

P-51B Build Log



A companion to the P-51B Pony plans drawn by Norman E. Meyers available on Aerofred.com. 57" wingspan, 1/7.5 scale.

This RC plane is converted to electric. This build log includes suggestions.

The plans state this plane has a 57.5" Wingspan, but with the center "tray," it is 62.75 (1/7). The length is 50" (1:7.5)

Equipment used on this plane: .46 Rimfire Motor, 70 ESC, and 6 digital servos

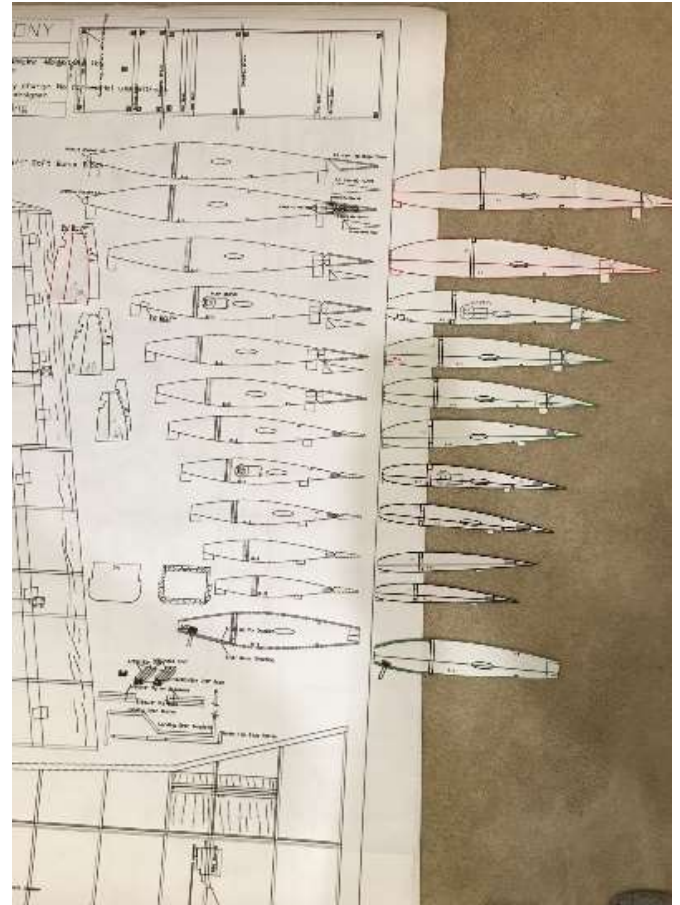
Model completed by UpNup. It was built as a way to honor Major James Howard, WWII fighter pilot for the Flying Tigers AVG who also flew "Ding Hao!" in the European Theater. He was son of missionaries to China. He's the only American awarded the Congressional Medal of Honor for his heroism January 11, 1944. Howard was from St. Louis, Mo.

-- December 2019



Plans were downloaded and printed at Office Max. They produce copies that are 36" high maximum. That allowed for the full-size plans to be developed. Two copies were made – one for mounting on the wall and the other was cut into manageable pieces for my 8' long building table. I paid \$7.50 for each page. I made two copies—one for reference and one to cut up in building.

Research on this warbird showed that the wing airfoil tends to tip stall. I sought counsel and changed the airfoil from a diamond to throw in a bit of dihedral. P-51B's have a diamond-shaped airfoil. It's pretty symmetrical end to end. Counsel online suggested unless you're going pure scale, then the airfoil should change.



I looked at two airfoils that could work: Selig S8036 and NACA 2415 root, 2414 span, and 2412 at the wingtips. The Selig was just too thick for a Mustang. Steps to changing the airfoil:

- In PowerPoint, create a large worksheet with 1" grids onscreen. Use plan graphic on the screen sized to accurate scale. Measure in real life to match the 1" grid in PPT.

- Trace NACA airfoils to use.

<http://airfoiltools.com/airfoil/naca4digit>

- Put NACA airfoil lines over the printed plans onscreen. Add markings on each rib to the drawing. Use 4 pt. Line width. Add titles on plans.



When researching to build an RC scale balsa plane from plans, I have found that it was helpful to build a plastic model of it first. I found just what I was looking for on eBay for \$14. In December 2018, I completed the 1967 Monogram 1/48 scale Ding Hao! P-51B. This was my first warbird and a real joy to research and build. The cockpit and wings had good detail.

However, 52 year-old decals did not go down easy. I had to coat them with a lacquer sealer. Micro-sol, Pledge floor wax, and finally CA at least got everything to eventually stick. Everything peeled up from the "no step" to the "Stars and Stripes." And this model certainly came with a generous collection of decals.

The P-51B base green plastic was rattle can sprayed with Testors paints (olive drab and gray) and a final coat of their dulling spray. I went with zinc chromate brushed on interior surfaces. And the coup de grace? My wife contributed a blond hair for the radio wire.



Review of Plans

Try not to sheet the elevator & rudder to save weight. Maybe only the front of each. Use 1/16".

3/8" balsa block or three 1/8" formers are glued between F1 & F2

Don't miss the Crossbeams holding Up the servo tray

Build braces for control rods before sheeting

F10 balsa goes with fuse; F10 ply Goes on the wing "Box"

Fuse should be sheeted in sequence 1/32 ply, 1/16 balsa, 1/32 ply

Sequence: Insert Rudder & Elevator before sheeting Fuse. Cover, too.

