





CAREFULLY READ ALL STEPS BEFORE ASSEMBLING

# SUNWARD LIBERATOR Flying Model Rocket

Parts List Rev 5 BNC

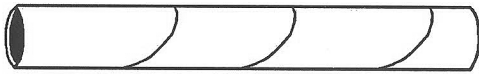
Recommended for Ages 16 and up.  
Adult supervision required for ages 14-15 with  
Intermediate skill level recommended  
Plastic bags should always be kept away from babies and  
children to avoid suffocation.

www.sunward1.com  
info@sunward1.com

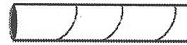
Use only single stage engines in this model  
Recommended engines: B6-2 (First Flight), B6-4, C6-3, C6-5  
Do not use Hot Melt Glue in building this kit.

Launch Pad, Ignition System, Engines, Igniters  
and Recovery wadding not included

1 MAIN BODY TUBE 18" (45cm) LONG



1 ENGINE TUBE



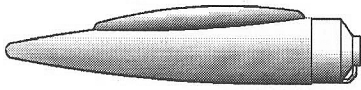
2 ENGINE CENTERING RINGS



2 LARGE LAUNCH LUG



1 PLASTIC NOSE CONE  
Ogive Plastique



1 ENGINE THRUST RING

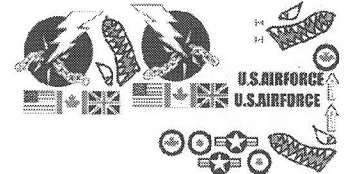


1 METAL ENGINE HOOK

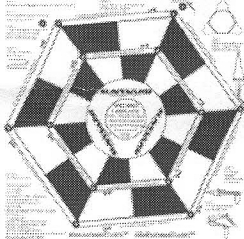
1 DECAL SHEET

CAREFULLY USE A HOBBY KNIFE TO CUT OFF EXCESS PLASTIC  
DO NOT CUT OFF EYELET RING

LAUNCH LUG



1 PARACHUTE SHEET  
Patron de parachute



6 PARACHUTE REINFORCEMENT RINGS

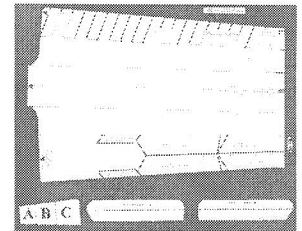


1 PARACHUTE ASSEMBLY STRING

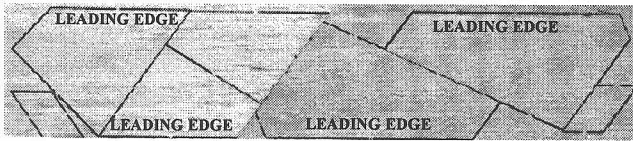


1 "JET ENGINE INTAKE" WRAP-AROUND  
AND FIN REINFORCEMENT SHEET

1 ELASTIC SHOCK CORD



LASER CUT Balsa WOOD FIN SHEET



NOTE: Balsa wings and fins must be removed only by cutting them out with a hobby knife. If you try to "punch" them out by hand, they may be seriously damaged

You will also need:

A ruler, 3/4" (2cm) thick book, white glue, scissors, hobby knife, cellophane tape, pencil, fine sandpaper, spray paint.

To install and ignite rocket engine, follow the instructions that are included with the engines or launch pad

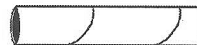
This model is built to work with igniters, engines, recovery wadding and launch pads built by the leading manufacturers

**"D" Motor Assembly Instructions** Use these set of instruction to use "D" engines instead of B/C engines

2 ENGINE CENTERING RINGS



1 ENGINE TUBE

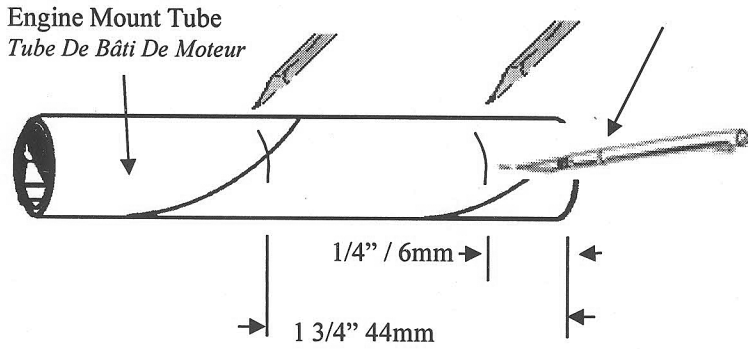


1 ENGINE THRUST RING

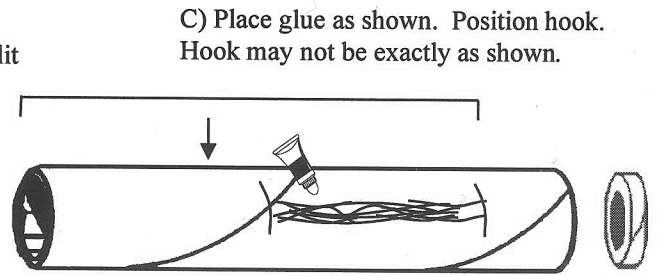


## Assembly Instructions

A) On the engine tube, mark two lines at 1/4" / 6mm and at 1 3/4" 44mm



B) Cut 1/4" 6mm slit

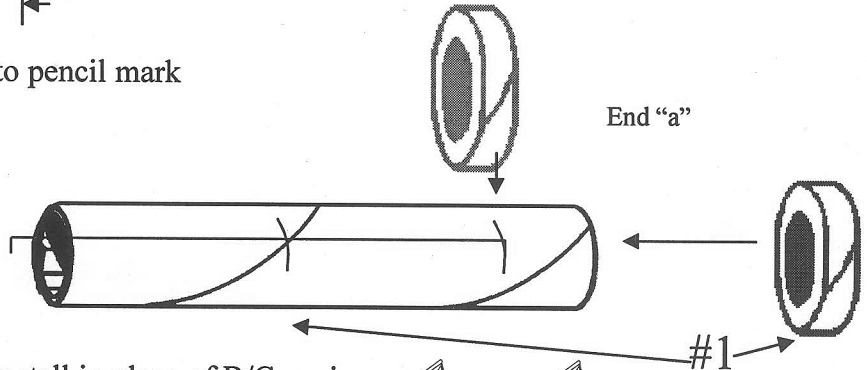


C) Place glue as shown. Position hook. Hook may not be exactly as shown.

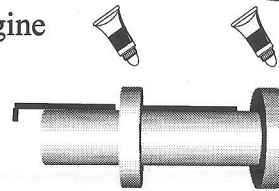
D) Glue smallest ring (thrust ring) inside engine tube, making it even with the end of the engine tube

E) Slide one engine centering ring (#1) to pencil mark shown from end "a"

F) Slide second engine centering ring flush with end of engine tube

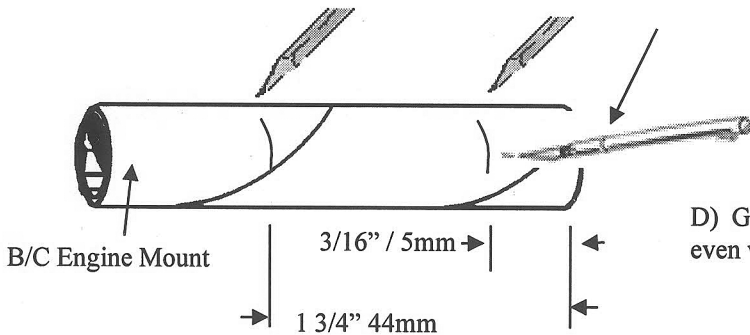


G) Complete tube should be as shown. Install in place of B/C engine mount where shown in instructions. Use D12-3 or D12-5 engines.



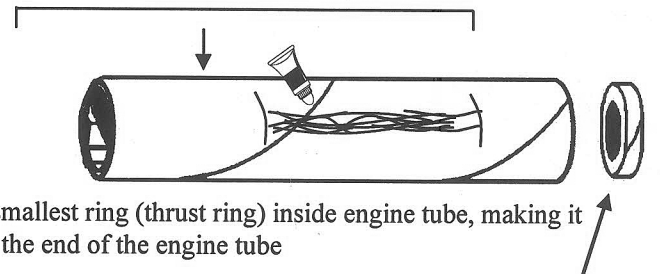
## B/C Motor Assembly Instructions

A) On the engine tube, mark two lines at 3/16" / 5mm and at 1 3/4" 44mm



B) Cut 3/16" 5mm slit

C) Place glue as shown. Position hook. Hook may not be exactly as shown.

