

GREAT PLANES

ElectriFly Reactor

Lightweight balsa & ply 3D high-performance park flyer

by Scott Stoops

It was only a couple of years ago, before the brushless/Li-Poly revolution, that I longed for a small pattern style model that I could fly at the local park, but would also fit in with the larger models at the glow field. At the time, it seemed unlikely at best.

Fast-forward a couple of years and all of my lofty expectations have been exceeded many times over. Now, instead of heavy kits, we have reasonably priced lightweight laser-cut ARF models whose quality far exceeds what the average builder can create. The Reactor from Great Planes is a perfect example of what was impossible only a short while back. The Reactor is easy to assemble, well thought out, and flies great on a relatively inexpensive power system. It offers all of the aerobatic traits I could hope for in a portable and approachable package.

ASSEMBLY

The Reactor is expertly covered in an attractive red/blue/yellow scheme. The covering may require some tightening, but even when drum tight I recommend going over all trim lines with a sealing tool. The box contains the airframe components, an aluminum landing gear with plastic wheel pants, a fiberglass cowling, a pre-painted and pre-cut plastic canopy, CA hinges, spinner, and several large plastic trees of control linkage assemblies. Overall, the kit is very complete and has proven to be very well engineered.

Unlike many small electric models, the Reactor uses a one-piece wing that requires the builder to glue the wings to the fuselage sides while joining the spar in the open center section of the fuselage with a joiner plate. Check the Tips section for more on that important step. While some might find the permanently joined wings inconvenient for transporting a model, they are quite a bit lighter than removable ones. Battery access is through a magnetic access hatch along the bottom of the model. This isn't the most convenient method for battery attachment but it is dramatically lighter than the top-hatch method common to small electric models. Both of those combine to make the Reactor very light for its size.



SPECS

PLANE: ElectriFly Reactor

MANUFACTURER: Great Planes Model Manufacturing

DISTRIBUTOR: Great Planes Model Distributors

TYPE: Aerobatic and 3D park flyer

FOR: Intermediate and advanced pilots

WINGSPAN: 41.5 in.

WING AREA: 384 sq. in.

WEIGHT: 26 oz.

WING LOADING: 9.8 oz./sq. ft.

LENGTH: 42 in.

RADIO: 4-channel radio required; Futaba 12Z transmitter, Futaba R156F receiver, (4) Futaba 3110 servos

POWER SYSTEM: RimFire 35-30-950 Kv brushless motor, SS-25 Silver Series brushless ESC, 3S 11.1V ElectriFly 1500mAh 15C Li-Poly battery, APC 11x7 SF propeller

FULL THROTTLE POWER: 20.1 amps, 232 watts; 8.9 W/oz., 142 W/lb.

TOP RPM: 5,855

DURATION: 10+ minutes of aerobatics

MINIMAL FLYING AREA: Large park or ball field

PRICE: \$99.99

COMPONENTS NEEDED TO COMPLETE:

200-300 watt power system, 4+ channel radio system with four 6-9 gram sub-micro servos, (2) 18-inch servo extensions, (2) 6-inch servo extensions. Great Planes recom-

mends use of the Rimfire Out-Runner 35-30-950 (GPMG4590) or Ammo In-Runner 24-33-4040 (GPMG5165), SS-25 ESC (GPMM1820) and 11.1V 20C 1250mAh Li-Poly (GPMP0609).

SUMMARY

The Great Planes ElectriFly Reactor is an extremely lightweight balsa/plywood ARF park flyer for 200-300 watt brushless power systems. It offers great traditional aerobatic and 3D performance for intermediate to advanced pilots, while also being easy to fly for most sport pilots. It has a very thin wing and light wing loading, which combine to make it very stable in high alpha flight, as well as offering excellent tracking and precise point-and-go performance during turn-around aerobatics. The Reactor has classic good looks and performance to match.

