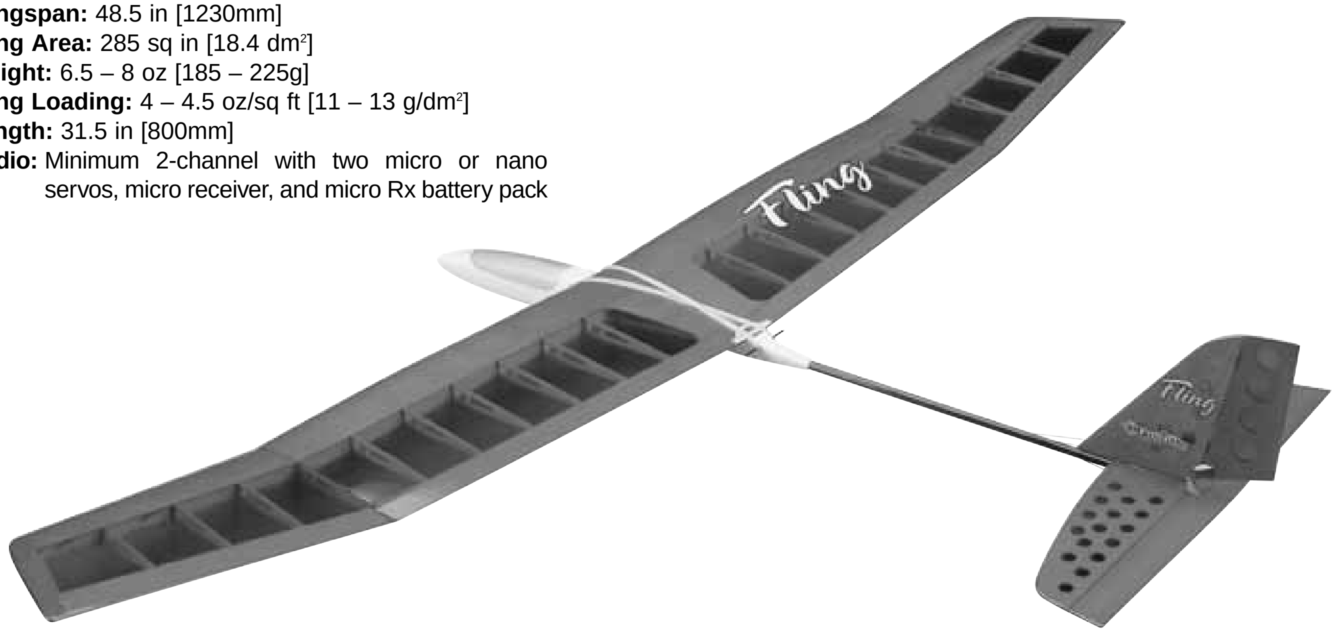
Fling™ ARF

INSTRUCTION MANUAL

Wingspan: 48.5 in [1230mm]
Wing Area: 285 sq in [18.4 dm^2]
Weight: 6.5 – 8 oz [185 – 225g]
Wing Loading: 4 – 4.5 oz/sq ft [11 – 13 g/dm^2]
Length: 31.5 in [800mm]
Radio: Minimum 2-channel with two micro or nano servos, micro receiver, and micro Rx battery pack



WARRANTY

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

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

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

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

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

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

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

GREAT PLANES® MODEL MANUFACTURING COMPANY
Champaign, IL
(217) 398-8970, Ext. 5
airsupport@greatplanes.com

GPMZ0215 for GPMA1060 V1.0

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INTRODUCTION

The Fling™ ARF is a great way to have fun and try your hand at R/C soaring flight. The Fling ARF uses two channels for control–rudder and elevator, and easy to set up pull-pull control surface actuation. The Fling ARF has few parts enabling easy and quick assembly, and will get you to the flying field fast, whether it be a sports park or a larger flying site. The Fling ARF can be hand-launched for low-level thermal hunting fun, or you can use the included mini hi-start and send your Fling ARF to higher soaring flights.

Items required for assembly are micro or nano servos, a micro receiver, and a micro Rx battery pack. The specific recommended radio gear is listed in the ***"Radio Equipment"*** section of the manual.

Have a friend get a Fling ARF too, and you can have "first up / last down" contests or compete against each other trying to land the Fling ARF closest to a certain place, a spot landing! Have fun with your new Fling ARF!

For the latest technical updates or manual corrections to the Fling ARF, visit the Great Planes web site at *www.greatplanes.com*. Open the "Airplanes" link, and then select the Fling ARF. If there is new technical information or changes to this model, a "tech notice" box will appear in the upper left corner of the page.

AMA

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

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

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

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

1. Your Fling ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Fling ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or un-flyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.

3. You must take time to **build straight, true** and **strong**.

4. You must use an R/C radio system that is in first-class condition.

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

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

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

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

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

ADDITIONAL ITEMS REQUIRED

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

Radio Equipment

A complete radio system may be purchased for the Fling ARF, or the individual radio components may be purchased separately.

If purchasing a complete system, the Futaba® 3FR single stick, 3-channel transmitter with R114F mini receiver and two S3108 micro servos is recommended (FUTJ53**). Replace the "**" with the channel number you wish to order. (For example, if you wish to order a system on channel 44, order FUTJ5344).

