



MODEL AERONAUTIC ASSOCIATION of CANADA.



office@maac.ca

www.maac.ca

“MINNOW R.O.G.” (Rise of Ground)

Rubber Power Model Airplane designed by Lloyd Shales 1994 and Engineered by Rolly Simonsen.

Pictures and write-up by Cato Hansen Zone Director Zone B Atlantic for Model Aeronautics Association of Canada.

The Minnow ROG was designed by Lloyd Shales and engineered by Rolly Simonsen. The prototype flew right off the drawing board, and the only changes were some improvements when the file was set up for Laser cutting including some changes to the ribs, leading and trailing edges. Initially, all parts of the Minnow ROG were pre-cut by hand, and the students had to cut out the ribs, wing mount etc.

The Minnow ROG has been used as an educational construction subject, teaching science classes in their Aeronautic education, Air Cadet Squadrons, Boys and Girls Clubs and a host of other groups.

Hopefully, the experience in building and flying this Rubber Power Model will light a spark and we just might have someone interested in aviation, who might not have been otherwise.

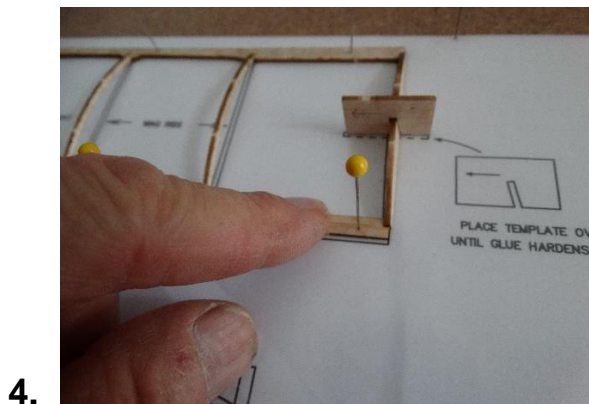
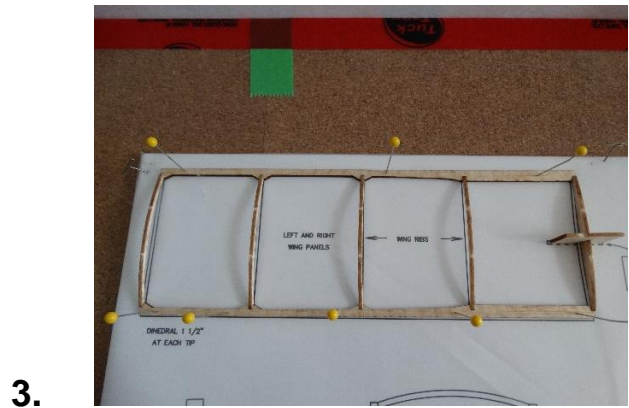
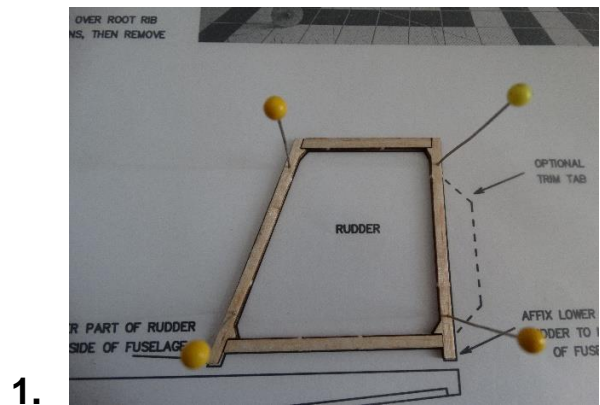
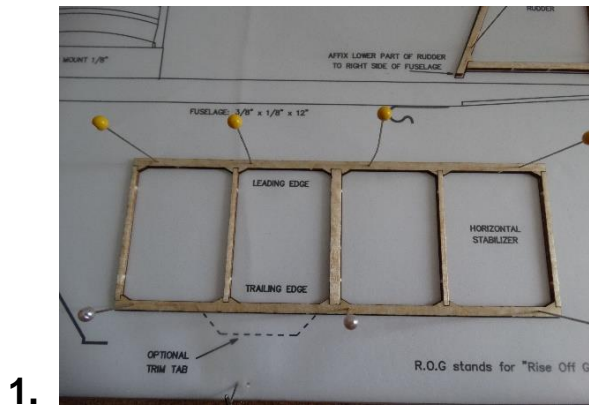
Many pilots, astronauts and members of the aeronautic community started out as model builders and flyers as a steppingstone towards their career.

Building tips:

- Building boards can be made from ceiling tiles cut down to 24 inch by 8 inch, or foamboards with paper backing, (can be had at Dollar store for \$ 1,25.) and which measure 20 inch by 30 inch and can be made into nice small building boards.
- Tissue can be had from the dollar store or similar **(20)**.
- Plans must be protected from glue sticking the assembled parts to it, so cover the plans with plastic wrap, construction 4 mil. polyethylene works great as the CA will not stick to it **(18)**.
- The sharp Quilting pins with a small plastic ball on the end are the best, get the medium length ones, about a dozen or so will do for the project, some will say that you should not put the pins through the balsa, but to put your pins on each side of the balsa on an angle to hold it in that way, but if you use those thin pins, they will work just fine going through the balsa, use whatever method works for you.
- Make a pin cushion to keep the pins organized and safe **(19)**. The pins **(22)** from any fabric store.
- Parts are not completely cut out by the laser and may require a little help from a sharp X-acto knife with the no.11 blade or similar. Use a sanding block with fine and coarse grit to remove very carefully the small bumps left over when you release the laser cut part.
- You will also see an extra set of 10 straight ribs if you like to make a flat wing **(21)**.
- Start with the Stab first, that is the wing at the back, then the Rudder, lay leading and trailing edge down flat over the plan **(1)**. Pin the leading edge down first **(1)**, put the ribs in place and then the trailing edge, make sure the leading edge and trailing edge are square and parallel.
- Do the same with the rudder and glue it all down.
- When making the main wings follow the information below.
- First pin down the leading edge **(2)**.
- Then put all the ribs in their slots **(2)**.
- Next line up the trailing edge with the ribs inserted into their respective slots **(3)**.
- Make sure the leading edge and the trailing edge are square and parallel to each other before you pin down the trailing edge **(3)**.
- Do not forget to use the guide to set the proper angle for the inside end rib **(4)**.

- When removing the pins, push down on the structure and twist the pin to remove (4).
- If you are using CA glue, make sure the students faces are a safe distance away as the release of the CA gas is quite irritating to the eyes and nose, expressly if any of the students have any breathing problems. You can use any woodworking glue you like, but it will slow down the process, as you must allow an hour for drying time. If you are using the so-called Carpenter glue, put a dab on scrap paper for the student to dip the parts in.
- You can also use HOT Glue with a fine tip.
- If not using the CA glue, after you have lined up and made sure all parts fit, remove one rib at a time and glue down until you have them all glued in place. Leave for at least one hour or until the next time available, do the same with the other wing follow the same procedure.
- Next comes the covering.
- Lay the covering flat down on your building board with the shiny colored side down (5). ***(When finished the shiny side should be the finished side on top of the wing for best appearance that you will see, same for the stab and the rudder, if you like you can put the dull side down which will give a little better performance)***. Use a glue-stick or whatever glue you would like (6), and put glue on all the ribs and leading edge and trailing edge, put your wing down onto the covering and roll it from front to the back to make the covering stick to the wing ribs (7). Lift it up and turn it, then lay it down on the building board and press the covering down carefully with your finger. Push and pull to remove any wrinkles that has formed. Be careful so you do not tear the tissue. Some small wrinkles are ok, they may actually contribute to some lift. Then lift the wing and put glue on the front of the leading edge and the back of the trailing edge and press the covering over the edge and glue it down (8). Do the same with the end rib (8), trimming the covering so you have about 2 Millimeter left, then add glue to the underside of the wing and glue the covering to it (8). This will make an extraordinarily strong wing, so I highly recommend it. Let it sit for a while for the glue to dry. When the glue is dry use a sharp single edge razor blade to trim away any of the covering left on the center rib, or use the sanding block to carefully sand the edge with a down stroke away from the covering, so you don't open the glue joint (9).
- The stab is covered on top side with the shiny side on top.
- Use the wrap-around method as explained above for the main wing (8).
- Glue the two-wing half's together (10).
- Glue the wing support to the fuselage (11).
- Glue the completed wing to the wing support and fuselage, making sure the wing dihedral is the same on each end (12).
- Glue the stab onto the rear of the fuselage (13).
- Cut the front tab away from the rudder and glue it on top of the fuse at an angle (14). Glue a paper trim tab to the ride of the rudder to increase or decrease the turns.
- Glue the rudder for right or left turn (15), in the picture it is for left turn.
- Attached the prop assembly, landing gear and hook up the rubber motor (3/32" FAI Rubber). Ideally lubricate with a little castor oil or your favorite solution for better performance and longer life for the rubber.
- Do a test flight slightly straight out, adjust the landing gear to get a nice straight long glide, no other weight should be necessary, but if you need too, add some plasticine (16).
- Wind up about 200 turns and let it fly out of your hands or from the ground, if it flies with a slight climb, try another 100 turns to a max of 400 turns, and enjoy and have fun (17).
- When building with a group, simple duration contests are a great way to put a successful end to the session. Flight of over a minute are easy to achieve in a school gymnasium.
- When you look at the pictures, you will see that I chooses to put my pins through the balsa, as I'm using very sharp and thin pins (22) that does not do any damage or splitting to the balsa.

