

# NIKE-TOMAHAWK

## ASSEMBLY INSTRUCTIONS with Detail Sketches

### 1/8 scale

#### Skill Level 5

Flight Systems Inc. 1/8 scale model of Nike Tomahawk is an excellent flying rocket. Its fine detailing makes it one of the most beautiful scale models available. It is modeled after the Nike Tomahawk, a two stage solid-propellant, unguided sounding rocket. The first stage was a Nike Ajax motor manufactured by the military with a burn time of 3.5 seconds and an average thrust of 48,700 pounds. The second stage Tomahawk was manufactured by Thiokol Corporation. It had a burn time of 9 seconds and an average thrust of 10,000 pounds.

#### Specifications:

Single Stage  
 Length - 46"  
 Upper Body Dia. - 1.13"  
 Lower Body Dia. - 2.00"  
 Takeoff weight without engine:  
 4.43 oz. (124 g.)<sup>+</sup>

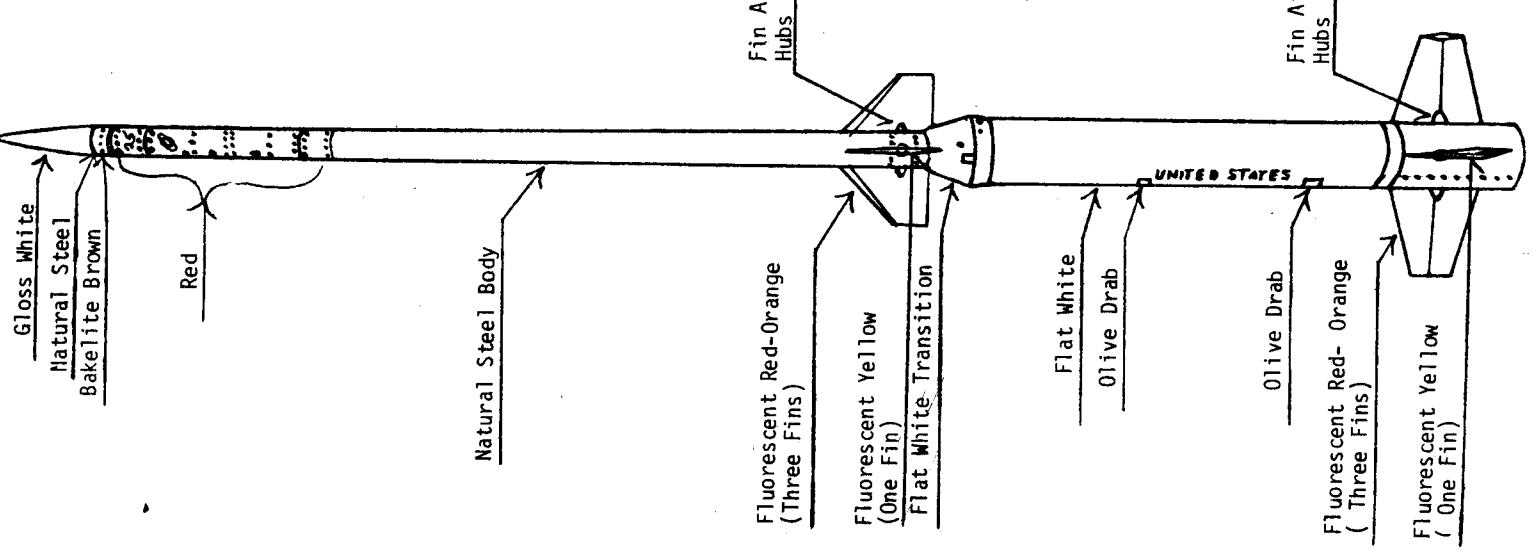
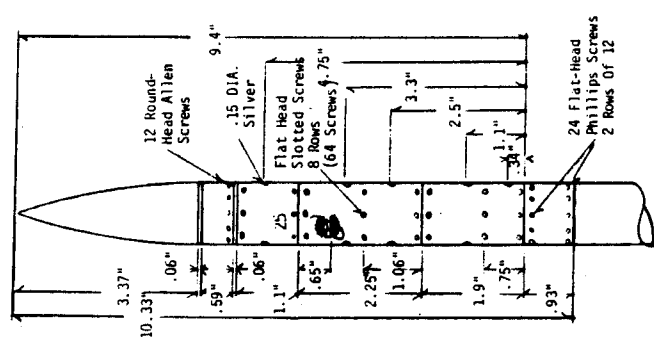
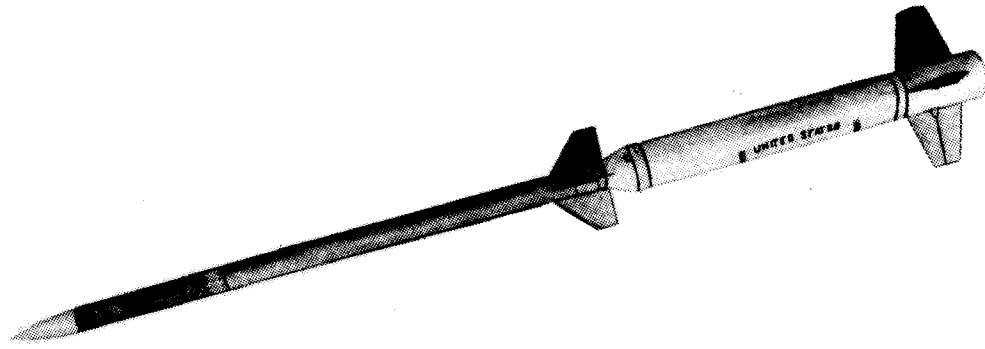
#### Recommended F.S.I. Engines:

E60-6, F100-6

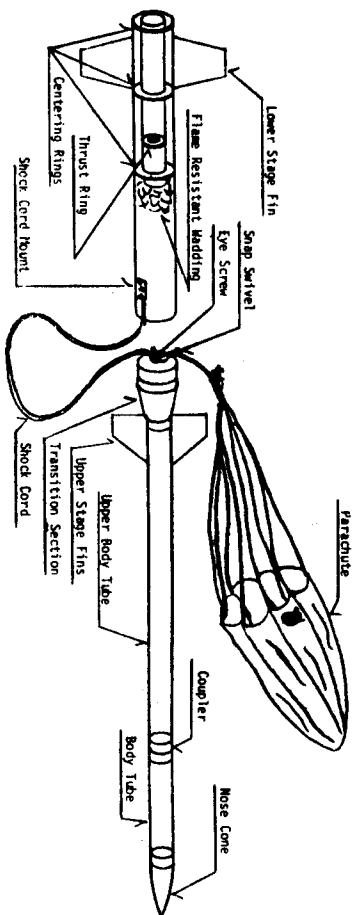
#### Catalog Number 1023



9300 EAST 68TH. STREET  
 RAYTOWN, MISSOURI 64133  
 816-566-2011



# NIKE-TOMAHAWK

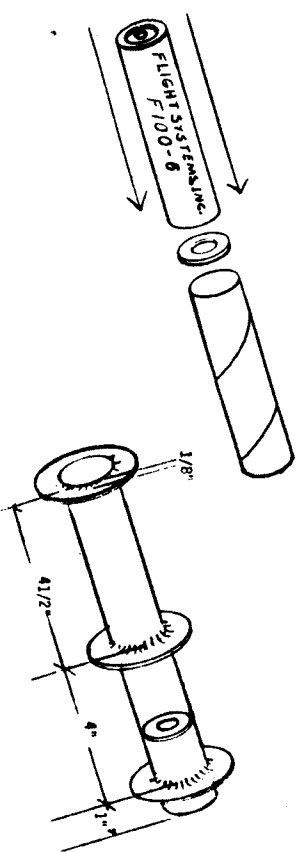


## PARTS LIST:

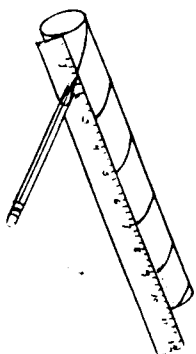
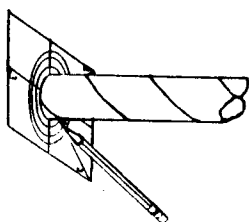
- |   |                                 |   |                     |
|---|---------------------------------|---|---------------------|
| 1 | 16 11/16" X 2" Lower Body Tube  | 1 | Thrust Rings (TR-2) |
| 1 | 18" X 1.13" Mid Body Tube       | 1 | Shock Cord (32")    |
| 1 | 6 9/16 X 1.13" Upper Body Tube  | 1 | Shock Cord Anchor   |
| 1 | Nose Cone                       | 1 | Mylon Parachute 22" |
| 1 | Transition Section (TS-1019)    | 1 | Eyescrew            |
| 4 | Lower Fins                      | 1 | Snap Swivel         |
| 4 | Upper Fins                      | 1 | 1/4" Launch Lug     |
| 1 | Coupler (SC-10)                 | 1 | Flameproof Madding  |
| 1 | Engine Holder Tube (9" X 1.13") | 1 | Decal Sheet         |
| 3 | Centering Rings (20F)           |   |                     |

## ASSEMBLY INSTRUCTIONS

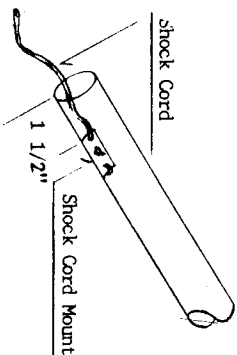
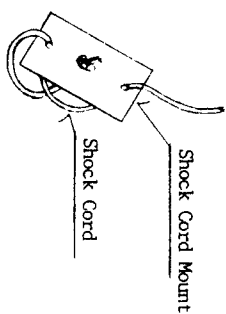
