

# F-18 JePe Fast Foam Instructions

Posted on [5 December 2012](#)



This my F-18 'big bird' project , I had these kits already for a long time but I did not have much time to finish my EDF prototype version. Now we finally have many parts ready like airducting(cnc hotwire cut) , cnc bulkheads and many other parts that are needed to convert it from a cheap pusherprop model to a real FastFoam Jet!

Prototype does carry up to 2x6s 4500mAh battery and to keep things simple it will be a 'bungee launcher'. Two fast 70mm Fans can easy produce a total thrust of 4.5 kgf !... Super cool and very big F-18 project!(small price!!) first flights proved it to be a: very easy to fly Jet with great speed range!

**Building skills: above average** (like F-22 and F-100 but bungee launch keeps construction simple as well)



**JePe F-18 + conversion Kit for 2x70mm EDF+ Now inclusive Nozzles for 70mm fans**

### **F-18 Material list:**

- **JePe FastFoam F-18 kit**
- **PU-Glue 75 gram JePe**
- **EasyFiller 300ml JePe**
- **PU Finish 250ml for fuselage + 300gr HT-2 Epoxy for the wings**
- **3,5 meter 25 gram glass tissue JePe**
- **4x mini servo: about 14 gram digital metalgear/ ball bearing / metal outgoing shaft**
- **10 meter bungee launcher +85mm wheel dolly JePe but it launches perfect with bungee only**
- **2x 70mm Fans like new JePe JET70-6s 9-blade (performance already great on 2x 5s 4000mAh packs**
- **2x 80-100Amp ESC like YEP-100A**

## **(1) Lets start with preparing wing panels**



**cut last 15mm from wingpanel trailing edge and glue the balsawood trailing edge on  
(comes with JePe kit)**



**sand trailing edge area with sanding block (120-150 grain)**



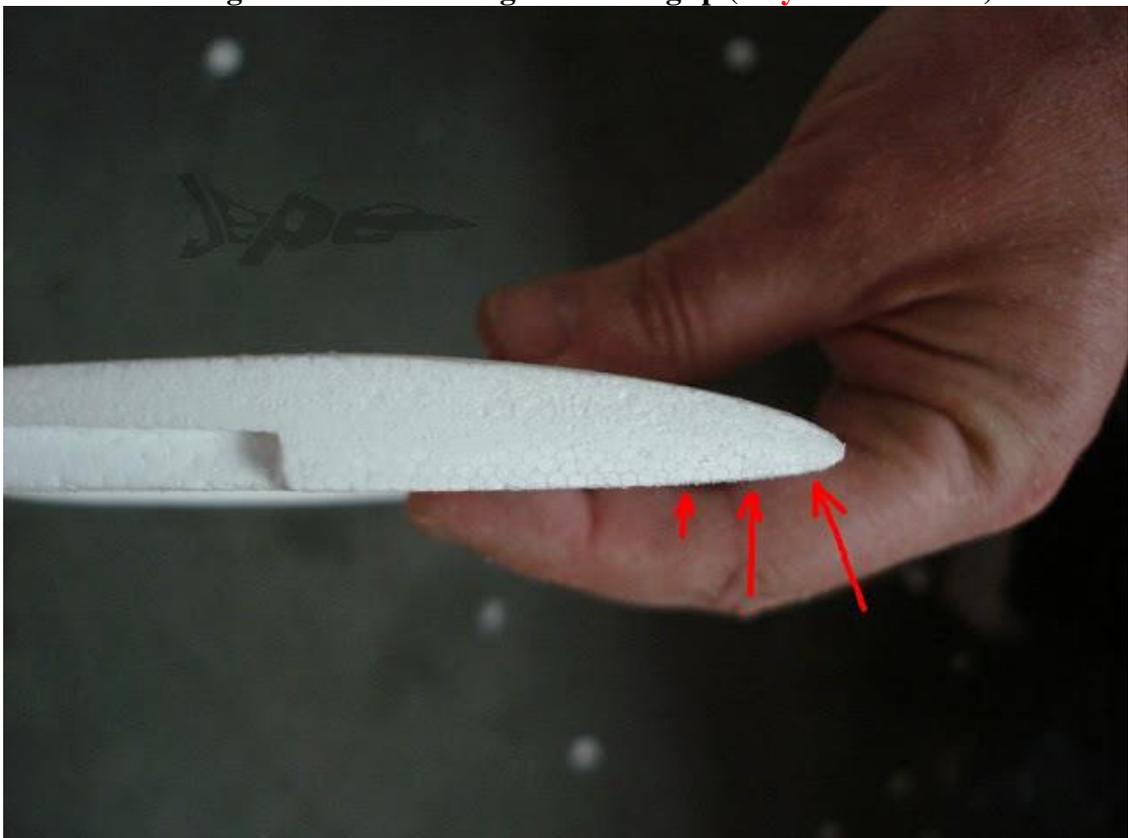
**after sanding you have strong balsa trailing edge**

## (2) Now we make small wing profile change:

we don't want a flat bottom wingprofile on a FastFoam Jet ! use sanding block and take some material away from bottom nose section of wingpanel



sanding **red** area from wingroot to wingtip (**only bottom side !**)



sanding of bottomside will lift up the wingprofile nose a little..we need that !

### (3)Joining wingpanels to topside fuselage and spar

Use the cnc cut plywood and balsa parts from the kit together with the 6mm carbon tube to make a 'BOX' construction like below (these parts are now supplied with the kit)



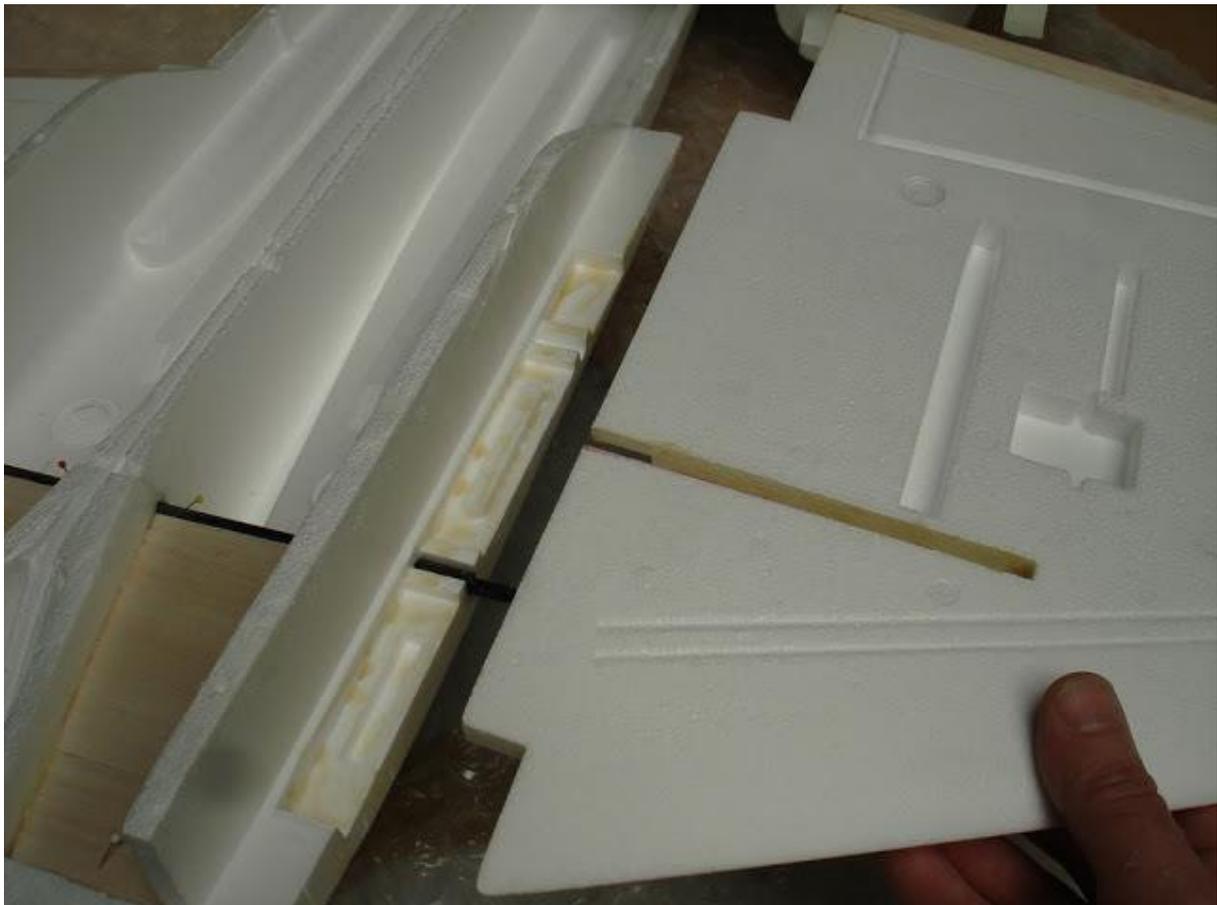
**Make box construction with cnc plywood parts from JePe kit, use PU glue**



**draw location of spar**



**and cut out!**



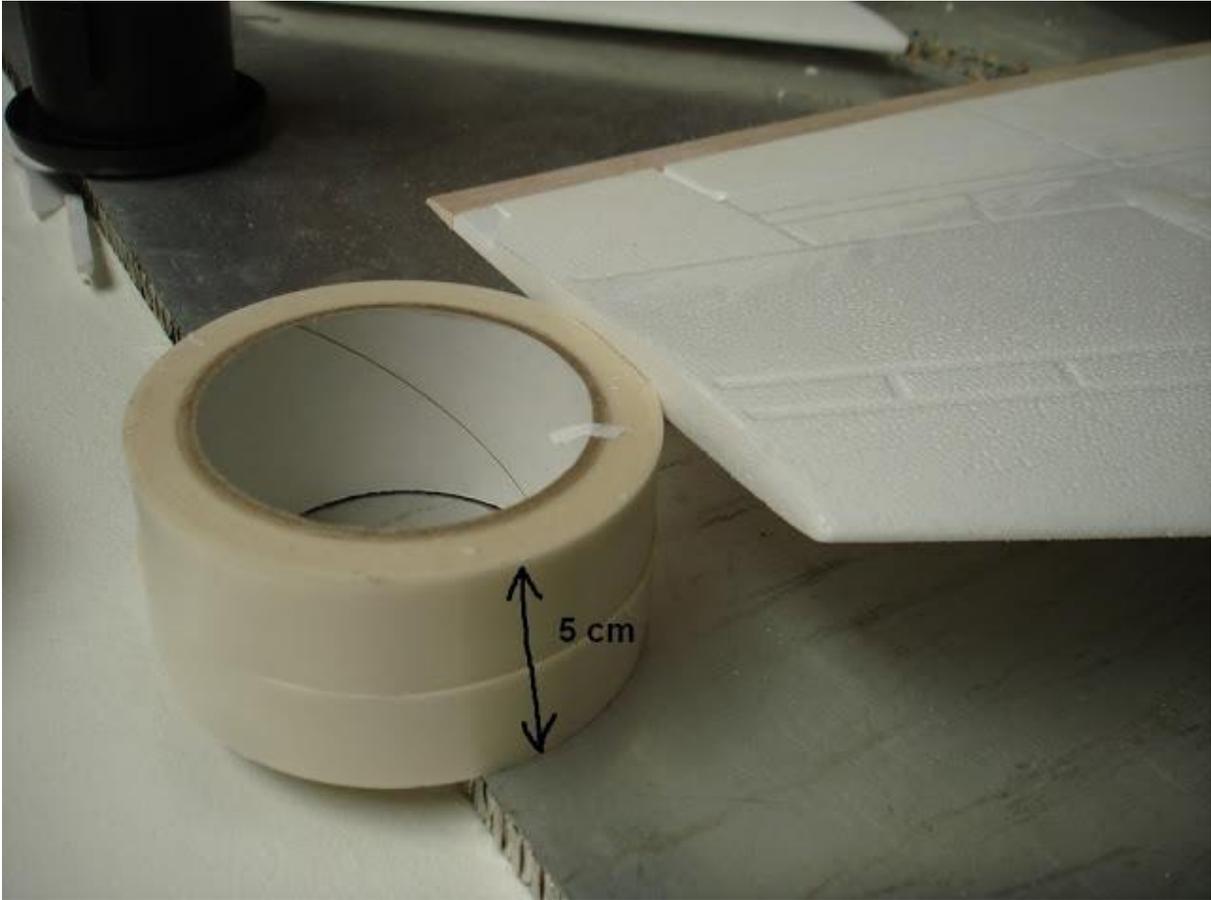
**use PU glue to place wingpanels to Fuselage and spar**



**some tape to prevent all glue comes out..**



**put it on flat building board**



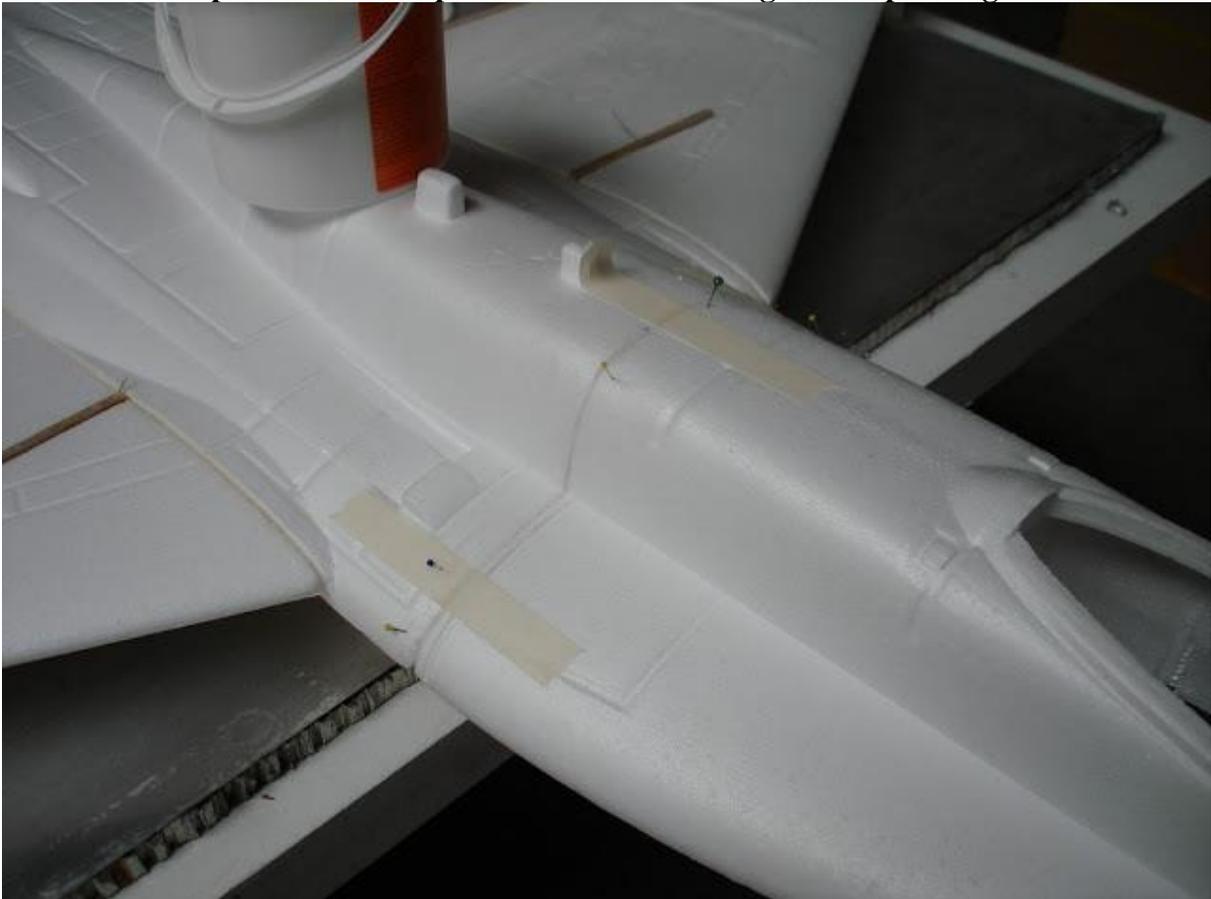
**use the slot at wingtip to rest on 5cm of 'something' (roll of tape)**



