

# ***TALON 6***



## **INSTRUCTIONS**

Revision A

GIANT LEAP ROCKETRY, INC. & KB KITS, LLC

[www.giantleaprocketry.com](http://www.giantleaprocketry.com) <http://www.giantleaprocketry.com>

6061 HIBISCUS DR BATON ROUGE, LA 70808 Ph 225 9564-0325

# GIANT LEAP ROCKETRY, INC.

**THANK YOU AND CONGRATULATIONS ON PURCHASING THIS PRODUCT.**

We at Giant Leap Rocketry, Inc. hope you enjoy building the best looking and best flying rocket on the flying field. The **Talon 6** is the flagship of the Talon fleet. It's stylish and commands attention. The **Talon 6** can attain over 8,500 feet on either the Aerotech M1315 or Cesaroni M1400 for spectacular level-3 flights. The center of pressure (CP) is 89.5" from the tip of the nosecone. Be certain your center of gravity (CG) is one to two diameters (6" to 12") in front of the center of pressure with 1.5 diameters being ideal. All measurements need to be done with a "full-up" rocket (including motor, recovery components and any electronics).

## **SPECIFICATIONS:**

Length: 124"

Diameter: 6.0"

Dry weight: 25lbs (fiberglass). Full up weight with motor, chute & electronics: Approx 42.5lbs.

Motor mount: 75mm

Recommended parachute sizes:

**Drogue parachute,**

Giant Leap Rocketry TAC-9 Drogue or TAC-1 36"

**Main parachute,**

Giant Leap Rocketry TAC-9C (TAC-9B can be used if the rocket is flown near sea level and is built especially light). In addition a Giant Leap Rocketry Parachute Slider is recommended to help reduce the shock of parachute inflation.

Recommended 75mm motors: Aerotech M1297, M1315, M1850 or Cesaroni M1400

## **Be sure to see our other Talons!**

# WARNING!!

Flying rockets is potentially dangerous, and you or others can be injured and/or killed by the usage of this product. Property damage can also occur by the usage of this product.

In using this product, you agree to comply strictly with all safety codes of the Tripoli Rocketry Association and the National Association of Rocketry, as well as all local, State and Federal laws. By using the product, you agree that Giant Leap Rocketry, Inc. and KB Kits, LLC, will not be held legally or financially responsible for the correct or incorrect usage of this product. If you do not agree with these statements, return the kit in resalable condition to Giant Leap Rocketry for a refund. Opening this kit states that you have read, understand and accept these conditions.

**PLEASE READ THE SAFETY CODE AND LIABILITY STATEMENTS AT THE END OF THESE INSTRUCTIONS. IF YOU HAVE ANY QUESTIONS OR ARE UNCLEAR REGARDING THE ASSEMBLY OF USE OF THIS PRODUCT, PLEASE CALL GIANT LEAP ROCKETRY, INC.**

You are totally responsible for the safe usage of this rocket. Follow all pertinent safety codes and directions at the launch site. Always wear eye protection whenever loading ejection charges of any type and keep spectators away. Make a checklist to help you prepare your rocket properly so as not to overlook an important step during the excitement and stress of pre-flight preparations. If you do not feel ready to fly this or any other rocket, DON'T. Take your time and do it safely and correctly.

**REMEMBER, THE FUTURE OF THIS HOBBY ALONG WITH THE SAFETY OF THOSE AROUND YOU IS IN YOUR HANDS.**

## **Parts included in this kit:**

- 1 – Fiberglass nosecone with sanded seams
- 1- 3.9” bulkhead with pre-mounted u-bolt for insertion in nosecone
- 3ft- of 2” elastic
- 1 – Fiberglass tail-cone with sanded seams at 7”-9” inside
- 3 – Small aft composite fins (with sufficient edging material to finish the fins)

- 3 – Large forward composite fins (with sufficient edging material to finish the fins)
- 1 – 6.0” x 42” phenolic airframe (fiberglass if ordered)
- 1 – 6.0” x 30” phenolic slotted airframe (fiberglass if ordered)
- 1 – 3.0” x 48” phenolic motor tube
- 1- 3.0” x 12” phenolic motor tube extension
- 1- 3.0” x 6” phenolic outside coupler (split lengthwise)
- 1 – 6.0” x 16” double walled phenolic coupler with inner coupler 13” long (6”x 16” fiberglass single walled coupler for fiberglass kit)
- 1 – 3.0” body bulkhead
- 1 – 75mm threaded Slimline Starter Kit
- 1 – 1/2” x 14’ Tubular Kevlar
- 1- 6.0” coupler centering ring (two c-rings together) assembly with two pre-mounted u-bolts and two extra 1/2” holes
- 1 – 6.0” x 3.0” centering ring (two centering rings together) assembly with two pre-mounted u-bolts
- 1 – 6.0” x 3.0” centering ring with two 1/2” holes drilled in each
- 1- 3.9” Giant Leap Rocketry Phenolic Av Bay
- 2 - 5.5” x 3.75” x 1/4” plywood board with rounded ends for electronics bay caps with one 1/4” hole and two 5/15” holes
- 4 – 5/16” quick-links
- 4 – 1/4” x 20 stainless steel pan-head machine screws
- 2- av-bay collar assemblies (each with one 6.0” x 3.9” center ring, one 6.0” x 3.9” coupler centering ring, two u-bolts, two threaded inserts and attached Kevlar bridle)
- 1- 3.9” x 8” phenolic body tube
- 1- Brass tube 1/4” x 2”
- 1 – 1/2” x 25’ Tubular Kevlar Shock-loop
- 1 – 1/2” x 25’ Kevlar Shock-loop assembly with 6”x 5” piston and 1/2” hole drilled in bulkhead
- 1 – Talon6 decal
- 1- Package with scrap piece of fin material and short piece of edging for practice purposes
- 3 – Rail buttons, screws and nylon spacers
- 4 – Plastic spoons for fin fillet and decal application
- 24 – feet EZ Glass Sock (for phenolic airframe version only)
- 1 – Set of instructions

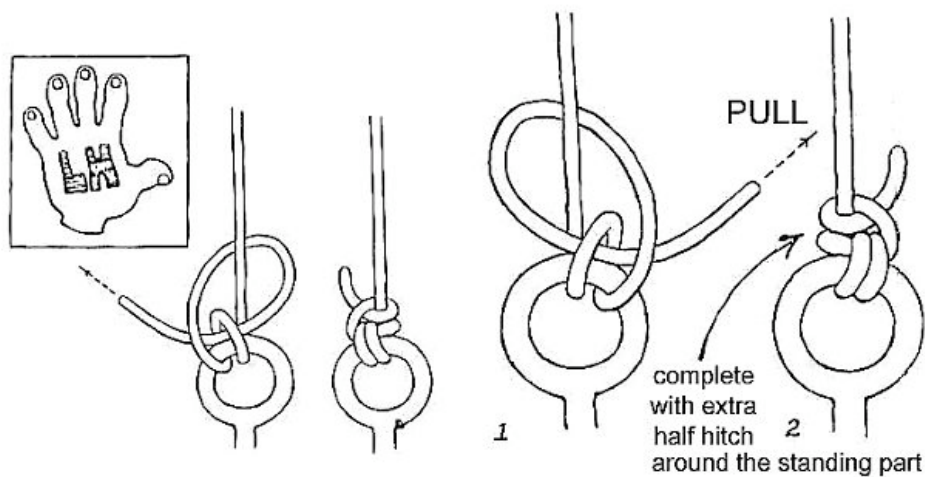
## **SUPPLIES NEEDED BY THE BUILDER TO COMPLETE THE TALON 6**

JB Weld & High-grade adhesive epoxy, Aeropoxy ES6209 recommended  
 CA glue  
 Wax paper & Disposable glue brushes

Ruler and tape measure, paper towels and masking tape  
Cleaning fluid (acetone or rubbing alcohol)  
Drill with bits  
Marking pen or pencil and disposable protective gloves  
Fiberglass and Carbon Fiber-cloth reinforcement material  
Chopped 1/32" fiberglass fibers  
High-Grade Laminating resin, Aeropoxy PR2032 resin and PH3660 hardener recommended  
Small wood sticks or tongue depressors  
Expanding Mega Foam  
quarter sheet electric sander  
Assortment of sandpaper: 60, 120, 180, 220, 320 and 400 grit  
Xacto type razor saw

**BEFORE YOU BEGIN**, confirm that all the parts are included in this kit. Also, be certain you have all the supplies needed by the builder to complete the Talon 6. **AND FINALLY, YOU MUST READ AND UNDERSTAND THE INSTRUCTIONS ENTIRELY BEFORE BEGINNING.**

**NOTE: Please use this knot diagram for reference when required to tie and knot.**



# TALON 6 ASSEMBLY INSTRUCTIONS

## ASSEMBLY OF MOTOR MOUNT TUBE

Please locate the following items:

- One 48" x 3.0" phenolic tube
- One 12" x 3.0" phenolic tube
- One 6" x 3.0" outside coupler tube with split lengthwise
- One 75mm Threaded SlimLine Starter System
- One 3.0" x 1/4" bulkhead
- One 6.0" x 3.0" coupler centering ring with two extra 1/2" holes
- One 6.0" x 3.0" coupler centering ring assembly with two pre-mounted u-bolts



**IT IS VERY, VERY IMPORTANT THAT YOU ARE NEAT AND DO NOT ALLOW ANY EPOXY RUNS OR SLOPPINESS ANYWHERE DURING THIS OR ANY OTHER PHASE OF CONSTRUCTION**

Begin by mounting the 75mm Slimline motor retainer on one end of the 3.0" x 48" phenolic tube as per the enclosed instructions in the Slimline kit. Please use JB Weld for attachment and allow curing.

Next, locate the 6" x 3.0" centering ring assembly with two pre-mounted u-bolts. **WITHOUT BONDING THE CENTERING RINGS TOGETHER**, slide the assembly

(with finger tight u-bolts) down the motor tube **U-BOLT LOOP ENDS POINTING AWAY FROM THE SLIMLINE UNTIL THE CENTERING RINGS ARE 21" TO THE CLOSEST PART OF THE PREVIOUSLY MOUNTED SLIMLINE RETAINER.**

Take a marking pen and make a circular mark on the motor tube on both sides of the centering ring assembly. Next, temporarily move the assembly approximately six inches back up the tube away from the Slimline. Loosen the u-bolts (but do not remove) and spread a thin layer of epoxy between the two centering rings and bring together by securely tightening both u-bolts. **BEFORE THAT EPOXY HAS TIME TO CURE**, epoxy this centering ring assembly into place on the motor tube (between the previously made marks) securely using a generous amount of epoxy.