**Important:**  
Read through entire instructions before starting assembly. Check to be sure all parts are included. Test fit the parts together before applying any glue. If a part doesn't fit properly, sand or build up for precision fit. Please read each step before starting that step. Check off each completed step.



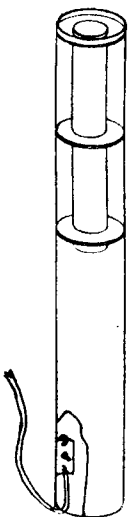
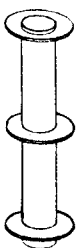
1. First determine which size F.S.I. engine you intend to use in your Nike-Tomahawk rocket (E60-6 or F100-6 is recommended). Locate the TR-2 thrust ring (1.13 O.D. fiber board ring) and the 9" X 1.13" I.D. engine holder tube. Next put a ring of glue inside of one end of the engine holder tube. Now using a F.S.I. 27mm engine push the thrust ring into the engine holding tube until the engine projects out of the end of the tube 1/2". Remove the engine. Install rings as pictured and glue in place. Apply a fillet of glue on each side of the rings as shown. Set aside and allow to dry.



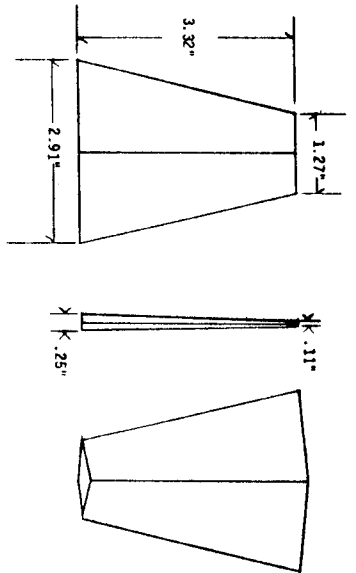
2. Using fin alignment guide mark lines on the large diameter (2.00") body tube for 4 fins as shown. Using a straight edge extend lines parallel to the body tube about 6".



