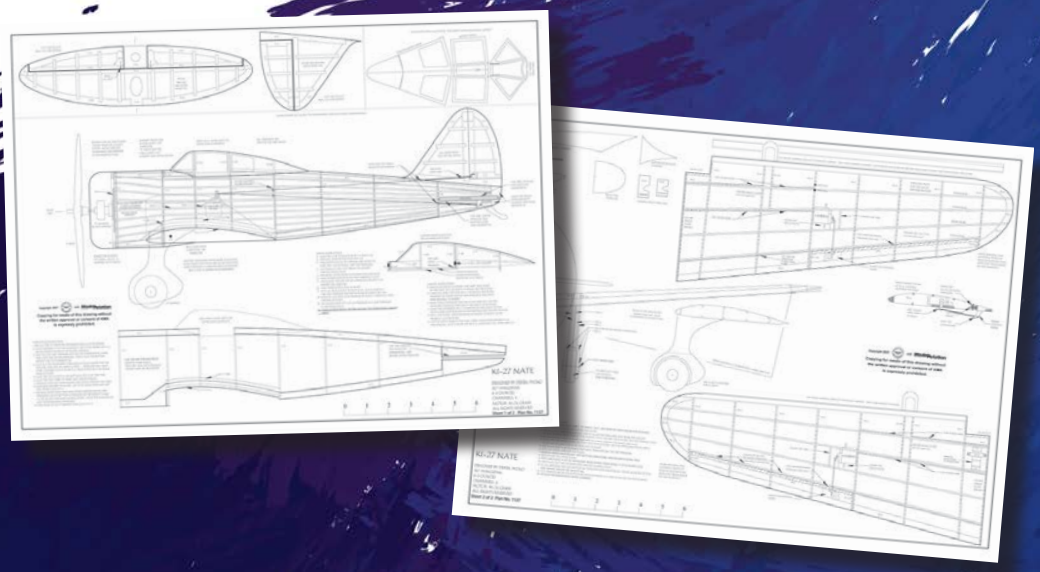
DOWNLOAD FREE PLANS!
Visit www.modelaircraft.org/plans to download plans for the Ki-27 Nate by Derek Micko.



Fighter Face-Off

PARK FLYER EDITION

Scratch-building and flying opposing aircraft, Part 2

By Paul Kohlmann and Derek Micko
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Photos by the authors and as noted

Ki-27 Nate: In last month's article, I covered the history of the full-scale Nate and the primary construction process. In this article, I will address covering, finishing, and flying the model.

The next major step was to cover the model. Usually, I would turn to a lightweight film, but recently, I have been trying printed tissue and I really like the results. Printed tissue has been popular with Free Flight modelers, and a great reference can be found on Paul Bradley's website (see "Techniques and References" in the "Sources" list).

I also created a "how-to" video on YouTube called "FSM Printing on tissue Ki 27 Nate." The video details the entire process, including how to design your printed sheets. Because the plans also include the sheets with which to print your own tissue, I will focus mainly on printing and application.

In researching the process, inkjet printers have proven to be most commonly used for tissue printing. Most printers' ink is water soluble, so before shrinking, the ink will need to be sealed—more on that in a bit. Most printers can print legal size (8.5 x 14 inches) and this will be needed for the print files provided. It's also best to use a printer that has a form feed versus a tray feed. (Mine is a form feed at the back and goes down and through the printer.)

I used light gray and white silkspan/tissue on the model. A word of warning: "Domestic tissue" (such as gift-wrap tissue paper) is typically not durable enough and it's best to use modeling tissue. To feed it through the printer, the tissue needs to be temporarily attached to a sacrificial sheet of paper. Spray a light coat—and I mean a really light coat—onto the sheet of paper. Place the sheet of tissue over the paper and smooth it out by hand.

The tissue can be carefully peeled back and reapplied if wrinkles form. Using a sharp blade, the tissue is trimmed along the bottom and sides of the paper. I usually leave approximately 1/4 to 3/8 of an inch of tissue overhang at the top of the sheet. This allows for easier separation of the tissue from the paper.

Set the tissue/paper combo into the printer feed. Before printing, it's best to set your printer preferences as borderless. After the sheet is printed, avoid touching any printed area and let it dry for roughly 10 or 15 minutes.

When the ink is dry, it needs to be sealed/waterproofed. For this I used Krylon K01303007 Acrylic Spray Paint Crystal Clear in an 11-ounce aerosol can. You can get this at most craft and hardware stores. I applied several light misting coats. Don't let it get too thick or wet. Let this dry, and then you are ready for the application.

When applying the tissue, I found that it's best to cut the individual part free as opposed to peeling the full sheet of tissue off then cutting out each part. To apply the tissue to the frame, I used a glue stick that goes on purple and dries clear. This is helpful in letting you know how much time you have before it's too dry to work.

Apply the glue stick on the "outside" frames of the section that you are covering, pulling it as taut as possible to remove any wrinkles. I've found that printed tissue will not shrink to the same extent that standard tissue does because of the light sealant coat. Seal the edges with thinned Eze Dope and let this dry for an hour or so. The tissue can then be shrunk using a fine mist of water.

Holding the model above you, spray "up" at the part to avoid having any large water droplets hit it. Let the tissue fully dry, applying a thin coat of water

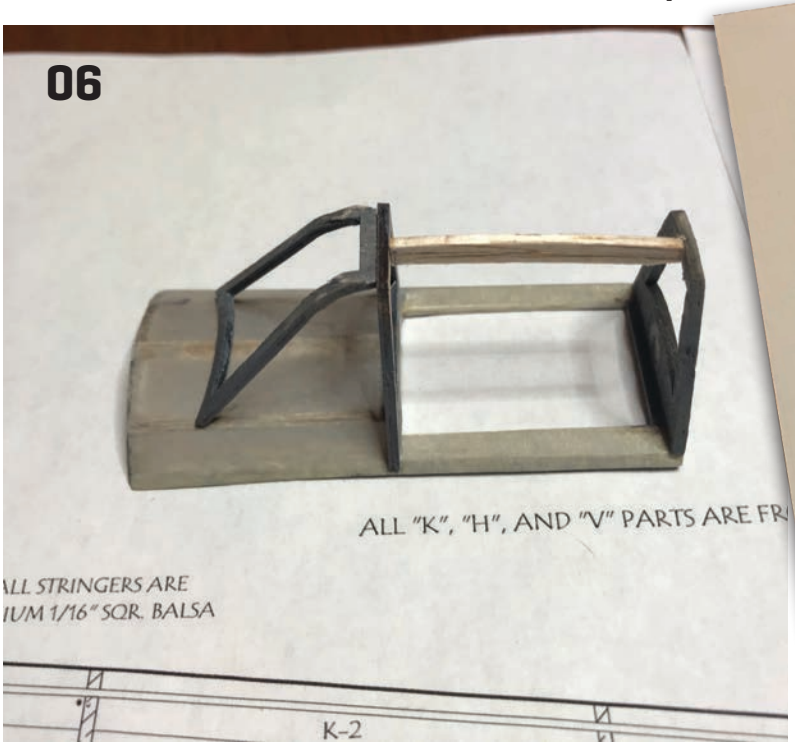
01. The vertical stabilizer and rudder were covered as one piece. These will be cut and separated later.

