

Squirrel

Model Airplane

Handbook

By Darcy Whyte

\$19.95

Rubber-Power.com

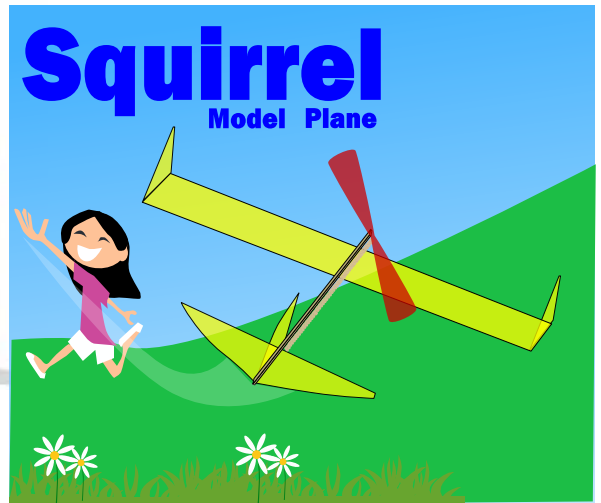


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Teachers Handbook v0001 Revised Feb 15, 2011
Contact the designer at darcy@siteware.com

For best results please follow these instructions. Email questions and comments to darcy@siteware.com.

You need craft glue, glue stick and scissors. Any craft or wood glue will work but Aileene's Tacky Glue (right) works well.

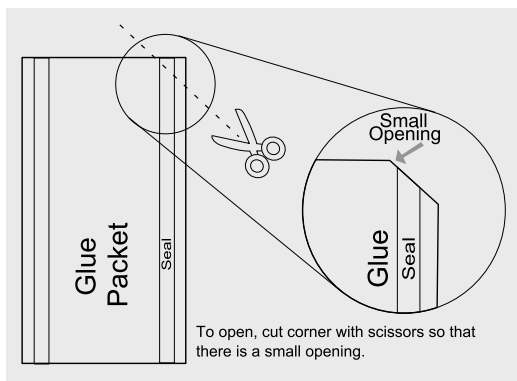
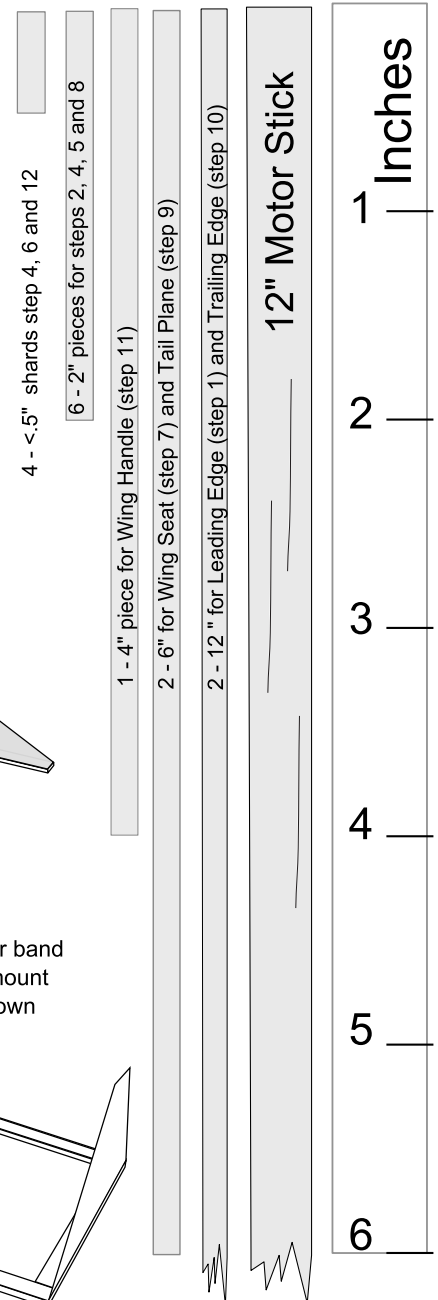
Use very little glue. It will dry faster and be lighter. The instructions call for a glue stick in some places to save time. You can use the craft glue everywhere if you want but use a very thin layer smeared with a toothpick..



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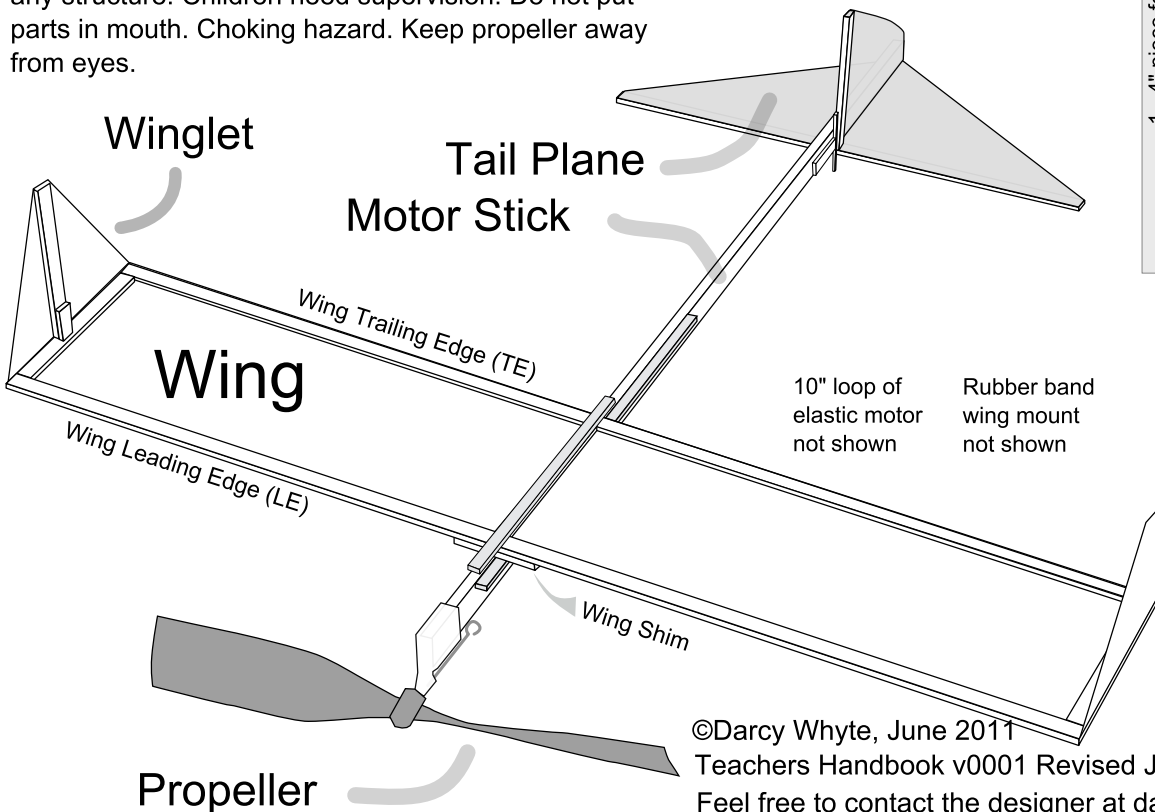
Video instructions are available at the Web site.

Balsa Sticks



If your Squirrel came with a glue packet, open the packet with scissors just before making your plane. Make a small opening!

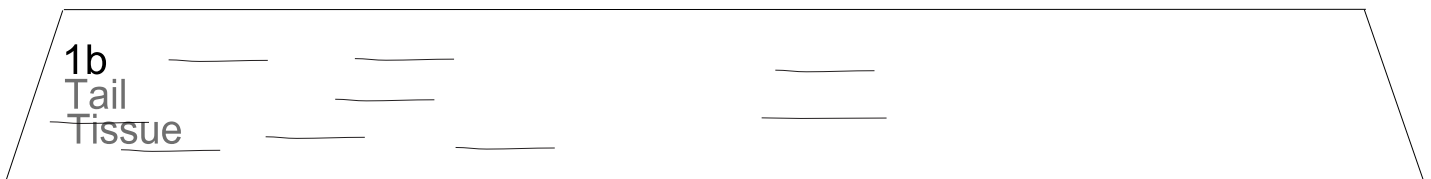
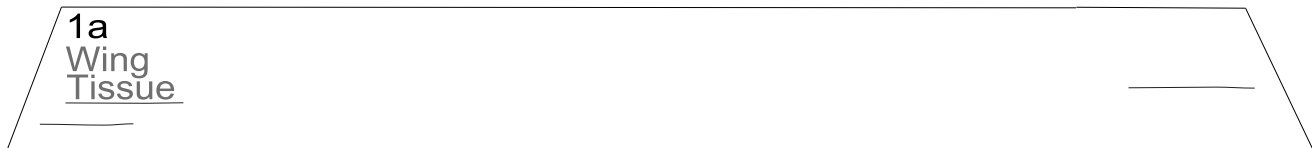
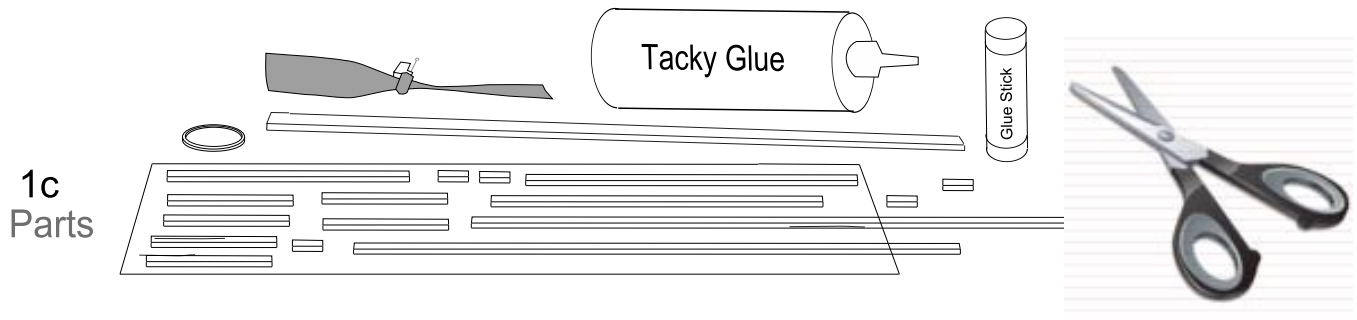
Safety - Do not chase plane onto roadway or other dangerous places. Do not climb trees, buildings, posts or any structure. Children need supervision. Do not put parts in mouth. Choking hazard. Keep propeller away from eyes.



