

NOMAD NOMADE



FLYING SPACE MODEL KIT TROUSSE MODELE SPATIAL VOLANT

ENGINES NOT INCLUDED - MOTEURS NON INCLUS

SKILL LEVEL - NIVEAU DE COMPETENCE

BEGINNER	NOVICE	INTERMEDIATE	ADVANCED	EXPERT
			X	

RECOMMENDED ENGINES
MOTEURS RECOMMANDES

A2-2 B4-2

SPECS

LENGTH 55 cm (21.7")
LONGUEUR ENVERGURE 30 cm (12")
DES AILES

MANUFACTURED IN CANADA BY / FABRIQUE AU CANADA PAR
IRWIN TOY LTD. / LTEE
43 HANNA AVENUE, TORONTO, CANADA M6K 1X6

#54010
54010013

nomad

BOOST GLIDER

READ THESE INSTRUCTIONS CAREFULLY
BEFORE YOU START BUILDING

Additional materials and tools
required for construction:

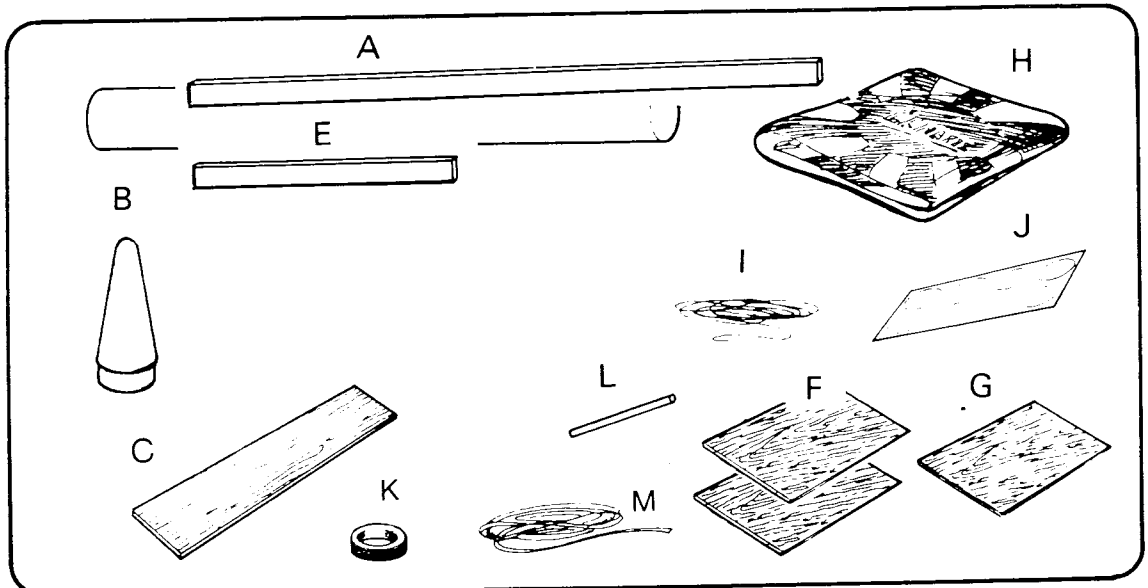
- modelling knife or
- single edge razor blade
- razor saw
- white glue
- assorted sandpaper
- butyrate dope
- cornstarch or talc
- paint
- masking tape
- scissors
- ruler
- engine casing

Additional items required to
fly the Nomad are:

- Heat Wadding
- Trans-A-Pad Launcher
- Countdown Controller
- Canaroc Engines
- Masking Tape

PARTS LIST

- | | |
|----------------------------------|---------------------|
| A) 1 - PT-100 Body Tube (21.1cm) | I) 1 - Shroud Line |
| B) 1 - PN-100A Nose Cone | J) 8 - Tape Disks |
| C) 1 - Plywood Sheet | K) 1 - Engine Block |
| D) 1 - Basswood Boom | L) 1 - Launch Line |
| E) 1 - Basswood Pylon | M) 1 - Shock Cord |
| F) 2 - Balsa Sheets (3.2mm) | N) 1 - Decal Sheet |
| G) 1 - Balsa Sheet (1.6mm) | (not shown) |
| H) 1 - Parachute (30cm) | |



BUILD THE WINGS

- A Cut out the wing pattern from the pattern sheet.
- B Trace the pattern onto both of the thicker sheets of balsa.
- C Using a modelling knife or a single edge razor blade, carefully cut out the wings from the balsa. **DO NOT ATTEMPT TO CUT THE Balsa IN A SINGLE STROKE.** Apply only light pressure on the first stroke, running the blade slowly along the line to be cut. On each consecutive stroke, apply more force. After three or four strokes, the wing will be cut cleanly and evenly. Applying too much force on a cut will often result in "tearing" the balsa, giving an unsightly appearance.
- D The cross-section of the wing must be shaped to the airfoil shown in Fig. 1. This shape increases the lift produced by the wing. As seen, the airfoil is flat on the bottom, rounded from the High Point to the Leading Edge, and flat from the High Point back to the trailing edge.