**BE CERTAIN THIS ASSEMBLY IS "SQUARE" TO THE MOTOR TUBE AND USE TAPE TO HOLD IN POSITION.**

**THIS IS A CRITICAL JOINT AND MUST BE STRONG.** BE CERTAIN THIS ASSEMBLY IS 21" TO THE VERY CLOSEST PART OF THE PREVIOUSLY MOUNTED SLIMLINE. Be sure you place epoxy on all mating surfaces and have fillets on both sides of the centering rings. **ALLOW THIS JOINT TO CURE WITH NO EPOXY RUNS!** Also place a small drop of epoxy on the exposed u-bolt threads. Be certain there is no excess epoxy on the motor tube where it shouldn't be.

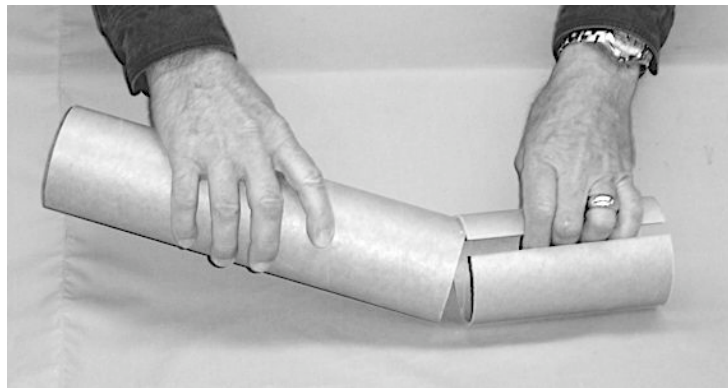
Locate the 6" x 3.0" centering ring with two extra 1/2" holes in each, and slide onto the forward end of the motor tube (away from the Slimline end) **PLACING THE CLOSEST PART OF THE CENTERING RING EXACTLY 4.25" FROM THE FRONT OF THE MOTOR TUBE.** Place a circular mark around the motor tube, on both sides of the centering ring. **BEFORE YOU USE ANY EPOXY**, make sure that the small 1/2" holes will be in a **STRAIGHT-LINE BACK** to the u-bolts mounted in the previous step,



Apply a generous amount of epoxy onto the motor tube between the previously made marks. Push the centering ring into the ring of adhesive, and tape into place square to the motor tube, **CHECKING ALIGNMENT OF THE SMALL HOLES TO THE U-BOLTS BELOW, THAT THEY ARE IN A STRAIGHT LINE.** Also be sure there are no epoxy runs. After epoxy has cured, apply epoxy fillets to both sides of this ring/body tube joint, set aside the entire assembly and allow curing.

After the centering ring is cured into place with fillets on both sides, apply a **THIN AMOUNT OF EPOXY** inside of the two 1/2" holes. **DO NOT CLOSE THE HOLES!** You are only coating the interior of these openings to prevent chafing of the soon to be mounted Kevlar cord. Allow curing.

Locate the 12" x 3.0" phenolic tube and 6" x 3.0" split outside coupler. You are now going to take the previous 48" motor tube and extend it 12" by sliding the split coupler over the **OUTSIDE** of the 3.0"x 12" extension.



Now butt the extension to the 48" x 3" motor tube end opposite of the Slimline retainer. Slide the split coupler over the joint of the two tubes until the coupler is equal in length on both sides of the joint.

Now apply a small amount of epoxy to the gap (split) area exposed by the coupler. Rotate the split coupler to distribute epoxy to all mating surfaces on both the 48" and 12" tube. **BE CERTAIN NO EPOXY MIGRATES INSIDE THE MOTOR TUBE OR THE EXTENSION. BE CERTAIN THAT BOTH TUBES ARE IN LINE WITH EACH OTHER AND ALLOW TO CURE.**

You have the **OPTION** now of mounting the 3.0" bulkhead inside of the motor tube. If you choose to do so, epoxy inside of the just completed motor tube opposite of the Slimline motor retainer (inside the 12" extension).

## ASSEMBLY OF COUPLER SECTION

Please locate the following items:

One 16" double wall phenolic coupler (or fiberglass coupler for fiberglass kit)

One centering ring assembly with two centering rings, two pre-mounted u-bolts and two extra 1/2" holes

One 1/2"x 14' tubular Kevlar cord



If you purchased the phenolic kit version, you will have a double wall coupler. There is a split, shorter coupler inside the solid, slightly longer outside coupler. Remove the inside coupler and squeeze it together reducing the diameter as much as possible without breaking. Use tape to hold this smaller diameter. You have a choice of either simply laminating the two couplers together or adding a piece of fiberglass or carbon fiber cloth between the two. Whatever you choose, you need to apply either epoxy adhesive or epoxy laminating resin to bond the two couplers together. You will insert the smaller coupler inside the outer, cut the tape and allow it to expand. After you have joined the two couplers together **BUT BEFORE THE EPOXY CURES**, SLIDE THE INSIDE COUPLER SO THERE EQUAL SPACE BETWEEN THE TOP AND BOTTOM IN RELATION TO THE OUTSIDE COUPLER. Remove all resin and/or cloth reinforcement from these areas of the outside coupler where it is not doubled. **IT IS CRITICAL YOU DO THIS!** Later in the construction of your rocket, you will be mounting the coupler c-ring assembly inside this recess. **BUT NOT AT THIS TIME.** After the unit has cured, clean up any exposed cloth reinforcement, if any was used.

If you have a fiberglass coupler, ignore the above instructions.

Locate the coupler and centering ring assembly. With the u-bolts on the c-ring assembly finger-tight, be certain that this assembly will fit inside one end of the coupler so 1/4" of coupler is above the c-ring assembly, AND THE LOOPS OF THE U-BOLTS ARE PROTRUDING OUTSIDE OF THE COUPLER.



If satisfied, remove the c-ring assembly and loosen (not remove) the u-bolts so you can spread a thin layer of epoxy between the c-rings, tighten the u-bolts and confirm that the assembly will still slide inside of the coupler.

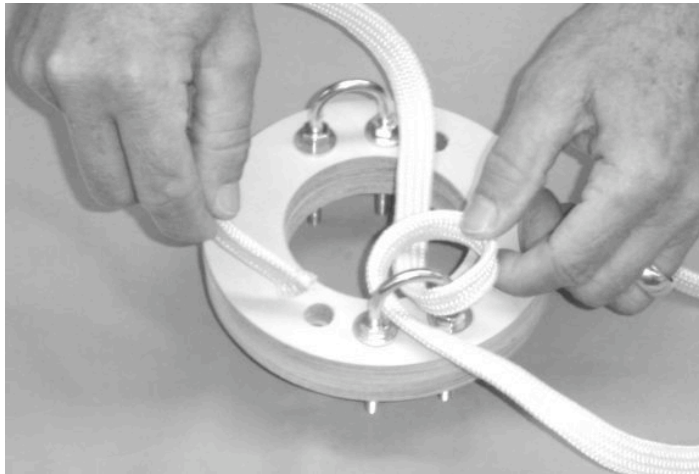


If not, loosen the u-bolts and adjust the c-rings until the assembly will fit inside the

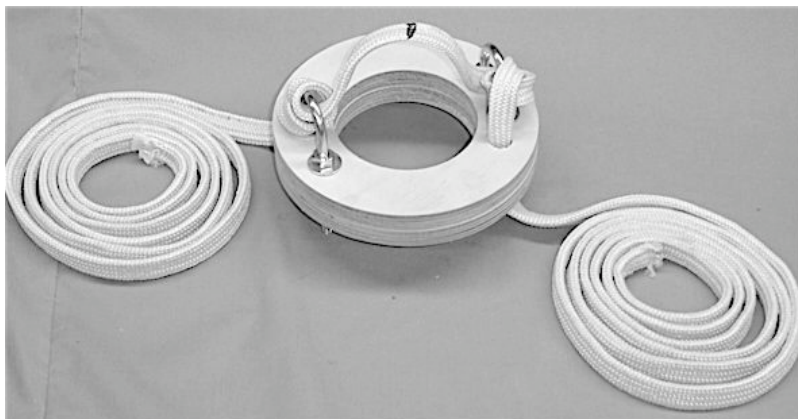
coupler properly. **BE CERTAIN BOTH U-BOLTS ARE TIGHT AND YOU PLACE A DROP OF EPOXY ON THE THREADS. DO NOT EPOXY THE C-RING ASSEMBLY INSIDE THE COUPLER AT THIS TIME.**

Next, “paint” a thin coating of epoxy inside the two 1/2” holes drilled in the c-rings. **DO NOT PLUG THE HOLES!** You only want to coat (and smooth) the inside surfaces.

This will help prevent “chafing” of the Kevlar cord to be mounted in the next step. Set aside to cure completely.



With the Kevlar cord, find and mark the center point. Take the finished c-ring assembly and with one end of the Kevlar cord, **LOOP AROUND AND THROUGH ONE U-BOLT** and continue by inserting through the 1/2” opening adjacent to that u-bolt. Pull several feet of the cord through that opening. Now take the other end of the Kevlar cord and repeat the same procedure with the other u-bolt, 1/2” opening and pull through until the center point on the cord is in-between the two u-bolts.



DO NOT EPOXY THE C-RING ASSEMBLY INSIDE THE COUPLER AT THIS TIME.