The elevator platform should be widened at least by 3/8" on both sides

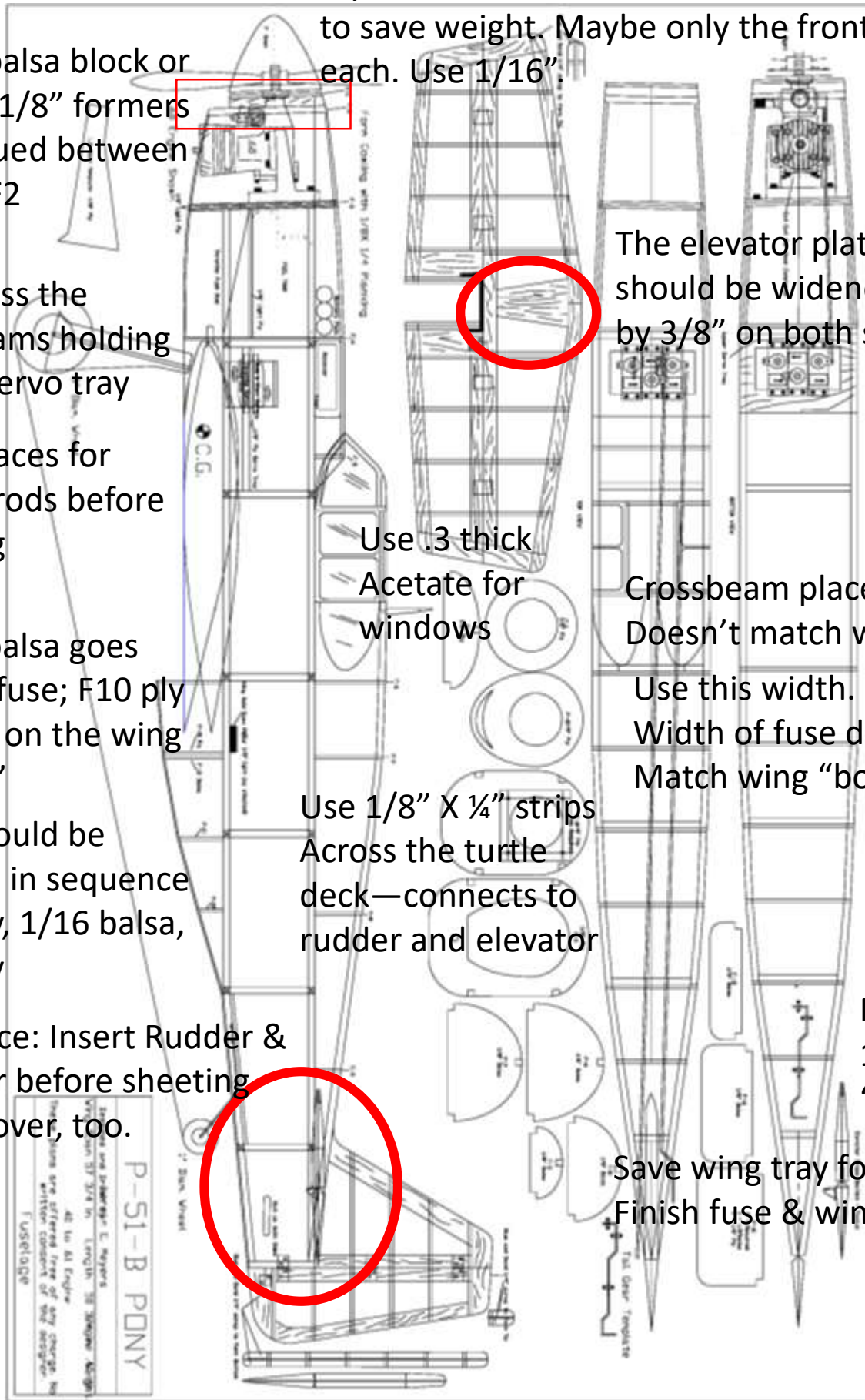
Use .3 thick Acetate for windows

Crossbeam placement Doesn't match wing box Use this width. Width of fuse doesn't Match wing "box."

Use 1/8" X 1/4" strips Across the turtle deck—connects to rudder and elevator

Make a 1/8" ply "floor"

Save wing tray for last. Finish fuse & wings first.



Designed and Illustrated by C. Meyers
Very Soon It Will Be Length of Journey
A - A Channel Route

Eng. Sean D. Smith, Length: 51, Slope: 4 - 4, Channel Width:

Score 1/Scale 10000

Use this wing tray to join the wings
Remember, it adds 5" to the wingspan.
Make this after wings and fuse are completed.
Make to fit with precision.

Use these dihedral guides

To save weight, use only
1/16 balsa skin to CG
And then from tip of
Aileron to fuse down
The small rear brace

Do not use these ribs.

To use Flaps, use this rib placement
And wing construction plan

This is how long
The LG brace
should be

Beef up LG with
3/16" wire. Make
Brace 3/8" thick.
Place a balsa
Block behind brace

Scale so that these wings are 26". (2 = 52" + 5" wing tray to fuse..

Use this for wing box sides.
Remark where the crossbeams go to match fuselage.

Review of Plans

Do not use this for sides of wing box

R1 leans 3 degrees toward wings.

