ICARE SAILPLANES

Osiris Mk2

by Steve Pasierb

Fully molded competition-class discus-launch glider

Flying a discus-launch glider, from its initial toss to its speck-out thermal, is a unique joy in our hobby. In the early days of hand-launch sailplanes, you may have heard stories of pilots getting sore arms, but the current generation of discus-launch gliders (DLG) is much easier to launch to significantly greater height; and when launched with the correct technique, there' s little, if any, arm strain.

Some DLG designers gladly give up a few appearance points in the quest for minimum weight and maximum performance, but that wasn't the case with the new Osiris Mk2. "Svelte and sexy" is an apt description, and this airframe delivers a flight performance that backs up its good looks.

The evolved Osiris Mk2 design now uses state-of-the-art CAD/CAM and molding technologies. Its airfoils were designed by MIT' s Dr. Mark Drela: the ag455ct at the root transitions to ag47 at the tip. These are proven discus-launch airfoils that provide a wide speed range using trailing-edge reflex and camber. My experience shows that the Mk2 can be trimmed for a fast launch and can slow down and work a tiny bubble of thermal lift.

PHOTOS BY WALT SHORE

SPECS

PLANE: Osiris Mk2

MANUFACTURER: J. Cermak F3K

DISTRIBUTOR: ICARE Sailplanes

TYPE: F3K discus-launch glider

FOR: Intermediate sport fliers to advanced competition fliers

WINGSPAN: 59 in.

WING AREA: 336 sq. in.

FLYING WEIGHT: 10.5 oz.

WING LOADING: 4.5 oz./sq. ft.

RADIO: 4-channel required; flown w/JR 9303 FM transmitter, FMA M5 receiver, 2 Dymond D60 servos on ailerons, 2 JR DS285 servos on rudder and elevator, 4-cell KAN 350 receiver pack

MINIMUM FLYING AREA: Large field suitable for thermal activity

PRICE: $489

COMPONENTS NEEDED TO COMPLETE: Radio system, four sub-microservos

SUMMARY

The Osiris Mk2 features a hollow molded wing with strategic composite reinforcements and airfoils designed by the renowned Dr. Mark Drela. This is a strong, accurate airframe that showcases exceptional engineering, a beautiful appearance and outstanding flight performance.

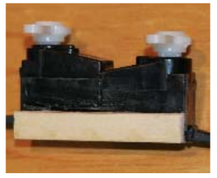
CONSTRUCTION

The kit has a very low parts count, and I immediately had to test the wing's fit in the molded fuselage saddle. It was perfect! The one-piece wing eliminates the need to set the dihedral and join wing panels—steps that cause some builders a little trepidation. The wing is hollow molded in CNC-cut molds. It includes strong, molded-in winglets at both tips to reduce induced drag and also to serve as grips where you hold the model to launch it. The model I tested had carbon reinforcement for launching only in the left winglet for right-handed launches, but future production runs will have reinforcement to accommodate left-handers as well.

The Mk2 wing is very thin but strong. The wing spar is vertical-grain balsa with a carbon-fiber cap, and the trailing-edge sub-spar is an inflated carbon tube that provides strength and flutter-free aileron operation. The wing skins are a fiberglass sandwich with a balsa core. A "disser matrix" of diagonal carbon-fiber tows set at 45-degree angles and spaced 2 inches apart on the inner surface of both the top and the bottom skins adds significant torsional stiffness and weighs only a few grams. Finally, the wing center section is reinforced with carbon-fiber cloth. All the hardware for the two steel wing bolts is already installed in the wing and fuselage. When installed, the bolts are recessed into the wing for a clean top surface.

The radio compartment is generously sized, allowing you to position the gear for optimum balance. I will be moving the servos forward to reduce the need for ballast.

