



CONSTRUCTION

BY MARK RITTINGER PHOTOS BY JOHN KAUK & MARK RITTINGER

The Skoda-Kauba V4 is a unique design. Here, the airplane was photographed by John Kauk at the 2016 Mid-America electric RC event.



Skoda-Kauba V4

An early WW II fighter trainer you can build

As a builder and model designer, I'm always on the lookout for new scale birds that have nice lines, good moments, and an interesting history. My latest search uncovered the little-known WW II-era Skoda-Kauba (S-K) series of aircraft. Of all the aircraft produced in the series, the V4 had great possibility for a sport-scale RC model.

The model translated into a very good flier, and performed well enough to garner two Contest Director's Choice awards at the 2016 Mid-America electric RC event. Whenever Ken Myers or Keith Shaw gives an award, the model has to be a winner!

THE MODEL

I chose a 49-inch span so that the builder can use stock 48-inch wood for the wing. In addition, this keeps the project affordable at 1/6 scale. It also performs great with lower-cost power system setups. I'm using an E-flite Power 32 brushless motor, and I use half power most of the time. I have no doubt that the smaller Power 25 motor would also work very nicely. Initially, I built the wing with retracts in mind, but it soon became apparent that retracts strong enough for a model of this size were too large to fit the wing. For this reason, I eliminated the gear. The model can be hand-launched, or you can use a takeoff dolly to get it into the air.

Parts are shown on the plans for the retracts that I tried, but they would require some additional work to make fit; you're on your own if you insist on retractable gear.

Because this is not a beginner's airplane, I will limit myself to a discussion of the important and unique parts of the model's construction. You should have some scratch-building experience if you attempt to build the Skoda-Kauba V4. She performs great in the air but requires constant attention. If you've flown some faster warbird types, you should be OK as it was originally designed to train fighter pilots.

THE WING

The wing features foam cores covered in 1/16-inch balsa. It has a 4% airfoil camber, so it's nearly a symmetrical section. Construction is straightforward, with the exception of the handholds in the center section. Cut the foam wing cores (I use pink foam) using the templates shown on the plans. Cut them with



The wings are built with foam cores. I use pink insulation foam and cut them with the hot-wire technique. The templates for the root and tip airfoils are printed on the plans.



Here, the two wing panels have been sheeted with balsa. Notice the plywood joiner sticking out of the right panel.

2 inches of dihedral and 1/8 inch of washout per tip. Carefully cut out the handhold portions and the servo wells, and notch the cores for the plywood spar. Sheet the wings top and bottom, then cut (drill) the servo wire troughs with a 1/2-inch aluminum tube. Attach the trailing edges and glue the two panels together, then add the plywood leading edge at the center of the wing. Wrap the centerline with fiberglass cloth and resin. Cut the ailerons free of the wing, then face them and the wing accordingly with balsa sheet. Add the wingtips, with the grain running spanwise root to tip, then sheet the inside of the handhold wells with balsa.

THE FUSELAGE

The fuselage is all balsa and aircraft plywood construction, with the framework built upside down on the board. It is then sheeted or planked. It's not super complicated but requires attention to avoid twisting it out of alignment during sheeting. Also, all the stringers and longerons must be closely matched in grain stiffness to avoid twisting issues. I used medium-grain balsa throughout.

Using the 1/4-inch-square longerons as a starting point, build the basic framework upside down on the board. After installing formers and bulkheads F1 through F4 and F6

through F9, add the 1/4-inch-square stingers and the 3/8-inch-triangle stock. Remove the framework from the board, and bevel the top longerons to match the fuselage contour. Pin it back onto the building board, and use light- to medium-grain 1/8-inch balsa to sheet the sides. The actual side pattern toward the nose is shown as a dotted line on the plan side view. Some trimming is needed to get it perfect.

Remove the fuselage from the board again, add the top turtle-deck formers, and then sheet or plank that area. Add the stabilizer mount block at the rear of fuselage, then cut and sand it to shape. Add the nose block and



The model is a moderate size, making it easy to transport in one piece.

