

# My Balsa & Glass Workshop

## 1/15<sup>th</sup> Semi-Scale Douglas A-26 Invader Build Description

Updated as of 19 May 2026

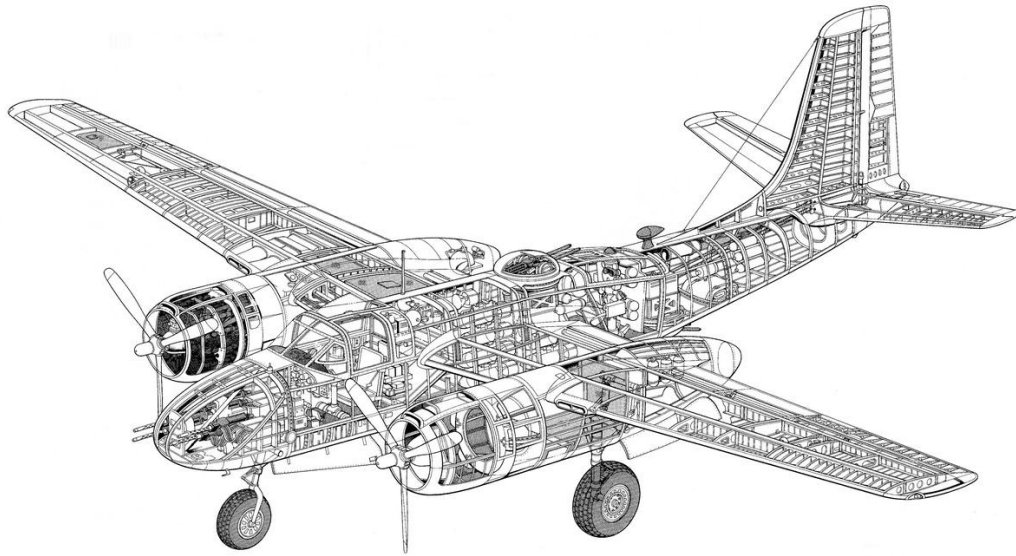
Having completed my scratch build of a 1/15<sup>th</sup> Semi-Scale USAF OA-1K Skyraider II, I wanted to try and see what I could come up with in the way of a twin engine post WW-II ground attack aircraft to add to my military collection. In doing research for my May 2026 "Build of the Month" Edition, I ended up selecting the Douglas A-26 Invader. After looking through and reading all the material for the BOTM Edition, I decided I would set off to try and develop a set of plans for a 1/15<sup>th</sup> Semi-Scale Douglas A-26 Invader and then attempt a balsa scratch build as my next RC model project.

First, a little history on the actual Douglas A-26 Invader. The Douglas A-26 Invader (designated B-26 between 1948 and 1965) is an American twin-engine light bomber and ground attack aircraft. Built by Douglas Aircraft Company during World War II, the Invader also saw service during several major Cold War conflicts. A limited number of highly modified United States Air Force aircraft served in Southeast Asia until 1969. Not only was it a fast aircraft capable of carrying a large bomb load, **but it could also be fitted to produce a formidable ground-attack aircraft.**

The Counter Invader was a highly modified version of the Douglas A-26 Invader, a World War II attack bomber. Redesignated B-26 in 1948, the Invader served again during the Korean War (1950-1953), mainly as a night intruder against North Korean supply lines. It was removed from service in 1958, but in 1961 the USAF recalled many Invaders for use as tactical bombers in Southeast Asia. Combat duty and two decades of wear took their toll, and in 1964 the B-26s again were removed from service.

In 1966 the old bomber was resurrected once more when the improved B-26K Counter Invader returned to Southeast Asia for ground-attack missions along the Ho Chi Minh Trail. Modified by *On Mark Engineering*, the B-26K had a rebuilt fuselage and tail, strengthened wings, improved engines, reversible propellers, wing-tip fuel tanks and other refinements. Redesignated A-26As, Counter Invaders remained in Southeast Asia until 1969 and retired from USAF service.





*Figures 1 thru 5 - Douglas A-26 Invaders*

Source of Images: [https://en.wikipedia.org/wiki/Douglas\\_A-26\\_Invader](https://en.wikipedia.org/wiki/Douglas_A-26_Invader) and <https://www.airvectors.net/ava26.html>

**Actual Douglas A-26 Invader Specifications:**

Crew: 3

Wingspan: 70 ft (21 m)

Length: 50 ft (15 m)

Height: 18 ft 6 in (5.64 m)

Wing area: 540 sq ft (50 m<sup>2</sup>)

Airfoil: NACA 65-215

Empty weight: 22,370 lb (10,147 kg)

Gross weight: 27,600 lb (12,519 kg)

Max takeoff weight: 35,000 lb (15,876 kg)

Fuel capacity: 925 US gal (770 imp gal; 3,500 L) normal + optional 675 US gal (562 imp gal; 2,560 L) ferry tank in the bomb bay; Oil capacity 60 US gal (50 imp gal; 230 L) in two nacelle tanks

Powerplant: 2 × Pratt & Whitney R-2800-27, -71, or -79 Double Wasp 18-cylinder air-cooled two-row radial piston engines, 2,000 hp (1,500 kW) each for take-off

Propellers: 3-bladed Hamilton Standard Hydromatic, 12 ft 7 in (3.84 m) diameter constant-speed fully-feathering propellers

Maximum speed: 359 mph (578 km/h, 312 kn) at 16,700 ft (5,100 m) (normal rated power)

Cruise speed: 266 mph (428 km/h, 231 kn) at 5,000 ft (1,500 m) (62.5% rated power)

Range: 1,600 mi (2,600 km, 1,400 nmi) without ferry tank at 5,000 ft (1,500 m) at 206 mph (179 kn; 332 km/h)

Combat range: 700 mi (1,100 km, 610 nmi)

Ferry range: 3,000 mi (4,800 km, 2,600 nmi) with ferry tank at 5,000 ft (1,500 m) at 210 mph (180 kn; 340 km/h)

Service ceiling: 28,500 ft (8,700 m) ; 14,400 ft (4,400 m) on one engine

**Armament:**

Guns: 6 or 8 0.50 in (12.7 mm) M2 Browning machine guns in solid, "all purpose" nose: or 2 × 0.50 in (12.7 mm) M2 machine guns in glass "bombardier" nose

Up to 8 × 0.50 in (12.7 mm) M2 machine guns paired in four optional under wing pods: or 3 × 0.50 in (12.7 mm) M2 machine guns in each outer wing panel

2 × 0.50 in (12.7 mm) M2 machine guns in remote-controlled dorsal turret

2 × 0.50 in (12.7 mm) M2 machine guns in remote-controlled ventral turret

Rockets: Up to 10 × 5-inch (12.7 cm) HVAR rockets on "zero length" launch pylons, five under each outer wing panel

Bombs: Up to 6,000 lb (2,700 kg) capacity - 4,000 lb (1,800 kg) in the bomb bay plus 2,000 lb (910 kg) carried externally on underwing hardpoints

## 1/15<sup>th</sup> Semi-Scale A-26 Invader Plans Development

The A-26 Invader RC model designed by Dick Sarpolus in my May 2026 BOTM Edition can be built from a set of plans and article which are available on the Outerzone A-26 Invader (oz10379) webpage. ([https://outerzone.co.uk/plan\\_details.asp?ID=10379](https://outerzone.co.uk/plan_details.asp?ID=10379)). I also found a larger (100" wing span, twin .45-.60 two-stroke engines) A-26 Invader RC model, designed by Gary Fuller, with a set of plans and RCM article at Aerofred ([https://aerofred.com/details.php?image\\_id=99331](https://aerofred.com/details.php?image_id=99331)) or Outerzone ([https://outerzone.co.uk/plan\\_details.asp?ID=5882](https://outerzone.co.uk/plan_details.asp?ID=5882)). I used these RC model plans along with other A-26 plans I found on the Internet, and several of my plans from previous scratch builds, as sources for my 1/15<sup>th</sup> scale plan design approach/design/details, materials selection/sizing, etc.

I first needed to set up the sizing for my 1/15<sup>th</sup> scale plans. Using the 3-view drawing in Figure 6, I converted the full scale measurements to 1/15<sup>th</sup> scale for my RC model A-26 Invader measurements.

Full Scale Wingspan: 70 ft (21.3 m)

1/15<sup>th</sup> scale - 56 in. (1,422 mm)

Full Scale Length: 50 ft 9in (15.47 m)

1/15<sup>th</sup> scale - 40.6 in. (1,031 mm)

Full Scale Height: 18 ft (5.49 m)

1/15<sup>th</sup> scale - 14.4 in. (366 mm)

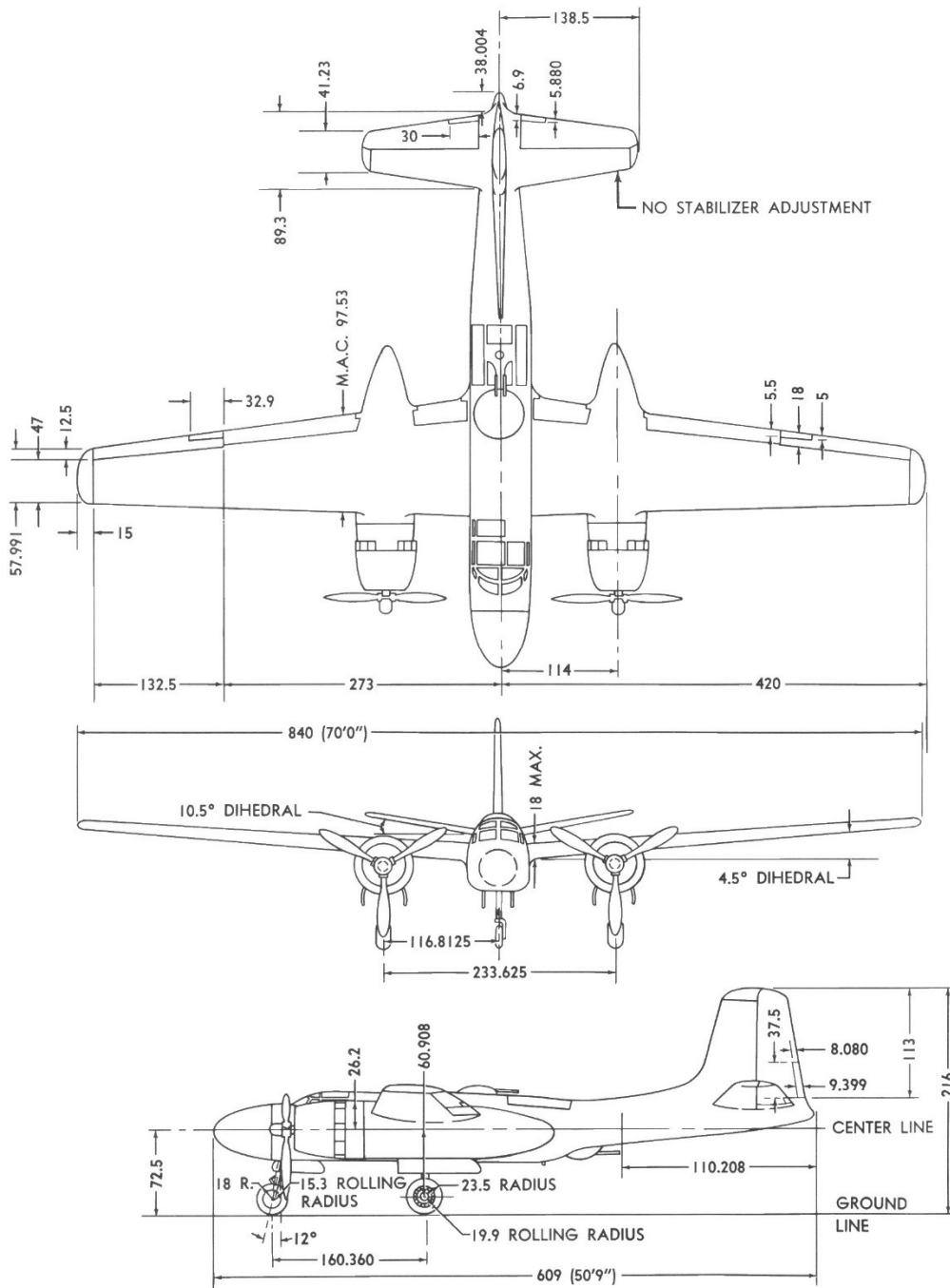


Figure 6 - Full-Scale Douglas A-26 Invader 3-View Drawing

Source of Image: [https://en.wikipedia.org/wiki/Douglas\\_A-26\\_Invader](https://en.wikipedia.org/wiki/Douglas_A-26_Invader)

## 1/15<sup>th</sup> Semi-Scale A-26 Invader Power System Selection

I'm going to make an initial assumption that the total weight (ready to fly) for my A-26 Invader will be somewhere in the range of 2,500 - 2,800 grams (88-99 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 930 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 a total of 930 watts of power (or 465 watts for each motor), that puts the power system somewhere in the range of a .25 glow engine, or the BadAss 2814 Series of motors. The BadAss 2814-980Kv specifications state a Max Continuous Power (*with 3-cell Li-*

Po) of 510 watts (*each motor*) at Maximum Continuous Current of 46 amps. The 2814-980Kv motor performance data chart lists data for a Master Air Screw (MAS) 10x7 3-blade prop using a 3S battery pulling 28.0 amps and producing 1,492 grams (52.6 oz.) of thrust at 8,471 RPM. So, my BadAss Power System is comprised of the following components: - 2ea. Motors: BadAss 2814-980Kv Brushless; 2 ea. ESCs: BadAss Rebel V2 Series Brushless, 50A; 2ea. Batteries: BadAss 45C 3,300mah 3S LiPo; 2 ea. Props: MAS 9x7 3-Blade. This Power System will provide a total power of 2,984 grams (105.2 oz.), which should give me approx. a 1:1 power to weight ratio for my A-26 RC model.

