Pemberton Technologies - Krãken

Skill Level – 2

The Pem-Tech **Krãken,** named for the dark, sinister creature of ancient sea lore, is a one of a kind sport flier featuring our unique, sculpted tube-fin design. She is as much a fantastic flying machine as she is a work of art, created by you.

The **Krãken** features a beautifully finished, high quality balsa nose cone, 16" parachute, a full five feet of Kevlar shock cord, laser cut centering rings, an extended 24mm motor mount that will handle everything from black powder "D" motors all the way to "F" AP motors, sleek nose canards (for that sinister Squidlyness), 1/4" launch lug and our infamous Destruction Manual.

Long and lean with sexy flowing lines, the **Krãken** will be sure to turn heads at your next launch.

Ok, enough of the intro. We at **Pem-Tech** would like to thank you for purchasing our **Krãken** flying rocket kit or smuggling it across the border in a llama, or stealing it from a friend. The **Krãken** is a half-scale Low-Power (LPR) version of our 3" Mid-Power (MPR) – HPR (High Power) **King Krãken**. Check the PembertonTechnologies.com website for more info. Right, so now you have the kit and want to build it, not a problem but first a word of warning. While the **Krãken** may not be for the green, wet behind the fins RTF noobie, building your **Krãken** doesn't require years of rocketry experience, a truckload of physicists or a commendation from Art Bell to complete. Carefully read the pictures and follow the words and you will be fine. To get started, here is a list of supplies required to complete this project: Aliphatic resin (wood glue), hobby knife with new blades, scissors, sand paper (lots-o-grits), wood filler, marking device, goggles, straight edge, masking tape and a little imagination. Suggested supplies: Patience, a steady hand and a little round thingy about that long and that big around with little bits hanging off the ends. Read the destructions thoroughly before beginning, for your safety and the safety of others.

Some images may vary from actual content and reality in general.

Recommended motors: Black Powder (BP) C11, D12, E9 or Ammonium Perchlorate (AP) D15, E15, E18 and E28 (F12 and F24 but only on a REALLY large fields or you can kiss your **Krãken** goodbye)
(Test your **Kraken** for stability and proper CP/CG relationship before flying him on any motor. That means do the "twirl it around on a string" thingy.)

Disclaimer: **Pem-Tech** cannot be held responsible for personal injury to any parties, loss of property, damaged livestock or harsh language incurred from the use or misuse of its products.

PARTS!!! (Figure-1)

If any part of this kit has escaped from its shipping carton, we will either capture and return the original or send a sibling as a replacement. All in short order and free of charge. (Sales@PembertonTechnologies.com)

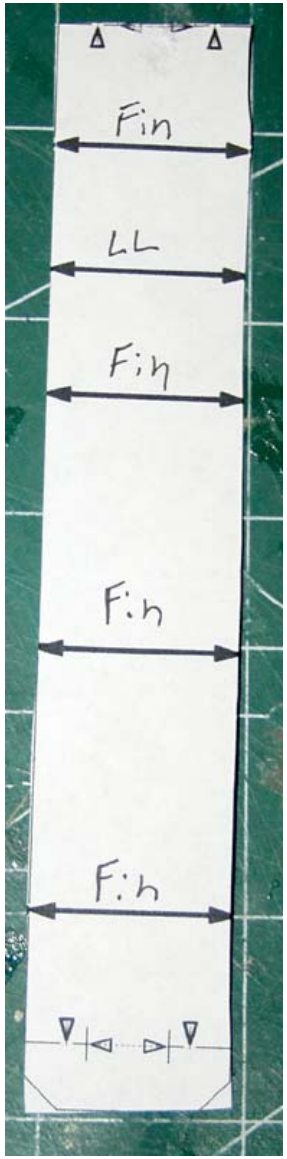
LPR Krãken

Parts Check List	Shipped	Received
A) Balsa Nose Cone	[ ]	[ ]
B) BT-60 tube - 2X	[ ]	[ ]
C) 24mm Motor mount tubing	[ ]	[ ]
D) Parachute	[ ]	[ ]
E) Kevlar shock Cord	[ ]	[ ]
F) BT60-50 Centering Rings - 2X	[ ]	[ ]
G) Nose ballast	[ ]	[ ]
H) balsa fin stock	[ ]	[ ]
I) Launch lug	[ ]	[ ]
K) Screw eyelet (Not available for picture)	[ ]	[ ]
L) Wrap around alignment guides – X2 (On a beer run)	[ ]	[ ]
M) Canard pattern (See Part L)	[ ]	[ ]

Assembly Destructions:

1) Before doing anything else, thoroughly scrounge through the shipping carton and check the bits **(Figure-1)** against the checklist. If all the bits are present and accounted for, go ahead and read through the destructions completely, at least once, before getting into the fun stuff. Now seriously, read them. No I'm not joking, take this booklet, have a seat and look at all the words. Don't make me come over there.

2) Now for real, if you don't read through all this complicated stuff you may put an eye out with a pointy thing. Then what would your mother say? (Pemberton Technologies cannot be held responsible for damages, personal harm or angry mothers due to pigheadedness.) OK, now you can start doing things.

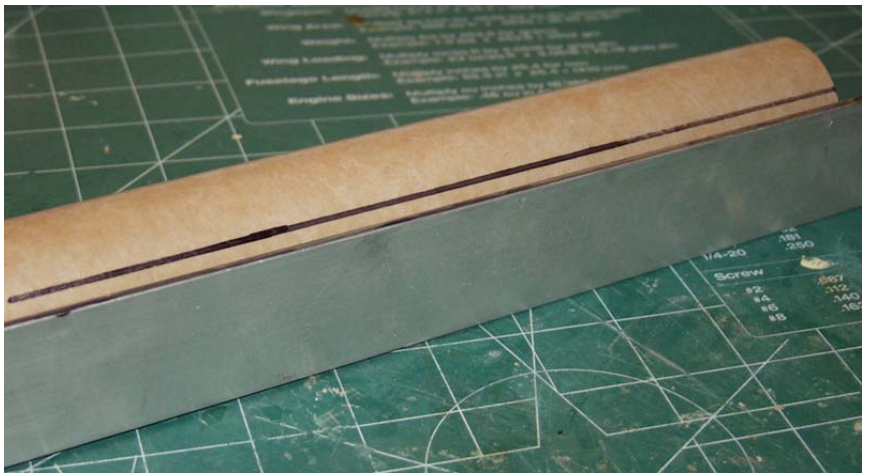


(Figure-2)

3) Break out your favorite filler material and fill those nasty seams in both of the body tubes (BT). Be sure to sand the glassine layer (shiny stuff) off the exterior of the tube. This is to promote adhesion, prevent tooth decay and soothe occasional bloating.

