

# ***DURAPLANE™***

## ***Trainer 40***



### ***Assembly Instructions***

#### ***Specifications:***

Wingspan:	50 in (1270 mm)	Weight:	5.25 lb (2380 g)
Wing Area:	500 sq in (32.3 sq dm)	Engine Required:	High-performance
Fuselage Length:	44 in (1117.6 mm)		2-stroke .40 to .46 cu in (6.5-7.5 cc) or
Radio Required:	4-Channel with 4 servos		4-stroke .48 to .51 cu in (7.86cc)

**READ THROUGH THIS INSTRUCTION MANUAL BEFORE BEGINNING ASSEMBLY. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND OPERATION OF THIS MODEL.**

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## Introduction

The Trainer 40 is a great "dual purpose" model because it's extra durable and simple to build for a beginner, and it builds fast so experienced modelers can quickly get something in the air if their primary model is out of commission. After you move on to a fully aerobatic sport model, or get your best model back into the air, the trusty Trainer 40 will still be waiting in the wings for you to take it out and get in a few relaxing flights. The "low risk" factor of the inexpensive, quick building DuraPlane series makes them great test beds for new radio equipment or breaking in new engines. Besides all that, the Trainer 40 flies great and we're sure you'll enjoy lots of smooth takeoffs and landings!

If this is your first model, the best way to learn to fly R/C is to join a flying club. The Academy of Model Aeronautics is the national organization that charters model clubs, sanctions competitions and insures flying fields throughout the United States. We urge you to join the AMA because membership will bring you flying insurance, a subscription to Model Aviation magazine and many other benefits. The AMA will gladly send you membership information and lists of AMA-chartered clubs in your area where you can seek the help of experienced modelers.

### Academy of Model Aeronautics

5151 East Memorial Drive  
Muncie, Indiana 47302-9252  
(800) 435-9262  
FAX (317) 741-0057

Your hobby shop is also an invaluable place for service, parts and information that you require. We urge you to patronize your local hobby dealer – he's there to help you enjoy your hobby. Finally, if you have any questions or comments about your DuraPlane, please write or call us at:

### DuraPlane

3002 N. Apollo Dr. Ste. 1  
Champaign, IL 61822  
Telephone: (217) 398-8970, Ext. 5  
Fax: (217) 398-7721

**E-mail: [productsupport@duraplane.com](mailto:productsupport@duraplane.com)**

DuraPlane 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 DuraPlane's liability exceed the original cost of the purchased kit. DuraPlane reserves the right to change or modify this warranty without notice.

## WARNING

Radio control models are intended for adults or use under the close supervision of an adult. Flying model airplanes can be dangerous and can cause serious injury. DuraPlane assumes no responsibility for accidents or injury caused by this product.

## Table of Contents

This instruction manual provides step-by-step instructions for assembling the Trainer 40 kit. Assembly of the Trainer 40 consists of eight major steps and must be completed in the following order:

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## Suggested Tools

To assemble the Trainer 40, you need the following tools:

- ☐ Flat blade and phillips screwdrivers
- ☐ Small pliers (needle nose)
- ☐ Hobby knife with #11 blades
- ☐ Electric drill
- ☐ Drill bits: 1/16", 7/64", 1/8", 5/32", #18 (or 11/64")
- ☐ Hobby covering iron w/Hot Sock™ – optional (TOPR2175)
- ☐ Sandpaper assortment and sanding block
- ☐ Ruler & felt-tip pen
- ☐ Masking tape

## Accessories & Additional Items

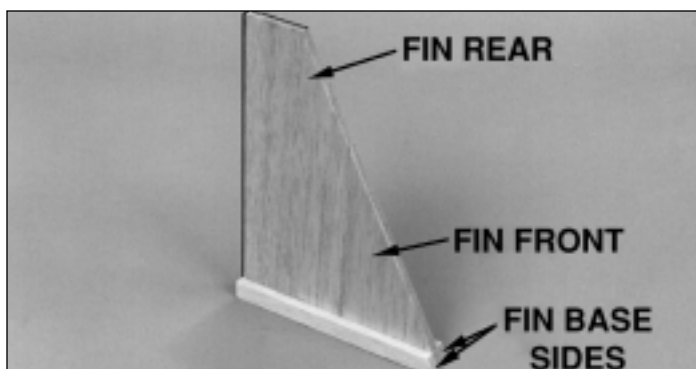
In addition to the parts included with the Trainer 40 kit, you need the following accessories (we have had good success using Great Planes® brand Adhesives and Accessory Items):

- ☐ 4-channel radio w/4 servos
- ☐ .40-.46 2-stroke or .48 - .51 4-stroke engine w/muffler
- ☐ Propellers (see engine instructions for size)
- ☐ Top Flite® EconoKote® film - (1) roll
- ☐ 6-minute epoxy – (GPMR6045)
- ☐ 1 oz. thin CA – (GPMR6002)
- ☐ Aliphatic resin (white glue) – optional (GPMR6160)
- ☐ #6 x 3/4" engine mounting screws – (4) (GPMQ3030)
- ☐ 2-1/4" spinner (GPMQ4515)
- ☐ 8 oz. fuel tank – (GPMQ4103)
- ☐ 12" medium silicone fuel tubing – (GPMQ4131)
- ☐ #64 rubber bands – (HCAQ2020)
- ☐ 5/32" wheel collars – (2) (GPMQ4306)
- ☐ 1/4" foam rubber – (HCAQ1000)
- ☐ 2-1/2" wheels – (3) (GPMQ4223)
- ☐ 3/4" wide fiberglass reinforced "strapping" tape
- ☐ 1/2" double-sided foam mounting tape (GPMQ4440)
- ☐ 1/16" x 5/16" wing seating foam tape (GPMQ4422)
- ☐ Loctite® thread lock

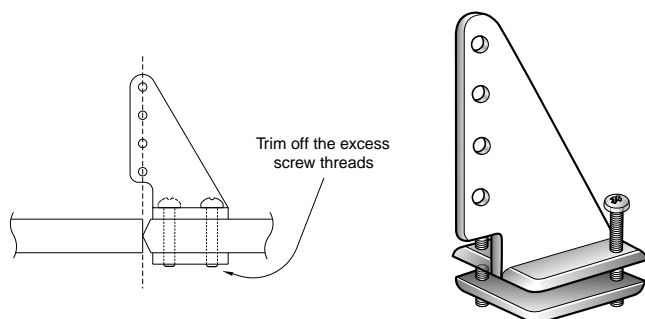
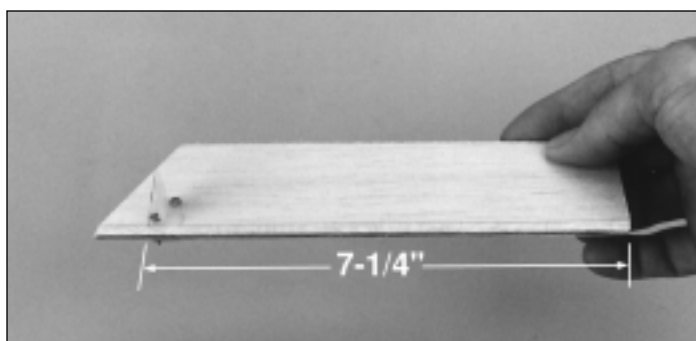
Refer to the Parts List for a description of the parts and hardware included with the Trainer 40 kit.

# Build The Tail Feathers

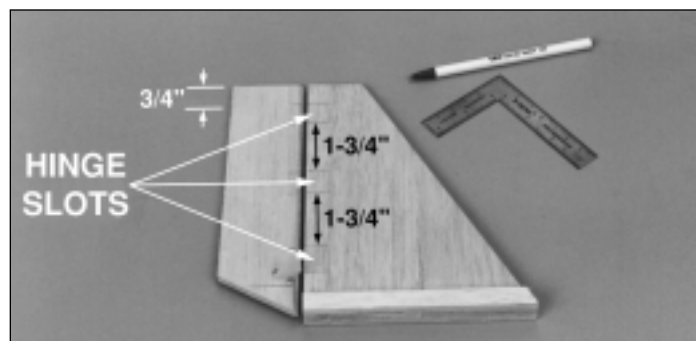
## Assemble The Fin & Rudder



- ❑ 1. Glue the shaped 1/4" balsa **Fin Front** to the **Fin Rear** with medium CA. Use 150-grit sandpaper and a sanding block to sand the **Fin** flat and round the leading edge before proceeding. Glue the 1/4" x 1/2" x 5-7/8" balsa **Fin Base Sides** to both sides of the **Fin**. Make sure that the bottom of the fin and the bottoms of the fin base sides are flush. Bevel the front of both fin base sides so they are even with the LE of the fin.



