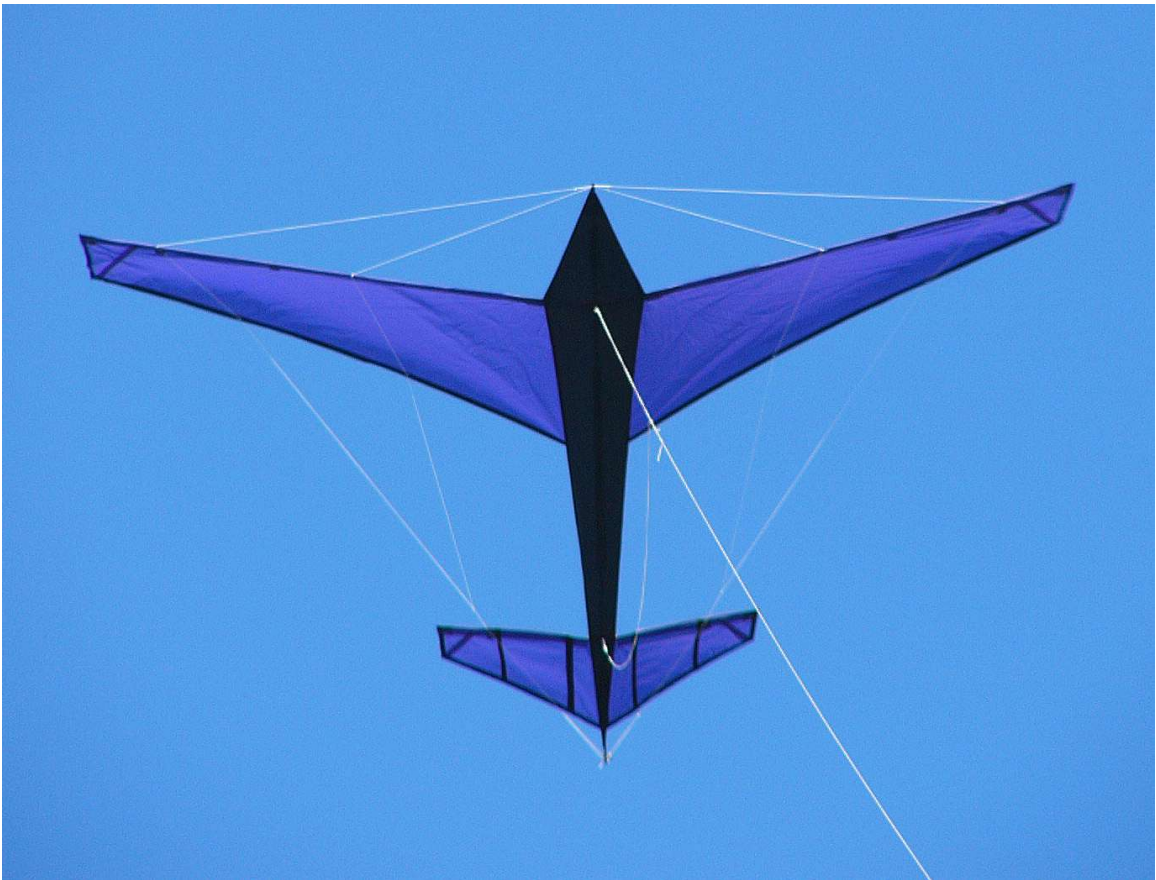


# Berlin Flier

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# Berlin Flier

This airplane is a beautiful, elegant, low-wind kite. It is an old German design we believe is called "the Berlin Flier". It is a fairly easy kite to cut out, sew, bridle, and assemble and is certainly easy to fly in gentle winds.

