BLUE RID

During the '30s and '40s, model aviation reached its Golden Age. This was the time of the Zipper, Bombshell, Playboy, Miss America, and the big Valkyrie. With their inherent stability and classic lines, these famous Free Flight designs are still popular today; a number of them have been converted to radio control.

The Blue Ridge Comet is a throwback to the models of that era. It features the boxy fuselage and fat airwheels that were commonplace back then. One feature, however, that's not found on those "Old-Timers" is split flaps. These really help to slow the model down, giving it excellent low-speed characteristics. They also keep the model from floating down the whole runway. While flaps are certainly not necessary, they're an enjoyable feature that enhances performance. If you've never tried flaps before, this would be a good model to start with.

CONSTRUCTION

While construction is not difficult, familiarize yourself with the plans and text first to see how it all goes together. Start by selecting the wood; look for the right hardnesses, and make sure that none of it is warped.

Spruce is used for the wing spars; it's stronger than balsa and has less tendency to warp.

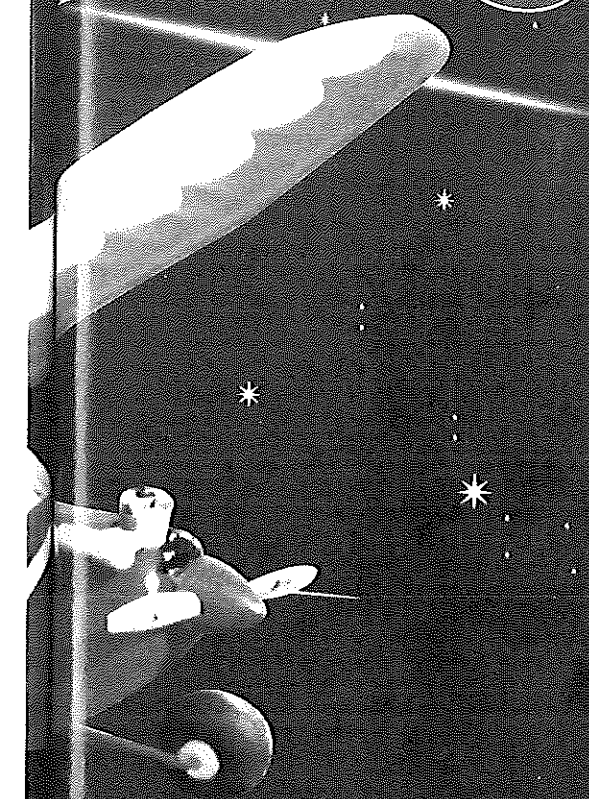
It is best to use a slow-drying glue on the spruce and plywood parts. This allows more time for the glue to penetrate the wood, resulting in a stronger bond. I used Titebond throughout, with 15-minute epoxy on high-stress areas. It's easier to cut the parts out in advance, then trial-fit them before assembly.

Construction can commence anywhere, but I usually start on the tail surfaces. The tail is the easiest and quickest assembly to build, so it's a good warmup for the rest of the model.

Use medium-hard balsa for the leading and trailing edge of the fin and stabilizer. When constructing the stabilizer, pin the

GE COMET

■ David Fortuna



A new-and-improved RC "Old-Timer"

leading edge, trailing edge, and tip pieces down, then add the 3/16 balsa ribs. These ribs are actually 1/16 x 3/8 balsa strips, glued in place, then sanded to a slight airfoil after the stabilizer is completed. The center ribs are undercut for 1/16 center sheeting. Don't forget to leave a slot for the fin in the top sheeting.

Cut the rudder and elevators from medium-soft balsa, and join the elevators with a 3/16 dowel. Lite Ply is used on the bottom of the rudder where the rudder horn and tail-wheel wire mount.

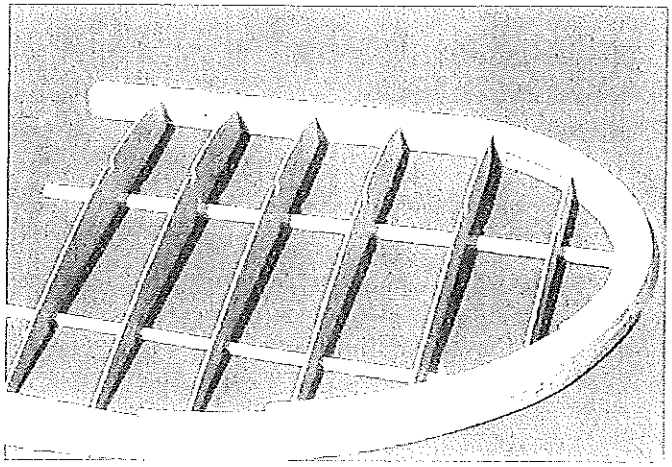
The fin is 3/16 balsa. Note that a part of the fin fits into the stab slot, while the rest mounts on top of the stab. Once everything is complete, carefully cut hinge slots, and shape the leading edges and ribs with a sanding block. The stabilizer's trailing edge is sanded to 1/16 thickness to match the elevator.