## **ASSEMBLY OF NOSECONE, INSTRUMENT BAY AND UPPER AIRFRAME**

Locate the following items:

Fiberglass nose cone

One 3.9" bulkhead with attached u-bolt

One brass tube 1/4" x 2"

Three feet of strap elastic

One 6.0"x 40" phenolic airframe (or fiberglass if ordered)

Two 6.0"x 3.9 av-bay mounting collar assemblies (each includes one each body and coupler centering ring with two attached u-bolts, two threaded inserts and one Kevlar bridle)

One 3.9"x 8" phenolic tube

Two 5.5"x 3.75" rounded corner plywood endplates

One Giant Leap Rocketry 3.9" Av Bay

Four 1/4" x 20 stainless steel pan head machine screws

One 1/2" x 25' Kevlar Shock loop and piston assembly

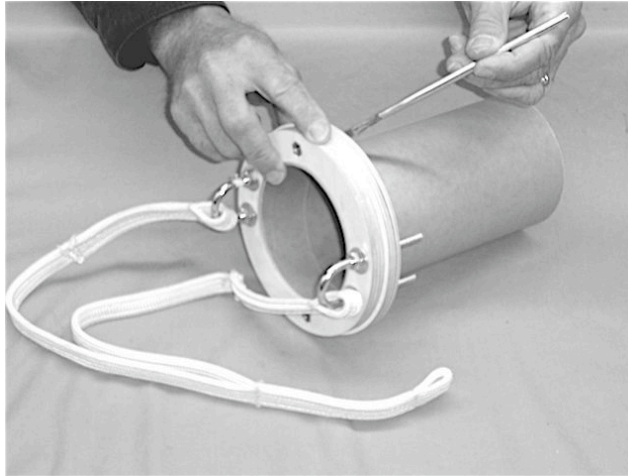
Two 5/16" quick links



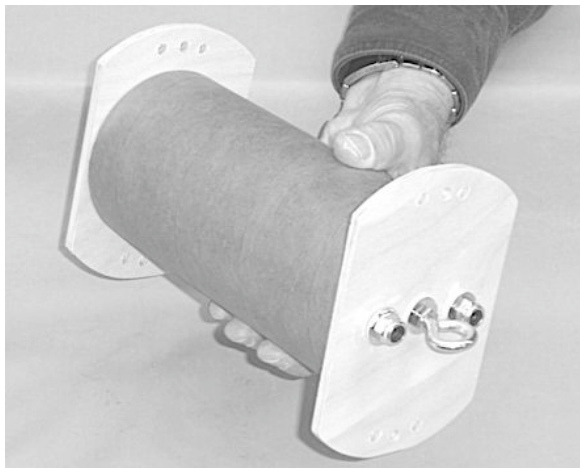
Locate the two av-bay mounting collar assemblies and the 3.9"x 8" phenolic tube.

Loosen, but don't remove the u-bolts or change the sequence of the assemblies, separate

the centering rings and apply epoxy sparingly between both centering rings on each mounting collar. Re-tighten the u-bolts, clean up excess epoxy and be certain the rings are centered one to the other and will slip over the 3.9"x 8" phenolic tube. **BE CERTAIN NO EPOXY MIGRATES INTO THE THREADED INSERTS OR THE KEVLAR BRIDLE.** Take that collar assembly and epoxy to one end of the 3.9"x 8" phenolic tube **U-BOLTS FACING AWAY FROM THE TUBE** so the end of the tube is **FLUSH** with the centering ring containing the threaded inserts. Only epoxy one of the collar assemblies on at this time, set aside and allow curing.

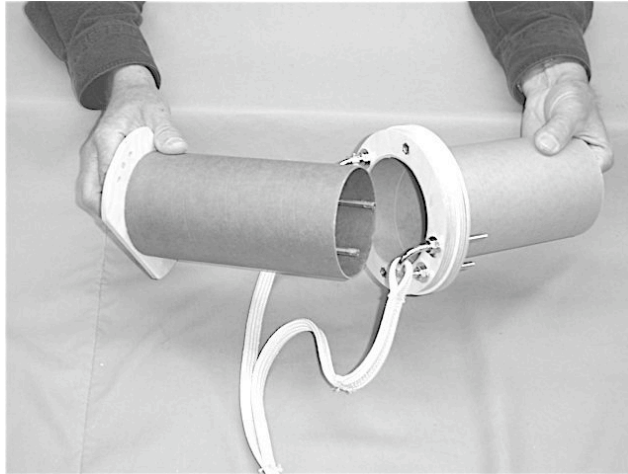


Find the av-bay kit and the two rounded corner plywood endplates. First, open the av-bay kit and remove the two larger body bulkheads and set aside. You will **NOT** use them. Instead the rounded corner endplates will be substituted. Assemble that kit per the included instructions so the rounded corner endplates are oriented the same direction on either end of the av-bay.

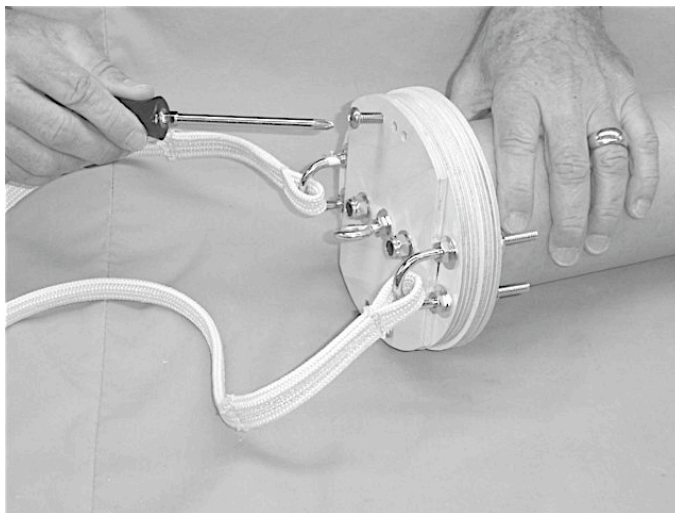


Temporarily remove one of the rounded corner endplates (wing nut side) and insert into

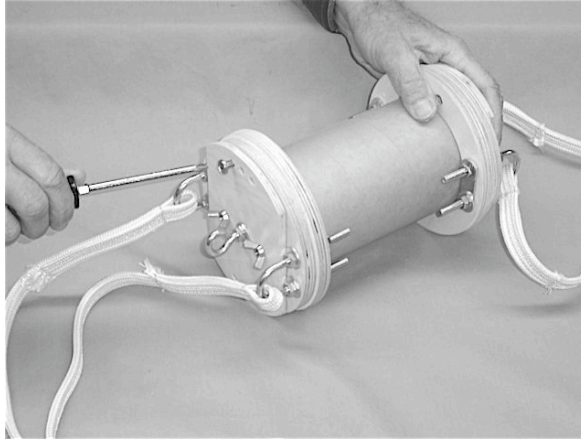
the partially assembled av-bay holder by inserting the end of the av-bay kit (end without the covering endplate first) into the 3.9"x 8" tube that **HAS** the collar assembly already mounted.



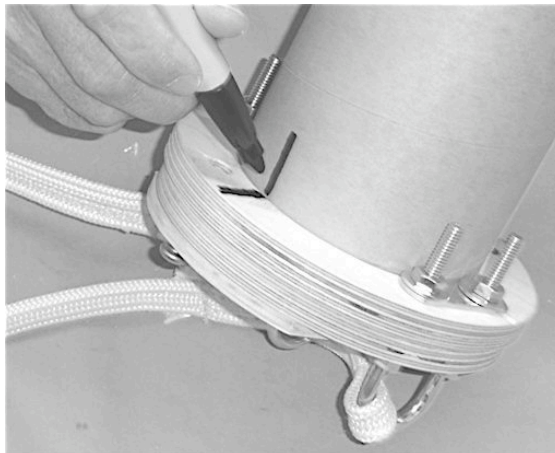
Line up the two holes in the endplate with the two inserts mounted in the collar assembly and install the two machine screws finger tight.



**DO NOT USE ANY EPOXY YET.** Slide the second collar assembly onto the opposite end of the 3.9"x 8" tube with the u-bolts again facing outward followed by the rounded corner endplate over the av-bay all-threads. Re-attach the av-bay wing nuts onto the all-threads and rotate the loose av-bay collar so you can attach and finger tighten the two machine screws through the rounded corner endplate into the inserts found in the mounting collar.



**DO NOT USE ANY EPOXY YET.** Place a witness mark from the 3.9"x 8" tube to the yet un-attached collar assembly so you can line up the collar properly when attaching it permanently.

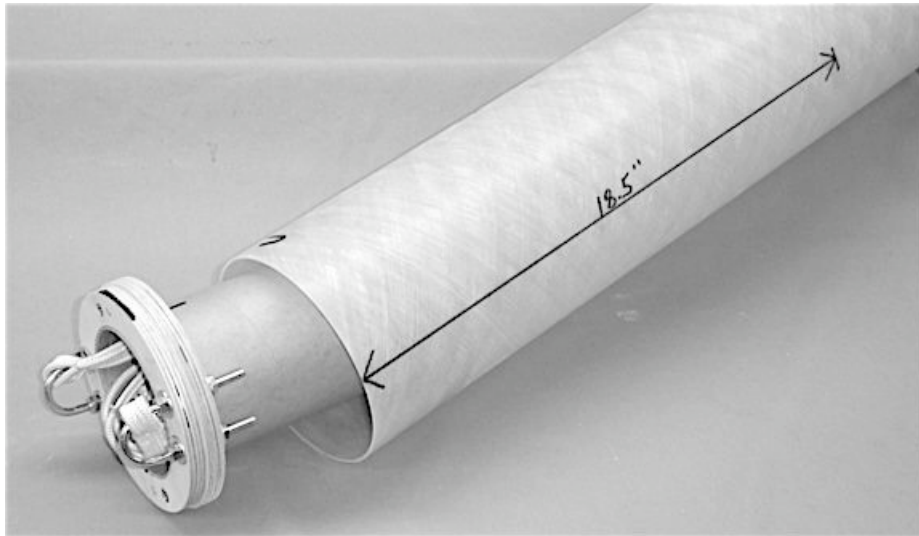


Now remove ALL four machine screws from both ends of the assembly and REMOVE THE AV-BAY. Remove the still un-attached collar assembly and LOOSEN ONLY the u-bolt nuts and apply a THIN coat of epoxy between the two centering rings. Re-tighten the u-bolt nuts making sure the 3.9"x 8" tube will still slide into the rings. **BE CERTAIN NO EPOXY MIGRATES INTO THE THREADED INSERTS OR THE KEVLAR BRIDLE.** Attach this collar onto the tube in the same manner as done previously **BEING CERTAIN THE PREVIOUSLY MADE WITNESS MARKS LINE UP, AND NO EPOXY MIGRATES TO THE THREADED INSERTS, KEVLAR BRIDLES OR INSIDE OF THE 3.9"X 8" TUBE.** Set aside to cure.

When done, go back and make certain all the u-bolts are tightened securely with a drop of epoxy on the threads to lock them into place. Apply epoxy fillets to the joints where the inside of both collars contact the tube. **THIS IS A CRITICAL, CRITICAL, CRITICAL JOINT. SHOULD THIS FAIL YOU WILL LOOSE YOUR**

**ROCKET.** When all epoxy has cured, insert the av-bay back into the “holder” to confirm all attachment points line up. Upon confirmation, remove the av-bay from the holder, stuff the Kevlar bridles inside the tube and go to the next step.

With the above holder and the upper airframe section, insert the holder into the upper airframe 18.5” from one end and place a mark around the inside of the airframe next to the av-bay holder.



