

cosmodrome rocketry

1:6 NIKE APACHE

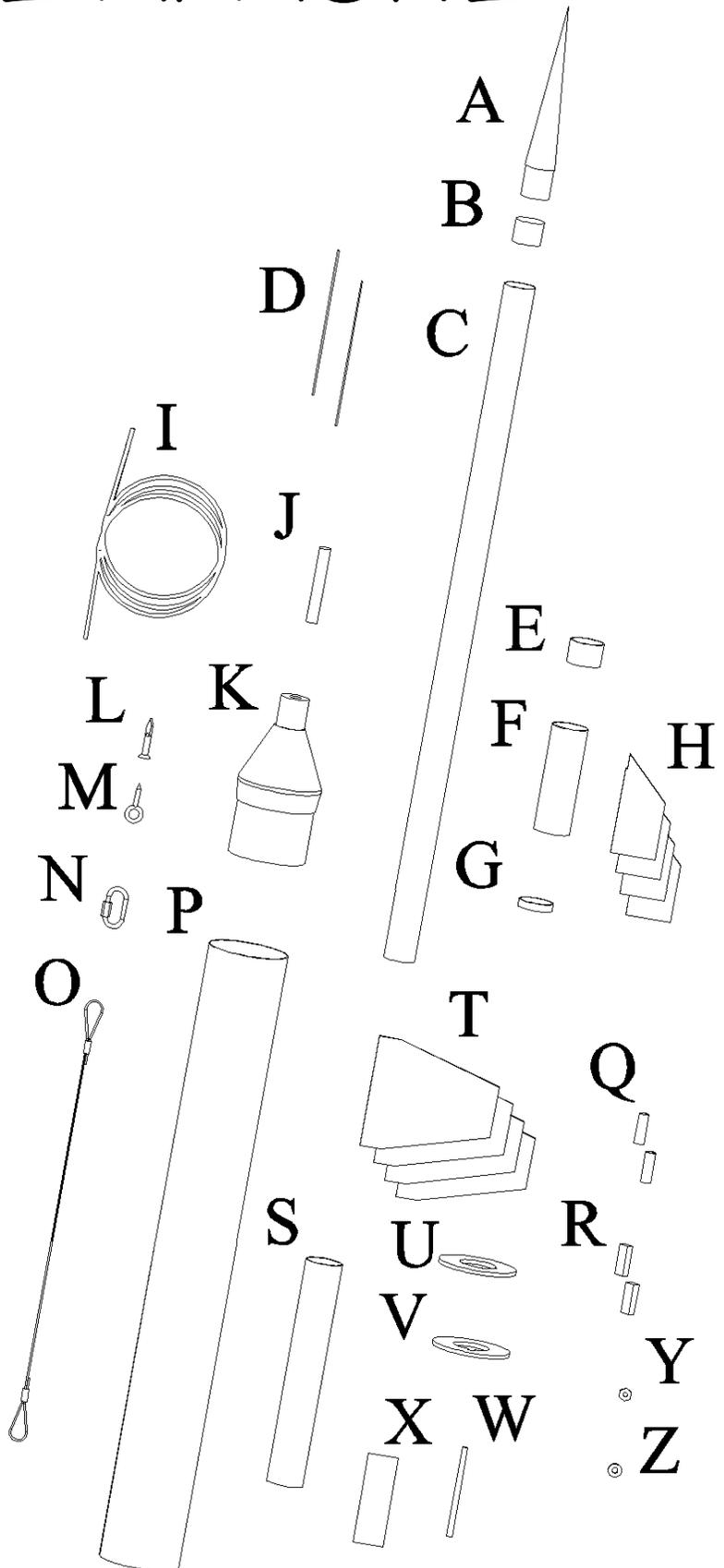
This kit is capable of use with high thrust motors. It is therefore strongly recommended that epoxy be used throughout the construction of this kit.

