

## TWIN JET JOB

An easy to build and fly profile foam sport flyer powered by twin electric ducted-fan units

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SEVERAL YEARS AGO, I made an electric ducted-fan powered airplane. At the time, I used two of the GWS EDF-50 units to get sufficient thrust for reasonable performance. I went with an under-cambered airfoil wing and tried to keep the plane light, as those early EDF units didn't provide too much thrust. Flight performance was okay, but the brushed motors in the fan units didn't stand up too well to the demands of EDF use. After burning out several pairs of motors, my jet plane soon ended up just sitting in the workshop.

Recently, with brushless motors, ESCs, and higher drain LiPos being more readily available and at lower prices, I retrofitted my EDF-50 units with 3-blade fan units, Feigao brushless motors and Castle Cre-

ations ESCs. That same airplane now had so much thrust that the model's aerodynamics were no longer suited for the job—an under-cambered airfoil isn't a good choice for higher-speed flying with plenty of power. So, I happily went back to the drawing board to start a new project: another jet-style airplane to utilize the better-performing EDFs.

The new Twin Jet Job is still an easy-build, small-sheet foam project; it's kind of at the lower end of foamie/EDF jet airplane complexity. To keep it simple, it has no full fuselage or enclosed fans. But it does fly very well and is relatively low priced for the technology involved. And best of all, it is a true EDF jet with no propellers around.

I drew out a 30-inch span wing with about 225 square inches of area. The fuselage is 26 inches long. The design was influenced by the latest jet fighter aircraft, but I wanted a straight wing and conven-

### SPECIFICATIONS

**MODEL:** Twin Jet Job  
**DESIGNER:** Dick Sarpolus  
**TYPE:** foam EDF sport jet  
**WINGSPAN:** 30 in.  
**WING AREA:** 225 sq. in.  
**WEIGHT:** 9 oz.  
**WING LOADING:** 6 oz./sq. ft.  
**LENGTH:** 26 in.  
**RADIO:** 4-channel (aileron, throttle, elevator)

### GEAR USED

**RADIO:** Spektrum DX6 transmitter; 3 GWS Naro H/BB servos ([horizonhobby.com](http://horizonhobby.com), [gwsusa.com](http://gwsusa.com))  
**ESCS:** 2 Castle Creations Thunderbird-9s ([castlecreations.com](http://castlecreations.com))  
**MOTORS:** 2 Feigao 1208428L brushless (BPHobbies.com)  
**FAN UNITS:** 2 GWS EDF-50 with 2030 3-blade impeller fans  
**BATTERIES:** Two, 3-cell 11.1V 450mAh E-Tec LiPo (BPHobbies.com)

tional layout, nothing aerodynamically strange. The plane is built mostly from Dow BlueCor "fanfold"  $\frac{3}{16}$ -inch insulation foam that's used under vinyl or aluminum house siding. Some  $\frac{1}{4}$ -inch square spruce is used for stringers, and a bit of  $\frac{1}{64}$ -inch plywood in high-stress areas is used for added strength. The way the model is designed makes it very easy to build straight and properly aligned. After it is painted, this ready-to-fly model's weight is only about 9 ounces, which gives it a 6 ounce/square foot wing loading—not bad for a jet!

There are only 12 parts to be cut out of sheet foam for this project.



The major subassemblies including the wing, spar, stabilizer and filler pieces—all glued together. The ailerons and elevator have been hinged into place and the upper and lower fuselage pieces are ready to be glued in place.



# A GREAT FIRST JET FOR ANYONE WANTING TO TRY A JET MODEL ON FOR SIZE



The basic airframe is fully assembled and ready for equipment installation.

through the wing panels, and the elevator servo is glued to the underside of the wing. I used hot glue to hold the servos in place. The two ESCs, the receiver and the two LiPo battery packs are held in place with Velcro tape; for extra security, a Velcro strap is also wrapped around the battery packs.

I applied water-based acrylic craft paint to the plane using a small airbrush. I found that thinning the paint with alcohol rather than water worked much better for spraying. There's less runs and less clogging of the airbrush. Some panel lines applied with a fine-tip marking pen provides enough finishing details for me.

The exact equipment I used included two GWS EDF-50 fan housings, the GWS 2030 3-blade impeller fans, two Feigao 1208428L brushless motors, two Castle Creations Thunderbird-9 ESCs and the E-Tec 3-cell 450mAh LiPo battery packs. I used GWS Naro H/BB servos. I obtained all-power system hardware from BP Hobbies and my radio is a 2.4GHz Spektrum DX6 DSM2 spread spectrum system.