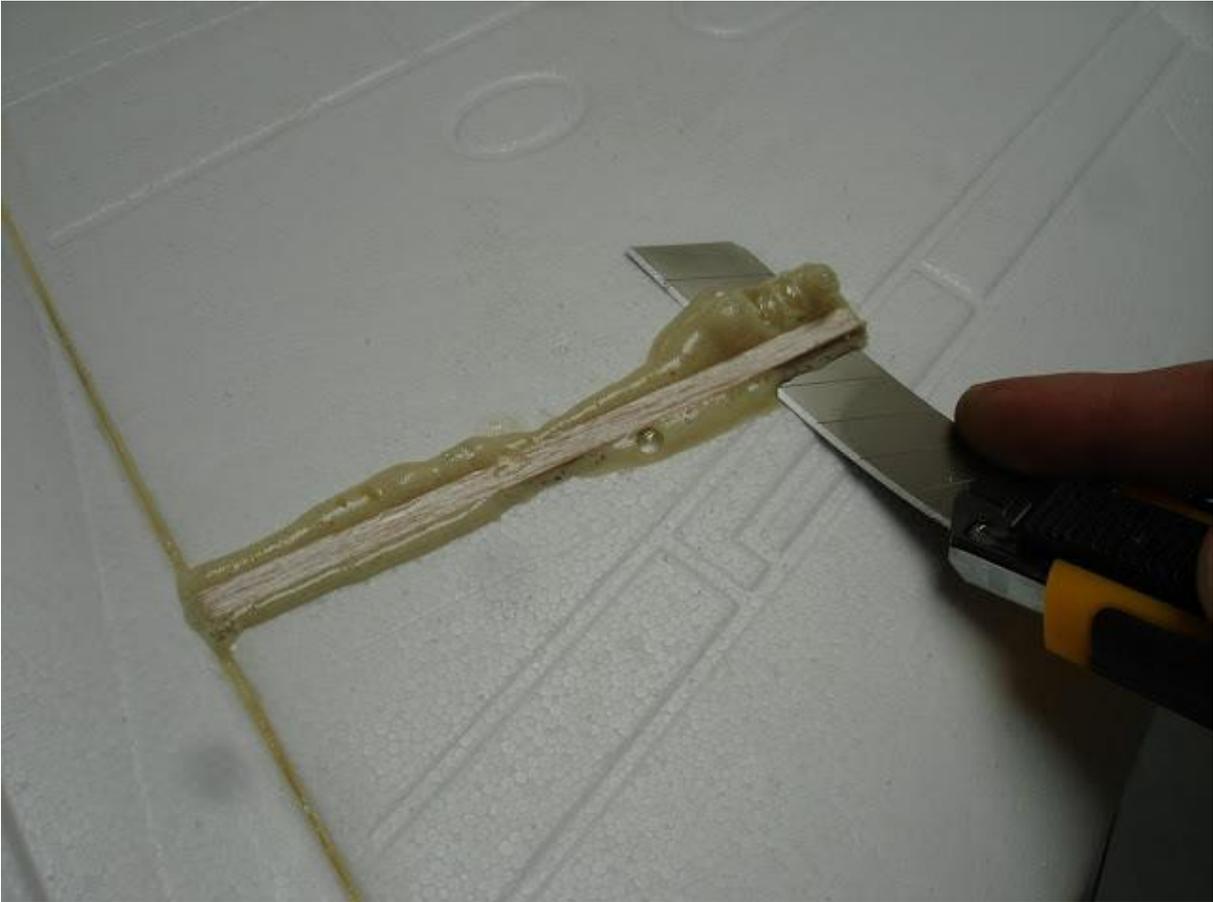
**5cm on both sides...**



**put in some scrap balsawood before PU glue is expanding**



**if you want you can now already put the nose section on**



**next day clean PU glue..with flexible knife**



**FINISHED !**

**(4)Placing 1st half of insert ducting inside top half of fuselage**



**cut foam away in front of this cut**

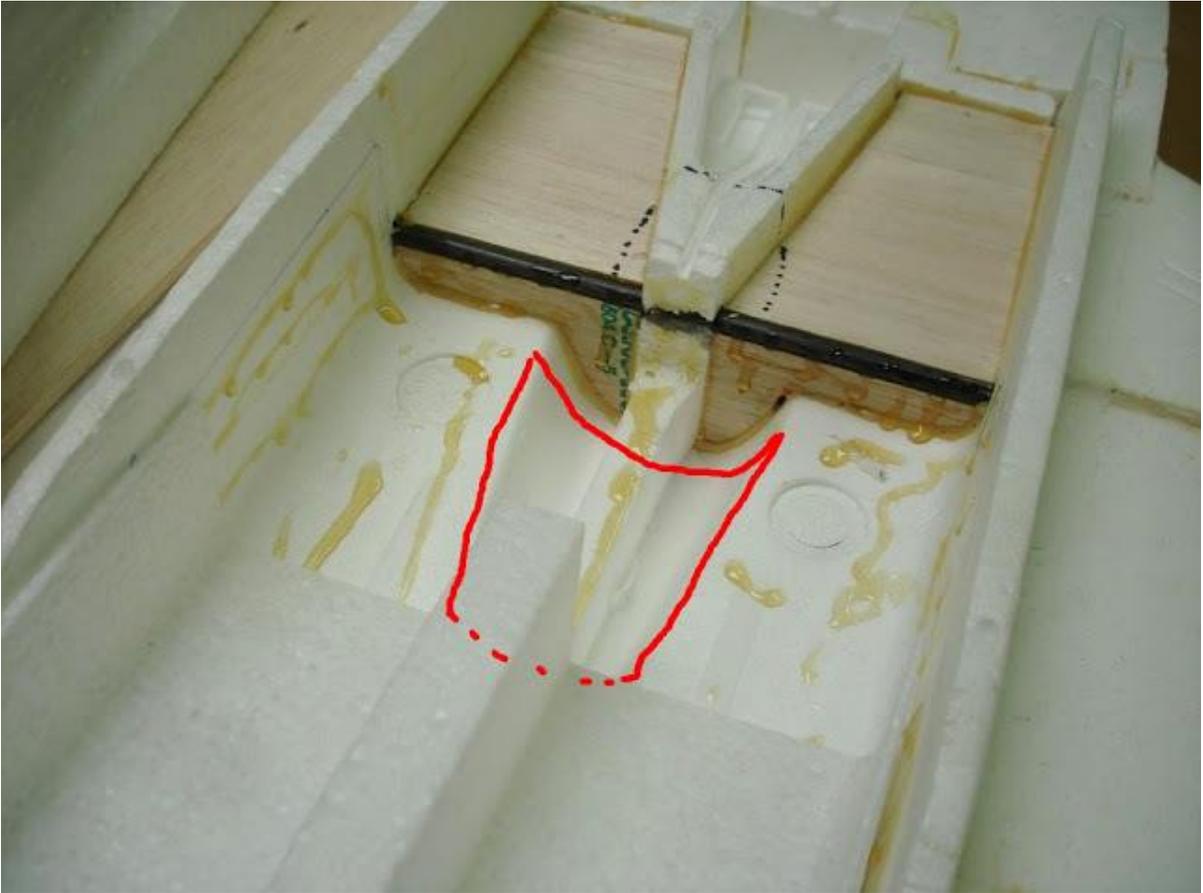


**be sure the foam insert drops in deep enough to make it level**

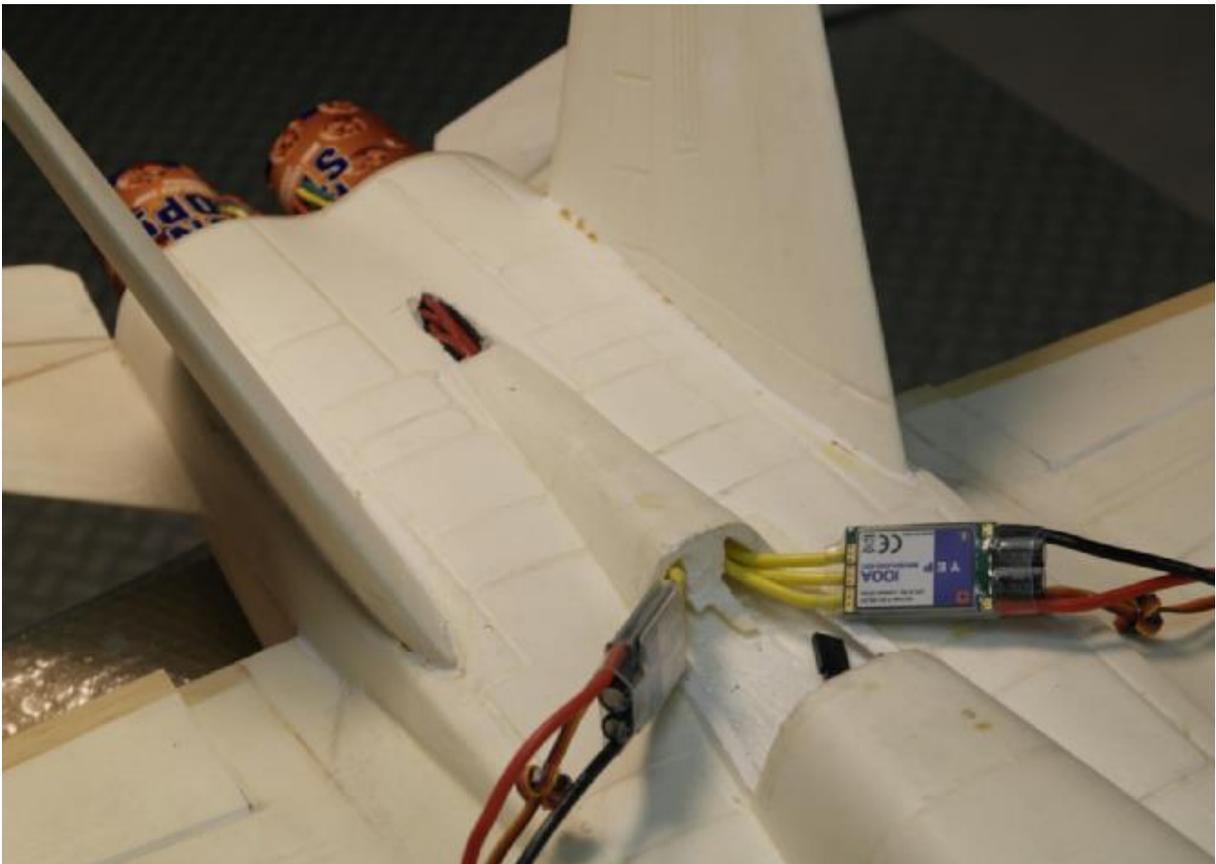


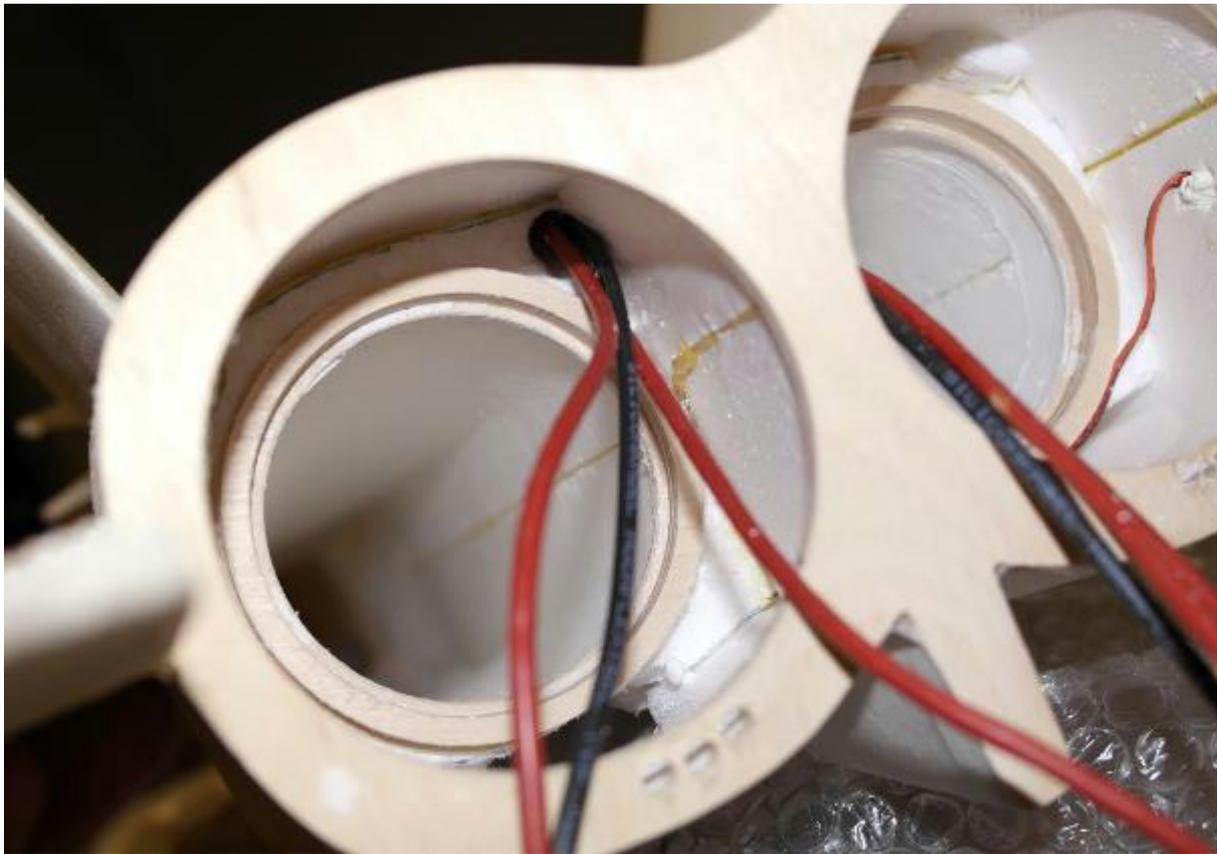
draw line so you know were to put PU glue

**Modification no1:** Later on during building my first F-18 I have decided to pull all motor and controller wires on topside (in the neck of) fuselage. I will cut a hatch from topside , just about 1cm behind of the main spar / bulkhead. The motor wire run behind the foam ducting insert and the fuselage top half, right up to the end of fuselage . This would make the technical design more clean (shorter cables) My 70mm Fans have weight of 260 gram (each) and controllers half way fuselage, with 2x5s 4500mAh or 2x6s 4500mAh packs the CG comes out perfect.



**this below is were I now cut an opening for my controllers**





**the power wires come out at rear end on topside (between the foam ducting insert and the fuselage)**

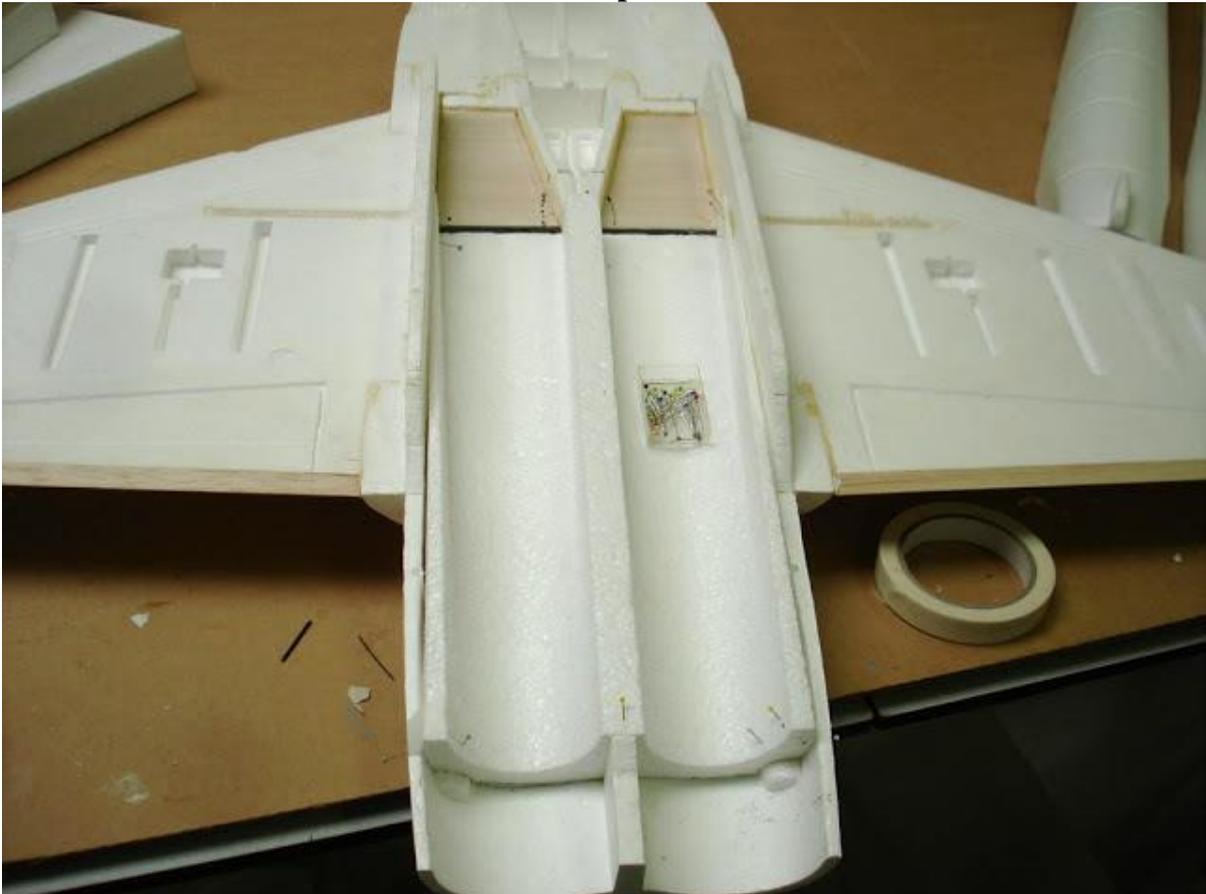
**I had a lot of work pulling the wires when model was already finished so you better put in some wire before you glue the insert in place (pictures are from first try without the wires..)**



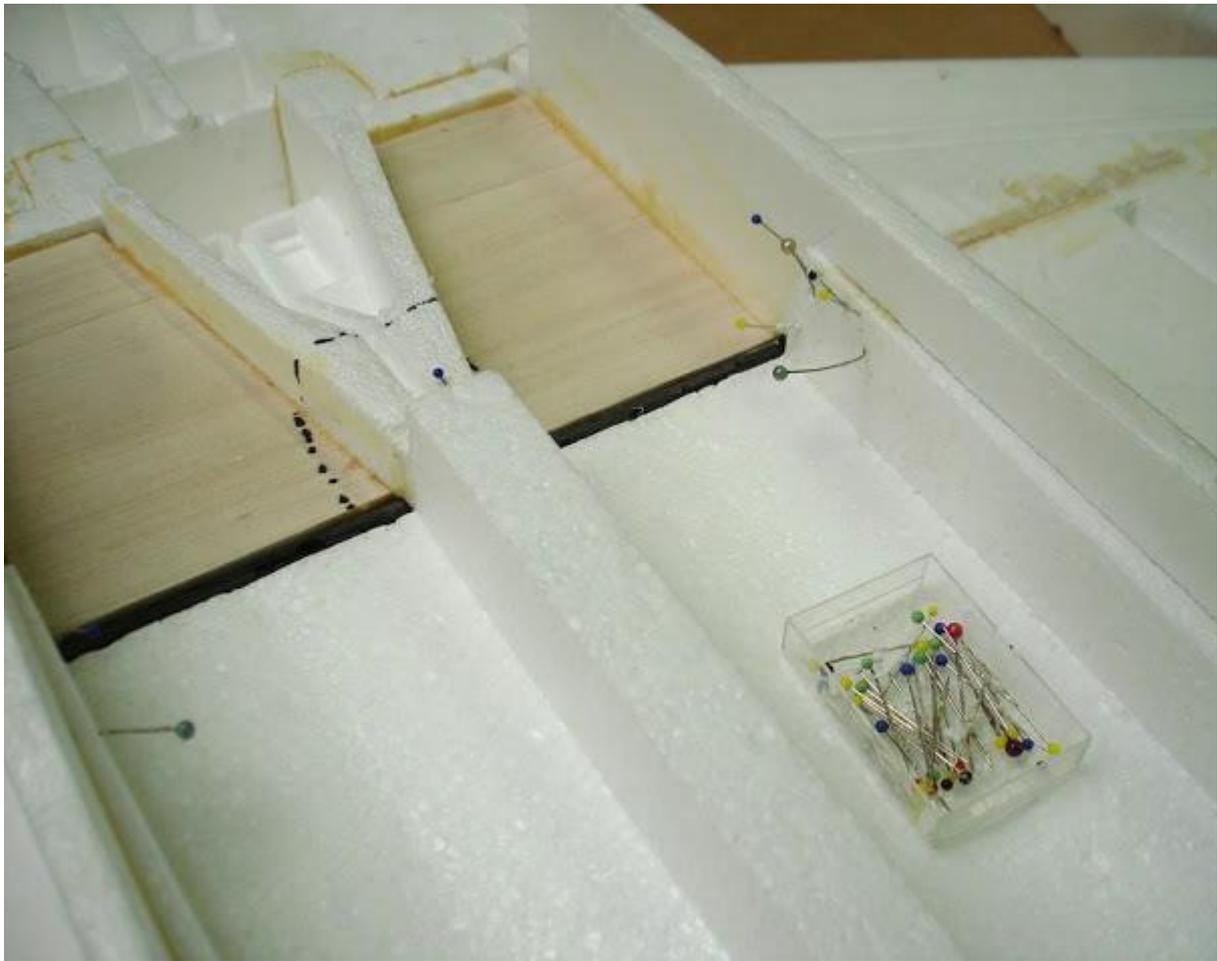
**for now we must go before PU glue is hardening**



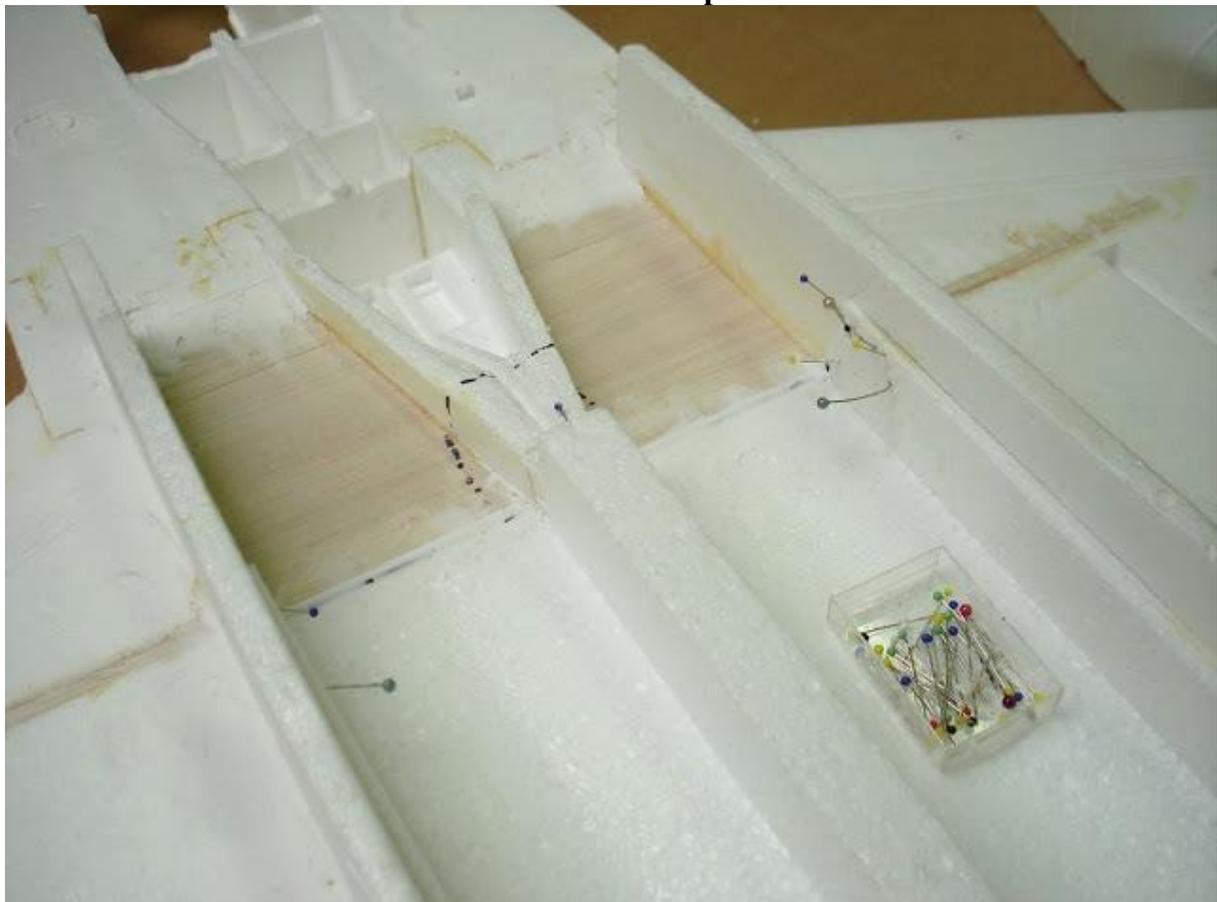
**insert in place !**



**use needles and pins**



**more needles and pins**

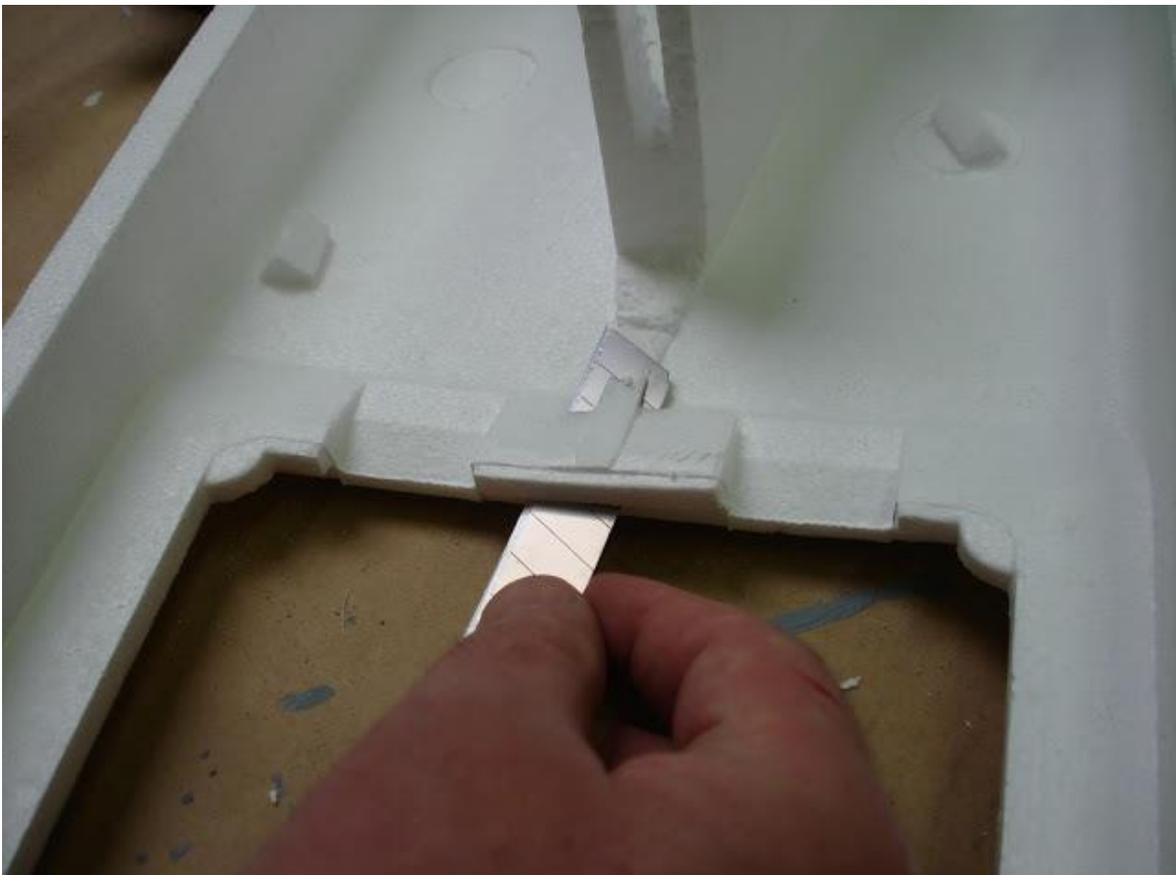


**use some Easy Filler to cover the spar and so on**



**more EasyFoamFiller + rubber to make foam surface inside ducting nice smooth**

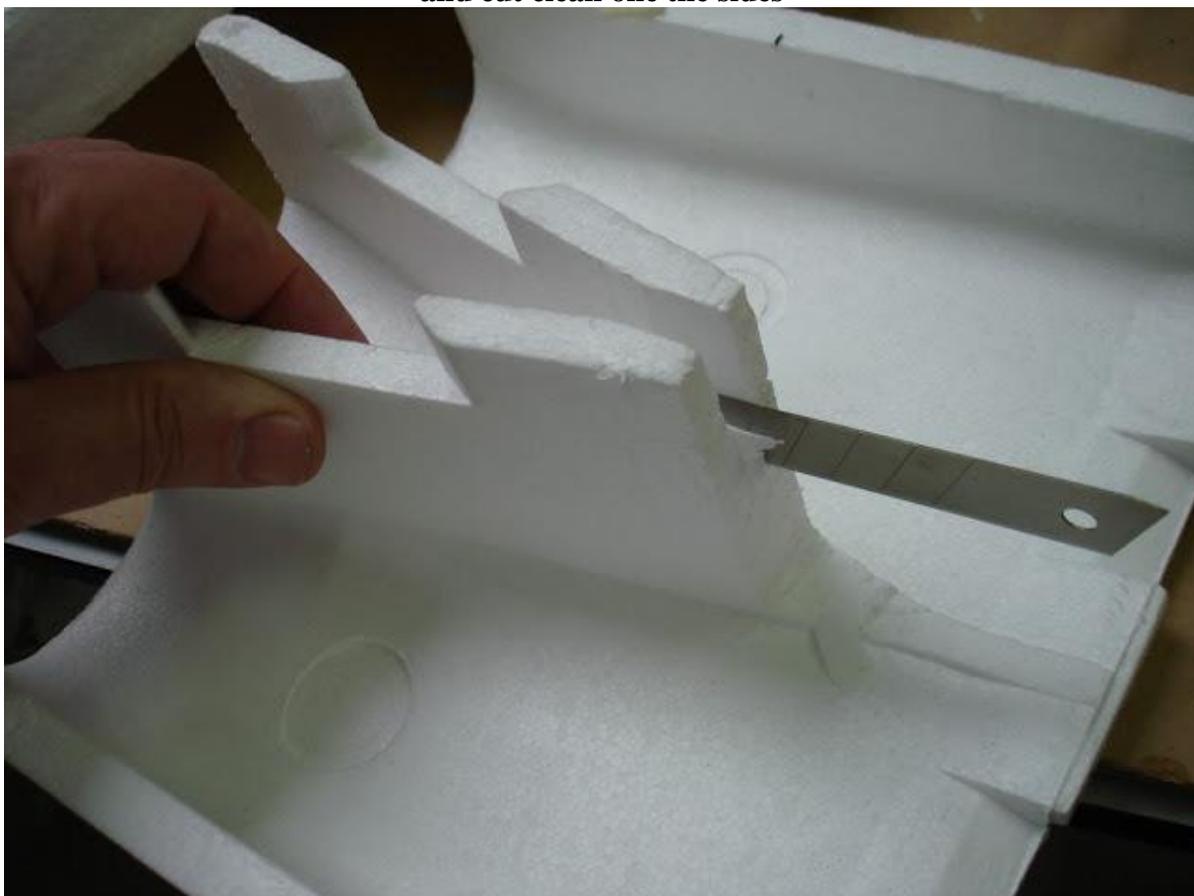
**(5)Next step: mounting bottom half of insert**



