer (TOPQ5700) in the workshop and keep a Great Planes Fingertip Prop Balancer (GPMQ5000) in our flight box.

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.

MOTOR SAFETY PRECAUTIONS

Failure to follow these safety precautions may result in severe injury to yourself and others.

Get help from an experienced pilot when learning to operate motors.

Use safety glasses when running motors.

Do not run the motor in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the motor.

Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarves, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

The motor could get hot! Do not touch it during or right after operation.

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 in the fuse.
- 3. Extend your receiver antenna and make sure it has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver.
- 4. Balance your model *laterally* as explained in the instructions.
- 5. Add a drop of oil to the axles so the wheels will turn freely.
- 6. Reinforce holes for wood screws with thin CA where appropriate (motor mounting screws).
- 7. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- 8. Make sure that all servo arms are secured to the servos with the screws included with your radio.
- 9. Balance your propeller (and spare propellers).
- 10. Place your name, address, AMA number and telephone number on or inside your model.
- 11. Cycle your battery pack (if necessary) and make sure it is fully charged.
- 12. If you wish to photograph your model, do so before your first flight.
- 13. Range check your radio when you get to the flying field.

FLYING

The Riot 3D ARF is a very responsive airplane. Be very careful on your first flights. The Riot 3D 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 & Takeoff

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 Riot 3D ARF by the fuselage just behind 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 Riot 3D 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.

The Riot 3D ARF is also capable of rise off the ground (R.O.G.) takeoffs. Since the Riot 3D ARF does indeed have a large thrust-to-weight ratio, ground takeoffs will require very short distances. Point the nose of the Riot 3D ARF into the wind and advance the throttle smoothly. A very sudden throttle movement could cause a great deal of roll due to torque and make the plane very difficult to control. When the Riot 3D ARF begins to lift off the ground, apply a small amount of up elevator to rise into the air. Once airborne, climb to a safe altitude and let the fun begin.

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 Riot 3D 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 remaining, 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 it 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 level, 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 flare 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 propeller 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.**

Have a ball! But always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!

This model belongs to:

_____	Name
_____	Address
_____	City, State Zip
_____	Phone number
_____	AMA number

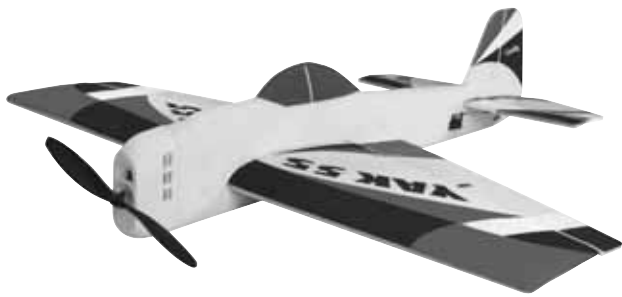
Make a copy of this identification tag and put it on or inside your model.

OTHER ITEMS AVAILABLE FROM GREAT PLANES



ElectriFly FlatOuts™ Reflection™

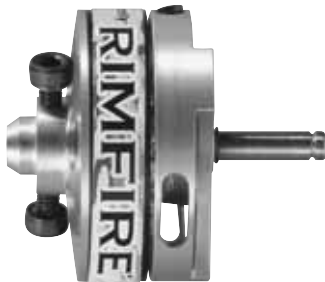
Go end-over-end with ease! If you're looking for tumbling fun, the FlatOuts Reflection is your plane. Waterfalls, tumbles, and rolls are amazingly easy. With its short wingspan and large ailerons, the roll rate is incredible. Flight-ready in only 2-3 hours, the Reflection includes a T-370 brushed motor with gearbox and slow-fly prop (and is also available in a version without them, GPMA1140). Using the supplied custom hardware and foam-safe CA, you'll easily assemble its colorful foam panels and carbon rods into a strong, eye-catching model that offers big returns in performance for very little time and money.



ElectriFly YAK 55 3D EP ARF

After just 2-3 hours of assembly, the YAK 55 3D EP ARF is ready to perform high alpha flight, Harriers, Blenders, Walls and more! It features ultra-durable FlightFlex™ construction that allows it to bounce back from crashes. With its pre-painted, high-visibility trim scheme, the model looks as great as it flies. A powerful Speed Force ball bearing motor and gearbox are included, assembled and ready to install.

The YAK 55 3D EP ARF is small and quiet enough to be flown at a park or sports field. It features large control surfaces that deliver maximum deflection for precision piloting, allowing you to perform nearly any 3D maneuver you can imagine! **GPMA1274**



ElectriFly RimFire™ Out-Runner Brushless Motor

Designed for explosive acceleration and maximum torque, RimFire out-runner brushless motors are dependable and virtually maintenance-free – there are not comms or brushes to worry about, and the bearings are double-shielded. The lightened aluminum can houses high-torque, “rare earth” Neodymium magnet. Improved cooling means 50% more power than other out-runners of similar size. **GPMG4505**



Futaba® 4EXA 4-Channel Computer Radio

The 4EXA stores up to 4 models in memory, and lets you call them up in seconds. Programming is easy; using just

two keys and a lever. But the 4EXA's biggest benefit is this: room to grow. With the 4EXA, EPA for servos, expo, wing mixing for V-tail and elevon are at your fingertips whenever you want them. Includes an R124 receiver, full NiCds and three S3108M servos. 72 MHz. **FUTK41****



Futaba S3110 Micro High-Torque Servo

Ideal for park flyers and small electric aircraft, Futaba's S3110 servo features a micro plug plus replaceable case set and gears. **FUTM0702**



Futaba R124F Ultra Micro Receiver

In park flyers, cutting even a gram from all-up weight helps performance – a good reason to choose Futaba's R124F. It weighs just 0.35 oz [9.8g] with case; substitute shrink wrap for the case, and weight drops again. Plus, it's compatible with the smaller, lighter micro plugs found on Futaba's sub-micro S3108 and S3109 park flyer servos. Fewer grams, FM signal tech – the R1247F can offer both, on both Low and High 72MHz bands. 1-year warranty. “Short” crystals required. **FUTL0438 – Low Band, FUTL0439 – High Band**



ElectriFly Silver Series 8A Micro Brushless ESC

If you're into electric flight, take it easy: get a Silver Series ESC. It's easy to find a compatible battery – you can use NiCd, NiMH or LiPo. Hook-up takes just seconds, and there's NO set-up. Silver Series ESCs detect the battery type, read the voltage and set the voltage cut-off. Brake turns on (or off) at your option. The BECs are hefty and realistically rated. The SS-8 delivers 1.5A, for right-now response and extended flight times. **GPM1800**