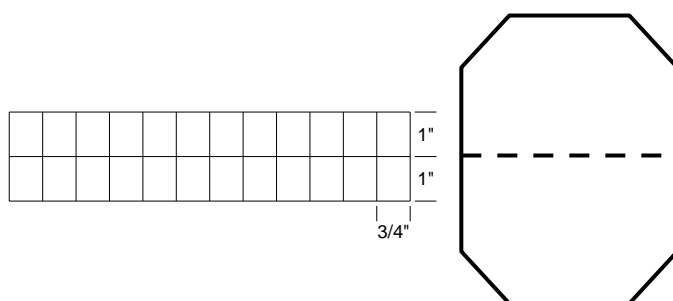
- ❑ 2. Sand the **Leading Edge (LE)** of the shaped 1/4" balsa **Rudder** to a "V" shape to allow for control movement. Position a nylon **Control Horn** on the rudder so the **bottom edge** of the horn is 7-1/4" below the top of the rudder. Use the control horn as a template to drill two 1/16" holes for the 2-56 x 1/2" screws. Push the screws through the control horn. Then thread them into the **Control Horn Back Plate** until it is snug.



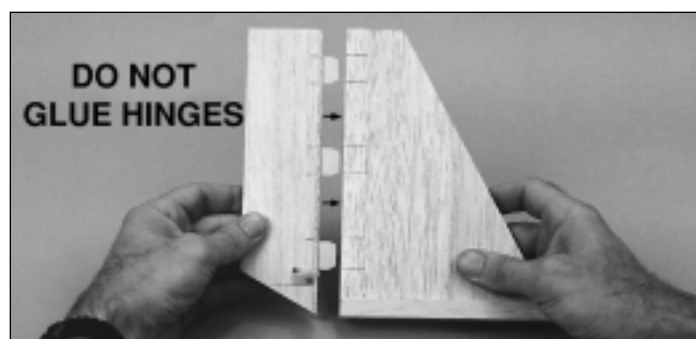
- ❑ 3. Mark the locations of the **Hinges** on the rudder and fin as shown in the photo above.



- ❑ 4. Use a hobby knife with a #11 blade to cut the hinge slots. **Tip:** Carefully move the blade back and forth to enlarge the slot

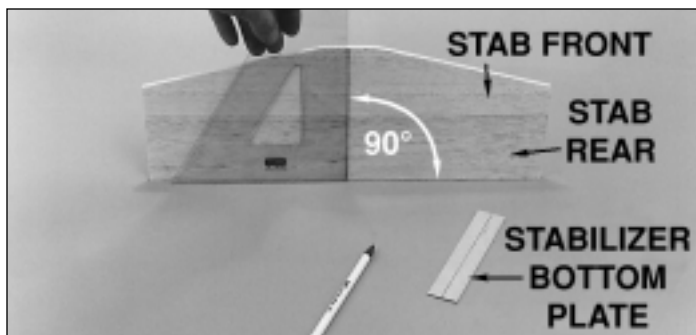


- ❑ 5. Cut the hinges from the 2" x 9" **CA Hinge Strip**, then use scissors to snip the corners off. Test fit the hinges to see if the slots are deep enough.



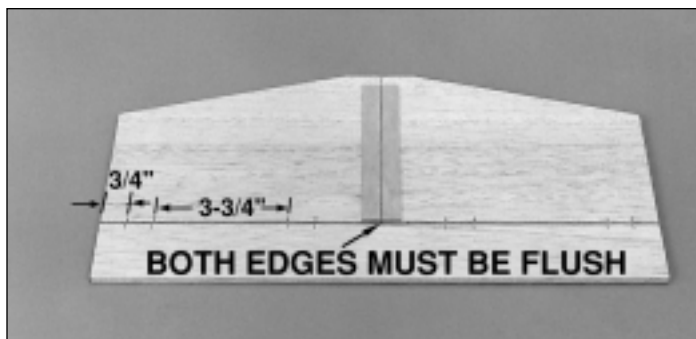
- ❑ 6. Temporarily join the rudder to the fin with three hinges. **Do not glue the hinges in the fin and rudder until instructed to do so.**

## Assemble The Stabilizer & Elevator



❑ 1. Glue the shaped 1/4" balsa **Stab Front** to the **Stab Rear** with medium CA. **Tip:** Sand the **Stabilizer** flat and even before proceeding. Draw a centerline on the stab and also on the 1/16" plywood **Stabilizer Bottom Plate**.

❑ 2. Align the centerlines. Then glue the stabilizer bottom plate to the stabilizer. The end of the bottom plate should be flush with the TE of the stabilizer. See the photo at step 3.

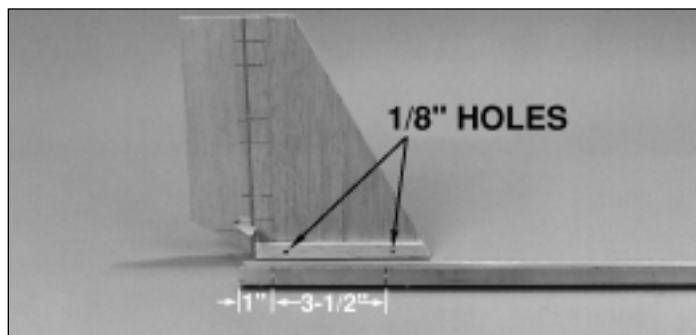


❑ 3. Sand the leading edge of the 1/4" balsa **Elevator** to a "V" shape. Cut four hinge slots in the elevator and stabilizer at the locations shown in the photo. Without using any glue, temporarily join the elevator to the stabilizer with four hinges.

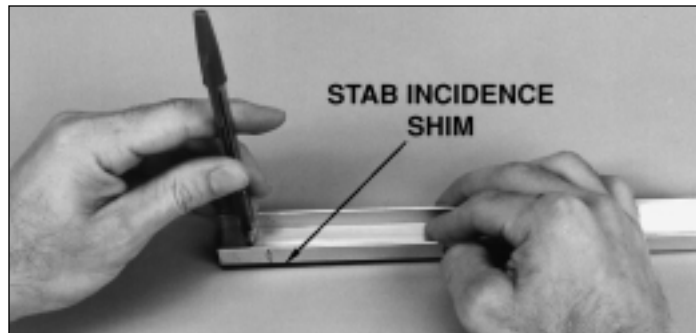


❑ 4. Draw a line on the top of the elevator 6-7/8" from the **left tip**. Align the **left edge** of a nylon control horn with the line, then drill two 1/16" holes through the elevator – just the same as you did on the rudder. Mount the control horn to the elevator with two 2-56 x 1/2" screws and the back plate.

## Mount The Fin & Stab



❑ 1. Drill two 1/8" holes through both sides of the **rear** of the **Aluminum Fuselage Channel** at the locations shown in the photo (the rear is the end with the two *pre-drilled* smaller holes in the bottom that are closer together). Insert the fin in the fuselage channel so that the trailing edge is aligned with the aft edge of the channel. Mark the location of the holes in the **bottom** and the **sides** of the fuselage channel on the fin. Remove the fin and drill 1/8" holes through only the marks on the **side** of the fin.



❑ 2. Center the black plastic **stab incidence shim** on the fuse channel so that the aft edges are aligned. The thickest part of the shim is the rear. Mark on the shim, the location of the aft hole in the channel, then drill a 1/8" hole at the mark in the shim.

❑ 3. Align the centerline you drew on the stabilizer bottom plate with the holes in the fuselage channel and mark their location.

**Note:** The TE of the stab should be aligned with the end of the channel. Drill 1/8" holes through the stab at the marks.

## Assemble the Fuselage

### Install the Engine Mount & Fuel Tank

- ❑ 1. Test fit your engine to the engine mount. If the engine does not fit perfectly into the mount use a Dremel® MultiPro™ or a file to carefully grind away the plastic until your engine drops into the mount.

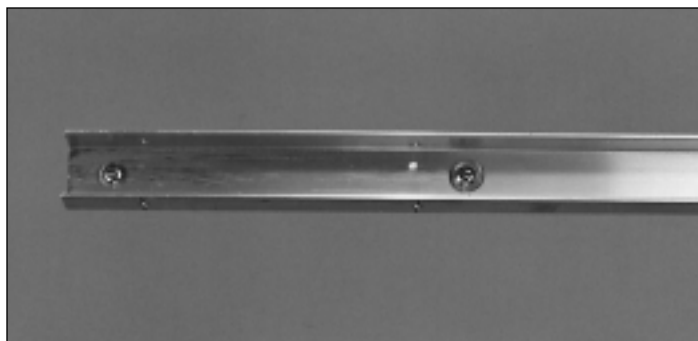


- ❑ 2. Determine the location where the throttle pushrod will exit the firewall portion of the engine mount so it will align with the carburetor arm on your engine. For most engines the molded-in hole on the upper right side of the mount is close enough. Enlarge this hole with a 3/16" drill all the way through the mount. If you decide to drill the hole in a different location make sure the throttle pushrod will not interfere with the fuel tank.

