

# My Balsa & Glass Workshop

## USAF OA-1K Skyraider II Build Description

Updated as of 1 June 2025

Having served 24 years in the Air Force, I tend to keep track of new USAF developments, especially when it comes to new aircraft. One that has caught my attention is the new OA-1K Skyraider II. Air Force Special Operations Command marked a new chapter with its latest aircraft on 3 April 2025 when the first Skyraider II fully modified for military use arrived at Hurlburt Field, FL. Additional aircraft will flow from the production line to Will Rogers Air National Guard Base, OK. where the Skyraider II formal training unit is located.

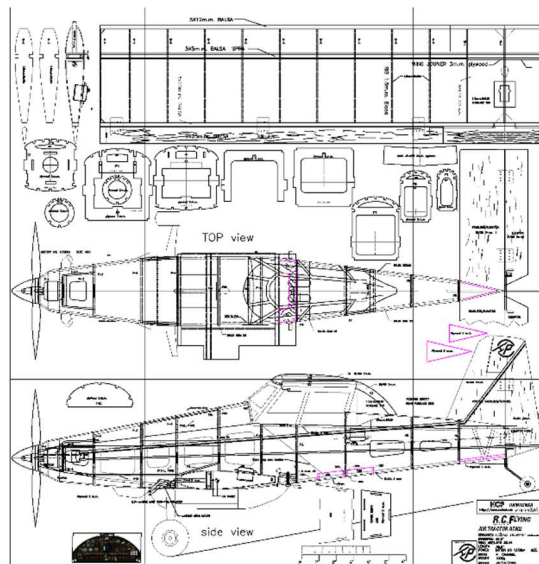
Based on a proven aircraft platform, the Airtractor AT-802 crop duster, the OA-1K will provide airborne eyes, ears, and precision fires to support ground troops in permissive airspace, just as its namesake, the A-1 Skyraider (top right image below), did in the Korean and Vietnam Wars. Produced by Air Tractor and modified by L3Harris, the Skyraider II replaces the U-28A Draco, a small intelligence, surveillance, and reconnaissance aircraft that also operated in austere conditions. Officials have spoken of Skyraider II's ability to "collapse the stack" of up to 20 ISR and armed defense aircraft that are sometimes called in to support special operations missions against violent extremist organizations.



Figures 1 thru 3 - OA-1K, A-1 Skyraider, and a Border Patrol OA-1K

Source of Images: <https://www.airandspaceforces.com/air-force-first-skyraider-ii-arrives/>, <https://iomax.net/projects/at-802-border-patrol-aircraft/>

For my **Semi-Scale** scratch build of the Skyraider II, my starting point will be the Airtractor AT-802. In my web search for plans, I was able to find a set from AeroFred ([https://aerofred.com/details.php?image\\_id=96287&mode=search/](https://aerofred.com/details.php?image_id=96287&mode=search/)) for a 46.5" wingspan (1/15th scale) electric-powered model designed by Chalempol Hamaunsa. With some additional digging around on the web, I found plans on RCGroups.com (<https://www.rcgroups.com/forums/showthread.php?2334101-AirTractor-AT-802/>) for the same Chalempol model, but with a better set of plans, and a PDF file for all the die-cut patterns. What more could I ask for! This site also contains several build images.



*Figures 4 and 5 - 1/15<sup>th</sup> Scale AT-802 and RC Flying Plans*

Source of Images: <https://www.rcgroups.com/forums/showthread.php?2334101-AirTractor-AT-802/>

One of the many modifications that will be needed to the AT-802 plans are the wing/fuselage hardpoints for all the external stores. The two-seat OA-1K Skyraider II wing and fuselage hard points can be armed with a range of weapon systems, including dual .50 cal. GAU-19/A three-barrel gatling guns, AGM-114 Hellfire missiles, dual M260 seven-tube rocket launchers, Advanced Precision Kill Weapon System II (APKWS II) laser-guided 70mm rockets, and 500lb Mk-82 bombs. The hard points can be increased to 15 to carry additional armament. The weaponry also includes FN Herstal gun pod, Dillon-Aero .50 caliber gun, GBU-12 laser guided bomb, Raytheon MTS-A multi-spectral targeting system, and 2.75-inch precision guided rocket.

L3Harris has put forward GBU-39/B Small Diameter Bombs (SDB) and GBU-53/B Storm Breakers, also known as Small Diameter Bomb IIs (SDB II), as potential future armament options for the OA-1K. The GBU-39/B and GBU-53/B both offer a degree of standoff capability, and the ability to engage static and moving targets over dozens of miles. Modeling some of these external stores could be a major task.