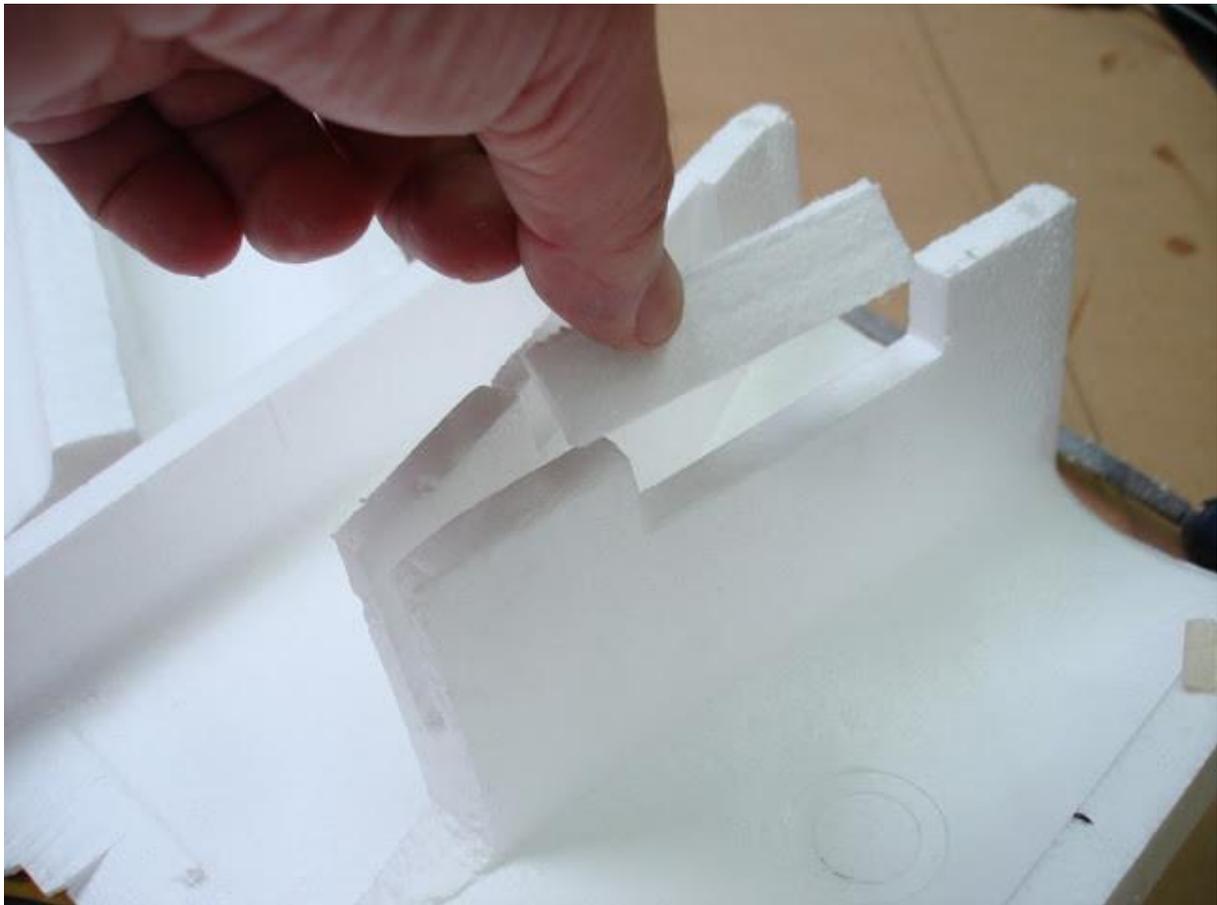
**make bottom flat: cut everything above the surface**



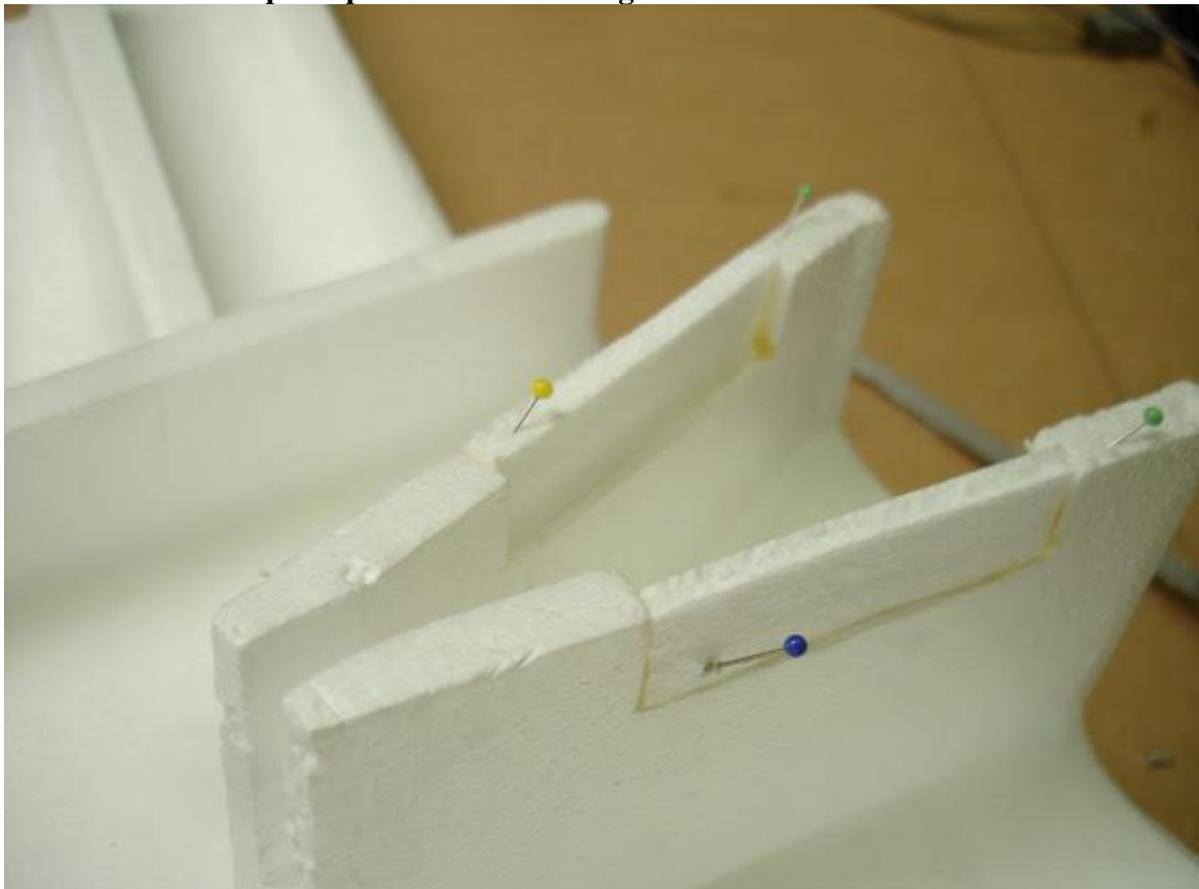
**and cut clean one the sides**



**cut sleeve for all coming servo wires**



**perhaps these were cooling holes but closed them**



**closed!**



**remove some foam of fuselage so it will fit over the insert**



**draw line...**



**and a second line..**



**and cut !**



**test good fit of bottom half of fuselage (do not glue yet)**



**use some easyfiller to make bottom insert smooth before it is glued together**



**time to put some PU glue on the insert join**  
**remember: the power wires that you see here are from my first try. Your wires should run in the topside neck of the fuselage**



**use tape and needles to keep insert together**

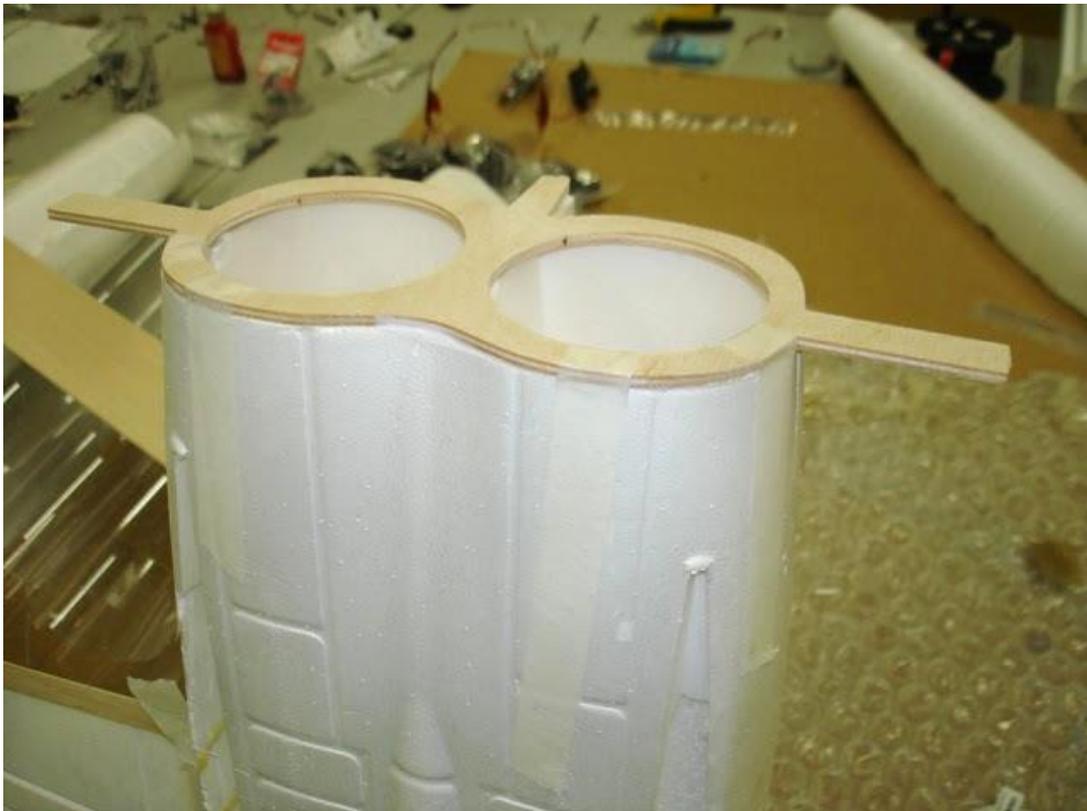


**use some white wood glue to install the Fan adaptor rings.**



**rings standard fit to JePe JET70-6s 7-Blade and CS70 10-14 blade (but you don't want these high blade numbers for speed!)**

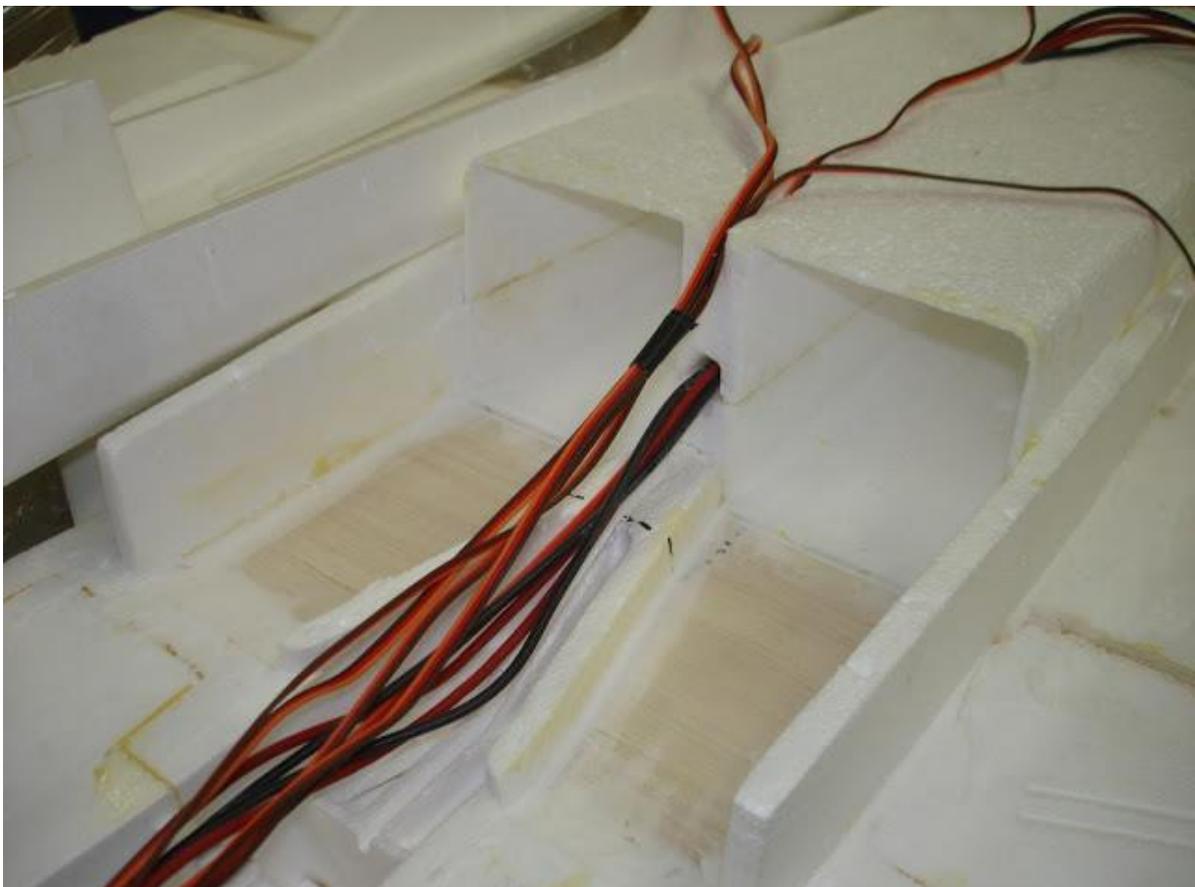
**glue last bulkhead only to tophalf of fuselage!**



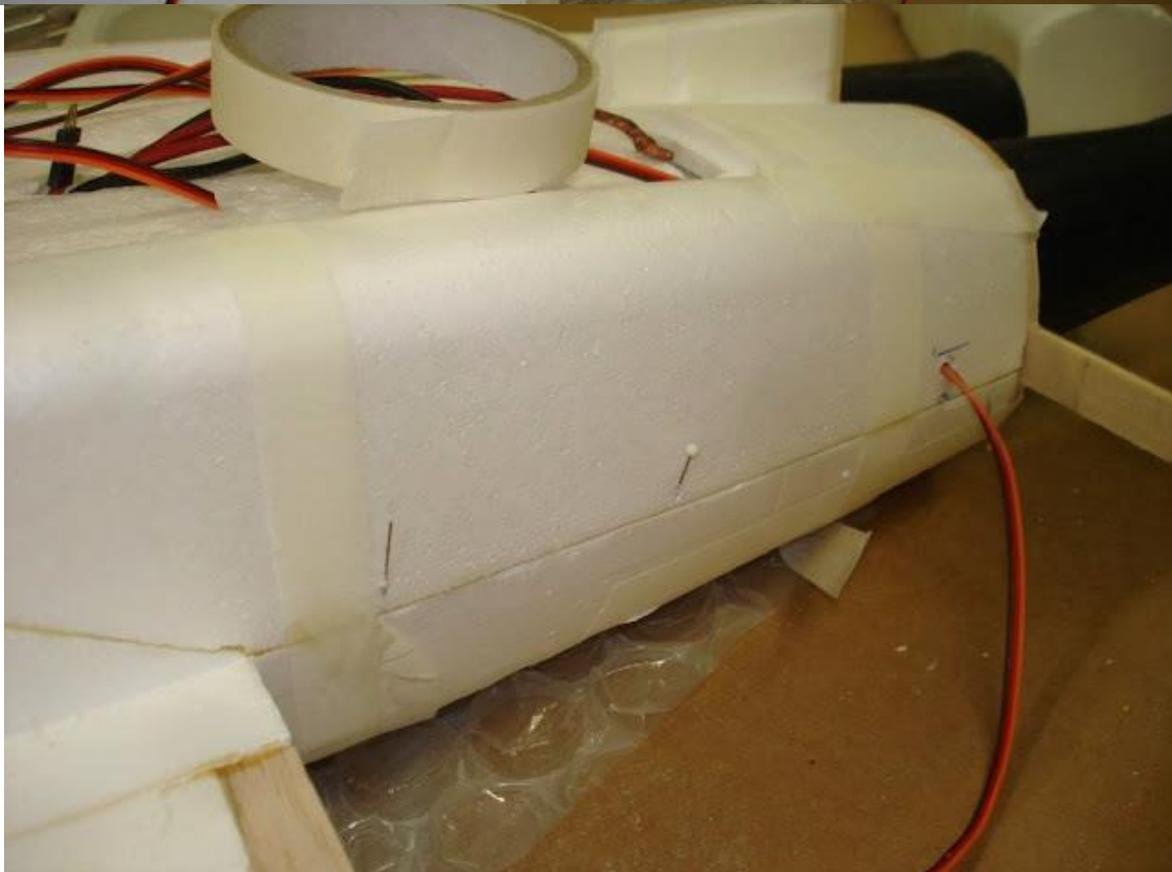
just use bottom fuselage part to check right angle and position of the last bulkhead

You can mount the bottom fuselage half for a short while so you know the last bulkhead is in the right position **(but do not glue to bottom fuselage part yet!)**