The 3FR does not come with a receiver battery pack, so the Great Planes 4.8V 350 mAh NiMH (GPMP0950) is recommended.

If purchasing the radio components separately, the following are recommended items and order numbers:

- Any 2-channel (or more) 72 MHz FM transmitter
- Great Planes ElectriFly™ 4-channel mini receiver w/o crystal (GPML0044 for low band, GPML0045 for high band)
- Low band receiver crystal for Great Planes mini receivers (channels 11 to 35, FUTL62**)
- High band receiver crystal for Great Planes mini receivers (channels 36 to 60, FUTL63**)
- (2) Futaba S3108 micro servos (FUTM0042)
- Great Planes 4.8V 350 mAh NiMH receiver battery (GPMP0950)

Note: An on/off receiver switch is not used. When ready to fly, the battery is simply connected to the receiver.

Adhesives & Building Supplies

In addition to common household tools and hobby tools, this is the "short list" of the most important items required to build the Fling ARF. ***Great Planes Pro™*** *CA and Epoxy glue are recommended.*

- ❑ 1/4" [6mm] R/C foam rubber – (HCAQ1000)
- ❑ 1/2 oz. [15g] Thin Pro CA (GPMR6001)
- ❑ Pro 30-minute epoxy (GPMR6047)
- ❑ Plan Protector (GPMR6167) or wax paper
- ❑ #1 Hobby knife (HCAR0105)
- ❑ #11 Blades (5-pack, HCAR0211)
- ❑ 2 oz. [57g] Spray CA activator (GPMR6035)
- ❑ Mixing cups (GPMR8056)
- ❑ Epoxy brushes (6, GPMR8060)
- ❑ Builder's Triangle Set (HCAR0480)

IMPORTANT BUILDING NOTES

- When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, and then slightly modify or *custom fit* the part as necessary for the best fit.

- Whenever the term ***glue*** is written, you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.

- ***Photos*** *and* ***sketches*** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

• The stabilizer and wing incidences have been factory-built into this model. However, some technically-minded modelers may wish to check these measurements anyway. To view this information visit the web site at *www.greatplanes.com* and click on “Technical Data.” Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

COMMON ABBREVIATIONS

Fuse = Fuselage
Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
" = Inches
mm = millimeters

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Fling ARF are available using the order numbers in the **Replacement Parts List** that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company. Parts may also be ordered directly from Hobby Services, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax.

To locate a hobby dealer, visit the Hobbico® web site at *www.hobbico.com*. Choose “Where to Buy” at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer. If a hobby shop is not available, replacement parts may also be ordered from Tower Hobbies at *www.towerhobbies.com*, or by calling toll free (800) 637-6050.

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

Mail parts orders and payments by personal check or money order to: Hobby Services, 3002 N Apollo Drive, Suite 1, Champaign, IL, 61822.

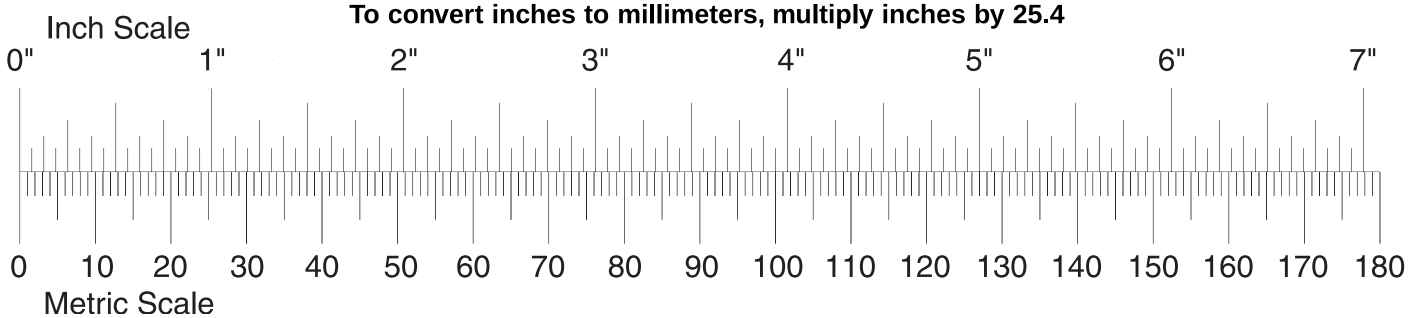
Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

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

Replacement Parts List

Order Number	Description	How to Purchase
	Missing pieces	Contact Product Support
	Instruction manual	Contact Product Support
	Full-size plans	Not available
GPMA2700	Wing Kit	Contact Your Hobby Supplier to Purchase These Items
GPMA2701	Fuse Kit	
GPMA2702	Tail Set	
GPMA2703	Canopy	
GPMA2704	Decals	
GPMA2705	Mini Hi-start	