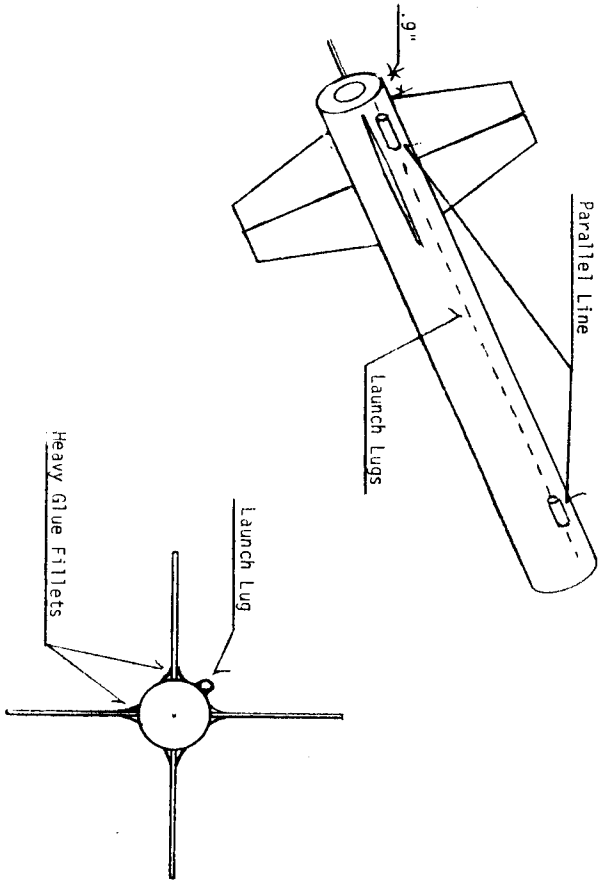
3. Install shock cord in shock cord mount as shown. Spread a heavy layer of glue over the side opposite the shock cord knot. Curve shock cord mount and insert into end opposite fin alignment marks. Drawing shows the proper position in the body tube.



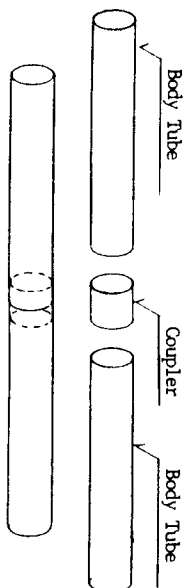
4. Install the engine mount unit. Be sure the engine mount will slide easily into the large body tube. (2" I.D.) If it is too tight, sand the ring until a precision fit is obtained. Apply a ring of glue inside the body tube. Insert the engine mount unit using one smooth motion until it is flush with the back of the body tube. **DO NOT STOP** pushing engine mount until it is in position or it will stick in the position in which you stopped. Be sure to insert engine mount in end of tube that you have previously marked for fin alignment.



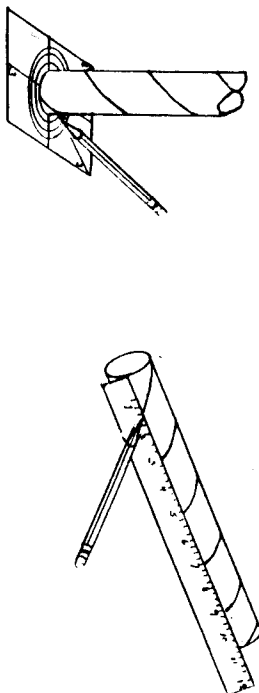
5. Sanding the fins for the booster section: If you are building your model to scale sand and shape fins as shown in the detailed drawing. For sport flying you may want to simply round the edges of the fins. If so round all edges except the red one. The red edge attaches to body tube.