### (6) Pulling Servo wires

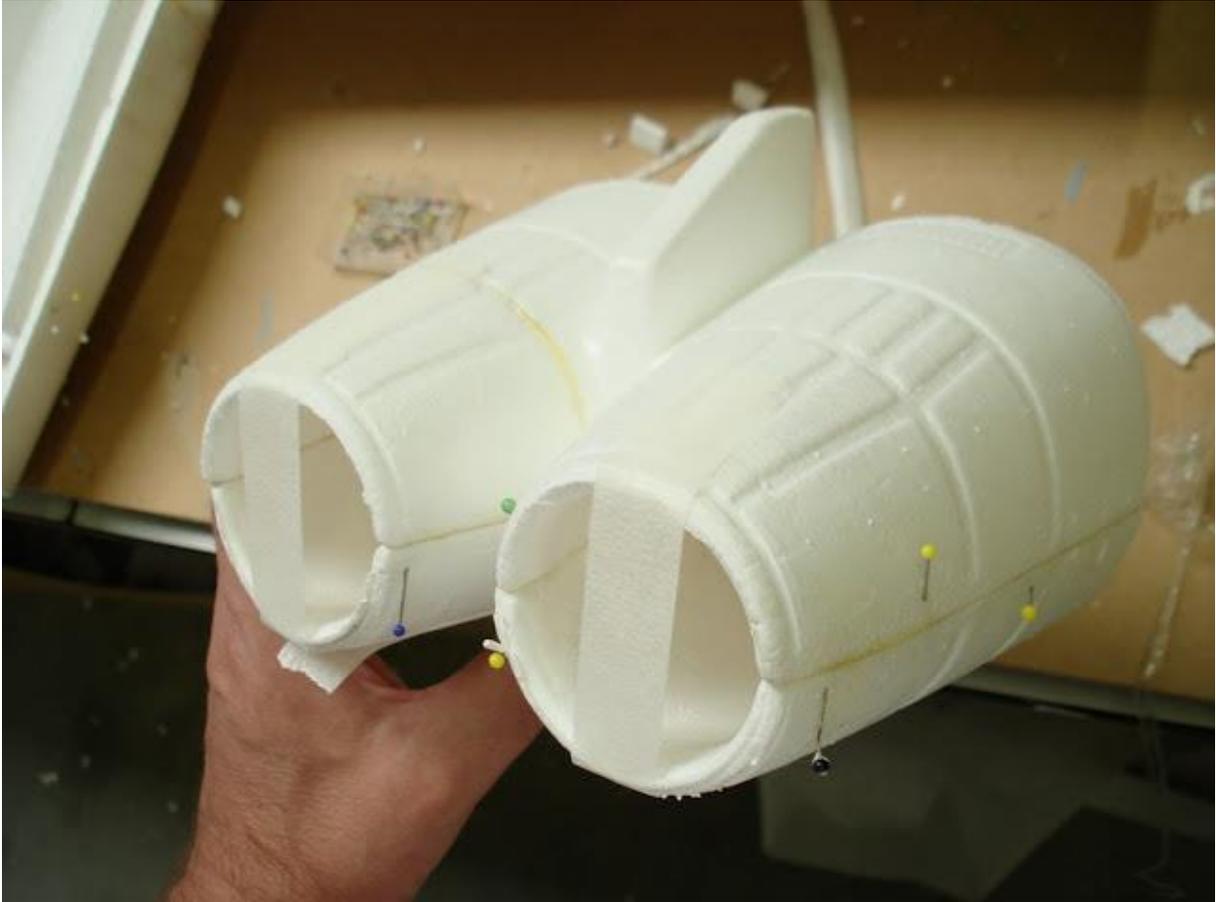


**4 servo wire are needed**



**servo wire must go right inside elevator panels**

## (7) Test fit Nozzle's and Fans



glue Nozzle parts to 1 piece



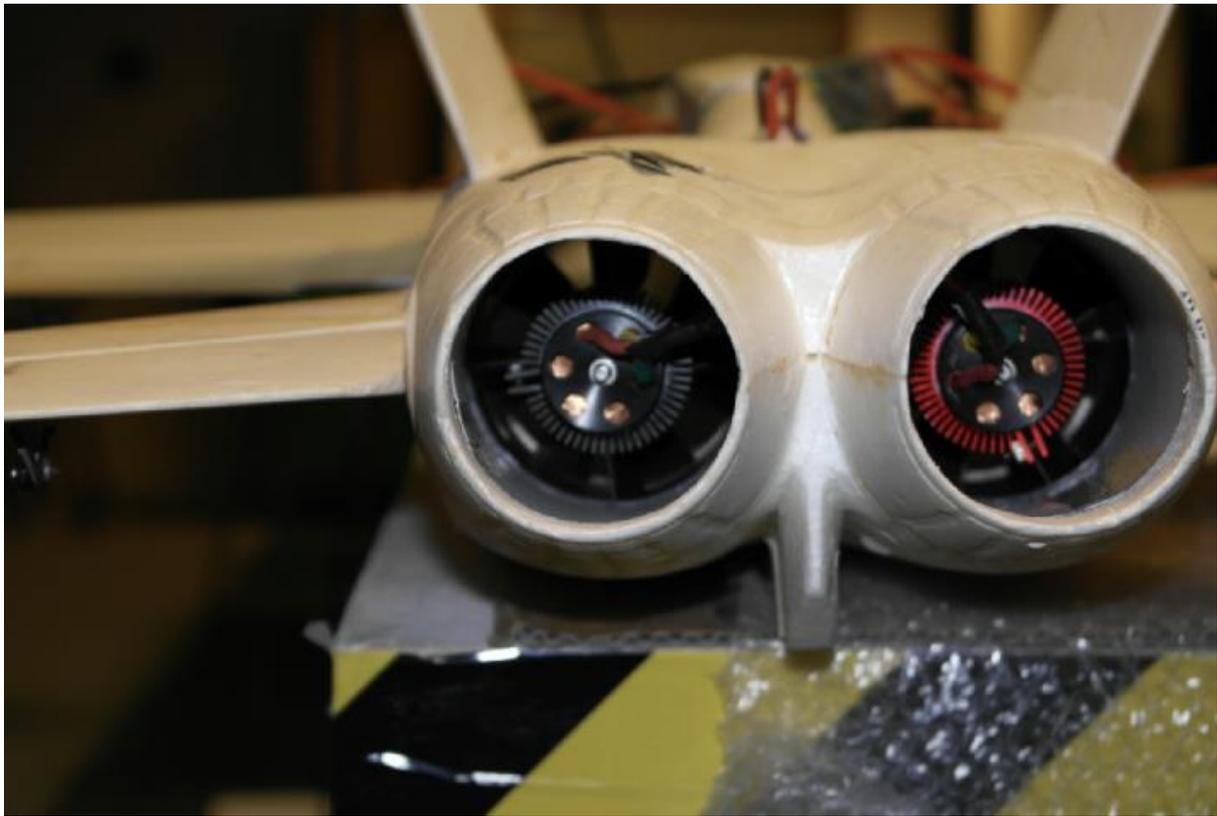
new free! Mach-1 Choco Nozzles are very easy to use as nozzles



**cut the paper lose: the hard paper cone is very easy to tape/glue and shape because it is almost the right diamer**



**If your export parcel exceeds the 5kg limit than it is very well possible that your cookies are gone..Mmm! Use some Tesse powertape tape to keep the cones at right distance(or use some contact glue)**



**Foam nozzles ends look bigger than they actual are, I did only little sanding on foam nozzle end (inside of foam)**



**The papercones stop a few cm before the foam nozzle ends: be sure they fit tight to inside so no air can escape. The Fans are just pressed into the CNC plywood ring (that is glued to the airducting in front of the Fan) . Perfect easy solution but only fits to my new JET70-6s 7-Blade or CS-70 Fans (other fans need some glue to stay in place..but you do not want another Fan!!)**

# Cleaning up the Model

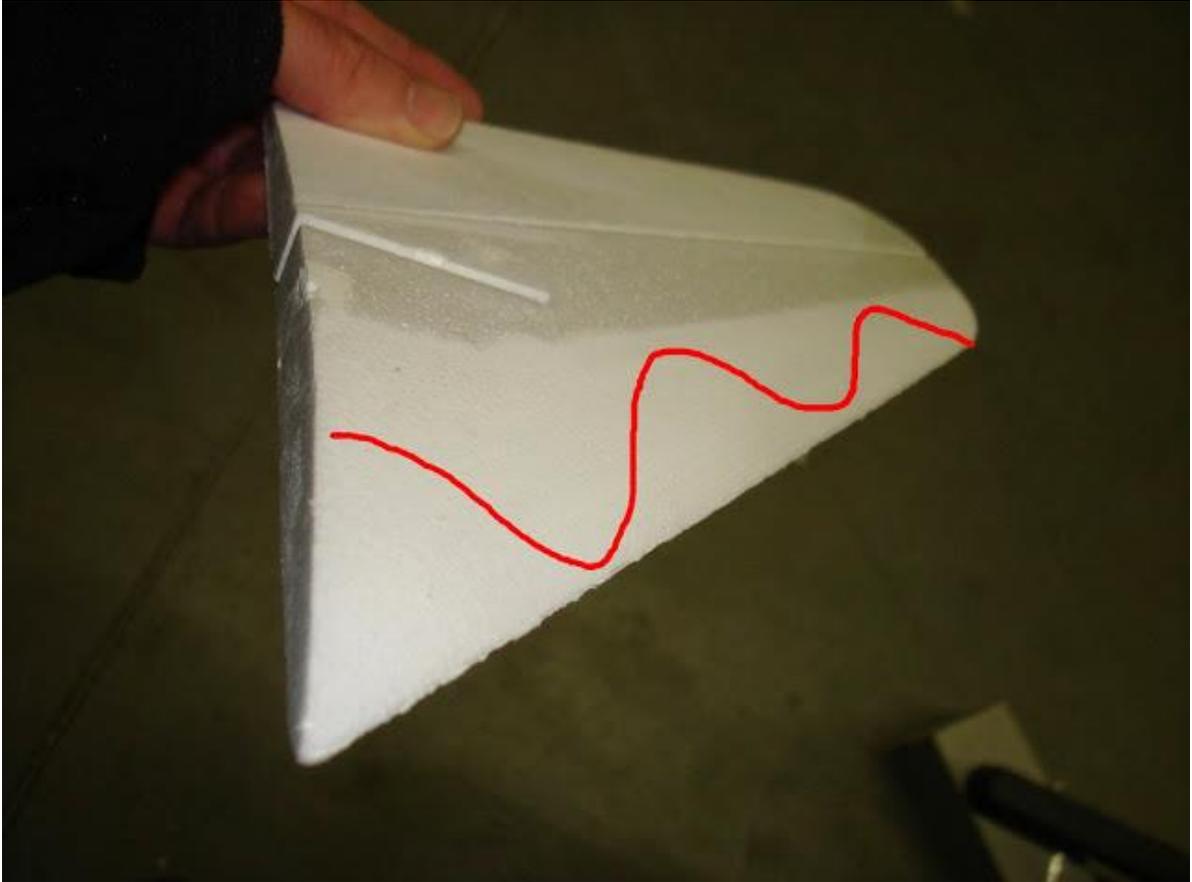


**clean up the fuselage joint with Easy Filler**

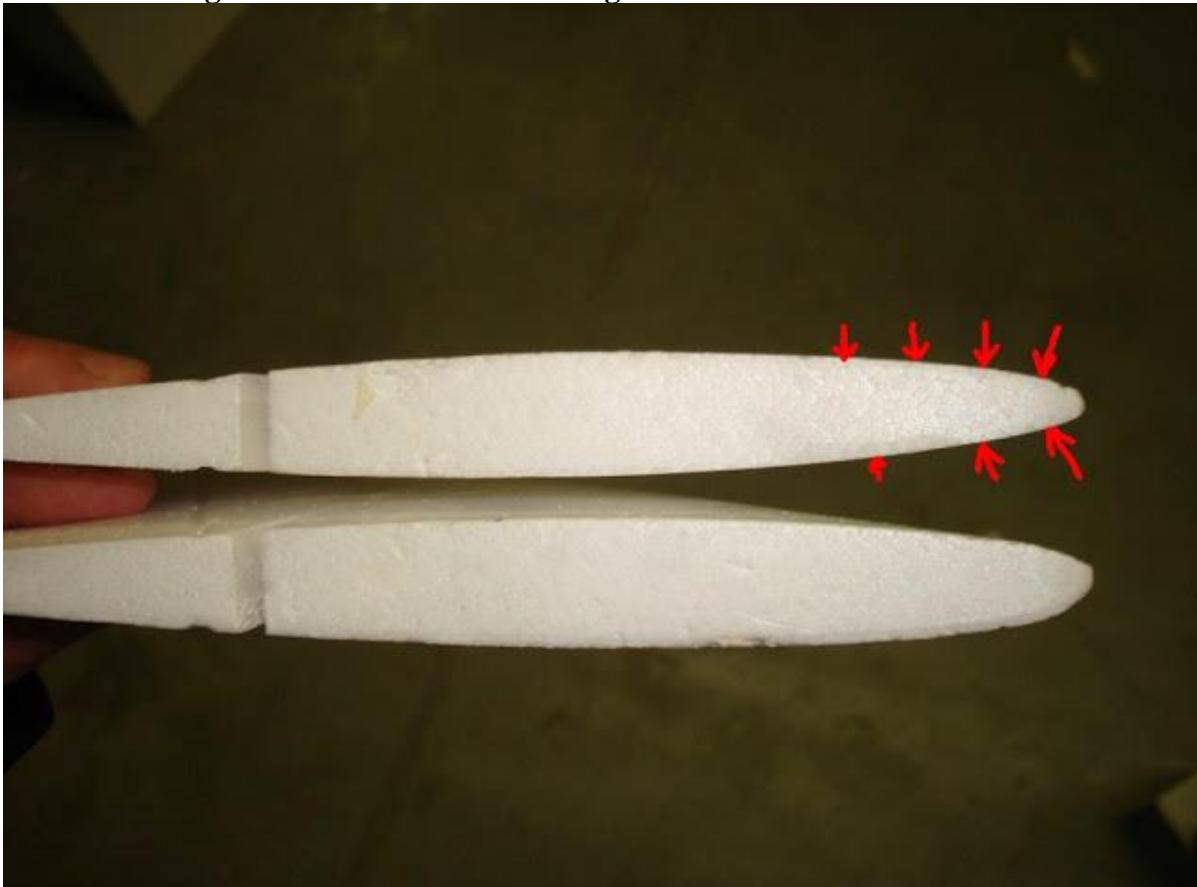


**you need this rubber to do an 'easy finish' job**

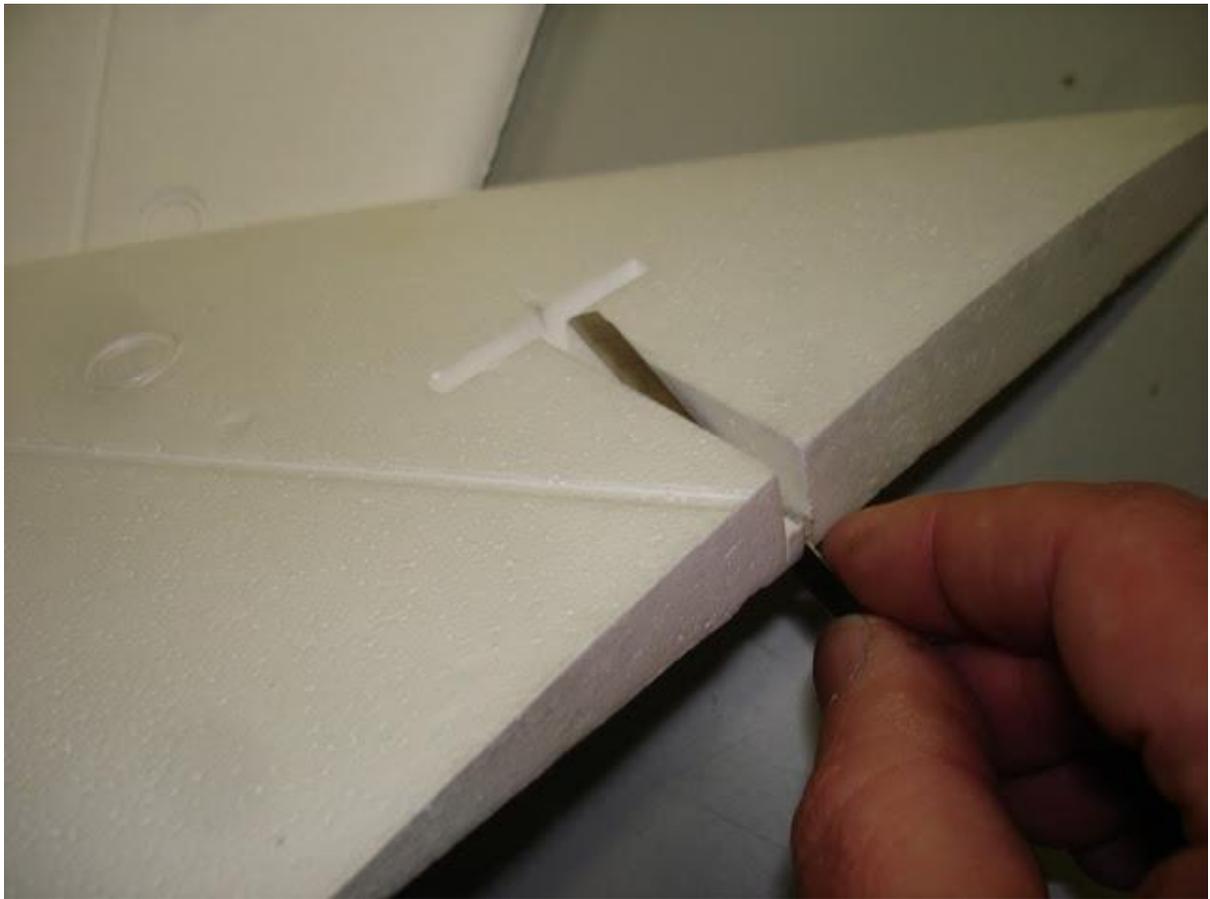
## (8) Mounting the elevators



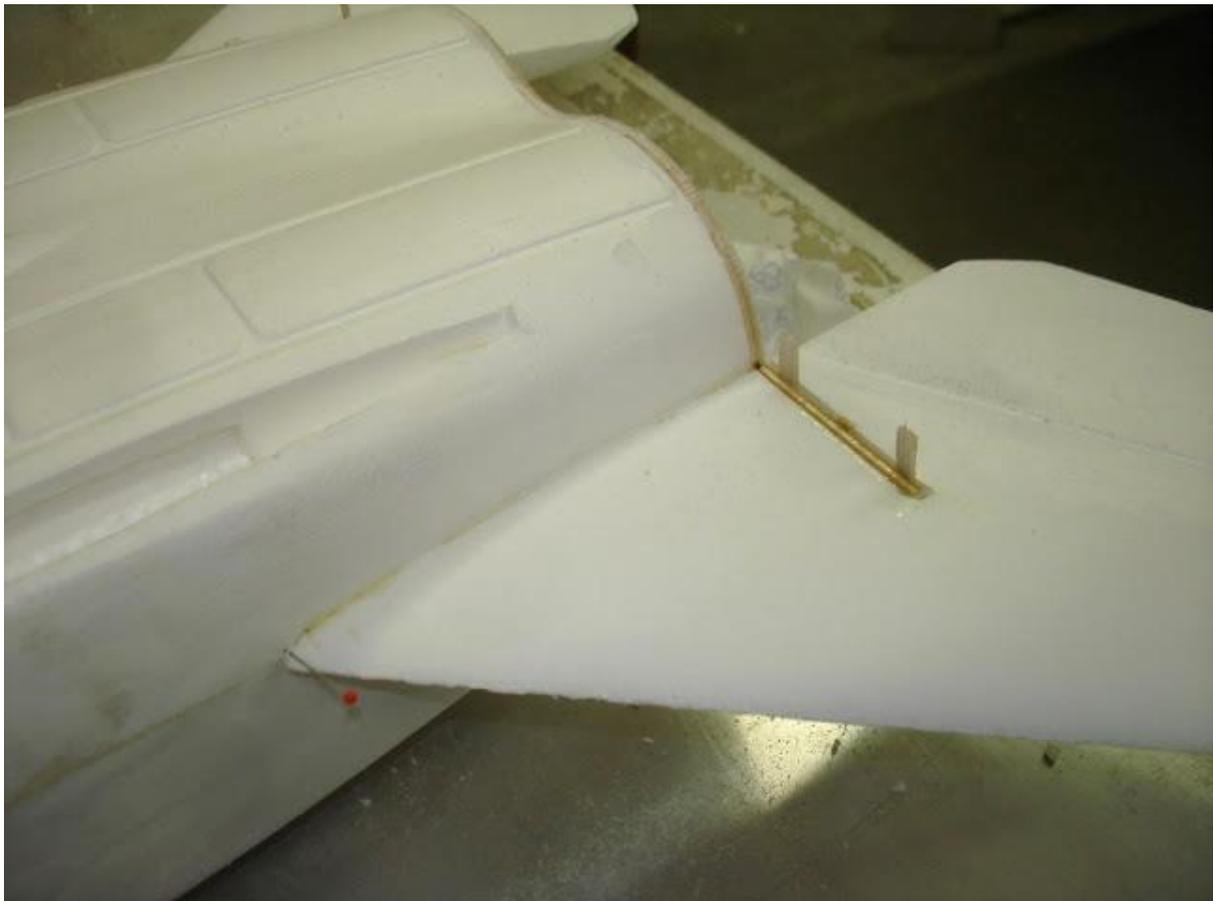
again we must do some sanding on front section of elevators



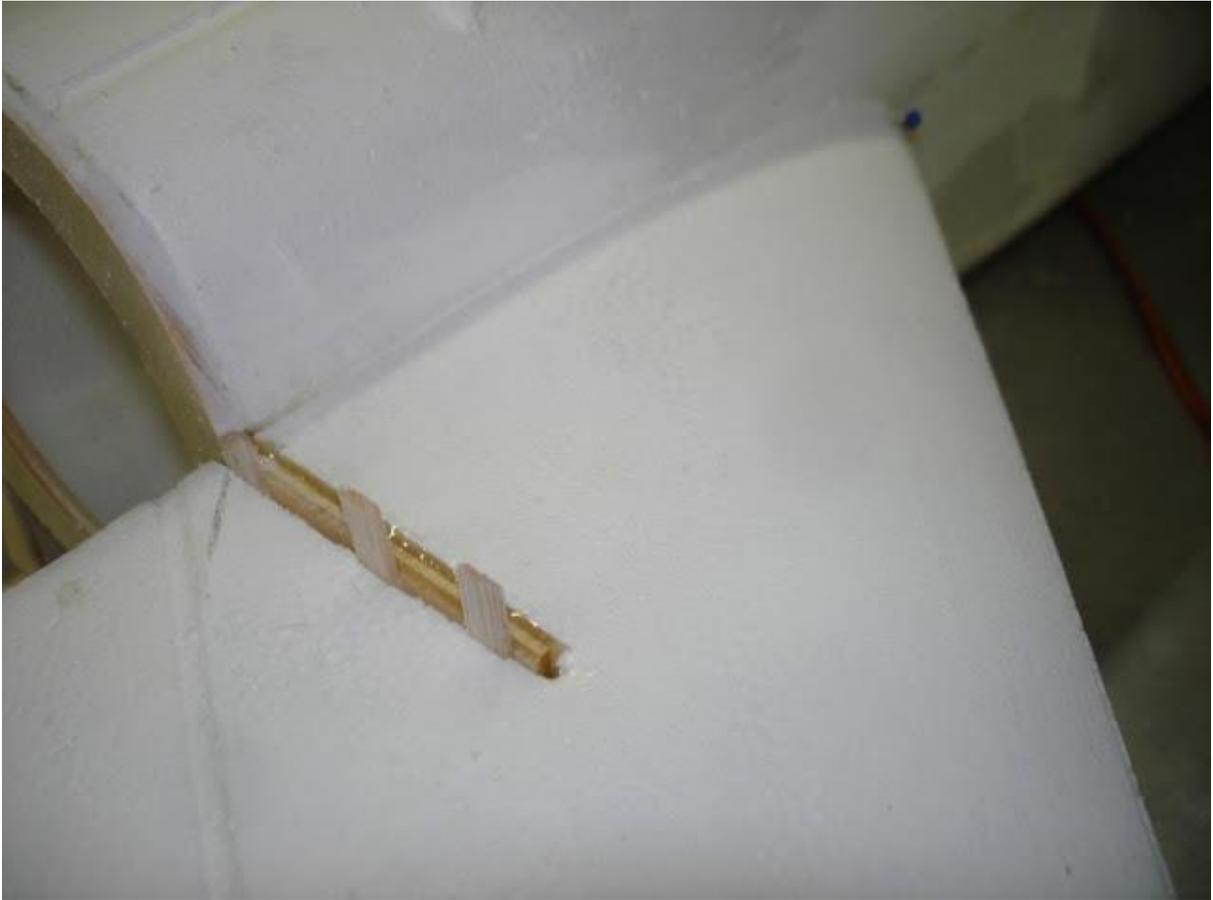
top panel: after sanding and bottom panel: before sanding



