Gentle Lady™ ARF

Wingspan: 79 in [2005mm]
Wing Area: 674 sq in [43.5 dm²]
Weight: 2.0–2.25 lb [910–1020g]
Wing Loading: 7–8 oz/sq ft [21–24 g/dm²]
Length: 41 in [1040mm]
Radio: 2-channel minimum with 2 servos and standard size receiver

CARL GOLDBERG™ CLASSICS by Great Planes

WARRANTY

Great Planes 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 this address:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA
(217) 398-8970 Ext. 5

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.

TABLE OF CONTENTS

The Gentle Lady ARF sailplane was designed to be a gentle trainer for the beginning modeler, yet to possess competition capability in the hands of the experienced glider pilot. The Gentle Lady is very efficient and reacts quickly to rising air (called lift, or thermals). To stay in a thermal, the Gentle Lady can circle very tightly without falling off. The model has good penetration into the wind and can "cruise" when desired.

THINGS TO CONSIDER

The Gentle Lady ARF requires a minimum 2-channel radio system with two 44 oz.-in. [3.2 kg-cm] minimum standard servos. A charge jack receptacle is optional, but is useful for quickly checking and recharging the receiver pack without removing the radio hatch. Recommended part numbers for the radio components are provided below:

- Futaba® S3004 Servo Standard (FUTM0004)
- Ernst Charge Receptacle Futaba J FM (ERNM3001)

ADDITIONAL ITEMS REQUIRED

REQUIRED HARDWARE AND ACCESSORIES

This is the list of hardware and accessories required to finish the Gentle Lady ARF. Order numbers are provided in parentheses:

- R/C foam rubber 1/4" [6mm] (HCAQ1000)
- Dynaflite™ Up-Start 2M (DYFP8305)
- Hobbico® #64 rubber bands (HCAQ2020)

ADHESIVES AND BUILDING SUPPLIES

This is the list of Adhesives and Building Supplies that are required to finish the Gentle Lady ARF:

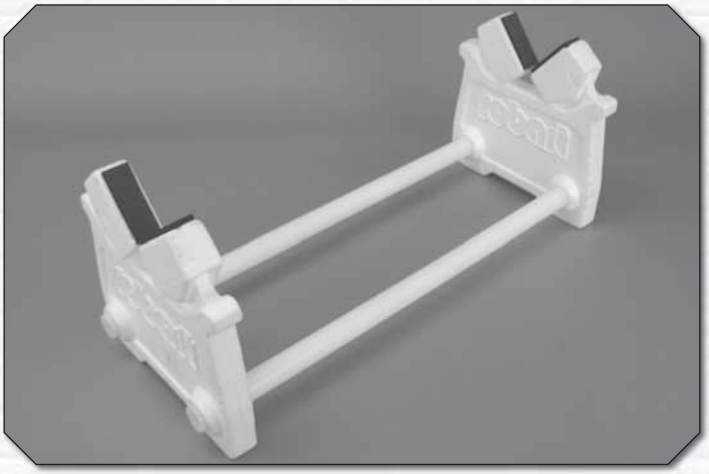
- 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
- Pro 30-minute epoxy (GPMR6047)
- Denatured alcohol (for epoxy clean up)
- Drill bits: 1/16" [1.6mm], 5/64" [2mm]
- #1 Hobby knife (HCAR0105)
- #11 blades (5-pack, HCAR0211)
- Top Flite® MonoKote® sealing iron (TOPR2100)
- Top Flite Hot Sock™ iron cover (TOPR2175)
- Panel Line Pen (TOPQ2510)

OPTIONAL SUPPLIES AND TOOLS

Here is a list of optional tools that will help you build the Gentle Lady ARF:

- 1/2 oz. [15g] Thick Pro CA– (GPMR6013)
- 2 oz. [57g] spray CA activator (GPMR6035)
- 4 oz. [113g] aerosol CA activator (GPMR6034)
- CA applicator tips (HCAR3780)
- CA debonder (GPMR6039)
- Pro 6-minute epoxy (GPMR6045)
- Epoxy brushes (GPMR8060)
- Mixing sticks (GPMR8055)
- Mixing cups (GPMR8056)
- Pliers with wire cutter (HCAR0630)
- Servo horn drill (HCAR0698)
- CG Machine™ (GPMR2400)
- Hobbico® flexible 18" ruler stainless steel (HCAR0460)
- Top Flite MonoKote trim seal iron (TOPR2200)
- Top Flite MonoKote heat gun (TOPR2000)
- Hobbico pin vise 1/16 collet w/6 Bits (HCAR0696)
- Great Planes® Clevis Installation Tool (GPMR8030)

BUILDING STAND

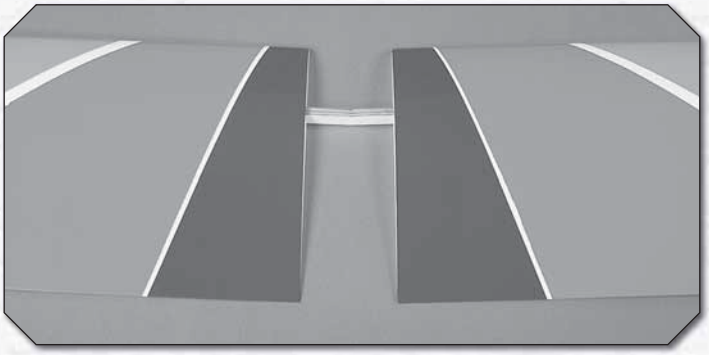


A building stand or cradle comes in handy during the build. We use the Robart Super Stand II (ROBP1402) for all our projects in R&D, and it can be seen in pictures throughout this manual.

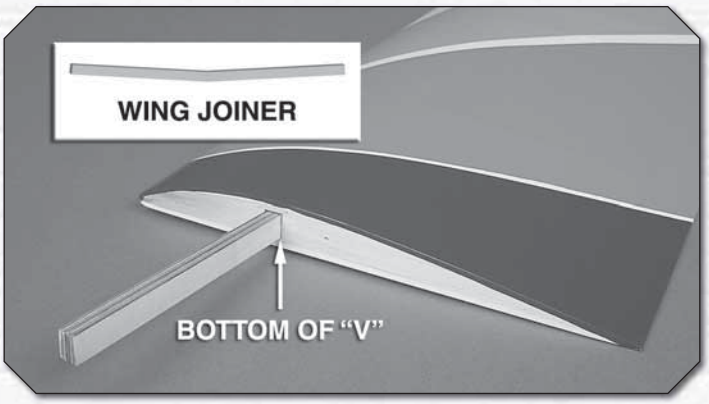
PREPARATIONS

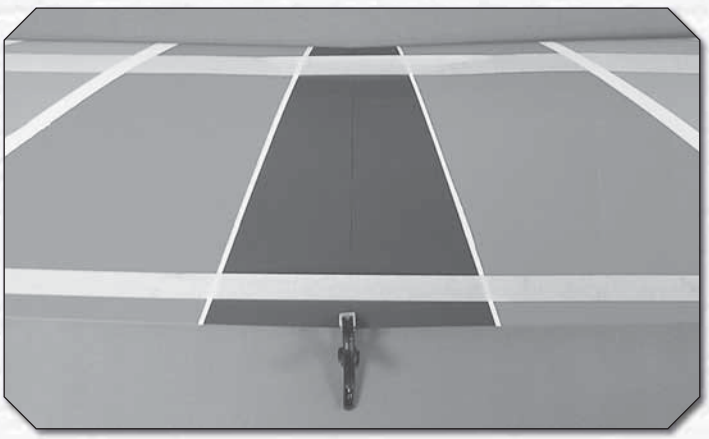
Remove the tape and separate all the control surfaces. Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

JOIN THE WING PANELS

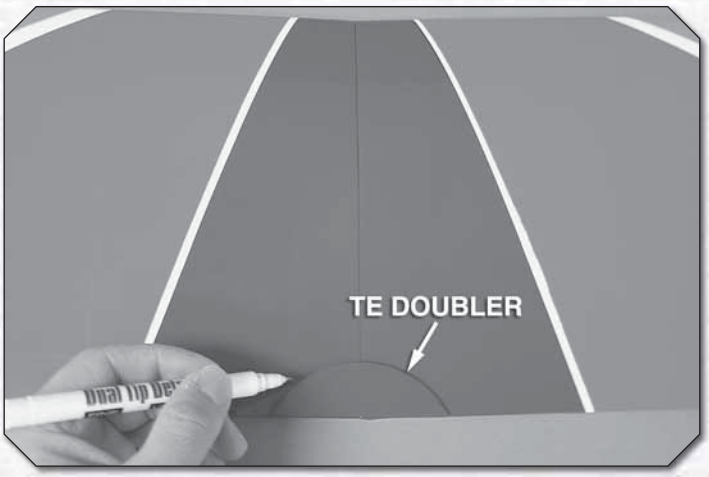


1. Test fit the **wing joiner** into the **wing panels**. The point of the "V" shaped joiner should point to the bottom of the wing panels. Sand the wing joiner or root ribs if necessary to achieve the correct fit. The root ribs should join together tightly with no gaps and the joiner should be just slightly loose in the joiner pockets to allow room for epoxy.