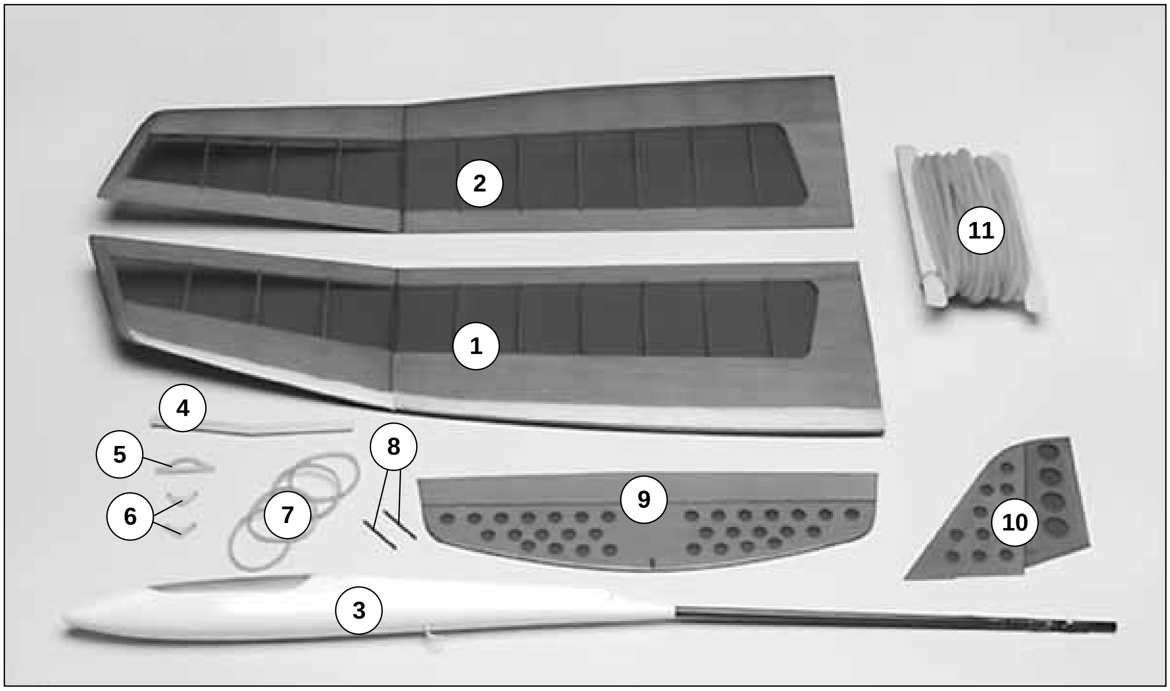
To convert inches to millimeters, multiply inches by 25.4



KIT CONTENTS

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

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



Kit Contents

1. Right Wing Panel
2. Left Wing Panel
3. Fuselage with Canopy
4. Wing Joiner
5. TE Support
6. Control Horns (2)
7. Rubber Bands (4)
8. Wing Dowels (2)
9. Stab & Elevator
10. Fin and Rudder
11. Mini Hi-Start

ASSEMBLY INSTRUCTIONS

Canopy Removal

❑ 1. Slide the **canopy** forward.

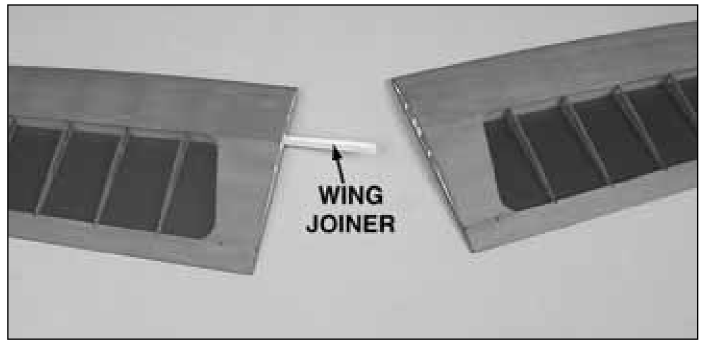
❑ 2. Lift the rear of the canopy so the wire clears the fuse.

❑ 3. Slide the canopy aft until the front wire releases.

❑ 4. To attach the canopy reverse the previous steps.

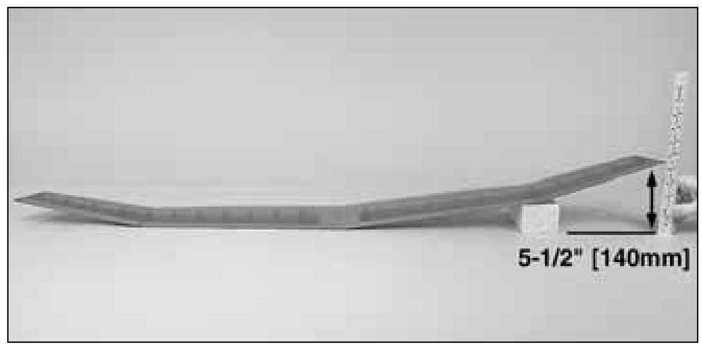
Assemble the Wing

Note: Accurate assembly of the wing is critical. In addition to your first cursory reading, please read all steps in this section carefully prior to beginning wing assembly.



