



CONSTRUCTION

By Mark Rittinger



A6M3 Zero WW II Japanese Aerial Samurai

The Imperial Japanese Navy's Type "0" fighter is probably the most recognized Japanese aircraft of World War II. Coming as a bit of a surprise to the Americans at the beginning of the war, it was widely used during the sneak attack on Pearl Harbor. Years ago, my father started building .19-sized Zero, but he passed away before finishing it. I remember seeing the framed-up Zeke hanging in the rafters, waiting to be finished. I've always

liked the clean lines, and excellent fore arrangement of the Zero, and so I sat down and drew out what you see here. Several considerations were made including keeping the tail light, the nose strong, and construction simple.

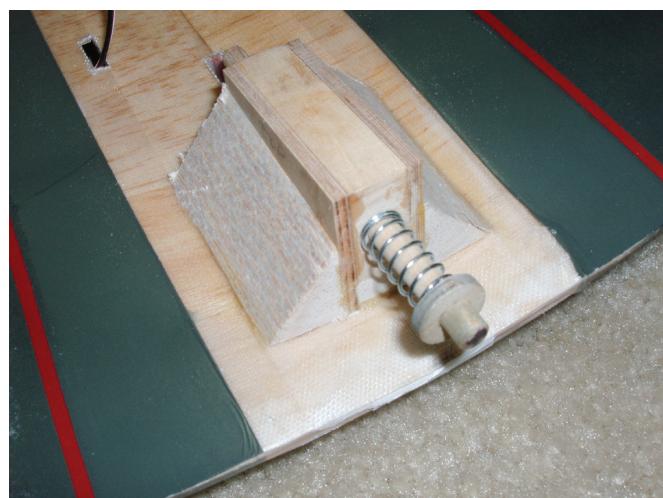
I designed a "quick release" latch setup so the entire wing comes off quickly and easily. It has worked out great, there are no hatch lines on the fuselage, and changing batteries take only seconds.

THE WING

The wing is a basic foam-core affair, sheeted with balsa. Retracts are an option, but they were not used on mine for simplicity, weight, and due to rough grass field restrictions. The support structure for retracts is shown on the plans. The plans include wing core templates, as well as all measurements needed to cut the cores. They should be cut with 1/8-inch washout under each wingtip. Cut the dihedral



The Zero uses foam-core wing construction. Here the two panels have been covered with balsa sheeting and cap strips.



This view shows the wing's release details. It is very simple and works great.

angle at the root and then decide if you want to build a hand-launched or a retract/fixed gear version. Once your cores have been cut, remove the handhold area or retract areas, and make the pockets for the aileron servos. Use a sharpened 1/2-inch diameter tube to bore holes through the cores from the center to the aileron pockets. Line the pockets and handholds with balsa.

On my model, I sheeted the "D-tube" leading edge portion with light 1/16-inch balsa, and to save weight, used cap strips between the Leading and trailing edges. Taper the trailing edge to 1/16 inch, then add the leading edge. I did not use the center section ply spars shown on the plans and the wing has held up fine. There is enough wing there on the retract version to stay together without dihedral braces if no handholds are cut out. If you want to use them, cut the wing vertically and make braces from aircraft plywood.

Make your wingtips from light block balsa then notch in the wing roots for the release tab, and join the two panels together with epoxy. Sand the center leading edge and trailing edge straight, then wrap the center joint with glass cloth and 30-minute epoxy.

WING RELEASE

The wing release is made from 1/8-inch aircraft ply (not light ply), a hardwood block, a 1/4-inch dowel (or better yet, a carbon-fiber rod) a spring plywood disc or "donut," and some triangle stock. The plans show all the details and complete in-

SPECIFICATIONS

Model: Japanese A6M3 Zero
Type: Scale electric warbird
Wingspan: 49
Length: 38 3/4 in.
Wing area: 410.16 sq. in.
RTF weight: 61 oz
Wing loading: 22.47 oz./sq. ft.
Radio req'd: 3 to 4 channels (rudder, aileron, throttle) rudder and retracts optional

GEAR USED

Motor: E-flite Power 25 (e-flitrc.com)
Speed control: E-flite Pro 40A
Propeller: 12x10 APC (apcprop.com)
Servos: HS-65 (hitecrcd.com)
Battery: 3S 5000mAh LiPo



The author shows off his finished A6M3 Zero. For complete instructions on how to build the wing release, head to ModelAirplaneNews.com/Zero

structions for the release can be found at ModelAirplaneNews.com/Zero

Cut the ailerons and excess balsa from the wing, install the wood facings, bevel the aileron facings to allow at least 25 degrees of up/down travel.