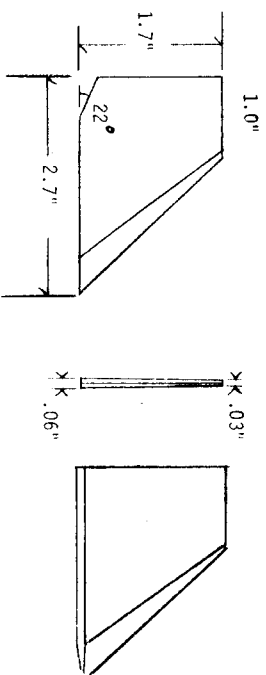
6. Attach the red edge of the fins to body tube. The fins should be placed on the tube so that their trailing edge is .9" from the back of the body tube. Be sure the fins stick straight out from the body tube and are carefully aligned with fin placement lines. Apply a line of glue to the launch lug and glue it centered between 2 fins and parallel with the body tube as shown above. Stand assembly on its forward end and allow to dry. When dry run 2 or 3 heavy glue fillets on both sides of the fins for added strength. After fillets dry, attach upper launch lug to the body tube 1" from the top of the tube (you may wish to extend a straight line from the bottom lug to the top of the tube to insure proper alignment of the lug as shown).



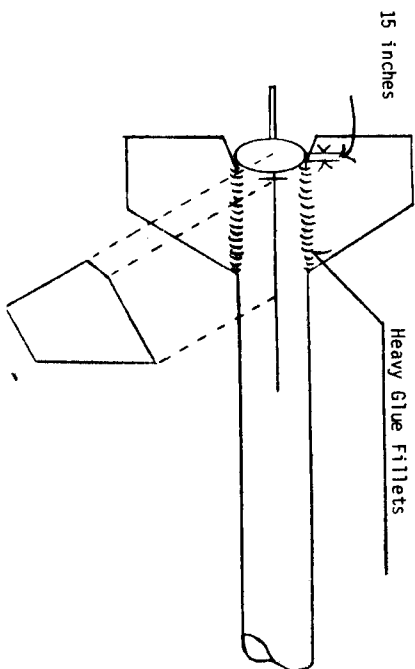
7. Locate SC-10 stage coupler (1.13" O.D.) and the 1.13" I.D. X 18" mid section body tubes. Place ring of glue inside one end of the 18" body tubes and slide coupler into the tube until it protrudes 7/8" out of tube. Then run a ring of glue inside the 1.13" I.D. X 6 9/16" body tube. Slide this over coupler end which is protruding from other body tube until the body tubes butt together. Roll assembly on table to assure proper alignment. Lay this assembly on a flat surface and allow to dry.



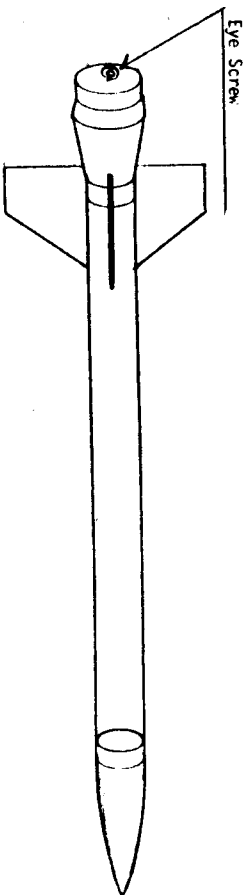
8. After the tubes have completely dried mark the end of the 18" X 1.13 I.D. tube with fin alignment marks as in step 2. Use the marks for 4 fins. Then use a straight edge to make parallel lines extending approximately 4" up the tube.



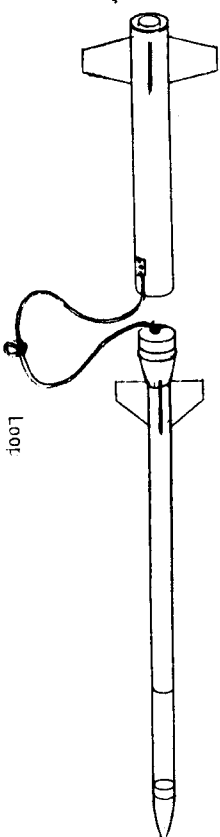
9. Sanding upper fins: For scale sand and shape fins as shown in the detailed drawing. For sport flying just round all edges of fins except the red one. The red edge attaches to the body tube.



10. Attach red edge of fin to body tube so that their trailing edge is .15" from the back of the tube. Carefully align fins on fin alignment marks and be sure they stick straight out from the body tube. Stand assembly on its front end and allow to dry. After the unit is dry, run 2 or 3 glue fillets on each side of each fin.