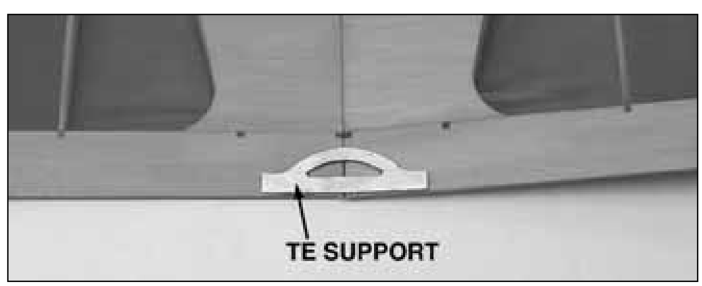
❑ 1. Test fit the **wing joiner** into the slots in the wing halves. Sand the joiners as required to get a good fit. **Note:** If the root rib angles aren't exactly the same, that's OK. The difference can be filled with a little epoxy when the wings are joined. The proper dihedral angle and the gluing of the wing joiner are more important than the fit of the two wing panels.

❑ 2. Cover your workbench with wax paper or Great Planes Plan Protector.

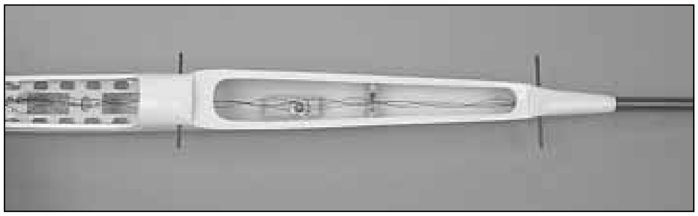


❑ 3. With the inner left wing flat on your workbench and the center joint on the wax paper, raise the right wing tip 5-1/2" [140mm] to properly set the dihedral. Block the raised right wing at the desired height and make a mental note of the position needed for it to maintain that dihedral.

❑ 4. Remove the joiner from the wings. Cover the joiner, left and right wing ribs and pockets in the wing panels with a moderate, but not excessive amount of 30-minute epoxy. Join the wing halves together. Ensure that the left wing remains flat and that the right wing tip is 5-1/2" [140mm] from your work bench and can remain that way undisturbed until the epoxy has hardened. Remove any excess epoxy with a paper towel and denatured alcohol, being careful not to disturb the joint. **Hint:** Use masking tape to hold the wing together while the epoxy hardens.

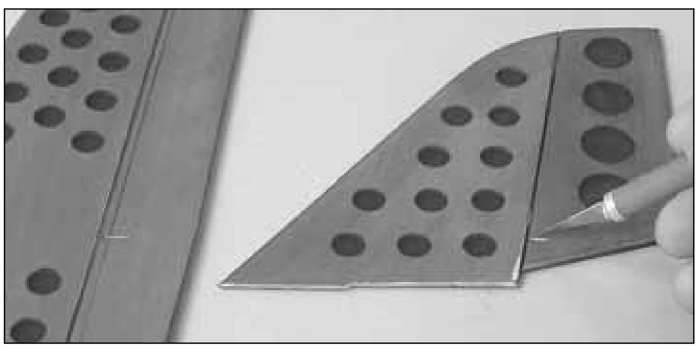


❑ 5. Glue the plywood **TE support** centered on the TE of the wing with CA.

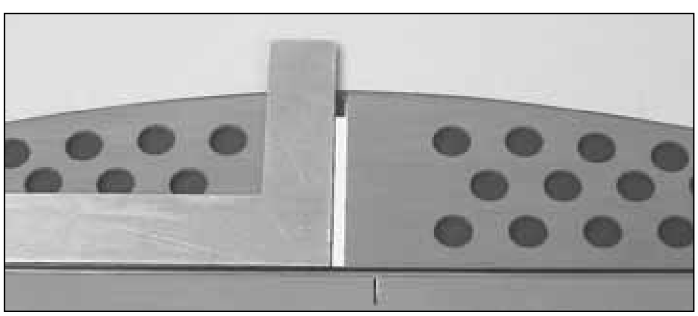


❑ 6. Glue the carbon fiber **wing dowels** into the fuse with a small amount of thin CA.

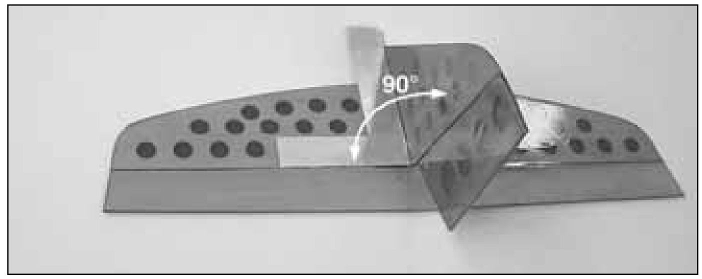
Assemble the Tail



❑ 1. Remove the covering from the control horn slots in the rudder and elevator.



❑ 2. Use a small square and a single-edge razor blade or a #11 hobby blade to cut a strip of covering from the bottom and top of the stab aligned with the fin slot and perpendicular to the hinge line. Use a light touch to cut **only into the covering** and not into the wood. Also be sure to use a new blade–if the blade is dull it will cause you to apply more pressure, thus cutting into the wood.

