

Daddy-O

A Golden Age Racer that should have been

by Thayer Syme



MAY 2005

SPECS

PLANE: Daddy-O

TYPE: Electric pseudo-scale park flyer

FOR: Intermediate pilots

WINGSPAN: 32 in.

WING AREA: 194 sq. in.

FLYING WEIGHT: 9.1 oz.

WING LOADING: 6.75 oz./sq. ft.

LENGTH: 27.25 in.

RADIO: 4-channel; flown with a Hitec Optic 6 transmitter, Hitec Electron 6 receiver, 4 Hitec HS-50 servos

POWER SYSTEM: AXI 2204/54, APC 8x3.8 prop, Jeti Advance Plus 4-amp programmable brushless controller, Kokam 2S 340mAh Li-Poly battery

FULL THROTTLE POWER: 4.82 amps, 29.6 watts, 3.26 W/oz., 52.1 W/lb.

TOP RPM: 6,250

DURATION: 8-12 minutes with throttle management

MINIMAL FLYING AREA:
Ball field

SUMMARY

The Daddy-O is a sport "could have been scale" model with classic Golden Age charm. Its traditional structure offers a strong and efficient one-piece airframe that is not difficult to build, and will reward you with a very unique airplane. At the field, the Daddy-O provides sparkling sport aerobatic performance and a head-turning silhouette. What more can you ask?

PHOTOS BY TINA HORAN AND THAYER SYME

FLY RC

FLY RC FREE PULLOUT PLAN

Sometimes when you see an airplane for the first time, it is just so “right” that you can’t get it out of your mind. Jason McGuire, a noted West Coast Free Flight modeler, showed up to fly one day with a delightful little flyer that immediately grabbed me. It simply oozed with the glamour of Golden Age air racing, and to everyone’s delight, it flew even better than it looked. Once I saw it in the air, I was lost. I simply had to have a Daddy-O of my own.

This plan represents my RC interpretation of Jason’s model. The shape is very faithful to his

original design. I used sheet fuse sides to speed building, though the truss shown on the plans would save some weight and look spectacular. Jason’s 16-inch Free Flight original could be replicated using these plans, and it would also make a wonderful micro RC flyer.

There never was a full-scale Daddy-O Racer. McGuire’s 16-inch “stick and tissue” model was the first time this design took

wing. While staying up late one night reading about air racing in the 20s and 30s, he swept off the drafting board in a fit of inspiration and sketched an outline before going to sleep. That outline became a working set of drawings, and ultimately gave rise to his model. Shall we go fly?

AIRBORNE

Flying this RC Daddy-O is a delight, but before you head out for your first flights, double check the CG and control throws. My prototype balances slightly nose down when supported on the main spar. The following control throws are well suited for your first flights: aileron +/- 1/2 inch, elevator +/- 5/8 inch, rudder +/- 1 inch. Check the batteries, and let’s get to it!

The Daddy-O tracks well on the ground and has plenty of rudder to keep it lined up with the runway. Slowly advance the throttle, let the tail come up, and your Daddy-O should soon lift off into a smooth climb. Sure, you could slam the throttle and horse it off, but it won’t look right doing it. Once you have some air under the wheels, start a slow bank to begin your departure

turn. I like to make a slowly climbing circuit after takeoff, racing back down the runway at 10-15 feet before climbing for some aerobatic adventures.

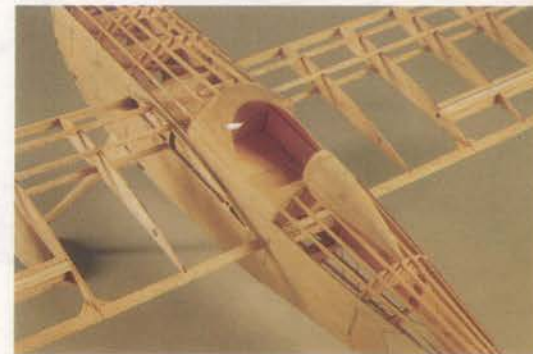
The little AXI is a powerhouse, and it was the perfect choice for this model. Its silent power will easily haul the Daddy-O through large loops, and it gives a good turn of speed if you want to carve it up around the pylons. A bit of a push is required for inverted flight because of the airfoil, but it is well mannered with the wheels up. Daddy-O stalls straight ahead and recovers quickly with a touch of throttle to regain flying speed. This is a very capable aerobatic model, and a lot of fun to toss about. Its light wing loading and abundant power really let you enjoy some fun flying in close.