Alright, with my initial RC model size and power system established, my next step was to start putting some "pencil to paper" and draw up some plans. With the days of using a ruler, pencil, and paper to make my model plans all now in the distant past, I started out this design exercise using my trusty 2D computer drawing program "Back To The Drawing Board" (<https://drawingboardapp.com>). I also plan to generate some 3D printed parts for this project, and once I get to that stage of the design I'll move over to my 3D computer program Autodesk Fusion 360 (<https://www.autodesk.com/products/fusion-360/personal>). Autodesk offers a 100% free Fusion 360 license to Students and Hobbyists. I'm working with the free version using a Personal Use license.

### 1/15<sup>th</sup> Semi-Scale A-26 Invader Plans Development

My first step was to get an initial outline and measurements for each major component of my RC scale model. Using another 3-view drawing with sufficient details for modeling, I traced outlines for the fuselage, wing, nacelles, horizontal & vertical stabilizers (I call them tail feathers), and tires. This is shown below in Figure 7. The outlines were then copied into separate plan sheets for each major model component.

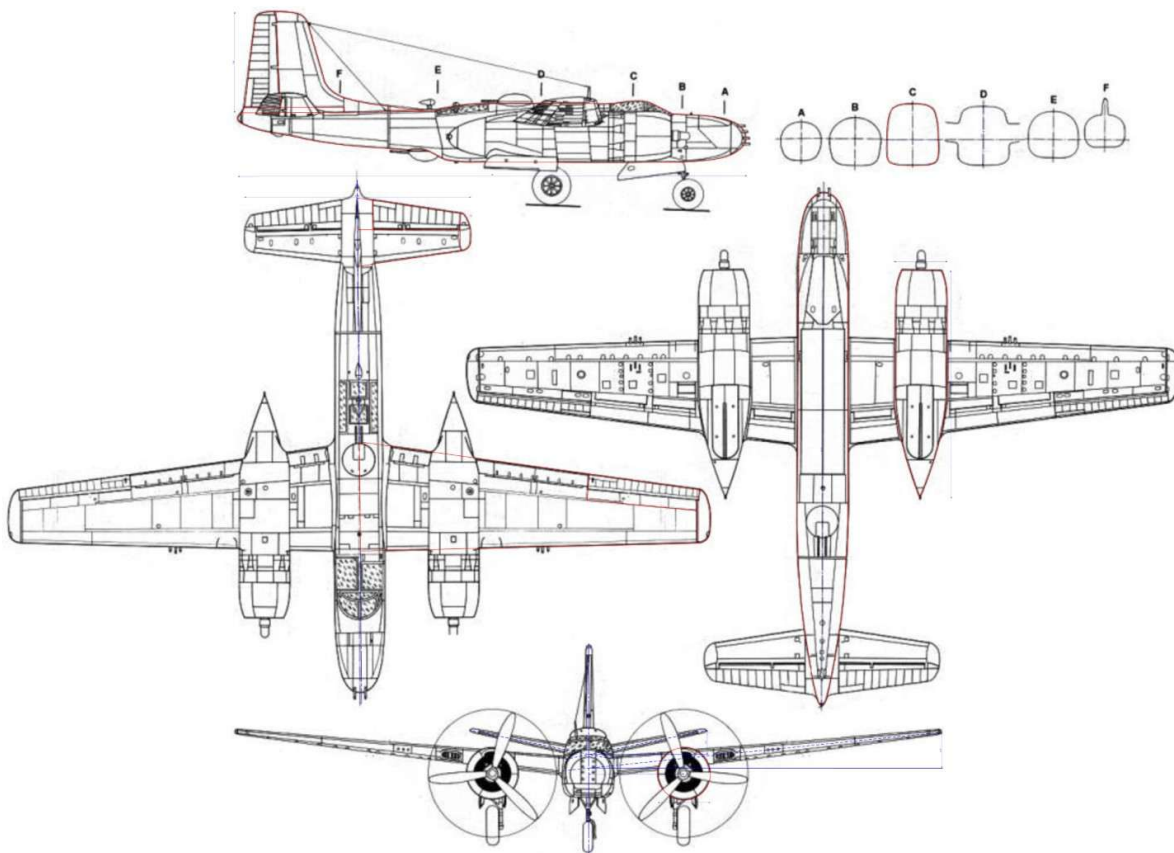


Figure 7 - Tracing Scale Model Components from a A-26 Invader 3-View Drawing

Source of Image: <https://drawingdatabase.com/douglas-a-26-invader/>

**Now the real fun starts.** As indicated earlier, I used other A-26 model plans and my **"modified"** model plans I have worked from for my other scratch builds (like the OA-1K Skyraider II) and started to lay out the various plans for the A-26 Invader. Since the tail feathers were fairly simple; this is where I started my first plan sheet. After a few hours each morning at my desktop computer keyboard/mouse, the results of my efforts are displayed in Figure 8.

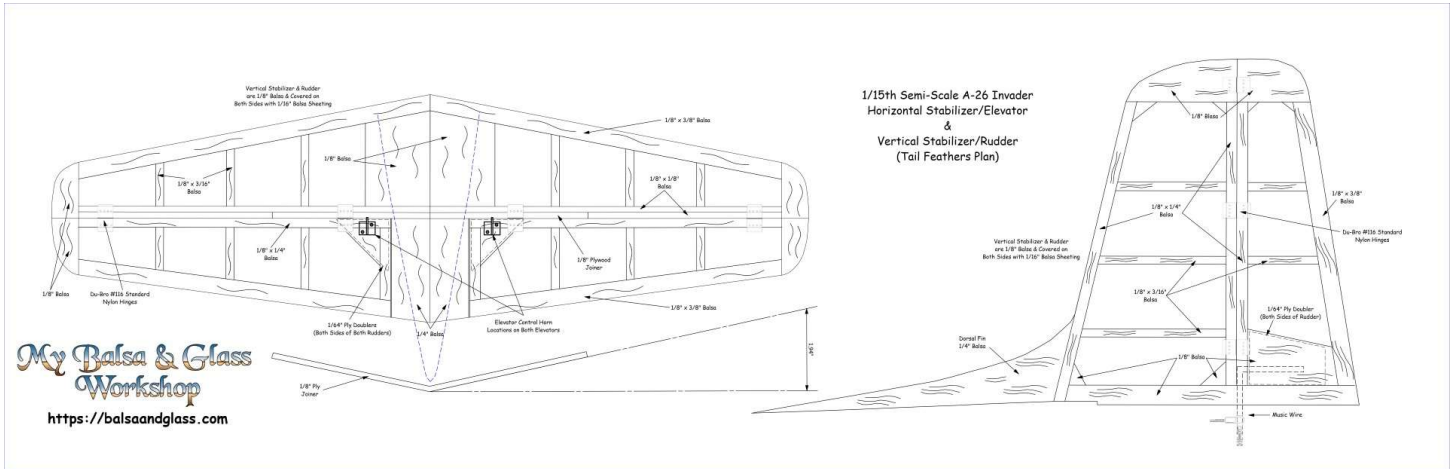


Figure 8 - Tail Feathers Plan

Next was the fuselage. Since the other A-26 plans were all designed using nitro engines, and I wanted to use an electric power system, I first needed to decide where the various power system components would be placed. I debated over LiPo and ESCs in the fuselage versus in each nacelle, and after placing images of the components in each model component plan sheet, I decided a LiPo & ESC would need to go in each motor nacelle with access for LiPo installation from the bottom of each nacelle. With that finalized I pressed forward with the fuselage plan sheet. Here I debated using full balsa sheets versus narrow balsa strips to cover the outside of the fuselage formers, and my initial design used the full sheets approach. This then drives using fuselage formers that are basically rectangles with rounded corners which is not a *"true representation"* of the actual A-26 fuselage shape, hence a *"semi-scale"* model design. Another debate was to use retractable gear versus the standard bent music wire landing gear arrangement. With my 1/15<sup>th</sup> Scale A-26 design being fairly small for a twin engine model, I elected not trying to squeeze retractable gear into the motor nacelles since they are already filled with the LiPo/ESCs.

Again, after **many** hours each morning at my desktop computer keyboard/mouse, the results for my **fuselage plan** are displayed below in Figures 9 & 10. As seen in the top plan, the wing/nacelles assembly is attached to the fuselage from above and held in place using forward & aft  $\frac{1}{4}$ -20 DU-BRO Nylon Wing Bolts from below. As I worked through my plans I built a complete materials and parts list which can be found at the end of this build description.

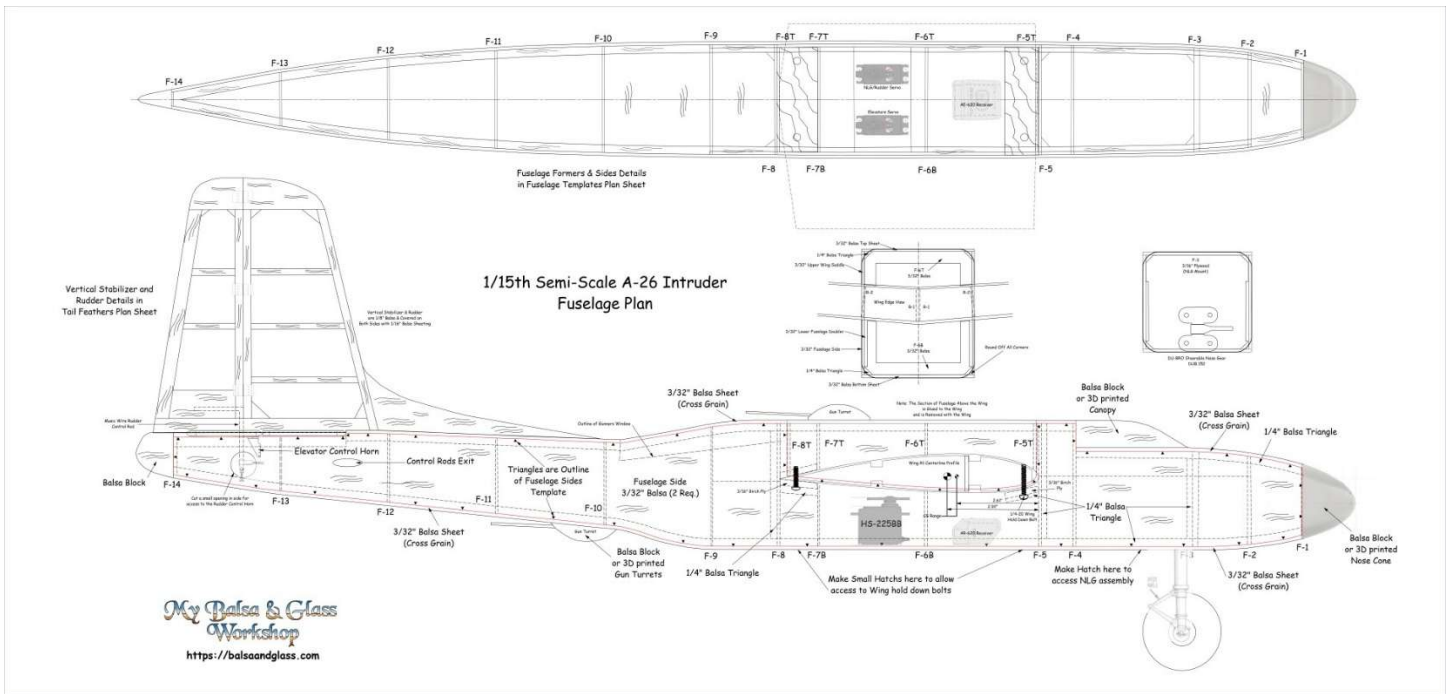


Figure 9 - Fuselage Top & Side View Plan

The fuselage plan could not be finalized until the wing plan was finished. Because the A-26 wing has a triple taper (angled leading/trailing edges and a reduced thickness from root to tip), and a small dihedral, the rib profile at the wing centerline (R1) is different from the rib profile (R2) where the wing passes through the sides of the fuselage, and each are at different heights from the bottom of the fuselage (as seen in the fuselage cross section at F-6 in Figure 9 above). The A-26 RC model plans I found on the web did not seem to address these differences and used only the centerline wing profile in the plan as seen in Figure 9. All my fuselage templates in Figure 10 below were adjusted to try and match the fuselage wing pass through opening to that of wing rib profile R2, and at the correct height.