11. After the fins are dry glue the transition section in the end of the upper body tube as shown. Now twist the eyescrew into the center of the transition. A small amount of glue may be used to keep the eyescrew from coming loose. Attach the nose cone.



12. Tie a loop in the center of the shock cord and tie the free end to the eyescrew. Roll the shock cord up and push into lower body tube. Slide (DO NOT GLUE) the transition section into lower body tube.

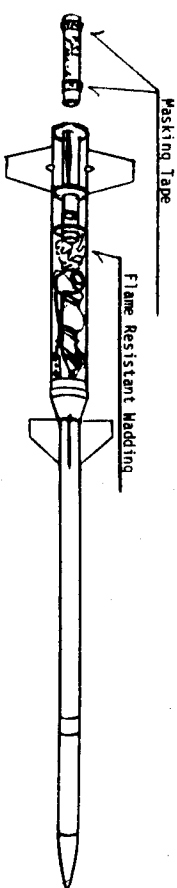
13. The rocket is now ready to paint and add decals. It is recommended that a light coat of paint be sprayed on and let dry. Add a couple more mist coats lightly sanding between them. Then apply a wet coat (gloss just appears) and set aside to dry. After model is completely dry, apply decals. Cut one decal at a time from the sheet and submerge in lukewarm water until decal will slide off of the paper (usually about 20 seconds). Gently slide decal onto rocket and carefully align and smooth out any wrinkles. Refer to back cover for scale detailing information.

### FLIGHT PREPARATION

1. Separate lower body tube from lower transition section. Tamp a piece of wadding down into the inside of the lower body tube until it comes in contact with the top of the engine holder tube.
2. Bring shroud lines of 2 1/2" nylon parachute together and tie into knot about 1" from shroud line ends. Leave 1 shroud line intact and cut the others off 1/4" below the knot. Now put a couple of drops of glue on the knot to insure it does not come loose during ejection. The snap swivel to shroud line that you left 1" long. Attach swivel to loop in shock cord from assembly step 13 as shown in cutaway view. Fold parachute. Insert shock cord first and then the parachute into upper end of lower body tube. Rejoin mid and lower sections.
3. Install engine using friction fit several wraps of masking tape are placed around the engine as shown to hold the engine in place. Insert F.S.I. engine until contact is made with the thrust ring. Be sure that engine fits tight enough that it will not come out of engine holder tube during ejection phase of flight.
4. Flight trim model for proper stability as follows.

Step A: Take an 8 to 10 foot string. Tie a loop in end of string. Place loop around rocket body tube and slide until a balance point (CG) is established. Tape loop to body tube at this point.

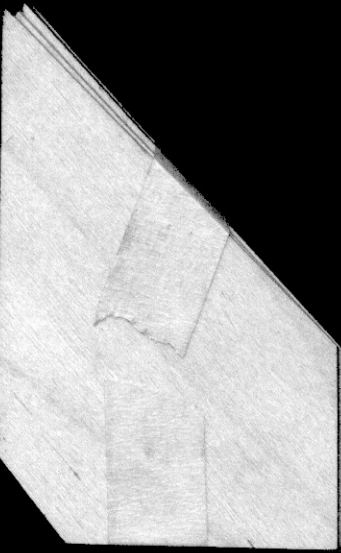
- Step B: Swing rocket overhead in a circular motion. A very stable rocket will point forward. It may be necessary to start rocket forward by hand if so questionable stability exists. Slide string back until a rocket nose tilts down at about 10° repeat test. If rocket proves unstable, this condition can usually be corrected by moving the CG forward by adding weight to the nose
5. Place rocket on the launcher insert the F.S.I. ignitor and attach the firing clips as shown in engine instructions.
  6. Go back to launch control and clear the area. Arm the launch control by inserting the phone jack attached to the firing line.
  7. Give count down 5-4-3-2-1, ignition.



Be sure to follow the #HIA-NAR Model Rocket Safety Code when carrying out your model rocket activities.  
 #HIA- Hobby Industry of America  
 #NAR- National Association of Rocketry



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