PHOTOS BY DAVID MIELKE

GREAT PLANES ELECTRIFLY REACTOR

Assembly steps include hinging the flight controls, attaching the horizontal stab, elevator, fin, rudder, and wings. Looking back, the only change I'd make would be the addition of a tailwheel over the stock tailskid. Basic assembly concludes by attaching the landing gear, wheel pants, and plastic canopy. The only issue I had was that the wheel pants tended to rotate using the stock attachment method, so I used a thin layer of silicone as an adhesive between the pant and the landing gear legs to hold them tight. Overall, the manual is

very complete and well written, making assembly easy.

POWER SYSTEM/ RADIO INSTALLATION

The Reactor was designed for either a geared inrunner or outrunner brushless power system. I'd recommend at least 220 watts for best performance. I chose the recommended Rimfire 35-30 outrunner and a matching ElectriFly SS-25 controller. Both



The ply motor mount is well designed and can be easily mated to many of a range of inrunner or outrunner motors.



AIRBORNE

You'll need a soft surface to rest the model on while installing the battery - grass or a small blanket works great. I've found the magnetic battery hatch holds tight through even the most aggressive aerobatics. Takeoff can be made from asphalt, dirt, and even short grass, but its small wheels make long grass somewhat problematic. I've also found that the model hand launches quite nicely and can land from a harrier in long grass with no damage. Its aluminum gear has proven to be quite durable and easily handles the normal bumps and bruises of park flyer flying.

Airborne, the Reactor has a nice balanced feel. I expected it to be a solid aerobic performer but was pleasantly surprised to find it also was a really great little 3D model. It has oversized flight controls, so be sure to use a low dual rate for precision and full throws/high expo for wild 3D flight. The elevator, in particular, can feel a bit twitchy if you forget to program exponential.

With a conservative CG, the model has a very slight pitch to the landing gear and a slight roll with the rudder during knife edge flight. I ended up with a 4-percent rudder/elevator mix, and a 7-percent rudder/aileron mix. The large canopy and generous side area make it a very stable KE platform. Its aileron and rudder are very powerful, and with full throw, the Reactors can fly both rolls and snaps faster than your eyes can count. Overall, the Reactor tracks nicely and is a very honest and predictable model, making it a great choice for those learning precision aerobatics.

The Reactor is also a very capable 3D model. With even a forward CG, it has an incredibly fast pitch rate, making Walls and Cobras easy to fly. As a result of its thin wing and low loading, the Reactor is very stable in harrier flight, exhibiting only very slight rock upright and none inverted. Transition to hover is quick and easy, and the Reactor has plenty of control authority in all axes to right a hover gone awry. Once established, only small inputs are required to maintain the hover indefinitely. Another fun maneuver is the blender and the resulting inverted flat spin. At first, I was worried about the wing assembly, but it has held strong, proving the designers have done their homework. With such great control authority and 3D performance, the Reactor really inspires confidence.

The Reactor is a really easy airplane to fly. That said, because it is such a responsive performer, it would make a great second aileron model or aerobatic trainer.

that and the Ammo 24-33 geared inrunner are drop-in power solutions, but it would be easy to adapt the ply motor mount to a variety of outrunner motors. Be sure to use both thin and medium CA or a quality Epoxy to assemble and attach the ply motor box to the fuse. I used thin CA followed by a fillet of medium with good success.

One of the more unique design features of the Reactor is the cowling's magnetic attachment method. The firewall has two recessed openings that are sized to accept small magnets. Matching magnets are installed in a ply cowl ring that is glued into the cowl. Alignment is critical for a good spinner transition into the cowling, so be sure to follow the instructions exactly. While I was skeptical of the magnet's ability to hold the cowl in place, this method really works well.

Finish the power system installation being sure to Dremel cooling inlet holes in the cowl. Per the instructions, initially I cut just one cooling inlet hole below the spinner. This proved inadequate and I've since added additional cooling holes on both sides of the spinner.

I chose the recommended Futaba 3110 micro servos for all flight controls. I've found the Futaba 3110 to be a good match for the airplane, providing plenty of torque



Note the magnets glued into recessed holes in the cowl. This system worked well.