Shape the airfoil, first with medium grit, then fine grit sandpaper. Wrap the sandpaper around a piece of wood, to make a sanding block. This will make it easier to shape the airfoil.

When shaping the second half-span, remember that you must have a left and a right wing. Do not airfoil the same side of both half-spans, or the result will be two wings for the same side!

- E The two half-spans must be glued together so that they form a wide V, called a dihedral. Before glueing the root edge, one of the fins must be sanded at an angle so that a strong glue joint can be made. This is done by taking one of the half-span pieces, laying the root edge along the edge of a table, and propping up the tip edge 5 cm above the table surface. Sand the root edge of the half-span with a sanding block, running it in a flat, up and down motion (Fig. 2). Do this until the entire root edge is sanded even at this angle. When the half-spans are mated, the root edges must come together, forming a tight joint.

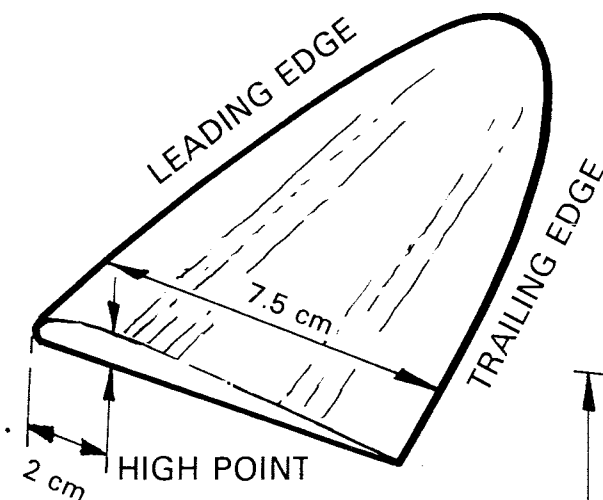


Fig. 1

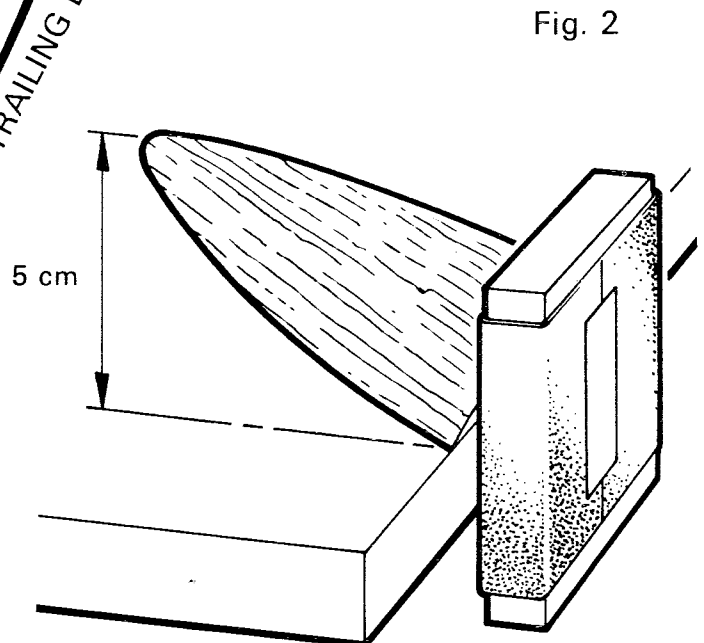


Fig. 2

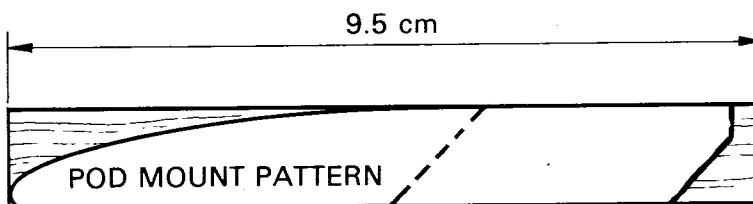
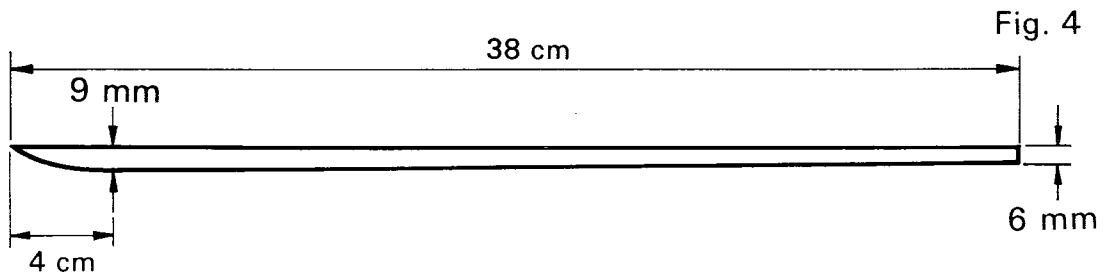
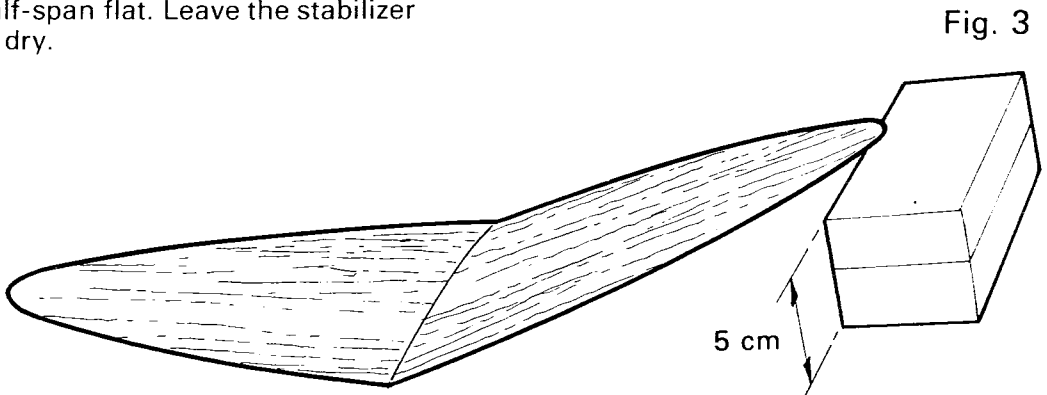
THE GLIDER ASSEMBLY