Lay out tissue and materials

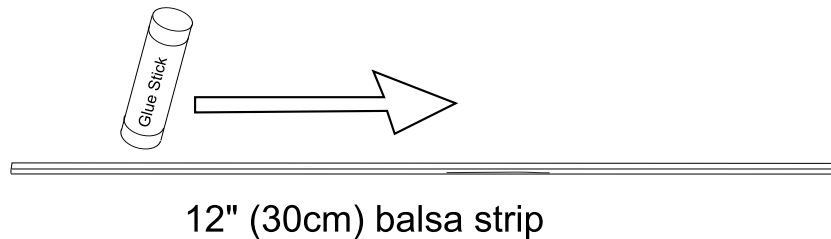
Lay two pieces of tissue in front of you. Put all the parts of your Squirrel kit just ahead of the two pieces of tissue.

Also keep your scissors, glue out near your parts. This is better for sharing and small spills will not be right in your work area.

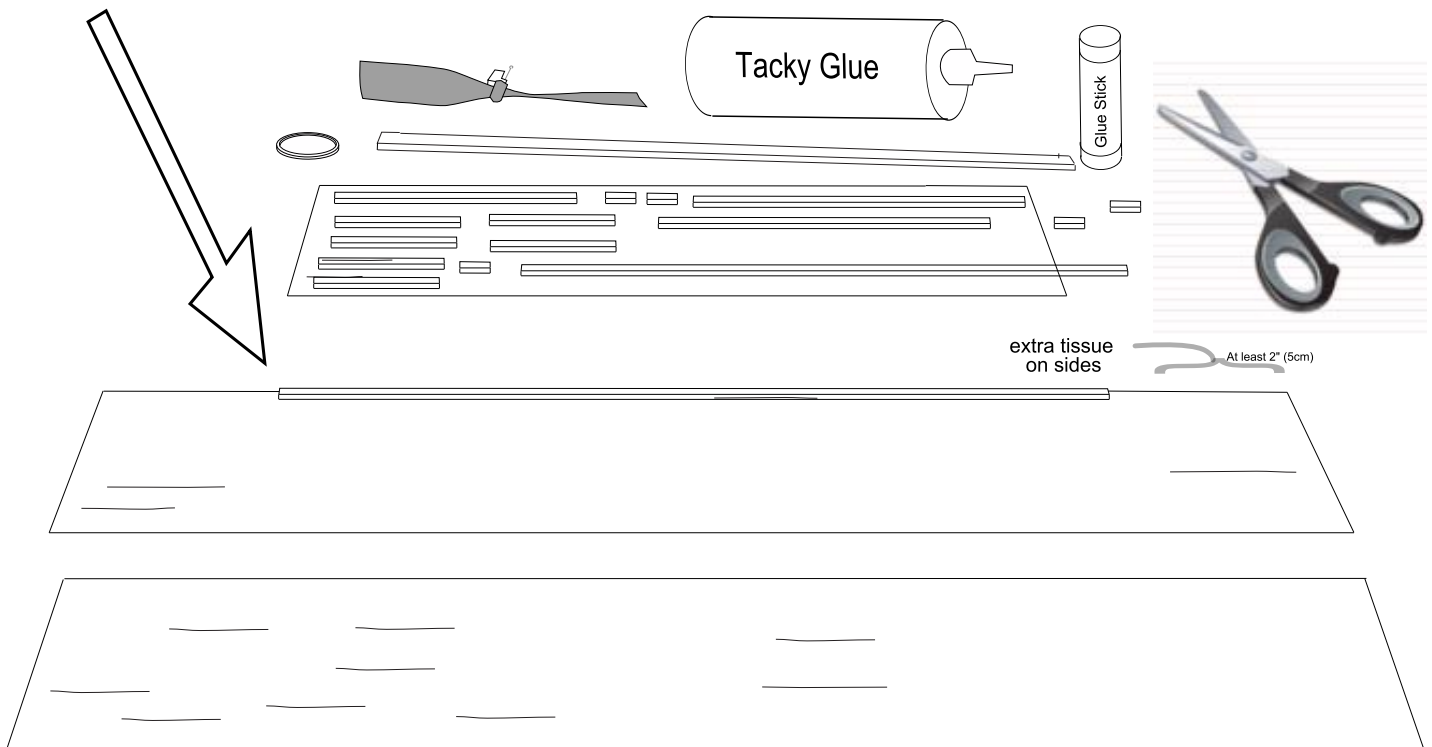


Wing Leading Edge

Take a 12" thin strip of balsa and place it on the table in front of you. Apply a thin layer of glue stick to one side. If you don't have a glue stick, you can use craft glue. Smear a very thin layer using a toothpick.



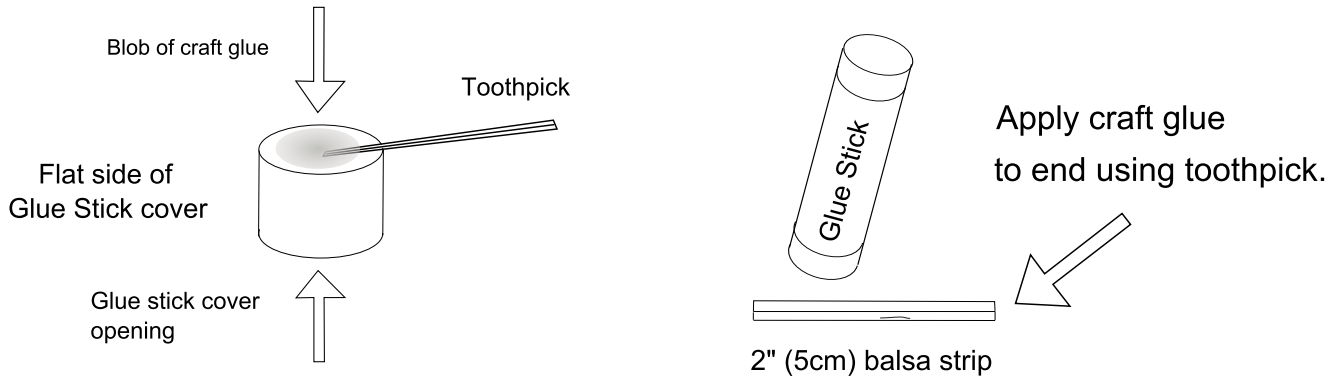
Glue it to the furthest edge of tissue. Make sure it is roughly centered from left to right.



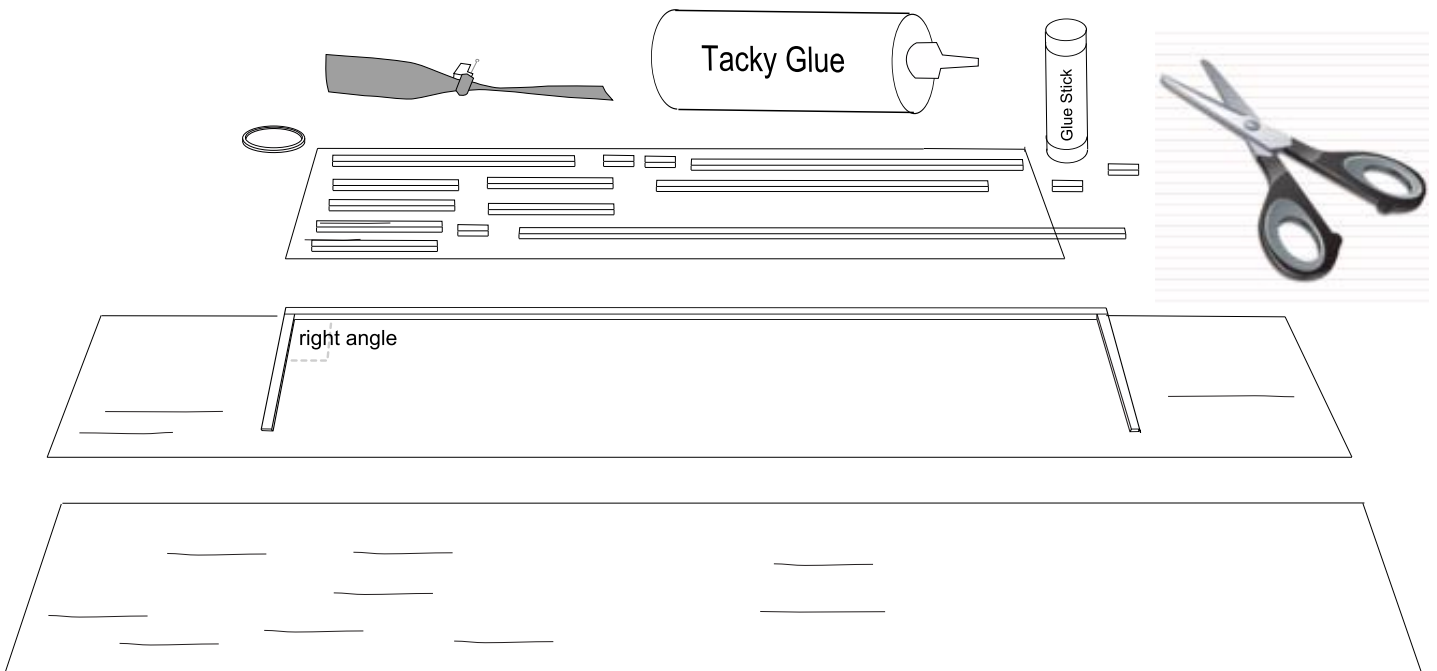
Wing Tips

In this step we will use two types of glue. To use craft glue, put a small blob of it on the flat side of the glue stick cover. Then use a toothpick to transfer the glue to the model.

