

THE STRIKE

This latest version in the author's series of sport flyers is powered by an electric ducted fan!

THE STRIKE IS AN electric ducted fan (EDF)-powered version of my original Strike design. I basically took the original version and spread its fuselage about 4 inches to accommodate a Himax brushless motor and ducted-fan assembly. The Himax ready-to-run brushless ducted-fan power package (no. EPF698BL) has an impeller diameter of 69mm and an outside diameter of 73mm. The EDF length is 2.5 inches, not including the end of the motor or the impeller hub, and the weight is about 7.5 ounces. It uses a HA2825-3600 motor and the thrust is just over 28 ounces using a 3-cell LiPo pack and drawing about 35 amps. The battery is located under the canopy hatch for balancing purposes.

Construction starts with the wing panels. Cut out all of the ribs as shown on the plans. Place your plan set on a flat and level building table and protect them with a layer of wax paper or some clear plastic food wrap.

Position the ribs as shown on the plans and hold them in place with pins and weights. Make sure they're square to the building surface. Add the square balsa trailing edges of the aft ends of the ribs and pin in place. Place the square balsa leading edge into the notches at the front of the ribs. Glue the leading and trailing edges in place with CA. Slide the square balsa wing spar in place and allow at least 2 inches to protrude from the R1 rib, and glue the spar in place with CA. The exposed spar will be tied into the fuselage structure later in the assembly process.

Remove the wing panels from the building surface and cut off the alignment tabs from the bottom of the ribs. Fit the top and bottom leading and trailing edge sheeting in place and glue with CA. Glue the aileron servo platform sheeting in place on the bottom of the wing panel. Glue the plywood aileron servo and hold down strips to the platform sheeting as shown on plans and

SPECIFICATIONS

MODEL: The Strike
DESIGNER: Joe Beshar
TYPE: Electric ducted fan
WINGSPAN: 37 1/2 in.
LENGTH: 28 1/4 in.
WING AREA: 367 sq. in.
WEIGHT: 32 oz.
WING LOADING: 12.56 oz./sq. ft.
RADIO: 3-channel (elevator, throttle, aileron)
POWER: 30 to 40A brushless motor w/70mm EDF unit

GEAR USED

RADIO: Airtronics RD 8000 transmitter, Airtronics 92778 receiver, three Airtronics 94407 servos
BATTERY: Polyquest 3-cell 2150mAh 20C LiPo
ESC: Dymond Model Sport 40A ESC
Motor/ducted fan: Himax EPF698Z brushless motor w/Himax EPF698BL RTR EDF unit

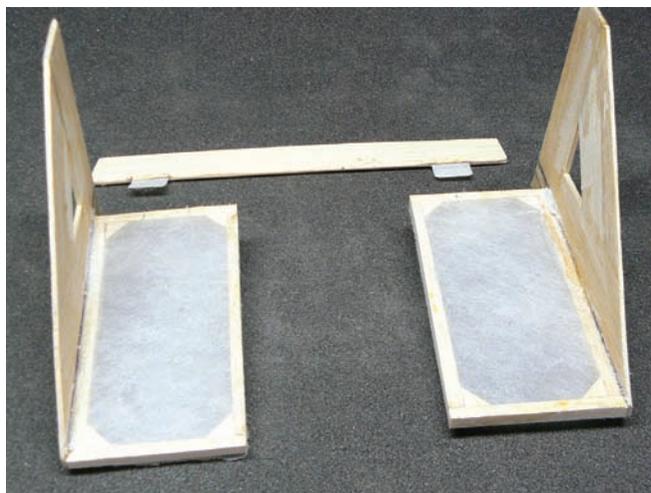
then glue all the rib capstrips (top and bottom) in place between the leading and trailing edge sheeting. The wingtip can be made from white, pink or blue insulation foam and carved and sanded to shape. Cut, trim and sand the aileron stock to blend into the wing's trailing edge. Sand smooth and then install the aileron hinges, but do not glue them in place until the covering has been applied.

TAIL SURFACES

These are very straightforward and easy to



The wing panels are easy to build and easy to assemble. There are building and alignment tabs on the ribs to keep them straight during construction. These are removed before sheeting is installed on the wings.



Here are the tail surfaces. Make sure the fins are glued on square to the horizontal stabilizers. There are no rudders.