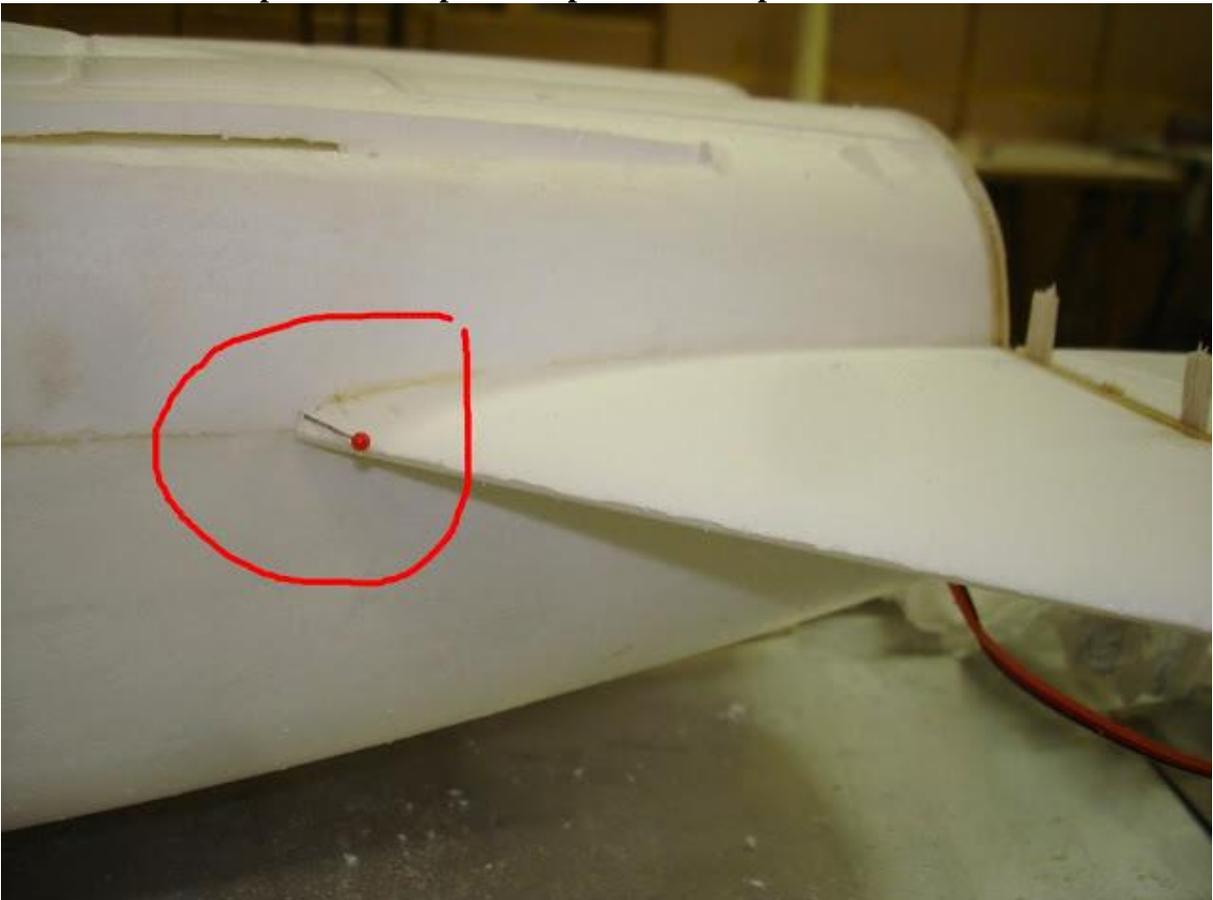
**remove all foam out of the sleeve**



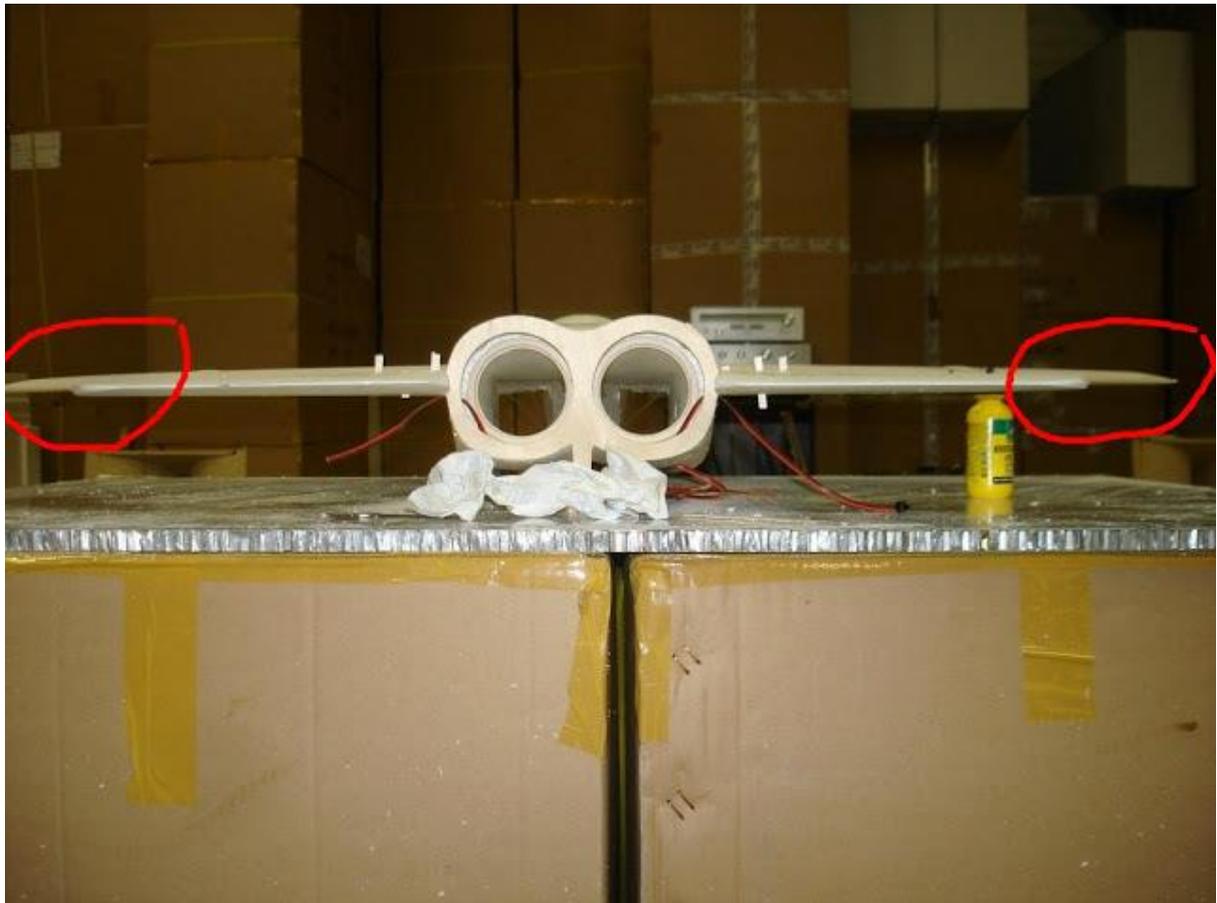
**glue elevator to fuselage and bulkhead with some PU glue**



**to keep elevator in position: push in small pieces of Balsawood**



**keep nose of elevator on fuselage join**



**level both elevators by looking at wingtips**

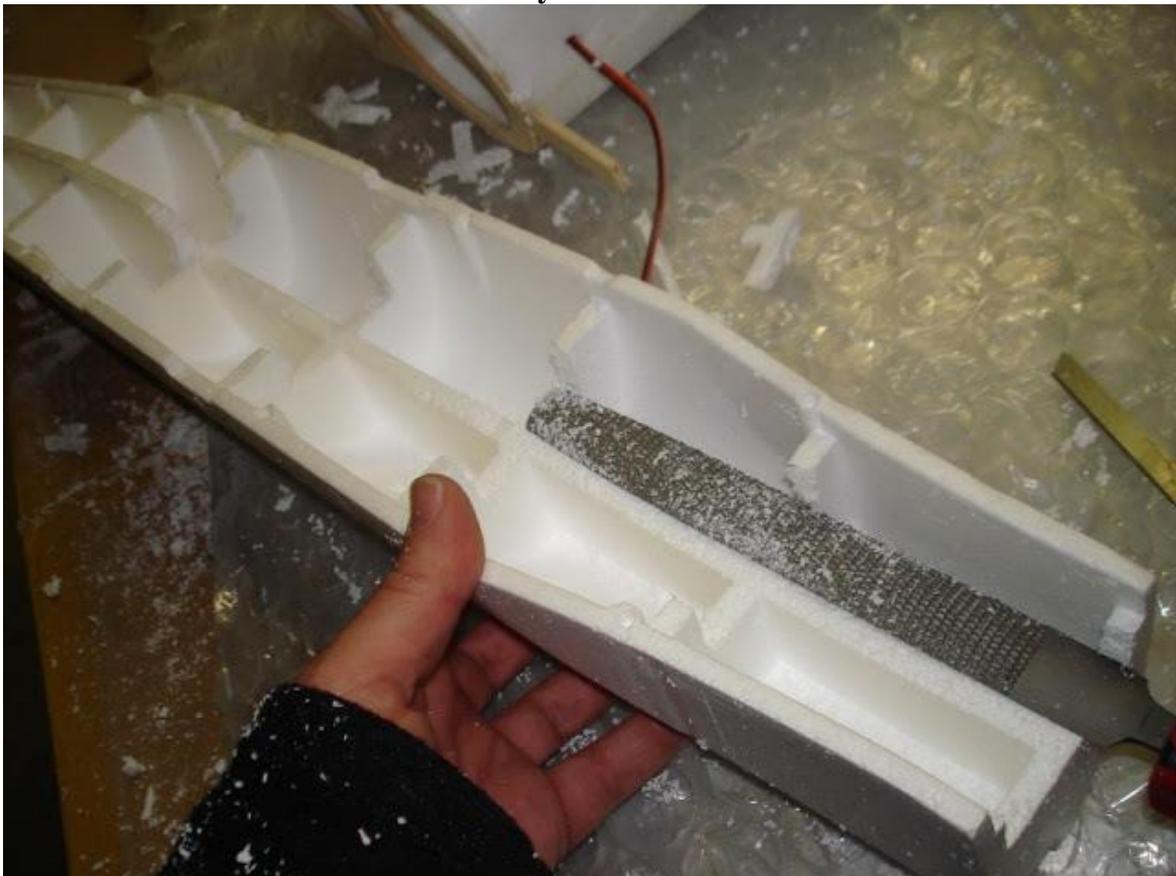


**Job done !!**

**(9)battery compartment of bottom nose section**



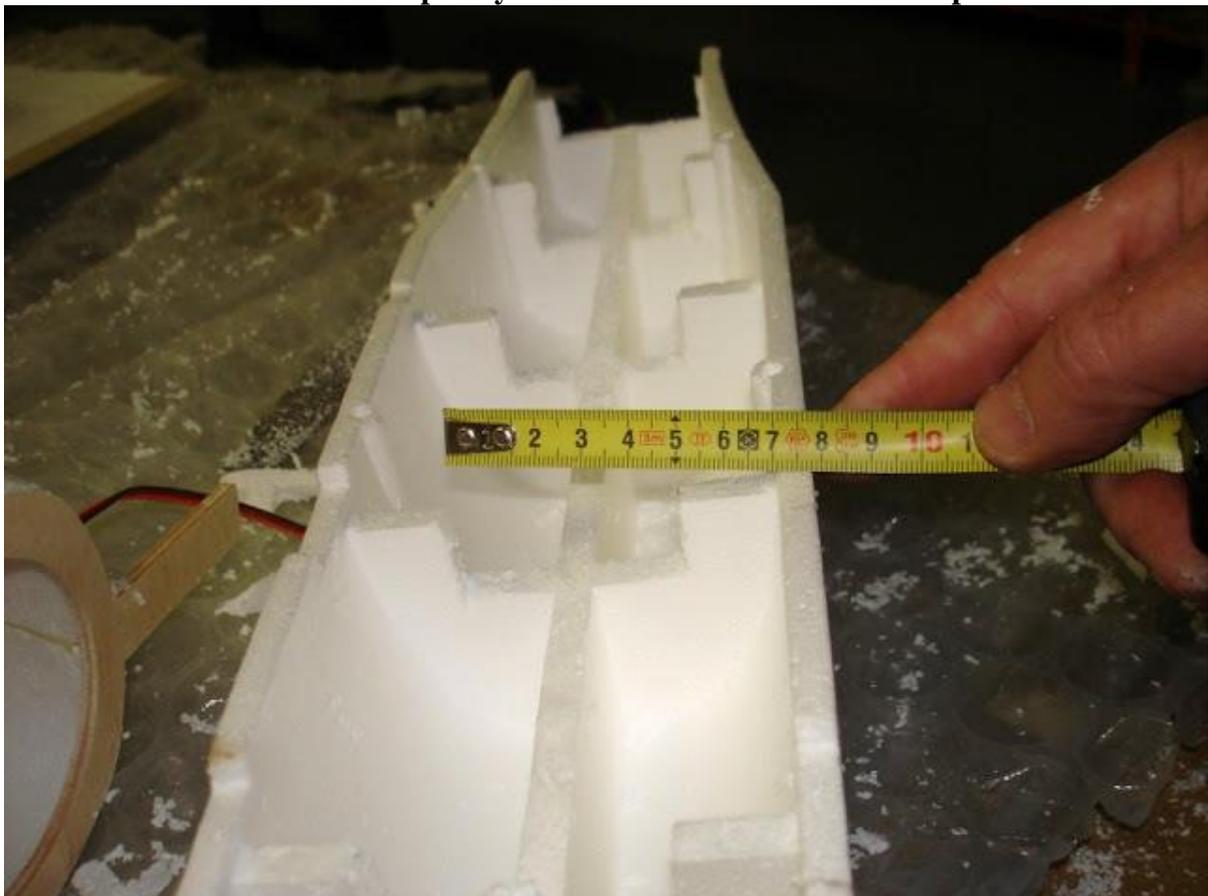
**50mm wide battery tunnel has to be created**



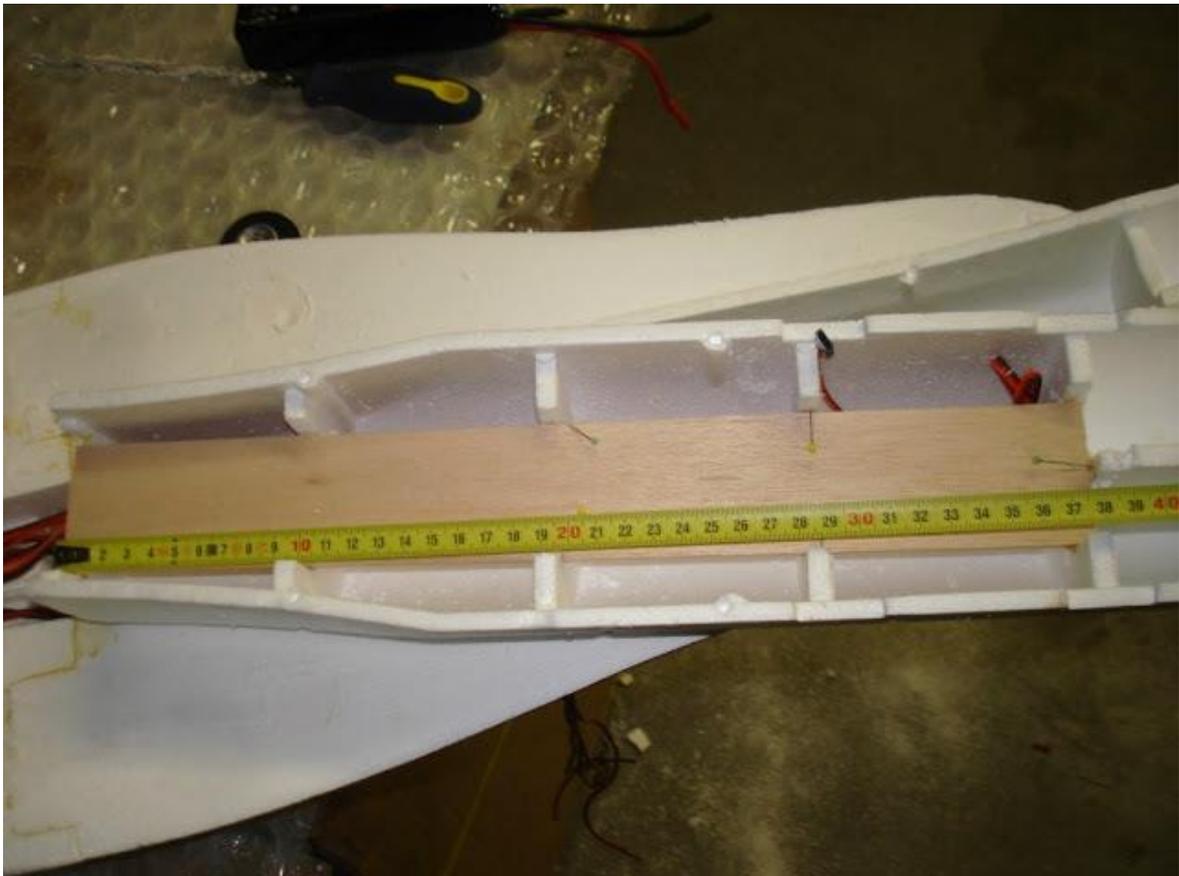
**always use air cushion protection on workbench!**