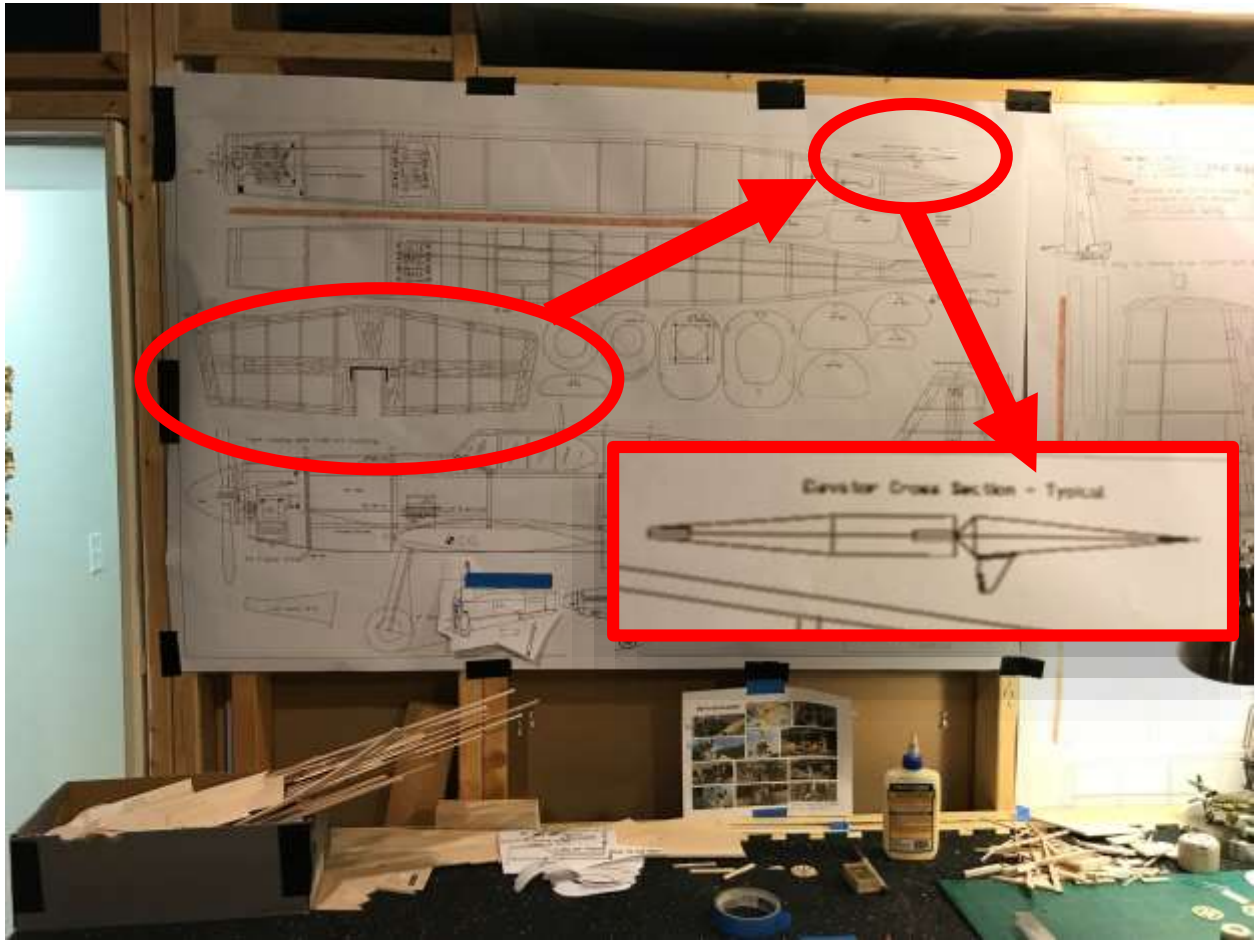
TRICKY:

1. Use these ribs. The **airfoil** avoids tip stalls.
2. Make 11 ribs X 2 as on the diamond ribs.
3. Size the ribs to accommodate flaps.
4. Note the placement of the web shearing must:
 - a. go along on both sides of the front dihedral brace
 - b. be 1/16" balsa, horizontal grain

Don't use these
dihedral guides;
there are others

Do not use this wing box (or tray).

