

Blue Flash, A Glow Powered .25-.40 Size Sport Flyer



The July 2007 issue of *Fly RC* contains a free pull out plan for the Blue Flash, a glow powered .25-.40 size sport flyer. The classic lines are augmented with traditional balsa construction, along with a modern airfoil and flaps for fun at the field. The following materials list and [this downloadable cutting guide \(PDF format\)](#) will help your plans building efforts. Please contact editors@flyrc.com with any questions. I did not itemize the materials or components used as I built my original prototypes. The following is an attempt to list what is needed to build this model. Go over the plans, this list and the cutting guide to determine what else you might need. I recommend buying extra balsa to have on hand in case you need to make extra parts, and to ensure adequate material quality and sufficient supply while building.

ThayerWOOD

All stock is balsa unless otherwise noted

Qty	Description
6 1/16 x 3 x 36	Wing and fuselage sheeting, shear webs, rib cap strips
2 3/32 x 3 x 36	wing ribs, fuselage sheeting
4 1/8 x 4 x 36*	formers, fuselage sides and doublers
2 3/16 x 4 x 36	tail surfaces, wing tips and leading edge
1 1/2 x 36 triangle	bracing
1 1/4 x 36 triangle	bracing
2 1-3/4 x 36 T.E. stock	ailerons and flaps
2 1/2 x 1/4 x 36	rear spar
1 1/16 x 4 x 6 ply	servo plates, LE & TE joiners
1 1/8 x 6 x 9 ply	wing joiner, F2A & F2B formers,
1 1/4 x 6 x 6 ply	F1 Firewall and wing attach plate

*3-inch wide stock can be used with splicing. See cutting guide and plans to help choose.

HARDWARE

Dubro .40 tailwheel bracket, #375

Dubro 3/4-inch tailwheel, #75TW

Dubro nylon hinges, #117

Dubro control horns, #105

Goldberg 2-inch snap on spinner, #138

Great Planes .40 Dural Landing Gear, #GPMQ1820

Great Planes 1/8 x 1-1/4 Bolt On Axle, #GPMQ4275

Hayes AS-40 short engine mount, #016

Sullivan 3-inch Skylite wheels, #S877

Sullivan 6-ounce slant tank, #S438

The prototype used Sullivan #S503 Gold-N-Rod pushrods throughout.

FLY RC FREE PULLOUT PLAN

The classic appeal of an open cockpit tailwheel airplane speaks to many of Aviation's Golden Age, when enterprising souls built airplanes in garages and workshops across the country simply for sport fun. This excitement inevitably inspired many models over the years. SIG's Astro Hog and Spacewalker spring to mind, as does Joe Bridi's classic 1970's sport flyer, the RCM Sportster. I borrowed some features from these designs and added a few ideas of my own to create a unique model.



DESIGN CONSIDERATIONS

Sport glow models often have fat airfoils for more lift at lower speeds, gentle stalls, and enough drag to help bleed off excess speed when landing. This convenience costs extra power to push air around the thicker wing. A "cleaner" glider-type airfoil might give higher top speeds and a wider speed range with smaller engines. I chose the semi-symmetrical Eppler 387 airfoil. I added flaps to give extra lift at slow speeds, and simply because they are fun.

The result is a compact, durable sport flyer with honest handling and great performance. Traditionalists will find the construction techniques very familiar, and newer builders should be able to follow along with just a little patience. I used thin and medium Zap CA for all the basic construction. High stress areas such as the spar joiners, landing gear mount and firewall were assembled with Z-Poxy.

CONSTRUCTION

Building the Blue Flash is relatively easy. The only complexity comes with the compound curve behind the cockpit. I planked this area with narrow strips to provide a base for a fiberglass and

epoxy finish. If you plan to use an iron-on film and want to simplify and lighten this area, substitute stringers as indicated on the formers.

The wing is a conventional D-tube design with rib cap strips. The tail surfaces are solid sheet for convenience and strength. The actual construction goes faster if you first cut a parts kit. A materials list and cutting guide is available at www.flyrc.com to make sure you leave your local hobby shop fully prepared. It is a fun build, so let's get started, shall we?

TAIL SURFACES

I recommend starting with the tail surfaces. If you have never built a model from plans, you won't find an easier step, and you will have a major component ready for finishing in less than an evening.