Apply glue stick to one side of the 2" (5cm) wing tip. Then add glue to the tip using a toothpick.



Glue the wing tips in place. Be sure to use craft glue to glue the wood to wood joint and the glue stick to glue the wood to the tissue.

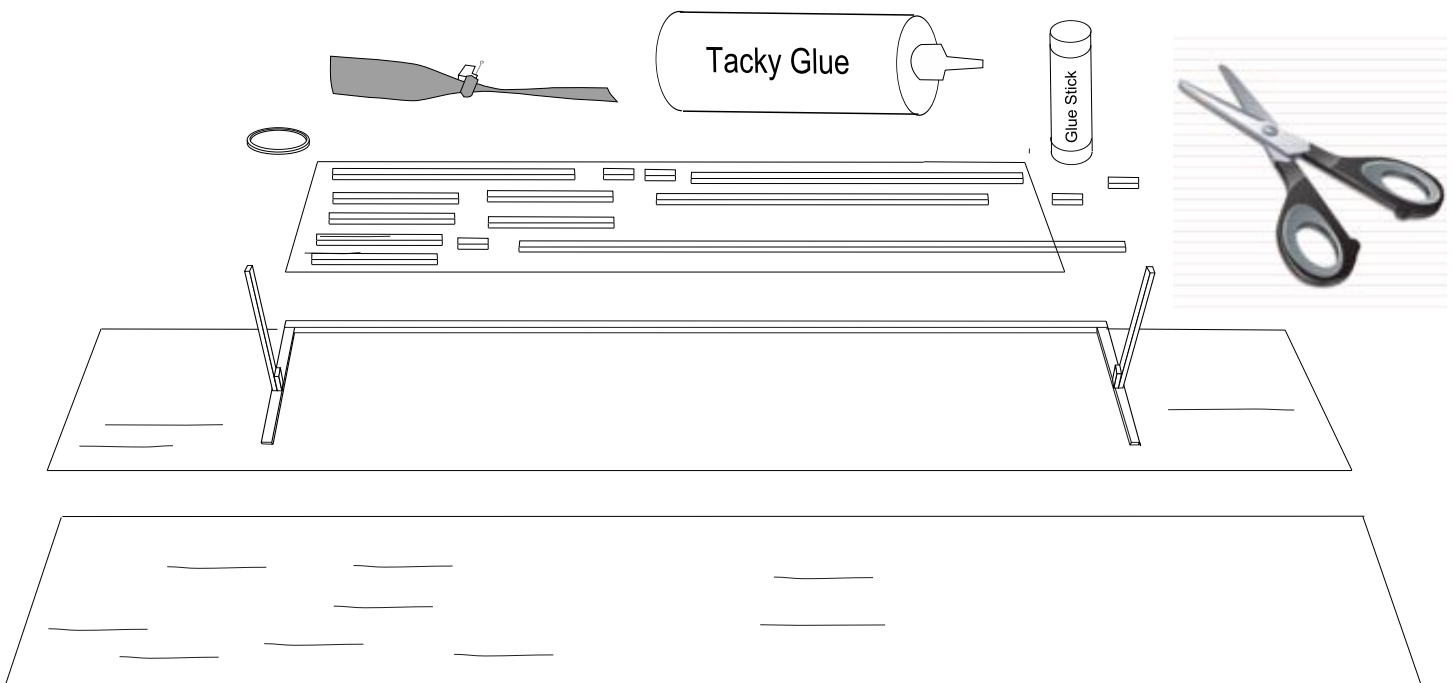
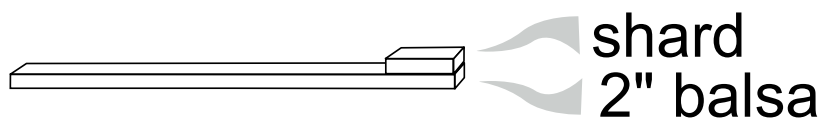


Winglets

Use craft glue to glue a shard of balsa to the end of a 2" (5cm) winglet.

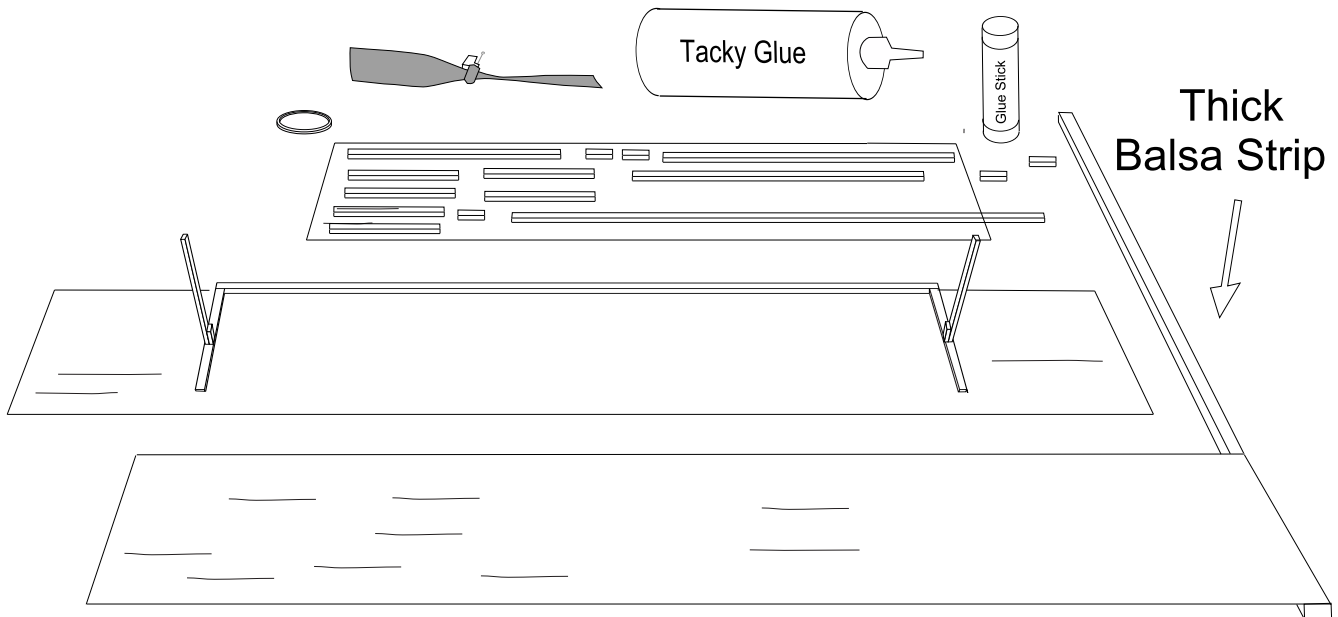
Glue the winglet to the top of the wingtip. The shard faces in and the winglet is flush to the outer edge of the wing tip.

Repeat for other side.

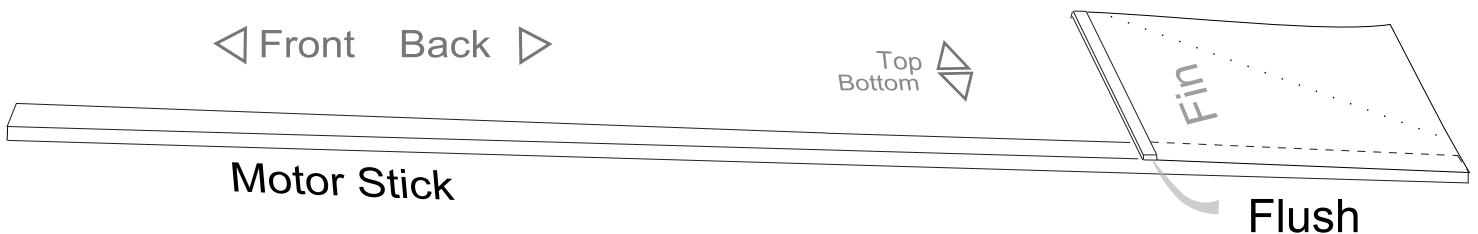
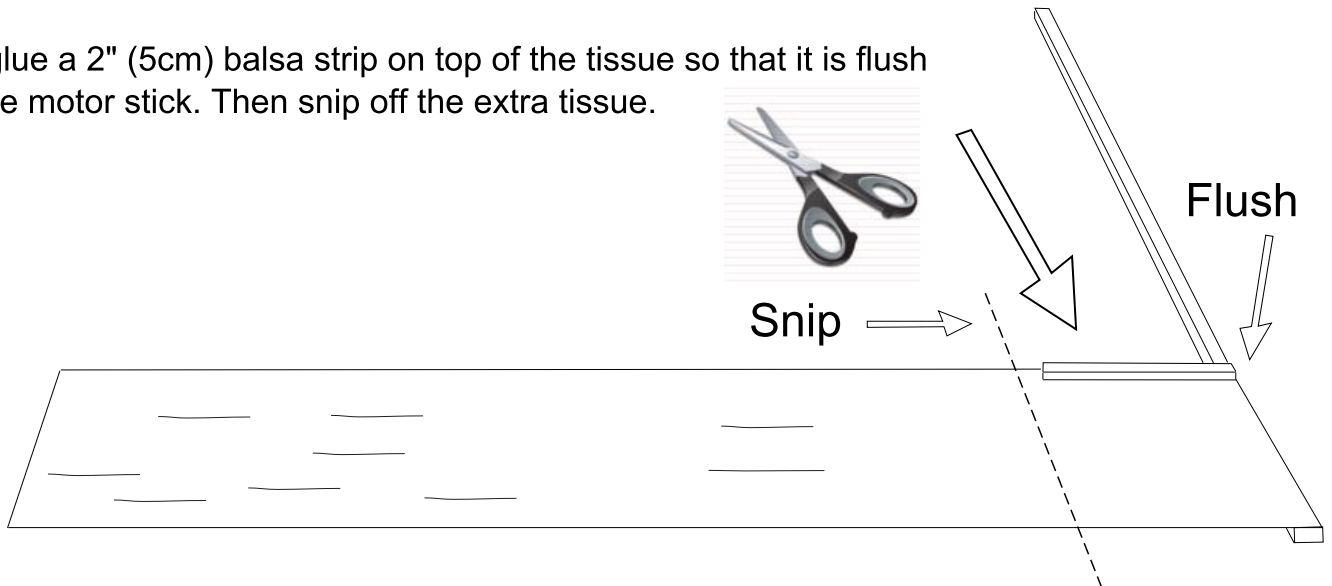


