THE ELECTRO HOTS

The newest member of this fun fly family is also the lightest and 3D capable!

The Electro Hots is the latest in my updated Hots designs and I think it takes the “keep it light” concept to the very limit using standard hobby materials like balsa, lite-ply and off-the-shelf hardware. No sense in trying to redesign the wheel!

CONSTRUCTION

The first thing to do is to assemble all your hardware, radio and power system equipment. Then, take sheet 2 of the plans and go to the hobby shop and buy the materials you’ll need. The plane is made almost entirely of ⅛-inch and ⅜-inch balsa sheet, with two layers ⅛-inch lite-ply and ⅛-inch square balsa stick stock used for the tail surfaces. You can use two layers of ¼-inch ply for the firewall former or you can use some ¼-inch ply. To save some weight, you could also use a laminate of ⅛-inch lite-ply faced with ⅛-inch birch plywood. Cut all the ribs (eight of them) from ⅛-inch balsa sheet and make the center rib out of ⅛-inch sheet. Cut the fuselage sides pieces as indicated in the Construction Detail shown on the plans. Be sure to note the direction of the wood grain.

Start building the fuselage by gluing all the F-1s together. Pin in place and then glue all the ¼-inch square balsa longe-rons in place to the inside of the fuselage side edges as shown on the plans starting at former F-2 and going all the way back to the tail post. Next, glue all the formers as shown. After assembling the fuselage you’ll need to cut out the center of formers F-2, F-3 and F-4 as marked on the plans. This would also be a good time to drill your motor attachment holes and install some 4-40 blind nuts in Former F-11. Use your motor’s attachment bracket as a guide.

Finish the fuselage by adding the top electric power systems, when applied to a very lightweight airframe, will produce very impressive aerobatic performance.

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TODAY, IN THE COMPETITION 3D WORLD, the models being used are little more than a wing and tail with a powerful engine bolted in for good measure. But more and more, the development of powerful light-weight electric power systems is changing the way competitive airplanes are being designed. There’s no question that the performance now available from LiPo battery packs and brushless outrunner motors is absolutely awesome. I have had great success in bringing together my father’s (Dan Santich) Hots designs and today’s E-power packages. You don’t even have to spend a lot of money as many of today’s sport-level electric power systems, when applied to a very lightweight airframe, will produce very impressive aerobatic performance.

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CONSTRUCTION
The first thing to do is to assemble all your hardware, radio and power system equipment. Then, take sheet 2 of the plans and go to the hobby shop and buy the materials you’ll need. The plane is made almost entirely of 1/16-inch and 3/32-inch balsa sheet, with two layers 1/8-inch lite ply and 1/4-inch square balsa stick stock used for the tail surfaces. You can use two layers of 3/16-inch ply for the firewall former or you can use some 1/4-inch ply. To save some weight, you could also use a laminate of 1/8-inch lite-ply faced with 1/8-inch birch plywood. Cut all the ribs (eight of them) from 3/16-inch balsa sheet and make the center rib out of 1/8-inch sheet. Cut the fuselage sides pieces as indicated in the Construction Detail shown on the plans. Be sure to note the direction of the wood grain.

Start building the fuselage by gluing all the F-1s together. Pin in place and then glue all the 1/4-inch square balsa longe- rons in place to the inside of the fuselage side edges as shown on the plans starting at former F-2 and going all the way back to the tail post. Next, glue all the formers as shown. After assembling the fuselage you’ll need to cut out the center of form ers F-2, F-3 and F-4 as marked on the plans. This would also be a good time to drill your motor attachment holes and install some 4-40 blind nuts in former F-11. Use your motor’s attachment bracket as a guide.

Finish the fuselage by adding the top
and bottom sheeting sections as well as the landing gear plate LG-1 and the spruce servo rails in the tail section. Use your servos as a guide to cut the servo openings to size and properly space the rails. Don’t cut out the large lightening openings in the fuselage sides until after you attach the wing.

THE WING IS THE THING

When you begin building the wing, start by pinning the bottom spar into place over the plans. Glue the grids to the spar using alignment blocks to ensure that all the ribs are plumb and square to the spar and building board. Glue the top spar, the leading edge and trailing edge in place then glue the top wing sheeting over the ribs. Trim the center ribs back ⅛-inch and glue the dowel support plate W2 in place. Glue the hardwood servo mounts in place and install the ¼-inch balsa braces under the mounts for additional support. If you haven’t already done so, use a Dremel Moto-Tool to cut holes in the ribs for the ailerons servo leads to pass through and glue the rib cap-strips into place. To make routing the servo leads easier, I installed paper tubes in the ribs leading to the center rib.