## **Fabric requirements for a 2 - color kite:**

wings and tail: 1.5 yards - .75 ounce 54" – 56" wide ripstop nylon. This length is generous but allows for a cutting mistake and the extra can be used for a bag. 1 ¼ yards will actually make the kite.

fuselage: 1 2/3 yard ripstop nylon

## **Rods:**

4 - C30 fiberglass rods (wing spreaders) and 2 internal ferrules for C30

2 - Avia Sport Carbon RLG 2540 (spine) and 1 FET 50 ferrule

1 - .05" RSG05 carbon rod cut into 4 pieces:

(2 - rods for tail tips approximately 5 1/4 to 5 1/2" long or 14cm)

(2 - rods for wing tips approximately 8 1/8 to 8 1/4" long or 21cm)

1 - 1/8" fiberglass rod (tail spreaders) (2 – 40cm approximately)

## **Bits and pieces:**

1 - ¼" dihedral

1 - 1/8" dihedral

4 ounce Dacron for pockets and reinforcements and ½ ounce ripstop tape

30# test line for rigging lines

5 meters 75-80# test line for bridle loops, bridle line and tow point loop

5 - beads and 10-12" heavy line for TE

75-100# line for LE tip loop, wing loops

2 - Arrow knocks and inserts for spine

2 – Arrow knocks and inserts for wing spreaders

8 – vinyl end caps for tail tip rods

2 – vinyl end caps for tail spreaders

Spine sleeves: 5 x 1 1/8" and 14 x 1 1/8" ripstop nylon

1" wide heat slit commercial ¾ ounce edge binding

Vinyl tubing for dihedral stops and spine LE tip

## **Notes:**

3/8" or 1cm seam allowed

fine tune Dacron reinforcements as necessary

Your kite will fit nicely into a bag 6" wide x 57" long.

## **Tail Construction:** (make 2, one opposite the other)

Edge bind short edge and the trailing edge. ←

Fold the LE sleeve (1 1/8"). Cut the inner flap. ☹️ Fold & tape the sleeve end on an angle (sewing is optional). \*

Add the 3 x 1 1/8" reinforcement. (1 is angled for the second tail piece.) ←

Position and sew in place the pockets for the short rod. Put rod into pockets.  
 Sew LE sleeve. Use the spacer dowel or put the edge at 1" from the fold. Jump the rod, backstitching at stop and starts points. Fold over the Dacron reinforcement and sew it as you sew the sleeve. Top stitch along the leading edge as far as the Dacron extends.  
 On the second tail piece, an opening for rod insertion is needed. First reinforce and encase the top outer edge of the sleeve with the narrow, 3" edge binding (or use a scrap of your ripstop nylon fabric) and narrow piece of Dacron. Sew the sleeve in place as the first tail piece, jumping the rod and stopping about 2" from the outer edge. Fold over the Dacron reinforcement and top stitch the Dacron pocket along the top edge.  
 Sew tail pieces to the fuselage. (3/8" or 1cm seam)  
 Add the tail/fuselage reinforcement. Ⓟ  
 Sew down the inner flap. Ⓟ  
 Add Dacron reinforcement to the TE tip of the fuselage. Position the reinforcement where it will fit the best and trim as needed. Top stitch tail/fuselage seam.  
 Add the heavy line at the tip. Zig zag, sew securely.

### **Fuselage Construction:**

Add Dacron reinforcement to the LE tip.  
 Add upper bridle line reinforcement. Bridle point is about 12" down from the LE tip.  
 Add spine sleeves. Short one starts about 4" from LE tip. Long one starts about 18" from LE tip. I put the sleeve edges at about 1/2" from the centerline. Use the spacer rod. This makes for a nicer sleeve.  
 Edge bind lower outer edges. ←

### **Wings Construction:** (Similar to the tail. Make 2, one opposite the other.)

Stick down the 2 -2 x 2" clear ripstop reinforcement tapes on leading edge.  
 Sew in place the 1.5 x 1" reinforcement. ←  
 Edge bind short edge and the trailing edge. ←  
 Add the Dacron line loop. This should barely stick out past the edge.  
 Fold the LE sleeve. Cut the inner flap. Ⓟ Fold & tape the sleeve end on an angle (sewing is optional). \*  
 Position and sew in place the pockets for the short rod. Put rod into pockets.  
 Sew LE sleeve. Use the spacer dowel or put the edge at 1" from the fold. Jump the rod, backstitching at stop and starts points.  
 Sew wing pieces to the fuselage.  
 Add the wing/fuselage reinforcements. Ⓟ  
 Sew down the inner flap. Ⓟ  
 Top stitch wing/fuselage seam.  
 Edge bind the remaining edges of the fuselage.  
 Add short loop at LE tip.  
 Thread 5 beads onto TE line at spine tip and tie last bead. (Tie last bead securely when spine is finished.)