Fin

Lay the 12" (30cm) thick stick beside the tissue that is closest to you. Smear a thin layer of craft glue onto the balsa and glue the tissue on top. It doesn't matter if the fin winds up on the left or right side of the motor stick.



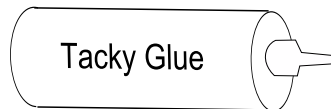
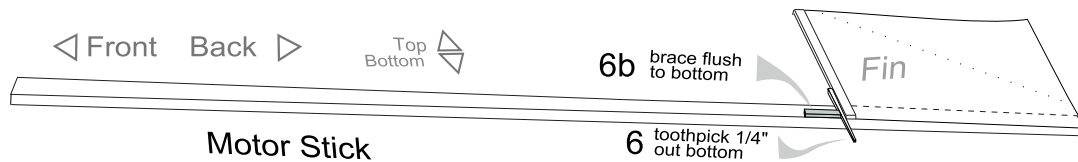
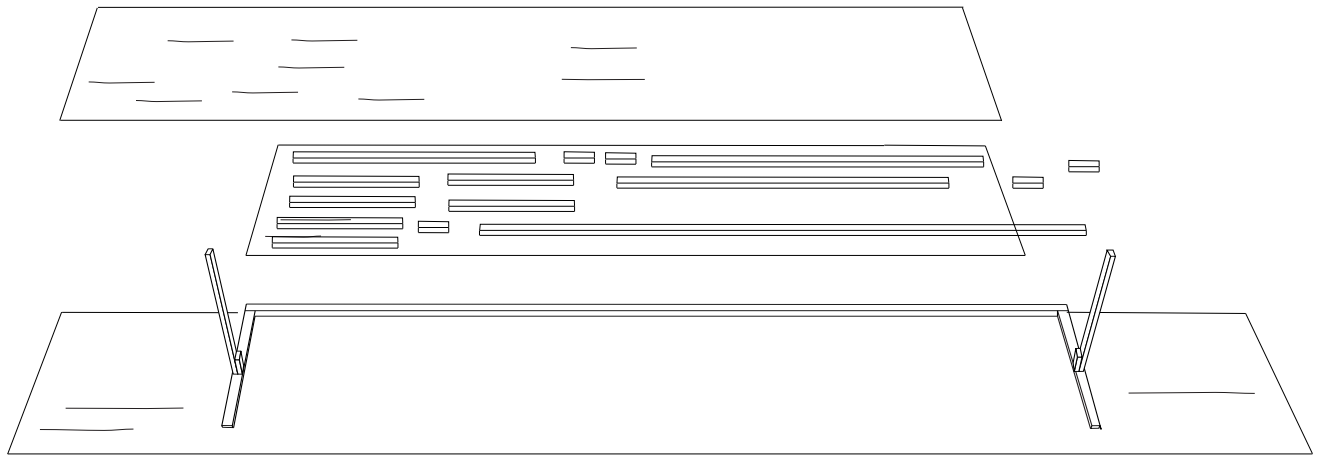
Craft glue a 2" (5cm) balsa strip on top of the tissue so that it is flush with the motor stick. Then snip off the extra tissue.



Toothpick

Snap a toothpick in half. Craft glue the stronger half to the leading edge of the fin. Make sure it overhangs the bottom by about 1/4" (5mm).

Craft glue a shard of balsa ahead of it to act as a brace.

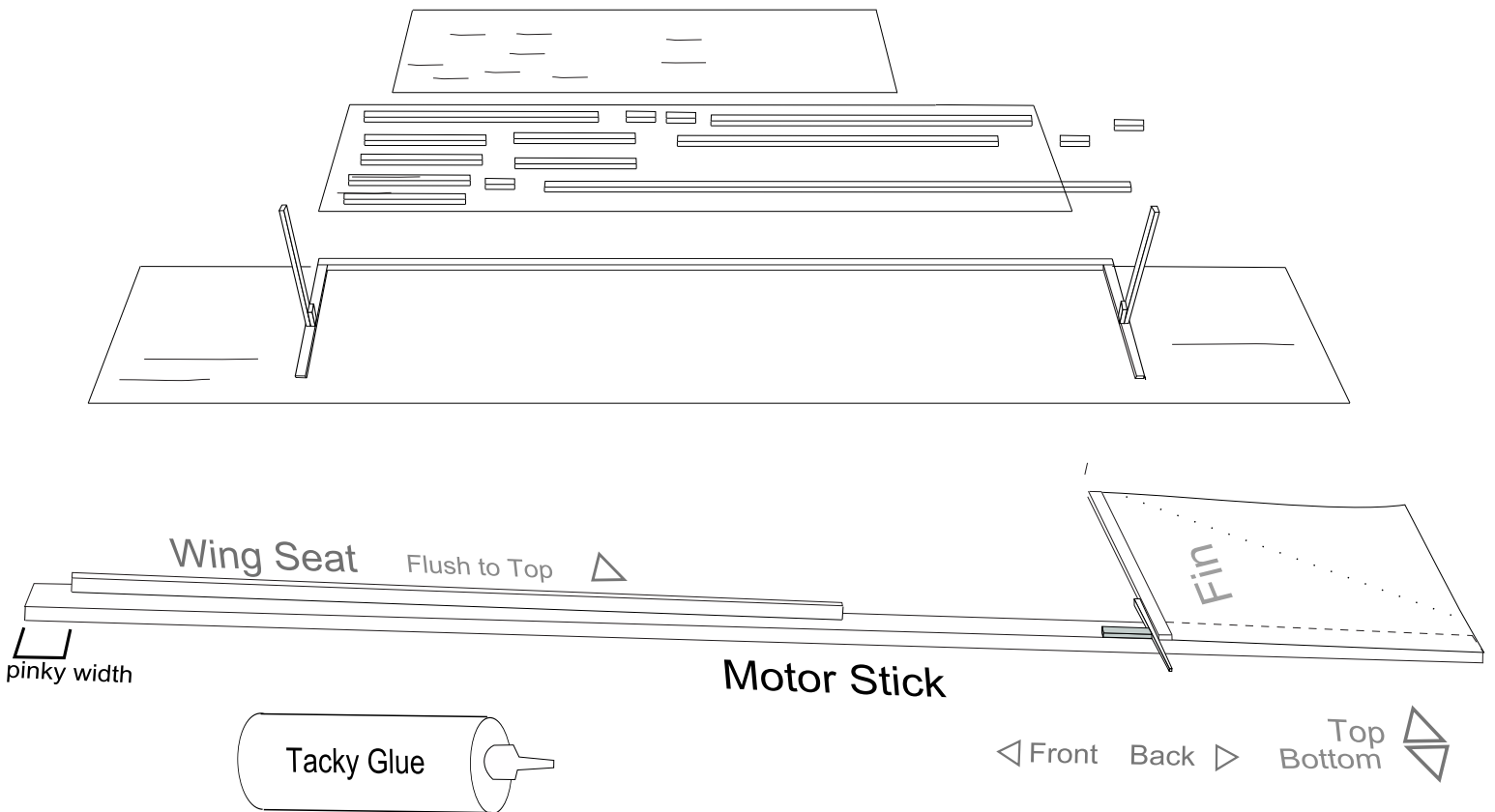


Wing Seat

Use craft glue to glue the 6" (15cm) wing seat in place.