- ❑ 3. Place the engine on the mount, then mark the location of the engine mounting holes. Drill 7/64" holes for mounting the engine with #6 x 3/4" screws and washers (not included). Some modelers prefer to drill and tap the holes for 4-40 x 3/4" machine screws (not included) instead. Use a #43 drill if you choose to tap threads for 4-40 screws.



- ❑ 4. Use a felt-tip pen to draw a line on the sides, top and bottom of the fuselage 5/16" from the front edge. Fit the engine mount into the fuselage, then drill two 7/64" holes, evenly spaced, through the four sides of the fuselage and the engine mount on the lines you drew. Make sure that you do not drill the holes in a location that will interfere with the throttle pushrod. Remove the mount, then enlarge the holes in the fuselage only with a 9/64" drill.



4-40 x 3/4" Machine Screw



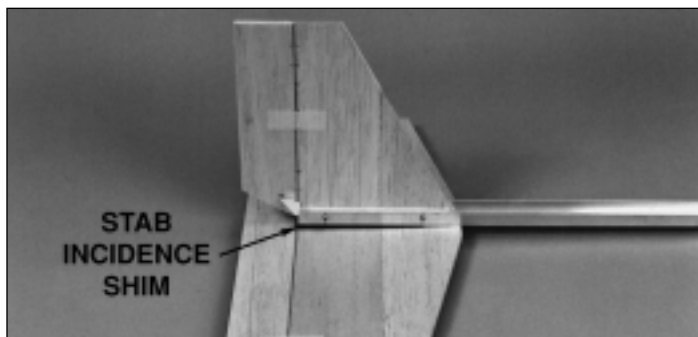
#4 Flat Washer



4-40 Hex Nut

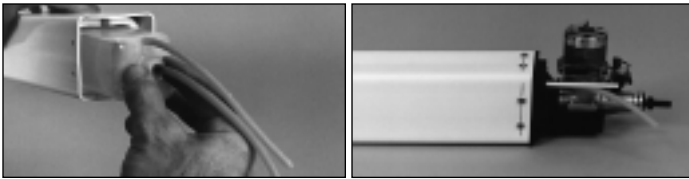
- ❑ 4. Use 6-minute epoxy to glue two 4-40 x 3/4" machine screws in the bottom **rear** holes of the fuselage channel. After the epoxy has cured, temporarily mount the stab to the fuselage channel with the stab incidence shim, 4-40 screws, #4 washers and two 4-40 nuts.

**Note:** The **bottom** of the stab is the side with the 1/16" plywood stabilizer bottom plate.



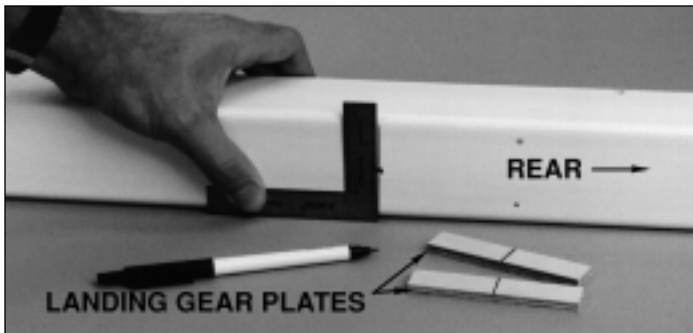
4-40 x 1" Machine Screw

- ❑ 5. Remove material from the bottom of the fin as needed to clear the heads of the screws, then temporarily mount the fin to the fuselage channel with two 4-40 x 1" machine screws and nuts.

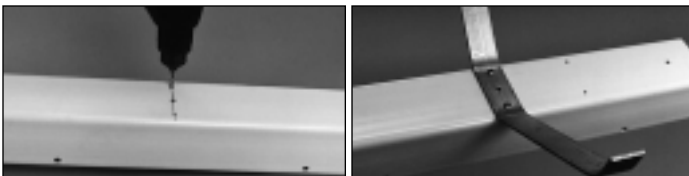


5. Assemble a Great Planes 8 oz. fuel tank according to the instructions included with the tank. Then install 6" of medium fuel line on the fill and vent tubes. Cut a piece of 1/4" foam to a size of 3" x 8" and place it inside the front of the fuselage about 1" back from the front edge. Slide the tank into the foam inside the front of the fuselage. Mount the engine mount to the fuselage with eight #6 x 3/4" screws included with this kit, then slide the 12" long throttle pushrod guide tube into the hole you drilled through the firewall and past the fuel tank. Slide the 12" long throttle pushrod into the guide tube. Mount the engine onto the engine mount.

### ***Mount The Landing Gear***

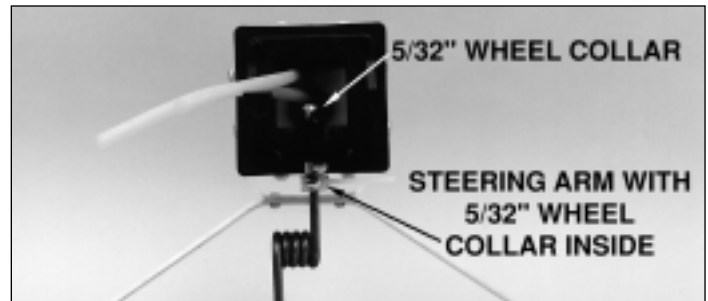


6. Place the fuselage on its side and use a 90-degree triangle or a builder's square to mark a line centered on the forward hole in the bottom of the fuselage. Draw a line across the center of each 1/4" plywood landing gear plate.

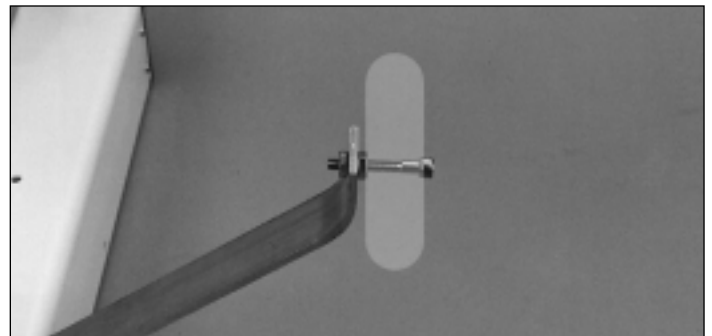


7. Fit a 8-32 x 1/2" screw through the hole in the center of the aluminum landing gear and the forward hole in the bottom of the fuselage. Align the outer holes in the landing gear with the line you drew, then mark the locations of the holes onto the fuselage bottom. Remove the landing gear, then drill a 7/64" hole through the marks. Use coarse sandpaper and a sanding block to round a bottom corner of each landing gear plate so it will fit the curve inside the fuselage. The bottom of the plates is the side with the line

you drew. Place one of the landing gear plates inside the fuselage so the line is visible through one of the holes you drilled, then mark the location of the hole on the landing gear plate. Drill a 7/64" hole at the mark. Position, mark, then drill a 7/64" hole through the other landing gear plate. Mount the landing gear to the fuselage with the landing gear plates and two #6 x 1/2" screws supplied with this kit. The wood landing gear plates do not need to be glued to the fuselage.

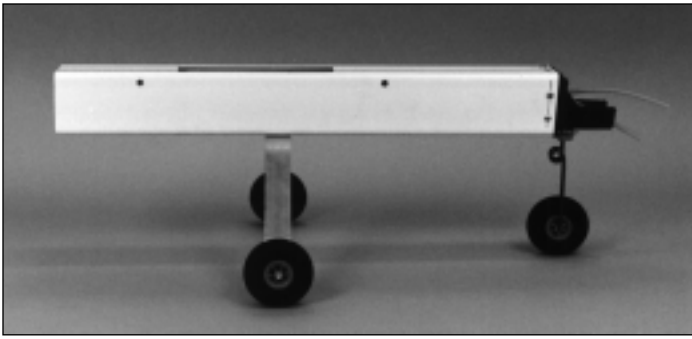


8. Remove the engine from the engine mount. Then mount the wire nose gear to the engine mount with three 5/32" wheel collars and 6-32 x 1/4" screws included with this kit. Insert one of the wheel collars into the nylon steering arm. Arrange the wheel collars and temporarily tighten the screws so the fuselage is level when sitting on your workbench.



9. Drill the hub of the 2-1/2" main wheels with a #18 (or 11/64") drill, then fit a 8-32 x 1-1/4" "axle" into one of the wheels and thread on a 8-32 nut. Screw the axle with the wheel and nut onto the landing gear and secure it with another 8-32 nut and a drop of thread lock. Mount the other wheel to the landing gear in the same manner.