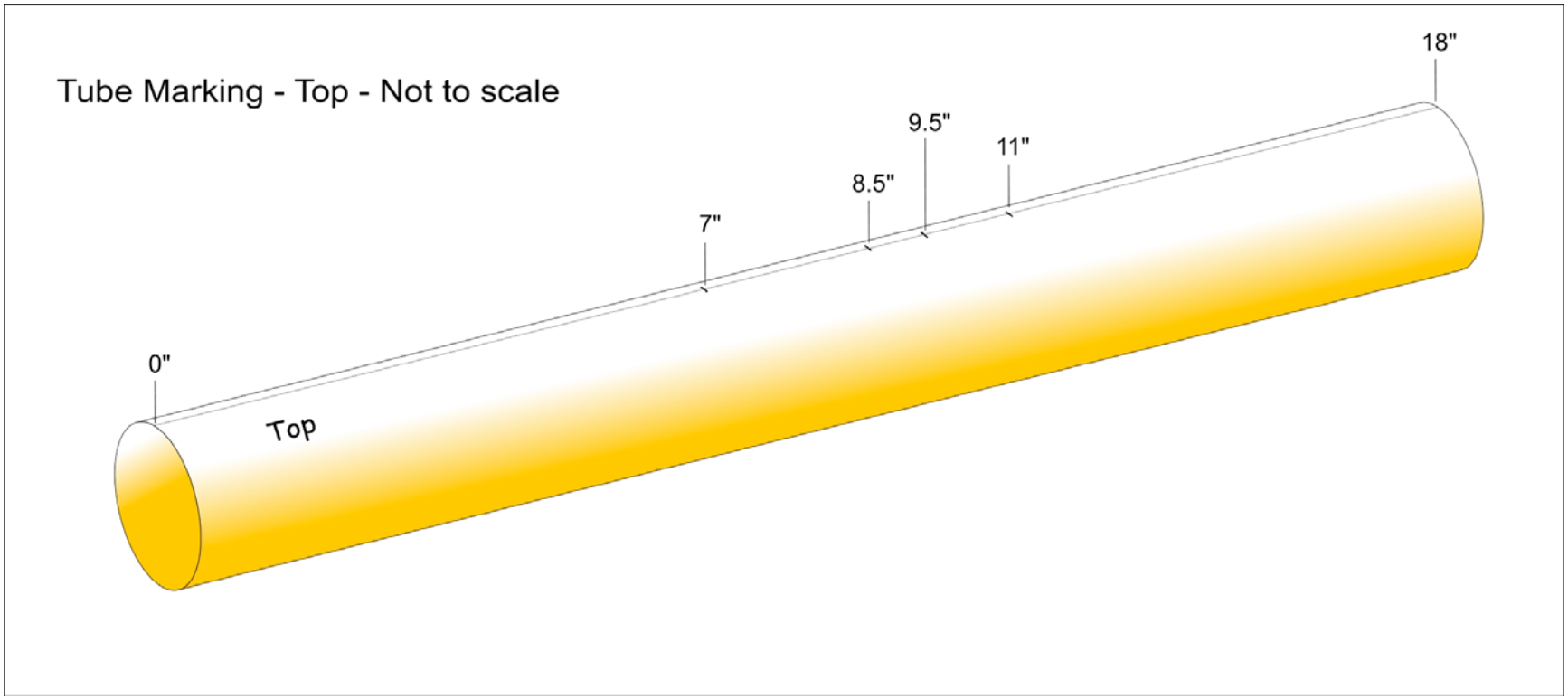
4) Now we are going to take one of these nice body tubes, which never hurt anybody, and slice it into lots of little tube fins. **(Figure-4c, 4d, 4e & 4f)** show the cuts we are going to make, and the final product. **(Figure-10a)**

5) Choose a 1.6" tube, any tube, and christen it "Fin Tube". There are two alignment guides, **(Figure-2)** shows the guide to use on the body tube. The Fin Tube (FT) will use the alignment guide with only two lines on it. Make marks on the Fin Tube (FT) at 180^0 utilizing a writing utensil and the proper wrap around fin alignment guide, after you have freed it from its captive sheet of paper. Extend the alignment lines the full length of the FT using some type of long straight thingy. **(Figure-4)** Label one line Top and one Bottom.