I used an old favorite on this model, an O.S. 25 FSR nearly 30 years old and protected by a Dubro inline fuel filter. A current 25-40 should be fine. I epoxied short pieces of brass tubing through the firewall as anchors for the fuel and vent lines. A composite Hayes mount supports the engine.



That kind of confidence builder will help keep you motivated as you tackle the more complex structures later.

While you are at the copy shop making your full size plans, make a few copies on smaller sheets of the formers, ribs and tail

The landing gear mounts with two 1/4x20 nylon screws, and is faired in with 3/16 sheet. Battery access is through the cutout in F2, and the Futaba receiver is bundled safely in foam. I formed the fillets with West Systems 105/205 epoxy and 410 microlight filler.

Blue Flash

FLY RC

JULY 2007

by Thayer Syme

Open cockpit vintage fun

SPECS

PLANE: Blue Flash

TYPE: Glow powered sport flyer

FOR: Intermediate builders and pilots

WINGSPAN: 50 in.

WING AREA: 418 sq. in.

WEIGHT: 64 oz.

WING LOADING: 22 oz./sq. ft.

LENGTH: 38 in.

RADIO: 4-5 channels required; flown with a Futaba 9C transmitter, Futaba R148DF receiver, (5) Futaba S148 servos

ENGINE: .25 to .40 glow; flown with O.S. 25-FSR

PROPELLER/SPINNER: APC 9x6 glow

propeller, Goldberg 2-inch snap-on spinner

TOP RPM: 10,800

FUEL: SIG Champion 15%

ONBOARD BATTERY: 600mAh 4.8V flat pack NiCd

COMPONENTS NEEDED TO COMPLETE: See materials and accessory guide at www.flyrc.com.

SUMMARY

The Blue Flash is a traditional glow powered sport model that builds quickly and is sure to delight in the air. The flaps will add an extra dimension to your flying, making worry-free landings easy for any intermediate pilot.

PHOTOS BY WALTER SIDAS

surfaces. They should also have a repositionable spray adhesive or glue stick that you can use to secure these paper templates to your balsa stock.

I used Dubro pinned hinges as shown on the plans, cutting the slots with their slotting tool. You can substitute CA-type hinges or even strips of covering, just don't glue any hinges until after covering the model. Bevel the rudder and elevator leading edges after sorting out the hinges.

Draw a centerline on the stabilizer that is perpendicular to the trailing edge/hinge line. Carefully align the fin with this line, and ensure it also sits vertically perpendicular to the stab before gluing. You will cover this intersection with a balsa block fairing later.

Hey, guess what! You have the first parts ready to hang on the wall, and to inspire your progress.

WING

By building the wing next, I can use its center section to sand the wing saddle in the fuselage sides to the perfect shape. I make a rib template from 1/16 plywood, then trace around it with the hobby knife to make all the ribs. I have also used 1/32 ply, and even non-corrugated cardboard with a CA-hardened edge. This isn't rocket science; any reasonably stiff material that is thick enough to guide the blade is fine. Stack up the finished ribs and give them a quick swipe with sandpaper to ensure they are all the same shape.

Lay out the plans on your building board and protect them so you don't glue the wing down as you build. I prefer Great Planes' Plans Protector, but plastic kitchen film and waxed paper also work. Secure the lower main and rear spars over the plan. I dry fit a couple of ribs to make sure the spars have proper parallel spacing before adding the lower cap strips and center section sheeting. Add the ribs followed by the upper spar, leading edge, upper cap strips and center sheeting. I used a Master Airscrew razor plane to shape the leading edge tangent to the ribs after installing it. Now you can install the upper leading edge sheeting and radius the leading edge. I left the lower sheeting off until I had drilled the leading edge for the retaining dowel, using F2 in the partially assembled fuselage as a guide.

The plans show two options for mounting servos. Contemporary practice uses multiple smaller servos in the wing as shown on the left panel. To save a little money, I mounted two standard servos in the center section of both prototypes, with pushrods and bellcranks driving the ailerons, and torque rods for the flaps, as detailed on the right panel, and the photo to the right. Either works well, just make sure you have the appropriate holes you need in the ribs before you install them.

FUSELAGE

Start the fuselage by cutting out the sides and marking the former locations. Add the vertical grain doubler from F4 forward, as well as triangle stock aft of wing and stabilizer doublers. Tape a sheet of 150-grit sandpaper to the center section, and slide the fuselage sides spanwise in place to tune the fit. Join the fuselage with F2 and F4, making sure they are perpendicular to the fuselage sides. Taper the rear of sides and glue together, add additional formers and tank compartment floor. Sheet upper deck from F2 to F4, add F3 and cockpit floor, and cut out cockpit opening. Plank from F4 to F8 and sand smooth, or fit optional stringers.

