

1/4 Scale P-39 Build.

17

Paul Fleming and Jim Lake
2/9/2023

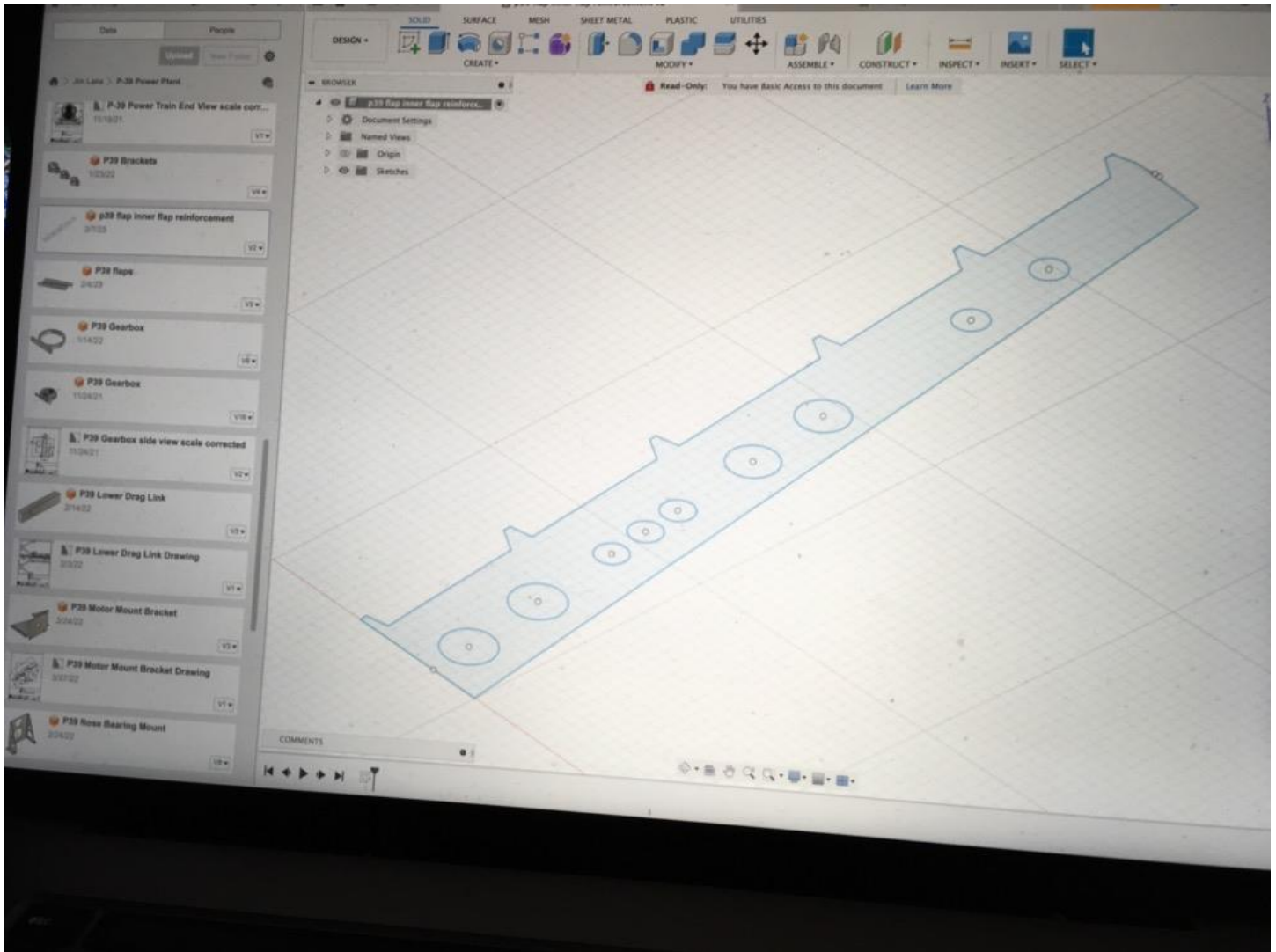
Here is a link to visit all previous issues of this build. http://kitsaparcs.org/construction_fleming_quarter-scale_p-39.html