### **Rods:**

#### **Diagonal Tail and Wing Rods:**

Measure, cut and glue end cap onto the 4 rods.

**Spine:**

- Put a piece of vinyl tubing on one spine rod, the ¼" dihedral, and another piece of tubing. Position the dihedral and tubing down at about 12.5" from one end. Glue an arrow knock onto this (the LE) end. Glue a ferrule onto the other end of this rod.
- Glue arrow knock onto one end of second spine rod, measure, and cut to length. Use tape. Add 1/8" dihedral. Put into kite. Tie last bead securely.

**Wing spreaders:**

Glue an arrow knock onto one end and a ferrule into the other end of two spreader rods. Measure and cut to length the other two spreader rods. (About 38-39cm.) Insert into kite.

**Tail spreaders:**

Approximate needed length (40cm) and cut (use tape, these are fiberglass). Glue vinyl end cap on one end. Repeat for second tail spreader. Check fit and adjust as necessary.

**Rigging:**

Spine is in place. Spreader rods are in wings only – not the tail. Small diagonal rods are in wings and tail. Kite is face down. You need a Sharpie, pencil, toothpick and a needle.

4 lines: 4.2 meters long

- Tie a stop knot midpoint on each line. With the first line, penetrate sail about 1/16" from leading edge at the 70cm mark. Pull line to stop knot. Go around rod twice, with fabric tight to rod. Slide a toothpick under the lines. Tie a square knot. Position the knot onto the face of the kite. Repeat with all 4 lines, at the 70 and 20 cm marks.
- Pass the free end of an outer line around the LE arrow knock. Penetrate the line with the needle several inches from the LE and pull line until the wing is shaped nicely. Grab the point where the line penetrates itself and hold securely. Tie 2 half hitches. Repeat for the second wing.
- Pass an inner line through the outer line's loop (at the arrow knock), snug up and tie off with half hitches. Repeat with other wing.
- Measure the inner lines from the point where it comes out of the front of the kite and mark at 92cm. Tie a stop knot.
- New lines.... Make 2 loops about 15cm long. Using a Prussic knot, attach these loops onto the outer lines. Put the loop over the arrow knock at the spine tip and snug up the line. Don't distort the wing.
- Bring the stopper knot on the inner line over to the outer line and move the inner line to where it crosses (snug, not strained) the outer line at the knot. Mark kite skin where the 2 lines exit the trailing edge of sail and hot cut small holes in the edge binding. Release outer line at TE spine tip. Put the lines through hole (to the back). Lines lay on the front of the sail!!
- Put outer line back onto the spine. Bring inner line to where it crosses again. Mark outer line. Thread inner line onto needle. Pierce long line mark with the needle and pull through to stopper knot.
- Tie a half hitch above the knot on the short line and a half hitch below the stop knot.

- Square up the sides. Measure with (the bridle) line from the TE spine tip to the outer line on the leading edge of the wing. Square them up using the loops you put on the outer line using a Prussic knot. The sides should be the same length.
- Half hitch long lines to the loops to secure.
- Glue knots. Trim tails on lines at the knots.

### **Bridling:**

4 meters of 75-80# test line cut into the 4 pieces listed below.

- 2 – 60cm lines. Make each into a loop. Release spine from beads and LE tip. Larks head the loops around the dihedrals. Pass to the front through hot cut bridle holes.
- 260cm line. Make a loop on each end about 8cm long. Larks head onto the loops which are around the dihedrals.
- 20cm line. Make into a loop. Larks head this loop onto the long line you just attached. This is the tow point and can be adjusted for proper flight.

Done!

### **Kite assembly:**

Rods which should be left in the kite: spine, outer half of each wing rod. The short diagonal wing and tail rods can also be left in if your bag is wide enough.

The spine must NOT be secured to the fuselage until after you put the tail and wing spreaders into place!!!

Put the two spine rods together. Leave loose at both ends.

Put one wing rod into the rod already in the sleeve. Put into the dihedral. Slide the arrow knock into the loop. Use a tag loop to help. Repeat for other wing.