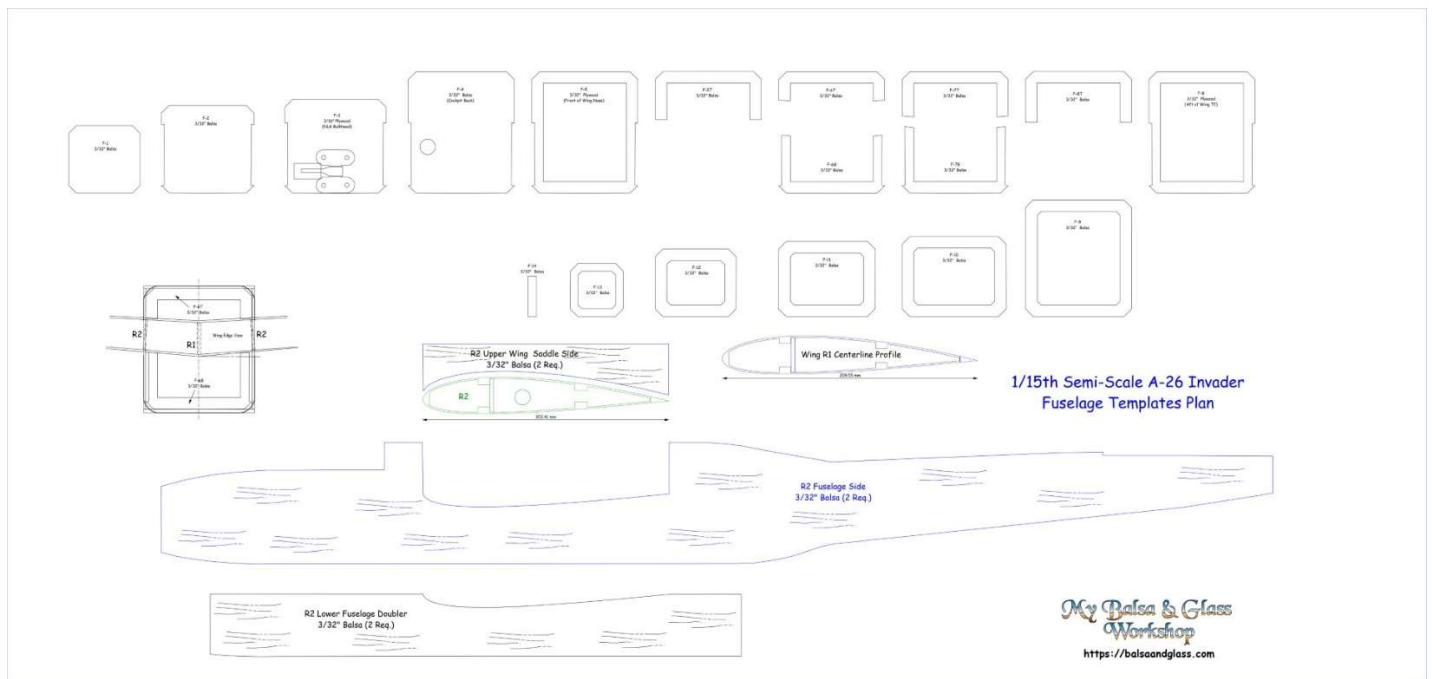


Figure 10 - Fuselage R2 Templates Plan

With the fuselage plan nearly complete, I moved on to draw up a wing plan. Starting with the wing outline, measurements from the detailed 3-view drawings, some of the other A-26 plans wing design elements, review of my other scratch build plans, and **many hours** of working at my computer station, the results are shown in Figure 11. The ailerons in my RC model are slightly larger than those on the actual A-26, but this adds more roll control to the model. I had considered putting flaps running from R5-R7 but elected to not add them to reduce the model's weight, and I need that area in the wing to add the weapons stations pylon attachment hardware. My airfoil is also thicker than the NACA 65-215 on the real A-26.

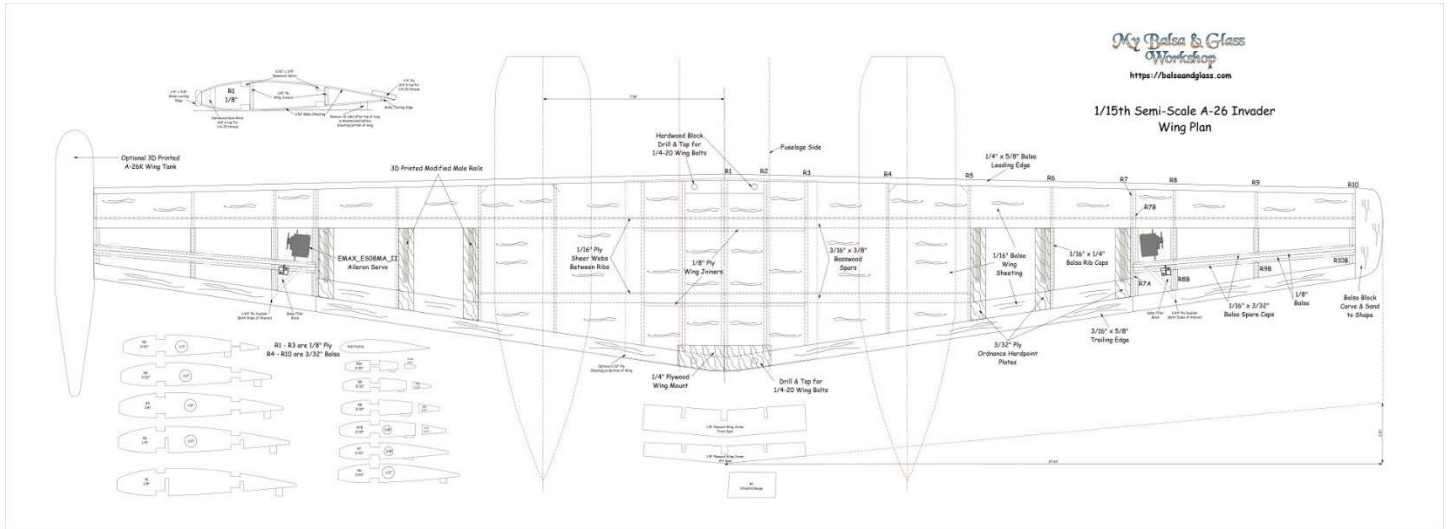


Figure 10 - Wing Plan

Now for the design of the motor nacelles. This part of my design was the hardest for me to draw up. Most of the other A-26 plans I found used nacelles based on a rectangular shape with sheeted sides, top, and bottom. I wanted to try and capture the real A-26 nacelles using a round shaped nacelle design that is covered using narrow 1/16" or 3/32" thick balsa strips to better fit the wing profiles. So, I first needed to try and understand how the wing and a round nacelle would fit together so I could then figure out what structures (formers, trusses, LiPo/ESC mounting plate, etc.) would be needed inside the nacelle to attach to the wing, and to mount the motor, ESC, LiPo, and MLG strut.

So, I took my A-26 wing plan and drew up a 2D front view in order to see the wing dihedral and thickness variation as it passes through a round nacelle placed on the wing, matching that of the A-26 3-view drawing in Figure 7. The results of my efforts are shown below in Figure 11.

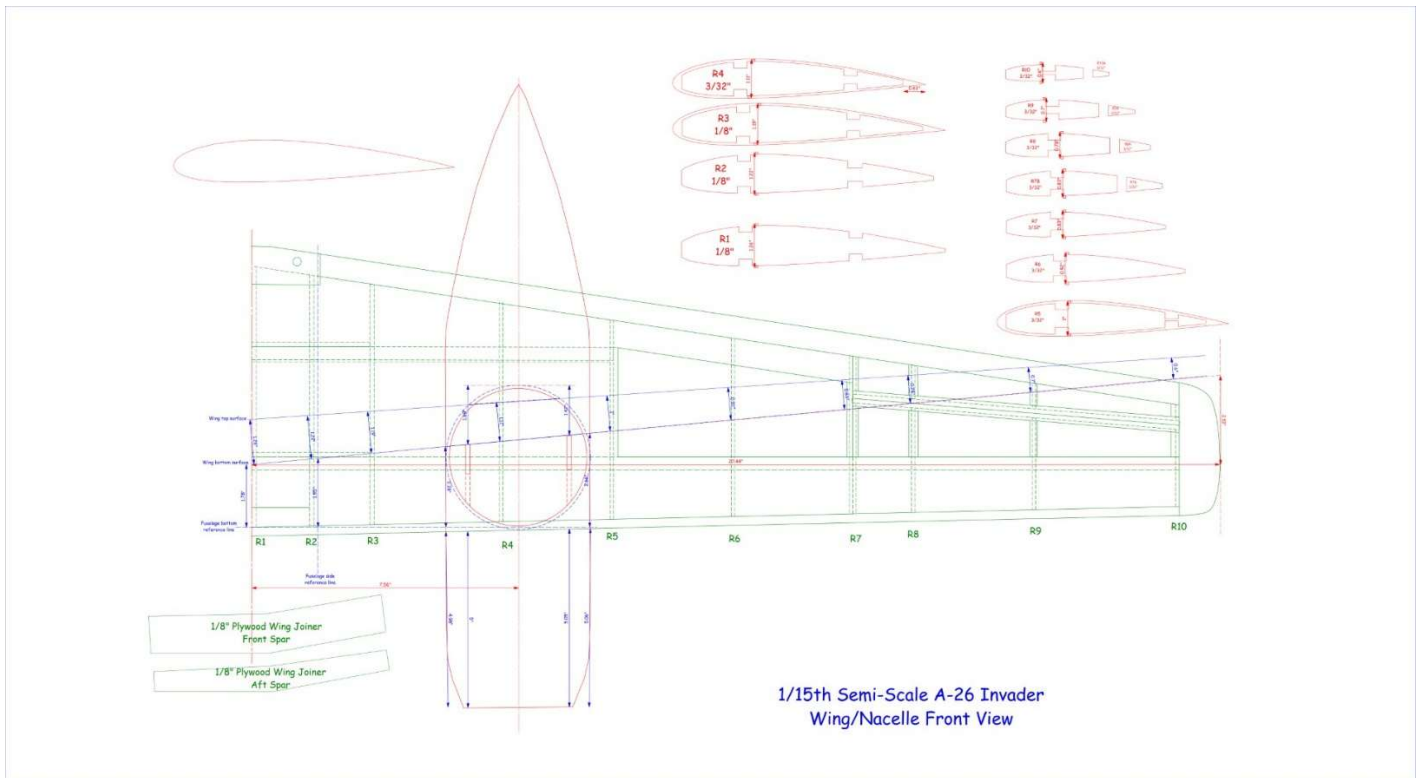


Figure 11 - Wing & Round Nacelle Front View Plan

While this helped, I still just could not visualize in my old brain the interface between the wing and nacelle, so I decided to try a 3D approach. Using my wing/nacelle 2D plan, I moved it into Fusion 360 and 3D modeled a section of the wing and the basic size/shape/position of the nacelle I needed. This turned out fairly nice as you can see in Figure 12.