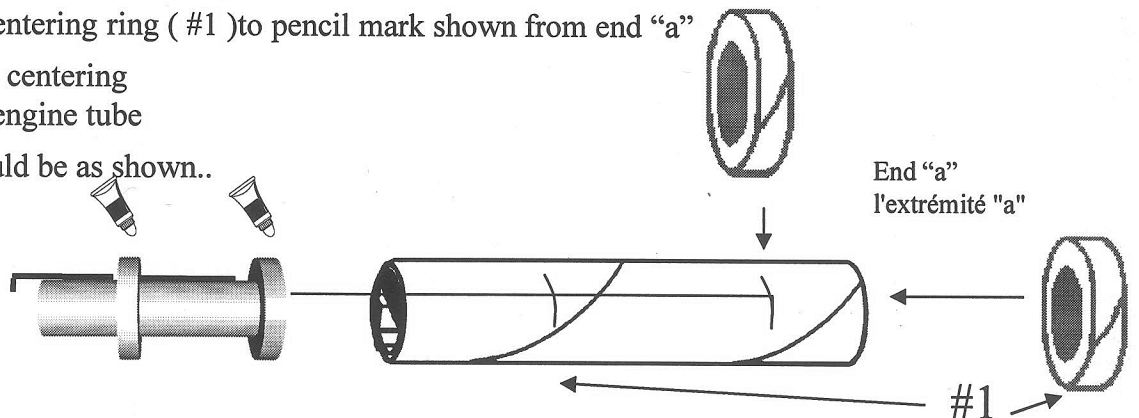


D) Glue smallest ring (thrust ring) inside engine tube, making it even with the end of the engine tube

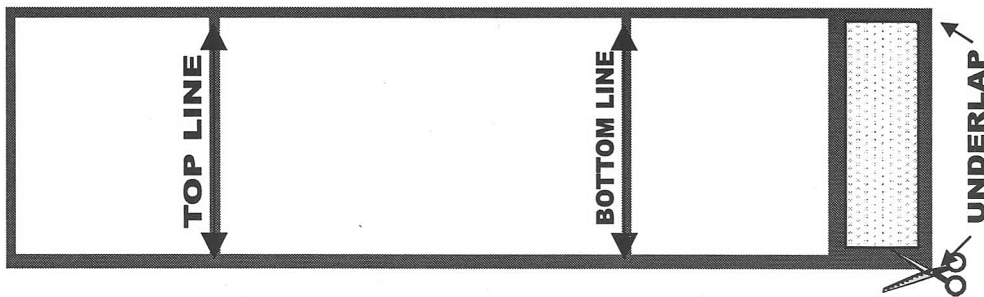
E) Slide one engine centering ring (#1) to pencil mark shown from end "a"

F) Slide second engine centering ring flush with end of engine tube

G) Complete tube should be as shown..



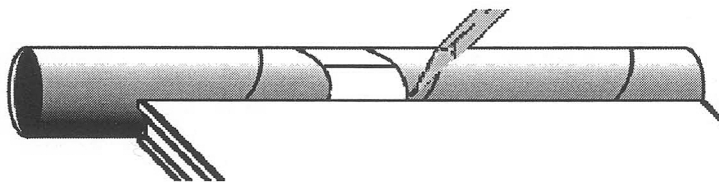
#2: CUT OUT THIS MARKING TEMPLATE ALONG THE OUTSIDE EDGE



#3: Wrap template around body (larger) tube. Fasten it together with tape so that the shaded area is covered. Tape template in place around the middle of the body tube. Mark body tube where arrows point, then remove template.

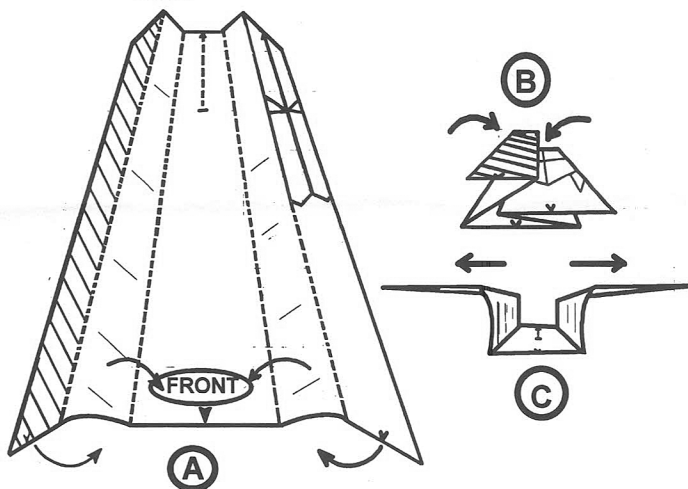


#4: Using a hard cover book as a straight edge, draw lines from one end of body tube to the other end. Be sure that they match up with the marks you just made on the body tube. Be careful to make them as straight as possible!

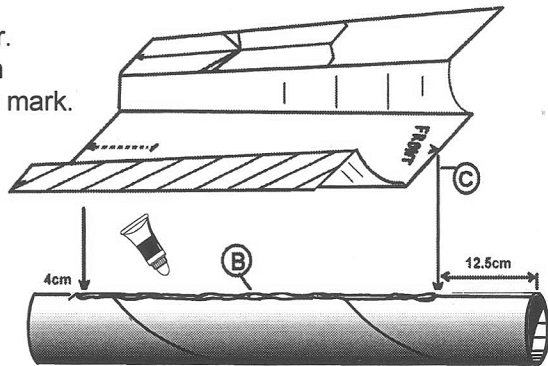
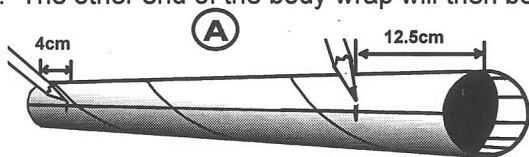


#5: Cut out body wrap from card

- A) Fold on dotted lines as shown using a ruler
- B) Carefully crease folds
- C) Open out to match diagram



#6: A) draw a mark on the "top line", 12.5cm (5"), from one end of the body tube. Then, draw another mark on the "top line", 4cm (1 5/8") from the other end of the body tube.  
 B) Run a thin bead of glue along the "top line" from one mark to the other.  
 C) Place body wrap on glue line so that the end with the "front" label is on the 12.5" mark. The other end of the body wrap will then be near the 4cm mark.



\*MAKE SURE THE ARROWS ON THE BODY WRAP LINE UP EXACTLY WITH THE "TOP LINE".\*

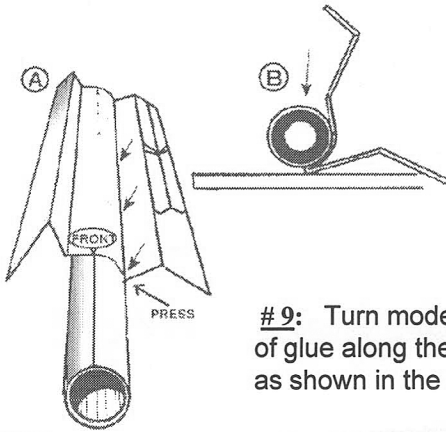
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SET ASSEMBLY ASIDE WHILE GLUE DRIES FOR ONE HOUR AT LEAST.

**# 7:** Turn model upside down.

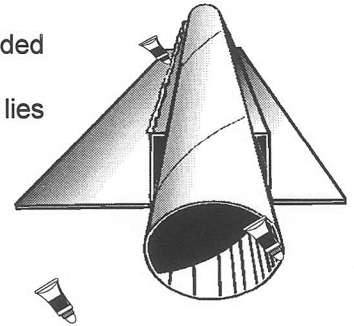
With "front" of the model turned toward you, run a thin to medium bead of glue along the folded edge on the left side of the body tube.

**# 8:** A) Turn model over and press glued edge firmly against body tube so that body wrap lies tightly against body tube and matches its shape.

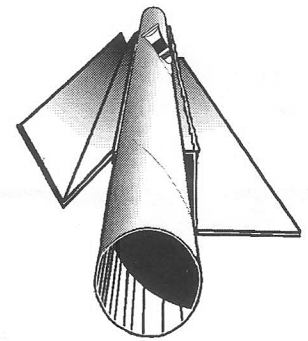


B) Press glued edge down against a flat, hard surface until it bonds to body tube.

C) Allow glue to dry for at least 30 minutes before proceeding to next step.



