

McDONNELL F-4 PHANTOM II by Dick Sarpolus



Here's another easy to build and fly electric foamy profile, another warbird, but this time it's a JET. Fighter planes must be the most popular warbird subject for modelers. And now that we have easy to use and powerful electric ducted fan (EDF) units, we can without much trouble model the jet fighters.

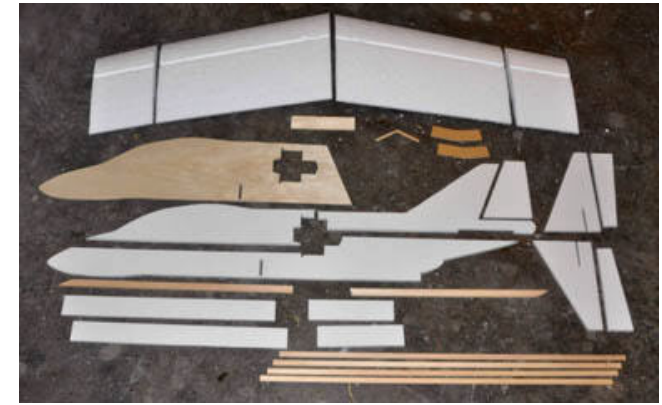
I had done a bunch of electric profile foamy warbirds, but I wondered if today's EDF units would be compatible with the profile fuselage layout. I tried it, and found that simply cutting a hole in the profile fuselage for the EDF unit worked fine.

I'd think it would be quite inefficient for the airflow going into the fan and for the exhaust blowing out of the fan, but apparently the EDF units produce so much thrust that the planes fly just fine anyway. Compared to the motor and prop we usually would use on the nose of the airframe, the EDF-equipped planes, about the same size and weight, fly faster and perform overall at least as well.

And, as a side benefit, we found that on fairly short dry grass, the EDF planes would simply slide across the field and jump into the air. Who needs landing gear!

For a new project, I looked at the McDonnell F-4 Phantom II. A lot of jet fighters are described as clean, streamlined, sleek machines that just look like they're going fast. I don't think many would describe the F-4 this way; rather, it would be called a flying tank, kindly, a rugged, heavy duty fighting machine.

The great thing about the F-4's history is that it was so successful! Flown by the Navy, the Marines, and the Air Force, it did a great job, for a long, long time, and it was built in large numbers. More than 5,000 F-4s were produced and that is quite a record. With so many having been around, there are a lot of choices in color schemes, camouflage, etc., to use in finishing your F-4.

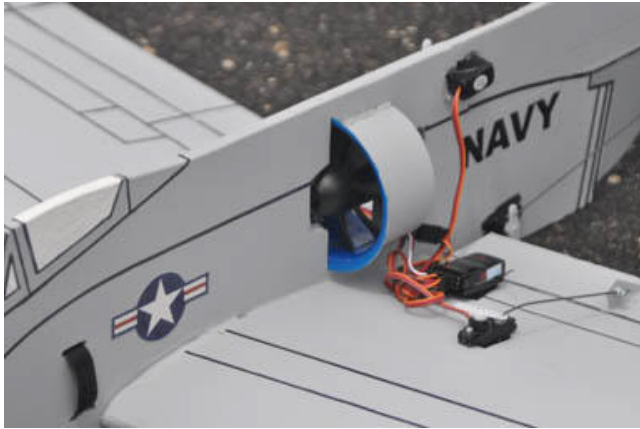


This model is built using sheet foam for the profile fuselage and tail surfaces, but uses a hot wire cut foam wing for what I think provides better flying characteristics than a flat plate wing.

I've done a bunch of warbird models using a basic foam wing layout, with a thick symmetrical airfoil and a slightly tapered planform. The real F-4 Phantom has a highly tapered wing, almost a delta wing – but I wanted to use that basic foam wing for its known easy flying characteristics, if I could make the plane still look sorta scale.

I think it works; if this airframe looks close enough to scale for you and you like the F-4, try this EDF jet fighter model. If you don't do your own hot wire foam cutting, The Core House has a





computerized cutting setup for my basic wing, which they cut to a 24" length.