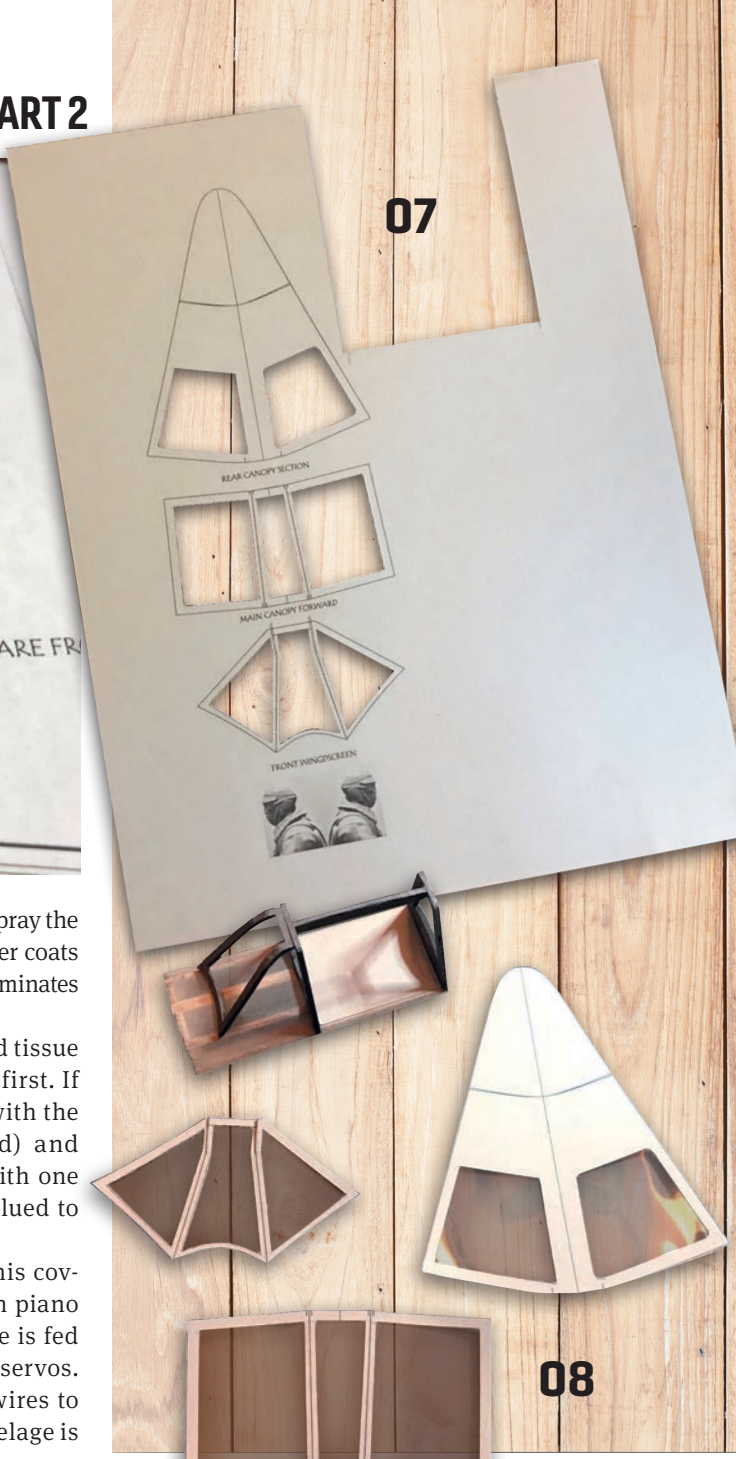
02. The rear section has been covered. The pushrods were added at this time. Scrap cross stringers helped keep the pushrods from flexing.

03. All of the top sheets are on and the tissue has been shrunk. The 3/32-inch piece of scrap material under the wingtip ensures achieving the correct amount of washout.

04. The forward fuselage section has been added. The sheets have marker lines to assist with correct placement.

05. This shows the wingtip covering details. Note the piece of 3/32-inch scrap wood under the rear of the rib.





06. The hatch is covered and the canopy parts have been added. The curve on C1 was done by soaking the part in ammonia for a few minutes to allow it to flex.

07. The canopy frames were printed on gray cardstock. The windows were cut free first, then the 3 mil clear plastic sheet was glued to the back.

08. The outside edges of the frames are cut free.

09. Canopy glue was used to add the rear canopy part to the fuselage.

to any stubborn areas. After this is complete, spray the section/part with several progressively heavier coats of Krylon. This is the final sealing coat, and it eliminates the need to seal the surface with Eze Dope.

Whether you choose to cover with printed tissue or film, start by covering the tail sections first. If using tissue, you can cover the tail parts with the rudder/elevators hinged (but not glued) and attached. The whole section is covered with one piece, shrunk, and then the overhang is glued to the leading edge of the control surface.

The rear of the fuselage is next. After this covering is applied, the exits for the 1/32-inch piano wire pushrods are opened up and the wire is fed through the fuselage and connected to the servos. Scrap stringers are used to "box in" the wires to keep them from flexing. The rest of the fuselage is covered in sections.

The wing bottoms are covered next. One wing panel is then pinned to a board with 3/32-inch scrap material under W-8. Cover the top of the wing (outer panel/tip) with this in place before adding the rest of the top wing covering. When shrinking the wing tissue or film, keep the 3/32-inch scrap there to ensure that the washout remains.

Find the canopy parts and paint them a dark gray and bend C-1 according to the plans. Glue C-1, F-3A, C-2, and F-4A to the hatch (see the plans detail). Using F4A as a guide, mark the magnet location on the top of F-4 and drill it out, adding the magnets to F-4 and F-4A and ensuring that the polarity is correct.

Add F-4B, C-3, and F-5A to the top of the rear fuselage according to the plans. The canopy framing

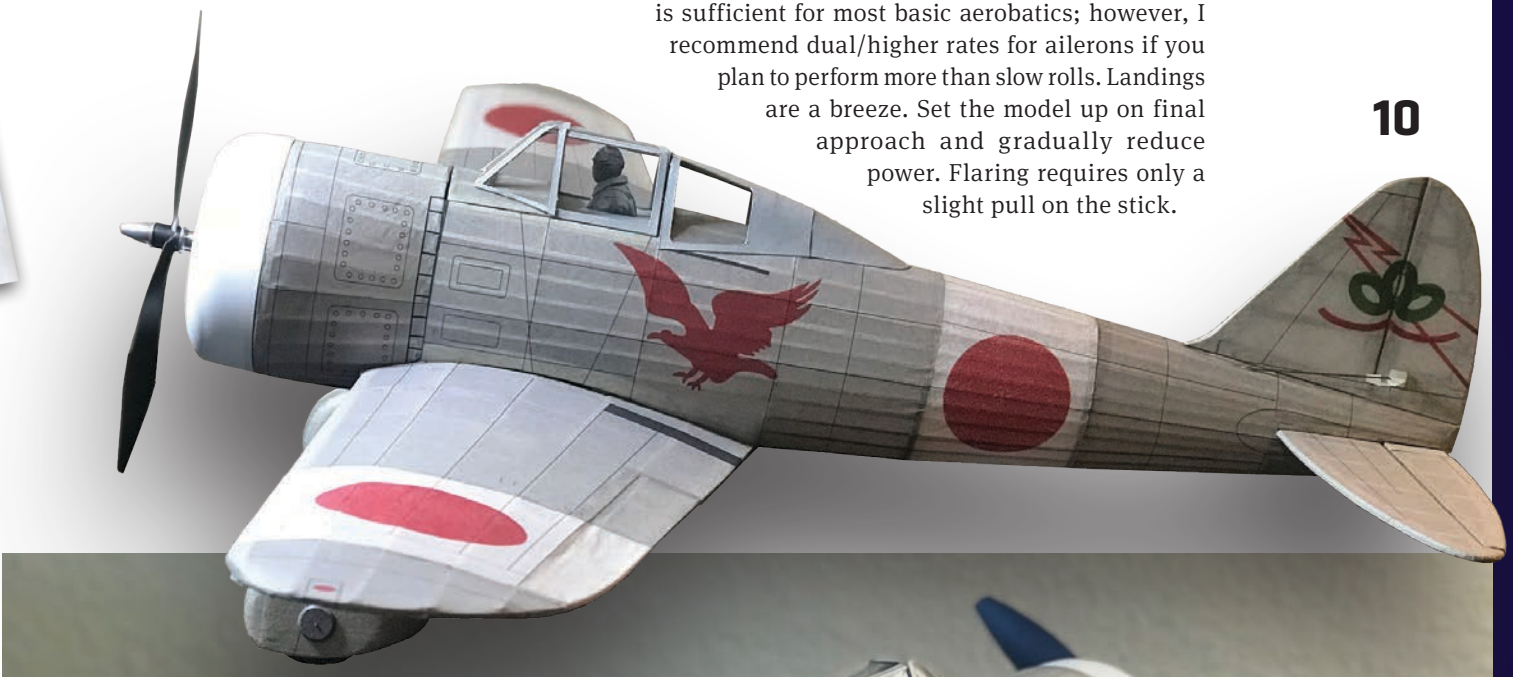
is made from lightweight cardstock and templates are provided. Cut out the interior sections first then the outside edges. Glue these frames on top of thin, clear plastic sheeting. The prototype used 3 mil plastic. Bend and shape it to fit the formers before using canopy glue to attach it. Use canopy glue to also attach the cowling to the CR parts.