Parts List

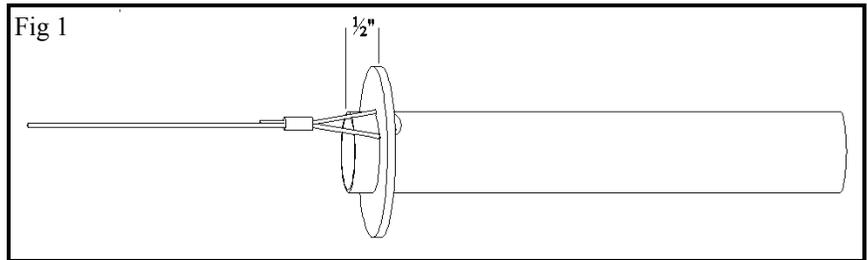
A	1	Nose cone
B	1	Nose weight
C	1	Apache body tube
D	2	Antennae
E	1	Large paper ring
F	1	29mm body tube
G	1	Small paper ring
H	4	Apache fins
I	1	Shock cord
J	1	Dowel
K	1	Transition
L	1	Transition anchor
M	1	Screw eye
N	1	Quick link
O	1	Shock cord mount
P	1	Nike body tube
Q	2	Launch lugs
R	2	Launch lug stand offs
S	1	Motor mount tube
T	4	Nike fins
U	1	Forward centering ring
V	1	Aft centering ring
W	1	Engine retainer
X	1	Engine retainer stand off
Y	1	Washer
Z	1	Nut
AA	1	Apache body tube wrap (not shown)
AB	1	Nike body tube wrap (not shown)
AC	1	28" parachute (not shown)
AD	1	Nike decal sheet (not shown)
AE	1	Apache decal sheet (not shown)

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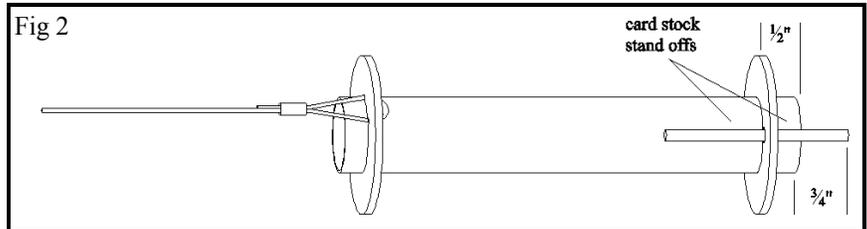
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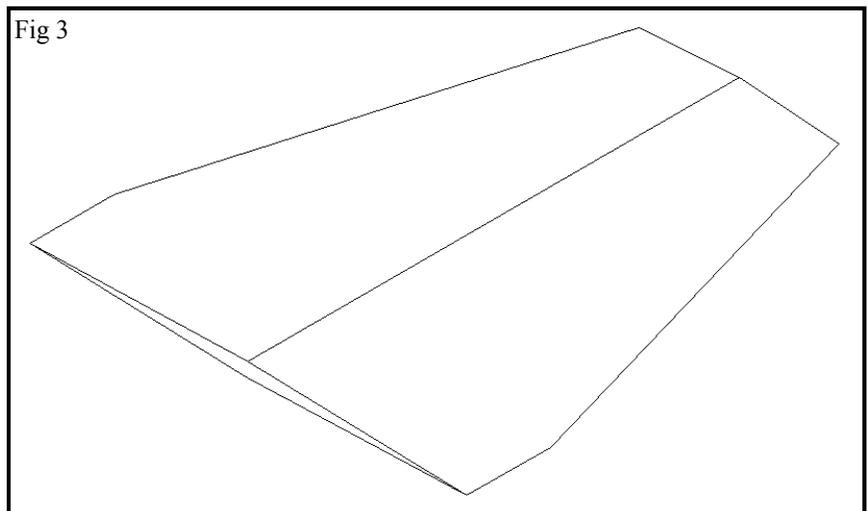
1. Draw a line down the side of the 29mm motor mount tube and mark the line 1/2" from both ends. Insert one end of the shock cord mount into the two holes in the forward centering ring. Slide the centering ring onto the motor mount tube. Position the centering ring onto one of the 1/2" marks on the tube as shown in figure 1. Epoxy the centering ring and shock cord mount to the tube.