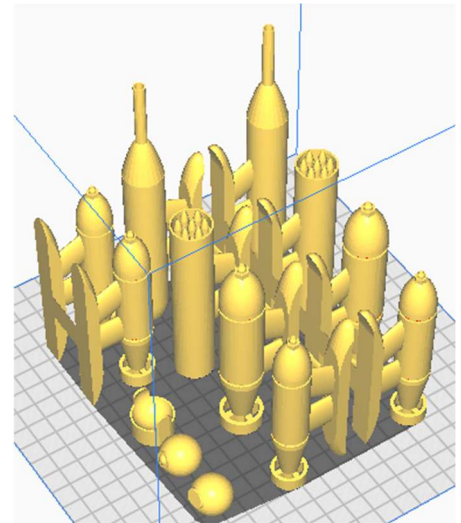
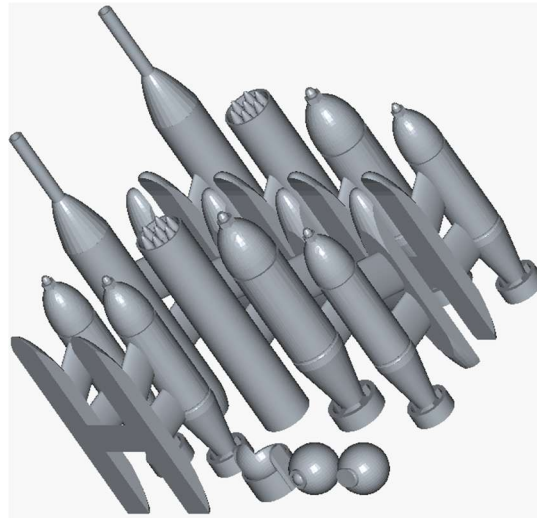
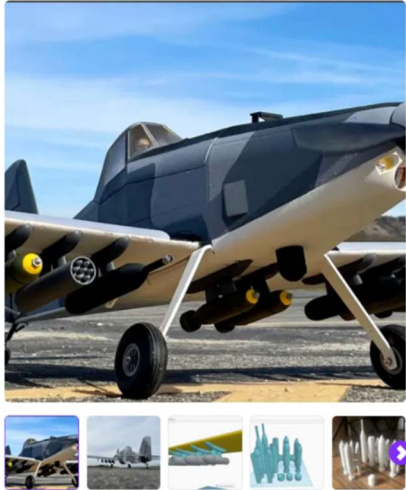
The first step in planning for this my build is to take the 1/15th scale AT-802 plan PDF file and convert all the pages into SVG files. I then import the SVG files into my "Back To The Drawing Board" 2D CAD program (<https://drawingboardapp.com/>) The original plan PDF file has 13 pages, with 12 of them being full-scale plans. I took each of the full-scale drawing pages and imported them into the CAD program to produce the total full-scale plan sheet as seen in Figure 6 below.





SelfCAD, and the image on the right is the same STL file loaded into UltiMaker Cura (<https://ultimaker.com/software/ultimaker-cura/>) but reduced to obtain the required 1/15th scale armament models. Yes, I'm now venturing into the world of 3D modeling and 3D printing. ***As I keep saying, you can always teach an old dog new tricks!***

AT-802L LONGSWORD ARMAMENTS V4 FU



Figures 7 thru 9 - AT-802L Armaments and Related STL File Images

Source of Left Image: <https://cults3d.com/en/3d-model/various/at-802l-longsword-armaments-v4-full/>

## Initial Power System Selection

Ok, enough with the external store's discussions for now. How about we see what power system we will need for this little beast. Given there are going to be some additions made to the wing internal structure, the ordnance loads, a communications tower aft of the cockpit canopy, and I will be using the same LiPo battery packs I use in my Stagger Bee (BadAss 45C 3,300mah 3S), I'm going to make an initial assumption that the total weight (ready to fly) of my OA-1K Skyraider II will come out in the range of 1,500 - 1,800 grams (53-64 oz.). With this model being somewhere between a sport flyer and warbird flyer, I'm going to use another initial assumption that the power system will need to produce 125-150 watts/lb., or somewhere around 475 watts total.