- F Spread glue on the root edge of one of the wings. Mate it to the other half-span, and set them onto a flat surface with one wing tip raised 5 cm. Leave it till the glue has dried (Fig. 3).

THE STABILIZER AND RUDDER

- A Cut out the stabilizer and rudder patterns from the pattern sheet.
- B Layout the patterns on the thin sheet of balsa stock, and trace out two stabilizer half-spans and one rudder. Be sure that the balsa grain direction is as marked.
- C Cut out the two stabilizer half-spans and the rudder.
- D Sand the leading and trailing edges of the stabilizer and rudder so that they are rounded.
- E Glue the stabilizer half-spans together. Prop up one stabilizer tip 2 cm while leaving the other half-span flat. Leave the stabilizer to dry.

- A Cut and shape the spruce boom material, using a modelling knife and sandpaper, to the shape shown in Fig. 4.
- B Cut out the Pod Mount Pattern, and trace the outline onto the basswood pylon piece (Fig. 5). Shape the piece, using a modelling knife and sandpaper. Next, cut the pattern in two along the dashed line, and lay one of the halves on the pylon piece. Trace the angled line onto the piece, and then cut it in half along the line, using a razor saw. While a razor saw is the best tool for this purpose, a sharp modelling knife can be used if extra care is taken in making the cut.



C The forward pod mount is glued directly to the top of the boom at the very front. Set the rear piece aside for the pod (Fig. 6).

D Glue the stabilizer to the boom at the very rear on top. To give a clean transition from boost to glide, the stabilizer must be set at a slight angle, relative to the wing. This is called "incidence" and is done by inserting a 1 mm thick sliver (or shim) of balsa or spruce under the TRAILING EDGE of the stabilizer (Fig. 7). This will lift the trailing edge very slightly above the boom and result in the desired incidence. Let the stabilizer dry.

E Glue the rudder to the bottom of the boom, at the very rear.

Fig. 6

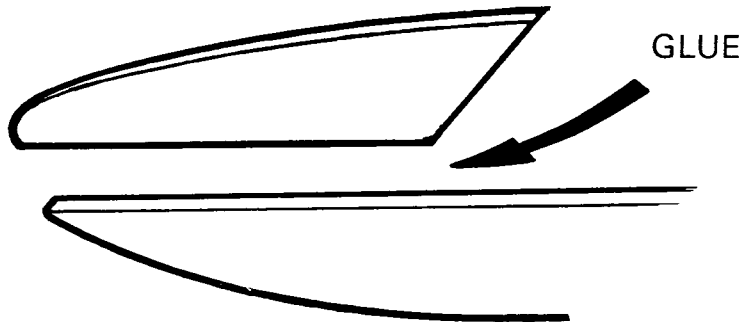
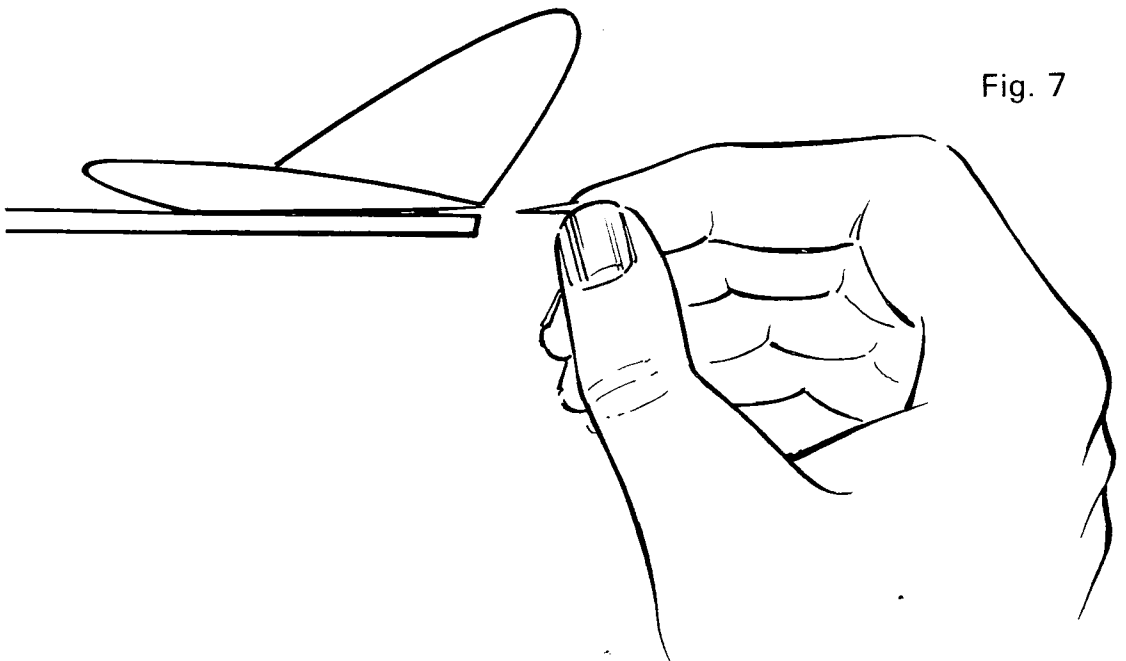