Glue the tail sections and wheel pants/spats in place. Check the model's suggested center of gravity on the plans and position the battery pack fore and aft as needed to get the correct location. The bottom hatch rail inside edge needed a little trimming to allow the pack to be positioned far forward on the prototype.

Set the control throws to be +/- 1/4 inch for the ailerons, +/- 3/8 to 1/4 inch for the elevator, and +/- 1/2 inch for the rudder. The model can be hand launched or can rise off of the ground from a smooth surface. Because the Nate has a tail skid instead of a wheel, taxiing can be difficult.

I set the model in the direction that I wanted to go, advanced the power, and it was in the air in roughly 10 feet.

The prototype required little trimming and grooved nicely. The 2S 450 mAh battery pack setup is sufficient for most basic aerobatics; however, I recommend dual/higher rates for ailerons if you plan to perform more than slow rolls. Landings are a breeze. Set the model up on final approach and gradually reduce power. Flaring requires only a slight pull on the stick.



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10. Note that the remaining canopy parts have been added to the hatch.

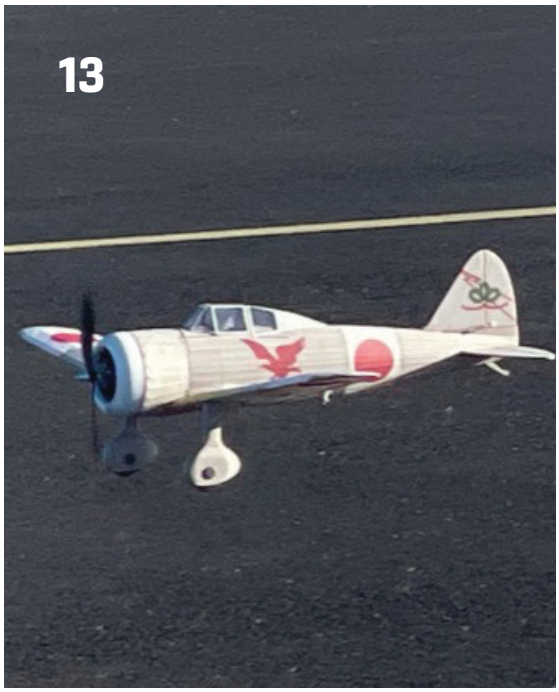
11. The wing fillet details can be seen in this picture.

12. The author/designer, Derek Micko, and the model.

13. The Nate lands easily on short grass or a tarmac.

14. The Nate stands out in stark relief against the rising sun.

15. The cool morning "loosened" the tissue slightly, but it did not impact the flight characteristics.



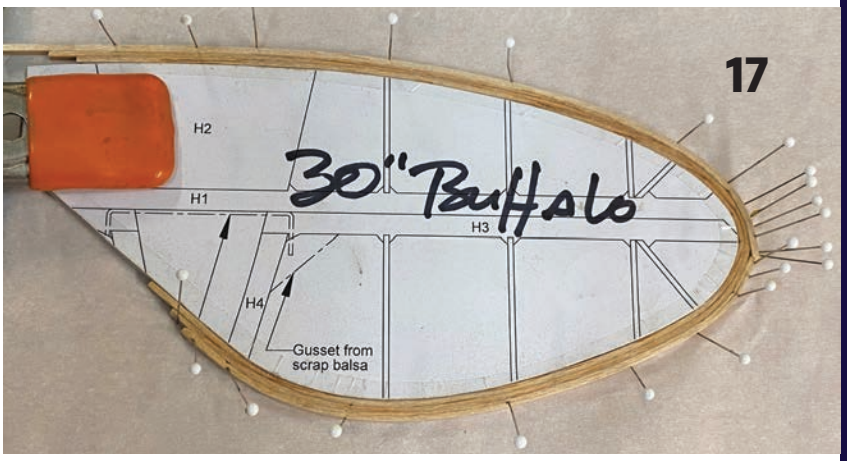
The light, 7 to 9 ounces-per-foot wing loading keeps the model forgiving, and the stalls are easy to recover. Overall, this aircraft is fun to build and fly and can fit into smaller spaces. Give the Nate a try and check out printing on tissue. I think you will have a lot of fun with both!

Infield Engineering 30-inch Brewster F2A-1 Buffalo: As Derek mentioned in the introduction to his Ki-27 Nate build in the September issue, this project is the second iteration of the Fighter Face-Off, in which Derek and I engaged in 2018. This time around, my subject is the Brewster F2A Buffalo.

Few military aircraft have had as checkered a past as the full-scale Buffalo. Initially, the Buffalo was a star. In 1939, it beat out the Grumman Wildcat in testing to become the U.S. Navy's primary fighter. Prewar pilots praised its maneuverability, although all variants were considered to be underpowered. But after a mauling by Japanese Zeros at Midway, the Buffalo was harshly criticized by surviving pilots as a flying coffin.

The Buffalo was also pitted against the Japanese in the hands of both British and Dutch pilots. Neither group was particularly impressed with the stubby fighter, although admittedly, the Japanese had the upper hand in both pilot experience and ground support.

The Buffalo fared reasonably well against early Japanese aircraft such as the Ki-27, but it was no match for the later Ki-43 Oscar. Soon, the British and Dutch found themselves in wars of attrition and retreat. It is this matchup between the Ki-27 and the Buffalo that is the subject of Fighter Face-Off, Part 2.



16. The 30-inch Brewster Buffalo is a lightweight balsa and plywood park flyer.

17. The horizontal stabilizer and elevator outline is made from three strips of 1/16-inch balsa and a wood form.

Tail Group Laminations

Begin the tail group by making forms for the laminated outlines. You can either print the tail group parts from the downloadable plans or trace the outline from your kit's hard copy. Either way, use the inside line from the outline for the form's template.

Attach the template to the form material of your choice. I used 3M 77 spray adhesive to attach the plans paper to a 1/4-inch fiberboard panel. That seemed like a good choice until I realized that I couldn't pin it down to my building board like the foam forms that I normally use. No worries—a pair of large spring clamps held the forms in place while I made the laminations. The edges of the form were covered with packing tape to prevent the laminations from sticking to the fiberboard.

Soak 1/8-inch strips of 1/16-inch balsa in water overnight. Test that the strips are flexible before starting the laminations. This tail group is fairly small. Prebending the balsa over a small jar or steam can loosen it.