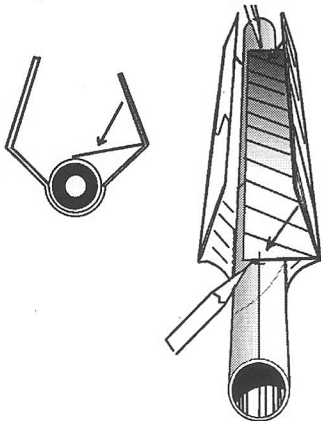
**# 9:** Turn model upside down again. Run a thin to medium bead of glue along the folded edge on the other side of the body tube as shown in the diagram.



**# 10:** A) As in step 8, press glued edge against body tube so that body wrap lies flat against body tube and matches its shape.

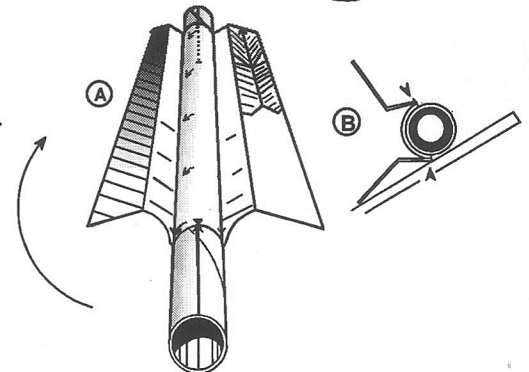
B) Press glued edge against a hard surface until glue bonds.

C) Allow model to dry for at least 30 minutes. Your model should match the diagram.

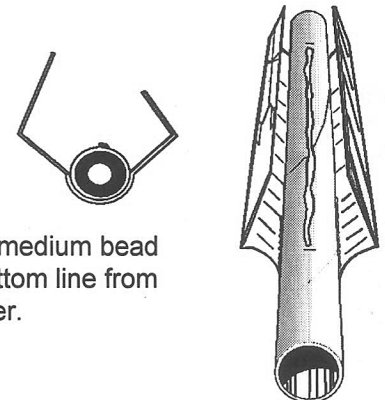


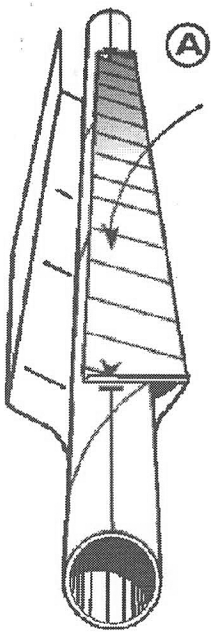
**# 11:**

Turn model upside down and position body wrap as shown. Lay one of the flaps against body tube as shown, and draw a mark on the bottom line at each end of the body wrap.



**# 12:** Run a thin to medium bead of glue along the bottom line from one mark to the other.

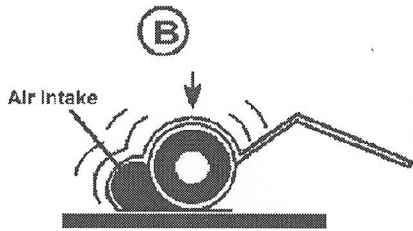




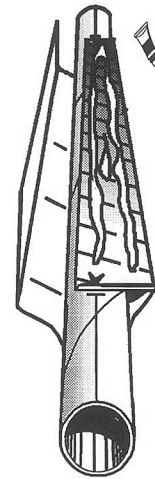
**# 13:** A) Lay the narrower flap (the one with the diagonal lines) on the glue line so that its arrows line up exactly with the bottom line.

B) Gently rock the model back and forth on the hard surface to make the "air intake" bulge outward and become rounded. This will also help to flatten the bottom of the model.

CAUTION - DO NOT ROCK THE MODEL SO FAR THAT THE AIR INTAKE" CRIMPS OR CREASES. KEEP THE CURVE AS NATURAL AS POSSIBLE. Allow glue to dry for 30 minutes.



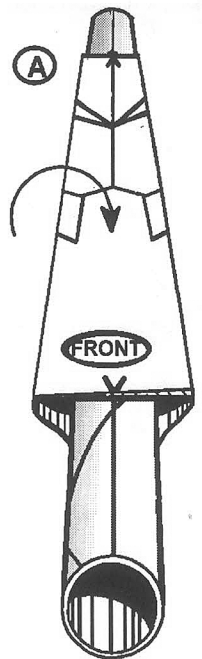
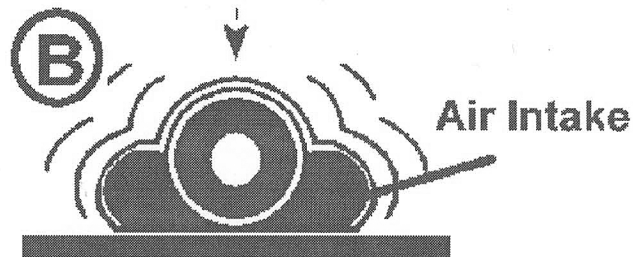
**# 14:** Spread a thin layer of glue on the flap with the diagonal lines (the one you just glued down).



**# 15:** A) Lay wider flap (the one with the word "front" printed on it) on the glued surface so that its arrows line up with the bottom line of the body tube.

B) Gently rock model back and forth as you did in step 13 to bulge and round out the other "air intake". Do not crimp or crease it while rocking.

MAKE SURE BOTTOM  
(THE FLAP WITH "FRONT" PRINTED ON IT) IS FLAT.  
HOLD IN POSITION UNTIL GLUE BONDS.



**# 16:**

A) Glue wings to model so that they fit into their outlines (printed on the body wrap.) Do this for both sides, as shown.

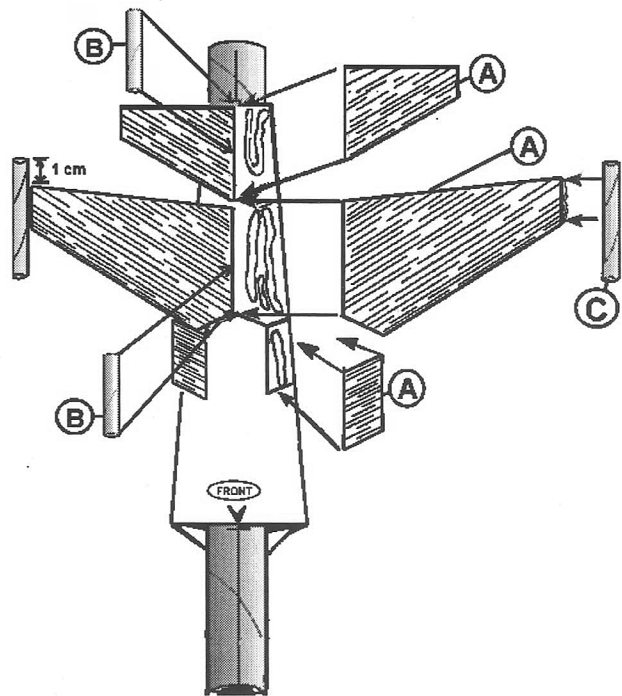
B) Once the wings are in position, cut one of the small launch lug tubes in half (it looks like a short drinking straw). Glue the pieces on the joint between the wings as shown.

- One piece should be glued at the front of the joint between the main wings as shown.

- The other should be glued on the end of the joint between the rear wings at the back of the model.

\* Make sure the launch lugs line up with each other perfectly.

C) Glue the large two launch lugs to the main wing tips as shown. About 1 cm (3/8") of the tubes should protrude past the rear edge of the wing. (These parts are purely for appearance!)



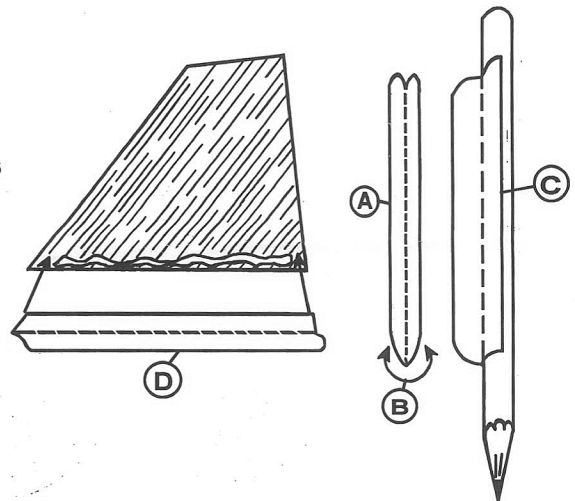
**# 17:** A) Cut out fin reinforcement tabs from card.

B) Using a ruler, fold them on the dotted line so that the shiny, printed surface is inside the fold.

C) Curl one side of each tab over a pencil as shown.