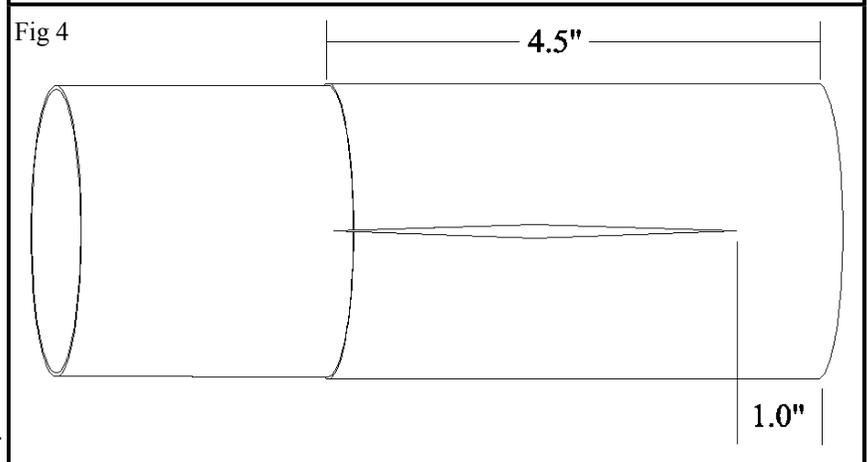
2. Slide the aft centering ring onto the tube until it is on the other 1/2" mark, such that the hole in the centering ring is lined up with the line on the motor mount tube. Without getting epoxy near the hole, epoxy the centering ring into place. Cut out two pieces of card stock, 1/8" x 1 1/2" and 1/8" x 1/2". Slide the engine retainer through the hole in the centering ring so that 3/4" extends past the end of the tube. Note: One end of the engine retainer is cut (painted), one is not (unpainted), position the uncut end aft and it will be easier to thread the nut on. Insert the two pieces of card stock between the tube and the engine retainer. Note: The card stock simply creates a space between the engine retainer and tube to allow for some reload cases enough clearance to fit. Epoxy the engine retainer to the tube, making sure that it is even with the line on the tube. Be careful not to get epoxy on the threads of the engine retainer that extend past the tube.



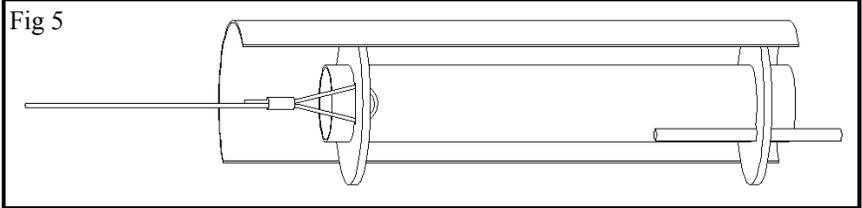
3. Sand the upper and lower parts of the Nike fins so that they are knife-edged to a point.



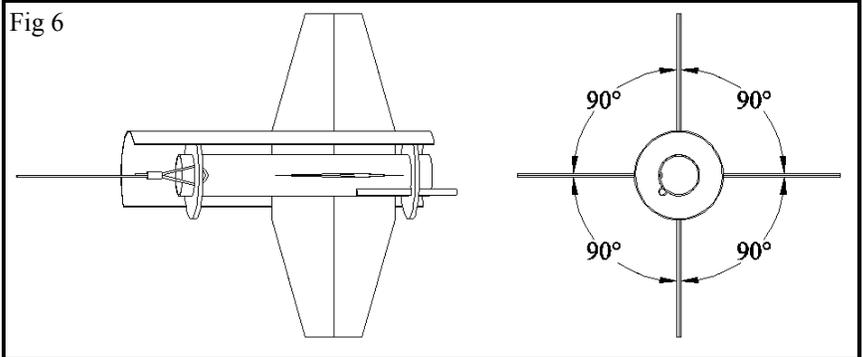
4. Using the Nike fin template, mark the Nike body tube at the 'Fin' and 'Lug' lines. Extend the fin lines 5" up the tube. Extend the lug line the length of the tube. Mark the fin lines 1.0" from the aft end of the tube. Place a fin on the tube so that the aft end of the fin tab is centered on a fin line and even with the 1.0" mark. Make sure that the forward end of the fin tab is centered on the fin line. Draw a line completely around the fin tab. Using an X-acto knife, cut out a slot for the fin tab by cutting on the inside of the outline. Carefully enlarge the slot, if necessary, until the fin tab fits snugly. Repeat for the other fins. Lightly mist the Nike body tube wrap with water from an atomizer bottle. It should be evenly sprayed, but not soaking. Wrap a piece of Saran Wrap around the body tube and wrap the body tube wrap around the Saran Wrap (make sure the 4.5" long side of the body tube wrap goes along the length of the body tube). Let the wrap dry (use a hair dryer to speed up the process). Once the wrap is dry it will conform to the shape of the body tube. Remove the Saran Wrap. Trim the 8.5" long side of the body tube wrap so that it just fits around the body tube. Apply a thin layer of epoxy to the inside of the body tube wrap and apply the wrap to the aft end of the body tube. Once dry, cut the fin slots out of the body tube wrap.