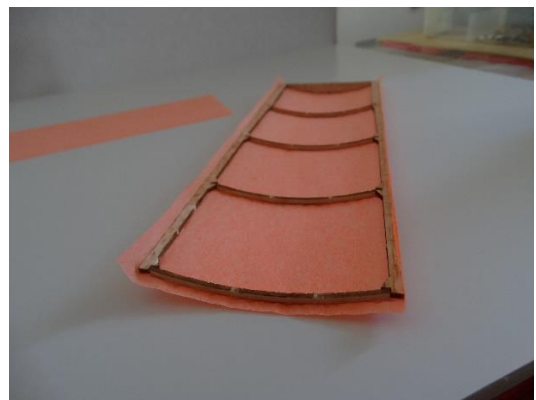
- **When getting your plans copied, check the measurements and make sure you tell them to copy at full size. The plans are on 11"X17" paper and are at the scale of 1:1.**



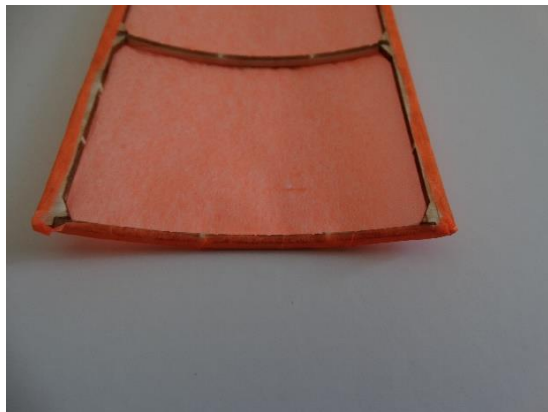
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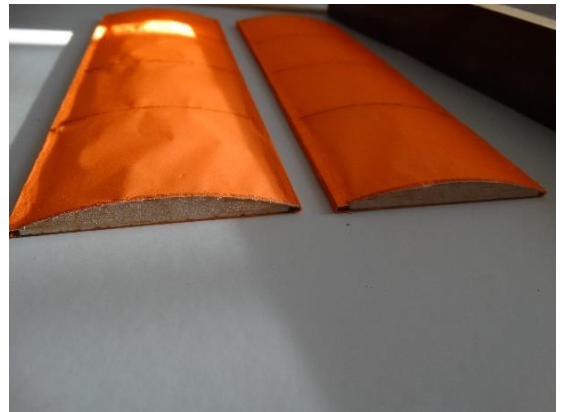
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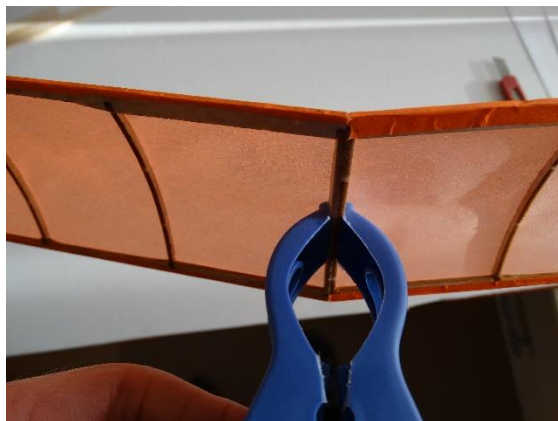
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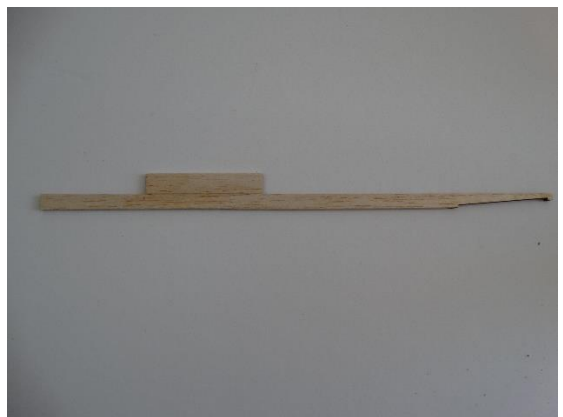
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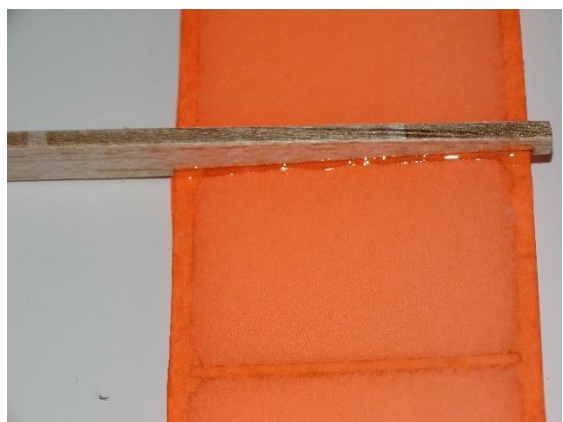
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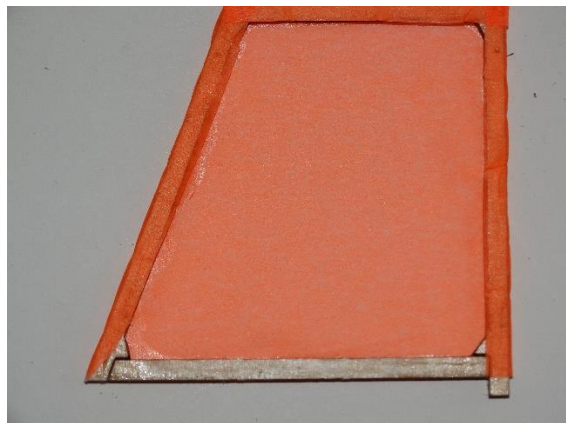
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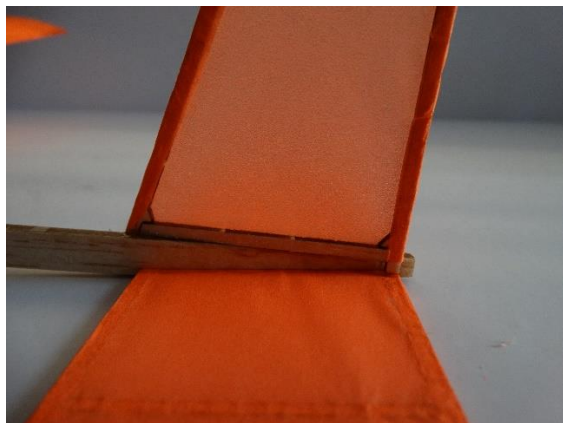
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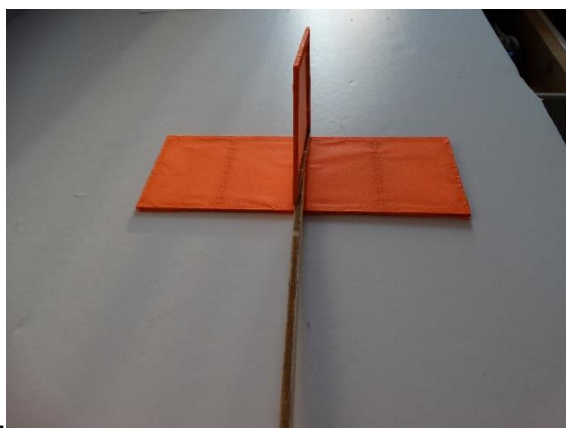
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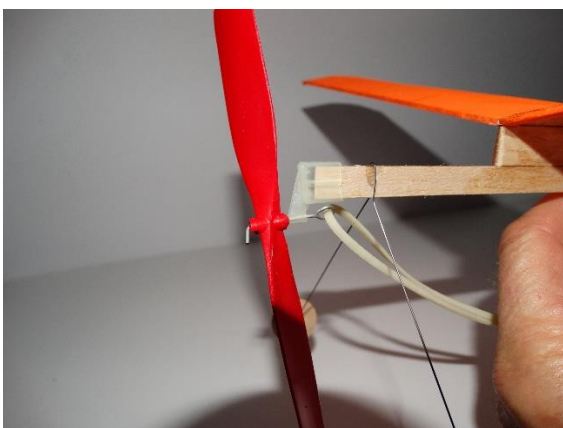
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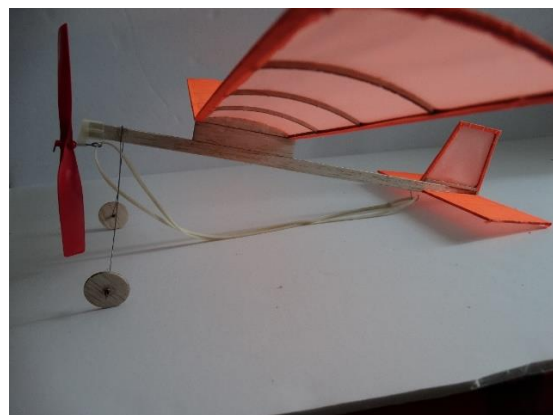
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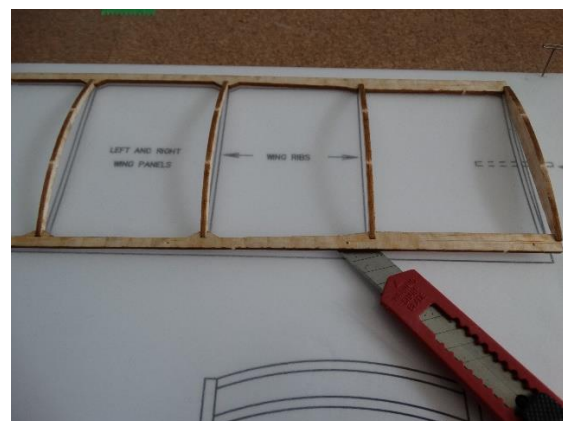
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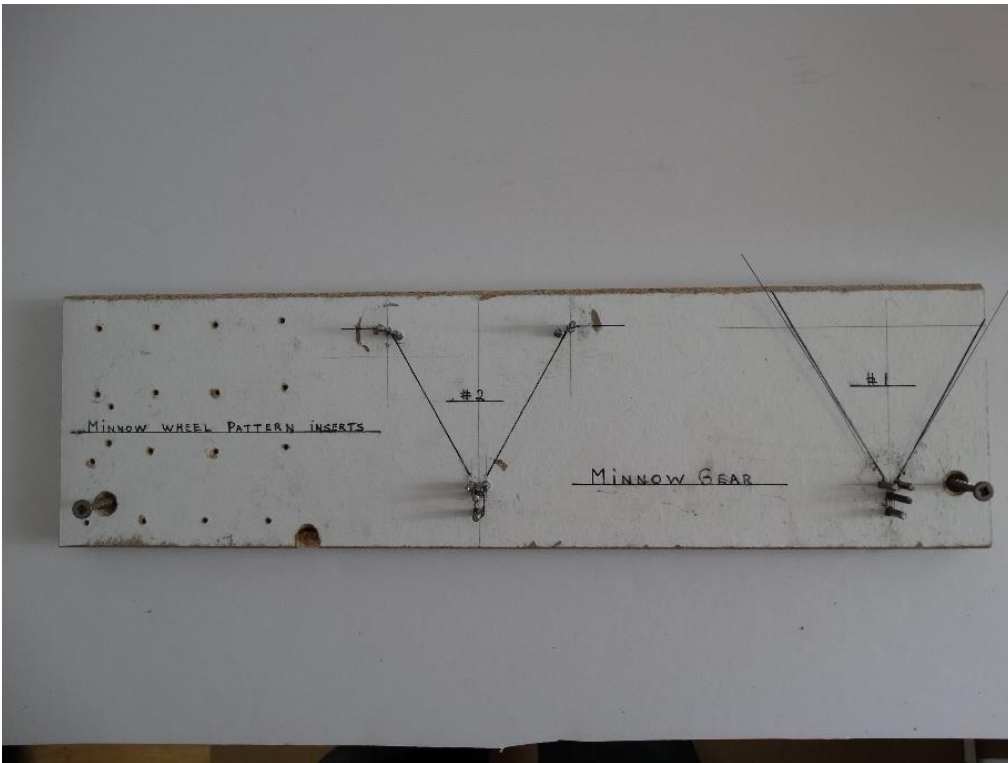
I hope you will have a pleasant experience in teaching and building the Minnow, I know I had. If you have any questions or something you would like to add to this, please feel free to contact me at:

zd-b@maac.ca

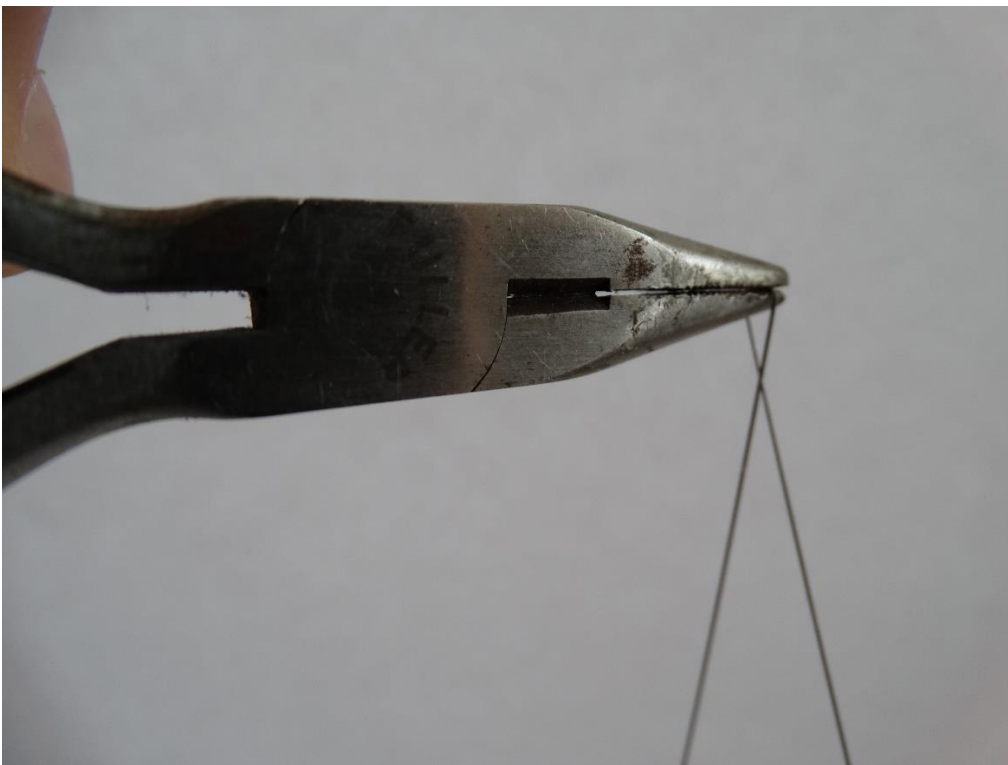
office@maac.ca

I you are planning to make your own Kits, see below for some information on how to make your landing gear, if you have another idea please use it as this is just my way of doing it.

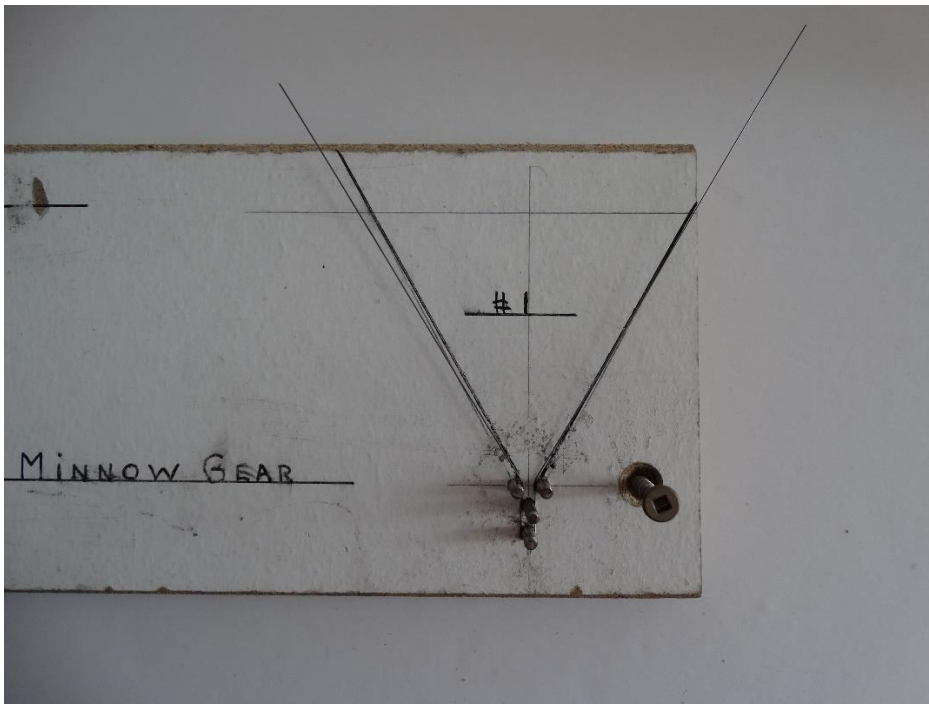
Good luck and enjoy your build.