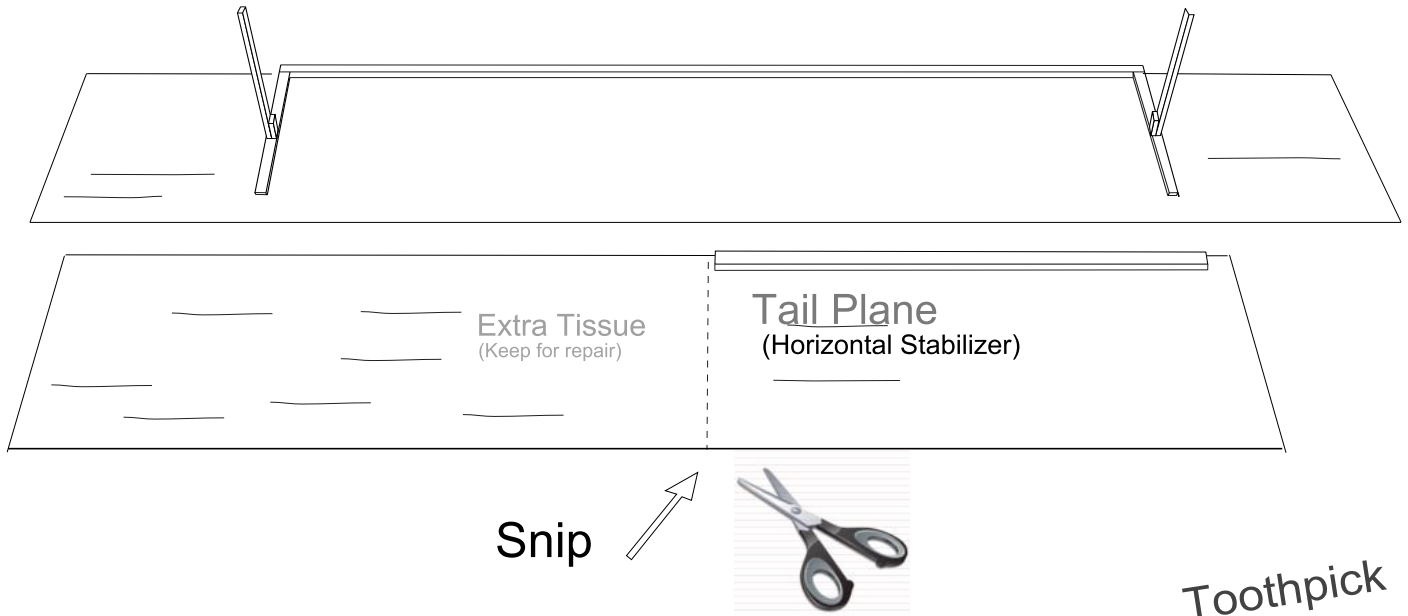
Start with a blob of glue on the toothpick that is nearly the size of a Q-tip. Run the bead of glue along the thin edge of the 6" (15cm) strip of balsa.

It is glued to the side. It is a pinky width from the front of the motor stick. It is top aligned.

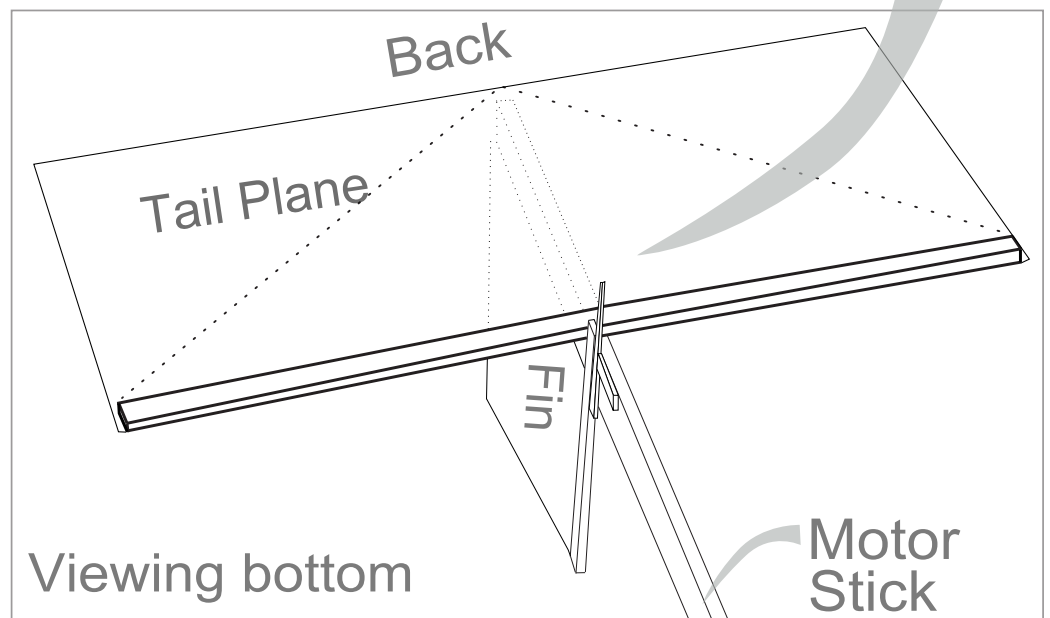


Tail Plane

Spread a thin layer of craft glue onto the flat edge of a 6" (15cm) balsa strip. Glue in place on top of the remaining tissue strip.



Craft glue the tailplane to the back of the motor stick just behind the toothpick. Notice that it's the tissue being glued to the motor stick.



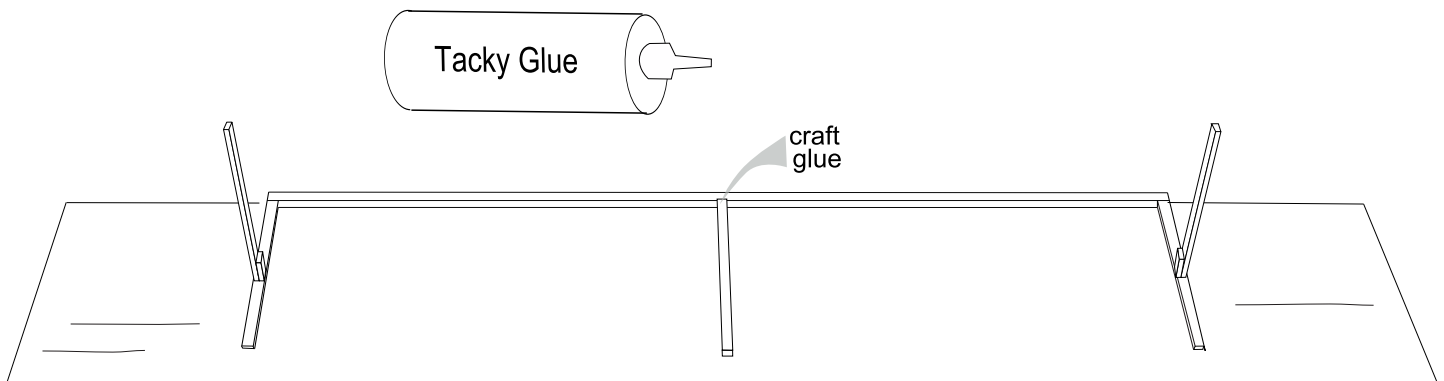
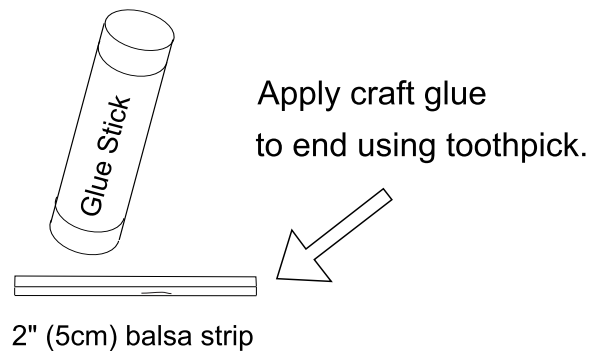
This assembly is vulnerable while the glue is drying. Leave it balanced on a glass or put the end of the stick inside a glass so that the tail sticks upward. You can also leave it at the table edge so that the tail overhangs. This will allow the glue joint to set up properly.

Wing Center

Add glue stick to the flat side of a 2" (5cm) balsa strip. Add glue to the end using a toothpick.

Find the middle of the wing by using a 6" propeller or balsa strip (the wing is 12").

Glue the wing center in place.

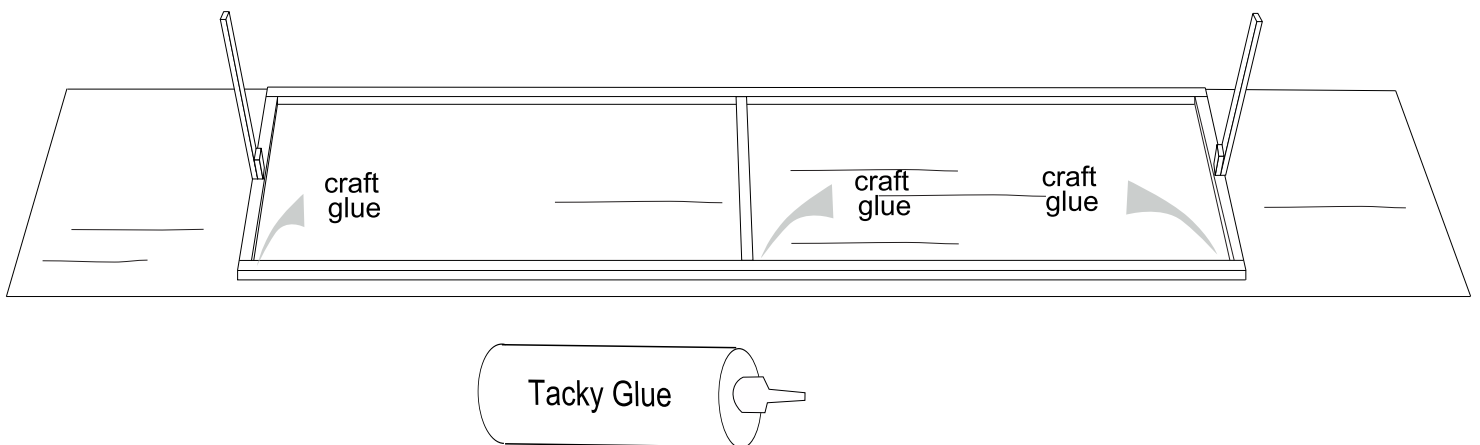
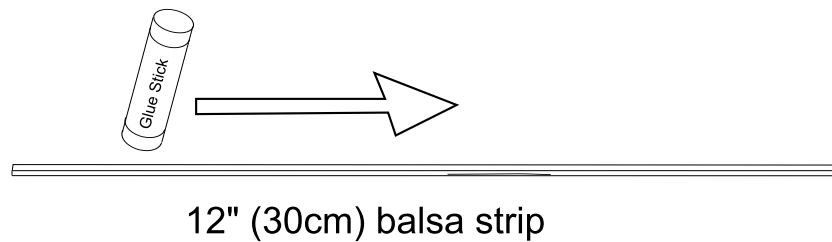


Trailing Edge

Add glue stick to the 12" (30cm) balsa strip.