GREAT PLANES ELECTRIFLY REACTOR



Control hardware is made up of a carbon control rod with adjustable plastic ends and a plastic control horn. Add a dab of CA on each of these control rod plastic-carbon fiber joints for added security.

and speed, but be careful to avoid bumping the flight controls while transporting the model. Like many sub-micro servos, they are not designed to withstand hangar rash and the unexpected bump can damage the gears. All servos mount externally, and using the recommended attachment method, are glued in place. I ended up gluing the tail servos, but used small screws on the ailerons.

The control hardware is molded plastic and comes in separate trees. At first, it looked quite complicated, but in operation has worked well. Included on the part trees are servo arms for all of the most popular servos, which is a really nice touch. Each assembly is made up of a carbon control rod, adjustable plastic ends, and a plastic control horn. I'd recommend adding a dab of CA on each adjustable plastic control rod/carbon pushrod joint once the assembly is installed and adjusted for added security.

The Receiver is installed above the battery tray and accessed through the small holes in the canopy area. I attached the Futaba R156 F with hook and loop fastener Velcro. The battery is installed through the magnetic battery hatch along the bottom of the model and is secured with Velcro and a Velcro strap. The battery tray is quite long, making CG adjustments for different equipment selections easy to accomplish.



TIPS FOR SUCCESS

Joining the wings to the fuselage is without question the most important assembly step. Great Planes has made it as easy as possible through the use of wingtip height jigs and thorough instructions, but there are a couple of areas that I found could trip up inexperienced builders.

First, be sure to use an Epoxy with at least 30 minutes working time. You will likely use all of it getting everything plumb. Second, my wing roots needed some slight trimming to fully seat in the recessed wing saddle area. It is possible to inspect the wing/fuse joint area by removing the covering over the access holes in the canopy area. Be sure the entire wing panel is flush with the fuse side before gluing. Finally, be sure to weight the fuselage down on a perfectly flat surface and use clamps to hold the wing joiner together while it cures. The wingtip jigs are only accurate if the entire airplane is on a perfectly flat surface. Take your time and follow the instructions exactly, and I'm confident you'll have a nice straight airframe.



CONCLUSION

The Reactor is a great flying model that assembles quickly, is small enough to fit into most vehicles, and won't break the bank to set up. Its ability to fly both precision and 3D make it one of the more versatile park flyers on the market. For maximum bang-for-the-buck, the Reactor is hard to beat. ☺

Links

ElectriFly, distributed exclusively by Great Planes Model Distributors, www.electrifly.com, (800) 682-8948

Futaba, distributed exclusively by Great Planes Model Distributors, www.futaba-rc.com, (800) 682-8948

Great Planes Model Manufacturing, distributed exclusively by Great Planes Model Distributors, www.greatplanes.com, (800) 682-8948

Landing Products, www.apcprop.com, (530) 661-0399

For more information, please see our source guide on pg. 177.

JR DIGITAL SERVOS

The rulers' specs.

DS168 THIN WING

Just 1/3 of an inch wide, the 168 is perfect in ultra-thin wings.
SIZE: .34 x 1.33 x 1.36
WEIGHT: 7 oz
TORQUE: 47 oz/in @ 4.8V
SPEED: .17 sec/60 @ 4.8V
GEARS: Metal

DS286 HI-SPEED SUB-MICRO

The snappy, high speed 285 is the fastest, most accurate sub-micro you can buy.
SIZE: .45 x .87 x .85
WEIGHT: 3 oz
TORQUE: 17 oz/in @ 4.8V
SPEED: .18 sec/60 @ 4.8V
GEARS: Nylon

DS2488B MICRO BB

With incredible torque for a micro servo, the 308 is known for robust reliability. Now with twin BB.
SIZE: .58 x 1.12 x 1.17
WEIGHT: .83 oz
TORQUE: 53 oz/in @ 4.8V
SPEED: .21 sec/60 @ 4.8V
GEARS: Metal

DS3421 MINI

Fast, powerful and accurate, the 3421 is a favorite among performance sailplane, jet and aerobatic enthusiasts.
SIZE: .58 x 1.30 x 1.82
WEIGHT: 1.84 oz
TORQUE: 65 oz/in @ 4.8V
SPEED: .18 sec/60 @ 4.8V
GEARS: Metal

Also available in nylon-gear SA (Special Application) version.