D) Glue the flat side of the tab onto the top fin. Make sure folded edge is even with the bottom edge of the fin.

E) Do the same on the other side of the fin.

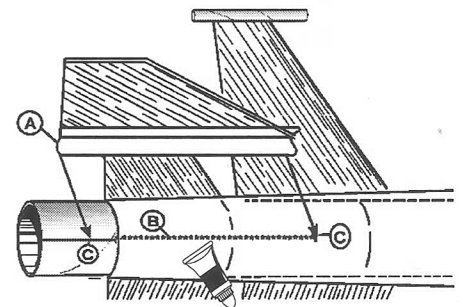


**# 18:**

A) Smear a bead of glue on the bottom edge of the fin and the bottom (printed side) of the reinforcement tabs.

B) Place fin on the line of stars on the top of the model, (printed on the body wrap).

\* MAKE SURE IT IS STRAIGHT.



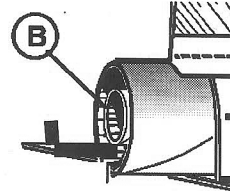
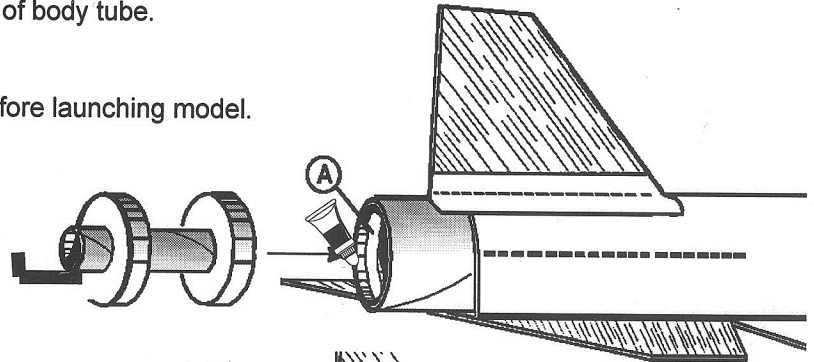
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C) Make sure the leading edge of the fin is on the mark at the front end of the "star line".

\*Note: the rear of the fin will be attached directly to the body tube. It should protrude beyond the body wrap toward the rear of the model. Make sure it lines up with the "top line" on the body tube.

- # 19:** A) Spread a thick bead of glue around the inside surface of the rear end of the body tube as shown.  
 B) Push the engine mount (from step 1) into the rear of body tube.

Caution: allow all glue to dry for at least 12 hours before launching model.



**! Choice**  
 Install either B/C or D Engine Mount

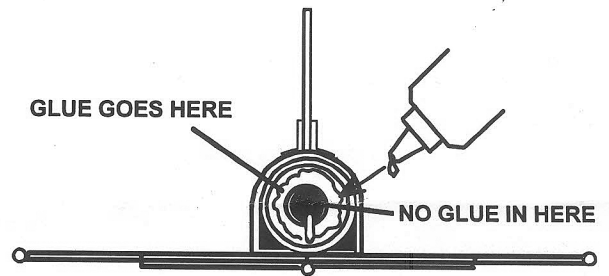
**! Install D engine mount so end of engine tube is even with edge of body tube**

**# 20:**

When the engine mount has bonded, it can be further strengthened by "pooling" some glue on the centering rings (between the body tube and the engine tube). This also helps hold the engine hook firmly in place.

Keep the tail of the model turned upwards until the glue dries.

Do not allow any glue to drip inside the engine tube or you will be unable to install the rocket engine when launching.



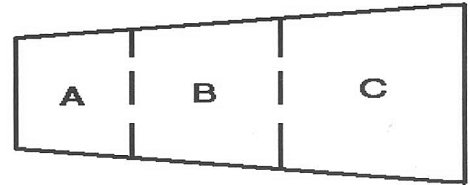
Join the [www.nar.org](http://www.nar.org) National Association of Rocketry  
[www.maac.ca](http://www.maac.ca) Model Aeronautics Association of Canada  
[www.canadianrocketry.org](http://www.canadianrocketry.org) Canadian Association of Rocketry



# FINAL ASSEMBLY & LAUNCH ASSEMBLÉE FINALE ET LANCEMENT

**STEP 21:** Cut Out the Following Shock Cord Mount:

A) Put a Blob of Glue on the Section Marked "A" Lay the End of the "Shock Cord" in the Glue

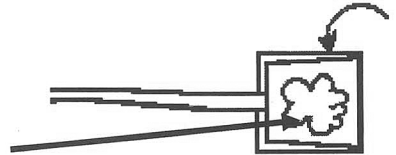


B) While the glue is still wet fold section "a" over on the dotted line and press it together with section "b"

C) Fold over sections "a" & "b" and glue them over to section "c" and press it together

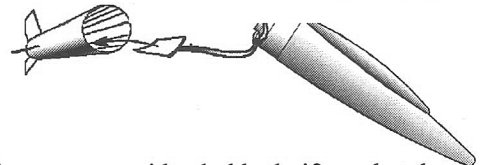


D) Put a blob of glue here

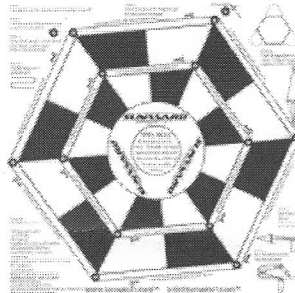


**STEP 22:**

A) Glue the "Shock Cord Mount About 1 1/2" (4.5cm) Down Inside the Top of the Body Tube



B) Tie the other end of the "shock cord" to the ring on the nose cone (ring may need to be cut open with a hobby knife so that the "shock cord" can be fed through)



3) Cut parachute string into 3 equal lengths

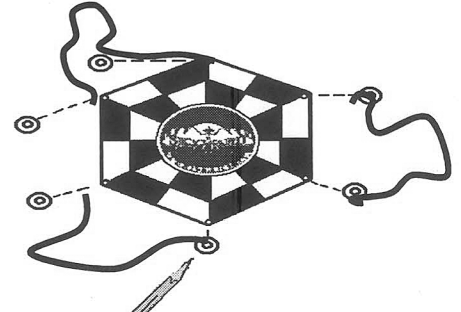
**STEP 23: PARACHUTE**

A) Cut out parachute with sharp scissors



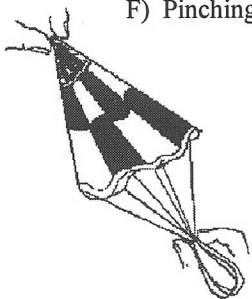
C) Stick the reinforcement rings to the parachute over the circles printed on the parachute

D) With a pencil, punch a hole through the circles printed on the parachute

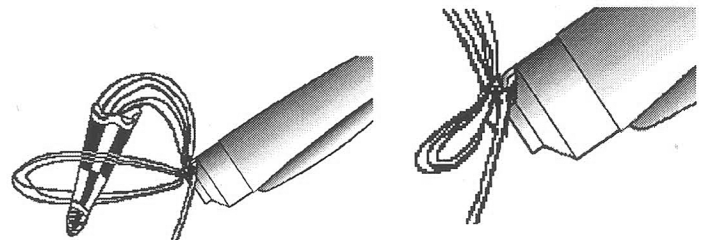


E) Attach the strings to the parachute by tying them through the rings and holes

F) Pinching the Parachute in the Centre, Bring All Strings to Form One Loop, Pass Loop Through Eyelet on Nose Cone



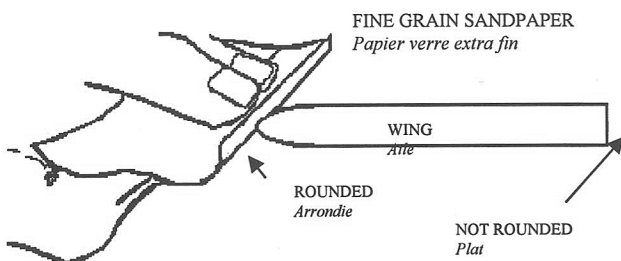
G) Pass parachute through loop and pull tight.



**STEP 24: PAINTING YOUR MODEL:**

A) Sand wings and nose cone until they are smooth. (Rounding wing edges by careful sanding will improve appearance and aerodynamics)

B) Sand nose cone thoroughly.