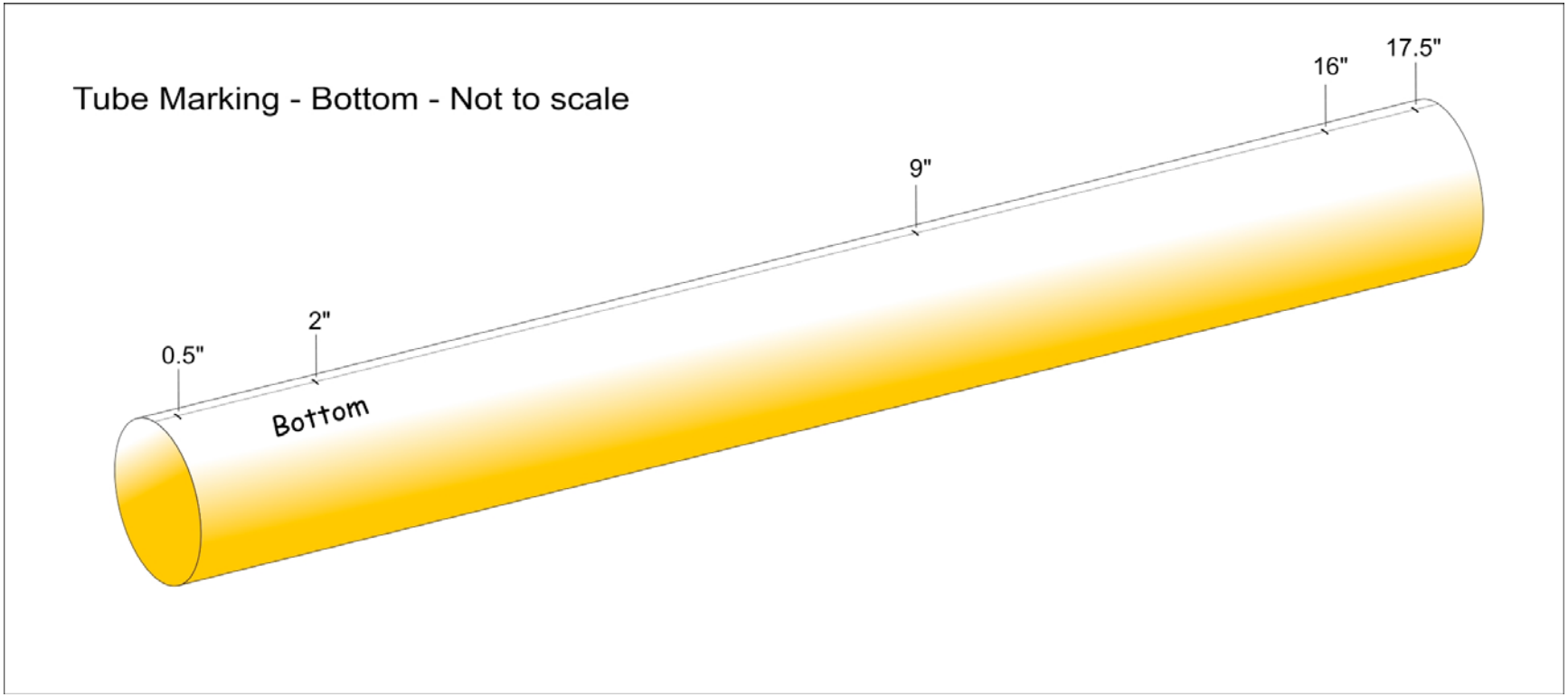


(Figure-3)

6) On the Top line mark the positions at 0", 7", 8.5", 9.5", 11" and 18" **(Figure-4a).** On the Bottom, from the same end, mark 0.5",2", 9", 16" and 17.5" **(Figure-4b)**.