Add craft glue to the ends of the 2" wing tips and wing center using a toothpick.

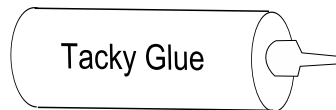
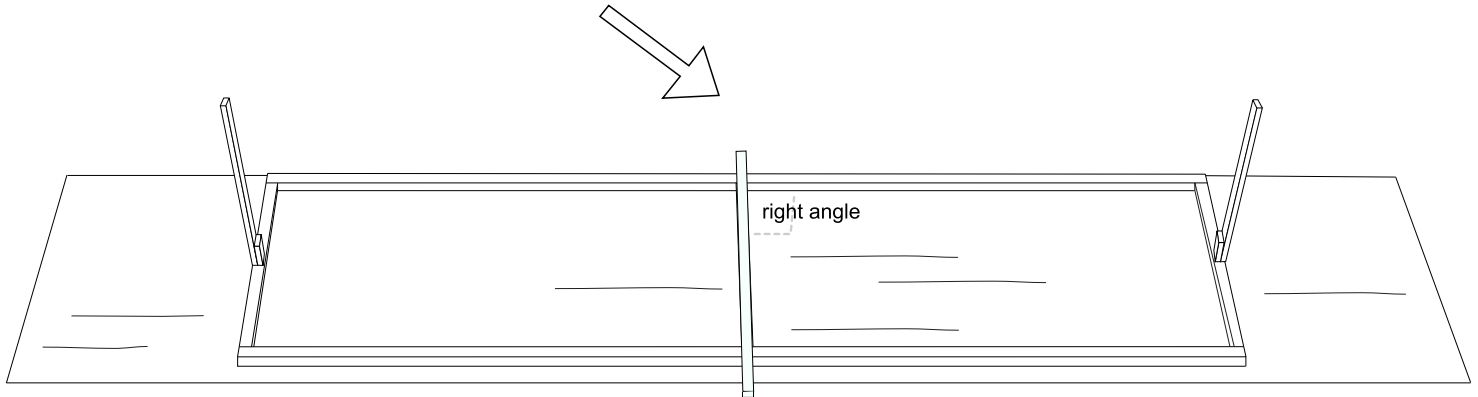
Add wing trailing edge.



Wing Handle

Use craft glue to glue the 4" (10cm) wing handle in place. Apply it to the wing center, leading and trailing edge then press the handle on top.

Make sure it is at a right angle.

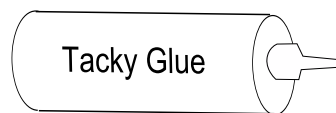
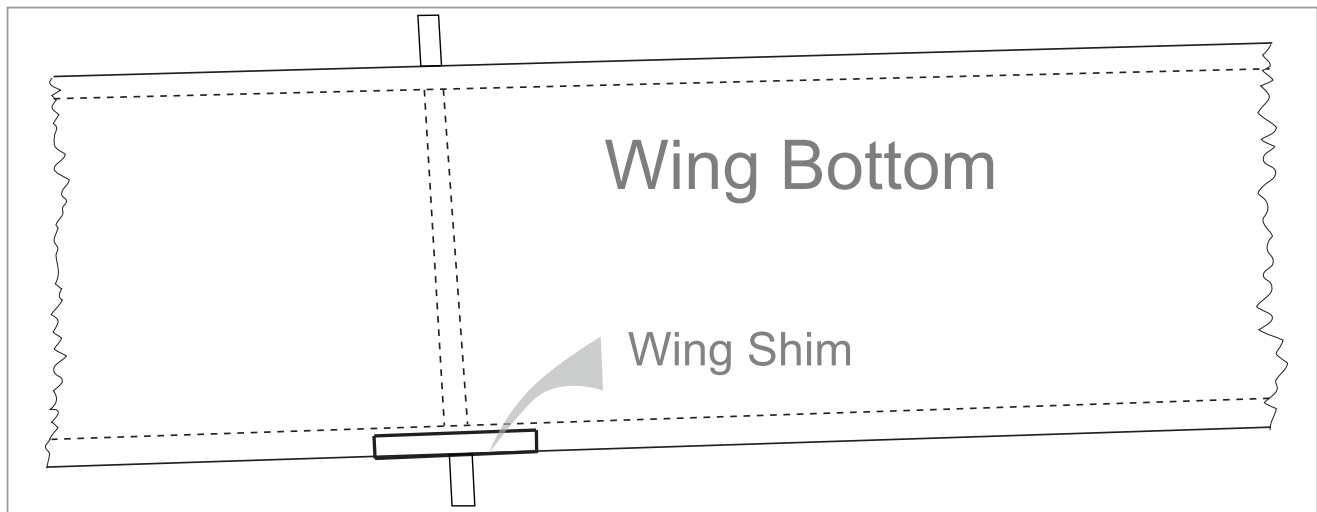


Shim

Use craft glue to add the shim to the bottom of the wing.

It doesn't matter which side you put it on.

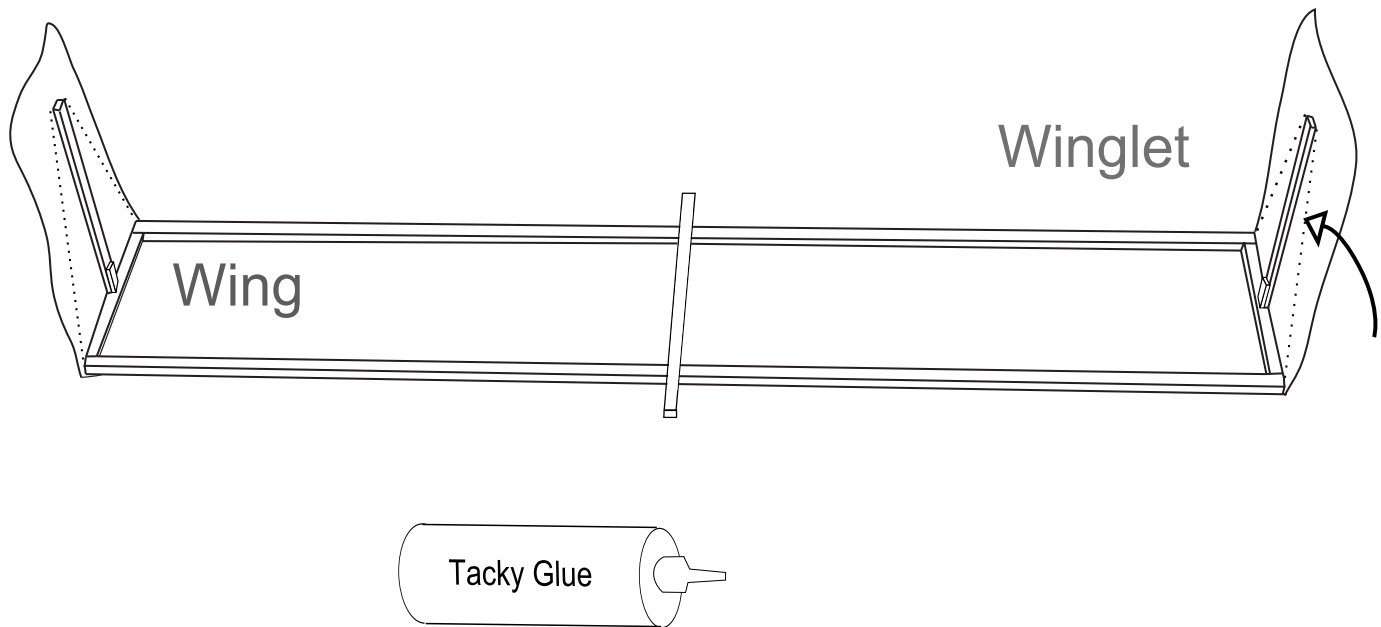
Which ever side you put it on will become the front of the wing.



Winglet Tissue

Apply some craft glue to the outside surface of the winglet uprights. Hold the upright in place while applying glue by having your palm on the table and your index finger resting on top of the winglet.

Flip the winglet tissue up starting from the bottom and working your way up.