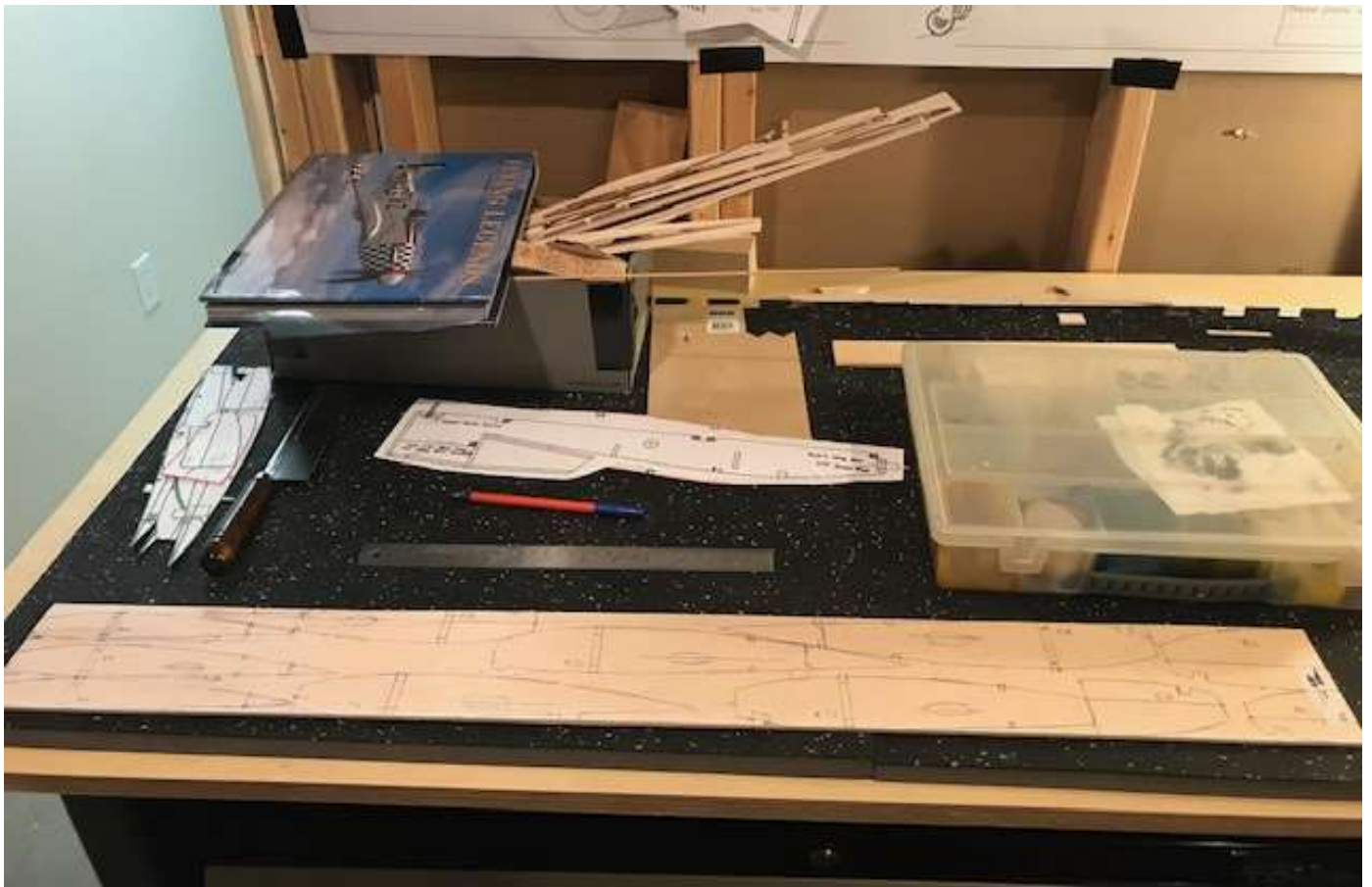
Review of Plans



The profile for the elevator is on the top right of the master plan.

1/7 scale WWII Fighter Pilot. Resin bust by Aces of Iron. Painted by the modeler. A Revel 1/48 scale plastic P-51B is in the background. It is intended to honor James Howard.





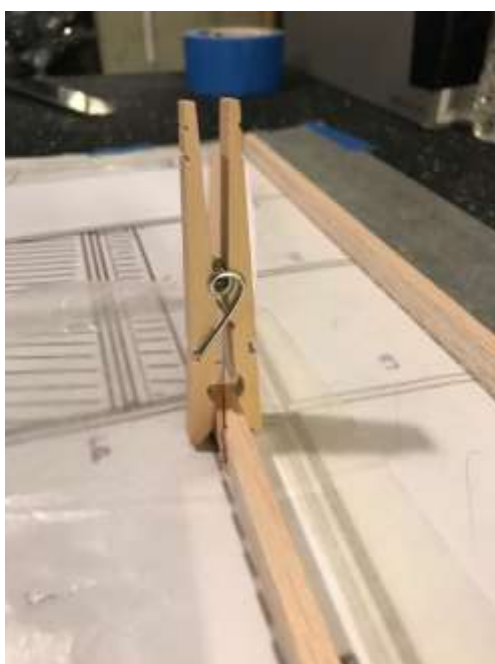
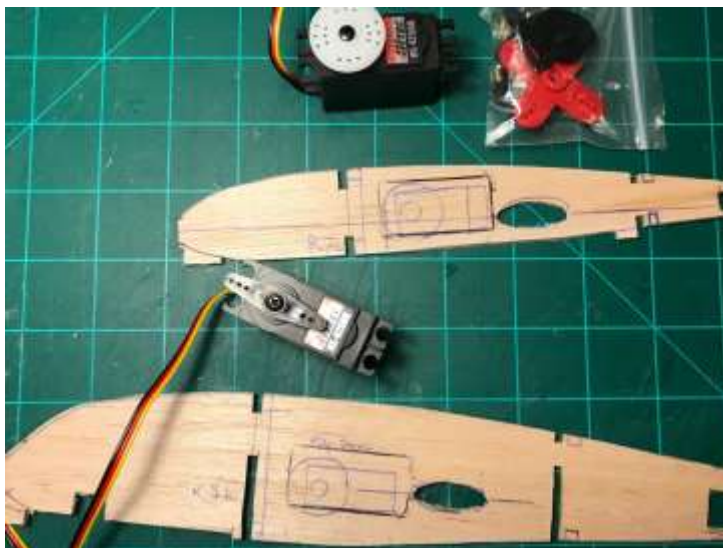


The rudder and elevator are good places to start. However, when I went to epoxy the elevator to the fuselage frame, I learned that the center support of the elevator needed to be wider and put into place before the hatching on the turtle deck. I decided to plank the stab and front elevators with 1/32" ply, but 1/16" would be much better.



After cutting out all the pieces, I noticed the elevator's side view diagram. It's on the plans, but up beyond the bottom view of the fuselage. I set up two sanding sheets and after gluing everything with TiteBond II and let set for 30 hours, I heavily sanded the elevator to the plans. (whew) But. I broke a rib and realized how fragile it was. I inserted 1/2" X 1/8" shims between the ribs.





Wings were cut out by using a micro-blade saw and an hobby knife. The LE leading edge had a joint that was bonded with 5-minute epoxy. Servos had to be built into the plane as it was constructed. The landing gear area has ply doublers. I chose to only sheet half the wing top and bottom.

The tricky part was getting the R1 Root Rib to lean at a 3 degree angle to accommodate the dihedral. I used a protractor and guess a lot. Note my building surface was an exercise mat 1" thick. Pins stuck to it and it was firm, but soft. Blue painters tape stuck to it. I used wax paper from Dollar General, as it is waxed on both sides.

The servos on the ailerons had an extension wire that connected to a Y-harness. This will be used with a 6-channel radio (Spektrum Dx6e.)



It is possible to cut 1/8" basswood ply to make the formers without professional equipment. All I used to cut was a micro-saw and an X-acto knife. It's not exact, but with lots of patience and some good sanding techniques, you'll make some good progress.

As soon as I could, I made the cockpit. I still don't know why, but it was one of the most challenging and rewarding parts of the build. Note the I sunk the floor of the cockpit by 1/2" to make it look more realistic from stand-off distance.

The formers are straight; the camera wide angle bent the photo edges a bit.

A Styrofoam cooler makes a great cradle for the plane during the build. I put black Gorilla tape along the edges as a cushion and to keep white beads from constantly breaking off.

The tail wheel was put into place as soon as the fuselage was built. I guessed on the wire, but used 1/16" wire. The tail wheel was anchored with straps and put into a basswood ply base – 1/8" thick. It was covered with 1/16" balsa.