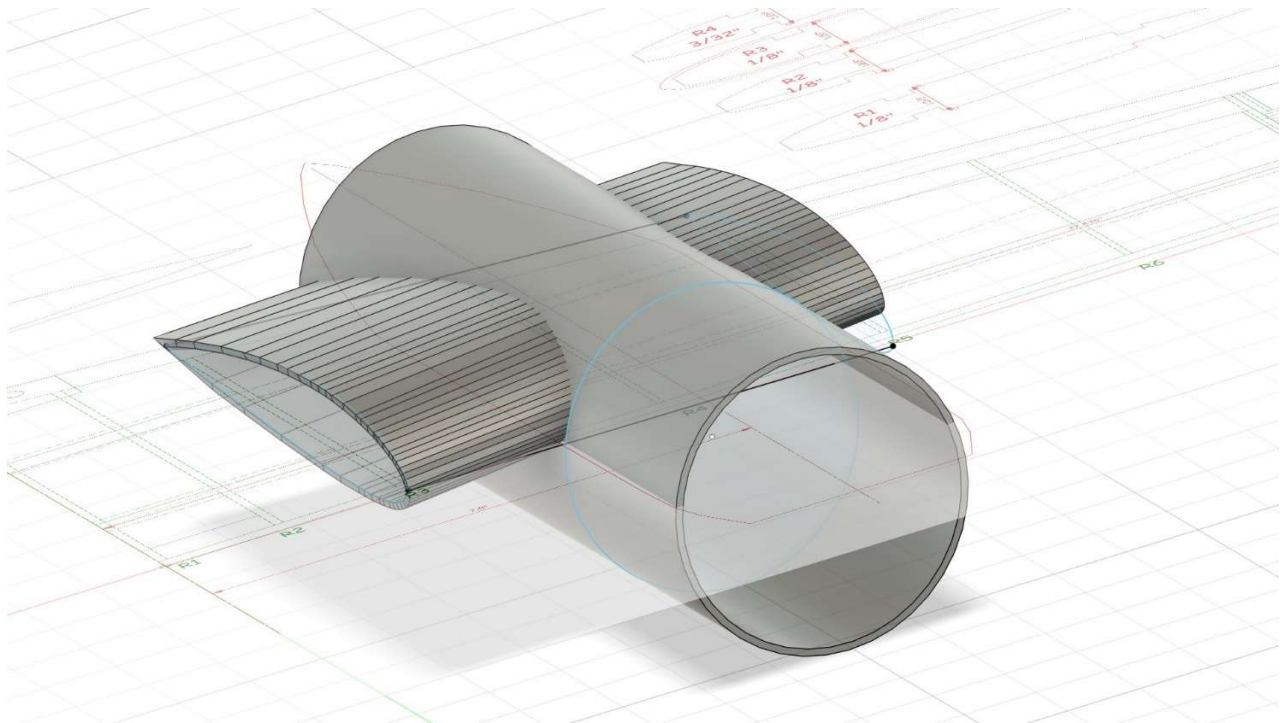


Figure 12 - Wing & Round Nacelle Interface 3D Model

Using this 3D model, I could rotate it around to get different views and take measurements so I could then go back to my 2D drawing to design the nacelle internal structures. After **many hours** of working on the 2D CAD program, I finally was able to come up with the nacelle design in Figure 13 that I think will work.

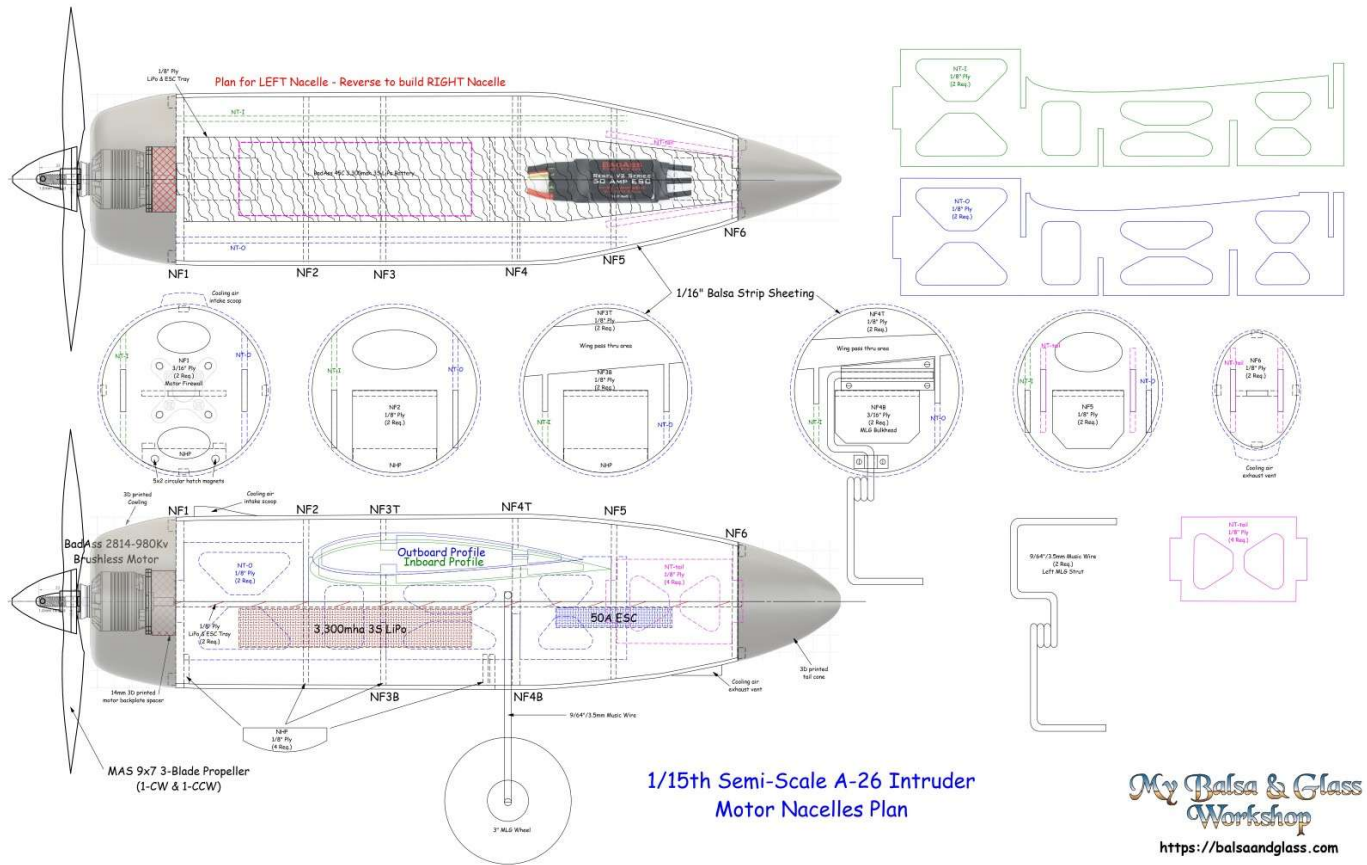


Figure 13 - Motor Nacelles Plan

While working on the nacelle and fuselage plans, in using 9/64"/3.5mm bent music wire MLG struts, I needed to do something to make them look at least a little more like the real aircraft struts. On a couple of my older models many years ago, I used some plastic strut covers to spruce up the gear. With a little web research, I was able to find that "Robart" still makes strut covers ([https://robart.com/products/small-straight-strut-covers?\\_pos=1&\\_sid=9a749acf6&\\_ss=r](https://robart.com/products/small-straight-strut-covers?_pos=1&_sid=9a749acf6&_ss=r)) for RC models. While these would be exactly what I needed, I decided to see if I could 3D model some covers myself.

Using some images I found of the Robart covers, I worked up a 2D plan (Figure 14) for the strut cover parts, imported it into Fusion 360, and after a couple hours on my computer had a 3D model of a strut cover (Figure 15) and set up ready to print in Creadity Print (Figure 16). These should work great.

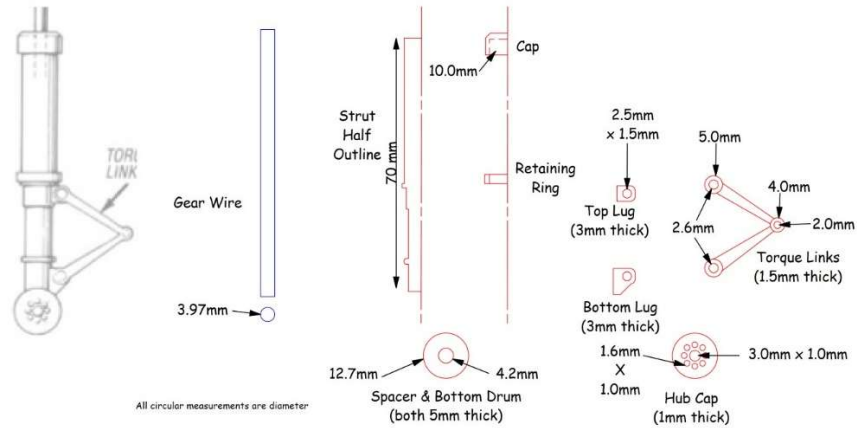


Figure 14 - Wire Landing Gear Strut Cover 2D Plan

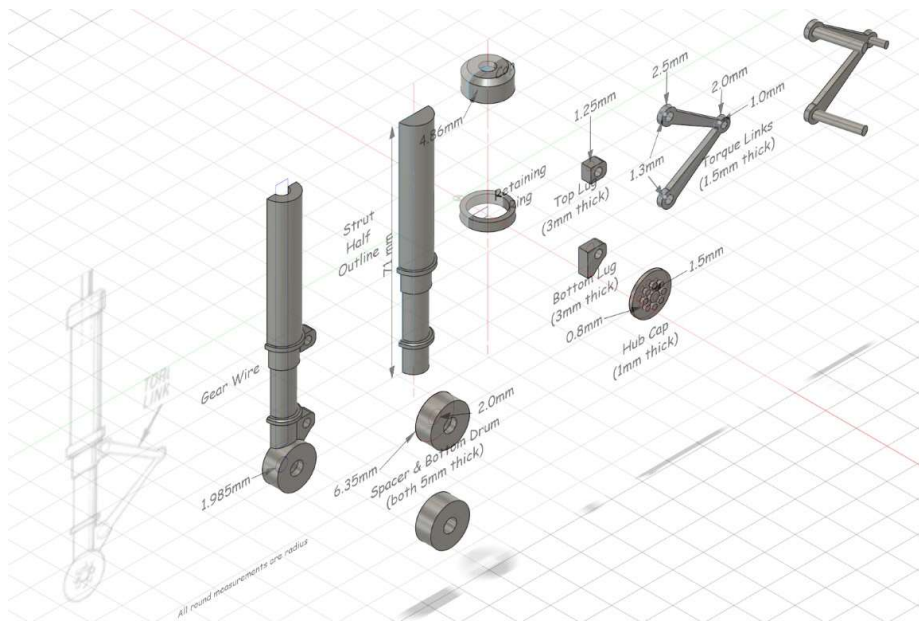


Figure 15 - Wire Landing Gear Strut Cover 3D Model

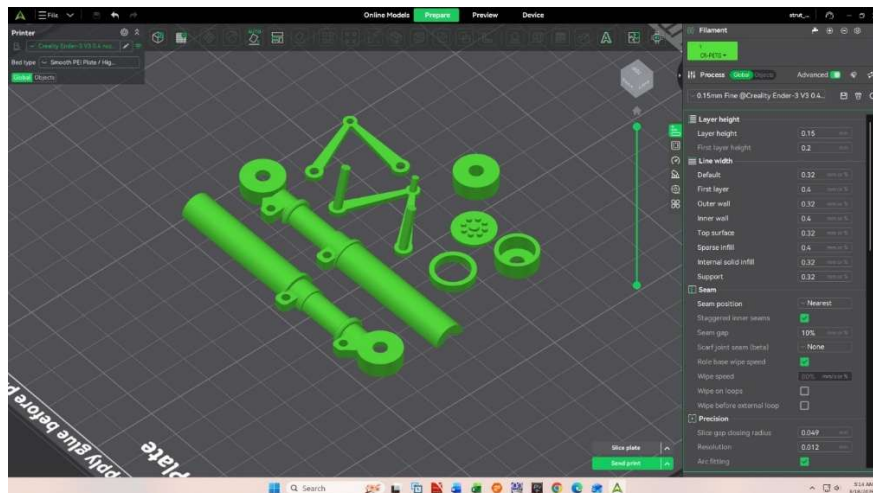


Figure 16 - Wire Landing Gear Strut Cover 3D Printer Set-up

To verify my Motor Nacelles Plan will work, I took the 2D plan and imported it into Fusion 360 so I could build a 3D model of the motor nacelle in my computer versus cutting out all the parts from balsa and plywood to see if they fit together correctly (Figures 17 & 18). This was an exercise in learning how to build sketches for each part and use "offset planes" to positioning each of the nacelle formers (NF1 - NF6) and nacelle trusses (NT-I, NT-O, NT-tail). While I was at it, I went ahead and 3D modeled the nacelle cowling and tail cone (Figure 19) using "lofts" to obtain the STL files I would need to 3D print them once the balsa/ply nacelles are built.