10. Mount the front 2-1/2" wheel to the nose gear with a 5/32" wheel collar (not supplied) on both sides of the wheel.

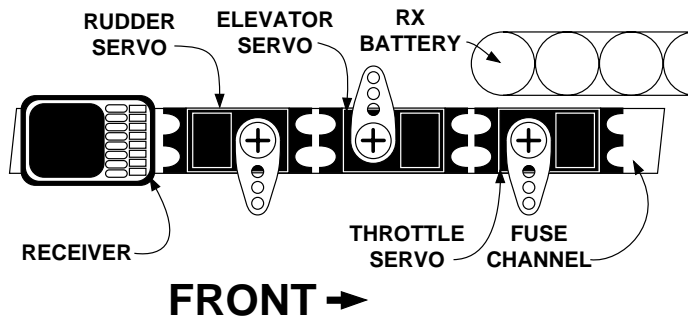


- ❑ 11. Set the fuselage on your work bench and readjust the wheel collars on the nose gear so the fuselage is level. Secure the 6-32 screws in the wheel collars with a drop of thread lock.

## Radio Installation

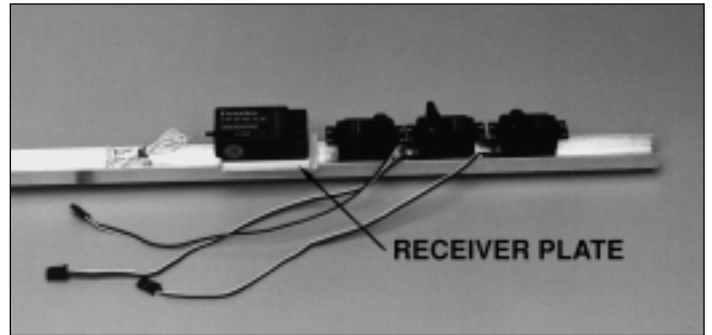
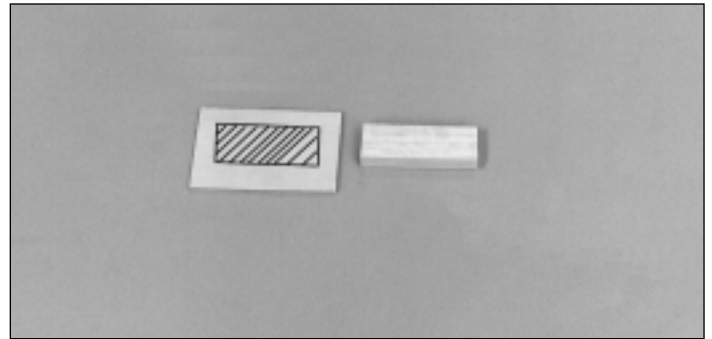
### Install the Servos

- ❑ 1. Use 6-minute epoxy to glue two 6-32 x 1/2" machine screws in the front holes in the fuselage channel. Insert the screws from inside the channel just like you did the 4-40 screws in the rear of the channel for the stab.



- ❑ 2. Insert three servos into the fuselage channel in the orientation shown in the sketch. The front servo should be approximately 3" from the front of the channel but should not interfere with the 6-32 screw you glued in the channel. The other servos should be behind the front servo but not contacting each other.

- ❑ 3. Temporarily connect the servos and a battery pack to the receiver. Then turn on the receiver and transmitter to center the servos. Place a servo arm on each servo in the orientation shown in the sketch, then turn off the system and disconnect the servos.



- ❑ 4. Mount the receiver to the fuselage channel behind the rear servo. There are a few ways to mount the receiver but the most secure way, and the recommended way is to make a receiver plate from a piece of 1/8" "lite-ply" and a piece of 3/4" wide balsa (not supplied). Glue the receiver plate (the approximate size of the base of the receiver) to the balsa block, then fit the block in the fuselage channel like you did the servos. Mount the receiver to the plate with 1/4" of foam in between the receiver and the plate. Make sure this arrangement will clear the rear 1/4" wing dowel when it is time to mount the fuselage channel to the fuselage.

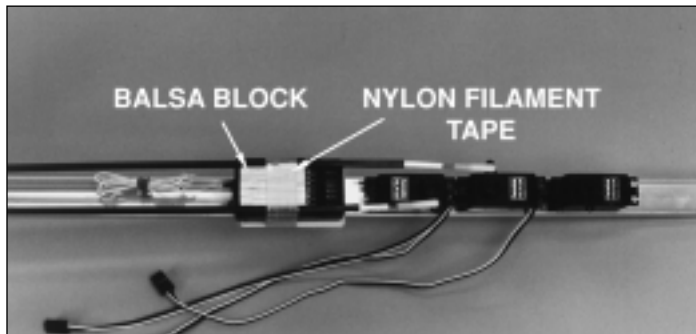
### Connect The Elevator & Rudder Pushrods



- ❑ 1. Thread a nylon clevis onto a 1" threaded stud about 20 turns, then thread the other end of the threaded stud about 1/2" into a 24" long **Inner Pushrod Tube**. Connect the clevis to the control horn on the elevator. Route the inner pushrod tube over the receiver and place it on top of the elevator servo (middle servo) arm. Cut the inner pushrod tube 7/8" short of the servo arm.

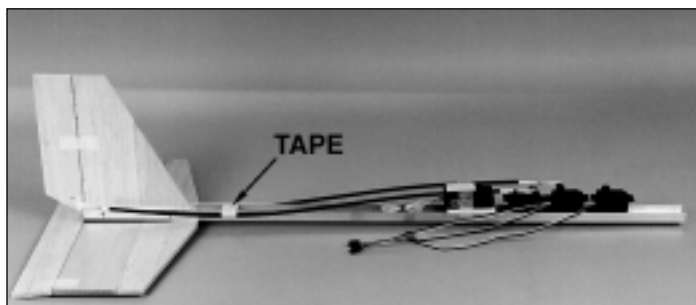
- ❑ 2. Cut a 24" **Outer Pushrod Tube** 2" shorter than the inner pushrod and slide it over the tube. Thread another clevis onto a threaded stud, then thread it into the inner pushrod just the same as you did on the other end. Temporarily connect the clevis to the servo.

- ❑ 3. Perform the same operation for the rudder with the same hardware you used for the elevator.



- ❑ 4. Secure the front end of the elevator and rudder outer pushrod tubes by taping them directly to the receiver.

**Tip:** Place a 3/16" x 7/8" x 1-1/2" balsa block (not included) between the pushrods.

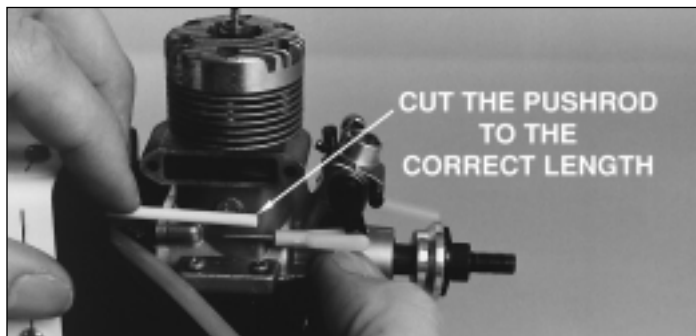


- ❑ 5. Temporarily tape the aft end of the outer pushrod tubes to the fuselage channel in the area about 1" ahead of the stabilizer.

### **Connect The Throttle Servo**

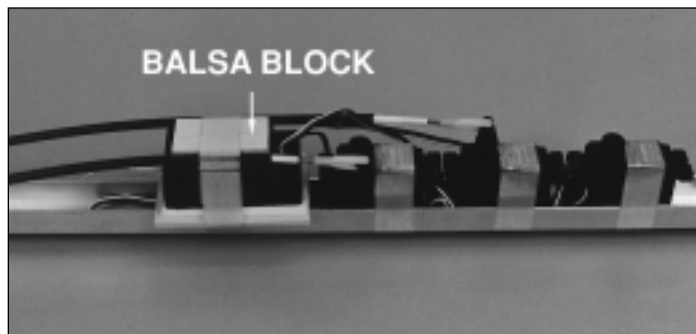
- ❑ 1. Connect a clevis using a 1" threaded stud to one of the 12" throttle pushrod. Slide the pushrod into the throttle outer guide tube from inside the fuselage.

- ❑ 2. Temporarily mount the fuselage channel to the fuselage with a 6-32 nut on both of the 6-32 screws you glued to the channel. Mount the engine if you have not already done so.



- ❑ 3. Connect the clevis on the throttle pushrod to the throttle servo arm. Thread a 1" threaded stud onto a clevis,

then temporarily connect the clevis to the arm on the carburetor. When the clevis and the threaded stud are connected to the carburetor, you can see where to cut the outer guide tube and the throttle pushrod. Cut the tube and pushrod, then disconnect the clevis from the carburetor and thread the stud into the throttle pushrod.