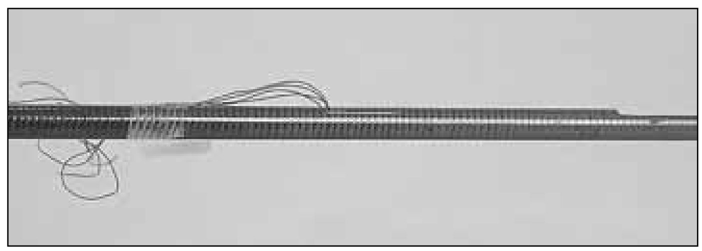


Large hinge gap on the bottom

❑ 3. Glue the fin to the top of the stab, keeping it vertical and perpendicular to the elevator hinge line. **Note:** The elevator hinge pivot is on the top of the stab.

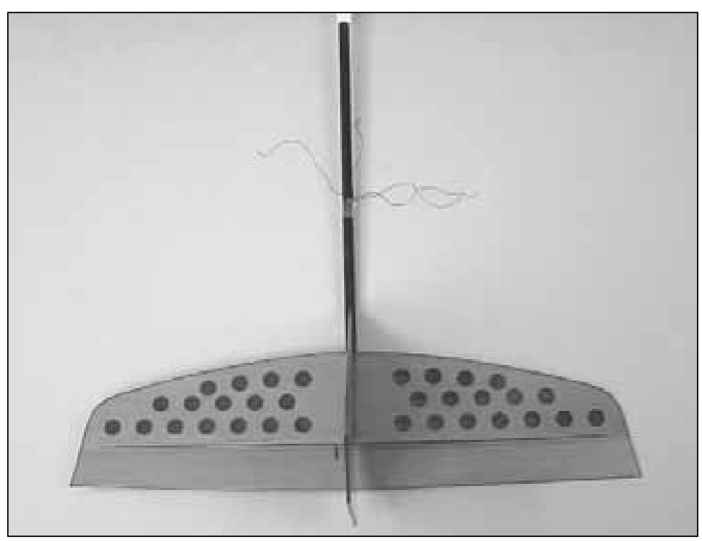
Mount the Tail

❑ 1. Mount the wing to the fuse with the four rubber bands.

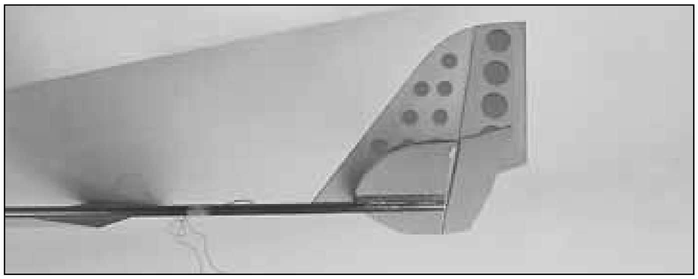


❑ 2. Move the tape holding the pushrod strings forward of the pushrod exits. This will minimize the chance of gluing the pushrod strings to the fuse while gluing the tail in place.

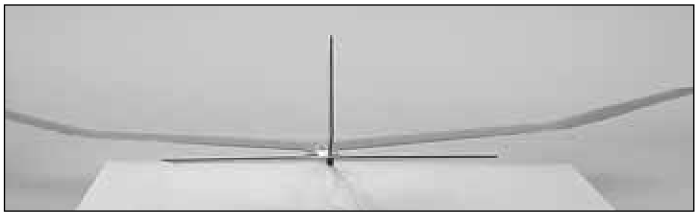
❑ 3. Three things need to be aligned before the tail can be mounted. Do several dry runs of this process before gluing the tail to the fuse with medium CA.



❑ 4. The center of the fin needs to be aligned with the center of the fuse.



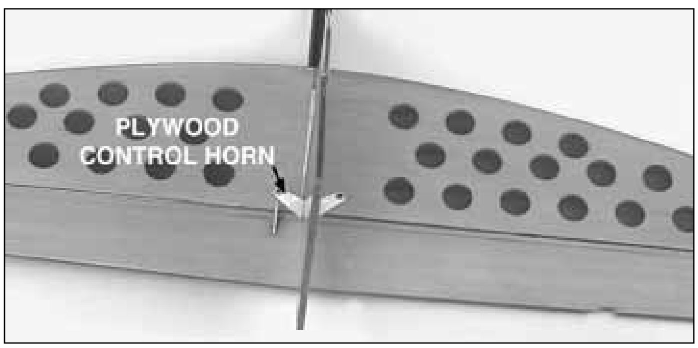
❑ 5. The LE of the stab needs to be aligned with the LE of the stab saddle.



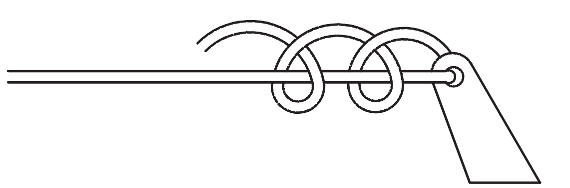
❑ 6. The stab needs to be parallel with the wing.

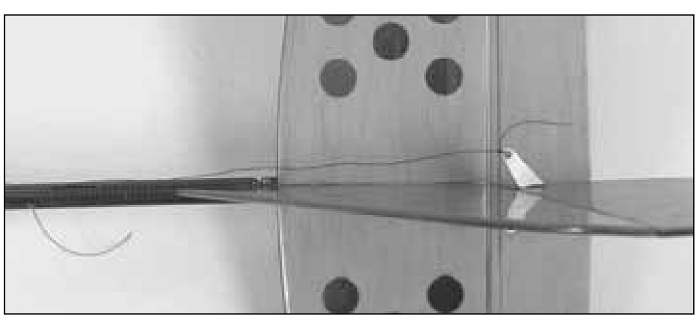
❑ 7. After achieving all three alignment processes, glue the tail to the fuse with medium CA.