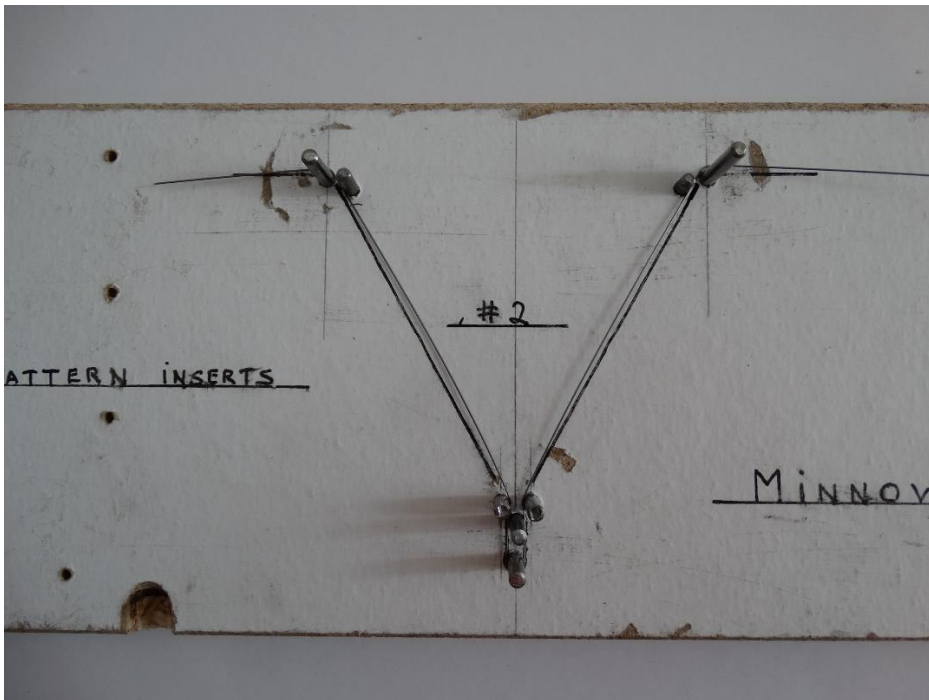
Starting with a template for the landing gear and the wheels, the wire for the landing gear is 0.015" or 0.020". The 0.015" is sufficient for the weight of the Minnow.



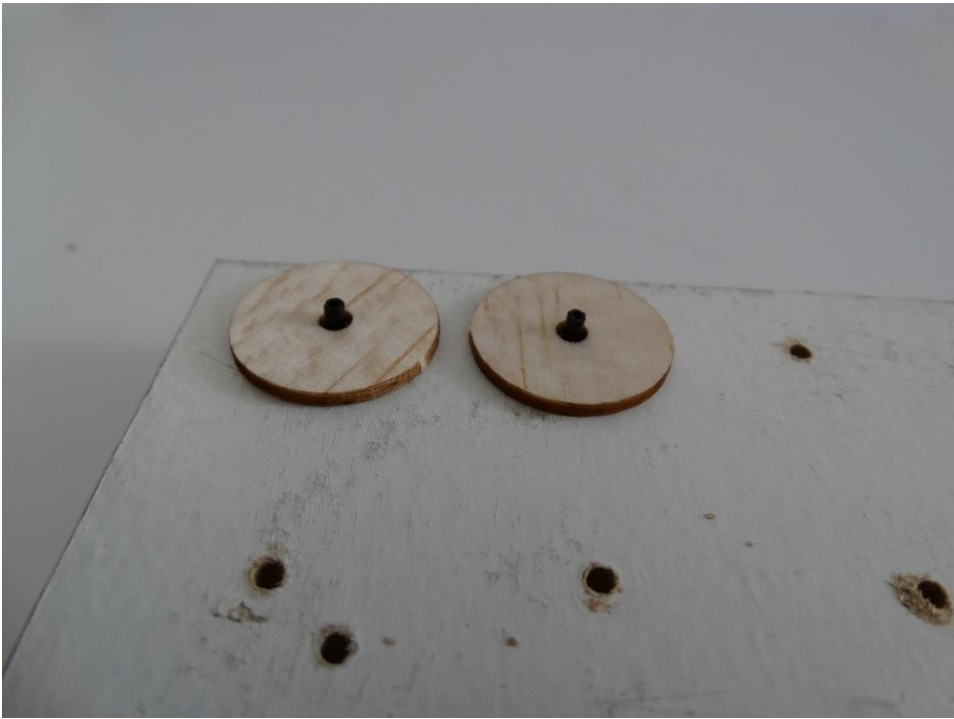
Use a sharp needle-nose plyer to make the first bend.



Place the gear in the #1 section and bend out to match the drawn lines on the pattern.



Second, place the gear in the #2 section and finish the bend for the wheels.



Place the ceramic beads in the holes and slip the wheels over and apply glue of your choice.

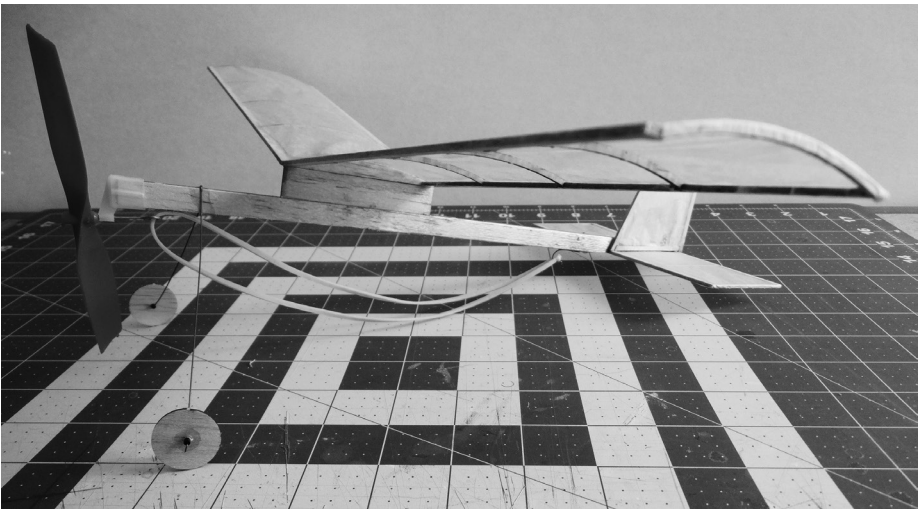
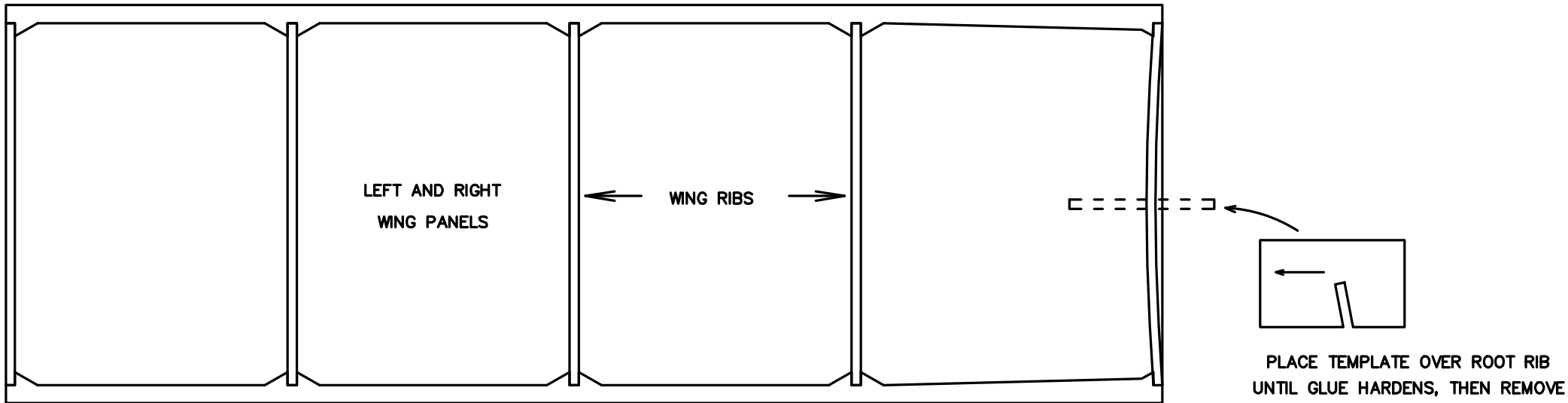


I purchased the beads from Michals, and her is the pacage they came in.