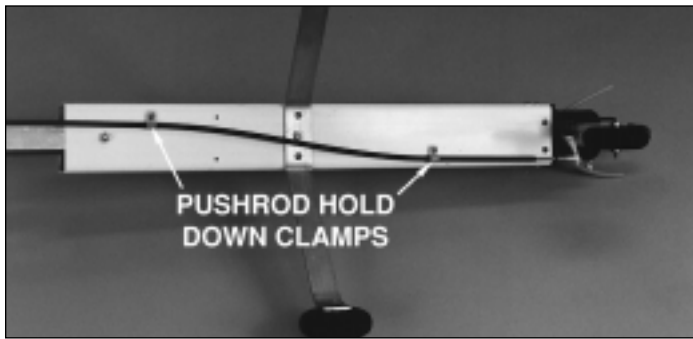
- ❑ 4. Now that the pushrods are connected and the exact location of the servos is determined, attach the servos securely to the aluminum fuselage. Wrap two layers of reinforced filament tape around the servos and the fuse channel the same as we recommended for the receiver.

### **Connect The Nose Wheel**



- ❑ 1. Thread a 1" threaded stud with a clevis into the 36" long inner pushrod tube, then slide it into an outer pushrod tube cut to a length of 35". Connect the clevis to the rudder control horn next to the other clevis from the rudder servo. Remove the tape from Step 5, then tape all three pushrod tubes to the fuse channel.

- ❑ 2. Install two **Pushrod Hold Down Clamps** on the outer pushrod tube and position them on the bottom of the fuselage at the approximate location shown in the photo in the following step. **Do not drill into the fuel tank, receiver, receiver battery or other equipment.** Drill two 7/64" holes through the bottom of the fuselage. Then use a #6 x 1/2" screw to fasten each nylon clamp to the fuselage.

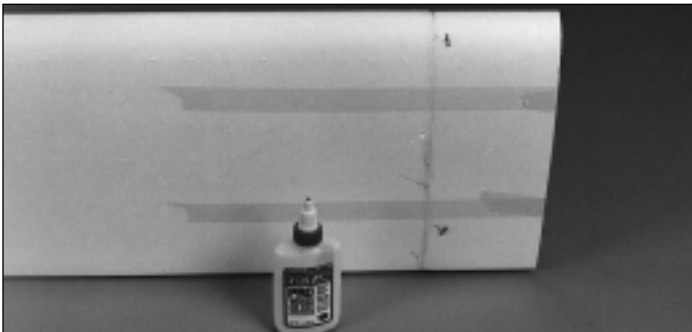


❑ 3. Cut the inner pushrod tube to the correct length, then install the last 1" threaded stud with a clevis. Position the steering arm as shown in the photo. Adjust the length of the pushrod so that when the rudder is neutral and the pushrod is connected to the steering arm, the nose wheel is also neutral.

❑ 4. Turn the model over and confirm the coordination of the rudder and the nose wheel – when the rudder moves left, the nose wheel should turn left.

## Build The Wing

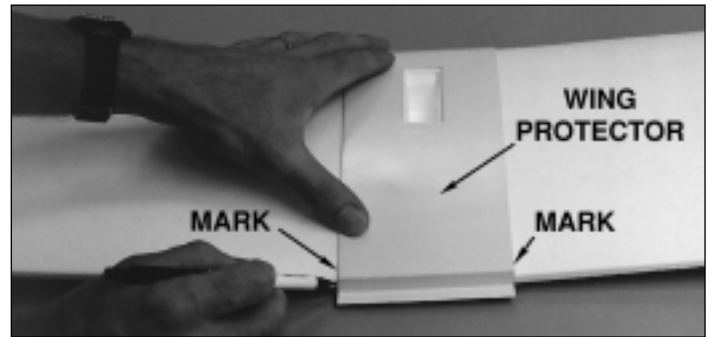
### Assemble the Ailerons



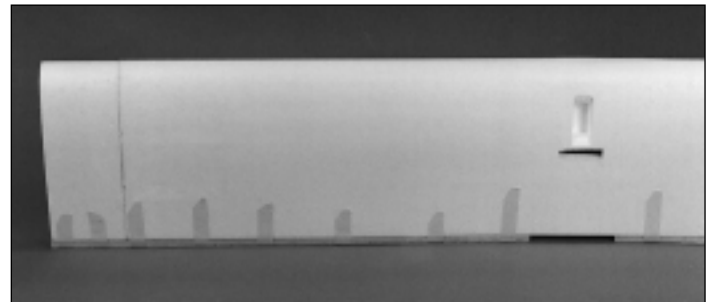
❑ 1. Apply a thin film of aliphatic resin (white glue such as Great Planes Pro) or epoxy to one of the wing tips and the root of one of the wing extensions then join the two pieces by clamping them together with T-pins and masking tape. Hint: Stick the T-pins in first as they will keep the root extension from shifting while you apply the masking tape. Place a straightedge on the bottom of the wing across the wing and the wing extension to make sure you have not inadvertently built in some dihedral or anhedral to the tip of the wing.

❑ 2. Glue the other wing extension the other wing tip in the same manner. Allow the glue to fully dry before proceeding.

❑ 3. Use a hobby knife or a MultiPro to cut the hole in the plastic wing shield for the aileron servo. True the sides of the wing shield with a bar sander and 220-grit sandpaper.



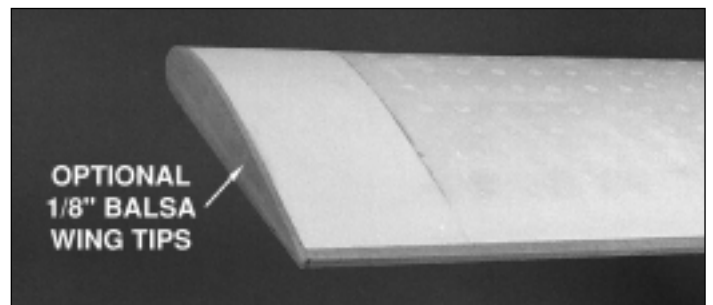
❑ 4. Place the wing shield on the wing and aligning the hole in the shield with the hole in the wing for the aileron servo. Use a felt-tip pen to mark the edges of the wing shield onto the trailing edge of the wing.



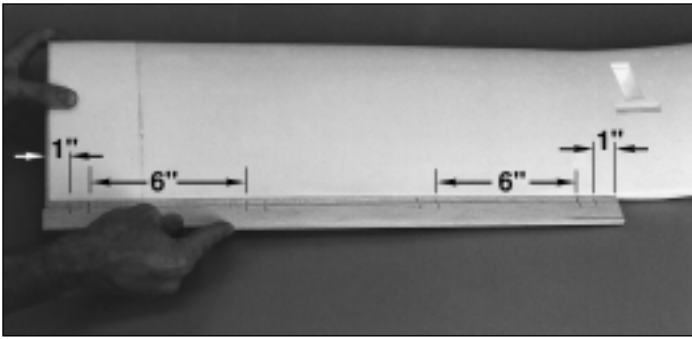
❑ 5. Cut the 1/4" x 5/16" x 24" balsa wing trailing edges so they fit between the marks you made and the tip of the wing. Use epoxy or aliphatic resin to glue the trailing edges to the wing and hold them in position with masking tape until the glue dries.

**Note:** The 1/4" side of the trailing edges is the side that gets glued to the wing.

❑ 6. Use a sanding block to sand the ends of the balsa trailing edges so they are flush with the wing tips.



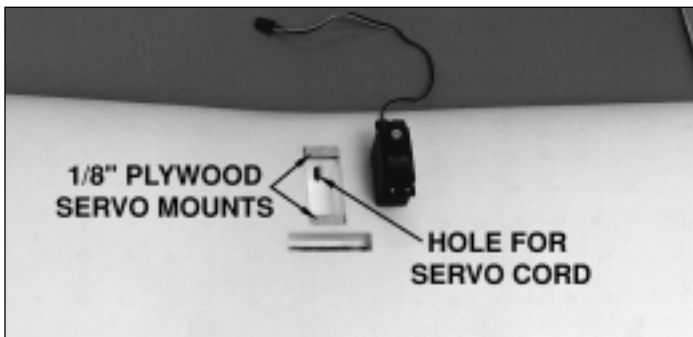
❑ 7. Optional: Trace the outline of both wing tips onto a 1/8" balsa sheet (not included), then cut the wing tips from the sheet and glue them to the tips of the wing. After the glue dries use a sanding block and 220-grit sandpaper to shape the balsa tips to match the contour of the wing. The 1/8" balsa will add a little durability by protecting the wing tips from dents and dings.



❑ 8. Trim one of the 1/4" x 1" x 24" balsa ailerons so it extends from the left wing tip to the line you drew indicating the left edge of the wing protector. Mark the location of the hinge slots on the trailing edge of the wing and the left aileron according to the measurements shown in the photo, then cut the hinge slots in the wing and the aileron the same way you did for the rudder and elevator. Perform the same procedure for the right aileron.