Specifications

Model: Skoda-Kauba V4
Type: Sport-scale WW II fighter trainer
Wingspan: 49 in.
Wing area: 380 sq. in.
Weight: 52 oz.
Wing loading: 19.7 oz./sq. ft.
Radio req'd: 4-channel
Motor req'd: 25- to 32-size brushless motor

Control Throws

Elevator: Low rate-5/32 inch up/down; high rate-1/4 inch up/down
Rudder: Low rate-3/4 inch left/right; high rate-1-inch left/right
Ailerons (at root): Low rate-1/4-inch up/down; high rate-5/16-inch up/down

Gear Used

Radio: Hitec Eclipse 7 Pro transmitter, Optima receiver, four HS-65 HB servos (hitecrcd.com)
Motor: E-flite Power 32 brushless w/ E-flite Pro 60-amp speed control (e-fliterc.com)
Battery: Pulse 4S 2250mAh LiPo (taillagrerrc.com)
Propeller: APC 11x8 E-prop (apcprop.com)

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Here, the wing has been mated to the fuselage structure, which has the side sheeting in place.

After the sides are sheeted, you add the turtle-deck formers to the top aft part of the fuselage and then add the sheeting.

Make sure to install the formers and bulkheads properly. The firewall must be installed with side-and down-thrust offsets.

install the firewall, with 2 degrees of right thrust and 1 degree of down thrust. Now sheet the bottom rear of the fuselage. Cut and install the 1/4-inch plywood wing mount plate, and fit the wing into the saddle section with 1 degree of positive incidence. Drill the dowel hole in the wing, then add the lower front block and fit the wing in place in order to drill the two holes for the 1/4-20 wing hold-down bolts. Install the wing, and build the lower belly pan under the

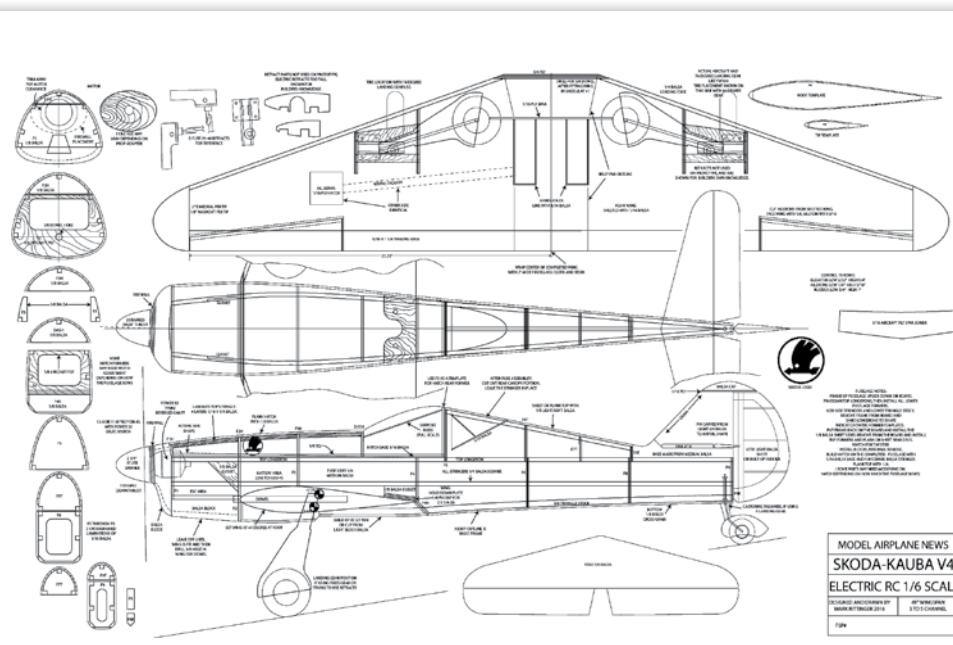


wing. Sand everything to shape, cut out the rear windows, and start building the hatch.

THE MAIN HATCH

The fuselage hatch is fairly large and is built using a floor, stringers, and planking. Build the hatch in place on the fuselage structure using 1/16-inch balsa for the floor, with the grain running crosswise. Using the H-formers, 1/8-inch-square balsa, and a laminated top

stringer, frame out the hatch cover and plank it using 1/8 x 3/8-inch-wide balsa strips. Some of the hatch formers might need to be adjusted in width in order to fit smoothly. To fill out the cockpit, I used a Williams Brothers 1/6-scale pilot bust and instruments from Aero Team. The canopy is made from a portion of a SIG WW II bubble canopy. The hatch cover is held down using four strong rare-earth magnets.