**STEP 25:**

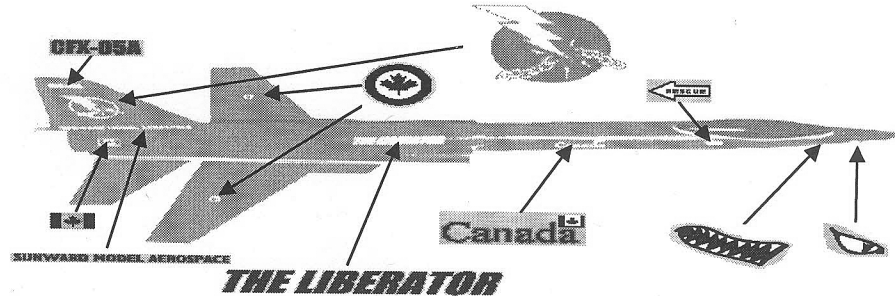
A) Spray paint entire model with polyethylene – safe paint. Use light coats. Use only enough paint to cover model evenly. Keep paint can at least 14” from model.



B) REMOVE NOSE CONE.

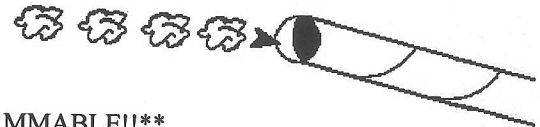
C) (Option step) when paint is completely dry, use masking tape to cover nose cone, except for canopy. Paint black. Carefully remove masking tape after painting

**DECAL PLACEMENT SUGGESTIONS:**



**STEP 26: PREPARING ROCKET FOR LAUNCH**

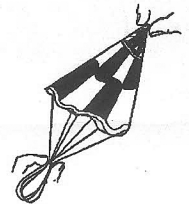
A) Stuff 4 loosely crumpled squares of rocket recovery wadding (available from your local hobby retailer) into the top of rocket body tube



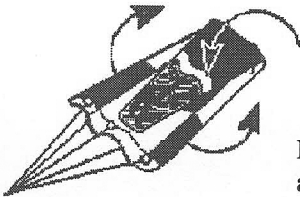
B) PUSH DOWN WITH A PENCIL. **\*DOT USE FACIAL TISSUE – IT IS FLAMMABLE!!!\***

**STEP 27: FOLD AND INSERT PARACHUTE**

A) Pinch parachute in the centre and straighten its strings

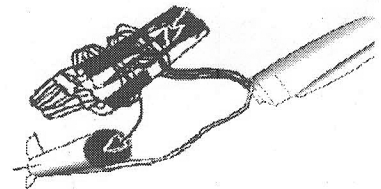


B) Loosely fold over and roll outside edges inward



C) Loosely wrap parachute strings around parachute and drop the parachute into the body tube

D) Push the rest of the string and “shock cord” into the body tube and then insert nose cone.



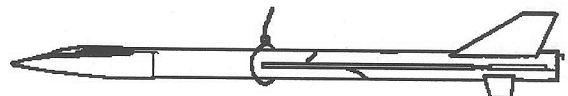
TO INSTALL AND IGNITE ROCKET ENGINE, FOLLOW THE INSTRUCTIONS THAT ARE INCLUDED WITH THE ENGINES OR LAUNCH PAD. THIS MODEL IS BUILT TO WORK WITH IGNITERS, ENGINES, RECOVERY WADDING AND LAUNCH PADS BUILT BY THE LEADING MANUFACTURERS. RECOMMENDED ENGINES.

:B6-2 (First Flight), B6-4, C6-3, C6-5, D12-3 D12-5 **\*\*USE ONLY SINGLE STAGE ENGINES!!!\*\***

**PREPARING THE ROCKET FOR LAUNCH:**

**FLIGHT TEST:** Every rocket must be tested for stability, here is a simple way to test stability:

A) With engine, wadding, and parachute installed and painting done, tie a 10’ (3m) string around the rocket on its balancing point (the spot where it will hang level) tape string in place

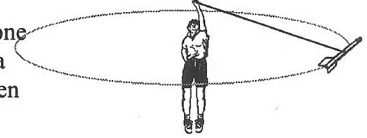


B) "Fly" the rocket by twirling the string over your head so that the rocket "orbits" you at high speed

B) *Faite voler la maquette par tournant la ficelle audessus de votre tête de façon a ce que la maquette vole en orbite autour de vous a grand vitesse.*

C) If the rocket flies straight, nose first, it is stable. If it does not, add weight to the nose cone. This can be done by dropping small balls of plasticine into the nose cone and pressing them into the point with the flat end of a pencil. Keep on testing, and if necessary, adding more weight to the nose cone until the rocket is stable. When the rocket is stable, it may be launched.

**\*\*Never launch an untested rocket.\*\***



### ROCKET COMPONENTS WARRANTY

Sunward guarantees that the components of this kit will reach you in good condition. If the kit does not reach you in good condition, simply return it\* to the address below and we will send you a replacement as soon as possible.

Since building and launching skills vary from one hobbyist to another, Sunward will not take responsibility for a rocket's performance, altitude loss or damage to property or injury to persons resulting from the use or misuse of any of our products. The buyer assumes all risks and liabilities therefrom and accepts and uses our products on these conditions. Your purchases from Sunward affirms your agreement to these conditions.

Sunward Group Limited, 9 Rooksgrove Place, Toronto, ON, Canada, M6M 2W3

\*Return Merchandise Authorization is required for all exchanges. Please contact Sunward Customer Service at [info@sunward1.com](mailto:info@sunward1.com)

Model Rocket Safety Code National Association of Rocketry [www.nar.org](http://www.nar.org)

Used with permission.

1) Materials. I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.

2) Motors. I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

3) Ignition System. I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

4) Misfires. If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

5) Launch Safety. I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with D motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.

6) Launcher. I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.

7) Size. My model rocket will not weigh more than 1,500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse. If my model rocket weighs more than one pound (453 grams) at liftoff or has more than four ounces (113 grams) of propellant, I will check and comply with Federal Aviation Administration regulations before flying.

8) Flight Safety. I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.

9) Launch Site. I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

10) Recovery System. I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.

11) Recovery Safety. I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

#### LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions ft / m
0.00--1.25	1/4A, 1/2A	50 / 15
1.26--2.50	A	100 / 30
2.51--5.00	B	200 / 60
5.01--10.00	C	400 / 120
10.01--20.00	D	500 / 150
20.01--40.00	E	1,000 / 300
40.01--80.00	F	1,000 / 300
80.01--160.00	G	1,000 / 300
160.01--320.00	Two Gs	1,500 / 450

Revision of February, 2001

### CANADA'S MODEL ROCKET SAFETY CODE

1) CONSTRUCTION. I will always build my model rocket using only lightweight materials such as paper, wood, plastics or rubber without any metal airframe components. My model shall include aerodynamic surfaces or a mechanism to assure a safe, stable flight.

2) MOTORS. I will only use rocket motors and reloads approved by Natural Resources Canada, Explosives Regulatory Division (NRC/ERD). I will store these motors in a safe and secure manner as described by the manufacturer and NRC/ERD. I will never subject these motors to excessive shock or extremes of temperature. I will not attempt to use, alter, or reload commercial rocket motors, except as instructed by the manufacturer.

3) RECOVERY. My model rocket will always use a recovery system to return it safely to the ground so that my model rocket may be reflown. I shall prepare the recovery system with due care to assure that it will properly deploy.

4) WEIGHT LIMITS. My model rocket will not weigh more than 1500 grams at lift-off, and the model rocket engine(s) will contain no more than 125 grams of propellant and produce no more than 160 N-s combined total-impulse.

5) FIRING SYSTEM. I will always use a remote electrical system to ignite the model rocket engine(s). My firing system will include an ignition switch that returns to "off" when released, and a safety interlock to prevent accidental ignition. I will never leave the safety interlock key in my firing system between launches.

6) LAUNCH SYSTEM. My model rocket will always be launched from a stable platform having a device to initially guide its motion. My launcher will have a jet deflector to prevent motor exhaust from directly contacting the ground. To protect myself and other from eye injury, I will position the launch rod or rail so that the upper end is above eye level, or else I will place a large guard on the upper end between launches.

7) LAUNCH SITE. I will never launch my model rockets near buildings, power lines, into clouds, or become a hazard to aviation. The area immediately around the launch system will be cleared of any flammable materials. I will always obtain the permission of the launch site owner prior to using the launch site for my model rocket activities.

8) LAUNCH CONDITIONS. I will never launch model rockets in high winds or in conditions of low visibility which may impair the observation of my model rocket in flight, or in a direction below 30 degrees from the vertical.

9) LAUNCH SAFETY. I will remain at least 5 metres away from any model about to be launched. I will always announce to persons within the launch site that I am about to launch my model rocket, and I shall give a loud countdown of at least 5 seconds duration. I shall immediately remove the safety interlock key from my firing system after the launch of my model rocket.

