

ElectriFly™

YAK-55 M

ALMOST-READY-TO-FLY EP AEROBAT

E • PERFORMANCE • SERIES



INSTRUCTION MANUAL

SPECIFICATIONS

Wingspan:	51 in [1295mm]
Wing Area:	508 in ² [32.8 dm ²]

Weight:	3.5– 3.75 lb [1590– 1700 g]
Wing Loading:	16– 17 oz/ft ² [49– 52 g/dm ²]

Length:	47 in [1195mm]
Radio:	4-Channel minimum or 5-Channel with mixing (for separate ailerons)
Motor/ESC/Prop:	RimFire .32 (42-50-800)

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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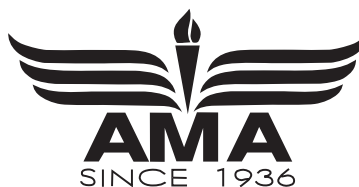
INTRODUCTION

The full scale Yakovlev Yak-55M EP is a low cost, advanced aerobatic aircraft. ElectriFly has taken the best qualities of the full scale Yak-55M and reduced it down to a light weight, 51" electric powered ARF. The ElectriFly Yak-55M EP flies great and looks great. Now you can practice for IMAC competition without risking your larger, more expensive planes.

For the latest technical updates or manual corrections to the Yak-55M EP visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the Yak-55M EP 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

Academy of Model Aeronautics: If you are not already a member of the AMA, please join! The AMA is the governing body of model aviation and membership provides liability insurance coverage, protects modelers' rights and interests and is required to fly at most R/C sites.



Academy of Model Aeronautics

5151 East Memorial Drive
Muncie, IN 47302-9252
Tele. (800) 435-9262
Fax (765) 741-0057
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 Yak-55M EP 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 Yak-55M EP, 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 (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. **WARNING:** The cowl and wheel pants included in this kit are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part (wheel pant, cowl) to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

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.

DECISIONS YOU MUST MAKE

Radio Equipment

The Yak-55M EP requires a 4-channel radio system with four micro servos such as the Futaba® S3115 Micro Precision Servo. For optimum performance, we recommend the Futaba S3150 Slim Digital Servos.

In addition, three 9" [229mm] servo extensions are required for the aileron servos and the ESC. Two 16" [405mm] servo extensions are required for the rudder and elevator servos. If you are using a radio system that does not support mixing functions, a Y-harness will also be required to connect the aileron servos to the receiver.

- ☐ (4) Futaba S3115 Micro Precision Servos [FUTM0415]
[38.9 oz-in (2.8 kg-cm) of torque]

OR

- ☐ (4) Futaba S3150 Slim Digital Servos [FUTM0303]
[51.4 oz-in (3.7 kg-cm) of torque]

PLUS

- ☐ (1) "Y" harness [FUTM4130]
☐ (2) 16" extensions [FUTM3955]
☐ (3) 9" extensions [FUTM3910]

Motor/ESC Recommendations

The recommended motor and speed control for the Yak-55M EP is a RimFire™ .32 (42-50-800) brushless outrunner motor and the SS-45A Brushless ESC.

- ☐ Great Planes RimFire .32 Brushless Outrunner Motor [GPMG4700]
☐ Great Planes Silver Series SS-45A Brushless ESC [GPMM1840]

Propeller

If using the recommended RimFire .32 Outrunner Motor, we suggest an APC 12x6E electric propeller [APCQ4130].

Recommended Batteries

If using the suggested motor and prop combination, a 2200mAh 14.8V LiPo battery pack is recommended.

- ☐ Great Planes ElectriFly LiPo 14.8V 2200mAh 25C (GPMP0521)
OR
☐ FlightPower® LiPo EOUX30 14.8V 2200mAh 30C (FPWP6199)

Recommended Charger

A LiPo compatible charger is required to charge LiPo batteries. The Great Planes ElectriFly PolyCharge4™ is designed for LiPo packs only; however, it is able to charge four LiPo packs simultaneously. The ElectriFly Triton2™ and AC/DC Triton2 EQ chargers will only charge one pack at a time, but are capable of charging NiCd, NiMH, Pb acid and LiPo batteries.

- ☐ Great Planes PolyCharge4 DC-Only 4 Output LiPo Charger (GPMM3015)
OR
☐ Great Planes ElectriFly Triton2 DC Computer Peak Charger (GPMM3153)
OR
☐ Great Planes AC/DC Triton2 EQ Charger/Balancer (GPMM3156)

Throughout the life of a LiPo battery, the individual cells located inside the battery may become unbalanced. These unbalanced cells can shorten the life of the battery or cause it to malfunction. For this reason, it is always recommended that a cell balancer be used when charging LiPo batteries. The ElectriFly Equinox™ is a cell balancer that may be used with any LiPo charger and is capable of maintaining the cell balance of the battery. Note: The AC/DC Triton2 EQ does not require a cell balancer.

- ☐ Great Planes ElectriFly Equinox LiPo Cell Balancer [GPMM3160]

ADDITIONAL ITEMS REQUIRED

Adhesives and Building Supplies

This is the list of adhesives and building supplies required to finish the Yak-55M EP. Order numbers are provided in parentheses.

- ☐ 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
- ☐ Pro 30-minute epoxy (GPMR6043)
- ☐ Threadlocker thread locking cement (GPMR6060)
- ☐ Denatured alcohol (for epoxy clean up)
- ☐ Paper towels
- ☐ Drill bits: 1/16" [1.6mm], 3/32" [2.4mm]
- ☐ #1 Hobby knife (RMXR6903)
- ☐ #11 blades (5-pack RMXR6930)
- ☐ Small T-pins (100, HCAR5100)
- ☐ Tape measure
- ☐ Pliers with wire cutter (HCAR0625)
- ☐ Phillips Head screw driver
- ☐ Masking tape
- ☐ Metal cutting file

Optional Supplies and Tools

Here is a list of optional tools mentioned in the manual that will help you build the Yak-55M EP.

- ☐ 2 oz. [57g] spray CA activator (GPMR6035)
- ☐ CA applicator tips (HCAR3780)
- ☐ CA debonder (GPMR6039)
- ☐ Pro 6-minute epoxy (GPMR6042)
- ☐ Epoxy brushes (6, GPMR8060)
- ☐ Mixing sticks (50, GPMR8055)
- ☐ Mixing cups (GPMR8056)
- ☐ AccuThrow™ Deflection Gauge (GPMR2405)
- ☐ CG Machine™ (GPMR2400)
- ☐ 21st Century® sealing iron [COCR2700]
- ☐ 21st Century iron cover [COVR2702]

IMPORTANT BUILDING NOTES

• There are three types of screws used in this kit:

Sheet metal screws are designated by a number and a length. For example, #6 x 3/4" [19mm]



Machine screws are designated by a number, threads per inch, and a length. For example 4-40 x 3/4" [19mm]



• 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**, and 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.

• We recommend 30-minute epoxy to install the stabilizer, because you will need the working time. 6-minute epoxy can be used for the remaining assembly, but 30-minute epoxy can also be used.

• **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.

• The Yak-55M EP is factory-covered with Top Flite® MonoKote® film. Should repairs ever be required, MonoKote can be patched with additional MonoKote purchased separately. MonoKote is packaged in six-foot rolls, but some hobby shops also sell it by the foot. If only a small piece of MonoKote is needed for a minor patch, perhaps a fellow modeler would give you some. MonoKote is applied with a model airplane covering iron, but in an emergency a regular iron could be used. A roll of MonoKote includes full instructions for application. Following are the colors used on this model and order numbers for six foot rolls.

White (TOPOQ0204)
Sapphire Blue (TOPQ0226)
True Red (TOPQ0227)

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.