Keep tension on the first strip to avoid kinks in the balsa as it bends around the form. Add pins as you go to keep the strip tight against the form and pushed against the surface of the building board. Put a thin, even layer of glue on one side of the next strip and repeat. Move the pins from the first strip to the second as you go.

Do the same for a third strip then set the lamination aside to dry. Carpenter's glue works great on wet wood and is easily sanded later, but make sure to let the outlines cure completely before unpinning them so that they hold their shape and don't delaminate.

Framework

Now pin the outlines to the plans. Build up the inner framework by assembling the parts in numerical order. But don't glue the parting lines for the rudder (parts V1 and V2) and elevators (H2 and H3).

After the numbered parts are in place, the bracing can go in. I used a balsa stripper to cut the bracing stock from the edges of the balsa in my kit. Cut each brace slightly large and sand it to the perfect size and shape for its position. Start with the longer braces so that if you get a little overzealous with the sanding, you can take another shot at fitting it in a shorter position.

After the last brace goes in and the assembly cures, unpin the tail group parts. Sand a radius in the leading edges (LEs) and a taper at the trailing edges with 60-grit sandpaper. Follow up with a light pass with 220-grit sandpaper.

Separate the fin/rudder and horizontal stabilizer/elevators by cutting through the laminated outlines as shown on the plans. Bevel the LEs of the rudder and elevators and these parts are ready to hinge. I

used 1/8-inch strips of CA hinge material on all of the control surfaces for my prototype.

Fuselage

The left side of the fuselage is built over the plans in the old Guillow's style. Start by gluing and pinning keel parts K1 through K4 to the building board. Formers F2L through F10L are next. Glue these to the keels so that the formers stand perpendicular to the board.

The next steps will tie the formers together. Join the formers with side keel K5 then use the left side of the cockpit deck to join formers F5L through F7L. Now add the left wing saddle. Dampen the outer side first so that it curls slightly. Glue the wing saddle to keel F5 and formers F2L through F5L. Now add a few 1/16 x 3/32-inch balsa stringers to stiffen the assembly. Letting the assembly fully cure before unpinning it will help prevent warps in the fuselage.

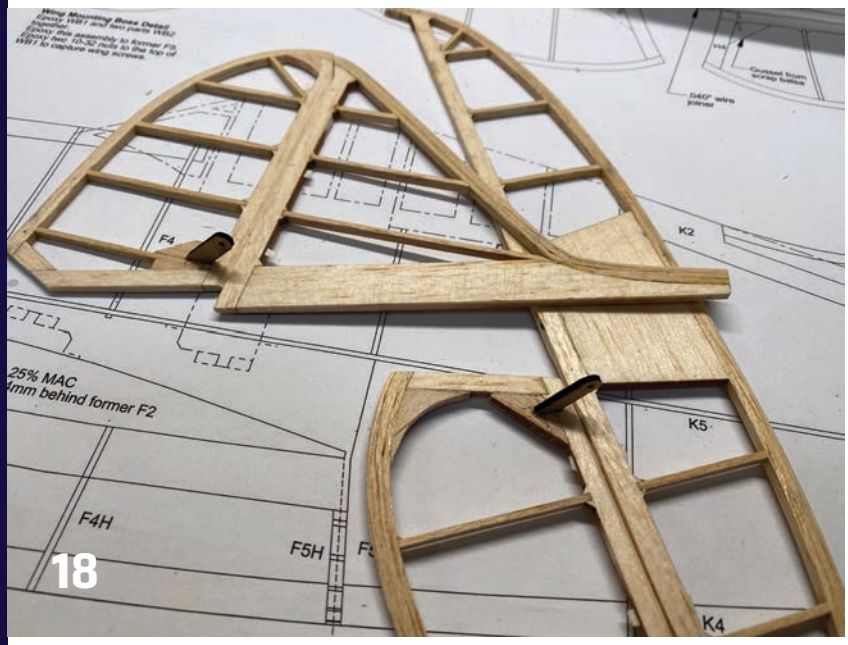
On the right side, unpin the left half of the fuselage and build the right half directly onto the left half. Start by adding the firewall. Preassemble this part by aligning and gluing balsa parts F1A and plywood part F1B. Now glue the firewall to the front keels of the fuselage's left side. Note that the long motor mount slot goes on the left side of fuselage.

Assemble the motor mount as shown in the detail drawing. Make sure that the side panels are in the correct positions. When assembled correctly, the motor will be positioned for the proper downthrust and sidethrust. Epoxy these parts together then fit the motor mount box into the well in the firewall.

The belly hatch is next. Glue hatch formers F2H through F5H to keel K4 and the left wing saddle. Be careful not to glue hatch formers F2H or F5H to their respective fuselage formers or it will be difficult to free the hatch later.

Now add formers F2R through F10R. Glue each of these parts to their left-hand mates. Use wing pin boss WP to strengthen former F2 and reinforce the wing pin hole. Slide in the battery tray from the hatch side and glue to the firewall and former F2. Preassemble the wing bolt boss from parts WB1 (plywood plate) and WB2 (balsa struts), and then attach it to former F5. Epoxy is a good adhesive for this critical assembly.

Now that all of the inner parts are in place, join the right-hand formers with keel K5 and the cockpit deck. Dampen the right-wing saddle as before and attach it to its keel and formers. Complete the fuselage assembly



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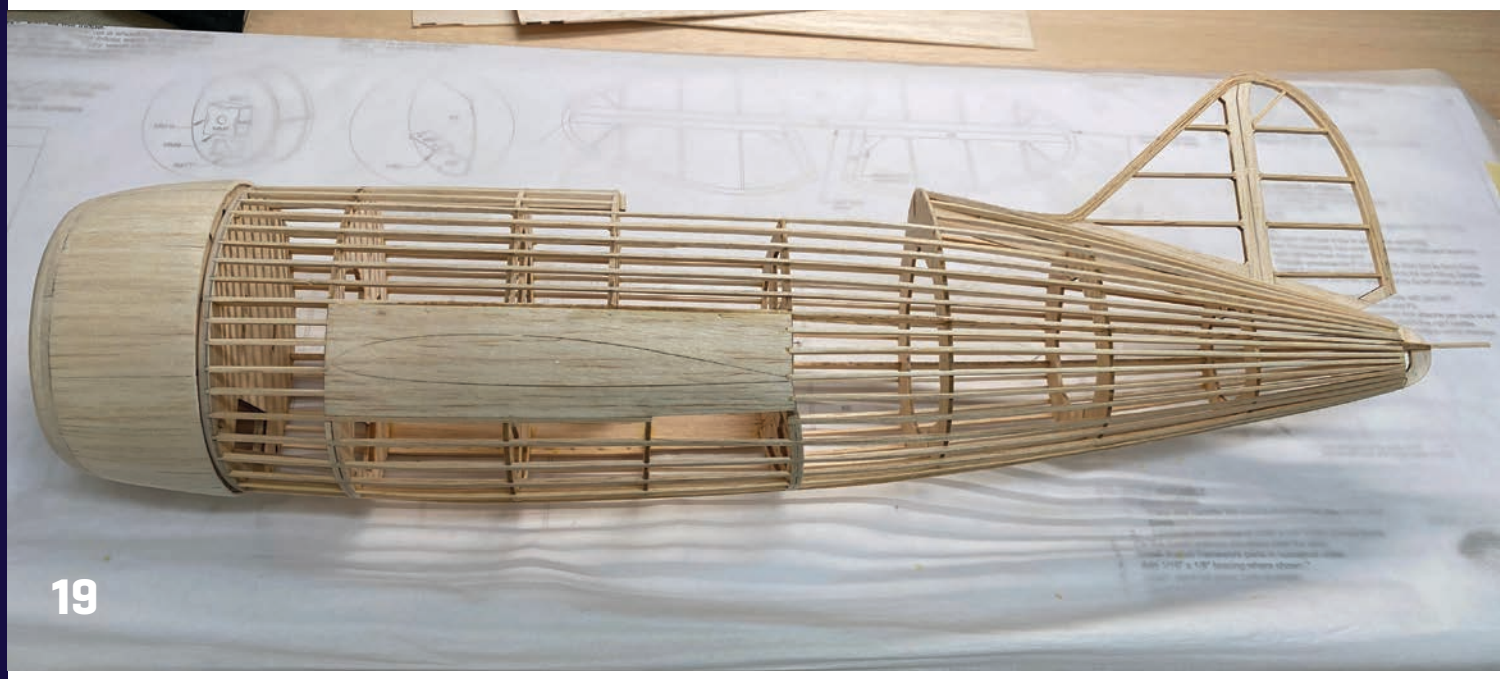

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18. This shows the tail group parts after shaping and hinging.