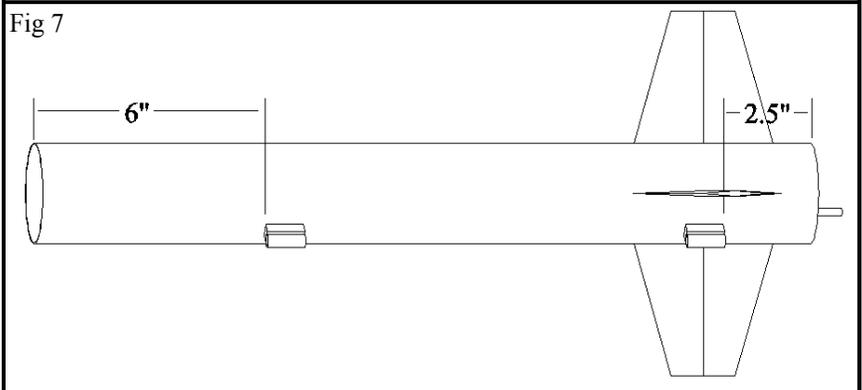
5. Apply a ring of epoxy to the inside of the body tube just forward of the fin slots. Push the motor mount assembly into the body tube until the aft end of the motor mount tube is even with the aft end of the body tube. Make sure the engine retainer is between two fin slots. Stand the assembly upright so that the epoxy can settle on the forward centering ring. Let the epoxy cure. Turn the assembly over and epoxy the aft centering ring to the body tube.



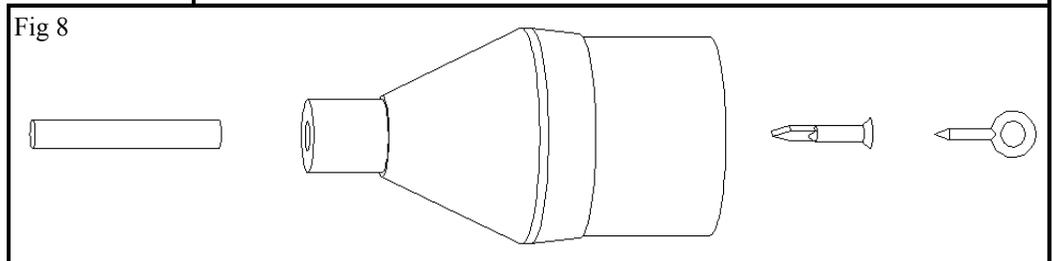
6. Apply epoxy to the motor mount tube through one of the fin slots. Also apply epoxy to the root edge of one Nike fin. Insert the fin into the slot. Make sure that the fin is perpendicular to the body tube. Let the epoxy cure. Repeat for the other three fins. Fillet each fin.