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

ORDERING REPLACEMENT PARTS

Replacement parts for the Yak-55M EP 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 Great Planes web site at www.greatplanes.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 fax 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

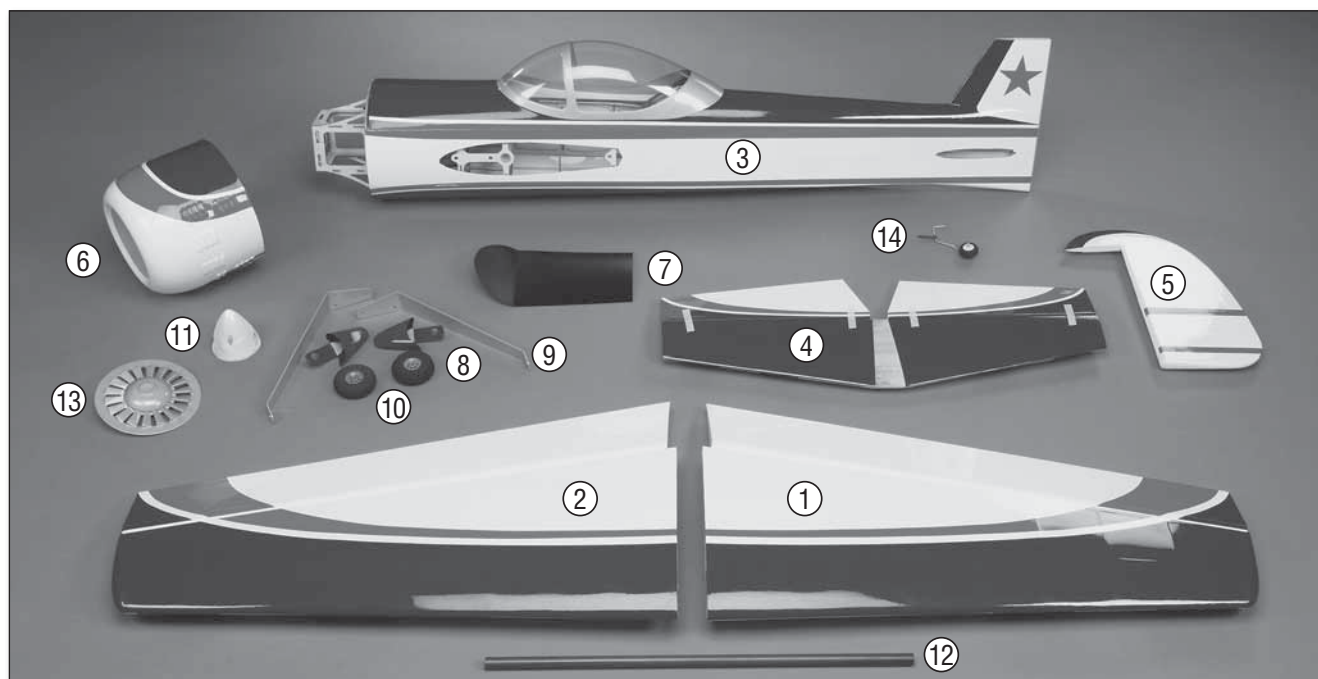
Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

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

REPLACEMENT PARTS LIST

Order No.	Description
GPMA4100	Fuselage
GPMA4101	Wing
GPMA4102	Horizontal Stab
GPMA4103	Rudder
GPMA4105	Canopy/Hatch
GPMA4106	Cowl
GPMA4107	Landing Gear
GPMA4108	Wheel Spats
GPMA4109	Decals
GPMA4110	Wing Joiner Rod
GPMA4111	Wing Screws (2)
GPMA4112	Tailwheel Assembly
NOTE	Full-size plans are not available. You can download a copy of this manual at www.greatplanes.com .

KIT CONTENTS



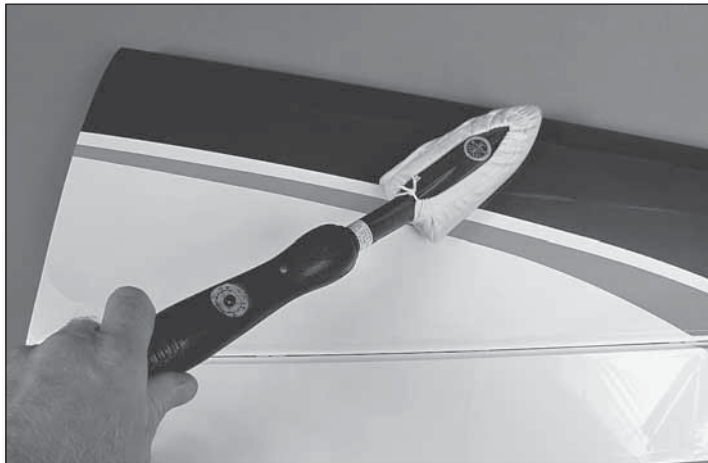
- 1. Left Wing
- 2. Right Wing
- 3. Fuselage
- 4. Stabilizer
- 5. Rudder

- 6. Cowl
- 7. Cockpit floor
- 8. Left & Right Wheel Pant
- 9. Left & Right Main Landing Gear
- 10. Wheels (2)

- 11. Spinner
- 12. Wing Tube
- 13. Cowl Louvers
- 14. Tail gear

PREPARATIONS

- ❑ 1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support at the address or telephone number listed in the "Kit Inspection" section on page 4.

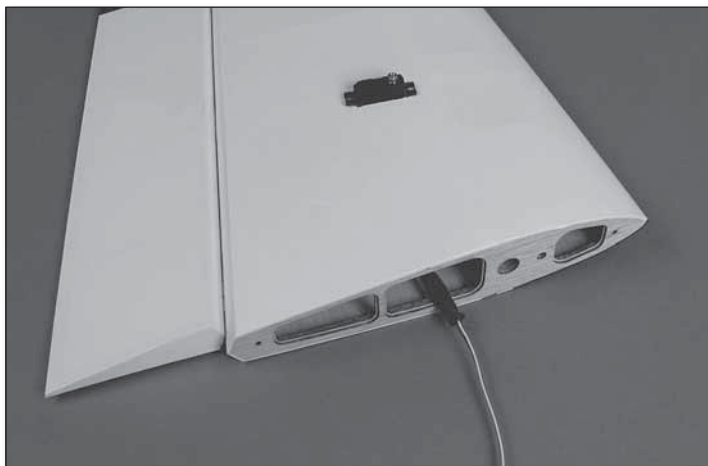


- ❑ 2. Remove the parts from the bags. Use a covering iron with a covering sock on medium heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

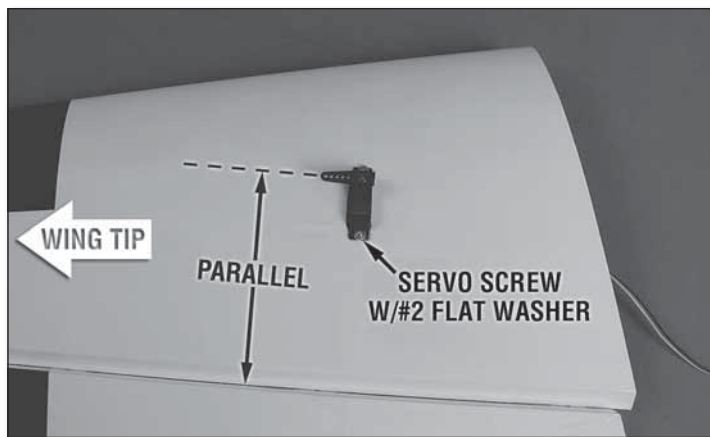
ASSEMBLE THE WINGS

Do the right wing first so your work matches the photos the first time through.

- ❑ ❶ 1. Install a 9" servo extension onto the servo lead. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



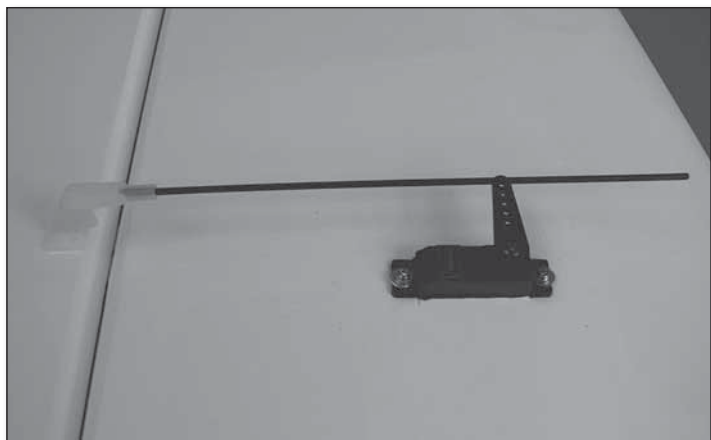
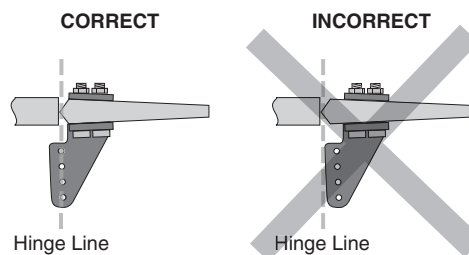
- ❑ ❷ 2. Insert the servo lead in the aileron servo opening and route the lead out the root of the wing. **NOTE:** The Futaba S3150 servo is 2mm longer than the S3115 servo. If the S3150 servo is installed, both ends of the aileron servo opening will need to be trimmed approximately 1/32" [1mm].



- ❑ ❸ 3. Install the servo into the servo opening. Drill through the servo mounting holes with a 1/16" [1.6mm] drill bit. Remove the servo from the servo opening. Install and then remove a servo mounting screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has cured install the servo into the servo opening. Do not install the brass grommets or rubber bushings in the servo. Secure the servo to the wing with the servo mounting screws and **#2 flat washers**. Center the servo and then install a servo arm as shown. The arm should be pointing towards the wingtip, parallel with the aileron hinge line.



- ❑ ❹ 4. Thread a **nylon clevis**, 16 turns, onto a 6" [152mm] **wire pushrod**.