I like using the performance data charts that can be found on the Innov8tive Design Website (<https://innov8tivedesigns.com/>). Using that and needing 475 watts of power, that puts the power system somewhere in the range of a .25 glow engine, or the BadAss 2814 Series of motors. I want to try and use a 5-blade prop, as used on the OA-1K. The BadAss 2814-980Kv specifications state a Max Continuous Power (3-cell Li-Po) of 510 watts at Maximum Continuous Current of 46 amps. While that motors performance data charts do not list a 5-blade prop, it does list data for a 11x7 3-blade prop using a 3S battery pulling 33 amps and producing 1,692 grams (59.7 oz.) of thrust. So, my initial BadAss Power System is comprised of the following components: - Motor: BadAss 2814-980Kv Brushless; ESC: BadAss Rebel V2 Series Brushless ESC, 60A; Battery: BadAss 45C 3,300mah 3S LiPo; Prop: 10x9 Scimitar 5-Blade Prop. This will provide a power ratio of approx. 1:1 for my Skyraider II.



## Modifications for OA-1K Plan Drawings

Let's get back to the plan drawings for the OA-1K. After looking over the AT-802 plans, I determined the following are some of the wing modification/additions needed: 1) addition of wing/fuselage ordnance hardpoints structure; 2) replace the center wing aileron servo with individual aileron servos on each side of the wing; 3) add wingtip blocks and shape to match those used on the OA-1K; 4) use basswood for the wing main spars; 5) new thicker wing ribs using the NACA 4415 airfoil profile that is used on the OA-1K; and 6) addition of some gussets to the wing structure. These plan changes can be seen in Figure 10 below of the left half of the wing.

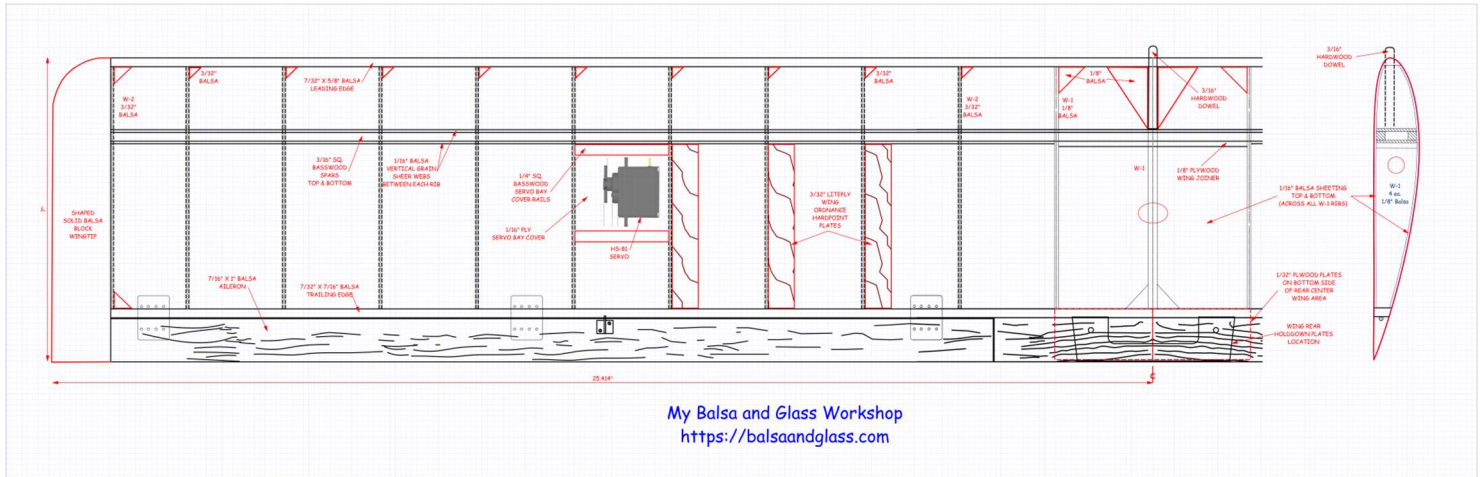


Figure 10 - OA-1K Left Wing Half 2D CAD Plan

For the horizontal and vertical stabilizers (*tail feathers*), the modifications I see needed are: 1) extend the elevator tips forward to better match that used on the OA-1K; 2) addition of some 1/32" and 1/64" plywood plates; and 3) addition of two vertical strakes on the horizontal stabilizer lower surface to match those on the OA-1K. These plan changes can be seen in Figure 11 below.