When it comes time to land, Daddy-O has a respectable glide. Don’t get too slow, though. You don’t want to plop it back on the runway if you stall. I like to carry a little power into the flare and wheel it on. With practice, you can even get the tail down for a smooth three-pointer.

Daddy-O looks great in the air, especially when down low and in close, circling a set of imaginary pylons. Backing off the throttle will greatly extend flight times, with only a slight speed penalty, letting you enjoy Daddy-O in the air for up to 20 minutes on a charge. Once you have a few flights on your Daddy-O, feel free to adjust the control setup to suit your preferences.

ON THE WORKBENCH

Building the Daddy-O is quite straightforward, but you will not be able to start tonight and fly tomorrow. The structure is a traditional balsa affair that offers a lot of pleasure for anyone with a



The lightweight structure combines a few unique ideas with traditional stringer and former construction.

The Astro Flight 109 Lithium is an economical charger that easily refills the Kokam 2S 340 mAh Li-Poly battery. It will charge 1 to 9 cell packs at 50 mA to 8A charge rates.

few wood models behind him. Just take your time, and enjoy building a model the old fashioned way.

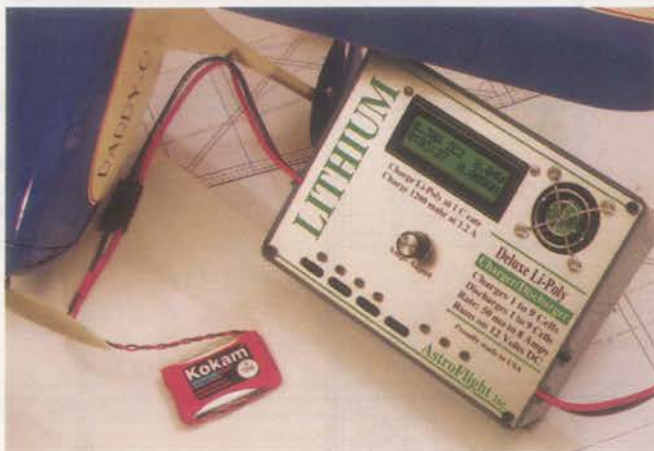
Start by cutting a full set of parts. This will speed assembly significantly. I selected reasonably light and stiff sheet wood from SIG in the six to eight-pound range for most of the structure. I cut the spars and other wing strip stock from eight to nine-pound stock.

You may notice some variation between the plan and the structure of my prototype. I was able to take advantage of laser cutting for my parts, so I designed them to key together. The plans show a much simpler structure, more suited to one-off construction.

I used Zap adhesive products throughout. Most of the construction was done with thin CA, with some 30-minute Z-Poxy to assemble the landing gear and Pacer Formula 560 to attach the windscreen.

FUSELAGE

Decide now if you are planning to build truss fuselage sides. The $\frac{1}{8}$ sq. built-up structure will have that classic Golden Age appearance with translucent covering, and the little extra time invested will save some weight as well. The top surface of the fuselage sides are flat behind F3, so you can assemble the fuselage upside down to help keep everything square. The $\frac{1}{8}$ square X-bracing in the nose really stiffens up the front of the fuselage, and it will lock in the alignment. Do not leave it out.



is critical with a new project with this level of emotional investment. The convenience of a single order to Hobby Lobby clinched the deal on these choices.

I stripped the case off the receiver to save a few grams, wrapped it with Clearly Superior Heat Shrink from Air Dynamics, and mounted it with a bit of double-sided tape. I also replaced the antenna with the E Cubed R/C M72-I indoor Azarr Lite antenna to keep from dragging a long wire behind the model.