Install the Servos



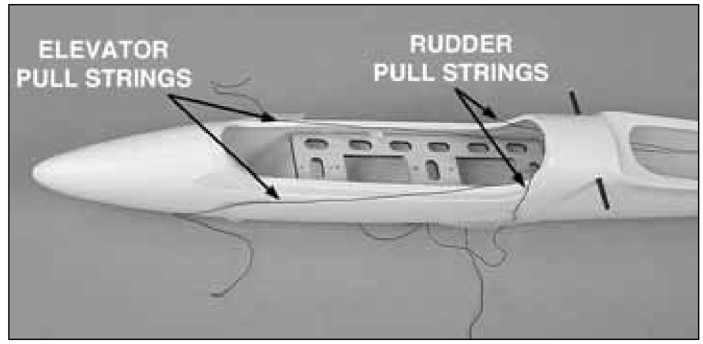
❑ 1. Slide the plywood **control horns** into the rudder and elevator, center, then glue with thin CA.



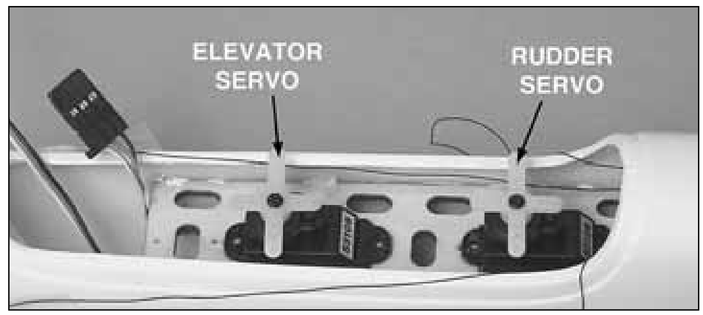


❑ 2. Tie the pushrod string from the pushrod exit on the right side of the fuselage to the right side of the rudder control horn as shown in the sketch.

❑ 3. Tie the other three strings to the control horns in the same way.



❑ 4. Pull on each string to see what control surface it moves. Tape the four strings to the fuse side as shown. **Note:** Take your time to make sure the strings don't interfere with each other.



❑ 5. Mount the servos to the servo tray. **Optional:** To keep the weight low, use a drop of medium CA through each servo screw hole instead of the servo screws.

❑ 6. Plug the servos and battery into your receiver. Turn on the transmitter to center the servos.

❑ 7. Tie the rudder pushrod strings to rudder servo arm. Tie a single knot first.

❑ ❑ 8. Repeat step 7 for the elevator pull strings.

❑ 9. Confirm the elevator throw is between 7/16" [11mm] and 9/16" [14mm].

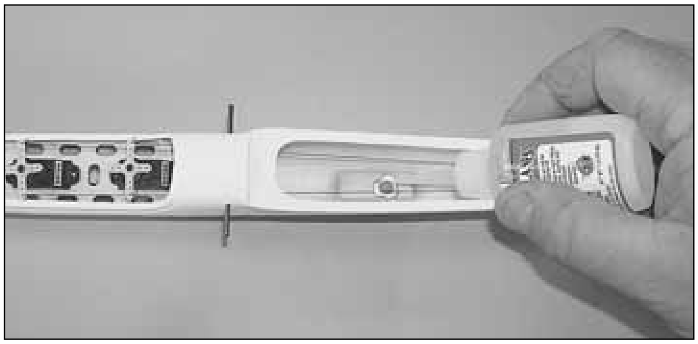
❑ 10. Confirm the rudder throw is between 11/16" [17mm] and 13/16" [20mm].

❑ 11. Then, after the tension and center have been checked, tie the second loop of the knot.

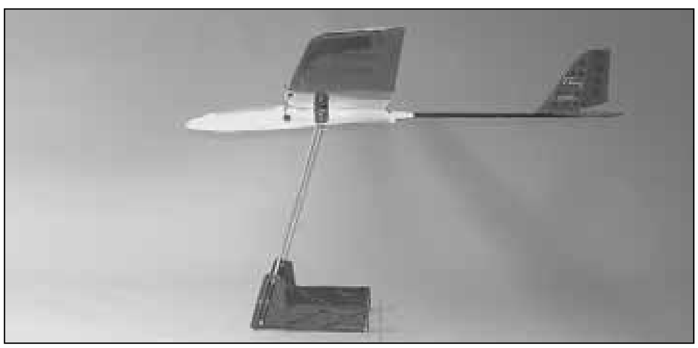
❑ 12. Cut the excess string 1/4" [8mm] from the servo arm.

Final Installation & C.G.

The receiver (Rx) and the battery should be all the weight that is needed to set the correct C.G. On our test models installing the Rx in front of the servos and the battery behind the servos set the correct C.G. Also, to keep the weight low, do not use a switch. Instead, plug the battery directly into the Rx.