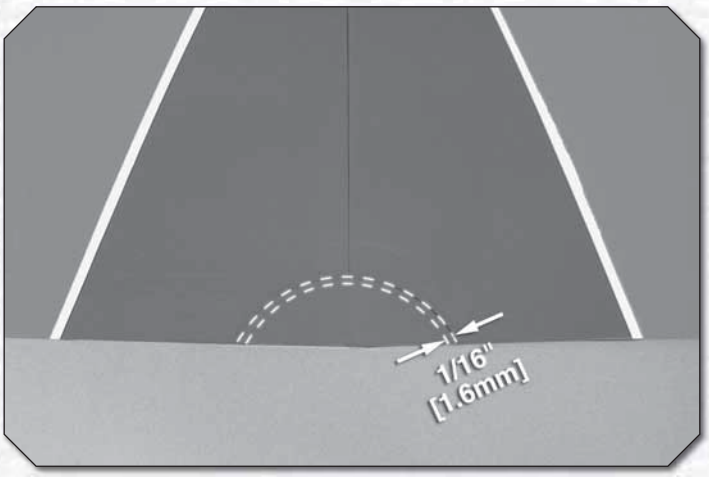


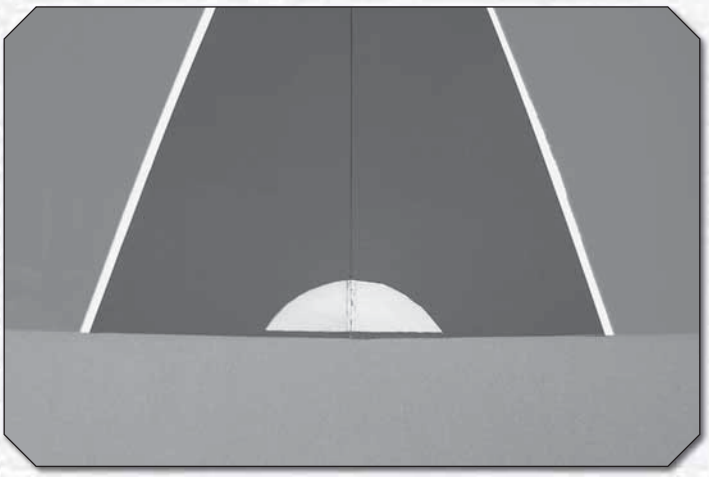


2. Use a mixing stick or something similar to coat the inside of the wing joiner pockets of both wing panels with 30-minute epoxy. Thoroughly coat one half of the wing joiner with 30-minute epoxy and insert it into the joiner pocket of one wing panel with the bottom of the "V" shape pointing to the underside of the wing. Coat the root ribs of both wing panels and the protruding end of the wing joiner with epoxy. Slide the wing panels together and use tape to hold them tight while the epoxy cures.



3. Center the plywood **TE doubler** along the TE of the wing as shown. Use a felt-tip pen to trace around the doubler onto the wing.



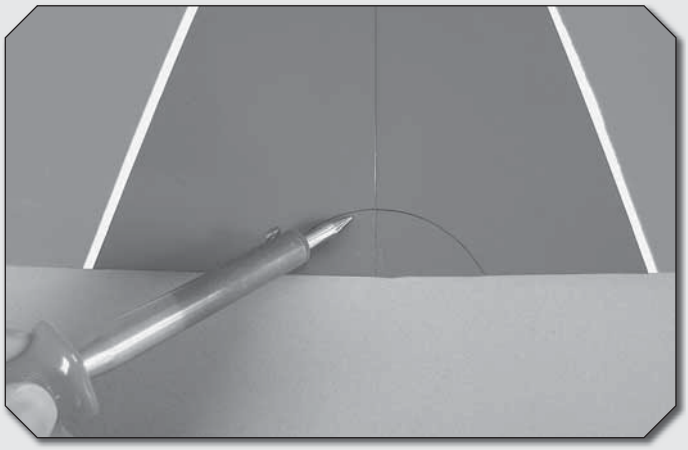


4. Use a sharp #11 hobby knife or use the following **Expert Tip** to cut the covering 1/16" [1.6mm] inside of the lines you marked. Use care to cut **only the covering** and **not into the wood**. Use alcohol to wipe away the lines. Glue the doubler in position with CA or epoxy.

EXPERT TIP

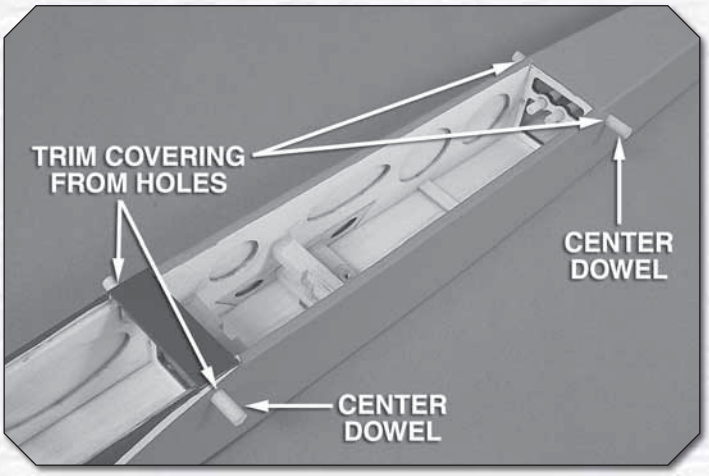
HOW TO CUT COVERING FROM BALSA

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

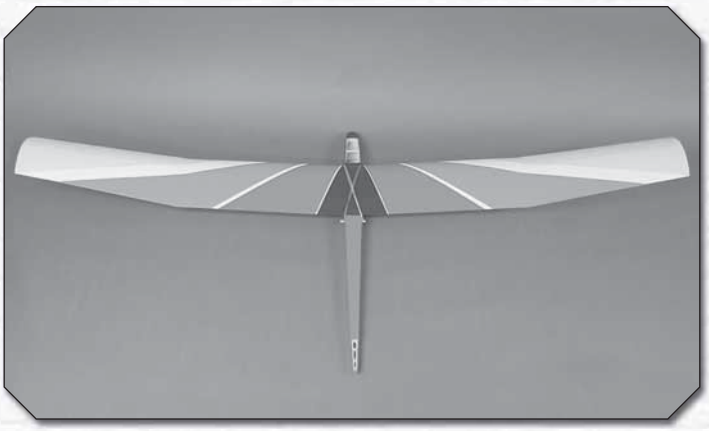


Guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut. Peel off the covering.

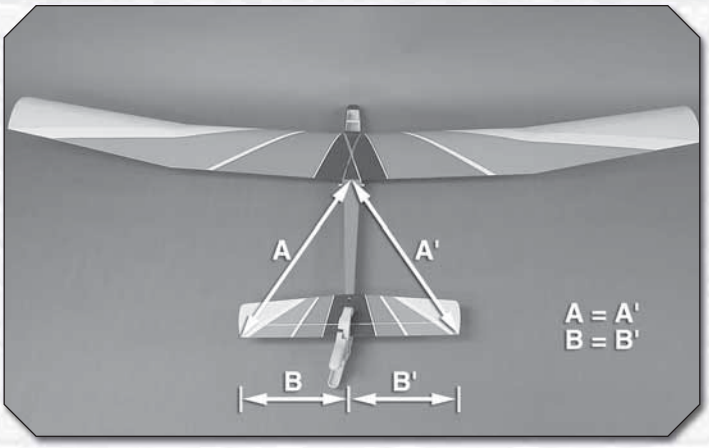
INSTALL THE TAIL SECTION

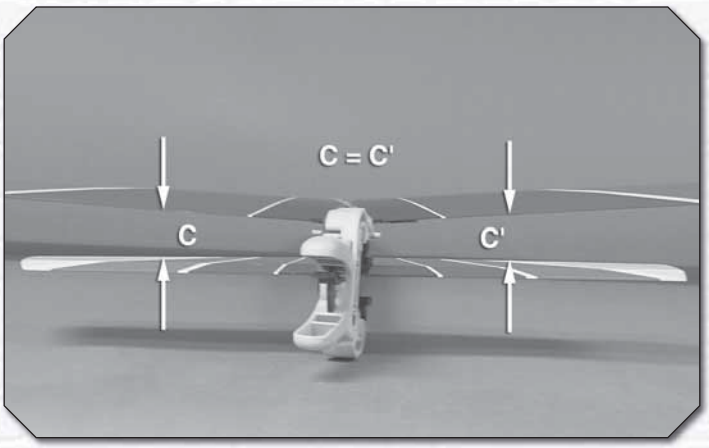


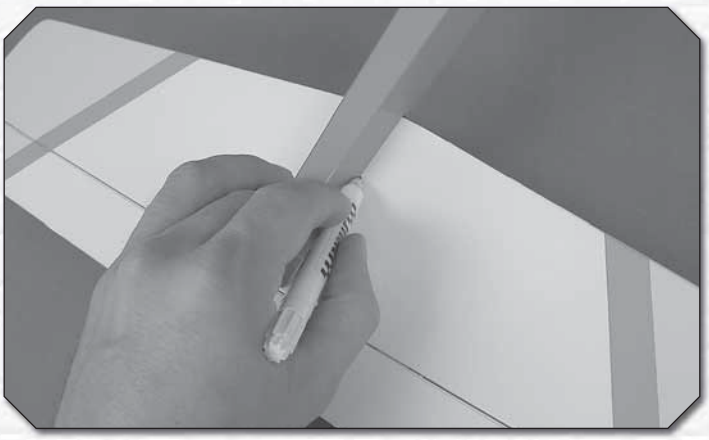
1. Trim the covering from the rubber band dowel holes in the sides of the **fuselage**. Center the dowels in the holes as shown and glue them in place with CA or epoxy.