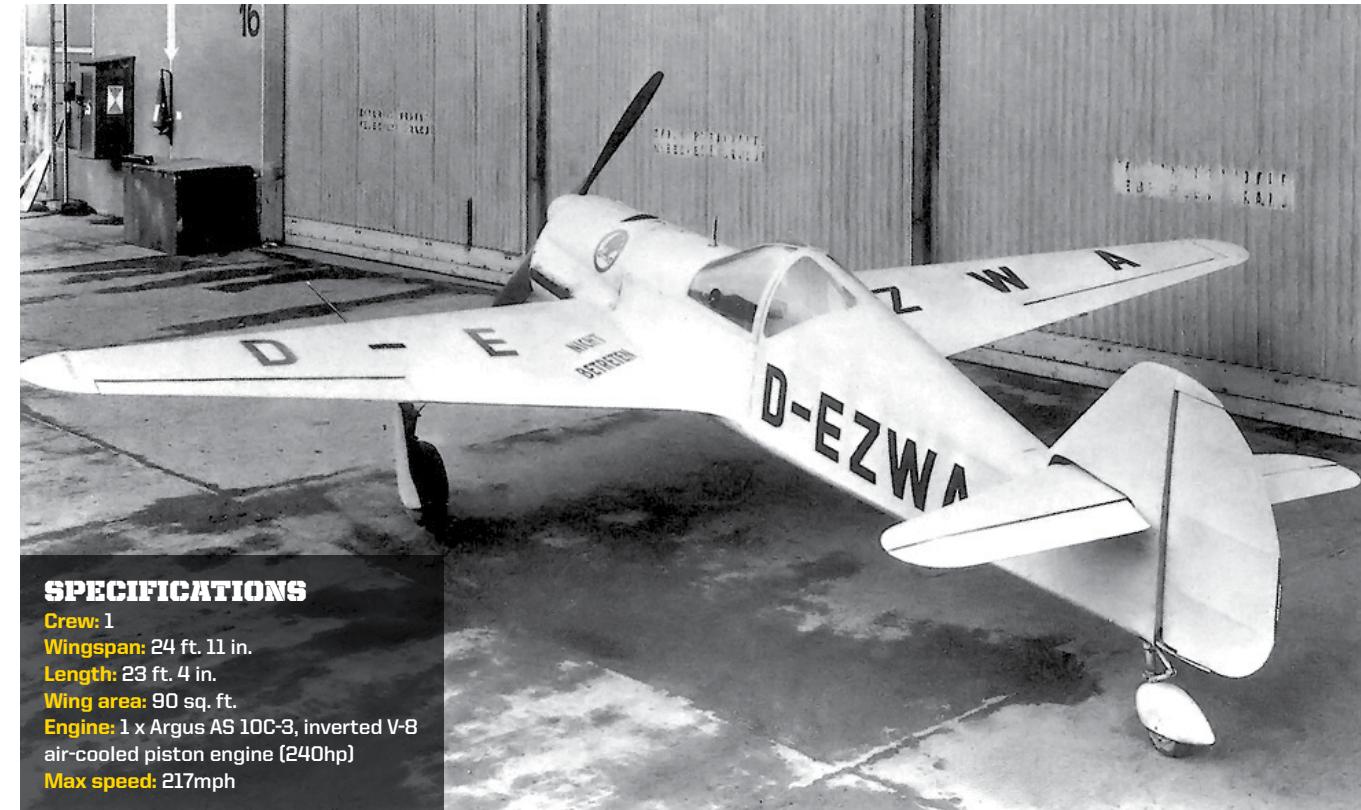
Skoda-Kauba V4

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Designed by Mark Rittinger, the Skoda-Kauba V4 is an early WW II German fighter trainer aircraft with a highly tapered leading edge. It is not for beginners and requires an experienced pilot. It has foam-core wing construction and a built-up wood fuselage. The plans show the airfoil templates for cutting the wing cores. WS: 49 in.; Power: E-flite Power 32; Radio: 4-ch.; LD: 2; 1 sheet; \$16.95