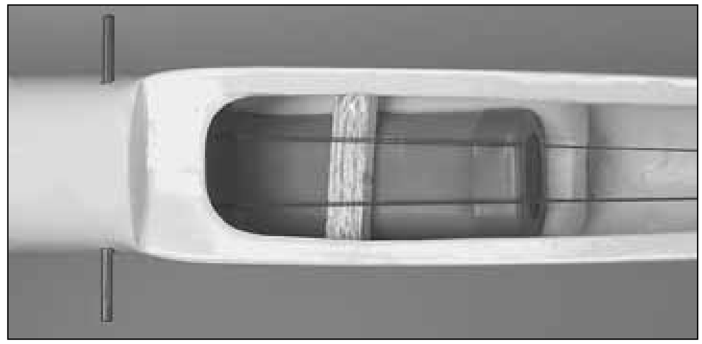


❑ 1. Secure the **tow hook** with a couple of drops of thin CA applied to the threads from the inside of the plane. **Note:** Do not glue the pushrod strings together.



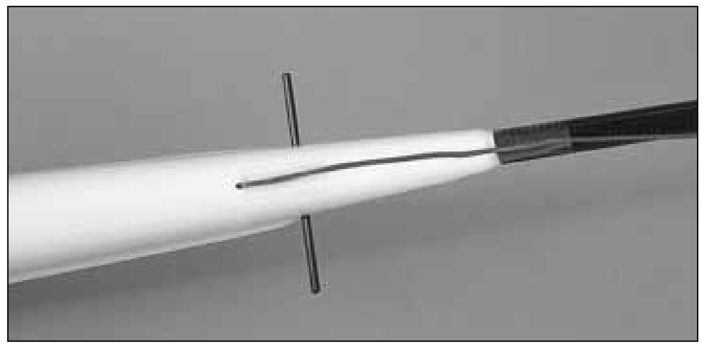
❑ 2. Accurately mark the balance point on the bottom of the wing on both sides of the fuselage. The balance point is located 2-3/4" [70mm] back from the leading edge at the fuselage. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to 3/8" [9.5mm] forward or 1/4" [6mm] back to change the flying characteristics. Moving the C.G. forward will add some stability but it will decrease the overall performance of the sailplane. Moving the balance back makes the model more agile with a lighter and snappier "feel" and improves the sailplane's response to air currents. In any case, please start at the location we recommend and do not at any time balance your model outside the recommended range.

❑ 3. Temporarily place the servos, battery and Rx in the fuse, and mount the wing and canopy. Check that the plane balances at 2-3/4" [70mm]. Move the components until the plane balances on that point.



❑ 4. Place a piece of 1/4" [6mm] foam in the bottom of the fuse under the location of the battery. Slide the battery wire forward in the fuse under the servos. Hold the battery in place with a leftover piece of balsa and glue using medium CA.

❑ 5. Install the Rx in front of the servos, isolating it from the fuse with 1/4" [6mm] foam.



❑ 6. Drill a 1/16" [1.5mm] hole in the bottom of the fuse in the rear of the wing opening. Route the antenna through the forward wing former and out the hole in the bottom of the fuse. Tape the antenna to the bottom of the fuse.

GET THE MODEL READY TO FLY

Charge the Batteries

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

Note: Checking the condition of your receiver battery pack is **highly recommended**. All battery packs, whether it's a trusty pack you've just taken out of another model, or a new battery pack you just purchased, should be cycled, noting the discharge capacity. Oftentimes, a weak battery pack can be identified (and a valuable model saved!) by comparing its actual capacity to its rated capacity. Refer to the instructions and recommendations that come with your cycler. If you don't own a battery cycler, perhaps you can have a friend cycle your pack and note the capacity for you.

Range Check

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

AMA SAFETY CODE (excerpt)

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

GENERAL

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

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

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

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

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

RADIO CONTROL

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

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

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

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

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

CHECK LIST

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

- ❑ 1. Check the C.G. according to the measurements provided in the manual.
- ❑ 2. Be certain the battery and receiver are securely mounted in the fuse. Simply stuffing them into place with foam rubber is not sufficient.
- ❑ 3. Extend your receiver antenna and make sure it has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver.
- ❑ 4. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ❑ 5. Place your name, address, AMA number and telephone number on or inside your model.
- ❑ 6. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- ❑ 7. If you wish to photograph your model, do so before your first flight.
- ❑ 8. Range check your radio when you get to the flying field.

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**, 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; Excessive free play in servo gears; Insecure servo mounting.

Preparations

First of all, if you are flying with other flyers, check to make sure they are not flying or testing on the same frequency as your model. Try to find an experienced pilot to help you with your first flights. Although the Fling ARF 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.

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.

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 6 feet [2M] 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 Fling ARF under the wing with the nose pointed slightly down and directly into the wind as shown in the photo. 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. Show your friend the preceding picture so he will know what to look for. 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, 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 Fling 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.

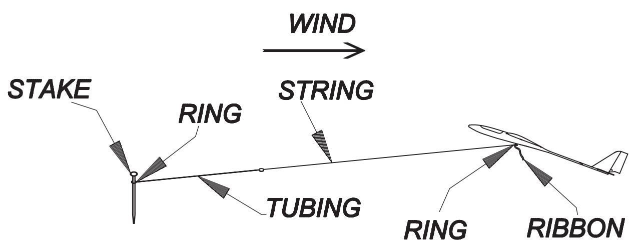
First Flights

Note: 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 Fling’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 took 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.