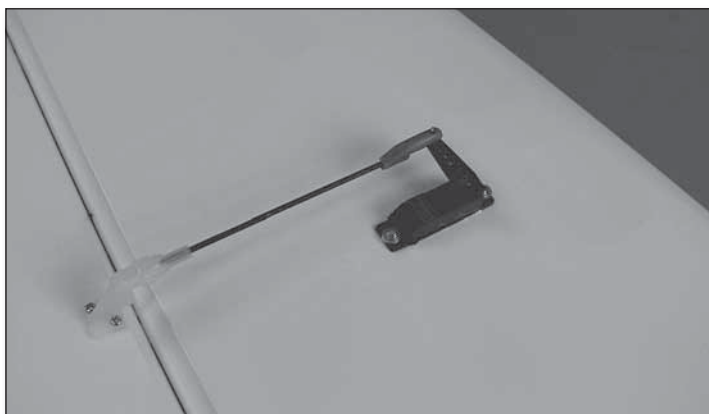


- ❑ ❺ 5. Attach the clevis in the outer hole of a **nylon control horn**. Place the control horn in line with the outer hole in the servo arm. When positioned properly the control horn will

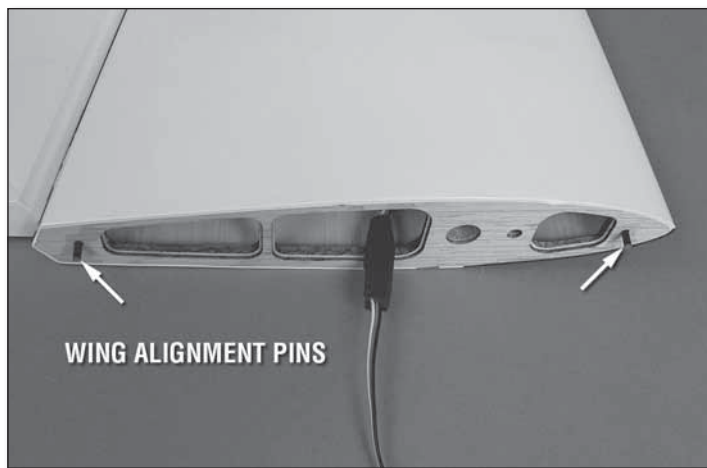
rest on a hardwood block in the aileron. Mark the location of the mounting holes onto the aileron. Drill a 1/16" [3.2mm] hole on the marks, approximately 3/8" [9.5mm] deep. Do not drill completely through the top of the aileron.



❑ ❶. Thread two #2 x 3/8" [9.5mm] **self-tapping screws** through the control horn, into the aileron control horn block. Remove the two screws and harden the screw holes in the aileron with thin CA. After the CA has cured, reinstall the control horn.



❑ ❷. Slide a silicone **clevis retainer** over the clevis. With the aileron servo and the aileron centered, mark the aileron pushrod where it crosses the aileron servo arm. Make a 90° bend at the mark. Cut the pushrod 3/8" [9.5mm] past the bend. Attach the pushrod to the aileron servo arm with a **nylon Faslink™**.

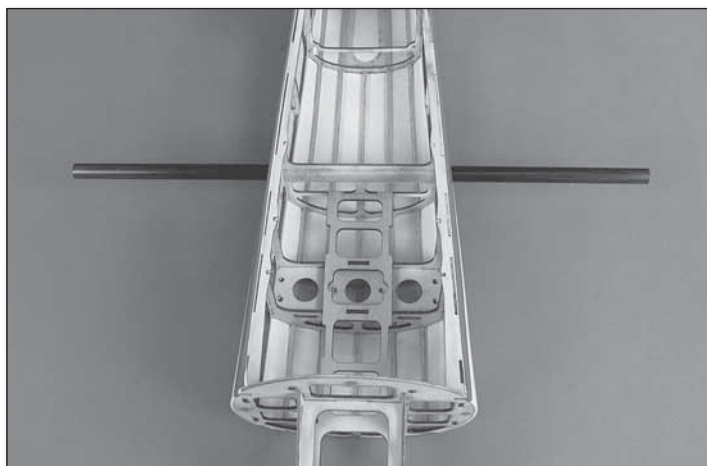


❑ ❸. Use thin CA to glue the two plastic **wing alignment pins** in the root rib. The pins should protrude from the rib approximately 1/4" [6.4mm].

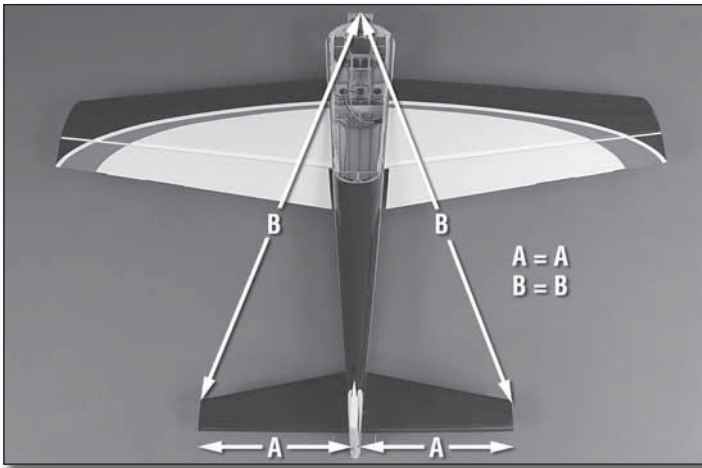
❑ ❹. Repeat steps 1-8 for the left wing panel.

ASSEMBLE THE FUSELAGE

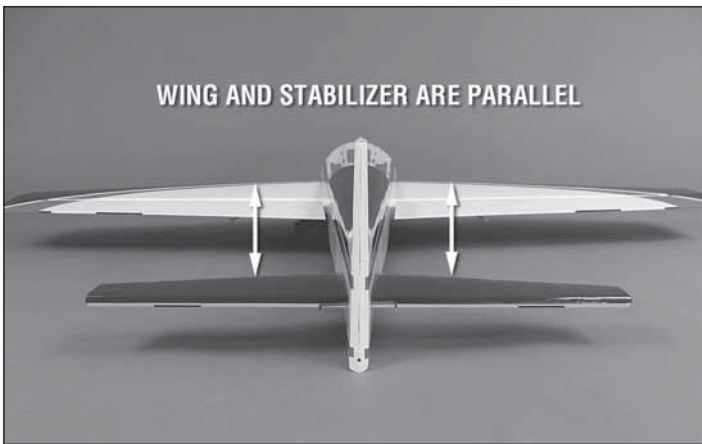
Install the Stabilizer



❑ ❶. Center the **wing tube** in the fuselage. Slide the wing halves onto the wing tube and secure the wing halves to the fuselage with the **aluminum thumb screws**.



- ❑ 2. Center the **horizontal stabilizer**, side-to-side, in the slot in the fuselage. Also measure the distance from the tips of the stab to the center of the fuselage. Adjust the position of the stab until the distance is equal.



- ❑ 3. Stand back and look at the stabilizer in relation to the wing. The stabilizer should be parallel with the wing. If not, lightly sand the stabilizer saddle until the stabilizer and wings are aligned.

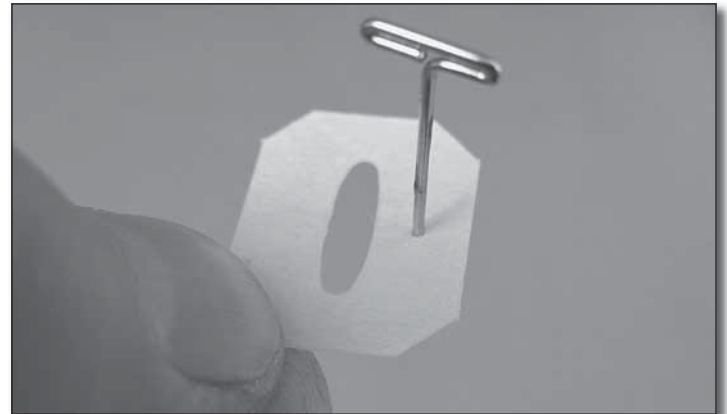


- ❑ 4. Insert the **elevator joiner wire** in the notch at the back of the stabilizer saddle. Use 30-minute epoxy to glue the stabilizer in place, being careful that the stabilizer is properly aligned. **Tip:** Place a piece of masking tape on the top and bottom of the stabilizer, just outside the cut covering. Insert the stabilizer in the fuse so that part of the bare wood is showing.