You trim the cores for the proper length, planform, and tip shape. In the case of this F-4, I cut the tips and glue them on at an angle to add to the scale appearance.

Any of the available sheet foams will work, such as Depron, Midwest Cellfoam 88, the blue house insulation foam, or BP Hobbies foam. I cut the sheet foam parts out with a sharp scalpel-type modeling knife and the aid of a metal straightedge.

The 1/32" plywood fuselage doublers add a lot of strength and are needed for the EDF mounting. Two strips of 1/4" x 1/2" basswood are glued into the fuselage in addition to the plywood doublers to stiffen the structure. Make the EDF cutout in the fuselage to suit the EDF unit that you are using.

I like the 70mm EDF unit by ELE; it comes with the motor installed and just needs the connectors soldered on the motor leads for use. I bought my EDF unit from BP Hobbies.



After the model is finished and detailed, the EDF unit is placed in the cutout and held in position with a few dabs of glue from a hot glue gun. That holds it securely and if it needs to be removed, a sharp modeling knife will do the job.

I use 5 and 15 minute epoxy for most of my building, it seems I'm usually in a hurry. Epoxy is fine for most sheet foams, but the foam with a thin plastic film sheeting will need a bunch of holes punched through the skin so the epoxy can get to the foam. I have a friend who uses foam-friendly CA glue, and his planes always turn out lighter than mine.

The wing spars are 1/8" x 3/8" basswood, available at hobby or arts & crafts stores, epoxied into the foam. Before gluing the spars in place, cut the slots in the ends of the foam panels for the plywood joiner pieces.

The two wing panels butt up against the sides of the fuselage, held together with the 1/8" plywood wing joiner going through a slot in the fuselage, into the wing cores, between the upper and lower spars.

This way, the only cut needed through the fuselage is the slot for the plywood joiner, leaving the fuselage stronger. Sand the foam on the wing-

tips to get a decent rounded shape; vinyl spackling putty works well to fill in gouges and rough spots.

The foam wing panels don't have to be covered for strength, but an iron-on plastic covering keeps them clean and smooth, and can be easily painted. The cores could also be covered with thin balsa sheeting, using contact cement, but I don't find it necessary.

I like to use the SLC covering material sold by The Core House, it's light, irons on pretty easily, and accepts most types of paint.

Hinging all the control surfaces is done in the usual foamy manner with 2" wide clear plastic packaging tape. The leading edges of the ailerons, elevator, and rudder are cut and sanded at an angle, and the tape applied to the upper surfaces first. Then, with the control surfaces folded upward, the tape is applied to the bottom, pushing it into the hinge gap and sealing it to both edges. This provides free movement and a strong, completely sealed hinge gap.





The servos are mounted by cutting holes in the foam so the servo is a push fit, and it is secured in place with a dab from a hot glue gun. In the wing panels, I like to glue in place a piece of 1/8" plywood, cut with a hole to accept the servo, which is then held in place with two mounting screws.

Two aileron servos are used in the top wing surfaces, to keep the bottom of the plane clean and smooth for easy landings and ground takeoffs.

Slots are cut into the control surfaces for the 1/16" plywood control horns which are epoxied in place. I use .047" wire for the pushrods, with a z-bend on one end and a DuBro Mini E/Z Link on the other end. Short pieces of nylon tubing are hot glued to the fuselage sides to keep the pushrods from flexing.

The ESC and the receiver are mounted on the top surfaces of the wing with hook-and-loop tape. The battery pack is mounted on the side of the fuselage with hook-and-loop tape, and slots are cut through the fuselage above and below the battery for a hook-and-loop strap used for security.

I paint my foamy models with water based acrylic craft paints, available in so many colors and at low cost at any arts & crafts store. A low cost foam paint brush is used, or I spray the paint on with a small airbrush or spray gun. With a fairly large nozzle on the airbrush I can thin the paint with plain water and not have any clogging problems.



I use a Sharpie marker pen to draw panel lines and other scale detailing which really helps the scale appearance. Military insignia is available through hobby outlets in stick-on vinyl, or the insignia can be copied onto peel-and-stick paper at a copy shop.