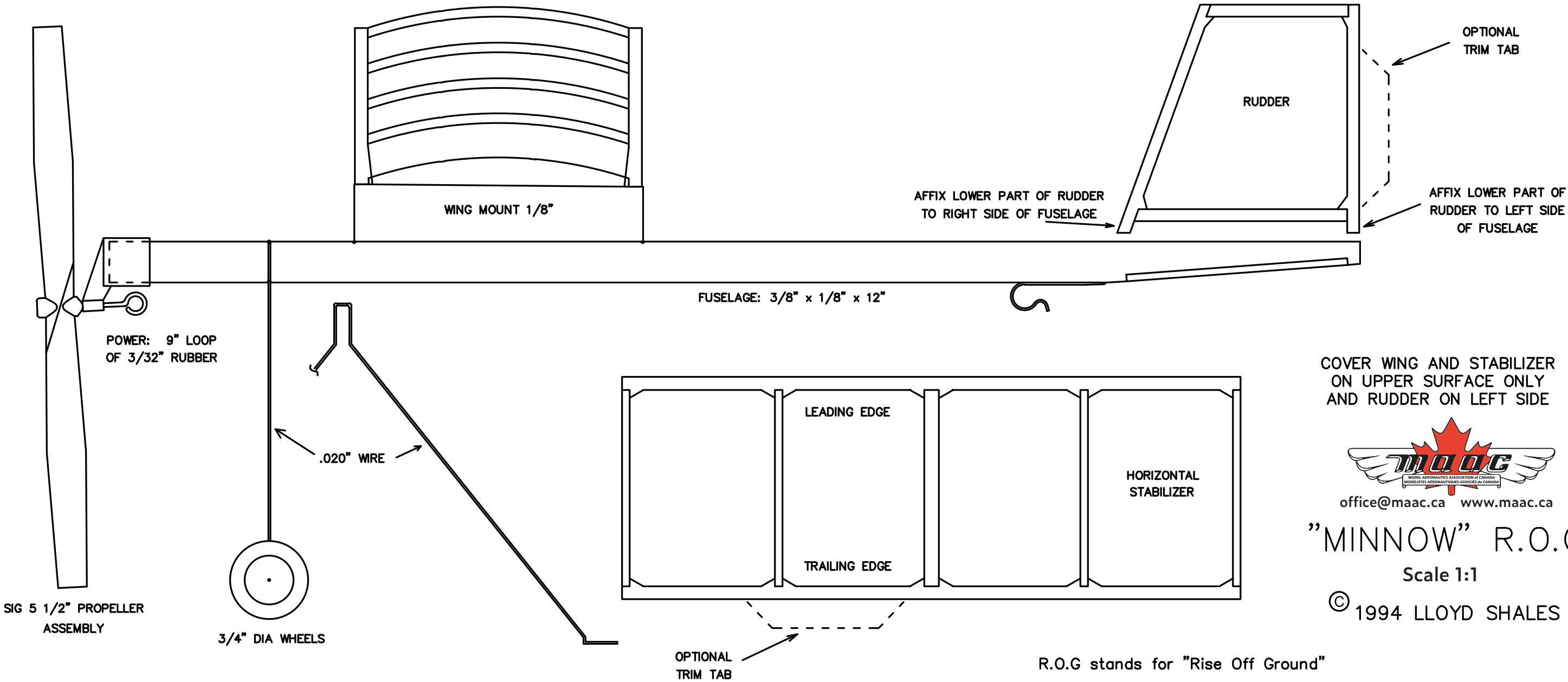


Finish the assembly by bending the wire up or down, and snip off the excess wire.

Enjoy and
Balsa dust to you all,
Cato Hansen,
Zone Director, Atlantic Zone B.



DIHEDRAL 1 1/2"
AT EACH TIP



COVER WING AND STABILIZER
ON UPPER SURFACE ONLY
AND RUDDER ON LEFT SIDE



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"MINNOW" R.O.G.

Scale 1:1

© 1994 LLOYD SHALES

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"SPARROW"



Catapult or hand launched glider designed by Lloyd Shales 1996.

Instruction and pictures by Cato Hansen, Zone Director Atlantic Zone B.

The Sparrow was first introduced and designed in 1996 by Lloyd Shales and later engineered by Rolly Simonsen into a laser cut version and has been used as an educational construction subject teaching science classes in their Aeronautic education, Scouts, Air Cadet Squadrons, Boys and Girls Clubs and a host of other groups in this country and beyond and was made available to all for a minimal of cost and no doubt by me, a lot out of Mr. Lloyds own pocket, for the sole purpose of introducing the youth into the building and understanding how airplanes works.

In 2019, Mr. Lloyd approached Model Aeronautics Association of Canada to see if we were interested in taking over the design of the Minnow and the Sparrow for the continuation of what Mr. Lloyds had started, and being available to all aviation minded individuals for their enjoyment and building of those models.

The Sparrow is a simple designed model that is easy to make and an excellent tool for teaching anyone how and what makes a plane fly. The model also comes with an addition of adding an attachment for Catapult hand launching, the hole is predrilled, the small finish nail and bungee cord is also included, if using, insert the nail and a drop of glue to strengthen the fuselage where the nail is inserted. It is advised to use caution in adding this launching technique as it can be a dangerous item in the wrong hands. The model also has an airfoil type wing with the tips ready to bend up and glue in place. It is advised to do a little sanding with the included fine sandpaper before the tips is glued in place.

No.1. This is what is included in the kit:

Main wing, Fuselage, Stabilizer, Rudder, Bungee cord, nail, and a small piece of Modelling clay.

No.2. Included is a picture of a JIG for you to make, if you so choose, this Jig will make sure that the fuselage is square with the wing, and it will be easier to glue and assemble, especially if you are teaching a class of students, as then all the models will be the same. The type of glue to use is entirely up to your discretion, but we recommend using medium type or thin CA glue for the assembly, but the so-called "Hot Glue" will also do. If using CA glue, do not forget to cover your JIG with a layer of poly-type plastic.

No.3. The assembly of the Sparrow starts with the stabilizer, draw the center line and measure 1.5 mm offset of the centerline, and make two small dots to line up the fuselage.

No.4. Glue the stabilizer to the fuselage on the two marks you made on the stabilizer, make sure the Stabilizer is 19 mm from the end as that is where you will hold the model if you use the bungee cord to launch your model.

No.5. Next glue the rudder to the left side of the fuselage and make sure it is square.

No.6. If you made the JIG, place the main wing in the jig and glue the wing tips, Do not forget to put some type of plastic sheet between the jig and the wing and leave in place for the fuselage.

No.7. Put the fuselage in the slot of the jig with the trailing edge of the fuselage location even with the back edge of the jig.

No. 8. Put the finished main wing on top of the fuselage and even with the back edge of the jig, put a dot of glue at the front and the back, and when dry, turn over and finish gluing the wing to the fuselage.

No.9. Put a small piece of modelling clay in the hole at the front of the fuselage to make the model balance at CG mark, as a starting point, *(this model balanced a little behind the center of gravity the mark after the glide test).*

Do a test glide holding the model level at the leading edge of the wing, and give it a small toss straight forward, if the model has a nice glide, you are good to go, if it pitches up, add some modelling clay, if it dives, take some modelling clay off.

No.10. If you choose to use the bungee cord version, insert the launching peg, and a drop of glue to strengthen the area.