DS5411 MID

Sailplane, nylon-twin, jets and aerobatic flyers of medium-size aircraft choose the 5411 Mid.
SIZE: .71 x 1.41 x 1.83
WEIGHT: 1.36 oz
TORQUE: 82 oz/in @ 4.8V
SPEED: .15 sec/60 @ 4.8V
GEARS: Metal

Also available in nylon-gear SA (Special Application) version.

DS3281 WING

Sailplane and jet flyers find the 3281 to be just the ticket when a precise, robust, 818 servo is required.
SIZE: .58 x 1.30 x 1.30
WEIGHT: 1 oz
TORQUE: 56 oz/in @ 4.8V
SPEED: .22 sec/60 @ 4.8V
GEARS: Nylon

DS621 SPORT HIGH TORQUE

The 621 is a best-seller, with excellent power, precision and reliability at an affordable price.
SIZE: .74 x 1.30 x 1.47
WEIGHT: 1.5 oz
TORQUE: 72 oz/in @ 4.8V
SPEED: .19 sec/60 @ 4.8V
GEARS: Nylon

DS8231 PRECISION

Excellent overall torque, reliability and unequalled precision make the 8231 an unbeatable servo for a great variety of models.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 1.73 oz
TORQUE: 88 oz/in @ 4.8V
SPEED: .22 sec/60 @ 4.8V
GEARS: Nylon

DS8417 ULTRA SPEED

When snappy precise controls are more important than torque, the 8417 is king.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 2.85 oz
TORQUE: 82 oz/in @ 4.8V
SPEED: .19 sec/60 @ 4.8V
GEARS: Metal

DS8411 ULTRA TORQUE

When big torque is required for big models—and only a standard-size servo will do—the 8411 is for you.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 2.83 oz
TORQUE: 135 oz/in @ 4.8V
SPEED: .18 sec/60 @ 4.8V
GEARS: Metal

Also available in nylon-gear SA (Special Application) version.

DS8711 ULTRA TORQUE

2mm longer and wider than the 8411, the 8711 uses exclusive technology to become the industry leader in torque, precision, speed and reliability.
SIZE: .83 x 1.59 x 1.41
WEIGHT: 2.36 oz
TORQUE: 147 oz/in @ 4.8V
SPEED: .19 sec/60 @ 4.8V
GEARS: Metal

DS8311 HIGH TORQUE HELI

Unique electronics equip the 8311 for the rigors of performance helicopter operation.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 1.87 oz
TORQUE: 125 oz/in @ 4.8V
SPEED: .18 sec/60 @ 4.8V
GEARS: Nylon

DS8617 HIGH SPEED HELI

Its special gearing delivers high speed response for clipper tick-tocks and other extreme tail flight.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 2 oz
TORQUE: 69 oz/in @ 4.8V
SPEED: .15 sec/60 @ 4.8V
GEARS: Metal

DS8706G ULTRA SPEED TAIL ROTOR

Any gim will hold better with the blazing speed and superb accuracy of the highly reliable 8.8V 8706G operation only.
SIZE: .73 x 1.52 x 1.33
WEIGHT: 2 oz
TORQUE: 49 oz/in @ 4.8V
SPEED: .09 sec/60 @ 4.8V
GEARS: Metal

DS8706G SPORT TAIL ROTOR

Affordable high speed tail rotor is a great choice for sport helis.
SIZE: .75 x 1.54 x 1.36
WEIGHT: 1.66 oz
TORQUE: 34 oz/in @ 4.8V
SPEED: .18 sec/60 @ 4.8V
GEARS: Nylon

DS3480G MINI TAIL ROTOR

Perfect for the 1-DEK and other high-performance mini-helis, the 3480G gives your gim unmatched holding power.
SIZE: .58 x 1.30 x 1.82
WEIGHT: 1.84 oz
TORQUE: 42 oz/in @ 4.8V
SPEED: .11 sec/60 @ 4.8V
GEARS: Nylon

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