10) MISFIRES. In the event of an ignition misfire, I shall not immediately approach my model rocket, but remove the safety interlock key and remain back for a safe period until assured that no ignition will occur.

11) ANIMAL PAYLOADS. I will never endanger live animals by launching them in my model rocket.

12) TARGETS. I will never launch my rocket so that it will fall on, or strike, ground or air targets. Nor will I include any explosive or incendiary payload.

13) HAZARDOUS RECOVERY. I will never attempt to recover my model rocket from a power line, high place, a tree, or other dangerous location.

14) PRE FLIGHT TESTS. Whenever possible, I will always test the stability, operation and reliability of my model rocket designs prior to flight. I will launch unproven designs in complete isolation from other persons.

©650164 ONTARIO INC.

MATCH TO BOTTOM LINE

©650164 ONTARIO INC.

UNDER LAP (GLUING SURFACE)

(DO NOT CUT OR FOLD THIS LINE)

MATCH TO TOP LINE

TOP FIN - POSITION ON THIS LINE

BODY WRAP

REAR

TAIL WING 2  
GLUE TAIL WING DOWN TO FIT SHAPE

(DO NOT CUT OR FOLD THIS LINE)

TAIL WING 1  
GLUE TAIL WING DOWN TO FIT SHAPE

MAIN WING 2  
GLUE WING DOWN TO FIT SHAPE

MAIN WING 1  
GLUE WING DOWN TO FIT SHAPE

LEADING EDGE 2 GLUE PIECE  
DOWN TO FIT SHAPE

LEADING EDGE 1 GLUE PIECE  
DOWN TO FIT SHAPE

MATCH TO BOTTOM LINE

BOTTOM LINE

UNDER LAP (GLUING SURFACE)

MATCH TO BOTTOM LINE

(DO NOT CUT)



BODY WRAP

MATCH TO TOP LINE



MATCH TO BOTTOM LINE

LEADING EDGE 2 GLUE PIECE  
DOWN TO FIT SHAPE

MAIN WING 2  
GLUE WING DOWN TO FIT SHAPE

(DO NOT CUT OR FOLD THIS LINE)

MAIN WING 1  
GLUE WING DOWN TO FIT SHAPE

LEADING EDGE 1 GLUE PIECE  
DOWN TO FIT SHAPE

TA  
GL

TA  
GL

MATCH TO BOTTOM LINE

FRONT

MATCH TO TOP LINE

BODY WRAP

\*\*\*\*\*  
(DO NOT CUT OR FOLD THIS LINE)  
TOP FIN - POS

LEADING EDGE 2 GLUE PIECE  
DOWN TO FIT SHAPE

LEADING EDGE 1 GLUE PIECE  
DOWN TO FIT SHAPE

MAIN WING 2  
GLUE WING DOWN TO FIT SHAPE

MAIN WING 1  
GLUE WING DOWN TO FIT SHAPE

(DO NOT CUT OR FOLD THIS LINE)

TAIL WING 2  
GLUE TAIL WING DO

TAIL WING 1  
GLUE TAIL WING DO

TOP FIN REINFORCEMENT TAB

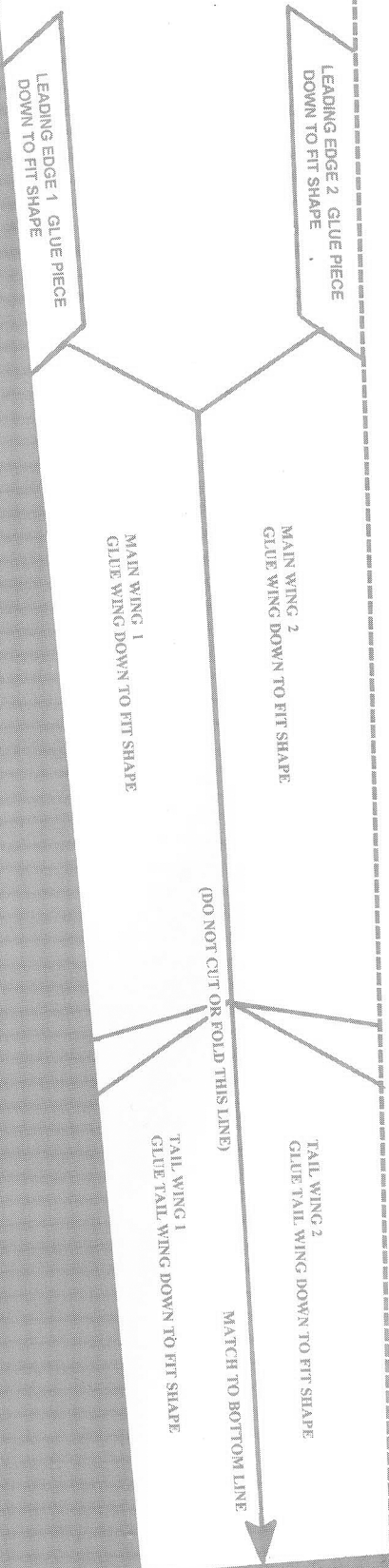
TOP FIN REINFORCEMENT

A B C



BODY WRAP

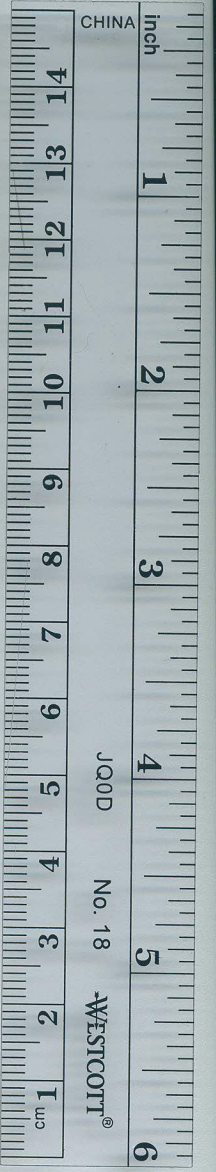
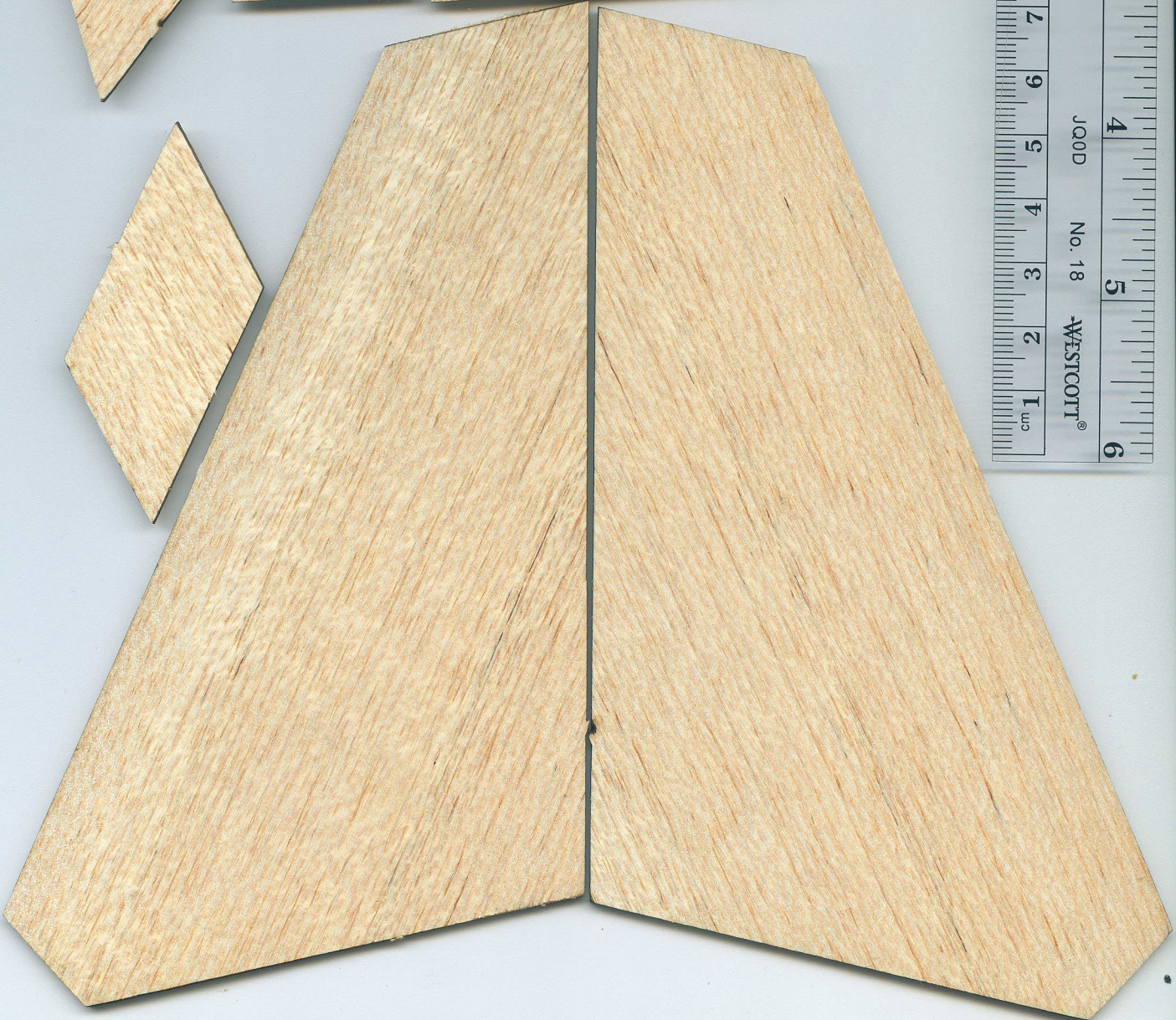
(DO NOT CUT OR FOLD THIS LINE)  
\*\*\*\*\* MATCH TO TOP LINE  
TOP FIN - POSITION ON THIS LINE