Insert the first tail rod into the closed pocket. The second tail spreader should be slid into the sleeve, pushed out through the opening, placed and seated into the dihedral and then the outer end slid back into the pocket. This is not necessarily easy!

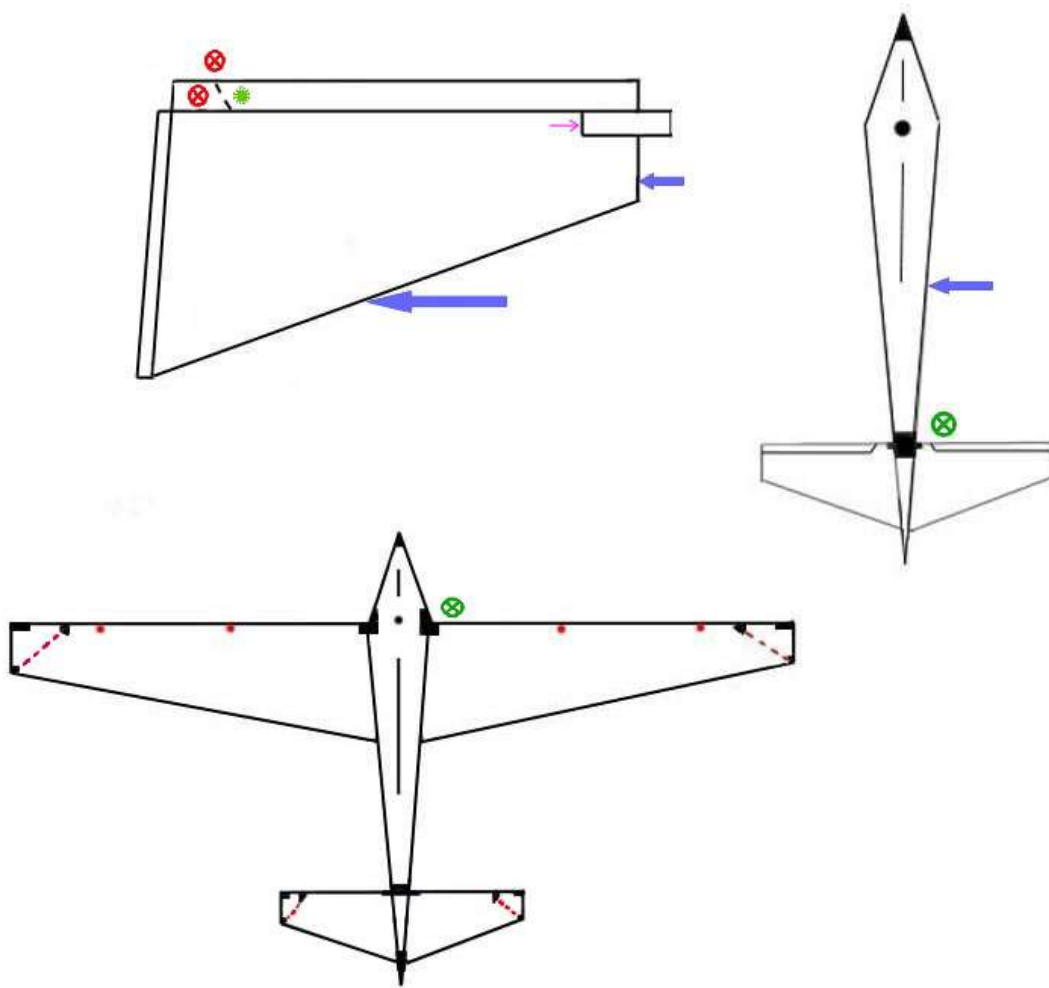
Attach the wing rigging line loops around the LE arrow knock.

Position the LE spine arrow knock into the loop and secure with the vinyl tubing.