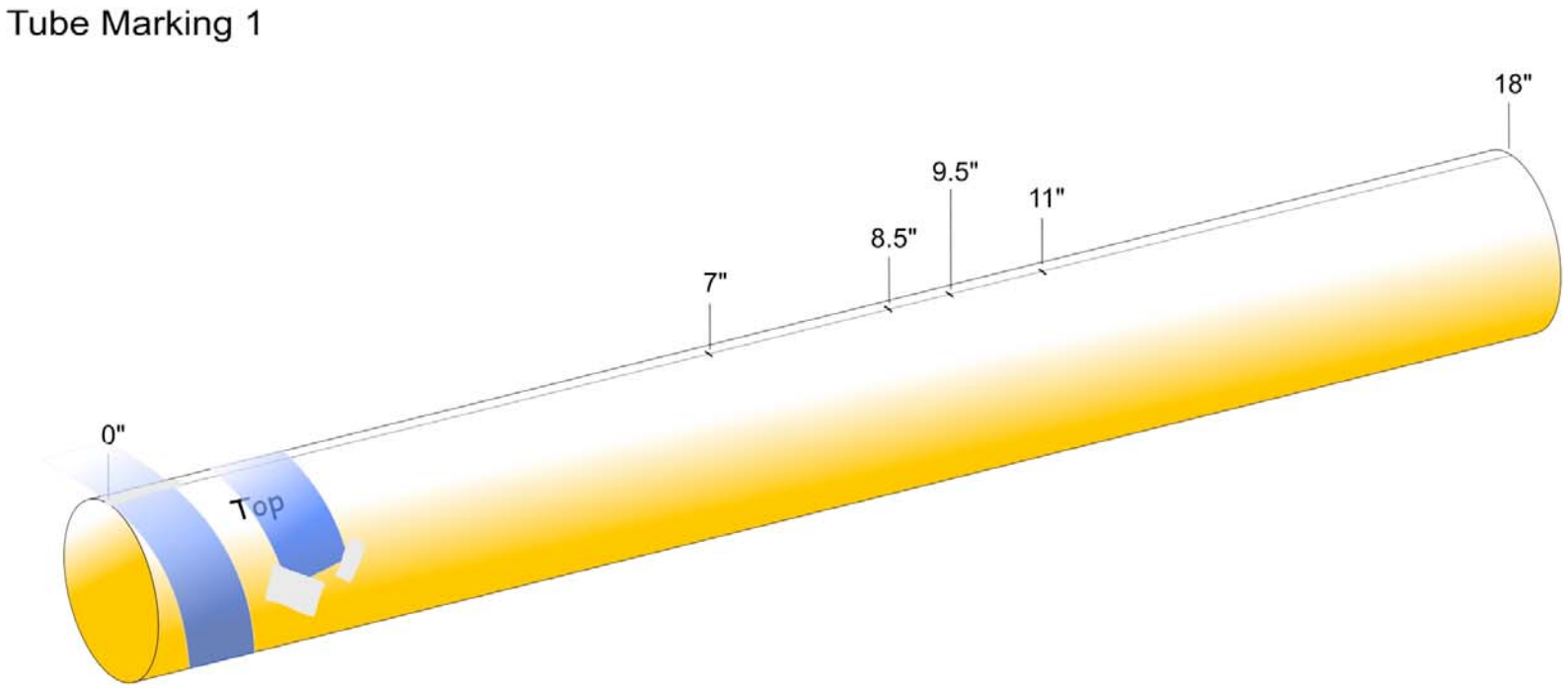


(Figure-4a) Illustration by Mal McClenaghan



(Figure-4b) Illustration by Mal McClenaghan

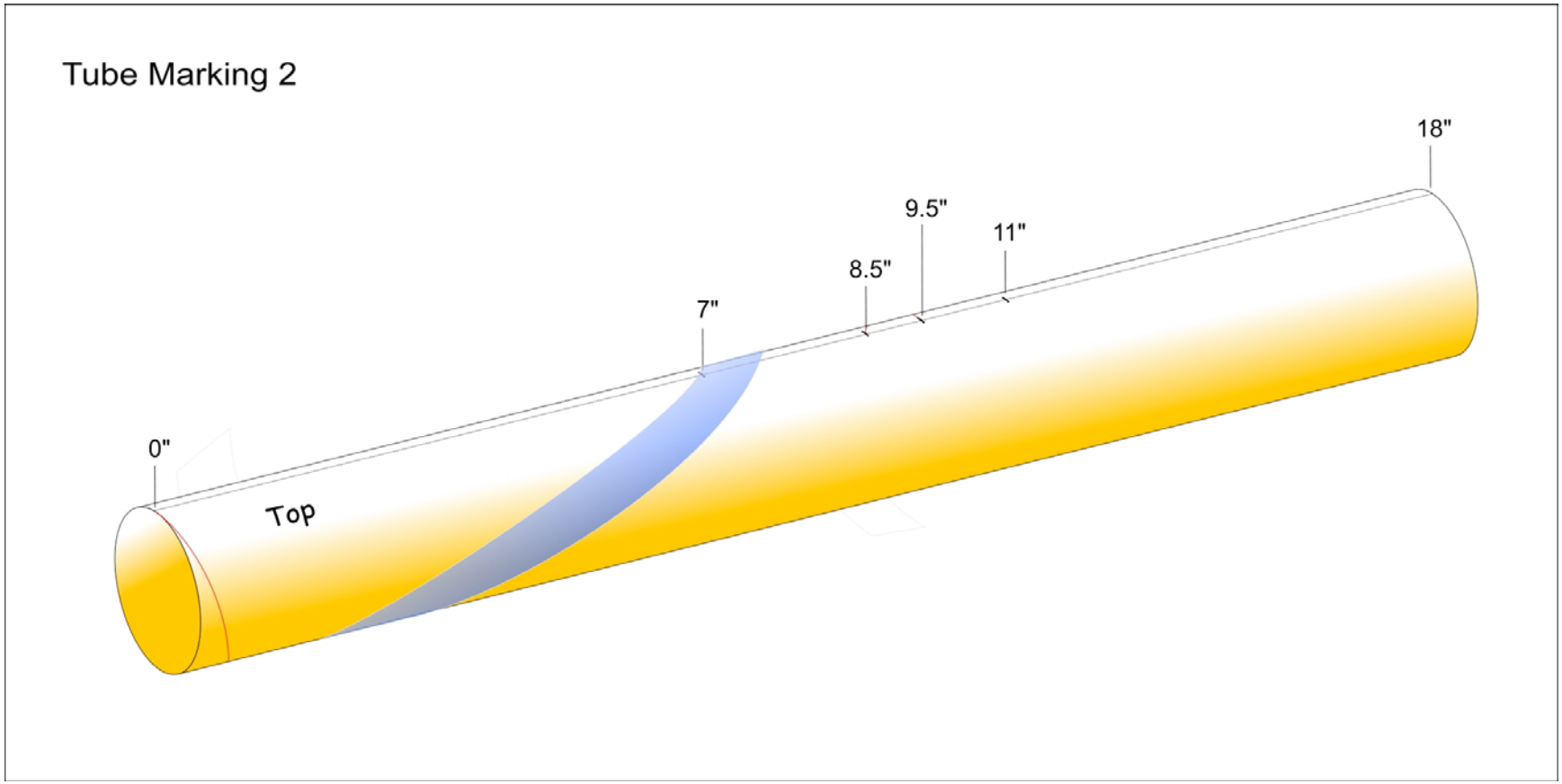
7) Using a stiff but flexible material (poster board, brass entrance way strip, metal tape measure, or whatever) tape one end of the material at the 0.5” mark on the Bottom, pull the edge of the material tightly around one side of the tube till it intersects the 0” mark, tape in place. **(Figure-4c), (Figure-6) & (figure-7)** Trace a line between these two marks. Repeat on the opposite side. Remove the paper and you should have something that looks like **(Figure-4d)**. If not, take a break, pet the fish or feed the dog, come back in a bit and try this step again.



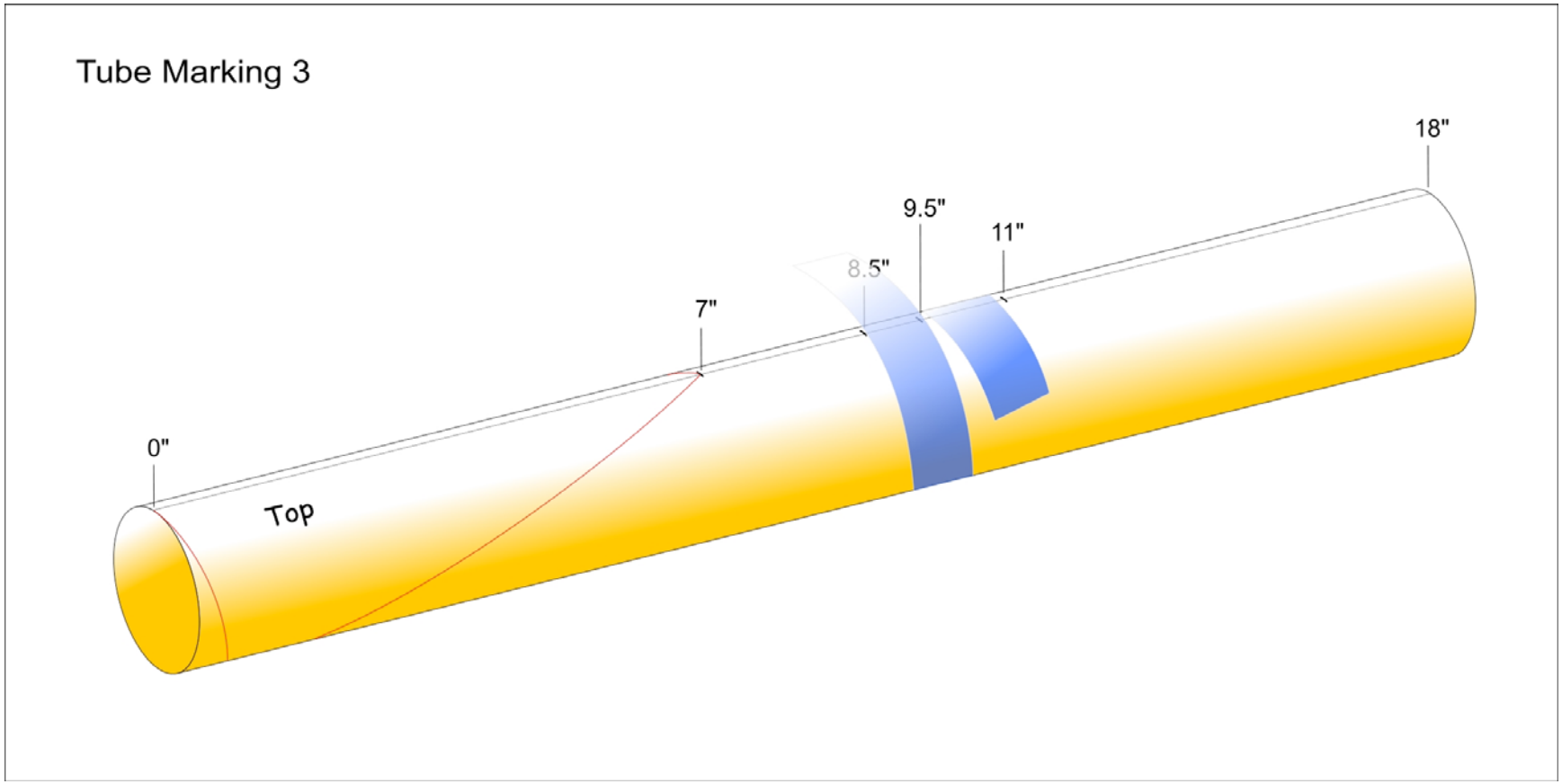
(Figure-4c) Illustration by Mal McClenaghan

