

ESPRIT MODEL Lark X

by Scott Stoops

Versatile aerobat for glow or electric!

The last few years have seen dramatic advances in power system and battery design. Often overlooked, however, are the recent advances in lightweight aircraft design. The Lark X is a new model that has helped raise the bar in "hybrid" model construction. Its lightweight structure, fiberglass fuselage, and convenient access hatch (the entire canopy) let you install either a glow engine or an electric power system and retain extremely high performance without extensive airframe modification.

ASSEMBLY

The Lark X came out of the box covered nicely in red transparent covering. The structure is comprised of balsa wings, ailerons and tail, as well as a fiberglass



fuselage, canopy, cowling, and wheel pants. Also included are pushrods, control arms, aluminum landing gear, main

wheels, and a nice tail-wheel assembly. Overall, the Lark is a very complete model straight out of the box.

While the Lark X is considered an ARF, there are several aspects of the kit that require a small amount of at least intermediate level craftsmanship to build correctly. The Lark's primary challenge is the lightweight fiberglass fuselage. It arrives as an empty shell,

so the builder has to install the formers, firewall, and landing gear plate. Additionally, the builder has to drill and

AIRBORNE

Having flown for years, I'm accustomed to the loud sound of a two-stroke engine powering larger models. Equipped with the AXI 4130, the Lark is virtually silent! It's very odd to see this nearly 6-pound model taxiing around with almost no perceptible noise (but some would say I'm hearing-impaired after years of flying airliners!) After getting beyond that initial shock of the stealthy sound of the AXI, I was ready to roll.

As soon as I brought the power up, the Lark was off and flying with minimal corrective inputs. With its light wing loading and extreme thrust to weight, I found basic cruising around took no more than 1/4 throttle. Basic handling of the model summons one thought: precision. The Lark tracks nicely, starts and stops rolling motions precisely, maintains its trim condition well, and in general, performs very predictably. As a part of my first flight repertoire, I always do a stall test, and the Lark performed extremely well. I found that power off, the model stalled straight ahead. Under slightly accelerated conditions (higher airspeed and throttle), it tended to drop the left wing slightly, but was very controllable before and after the stall.

The Lark excels at traditional aerobatic maneuvers. Set up with zero aileron differential, the slow rolls are very axial. The wing continues to perform well under G loads, too. In general, it goes where you point it, just like it should! I also found that by increasing the elevator throw slightly more than recommended, the model will snap roll cleanly and predictably. The roll rate in the snap roll is extremely high, so make sure you're prepared to initiate the recovery a bit earlier than you're used to.

While not designed as a 3D ship (there is a 3D version of the Lark specifically designed for 3D flying), the Lark X is capable of some basic 3D maneuvers. As a result of its large control surfaces and the strong but silent power of the AXI, hovering, torque rolling, and basic harrier flight are possible. The Apogee 6S2P Li-Poly battery provides more than enough power for solid punch-outs and climbs out of hovering flight. The model does exhibit some wing rock during harriers, but that is easily controlled with aileron inputs. Considering that it isn't designed as a 3D model, its 3D performance is astounding!

In the landing pattern, the Lark behaves itself far better than most .40 sized models I've flown. This is due primarily to its light wing loading. It slows down very nicely! Smooth three-point or wheel landings are a breeze.



SPECS

PLANE: Lark X

MANUFACTURER: P&B Model

DISTRIBUTOR: Esprit Model

TYPE: High performance glow/electric sport aerobatic model

FOR: Intermediate and advanced pilots

WINGSPAN: 59 in.

WING AREA: 706 sq. in.

FLYING WEIGHT: 93 oz.

WING LOADING: 19 oz./sq. ft.

LENGTH: 49 in.

RADIO: 4 channels required; flown with a Futaba 9C transmitter, Hitec Electron 6 receiver, (2) HS-225BB and (2) HS-422 servos

POWER SYSTEM: AXI 4130/16 brushless electric motor, 17x8 APC-E prop, Jeti Advance 77 Opto brushless speed control, Apogee 6S2P 4180mAh Li-Poly battery (2 3S2P packs in series)

FULL THROTTLE POWER: 46.5 amps, 920 watts; 9.9 W/oz., 158 W/lb.

TOP RPM: 6,380

DURATION: 10-12 minutes of aggressive flying, 15+ minutes with good throttle usage

MINIMAL FLYING AREA: RC club field

PRICE: \$199

COMPONENTS NEEDED TO COMPLETE: 600 watt power system minimum (motor, ESC, battery, propeller) or .35-.40 glow engine and fuel tank, radio system (4-5 standard servos, receiver, onboard battery or Ultimate-BEC for electric)

SUMMARY

The Lark X is an extremely attractive, high performance sport model that offers either glow or electric versatility. The lightweight fiberglass fuselage and plug-in wings are extremely nice touches usually reserved for much larger, more expensive models. As a result of the light weight, generous wing area, large control surfaces, and clean lines, it is comfortable flying both precision aerobatics as well as some basic 3D maneuvers. These good manners also translate directly to the landing pattern. The Lark is a true pussy cat all the way through the approach to touchdown, a perfect end to enjoying its thoroughbred lines and exciting performance in the air.