Fig. 7



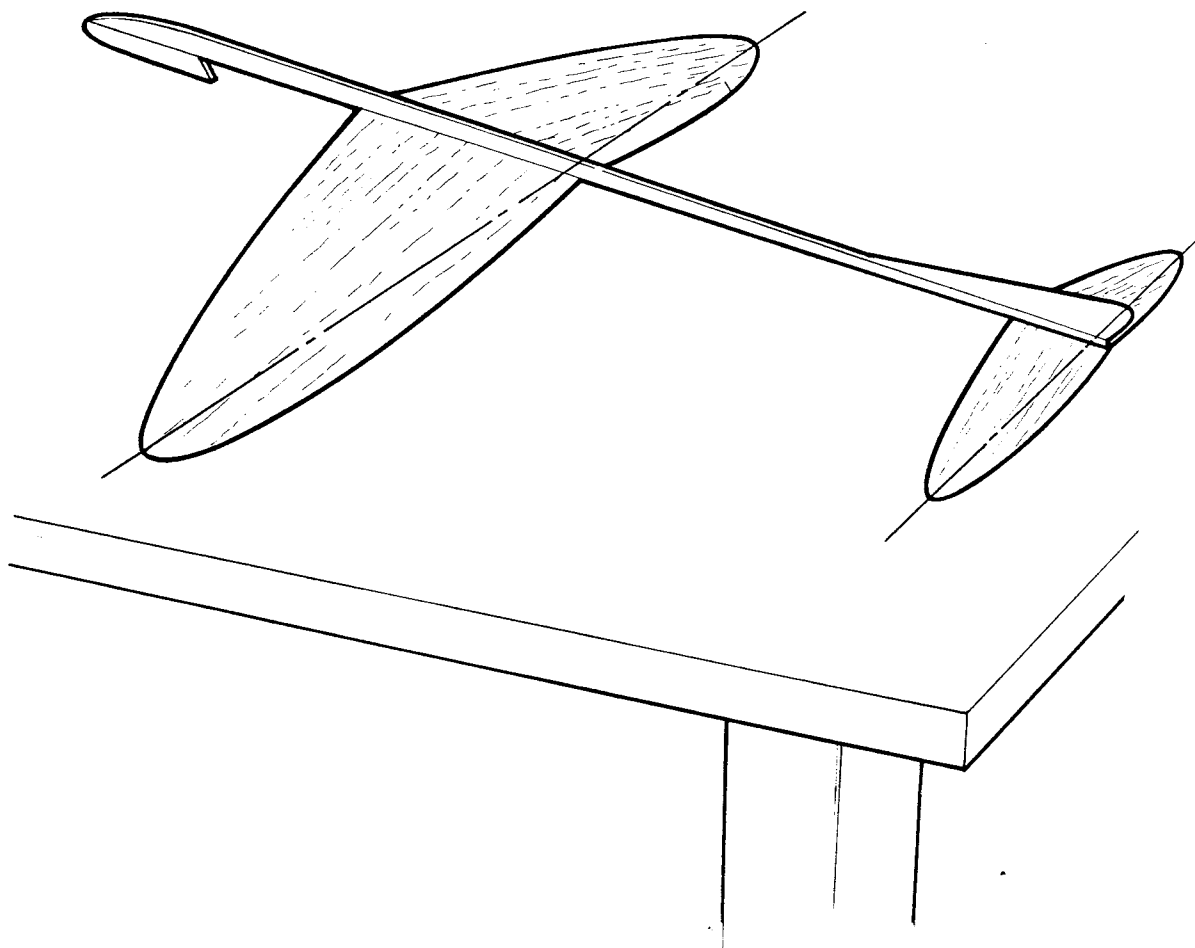
F The wing is glued into position 15.5 cm ahead of the leading edge of the stabilizer. In order to have a strong glue joint to the boom, the bottom of the joint between wing half-spans should be lightly sanded to make it flat. Spread a line of glue along the joint and place the wing in position. It is very important that the wing is sitting at the same angle as the stabilizer. If one is "leaning" with reference to the other, it may induce excessive undesired turn in the glide. While the glue is setting, the glider can be set upside down on a flat surface, resting on the wing tips and the stabilizer tips (Fig. 8). This will keep the wing and stabilizer properly lined up.