8) However, if we are of the same mind and your parts look like **(Figure-4d),** go ahead and do the same trick from the 2” mark on the Bottom to the 7” mark on the Top on both sides. **(Figure-4d)**

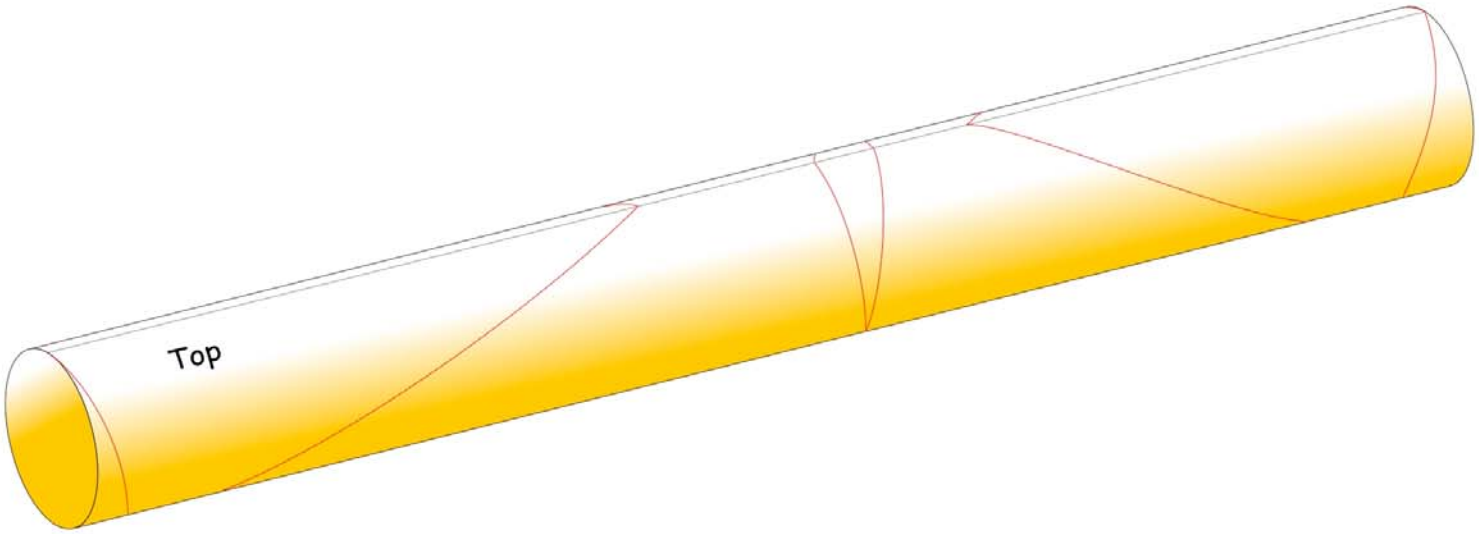
9) Now do it again from 8.5” on the top to 9” on the Bottom both sides. Again from 9” on the Bottom to 9.5” on the Top. Again from 11” on the Top to 16” on the Bottom. And finally from 17.5” on the Bottom to 18’” at the Top. Do both sides of the tube for each line. Reference **(Figure-4d), (Figure-4e),** & **(Figure-4f)** to see if we are on the same planet.



