

# T u r b o r a v e n



## B u i l t R e p o r t

### *0.0 Impressum:*

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## *0.1 Copyright, Distribution and Exclusions:*

Setting up this built report as a guideline for other hobbyists, drawings and plans are free for non commercial usage. Rebuilding the plane is also welcome.

This report is only a description of the built.

As the plane didn't finish its maidenflight, yet, I can't take any responsibility about the aerodynamical behaviour. Your building at own risk - so to say!

## *0.2 Introduction - WHY???*

Searching for seldom planes - not being compared with any series solution of manufacturers as FSK or ALFA all the time, I set up a dewoitine D520, a ME 309, a DVII and some others. ( At the moment I'm already searching again).

Working in the Parkflyer forum I often was asked, how to form the fuses and wings using DEPRON sheets, so this manual shall give you the answers to your questions

The idea to build a Turboraven came from some colleges, from Germany and the US. With this background I decided to write this built manual in English language. Speaking English not very well, I might ( surely will) make some mistakes, please IGNORE THEM!

## *0.3 Introduction - WHAT???*

The contents of this script will lead you through the tooling, cutting, reforming, mounting and painting of the plane, so everything about building will be explained. Mounting the RX will not be part of this documents, because everyone has different material to use and so this is YOUR THING!

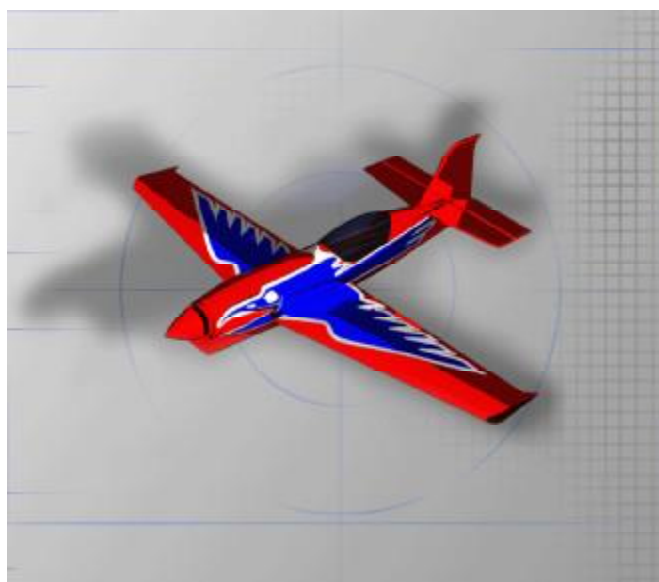
But now - have a nice built!!!

## 1.0 Fuselage

The first step is to show you how the tooling for forming the fuselage is built. For the construction I use a 3 D CAD. Its name is Rhinoceros3d and it is a surface modeller - excellent for modelling freeformed surfaces of meshes, nurbs and splines.

For the base I used some sketches made by a friend ( thanks to Markus at this point). Using the sketches I constructed a 3D surface model of the plane ( picture 1) and used this to create the inner structure for the DEPRON built.

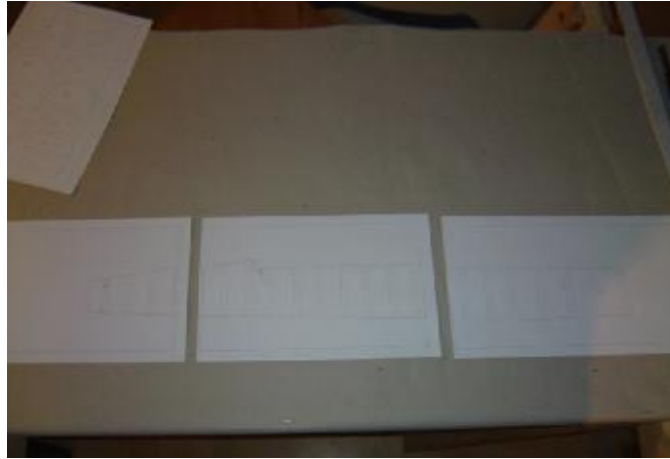
Picture 1:



Flattened to 2D the CAD parts became shapes, were cut and printed out, copied to the DEPRON and so became parts.

## 1.1 Tooling of The Fuse

Picture 2:



I tiled the drawings, created by CAD and printed them on standard A4 sheets of paper...