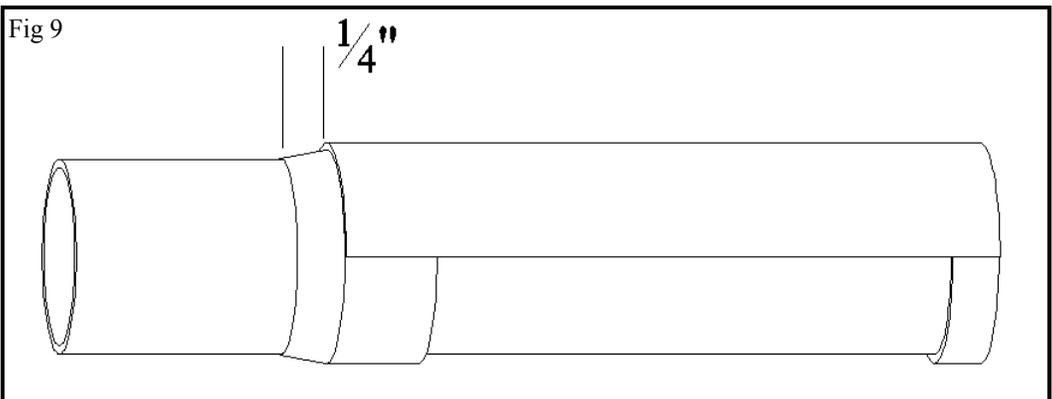
7. Epoxy the launch lug stand offs to the body tube on the 'lug' line. Place one of them 2 1/2" from the aft end of the body tube and the other 6" from the forward end. Place the stand offs with the wider side against the body tube. Epoxy a launch lug to each of the stand offs. Using a 1/4" launch rod, align the lugs so that the rod slides easily through them.



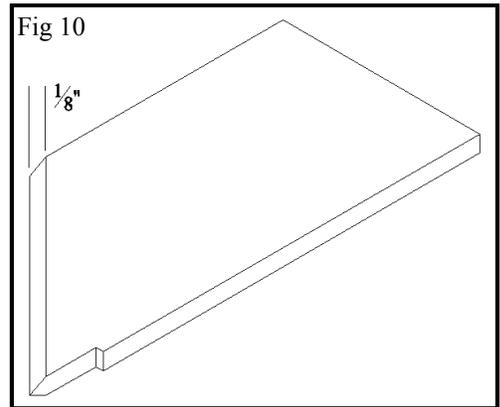
8. Thread the screw eye into the plastic anchor and remove. Apply a small amount of epoxy to the inside of the anchor and re-install the screw eye. Let the epoxy cure. Thread the screw eye/anchor into the base of the adapter and remove. Fill the hole with epoxy and re-install the screw eye/anchor. Epoxy the 3/8" dowel into the top of the adapter.



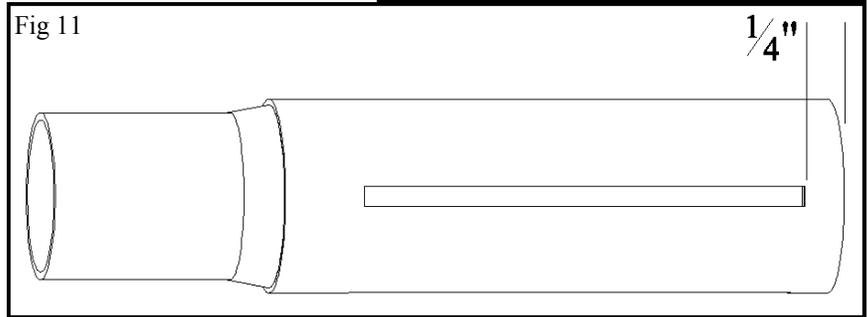
9. Mark the long paper centering ring 1/4" from one end. Epoxy the long paper centering ring into one end of the 29mm tube so that 1/4" sticks out. Epoxy the short paper centering ring into the other end of the 29mm tube so that it is flush with the end of the tube. Sand the part of the long paper centering ring that sticks out of the 29mm tube so that it transitions down to the diameter of the Apache body tube. Epoxy this assembly onto the Apache body tube so that its aft end is flush with the aft end of the Apache body tube.



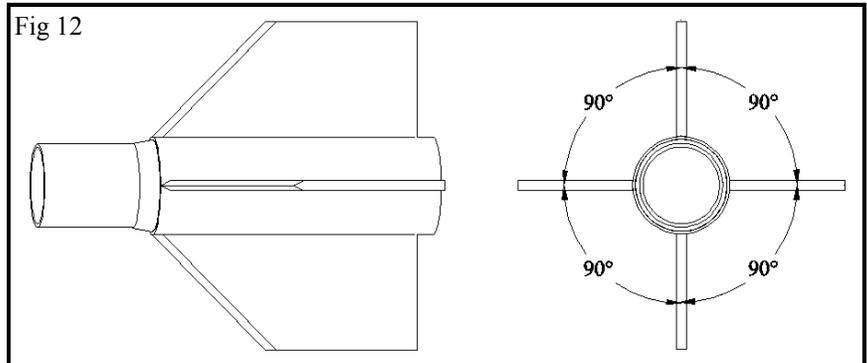
10. Sand the leading edge of the Apache fins to a knife edge as shown.