**WITHOUT MOVING THE HOLDER**, make a mark around the inside of the airframe next

to the other end of the av-bay holder. Now remove holder from airframe. You are now going to place a ring of epoxy, one inch wide, on the **INSIDE** of each mark you drew inside the airframe. Insert the av-bay holder inside the airframe (it doesn’t matter which way) until it is in position **INSIDE OF BOTH MARKS** drawn previously.

**IMMEDIATELY, WIPE UP EXCESS EPOXY, BEING CERTAIN NONE GETS ON THE KEVLAR BRIDLES OR THREADED INSERTS.** Let the airframe lay on its side occasionally rolling to prevent the epoxy from “pooling”. **REMOVE ALL EXCESS EPOXY.** Allow to cure.

Standing the airframe on one end, apply a small epoxy “fillet” to the av-bay holder/airframe joint allowing epoxy to run into the thin gap between the smaller outside centering ring to the larger interior ring. **BUT NOT ON THE FACE OF THE SMALLER CENTERING RING! DO NOT ALLOW ANY EPOXY TO MIGRATE TO THE THREADED INSERTS OR INTO THE 3.9” INTERIOR TUBE.** Allow that fillet to cure. When completed, reverse the tube and re-do the same procedure preventing any epoxy runs and allow curing.

Now, remove the Kevlar bridles from the interior tube. Insert the wing-nut end (minus

the wing-nuts and cap) of the av-bay into the av-bay holder. You have the option of inserting it in which-ever end of the airframe that you prefer. Rotate the av-bay until the rounded end cap lines up on the opposite side allowing you to insert the machine screws into the threaded inserts. Replace the second end cap, insert the machine screws and run the wing nuts back onto the all-thread.



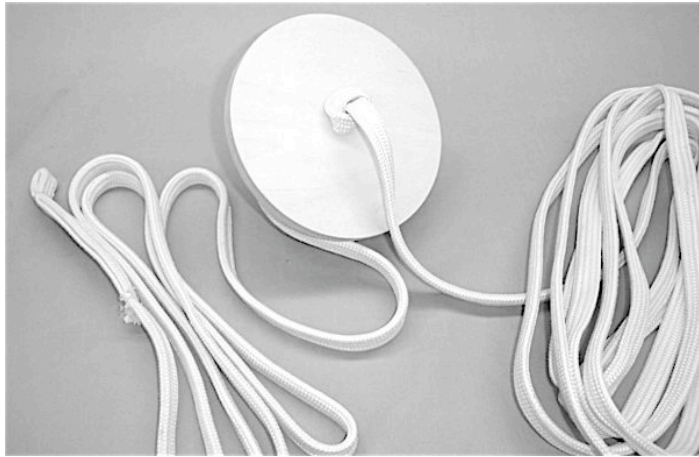
**NEVER PERMANENTLY MOUNT THE AV-BAY INSIDE OF THE HOLDER.** It is designed to be removable for your ease of use. **NEVER, EVER ATTACH YOUR RECOVERY HARNESS TO THE EYEBOLT ON THE ELECTRONICS BAY. THAT EYEBOLT IS ONLY A KNOB TO REMOVE THE TRAY AND CANNOT ACCEPT THE STRAIN OF RECOVERY EQUIPMENT ATTACHMENT.** Instead, your recovery harnesses will connect to the Kevlar bridles.

Upon completion of the av-bay section installed in the airframe, it will be necessary to drill a “static port” (hole to permit the air pressure to fluctuate in the electronics section for altimeter readings) into the electronics area. The opening should be 1/4” in diameter **THROUGH THE AIRFRAME ONLY AT THIS TIME!** Place wide masking tape on all sides around this opening and have a large number of paper towels available for the next step. Mix a small amount of two-part foam (no more than one ounce total per each attempt) and pour into the outside airframe static port opening and fill the cavity between the airframe and the interior 3.9” tube, **DO NOT OVERFILL OR YOU WILL CRACK THE AIRFRAME OR THE INTERIOR TUBE AND WIPE UP ALL EXCESS FOAM ON THE OUTSIDE OF THE AIRFRAME BEFORE IT HARDENS.** After the foam has hardened and totally filled the cavity in-between, re-drill the static port opening and continue drilling through the interior phenolic tube into the interior av-bay. Smooth the foam passageway between the nosecone and the interior av-bay and remove all tape from the airframe. Locate the 1/4” x 2” brass tube and insert into the just completed opening checking for size. When satisfied with the fit, remove,

roughen and apply a small amount of epoxy to the exterior of the brass tube and the wall of the foam passage-way. Insert into position **BEING CERTAIN THE BRASS TUBE DOES NOT INTRUDE INTO THE 3.9"X 8" INTERIOR TUBE.** When the brass tube has cured permanently into position, it will be necessary to cut away the excess tube protruding from the airframe so it is "flush" with the airframe.

Locate the 1/2"x 25' Kevlar Shock loop and piston parts. First, take the Kevlar shock loop and thread through the hole drilled in the bulkhead. Pull eight to ten feet of cord through and tie a knot, **AS CLOSE AS POSSIBLE, ON BOTH SIDES** of the bulkhead hole that will prevent the piston from moving one way or another on the Kevlar cord.

**DO NOT FILL OR EPOXY THE OPENING, TO DO SO WILL MAKE THE KEVLAR BRITTLE AND AT RISK OF BREAKING UNDER STRESS.**



Thread the 6"x 5" phenolic coupler through the Kevlar shock loop and epoxy the bulkhead into place on one end of the 6"x 5" coupler **SO THE LONGER LENGTH OF KEVLAR SHOCKLOOP EXTENDS OUT THE OPEN-COUPLER SIDE OF THE PISTON.**



Locate the 3.9" bulkhead with loosely attached u-bolt. Remove the u-bolt and slip it through the above sewn Kevlar loop end found on the **LONGER SIDE** of the shock cord and permanently re-attach to the 3.9" bulkhead. Using that bulkhead, epoxy into the nosecone as far as it will go. Be certain to mount it well because should it fail, your nosecone will be lost. Do not allow epoxy to get on the Kevlar shock cord.



Using a 5/16" quick link, connect the loose end of the above Kevlar shock loop (with piston connected to the nose cone) to the Kevlar bridle found at the av-bay holder, 14"-15" inside of the upper airframe.

Because of customer requests for the Talon 6 to be dual deployment yet keeping the size of the rocket the same, an unusual technique must be employed to provide adequate space for the main parachute. It will be necessary for at least some of the parachute to be packed inside of the nosecone (it is recommended that a deployment bag be used to prevent snagging of the chute). To help facilitate that the nosecone and parachute separate from one another at the required time, three feet of 2" wide elastic strap has been included to be cut and epoxied inside of the nose cone as shown in the following photo. This will assist the event to occur.



**Because of the wide variety of parachutes available and the amount of room required to pack them, instructions on where in the nosecone and the amount of elastic needed for the proper stretch can only be determined on-site by the builder. In addition, it is also recommended that shear pins be employed to hold the nose cone and the upper airframe together as (hopefully) the elastic will be continuously trying to force the nosecone off. IT IS ABSOLUTELY CRITICAL THAT YOU DO GROUND TESTS TO BE CERTAIN THE MAIN CHUTE PROPERLY DEPLOYS AND ANY SHEAR PINS UTILIZED BREAK CLEANLY AND EVENLY.**

## **JOINING OF SUB-ASSEMBLIES**

Please locate the following items:

Tail-cone

Motor tube assembly

Slotted airframe

Double-walled coupler (or fiberglass coupler for the fiberglass kit) with centering ring assembly (including u-bolts and Kevlar cord)

Two 5/16" quick-links

One 1/2"x 25' Tubular Kevlar Shock-loop

First **TEST FIT WITHOUT ADHESIVES** the motor tube assembly into the tail-cone.

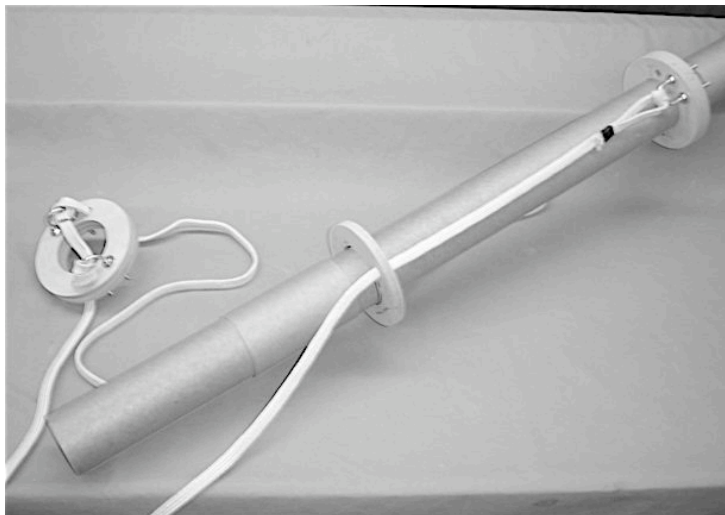
Insert the Slimline end first through the large end of the tail-cone, **DO NOT FORCE**, to confirm that the small end of the tail-cone and Slimline are flush together at the end.

If for some reason they do not, please sand as necessary. After you are confident of the

fit, **DO NOT, REPEAT, DO NOT ALLOW THE U-BOLTS TO LINE UP WITH THE SLOTS IN THE TAILCONE ON EITHER SIDE.** Place a mark around the inside of the tail-cone showing the position of the centering rings with u-bolts. Now remove the entire motor tube assembly and place a mark inside the tail-cone approximately **ONE INCH** above the very bottom (or small end opening) where the Slimline will reside. Now take heavy grit sandpaper to the outside of the Slimline and scuff the outside surface. You need to do this to provide a “tooth” for the following steps. **TAKE MASKING TAPE AND COVER ALL THE INTERIOR METAL AREA OF THE SLIMLINE.**

**IMPORTANT NOTE FOR PHENOLIC KIT BUILDERS:** If you purchased a phenolic T6, you **CANNOT** do the next described step at this time, “attaching the Kevlar cords from the bulkhead/Kevlar cord assembly to the motor mount tube”. You will be instructed when to do this step prior to “**MOUNTING OF COUPLER TO AIRFRAME**” instructions. For now, please continue with the instructions detailing how to join the motor mount tube to the tail cone.