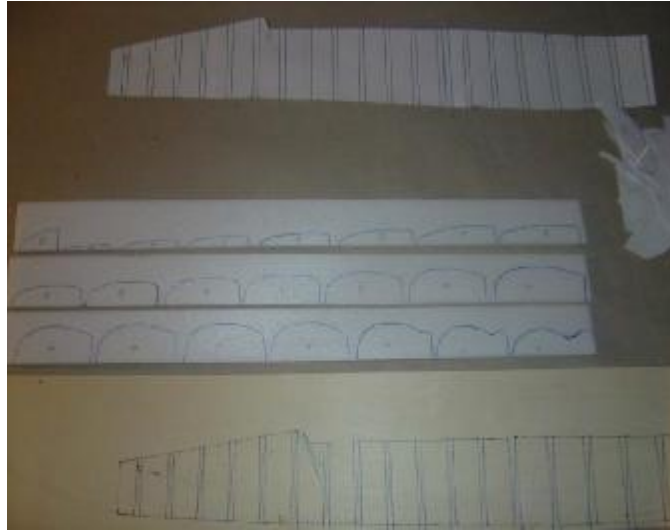
Picture 3:



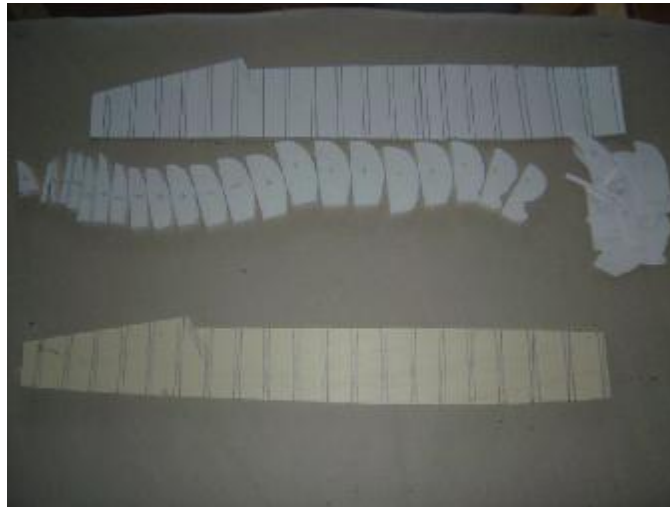
cut them off (picture3) and copied the shapes to, what later became the parts of the fuses tooling. The fuses shape was copied to a 6mm multilayered sheet of wood ( as a massive base), and the formers were copied to 6mm DEPRON. and cut (picture 5) off again.

The wooden base is important to be massive, that the fuses surface is able to be strapped over the tool, without bending the tool. The formers should be elastic to compensate the strapping strength and tolerances in cutting.

Picture 4:



Picture 5:



Then the parts became assembled, and the tooling was finished. I used styro glue to fix the formers on the wood so they are removeable to be placed on the other side of the wood for the other half of the fuse.

Picture 6:





## 2.0 The Fuselage Itself

After tooling had been finished, the fuselage surface had been created. I also used 6mm DEPRON for this parts. Some of you may think that the strength of the Depron is to much - 6mm DEPRON is no handicap in this case - the material strength causes a self carrying and smooth surface so the efforts on the inner structure are reduced ( less glue).

### 2.1 Two halves of the Fuselages surface

First I took a sheet of DEPRON (600mmx250mm) and taped one side ( I used TESA 4124 for taping - this tape contracts a bit when heated).

Picture 7:



Then pre bended the inner side of the fuselage surface over a desks edge ( don't fold) to get a weaker and pre formed sheet .

Picture 8:





Then I fixed one side of the tool to the DEPRON sheet as shown below.

Picture 9:



.. And strapped the sheet around the tool (no glue here), cut off the parts of the DEPRON that didn't fit and fixed the edges to the baseplate with some more tape!