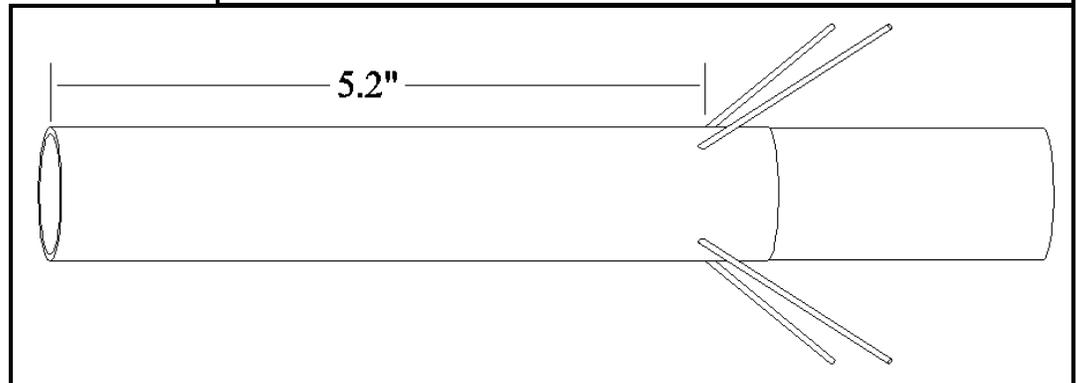
11. Using the Apache fin template, mark the 29mm body tube at the fin lines. Extend the fin line the length of the 29mm body tube. Extend one of the lines the length of the Apache tube. Mark the fin line 1/4" from the aft end of the 29mm body tube. Place an Apache fin on the body tube so that the aft end of the tab is centered on a fin line at the 1/4" mark. Make sure that the forward end of the tab is centered on the fin line. Draw a line completely around the tab. Using an X-acto knife, cut out the slot for the fin tab by cutting on the inside of the outline. Carefully enlarge the slot, if necessary, until the Apache fin fits snugly. Repeat for the other three fins.



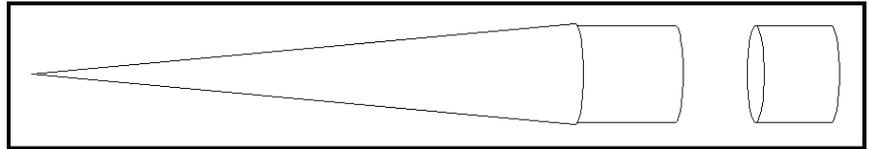
12. Apply epoxy to the 29mm body tube through one of the Apache fin slots. Also apply epoxy to the root edge of one of the Apache fins. Insert the fin tab into the slot. Make sure that the fin is perpendicular to the body tube. Repeat for the other three fins. Fillet each fin.