Before the fuselage hatch and bottom is planked, it's necessary to build a balsa platform that will house the battery (top) and the ESC and Receiver upside down. On the right of the photo, the black boxes are the servos in place for the rudder and elevator.

The red tubes are Sullivan Gold-n-rods that run through formers in the fuselage back to the tail fins.



The cockpit uses a photo of a P-51B dashboard sandwiched between a .030 clear plastic sheet. The cowl is balsa covered in pleather. Scratchbuilt is a N3B gunsight.



Considering the guns ver



the left is the K-14



P-51B Build Log

Use Zinc Chromate color on interior.

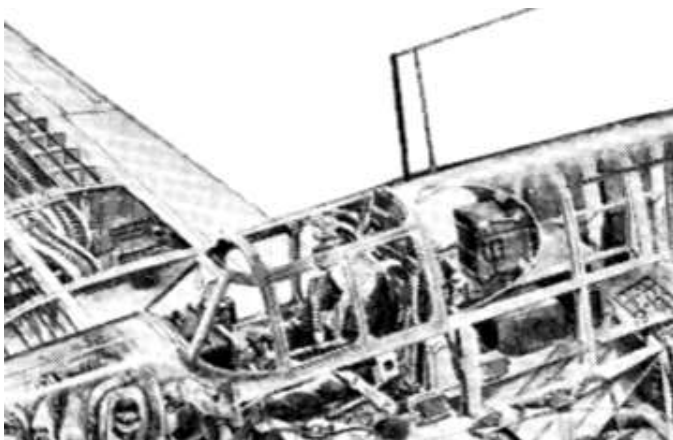
Pilot is from Aces of Iron. A 1/4" base could raise the pilot up a bit, but 1/7 scale pilot was a good and realistic fit.

Seat back and pads are painted balsa

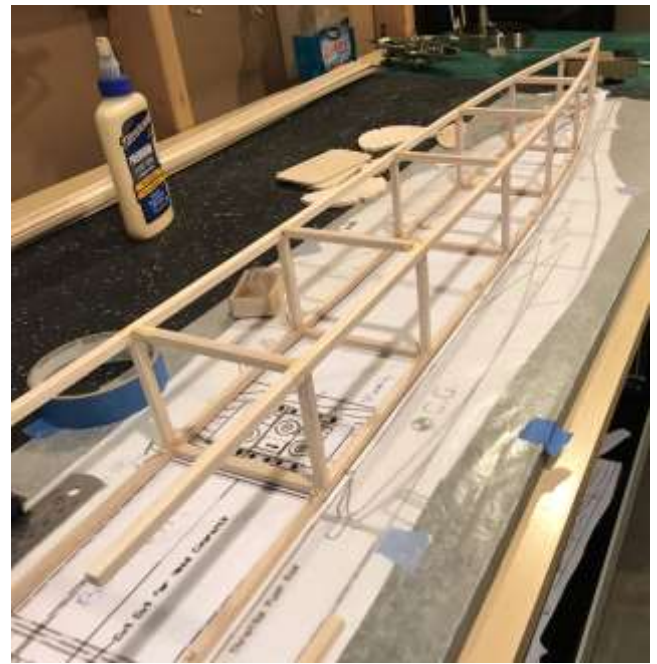
Radio is balsa block, but could be built up from 1/8" balsa sheet.

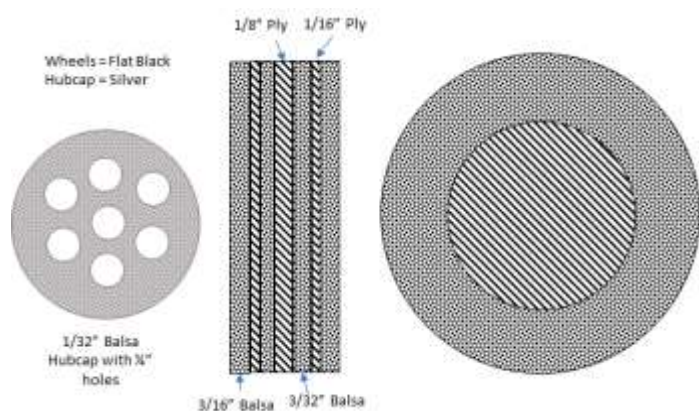
Antenna base in roof is tip of a flag stick. Round dowel nubs on radio box and snorkel are from the same flag stick. Radio could be up to 1/2" higher to show more in window.

Use .3 plexiglass – it can be cut with scissors and curved with a heat gun over a curved balsa block. Here was a first attempt.