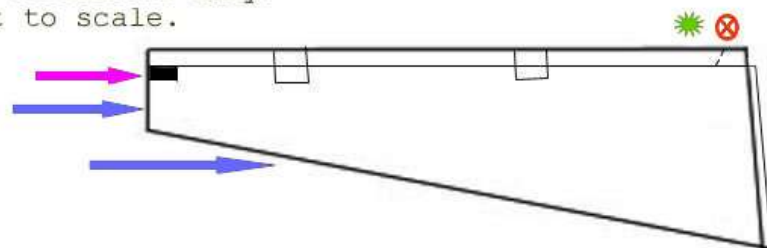
Attach the TE rigging line loops around the arrow knock.

Attach the beads/string to the spine arrow knock.

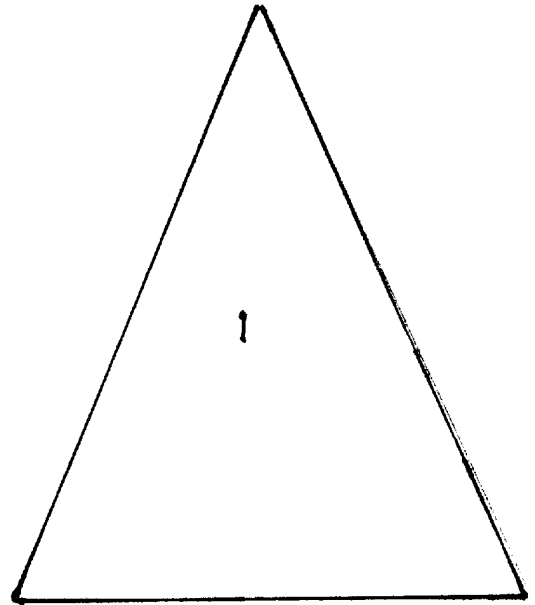
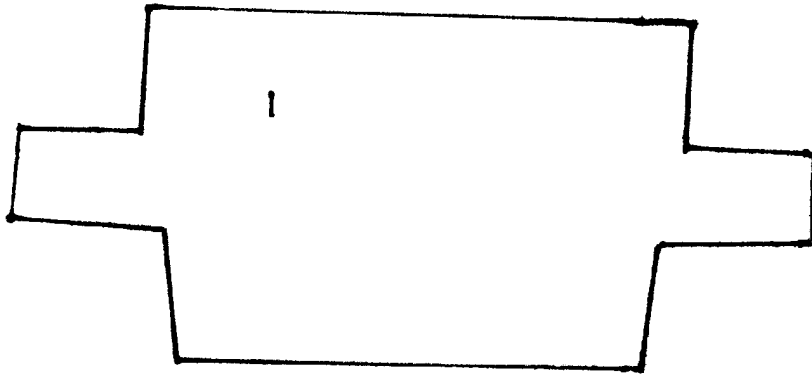
Attach your flying line to the tow point loop on the bridle line. Go fly in light, smooth winds!