**for a 6s 4500 pack you have to dive about 30mm deep**



**and 50mm wide**

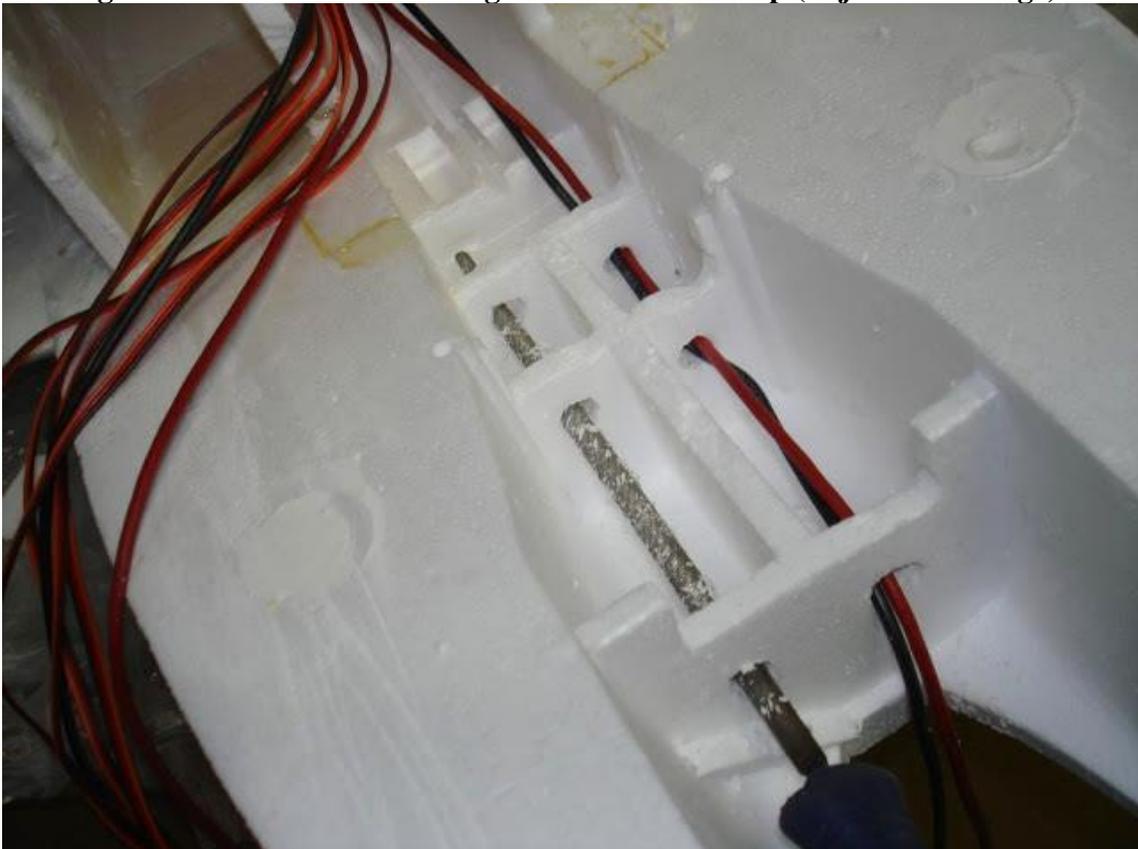


**I will make a nice plywood CNC panel for this in the kit**

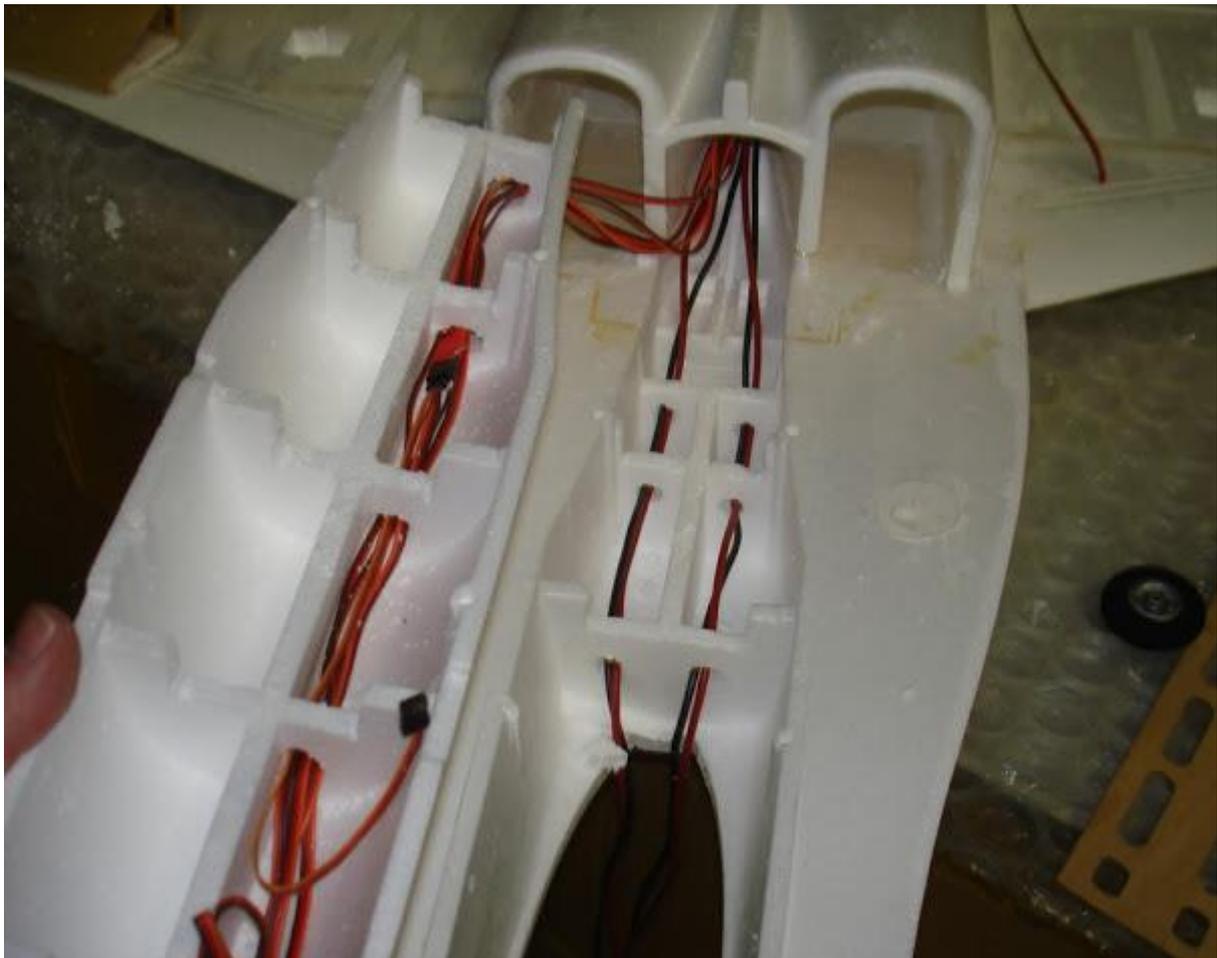
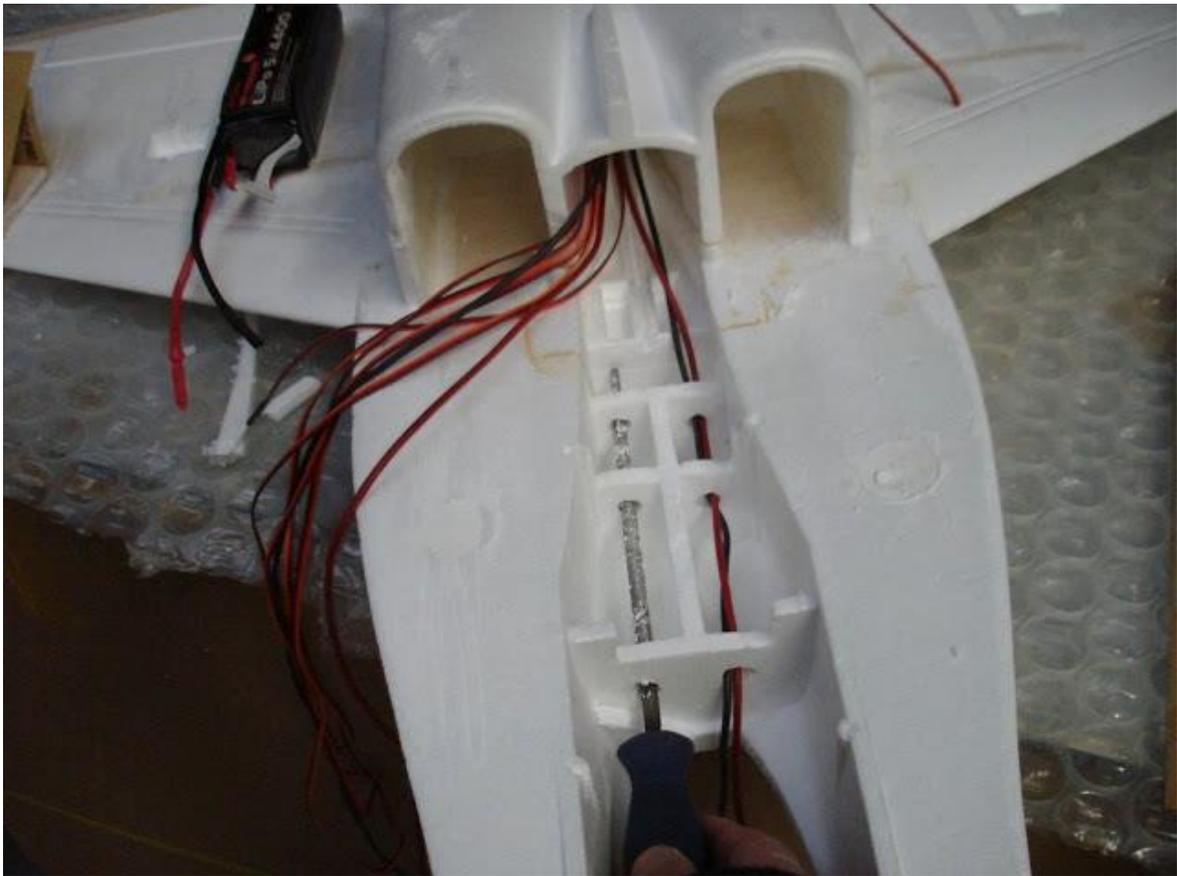
## **(10) Battery compartment top nose section**



**again some 50mm wide and again some 30mm deep (to join of fuselage)**



**use a 'rat tail' to make holes in line**



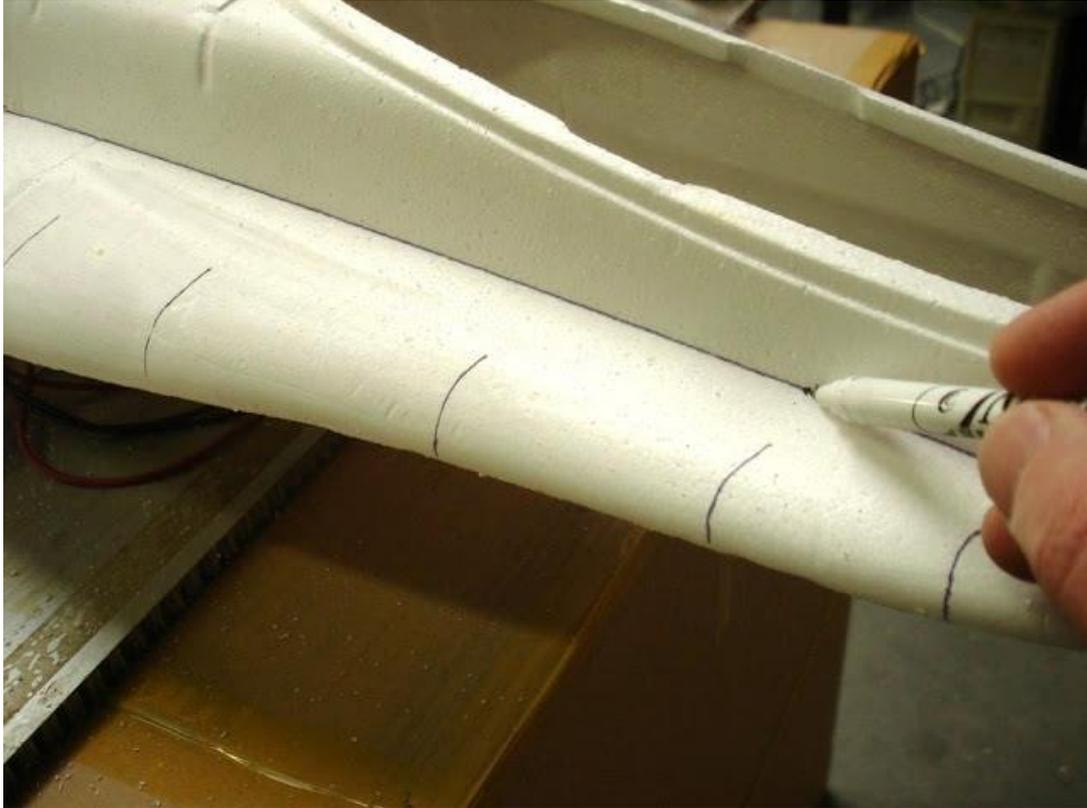
**pull motor wire on topside and servo wire on bottom side**



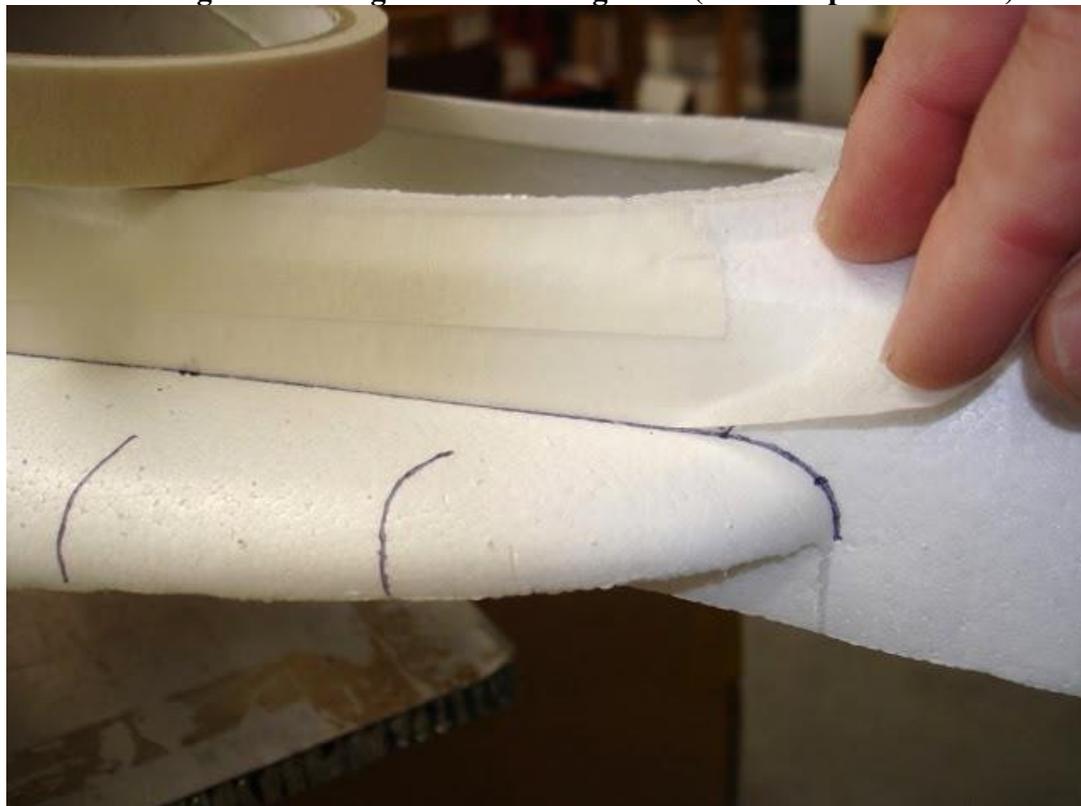
**and close the nose with some PU glue..Job Done!**

## **(11)Plastic surgery: brings out the artist in you!**

**First we do the 'Nose Job'**



**don't forget the line against the fuselage side (were the pencil is now)**



**use some tape to protect the fuselage**



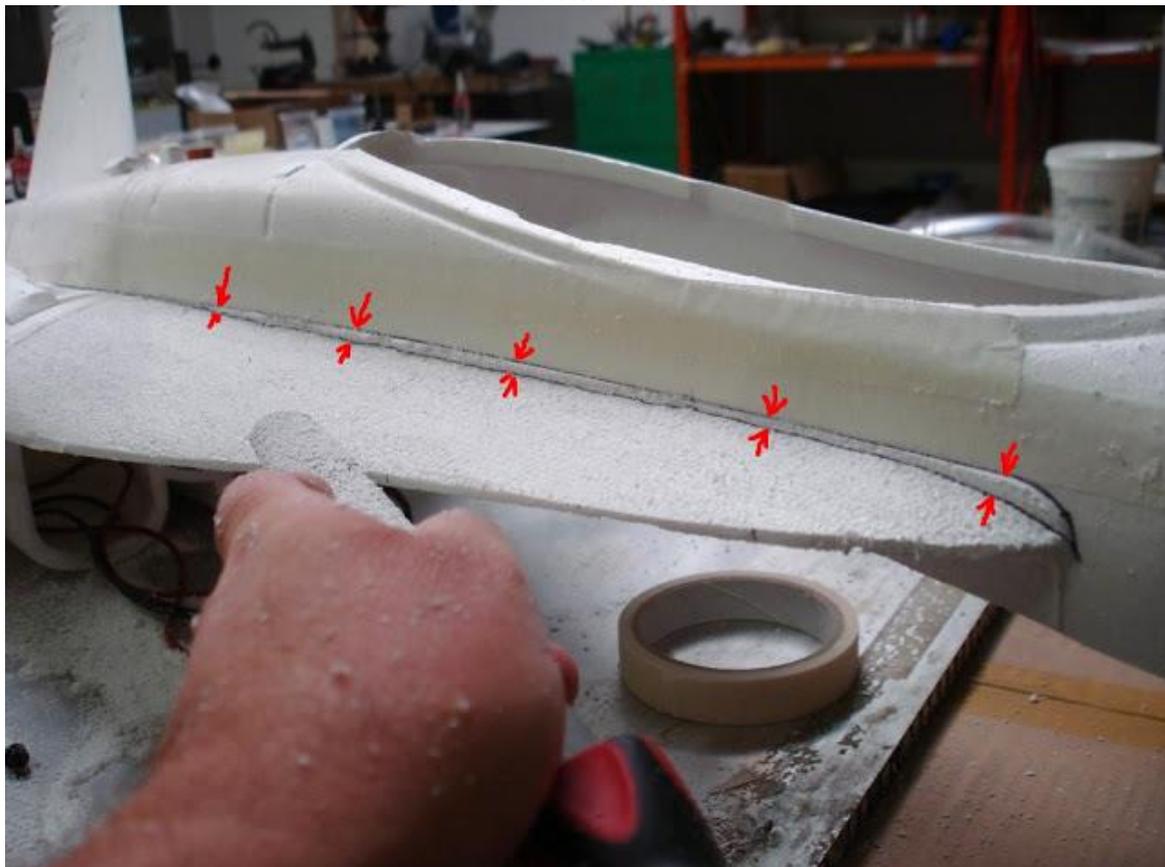
**use a raw sanding file and start removing foam**



**remove in long strokes, the foam will fly-off !**



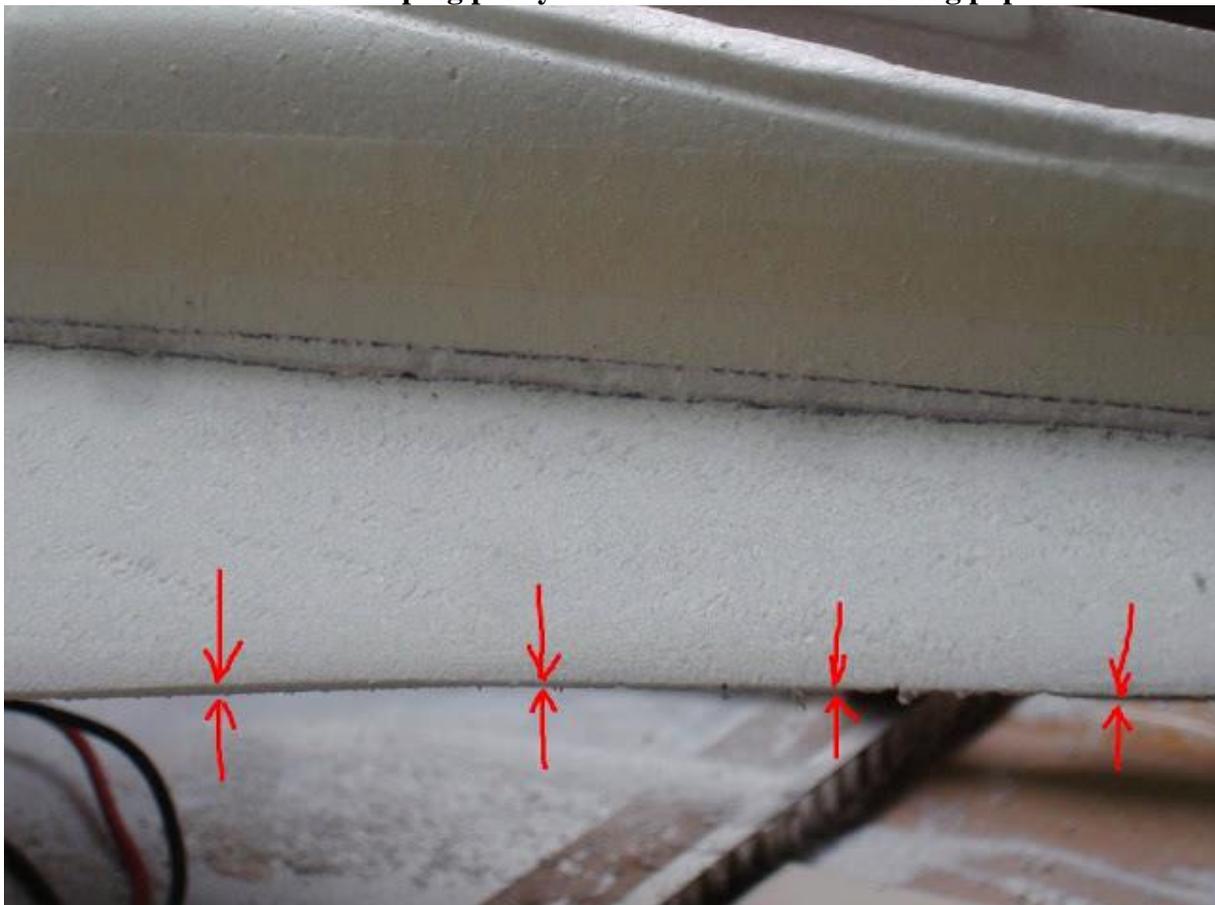
**make the start nice thin**



**make it not only thin on outside but also on fuselage side (see arrows)**



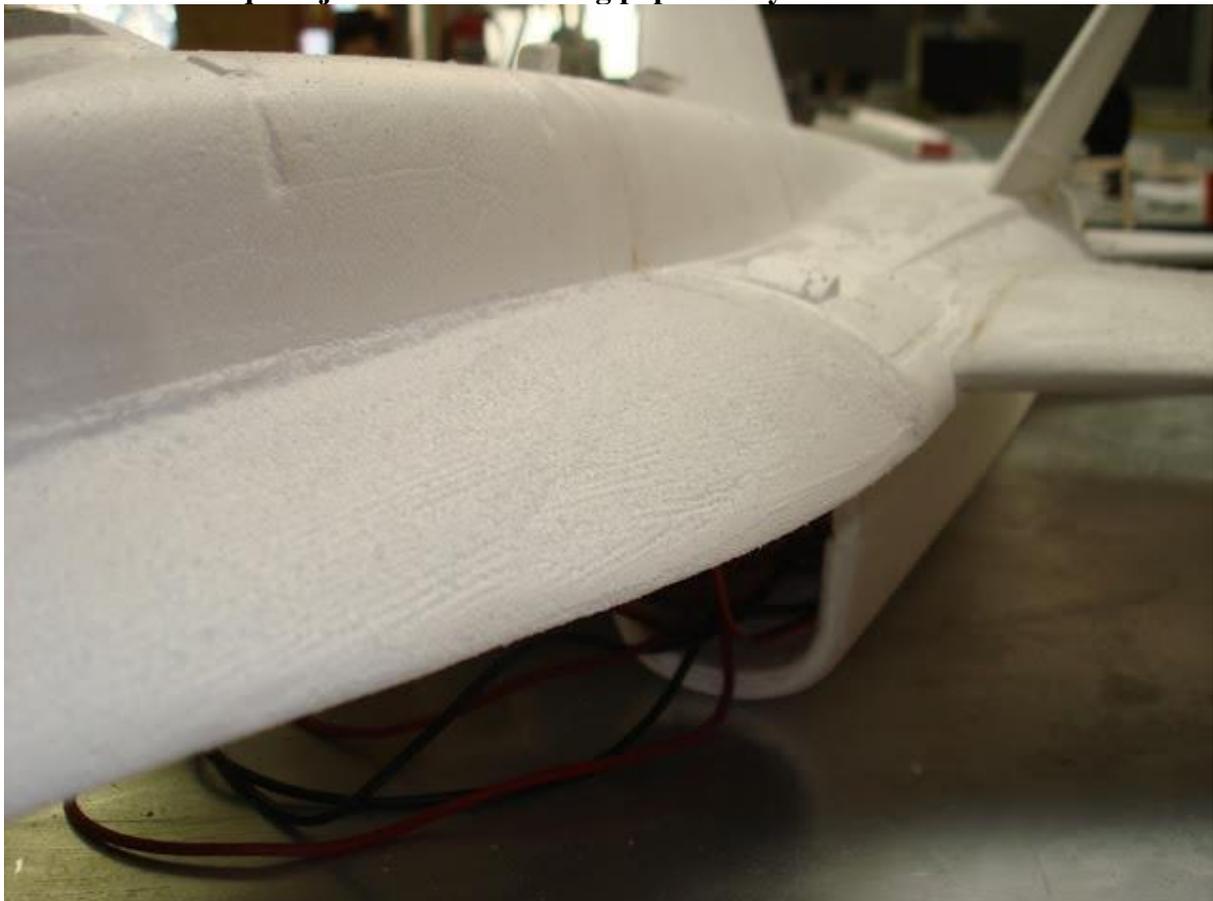
**after the raw shaping part you now switch to raw sanding paper**