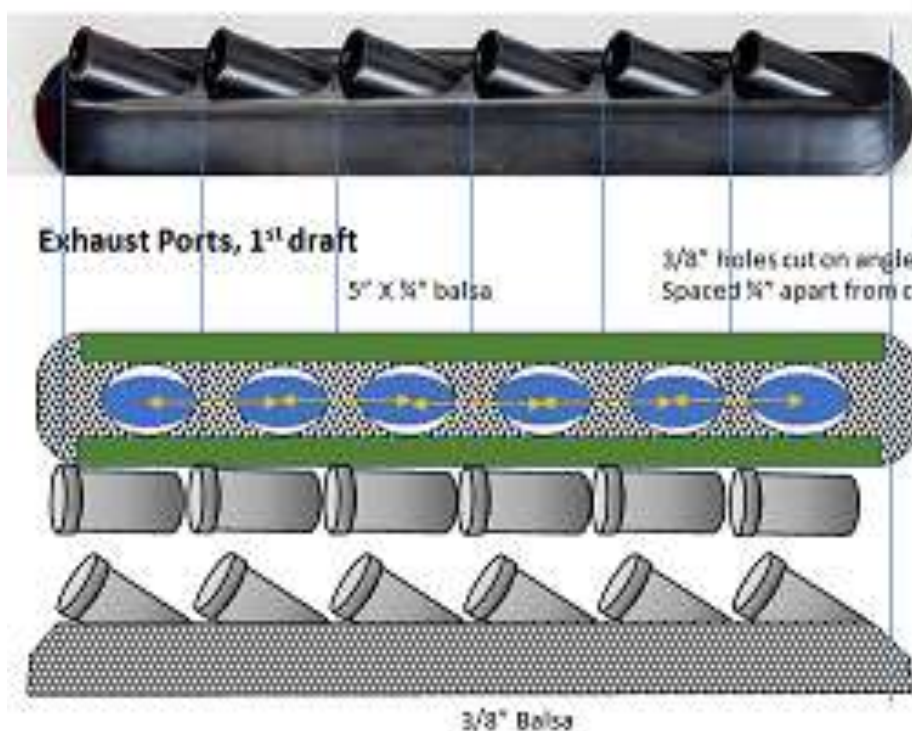


Stepping back for a second, it's important to note the sequence. Rudder, then elevator were first. I used scraps of balsa that I had on hand. Then I made the wings and then fuselage. The very last major construction piece must be the tray that joins the wings together. This must be custom-fit to accurately join the wings and fuse.





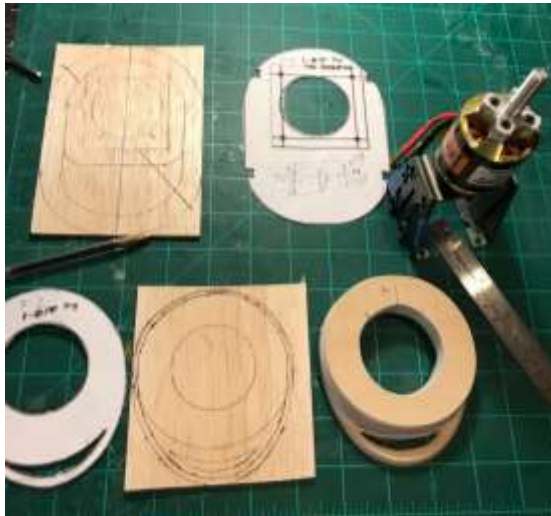
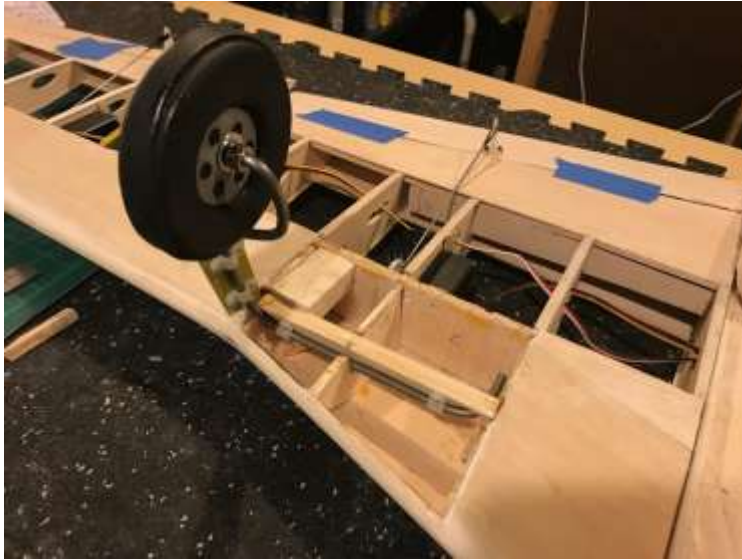
Balloon wheels required for the P-51B are readily available for about \$12 plus shipping cost. Still trying to be frugal, I thought I'd make my own. This required research. The plans call for 3" wheels up front and 1" diameter dragging behind. Math on scale put my width at 15/16" thick wheels. I used several layers of alternating ply and balsa to achieve the desired effect. The hubcaps on the front wheels are 1/32" thick. I learned that my hole punch could handle 1/4" squares.



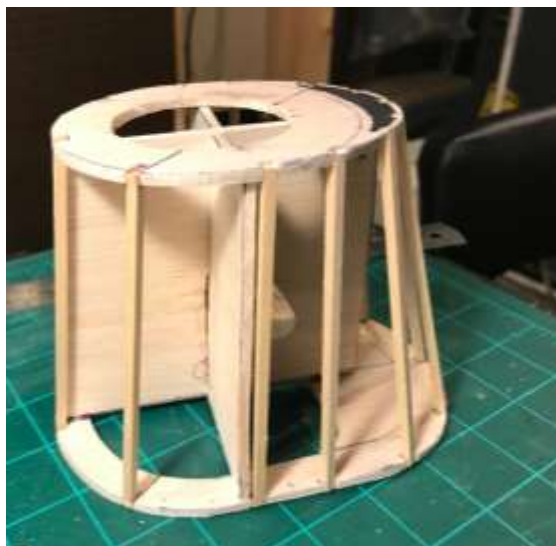
3/4" L X 3/8" D tube
3/8" O ring X 1/32" Th
Holes: 3/8" D X 5/8" angled
Inset 3/16" from sides



Landing gear must be beefed up. Use 3/6" steel wire. The LG brace should be 3/8" thick. Use 3/16" nylon straps. Bending 3/16" wire is difficult, so choose how swoopy it can be. Place a balsa block behind the brace (wheel side) to help absorb hard landings.)

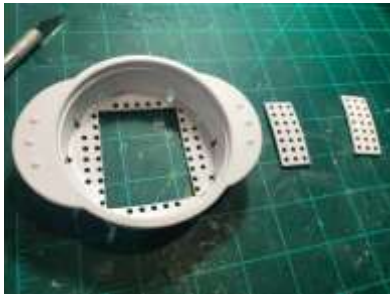


The cowl required formers and planking. It was necessary to have the motor mount in place and to have the front ply formers in place with two balsa spacers between them. Note that the cowl is being held on with rare earth magnets and metal cut from discarded razor blades.