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



SPECIFICATIONS

Crew: 1
Wingspan: 24 ft. 11 in.
Length: 23 ft. 4 in.
Wing area: 90 sq. ft.
Engine: 1 x Argus AS 10C-3, inverted V-8 air-cooled piston engine (240hp)
Max speed: 217mph

The Skoda-Kauba V4

Built by Avia as a fighter trainer in German-occupied Prague, Czechoslovakia, the S-K V4 was designed by Otto Kauba. Its highly tapered wing gave it the looks of a Rivets racer, and its inverted V8 240hp "Argus" powerplant made for a standout bird, both interesting and different. Built from nonstrategic materials, it used a tubular main wing spar that was tapered toward the wingtip. The ribs were welded into place, forming the basic wing framework, which was then covered with plywood. The fuselage featured welded steel-tube frame construction and was also covered with thin plywood. The V4 also featured an electric-powered horizontal stabilizer trim system.



Here, the nose block and the front of the airplane has been shaped and sanded smooth. The spinner is used as a guide to get the nose block shaped properly.



With the hatch cover (which includes the canopy section) removed, there is excellent access to the interior to allow you to get to the radio and power-system gear.

TAIL FEATHERS

The stabilizer and the vertical fin are all made out of balsa. The horizontal stabilizer is 1/4-inch light-grain balsa with a wire elevator joiner. The vertical fin is made with 1/2-inch light balsa; using a razor plane, it is tapered to an airfoil shape. The rudder can be built up to save weight, or it can be made with solid light balsa. The horizontal stab should be set to zero degrees.

FINAL ASSEMBLY

Install the E-flite Power 25 (or Power 32) motor with the shaft reversed, using a 2 1/4-inch E-flite spinner and a 60-amp speed control. Put in the servos, receiver, and other related radio gear. To cover the bird, I used Gloss Dove Gray MonoKote overall, and then added yellow bands (honscale) to aid in visual orientation. The lettering is flat black MonoKote. Set the initial center of gravity (CG) at a forward point of 22% of the mean aerodynamic chord. Once you establish the proper battery placement, build a flat deck on the wing center and secure your battery pack to it. The model likes a forward CG, so start flight testing at the 22%



Because I did not install retracts, I added the detail of the landing gear in the retracted position, by drawing it on the wing.

balance point. You can always work it back to your liking later. The position might look "off" on the plan side view, but this is due to the highly swept leading edge.

IN THE AIR

Ready to fly, the prototype came out at 52 ounces with a 4S 2250mAh "Pulse" LiPo battery pack. Flying with the Power 32 motor, a 11x8 APC E-prop, power is at 37 amps and 550 watts. It has also flown with a 12x8 APC E-prop at 43 amps and 620 watts. I cruise around at one-half to two-thirds power and land at three minutes with about half a pack remaining.

Before you launch, double-check your CG, control throws, and directions (i.e., left is left, up is up, etc.). A dolly takeoff is fairly straightforward, but having a friend hand-launch for your first flight is best. It required a firm toss at a 30-degree nose-high attitude. Thrown firmly, wings level, it might drop the left wing a bit, so be prepared. After a few times, it becomes a nonevent.

The SK V4 will slow down surprisingly well. This is more than likely due to its airfoil thickness. Try slow-speed flight at altitude.

before your first landing. If slowed too much, the left wing will drop abruptly! You can thank the wing sweep and tiny tips for that.

The model has a very "clean" airframe, and it retains speed well. It grooves nicely at speed and handles well on low rates. The SK V4 looks the part of a WW II trainer aircraft, and it flies like a fighter. It's rock solid at the top end, with plenty of control authority.

With a 4% camber airfoil, the bird likes to do aerobatics, including fast and slow rolls as well as point rolls and figure-8 maneuvers. Inverted flight is no problem. Just about anything a warbird would do, it can do also.

Coming in for a landing is simple. Leave enough battery power for a go-around if needed. Keep in mind that it likes to retain speed, so set up your final a bit longer than normal and bring in straight into the wind. The rudder is very effective to adjust for any crosswind.

BOTTOM LINE

I really loved building and flying this unique bird. I hope you enjoy your Skoda-Kauba V4 as well. If you have any questions, feel free to contact me at mrittinger70@hotmail.com. 