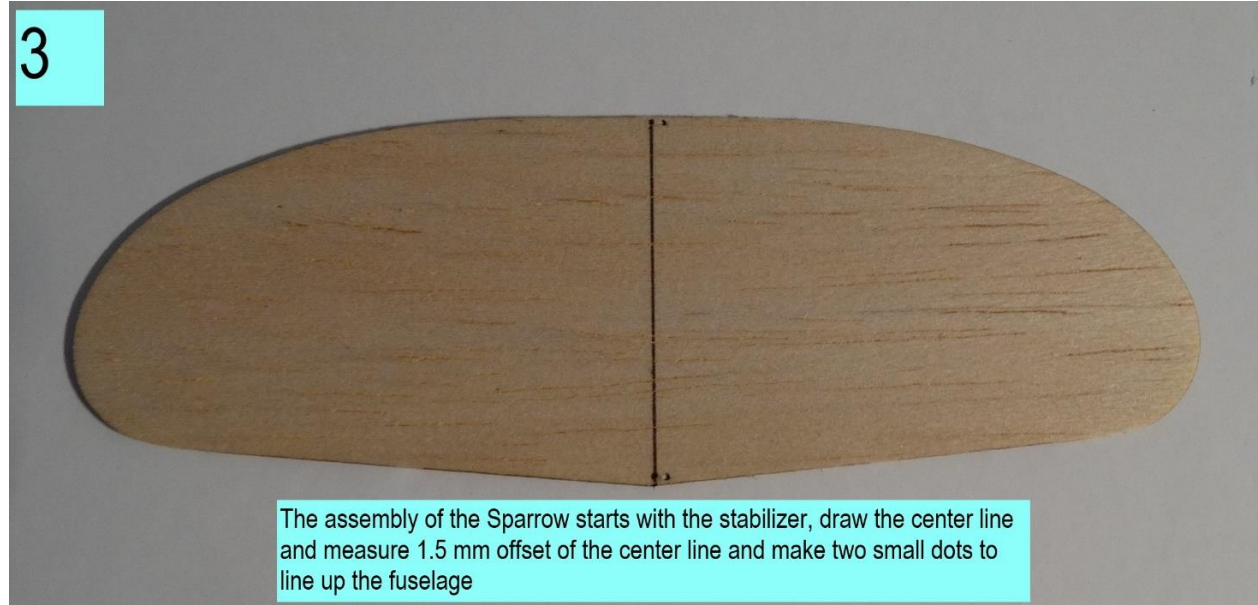
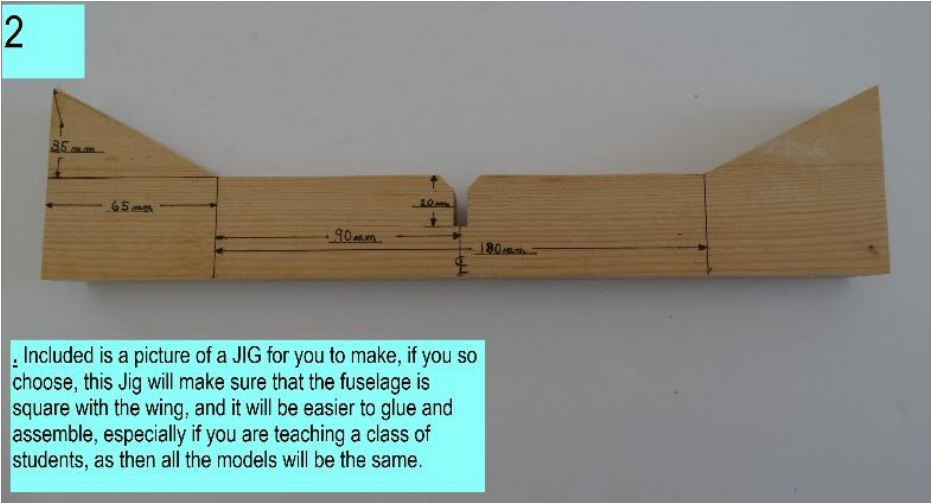
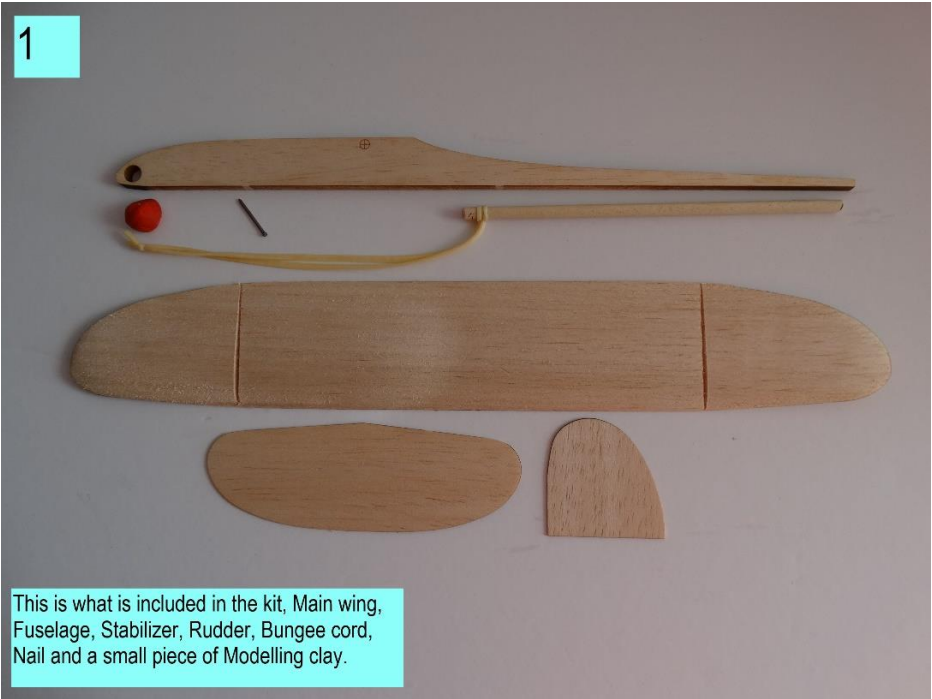
Hold the model at the end of the fuselage behind the stabilizer, aim it at an angle of about 45 degree up and tip it a 45-degree angle to your right or left and do a small launch, follow the trim sequence as above. When the trim is good, the model will settle into a glide pattern to the right or left, if not, glue a small piece of cardboard or balsa to the rudder and bend it to what

ever turn you would like. You can also do that to the stabilizer if you like to make the model doing loops or other aerobatic tricks, due some experimenting and have fun.

No.11. Here are the finished model ready for balancing and trimming.

There you go, your model glider is ready, bring out the stopwatch, and time your flight for a nice friendly competition with the rest of your group, and watch out for the thermal god if you are flying the model outside, he has been known to grab the model and take it on a grand flight never to be seen again.

On behalf of MAAC, Good luck.



4

Glue the stabilizer to the fuselage on the two marks you made on the stabilizer, make sure the Stabilizer is 19 mm from the end as that is where you will hold the model if you use the bungee cord to launch your model.

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Next glue the rudder to the left side of the fuselage and make sure it is square.

6

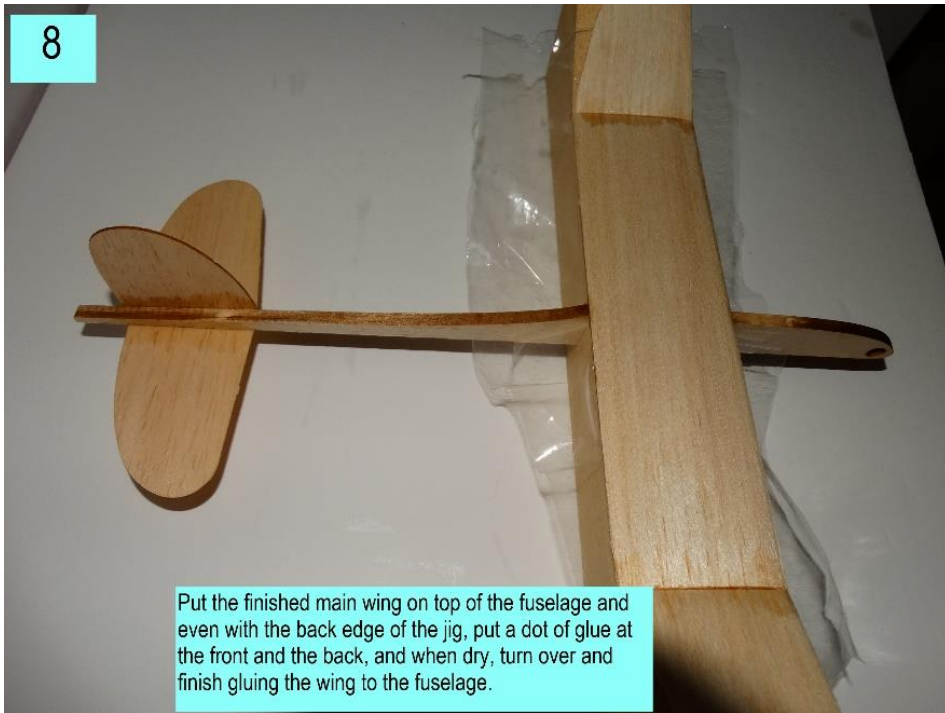
If you made the JIG, place the main wing in the jig and glue the wing tips. Do not forget to put some type of plastic sheet between the jig and the wing and leave in place for the fuselage.