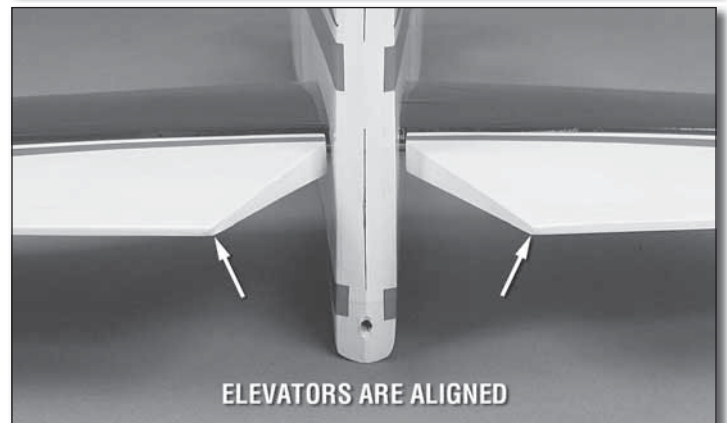
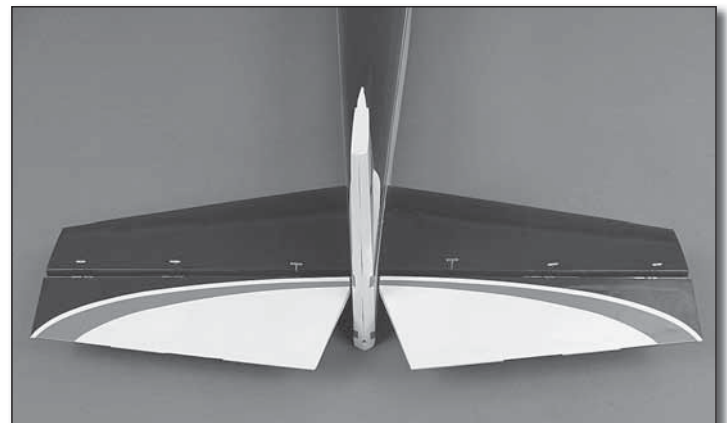
Apply 30-minute epoxy to the wood, top and bottom. Slide the stabilizer through the fuse so that approximately 1/2" [12.7mm] of bare wood is showing on the other side and apply epoxy to the wood. Now align the stabilizer, remove the masking tape and wipe off any excess epoxy from the stabilizer and fuselage. Recheck that the stabilizer is still aligned.

You can now remove the wings and continue with the assembly of the fuselage.

Install the Elevators



- ❑ 1. Test fit the **elevators** to the stabilizer with the **CA hinges**. If the hinges don't remain centered, stick a pin through the middle of the hinge to hold it in position.

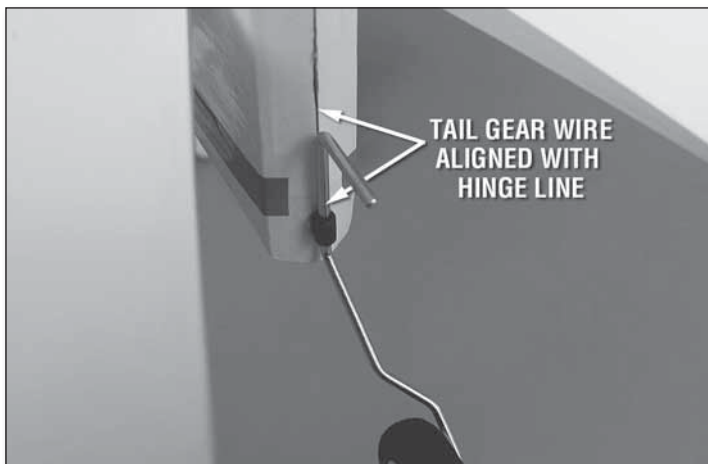


- ❑ 2. Install three CA hinges into each elevator half. Install the elevators onto the stabilizer with the elevator joiner

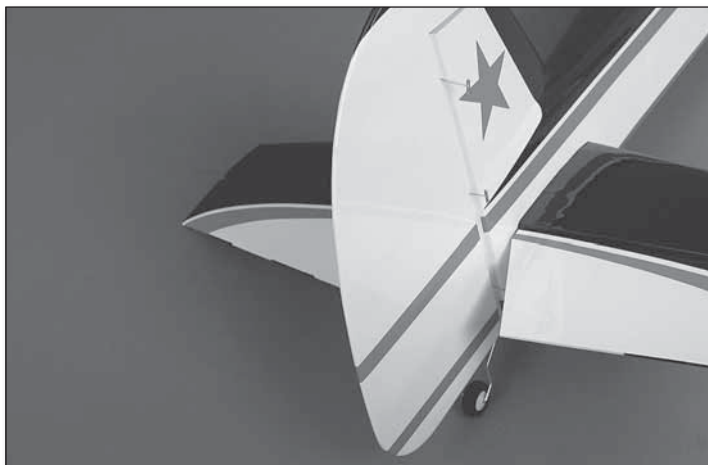
wire in each elevator half. Check that both elevator halves are aligned. If not, remove the elevators and while holding one leg of the elevator joiner wire, slightly bend the other. Reinstall the elevator halves and check again.

- ❑ 3. Coat the inside of the two elevator joiner wire holes and the ends of the elevator joiner wire with epoxy. Install the two elevator halves and glue the hinges with thin CA.

Install the Rudder

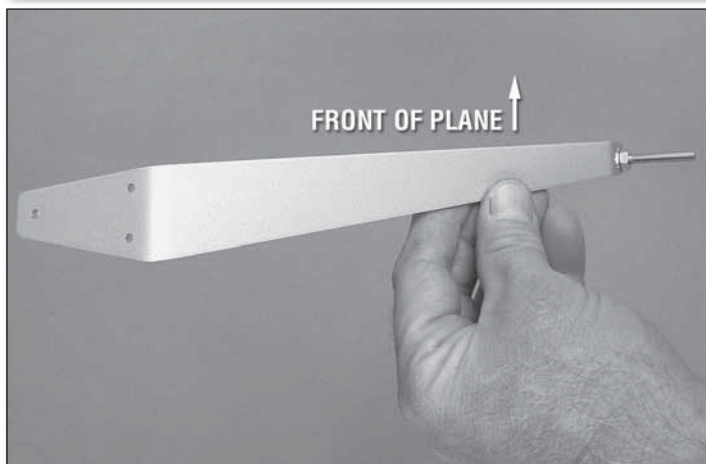
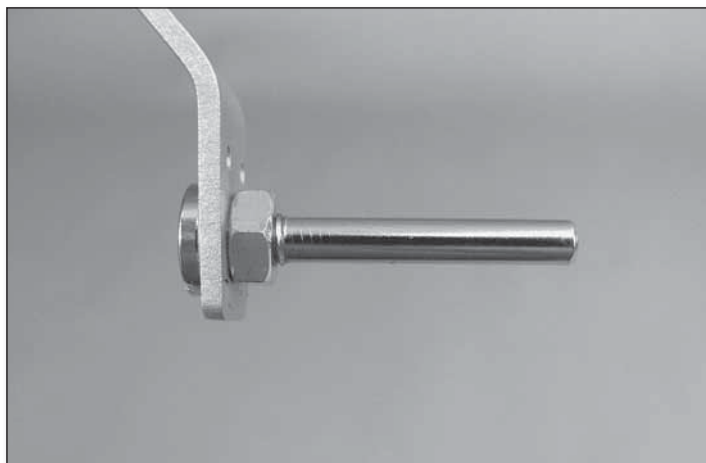


- ❑ 1. Use epoxy to glue the **tail gear bearing** in the aft end of the fuselage. Make sure the tail gear wire is aligned with the hinge line.

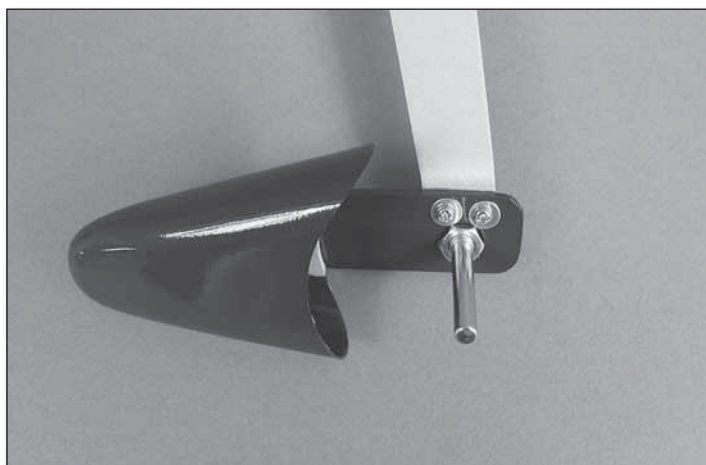


- ❑ 2. Install the three CA hinges into the rudder. Insert the tail gear wire in the rudder and check the fit of the rudder on the fin. Use pins to hold the CA hinges in position.
- ❑ 3. Coat the inside of the tail gear wire hole with epoxy. Install the rudder and glue the hinges with thin CA.

Install the Main Landing Gear



- ❑ ❑ 1. Insert a **4mm axle** through the **right main landing gear**. Apply a drop of thread locker on the threads of the axle. Secure the axle to the landing gear with a **5mm nut**. **Note:** The front of the main landing gear sweeps forward.



- ❑ ❑ 2. Attach the right wheel spat to the main landing gear with two 2-56 x 3/8" machine screws, two #2 flat washers and two 2-56 nuts. Apply threadlocker to the threads of the machine screw before installing the nuts.