Lightly tack a 3/16 spacer to stab saddle, and add a stub fin. Tack fairing blocks in place, and contour to the rear deck. Install fairings after covering.

I formed the tank compartment cover and cowl from fiberglass and epoxy. Tack blue foam blocks in place and sand to shape. Remove these plugs from model and cover with 2-ounce fiberglass cloth and epoxy resin. Fully seal fuel tank compartment and firewall. Chip out the foam after the epoxy cures.

FINAL DETAILS

My first prototype was covered with iron-on film and powered by a well-used plain bearing .19. I already knew I had a good design, so I added a little extra effort to this second prototype. I covered the wing with Super Coverite, and the fuselage with .75-ounce fiberglass and West Systems epoxy, before spraying primer and paint. I knew this finish added several ounces, so I installed an old O.S. 25 FSR I had waiting for a new home. This engine is no longer available, but any of the newer O.S. .25 - .40 engines would be fine.

AIRBORNE

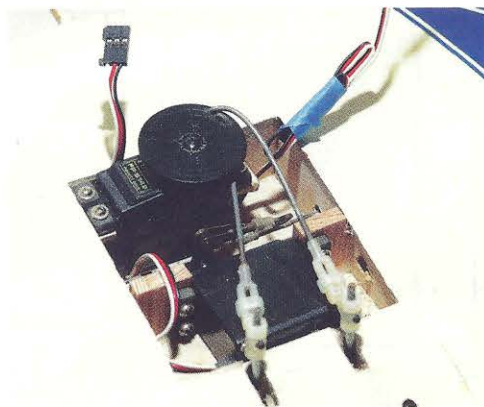
You will really enjoy the Blue Flash at the field. Acceleration is brisk and handling will seem familiar to any experienced pilot. The rudder is very effective as soon as you throttle up, so a light touch will keep it straight. The wheels are far enough forward so you needn't worry much about nosing over. 20 degrees of flap or so help it get off the ground a little faster, and the wing's low drag characteristics are readily apparent as soon as you lift off and the model picks up speed.



I personalized the Williams Brothers' 2-inch scale pilot with a little 5-minute Z-Poxy and 410 micro-light filler for the beard. Instead of gluing the head in place, I mounted it on a length of Sullivan Nyrod and attached it to the rudder servo. The cockpit combing is nothing more than silicon fuel tubing split lengthwise and pressed in place.



Three Futaba S-148 standard servos operate the throttle, elevator and rudder. Note the additional pushrod on the rudder servo to operate the swiveling pilot's head.



Left: I mounted two more servos in the wing center section to operate the flaps and ailerons. Note the offset attach points for the flap pushrods. This equalizes the motion between the two flaps. If separate aileron servos are used, you can lay the flap servo on its side to equalize the motion as well. Right: The Dubro tailwheel and bracket and wheel provide positive ground handling. I added the wire bracing after flying the model several times, purely for cosmetic reasons.



All traditional aerobatics are possible, with large, open loops and clean rolls. Spins are very pretty. Entry is positive with just full rudder and elevator inputs at low throttle. Recovery comes very quickly as soon as you release the sticks. Level the wings, ease in some power and pick up the nose to get flying again.

The flaps are very effective, and I have the most fun just shooting landings. Partial flaps offer a lot of lift and a bit of drag. If you really want to crawl in, try full flaps with a bit of extra power to control the descent rate. Your descent rate can be nearly vertical when landing with full flaps in a strong breeze. I add a little extra power blip to help smooth the flare.

CONCLUSION

The Blue Flash more than satisfied my initial curiosity and has been a lot of fun over the years. If you like the lines and don't mind rolling up your sleeves and cutting a little wood, consider building one of your own. The airframe goes together quite quickly, and there is nothing like the satisfaction of that first flight with a model you built yourself. ☺

Links

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

West Systems epoxy, distributed exclusively by www.cstsales.com, (800) 338-1278

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

O.S. Engines, distributed exclusively by Great Planes Model Distributors, www.osengines.com, (800) 682-8948

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

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

Zinger Propellers, www.zingerpropeller.com, (310) 539-2313

For more information, please see our source guide on pg. 185.