**with sanding paper you can even make it more sharp!**



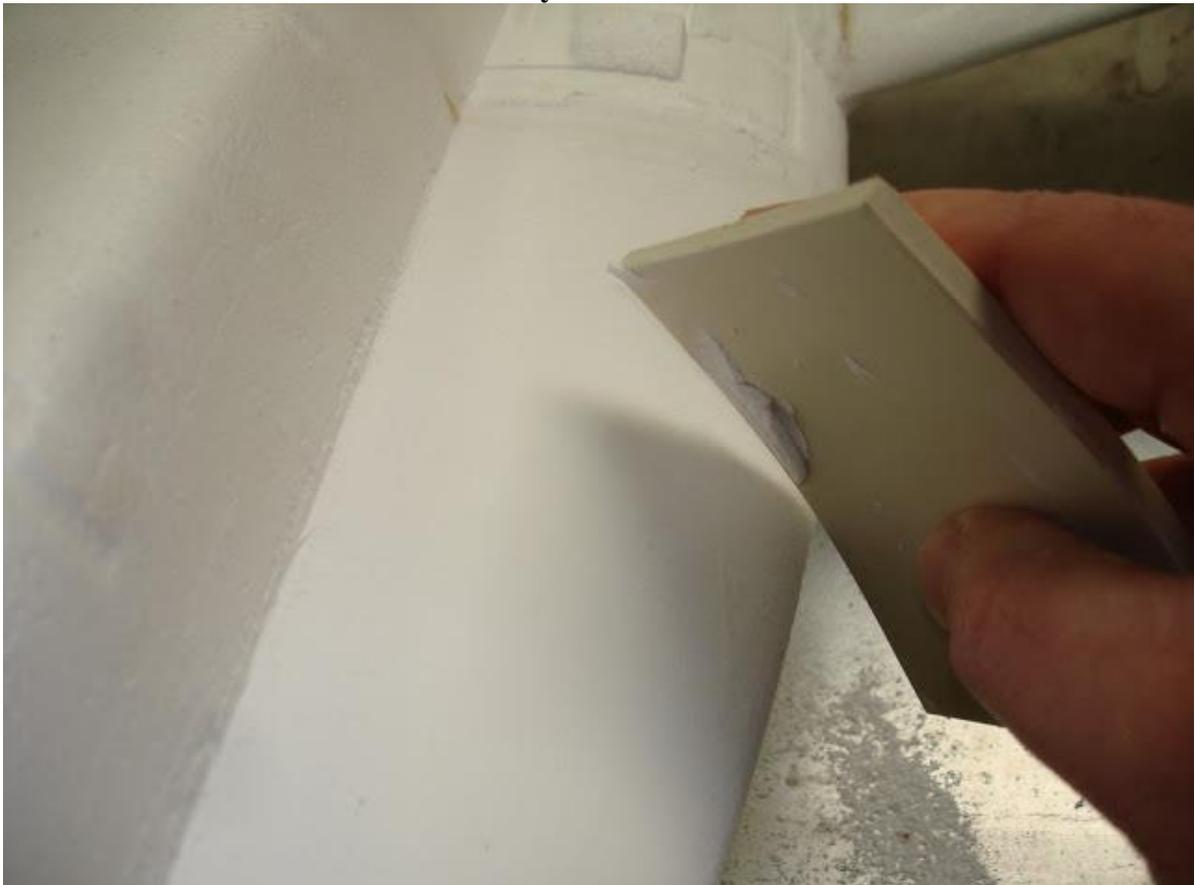
**this is a quick job with raw sanding paper: Easy Filler will do the rest!**



**and we have also the other side: don't forget!**



**Here comes EasyFiller back into action!**



**for perfect finish and easy work you need this rubber and EasyFiller!!**

**(12) the second plastic surgery is smaller**

**this has to be a design error...??**



**???**



**a little raw shaping according to pencil lines**



**a little sanding**



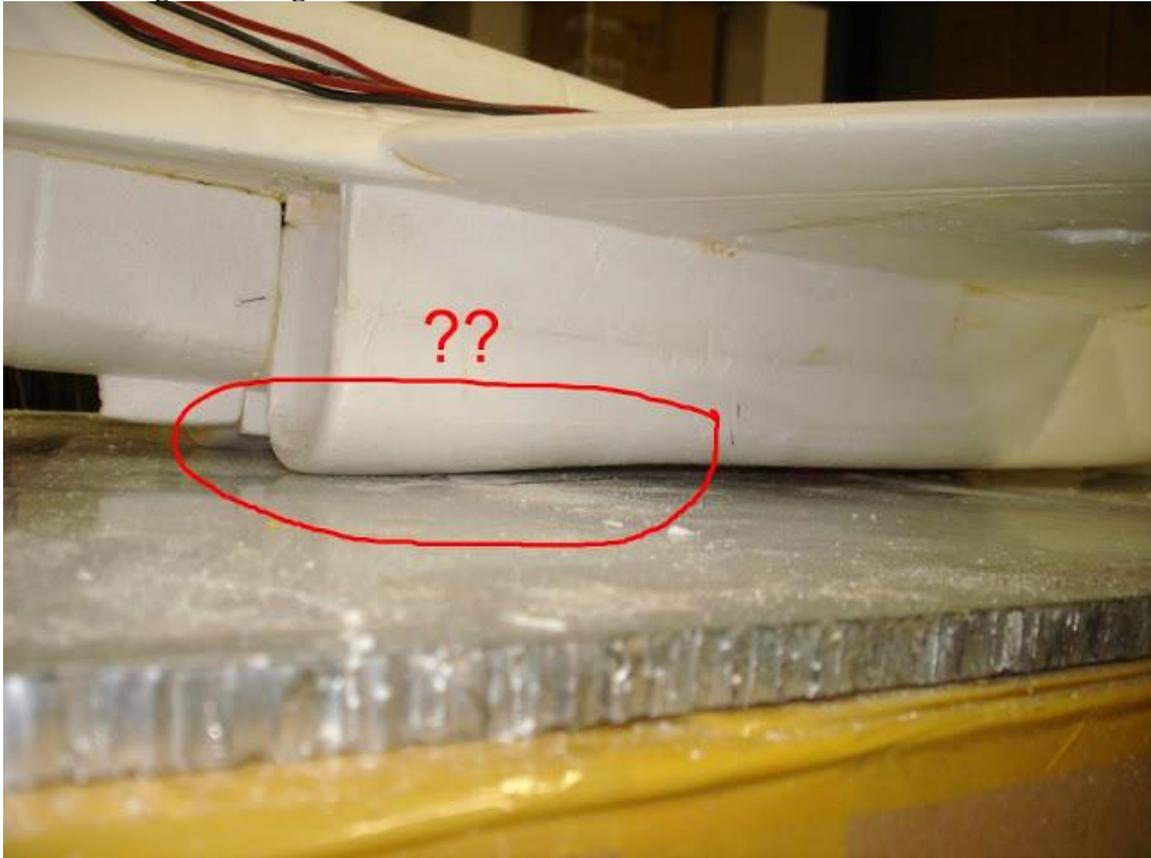
**cleaning**



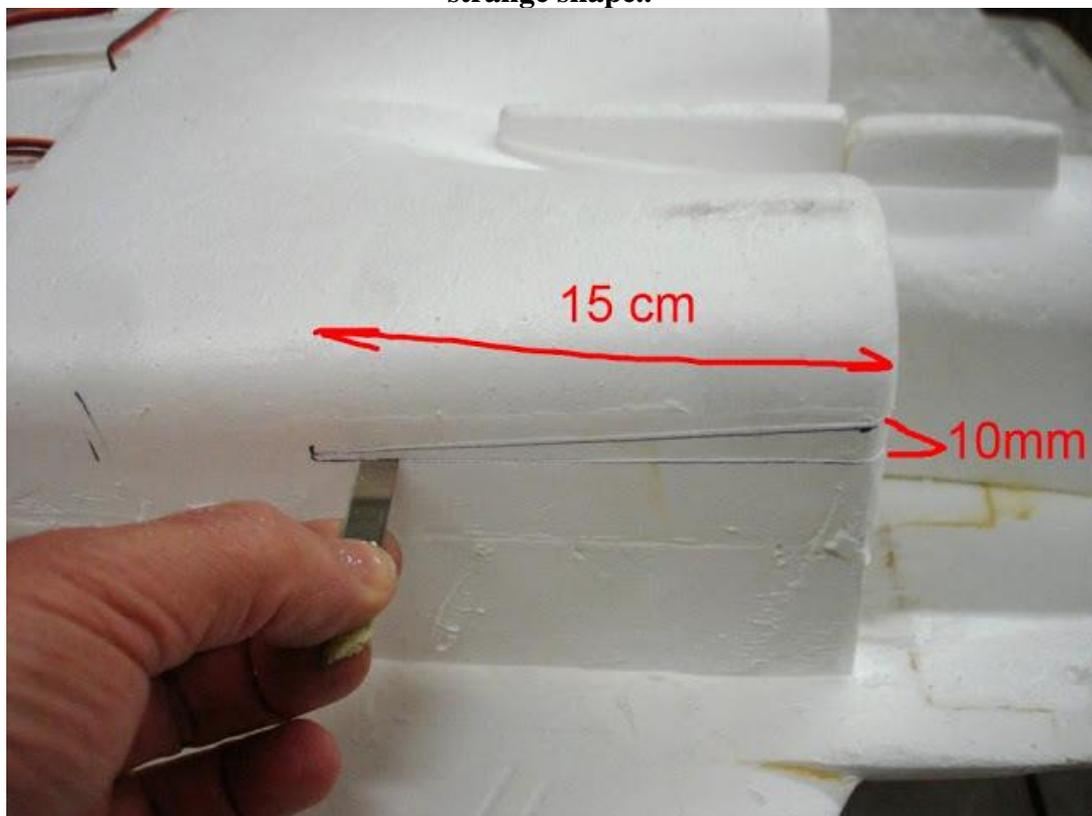
**and here comes EasyFiller again ..No F18 without this stuff !**

### (13) Last Plastic surgery, but now with a Knife !

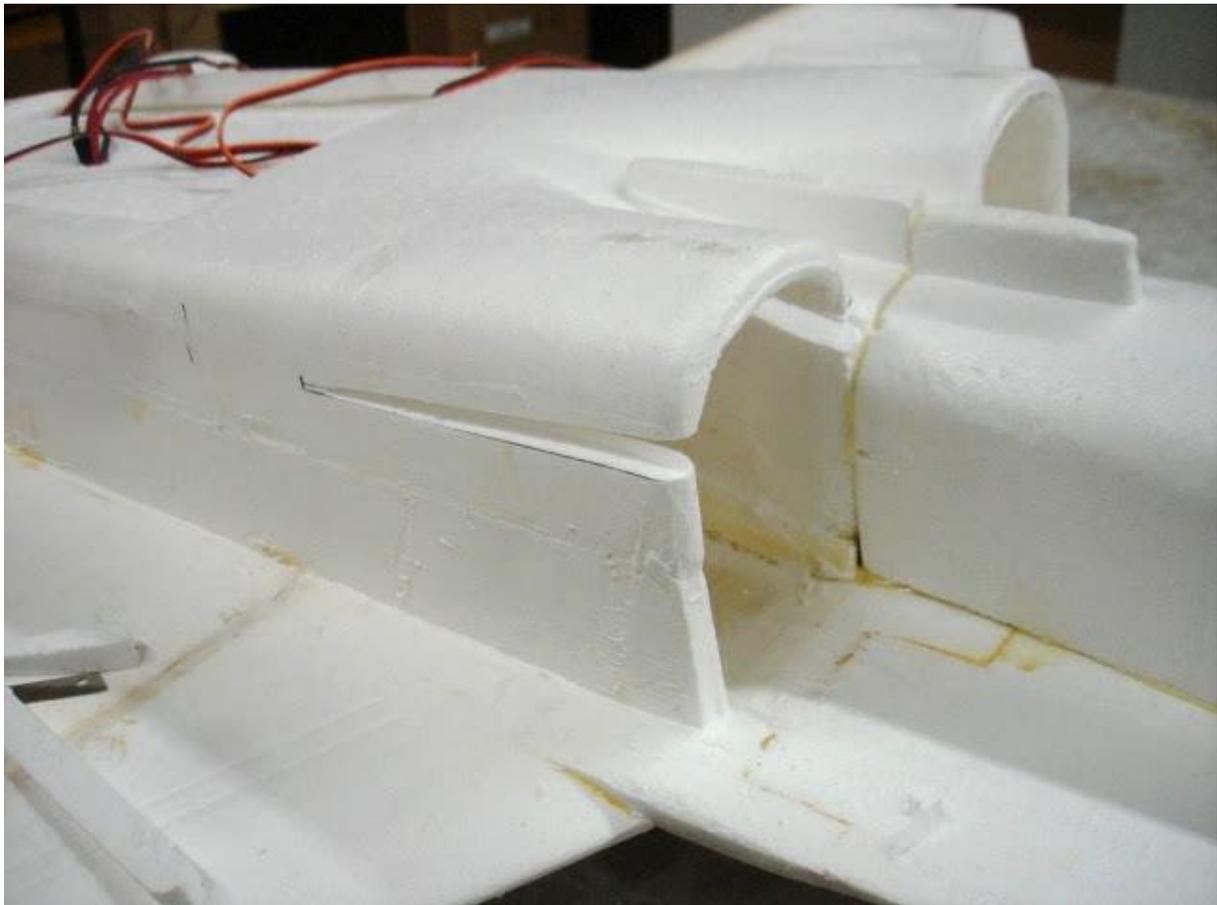
air intake is already to big(non scale) and we don't want to make landing on this: it will dig into the ground ! We don't want that dirt inside the airintake.



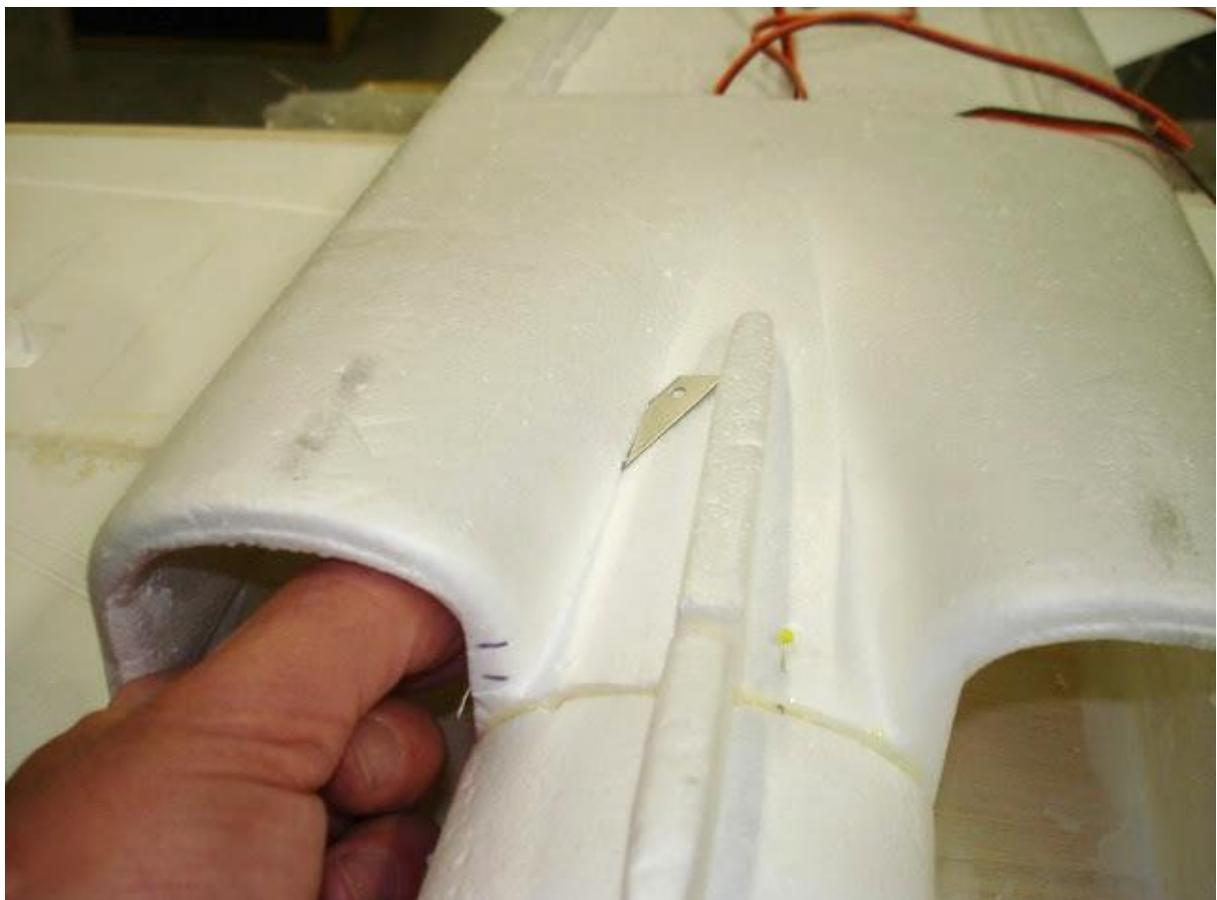
strange shape..



here comes the doctor..



**remove the 10x15mm piece**



**and on inside too**



**remove the -V-**



**this shape will do much better for landing**



PU glue and tape (I even had to put some weight on it) and let it dry

## **(14)Wing Glassing + Wing Correction at same time!**

Now its getting technical: I am not a Fan of 'wash-out' on fast planes but if someone in China produces a wing with positive(in stead of normal negative) wash-out than we have a small problem..

Explanation: wash-out is a slightly negative angle of wingtip: this creates less lift on wingtip area and should prevent tipstall at low landing speeds. It's still OK if you have no wash-out, but if you have a positive angle at your wingtip (like on this kit) than you are in trouble! So we better fix this wing as long as it is still flexible.

I use the HT-2 Epoxy for glassing the wings of this Jet: reason 1 is that these are very thin wings and final weight with 2x6s battery will be about 3,3 kg (so they must be strong as possible) . The other reason is that this HT-2 Epoxy is very slow and gives me plenty of time to bring the wings into right shape before it starts hardening.

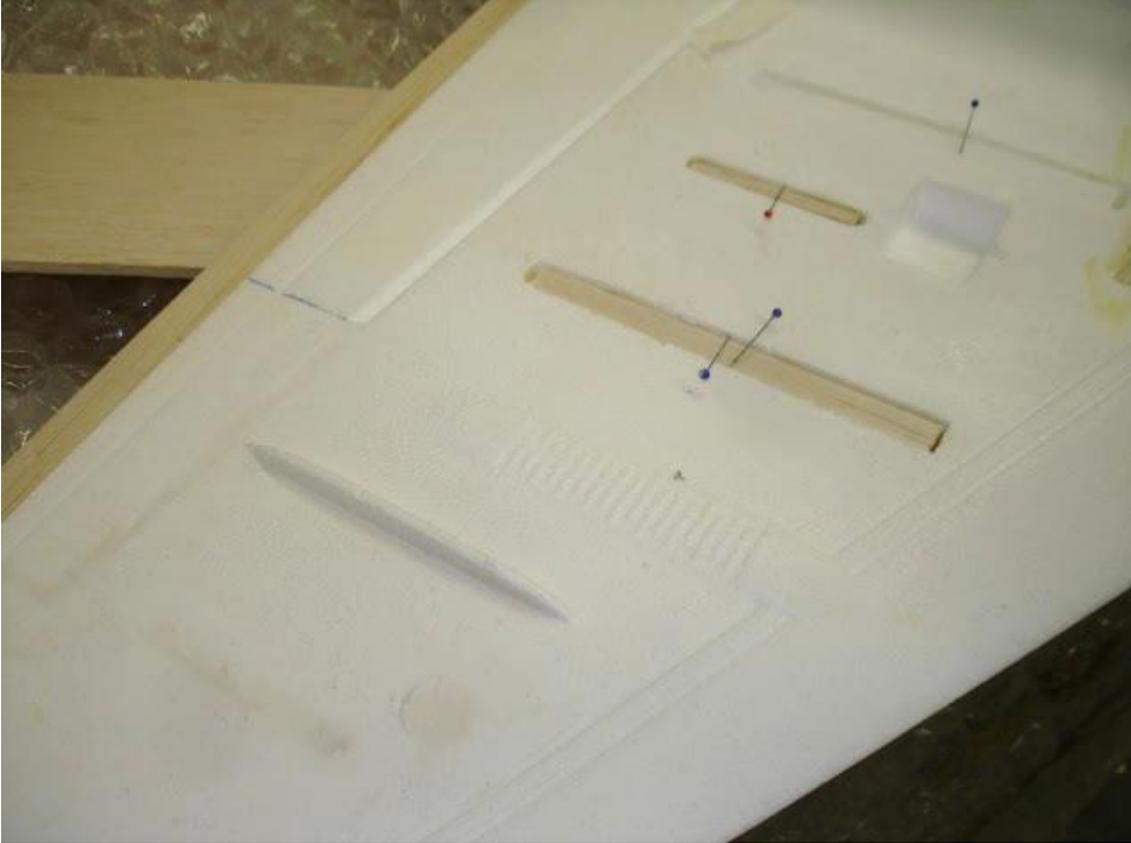
**Mixing the Epoxy: do not mix too little Resin because you weight scale can make an too big error. Best mix 20gr Resin+10gr Hardener (not less) . If you mix 15+5 it can be that you get too little hardener and your epoxy will stay soft..(we do not want that to happen!)**

## **How to do list:**

1. you need a flat building board
2. glass your wings with 25 Gram tissue and HT-2 Epoxy
3. level the wingroot horizontal (use just a piece of wood between fuselage and table)

4. use a piece of 10cm wide (balsa)wood taped to board: this will support wingtip
5. put some extra 5mm thick wood under trailing edge of wingtip (5mm for wash-out)
6. put some weight on wingtip and let it harden for 2 days in this forced new shape