(Figure-4d) Illustration by Mal McClenaghan



(Figure-4e) Illustration by Mal McClenaghan

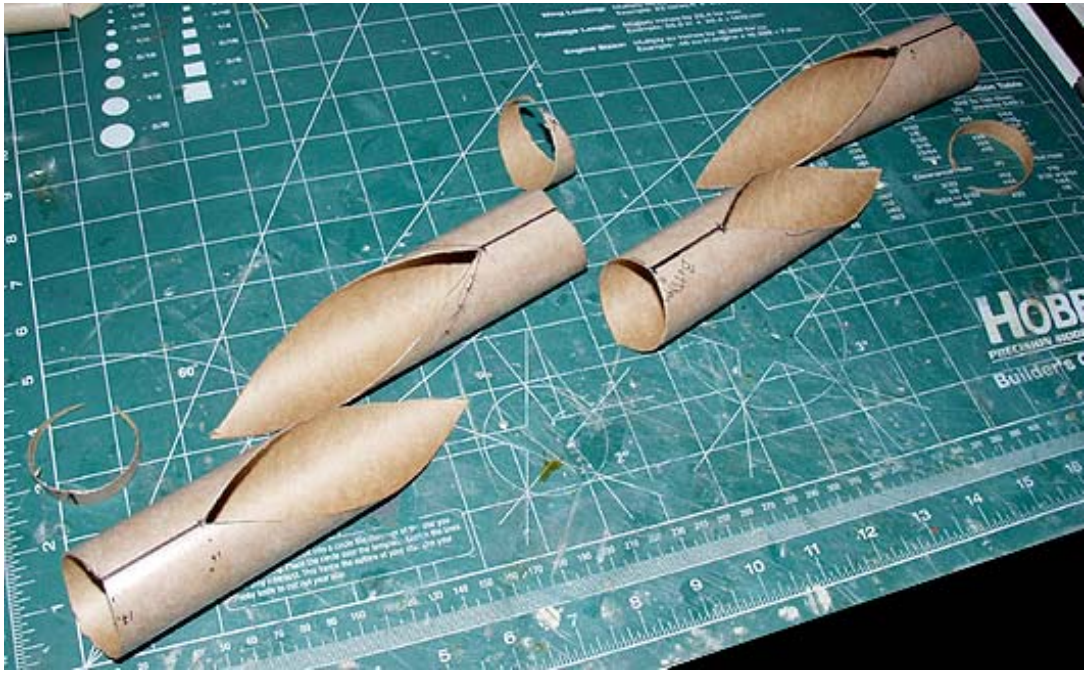


(Figure-4f) Illustration by Mal McClenaghan

10) If all is good then, using a new hobby blade, carefully cut along the 0” to 0.5” line, this will produce the base of your first tube fin. Now cut along the 2” to 7” line. Do this carefully as these will be the leading edges of the tube fins. Your first tube fin should be complete at this point. Cut along the 8.5” to the 9” line, and this is your second tube fin. Repeat and produce the third and fourth fins. **(Figure-5) & (Figure-6)** Make an ink mark at the outside of the very tail edge of all four tube fins; this will help in construction later on. **(Figure-7)**

11) Using the correct marking guide **(Figure-2)** make fin and LL alignment lines on the airframe. Draw a line through these marks the full length of the BT and carry the fin line over the rear edge of the tube to help align with the marks on the tube fins. **(Figure-9)**

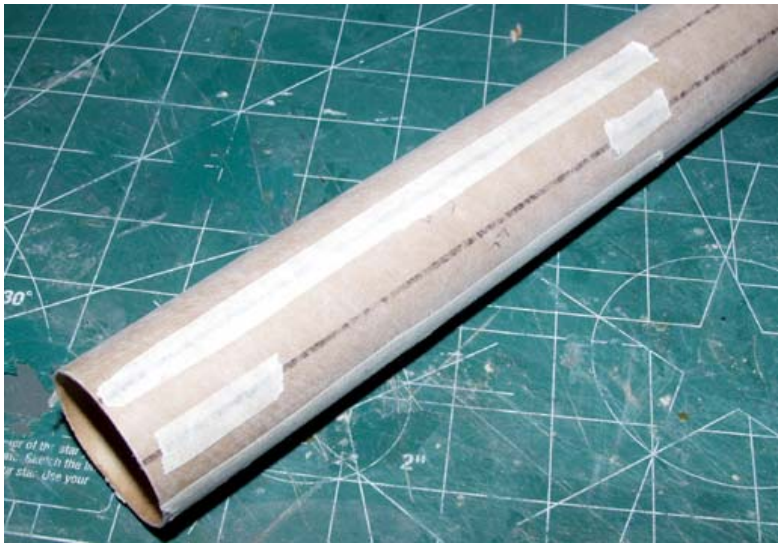
12) Next is your call, but this is how I finished mine. Run a 1/4" strip of tape along the underside of each tube fin, following the line that is already there. Do the same on the fin and LL alignment lines on the BT, run the tape the length of the tube fins and LL mounting area. **(Figure-8)** Now, you can sand and seal all you want and still have a clear area to attach the fins. Now I suggest this because it is a pain in the asp to sand and seal up under those tube fins once they are attached. Don't forget to seal and sand the insides of the tube fins as well, just to makem' purdy. There are rumors of individuals that completely paint their rockets before stripping off the masking tape and gluing on the fins. If you are one of these, I really don't need to know about it.



(Figure-5)

(Figure-6)

(Figure-7)



(Figure-8)

(Figure-9)

13) However you choose to finish out your **Krãken**, once the sanding and sealing is done, strip off the masking tape and get prepped to start gluing stuff together!

(Figure-10)

14) Run glue along the base of the tube fins; just a bit of quick tacking wood glue works well. Align the ink mark at the base of the tube fin with the ink mark on the BT **(Figure-9) & (Figure-10)** and press the fin in place. Hold till the glue tacks, being careful to align the fins perpendicular to the surface of the BT, along the fin alignment line, and flush with the base of the BT. Cut the LL in half and attach the halves anywhere from the tip of the tube fin and aft. The most aesthetic option is to place them far enough back as not to disrupt the flowing edges of the tub fins. For super coolness try this trick sent to us by Jeff "Handeman" Boldig from TRF (www.rocketryforum.com). Bevel the front and/or back end of the LL's to match the shape of the fins. This takes a sharp blade and a steady hand, or a miter box and razor saw. Then paint the insides and beveled edges of the LLs to match the inside color of the tube fins. Thanks to Jeff for the idea! Fillet the fins and LL's if you can, but it ain't gonna' be easy. **(Figure-10)**

15) Snag the Nose Cone (NC) from your pile of parts and give its hide a good sanding. Personally I use a 230 grit paper, but you are an adult, make your own decision. Chase down the nose canard pattern sheet and commence to cutting it out. Trace two canards onto the balsa stock being sure to align the leading edge of the canard with the grain of the wood. Carefully, gently, lovingly cut them out **(Figure-11)** and glue them on either side of the NC about 2" from the tip. CA works well for this, but fillet with wood glue. **(Figure-12)** Take the NC out for drinks, a little dancing, just to let it know that you really care.

16) There are a number of ways to fill balsa, two that seem to work well are using wood glue shmeared over the NC in thin coats or using water thin CA (Super Glue). Wood glue is slower but doesn't require any special fillers, take your time, use thin coats and allow each to dry completely. Water thin CA not only seals the balsa but also strengthens the NC against dints, dings and "Dohs!" Here is the process for either: sand, seal, sand again, seal some more, repeat until the NC is smooth or you are sick of looking at the thing. CA gives off some nasty fumes so be careful not to inhale them. Be sure to work outside or in a well ventilated area and don't glue any of your body parts together. Strange questions may ensue.