**NO SPECIAL ABILITIES ARE
REQUIRED TO MANAGE THE
STRIKE. IT'S A STEADY FLYER
AT CRUISE SPEEDS**

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build and install. Cut the balsa material to form close, tight-fitting glue joints, as shown on plans. Reinforce the corners with the gussets as shown in the top view of the plans. The two vertical fins are cut from 1/8-inch balsa sheet; make sure all the glue joints are square and gap free. Be sure that both fins are the same. The horizontal stabilizers and fins will be glued into place with CA after the wing panels have been glued to the fuselage. When they are assem-

bled into place, the ends of the stabilizers are glued to both the wing's trailing edge and the fuselage sides. The elevator is cut from the same stock used to form the ailerons. It should fit between the fins with a slight gap at each end. There are no functional rudders shown on the plans.

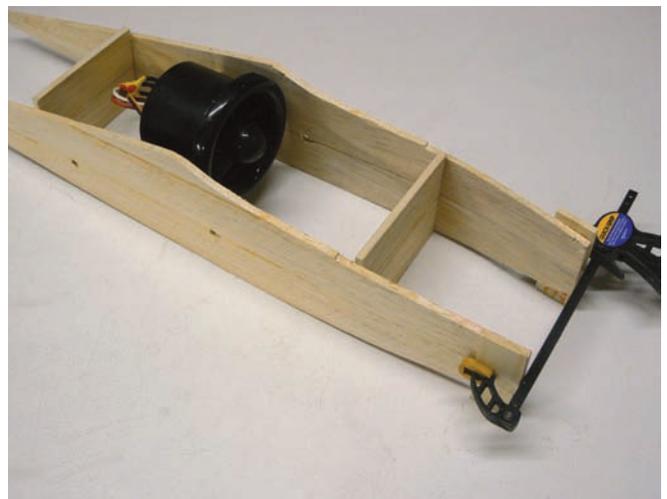
FUSELAGE

The fuselage is very simple; it consists of basically the two fuselage sides, a couple of

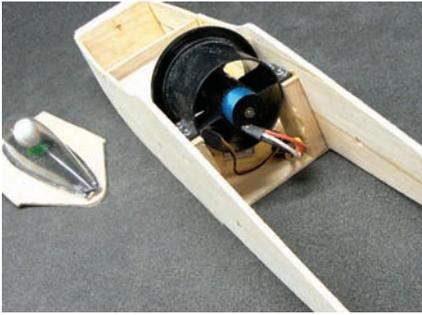
formers, some bottom sheeting and a top hatch cover. The two fuselage sides should be cut from 3/16-inch sheet balsa. The Himax brushless motor and fan assembly and its motor mount rails determine the width of the fuselage. If you use a different power system, you can adjust the width of the fuselage structure accordingly. The two mounting rails should be glued to the inside of the fuselage sides so the EDF unit sits level with the fuselage centerline. Dur-



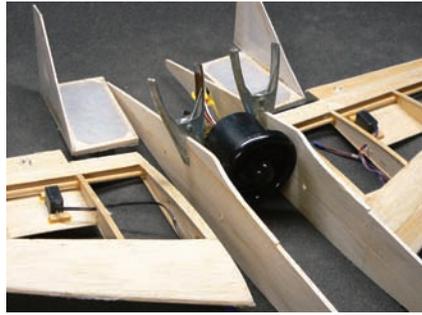
The width of the fuselage is determined by the size of the ducted fan unit you use. Here the motor mount rail and spacer have been screwed to the attachment tab on the EDF unit.



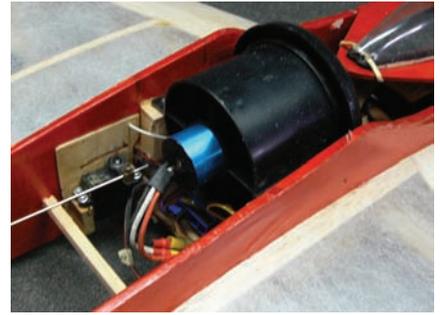
Here, the fuselage sides are being glued in place around the EDF unit. Temporary spacers are in place to keep the sides straight as the glue dries.



Here's a rear view of the completed fuselage assembly. The bottom is sheathed with balsa from the EDF unit forward and the top is closed with the hatch/canopy assembly.



Here all the major parts are being aligned and made ready to be glued together.



Nothing complicated with the Strike. The elevator servo is out in the open, just behind the EDF unit. Notice the wing spars joined together just aft of the servo.

ing construction, you can also adjust the position of the EDF forward or aft slightly to help fine-tune your model's balance point. The position shown on the plans works for the HiMax unit I used.