19. Completed cowling and fuselage.

by adding the rest of the stringers. Alternate from side to side and check for twisting as you go.

Cowling

The cowling is built up from a balsa and plywood frame that is planked with balsa. Begin by preassembling balsa cowling formers C2 and C3. Each is composed of three parts to manage the direction of the wood grain.

Join these formers and plywood former C1 with cowling keels C4 through C7. Note that there are small alignment holes in parts C1 and C2. They mark the top of these formers. The square cutout in C3 is the top of that part.

Use the plans sideview as a template for setting the angles of top and bottom cowling keels C4 and C7. Check that the angle of the sides of the cowling frame is the same from side to side as the assembly cures.

Assemble the cowling opening ring from parts C8 through C10. Use the scoop openings to align these parts. Glue this stack to the front of C3. Note that the outside diameter of C3 is smaller than the cowling opening ring. This will make it easier to perch the planks on C3 in the next step.

Planking

Some builders shy away from planking because it looks tedious. It's not that bad, especially on a small part such as the Buffalo's cowling. It also helps that there isn't much curvature in this cowling, meaning that the shapes of the planks will be simple.

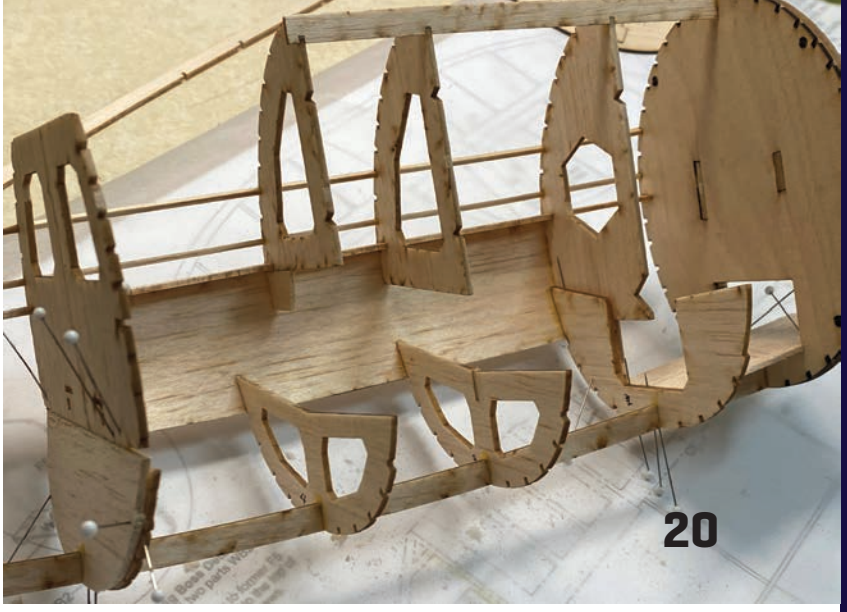
Plank the cowling between C1 and C3 with 1/16-inch balsa. Cut 1/2-inch-wide strips for this job. Add a plank to the top of the cowling that covers half of the cowling's keel C4. Do the same with the bottom and keel C7. Tying the cowling rings and these keels together will make the cowling assembly much more rigid.

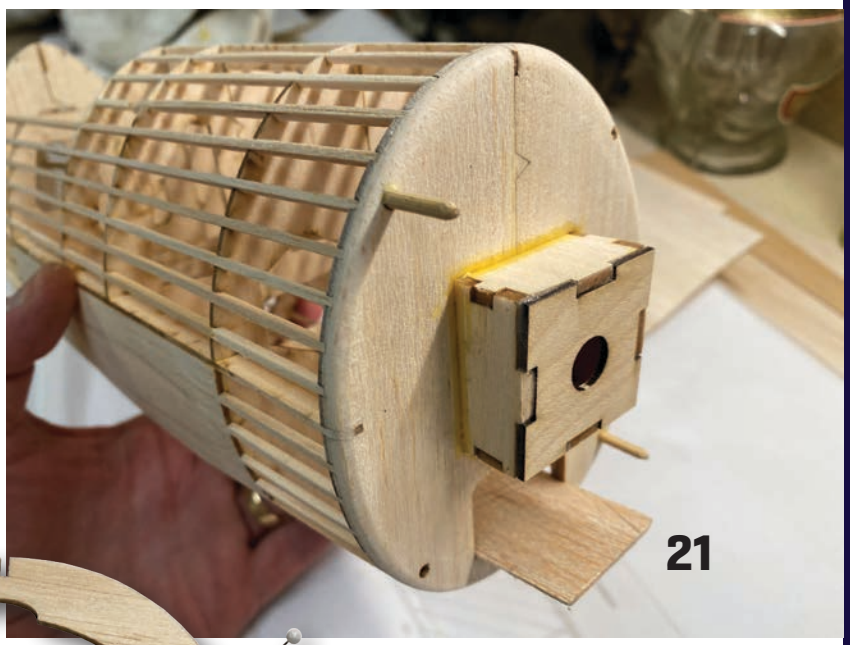
As with the wing saddle, dampening the outside of the planks will make them curve slightly. Use this to your advantage as each plank is fitted. Place a plank in position to check for tight spots. Sand the plank lightly and fit it again. After a uniform parting line is achieved, glue the plank into position.

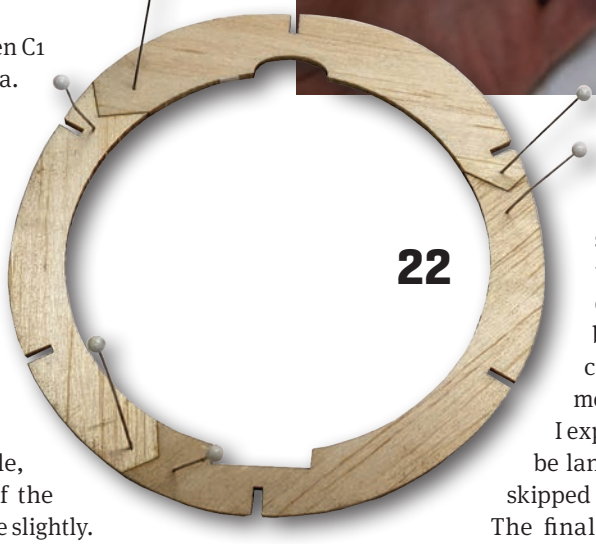
I generally avoid using CA adhesive, but it works great for this application. A shot of accelerator helps to quickly cement it in place. Alternate the addition of planks from top to bottom and side to side to avoid warping the assembly. Sand the finished cowling with 120-grit sandpaper to knock off the high spots at the edges of the planks. The bottom of the cowling can be fiberglassed for more durability if desired. I expect that my Buffalo will be landing on soft grass, so I skipped this step.

The final steps in the cowling assembly are the addition of the attachment hardware. Add two 1/8-inch diameter alignment pins to attach the firewall to the cowling. These can be made from doweling or barbecue skewers. Use two of the four attachment holes that are diagonal from one another.

Use the other two holes for pairs of rare earth magnets. An easy way to deal with these is to put a small piece of waxed paper between each magnet pair



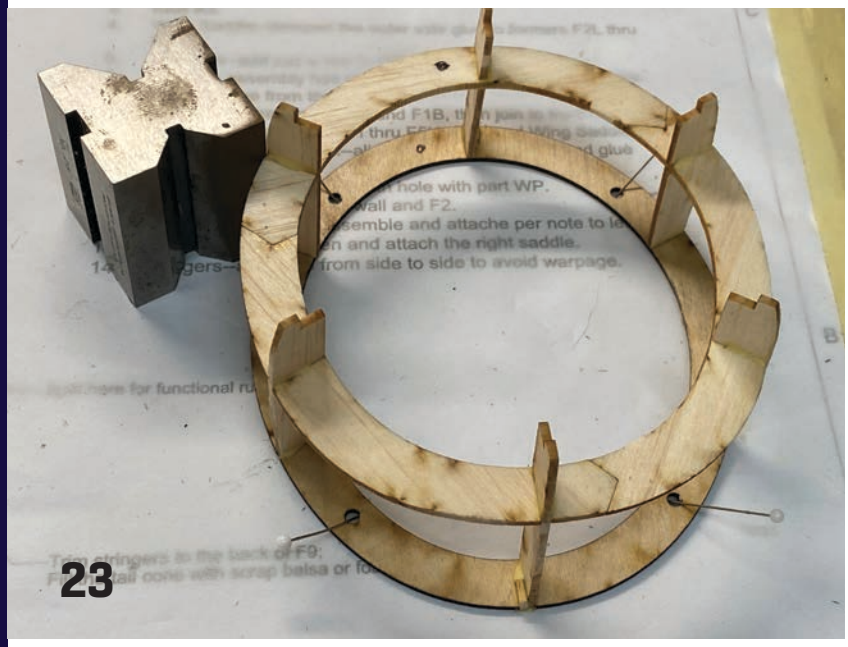


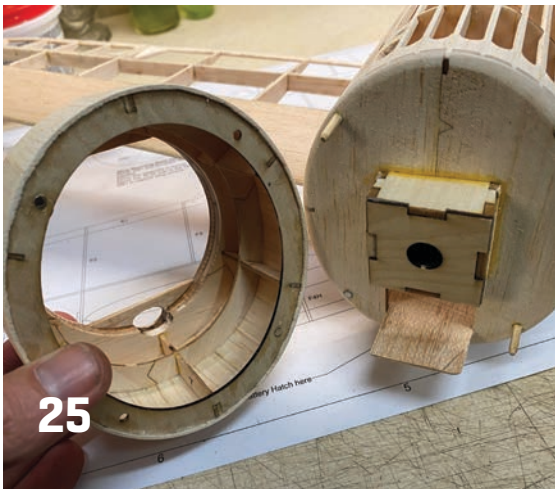


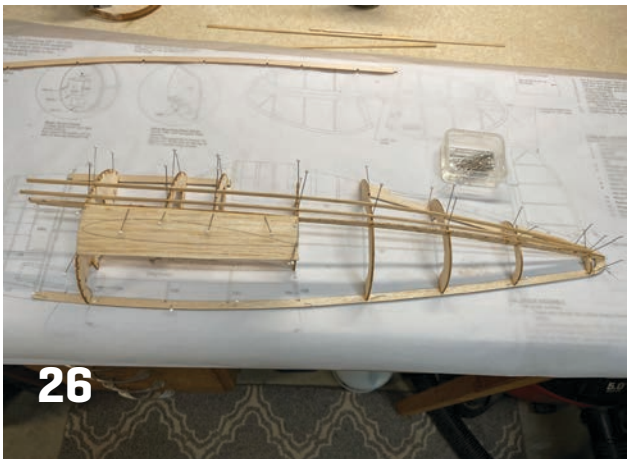
20. The hatch formers are in place.

21. The motor mount, battery tray, and cowling attachment pins are in place.

22. The cowling formers need some preassembly.







23. The cowling framework is squared and waiting for former C3.

24. The cowling planking is underway.

25. This shows the completed cowling with pins and magnets in place.

26. This is a good place to stop for now!

then epoxy a magnet into each hole in the firewall so that the waxed paper is flush against the firewall's surface and the second magnet is facing the cowling. After the firewall magnets are secure, fit the cowling over the two magnets. Adjust the cowling magnet hole openings if necessary.

After the cowling drops over the magnets, put epoxy in the magnet holes and on top of the cowling magnets. Drop the cowling in place and wait for it to cure. When it does, remove the cowling and discard the waxed paper. The magnet pairs will be correctly oriented, and the gap set perfectly.

Wrapping It Up

That gets us roughly halfway through the build. Next time, we'll frame the wing, rig the controls, and get some covering on this model.

Until then, fly low and build light!

SOURCES:

Manzano Laser Works
www.manzanolaser.com

Park Flyer Plastics
(817) 233-1215
www.parkflyerplastics.com

Du-Bro
(800) 848-9411
www.dubro.com

Paul and Ralph Bradley's Model Airplane Hangout
www.parmodels.com

FMS Printing on tissue Ki-27 Nate
https://youtu.be/1980sL-UJC0

RCGroups Build Thread
Park Flyer Fun Scale Ki-27 vs. I.E. Brewster Buffalo
https://bitly/39zYm

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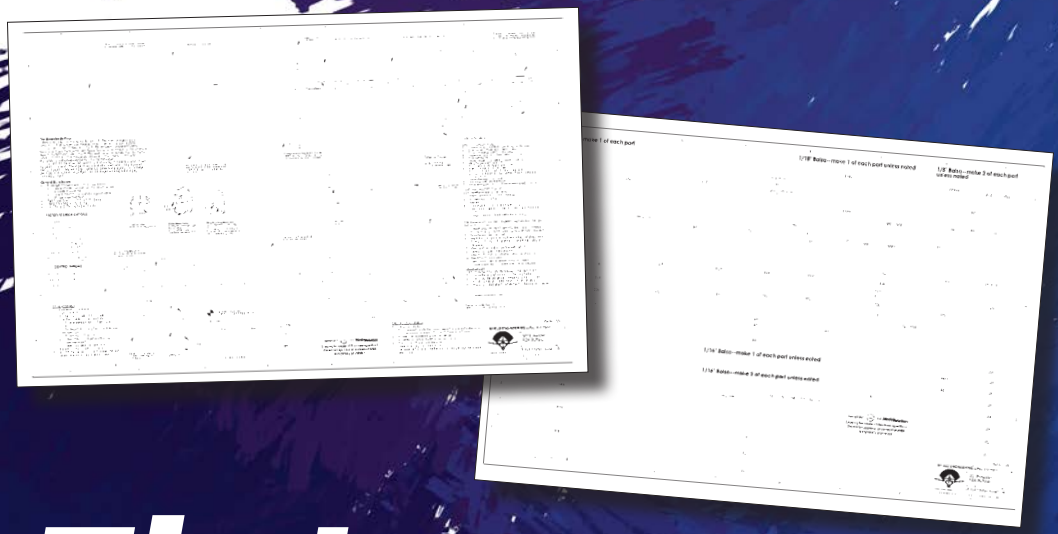

Fighter Face-Off

PARK FLYER EDITION

Scratch-building and flying opposing aircraft, Part 3

By Paul Kohlmann and Derek Micko
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Photos by the authors

Welcome back to the second half of my Brewster Buffalo build. In the September issue, Derek and I introduced the project, and in the October issue, the fuselage and the tail was framed. I'll complete the project in this session, but before I resume, let's jump ahead to the paint scheme.

Although a minor player in World War II, the Buffalo boasted a wide range of paint schemes. It was initially dressed in the U.S. Navy's colorful prewar livery. Exports to Europe and Asia, and even a few U.S. Army aircraft, were camouflaged.

In the spirit of the Fighter Face-Off, I needed a Buffalo that was hungry for Ki-27 Nates. Ultimately, I selected the aircraft of Royal Air Force (RAF) Flying Officer J.F. Mingaladon of the 67 Squadron Buffalos that operated out of Burma. Aircraft from this unit were particularly striking because the left half of the underside of their aircraft was painted black while the right side was standard sky green. This scheme was adopted to reduce friendly fire incidents from inexperienced ground gunners.

Wing Framework

Start the wing construction by pinning the lower main spar and the rear spar to the building board. Use straight 1/16 x 3/32-inch strips of hard balsa or basswood for the main spars. I use balsa, but if you are more concerned about rough landings than weight, basswood is a good choice.

Next, glue ribs W2 through W8 into place. Each of these ribs stands perpendicular to the board. Use the dihedral gauge from the plans to set the angle of root rib W1 while gluing it into place. Lock the ribs into position with the upper main spar. Add the 1/16-inch balsa shear webs (parts S1 through S7) to complete the main spar assembly.

Attach the trailing edge (TE) to the back of the ribs. Fasten a straight 3/32-inch square balsa or basswood strip to the front for the leading edge (LE). Stack two wingtip (WT1) parts then glue them to the outside of rib W8. Complete the wingtip by joining ribs W7 and W8 with part WT2.

Finish the wing framework by installing the aileron parts in numerical order, but don't glue part A1 to A2. The parting line for the aileron is between these two parts. Give the framework a light sanding to remove any high spots.

Sheeting the Wing

The upper surface of the wing between the LE and the main spar is sheeted with 1/32-inch balsa. The center section, including all of the upper and lower surfaces between ribs W1 and W2, is also sheeted to give the wing strength where it connects to the fuselage.

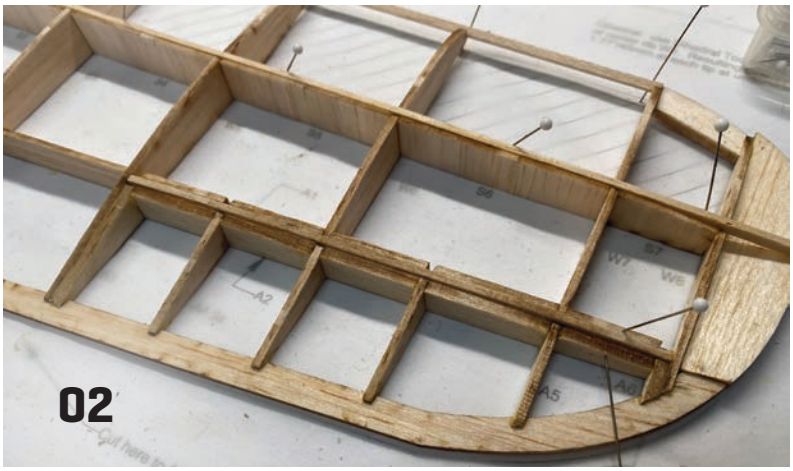
I like to attach the upper sheeting in one piece while the wing frame is pinned to the board. This ensures that the resulting assembly will be true. This is a good time to add washout by shimming the TE of rib W8 up by 1/8 inch.

Carefully trim the upper sheeting so that the back edge sits on top of the main spar and the shear webs. The front edge should just reach the LE. After the fit is good, dampen the outside of the sheet and glue it in place. Let it dry completely before unpinning it and it should hold its shape nicely. Add the lower center section sheeting and the framework is finished.

Controls

The builder has the choice to install one servo for each aileron or to use a single servo to drive torque rods to both ailerons. The first option is simpler to rig, but when the torque rods are done well, they are completely hidden. If you go with torque rods, it's easier to install them before the wing halves are joined.

On the prototype, 1/16-diameter music wire was used for the bellcranks at the ends of each torque rod. A 1/8-inch diameter aluminum tube was used for the main shaft. A little 3/32-inch diameter aluminum tube was used to fill the gap between the wire and the larger main shaft. The result was a torque rod with sufficiently rigid arms and main shaft but with a modest weight.



01. The wing ribs and spars are in position.

02. A detailed view of the aileron and wingtip parts.

Joining the Wing Halves

A plywood dihedral brace is included. After sanding each wing root completely flat, install the brace up through the bottom of the wing. Mount the brace behind the main spars the same as the shear webs in the other bays.

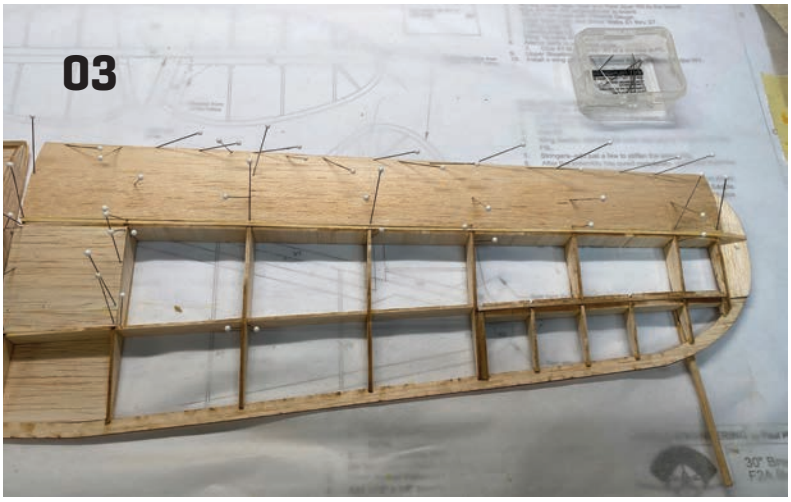
After the brace has been successfully test-fitted, epoxy the wing halves together then epoxy the brace into position. Add a bit of 1/8-inch dowel for a wing pin at the wing root LE.

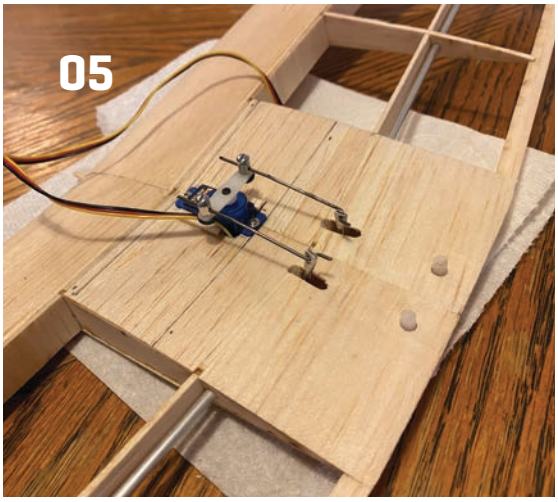
Belly Hatch

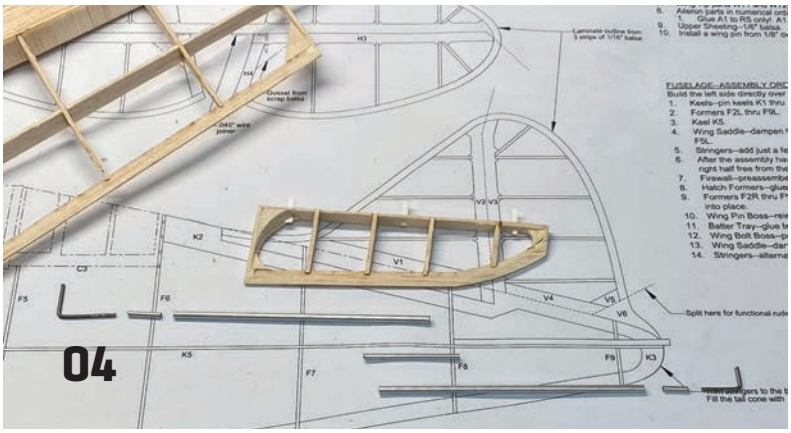
Now it's time to fit the wing to the fuselage. Start by cutting out the airfoil that is marked on the wing saddles. Carefully cut through keel K4 and the stringers that are between fuselage formers F2 and F2H and F5H and F5B. Coax the belly hatch free from the fuselage.

Mate the wing to the fuselage by inserting the wing pin into the reinforced hole in fuselage former F2. When the TE is pressed against the wing-bolt boss, the bottoms of fuselage formers F3 and F4 should touch the top of the wing sheeting. Lightly sand the wing saddles if needed to get the right fit. Now fasten the wing to the fuselage with two nylon 10-32 screws and nuts.

After the wing is seated in the fuselage, fit the belly hatch in a similar fashion. F3H and F4H should rest against the bottom sheeting. The gap between the wing saddle and the wing should be small and even,







03. Note the washout shim at the wingtip when sheeting the upper wing.

04. This shows the aileron torque-rod parts.

05. The wing halves have been joined and the aileron servo has been hooked to the torque rods.

06. Start the belly hatch by cutting out the airfoil that is marked on the wing saddle.

and the hatch should fit flush with the fuselage. Use rare-earth magnets to hold the belly hatch in place between battery swaps.

Controls

For the prototype, a servo tray was made from scrap balsa and fitted between formers F3 and F4. Two 5-gram servos and .035-inch control rods were installed to drive the rudder and elevators. Two motor options were fitted. The first was a 24-gram Blue Wonder-type motor. These were popular a few years ago but have become relatively scarce. That led to the evaluation of a second motor. A Turnigy 2822-1275 Kv brushless motor and its larger 15-amp ESC weighed 20 grams more, but this combination is a drop-in replacement for the 24-gram motor and produced 50% more power.

Finishing

The prototype Buffalo was covered in Polyspan fabric. Mod Podge was used as a heat-activated adhesive. A little was brushed onto the framework, allowed to tack, and then the Polyspan was ironed into place.

After trimming and shrinking the Polyspan, water-based polyurethane was used as dope. Five coats, thinned with 70% water, were brushed on. After the dope was dry, another session with the sealing iron followed.

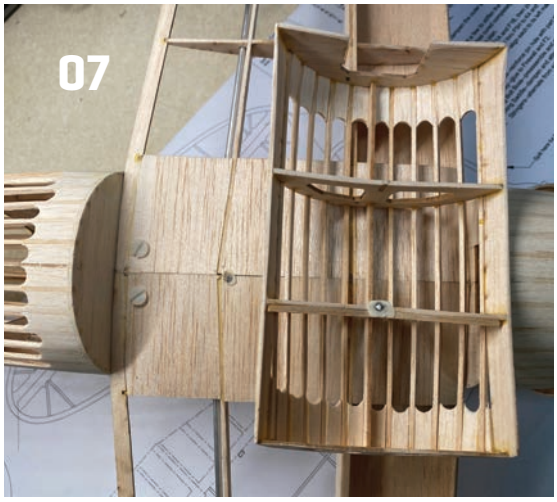
The four colors of the paint scheme were all Behr interior latex colors. The mixture I used was 40% paint, 30% water, 30% isopropyl alcohol, plus a splash of ammonia. The addition of alcohol sped up the drying, while the ammonia helped the paint wet a little better. Even so, extremely light coats were required to avoid runs. Judicious use of a heat gun helped a lot.

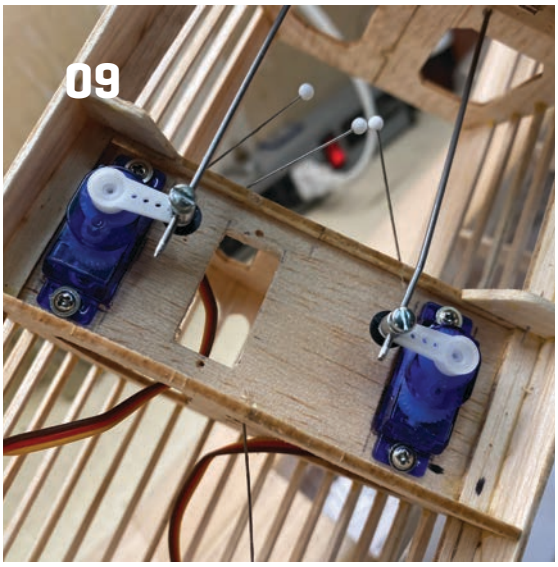
Several plastic parts are required to complete the project. A vacuum-formed canopy comes with the kit, or one can be ordered separately from Park Flyer Plastics. Several other parts are available as 3D-printable files. These can be downloaded from Thingiverse. Search for Infield Engineering Buffalo. There are files for the dummy wheels, a dummy motor, and a two-piece spinner.

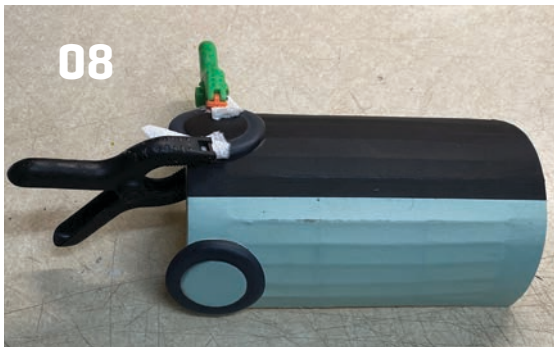
Flight Report

The prototype Buffalo weighed 10.9 ounces with all of the paint and details, plus the 24-gram motor and a 500 mAh LiPo battery. This is slightly more than Derek's Nate, but I have two excuses for that. First, the Buffalo has a larger power system than the Nate. Second, historical accuracy required that the U.S. Navy fighter be a bit "portly" compared with its nimbler Japanese counterpart.

In any event, this Buffalo flies like a dream. For all of my flights so far, I've hand-launched it myself







07. These are the wing bolts and belly hatch magnets.

08. 3D-printed dummy wheels were epoxied to the belly hatch.

09. The tail-group servos and control rods are in place.

10. The 30-inch Brewster Buffalo is ready for RAF service.

11. The Brewster Buffalo looks great in the air!

SOURCES:

Manzano Laser Works
www.manzanolaser.com

Park Flyer Plastics
(817) 233-1215
www.parkflyerplastics.com

Thingiverse
www.thingiverse.com

RCGroups Build Thread: Fighter Face Off 2: Infield Engineering Brewster Buffalo vs. Fun Scale Ki-27 Nate!
www.rcgroups.com/forums/showthread.php?3773991-Fighter-Face-Off-2-Infield-Engineering-Brewster-Buffalo-vs-Fun-Scale-Ki-27-Nate%21

because my wingman chickened out. That hasn't been a problem because the Buffalo simply lifts off with determination. Loops are appropriately large, and any scale maneuver is readily done.

For landing, the large cowling delivers plenty of drag to slow things down. Switch to high rates and wait for walking speed before the flare—the Buffalo will drop onto the grass with only a short slide.

That wraps up this project! Unlike the original Fighter Face-Off, Derek and I haven't yet gotten together to fly these creations in the same airspace. Perhaps when COVID-19 is in the rearview mirror, we'll be able to scramble our fighters sometime soon.