With the router computer is updated Jim mounted the .032 G10 on the plywood sacrifice sheet and cut out both flaps. Using a 1/8" cutter running at 22,000 RPM it sailed through the G-10 like a hot knife through butter. The edges require a small amount of smoothing. All in all, a great job. Here is a link. <https://youtu.be/IBMijAzgkDE>

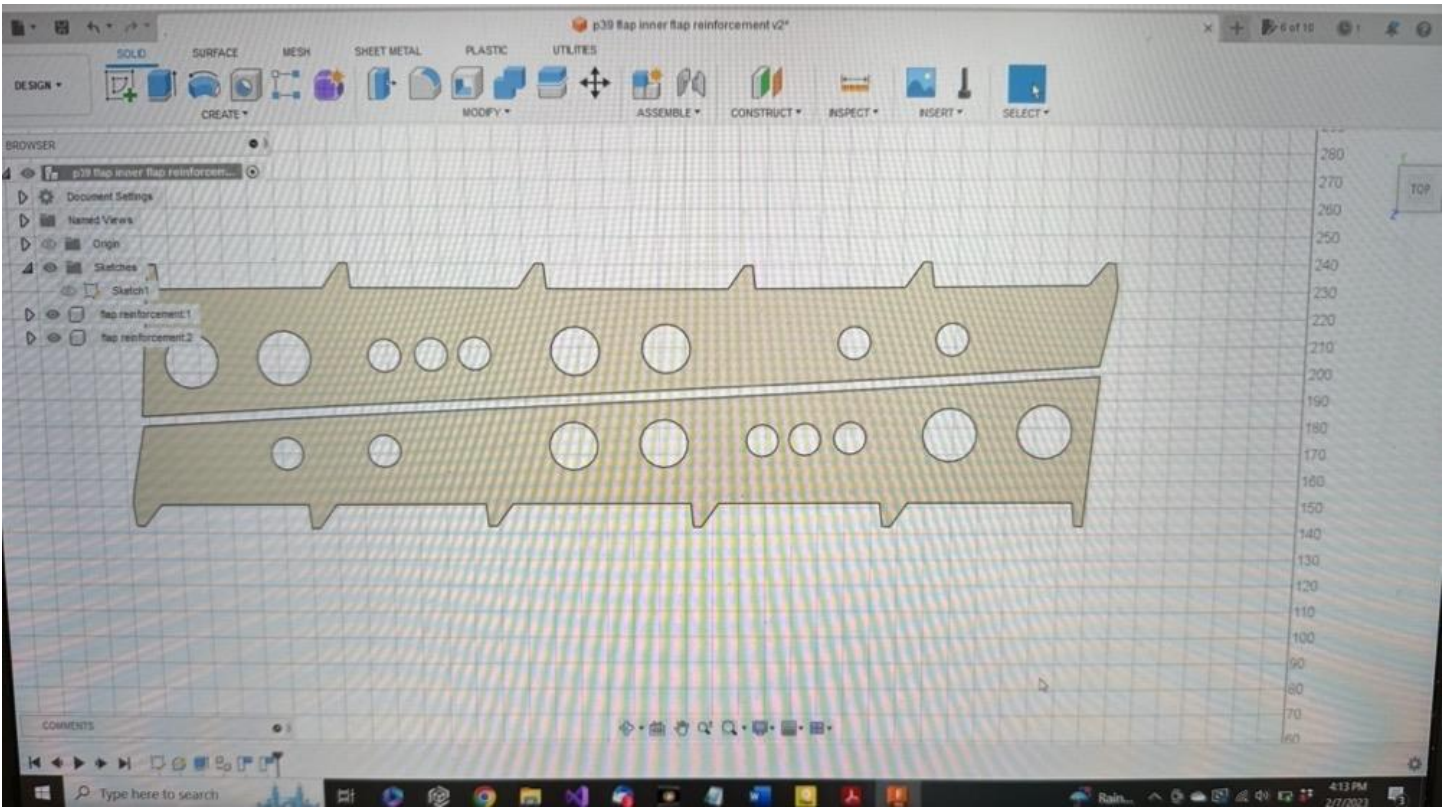


We didn't have enough remaining long G-10 to cut the wing trailing edge supports. I have another 12x24 piece on the way. We will also make a bunch of hinges using the .032.

The next step in the process of making parts for the flaps is a .020 G-10 support structure. The plans call for a thinner piece of G-10 glued over the stringers to stiffen the flaps. Again, we will use Fusion 360 as our basic drawing tool.



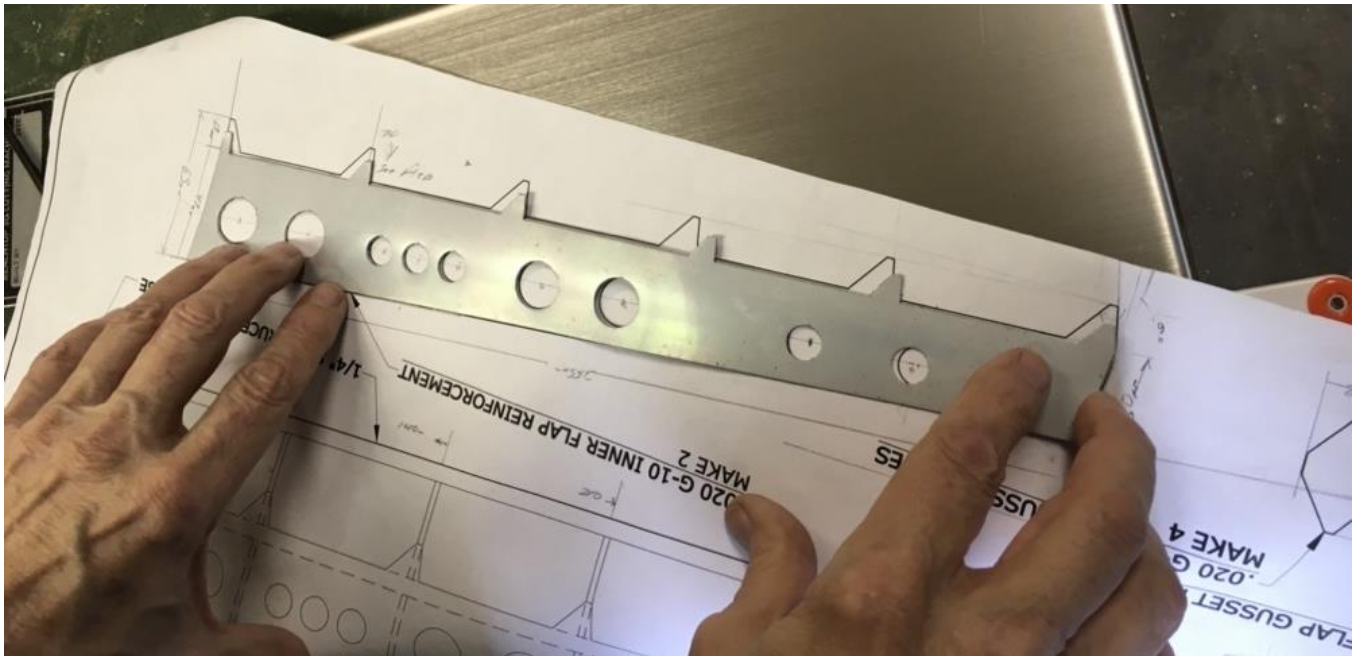
Once Jim completed the layout it was reversed and copied so we can cut both parts at once. Here is where it gets difficult. In Fusion 360 you convert the 2D sketch to a 3D object. In this case by simply adding depth to the part. Since we are going to waterjet cut the G-10, the format the waterjet (WAZER) needs is .DXF(drawing exchange format). However, the free version of Fusion 360 we are using won't allow us to convert the CAD drawing to the .DXF format. But, RHINO to the rescue. Fusion 360 can output a .STEP file (Standard for the Exchange of Product Model Data) and RHINO can accept that. Then, RHINO can be convinced to export a .DXF file for WAM, which is the software WAZER uses to create a gcode file (.nc). I know, this is a convoluted work around we wish was better, but it does work.