PHOTOS BY DAVID MIELKE



ESPRIT MODEL LARK X

fit the fiberglass wing tubes, a task which requires great care. For an inexperienced builder, these steps could be rather daunting.

With the internal fuselage structure glued in place, and the wing tubes installed (check the "tips for success" section for more info on this important step), I epoxied the horizontal and vertical stabilizers in place. Finally, I hinged all of the control surfaces using the flexible hinges included in the kit. They worked perfectly. With the primary structure completed, it was time to start adding components so I could establish an initial center of gravity (CG), and then fabricate a battery tray (the model leaves battery attachment and fuel tank placement up to the builder).

MOTOR INSTALLATION

The Lark is designed to easily accept either glow or electric power. The kit includes hardwood motor rails for glow power or for clam shell-type electric motor installations. I elected to use an AXI 4130 (with radial mount) and Jeti Advance 77 Opto controller from Hobby Lobby, so I would need to



The improvised motor mount extension for the AXI 4130 is lightweight, quite solid, inexpensive and easy to adjust.

either fabricate or purchase a firewall mount. Being the fabricating type, I decided to build my own from four $\frac{3}{16} \times 3$ threaded rods, matching blind nuts, and a suitable offset from the firewall (which happened to be a piece of 1.25 PVC pipe). As you can see from the picture, the mount is adjustable in all axes by changing the angle the PVC is cut, and tightening or loosening each of the threaded rods. I ended up with one degree of down thrust and two degrees of right to compensate for the propeller's spiral slipstream. This makes for straight tracking during aerobatics.

RADIO INSTALLATION

The Lark kit includes hardware for several different servo locations. I elected to place the rudder and elevator servos in the tail, allowing very short and precise push/pull control rods. This worked perfectly. I also used the stock aileron servo locations. The receiver and its associated 6-volt Ultimate

BEC were then mounted to the fuselage sides with Velcro.

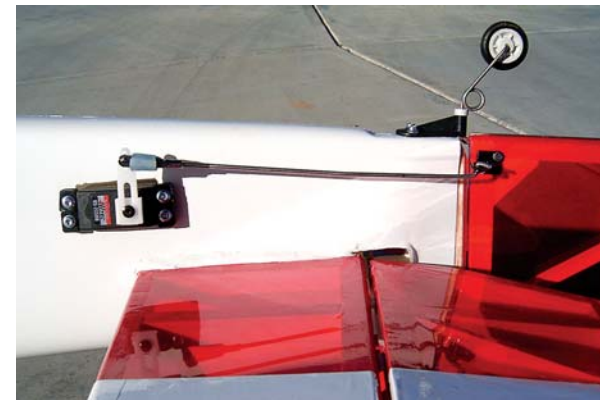
With all of the electronics installed, it was time to build a battery tray. I decided to use two Apogee 3S2P 4180 packs wired in series (a total of 6S2P Li-Poly) to deliver the 900 watts I wanted. The small dimension of the Apogee packs also allowed a relatively compact battery tray that would fit the batteries under the fiberglass wing tubes in the fuselage. I elected to use $\frac{1}{8}$ -inch light plywood for the tray. Without the battery, the model ended up being slightly tail-heavy (as expected), so I positioned the center of the batteries slightly ahead of the recommended CG position to achieve a proper balance. I built a tray that tied into the firewall, the landing gear attach plate, and the forward former. This anchored the tray and stiffened the fuselage at the same time. I had to fabricate one sub former from $\frac{1}{8}$ ply to act as a rear attach plate for the tray. I used thick CA and epoxy to secure it to the formers and the fiberglass fuselage. After basic radio setup and a final check of the recommended CG, I was ready to head to the field.

TIPS FOR SUCCESS

Installing the wing tubes in the fiberglass fuselage is the most critical step in building the Lark. The fuselage comes with small drill marks denoting the precise position of the tubes. My first thought was simply to drill out the holes to the correct diameter, but later decided that the drill could slip or the holes could migrate while I was reaming them to the proper dimension. I decided to build a small drilling jig to ensure that I placed the wing tubes at precisely the right spots in the fuselage, and in relation to each other. This simple jig worked very well. As a bonus, I glued the light ply jigs into the fuselage as additional structural supports for the wing tubes. While I'm sure a good builder could do this step precisely the first time without a jig, I wanted to make sure I got it right. And I did. The wing spars fit snugly in the entire assembly, and the wings are perfectly square with the tail.

CONCLUSION

The Lark X has proven itself to be an extremely fun model to fly! While it



involves more work than the traditional ARF, it was clearly worth the extra time and effort to have the clean looks and light weight of its fiberglass fuselage and plug-in wings. The fact that the Lark X is designed light enough to be used with either a glow or electric power system is a testament to its outstanding construction techniques. Combine its attractive lines with its great in-flight performance, and this is one model that stays in my hangar! 🌟

Links

APC Propellers, distributed by Landing Products, www.apcprop.com, (530) 661-0399

Apogee Batteries, distributed by PFM Distribution Inc., www.pfmdistribution.com (618) 558-5818

Esprit Models, www.espritmodel.com (321) 729-4287

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

Hobby Lobby International, Inc., www.hobby-lobby.com, (615) 373-1444

The Ultimate BEC, www.koolflightsystems.com/ultimatebec.htm (770) 716-7578

For more information, please see our source guide on pg. 161.