Picture 10:



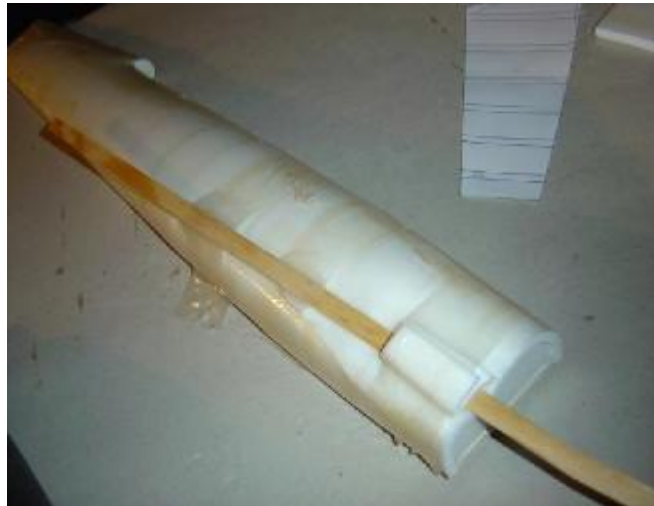
Picture 11:





In the first wrap I didn't reform the cowlings air inlet. For this I fixed a "lever" on the surface and formed it while heating with the heatgun ( pushing the lever) in a separate second step.

Picture 12:



For removal of the surface from the tool, (remember that there is a 6mm baseplate in the wrap),- Take a piece of the wood and fix a sharp blade on this. Put both - the half fuselage and the wood with the fixed blade on a plain desk and draw the blade around the wrap. The results ... as shown. Do the same steps for the other half. And the fuses surfaces raw parts are finished.

Picture 13:

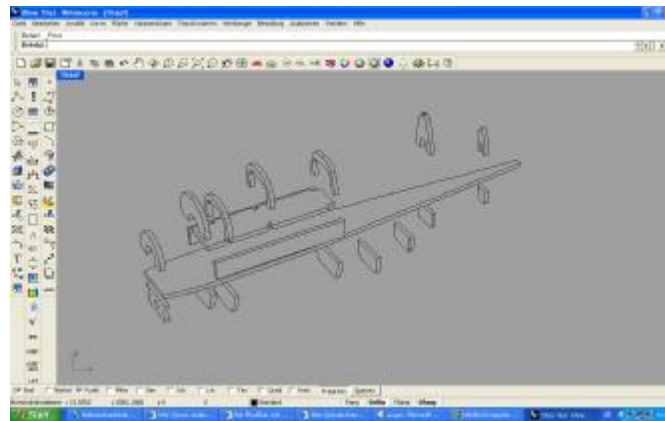


## 2.2 Fuselages Inner Structure

Unfortunately I lost the picture from the inner structure of the fuse, so I try to explain this, using a CAD drawing.

The parts - all of 6mm DEPRON were assembled in the way shown in picture 13.

Picture 14:



So the inner structure was finished very fast( just took me about 20 minutes). ( 'used styro glue here!)

## 2.3 Assembly of Fuselage

One half of the fuselage was assembled with the inner structure ( styro glue) and the motor mount (epoxy). The second half was mounted on this group ( ..also used epoxy for a better positioning). Then I masked the place for the canopy and cut the part of the "skin" off. After this I fixed the fins to the fuse. ( Rudders still weren't hinged).

Picture 15:





### 3.0 *Finishing The Fuselage*

#### 3.1 *Masking and Painting*

After printing the ravens shape on an inkjet overhead film, I stuck a layer of tape over the logo - ( on the inked side) and ripped it off. The logo was copied on the tape ( mirrored). I stuck the tape on the fuse and perforated it, using a sharp blade.

Picture 16:



Now I unmasked the red area and brushed it (cherry red), afterwards I remasked with some new tape and unmasked the blue area (brushed with night blue).

Picture 17:



Picture 18:



After unmasking the fuse totally, I hinged the rudder and the lift, using some short parts of plastic tube and two 2mm carbon sticks. - Finished!