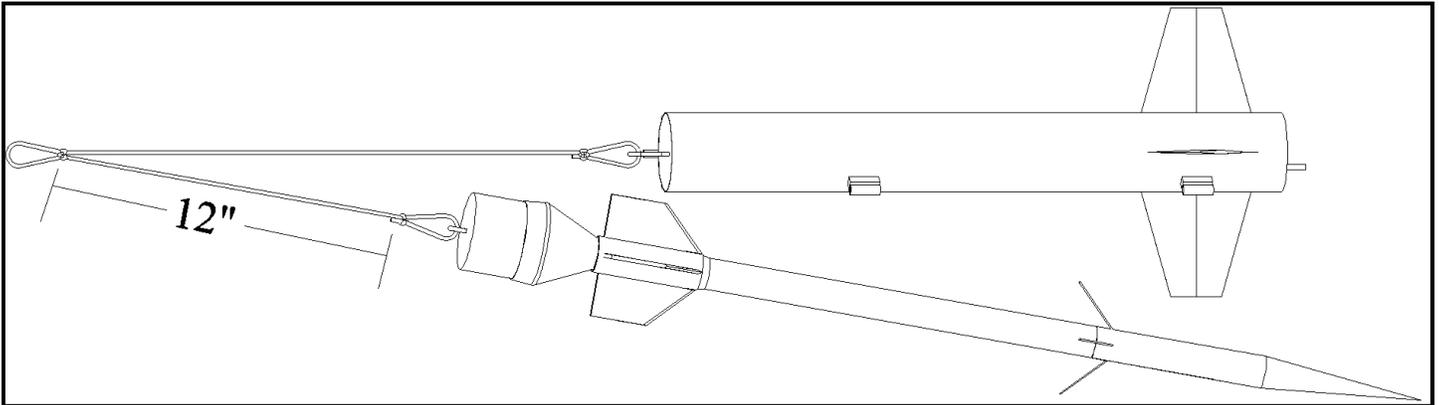
13. As in step 5, wrap the Apache body tube wrap around the Apache body tube such that one end of the wrap is even with the forward end of the body tube. Using the Apache template, mark the Apache body tube at each of the four lines, making sure that one of the lines is lined up with the extended fin line. Mark the Apache tube wrap at each of the four lines (these should all be in line with the fins). Extend the lines the length of the wrap. Mark the line 5.2" (5 13/64") from the forward end of the Apache tube. At these marks, drill small holes in the body tube the same diameter as the antenna. Thread each antenna through opposite holes so that equal lengths extend out of the body tube. Epoxy the antennae to the inside of the body tube. Using the antenna template, bend an antenna down until it matches the angle of the template. Repeat for the other antennae.



14. Apply a line of epoxy 1/2" into the forward end of the Apache body tube. Slide the nose cone weight into the tube so that it is completely in the tube. Insert the nose cone into the end of the tube, pushing the weight further into the tube. Set the tube upside down to allow the epoxy to cure and to prevent the weight from slipping further down the tube.



15. Feed one end of the shock cord through the screw eye and tie it to itself, forming a loop. Tie a loop in the shock cord one foot away from the transition, this is where the parachute is attached. Tie a loop in the other end of the shock cord. The quick link will go through this loop and attach to the shock cord mount.

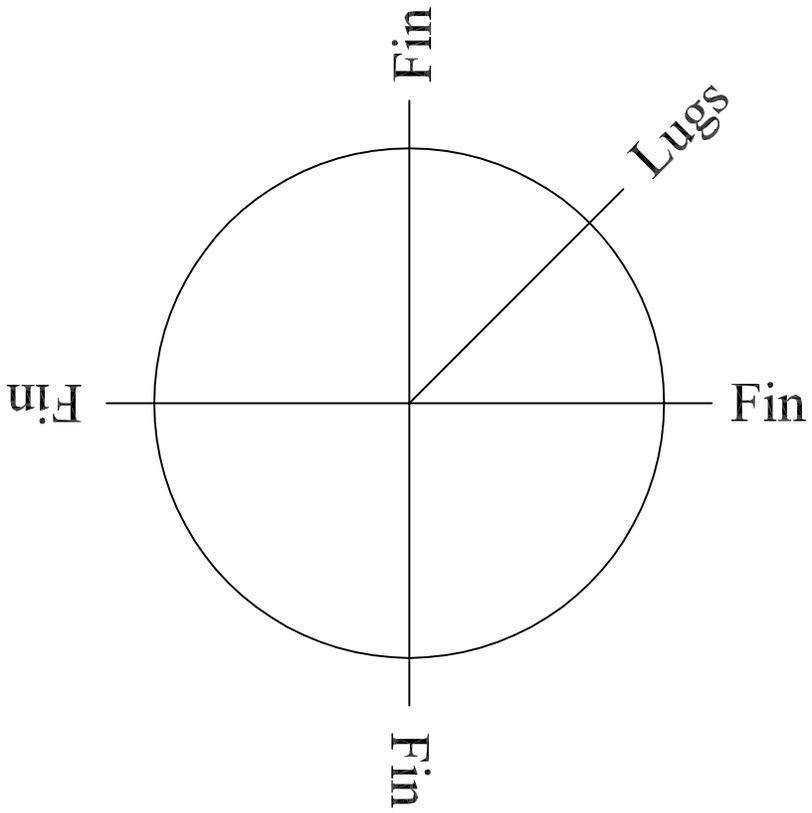


16. Finishing. This step is optional, but recommended. The standard paint scheme for the Nike Apache is outlined here. Fill in the spirals in the body tube.