- ❑ 3. Install a **4mm wheel collar** on the axle, then the **foam main wheel**, followed by a second 4mm wheel collar. Secure the wheel collars on the axle with **3mm set screws**. Mark the location where the set screw, in the outer wheel collar, tightens on the axle and use a metal cutting file to file a flat spot on the axle. Apply a drop of thread locker on the set screws and reinstall the wheel collars on the axle.

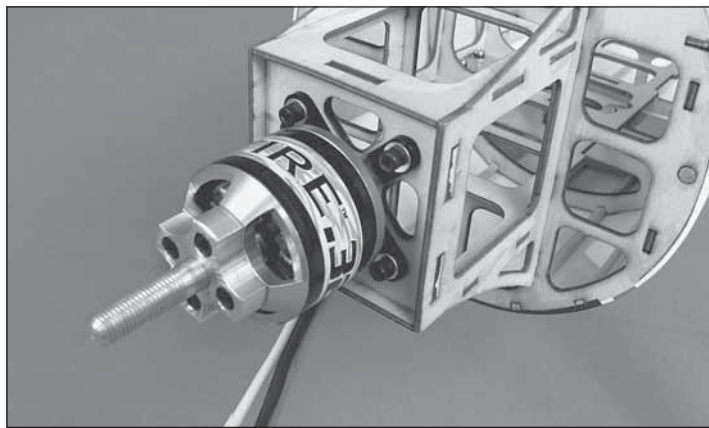


- ❑ 4. Attach the main landing gear to the **fuselage** with three **4-40 x 1/2" SHC screws**, **#4 lock washers** and **#4 flat washers**. Before installing, apply threadlocker to the threads of the SHC screws.

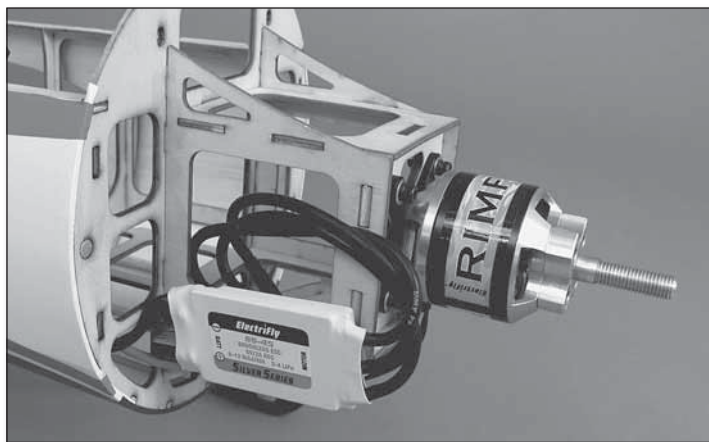
- ❑ 5. Repeat steps 1-4 for the left main landing gear.

Install the Motor

*The Yak-55M EP has been designed to use the Great Planes RimFire .32 Outrunner Brushless motor. If you will be installing a different motor, you may need to modify the plywood **motor box**.*



- ❑ 1. Install the RimFire motor using four 4-40 x 1/2" [12.7mm] SHC screws, four #4 lock washers and four #4 flat washers. Before installing, apply a drop of threadlocker to the threads of the SHC screws.



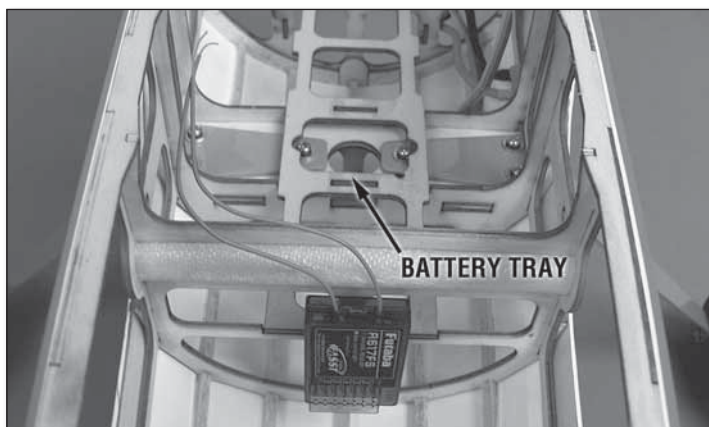
- ❑ 2. Attach a 9" [229mm] servo extension to the ESC. Connect the ESC to the motor. The ESC can be attached to the side of the motor box with adhesive-backed hook and loop material.



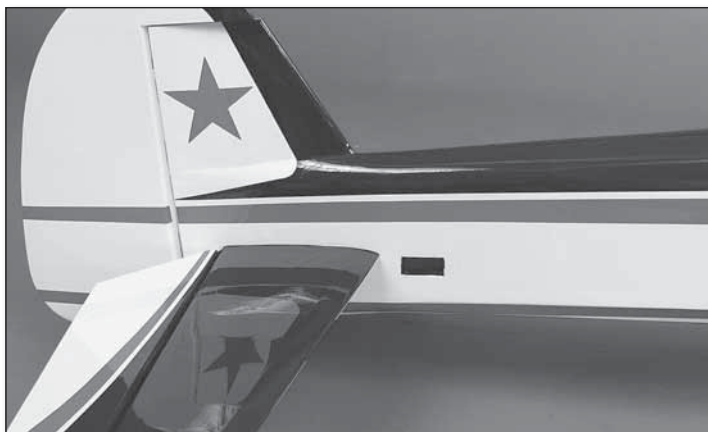
- ❑ 3. Use a sharp hobby knife to trim the covering from over the cooling air exit hole in the bottom of the fuselage.

INSTALL THE RADIO SYSTEM

Install the Elevator Servo

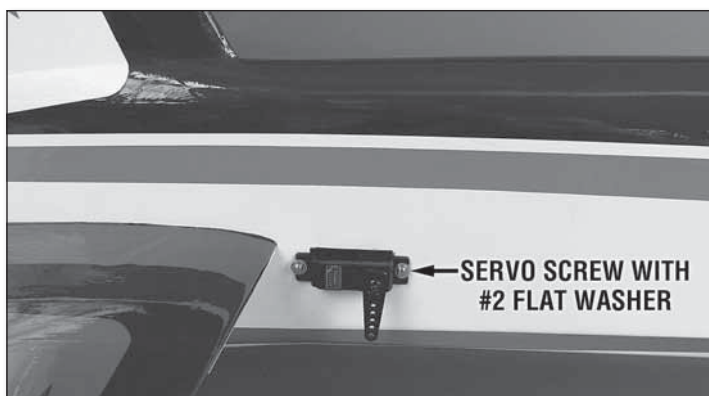


❑ 1. Use adhesive-backed hook and loop material to mount the receiver to the aft end of the battery tray former. Connect the ESC to the receiver.



❑ 2. Cut the covering away from the elevator servo opening on the right side of the fuselage, in front of the stabilizer.

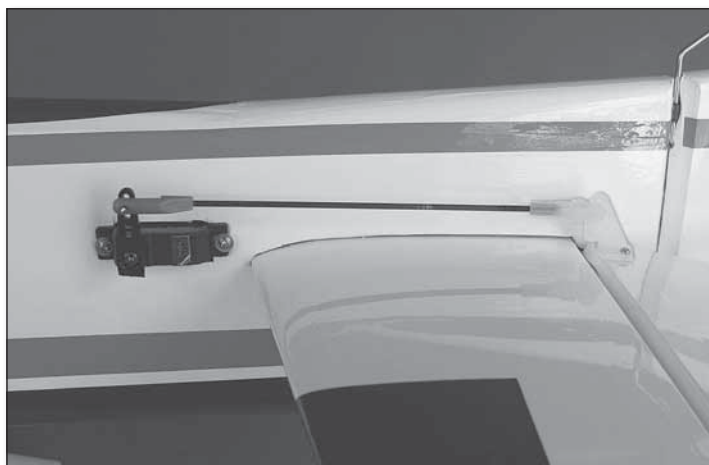
❑ 3. Install a 16" [406mm] servo extension to the elevator servo. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



❑ 4. Install the elevator servo into the servo opening following the same procedure used to install the aileron servos. Connect the servo to the receiver, install and center the servo arm.



❑ 5. Thread a nylon clevis 16 turns onto a **2-56 x 10" [254mm] wire pushrod**. Connect the clevis to a nylon control horn. Using the elevator pushrod, position the control horn in line with the servo arm. When positioned properly the control horn will rest on a hardwood plate in the elevator. Mark the location of the mounting holes onto the elevator. Drill a 3/32" [2.4mm] hole on the marks, drilling through the elevator. Attach the control horn to the elevator using two 2-56 x 5/8" [16mm] machine screws and the control horn back plate.



❑ 6. Slide a silicone clevis retainer over the clevis. With the elevator servo and the elevator centered, mark the elevator pushrod where it crosses the elevator servo arm. Make a 90° bend at the mark. Cut the pushrod 3/8" [9.5mm] past the bend. Attach the pushrod to the elevator servo arm with a nylon Faslink.