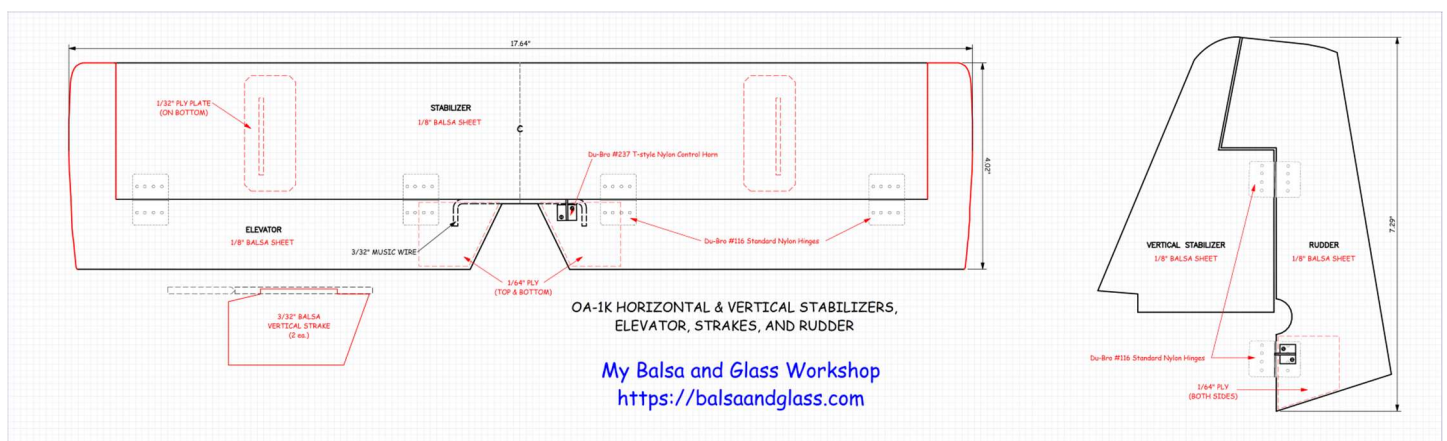


Figure 11 - OA-1K Tail Feathers 2D CAD Plan

Next are the modifications to the AT-802 fuselage plan. **Note** - I updated all the plans to change any measurements from metric to Imperial (US). While I find it easier to build using metric, to aid other builders in ordering balsa and plywood, Imperial measurements are a must. Having selected a BadAss 2814-980Kv Brushless motor for my power system, the structure of the motor box used in the AT-802 plan was shortened to ensure a correct spacing between the propeller and fuselage nose and widened to allow mounting of the new larger motor backplate. With the change of wing rib profile to a NACA 4415, this drives some modifications to the fuselage sides, doublers, several formers, and the area below the wing center section to match the fuselage profile. These plan changes can be seen in Figure 12 below.