Wing: The wing is the heart of the model; it determines how well it will fly. Take your time and make sure that everything is true. A poorly built wing (or one that is warped) can adversely affect the flying characteristics of your model.

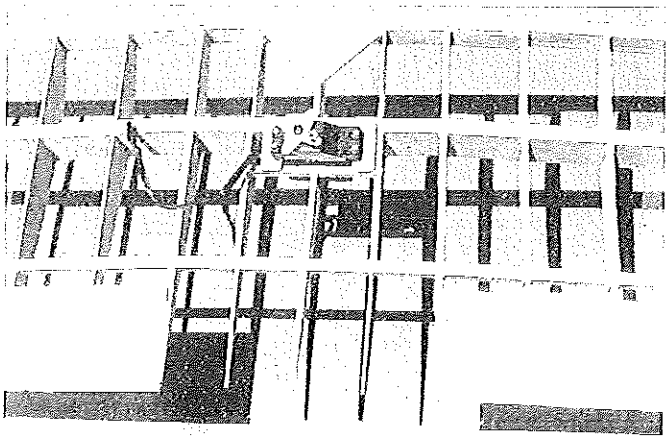
Although the plans show a polyhedral wing, straight dihedral could be used instead. This would save a little building time. Before you start construction, decide whether or not you are going to install flaps. The plans show flap construction on the left wing; the right wing shows normal construction. The wing ribs are cut from C-grain balsa.

The center section is built by cutting the bottom spars and leading edge to length, then gluing them to wing braces D-1, D-2, and D-3. After they're dry, pin them in place. Add the trailing edge; remember that the there are different sizes for the flapped and non-flapped versions. When I glued the ribs in place, I raised them off the building board 1/16 with scrap balsa, then added the sheeting after the wing panels were joined. It seemed to come out a little neater this way. Note that the center rib is cut out if the flap servo is used.

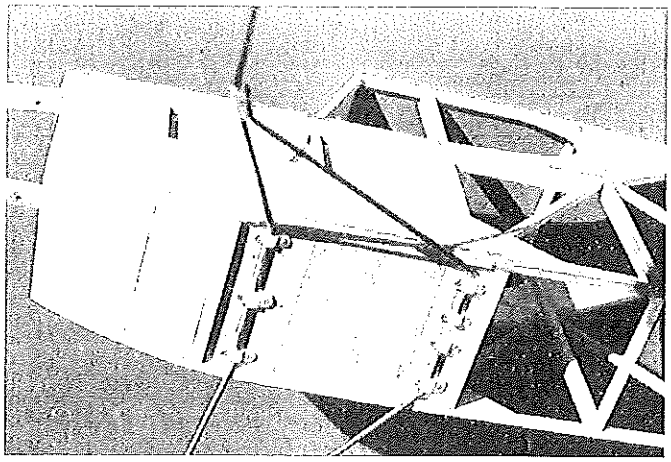
To build the inner panels, pin the leading edge and bottom spars in place. Use the center section to align these pieces. If you're building the version without flaps, the trailing edge can be added. Add the wing ribs as



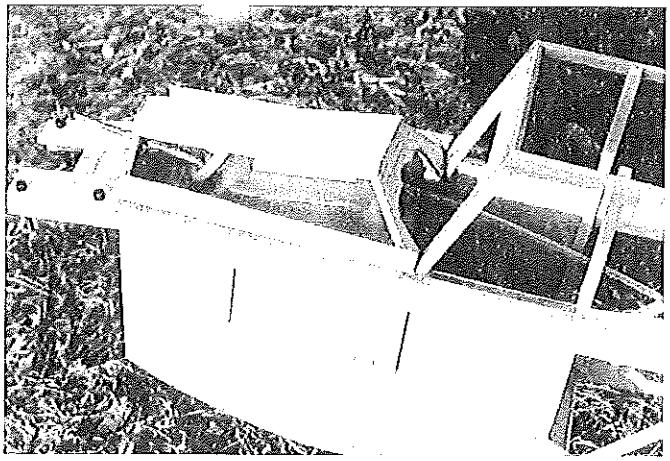
The wingtips are laminated from very light ¼ sheet balsa. The wing ribs are cut from sturdier C-grain.



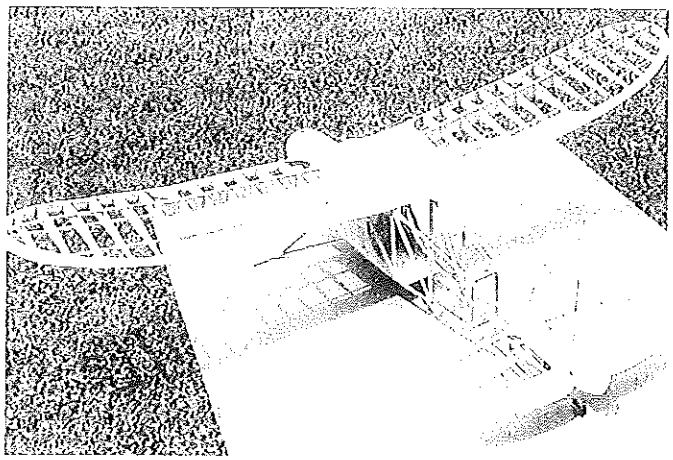
The flap servo is mounted on ⅛ x ⅜ plywood rails. Center-section sheeting is added next. Wing is well-stressed.