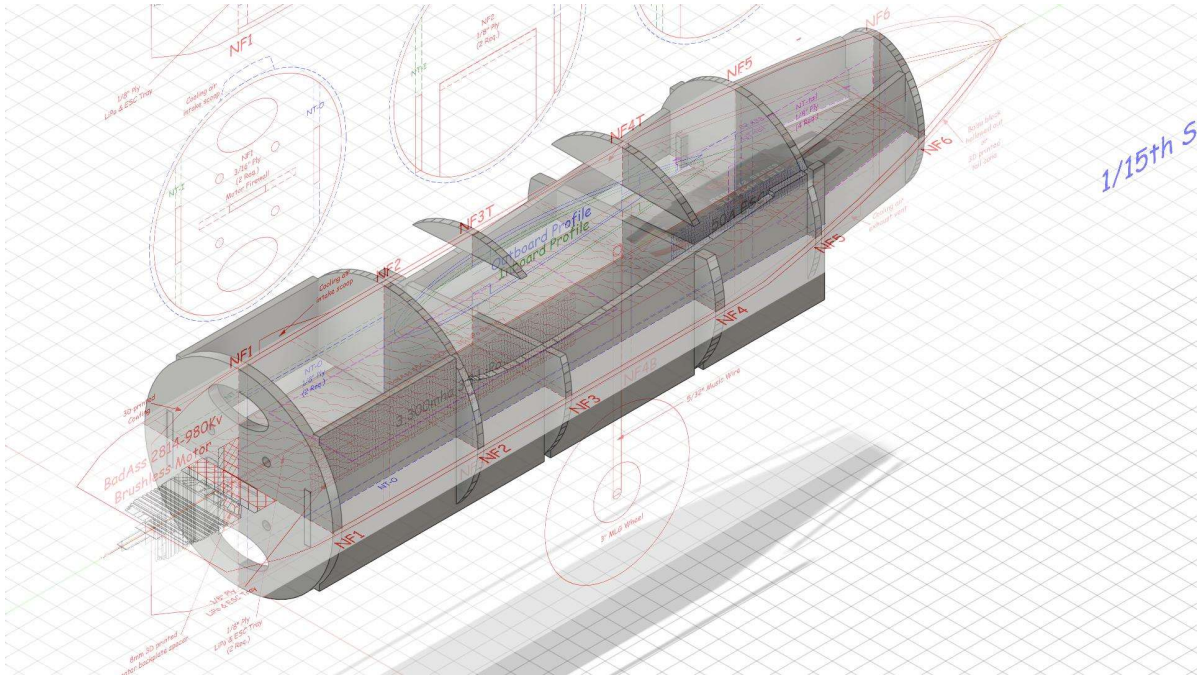


Figure 17 - Left Motor Nacelle in Fusion 360 (with plan drawing)

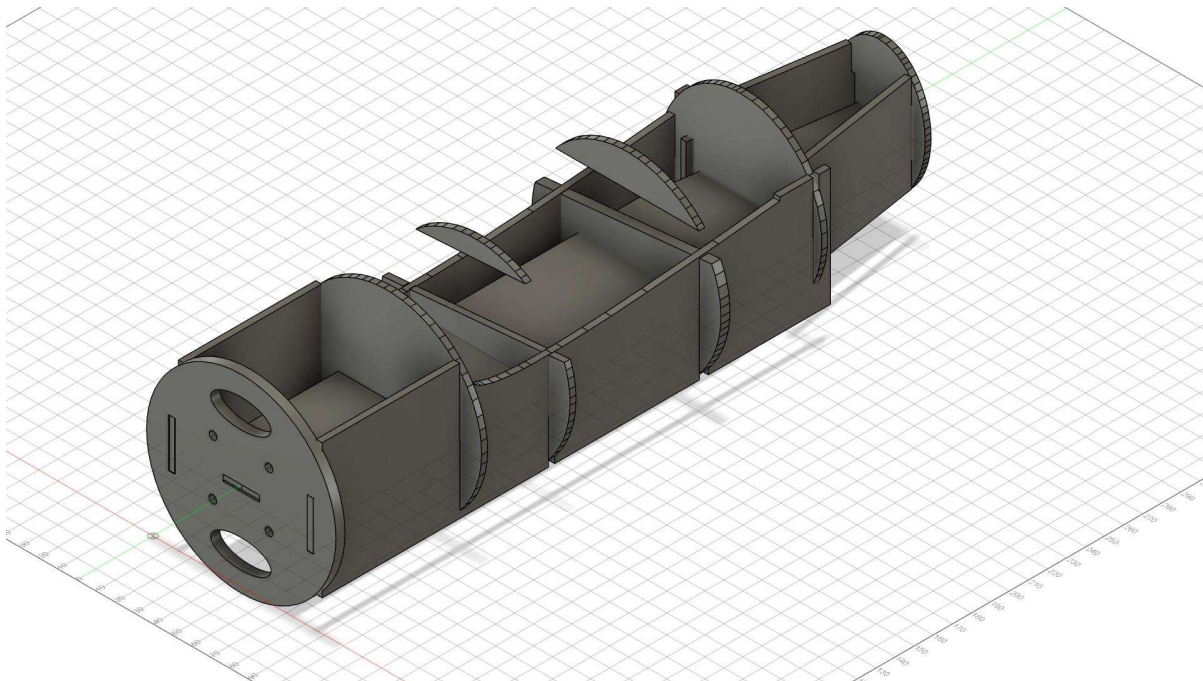


Figure 18 - Left Motor Nacelle Parts Fit Check

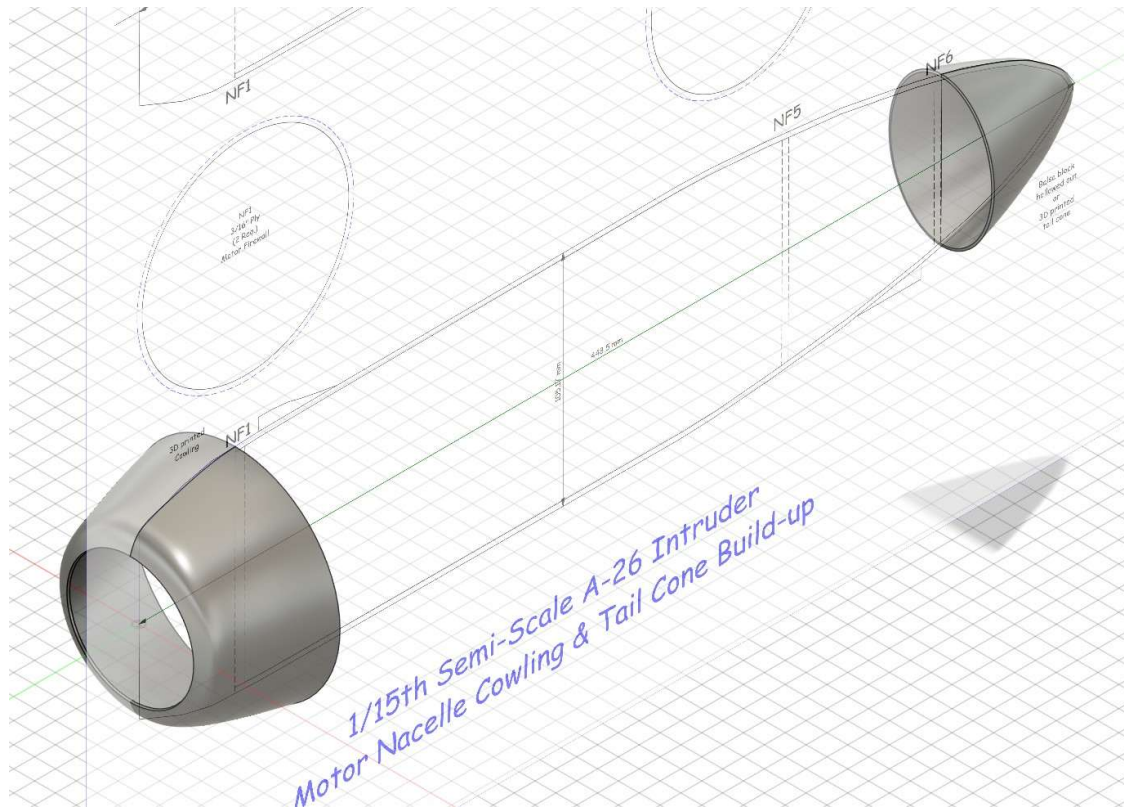


Figure 19 - Motor Nacelles Cowl & Tail Cone 3D Models in Fusion 360

Since I had Fusion 360 up and running, I went ahead and imported the forward section of the fuselage plans and then 3D modeled a nose cone (Figure 20) using a "surface loft" design approach for my A-26 Invader model. With that finished I exported the STL file needed to 3D print the nose once the balsa/ply fuselage is built.

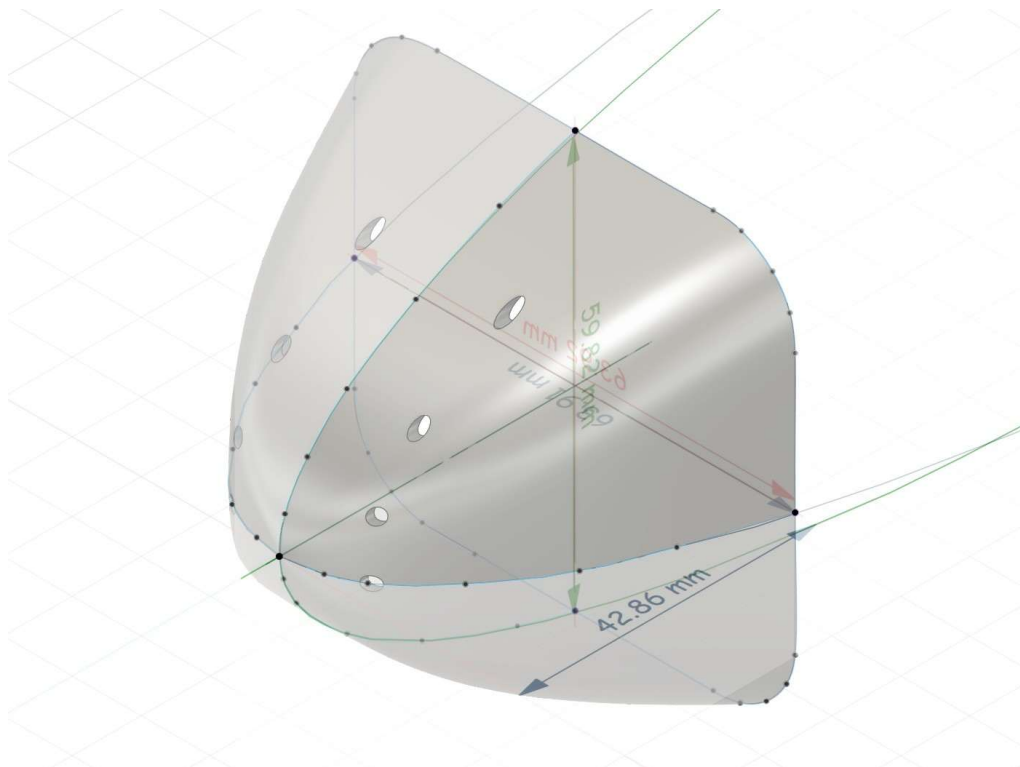


Figure 20 - Fuselage Nose Cone 3D Model in Fusion 360

Ok, with that finished I decided to address a couple other items in my motor nacelle design. In my motor nacelle plan, the bent music wire MLG is attached to the front of former NF4B (MLG bulkhead). While this can be accomplished using standard 5/32"/4mm DU-BRO Nylon MLG Straps, as you can see in Figure 21 there is only enough room on the face of the bulkhead to install two of those straps. One at the bottom of the MLG wire, and the second at the upper outboard end of the MLG wire.