Once the cowl is finished, cut a hole on both sides for the exhaust stacks to fit. Epoxy in the cowl side. But leave the overhang onto the fuselage just sliding into place, hanging freely. Depth is 1/8".

The framing for the canopy arches came from tracing the former behind the cockpit on 1/8" basswood. I made them 1/4" thick, but they could have been 3/16". Paint is Testors Zinc Chromate.



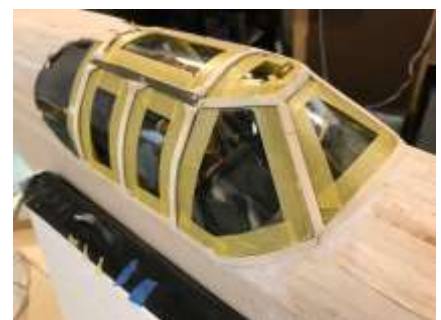
Note that spaces were cut for a grid of holes. This vent on both sides was cut from a small plastic colander that my wife donated.

.030 K/S plastic sheets made for clear panes.

Base coat is flat black and final coat is olive green Testors enamels.



Tamiya masking tape was used on the panes.



Trim pieces were 1/16" basswood custom cut for each pane. The exception was a 1/32" strip across the front pane. Canopy glue was used on this segment. Each pane was molded with a heat gun.





The P-51B is coming along. One decision is to be made regarding a final side sheeting to the fuselage. At present, the sheeting was 1/16" basswood covered by 1/16" balsa sheets.

The wings are joined under the fuselage in a special tray that is 5" wide. This is how the WS totals 62.75". The plans did not match the formers used in the fuselage. I was advised to complete the fuse and wings first and then work on this custom-fit aspect. I hope these photos help give some ideas in 3D what the plans were trying to communicate. Most of this tray was made from basswood, including the spars and dihedral braces.



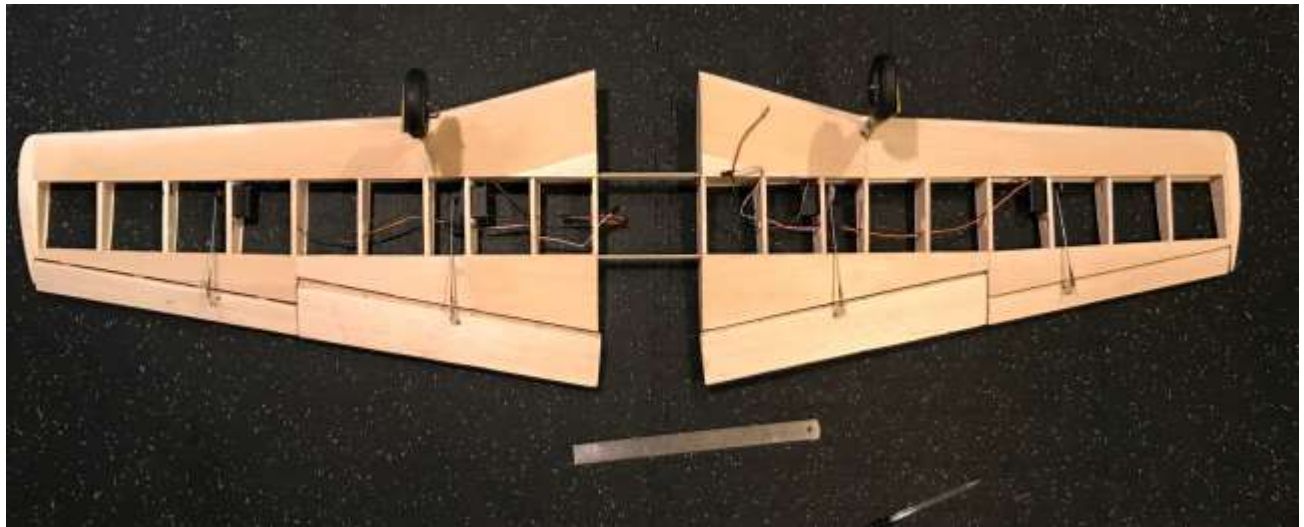
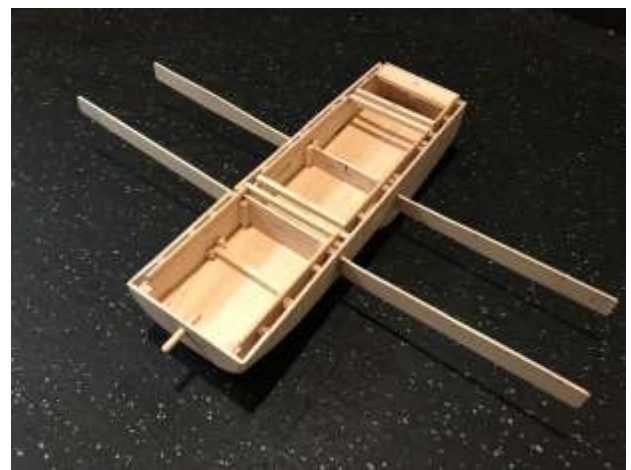
The challenge is that the tray needs to sit up into the fuselage by 1/4". This meant building a secondary wall out to the fuselage. It is built upside down.





The iconic P-51B scoop has a 1/8" core and covered in balsa sheeting. Between the braces is a slit for the servo wires.





The wings have a three degree dihedral. This is shaped by the dihedral braces and the wing root rib. This photo was taken before I beefed up the landing gear to 3/16" steel wire.

At every step it seems there is something new to learn. Today I learned that there is such a thing as Monokote FLAT Olive Drab. After buying two rolls of Olive Drab that was nice and shiny from my LHS, you would have thought he'd have mentioned it. I also used one roll of gray and decided to buy white to use on accent pieces and future builds. The dark OD did not show through the white. I did the bottom first and then the top.