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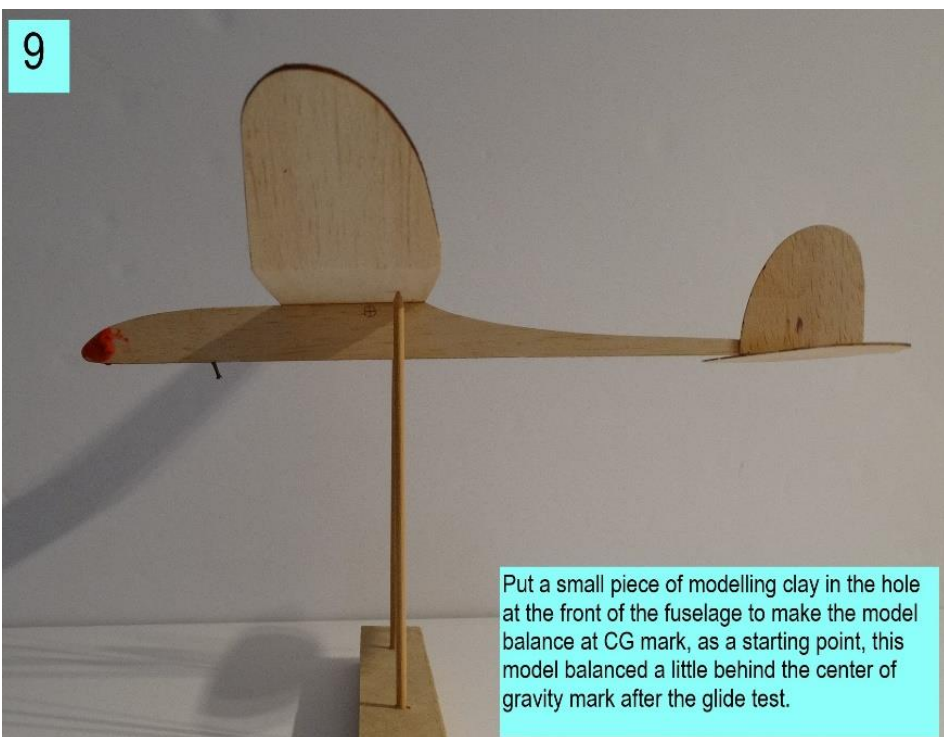
Put the fuselage in the slot of the jig with the trailing edge of the fuselage location even with the back edge of the j.

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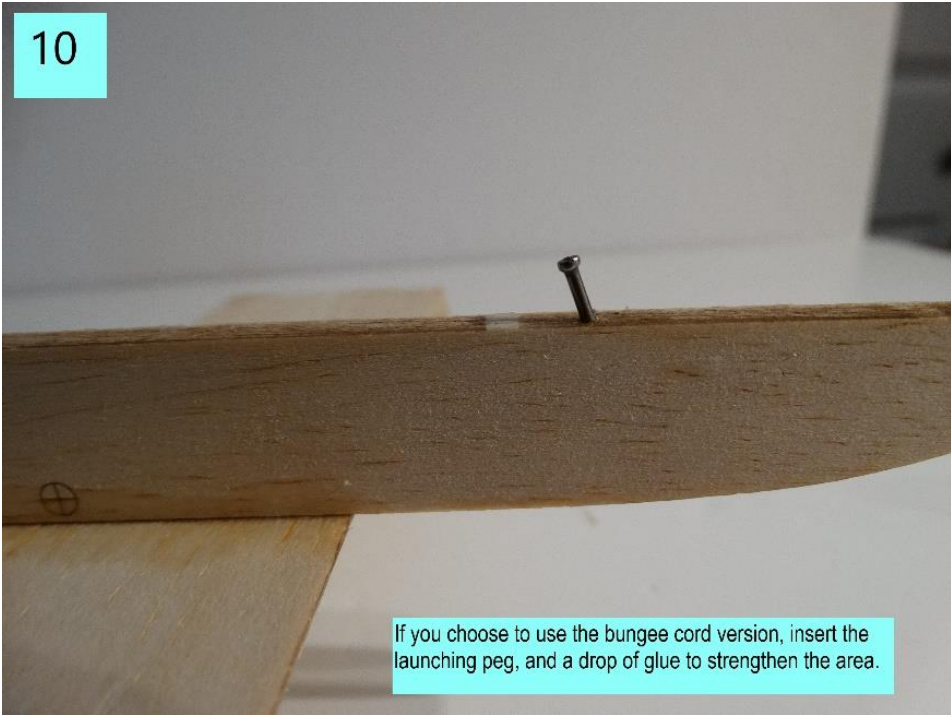
Put the finished main wing on top of the fuselage and even with the back edge of the jig, put a dot of glue at the front and the back, and when dry, turn over and finish gluing the wing to the fuselage.

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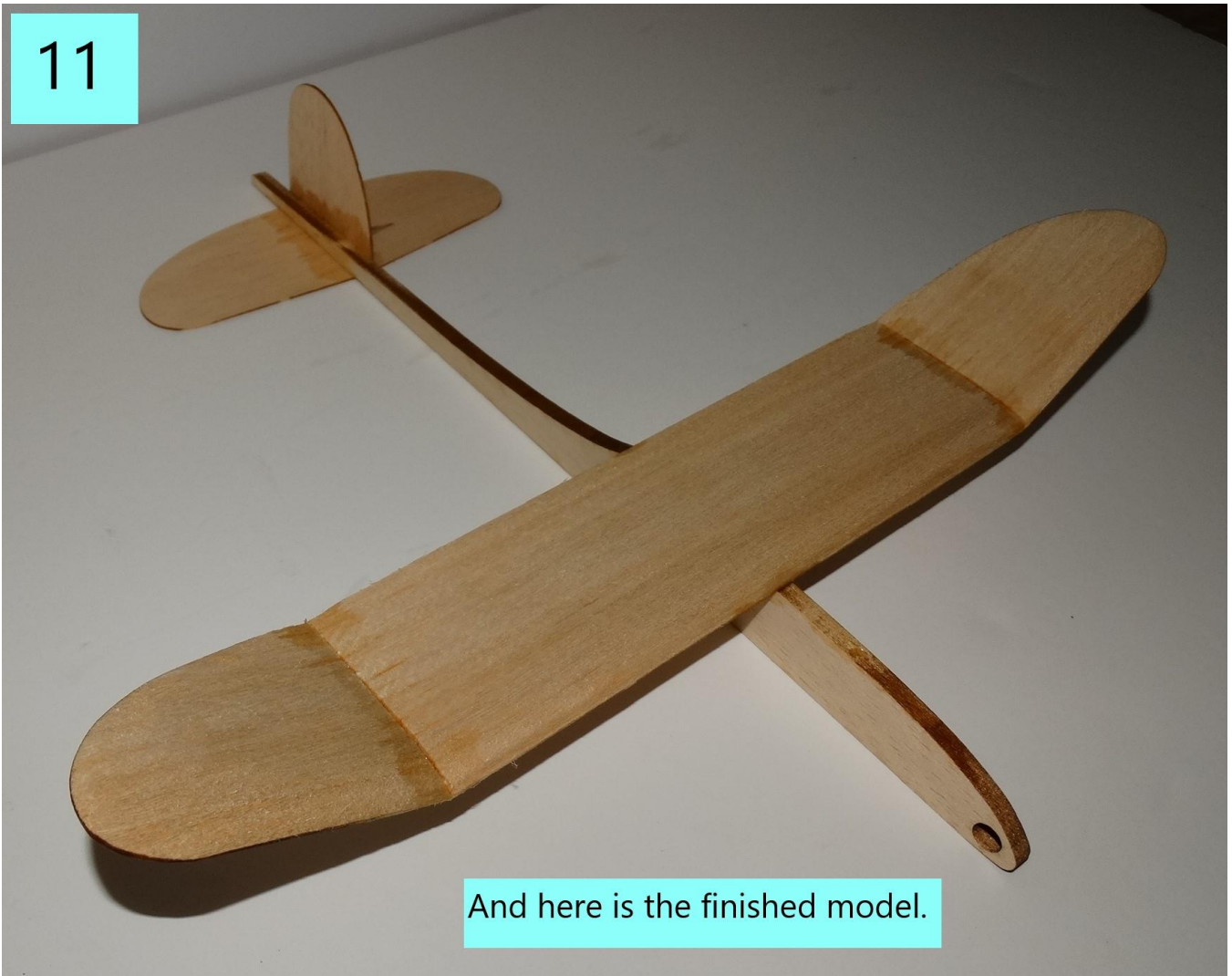
Put a small piece of modelling clay in the hole at the front of the fuselage to make the model balance at CG mark, as a starting point, this model balanced a little behind the center of gravity mark after the glide test.

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If you choose to use the bungee cord version, insert the launching peg, and a drop of glue to strengthen the area.