Make some assembly spacers to hold your EDF unit level and square to the workbench, then set the EDF unit in place over the plans. Clamp and glue the fuselage side members to the mount rails and the spacers. Use temporary former supports to keep the fuselage sides straight and square, then glue in the front former and the cross-member just in front of the EDF unit. Glue the lower cross-grain fuselage sheeting in place and then cut the removable top hatch from

1/8-inch sheet balsa and mock up your canopy and pilot installation.

FINAL ASSEMBLY

The square openings in the sides of the fuselage that accept the wing spars should be cut slightly oversize so you can adjust the alignment of the two wing panels. Place the fuselage and wings on a flat surface and measure the distance from the leading and trailing edges to the work surface to ensure both panels have the same zero degrees of incidence. Once you're sure everything is straight and properly aligned, glue all of the components together. But glue the ends of the spars together and add a doubler to

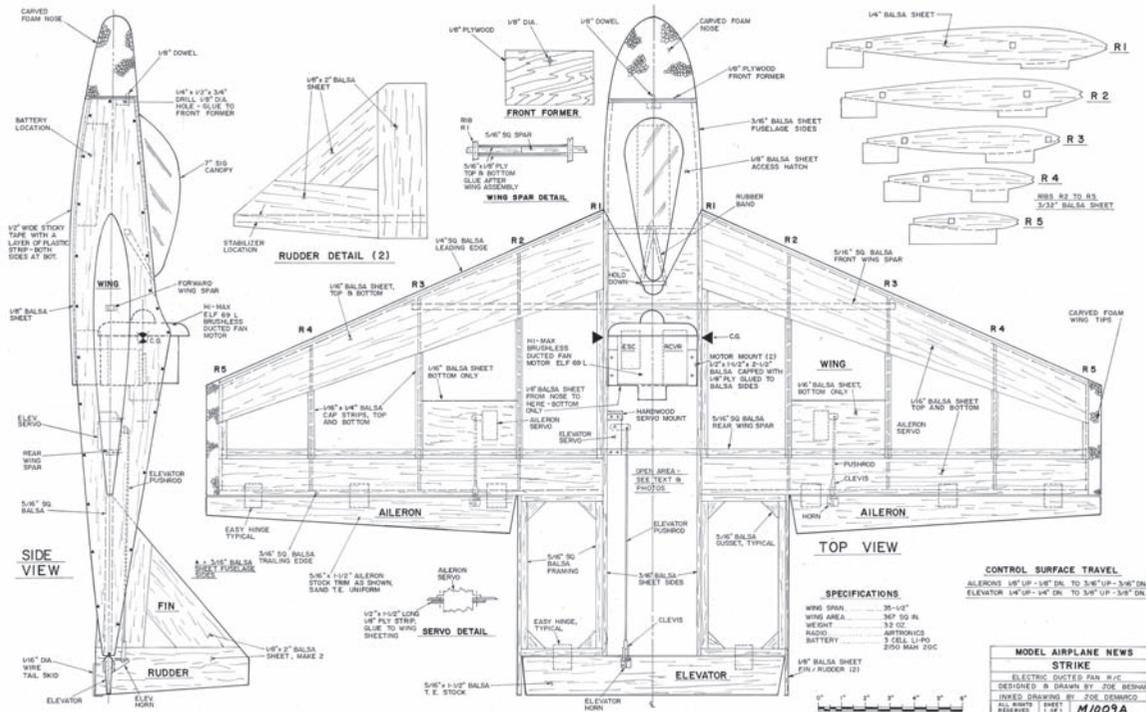
strengthen the joint. The horizontal stabilizers should also be set at zero degrees of incidence and the fins should be glued in place so they're square to the stabilizer and wing panels.

The elevator servo is located just aft of the EDF unit and the servo mount is glued to the inside surface of the fuselage side. Now, complete the power wiring and install your radio and ESC and install the pushrods and control horns.