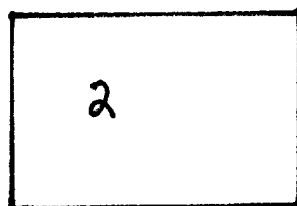
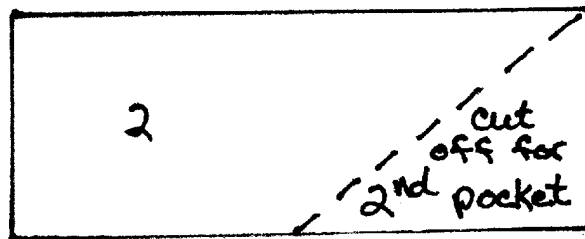
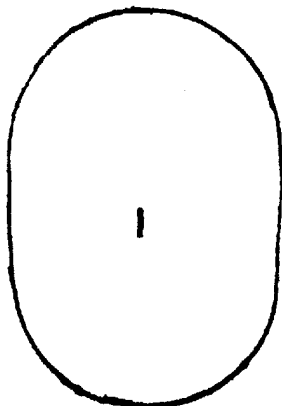
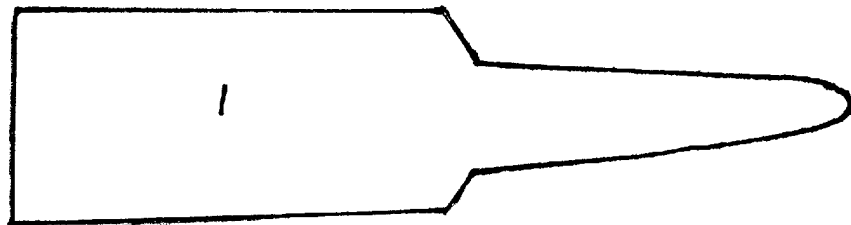
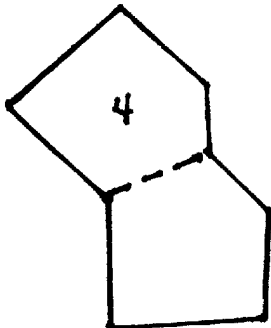
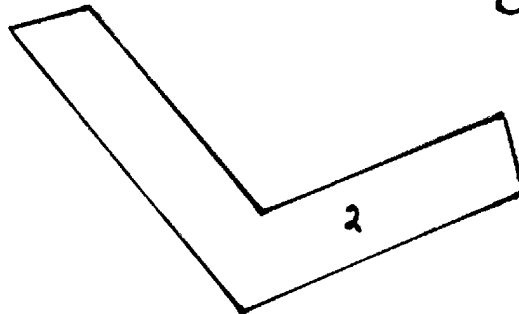
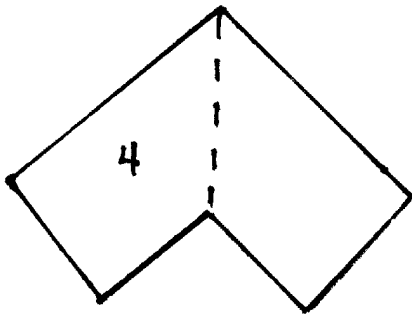
Pockets, sleeves, reinforcement placement.  
 Location reference only.  
 Not to scale.