G All glue joints should receive a "fillet" of glue to ensure that they are strong enough to hold together under boost. Run a line of glue along each joint, then smooth it out with the tip of a finger.

BUILD THE POD

- A Place the body tube for the pod along a door ledge, window or drawer sill, to act as a straight edge. Draw a straight line about 4 cm long from one end of the tube. Glue the rear pod mount spruce piece along this line. Be sure the spruce piece is oriented to mate properly with the piece on the glider.
- B Cut out the pod mount siding pattern from the pattern sheet, and trace out the pattern twice on the plywood siding material.

Fig. 8



- C Glue the sidings to the pod along side the basswood piece, as shown in Fig. 9. Before the glue sets completely, test fit the pod onto the glider. The sidings must fit over the boom closely, so as not to wobble, but must not be too tight or the pod will not be able to easily separate.
- D Glue about 2 cm of one end of the shock cord to the top rear of the pod, so that the cord trails off behind the pod. (Fig. 10).
- E Glue the launch lug along side the shock cord. Sight the lug to make sure it is straight by rotating the tube and watching to see that all of the lug disappears over the "horizon" of the tube simultaneously.
- F Spread glue around in a ring on the inside of the tube, about 6.5 cm from the rear. Insert the engine block, and slide it into position with an engine casing, until 3 mm of the casing is left sticking out of the tube. (This will leave the engine block positioned 6.7 cm from the rear). Pull out the casing immediately, before the glue sets.
- G Pierce a hole in the eyelet of the nose cone to attach shock cord. Attach free end of shock cord to eyelet and make a solid knot. Trim off and sand smooth any flash from the seam of the nose cone.

FINISHING

The glider should not be finished in the same manner as a normal model rocket; That is, filling the balsa then painting. The great increase in weight will result in a very high sink rate, and poor glide durations.

The glider should be given a single coat of clear dope, then lightly sanded after drying. This will strengthen and improve the finish of all of the balsa parts. As well, it will prevent the balsa wings and stabilizer from warping if they get wet.

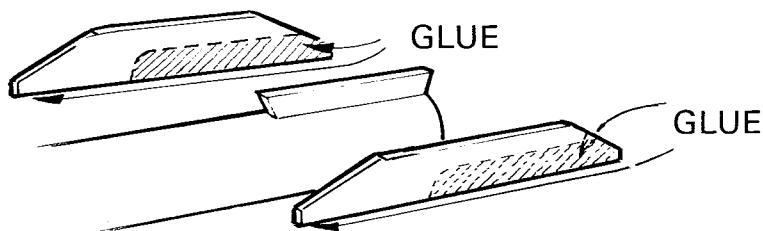
Color may be added to the glider to improve visibility while in the air, and after it lands. This may be done with felt markers to keep weight to a minimum. The glider may also be "dusted" with spray paint, where the application of paint is barely thick enough to pick up the color.

The pod may be finished as desired, or left as is, depending on individual preference. Either way has little effect on performance.

DECALS

Apply decals as indicated on back of decal sheet.

Fig. 9



PARACHUTE

- A Construct the parachute as indicated on the pattern.
- B Tie the knotted end of the parachute shroud lines to the eyelet in the base of the nose cone.

Fig. 10



TRIMMING THE GLIDER

The greatest single factor in achieving good performance from a boost glider is the "trim" of the glider. This refers to adjusting the balance to give the best glide characteristics.

Hold the glider below the wing, between thumb and forefinger (Fig. 11). Gently toss the glider from shoulder height and release it pointed slightly upward and to the side. The glider will most likely "stall" as is characteristic of the pop-pod configuration (Fig. 12).