COVER AND FINISHING

Cover the model with your favorite covering material, the one you are most comfortable with. Just remember, the

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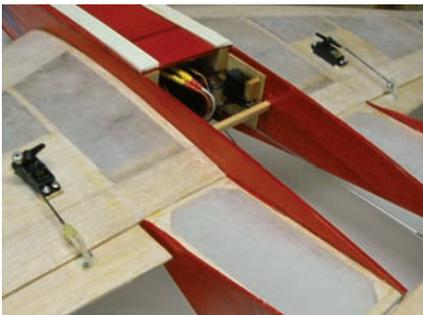


lighter the better—I used Coverite Micafilm. After covering is complete, assemble and glue in the hinges. To hold the main hatch cover in place, I installed a $\frac{3}{16}$ x $\frac{1}{2}$ -inch balsa cross member and looped a no. 62 rubber band hatch to hold down the aft end of the hatch. The front of the hatch is secured with an alignment dowel. The bottom floor is coated with Coverite's Balsarite as a sealer. The battery, receiver and ESC are all held in place on the floor with Velcro. For additional strength, I attached two plastic landing skids along the fuselage bottom sheeting with double-sided tape.

My method for balancing the Strike is to bend a length of soft wire into a U-member with the ends bent inward about $\frac{1}{2}$ inch. This fits into two $\frac{1}{16}$ -inch holes drilled at



Plenty of room under the hatch for the battery pack.



Aileron servos are out in the wing panels, just in front of the control surfaces making the control linkage short and stiff for good response.

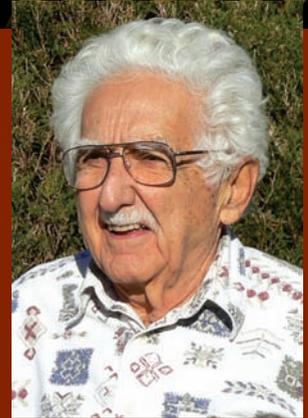


I checked the model's balance with a piece of wire bent like this and inserted into holes in the side of the fuselage. Works great!

ABOUT THE AUTHOR

**JOE BESHAR:
DID YOU KNOW?**

Joe Beshar of Oradell, NJ, has been an active supporter of model aviation for more than 50 years. He has served as president of various modeling clubs as well as the Society of Antique Modelers (SAM) from 1975 to 1978. He has authored dozens of modeling articles in various publications including *Model Airplane News* and our sister publication, *Backyard Flyer*.



Joe, when did you first get started in the hobby and what was your first model?

JB: I built my first flying model in 1938 when I was 15. It was a Curtiss Hawk P6E and a summer camp counselor helped me build it. The hardest part was covering the wings. A year later, I joined my first modeling club, the East Paterson Model Airplane Club in New Jersey.

When and where did you get started in competition flying?

JB: My first contest was in 1939. It was a Free Flight contest sponsored by the Skyscrapers in Creedmore, NY. I placed first in Class-B with a Comet Mercury powered by an Ohlsson 23 ignition engine. I didn't get involved in national competition until 1975. It was the AMA Nats and I placed first in the Old-Timer class.

You've been very active in developing the RC hobby, as well as assisting the AMA acquire new flying fields across the country. Tell us a little more.

JB: Well, it was February 2005 when I started communicating with the Environmental Protection Agency (EPA) in Washington, D.C. I eventually succeeded in getting the EPA to write a Memorandum of Understanding (MOU) that in effect, defined an alliance with the AMA to use previously closed EPA Superfund sites as model airplane flying fields. The program has been very popular with clubs and local municipalities.

In 2008, I came up with the idea and developed the "Fly the RC Adventure" program. This is an educational course for high school students describing how to learn and participate in model aviation.

the CG location shown on the plans. Adjust the position of your radio and battery pack so the model balances level while suspended by the U-member.

IN THE AIR

Hand launching the Strike is easy. Just add some up-elevator at the start and slowly neutralize elevator input as the model gets up on step. I asked my buddy Steve Perl-binder, who is the most prolific RC pilot at our flying field, to test fly the Strike. The plane was been flown in both light and moderate winds and it has no tendency to tip stall after the hand launch. Acceleration to flying speed is quick and smooth with no control trim problems. The model is pitch sensitive and requires very little elevator

throw to achieve elevator authority. Exponential is recommended on both elevator and aileron. Fourth percent expo was used successfully during test flights. At full power, the speed of the model is more than enough for the average pilot. One characteristic to keep in mind is the need for smooth up-elevator control input during landings. This is necessary to keep the nose from suddenly dropping as the power settings are lowered. Best results are with a good glide angle to maintain glide airspeed until the model is within a few feet of the ground. Then add up-elevator as needed to hold the model level. The Strike is intended for the intermediate pilot skill levels. No special abilities are required to manage the Striker. It's a steady flyer at cruise speeds. ✚