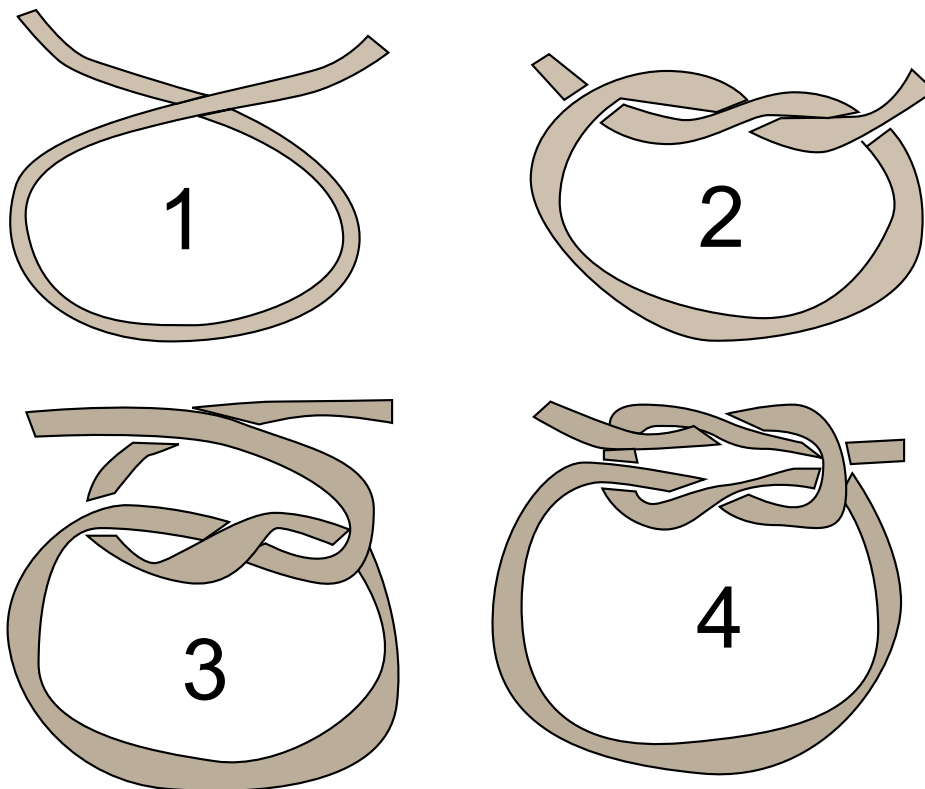
Motor Loop

Tie a square knot in the large rubber band motor.

Try to have the loose ends as short as possible.

Pull the knot tight by gently pulling all four strands coming off the knot.

Pull it tight in several pulls till the knot shrinks down and is tight enough that it will not come undone.



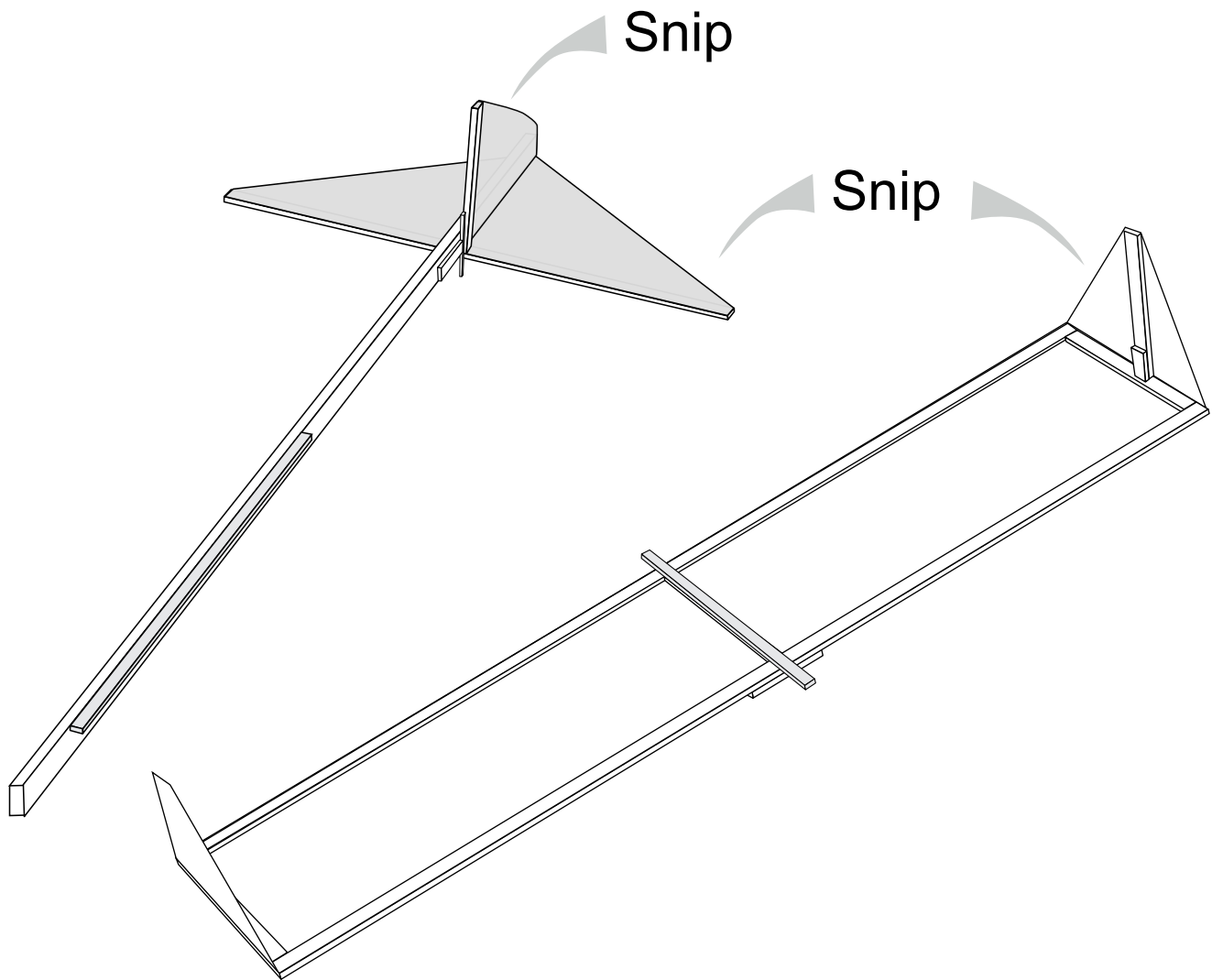
Snip

Snip the extra tissue from the winglets.

Snip extra tissue from leading or trailing edge of wing.

Snip extra tissue from fin and tailplane.

Curved surfaces are stronger. Cutting them straight works too.



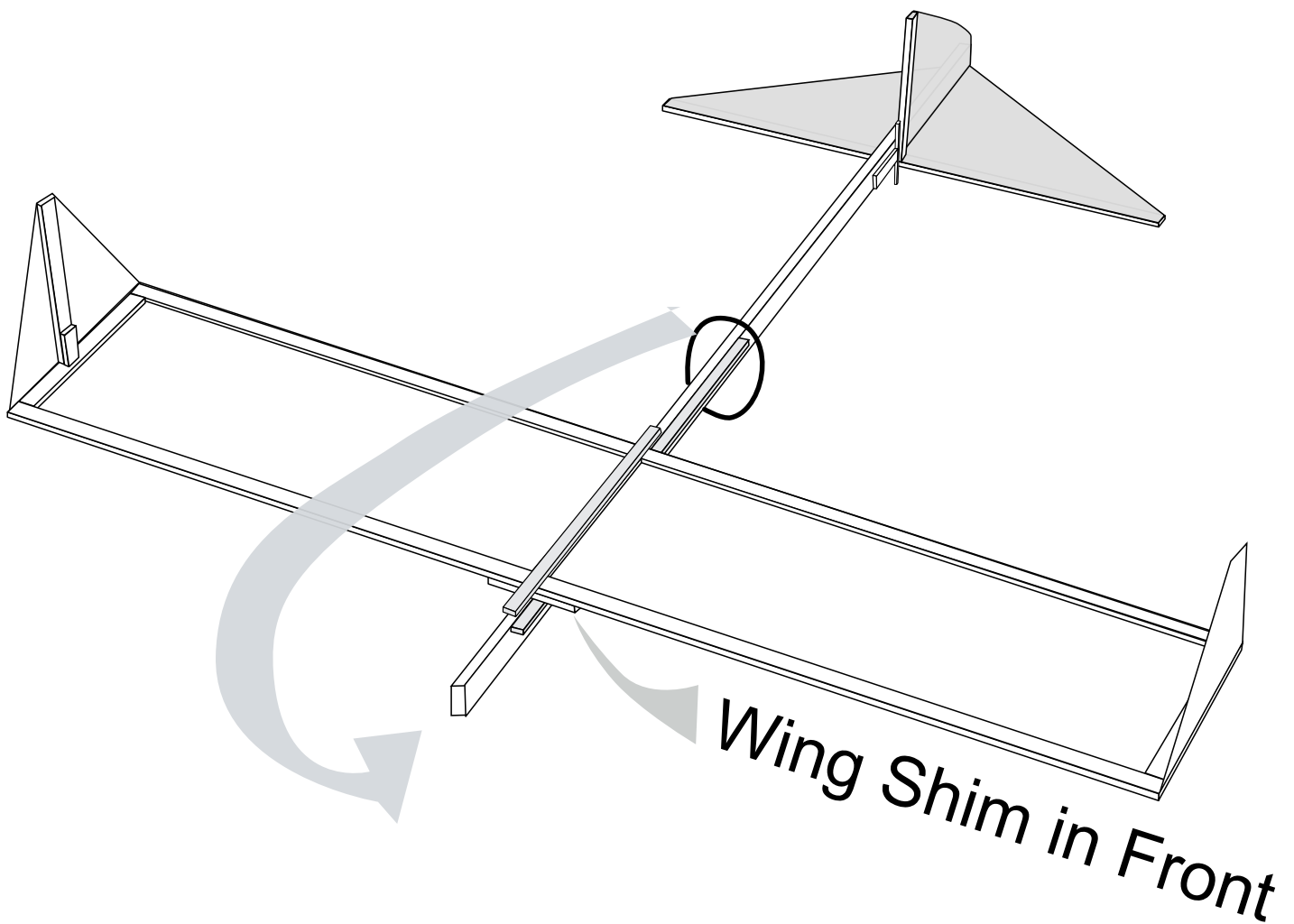
Mount Wing

Use the small elastic to strap on the wing. First stretch the elastic a few times to soften it up.