The integral aileron hinge ("live hinge") is on the bottom skin. Bottom hinging means that the aileron pushrod exits the top of the wing and leaves the airflow over the bottom surface perfectly clean. Aileron servo installation requires careful planning to make certain that the component travels are correct and everything operates smoothly. The first step is to make the pushrod exits in the top of the wing just in front of the aileron. I used a small drill bit and then a tiny round file to create elliptical openings. Next, I glued a small brass horn into each aileron. The instructions' detailed photographs of the pushrod exit and the control horn help immensely here.



I joined a pair of JR DS285s together for the elevator and rudder controls using a strip of thin plywood and some medium CA.

I chose thin Dymond D60 servos for each aileron. At 9 grams each, I paid a bit of a weight penalty over 5g options, but I know these will be rock-solid. The kit includes carbon rod for the pushrods. Each end of the rod is CA'd to a clevis. I taped my servos in place until I was absolutely certain that everything worked correctly. Finally, I put light shrink-wrap on each and glued them into the wing with clear silicone. Tiny covers are provided to preserve a clean airflow over the recessed servo openings along the wing bottom. Both servo leads exit the bottom center of the wing together, and I combined them on a 4-pin Deans micro-connector (two separate signals, one common ground, one common positive) to make wing installation at the flying field a breeze.

The fuselage is beautiful. This is not a typical two-piece pod-and-boom like most DLGs have. The Osiris Mk2 sports a one-piece carbon layup that is molded under high pressure in a CNC-cut mold. For a flawless finish, It is also painted in the mold. I am very

AIRBORNE

Before the first big discus spin, I initially made a javelin-style throw to make certain everything was functioning properly. All I needed was a tiny bit more up-elevator trim and less elevator travel overall. I then took a couple of gentle discus throws and learned that the plane doesn't have any bad tendencies. A hard discus launch netted excellent altitude that was comparable to those of my other composite competition DLGs. Transition from the launch climb to cruise showed that I needed to put back a bit of down-elevator travel to force the nose over smoothly. I got the plane flying flat and cruised downwind to look for lift. At the corner of the field, I was rewarded with a small bubble that I worked as it built into a nice thermal. Off we go!

On that 6-minute journey and subsequent flights, the plane responded very well to reflex and camber. I now have a fixed reflex setting and have chosen to fly variable camber off the left transmitter stick so that I can refine the amount as needed. The camber setting also has a touch of proportional up-elevator compensation. I used a two-position switch to convert the variable camber function to full down flaperon with down-elevator compensation in case I need to bring the plane to a quick stop at the end of a flying task.

A friend and I recently compared the DLGs we own to golf-club equivalents. He says the Osiris Mk2 is definitely the big driver! I have been very impressed by its ability to travel in search of lift and to penetrate and return home in the wind. On the day of the photo shoot, I experienced big lift and heavy sink in fairly regular cycles. While nothing flies well when all the air is sinking, the Osiris did make every bit of the lift and was able to run after bubbles that were leaving the field and still get home. I enjoy flying this airframe very much and am still learning how it performs in various conditions. My other DLGs are in the 8.5- to 9-ounce range, but at 10.5 ounces, the Osiris Mk2 flies very well. Moving the servos forward will reduce or eliminate the need to add nose weight. Using light servos could bring the plane in at the low end of the manufacturer's specified 9- to 11-ounce range.

impressed by the fuselage's sleek lines, and I appreciate the roomy radio-gear area and sleek carbon canopy. What' s more, the fuselage also has a molded pylon for the full-flying horizontal stab. This is one serious DLG fuselage.

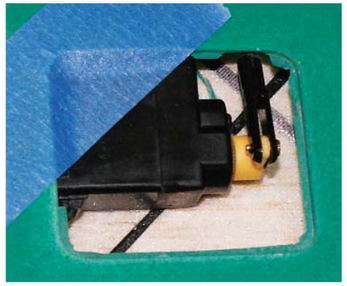
TIPS FOR SUCCESS

I began by installing the vertical stabilizer/rudder. This part is keyed onto the rear of the fuselage boom, and the joint is reinforced with fiberglass cloth. Make certain that it is aligned absolutely straight with the wing and fuselage. The tail surfaces are painted balsa with carbon reinforcements and have survived well. All the surfaces operate via pull-pull cables.