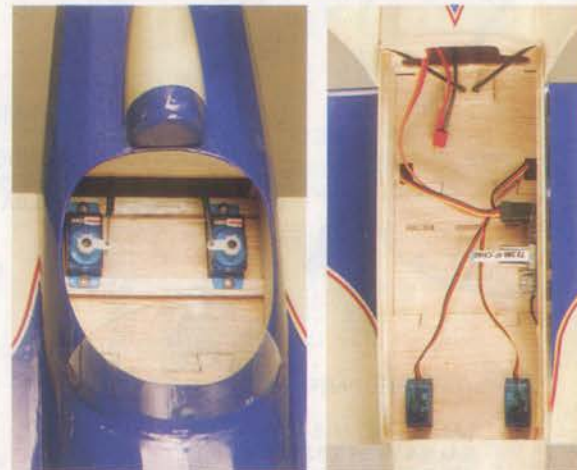
I made my pushrods from lengths of .060 carbon fiber rods with music wire Z-bends attached with heat-shrink tubing. This makes a very light pushrod with excellent stiffness for precise control.

FINISHING UP THE DETAILS

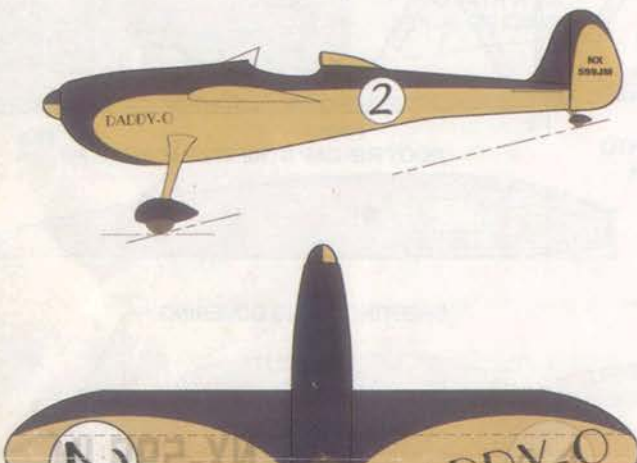
I knew I wanted the Daddy-O to look great, but I also wanted to use a light-weight covering. The new AeroKote Lite Film from SIG is great for models like this. It is easy to apply, doesn't seem to have as much gloss as some other plastic films and is quite opaque. The racing numbers and their circles were cut from AeroKote Lite. Surprisingly, the blue does not show through the white circles on the fuselage sides at all. I also used strips

LANDING GEAR

The landing gear presented an interesting challenge for this design. I did not want to use music wire because of the weight and flexibility of such a long strut. Instead, I made the gear legs out of .080 carbon fiber rod from Air Dynamics, and laminated shaped balsa fairings around



Left: Choices, choices. Mounting the Hitec HS-50s upright allows easy access with the Daddy-O sitting upright. Mounting them inverted will hide them within the radio compartment. Right: The landing gear struts anchor to the equipment tray in the radio compartment. The two-pin Deans connector goes to the Jeti speed control in the nose.



DADDY-O RACER



The wheel pants have a $1/32$ ply plate on the inside face that is glued directly to the balsa fairing and carbon rod. I used a short piece of $1/16$ aluminum tube as an axle for the Du-Bro Mini-Lite foam wheels, sleeved through pieces of $3/32$ tubing glued into the wheel pants. A very slight squeeze on one end of the axle will hold it in place. Use a piece of $1/16$ music wire to align the wheel pants when gluing them to the landing gear legs. I bent a simple wire tailskid to save time. Feel free to fit a tailwheel.

FLYING SURFACES

Start the wings and tail surfaces by laminating the outlines for a strong lightweight structure. I soaked the balsa strips for an hour or so in hot water, and then laminated them with thinned yellow carpenter's glue around $1/8$ -inch hardboard forms.