FIBERGLASS: you are going to attach the Kevlar cords from the bulkhead/Kevlar cord assembly to the motor mount tube. First, stretch out the cords in straight, parallel lines and remove all kinks so they are smooth. Insert one cord each through the holes beginning in the upper centering ring located near the top of the motor mount tube and pull downward and loop one cord each through both u-bolts mounted to the lower centering rings which were previously attached 21” above the Slimline. Permanently tie each cord to the u-bolts utilizing the Anchor Knot (described earlier) or a similar knot. Make sure six inches of cord remains past the knot and tape in place to keep out of the way. **DO NOT EPOXY THE COUPLER CENTERING RING ASSEMBLY WITH KEVLAR CORD ONTO THE MOTOR TUBE AT THIS TIME.**



**BE SURE TO READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE BEGINNING, ONCE THE PROCEDURE HAS BEGUN, YOU**

**CANNOT STOP UNTIL COMPLETION.** Spread out wax paper on your work surface and have the tail-cone and motor tube assembly nearby. Mix sufficient JB Weld to generously coat the outside of the Slimline and inside “neck” of the tail-cone and simultaneously mix a large amount of slow-cure epoxy to coat the interior of the tail-cone where the 6.0 centering ring assembly with u-bolts will be in contact.



Also, you will be putting epoxy on the mating surfaces of those centering rings where they come in contact with the tailcone. With adhesives mixed, lay the tail-cone horizontal and coat the interior “neck” with JB Weld approximately one inch high and the entire EXTERIOR surface of the Slimline. Next, quickly coat the interior area of the tail-cone with epoxy where you marked placement of the 6.0” centering rings. Keeping the tail-cone horizontal and rotating to hold the epoxy in place, cover the mating (contact) edges of the above-mentioned centering rings with epoxy. Once this is done, stand the tail-cone vertically, small end down, and insert the motor tube assembly **STRAIGHT DOWN** until the motor tube/Slimline is flush with the small end of the tailcone opening. **IMMEDIATELY CHECK THE SLIMLINE TO CONFIRM THERE IS NO EPOXY OR JB WELD ON ANY INTERIOR SURFACE. REMOVE ANY IF PRESENT. FAILURE TO DO SO WILL RUIN THE SLIMLINE. NOW ROTATE THE MOTOR TUBE INSIDE THE TAILCONE TO MATCH POSITIONING MARKS BEING CERTAIN THE U-BOLTS (on centering rings) AND FIN SLOTS DO NOT LINE UP.** Quickly lay the assembly horizontal and slowly rotate keeping the tail-cone slots clear of epoxy. BE SURE NO EPOXY MIGRATES ONTO THE MOTOR TUBE WHERE FINS WILL LATER ATTACH. If that does occur, put a paper towel on some kind of stick small enough to insert through the slot to wipe away excess epoxy. Again check that the Slimline interior is clean and flush with the end of the tail-cone. Remove any excess adhesives from the exterior of the tail cone. Slowly, keep rotating until the just applied epoxy has

begun to “set” and stay in place. Then you can stand the assembly vertical, small end down on wax paper to finish curing.

When the above assembly has cured, check the bottom of the tail cone and determine if there are any gaps between it and the Slimline. If there are, mix a small amount of JB Weld and apply to the gaps with a toothpick or the like. **REMEMBER; KEEP THE INTERIOR OF THE SLIMLINE CLEAN AND CLEAR OF ALL ADHESIVES.**

Also, look inside the large end of the tail-cone to determine if there are any gaps between the 6” centering rings and the inside of the fiberglass tail cone. If any are present, mix up an adequate amount of epoxy to fill those gaps. If those gaps are large enough to allow the epoxy to run through without staying in place, utilize “filler” mixed with the epoxy to thicken the adhesive. In a pinch, you can also use strands of fiberglass or even cotton balls mixed into a pulp with the epoxy to make a paste. **BE CERTAIN THAT NO EPOXY RUNS DOWN ONTO THE MOTORTUBE OR THE TAILCONE SLOTS WHERE THE FINS WILL EVENTUALLY BE MOUNTED.**

Allow this assembly to fully cure. Do not epoxy the coupler centering ring assembly with u-bolts and Kevlar cord onto the motor tube at this time.

## **MOUNTING OF COUPLER TO AIRFRAME**

**NOTICE TO PURCHASERS OF THE PHENOLIC TALON 6.** Because the phenolic T6 utilizes a double-wall coupler, some assembly procedures are different from the fiberglass version. The next two paragraphs are for the phenolic version. **THE FOLLOWING PROCEDURES ARE NOT DIFFICULT, BUT THEY ARE INVOLVED. BE PATIENT AND READ EVERYTHING FIRST BEFORE ATTEMPTING THE FOLLOWING.** Locate the phenolic double-wall coupler, centering ring assembly with u-bolts and Kevlar cord, assembled motor mount tube/tailcone assembly and slotted airframe. First, take the double wall coupler and place a mark 7.5” up from one end. Next **USING NO ADHESIVES**, slide the same coupler end over the upper centering ring on the motor mount tube. If necessary, sand to fit. When satisfied, remove coupler from the centering ring/motor mount tube. Now you are going to permanently mount the coupler, **into the slotted airframe where the slots are FURTHEST from the end.** Mix sufficient epoxy to coat the exterior, end of the coupler up to the 7.5” mark previously made and the correct interior end of the airframe approximately 7.0” down. Join the two parts together using a twisting motion to evenly distribute the adhesive and stopping when the 7.5” mark on the coupler is **FLUSH EVEN** with the top of the airframe. **BE CERTAIN THE COUPLER DOES NOT SLIP INTO THE FIN SLOTS. When satisfied with the position, completely remove all excess epoxy from the interior and exterior of the airframe and coupler. IT IS CRITICAL THAT NO EPOXY REMAINS INSIDE THE COUPLER, THE FIN SLOTS OR THE EXTERIOR OF THE COUPLER.** It is recommended that

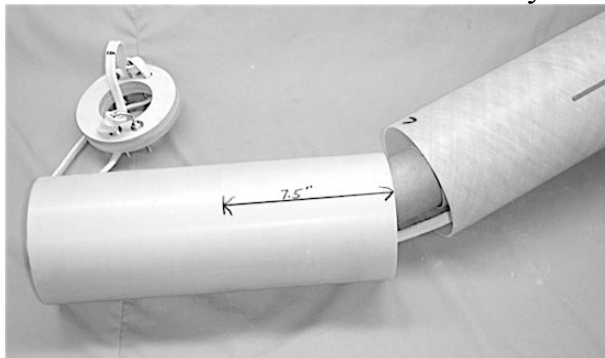
you temporarily tape the two parts together allowing time for curing, remove when finished.

Taking the centering ring assembly with u-bolts and Kevlar cord, thread both ends of the Kevlar first through the coupler and then the airframe and pull through until the centering rings temporarily rest on the top of coupler, **DO NOT USE ADHESIVES AT THIS TIME**. Place the motor tube/tailcone in a straight line behind the airframe with the Kevlar cords protruding and thread one end through each of the 1/2" openings on the top centering ring and pull all excess cord through. **WITHOUT USING ADHESIVES YET**, slide as necessary the motor tube/tailcone inside the airframe until sufficient Kevlar cord is available to thread each end through both u-bolts located on the centering rings just inside the tailcone. Utilize Anchor knots (or equivalent) to tie each Kevlar cord end to each u-bolt leaving approximately six inches of loose cord past the knots.

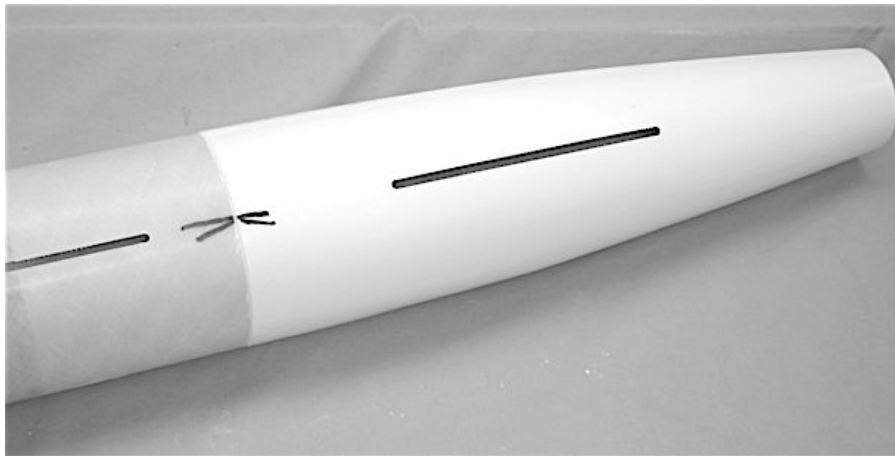
Tape the loose ends back onto the Kevlar cord above the u-bolts. **THESE KNOTS ARE CRITICAL; IF THEY FAIL YOU WILL LOSE YOUR ROCKET**. Separate the coupler centering ring assembly from the coupler as far as the Kevlar cords will allow. **TEMPORARILY TEST FIT** by completely sliding the motor tube/tailcone assembly into position inside of the airframe. Rotate the tailcone/motor tube so **NO KEVLAR CORDS ARE UNDERNEATH THE FIN SLOTS OF THE AIRFRAME AND THE WITNESS MARKS ON THE AIRFRAME AND TAILCONE LINE UP**. Now reach inside the coupler (centering ring assembly with u-bolts and Kevlar cord already removed from the coupler) and place a mark inside the coupler along the top edge of the single, interior coupler centering ring.

#### **NOTICE TO PURCHASERS OF THE FIBERGLASS TALON 6.**

THE FOLLOWING PROCEEDURES ARE NOT DIFFICULT, BUT THEY ARE INVOLVED. BE PATIENT AND READ EVERYTHING FIRST BEFORE ATTEMPTING THE FOLLOWING. Locate the 16" coupler, coupler centering ring assembly with u-bolts and Kevlar cord, motor tube/tailcone and the slotted airframe. If you have a phenolic Talon 6 kit, please read THE PRECEEDING instructions. **USING NO ADHESIVES**, thread the centering ring assembly with Kevlar cord into the coupler onto the top of the motor tube to make certain they fit inside.