❑ 9. Use a razor plane or a bar sander and 150-grit sandpaper to shape the leading edge of the ailerons to a "V" to allow for control movement. Test fit the ailerons to the wing with eight hinges cut from the hinge strip.

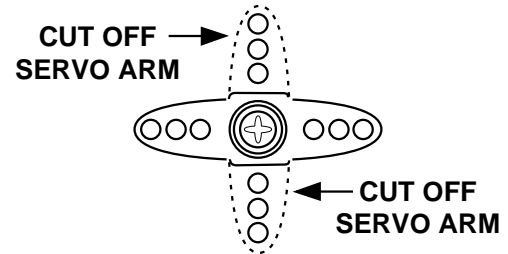
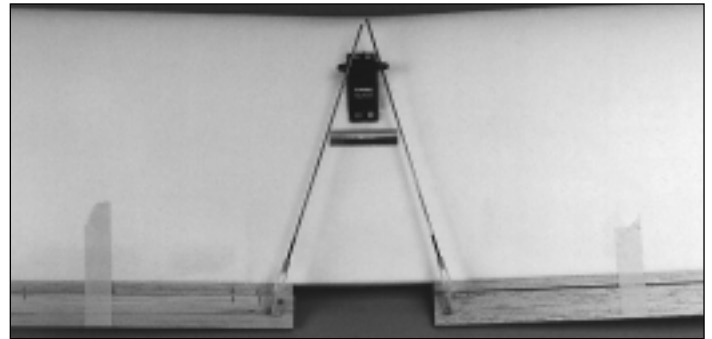
### Hook Up the Ailerons



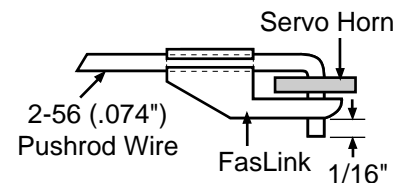
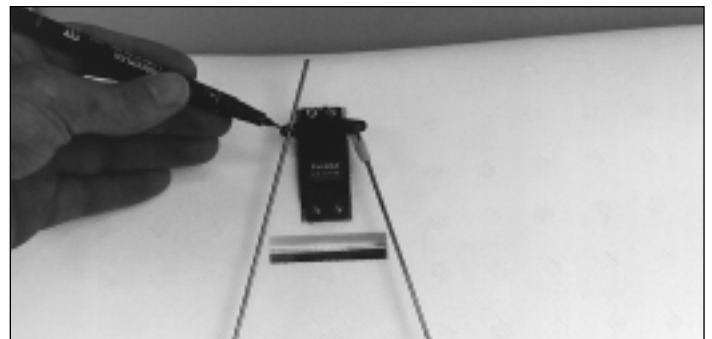
❑ 1. Drill or cut a hole through the wing to allow the aileron servo cord to pass, then test fit your servo in the wing so the output shaft is forward. Make adjustments if required, then use 6-minute epoxy to glue the 1/8" plywood servo mounts in the wing. Hint: Use a piece of 1/4" brass tube sharpened at one end to make the hole in the foam for the servo cord.

❑ 2. Fit the aileron servo into the wing, then drill two 1/16" holes in both servo mounts for the servo screws included with your radio system. Mount the servo to the servo mounts.

❑ 3. Thread a clevis about 20 turns onto a 12" wire pushrod, then cut 4" off the other end. Connect the clevis to the third from the outer hole of a control horn. Make another pushrod assembly the same way.

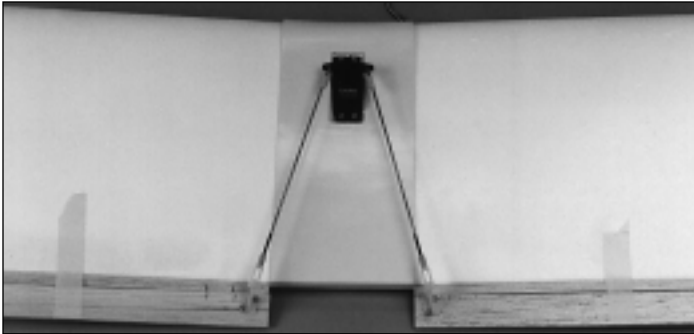


❑ 4. Make a 2-armed servo arm by cutting the opposite arms off a 4-armed servo arm. Place the arm on your aileron servo, then position one of the pushrod assemblies on the wing so the control horn is 1/4" from the end of the aileron and the pushrod aligns with the middle hole of the servo arm. Mount the control horn to the aileron with two 2-56 x 1/2" screws and the control horn back plate the same way you did for the elevator and the rudder. Mount the other control horn to the aileron in the same manner.



❑ 5. With the ailerons in neutral position, use a felt-tip pen to mark both pushrods where they cross the holes of the servo arm, then use pliers to make a 90-degree bend at each mark. Temporarily connect a nylon Faslink to the pushrods, then cut the pushrods so only about 1/16" of

wire protrudes out of the Faslinks. Connect the pushrods to the servo arm with the Faslinks (you may have to enlarge the holes in the servo arm for the pushrod wire – use a hobby knife or a #48 drill for precision).



❑ 6. Finish trimming the wing shield by cutting the front so it extends below the centerline of the leading edge of the wing by approximately 1/8" and the rear so it is even with the bottom of the wing. Test fit the wing shield and make adjustments to the opening for the aileron servo if needed.

## Cover The Wing & Tail Surfaces

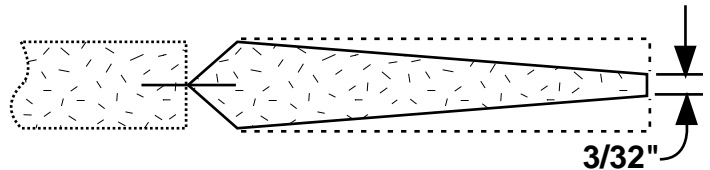
For new modelers or those unfamiliar with finishing techniques, we have provided some basic information about the covering materials that are available and the recommended covering sequence.

The foam wing and the balsa surfaces, including the ailerons and tail feathers, must be covered with some kind of protective, fuelproof finish. Among the many model airplane covering materials available, Top Flite EconoKote film is recommended. EconoKote film requires a lower heat range to apply than other iron-on films, so it can be applied over the foam wing. It can also be applied to the wood tail surfaces as well. Apply EconoKote film with a hobby heat seal iron.

One six-foot roll will be enough to cover the Trainer 40, but if you wish to add trim colors or other designs, you will have to purchase more than just one roll.

## Prepare The Tail Feathers & Wing For Covering

❑ 1. Disconnect the elevator and rudder pushrods from the tail feathers. Remove the control horns and hinges, then take the stabilizer and fin off the fuselage channel. Use a bar sander and 150-grit sandpaper to round the leading edges of the fin and stabilizer. Final sand all the tail surfaces with 320-grit sandpaper.



**Tip:** If you don't mind a little extra work and would like to have a better looking model with a "finished" appearance, taper the rudder and elevator by sanding the trailing edges to a thickness of approximately 3/32". This is optional and does not affect the flight performance of the Trainer 40.

❑ 2. While the ailerons are still connected, sand the tips of the wing so the balsa trailing edge and ailerons are all flush with the wing tip. Disconnect the pushrods and remove the control horns from the ailerons. Detach the ailerons from the wing and remove the hinges.

❑ 3. Apply white Hobbico HobbyLite™ filler to any dents in the foam wing. After the filler has hardened, use a sanding block and 220-grit sandpaper to blend the wing extensions to the rest of the wing and remove the seam on the leading edge or any other molding irregularities. For the best appearance, it is recommended that final sanding be done with 320-grit sandpaper but without a sanding block.

**Tip:** As with the rudder and elevator, for a "finished" appearance, you may taper the ailerons.

❑ 4. Before covering, remove as much balsa and foam dust as possible left from sanding the model. This can be done with compressed air, a vacuum cleaner, a brush or a tack cloth.

*Now the Trainer 40 wing and tail feathers are ready for covering.*

## Cover The Wings & Tail Feathers

Carefully follow the instructions included with the covering you have selected.

### Tips For Covering A Foam Wing With EconoKote Film

*Many modelers are experts at applying iron-on coverings to wood surfaces but have never tried it over foam. Here are some tips:*

**A Top Flite Hot Sock™ is highly recommended for covering the foam wing.** It helps distribute the heat and keeps dents, scratches or “swirls” from being added during covering.

**Find the optimum temperature of the iron.** The hotter the better, up to the point of distorting the foam. The Top Flite MonoKote Iron can be set at around “2-1/4”, but this may vary from iron to iron. Use the flat center section on the bottom of the wing as a test area. Cut out a piece of covering and apply it to the bottom of the wing in the center. Increase the heat of the iron until the covering gets that “pig skin” look (like a football). At that point the iron is slightly too hot, so turn the heat down a little and you're ready to apply the covering.

**Start by touching the iron to the middle of the covering and work outward when covering the wing (or other large surfaces).**

**Lightly “push out” wrinkles and air bubbles as you get to the edges.**

**Don't be afraid to press down on the iron and apply a little pressure to the covering.** This helps bond it to the foam and will eliminate wrinkles and air bubbles from appearing later.

**Avoid moving the iron in a circular motion and hold it as flat as possible.**

**Always use a sharp hobby knife to cut the covering.** Some modelers prefer a single edge razor blade for this.

### Cover The Wing In This Sequence

- ☐ 1. Bottom of the center section
- ☐ 2. Right, then left wing tip
- ☐ 3. Bottom right wing panel
- ☐ 4. Bottom left wing panel
- ☐ 5. Top left wing panel\*
- ☐ 6. Top right wing panel
- ☐ 7. Ailerons\*\*

\* Temporarily place the wing shield on the wing, then lightly trace its outline onto the wing. The covering should extend

past the line and “under lap” the wing shield by 1/8". The wing shield must be glued directly to the bare foam, not the covering. You will be instructed, at the proper time, to glue the wing shield to the wing.

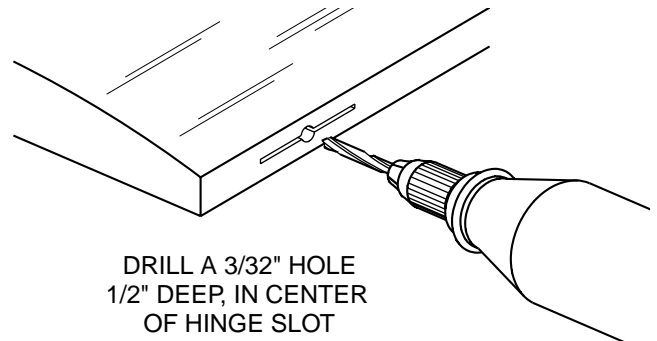
### Cover The Tail In This Sequence\*\*

- ☐ 1. Stab bottom plate
- ☐ 2. Stab bottom left, then right\*\*
- ☐ 3. Stab top
- ☐ 4. Elevator
- ☐ 5. Fin Base Sides
- ☐ 6. Fin left, then right side
- ☐ 7. Rudder

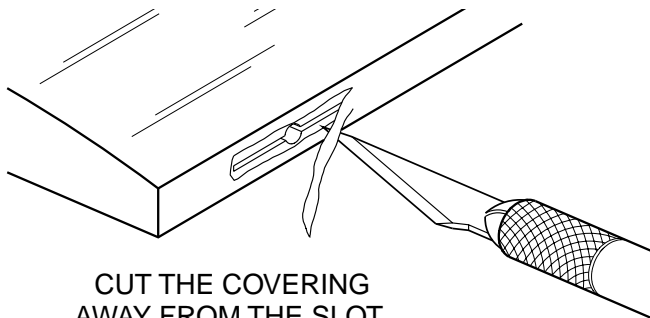
\*\* Some modelers cover the **tips** of the ailerons, elevator, rudder, stab and fin separately. If you use this method, this should be done first. Generally, it is easiest to cover the stab and fin in two pieces (halves). The ailerons, rudder and elevator are smaller, so they may be covered in one piece by “wrapping” the covering all the way around. Try to make all seams in the covering face rearward or downward.

## Final Assembly

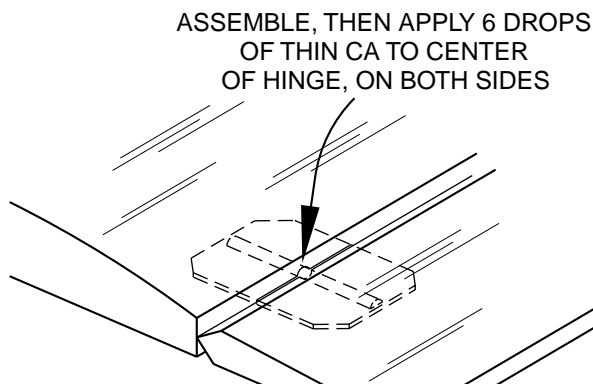
### Glue The Hinges



- ☐ 1. Slit the covering on all the surfaces where each hinge slot is located. Drill a 7/64" hole 1/2" deep in the center of each slot. This will enable the CA to “wick” into the hinge much better.



- ❑ 2. Cut the covering away from the slot.



- ❑ 3. Insert the hinges and attach the ailerons to the wing, the elevator to the stab, and the rudder to the fin. Glue the hinges by applying 6 drops of thin CA to the center of the hinge, on both sides.

### Reassemble The Model



- ❑ 1. Add a 1/16" thick x 5/16" wide strip of wing seating foam tape to the wing saddle area on the fuselage (where the wing contacts the fuselage). Round the ends of the 1/4" **Wing Dowels**, then install them in the fuselage. No glue is required to secure the dowels but you should fuelproof the dowels with a thin coat of epoxy.

- ❑ 2. Roughen the underside of the wing shield with 150-grit sandpaper so glue will adhere, then glue it to the wing with 30-minute epoxy.

**Tip:** "Clamp" the wing shield to the wing by mounting the wing on the fuselage with #64 rubber bands with the wing shield in position.

- ❑ 3. Reinstall the aileron control horns and hook up the linkages.

- ❑ 4. Mount the stab and rudder to the fuselage channel as you did during construction. Use thread lock or CA on all the nuts. Install the control horns and connect the pushrods.

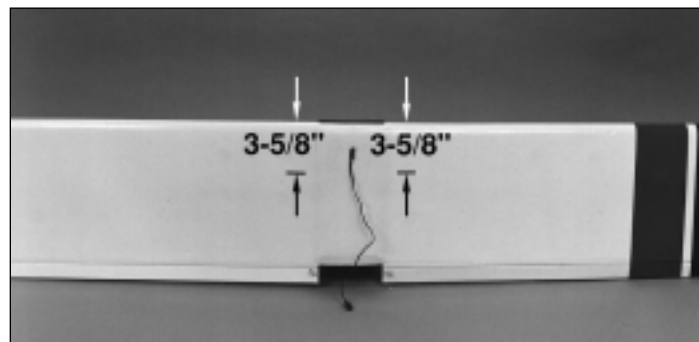
- ❑ 5. Mount a 2-1/4" spinner (optional) and a propeller of the correct size to the engine.

- ❑ 6. Mount the switch. You can cut a slot and drill two holes just about anywhere and mount it directly to the fuselage, or you can use foam mounting tape to secure the switch inside the fuselage at the rear where it is accessible.

### Balance The Model (Check The Center Of Gravity)

This procedure **must not** be omitted. A model that is **improperly balanced** will be **uncontrollable**, resulting in a crash and possible damage to persons or property.

**Note:** The C.G. must be determined with the fuel tank empty.



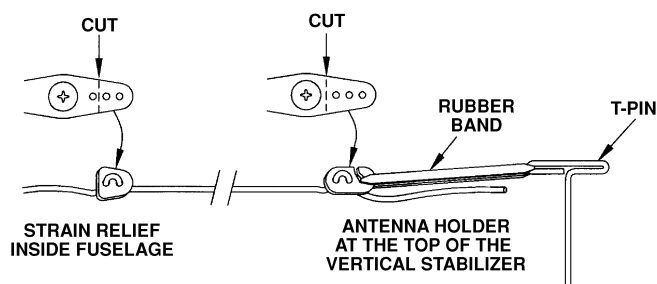
- ❑ 1. Apply two pieces of 1/8" wide tape or use a felt-tip pen to mark the **Center of Gravity** (C.G.) location on the bottom of the wing, near the fuse, 3-5/8" back from the leading edge.

- ❑ 2. Mount the wing to the fuselage with a couple of #64 rubber bands. With your battery pack handy, lift the model at the C.G. location on each side of the wing. Position the battery pack on the wing until the model is level or slightly nose down. This is the position where you must mount the battery pack inside the fuselage. Try to position the battery pack so no ballast will be required to correct the C.G.

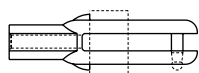
## Final Hookups & Checks

1. Mount the battery pack. There are several ways to do this. Wrap the battery pack in 1/4" thick foam and tape it directly to the fuselage channel or mount it to the inside of the fuselage with foam mounting tape. On our prototype, the 500 mAh flat battery pack was mounted directly to the inside of the fuselage next to the front servo with no additional weight required for C.G. correction.

2. Recheck the C.G. Add stick-on lead weights to the nose or tail of the model if required to correct the C.G.



3. Route the receiver antenna. You can secure it to the top of the fin with a piece of tape or make a strain relief and antenna hook out of a servo arm as shown in the sketch. Connect the rubber band to a pin inserted into the top of the fin.