TAIL SURFACES

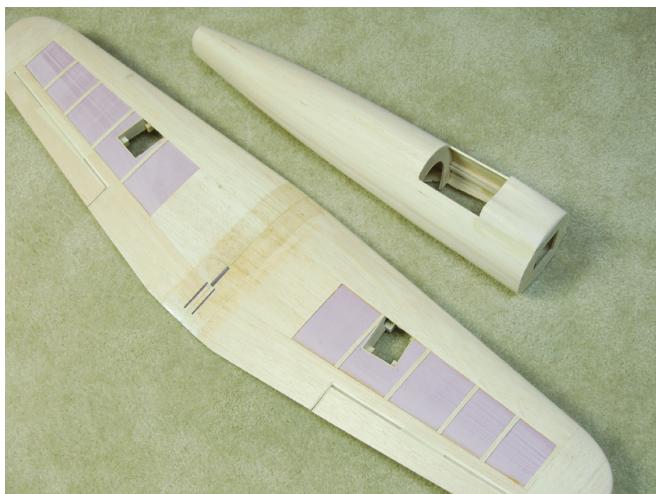
There are two ways to make the tail surfaces: solid balsa or foam covered with sheeting. I used very light, contest-grade 1/2-inch sheet balsa for the stabilizer and

elevators. I carved it in no time with a small razor plane, then cut off the elevators and trim pieces at the trailing edge. I recommend making a centerline around the perimeters to ensure a symmetrical airfoil. Bevel the elevator fronts and a notch in the stabilizer to clear the SIG Mfg. elevator joiner.

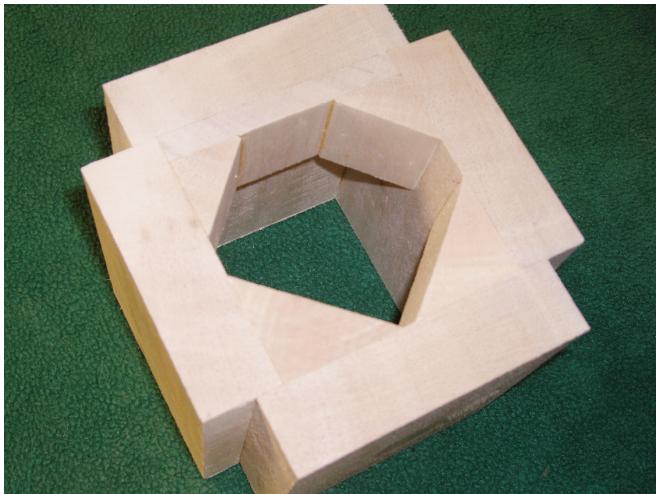
For the fin, I used 1/2-inch sheet foam, sanded to shape and sheeted with 1/32-inch contest balsa attached with 3M spray contact cement. My model has no rudder,



The fuselage is built in halves (top and bottom). Here the bottom half is taking shape.



Here are the completed fuselage and wing structures. Construction is simple and lightweight.



The cowling is made from balsa blocks. Here are the initial glued-up blocks ready for shaping.

so the fin/rudder surfaces are all one piece. Make sure the fin has a tab on the bottom that will go through the fuselage top and attach to the top of the stabilizer.

FUSELAGE

The fuselage is built in top and bottom halves and then joined. Begin by placing the stringers on the top view. Laminate (cross-grain), and cut out the balsa formers. Cut F1 and F4 parts from aircraft plywood then install all the F bottom parts

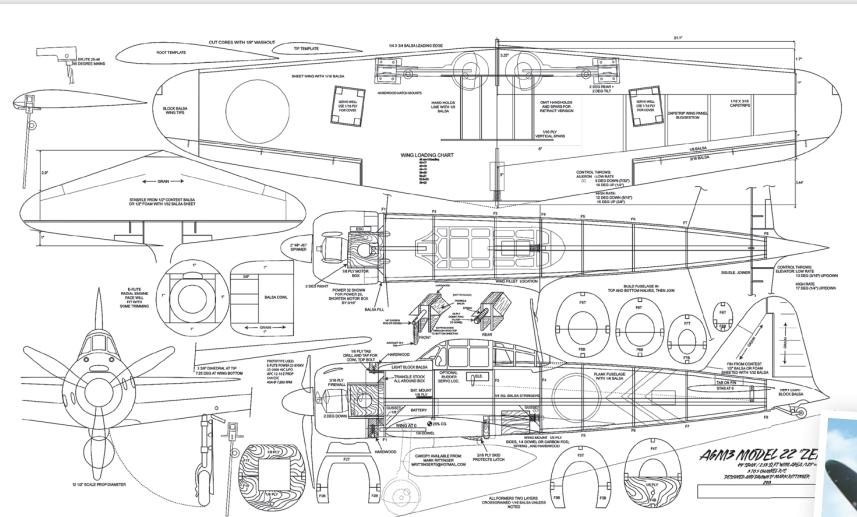
onto the side stringers and add the bottom rear stringers. Add the gussets against F1B and F4B. Be sure that they are 90 degrees to your building board and that the wing will fit in between.

Plank the fuselage bottom using light balsa strips with beveled edges, applied wet with medium CA on the formers, and with Titebond II on the plank edges. Wipe up excess glue so it sands nicely. When dry, remove from the board, and lay down new side stringers for the top half. Again,

place all the formers and the side stringers for the top half then add the top center stringer. Plank the top fuselage section leaving the cockpit area open. The top front in front of the canopy is done with a balsa block carved to shape. When the planking is done and dried, remove it the top from the board.

Make the elevator pushrod and install in the fuselage and connect it to the elevator joiner. It's much easier to install now. Glue the top half to the bottom half, making sure it is properly aligned. The F1 formers should match perfectly. Add the front top block and then sand everything nice and smooth.

Carefully mark the wing location on the fuselage sides, and cut the wing saddle out. Leave plenty of wood for fine-tuning the location for a nice fit. Once the wing is in position with 0 degrees of incidence, drill through the F1B former for the wing mount front dowel. Next, glue the 1/4-inch dowel into the wing. Using the plans as reference, mark the location of the stabilizer on the fuselage, cut out the slot and



Japanese A6M3 Zero | X0314A

Designed by Mark Rittinger, the Zero is an electric-powered fighter with traditional wood construction and foam wing cores. It features a quick wing release for fast battery changes. Rudder and retracts are optional.

Wingspan: 49 in.; Length: 38 3/4 in.; Power: E-flite Power 25; Radio: 3 to 5 channel; LD: 2; 1 sheet, \$19.95



To order the full-size plan, visit AirAgeStore.com



It takes a little work, but the cowling looks great and is very sturdy.



slide the stabilizer into place. Work a little at a time until it is straight and fits nicely.

Position the wing in the saddle and line it up with the release fitted in place. Mark the release pin's location through the cockpit opening, pull the wing off, and epoxy the release in place on the wing. This is why we didn't sheet above the wing/cockpit area. If you want wing fillets, now is the time to make them. I used the top view to make sure the fillet outlines are correct and build them up using small balsa formers.

Now build up the motor mount box and pay attention to how it's drawn. The firewall is captured in place for strength. The box is offset to the left, and there should be 2 degrees down and 2 degrees of right thrust with the propeller centered. Reinforce with triangle stock around the perimeter. Epoxy the firewall box to the fuselage. The 3S 5000mAh LiPo pack fits right into the box to keep the weight forward.

Now add the light balsa tail block, sand to shape, and cut the top fuselage slot for the fin tab. When all is in perfect alignment, glue the stabilizer in place first, then glue the fin to the fuselage and stabilizer. Use Model Magic filler or form fillets around the tail surfaces. Add the cowling attach points and the balsa filler around firewall. Install the elevator servo mount, battery tray and cockpit floor.

COWLING

The cowling is all balsa, with hardwood attach points. Using 1" thick light planks, cut the sides and top to shape. Add the 3/8-inch and triangle pieces then carve the cowling to shape. Leave the rear portion that goes against the model fully square, do not hold-



PHOTO BY BUDD DAVISSON/AIRBUM.COM

Dogfighting the Zero

When it was first introduced, it was considered the most capable carrier-based fighter in the world. It proved a very formidable weapon early on and it shot down many U.S. aircraft when they first encountered it in combat. After one was found crashed on Akutan Island, Alaska Territory, it was repaired and made flyable again so military experts could develop tactics to successfully take on this nimble little fighter. In 1942, instructions from the U.S. Informational Intelligence Summary were "Never attempt to dogfight a Zero. The Zero has superior maneuverability to all our present service type aircraft." That's quite a bit of instruction! Eventually, U.S. pilots learned not to engage the Zero in traditional dogfights, where the Zero was could out turn them, but instead to dive down from higher altitude to build up airspeed, fire their guns in quick bursts, and then zoom back up to altitude. Though more maneuverable, the Zero lacked armor plating for protection and were extremely fragile. With the new "Boom and Zoom" fighting tactics, the Zeros quickly lost their flight superiority.

low that part. Once shaped, remove material from the inside with a Moto-Tool and sanding wheel leaving about a 1/2-inch wall thickness.