While the outlines were drying, I cut all the strip stock, then set up a stop block on my scroll saw and notched the rib locations on the leading and trailing edges.

I built the ailerons as part of the wing and then cut them free after sanding. Leave the spars and leading edges long at the root. These pieces pass through the fuselage sides and they are joined within the fuselage. The trailing edge simply notches into the fuselage side to maintain the proper incidence angle.



The low profile AXI 2204/54 is easy to mount on the front of the firewall, and provides plenty of silent power for spirited flight.

EQUIPMENT

Choosing the onboard systems for my Daddy-O was easy. The little 2204/54 AXI, JETI Advance 04-3P controller and Kokam 2S 340mAh Li-Poly are a perfect match for this size model, and I designed the Daddy-O around them. Looking toward the radio, I knew a set of Hitec HS-50 servos and Electron 6 receiver would provide light weight and complete reliability. That confidence and piece of mind

them. The CF rod anchors into the fuselage as it passes through F4 near the lower edges of the fuse sides. The rods extend up into plates F10 A & B that form a small block on the equipment tray right behind F4. The sheet fill surrounding the gear strut provides a secure anchor for the fairings, which act as large gussets and transmit loads into the fuselage structure.



The laminated outlines on the tail group are light and strong. Note the block fill between the fuselage and fin.

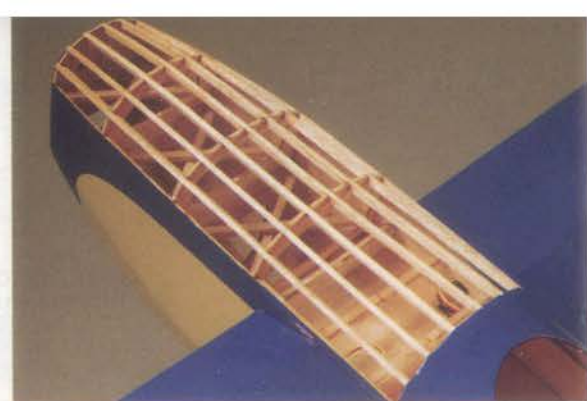
of AeroKote to hinge the control surfaces. The additional lettering was cut using a Stika vinyl cutter.

I cut the windscreen from a water bottle and used a toothpick to glue it in place with Formula 560. After the glue had dried, I carefully ironed a strip of covering around the base to give it a finished look.

Since this is a one piece model, cover as much of it as you can before assembly. I covered everything but the forward upper fuselage before I put it together. Leaving this open let me easily glue the leading edge and spars to F11 and 12 and confirm proper alignment.

CONCLUSION

The Daddy-O has been a great project. The classic structure was almost too pretty to cover, but the results were worth it. Flying the Daddy-O is a joy, as it carves smooth turns and maneuvers effortlessly through the sky. I can't help but wonder how it would fly a bit larger still, with an inline Ranger, Menasco Pirate, or Gypsy Major up front. ☺



Cover the model before final assembly, leaving just this area open before adding the wings. The x-bracing really stiffens the nose.



Dremel's new Lithium-Ion cordless rotary tool made quick work of shaping and hollowing the wheel pants, cowl and headrest. I used 150 and 220-grit sandpaper for final smoothing.

Links

Air Dynamics, www.airdyn.com, (646) 220-9732.

Astro Flight Inc., www.astroflight.com, (310) 821-6242.

AXI Motors, distributed exclusively by Hobby Lobby International, Inc., www.hobby-lobby.com, (615) 373-1444.

Dremel, www.dremel.com, (800) 437-3635.

Du-Bro, www.dubro.com, (800) 848-9411.

E Cubed R/C, www.azarr.com, (937) 849-0418.

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

Richmond RC Supply Ltd., www.richmondrc.com, (604) 940-1066.

SIG Manufacturing, www.sigmf.com, (800) 247-5008.

Stika, www.stika.com, (450) 449-0142.

W.S. Deans, www.wsdeans.com, (714) 828-6494.

ZAP and Z-Poxy are manufactured by Pacer Technology, www.zapglue.com.