Add the elastic to the motor stick, then place the wing on top. Make sure the shim is facing the front of the plane. Also make sure the fin and winglets are facing up.

Pull the elastic over top of the wing and on to the front of the motor stick.

Make sure the elastic is not hooked on the front of the wing seat. The wing is adjustable and removable.



Mount Propeller

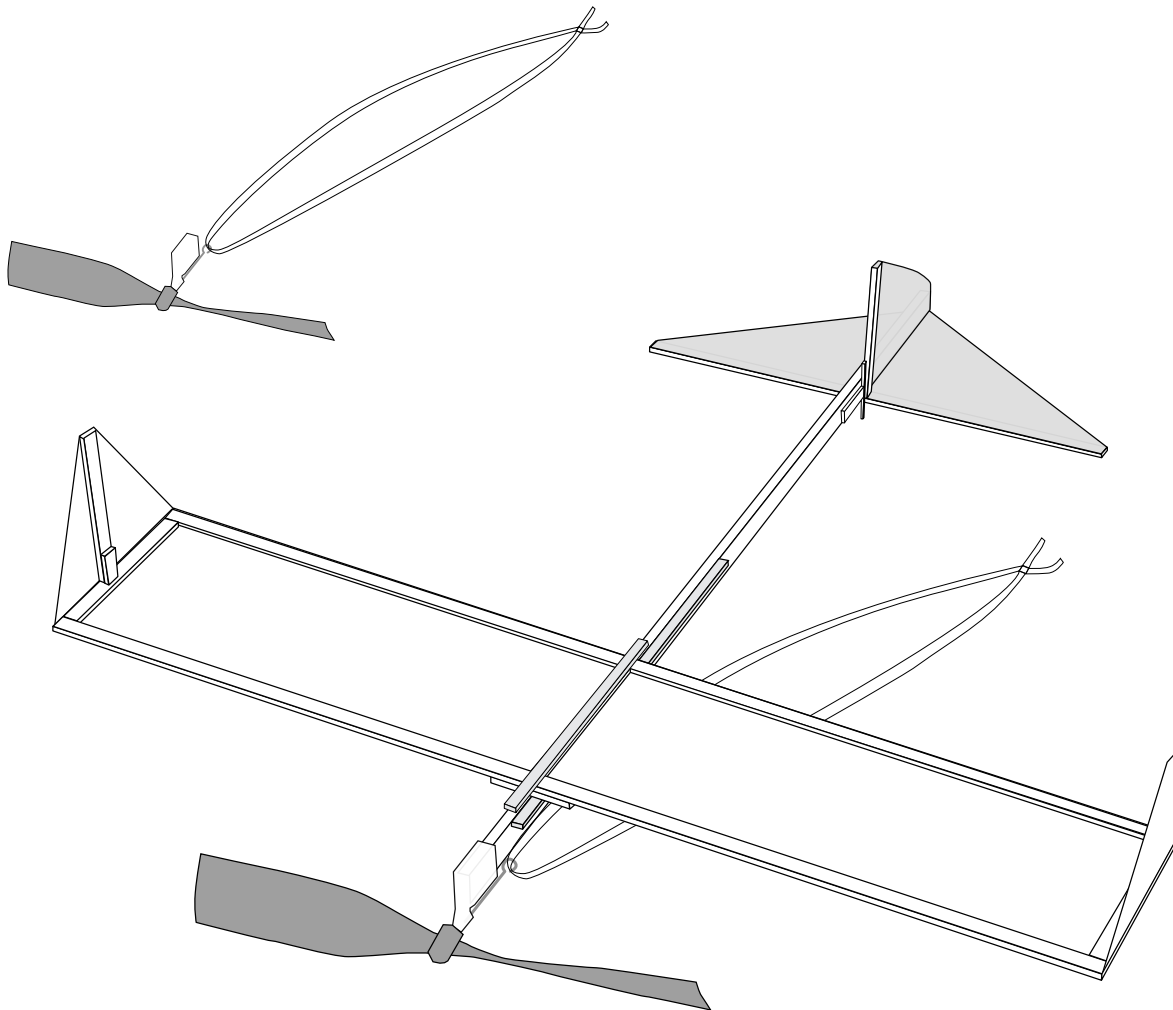
Loop the large elastic onto the hoop at the back of the propeller.

Make sure the knot is at the opposite end from the propeller.

Press propeller onto model from front. If it is too tight, shave some wood off the top or bottom of the motor stick with scissors.

If it is too loose, glue a section of a toothpick to the top or bottom of the motorstick.

The rubber motor should hang loose beneath the plane.



Admire your work!

You are now finished making your Squirrel model airplane!

Take some pictures and submit them to darcy@siteware.com!

Always handle the Squirrel by picking it up by its nose. This is the plastic hub that attaches the propeller to the plane.

This will help prevent damage and will prevent the propeller from turning.

You can easily store your Squirrel at home by hanging it by its elastic motor. Hang it on the side of a picture frame or the corner of a television.



Winding

Pinch about 2" (5cm) of the elastic band and hold the Squirrel right underneath it's wing with one hand.

Wind the propeller with the other hand.

After about 40 or 50 turns, you can hook the elastic onto the toothpick.

Only use about 200 turns when testing your Squirrel.

Once you have it flying nicely, you can increase the winding a bit with each try.

Too many turns can break the elastic and cause damage to the plane.



Prewind 40-50 turns.



Hook elastic onto toothpick and continue.

Launching

Hold the Squirrel underneath the wing with one hand. Hold the lower propeller with the other.

It's important to release the propeller as one step, then push the plane gently forward as the second step.



Retrieve the plane by holding the nose piece like the above picture. This prevents the propeller from unwinding further.

Retrieve the plane by holding the nose piece like the above picture. This prevents the propeller from unwinding further.



Ready for launch.



Release the propeller THEN push the plane level.



Do not launch it from back here!

Trimming

Squirrel has an adjustable wing.

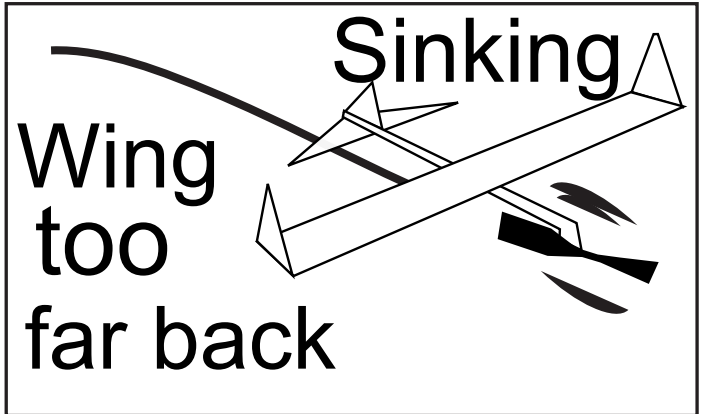
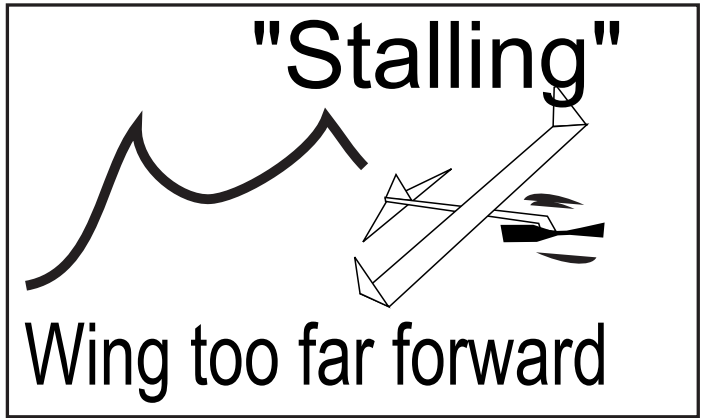
Moving it forward makes the plane climb.

Moving the wing back makes the plane dive.

We need to find the sweet spot for each plane.

It usually takes a few flights to get the wing setting right.

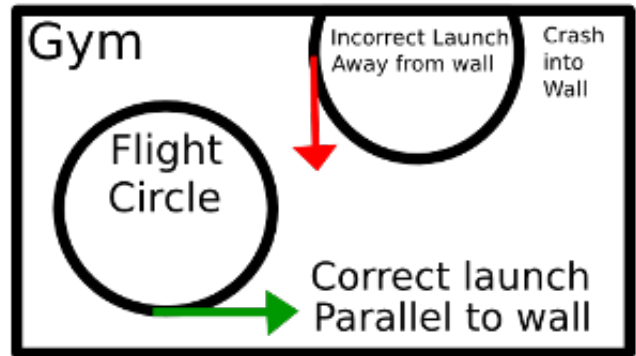
A good starting point is to have the wing about 1" (2.5cm) from the front of the motor stick.



Tips

When flying indoors, it may strike the walls. If your plane flies in a circle, then launch it parallel to the wall (not away from the wall).

As you can see in the illustration at the right, launching away from a wall results in hitting the wall.



If your Squirrel turns, then it is easy to fly it indoors. If not, you may want to add one or more ailerons to get control of the turning radius. It's easy make an aileron out of a piece of paper and then glue stick to the top or bottom of the trailing edge of the wing. It's better to put them towards wing tips rather that towards the middle of the wing. It works well to have one aileron that's about 2" wide. I've been making them about an inch in chord and that has been



You can store your Squirrel on a picture frame.

They can also be pinned to a bulleting board. Pin the elastic not the plane!



Broken Sticks - Glue back with craft glue. Be sure to match the break back up exactly so that the wood grain is perfectly matched back. Use scrap balsa to splint break if necessary.