#### Glassing the wings



fill up some holes in bottom of wing with Balsa and EasyFiller



**some last sanding and Clean wing afterwards !**



**Glassing wing with 25 gram glass tissue and HT-2 Epoxy**



**use fresh blade to make a cut here in tissue**

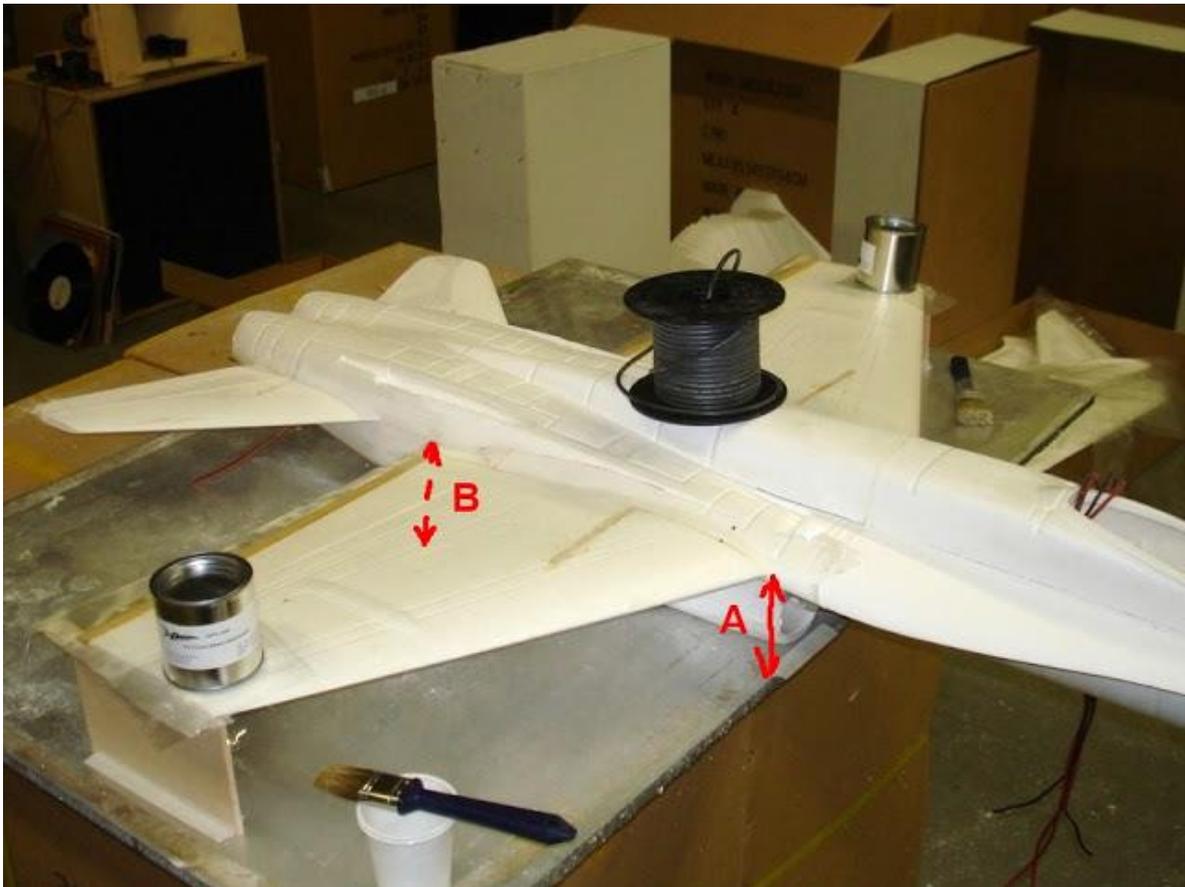


**you can do this only with JePe 25 Gram glass (forget!! 18 and 50 gram glass)  
cut glass at leading edge and pull it to other side**

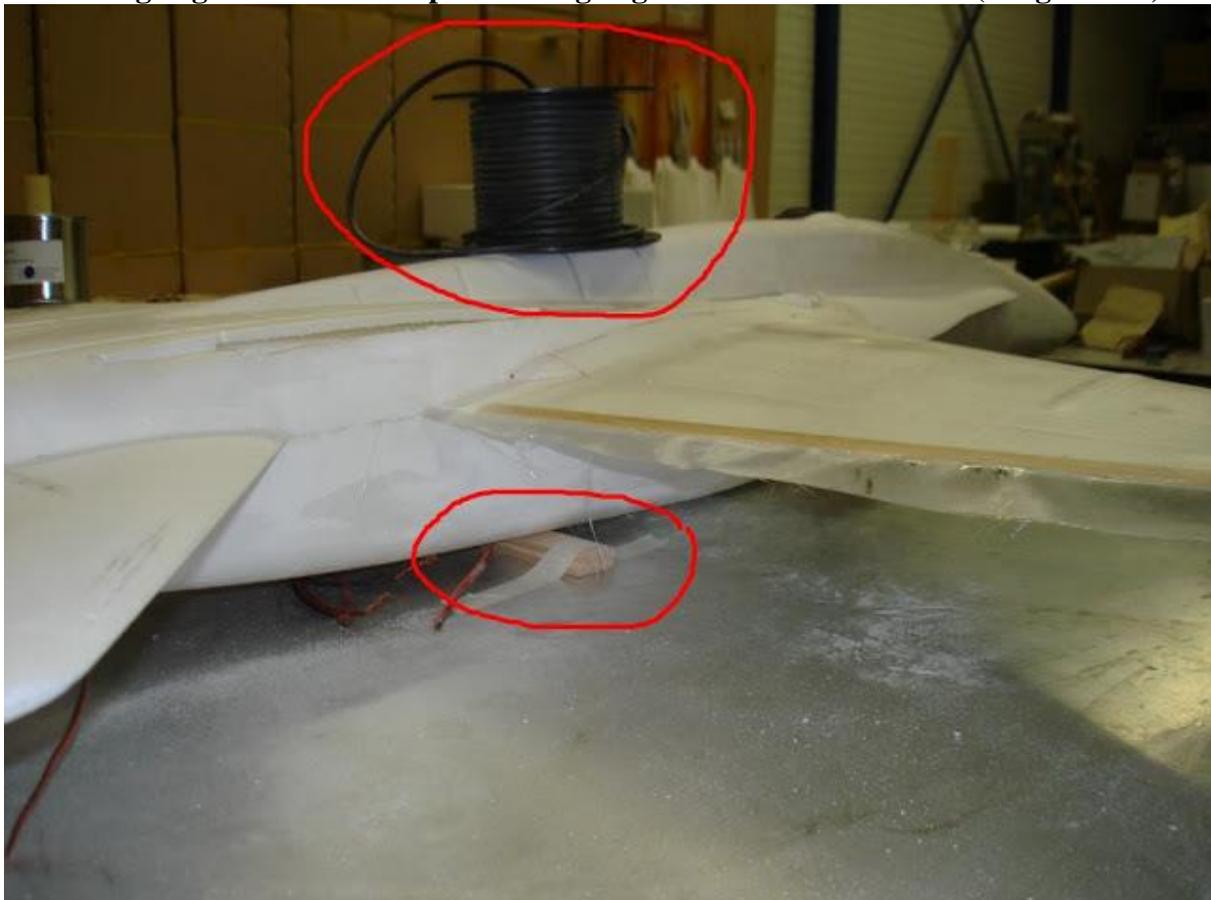


**leave glass uncut at balsa trailing edge . Cover both sides of wing (you can do top and bottom side in easy 2 times but than you must also use the Jig 2 times to push wing into right wash-out shape)**

**Complete wing(top and bottom) is now glassed and Epoxy is still 'wet': time to twist it into correct shape!!**



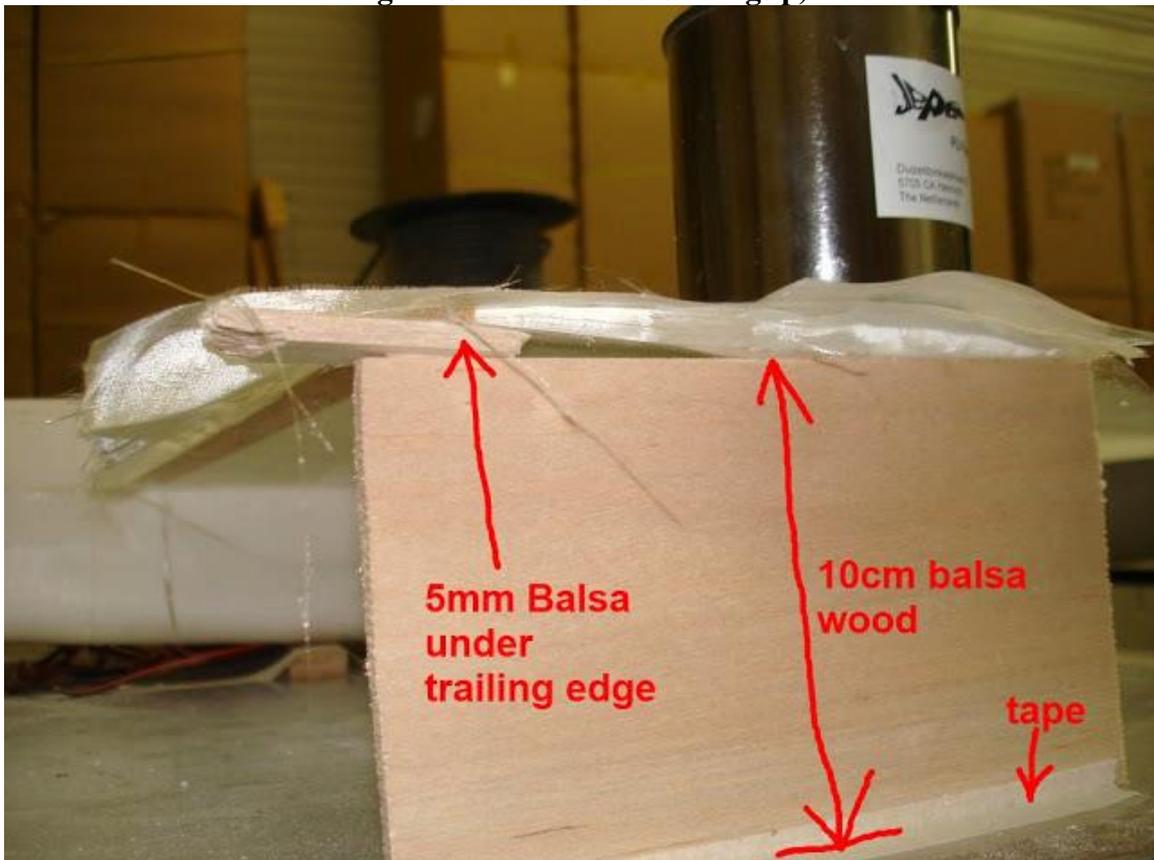
**Level wingroot: distance to Table must be same for A and B (distance from tip of leading edge to table and tip of trailing edge to table must be same (wing is level))**



**use some wood under fuselage to level wingroot . Put some weight on top to make it stable**



put some tape on balsa wood: prevent it from sticking to wing (balsa wood must be 10cm high from start to end of wingtip)



the 5mm extra balsa are for the new wash-out Total difference to original is about 10mm (original wing was hanging for about 5mm..)



**a 250ml can will press the nose down (plastic in between)**



**tissue is not cut on trailing edge (only finished at leading edge)**



**I put a small stick between table and trailing edge to push it up a little in the middle to make even more straight trailing edge (but you can leave it too)**



**Now you start wanting one, don't you ??**

**Tail Fins are still not glued to model (do that best as final job)**

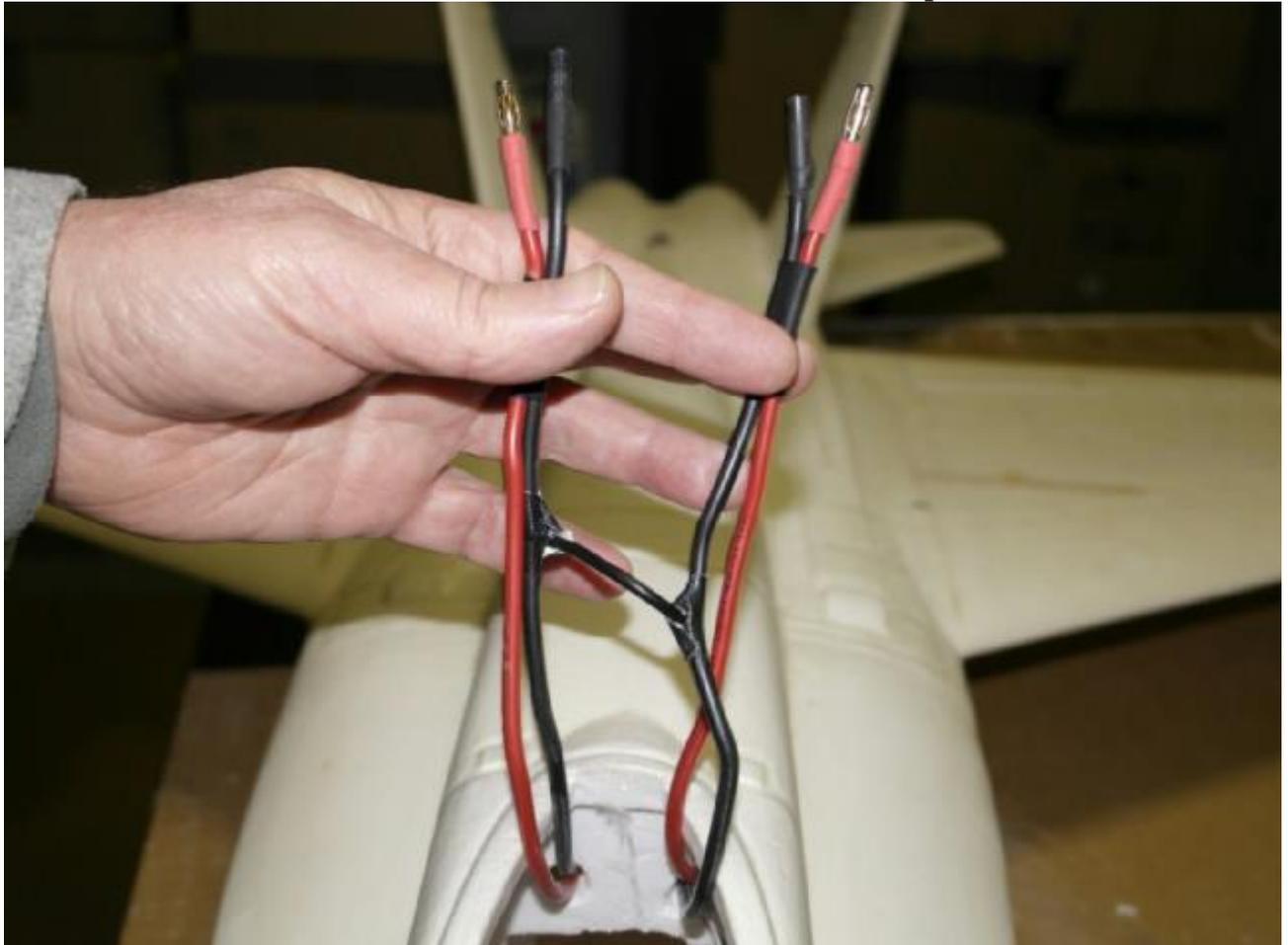
# Final Elec-tricks and radio Settings:

I used disconnected both red 5V servo wires from the YEP-100 Amp controllers. The Receiver gets its power by an external 5-Amp UBEC to feed the 4 servo's. Also I run 2 Battery packs and 2 sets of powerleads to my cockpit (were I connect them to my packs).

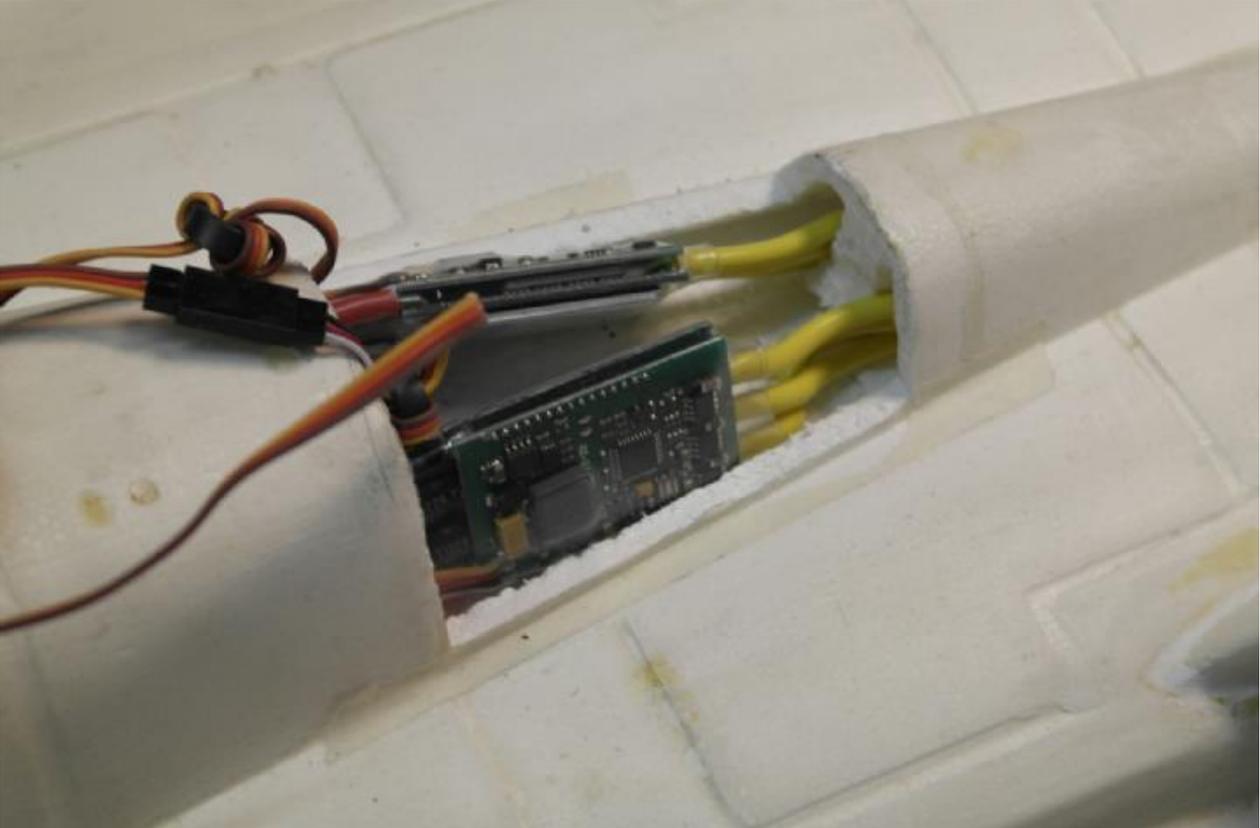
To get a stable troublefree grounding in my energy system with 2 battery packs I did connect the 2 black grounding wires to make 1 central grounding point (see picture). The external UBEC that powers my receiver and servo's gets its power from only 1 pack (I connected it to the balance connector). In this way I have not created any grounding loops and use only 1 central grounding point: very important and often forgotten in planes with 2 motors running on 2 packs.

Some controllers labeled as 'OPTO' coupled still conduct a grounding current and cause not wanted groundloops: danger is that high grounding currents can run tru your receiver and make the system instable (or burn pc boards or thin servo cables...and we don't want that to happen with a FastFast Foam jet) This danger is almost impossible if you run only 1 motor and 1 battery but can become a danger with 2 power systems interconnected by only 1 receiver.

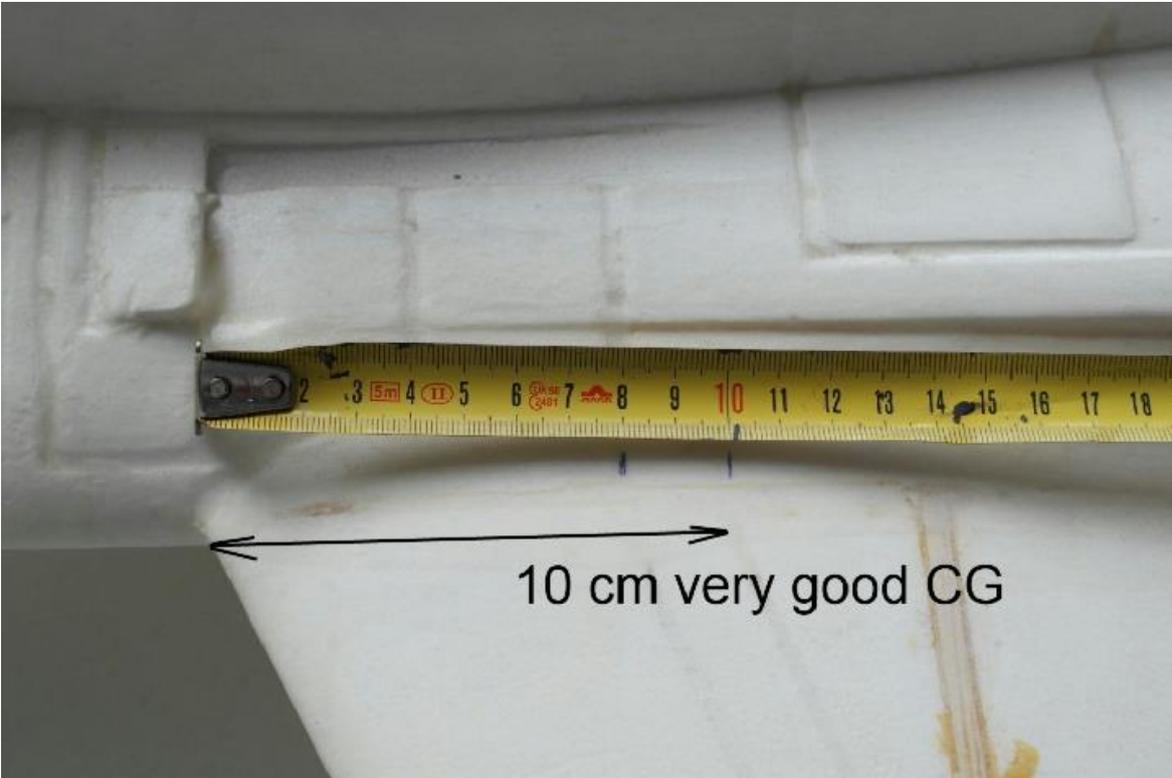
Just use an external UBEC and connect the 2 black wires like picture below.



and here are the 2x YEP-100 Amp , I did disconnect the UBECS and I use 4mm<sup>2</sup> power wire to connect to battery's in cockpit



and here is the correct CG: it is 10CM !



## **and the bungee hook position:**



**I will measure my rudder movements and EXPO next day and will add this info soon.**

**here is also little movie of first test with new Fans (it was second flight for my F-18 because I had little time for experimenting) . The new JePe JET70-6s Fans have 7-blade rotor with high rpm and high pitch (very dynamic high speed fans). To make good test I flew on some (4 year old) 5s 4400mAh packs, these are same packs as on my first flight with the CS70-12blade and also same motors! My current was now 10Amps lower(for each motor) and speed was already much higher! Also the sound was much better if you want to fly far out on the horizon like a real FastFoam Jet! 9the CS70 12 blade were too silent (and too inefficient to power such large 3,2kg Jet). The new jePe Fans in the video are pulling only some 55-60 Amps at 5s and just 1000 Watts but on 6s they go for 1650 Watts and 2,3kgf thrust each (that will be a nice video but first I have the ‘slow’ 2x1000Watt 3,2kg heavy F-18 on video for you:**