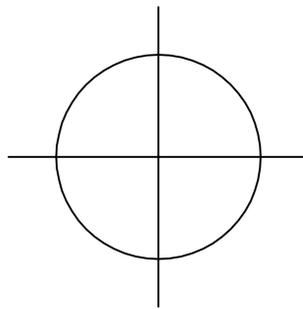
- 1 Coat the nose cone and fins with a sanding sealer to remove the grain of the wood.
- 2 Coat the inside surfaces of the forward end of the body tube and the aft end of the motor mount tube with thin CA. Sand until the motor and adapter fit. This will help increase the life of your kit.
- 3 Paint as follows:
 - a Nike body tube and transition: White.
 - b Apache fins and 29mm body tube: Aluminum.
 - c Paper centering ring transition: Black.
 - d Apache tube and nose cone: Silver-Grey.
 - e Upper 3/8" and lower 1" of Apache body tube wrap: Aluminum.
5. Decals:
 - a. Cut out the two "UNITED STATES" decals as close to the letters as possible.
 - b. The first "UNITED STATES" decal should be placed on the body tube 8 1/4" from the aft end, centered between two fins, reading "UP" the body tube.
 - c. The other one is placed on the opposite side of the body tube, reading "DOWN" the body tube.
 - d. The "Thiokol" decal should be placed on the Apache body tube, 12" from the forward end of the body tube, centered between two fins, reading "Down" the body tube. It should be in line with the "UNITED STATES" decal that is reading "UP" the Nike body tube.

11. Flying.

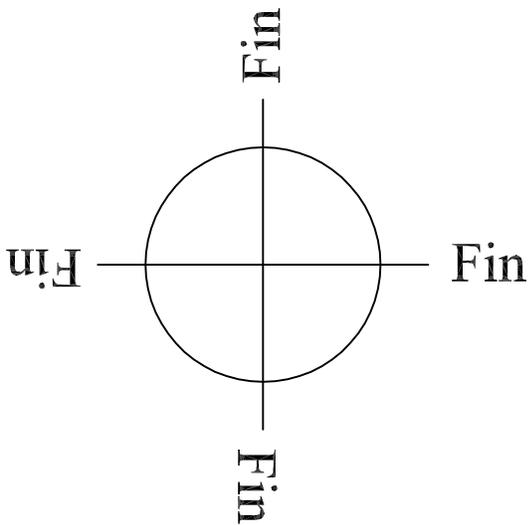
1. Insert recovery wadding and loosely pack the parachute. Install the transition.
2. Select a motor according to the most up-to-date recommended motor list available at <http://www.cosmodromerocketry.com>
3. Disposable motors:
 - a. Build up a thrust ring on the aft end of the motor using 1/2" masking tape. Wrap tape around the motor until it is at least as thick as the motor mount tube.
4. Reloadable motors:
 - a. Assemble the motor according to the manufacturer's instructions.
 - b. The thrust ring is built into the aft closure of the motor. No tape ring is needed.
5. Install the motor into the motor mount tube.
6. Slide the washer over the engine retainer.
7. Thread the nut on the engine retainer and tighten against the motor.
8. Install the igniter according to the manufacturer's instructions.



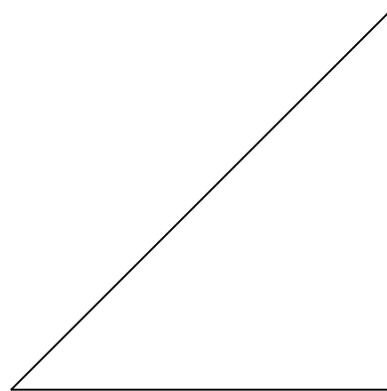
Nike Fin
Template



Apache Template



Apache Fin
Template



Antenna Template