If necessary, sand to fit. When satisfied, remove the coupler from the top centering ring and centering ring assembly with Kevlar cord. Next, place a mark 7.5" up from one end of the coupler. You are going to permanently mount the coupler into the **END OF THE AIRFRAME WITH THE SLOTS FURTHEST FROM THE END** and stop at the 7.5" mark. Mix sufficient epoxy to completely coat the exterior of the coupler up to the 7.5" mark and coat the interior of the **CORRECT END** of the airframe approximately 7.0" down. Join the two epoxy areas together using a twisting motion to evenly distribute the adhesive and push together **STOPPING AT THE 7.5" MARK ON THE COUPLER. BE SURE THE COUPLER DOES NOT SLIDE DOWN INTO THE FIN SLOTS. WHEN SATISFIED WITH THE POSITION, COMPLETELY REMOVE ALL EXCESS EPOXY FROM THE INTERIOR AND EXTERIOR OF THE AIRFRAME AND COUPLER. IT IS CRITICAL THAT NO EPOXY REMAINS INSIDE THE COUPLER, THE FIN SLOTS OR THE EXTERIOR OF THE COUPLER.** If you wish, you may temporarily tape these items together to retain position and allow the epoxy to cure. Set aside and allow curing. When curing is complete, **TEMPORARILY TEST FIT** by first inserting the coupler centering ring assembly with Kevlar cord attached to the motor tube/tailcone assembly into the airframe to check the fit of the forward centering ring and coupler centering ring assembly inside of the coupler. If necessary, sand the centering rings and/or the interior of the coupler tube. When the fit is correct, leave all assemblies together but pull out the upper coupler centering ring assembly with u-bolts and Kevlar cord exposing the motor tube. Place a mark inside the coupler along the top edge of the interior coupler centering ring. Next, rotate the tailcone until the "witness marks" on the airframe and tailcone line up.

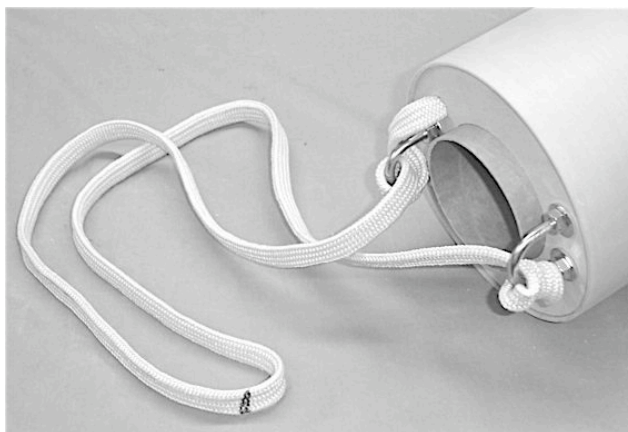


**BE AWARE OF THESE MARKS, IT WILL BE NECESSARY TO LINE THEM UP WHEN PERMANENT ATTACHMENT TAKES PLACE LATER. DO NOT EPOXY THE MOTOR TUBE/TAILCONE ASSEMBLY OR COUPLER CENTERING RING INSIDE OF THE AIRFRAME YET!**

## **FINAL ASSEMBLY OF THE SLOTTED AIRFRAME, MOTOR TUBE/TAILCONE AND COUPLER BULKHEAD ASSEMBLY.**

THE FOLLOWING INSTRUCTIONS RELATE TO BOTH FIBERGLASS AND PHENOLIC VERSIONS OF THE TALON 6. PLEASE READ THE FOLLOWING COMPLETELY BEFORE BEGINNING. UNDERSTAND THE PROCESSES AND TECHNIQUES EXPLAINED.

Lay out in a straight line the airframe with coupler attached and coupler centering ring assembly/motor tube/tailcone assembly with the Kevlar cord. Remove the coupler centering ring assembly with cord tied to the motor tube/tailcone through the airframe/coupler and allow at least six inches of separation between the airframe and the tailcone. Mix up a large amount of slow cure epoxy. Coat the exterior of the tailcone shoulder and the first five inches **INSIDE** of the airframe where the two parts join together. **DO NOT PUT TOGETHER YET!** Quickly apply a ring of epoxy inside the coupler below the mark drawn previously where the lower coupler centering ring resides. THE EPOXY WILL GO BELOW THE MARK MAKING A RING ONE INCH WIDE. QUICKLY, slide the motor tube/tailcone into the airframe **MATCHING THE TWO WITNESS MARKS TOGETHER**. Clean up all excess epoxy around the tailcone/airframe joint, all fin slots and around the coupler centering rings inside the coupler. **BE CERTAIN THERE ARE NO EPOXY RUNS UNDER THE FIN SLOTS ON THE MOTOR TUBE. BE CERTAIN THE KEVLAR CORD IS STRAIGHT, PULLED TIGHT, AND DOES NOT APPEAR UNDERNEATH ANY FIN SLOTS AND KEEP EPOXY OFF OF THE KEVLAR CORD. BE CERTAIN THE UPPER AND LOWER FIN SLOTS ARE STRAIGHT AND IN LINE. LOOK INSIDE THE COUPLER END (DO NOT INSERT CENTERING RING ASSEMBLY YET) AND MAKE SURE THE EPOXY AROUND THE LOWER CENTERING RING/COUPLER JOINT IS NEAT AND HAS NOT MIGRATED ONTO THE KEVLAR. CLEAN OFF IF NECESSARY.** Stand entire assembly vertical, tailcone end down and allow epoxy to cure.



When the above assembly is finished, be sure all Kevlar cord is pulled tight inside of the airframe and all excess is outside.



Apply a fillet of epoxy around the top of the centering ring inside the coupler. Now grasp the coupler centering ring assembly in one hand and the Kevlar cord in the other pulling the centering ring assembly CLOSE TO THE COUPLER BUT LEAVING SEVERAL INCHES OF SPACE BETWEEN THE TWO PARTS AND NO KEVLAR CORD IS “SLACK” BETWEEN THE PARTS. Apply another ring of epoxy approximately one inch wide around the top edge of the coupler and a light coat on the outside edges of the centering ring assembly. Permanently press into position the centering ring assembly inside of the coupler with approximately 1/8” of coupler extending above the bulkhead assembly. **WARNING, BE CERTAIN ALL EXCESS KEVLAR CORD IS PULLED OUT OF THE AIRFRAME/COUPLER AND THE HOLES IN THE CENTERING RING ASSEMBLY ALLOWING THE KEVLAR CORD TO PASS THROUGH ARE IN A STRAIGHT LINE WITH THE REMAINING TAUNT KEVLAR CORD IN THE SLOTTED AIRFRAME. BE CERTAIN THE KEVLAR CORD IS NOT UNDERNEATH ANY OF THE FIN SLOTS. TRY TO KEEP EPOXY OFF OF THE KEVLAR CORD.** Stand entire assembly up-right and allow epoxy to cure.



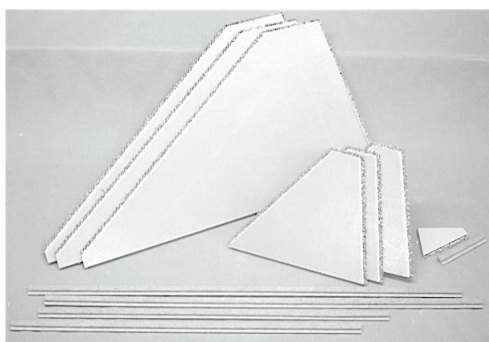
Locate the two 5/16" quick-links and 1/2" x 25' Kevlar shock loop. Insert a quick link through each loop end and attach one loop to the above 1/2" Kevlar between u-bolts that extends above the airframe coupler. The opposite end of the shock loop will eventually attach via 5/16" quick-link and the Kevlar bridle to the lower part of the av-bay located inside of the upper airframe.

**IF YOUR TALON SIX HAS A PHENOLIC AIRFRAME, NOW IS AN EXCELLENT TIME TO COVER THE TUBING WITH EITHER FIBERGLASS, CARBON FIBER OR THE ENCLOSED EZ-GLASS SOCK**

**REINFORCEMENT.** It is unnecessary to cover a fiberglass airframe with tube reinforcement. BUT IT IS IMPORTANT, WHICHEVER TALON 6 YOU PURCHASED, THAT YOU APPLY A 2" WIDE STRIP OF FIBERGLASS TAPE AND RESIN COMPLETELY AROUND THE TAILCONE-BODY TUBE JOINT.

Failure to do so will result in a crack in the final paint finish around the entire circumference when the rocket lands under parachute. Cut out the airframe slots after application of the reinforcement.

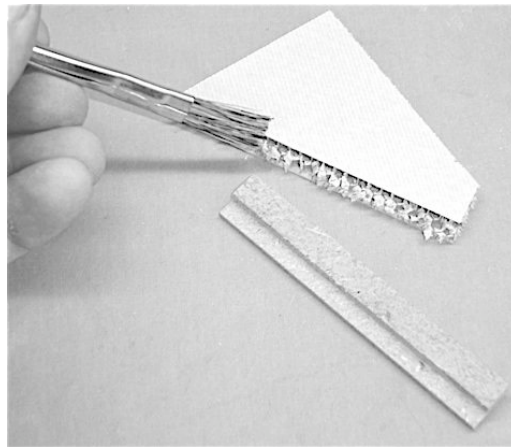
**FIN INSTALLATION**



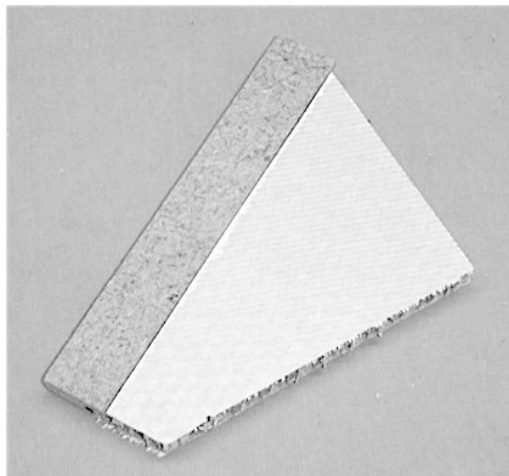
Locate both large and small sets of fins, edging and practice materials in small bag.

Before installation, you must attach the included edging. Begin by laying a sheet of wax paper onto your work surface. Taking the include practice scrap piece of composite material and short piece of edging, apply a “bead” of epoxy in the “channel” routed into the composite fin material and a thinner amount along the channel routed in the edging.