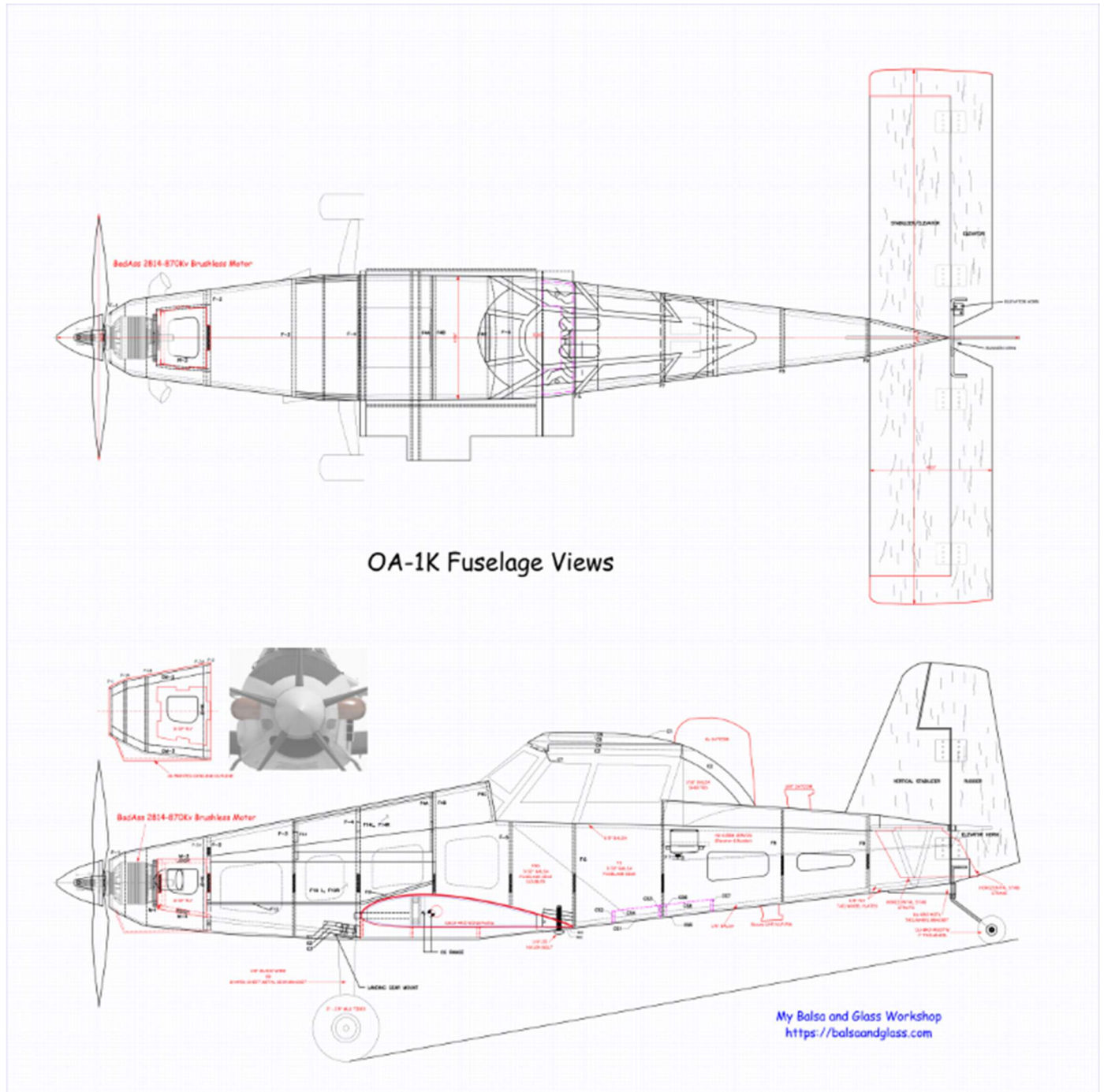


Figure 12 - OA-1K Fuselage 2D CAD Plan Views

As I stated above, the motor box templates all required modification to reflect the required changes due to the BadASS 2814 motor size. Changing to the NACA 4415 wing profile resulted in modifications to the fuselage sides, doublers, and formers F4, F4B, and F5. These changes can be seen in Figures 13 and 14 below.