TOP FIN REINFORCEMENT TAB

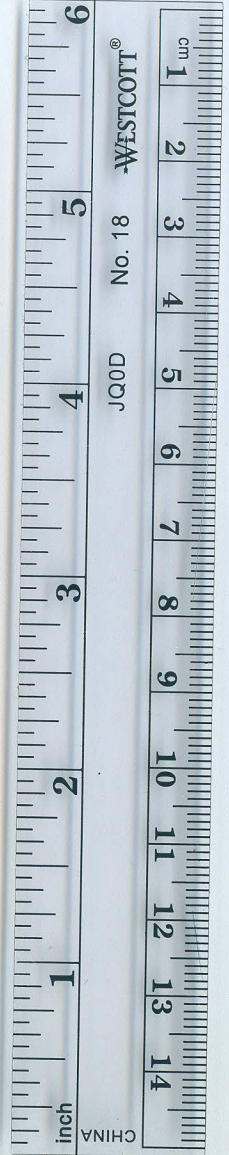
TOP FIN REINFORCEMENT TAB

1/8"



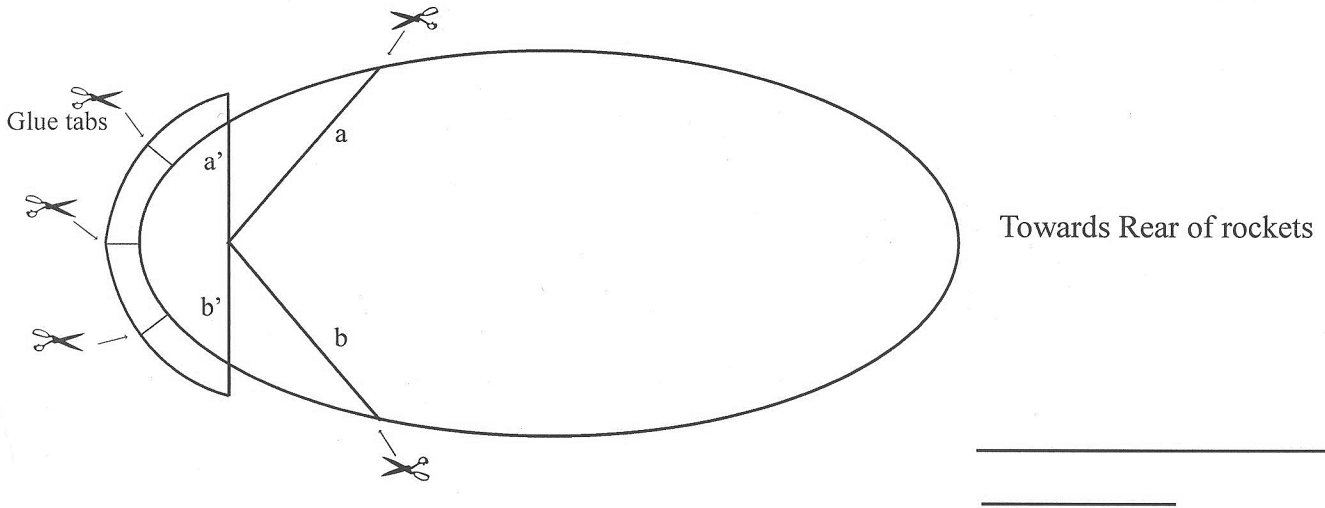


1/8"

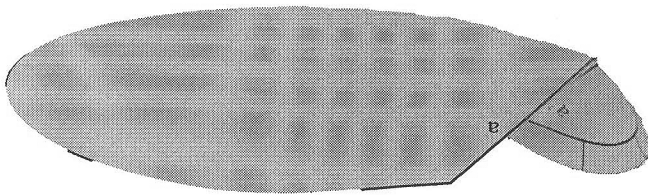


# Sunward Canopy Template

For added realism, we have provided a template for a canopy to place on the nose cones of the Jet Fighter model rocket kits.

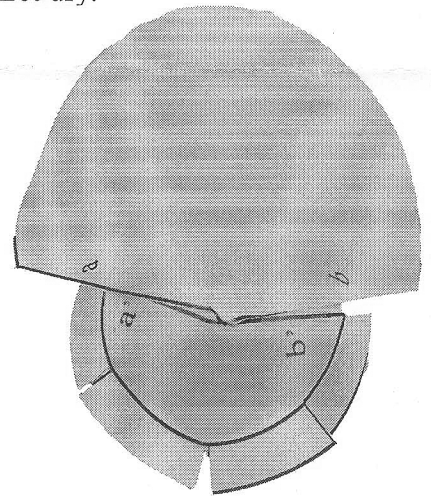


- 1) Cut on outside of template.
- 2) Cut along line "a". Fold tab under tab "a" so a' meets "a". Glue or tape in place.
- 3) Repeat for b/b'
- 4) cut 3 glue tabs
- 5) apply bead of glue along base of template and glue to nose cone. Let dry.
- 6) As shown:



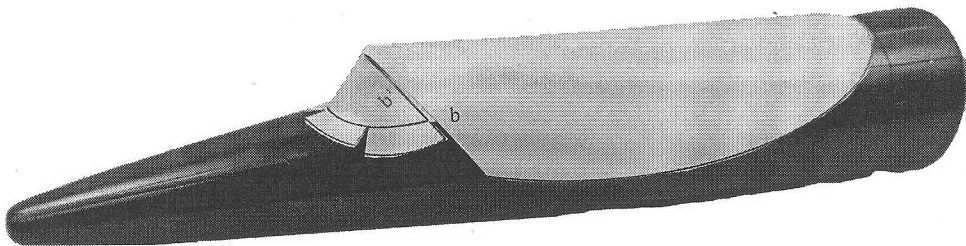
Step 1

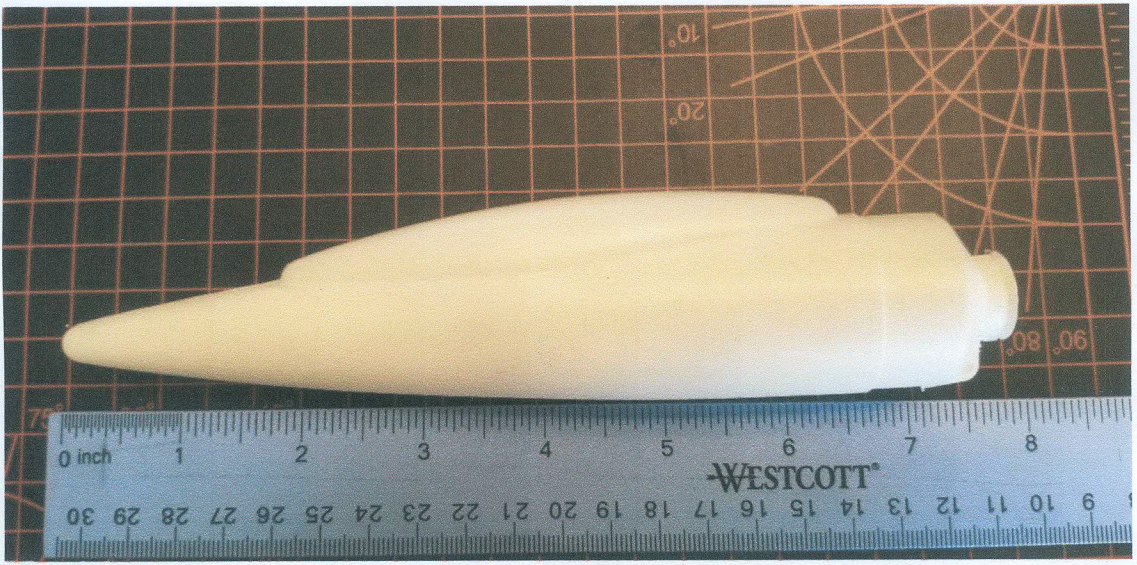
NOT TO SCALE

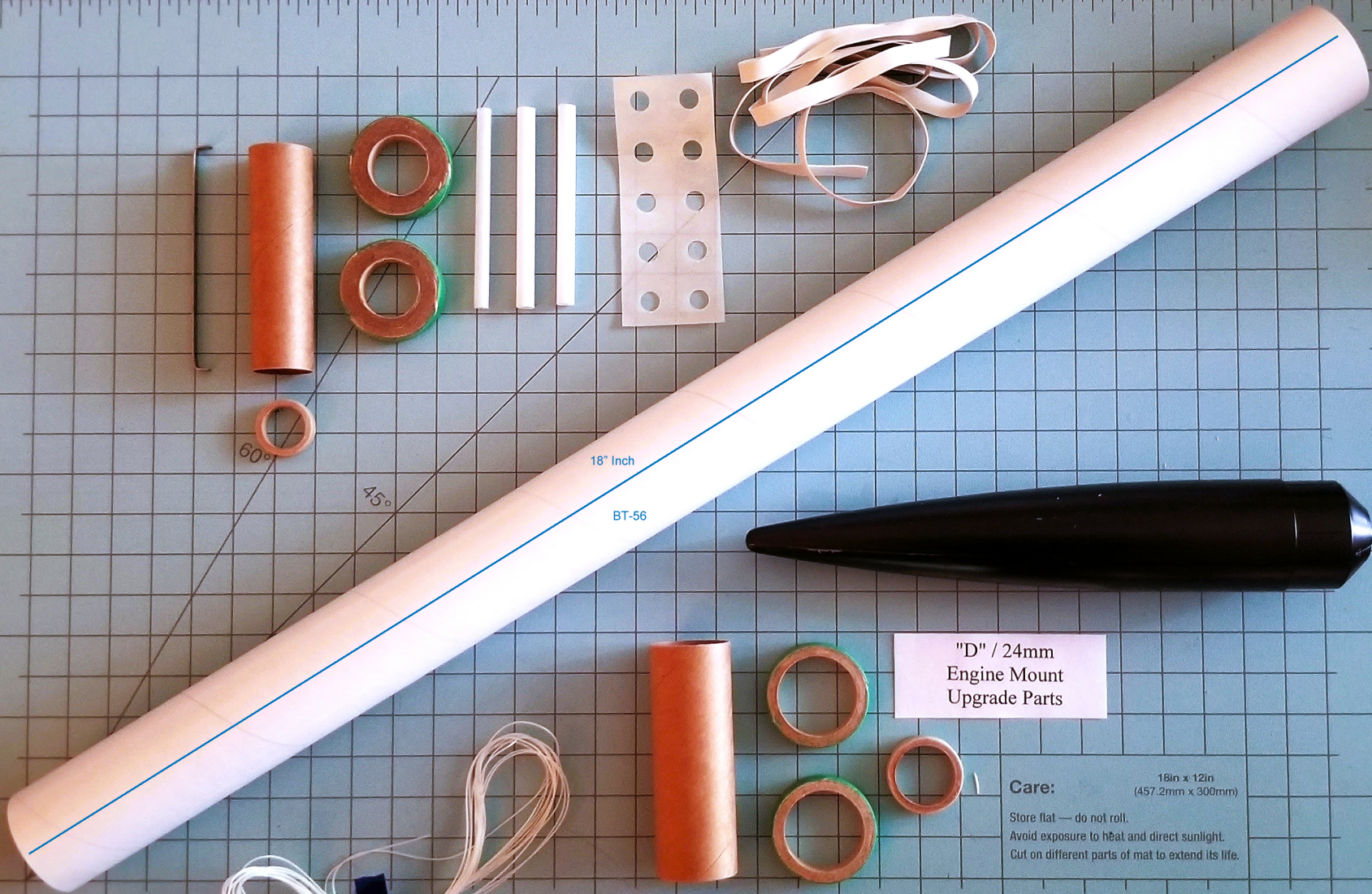


Step 2

Completed nose cone







60°

45°

18" Inch

BT-56

"D" / 24mm  
Engine Mount  
Upgrade Parts

**Care:**

18in x 12in  
(457.2mm x 300mm)

Store flat — do not roll.  
Avoid exposure to heat and direct sunlight.  
Cut on different parts of mat to extend its life.

1/4 yd

1/4 yd

MODEL  
ROCKETS  
ACCESSORIES  
PARTS AND COMPONENTS

**SUNWARD**  
MODEL AEROSPACE

PARTS  
AND  
COMPONENTS

# THE LIBERATOR

Flying Model Rocket Kit  
includes main motor delay

FLIGHTS TO 600 FEET (183m)  
With 6 600 grains (182g)

HUGE 18" PARACHUTE RECOVERY  
18" Parachute

HIGH QUALITY LASER-CUT Balsa  
Découpe au laser de haute de qualité

EASY TO FOLLOW INSTRUCTIONS  
Instructions simple et claires

LENGTH: 24"  
WINGSPAN: 11"  
Longueur: 24"  
Envergure: 11"

Recommended M-12 Free Flight  
M-4, C-3 and C-5

MODEL NUMBER: 1

**SUNWARD**  
MODEL AEROSPACE

See back panel for further details  
Veuillez voir le recto pour détail

POWER PRECISION PERFORMANCE

For details in French

For details in English

Sunward Model Aerospace  
Ontario, Canada  
www.sunward.ca

## SUNWARD LIBERATOR Parts List

1. MAIN MOTOR (M-12) (See Flight M-4, C-3 and C-5)  
2. PARACHUTE (18")  
3. PARACHUTE HOUSING (18")  
4. PARACHUTE HOUSING BANDS (2)

5. PARACHUTE HOUSING BANDS (2)

6. PARACHUTE HOUSING BANDS (2)

7. PARACHUTE HOUSING BANDS (2)

8. PARACHUTE HOUSING BANDS (2)

9. PARACHUTE HOUSING BANDS (2)

10. PARACHUTE HOUSING BANDS (2)

11. PARACHUTE HOUSING BANDS (2)

12. PARACHUTE HOUSING BANDS (2)

13. PARACHUTE HOUSING BANDS (2)

14. PARACHUTE HOUSING BANDS (2)

15. PARACHUTE HOUSING BANDS (2)

16. PARACHUTE HOUSING BANDS (2)

17. PARACHUTE HOUSING BANDS (2)

18. PARACHUTE HOUSING BANDS (2)

19. PARACHUTE HOUSING BANDS (2)

20. PARACHUTE HOUSING BANDS (2)

21. PARACHUTE HOUSING BANDS (2)

22. PARACHUTE HOUSING BANDS (2)

23. PARACHUTE HOUSING BANDS (2)

24. PARACHUTE HOUSING BANDS (2)

# THE LIBERATOR

- Length 24" / 61cm
- Wingspan 11" / 28cm
- Flights to over 800' / 240m
- Quality Nose Cone
- Laser Cut Balsa Fins
- Jet Fighter Design
- Safe 18" / 46cm

parachute recovery -  
clear with red printing for easy tracking

- Full instructions with 3  
Colour Silkscreen Decal
- Recommended Engines:  
TWO ways to Build:  
B6-2 (first flight), B6-4  
C6-3, C6-5, OR  
D12-3, D12-5, D12-7

- Based on  
F20 Freedom &  
F20 Tiger Shark  
Jet Fighters



One Model Rocket Kit.  
Not to any scale.  
Recommended for ages 14 and up.  
Adult supervision required for children 15-16.  
Check local regulations for engine age requirements.  
Use only with 1/8" diameter rod for launching.  
This model requires assembly.  
Glue, epoxy, paint, wadding, engines,  
ignitors, launch system, and tools not included.  
Plastic bags should be always kept away  
from babies and children to avoid suffocation.  
Contents subject to change

Skill Level 3

[www.sunward1.com](http://www.sunward1.com) [info@sunward1.com](mailto:info@sunward1.com)

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SUNWARD  
THE LIBERATOR  
SNW00005