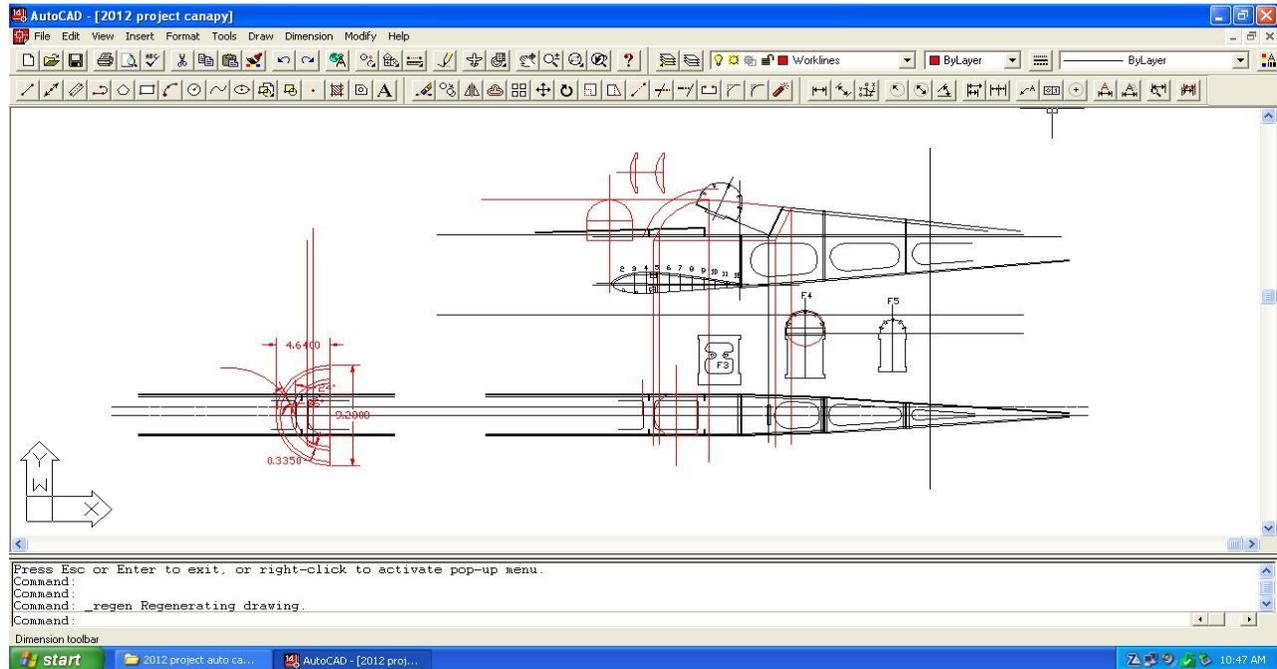
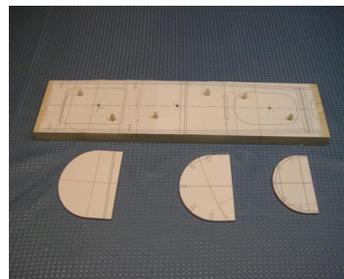
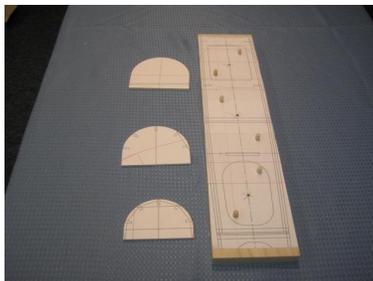
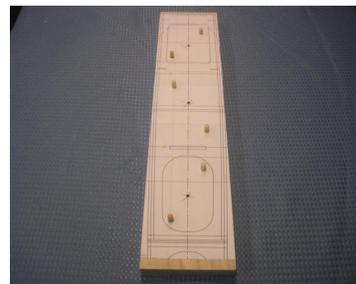
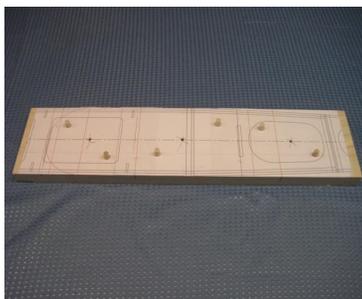


CANOPY DEVELOPMENT & TOOLING

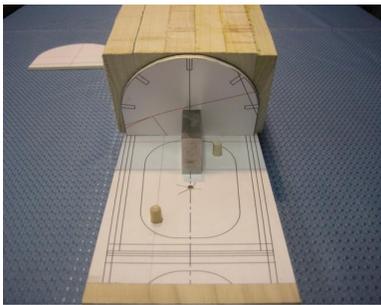
The canopy was developed using Auto CAD software. High line shape lines, overall shape lines, and cross sections were developed and printed 1:1 scale.



These actual size paper prints were glued on a poplar wood base, previously glued-up poplar blocks, and 1/8" plywood male templates.



The width of the poplar base was cut to the overall width of the fuselage shown on the paper print glued to it. The middle poplar block was fastened and doweled to the wood base. The rear end of the middle block was cut on the head rest angle and to length as shown on the print attached to the base. A 1/8" plywood template was made by cutting and sanding the profile of the template to the shape of the head rest shown on the paper print attached to it. The template was then fastened to the rear end of the middle block.