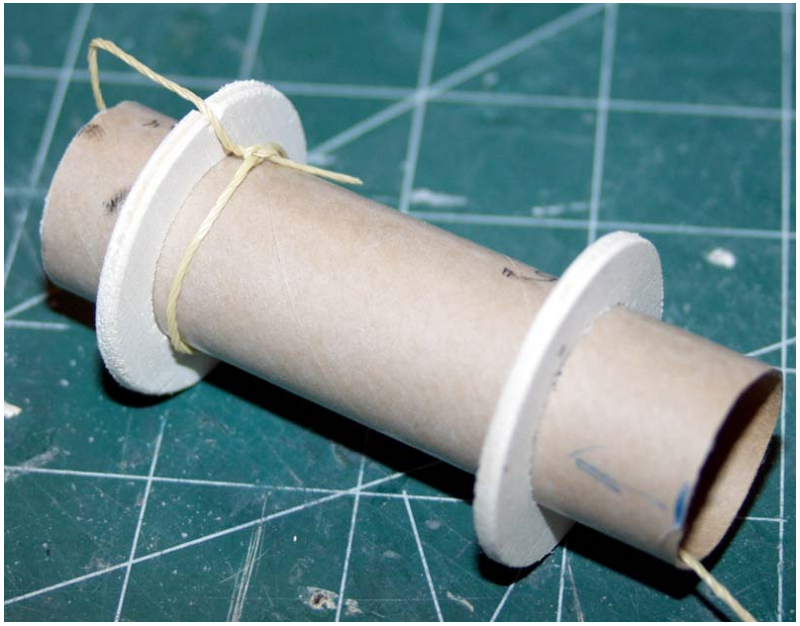
17) While you are at it, glue the supplied ballast washer on the base of the NC. Screw the eyelet into the center of the NC base (and center of the washer). Now unscrew the eyelet, put a drop of glue into the hole and screw the eyelet back in. Or be imaginative and find your own method to attach the chute.

(Figure-11)

(Figure-12)

18) On to the Motor Mount (MM)! Go roundup the motor mount tube; it is probably in your fridge eating all the cheese. Haul it back to the workbench and tie it to the leg of your chair, or something. Force it to wear the two supplied centering rings, no matter how much it screams and cries. Glue a centering ring _" from each end of the now crying motor tube. **(Figure-13)** Tie the shock cord around the middle of the MM, just tell the motor tube it is a stylish belt that will make it look thinner. Now while the motor tube is admiring its new belt in the mirror, sneak up behind it and carve a notch in the outer edge of one of the CR's with a sharp instrument. Having betrayed your motor tube's trust you will now be forced to glue the shock cord to the aft face of the notched CR and run it through the notch. **(Figure-13)** This is now the fore end of the motor mount that will be closest to the nose cone. Allow to dry, comics and bedtime stories optional.

19) To make things a bit easier on you later on, pull the shock cord back through the motor tube, so that it dangles in a disturbing manner. Squirt some glue up the aft end of the airframe **(Figure-14),** and shove the MM into the airframe making sure the motor tube is flush with the aft of the BT. **(Figure-15)**



(Figure-13)

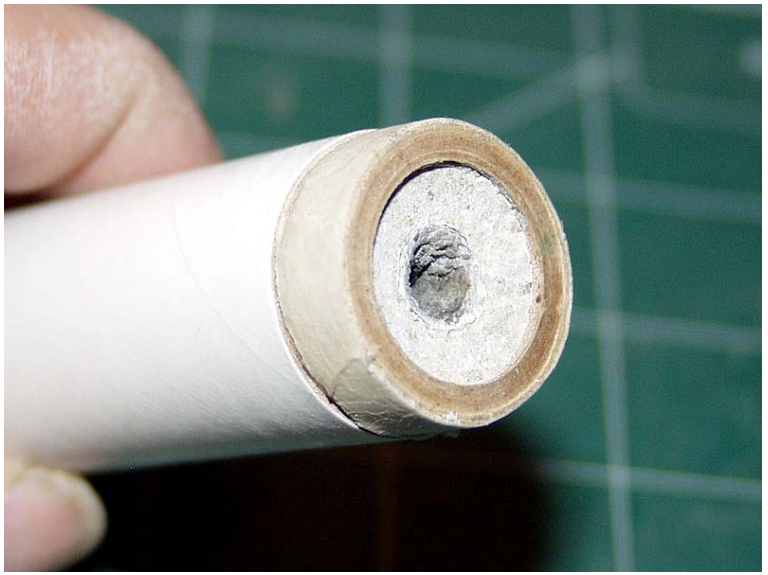
(Figure-14)

(Figure-15)

20) Stand the whole assembly upright and allow the glue to dry. Once dry stand the whole mess on its nose and run a glue fillet between the aft CR and the BT. Allow to dry undisturbed, under a pile of unwashed undergarments for three days. *Just kidding clean ones will do fine*

21) OK, I can almost hear some of you jumping up and down shouting, “Where is my motor retainer?” No matter how hard you look in the bag, you won’t find one, but there is madness to my methods. By not using a standard “engine hook” type motor retainer you will be able to fly your **Krãken** on a wider variety of motors. From 18mm, 24mm and even E sized BP motors up to a frightening spectrum of 18mm and 24mm AP motors. Now you may be asking yourself some very important questions, “How shall I retain my motors?”, “Where the devil is the thrust ring?” and “How do I lose all this unsightly facial hair?” The answer to all is “Duct Tape.”