### *3.2 Cutting The Wings Fittings*

I used a mask to transfer the wings sections on the fuse and took a blade to remove this parts. ( I also cutted the hole for the central servo)

Picture 19:

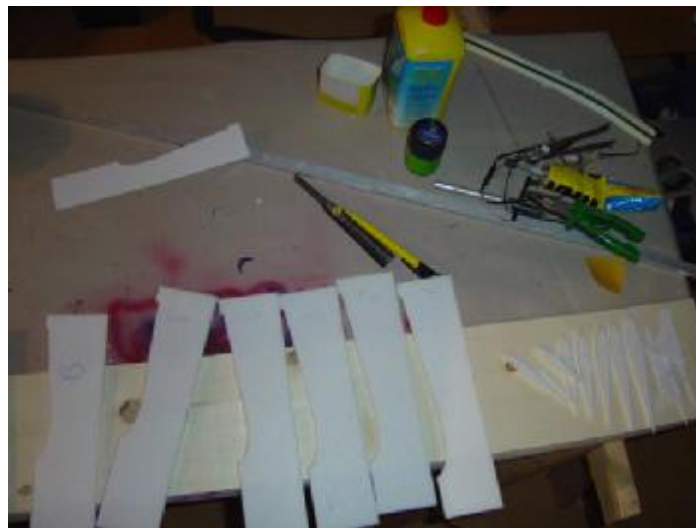


## 4.0 Set Up of The Wings

### 4.1 Built of The Wings

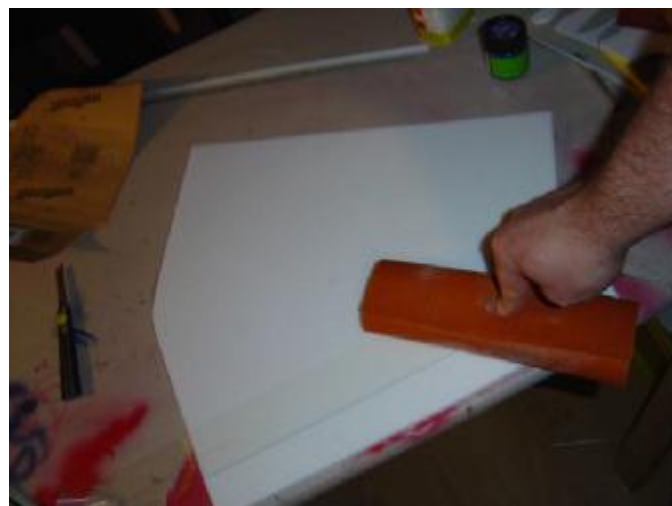
First I cutted off the tooling for the wings and the formers from 6mm DEPRON. Then I made the skin part of the wing of a sheet of DEPRON and taped the outside.

Picture 20:



Both edges of the taped DEPRON got a chamfer wit 51mm depth ( what later became the trailing edge)

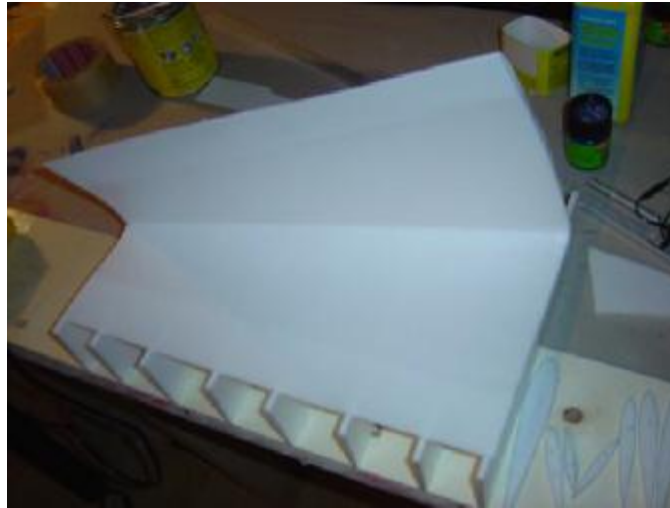
Picture 21:



Then I set up the tool and glued the pre - bended DEPRON part with the taped surface into the tool.



Picture 22:



I fixed the formers ( aligned to the 4mm carbonstick using styro glue)...

Picture 23:



... and closed ( glued) the wing - the carbon stick is still not glued.

Picture 24:



After I had built the wing, I shaped and finished it. I built the second wing the same way and removed the tape.

I painted the wing in the way I did the fuselage and mounted the wings from both sides into the holes in the fuse. Then I hinged the flaps ( same technique as used hinging the rudder).

As a last stabilization I mounted the carbontube (through both wings).

THIS WAS COMMING OUT!!!

The c.o.g. is about 18mm in front of the wing's carbon tube!

Picture 25:



## 5.0 End .. ( ..and some pictures of the maiden)

Picture 26:

