Margaret June

CL SPORTSMAN
GOODYEAR RACER

The business side of the airplane shows engine installation to good effect. ASP S15A and Magnum XLS-15A engines have excellent starting qualities, and are perfect for novice racers. Other engines are also legal. See the DMAA website for complete rules.

Build your own competition aircraft

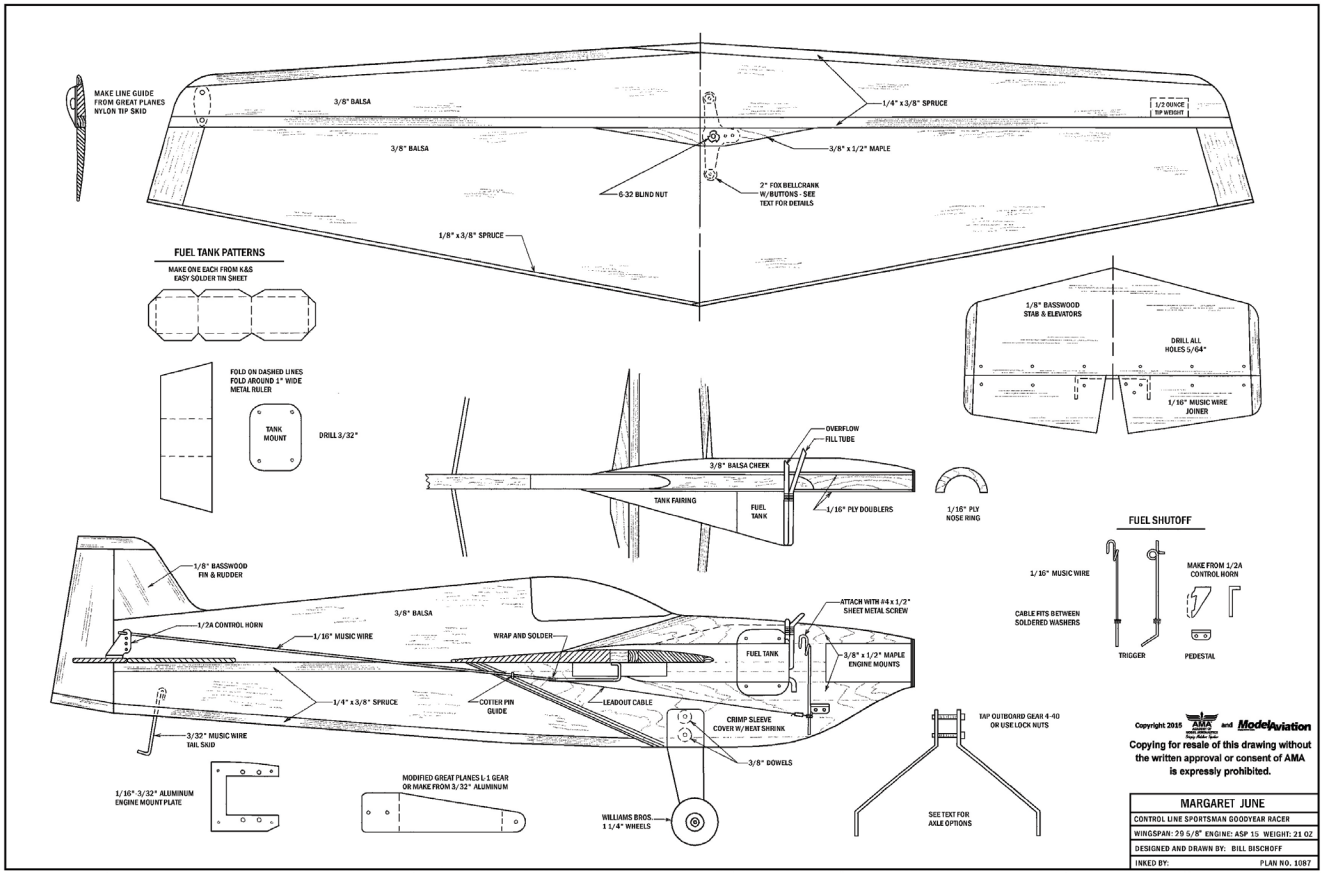
by Bill Bischoff

What is Control Line (CL) Sportsman Goodyear Racing? This is a fair question, so let's break it down.

Although the concept of CL flying is generally already understood, CL Racing may not be familiar to everyone. In CL Racing, two or three airplanes are flown simultaneously in the same circle.

Everyone must complete a prescribed number of laps, and within that time, several pit stops must be made. This means the engine stops, the airplane lands, the mechanic refuels and restarts the model, and the airplane takes off again. The airplane that finishes in the shortest amount of time is the winner.

Goodyear refers to a specific AMA competition event, the formal name of which is Scale Racing. The models must be $^1/_8$-scale profile renditions of actual racing airplanes that compete or competed in the International Formula 1 air-racing class, hence the name Scale Racing.



Specifications

Type: CL Racing
Wingspan: 29-5/8 inches
Length: 23 inches
Weight: 21 ounces
Power system: ASP S15A or Magnum XLS-15A glow engine
Propeller: APC 6.5 x 5 or APC 6.5 x 5.5
Construction: Balsa and plywood

When this midget race airplane class was created after World War II, it was sponsored by the Goodyear Tire and Rubber Company, giving the full-scale event the common name of Goodyear Racing. When the model event was created, it also took the common name of Goodyear Racing. The Sportsman designation denotes a local or regional modification of the AMA Scale Racing event, usually with additional restrictions designed to limit performance.

As an example, a good AMA Goodyear model can go approximately 120 mph, while a top-performing Sportsman Goodyear model might go 85 mph. The reduced performance is usually accompanied by reduced costs, and these factors make the event appealing to novices and casual competitors. With a stock engine requirement, the emphasis is on team performance rather than equipment performance.

For the complete Dallas Model Aircraft Association (DMAA) rules, visit the club's website listed in "Sources." Based on the success and popularity of the event in 2014, it was decided to include DMAA Sportsman Goodyear as a supplemental event at the 2015 Nats.

Margaret June was chosen as the subject of this construction article for several reasons. I wanted to model an aircraft that is currently competing, and has not been modeled before, and I wanted it to look good. After some Internet research, I came across the Margaret June. It met my preliminary requirements, and to make things even better, I found a small drawing that could be scaled up. The only problem was that, without any dimensions, I didn't know exactly how much to scale it up.

I also found the name and email address of Margaret June's pilot, Kent Cassels. I sent him an email explaining that I wanted to build a model of Margaret June, and needed some dimensions. Although he was actually driving back home from the Reno National Championship Air Races at the time, I had a reply from him within about 10 minutes!

Kent included pictures, dimensions, and a scale drawing. I was surprised and impressed, and with that I knew my project had to be Margaret June!

My engine of choice is either the ASP S15A or the Magnum XLS-15A. They are the same engine other than the name on the crankcase and minor carburetor differences. These engines are inexpensive and start easily, even in the hands of a novice.

The ASP is available from HobbyPartz.com for less than $45. The slightly more-expensive Magnum is available from Tower Hobbies and Hobby People.

The stock engine must be used, except for the venturi and spraybar. I can provide venturis and needle assemblies for $10 each or $20 for both (contact me at the email at the end of this article), although anything that meets the rules may be used.

Let's get started!

Construction

Throughout the airplane build, I tried to use standard hobby shop parts and supplies as much as possible. If your preferences are different, feel free to use what you like. The recommended construction sequence may seem to jump around, but will make sense after reading through the text.

Wing

Begin by cutting out the forward part of the wing and wingtips from $^3/_8$-inch medium-hard balsa. Cut the rear portion of the wing from $^3/_8$-inch medium-light balsa. Cut the bellcrank mount from $^3/_8$ x $^1/_2$-inch maple engine-mount stock.

Notch the rear portion of the wing to fit the bellcrank mount. Assemble all parts of the wing, including the spruce spar and leading and trailing edges.

Throughout the airplane, wherever spruce is called out, basswood may also be used. If you can't find spruce or basswood longer than 24 inches, the wing spar can be spliced in the center.

When it has dried, taper the wing's thickness from $^3/_8$ inch at the center to approximately $^1/_4$ inch at the tips, leaving the bottom of the wing flat. Carve and sand the wing to the airfoil shown on the plans. If you prefer a different airfoil, use whatever you like, but the flat bottom works fine and is the easiest.

Drill a hole for the 6-32 bellcrank mounting bolt. Recess the top of the bellcrank mount so that a 6-32 blind nut will sit flush with the top of the wing, and install the blind nut. Add $^1/_2$ ounce of tip weight to the outboard wing, give the wing a final sanding, and put it aside.

A word of caution: pay attention to the bellcrank mount as you work on the wing. It is not symmetrical, and it would be easy to build the wing upside down.

Landing Gear

You will need the landing gear while working on the fuselage, so make it at this time. The landing gear can be made from a Great Planes Dural L-1 aluminum landing gear (#GPMQ1810), available from the hobby shop or Tower Hobbies. Measure $^{43}/_8$ inches from the bottom of the gear (measure as if the gear were flat instead of bent) and cut off the gear legs. Bend each gear 1 inch from the top to make a matched left and right pair. Alternately, the gear can be cut from $^3/_{32}$-inch sheet aluminum. Tap the outboard gear 4-40 and clearance drill the inboard gear for the 4-40 bolts that will hold it on. The gear can be tapered, sanded, and polished as desired.

The $^{11}/_4$-inch Williams Brothers (#13800) wheels are available from the hobby shop or Tower Hobbies. Use 6-32 x $^{11}/_2$-inch Great Planes bolts for the axles (#GPMQ3042). These were chosen because the unthreaded portion of the bolt is an appropriate length for the thickness of the wheel. Drill the wheels to spin freely on the bolts. Use a washer on each side of the wheel and attach to the gear with a 6-32 hex nut on each side of the gear. Be sure to use Loctite. Cut off any excess bolt length.

For a sleeker installation, get some $^1/_4$-inch outside diameter x $^7/_{16}$-inch threaded standoffs from McMaster-Carr (#92474A264). Drill the wheels out to $^1/_4$-inch inside diameter. Using Loctite, install the wheels and axles with 6-32 x $^1/_4$-inch button-head screws and washers. Alternately, standard RC-type bolt-on axles and wheel collars can also be used.

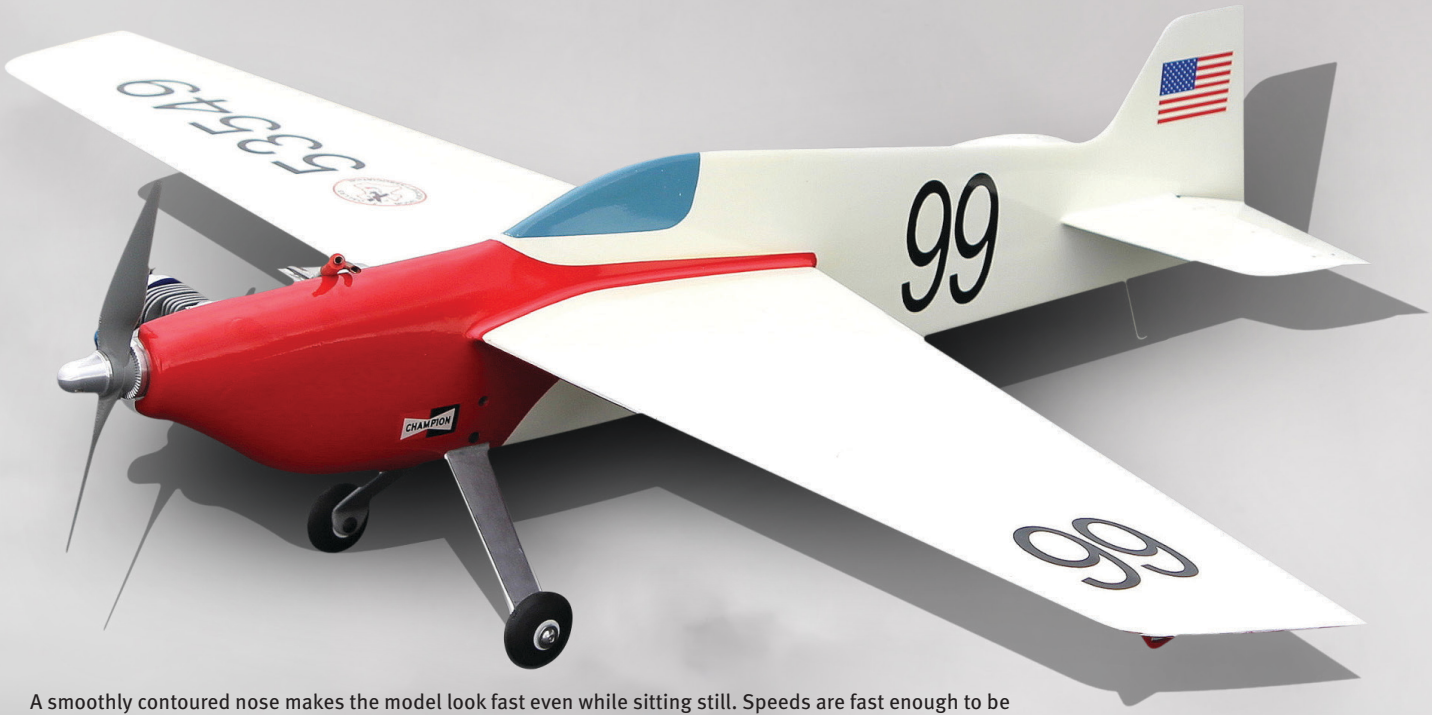
The bare wood structure clearly shows off the spruce reinforcements. The components are fiberglassed before being assembled.

Engine Mounting Plate

The engine should be mounted on a $^1/_{16}$ to $^1/_8$-inch thick aluminum plate or pads. If you used the L-1 landing gear, the pads can be cut from the leftover aluminum. Cut them approximately $^3/_8$ x $^{11}/_4$ inches. The plans show a pattern for a one-piece plate. Drill the plate to fit the engine. Drill holes for the #2 sheet-metal screws that will hold the plate in place.

Fuselage

Cut out the fuselage top and bottom from $^3/_8$-inch medium-hard balsa, but don't make the cuts for the maple mounts yet.



A smoothly contoured nose makes the model look fast even while sitting still. Speeds are fast enough to be fun, but not physically demanding. Sportsman Goodyear is a great introduction to CL Racing.

Make the wing cutout on the bottom edge of the fuselage top using the actual wing as a guide. Make the $^1/_8$-inch cutout for the tail as well. Glue the $^1/_4$ x $^3/_8$-inch spruce stiffener to the top edge of the fuselage bottom, and make the bellcrank cutout in the fuselage bottom.

Join the fuselage top and bottom and you should have perfect cutouts for the wing, tail, and bellcrank with a minimum of fuss! Make the cutouts and install the maple engine bearers using the spruce as a horizontal reference line.

Leave the outline of the top bearer oversized for now. It will be sanded to final shape later. If you haven't already done so, glue the bottom spruce stiffener to the fuselage now. Using the landing gear as a guide, drill the fuselage for the $^3/_8$-inch dowels that will prevent the landing gear from crushing the fuselage.

Cut out the $^1/_{16}$-inch plywood doublers. Cut the doublers slightly oversized. They will be cut and/or sanded to size later. Neither doubler should be cut away to fit the engine at this time.

Make the wing/bellcrank cutouts in the doublers as accurately as possible. Taper the edges of the doublers, being sure to make a right and left side. Epoxy the outboard doubler in place. If necessary, peg it in place with toothpicks to keep the wing cutout properly positioned. When dry, cut away the doubler for engine mounting.

Turn the fuselage inboard side up. Drill the landing gear mounting bolt holes through the $^3/_8$-inch dowels installed earlier, using the landing gear as a guide. Glue the inboard doubler in place, again keeping the wing cutout properly aligned. When dry, the nose of the airplane can be cut or sanded to its final outline. Note that the inboard doubler does not get cut away for the engine.

Tack the aluminum engine plate in position on the fuselage with a drop of CA glue and drill the engine mounting bolts and the small pilot holes for the screw that attach the pads. Install 4-40 blind nuts for the engine. Remove the pads and drill the landing gear mounting holes through the inboard doubler.

Test-mount the engine and landing gear to the fuselage and slide the wing in place. Make any necessary adjustments or corrections.

Cut the $^3/_8$-inch balsa cheek cowl to the same outline as the plywood doublers. Firmly press it against the inboard side of the fuselage to make impressions of the blind nuts in the balsa. With a Dremel tool, make shallow recesses in the cheek cowl for blind-nut clearance. Next, drill the landing gear mounting holes through the cheek cowl using the fuselage as a guide.

Redrill the holes in the cheek big enough to clear the heads of the landing gear mounting bolts. Cut away the back side of the cheek cowl to allow the landing gear to slide in between the cheek cowl and fuselage. Epoxy the cheek cowl to the fuselage, making sure to seal the bare wood in the landing gear mounting area. When it's dry, install the plywood nose ring.

Cut the fin and rudder from $^1/_8$-inch basswood and install them on the fuselage. No rudder offset is used. Do not omit the cross-grain top and bottom caps. They add considerable stiffness without additional weight. Sand, contour, and taper the fuselage as desired.

Stabilizer and Elevator

Cut the tail parts from $^1/_8$-inch basswood. Again, do not omit the cross-grain tips. Join the elevator halves with a $^1/_{16}$-inch wire joiner. Drill $^5/_{64}$-inch holes for the hinges and control horn. Round and/or taper the edges as desired. For proper alignment later, mark the stabilizer so you can tell the top from the bottom.

Assembly and Finishing

Decide how you plan to finish your Margaret June. I prefer a fiberglass and epoxy finish for durability, but silkspan or carbon veil and dope will work as well. I will describe my procedure, but use whatever you prefer.

I find it easiest to glass the parts of the aircraft before they are assembled. For a dope finish, you may want to assemble the airplane first.

Sand all of the parts with 220-grit sand paper. If the fuselage needs filler around the edge of the doublers or fin base, apply it now so it will be beneath the fiberglass. I use Super Fil, a two-part epoxy filler made for full-scale aircraft. It is available from Brodak Manufacturing or Aircraft Spruce & Specialty. Epoxy and microballoons will also work.

After the filler has been sanded, the fuselage is ready to be covered with 1.5- to 2-ounce fiberglass cloth. I use either Bob Smith FINISH-CURE Epoxy or Pacer Z-Poxy Finishing Resin to apply the fiberglass cloth to the wood.

Lay the fuselage inboard side up on some paint cans or drink cans (full cans will be more stable.) Cut a piece of fiberglass cloth at least an inch too large and lay it on the fuselage. Pat it down and smooth it out as much as possible. Mix $^1/_2$ ounce of finish epoxy and pour a 1-inch puddle in the middle of the fuselage on top of the cloth.

With a business card or playing card, spread the epoxy in all directions. Keep pouring/spreading/scraping in all directions until the cloth is wetted and smooth and there are no blobs or puddles of wet epoxy. Don't try to wrap the cloth around the edges of the fuselage. Just let it hang. If you've scraped it carefully, there won't be much sanding required later.

Let it dry overnight then trim and sand the excess cloth around the edges and fiberglass the other side in a similar manner. Cover the wing and tail the same way. When all of the parts have been glassed, sand them smooth with 220-grit then 400-grit sand paper. If you sand through to bare wood anywhere, seal it with a smear of finish epoxy or thin CA and sand again.

Bend the tail skid from $^3/_{32}$-inch music wire. Drill several $^1/_8$-inch holes in the bottom of the fuselage to create a slot for the tail skid. Prop or clamp the fuselage bottom side up, and epoxy it in place. I use finishing epoxy for this because it is thin and will seep down to the bottom of the hole. As the glue settles, add more to the hole as required. When the leftover glue begins to thicken, mix in a dab of microballoons and slightly overfill the hole. Sand it flush after the glue cures.

The line guide is made from a nylon wingtip skid. It is simple and durable. The line ends fit through the hole.

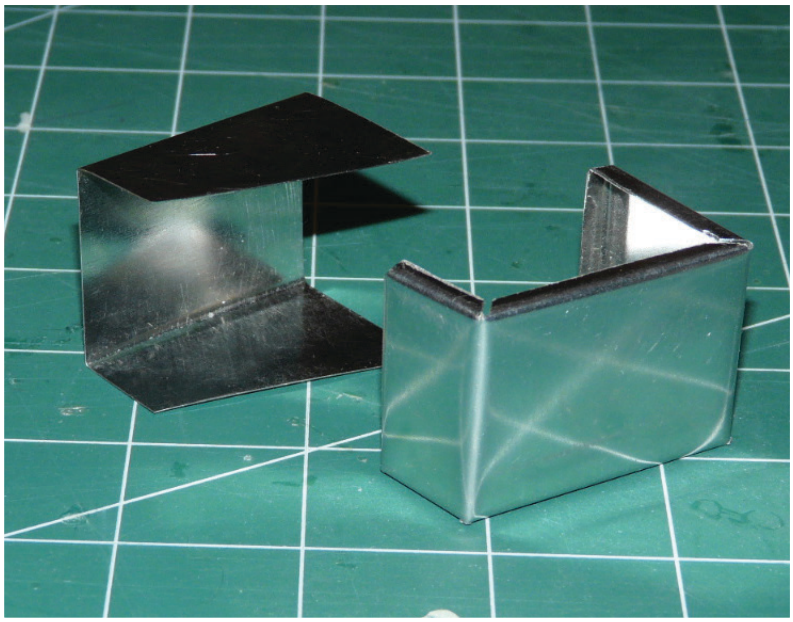
The wing can now be glued into the fuselage. Use 15-minute epoxy for strength. Heat from a heat gun will make the glue thin and runny and better penetrate the joint, but too much heat will make the glue start to set. If the fit is good without any gaps where you can see all the way through, finishing epoxy can be used. Double-check the alignment before the glue sets.

Make the line guide from a Great Planes nylon wingtip skid (#GPMQ4445) as shown on the plans. Drill mounting holes through the wing, and epoxy the guide in place. Cut and sand the mounting pegs flush with the top of the wing.

Before gluing the stabilizer in place, don't forget to put the elevator through the stabilizer slot in the fuselage. The elevator with the holes for the control horn should be on the outboard side of the airplane. Glue the stabilizer in place, making sure it is right side up. Sew a couple of temporary hinges with fine copper wire to hold the elevator during the finishing process.

Fuel Tank

The tank is built next, because the tank and fuselage need to be fitted to one another. Make several photocopies of the tank patterns and attach them to some K&S #254 easy-solder tin sheet with rubber cement or spray adhesive. Cut the straight lines with a scissors, and cut the "notches" with a Dremel tool and cutoff wheel. Fold on the indicated lines. Fold the parts around a 1-inch wide metal ruler for maximum accuracy and minimum effort.



Making the tank is easier than it seems. Parts are folded around a 1-inch ruler, ensuring a good fit. The metal can be cut with scissors.

The pickup, vent, and overflow tubes stop just inside the tank. With this design, it is unnecessary to cap the overflow for flight.

Assemble the two main parts of the tank with the outboard portion of the tank's body fitted inside the inboard portion. Using a few strips of masking tape to hold it in place, solder the tank body together.

Study the plans and photos so you understand the tube arrangement on the tank, then bend and install the $^1/_8$-inch copper tubes. All tubes stop just inside of the tank. The fuel pickup should point toward the fuel shutoff. The filler tube pokes into the front of the tank and should clear the top of the fuselage when installed.

Consult with your pit person about how he or she would like the filler tube pointed: up, forward, inboard, etc. The overflow goes from the top outboard corner of the tank and "snuggles in" behind the filler tube. It should be cut off so that any fuel overflow is discharged down and away from the model. The fill tube and overflow tube are wrapped together with a few turns of soft wire and soldered for extra strength in the event the aircraft flips over.

After the tank is finished, solder it to the mounting plate and check the tank for leaks. Connect the fill tube and vent with a short piece of fuel line, then connect a bulb or syringe to the pickup tube. Pump air into the tank, immerse it in water, and look for bubbles, which indicate leaks.

Solder any leaks and repeat the procedure until the tank is leak free. Fill the tank roughly half full of dope thinner and swish it around to remove any soldering residue. Drill $^3/_{32}$-inch mounting holes in the tank, and matching pilot holes in the fuselage.

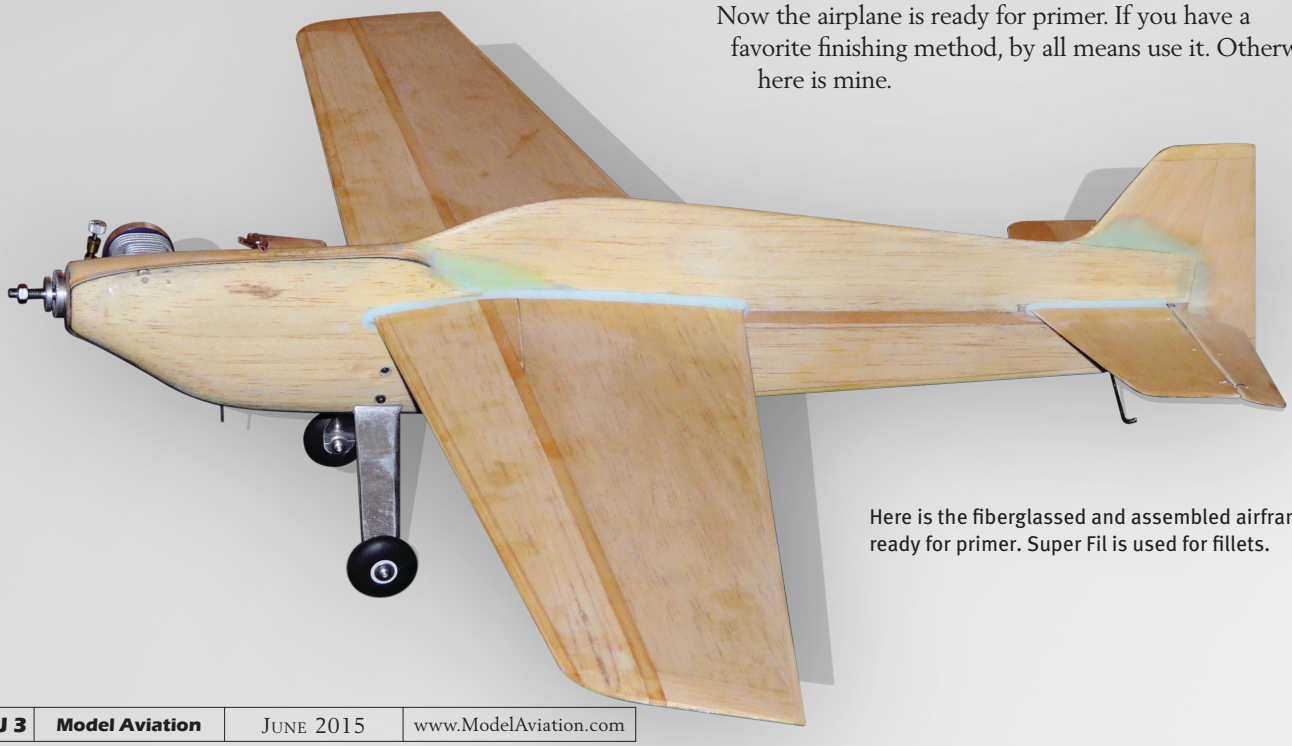
Tank Fairing

Make the fairing from a soft balsa block or laminate some scraps of $^3/_8$-inch balsa. Before installing the fairing, cover it with fiberglass cloth and finishing resin. When it's dry, sand it smooth and install. To get a perfect fit between the tank and fairing, liberally coat the front of the fairing with 5-minute epoxy and microballoons then install the tank with a wax paper barrier between the tank and the fairing.

Remove the tank when the epoxy is dry, and sand to final shape. Super Fil or epoxy/microballoon fillets can be installed on the wing and tail joints and sanded smooth when dry. Sandpaper wrapped around various sizes of fuel tubing makes a great sanding tool.

Painting

Now the airplane is ready for primer. If you have a favorite finishing method, by all means use it. Otherwise, here is mine.



Here is the fiberglassed and assembled airframe ready for primer. Super Fil is used for fillets.

I like using Colorline DC540 gray spray-can primer from Napa Auto Parts. It is easy to use, compatible with epoxy glue and paint, dries quickly, and sands beautifully.

Prime the entire airplane, and look for any areas that could benefit from a bit of spot putty or additional attention. I prefer to use Squadron white putty because white is easy to cover. This is primarily a product for plastic models.

Sand the entire model with 220-grit then 400-grit sandpaper. Prime and sand again any areas that may require it. The idea is to sand almost all of the primer off, leaving it only in low or uneven areas.

Blow the dust off the model, paying particular attention to the mounting holes. Clean the model with Windex, allow it to dry, and wipe it with a tack rag. The model is now ready for color.

I use Klass Kote two-part epoxy paint. It is durable, glossy, and fuelproof. Its instructions are good, so I won't repeat them.

For the base color, I spray with an 8-ounce automotive-type touchup gun at 35 psi. Roughly 50ccs of paint, 50ccs of catalyst, and 60ccs of reducer should be a sufficient quantity to paint the airplane. For trim colors, numbers, and the canopy, I use a basic siphon-type airbrush, also at 35 psi. This may require more reducer for optimal spraying.

I don't always clear coat the model, but go ahead if you prefer. Let the paint cure for 24 hours before handling or beginning final assembly.

Hinges

The elevators are sewn to the stabilizer with $^1/_2$A Dacron flying line. Cut six 2-foot pieces and saturate one end of each piece with thin CA. This will harden the line and let it function as a sewing needle.

Starting at the hinge location closest to the fuselage, pass the line through the stabilizer, leaving approximately 8 inches. Temporarily tape this end to the bottom of the stabilizer and sew four or five figure-eight stitches to connect the stabilizer and elevator. Pull both ends of the line tight and tie a knot underneath the stabilizer.

Thread the CA-hardened end up through the stabilizer again and pull the knot up into the hole. Sew the rest of the hinges in a similar manner. Pull a little tension on the elevators to align the hinges. Using a toothpick, apply a drop of medium CA into each hinge hole in the stabilizer and elevator, being careful not to get the glue in the hinges. Cut off the excess thread with a new #11 blade.

Engine, Tank, and Landing Gear Installation

Fasten the tank and engine plate to the airplane with #2 sheet-metal screws. Attach the engine and landing gear with 4-40 screws. Install the fuel line between the engine and tank. Always use a filter. I prefer the Sullivan #204 silicone tubing because it is softer and easier to pinch.

Begin with an APC 6.5 x 5.0 propeller. This is generally the fastest, but an APC 6.5 x 5.5 might be slightly faster, so don't be afraid to try it as well. If you prefer a spinner nut over the stock hex nut, the O.S. 10 spinner nut (#OSM20824005) has the correct thread size.

Fuel Shutoff

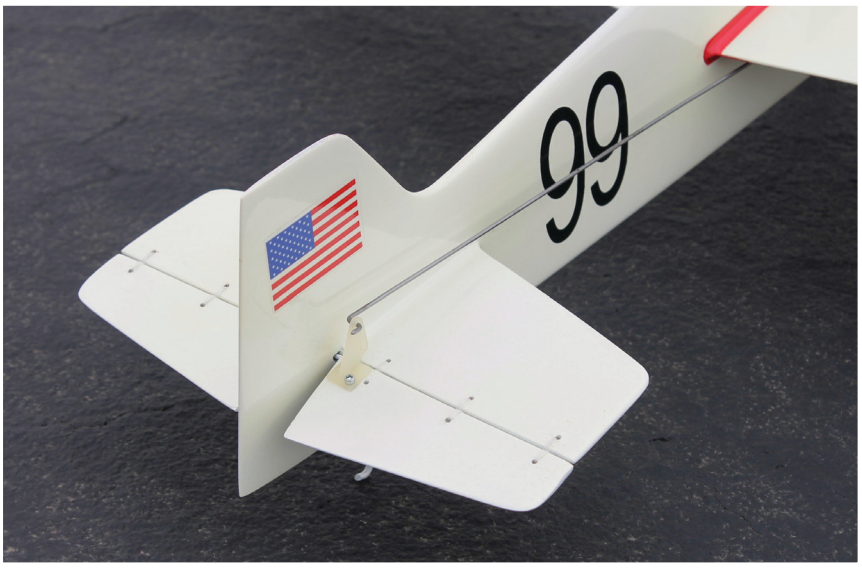
The fuel shutoff is composed of a pedestal made from a $^1/_2$A control horn and a $^1/_{16}$-inch music-wire trigger. Fabricate these parts as shown on the plans and install them on the airplane.

The trigger wire is held away from the fuselage by the pedestal, and the fuel line is captured between the trigger wire and the fuselage. When the trigger wire is pulled aft by the shutoff cable, it comes off the pedestal and pinches the fuel line against the fuselage, stopping the engine.

Bellcrank

Use a 2-inch Fox metal bellcrank. I attach the lines directly to the bellcrank primarily to eliminate the chance of line connectors becoming fouled, but it also decreases drag. The line ends are constructed in the usual manner.

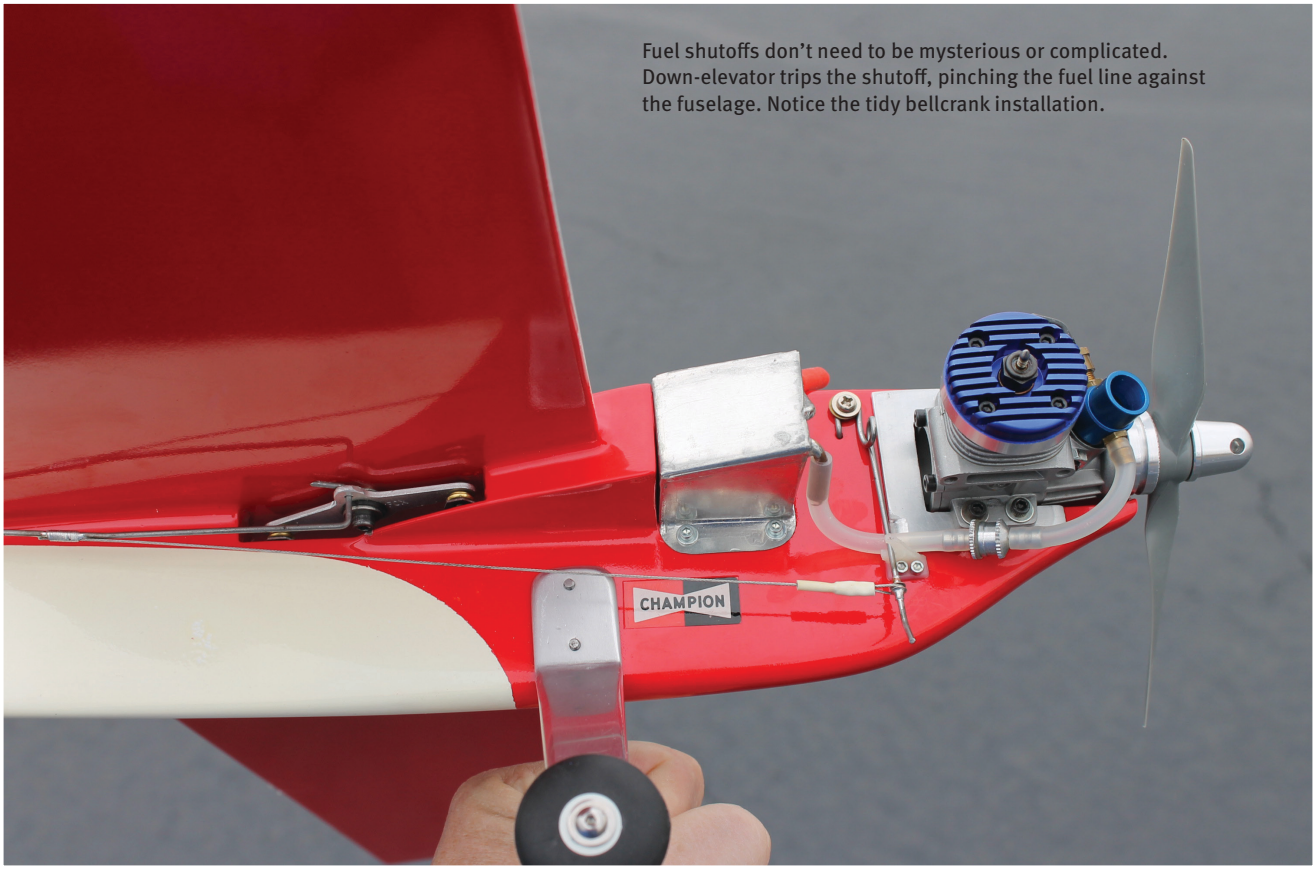
I use Brodak BH321 large-thimble eyelets. They perfectly match with the Du-Bro #135 4-40 blind nuts that serve as the line-attachment buttons. I also used 4-40 x $^1/_4$-inch button-head cap screws because their low profile eliminates interference.



Dacron 1/2A control line is used for sewn hinges. A simple Z-bend is sufficient for the pushrod, although a clevis can be used.

Drill and tap the leadout holes in the bellcrank 4-40 then install the screws. Be sure to use Loctite. To make the buttons, thread a blind nut onto a long 4-40 bolt (to use as a handle). Screw a regular 4-40 hex nut down on top of the blind nut, and "jam nut" them together so they don't move.

With a Dremel tool and cutoff wheel, file the round flange of the blind nut down to match the hex nut. The idea is to



Fuel shutoffs don't need to be mysterious or complicated. Down-elevator trips the shutoff, pinching the fuel line against the fuselage. Notice the tidy bellcrank installation.

create a blind nut with a hex flange that can be tightened with a 1/4-inch nut driver. Repeat three more times. You never know when you might lose one and need a spare.