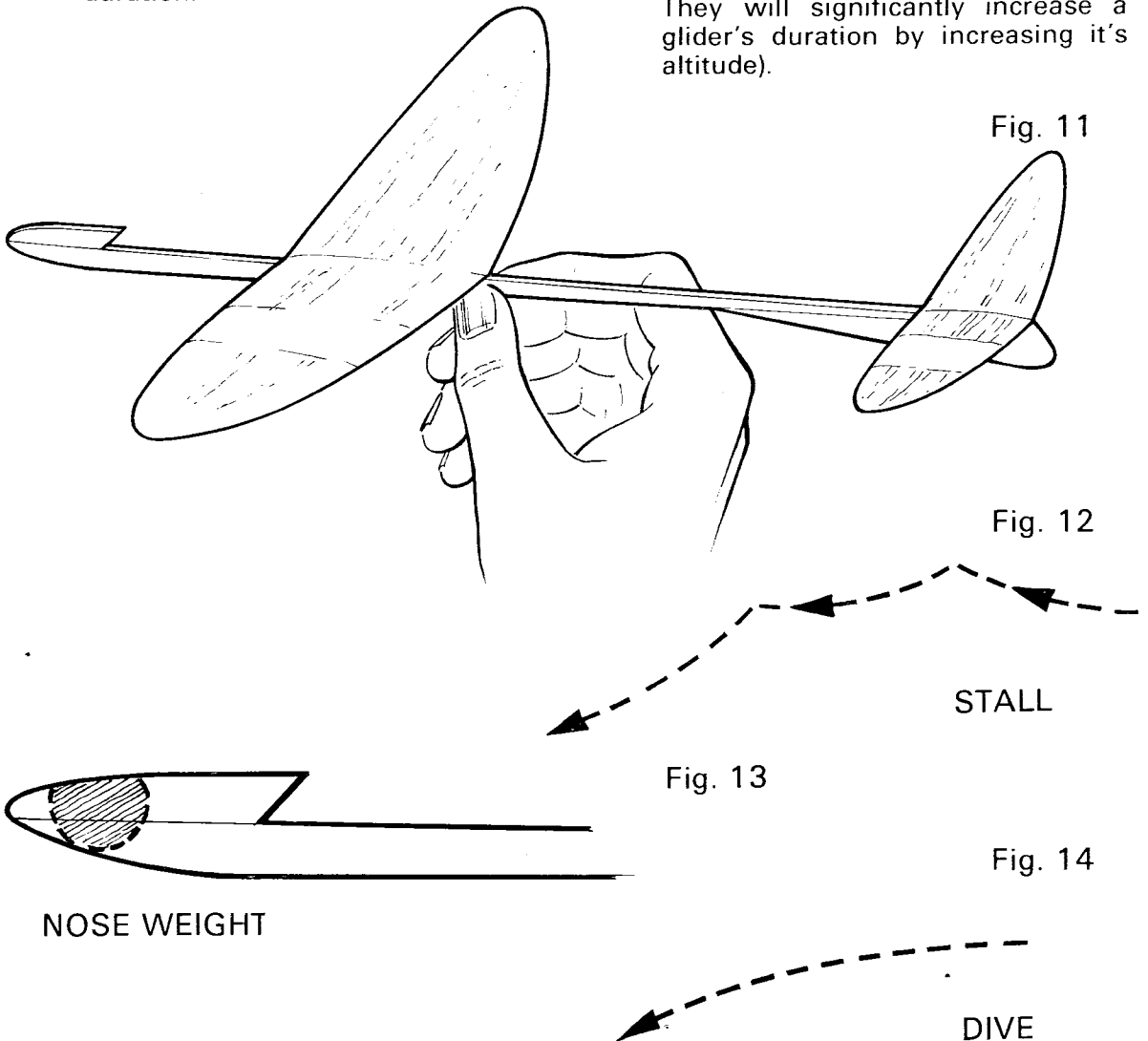
This means that the balance point is too far back. The problem is corrected by adding weight to the nose of the glider. Modelling clay or lead foil may be used for this purpose (Fig. 13).

Continue hand throwing, and adding nose weight, until the glide is barely below the point of stalling. This trim point will result in best flight duration.

The other problem which can occur is a "dive" (Fig. 14) where the balance point is too far forward. This is corrected by removing nose weight, or adding tail weight. If the condition is severe, it could be due to improper construction. The best solution is to remove the wing, and reglue it farther ahead of the stabilizer.

When hand throwing, do not throw the glider hard. This will cause a "speed stall", and not give a true indication of a glider's trim condition. A glider's natural speed is slow, and it must be hand thrown at that speed in order to act as it would in free flight.

While trimming, a small piece of clay may be added to a wing tip to induce a turn to the glide. This will help keep the glider near the launch area by flying in circles. Giving a glider a right turn will cause it to circle back into thermals, whereas a left turn will cause it to circle out of thermals. (A thermal is an updraft of hot air. They will significantly increase a glider's duration by increasing it's altitude).



FLYING THE NOMAD

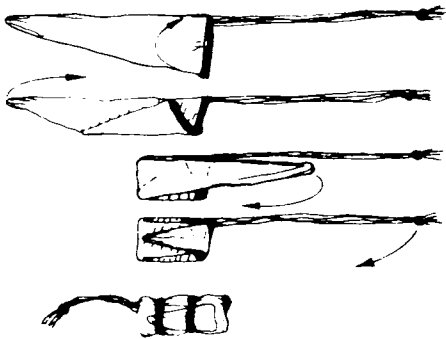
- A Prepare the power pod as you would prepare a normal rocket:

Install the engine, wrapping enough masking tape around the casing to ensure a tight friction fit. Install an igniter into the engine according to the manufacturer's instructions.

Push down a piece of Heat Wadding into the top of the tube. This wadding serves to protect the plastic parachute from melting by the hot gasses of the engine's ejection charge. There should be about 2 to 3 cm thickness of wadding to create a good piston between the parachute and the engine.

Fold the parachute in the following manner:

- hold the tip of the parachute with one hand and the shroud lines with the other.
- gather together all of the free corners so that the parachute forms a triangle.
- fold over the corners.
- fold over the parachute into thirds.
- wrap shroud lines around the bundle.



Run the shock cord up along the body tube then into the tube. Push the nose cone into the tube.

This externally, rear mounted shock cord is a feature that increases the reliability of power pod separation, and prevents the parachute from getting tangled on the glider. (Fig. 15).

- B Test fit the power pod onto the glider. The fit should be tight enough that the pod does not wobble, but should be loose enough that the pod falls away

from the glider when the glider is held upright. If the pod stays attached in this position, sand down the area on the boom where the pod sidings sit. Repeat until the pod falls off freely.

- C Wrap a strip of tape around the launch rod, about midway down it's length (Fig. 16). Slide the power pod onto the rod and let it rest on the tape. Attach the micro-clips to the igniter in the engine, then wrap tape around the clips and the launch rod (Fig. 17). This will prevent the clips from falling away after ignition and catching the tail section of the glider. Be sure the clips do not make contact and "short" the ignition circuit.

- D Hang the glider on the pod. Insert the safety key into your launch controller, give a 5 second countdown and press the button to launch your model.

For further tips see Canaroc's GUIDE TO SPACEMODELLING.

Fig. 15

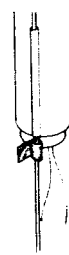


Fig. 16

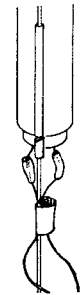


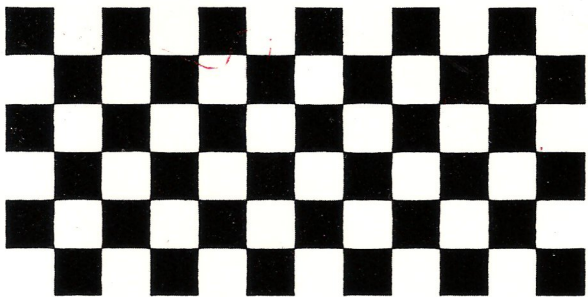
Fig. 17

CANAROC



MANUFACTURED BY

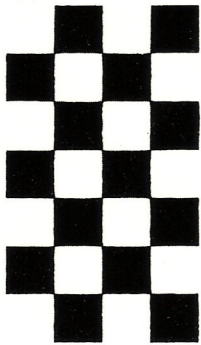
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43 Hanna Avenue
Toronto, Canada
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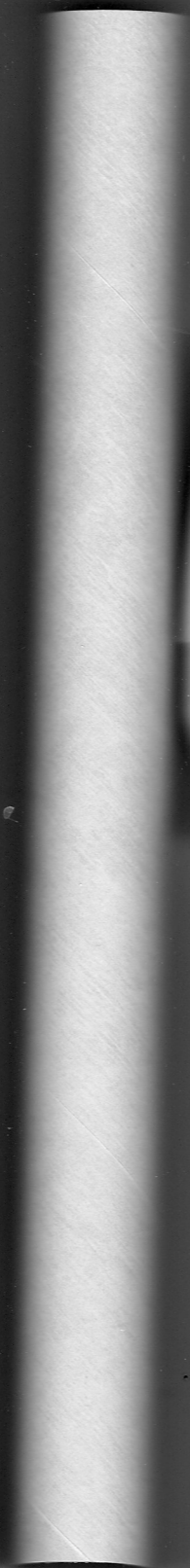
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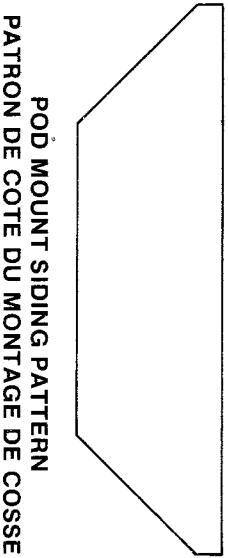
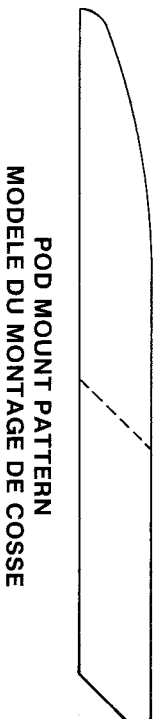
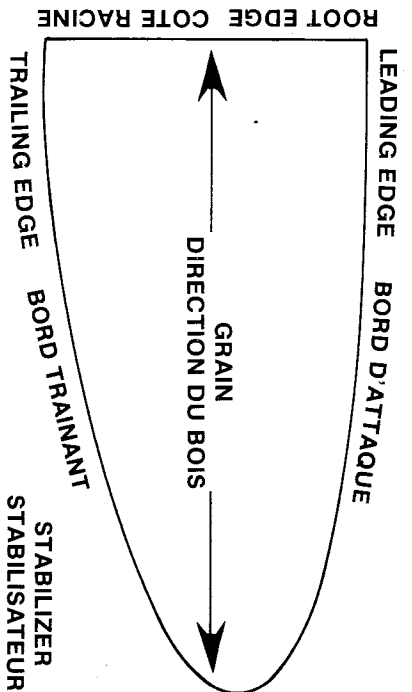
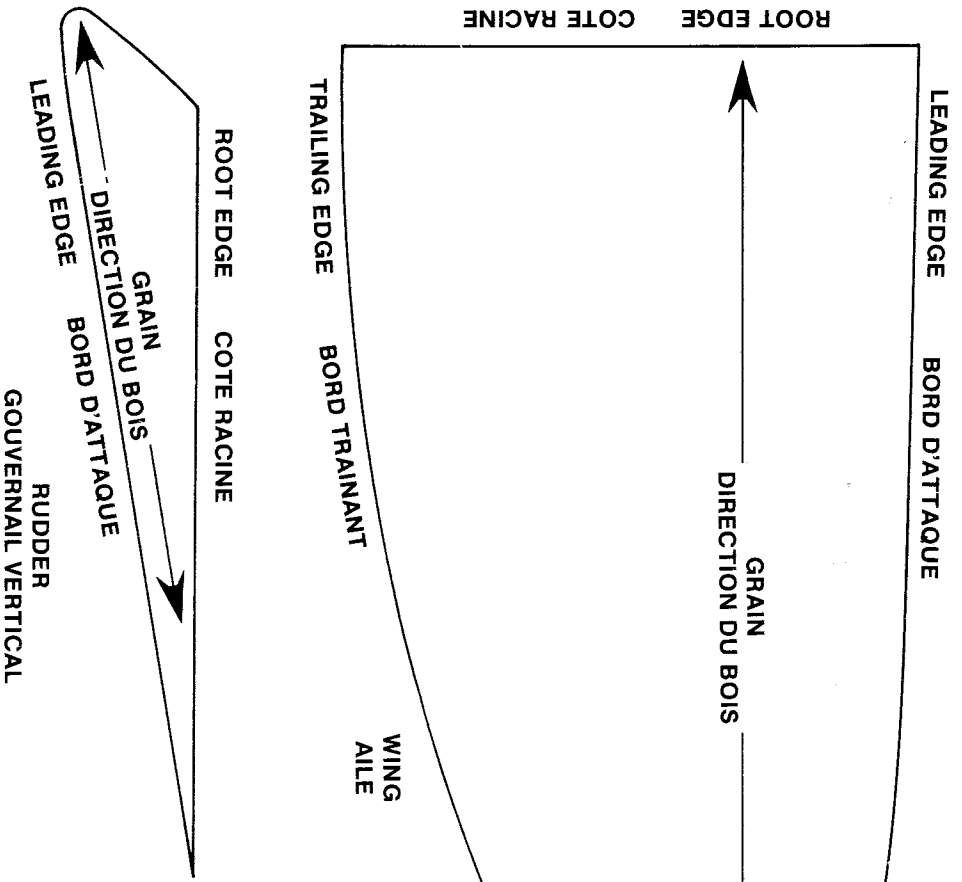


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NOMAD #54010
 PATTERN SHEET
 NOMADE #54010
 FEUILLE DE MODELE

Canaroc Nomad Parts Description

A. 1 – PT-100 Body Tube	8 11/32" (use BT-20)
C. 1 – Plywood Sheet	3/4" X 7" X 1/32"
D. 1 – Basswood Boom	3/8" X 15" X 1/8"
E. 1 – Basswood Pylon	3/8" X 4" X 1/8"
F. 2 – Balsa Sheets	3 1/4" X 6" X 3/32"
G. 1 – Balsa Sheet	3 1/4" X 9" X 1/16"
H. 1 – Parachute	12"
M. 1 – Shock Cord	1/8" X 21" elastic cloth

The provided balsa for the wings, item F, are just barely large enough for the wings. The construction technique is to cut each half of the wings from separate sheets. Ideally, you should use a single sheet of balsa, a minimum of 3" X 12" and trace the wings onto it, root edge to root edge. Then cut the wing from the sheet. Then you can sand and shape the entire wing so both sides are almost identical. Once the sanding is complete, cut the wing in half at the root edge joint and continue the build per the instructions. This method also eliminates the possibility of cutting out two wings for the same side of the glider.

A 12" parachute is over kill for the glider pod. A streamer should be sufficient. If you are set on using a parachute, use one smaller or install a spill hole.

The shock cord is to be installed on the outside of the body tube. A length of Kevlar would be more appropriate for this application. I'd recommend a 9 to 10 inch length to be outside the body tube and the remainder to be the elastic cloth, attached to the end that would be inside the body tube.

No clay is included in the kit for trimming the glider. Be sure to have some on hand.