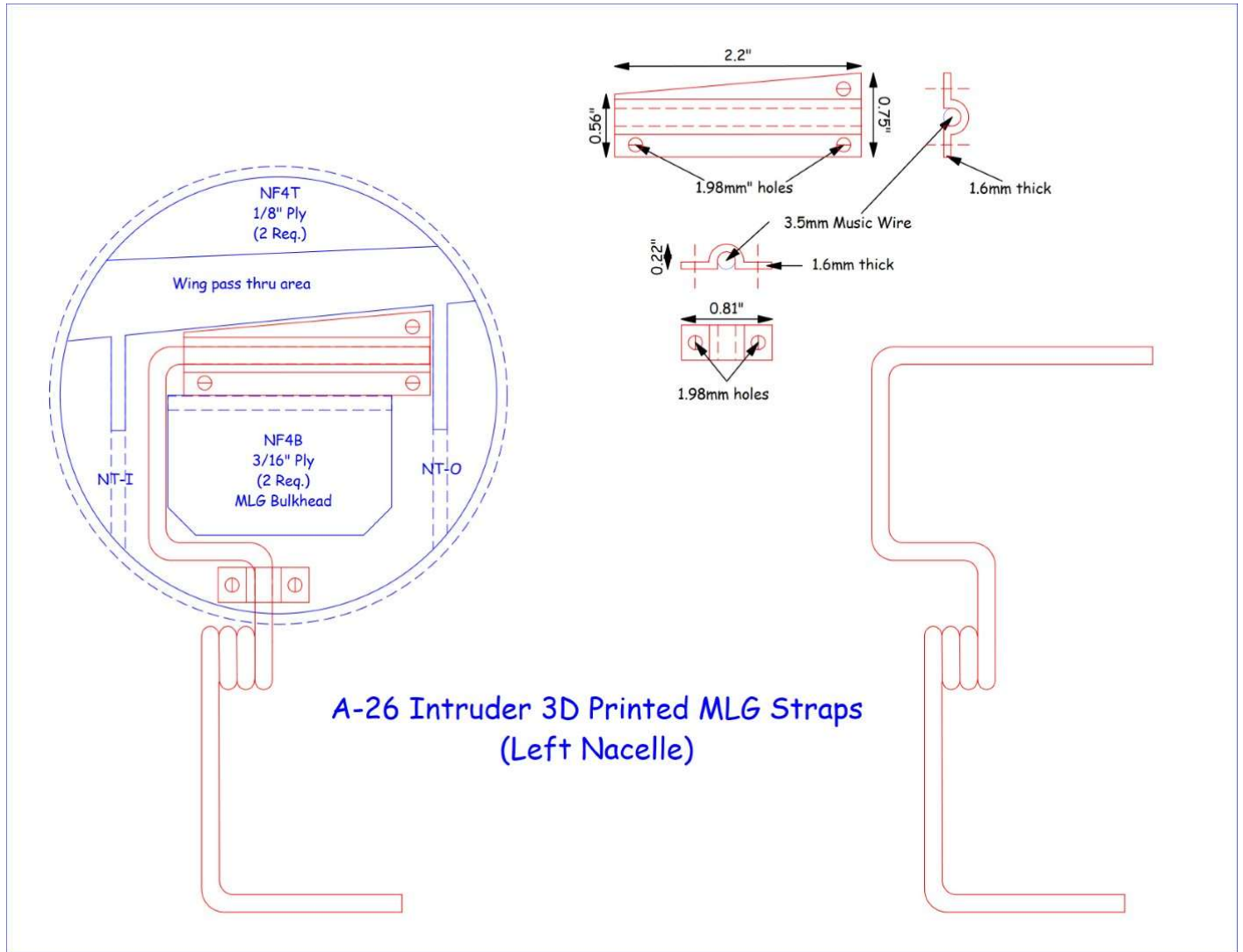


Figure 21 - Nacelle MLG Bulkhead NF4 2D Plan

While this may work ok, I was not happy with not having any support around the MLG wire at the upper inboard bend. So, to address this concern I decided to design and 3D model my own MLG straps. Using my 2D plan in Figure 21, I exported a DXF file which I then imported into Fusion 360. Using this I then developed 3D models for a large strap across the top of the MLG wire, and a small strap at the bottom. These are shown in Figure 22. I exported the STL file to use once the NF4B formers are made.

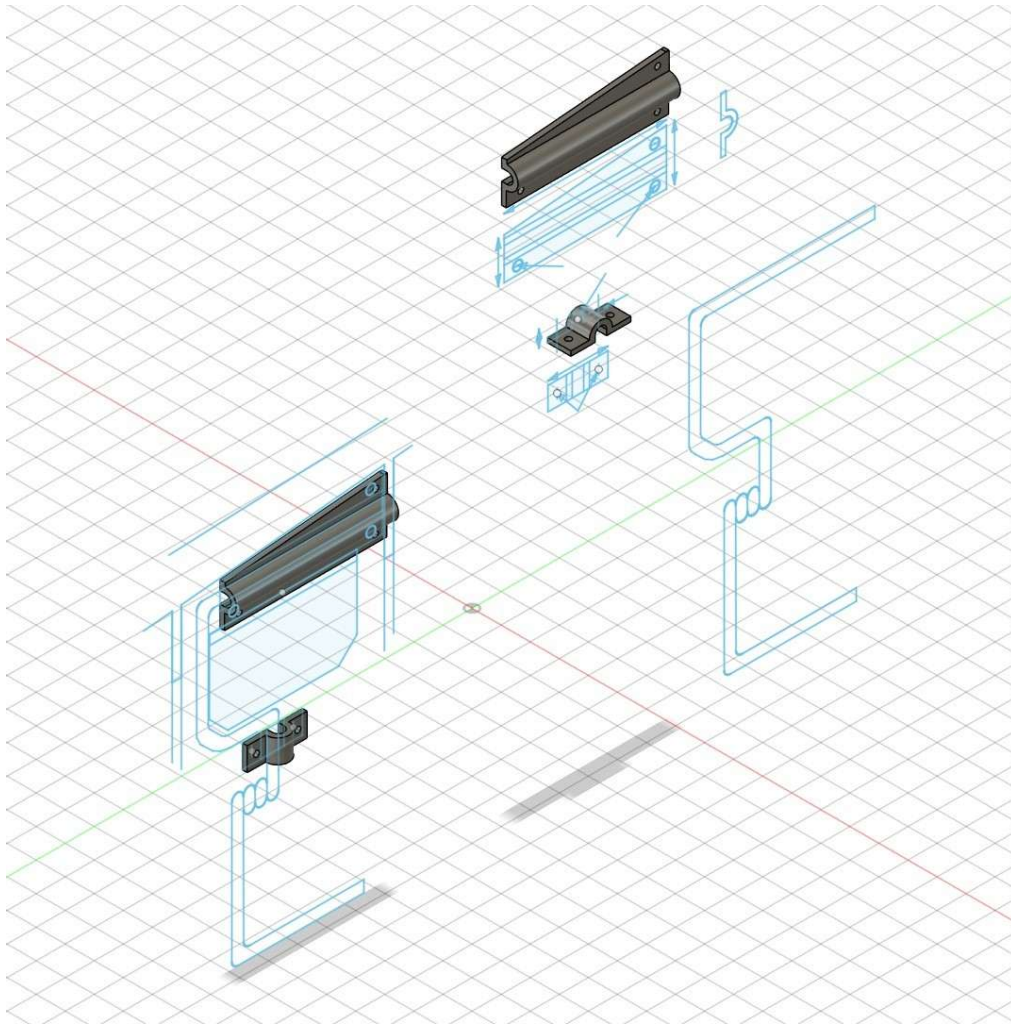


Figure 22 - Nacelle MLG Bend Wire Straps 3D Model

The other item was to come up with something to cover the front of the BadAss 2814-980Kv Brushless Motor so it would look more like the actual Pratt & Whitney R-2800-27 (Wasp) engine. After searching the web, I was able to find a couple **free** STL files of the Wasp engine, one in a "high poly count", and another in a "low poly count". I imported each of these into Creality Print, scaled them to the 1/15<sup>th</sup> scale size I needed for my A-26 nacelle, and cut them so I would only have the front face of the engine which I could place around the front of the BadAss motor. I then moved the STL files into Fusion 360, where after converting them to solid bodies, I was able to make the opening in the center of the engine for the BadAss motor to pass through. The resulting Wasp engine 3D model is shown in Figure 23, and the model set-up in Creality Print in Figure 24. When printed, which will take 3 hrs. and 4 minutes, this engine model will be mounted on the inside of the 3D printed nacelle cowling. *Well, that's the plan at least.*

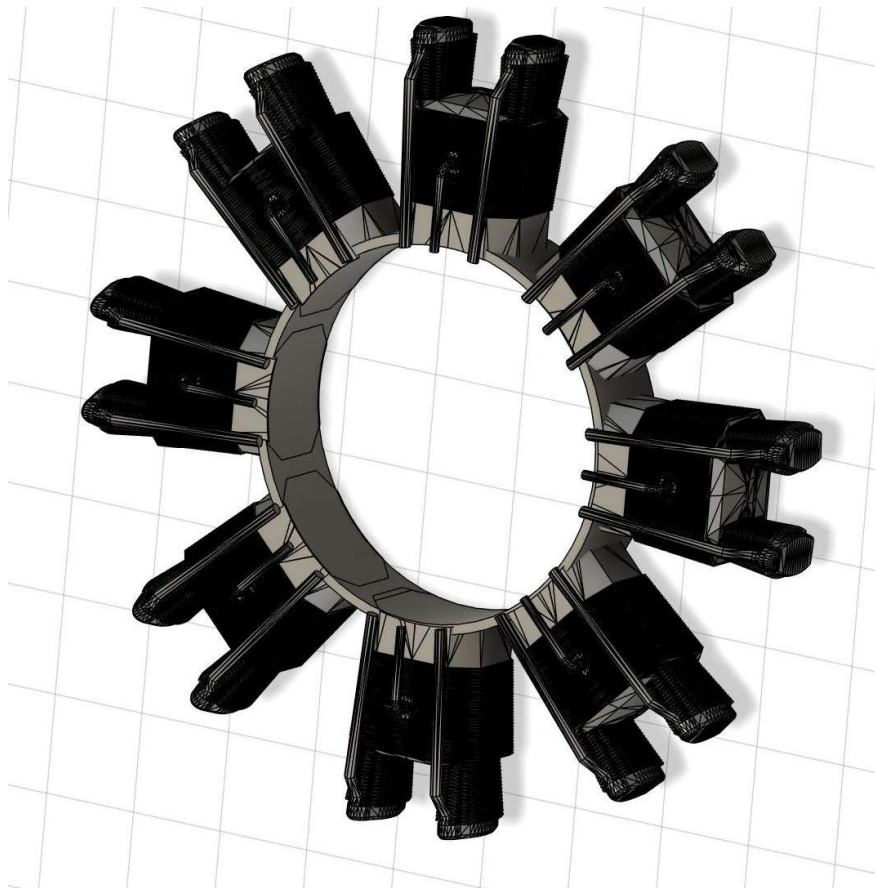


Figure 23 - Pratt & Whitney R-2800-27 Front Face 3D Model

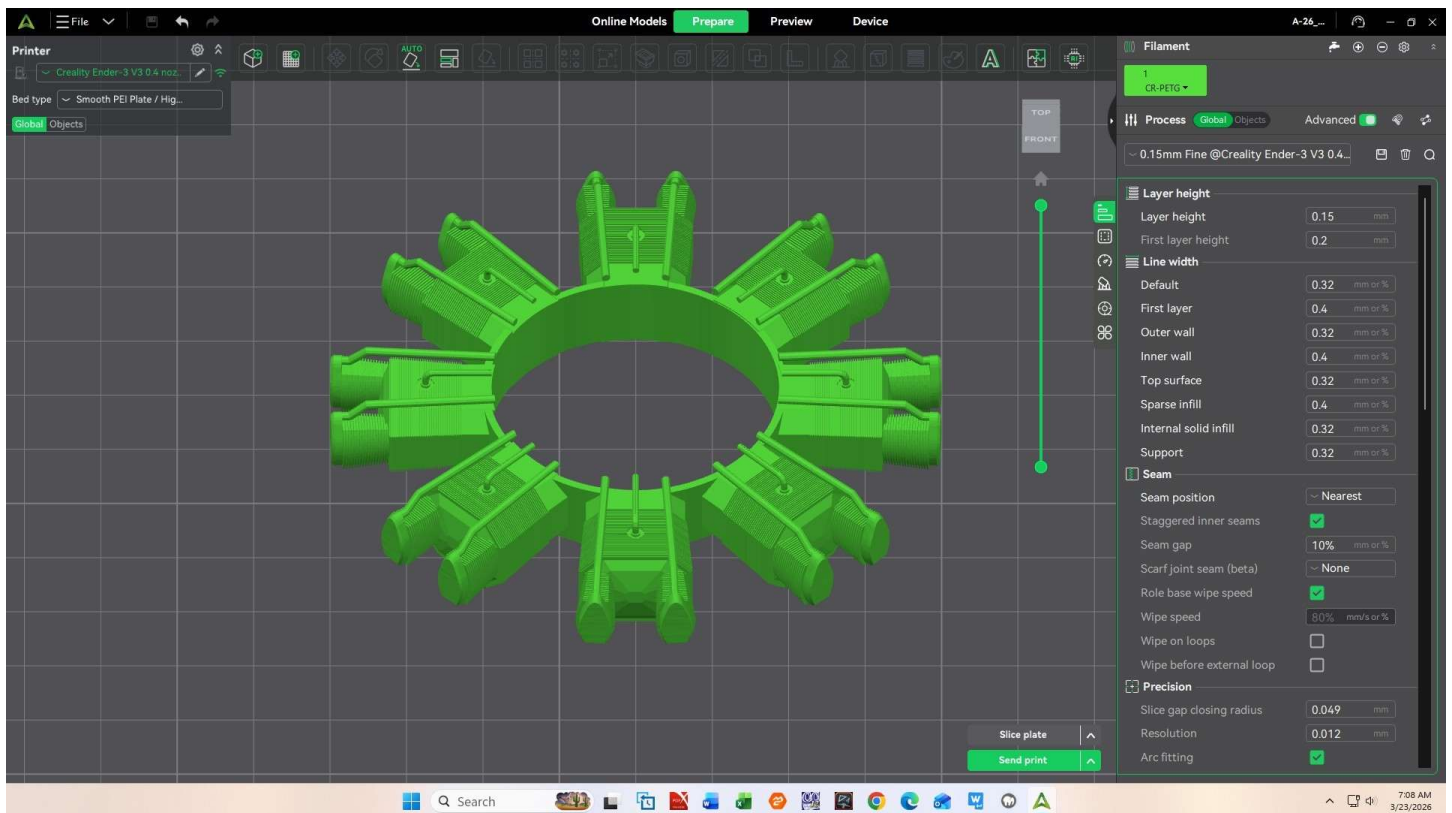


Figure 24 - P&W Engine Front Face 3D Model Set-up in Creality Print

Alright, the plans are far enough along now that I can run an initial Center of Gravity (CG) calculation for my A-26 Invader RC model. I plugged the required measurements of my A-26 Invader model into a very nice online CG calculator from eCalc (<https://www.ecalc.ch>) to calculate the "required" CG range based on a measurement from the leading edge of the wing. After inputting all the required measurements, the results are shown in Figure 25. Using the eCalc method with the static margin set at 12.5 - 7.5% of MAC and an AC position of 25% of MAC, the calculated A-26 Invader model CG range works out at 2.61"-2.92" aft of the wing root leading edge.



cgCalc - Center of Gravity (CG) Calculator  
Full Member Version

1'731'721 simulated Center of Gravity

The cgCalc of eCalc.ch not only calculates and evaluates the center of gravity (CG), neutral point (NP) and mean aerodynamic chord (MAC) but also visualizes your design of conventional aircraft, flying wing, delta or canard. Approximate complex wing design with 5 trapezoidal wing panels. For further instructions see below...

Never ever exceed Center of Gravity on maiden flight!  
Select always the more conservative CG of the manufacturer and cgCalc for your maiden flight and read the limitations below.

Aircraft or Project Name:

Wing:

Root Chord [R]:  in

Tip Chord [T1-T5]:  -  -  -  -  in

Sweep [S1 - S5]:  -  -  -  -  in

Panel Span [W1 - W5]:  -  -  -  -  in

Tail:  (Tail Effectiveness)

Root Chord [R]:  in

Tip Chord [T1-T5]:  -  -  -  -  in

Sweep [S1 - S5]:  -  -  -  -  in

Panel Span [W1 - W5]:  -  -  -  -  in

Distance LE Wing to Tail [D]:  in (use negative value for canard)

AC Position:  % of MAC (default: 25%)

Static Margin:  % of MAC (recommended: 12.5...5%)

Fuselage:

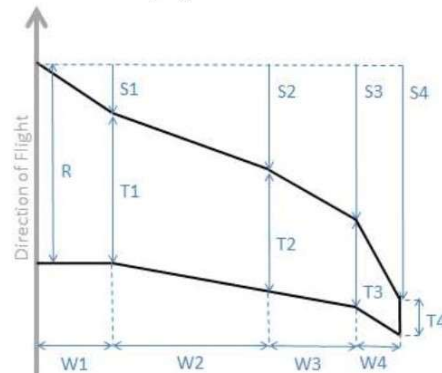
Width:  in

Length:  in

Nose Overhang:  in

Units:  [Deutsch](#) | [Login](#)

Datum is the leading edge of the center chord R



(if less than 5 half wing panels are required, define the panel Chord, Sweep and span as 0 starting from the far right with W5)

Results: [Link to recall A-26 Invader](#)

Aircraft CG range [+]: **2.61 ... 2.92** in (@ 37.89 ... 42.89% of MAC)

Wing AC [+]: 1.81 in (@ 25% of MAC)

Wing MAC @ Distance: 6.22 in @ 11.94 in

Wing Sweep @ MAC: 0.26 in

Wing Span: 54.88 in

Wing Area: **324.89** in<sup>2</sup>

Wing Aspect Ratio: 9.27

Fuselage influence: -0.34in (= -5.42% of MAC)

Aircraft NP [+]: 3.39 in (@ 50.39% of MAC)

Tail AC [+]: 1.76 in (@ 25% of MAC)

Tail MAC @ Distance: 4.11 in @ 3.93 in

Tail Sweep @ MAC: 0.73 in

Tail Span: 17.86 in

Tail Area: **70.46** in<sup>2</sup>

Tail Aspect Ratio: 4.53

Stabilizer Volume (V<sub>bar</sub>): 0.77

Figure 25 - A-26 Invader Initial Center of Gravity (CG) Calculation Results

## 1/15<sup>th</sup> Semi-Scale A-26 Invader Plans Development Re-Cap

Let's do a quick recap of what has been accomplished to date in the development of some 2D CAD plans for my 1/15<sup>th</sup> Semi-Scale A-26 Invader. Starting with a set of 3-view drawings of actual A-26 aircraft, I first took measurements and profiles for each major component (fuselage, wings, tail feathers, nacelles, etc.). Using these I reduced the actual measurements down to a 1/15<sup>th</sup> scale and developed a starting point for the various plans needed to scratch build my RC model.

Using my experience in modification of many other RC model plans for earlier scratch builds, together with a review of several other A-26 RC model plans, I started to lay out the various 2D plans for each of the A-26 Invader major components. I made initial assumptions of the overall RC model weight to establish what I would need for an electric power system and selected what I felt were the best locations for each of the system components (LiPos, ESCs, servos, etc.).

I started my scratch build plans development with the tail feathers, and once those were finished I moved next to the fuselage. Here I debated using full balsa sheets versus narrow balsa strips to cover the outside of the fuselage formers, and my initial design used the full sheets approach. This then drove using fuselage formers that are basically rectangles with rounded corners which is not a "true representation" of the actual A-26 fuselage shape, hence a "semi-scale" model design. Another debate was to use retractable gear versus the standard bent music wire landing gear arrangement. With my 1/15<sup>th</sup> Scale A-26 design being fairly small for a twin engine model, I elected not trying to squeeze retracts into the motor nacelles since they would be filled with the LiPo/ESC.

Due to their interdependencies, in order to finish the fuselage plans I needed to work up my initial plans for the wing. The ailerons in my RC model are slightly larger than those on the actual A-26, but this adds more roll control to the model. I had considered putting flaps running from wing ribs R5-R7 but elected to not add them to reduce the model's weight, and I need that area in the wing to add the weapons stations pylon attachment hardware. With the wing profile and dihedral established I was able to finalize the fuselage plan sheet and developed a fuselage templates plan sheet.

Finally, I developed the plan for the motor nacelles. This part of my model design was the hardest for me to draw up. Most of the other A-26 RC model plans I reviewed used nacelles based on a rectangular shape with sheeted sides, top, and bottom. I wanted to try and capture the real A-26 nacelles using a round shaped nacelle design that is covered using narrow 1/16" or 3/32" thick balsa strips to better fit the wing profiles. In order to understand the interface between the nacelle and wing profile I used a 2D front view of the wing/nacelle and developed a 3D model of the various nacelle parts. Using these I not only completed the nacelle plan sheet but also designed 3D models to support 3D printing of the nacelle cowls, tail cones, dummy Wasp engines, and some MLG strut covers/straps.

With my Workshop primary building table occupied with a Hot Air Balloons Stained Glass Panel assembly, starting the A-26 scratch build will need to be placed on hold until that glass panel is finished. But there are other 3D models that need to be developed for the A-26, such as gun turrets, nose guns, antennas, cockpit canopy, and maybe even the rear gunner canopy.

## 1/15<sup>th</sup> Semi-Scale A-26 Invader - Other 3D Printed Parts

As shown in actual aircraft images and my fuselage side view plan, the A-26 has a twin 50 caliber General Electric W35 remote-controlled dorsal turret gun, and a similar twin 50 caliber remote-controlled ventral turret gun. I decided to make a 3D model of these for my A-26 build. Using images of the W35 turret gun that I found on the internet, I first drew up sketches in Fusion 360 for the turret base and gun housing. I then found an STL file for the Browning 50 caliber machine gun and imported just the gun barrel part into my Fusion 360 file. After building 3D model parts from the sketches for the turret base and gun housing, my completed gun turret 3D model is shown in Figure 26, and I exported the STL file for use later.

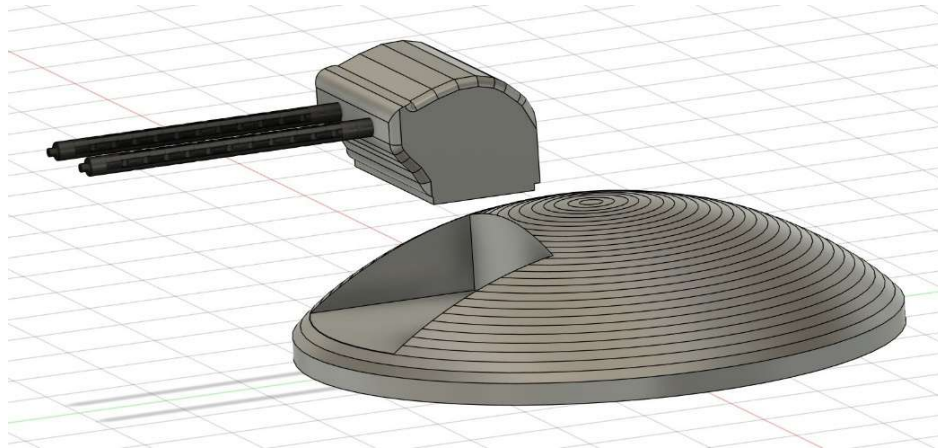


Figure 26 - 50 Caliber Machine Gun Turret 3D Model

Again, as shown in actual aircraft images and some of the other A-26 plans, the A-26 has a cone shaped "direction finder" antenna on the top of the fuselage just forward of the dorsal fin. To 3D model this antenna, I first started with the UHF antenna model I built for my 1/15<sup>th</sup> Semi-Scale OA-1K Skyraider II, modified the top part of the antenna using a side view of the antenna cone from one of the other A-26 plans, and scaled it to a 1/15<sup>th</sup> model of the real antenna on my reference A-26 3-view drawing. The resulting antenna 3D model is shown in Figure 27, and I exported the STL file for use later.



Figure 27 - "Direction Finder" Antenna 3D Model

Now for a 3D model of the cockpit canopy. Starting with my A-26 fuselage 2D plan and the 2D templates for fuselage formers F2 through F5, I imported the DXF files into Fusion 360 and built sketches to set up the profiles for each of the formers. Using the former "profiles" and a couple "rails", I "lofted" a 3D fuselage body section between formers F3-F4 and then cut that fuselage body section so I would end up only having the section of the cockpit canopy as shown in Figure 28. This will be 3D printed using transparent CR-PETG filament and glued to the top of the balsa/ply fuselage between formers F3 & F4.

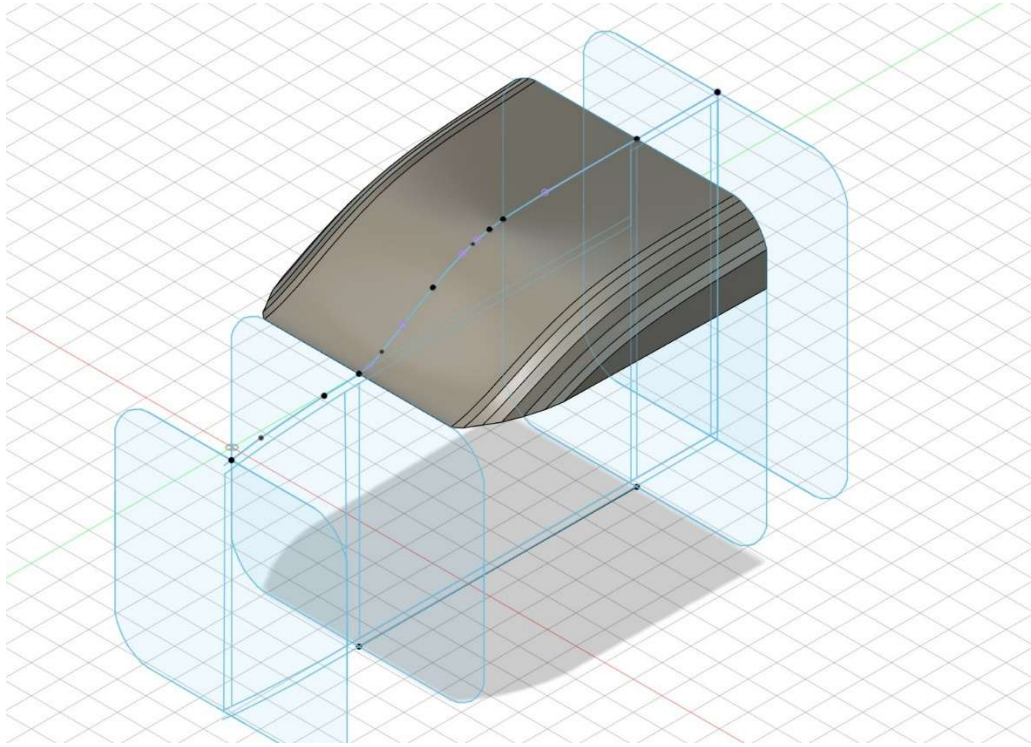


Figure 28 - Cockpit Canopy 3D Model

There are two parts of the wing which could be made using 3D models, the standard wing tip, and an optional A-26K wing tip tank. Using my 2D Wing Plan, I extracted the profiles for the two types of wing tips, and the profile of wing rib R10, and then imported them as DXF files into Fusion 360. For the standard wing tip, I used the "mesh" design approach to develop the 3D model. And for the optional wing tip tank I first "extruded" the R10 profile, "rotated" the tip tank profile around its centerline, and then joined the two together into a single body for the tip tank 3D model. Each of the wing tip models are shown below in Figure 29, and I exported the STL file for use later in the RC model scratch build.