Cut out a spot on the top and bottom for hardwood blocks, and glue them in place. Fit the cowling onto the fuselage, and drill the hardwood blocks for mounting screws. Tap the mounting holes with 6-32 threads, and attach the cowling. I also added an E-flite AT-6 radial engine face inside the cowling for scale looks.

FINISHING

I used Doculam laminating film covering on the wings. For the fuselage and tail group, I used Deluxe brand EZE-Kote and .4 ounce fiberglass cloth from SIG Mfg. This durable water-based finishing resin sands nicely, has no odor, and is not sticky. I applied three coats — a base coat, a glass cloth application coat, and a finish coat all sanded before and after each coats. The great thing is that it dries in 20 minutes! After a few light coats of automotive



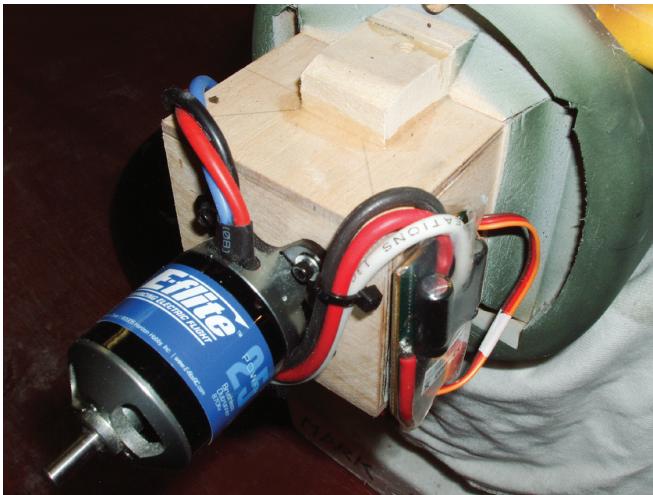
The finished cowling with dummy radial engine detail added. Notice the weathering.



Inside you can install any type of radio gear and servos. Plenty of room in the fuselage.



CONSTRUCTION A6M3 ZERO



The motor is attached to a motor box that is affixed to the firewall.



A little weathering and the Zero is looking like a real nice scale fighter.

"high buildup" primer and a sanding with 400 wet-n-dry sandpaper, I hinged all the surfaces in place. I then painted the cockpit area, add the pilot bust and glued the canopy in place.

After masking it with tape, I sprayed the whole model with Top Flite LustreCoat white primer. I then used an airbrush to apply Tamiya Acrylic paints using about 1 1/2 ounces of IJN Black-Green on top and the same amount of IJN Gray on the bottom. All markings are airbrushed. I drew all the panel lines on with a soft pencil, and added paint weathering/chipping with Tamiya Chrome-Silver brushed

on. A final coat of semi-gloss Tamiya clear spray sealed everything and the cowling was shot with a cheapo semi-gloss black spray paint. The markings are of Saburo Shindo's 582 Kokutai.

FINAL ASSEMBLY

Install the aileron servos and hook up the ailerons using 1/2A-size horns. Install the receiver with Velcro fastener and secure the speed control to the right side of the motor box. Install a 12x10 APC prop on the E-flite Power 25 870Kv motor, add the spinner and check the CG balance and control throws.

My Zero came in at 61 oz. with a 3S 5000mAh pack. It produces 430 watts with the 12x10 prop drawing 40A coming in with a power loading of 113W per pound. More than enough for this agile fighter!

IN THE AIR

Start with about five clicks of up-trim, and have a buddy hand launch the Zero into the wind with the nose up about 15 degrees. Get some air under the Zero's wings and trim it out for straight and level. The Zero does well at lower speeds, as the washout really helps. With quick thumbs, you might be shocked at how nice it'll handle when slowed down. It will not go to walking speeds — but then again few WW II fighters will!

The Zero loves to fly fast. For its size, the short nose and ample wing area give it excellent handling at full bore. While not a Pattern model, it does possess a nice set at high speeds, and control response is immediate. I suggest low rates at high speed, as the ailerons are large and the tail is rather short coupled.

Like the full-scale Zero, the model is quite aerobatic, even without a rudder. It does large loops, nice rolls, smooth inverted lines, and has great point roll performance.

Practice a "landing" at altitude to gauge its sink rate. Once on final, the model will remain pretty steady with a smooth descent. Always leave enough power in the pack for a "wave-off" should you need it!

I hope you enjoy the A6M3 Zero as much as I do. If you have any questions, or would like to order a canopy, contact me at mrittiner70@hotmail.com

Banzai! †