Some modelers had mixed results with the original Osiris's tape rudder hinge. This was probably because the force of the pull-pull cables weakened the tape adhesive over time. I chose instead to make my own modification by installing a full-length CA hinge made out of a strip of Coverite's reinforced and rip-proof Micafilm covering. First, I made a small jig that holds a single-edge razor blade between four layers of balsa. The outer layers form a channel and keep the blade perfectly centered against the control surface. This made cutting a full-length slot in the center of both surfaces very easy. I went 1/4-inch deep in each half, carefully beveled the rudder face to facilitate surface travel and then inserted a full-length 1/2-inch-wide piece of Micafilm. When the hinge was in place and I was confident about the surface travel, I carefully applied thin CA along its entire length. The stabilizer and the rudder are now mated forever, they travel beautifully, and the hinge is rock-solid.

I made this simple tool out of scrap balsa and a single edge razor blade to center and cut a full length hinge slot in the fin and rudder. The hinge is a length of Coverite Micafilm.

Hinging the ailerons on the lower surface allows a very low drag pushrod installation through the upper skin. Carefully mark and cut this hole to minimize its size.



I taped the aileron servos in place during setup, and then glued them in once everything was operating smoothly.

Installing the full flying horizontal stabilizer was relatively simple: install the center pivot in the pylon with epoxy, making certain that it is perfectly level with the wing and square left to right. Next, drill two tiny holes in the top of the boom, both fore and aft of the pylon, so that they align with the front and rear carbon alignment rods that join the two-piece, removable stabilizer. Bush these holes with small sections of tubing for the elevator pull-pull cable exits. The cables loop over the alignment rods to actuate the elevator as detailed in the instructions.

Actuating tail surfaces via pull-pull cable may be new to some modelers. Very nice, thin cable is provided in the Osiris kit, but I prefer Spectra braided composite fishing line for this. I like Spiderwire 50-pound Stealth, which has Teflon in the weave. It's incredibly strong, thin and light, and you can secure the knots with CA instead of using connectors. And a lifetime supply costs around $11! From there, it's a matter of time and detail to get the servos installed and everything functioning smoothly. One mistake I will correct is that I could have pushed my servos a tiny bit farther forward for a weight savings. The servos should go as far forward as possible to just clear the canopy when it's installed.

The final steps were to install a KAN 350mAh 4-cell battery made up in a "T" configuration for the receiver and servos and then to balance the plane at the recommended CG range of 65 to 75mm from the wing leading edge. A 65mm setting required just under 1/2 ounce of lead in the nose in front of the battery, and pushing the servos farther forward would reduce this. With everything installed and trimmed according to the instructions, it was time to head out to the flying field.

If you want a few tips and pointers on flying DLG sailplanes, you can't do better than getting one-to-one help from the pros who fly day in and day out. The next best thing is to buy and watch "Handlaunch Pro Clinic" produced by Paul Naton of Radio Carbon Art. This two-DVD set offers nearly four hours of detailed tutorials for setup, launching and flying these unique aircraft, and it comes with a money-back guarantee.

CONCLUSION

If you're interested in a sleek, molded, DLG airframe with the best current airfoil offerings, the Osiris Mk2 is a great fit. Careful assembly will keep weight low, and the pull-pull controls can yield slop-free results. And it all comes with fantastic customer care from Etienne and the folks at Icare.

Links

FMA Direct, www.fmadirect.com, (800) 343-2934

Icare/Icarus, www.icare-rc.com, (450) 449-9094

JR, distributed exclusively by Horizon Hobby Distributors, www.jrradios.com, (877) 504-0233

Radio Carbon Art, www.radiocarbonart.com, (888) 834-2261

For more information, please see our source guide on page ___.