With DFX converted into machine language the water jet cutter is set up for a test cut. A piece of thin stainless steel was used as our G-10 supply is limited, and this stuff is too expensive to waste.



We verify our cut on the plans and something is very wrong. The gussets to increase the surface contact area to the flap ribs are mostly too small and some are incorrectly spaced.



The shape and size are ok. The outline has all the correct angles. Surely it is something caused by having to convert the basic drawing through two additional programs till the cutter understands what we want. We will get there, but for now we are stuck. Later: Jim got it figured out, corrected and made a test cut on the thicker .032 not the .016 we intend to use. Then this happened, the G-10 delaminated.

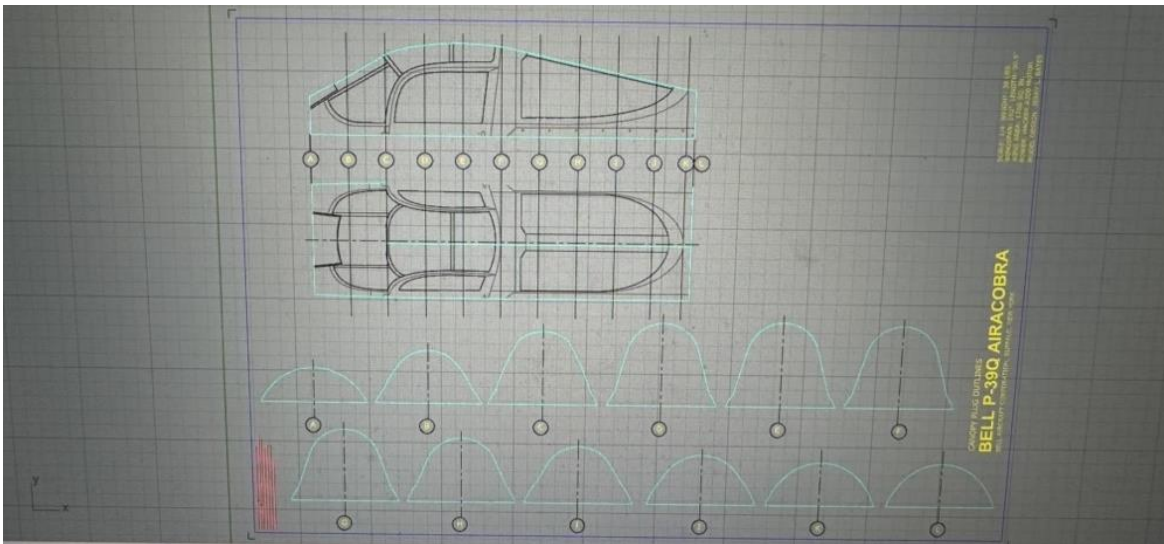


I will contact the G-10 supplier and see what they have to say. Since we are discussing things going wrong, here is another. The top half of the forward



fuselage is no longer flat. I can slide a 3/32 piece of balsa under. When planked it was done on both sides at the same time and it remained flat on the bench. Apparently, the balsa sealer caused the shrinkage. I will hose the inside down with denatured alcohol and firmly weight it down, till it dries flat. Two steps forward.....

Jerry Bates provided this CAD drawing. Now we have sufficient information to produce a master plug to vacuum form canopies.



Last entry 2/11/2023