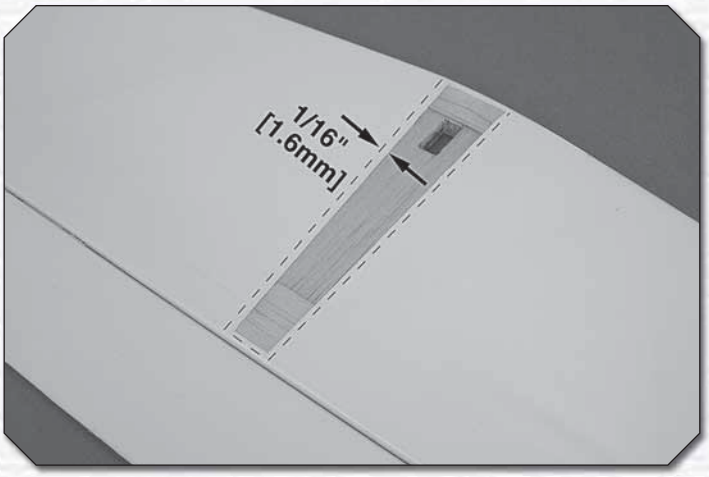
2. Center the wing on the fuselage and secure it using two crisscrossed rubberbands as shown.







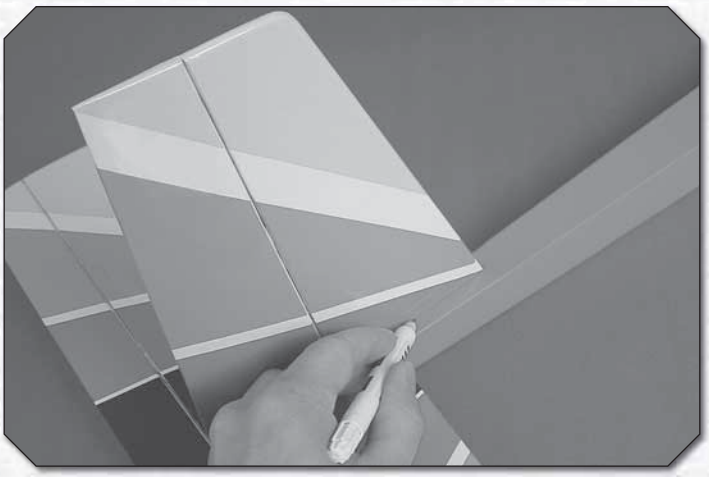
3. Place the **horizontal stabilizer** onto the stab saddle as shown. Center the stab left and right on the fuse (making a center mark on the stab is helpful) and make the distance between the fuse center and stab tips equal on both sides. Stand back 5-6 ft [1.5 - 1.8m] and view the model from behind. Confirm that the stab and wing are parallel. If not, sand the fuselage as necessary until they are parallel. When satisfied, use a felt-tip pen to trace around the saddle where it meets the underside of the stab. We used a small clamp to hold the stab in place while we did this.



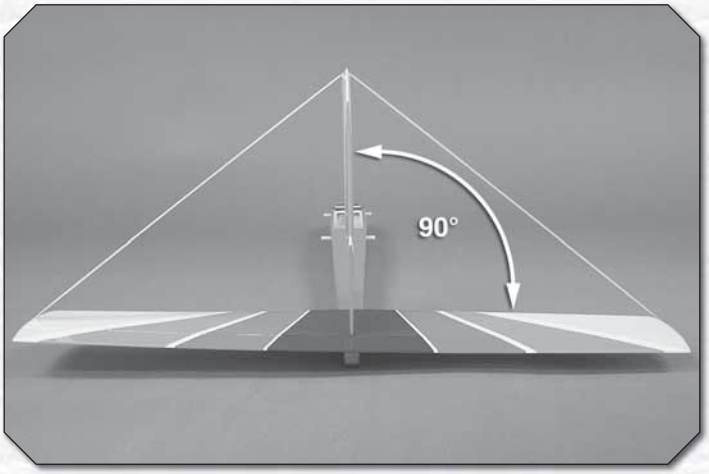
4. Remove the stab from the fuse and trim the covering 1/16" [1.6mm] inside the lines you drew. Be careful not to cut into the wood structure beneath the covering. Use denatured alcohol to wipe away the lines.

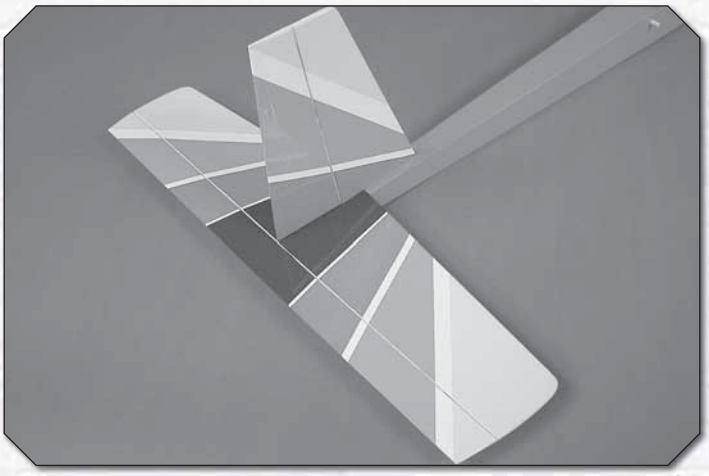
5. Coat the stab saddle on the fuselage and the area where you removed the covering from the stab with 30-minute epoxy. Put the stab back into place on the saddle and re-center its position. Use clamps or weights to hold the stab in place while the epoxy cures. Wipe away any excess epoxy with alcohol.

6. Trim the covering from the **vertical fin** post as shown. Be careful not to cut into the wood.



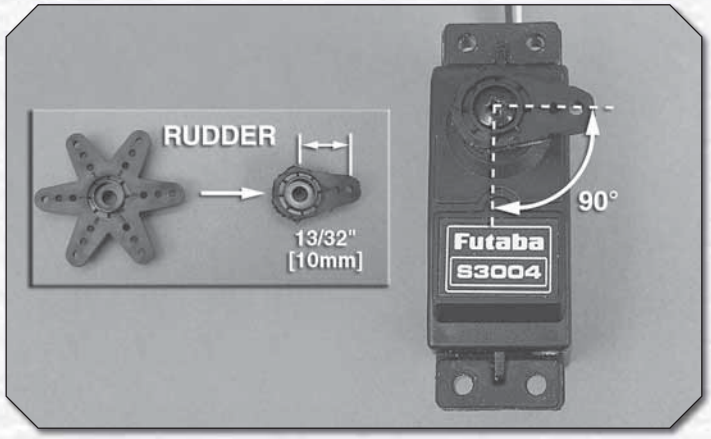
7. Fit the fin post into the slot in the stab. Trace around the fin, being sure it is aligned over the fuse center line (a reference line drawn on the fuselage is helpful to keep the fin aligned with the center of the fuselage. Cut the covering 1/16" [1.6mm] inside the lines you drew and use alcohol to wipe away the lines.





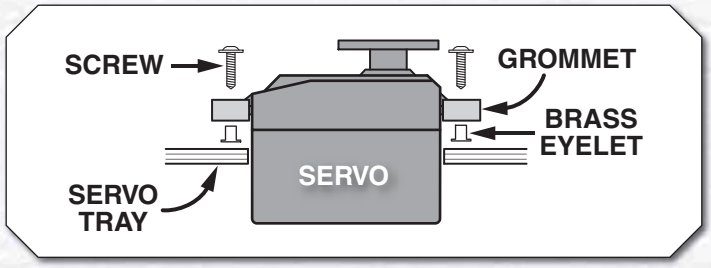
8. Epoxy the fin in place. Confirm that the fin is perpendicular to the stab. Use tape if necessary to hold the fin square to the stab while the epoxy cures.

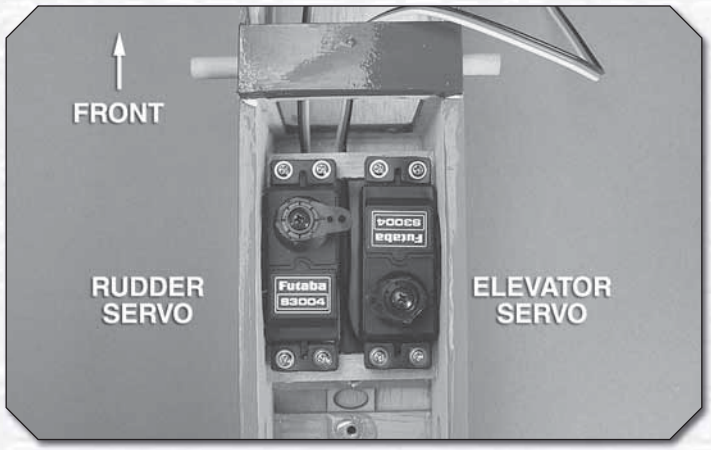
INSTALL THE SERVOS & PUSHRODS



1. Select a servo arm that offers a hole location of 13/32" [10mm] from the center. Remove all but one of the arms of the servo arm. Trim the servo arm beyond the hole that is 13/32" [10mm] from the center. Use a file or sandpaper to round over the corners of the arm. Enlarge the outer hole with a 5/64" [2mm] drill bit. Center the rudder servo with your radio system and install the servo arm perpendicular to the servo case as shown.