## ON THE BUILDING BOARD

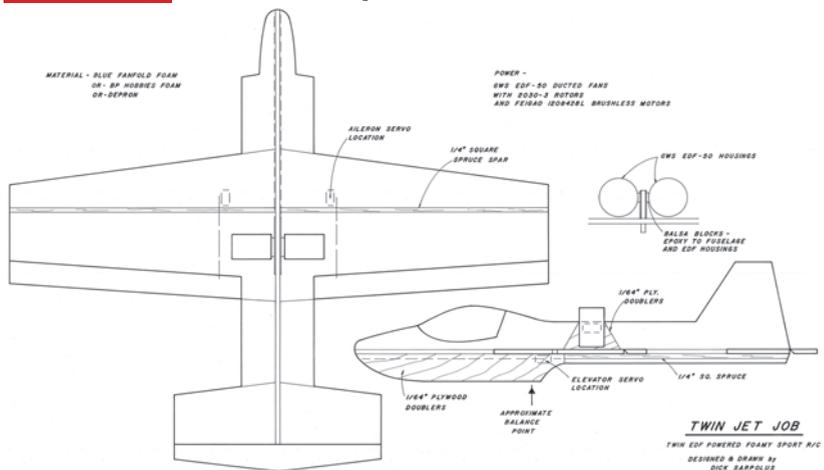
Construction starts by cutting out all of the sheet foam parts. To do the cutting, I used paper patterns, a metal yardstick for a straightedge and a sharp modeling knife. I glued the wing panels and spruce spar together with five-minute epoxy on a flat work surface. Bevel the leading edges of the ailerons and elevator and hinge the control surfaces in place with clear packaging tape applied on both sides. I then glued the wing and stabilizer together with the filler pieces; again, I did everything on a flat work surface, and aligned the pieces over a copy of the plans.

Next, I assembled the lower fuselage half with its spruce stringer and plywood doublers. With the wing and stab assembly upside down on the workbench, I added the lower fuselage half and aligned it straight down the model's centerline. Remove the assembly from the workbench and then add the upper fuselage half to finish the airframe.

## POWER SYSTEM AND RADIO GEAR

The plastic EDF housings are glued directly to the fuselage and reinforced with balsa spacer blocks. The aileron servos are inserted into tight-fitting holes that are cut

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## 150 DESIGNS AND COUNTING!

From 1/4-scale models to simple foamies like the Twin Jet Job, Dick Sarpolus's designs are always a hit. We sat down with him to find out how he stays inspired.

*When did you start your career as an RC author and designer?*

**Dick Sarpolus:** In the early '70s I found it was fun to write magazine articles about the stuff I was doing, and went on to do more than 500 articles in most all the magazines, including about 150 aircraft design/construction articles. Hey, the first full construction article I had was in *MAN*, followed by quite a few others over the years.

*Model Airplane News: What keeps your creative juices flowing?*

**DS:** I've always been excited by the latest technology; I don't keep old engines or equipment for nostalgia, I like the latest and greatest stuff. It's been so much fun to see the technology



The author shows off his handy work. He loves his Spektrum DX6 DSM2 2.4GHz radio system

advance over the years: engines, glow, Schnuerle-porting, more power, better carburetors, 4-cycle...good stuff! Gas engines, great, bigger airplanes...great stuff! I had a turbine; it was fun, but I want to keep things simpler than turbine power. I tried electrics early in the game when it was all too heavy, then watched and waited until brushless motors and LiPo batteries came along and got back into it.

*MAN: What do you like best about building with sheet foam?*

**DS:** As it got harder to get the big heavy airplanes up and down the cellar workshop stairs, I went to sheet foam electrics. It's just so easy to experiment and try many different designs. I find the new airplane ideas keep coming along, but it just takes a while longer to get them done. I like to start a project on a clean sheet of paper, lay down the pencil lines, get the material, cut out the parts, build the thing and get it out there to fly. A day of

good flying along with hamburgers, chili, sausage and peppers, other airplane guys...what more could you want?!

If you want to give EDF jet flight a try, I think you will find this a fun, very easy-to-build project. The Twin Jet Job's flight performance is impressive and everything is readily available—no exotic, high-priced equipment required!

### IN THE AIR

This is, of course, not a screaming fast jet model. It's a sheet-foam profile project that uses low-cost, small, lightweight ducted-fan units for power. But it flies easily and reliably, and a normal straight-ahead hand launch is all that's needed to get it in the air. Like a real jet, large radius, smooth turns are the best way to fly and at relatively high speed, a diving, straight pass looks good. It will loop from level flight without a problem, and while straight-up vertical flight is very limited, a shallow dive to pick up some more speed will produce a nice, rapid climb. Inverted flight? Again, there's no problem. As with any ducted-fan jet, it doesn't like hard, tight turns; but trading altitude for added speed, you can do some good-looking stuff.

With its large wing area and low wing loading, landings are easy. Use a power-on

approach and then cut the power as it gets closer to the ground. You can drop it in wherever you want. The Twin Jet Job doesn't make a great glider, should you fly it until the battery power shuts off. However, it's easy to get the model back down on the ground safely. I fly it with either a 450mAh

or a 700mAh LiPo battery pack; the smaller pack provides about three to four minutes of flight time, while the larger pack gives you a few minutes more. The added weight of the larger pack does cut down a bit on the model's climb performance. Have fun! ✚



This closeup shows the twin EDF installation. The ducted-fan unit housings are simply glued into place with epoxy onto balsa support blocks that are in turn, epoxied to the plywood doublers on the sides of the fuselage.