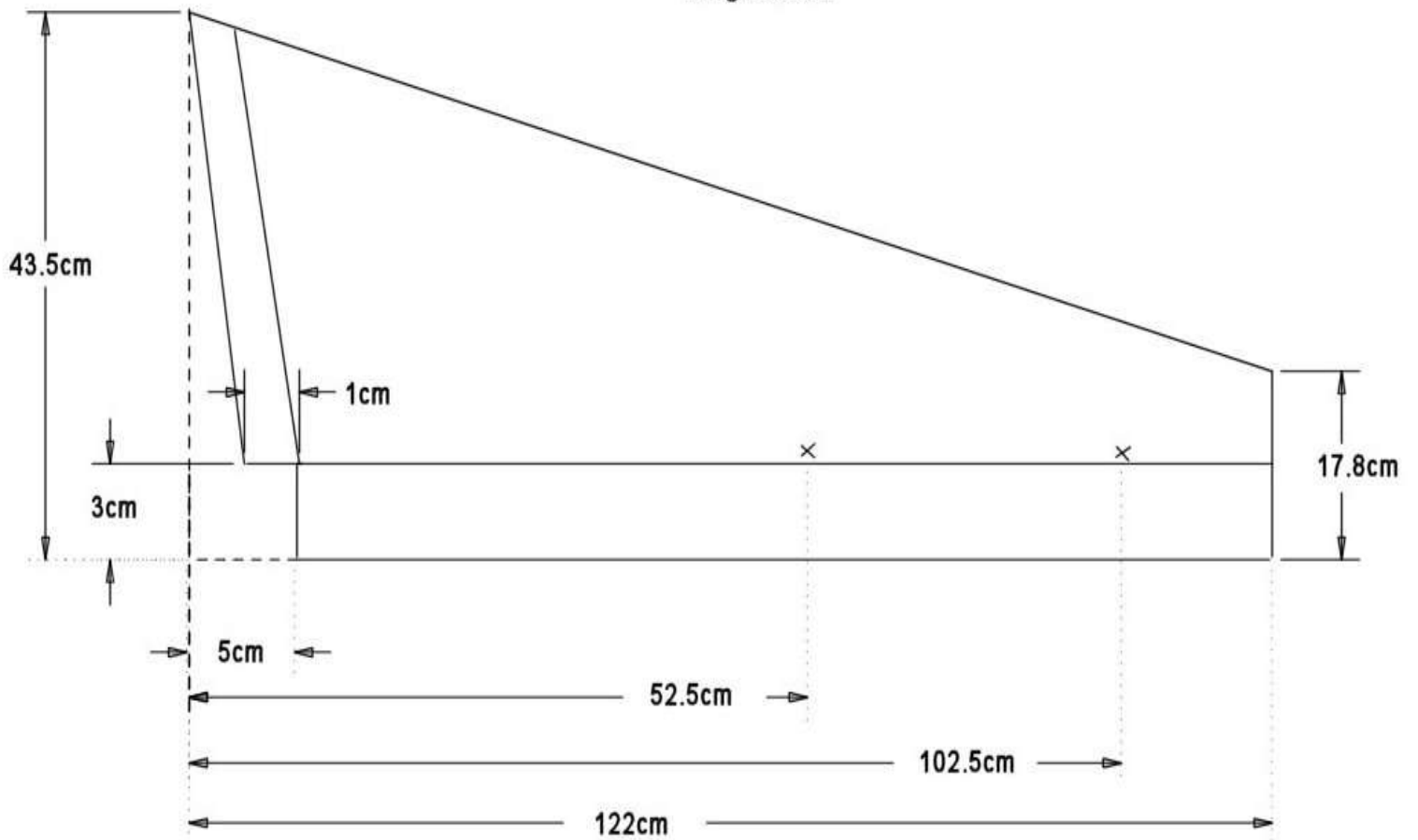
# Berlin Flyer



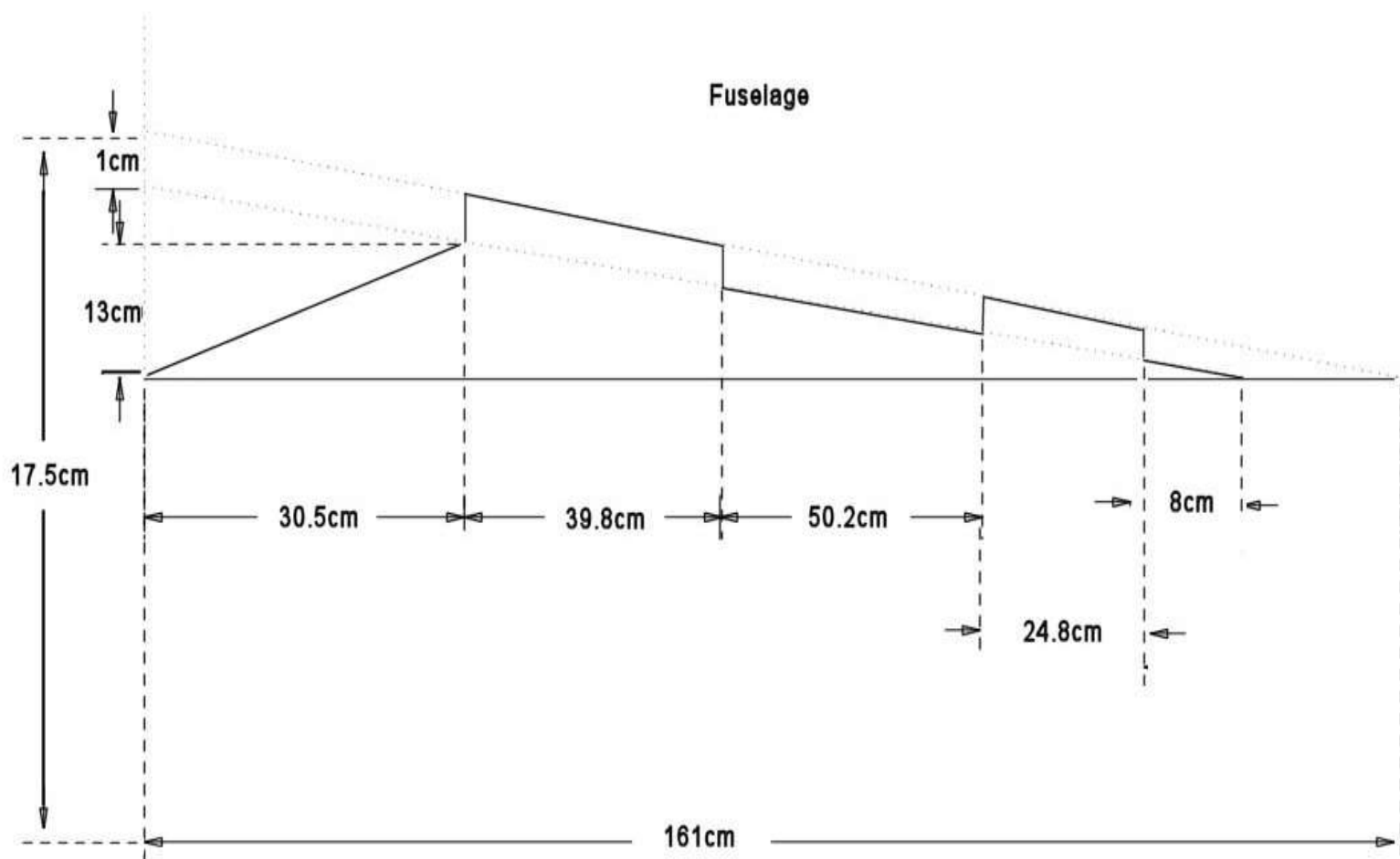
## Dacron Reinforcements