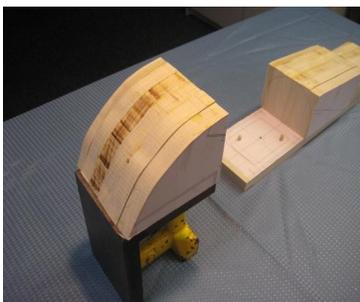
The front edge of the rear poplar block was cut on the head rest angle and the rear end of the block was cut in length to the front of former F4 T. The front edge of the rear block was positioned against the plywood template that was fastened to the middle block. The rear block was rough cut to the high line shape of the head rest plywood template and fastened and doweled in place on the base. The rear 1/8" plywood template representing the shape of the top of the fuselages stringers that form the turtle deck surface was cut to shape using the attached paper template. This template was attached to the rear end of the rear block.



The front 1/8" plywood template was cut and sanded to the paper print attached to it which shows the canopy shape at it's highest point in the front view. This template was positioned in place and temporarily attached to the front of the middle block.



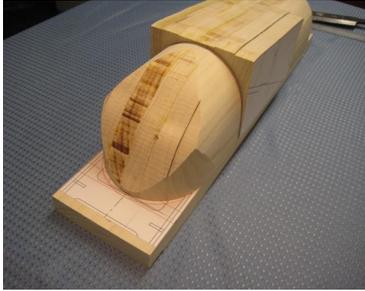
The front poplar block was positioned on the base with the rear face of the block positioned against the plywood template that was attached to the middle block. The front block was then fastened and doweled to the base. The front block was rough cut to the high line shape of the canopy shown in the side view paper plan attached to it.



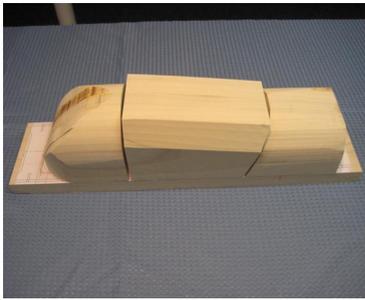
The plywood template which shows the canopy shape at it's highest point in the front view was used to mark an outline on the front block. The front block was then cut and sanded to shape using the marked line as a guide.



The front block was then cut and sanded to shape in the plan view using a paper plan fastened to the bottom of the block.



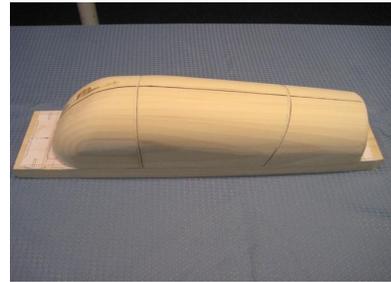
At this point all the blocks are fastened and doweled to the wood base and the excess wood on the middle and rear blocks are removed by table saw and band saw.



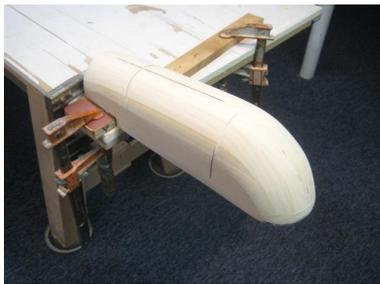
The plywood templates are placed back in between the blocks and the surface of the blocks are now worked in by hand using a block plane and spoke shaves.



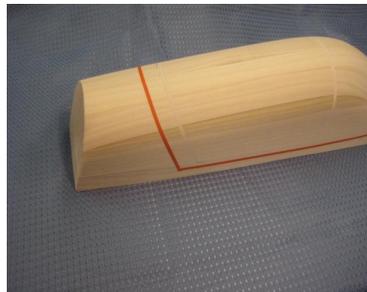
The roughing of the surface of the blocks continue, controlled by the plywood templates and the overall shape of the base.



The surfacing of the blocks are now in the finalizing stage and the front surface of the front block is extended down to the bottom of the wood base.



The rear end of the rear block is cut on an 24 degree draft angle and the surface of the blocks is now finish sanded. The wood is sealed with multiple coats of shellac and sanded between coats. The approx. canopy trim line is laid out in fine line tape.

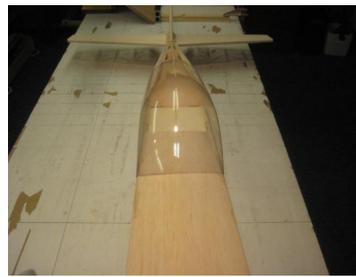
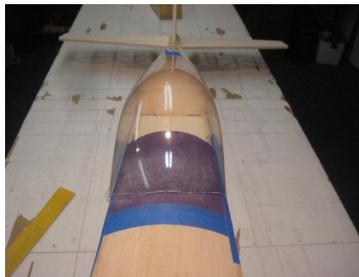


The wood blocks are now considered a vac former ready for vac forming prototype parts.

A series of vac formed parts were made to develop the runoff required to eliminate any webbing on the part surface, and to produce an acceptable prototype part.



The prototype Part was rough cut and fitted to the fuselage.



The trim line on the prototype vac formed canopy was finalized and placed on the vac former. The final trim line was then scribed from the part onto the vac former. This scribed trim line will be transferred onto the production parts during the vac forming process.



A wood ring was constructed to surround the vac former when it is placed in the vac forming machine. This ring will aid in drawing any webs or wrinkles away from the surface of the part. The rear edge draft angle was also increased.



The vac former is now ready for production parts.