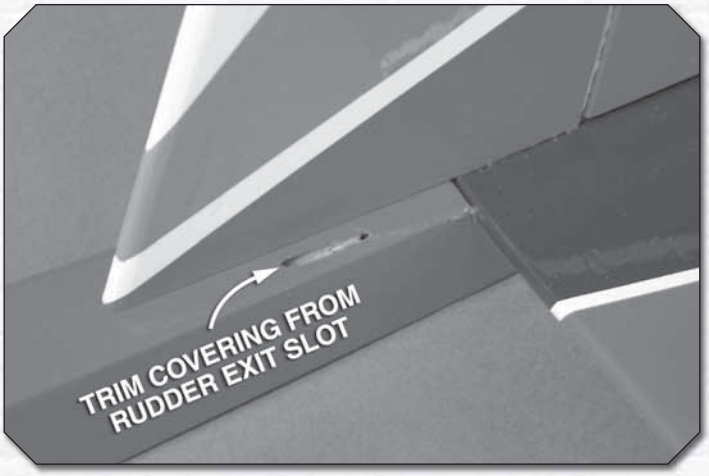
2. Prepare the elevator servo arm in the same manner, but select an arm with a hole 5/16" [8mm] from the center and trim the excess length of arm from beyond the hole. Enlarge the hole with a 5/64" [2mm] drill bit.

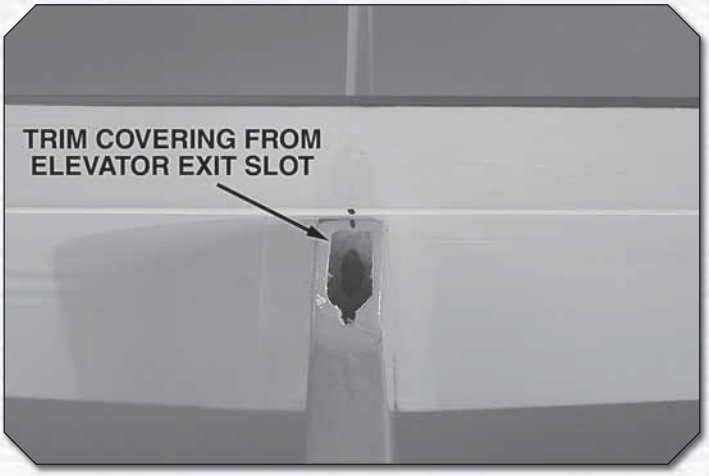




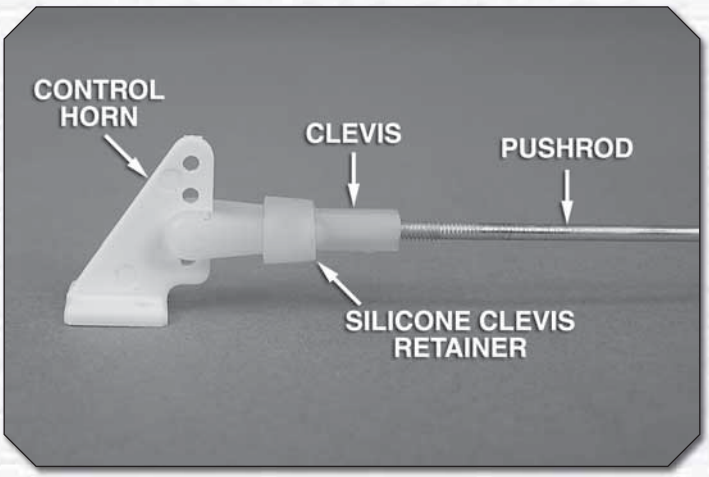
3. Position the servos onto the servo rails in the orientation shown. Drill servo mounting holes using a 1/16" [1.6mm] drill

bit. Thread a servo mounting screw (included with the servo) into each hole then remove it. Remove the servos and apply a drop of thin CA to each hole to harden the wood. When the CA has hardened, install the servos using the hardware included with the servos.

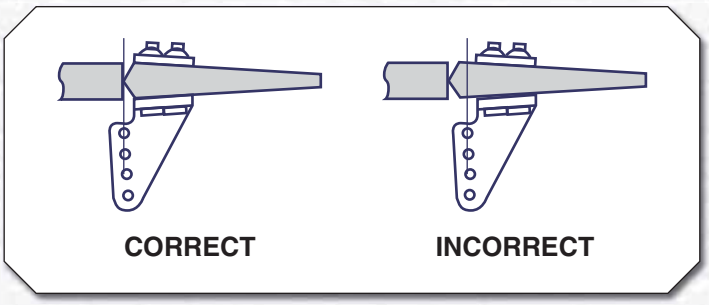


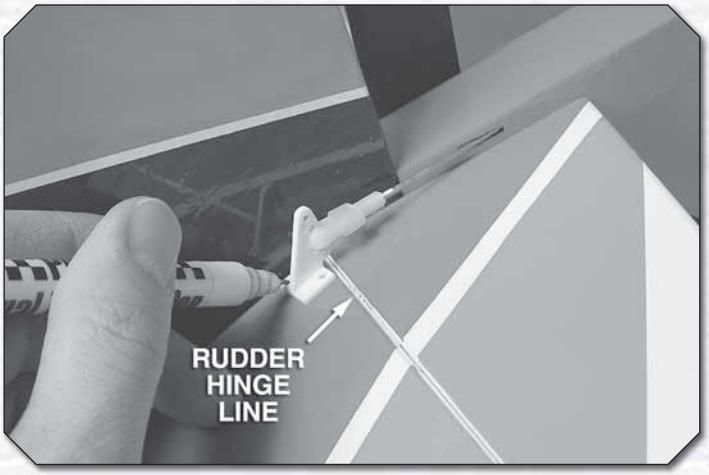


4. Trim the covering from the rudder and elevator pushrod exit slots.

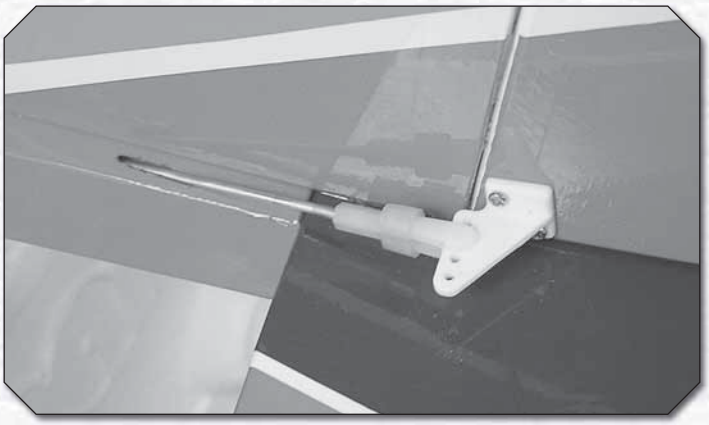


5. Thread a nylon clevis onto a 31-1/2" [800mm] pushrod 20 complete turns. Slide a silicone clevis retainer over the clevis. Temporarily attach the clevis to the second inner hole of a control horn (separate the control horn backplate from the control horn).

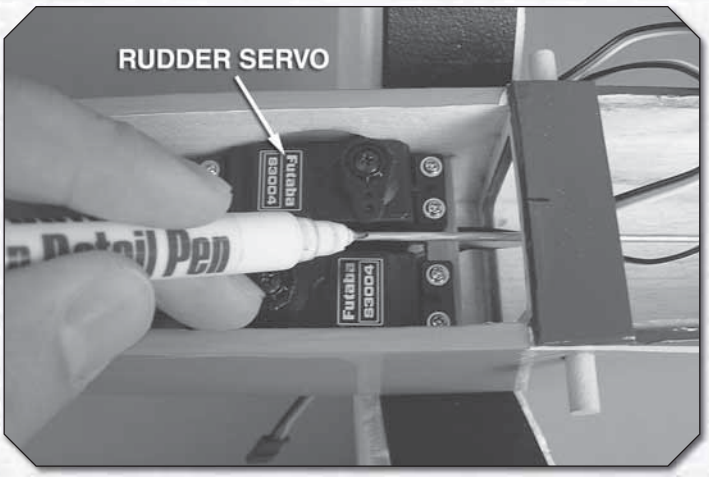




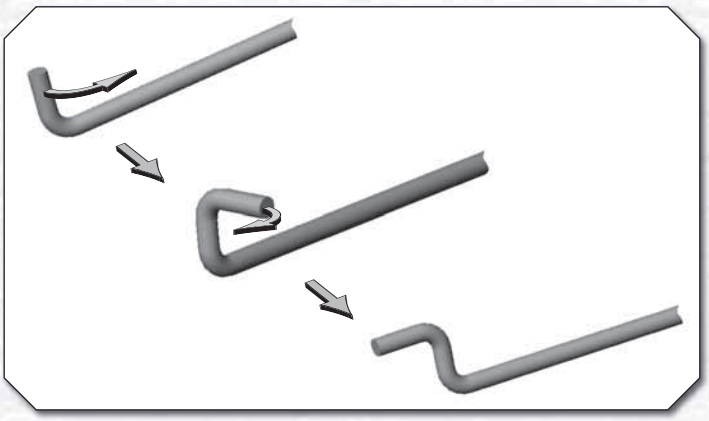
6. Insert the rudder pushrod into the rudder outer pushrod tube from the aft end. Align the holes in the control horn over the rudder hinge line and mark the locations of the control horn mounting holes onto the rudder. Drill two 5/64" [2mm] holes at the marks on the rudder. Apply a drop of thin CA into each hole to harden the balsa.

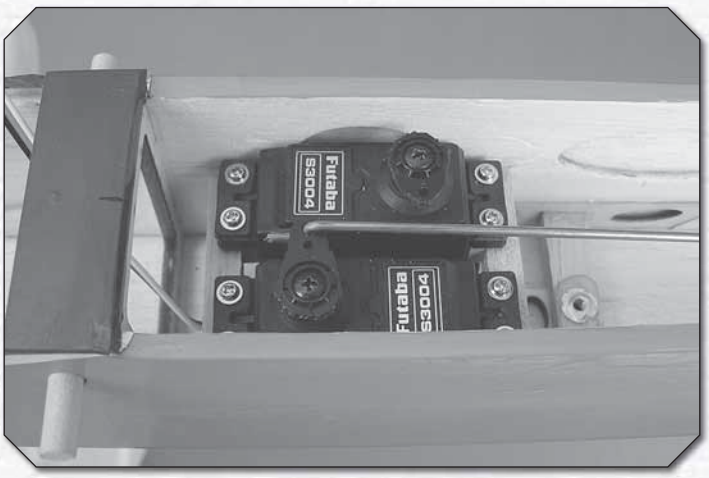


7. Install the control horn using two 2x10mm machine screws and the control horn backplate.

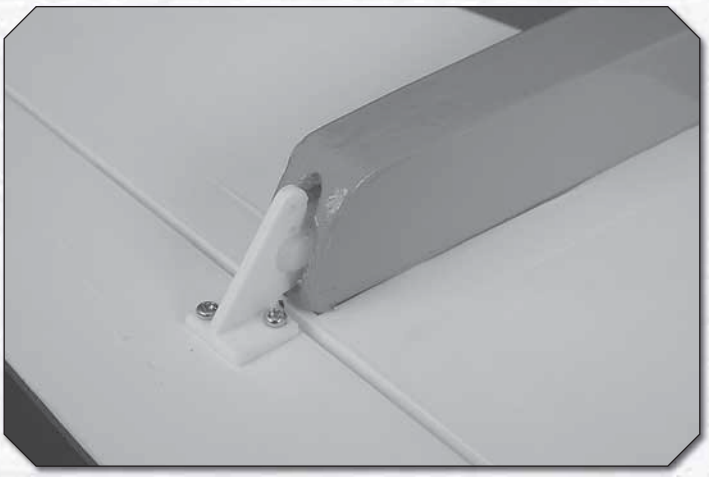


8. Use a small clamp or tape to hold the rudder in the neutral position. Mark the pushrod where it crosses the outer hole in the rudder servo arm.

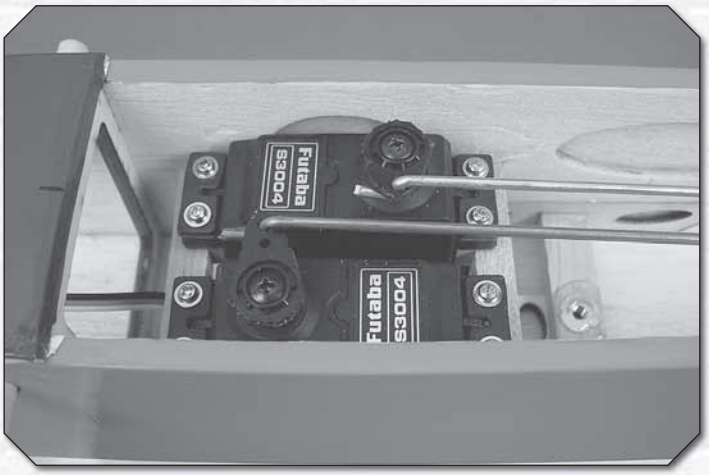




9. Remove the clevis from the rudder control horn and remove the pushrod from the fuselage. Make a "Z" bend at the mark on the pushrod and cut off the excess pushrod 1/4" [6mm] beyond the bend. The "Z" bend can be made using needle nose pliers or "Z" bend pliers designed specifically for that purpose (GPMR8025). Fit the Z-bend into the servo arm as shown. Remove the clevis from the pushrod and reinsert the pushrod into the pushrod guide tube from the front this time. Reinstall the clevis onto the pushrod by 20 turns and attach to the control horn and secure with a clevis retainer. Thread the clevis up or down on the pushrod as necessary to center the rudder with the servo arm centered. Slide the silicone clevis retainer to the end of the clevis to secure it.

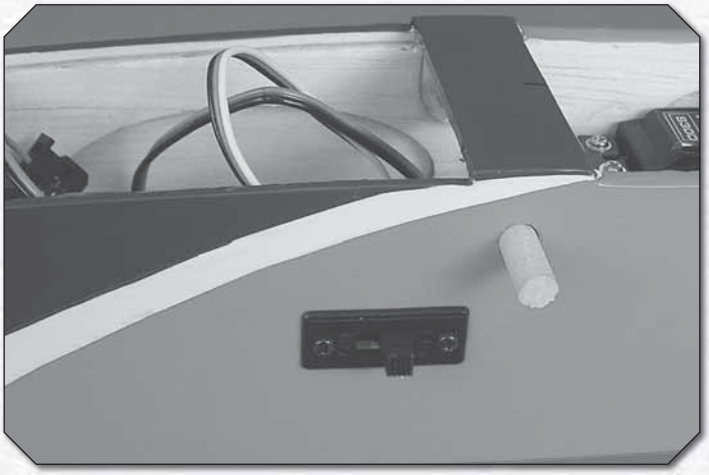


10. As you did with the rudder pushrod, thread a nylon clevis onto a 31-1/2" [800m] pushrod 20 complete turns. Slide a silicone clevis retainer over the clevis. Temporarily attach the clevis to the second inner hole of a control horn. Insert the elevator pushrod into the elevator outer pushrod tube from the aft end. Confirm that the elevator clevis moves easily in and out of the fuselage. If there is any rubbing, use a hobby knife to remove wood from the sides of the opening. When satisfied, align the holes in the control horn over the elevator hinge line and mark the locations of the control horn mounting holes onto the elevator. Drill two 5/64" [2mm] holes at the location, harden the holes with CA and install the control horn using two 2x10mm machine screws and the control horn backplate.

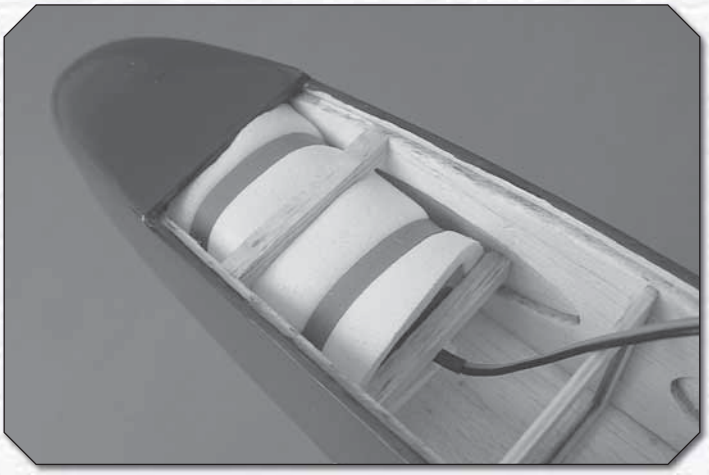


11. With the elevator in the neutral position, mark the pushrod where it crosses the hole in the elevator servo arm. Remove the pushrod from the fuse. Make a "Z" bend in the pushrod and reinstall the pushrod. Make any adjustment to the clevis necessary so the elevator is centered when the servo is centered. Be sure to slide the silicone clevis retainer to the end of the clevis and that the servo arm screw in the elevator is installed.

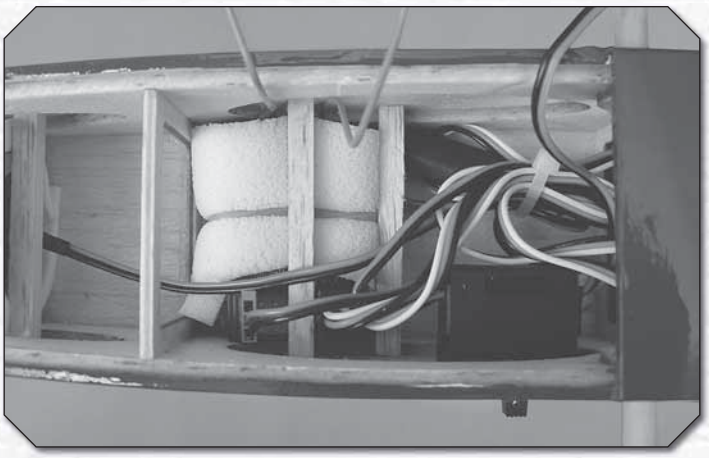
INSTALL THE RECEIVER & BATTERY



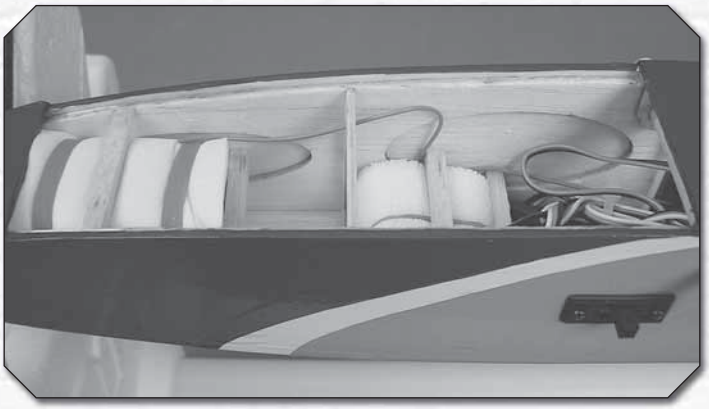
1. Mount the radio switch in a location that will not interfere with the installation of the receiver and battery. Use the switch plate as a guide to drill the two holes and to cut a slot for the on/off switch. After you have drilled the mounting holes for the switch, apply a drop of thin CA to each hole to harden the wood surrounding the holes. Be sure that the CA is completely dry before installing the switch.

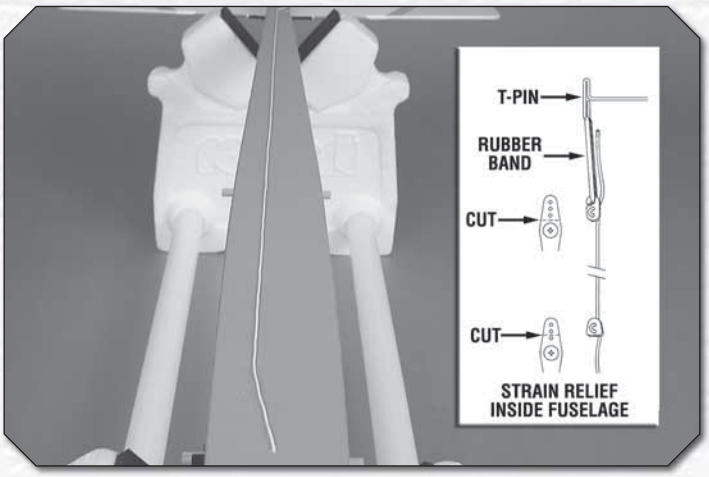


2. Wrap your receiver battery in 1/4" [6mm] foam rubber (not included). Fit it into the front radio compartment. Cut pieces from the included 6x6x200mm balsa stick and glue them along the top and back of the battery to hold it in place using CA or epoxy. When gluing the sticks, be sure that the radio hatch cover can be installed without interference.



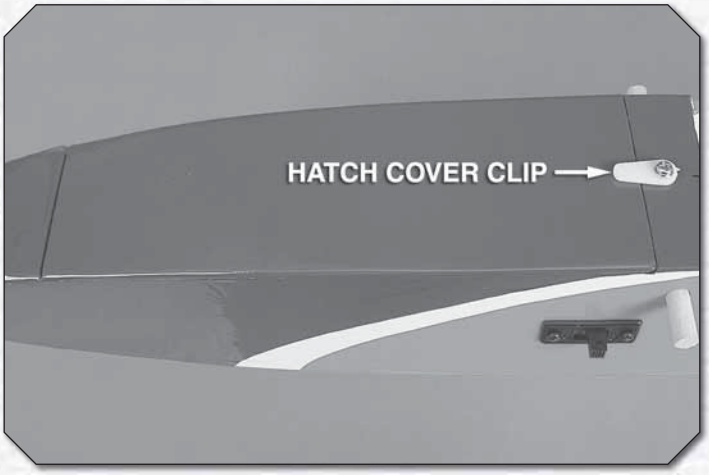
3. Connect the battery to the switch. It is highly recommended to secure the connection using tape, heat shrink tubing (not included), or a clip designed specifically for that purpose. Connect the elevator and rudder servo leads to the receiver. Wrap the receiver in foam rubber and install it behind the battery using pieces of the 6x6x200mm stick. We used a zip tie (not included) to neatly bundle the excess wires behind the receiver. A rubberband could also be used.





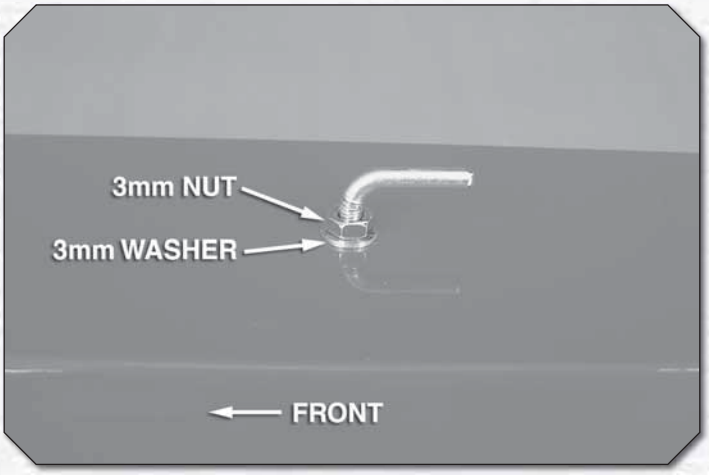
4. If you installed a 2.4GHz receiver, follow the radio manufacturer's instructions for routing the antenna wires. If you are using an AM or FM system, drill a small hole through the bottom of the fuse just behind the receiver. Route the receiver antenna wire out the hole and tape it down the length of the fuselage as shown. Install a "strain relief" (made from a leftover servo arm) inside the fuselage as shown in the sketch. Be sure that the antenna will not interfere with the tow hook locations.

FINISH THE MODEL

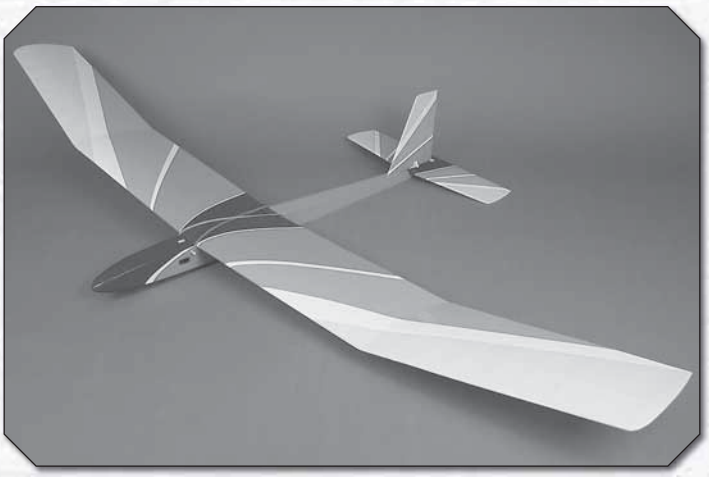


1. A small hole is pre-drilled behind the radio hatch opening. Thread the 2.5x5mm self-tapping screw into the hole and remove it. Apply a drop of thin CA to the hole to harden the wood. When the glue has hardened, install the nylon radio hatch cover clip using the 2.5x5mm screw and 2.5mm washer. The screw should be tight, but still allow the clip to swivel on the screw. Fit the hatch cover in place and secure it with the clip as shown.

2. Two tow hook positions are provided on the underside of the fuselage. For the first few flights, the forward position should be used. When you are accustomed to the launch and flying characteristics of the Gentle Lady, the tow hook position can be moved back to aft position for a higher launch. Be careful as the plane may be more apt to "pop-off" the line when using the aft position.



3. Trim the covering from the forward tow hook hole (approximately 11-13/16" [300mm] back from the front of the fuse). Thread the 3mm nut and 3mm washer all the way onto the tow hook. Tighten the tow hook into the blind nut. With the hook threaded almost all the way into the blind nut and pointing straight back, tighten the 3mm nut to secure it.



4. This completes the assembly!

APPLY THE DECALS

1. Use scissors or a sharp hobby knife to cut the decals from the sheet.

2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water—about one teaspoon of soap per gallon of water. Submerse 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 decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.

4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

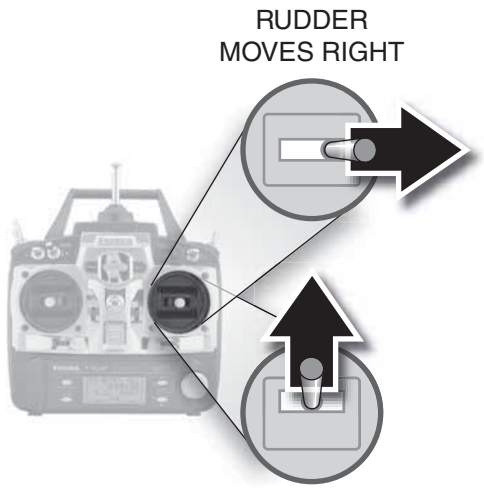
GET THE MODEL READY TO FLY

CHECK THE CONTROL DIRECTIONS

1. Turn on the transmitter and receiver and center the trims. If necessary, remove the servo arms from the servos and reposition them so they are centered. Reinstall the screws that hold on the servo arms.

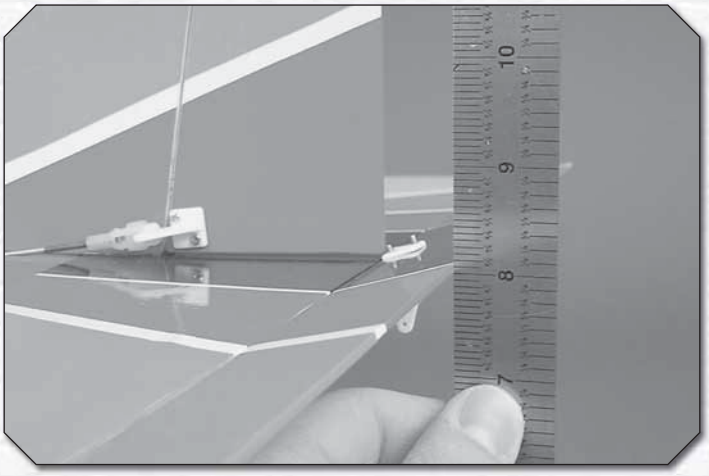
2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.

2-CHANNEL RADIO SET UP (STANDARD MODE 2)

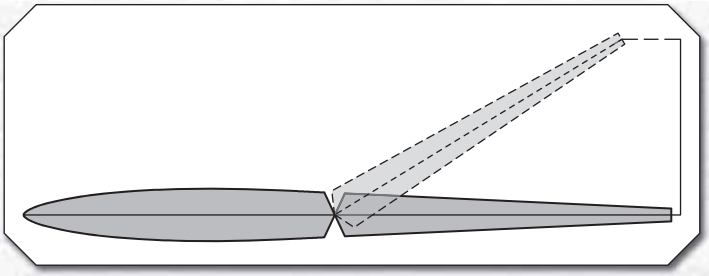


3. Make certain that the control surfaces respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered.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

SET THE CONTROL THROWS



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



NOTE: The throws are measured at the **widest part** of the elevator and rudder. If you are using a ruler to set your control surface throws, the deflection distance is measured as the height from the center trailing edge of the control surface when moved from the neutral position as shown in the sketch. Deflection in degrees is also provided for an alternative measuring method.

These are the recommended control surface throws:

	HIGH RATE		LOW RATE	
	Up	Down	Up	Down
ELEVATOR	1/2" [13mm] 21˚	1/2" [13mm] 21˚	3/8" [10mm] 16˚	3/8" [10mm] 16˚
	Right	Left	Right	Left
RUDDER	1-5/8" [41mm] 35˚	1-5/8" [41mm] 35˚	1" [25mm] 21˚	1" [25mm] 21˚

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

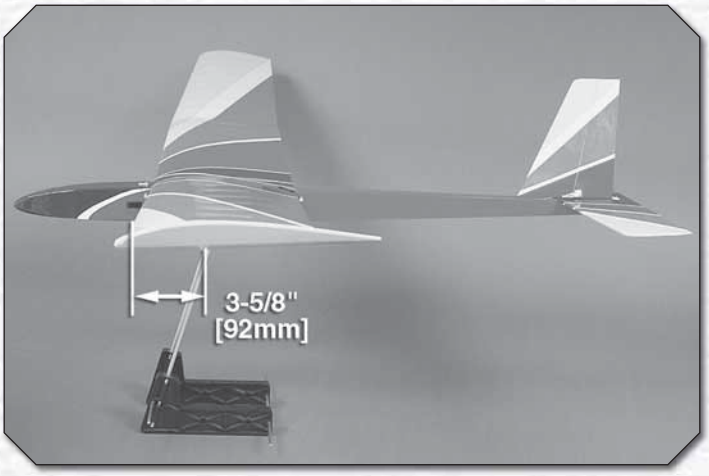
BALANCE THE MODEL (C.G.)

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

At this stage the model should be in ready-to-fly condition with all of the systems in place including the engine or brushless motor, landing gear, and the radio system (and battery pack if applicable).

1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the bottom of the wing on both sides of the fuselage. The C.G. is located 3-5/8" [92mm] back from the leading edge of the wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/4" [6mm] forward or 1/2" [13mm] back to change the flying characteristics.



2. With the wing attached to the fuselage and all parts of the model installed (ready to fly), place the model on a Great Planes CG Machine, or lift it at the balance point you marked, using your fingertips.

3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, use Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is at the front of the radio compartment. Begin by placing incrementally increasing amounts of weight on the fuse over this area until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside.

Note: Do not rely upon the adhesive on the back of the lead weight to permanently hold it in place. Over time, the weight may 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 nose 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. **A glider that has been laterally balanced will track better in flight.**

FLYING

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 speed, 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 or insecure servo mounting.

Try to find an experienced pilot to help you with your first flights. Although the Gentle Lady is very easy to fly, an experienced pilot can save you a lot of time and possible aggravation by helping you get your model in the air smoothly.

TRIM FLIGHTS

It is a good idea to do a couple of trim flights before each flying session to make sure the plane is still in trim and the radio is working properly. The model will survive a hard landing from 5 feet much better than it will one from several hundred feet. The first few trim flights should be done over a grass field. The longer the grass the better (more cushion).

Turn on the transmitter first and then the receiver. Hold the fuselage of the Gentle Lady ARF under the wing with the nose pointed slightly down and directly into the wind. It is very important that you launch the model with the wings level and the nose pointing at a spot on the ground about 50 feet in front of you. Have a friend stand off to the side of you and tell you whether the nose is pointing up or down. If the sailplane is launched with the nose up or launched too hard it will climb a few feet, stall and fall nose-first straight down. With the nose pointed down slightly, the sailplane will accelerate down until it picks up enough flying speed and then level off and glide forward. The plane should be launched with a gentle push forward. With a little practice you will be able to launch it at just the right speed so it soars straight ahead in a long and impressive glide path. Adjust the trims on your transmitter to get the plane to fly straight ahead in a smooth glide path.

Once you get the hang of launching it you can try turning the plane during the trim flights by gently applying a "touch" of right or left rudder. You can also try "flaring" the landings by slowly applying a touch of up elevator (pull the stick back) as the plane nears the ground. The Gentle Lady ARF will continue to fly just a few inches off the ground for a surprisingly long distance. It is important you don't "over-control" the model. Make any control inputs slowly and smoothly rather than moving the transmitter sticks abruptly.

YOUR FIRST HI-START LAUNCH

A hi-start is the most popular way to launch your Gentle Lady ARF. It consists of 25' – 100' of rubber tubing and 200' – 400' of string with a parachute or streamer at the end. One end of the rubber is staked down directly upwind of the launch point. One end of the string is attached to the other end of the rubber and the end of the string with the parachute has a loop or ring and is attached to the tow hook on the sailplane.

Follow the directions that came with the hi-start and lay it out directly into the wind. Place the stake at the far **upwind** edge of the flying field so the parachute will blow back onto the flying field.

Turn on your transmitter and then your receiver and hook the parachute onto your plane's tow hook. Pull the plane back approximately twice as far as the rubber is long (i.e., 100' of rubber = pull back 200') or whatever the hi-start instructions state. A "fish scale" is handy for determining the correct amount of pull. For your first flights pull the plane back until there is approximately 8 lbs. of tension. More tension can be used after you get acquainted with the launching procedure. Hold the plane **above your head** with the wings level and the nose pointed **slightly up and directly into the wind**. Give the plane a healthy push forward to get it flying and it will climb up like a kite. You should not have to touch the elevator during the launch but use the rudder stick to keep it going straight up. As the rubber relaxes the plane will fly off the hi-start and the parachute will bring the end of the string back towards you.

FIRST FLIGHTS

Find a BIG, OPEN field for your first flights – the bigger the better, as you won't have to worry about where you need to land. Ground based objects (trees, poles, buildings, etc.) seem to attract model airplanes like a magnet. **Again, we would like to recommend that you find an experienced pilot to help you with these first flights.**

Note: You need to remember that your radio control responds as if you were sitting in the cockpit. When you push the transmitter stick to the right, the rudder moves to the plane's right! This means that when the plane is flying towards you it may seem like the rudder controls are reversed (when you give "right" rudder the plane turns to your left–which is the plane's "right"). It is sometimes easier to learn to fly the plane if you always face your body in the direction the plane is flying and look over your shoulder to watch the model.

Don't worry about accomplishing very much on your first flights. Use these flights to get the "feel" of the controls and the Gentle Lady ARF's flying characteristics. Try to keep the plane upwind and just perform some gentle "S-turns" (always turning into the wind) until it is time to set up for landing. Have a helper adjust the trims on your transmitter (a little at a time) until the plane will fly straight and level with the transmitter sticks in their neutral positions. It can be very hard for a beginner to fly a plane straight towards him as he would have to do if the plane were downwind and every mistake takes the plane a little farther downwind. When it is time to land, just continue performing the gentle "S-turns" upwind and let the plane glide onto the ground. Don't worry about where the plane lands–just miss any trees, etc.

Practice flying directly into the wind (upwind of yourself) without letting the plane get off course, and then turn and come downwind until the plane is even with you and try it again. When you are comfortable with flying directly into the wind, start letting the plane go behind you (downwind) a little before you start back upwind. Continue this until you can fly directly towards you from downwind without getting disoriented. At this point you can start to establish a "landing pattern" and bring the sailplane in for a landing from downwind. This enables the plane to be flown as slowly (ground speed) as possible for accurate landings.

THERMAL FLYING

Thermal soaring is one of the most intriguing of all aspects of flying and the Gentle Lady ARF was designed to excel at thermal soaring even in the hands of a novice. It can be hard for the average person to understand how a plane can fly for hours and gain altitude **without a motor!**

FACTS ABOUT THERMALS

Thermals are natural phenomena that happen outside, by the millions, every single day of the year. Thermals are responsible for many things including forming several types of clouds, creating breezes, and distributing plant seeds and pollen. If you have ever seen a dust devil (which is nothing more than a thermal that has picked up some dust), you have seen a thermal in action. Their swirling action is very similar to that of a tornado but of course much gentler. Most thermals have updrafts rising in the 200 – 700 feet per minute range but they have been known to produce updrafts of over 5,000 feet per minute (that's over 50 miles/hour straight up!) These strong thermals can rip a plane apart or carry the plane out of sight before the pilot can get out of the updraft.

Thermals are formed by the uneven heating of the earth and buildings, etc. by the sun. The darker colored surfaces absorb heat faster than the lighter colors which reflect a great deal of the sun's energy back into space. These darker areas (plowed fields, asphalt parking lots, tar roofs, etc.) get warmer than the lighter areas (lakes, grassy fields, forests, etc.). This causes the air above the darker areas to be warmer than the air over the lighter areas and the more buoyant warm air rises as the cooler, denser air forces its way underneath the warmer air. As this warm air is forced upward it contacts the cooler air of the higher altitudes and this larger temperature difference makes the thermal rise quicker. The thermal is gradually cooled by the surrounding cooler air and its strength diminishes. Eventually the thermal stops rising and any moisture contained in the once warm air condenses and forms a puffy cumulus cloud. These clouds, which mark the tops of thermals, are usually between 2000 and 5000 feet high.

THERMAL SOARING

It takes a lot of concentration to thermal soar effectively. A sailplane can fly along the edge of a thermal and unless the pilot is carefully watching the model he may not realize the opportunity to gain some altitude. Because most thermals are relatively small (a couple hundred feet in diameter or less at 400' altitude) compared to the rest of the sky, the sailplanes will rarely fly directly into the thermal and start rising. Generally, the sailplane will fly into the edge or near a thermal and the effects the thermal has on the plane may be almost unnoticeable. As the sailplane approaches a thermal, the wing tip that reaches the rising air first will be lifted before the opposite wing tip. This causes the plane to "bank" and turn away from where we would like the plane to go.

When you are thermal soaring, try to fly as smoothly and straight as possible. Trim the plane to fly in a straight line and only touch the controls when you have to. Watch the sailplane carefully and it will tell you what it is encountering.

When the sailplane flies directly into a thermal it will either start rising or stop sinking. Either case is reason enough to start circling (especially in a contest where every second counts). Fly straight ahead until you feel like you are in the strongest lift, **fly a couple of seconds farther** (so your circle will be centered in the strongest lift) and then start circling in a fairly tight but smooth turn. When the sailplane is low the turns have to be tighter to stay in the strongest lift. As the plane gains altitude, the turns can be larger and flatter. The flatter the turn, the more efficient the plane is flying, but don't be afraid to really "crank" it into a steep bank when you are low. If you see the plane falling off on one side of the turn, move your circle over into the stronger lift. Thermals move along with the wind so as you circle you will be swept along with it. Be careful when thermaling, that you don't get so far downwind you can't make it back to the field to land.

If the sailplane is flying along straight and all of a sudden turns, let the plane continue to bank (you may have to give it some rudder to keep it banking) until it has turned 270-degrees (3/4 of a full circle). Straighten out the bank and fly into whatever turned the plane. If you encounter lift, and you won't every time, start circling just as you did when flying directly into a thermal.

Thermals are generated all day long, but the strongest thermals are produced when the sun is directly overhead. 10:00 am – 2:00 pm seems to be the best time to get those "killer" thermals. Some of these thermals can be very large and you may find it hard to get out of them. If you find yourself getting too high, don't dive the plane to get out of the lift. Sailplanes are very efficient aircraft and they will build up a lot of speed and could "blow up" in the rough air of a thermal. The easiest way to lose altitude is to apply full rudder and full up elevator. This will put the plane into a tight spin that will not over stress the airframe but it will enable it to lose altitude very quickly. This is especially helpful if the sailplane gets sucked into a cloud or it gets too high to see. The twirling action will give the sun a better chance of flashing off of the wing and catching your attention. When you are high enough and want to leave the thermal, add a little down trim to pick up some speed and fly 90 degrees to the direction of the wind. If you are not real high and want to find another thermal, you may want to look upwind of the last thermal. The same source that generated this thermal is probably producing another. Just watch out for "sink" which is often found behind and between thermals.

As you might expect, with all this air rising, there is also air sinking. This air is the sailplane pilot's nightmare that can really make soaring challenging. "Sink" is usually not as strong as the thermals in the same area, but it can be very strong. Down drafts of many hundreds of feet per minute are common on a good soaring day. These down drafts can make a sailplane look like it is falling out of the air. Because of this, it is important that you do not let the sailplane get too far downwind.

When encountering sink, immediately turn and fly 90 degrees to the direction of the wind (towards you if possible). Apply a little "down elevator" and pick up some speed to get out of the sink as fast as possible. Every second you stay in the sink is precious altitude lost.

POINTERS FOR CONTEST FLYING

Pay Attention! – Pay close attention to the sailplanes flying before you, watch them and try to establish where and when the thermals are being formed. Thermals are often formed in cycles and can be fairly regular, so if you keep track of the time intervals you will have a pretty good idea of when and where a thermal may be generated.

Watch The Birds! – Thermals suck up small insects that many birds love to eat. A bunch of swallows flying around in one area may indicate a thermal. Soaring birds (hawks, vultures, eagles etc.) are the best thermal indicators. They not only show you where the thermal is but they also show you where the center is. These "Masters of the Sky" will often fly right along with sailplanes.

Practice Those Landings! – Most thermal contests are won or lost during the landing. Establish a particular landing pattern and try to stick to it for all landings. Learn to shift your pattern to account for the wind and particular flying field characteristics. Spoilers can be very useful during contest landings. They allow you to bring the sailplane in for a landing higher or faster than normal to guard against any last minute sink or gusts and dump the extra altitude and speed at the last second. They can also be used to help control your skid. Opening the spoilers will stop the plane from sliding a little quicker. You can also "steer" the plane while it is sliding along the ground. Don't expect to be able to "horse it around" but you can gain valuable inches by using the rudder to guide it toward the spot as it slides to a stop. Be very careful not to "ground loop" the plane since you will lose your landing points if the plane flips over.

Know Your Sailplane! – Learn what your sailplane will and won't do and fly within this envelope. This will allow you to ride thermals downwind while knowing when you have to head back to make your landing safely.

Learn From The Wind! – Keep track of which way the wind is blowing. If the wind suddenly shifts, there is some thermal action fairly close to you. The air is probably being either sucked up into a thermal or falling out of some sink. In either case it is often a good idea to fly in the direction the wind is blowing if your sailplane is in the general area. This will take you towards a thermal if there is one or away from the sink, both of which are desirable.

SLOPE SOARING

Slope soaring is a type of flying that is very popular in hilly regions and along the coasts. This type of soaring is possible when the wind is blowing directly up a hill or cliff. As the wind hits the slope it is forced up, producing lift which can be utilized by real sailplanes, hang gliders, birds and even model sailplanes.

To be able to slope soar, you need a slope with a smooth piece of land (or water) out in front of it and a breeze blowing pretty close to straight up the slope. The higher and steeper the hill or cliff the better. Also the larger and smoother the land out in front the better. The air flowing along hits the hill, is forced up and can generate a very large area of lift. Behind the hill is a large area of turbulent air that can be very dangerous to try to fly in. The faster the wind is blowing, the stronger the lift and turbulence will be.

To fly off a slope, stand near the edge and throw the sailplane (nose down) into the wind. As the sailplane flies out into the "band" of lift it will begin to gain altitude. Turn and fly parallel to the slope and make all of your turns into the wind (especially when you are close to the slope). You will be surprised at the altitude you can gain just from slope lift. Thermals will often be "popped loose" by these slopes. If you catch a thermal and follow it downwind, be very careful to stay high enough to make it back to the slope without flying through the turbulent air behind the slope. If you don't have enough altitude you may want to land a good distance behind the slope if possible to avoid this turbulent air.

SLOPE LANDINGS

Landings can be very tricky on some slopes. On gentle slopes you can often fly very close to the top of the slope and "slide" into the top of the slope without encountering any turbulent air. On steeper slopes you may have to be a little more aggressive to get the plane out of the lift. In any case it is a good idea to plan your landing before launching your plane.

BALLASTING

In strong wind conditions, you may want to add ballast (weight) to the sailplane to increase its wing loading which increases its normal flying speed. Increasing the weight of your sailplane does not change its "glide ratio" but it does make it fly faster which makes it sink a proportional amount faster. Because of this faster sink rate, you need to be very cautious when ballasting for a thermal contest. In duration type contests only use ballast on very windy days that also have a lot of thermal activity.

Add the weight as near as possible to the C.G. of the plane. Adding 6 – 8 oz. will make a noticeable difference in the sailplane's flying speed and more can be added later, if needed. Make sure to recheck the C.G. of the plane after adding ballast–it should remain where it was.

Have a ball! But always stay in control and fly in a safe manner. GOOD LUCK AND GREAT FLYING!

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