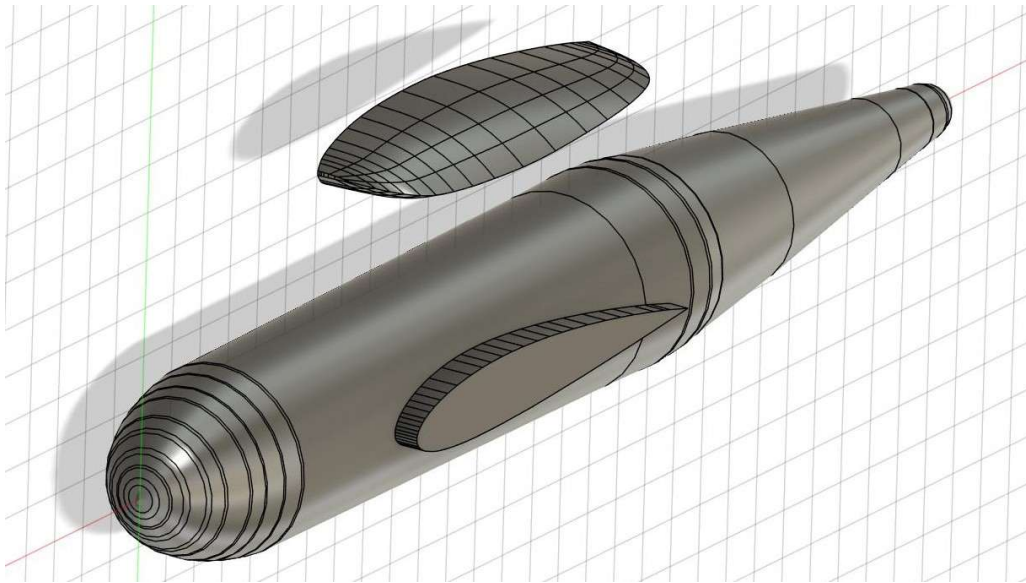


Figure 29 - Standard Wing Tip & Optional A-26K Tip Tank 3D Models

As shown in Figure 30 below, there were several types of weapons carried under the wings of the A-26 during its service in Vietnam and other conflicts. I was fortunate to find 3D models for each of the weapons in this image. Starting with the inboard wing station just outside of the engine nacelle is a BLU-27 Napalm Incendiary Bomb (<https://cults3d.com/en/3d-model/various/blu-27-napalm-incendiary-bomb>). The next station outward has a MK82 500lb Bomb with MAU-93 slick tail & M1A1 "Daisy Cutter" fuse extender/M904 fuse (<https://cults3d.com/en/3d-model/game/1-48-mk82-family>). The third station holds a SUU-14/A Bomblets Dispenser (<https://cults3d.com/en/3d-model/various/bombulet-dispenser-suu-14-a-xm-18>), and the final outboard station has a ) LAU-3 19-Round Rocket Launcher (<https://cults3d.com/en/3d-model/various/lau-3-rocket-launcher>).



Figure 30 - Example of A-26 Weapons under Wing

Using these four 3D models, I rescaled each to match my 1/15th scale A-26 Invader RC model and then imported them into Fusion 360 to modify the mounting lugs so they could be mounted to the weapon stations pylons using the same rail system I used on my OA-1K. Then each weapon model was imported into Creality Print where I setup the print files using Gray Creality Hyper-PETG with a 0.4mm nozzle and 0.2mm layer height.

Given my A-26 will only have three weapon stations on each wing, I decided to not print the BLU-27 Napalm Incendiary Bomb. The next image below shows the other three weapon models I discussed above. After 3D printing a pair of each, I painted them and added yellow tape to match the configuration of actual USAF live weapons. These should fit the bill very well I think.



*Figure 31 - A-26 Weapons under Wing 3D Printed Models*

**Stay tuned for more to come!!!**

## A-26 Invader RC Model Specifications

Aircraft Type: Semi-Scale Warbird  
Flight Performance Category: General Twin-Engine Sport Scale  
Scale: 1/15th  
Wingspan: 55"  
Wing Chord: 8.2" (centerline) - 3.75" (wing tip)  
Total Wing Area: 325 in<sup>2</sup> (approx.)  
Wing Location: Mid-Fuselage Wing  
Airfoil: Semi-Symmetrical 1.25" (centerline) - 0.6" (wingtip)  
Wing Platform: Triple Tapered (*only 2 wing ribs are the same size*)  
Wing Dihedral: 2.5" at wingtip  
Fuselage Length: 40"  
Fuselage Width: 3.75"  
Horizontal Stabilizer/Elevator Span: 17.8"  
Horizontal Stabilizer/Elevator Chord: 5.4" (centerline) - 2.65" (stab tip)  
Total Horizontal Stab/Elevator Area: 70.5 in<sup>2</sup> (approx.)  
Horizontal Stabilizer/Rudder Dihedral: 2" at stab tips  
Stabilizers Airfoil Sections: Both  $\frac{1}{4}$ " Flat  
Vertical Stabilizer/Rudder Height: 7.25"  
Vertical Stabilizer/Rudder Chord: 7.2" (base) - 4.25" (tip)  
Total Vertical Stabilizer/Rudder Area: 39.6 in<sup>2</sup> (approx.)  
Center of Gravity Location: 2.61" - 2.92" aft of wing root leading edge  
Required No. of Channels: 5 - Throttle, Rudder, Elevator, and Separate Ailerons  
Landing Gear: Tri-cycle Bent Music Wire Gear  
Ready to Fly Weight: **TBD** oz.

## A-26 Invader Materials and Parts List

### Balsa & Plywood:

6	1/4" x 36" Balsa Triangle	fuselage corners & formers bracing
1	1/4" x 3" x 36" Balsa Sheet	tail feathers parts
1	1/8" x 3" x 36" Balsa Sheet	tail feathers parts
2	3/32" x 4" x 36" Balsa Sheet	fuselage sides
<b>TBD</b>	3/32" x 3" x 36" Balsa Sheet	ribs, fuselage formers & sheeting
<b>TBD</b>	1/16" x 3" x 36" Balsa Sheet	wing, nacelles, and tail feathers sheeting
4	3/16" x 3/8" x 36" Basswood	wing spars
1	3/16" x 12" x 12" Birch Plywood	NLG & MLG bulkheads, nacelle firewalls
1	1/8" x 12" x 12" Birch or Lite Plywood	fuselage & nacelle formers
1	3/32" x 12" x 12" Birch Plywood	aileron servo & fuselage access plates
1	1/16" x 12" x 12" Birch Plywood	wing spars shear webbing
1	1/64" x 12" x 12" Birch Plywood	control horn surfaces doublers
1	1" x 3" x 12" Balsa Block	fuselage tail cone

### Flight Control System:

- |   |  |                                 |
|---|--|---------------------------------|
| 1 | Spektrum AR620 6-Channel Telemetry Receiver        | 2.4GHz DSMX receiver            |
| 2 | Hitch HS-225BB 27.7g Nylon Gear Analog Mini Servos | rudder & elevator servos        |
| 2 | EMAX ES08MA II (12g) Metal Gear Servo              | aileron servos                  |
| 2 | 18" Servo Lead Extensions                          | aileron servo leads             |
| 2 | 10" Lead Extensions                                | ESC throttle leads              |
| 2 | 6" Lead Extensions                                 | receiver to aileron servo leads |
| 1 | "Y" Harness  | receiver to ESC throttle leads  |

### Electric Power System:

- 2 BadAss 2814-980Kv Brushless Motor, or E-flite Power 15 Brushless Outrunner Motor 950Kv EFLM4015A (<https://www.amazon.com/flite-Power-Brushless-Outrunner-Motor/dp/B000ERG180/>), or E-flite Power 25 Brushless Outrunner Motor 870Kv EFLM4025A (<https://www.amazon.com/flite-Power-Brushless-Outrunner-Motor/dp/B000C8KZ5W/>)
- 2 BadAss Rebel V2 Series Brushless 50A ESC, or 50A ESC 2-4S Electric Speed Controller 5v 3A BEC with XT60 & 3.5mm Bullet Plugs (<https://www.amazon.com/Flycolor-Electric-Controller-Airplane-Brushless/dp/B09L5Z7GV7/?th=1>)
- 6 14AWG ESC to Motor Extension Cables w/3.5mm bullet connectors (200mm)
- 2 BadAss 45C 3,300mah 3S LiPo Battery
- 2 MAS 9x7 3-Blade Propeller (1-CW & 1-CCW) (<https://www.amazon.com/Master-Aircrew-Blade-Propeller-MAS0970T/dp/B07H961NYP?th=1>)
- 2 Black Spinner Nut for Threaded M6 x 1.0mm Shaft

### 3D Printing Materials:

Creativity CR-PETG: Gray - Fuselage Nose Cone, Motor Nacelle Cowlings/Tail Cones, Weapon Station Pylons/Rails, Various Munitions Models, MLG & NLG Strut Covers, MLG Strut Straps, Cockpit Canopy, Gunner Turrets, air cooling scoops/vents/grills, and various antennas

### Miscellaneous Items:

- |   |  |            |
|---|--|------------|
| 2 | 3" Diamond Tread Lite Wheel  | MLG Wheels |
| 1 | 2-1/2" Diamond Tread Lite Wheel  | NLG Wheel  |
| 1 | 9/64"/3.5mm diam. x 36" Music Wire   | MLG Struts |
| 6 | 5/32"/4mm DU-BRO Nickel Plated Shaft & Wheel Collars                                     |            |
| 1 | 5/32"/4mm DU-BRO Steerable NLG Set   |            |
| 4 | 5/32"/4mm DU-BRO Nylon MLG Straps or a set of Custom 3D Printed MLG Straps               |            |
| 1 | ROBART #106 Scale Small Tri-Gear Straight Strut Covers .40 size (set) or a set of Custom |            |

### 3D Printed Strut Covers

- |   |   |  |
|---|---|--|
| 4 | 1/4"-20 DU-BRO Nylon Wing Bolts                   |  |
| 2 | Du-Bro #129 Socket Head Bolt & Blind Nut Set      | motor mount to N1 firewalls mounting     |
| 9 | Du-Bro #116 Standard Nylon Hinges                 | elevator, rudder and aileron hinging, or |
| 1 | Robart #308 1/8" Steel Pin Hinge Points (15 pack) |  |
| 1 | Du-Bro #500 36" Lazer Rod Pushrods                | rudder/elevator control rods             |
| 1 | DU-BRO #2-56 Threaded Ball Link                   | rudder rigging                           |
| 3 | Du-Bro #237 T-style Nylon Control Horns (2 each)  | control surfaces rigging                 |
| 6 | Du-Bro #600 2-56 Spring Steel Kwik-Link Clevises  | control surfaces rigging                 |

2	Du-Bro #855 E/Z Links	ailerons rigging
2	6" 2-56 control rods	ailerons rigging
3	12" 2-56 control rods	elevators rigging
10	2-56 nuts	rudder, elevator, and ailerons rigging
20	#1 x 5/16" pan head screws	wing bolts hatch covers, wing servo mounting
plates, & NLG assembly hatch cover		
1	2" x 12" VELCRO fastener tape	ESCs and LiPo batteries mounting
1	Hangar 9 Self Stick Weight 6 Oz	for CG balancing (if needed)
6	PETG 3D Printed Weapons Station Attachment Rails	
6	PETG 3D Printed Weapon Station Pylons	
12	4x2mm Neodymium disc magnets	pylons & wing station attachment rails
8	5x2mm Neodymium disc magnets	LiPo access hatches in nacelles
1	8x11.5" 10mil clear plastic sheet	cockpit canopy windows??
1 bottle	Canopy glue??	
1 bottle	Titebond Ultimate III wood glue	
1 set	20 minute two-part epoxy	
1 sheet	220 & 320 grit sandpaper	initial & finish sanding
2	Rolls of Ultracoat Light Gray Covering	
1	Pack of Clear Waterslide Decal Paper for Inkjet printer	