Install the aileron servos in the wing and then add the bottom wing sheeting. Glue the ⅛-inch balsa vertical shear webbing to the main spar and then glue the wing hold-down bolt plate WB-2 at the center trailing edge. Glue the wingtips on and sand everything nice and smooth with some 150- and 220-grit sandpaper.

Test fit the wing to the fuselage and see how it fits. You may need to sand the wing saddle and formers W-4 and W-10 a bit to make the wing fit properly. It should sit 90 degrees to the fuselage centerline. Drill the holes for the wing hold-down dowels and for the ¼-inch nylon wing bolt. Cut

**GEAR USED**

**Radio:** JR X9303 transmitter (jrradios.com); Spektrum DSM2 AR6200 6-channel Ultralite receiver (spektrumrc.com), 4 JR DS-3421SA ultra torque mini digital servos

**Power system:** E-flite Power 25 BL outrunner motor (e-fliterc.com), Castle Creations Thunderbird 54 ESC (castlecreations.com); Flight Power Evo25 2500mAh 3S LiPo battery

**Prop:** APC 12x6 to 14x6 Eprop (apcprop.com)
Use a fine-tooth hobby saw to separate the belly pan from the rest of the fuselage assembly.

Build the tail surfaces from ¼-inch-square stock directly over the plans. Be sure to add material to properly support your hinges.

The ailerons are built just like the tail surfaces, flat over the plans using ¼-inch square balsa stock.

With the wing removed, you have unlimited access to your radio gear. A hatch just forward of the landing gear allows battery changes without removing the wing.

an opening in the top center wing sheeting for servo leads. Sand the model smooth with 320-grit sandpaper and it’s ready for covering! Install your motor, ESC, battery pack, receiver and servos. Build a battery hatch forward of the landing gear plate out of ¼-inch sheet balsa.

Build the horizontal stabilizer, vertical fin, elevators, rudder and ailerons using ¼-inch square balsa stock. Glue the wing support WB-1 into place and glue a ½-inch thick balsa piece on top of WB-1. Install wing saddle former F-9 and then build the belly-pan section in place over the bottom of the wing while it’s bolted in place. Glue horizontal stab and vertical fin in place. Drill holes in LG-1 and LG-2 for landing gear attachment bolts.

FINAL ASSEMBLY
I used transparent MonoKote to cover my prototype, but you can use whatever covering material you like, just be sure to keep it light. For power I used an E-flite Power 25 BL outrunner motor, 870kV with a Castle Creations Thunderbird 54 ESC. You can use an APC 12x6 to 14x6 Eprop. Du-Bro hardware is used throughout, including 2-56 kwik-Links and Du-Bro control horns. The landing gear is from a Hangar-9 .40-size ARF. For servos, I prefer the JR DS-3421SA ultra torque mini digital servos. I used a Flight Power Evo25 2500mAh 3S LiPo pack. Move your equipment around and then secure it in place with Velcro when your model balances at the range shown on the plans.

IN THE AIR
As soon as I finished building the Electro Hots, I headed straight to the flying field. Ready to fly, the model weighed three pounds, four ounces. When I took off, the model only needed a couple of clicks...
to the right aileron for straight and level flight. The model flies extremely well and is very light on the controls. I set up my dual rate switch so full throw gives 120% of travel. At this setting you can really test the glue joints and see how much stress the model could take. I came in at full speed and did some snap rolls and then slowed down for some 3D harrier flybys. Loops are very tight and lovely! Really, the Electro Hots is limited only by your own piloting skills! It’s light weight and flyer-friendly wing loading make landings trainer-like. If you want to shoot touch and gos on a lazy Sunday afternoon, this is the plane for you!

Whether you are a beginner or an expert, the Electro Hots can be set up to challenge you. It’s very easy to construct and is designed for the new breed of outrunner electric motors. While building, take out any balsa that is just dead weight but not too much of the frame structure. The lighter the model, the better slow flight performance will be. But please, don’t use a glow engine. The airframe is not designed to take the vibration and stress put out by a nitro-sipping engine. Have fun!