Your First Hi-Start Launch



The included hi-start is the most popular way to launch your Fling ARF. It consists of 30' of rubber tubing and 200' of string with a 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. The end of the string with the streamer has a loop or ring and is attached to the tow hook on the sailplane. Lay the hi-start out with the stake directly into the wind. Place the stake at the far **upwind** edge of the flying field so the streamer will blow back onto the flying field. Turn on your transmitter and then your receiver and hook the ring onto your plane’s tow hook. Pull the plane back approximately 20 yards. More tension can be used after you get acquainted with the launching procedure. **NEVER** pull more than 30 yards. 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 streamer will bring the end of the string back towards you.

THERMAL FLYING

Thermal soaring is one of the most intriguing of all aspects of flying and the Fling 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 a natural phenomenon 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. 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° (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.

Slope Soaring

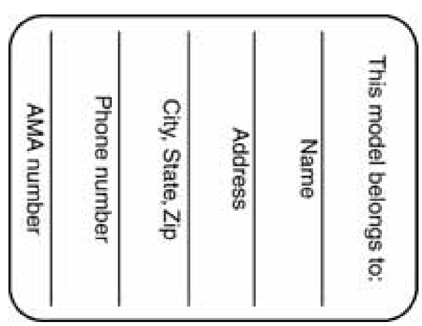
Slope soaring is a type of flying that is very popular in hilly regions and along the coasts. This type of soaring is possible when the wind is blowing directly up a hill or cliff. As the wind hits the slope it is forced up, producing lift which can be utilized by real sailplanes, hang gliders, birds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

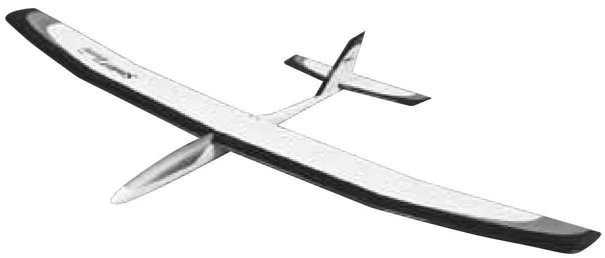
Have a ball! Remember to always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!



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

OTHER ITEMS AVAILABLE FROM GREAT PLANES



Great Planes Spirit Elite™ ARF

Like the International Model of the Year kit version, the Top Flite® MonoKote®-covered, 2-meter Spirit Elite ARF 4-6 channel sailplane is ideal for competition – with rudder, elevator, ailerons, flaps, and balsa/ply wing panels that employ an SA 7035 root airfoil for speed and SA 7036 airfoil at the wingtips for low-speed stability and lift. The fuselage is durable fiberglass, shaped to reduce drag. Assembly time is minimal...leaving you more time for set-up, flight, and experimenting with mixes! Requires a 4-6 channel radio with 4-6 mini or micro servos. **GPMA1047**

Great Planes Spectra™ ARF

The all-wood Spectra ARF sailplane arrives assembled and covered in Top Flite MonoKote film. It features a triple-taper wing with a semi-symmetrical airfoil, ElectriFly T-601 motor and 8 x 4 folding prop that quickly carries it from an easy hand launch into smooth, soaring flight. Required for operation are a 3-channel radio, electronic speed control, 7-cell NiCd, and charger. **GPMA1050**

Futaba 3FR 3-Channel FM Radio

This version of Futaba's 3FR 3-channel FM radio features super-light on-board components that are ideal for park flyers and other weight-sensitive aircraft: the compact R114F single-conversion receiver and two S3108 micro servos. Single-stick simplicity makes the 3FR very user-friendly, and the case is ergonomically designed for comfort and easy access to controls. Performance perks include V-tail mixing, a proportional 3rd channel, trims, servo reversing and more. Plus, 600mAh NiCd transmitter batteries with Sanyo® cells and a 50A overnight AC charger are included. **FUTJ53****

Futaba S3108 Micro Servo

The S3108 Micro Servo produces excellent torque and speed for its compact size and light weight, which makes it ideal for small planes and park flyers. The servo features a special four-point micro servo horn and can be used for elevators, ailerons and rudders. **FUTM0042**

Great Planes ElectriFly Mini 4-Channel FM Receiver

Worried about receiver-transmitter compatibility? Hook up an economical ElectriFly 4-channel Mini FM receiver, and it will automatically select the circuitry compatible with your Futaba, JR®, Hitec®, or Airtronics® "Z" radios. Innovative circuitry makes it a match for most popular systems – the size, range, and low 10-gram weight make it perfect for today's small electrics. Designed for park, slow and indoor flyers, the receiver features SMT components for maximum dependability. Available in high- and low-band versions on 72MHz. Requires a short, single-conversion Futaba FM crystal, available separately. 1-year warranty. **GPML0044**

FLYING NOTES

BUILDING NOTES

Kit Purchased Date: ______________________

Where Purchased: ______________________

Date Construction Started: ______________________

Date Construction Finished: ______________________

Finished Weight: ______________________

Date of First Flight: ______________________

FLIGHT LOG