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And here is the finished model.

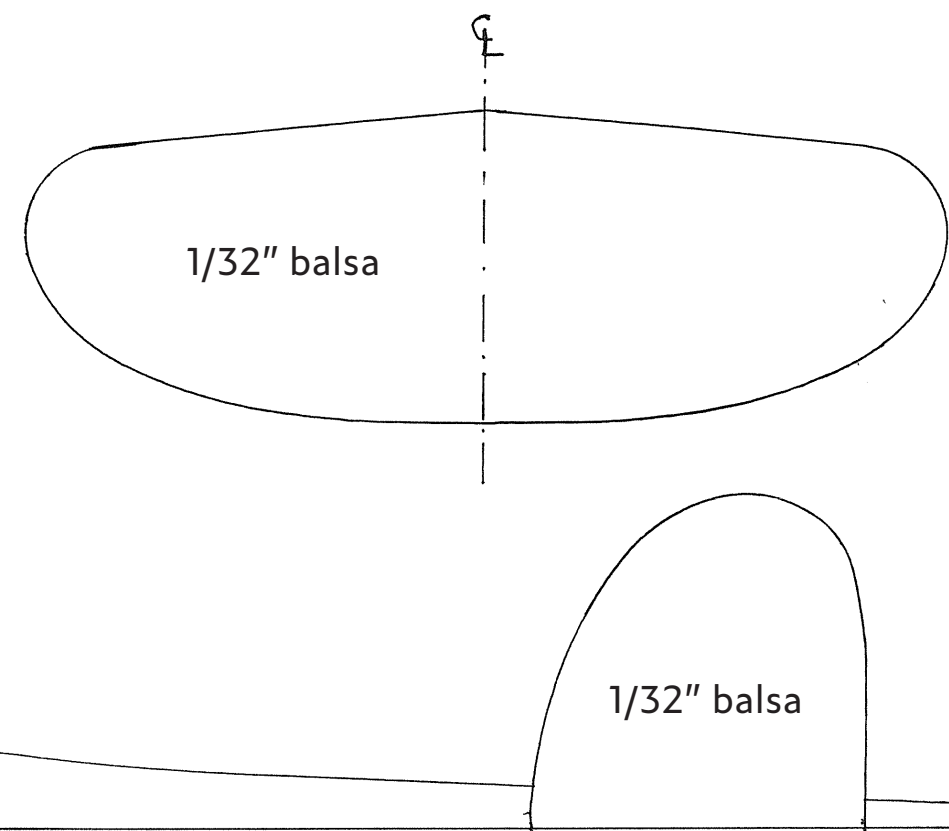
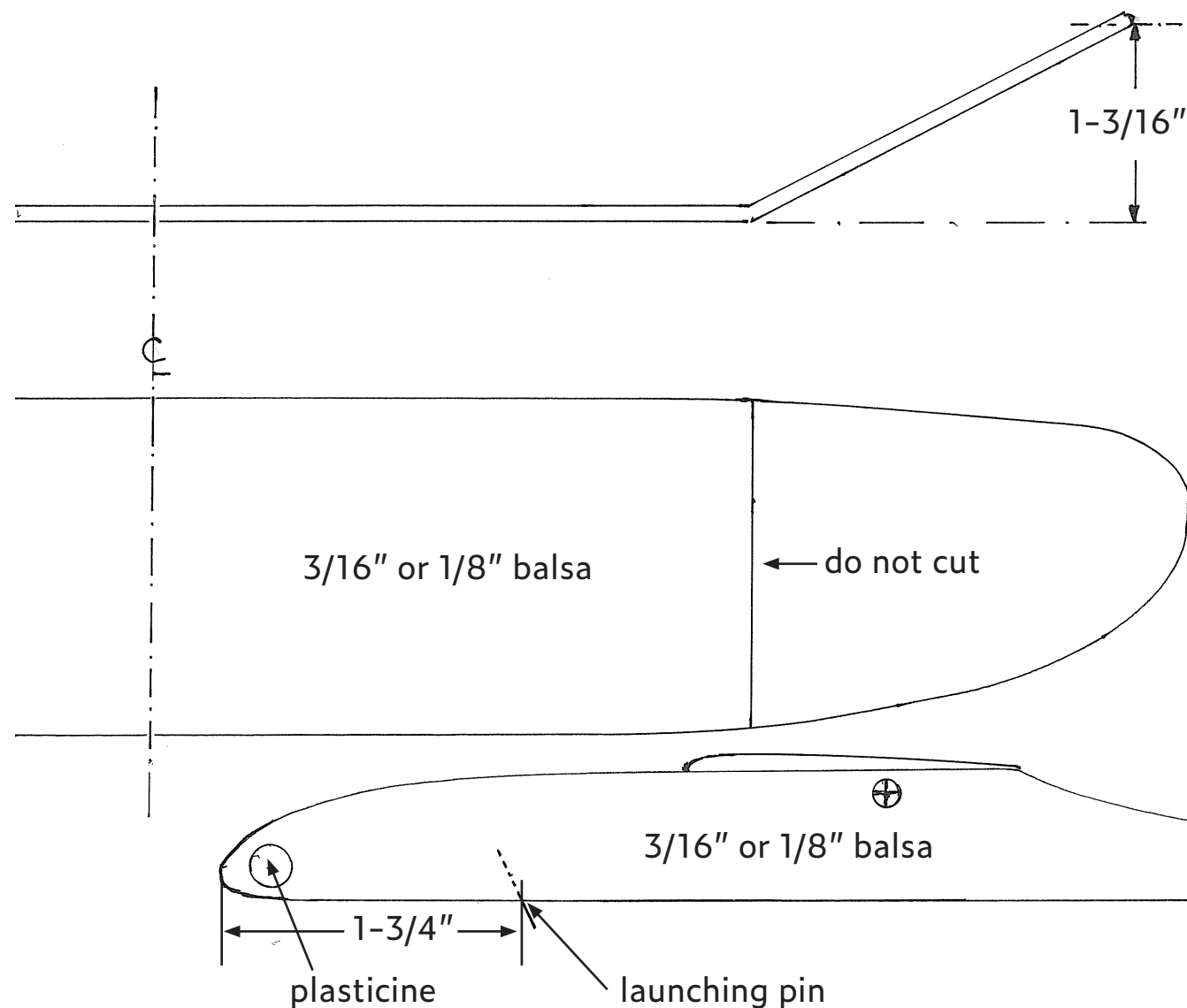
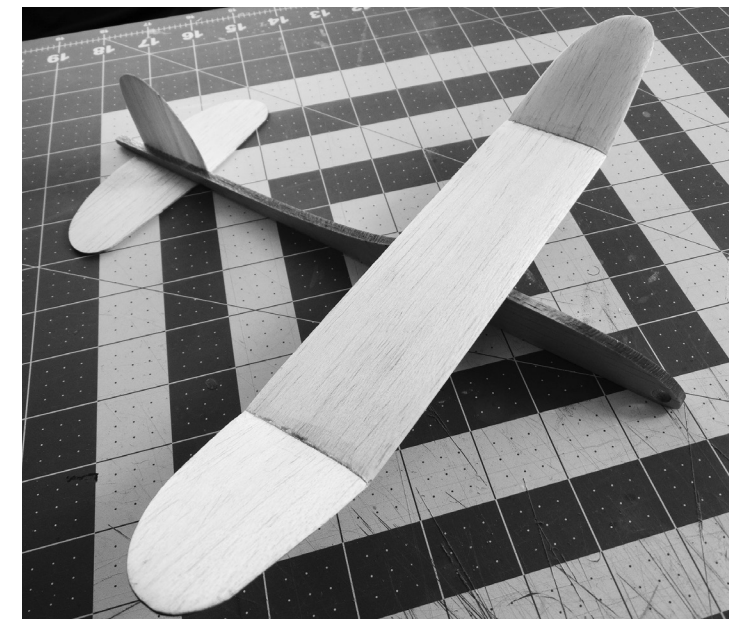


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ASSOCIATION OF CANADA

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SPARROW

Catapult or hand
launched glider designed
by Lloyd Shales 1996.



Scale 1:1

"THROW UP MODIFIED" By SAINT JOHN MODEL FLYING CLUB 2007.

ORIGINALD APPEARED IN "MODEL BUILDER MAGAZINE" MAY 1979.

REDESIGNED BY C. HANSEN.

FUSELAGE: $1/8 \times 1/2$ BALSA

WING-STAB-FIN: $1/32$ BALSA.

BALANCE WITH MODELING CLAY TO CENTER OF GRAVITY $7/8$ " +- FROM L/E.

LET FIN AND STAB OVERHANG $3/8$ "

GLUE: HOT GLUE.

IF USING CA, PLEASE

READ WARNING ON

LABEL.