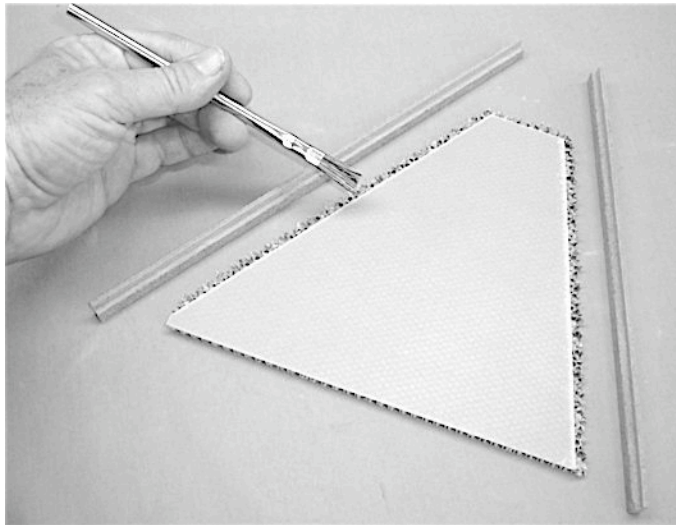
Lock both pieces together, remove excess epoxy and tape together and allow curing. To save yourself difficulty later, remove the tape prior to complete curing of the epoxy and remove any excess epoxy. This will need to be trial and error timing on the builder’s part as all cure rates are different. But be certain that the two parts stay locked together and in line with one another.



When completed, remove the tape and inspect your results. Check to see that both parts are firmly locked together and straight in line with each other. Notice the amount of excess epoxy that has migrated to the exposed area of the sample under the tape. Your goal is to use sufficient epoxy to bond the parts together, but minimize the amount squeezed out that you didn’t wipe up prior to curing. Otherwise, some sanding may be necessary to remove hardened excess epoxy.



Now collect all the composite fins and edging material. Turn all the fins with the routed “channels” up on wax paper. **YOU MUST APPLY EDGING TO THE LEADING AND TRAILING EDGES OF THE FINS FIRST!** Take a section of the edging and with your Xacto (or equivalent) razor saw cut a piece **4” LONGER** than the length of the fin edge you want to cover. **THERE MUST BE THIS EXCESS EXTENDING ON BOTH ENDS OF THE FIN EDGE FOR A LATER STEP.**

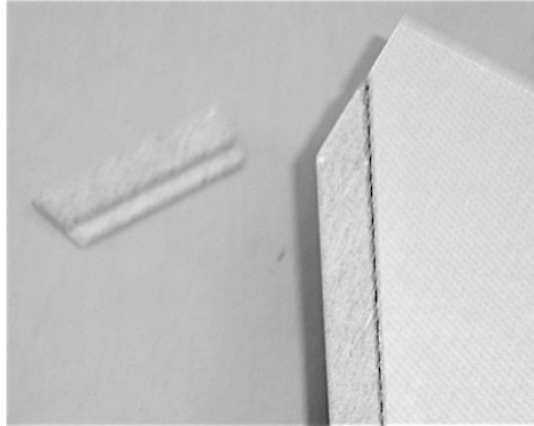


Apply epoxy in a similar method to your practice exercise above, wipe off excess epoxy, tape and allow curing. To speed up the process, you can apply edging in the same method to the opposite edge. **DO NOT APPLY EDGING TO THE FIN TIP UNTIL NOTIFIED.** Do this procedure to all the leading and trailing edges for the upper and lower fins. Set aside and allow curing flat on the wax paper surface.

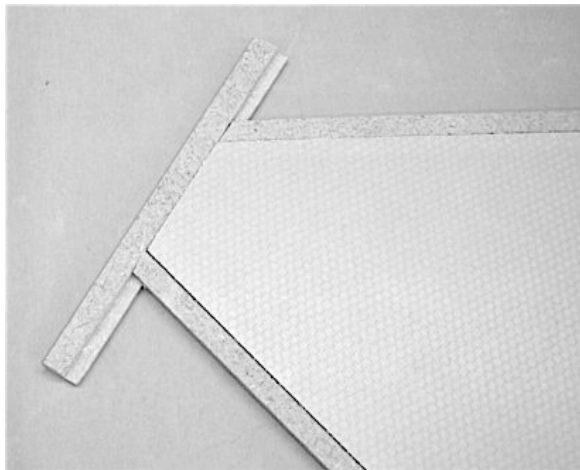
When finished, remove all tape but do no “flat-face” sanding at this time. Now you will remove the excess edging prior to application of the tip cord edging. Take your razor saw and carefully remove the excess edging extending past the tip cord.



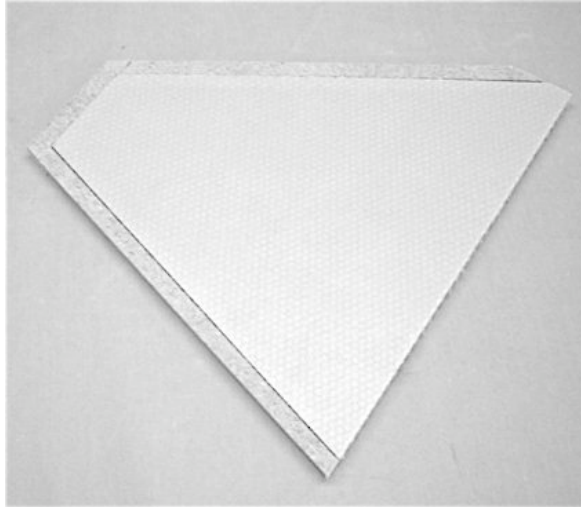
You will now do the same “trimming” to the opposite end of excess edging, down by the fin tabs. This procedure is slightly tricky as you must follow the fin tab “line”.



Take additional edging and apply in the same manner to the tips of all fins **MAKING SURE THAT EXCESS EDGING EXTENDS PAST THE PREVIOUSLY MOUNTED LEADING AND TRAILING EDGING.** When completed, trim and sand the excess edging in the same “line” as the previous edging.



Now you can “flat sand” the faces of all the fins and edges **BEING CERTAIN NOT TO SAND INTO THE COMPOSITE FIN MATERIALS.** It will be necessary to fill the cavities left on the tip edging prior to shaping of the edging into airfoils.



## ATTACHMENT OF FINS

Lay the rocket airframe horizontally with one set (fore and aft) of fin slots pointing straight up. Prevent this assembly from rolling unexpectedly. Mix a sufficient quantity of epoxy to attach a large fin and the small fin directly behind it. **YOU WILL NOT BE MAKING FIN FILLETS AT THIS TIME.** Utilizing small wood sticks or tongue depressors, apply epoxy to the motor tube through the entire length of the large fin slot until a sufficient quantity has been applied **BUT DOES NOT RUN!** When accomplished, coat the root edge of a large fin with epoxy and insert into the long slot pressing the root edge with epoxy against the epoxy on the motor tube. Insert the fin permanently into place, wipe off excess epoxy at the fin/body tube joint and secure into correct position using masking tape to keep the fin perpendicular to the airframe.

Now repeat the above procedure with a smaller fin into the slot below the just attached larger fin. Again, clean excess epoxy away and use masking tape to hold the fin in place **MAKING SURE BOTH UPPER AND LOWER FINS ARE IN LINE WITH ONE ANOTHER.** Allow assembly to cure. Only after the epoxy has cured for these fins can you turn the airframe and attach another set of upper and lower fins following the procedures listed above.

After all fins have been attached in the above manner and allowed to cure, turn the assembly so looking from the aft end the fins form a “Y” pattern. Apply epoxy mixed with chopped fiberglass for strength to each upward facing fin/body tube/tail cone joints, four in this position. Use a plastic spoon to smooth the epoxy into the correct shape and wait to cure. Then following the above instructions, apply epoxy fillets to the remaining fin/body tube/ tail cone joints.

**IT IS HIGHLY RECOMMENDED THAT YOU NOW APPLY FIN TO BODY**

**TUBE REINFORCEMENT.** With the rocket horizontal, take a sheet of newspaper and lay over one of the smaller fin-body tube-opposite fin section. Press the newspaper closely to this area and crease the paper along the edges of the fins and body tube. Cut out the paper along the creased edges to make a pattern. Repeat this same procedure with another piece of newsprint on one of the larger fin-body tube-fin sections.

**With these two patterns, trace out on your fiberglass or carbon fiber reinforcement cloth three upper (larger) and three lower (smaller) shapes. MAKE SURE TO CUT THE CLOTH 1 INCH LARGER ALL AROUND THAN YOUR PATTERNS.** Be certain you also cover the wood edging to give it strength also. Apply with laminating resin (Giant Leap recommends Aeropoxy), shape, clean up and sand to final form.

**It is not the intention of Giant Leap Rocketry to explain all facets of epoxy reinforcement. Explanations of fiber glassing are covered in detail by various authors on the subject. If you have questions specific to reinforcing your Talon 6, please contact Giant Leap Rocketry using the information given on the cover page of these instructions.**

## **RAIL BUTTON INSTALLATION**

The Talon6 utilizes rail buttons in three locations. These rail buttons may look small, but they are quite sufficient for the task and fit a standard 1"x 1" launch rail. First locate the upper airframe section and drill a 3/32" hole **26" UP FROM THE END WHERE THE BOOSTER SECTION COUPLER SLIDES INTO DRILLING INTO THE UPPER COLLAR OF THE PREVIOUSLY ATTACHED AV-BAY HOLDER AND NO MORE THAN 1/2" DEEP.** Utilizing the included hardware insert a bolt/screw through the rail button and nylon washer stand-off into the previously drilled opening. You must mount the two lower buttons (on the booster section) drilling 3/32" holes at 29.5" and 7" from the top of the **EXPOSED BOOSTER AIRFRAME. DO NOT MEASURE FROM THE COUPLER.** Through those airframe openings, continue drilling a 3/32" hole, **NO MORE THAN 1/2" DEEP INTO THE EXPOSED CENTERING RINGS.** Utilizing the included hardware, insert a bolt/screw through the rail-button and nylon washer-standoff. For even greater strength, place a drop of epoxy in the opening and push into the hole with a toothpick or the like. Immediately screw the rail-button assembly into position. Repeat this procedure with the second rail button on the upper part of the booster.

When preparing for launch, all three buttons must be in a straight line so they do not "bind" on the launch rail. Also, be sure the launch pad is very stable and has at least a 12' launch rail.

## EJECTION CHARGE(S)

The Talon 6 utilizes dual deployment ejection separating the rocket above the booster section for drogue deployment with the main parachute deploying between the upper airframe and nosecone. Ejection charge(s) will be mounted inside the recovery section between the lower part of the av-bay and drogue parachute and between the upper part of the av-bay and piston. It will be necessary to drill a small opening through the electronics bay cap to allow “pass-through” of wires to whatever electronics you install in the bay.

Be certain you use some kind of putty (Sticky Tack) to seal this opening from ejection gases. And replace the bolts to keep the nose cone attached to the recovery airframe.