Done this way, the copy ink isn't waterproof, so I spray the paper copies with flat clear polyurethane from a spray can, before sticking them onto the airframe. The military insignia is definitely necessary, again for that scale appearance.



With the ample EDF power, it's easy to hand launch this F-4, with an underhand swing arm release. And, on fairly short, dry grass, the plane will easily slide across the ground and jump into the air – without any landing gear.

This thing is quite fast and will burn up a lot of sky quickly, so stay alert. It looks best when flown as a jet fighter, with large radius, smooth turns. I like the low inverted passes. It is aerobatic.



Hey, this stuff is fun.
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home.earthlink.net/~philcartier/ for the hot wire cut foam wing panels

www.bphobbies.com for the EDF unit and other hardware

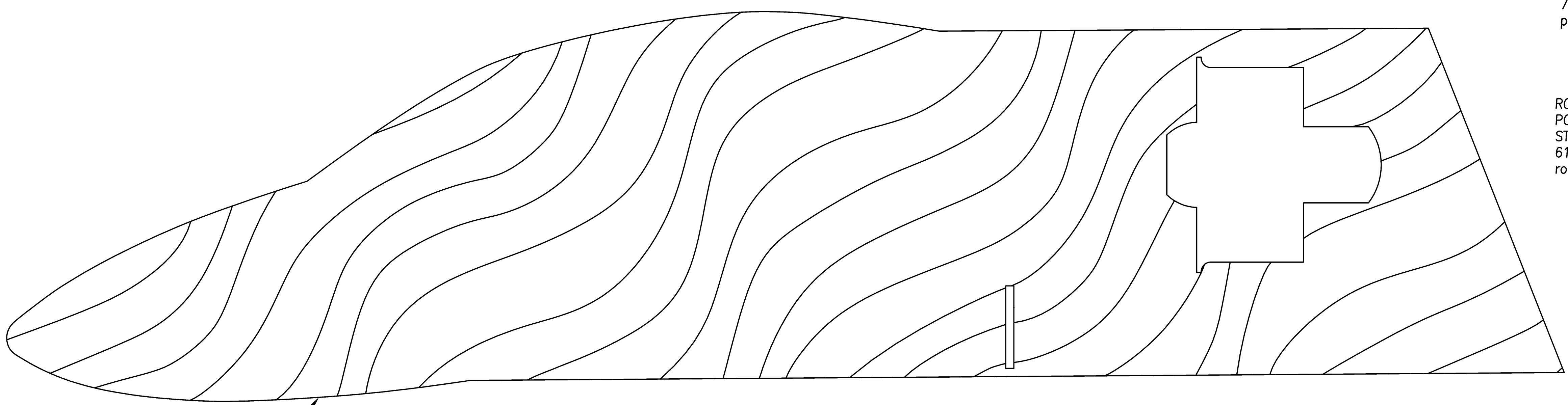
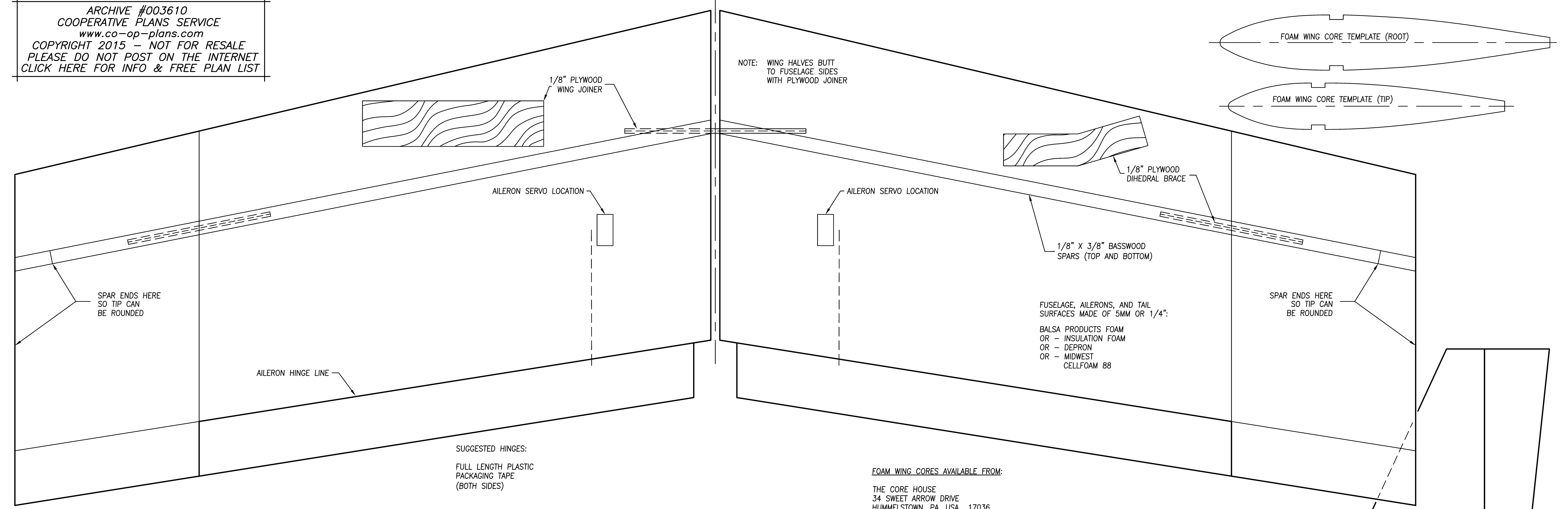