To put Monokote over the elevator wire, I measured and cut a slit. I cut up a t-shirt and use wooden clothespins to form a sock over the in I like to keep the heat up high on my iron. If you look at the "grate" along the green/gray line, I matched paint to the Monokote gray. Barely noticeable.



The ETO stripes were applied with white Monokote. I cut the strips and then sprayed the back with Windex with ammonia. It activated the glue, but not so much that I couldn't move the strips around to get the placement right. Even though I wiped out the liquid, there were still some bubbles left, which I poked with a pin when applying heat.



Measurements placed the real wing stripes 40" from center and 15" wide. Rudder stripes came down 18" and 12" wide.

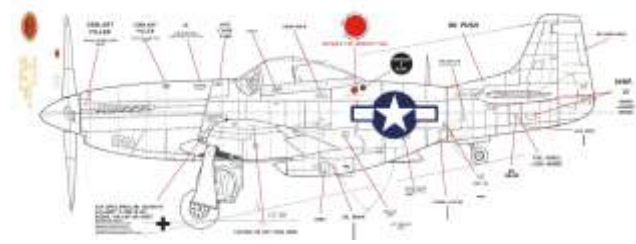
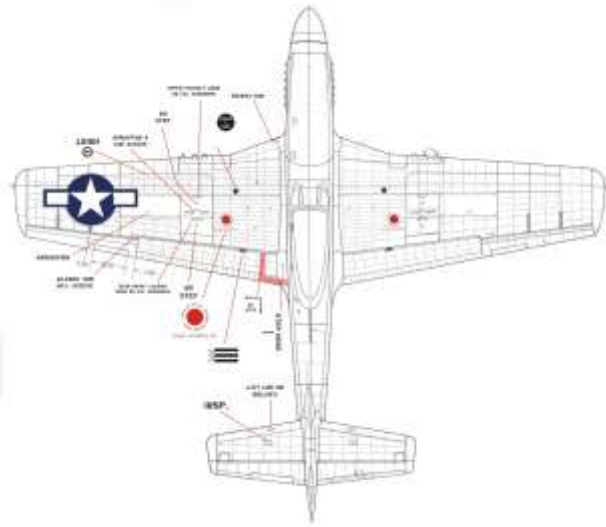
I used the scale measurements to put Sharpie dots which were later wiped off with alcohol. After a day of drying, the ETO stripes were ready to iron with medium heat.

Wing strips were 2" wide and I cut them 16" long. Stripes on tail feathers were each 1.6" wide (1 5/8") and I cut them 6" long. I cut the hinge gaps before the strips were dry.

The wing stripes were placed 5.5" from center of plane. The elevator stripes were placed out 4.75" from center of plane. The rudder stripes were placed 2.4" from the top.



Graphics & Nomenclature



Callie Graphics (gray box) can only provide so much. Her graphics are printed on white vinyl. Clear decal sheets provide another option. (See photo with gas cap.) Decals are on the next page.

Panel lines were too wide with a Sharpie fine marker (photo with blue tape). I used acetone to wipe the lines off. The Sharpie Ultra Fine Point left much less obvious panel lines.



Sequence:
Cover with Dull Monokote
Sand 400 grit in airflow
Clean with Alcohol
Apply Graphics and Decals
Apply Weathering Chalk
Spray with Dullcoat / Matte Finish

PILOT - LT.COL.J.H.HOWARD
C/C - S/SGT. M.P. TRICE



SUITABLE FOR AROMATIC FUEL

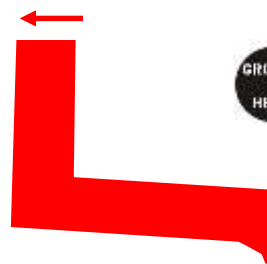
SUITABLE FOR AROMATIC FUEL



U.S. ARMY P-51B-15-MA
SERIAL NO. A.A.F. 43-38374
CREW WEIGHT 200 LBS.
SERVICE THIS AIRPLANE WITH
GRADE 100/130 FUEL IF NOT AVAIL-
ABLE T.O. NO. CQ-5-1 WILL BE
CONSULTED FOR EMERGENCY
ACTION. SUITABLE FOR AROMATICS.



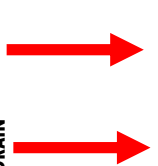
NO
STEP



HAND HOLD FUEL VENT

COOLANT DRAIN

STEP HERE



Here are the decals that I printed on clear decal paper. I'm including the white cross for sizing, but I found a white vinyl sticker and cut a cross. The cross indicates that there is a fuel tank in the fuselage.

While including decals, I'm including a photo of a P-51B instrument panel. After completing my plane, I discovered that this instrument panel is available from Callie Graphics.

And here is the decal sheet from the P-51B 1/48 scale plastic model. They are cracked because the decal sheet was 52 years old when I received it.



Weathering for my P-51B followed this sequence:

Scour Monokote with 400 grit sandpaper. Dip in water to keep the sandpaper clean. Move in the direction of airflow.

Add graphics. I used Callie Graphics and made some of my own water-slide decals for nomenclature, gas caps, camera access panel, etc.

Chip panel edges and cockpit edges with a fine art brush and Testors aluminum enamel.

Use 0000 grit steel wool to gently dab paint chips on LE, certain panels, and places where crew members walk.

Mark major panel lines with an Ultra Fine Point Sharpie. Lay out lines with blue painters tape and carefully draw straight lines.

Option—mark rivets with a small brass tube heated with a soldering iron on low. I passed.

Option to airbrush: Shave brown, dark gray, and a rust color into a pan. Use a soft wide brush to stroke streaks on the surface. Use blue painters tape this way: horizontal put the tape upwind. On vertical lines put the tape on the outside of the line and stroke toward the plane. Don't be shy with the chalk. It melts away a lot with the matte spray.

Seal top surfaces with clear matte spray. Then flip plane over and stroke chalk on the bottom side. Spray clear matte spray over the bottom.