It is recommended the flyer utilize two separate high quality altimeters for redundancy. Each altimeter would control one each separate ejection charges to the drogue section and one each separate ejection charge to the main parachute section. For ground testing purposes, a 1.5 oz. black powder charge may be utilized for each ejection container in the drogue section and a 2-3 oz black powder charge is utilized for each ejection container in the main parachute section. **BE ABSOLUTELY CERTAIN THE CHARGES ARE PACKED AND SEPARATED TO PREVENT ONE CHARGE FROM BLOWING THE SECOND CHARGE SIMULTAINOUSLY.** Pack cellulose insulation around and between both charge units. **FINALLY, YOU MUST GROUND TEST BOTH DROGUE AND MAIN PARACHUTE DEPLOYMENT CHARGES WITH PARACHUTES MOUNTED TO CONFIRM A COMPLETE DEPLOYMENT.** With your rocket 8-9000 feet up in the air, it is a poor time to discover that your charges or packing procedures were not correct.

## ATTACHMENT OF THE TALON 6 DECAL

After all construction, sanding, painting and finishing of your Talon 6, it is time to mount the decal. DO NOT separate the layers of the decal at this time. Determine the position you desire for decal placement and tape either the top or bottom edge of the decal to your T6 creating a “hinge”. Lift the end of the decal opposite of the “hinge” and fold back. Carefully and slowly peel back the bottom waxy paper while holding the remaining decal section off the surface of the rocket airframe. Discard the waxy paper.

Very slowly, lower decal at the hinge point following the natural positioning caused by the hinge. Slowly, lightly press the center out of each character as it comes in contact

with the rocket until the entire carrier of the characters is in place on your rocket. If any air bubbles remain under the decal, use one of the clean plastic spoons to press any defects out from under the carrier.

### **Mounting of ejection charges**

There are many ways of mounting ejection charges for parachute deployment. Be sure to use epoxy, or wax or “Sticky-Tack” to tightly seal the openings used to pass the wires through for your ejection charges in order to avoid the blowback gasses. These gasses are corrosive to your electronics and may cause their failure. Warning: Black powder is exceedingly dangerous and explodes instantly with an igniting spark, so be sure to handle it while clear of any possible ignition sources including cigarettes or static charges. Be sure your electronics are turned off and that no residual charge remains in the capacitors of your ejection unit. See the instructions specific to your electronics.

Also wear eye protection when handling and preparing black powder ejection charges. Make sure there are no bystanders, children or animals around while you are preparing ejection charges.

***IMPORTANT: ALWAYS WEAR HAND AND EYE PROTECTION WHEN HANDLING EJECTION CHARGES.***

### **Safety Code and Liability Waiver.**

Giant Leap Rocketry, Inc. and KB Kits, LLC (herein referred to as Giant Leap Rocketry) has exercised reasonable care in the design and construction of our products and carefully inspects every product prior to shipment. However, since Giant Leap Rocketry cannot control the use of our products or information provided once sold, we cannot and do not warrant the products or information included herewith or the performance or results obtained by using our products or information. Our products and information are provided "AS IS". Giant Leap Rocketry, Inc. makes no warranties of any kind, either expressed or implied, including but not limited to, non-infringement of third party rights, merchantability, or fitness for a particular purpose with respect to the product and any related published materials. To the extent you use or implement our products or information in your own setting, you do so at your own risk. In no event will Giant Leap Rocketry, Inc. be liable to you for any damages arising from your use or, your inability to use our products or information, including any lost or damaged property, or other incidental or consequential damages, even if Giant Leap Rocketry, Inc. has been advised of the possibility of such damages, or for any claim by another party. Remember, with lack of care, rocketry can be dangerous. By purchasing our materials you agree to the above conditions, and agree to use our products at your own risk. You must abide by the following safety guidelines: (for more info, see [www.tripoli.org](http://www.tripoli.org) <<http://www.tripoli.org>> )

**The following is a condensed version of the NAR/TRA HIGH POWER SAFETY CODE. The complete code can be found in the handbooks of the organizations.**

1. Only a person who is a certified flyer shall operate or fly a high power rocket.
2. Must comply with United States Code 1348, "Airspace Control and Facilities", Federal Aviation Act of 1958 and other applicable federal, state, and local laws, rules, regulations, statutes, and ordinances.
3. A person shall fly a high power rocket only if it has been inspected and approved for flight by a Safety Monitor for compliance with the applicable provisions of this code.
4. Motors.
  - 4.1 Use only certified commercially made rocket motors.
  - 4.2 Do not dismantle, reload, or alter a disposable or expendable high power rocket motor, not alter the components of a reloadable high power rocket motor or use the contents of a reloadable rocket motor reloading kit for a purpose other than that specified by the manufacture in the rocket motor or reloading kit instructions.
5. A high power rocket shall be constructed to withstand the operating stresses and retain structural integrity under

conditions expected or known to be encountered in flight. 6. A high power rocket vehicle intended to be propelled by one or more high power solid propellant rocket motor(s) shall be constructed using lightweight materials such as paper, wood, plastic, fiberglass, or, when necessary, ductile metal so that the rocket conforms to the other requirements of this code. 7. A person intending to operate a high power rocket shall determine its stability before flight, providing documentation of the location of the center of pressure and center of gravity of the high power rocket to the Safety Monitor, if requested. 8. Weight and Power Limits.. 8.1 Ensure that the rocket weighs less than the rocket motor manufacturer's recommended maximum liftoff weight for the rocket motor(s) used for the flight. During pre-flight inspection, The Safety Monitor may request documentary proof of compliance. 8.2 Do not install a rocket motor or combination of rocket motors that will produce more than 40,960 newton-seconds of total impulse (4,448 newtons equals 1.0 pound). 9. Recovery. 9.1 Fly a high power rocket only if it contains a recovery system that will return all parts of it safely to the ground so that it may be flown again.

9.2 Install only flame resistant recovery wadding if wadding is required by the design of the rocket. 9.3 Do not attempt to catch a high power rocket as it approaches the ground. 9.4 Do not attempt to retrieve a high power rocket from a place that is hazardous to people. 10. Payloads. 10.1 Do not install or incorporate in a high power rocket a payload that is intended to be flammable, explosive, or cause harm. 10.2 Do not fly a vertebrate animal in a high power rocket. 11. Launching Devices

11.1 Launch from a stable device that provides rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path. 11.2 Incorporate a jet deflector device if necessary to prevent the rocket motor exhaust from impinging directly on flammable materials. 11.3 A launching device shall not be capable of launching a rocket at an angle more than 20 degrees from vertical. 11.4 Place the end of the launch rod or rail above eye level or cap it to prevent accidental eye injury. Store the launch rod or rail so it is capped, cased, or left in a condition where it cannot cause injury. 12. Ignition Systems. 12.1 Use an ignition system that is remotely controlled, electrically operated, and contain a launching switch that will return to "off" when released. 12.2 The ignition system shall contain a removable safety interlock device in series with the launch switch.

12.3 The launch system and igniter combination shall be designed, installed, and operated so the liftoff of the rocket shall occur within three (3) seconds of actuation of the launch system. If the rocket is propelled by a cluster of rocket motors designed to be ignited simultaneously, install an ignition scheme that has either been previously tested or has a demonstrated capability of igniting all rocket motors intended for launch ignition within one second following ignition system activation.

12.4 Install an ignition device in a high power rocket motor only at the launch site and at the last practical moment before the rocket is placed on the launcher. 13. Launch Site. 13.1 Launch a high power rocket only in an outdoor area where tall trees, power lines, and buildings will not present a hazard to the safe flight operation of a high power rocket in the opinion of the Safety Monitor. 13.2 Do not locate a launcher closer to the edge of the flying field (launch site) than one-half the radius of the minimum launch site dimension stated in Table 1. 13.3 The flying field (launch site) shall be at least as large for a given impulse as stated Table 1 of the Tripoli safety code. See [www.tripoli.org](http://www.tripoli.org) <<http://www.tripoli.org>>. 14. Launcher Location

14.1 Locate the launcher more than 1,500 feet from any occupied building.

14.2 Ensure that the ground for a radius of 10 feet around the launcher is clear of brown grass, dry weeds, or other easy-to-burn materials that could be ignited during launch by the exhaust of the rocket motor. 15. Safe Distances 15.1 No person shall be closer to the launch of a high power rocket than the person actually launching the rocket and those authorized by the Safety Monitor. 15.2 All spectators shall remain within an area determined by the Safety Monitor and behind the Safety Monitor and the person launching the rocket. 15.3 A person shall not be closer to the launch of a high power rocket than the applicable minimum safe distance set forth in Table 2 of the Tripoli Safety code. See [www.tripoli.org](http://www.tripoli.org)

<<http://www.tripoli.org>>. 16. Launch Operations. 16.1 Do not ignite and launch a high power rocket horizontally, at a target, or so the rocket's flight path goes into clouds or beyond the boundaries of the flying field (launch site). 16.2 Do not launch a high power rocket if the surface wind at the launcher is more than twenty (20) miles per hour. 16.3 Do not operate a high power rocket in a manner that is hazardous to aircraft. 17. Launch Control. 17.1 Launch a high power rocket only with the immediate knowledge, permission, and attention of the Safety Monitor. 17.2 All persons in the launching, spectator, and parking areas during a countdown and launch shall be standing and facing the launcher if requested to do so by the Safety Monitor. 17.3 Precede the launch with a five (5) second countdown audible throughout the launching, spectator, and parking areas. This countdown shall be given by the person launching the rocket, the Safety Monitor, or other flying site operating personnel. 17.4 Do not approach a high power rocket that has misfired until the safety inter-lock has been removed or the battery has been disconnected from the ignition system, one minute has passed, and the Safety Monitor has given permission for only a single person to approach the misfired rocket to inspect it. I understand and will at all times conduct myself with the understanding that the above stated risks and safety procedures; (a) are not necessarily all of the risks. (b) That even by observing the above procedures there remain RISKS OF INJURY OR DEATH from HIGH POWER ROCKETRY. (c) That the utmost in attention and prudence must be exercised at all times. By purchasing this product(s) from Giant Leap Rocketry, Inc., you agree to: (1) Assume all of the risks, damages, injury, or even death. (2) Assume the obligation to exercise the utmost care in pursuit of my activities at this event. (3) That you must be over 18 years old (for motor purchase and use).

Giant Leap Rocketry cannot be held responsible for the failure of participants to abide by safety codes, rules, regulations, etc. By using the products, you agree to abide by these conditions.