Nylon Clevis

4. Add silicone Clevis Retainers to all clevises on the model.

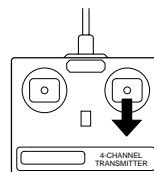
## Control Surface Throws

We recommend the following control surface throws as a starting point. The throws are measured at the **trailing edge** of the ailerons, elevator and rudder:

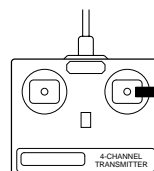
<b>AILERONS</b>	<b>3/8" Up</b>	<b>3/8" Down</b>
<b>ELEVATOR</b>	<b>5/8" Up</b>	<b>1/2" Down</b>
<b>RUDDER</b>	<b>1" left</b>	<b>1" Right</b>

## Before Going To The Flying Field

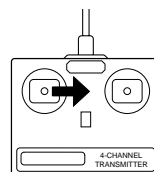
### 4-CHANNEL RADIO SET-UP (STANDARD MODE 2)



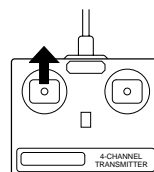
ELEVATOR MOVES UP



RIGHT AILERON MOVES UP  
LEFT AILERON MOVES DOWN



RUDDER MOVES RIGHT



CARBURETOR WIDE OPEN

1. Confirm the direction of the controls.

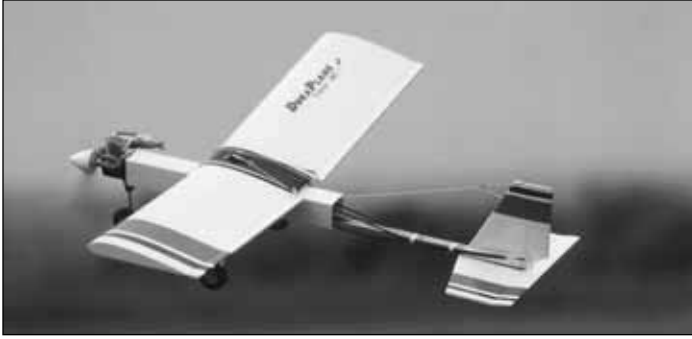
2. It is highly recommended that you balance the propeller. An unbalanced propeller can cause poor engine performance and decrease its life. Vibration can cause problems with your in-flight radio system. A Top Flite Precision Magnetic Balancer is recommended (TOPQ5700).

3. Make sure the fuel lines are properly connected. An in-line fuel filter is recommended.

4. Make sure the transmitter and receiver batteries are fully charged.

5. Perform a range check of your radio system as described by the radio manufacturer.

# Flying



The DuraPlane Trainer 40 is intended for intermediate to expert level pilots. Beginners can enjoy flying the Trainer 40 also, if they have had experience flying trainer models. Unless you are a highly experienced pilot, first flight attempts should be reserved for calm days or when the prevailing wind – no more than seven to ten mph – is down the runway. Beginners should seek the help of an experienced modeler to check the airworthiness of your Trainer 40, make sure all the controls operate correctly, and to provide flight instruction. Avoid flying engine powered R/C models in areas near traffic or areas that can attract unrestrained observers (wild kids). Such seemingly ideal places include parks, school yards, office building lawns, etc. If you are a beginner, you are busy enough concentrating on your model without having to answer lots of questions and performing crowd control. Ask your hobby shop where the nearest R/C flying field is and join the AMA.

**TAKEOFF:** Exact control throws are not provided for the nose wheel because the amount of throw required varies greatly depending on the conditions of the field. More nose steering will be required if taking off a grass field than would be required if taking off from a paved runway. In any case, beginners should refrain from adding too much nose wheel steering because as the model rolls down the runway and picks up speed, the steering becomes more sensitive and it may become difficult to maintain heading before you lift off. For a paved runway approximately 1/4" of nose wheel steering should be all that is required.

Advance the throttle slowly at first, then apply full throttle a little more rapidly. Build as much ground speed as your strip will allow, then smoothly apply "up" elevator (pull back on the stick to lift the nose just like in a full size airplane) until the nose wheel rotates and the model lifts into the air. Never "yank up" on the stick but slightly relax the up elevator and allow the Trainer 40 to steadily climb to a comfortable altitude before executing the first turn. Since the rudder and nose wheel are controlled by the left stick ("ground steering") you will have to transition to the right stick (ailerons – you can think of them as "air steering" for the time being) once the model is in the air.

**FLIGHT:** If you find that you "have your hands full" once the Trainer 40 is in the air, this is the most important thing you should remember: SLOW IT DOWN! No matter the size of

the engine you have on your Trainer 40 (within the recommended range), it does not require full power to fly. Once the model has lifted into the air you should throttle back to half or even less than half throttle. This will allow the model to fly much slower giving you time to calm down, focus, think and react. This rule applies for nearly all the models you will probably build in the future.

Once your Trainer 40 is airborne and you have throttled back, perform a gentle down wind turn. You must apply a little "up" elevator to keep the model level while you are turning. Beginners can use just the ailerons (the right stick) for turning but some experts prefer to execute "coordinated turns" by adding a little rudder as well. After the model has completed the turn add a little "opposite" aileron to bring the Trainer 40 back to a straight and level attitude. Continue flying a "racetrack" pattern at a safe altitude exercising the ailerons and elevator to maintain your heading and altitude.

After a few minutes of flying a "race track" pattern point the Trainer 40 into the wind and throttle back to just above idle speed and see how it will behave. Do this a few times so you can gauge the models' landing speed and control response. Make several landing "approaches" (always into the wind) and throttle up and climb out, then go around again.

**LANDING:** Now it's time for the real McCoy. Make sure you have enough fuel to make a few more "go-arounds" just in case you are coming in too short, too long, or "all wacked out of shape" so you can abort the landing. If you must do so, just slowly add power, stay calm, climb smoothly, and go around – just like taking off. Keep practicing approaches and when you find one you like, throttle all the way back. When the model reaches an altitude of about ten feet, slowly begin applying up elevator as the model descends. The slower the model flies, the more up elevator it will require to keep it off the ground. Ultimately, by the time you touch down you will have simultaneously "run out" of up elevator and airspeed. The idea is for these two things to happen at the same time. The model should quit flying the moment it touches down. Until you get to this stage of perfection however, it is best to land slightly "hot" with a few "clicks" of power on the throttle trim so you do not inadvertently stall the wing before the model is on the ground. You can "fly" the model to the runway instead of keeping it on the verge of a stall.

As easy (and fun) as flying sounds, it's always best to have an instructor take you up for your first few "outings" until you are ready to land and takeoff by your self. You'll end up with a model that lasts longer and your modeling "career" will be much more enjoyable! We hope you have as much fun with your DuraPlane Trainer 40 as we do with ours.

The Trainer 40 is a tough "kick around" plane that looks rather sporty and is lots of fun to fly. So get carried away and have a blast!

# ***DURA*PLANE™**

## ***Trainer 40***

***Everything For Flying Your Trainer 40!***



### **Aerobat 40**

Designed for advanced flying, the Aerobat 40 is fully aerobatic. It features injection-molded parts that save construction time and aluminum channel reinforcements for extra strength. High-quality components and a low parts count make the DuraPlane series the most rugged and practical airplanes available. **DURA1130**



### **Hobbico® Ultra-Tote™ Field Box**

Keep your field gear organized and handy with the Hobbico Ultra-Tote. Tools can be stored in its deep, roomy drawer, held closed by a hook & loop strip. Foam padded cradles are included for plane repairs and maintenance. Also featured are a ventilated 12V battery compartment and a power panel opening. Comes in kit form with assembly instructions included. **HCAP5020**



### **Futaba® 4NBF Conquest 4-channel Radio**

Flexibility and convenience make the Futaba Conquest FM radio systems a good choice for experienced fliers. **FUTJ39\*\***



### **O.S.® .48 Surpass 4-stroke Engine**

Lower noise, higher torque, increased fuel economy and longer engine life make the O.S. .48 Surpass engine an excellent choice for your Aerobat. **OSMG0848**



### **Great Planes Pro™ Thin, Instant Set CA**

Instant-setting Pro CA is ideal for fast assembly with a curing time of 1-3 seconds. All Pro CAs are dated for freshness. **GPMR6002**



### **Great Planes Pro Medium CA**

Thick CA+ is an excellent gap filler that cures in 10-15 seconds. All Pro CAs "wick" better into balsa wood for the strongest possible bond. **GPMR6008**



### **Great Planes Pro 6-minute Epoxy**

Pure, powerful Pro 6-minute Epoxy cures very quickly while also providing incredible strength. Two-bottle set includes 4.5 oz. bottles of epoxy and hardener. **GPMR6045**



### **Great Planes Pro 30-minute Epoxy**

Pro 30-minute Epoxy provides modelers with longer curing time to reposition parts and provides greater strength for high-stress areas. **GPMR6047**