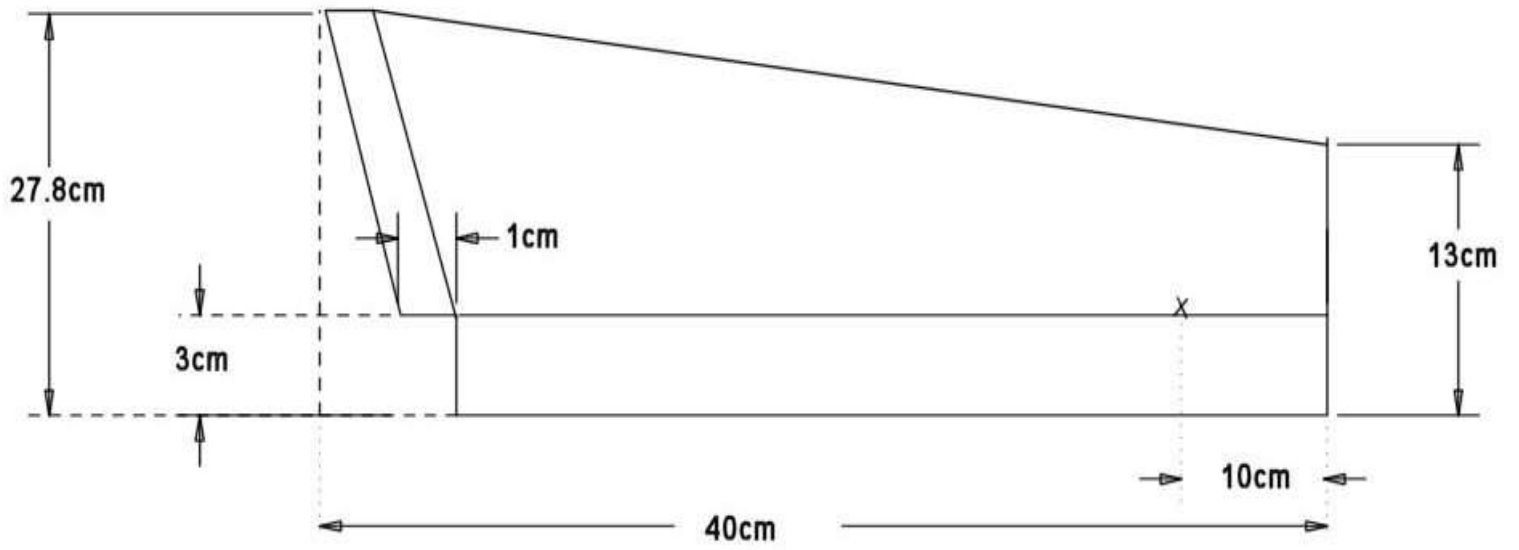
# Wing Section







# Tail Section



Miscellaneous photos of tail section, no particular order.