The lines should swivel freely when the blind nuts are tightened down over them. If necessary, lightly compress the thickness of the eyelets by tightening them between two nuts on a 6-32 bolt.

The control lines attach directly to the bellcrank, eliminating leadouts and line clips. The screw-on buttons are made from blind nuts.

Control Linkages

The pushrod is made from a piece of 1/16-inch music wire with a Z-bend at each end. If you are uncomfortable with your ability to accurately bend the pushrod, you can use a 2-56 threaded pushrod with an adjustable clevis on the elevator.

Before installing the pushrod, attach the unfinished shutoff cable with a fine wire wrap and solder. The pushrod is installed in the inner hole in the bellcrank, and the topmost hole on the control horn. Install the bellcrank with a washer or two between it and the wing to allow clearance for the pushrod. Make sure there is adequate clearance for the bellcrank buttons so they don't bind on the fuselage.

Install the elevator control horn and attach the pushrod. Test the controls for smooth operation and approximately equal amounts of up and down. When satisfied, install the cotter pin pushrod guide.

Solder the two small washers onto the shutoff trigger wire (if not already done). Slide a leadout crimp sleeve and a 1/2-

inch long piece of 1/8-inch heat-shrink tubing onto the shutoff cable. The shutoff cable wraps around the trigger wire in the space between the washers, then back through the crimp sleeve. It should be able to rotate freely around the trigger wire.

The shutoff should trip with about 5/16 inches of down-elevator. Crimp the cable at the appropriate length then cover with heat shrink material. If test-flying reveals that the shutoff needs to be adjusted, the solder joint can be reheated and the cable moved forward or back, or simply adjust the clevis if applicable.

Balancing

The model should now be complete, so check the center of gravity (CG). It should be approximately equal to the front of the bellcrank opening. If it is ahead of this, don't worry about changing it until after it has flown. If it is more than 1/4 inch aft of this, you may want to add some nose weight for the first flights.

Flying

Make a set of .015-inch stranded lines, trying to get as close to the minimum length of 52 feet as you can. This is the length from the handle grip to the center line of the fuselage, not the actual length of the lines. Remember, an extra foot of length is equivalent to an extra second for every 52, or an extra 10 or 11 seconds in a race.

The controls on this airplane are set up for a typical 4-inch handle spacing, so try that first. Don't forget the preflight pull test.

If the airplane seems jumpy, try adjusting more down-elevator into the handle. If that doesn't help, try a handle with narrower line spacing. If it is still too touchy, add some nose weight. You did check the CG, didn't you?

When you are satisfied with the model's general flight characteristics, try the fuel shutoff. Make your first attempts directly over your pit person. Give a quick blip of down-elevator, followed by a quick blip of up-elevator, then level off.

If this is your first time using a fuel shutoff, don't worry if it didn't trip on the first try. Relax, regroup, and try again. Don't just keep trying, because then you lose track of where you shut off relative to your pit person. If you can't ever seem to get it to trip, you will probably need to adjust the shutoff so that it trips with less down-elevator. Don't go too far, or it may trip when you don't want it to.

Okay, you've got the hang of the shutoff. Now, when you shut off right over your pit person, where does the model land? If it stops short of the person by a quarter lap, then hit the shutoff a quarter lap later. You want the model to come to your pit person at a speed that is comfortable for both of you. As you become more proficient at this, try fluttering the elevator up and down after the shutoff. This will allow you to slow the airplane faster, which means you don't have to shut off as soon.

Shutting off directly opposite your pit person means only a half lap of gliding instead of a full one. This can save several seconds on every pit stop, but if the person can't make the catch, you've just wasted those seconds—and probably more. Consistency first! Get comfortable with your airplane by practicing your pitting until is second nature.

Flying with another person in the circle can be intimidating at first. Even if you don't have anyone to race with, fly any sport model with one or two friends to get the feel of having other people in the circle. If possible though, try to find some other racers to practice with. Chances are you will be welcomed with open arms.

Here in Dallas we always encourage new fliers to come out and fly with us, and we are happy to give them all the help they need.

If you can't get together with anybody except at contest time, try to arrange some practice with another team before or after the contest. Your flying will benefit, and you will make new friends or improve existing friendships. That makes everyone a winner!

Best of luck with Margaret June. I'll look for you at the 2015 Nats!

—Bill Bischoff
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SOURCES:

Margaret June Air Racing
www.facebook.com/MargaretJuneAirRacing

Aircraft Spruce & Specialty Co.
(877) 477-7823
www.aircraftspruce.com

APC Propellers
customer-service@apcprop.com
www.apcprop.com

Bob Smith Industries
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www.bsi-inc.com

Brodak Manufacturing
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Hobby People
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www.hobbypeople.net

KlassKote
(612) 243-1234
www.klasskote.com

Loctite
(800) 624-7767
www.loctite.com

McMaster-Carr
(330) 995-5500
www.mcmaster.com

Sig Manufacturing
(641) 623-5154
www.sigmfg.com

Sullivan Products
(410) 732-3500
www.sullivanproducts.com

Team Associated
(949) 544-7500
www.teamassociated.com

Tower Hobbies
(800) 637-6050
www.towerhobbies.com

Williams Brothers Model Products
(512) 846-1243
www.williamsbrothersmodelproducts.com

Pacer Technology/Super Glue Corporation
(800) 538-3091
www.supergluecorp.com/zap-brand-products

DMAA
www.dmaa-1902.org