SWAMP

by Gary Clark



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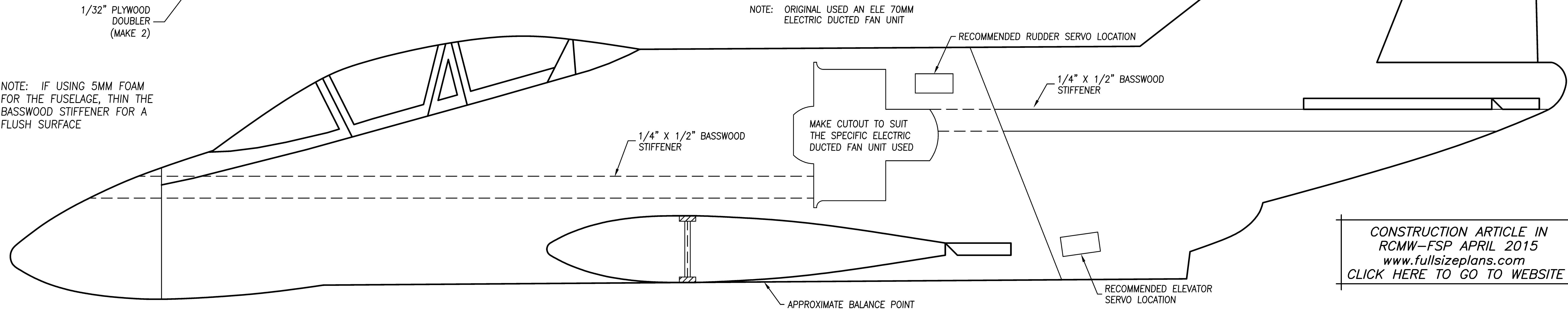
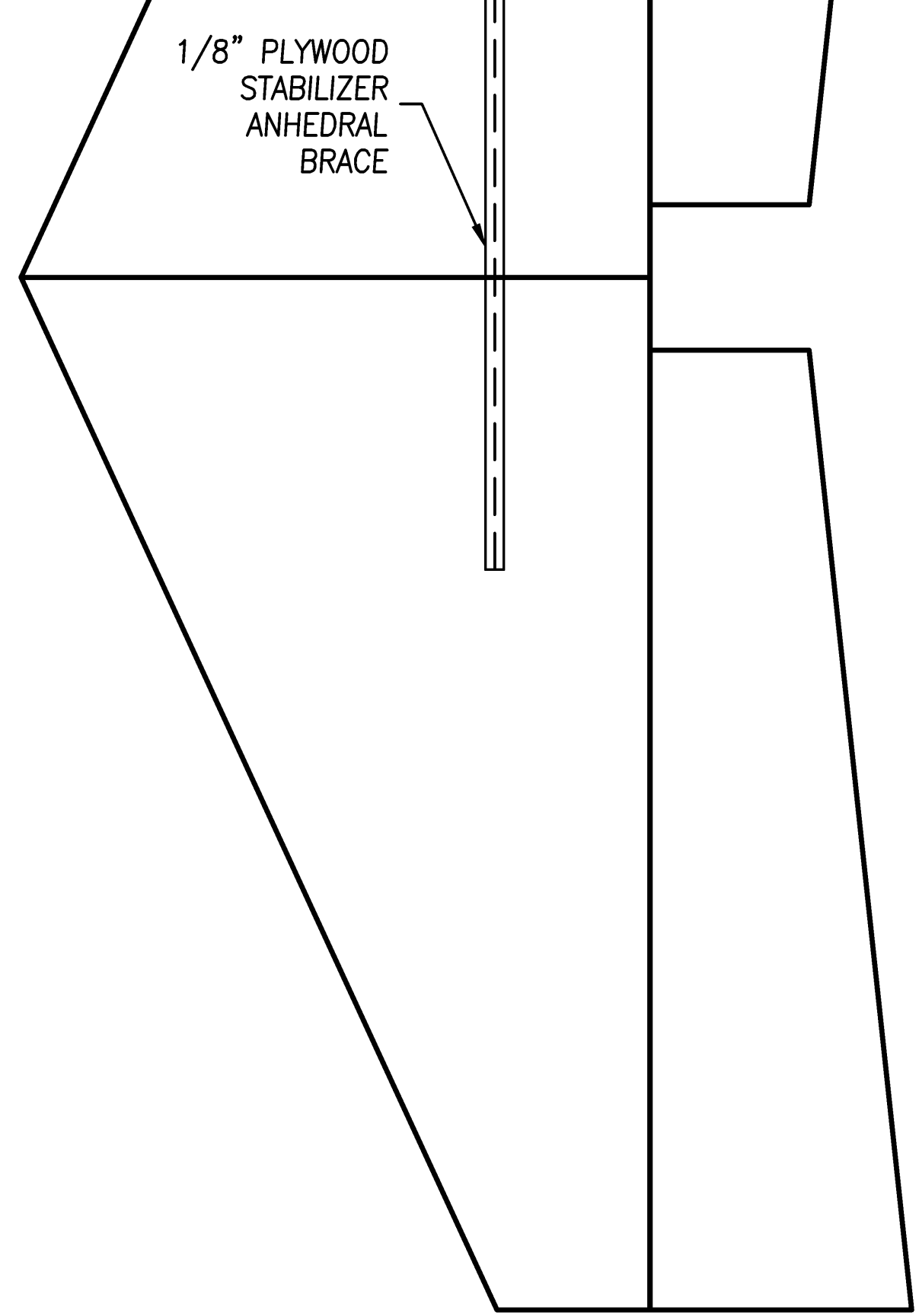
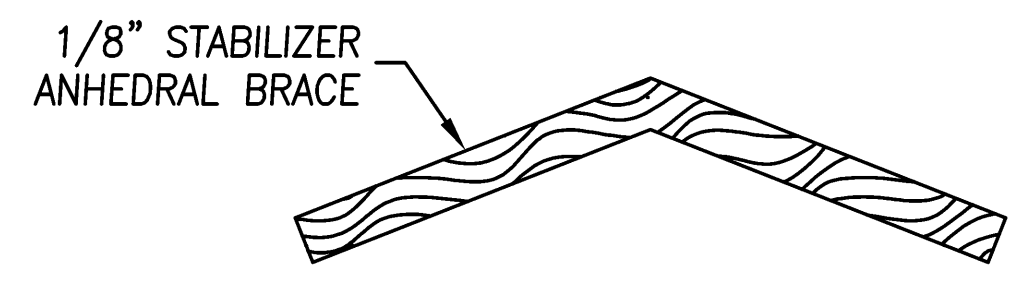


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DESIGNED BY: DICK SARPOLUS
CAD BY: BOB KRUGER
REVISION 1.01c 24 MAR 2014 SHEET 1 OF 1