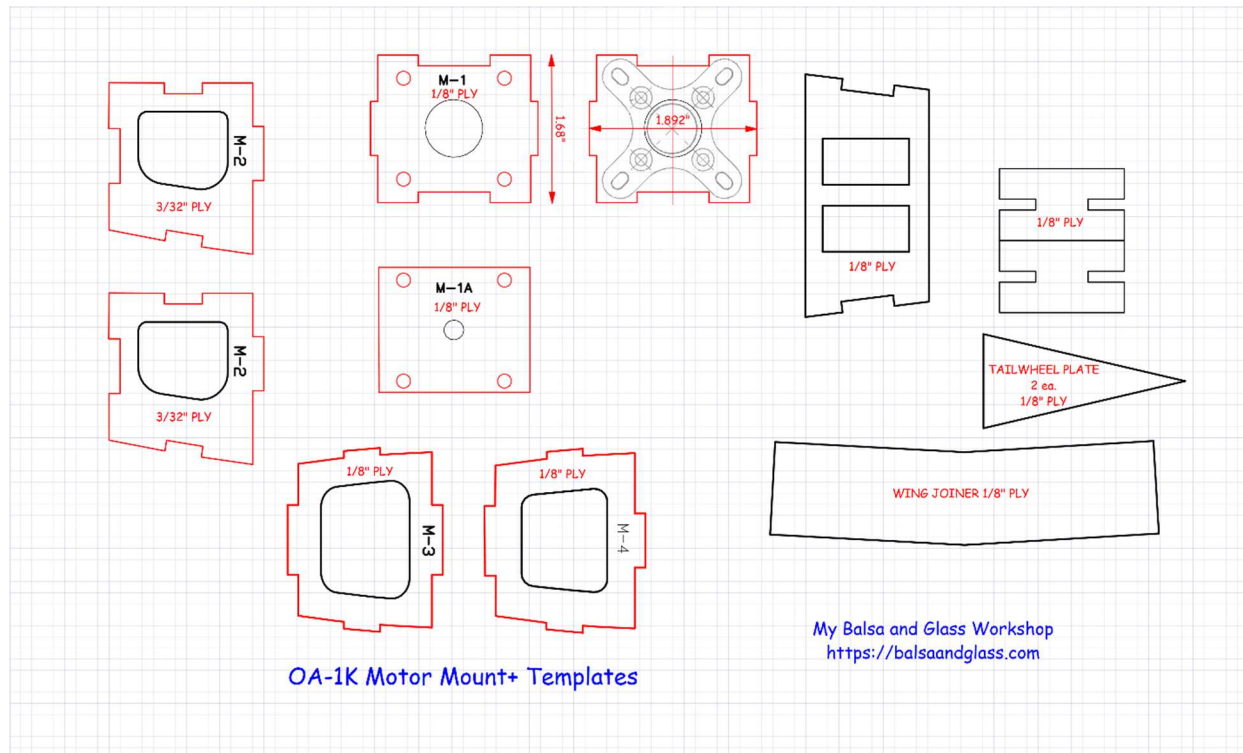


Figure 13 - OA-1K Motor Box Templates Modifications

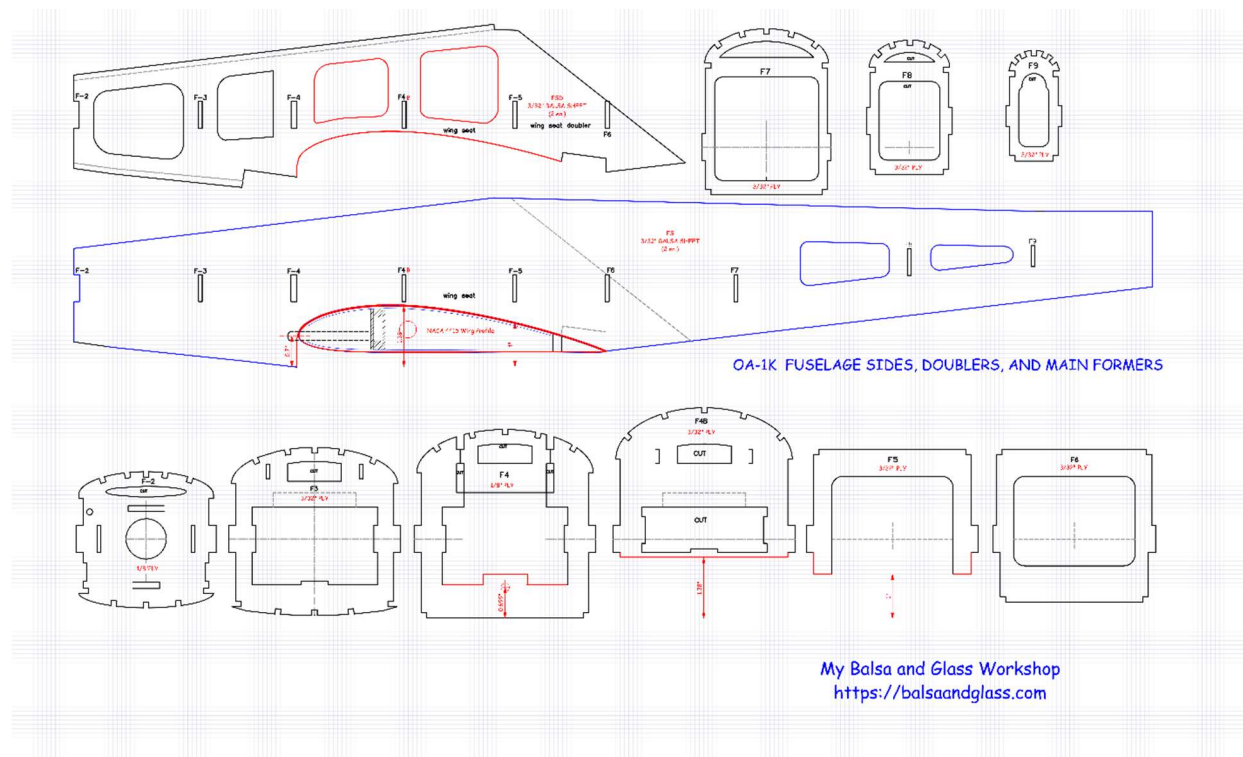


Figure 13 - OA-1K Fuselage Templates Modifications

Additionally, I still have other items to work on the fuselage plan, so more to come.