Install the Rudder Servo

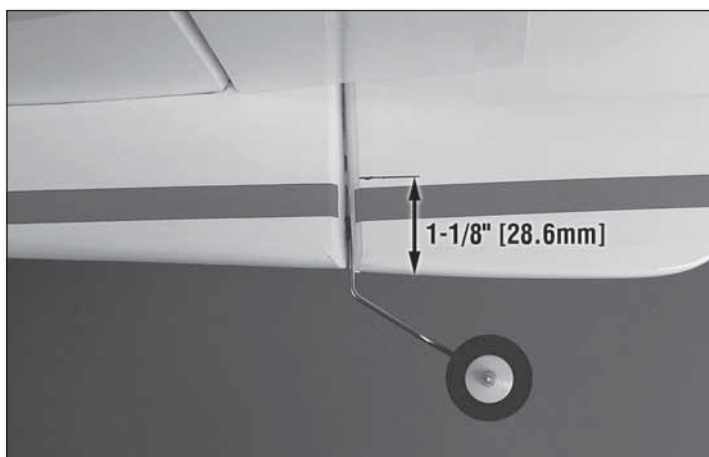


❑ 1. Cut the covering away from the rudder servo opening on the left side of the fuselage, in front of the stabilizer.

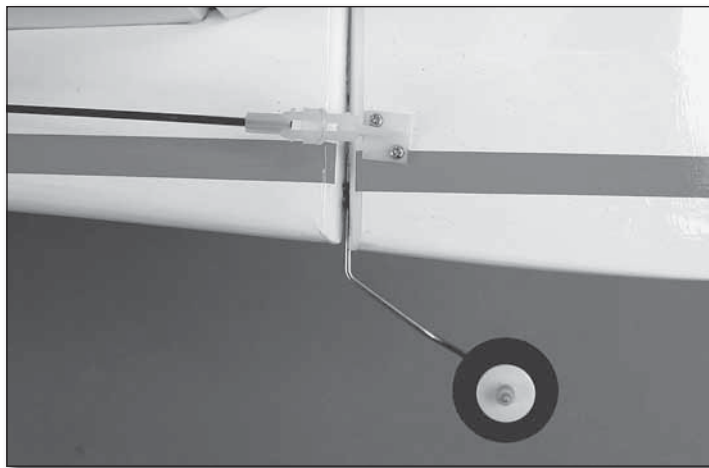
❑ 2. Install a 16" [406mm] servo extension to the rudder servo. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



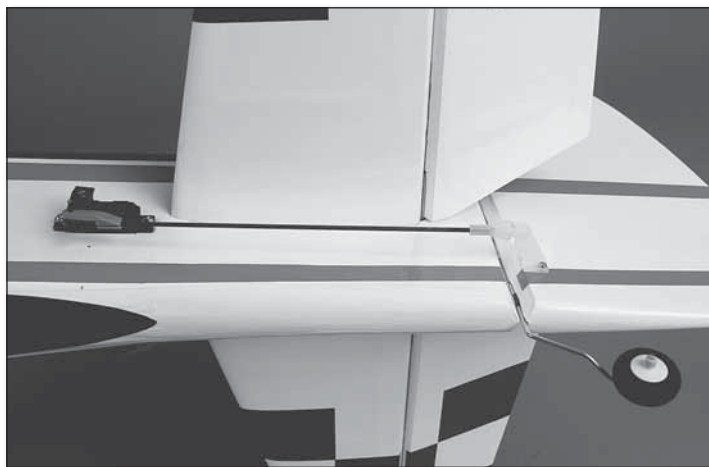
❑ 3 Install the rudder servo into the servo opening following the same procedure used to install the aileron servos. Connect the servo to the receiver, install and center the servo arm.



❑ 4. Place a mark on the leading edge of the rudder, 1-1/8" [28.6mm] from the bottom of the rudder.



❑ 5. Thread a nylon clevis 16 turns onto a 2-56 x 10" [254mm] wire pushrod. Connect the clevis to a nylon control horn. Position the control horn so that it is centered on the line from the previous step. Mark the location of the mounting holes onto the rudder. Drill a 1/16" [1.6mm] hole on the marks. Do not drill completely through the rudder. Attach the control horn to the rudder using two #2 x 1/2" [12.7mm] sheet metal screws. Remove the screws and apply a drop of thin CA to both holes. After the CA has cured, reinstall the control horn.

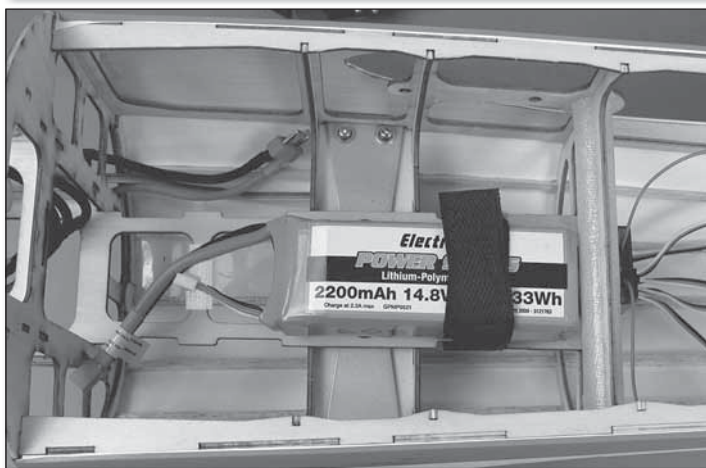
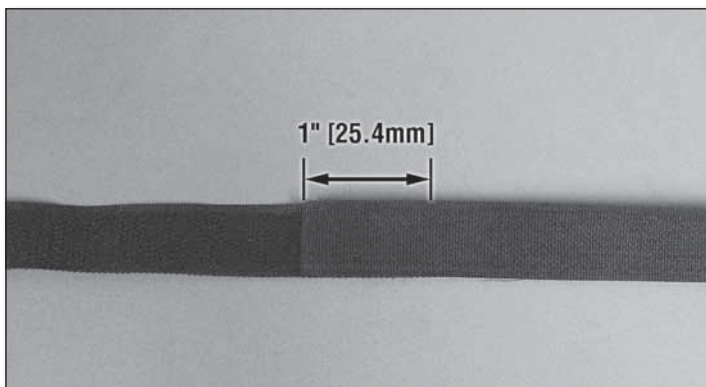


❑ 6. Slide a silicone clevis retainer over the clevis. With the rudder servo and the rudder centered, mark the rudder pushrod where it crosses the rudder servo arm. Make a 90° bend at the mark. Cut the pushrod 3/8" [9.5mm] past the bend. Attach the pushrod to the rudder servo arm with a nylon Faslink.

❑ 7. Connect the flight battery to the ESC and check that all the servos are operating correctly. Arm the motor (with the prop removed) and slowly start the motor to make sure it is rotating in the correct direction.

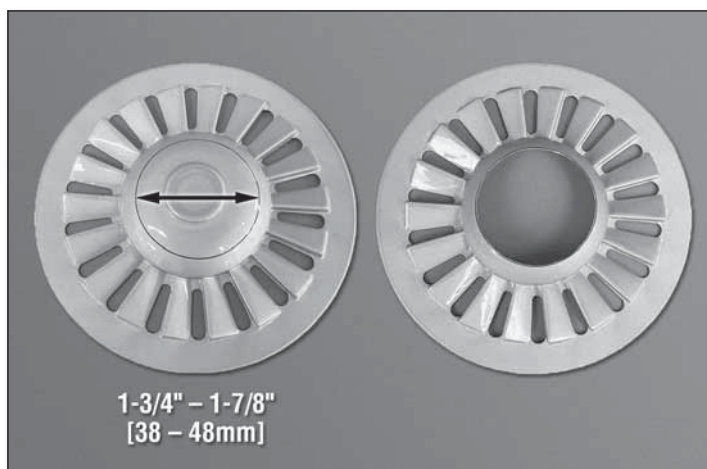


- ❑ 8. Attach strips of adhesive-backed hook material to the cross members of the battery tray. The adhesive backed loop material can be attached to the back of the battery. This will prevent the battery from sliding forward and aft.



- ❑ 9. Overlap by 1" [25mm] two strips of non adhesive backed hook and loop material. Route the hook and loop material under the battery tray. Place your flight battery on the tray and wrap the hook and loop material around the battery. Trim off the excess material.

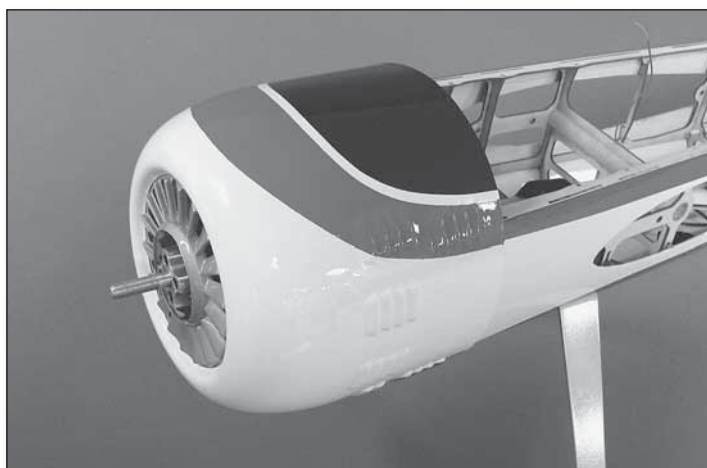
Install the Cowl



- ❑ 1. If you have installed the recommended RimFire .32 brushless motor, the **cowl louvers** will need a 1-3/4" [38mm] to 1-7/8" [48mm] diameter cutout in the center.



- ❑ 2. Center the cowl louvers in the front of the cowl. While applying upward pressure on the louvers, wick thin CA along the joint between the cowl and louvers.



- ❑ 3. Check the fit of the cowl on the fuselage. The cowl is held on with four magnets. It slides over the fuselage and snaps into place. Trim the cowl louvers as necessary to prevent them from rubbing on the motor when the cowl is installed.

Apply the Decals

The box photographs show the location of the decals on the airplane. Refer to the box for the exact placement of the decals. The following tips may be useful for applying them.

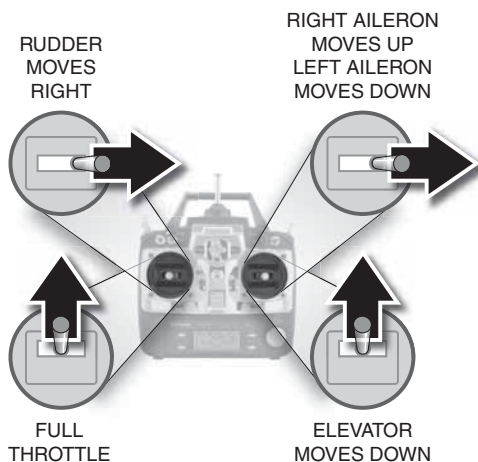
- ❑ 1. Remove the decals from the decal sheet.
- ❑ 2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water—about one teaspoon of soap per gallon of water. Submerge the decal in the soap and water and 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 decals on the model. Holding the decals 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.

4-CHANNEL RADIO SET UP (STANDARD MODE 2)

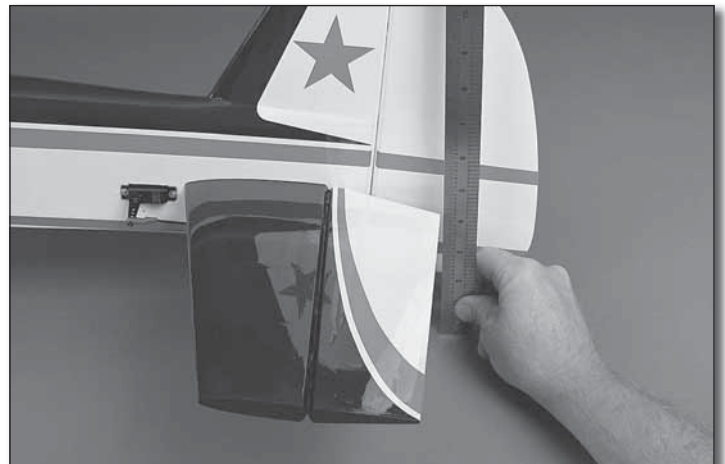


- ❑ 3. Make certain that the control surfaces and the throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces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

Set the Control Throws

To ensure a successful first flight, set up your Yak-55M EP according to the control throws specified in the manual. The throws have been determined through actual flight testing and accurate record keeping, allowing the model to perform in the manner in which it was intended. If, after you have become accustomed to the way the Yak-55M flies, you would like to change the throws to suit your flying style, that is fine. However, too much control throw could make the model too responsive and difficult to control, so remember, “more is not always better.”

- ❑ 1. Use a box or something similar to prop up the bottom of the fuselage so the horizontal stabilizer and wing will set level.



- ❑ 2. Measure the 3D elevator throw first. Hold a ruler vertically on your workbench against the widest part (front to back) of the trailing edge of the elevator. Note the measurement on the ruler.

These are the recommended control surface throws:

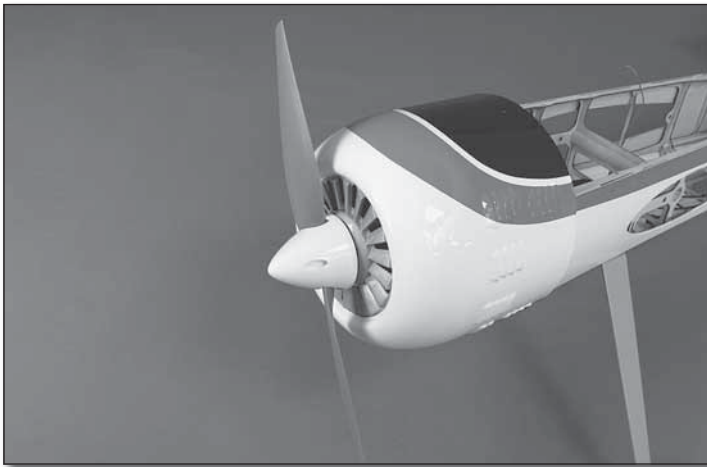
	3D RATE		HIGH RATE		LOW RATE	
	Up	Down	Up	Down	Up	Down
ELEVATOR	1-7/8" [48mm] 34°	1-7/8" [48mm] 34°	5/8" [16mm] 11°	5/8" [16mm] 11°	5/16" [8mm] 5°	5/16" [8mm] 5°
	Right	Left	Right	Left	Right	Left
RUDDER	2-1/2" [64mm] 29°	2-1/2" [64mm] 29°	2-1/8" [54mm] 25°	2-1/8" [54mm] 25°	1-3/4" [44mm] 20°	1-3/4" [44mm] 20°
	Up	Down	Up	Down	Up	Down
AILERONS	1-3/4" [44mm] 28°	1-3/4" [44mm] 28°	3/4" [19mm] 12°	3/4" [19mm] 12°	1/2" [13mm] 8°	1/2" [13mm] 8°

❑ 3. Move the elevator up with your transmitter and move the ruler forward so it will remain contacting the trailing edge. The distance the elevator moves up from the center is the “up” elevator throw. Measure the down elevator throw the same way.

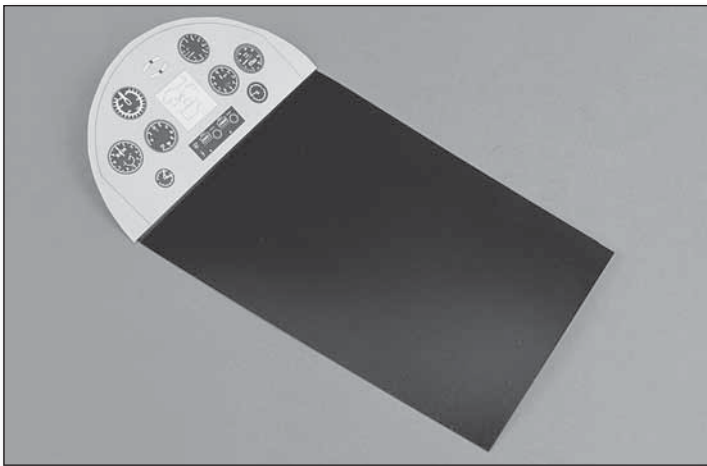
❑ 4. Measure and set the high and low rate elevator throws and the high, low and 3D rate throws for the rest of the control surfaces the same way.

Note: We put exponential into the High rates and the 3D rates to make the control throws less sensitive around neutral. These can be set up to your own preference and flying style. We put 20% to 30% in the high rate and 50% to 60% in the 3D rates.

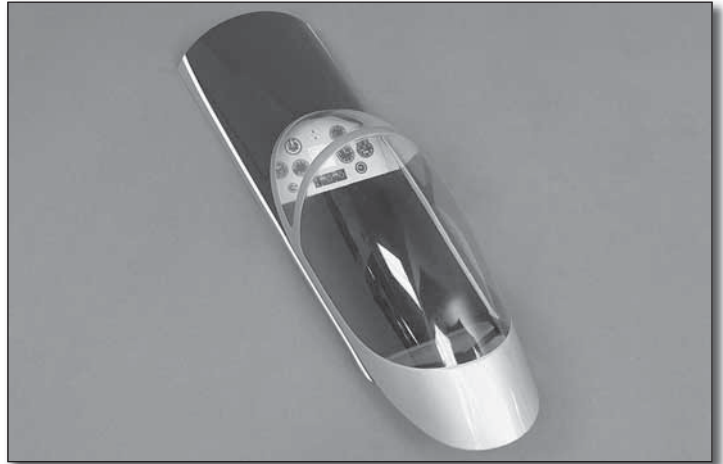
Finish the Model



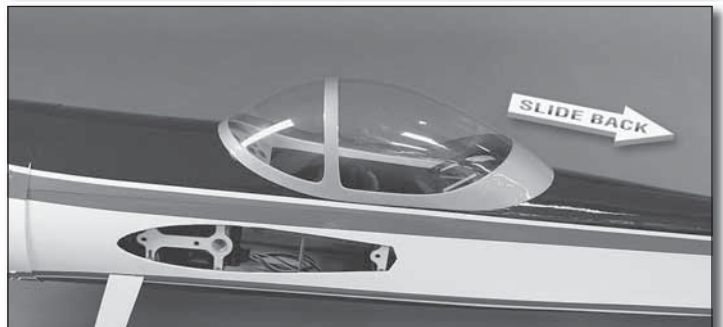
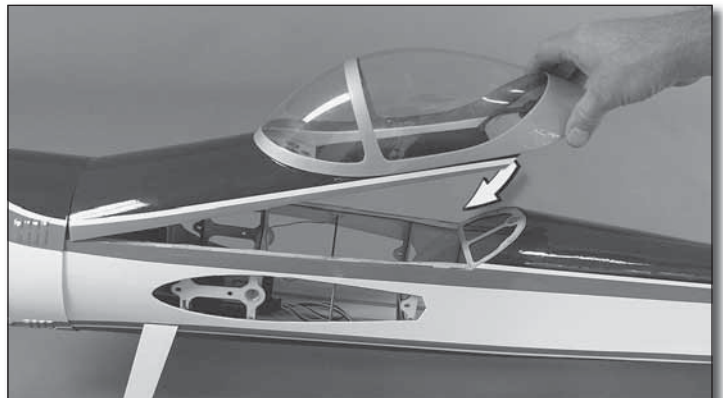
❑ 1. Use a prop reamer or drill bit to enlarge the **spinner back plate** to fit your motor's prop adapter. Install the spinner back plate, propeller with washer and prop nut and the **spinner cone**. Secure the spinner cone to the back plate with two **3 x 12mm sheet metal screws**.



❑ 2. Apply the **instrument decal** to the front of the **cabin floor**.



❑ 3. To install the cabin floor in the **canopy hatch**, slide the cabin floor into the cabin hatch from the front. If you prefer to install an optional pilot figure, it will need to be installed as the cabin floor is slid in. Once the floor is in, a pilot figure will be difficult to install. Use thin CA to glue the cabin floor to the canopy hatch frame.



❑ 4. To install the canopy hatch on the fuselage, insert the two guide pins in the front of the hatch in the two holes in the front of the fuselage. Push the hatch down and slide it back. The plywood tab on the bottom of the hatch should slide under the frame in the fuselage and lock the hatch in place.

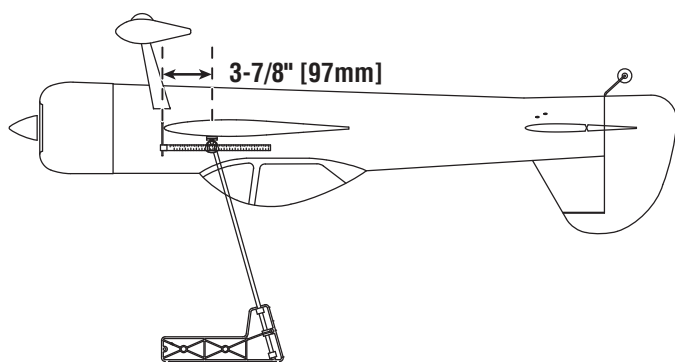
Balance the Model (C.G.)

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, landing gear, wings, and the radio system.

- ☐ 1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing at the side of the fuselage. The C.G. is located 3-7/8" [97mm] back from the leading edge of the wing at the side of the fuselage.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 3/8" [9.5mm] 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 the wing attached to the fuselage, all parts of the model installed (ready to fly) and a flight battery installed, lift the plane at the balance point you marked.
- ☐ 3. If the tail drops, the model is "tail heavy" and the battery pack 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 must be shifted aft or weight must be added to the tail to balance. If additional weight is required, use Great Planes (GPMQ4485) "stick on" lead. A good place to add stick-on nose weight is to the motor box (don't attach weight to the cowl—it is not intended to support weight).

Begin by placing incrementally increasing amounts of weight on the fuse over the motor box until the model balances. Once you have determined the amount of weight required, it can be permanently attached.

NOTE: Do not rely upon the adhesive on the back of the lead weight to permanently hold it in place. Over time the adhesive may soften and cause the weight to fall off. Use #2 sheet metal screws, RTV silicone or epoxy to permanently hold the weight in place.

- ☐ 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 motor 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

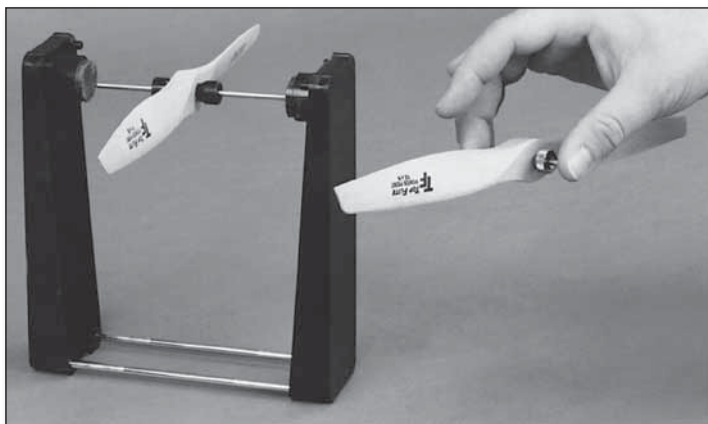
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 19 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 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 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. The problem may be the location of the antenna. The antenna should be as far away from the ESC and battery as possible.

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 electric motors.
- Use safety glasses when running electric 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 run the motor.
- Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.
- The motor gets hot! Do not touch it right after operation.
- When working on your plane, remove the propeller if the motor battery will be connected.
- Always remove the motor battery from the plane when charging.

LITHIUM BATTERY HANDLING & USAGE

WARNING!! Read the entire instruction sheet included with the 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.
- **ONLY** use a LiPo approved 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 unless the battery is rated for a higher charge rate.
- **ALWAYS** set the charger's output volts to match the 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 the pack wiring in any way or puncture the cells.
- **NEVER** discharge below 2.5V per cell.
- **NEVER** place the battery or charger on combustible materials or leave it unattended during charge or discharge.
- **ALWAYS** KEEP OUT OF THE REACH OF CHILDREN.
- **NEVER** charge the battery in the plane.
- **ALWAYS** remove the battery from the plane after a crash. Set it aside in a safe location for at least 20 minutes. If the battery is damaged in the crash it could catch fire.
- If the battery starts to swell, quickly move the battery to a safe location, preferably outside. Place it in a bucket, covering the battery with sand.

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 motor battery and receiver are **securely** mounted in the fuse. Simply stuffing them into place is not sufficient.
- ☐ 3. Position your receiver antenna according to the instructions included with your radio system.
- ☐ 4. Balance your model laterally as explained in the instructions.
- ☐ 5. Use threadlocking compound to secure critical fasteners such as the motor screws, wheel collar SHC screws, etc.
- ☐ 6. Add a drop of oil to the axles so the wheels will turn freely.
- ☐ 7. Make sure all hinges are securely glued in place.
- ☐ 8. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, control horn screws, etc.).
- ☐ 9. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ☐ 10. Make sure there are silicone retainers on all the clevises and that all servo arms are secured to the servos with the screws included with your radio.
- ☐ 11. Secure connections between servo wires and Y-connectors or servo extensions with vinyl tape, heat shrink tubing or special clips suitable for that purpose.
- ☐ 12. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
- ☐ 13. Balance your propeller (and spare propellers).
- ☐ 14. Tighten the propeller nut and spinner.
- ☐ 15. Place your name, address, AMA number and telephone number on or inside your model.
- ☐ 16. If you wish to photograph your model, do so before your first flight.
- ☐ 17. Range check your radio when you get to the flying field.

FLIGHT NOTES

The Yak-55M EP is a great-flying model that flies smoothly and predictably. The Yak-55M EP 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.

The Yak-55M EP is easy to fly and does not have any bad flying traits. It requires only a short distance for takeoff. In the air, you will notice that it does have some pitch coupling with rudder. This can be easily mixed out with a computer radio. We recommend taking off on high rates. Once you feel comfortable with the high rates, check out what you can do with the 3D rates.

We do recommend that a flight timer be set up on your transmitter to avoid a dead stick when the motor battery dumps and the ESC cuts the power to the motor. Landing the Yak-55M EP is easy. As the power is reduced for landing, the speed bleeds off quickly. It may take a couple of landings to get the feel of how quickly the plane slows down. We found that the plane lands as if it has flaps.

Have a ball flying the Yak-55M! But, remember to 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