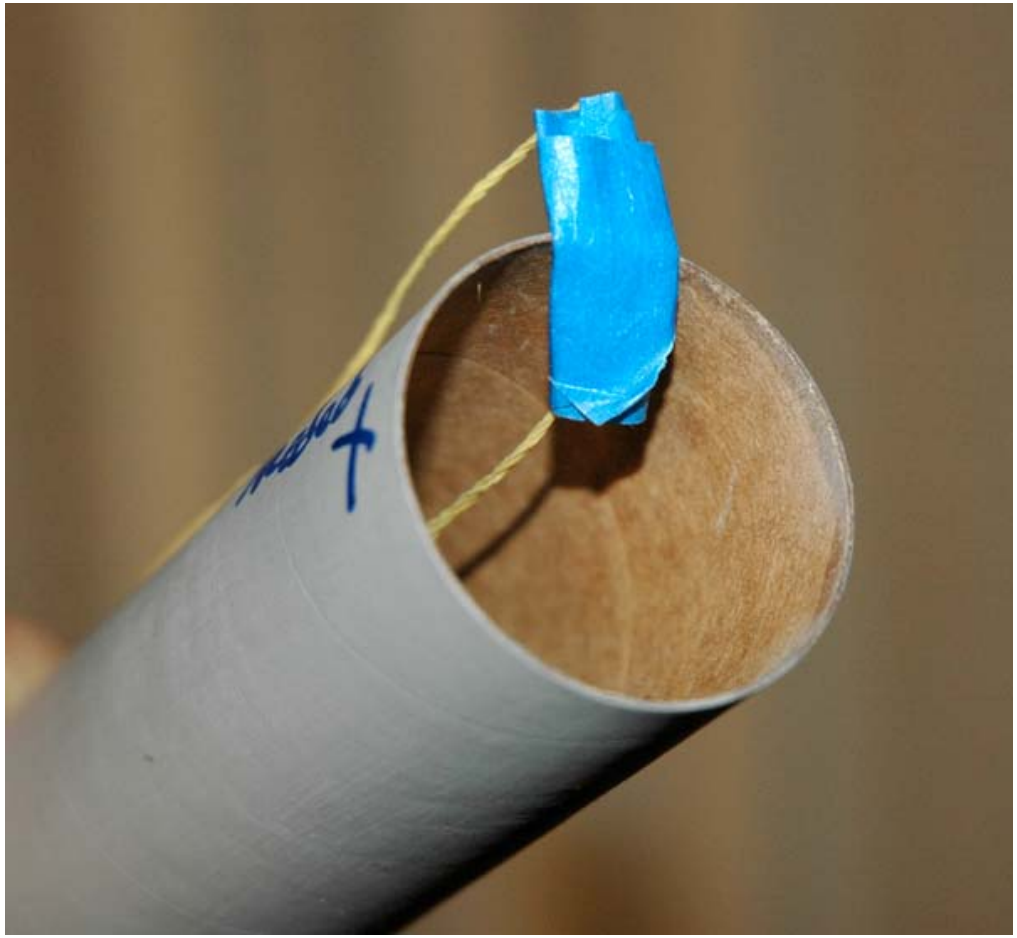
(Figure-16)



(Figure-17)

22) Now, before you folks gather up pitchforks and torches and lapse into a mob mentality, let me explain. To create a thrust ring for Single Use (SU) 24mm motors simply tear off a _" to 3/8" wide length of Duct Tape or masking tape and wrap it about the nozzle end of the motor. As seen in **(Figure-16)** using a much abused 24mm D motor casing. And what the motor looks like installed. **(Figure- 17)** Stop looking at me like that. No, I am not crazy and have the papers to prove it. This bit of tape is all that is needed to keep the motor from roaring up through the guts of your **Krãken**. To hold those naughty motors in place during ejection, wrap bit of tape, a little wider, around the end of the motor and MM

23) Now that that unseemly bit is out of the way, let's move on. Untie the shock cord, that you hopefully left dangling from the rear of your **Krãken** and thread it back up through the BT. Tie a loop in the very end of the shock cord and attach the parachute. (Build the chute first, of course.) Tie the shock cord to the eyelet in the nose cone about 12" back from the parachute. Now, take a strip of masking tape and wrap it around the shock cord just where it contacts the lip of the BT. The KEVLAR, while strong, is thin and could cut or "zipper" the BT on recovery. **(Figure-18)**



(Figure-18)

24) Your **Krãken** will fly beautifully on C11 and D12 Black Powder (BP) motors as well as Composite Ammonium Perchlorate (AP) motors like the Aerotech D15, E15 and E18. (If you are of the thrill seeking personality try an F12 or F24.) The minimum motor for stable flight from a 36” long 1/8” diameter launch rod is a C11. Of course this is dependant on how heavily you have built your **Krãken**. C11, D12 and AP motors will do just fine on 36” or 48” long rods. On another important note, you should have noticed by now that this kit is supplied with a 1/4” Launch Lug (LL) which will work fine with 1/8”, 3/16” and 1/4” launch rods and over the full range of motors. Just be sure you fly your **Krãken** safely and don’t go around skewering people or livestock with **Pem Tech** rockets. If all else fails and you still have no idea of what we are talking about, drop us an email and we will be glad to help. (HELF@PembertonTechnologies.com)

25) There has been much speculation and many threats of violence over the painting of the inside of the fin tubes, so here is how it is done. Put the kit together. OK, that was the hard part. Now, spray the insides of the tube fins red, or purple or whatever color turns you one, and let this paint dry COMPLETELY. Next, acquire through illegal means, four (4) letter size pieces of stiff paper or sheet plastic. "No trespassing" signs work great. Roll them small enough that they will fit inside the tubes, and insert them from the rear until they just cover the pointy bit of the fin closest to the NC. Let go. *SPROING* Your red paint is now masked off. Use light coats of black, being sure to get the crevasses, and remove the masking material from the tube BEFORE the black is completely dry. A little touch-up around the edges of the fin is normal.

26) Prep your **Krãken** for flight as you would any other flying rocket. Stuff a handful of **BodWad** ejection wadding into the airframe, carefully FOLD (not scrunch, wad or crumple) the parachute and pack it and on top of the Kevlar shock cord and

carefully insert the nose cone. The NC should slide easily from the airframe but not fall out under its own weight. If needed, apply tape to or sand the shoulder of the nose cone for a proper fit. Do the tape/motor retention thing that is most appropriate for your motor selection.

27) Stuff a motor up the pipe and let'er rip. Well, maybe not so quickly. Always read and follow the motor manufacturer's instructions, adhere to the NAR (National Association of Rocketry) Safety Code, and be nice to people and small furry mammals.

28) Pemberton Technologies cannot and will not be held responsible for any use or misuse of its products resulting in damage to persons (naughty or nice), property, animals, fairies, Underpants Gnomes or loss of life and limb.

29) Go forth and go **WHOOSH**.

If any mistakes, errors, inconsistencies or secret messages are found in these instructions please email me.

Thanks,
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Edited by Bob Cox (http://www.rocketreviews.com/featured/cox.shtml), any incorrect punctionations or mispilled werds is his fault, and additional illustrations provided by Mal McClenaghan