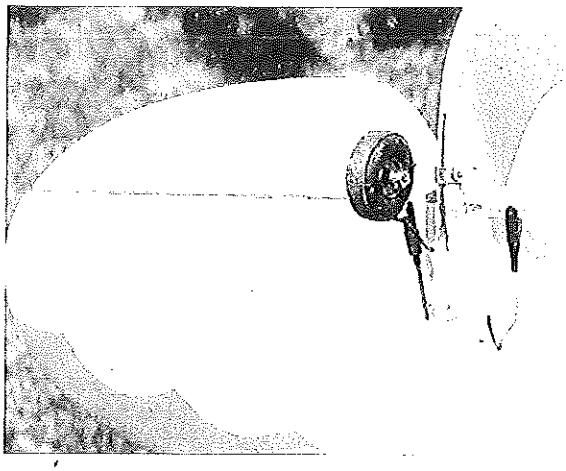
Music wire landing-gear legs are attached to ⅛ plywood with nylon clamps. Spruce sheeting covers this.



The nose section is planked with light ¼ balsa. Maple engine mounts are drilled for 6-32 bolts with blind nuts.

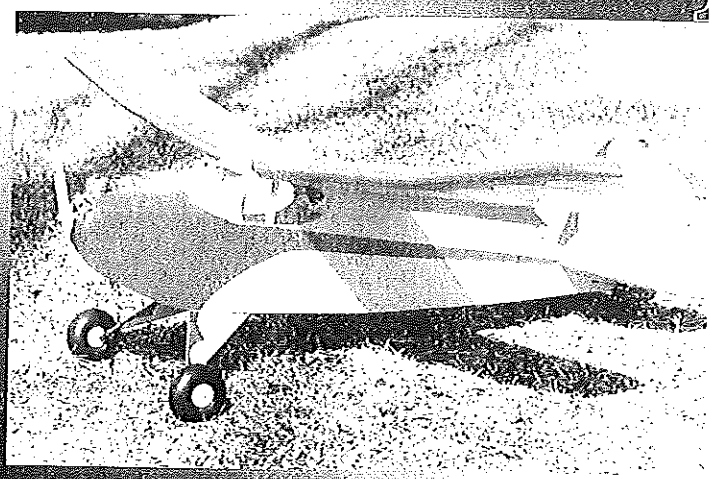


The finished airframe prior to covering. With all of the open framework a strong covering material is recommended.



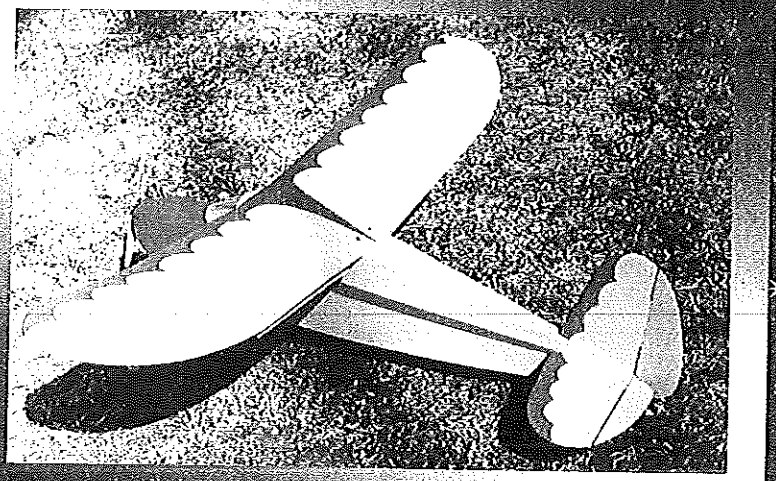
Rudder, elevator, and tail wheel details. Mount the tail wheel on a Carl Goldberg (or similar) bracket.

BLUE RIDGE COMET



Finished and ready to go. The polyhedral wing and Trexler balloon wheels add to the model's "Old-Timer" appearance.

Photos by the author Graphic design by Car



The polyhedral wing can also be built with straig dihedral. Both versions can be built with split flaps.

before, then wing braces D-4 and D-5 can be glued to the bottom spar. After these have been installed, the end rib W-2 is added.

After the wing panels are completed, they are joined to the center section. Use a slow-drying glue and block the panels for the correct dihedral angle, and let them dry. The top spars and vertical webbing are now added. The vertical webbing is cut from 1/16 C-grain. Sheet the center section, with the sheeting going between the spars. A cutout is made in the front sheeting for a 1/16 plywood hold-down support. Plywood is also inserted where the rear hold-down bolt goes. Now drill holes for 10-32 nylon bolts. The front hold-down tab is screwed into 1/8 plywood.

If you are installing flaps, it's best to complete the rear wing section now. Turn the wing over, and add the rear 1/32 x 2 5/16 x 14 basswood section. Basswood seems to warp less than other woods. Plywood could also be used, but it's hard to find 1/32 plywood that's not warped. If this section of the wing is warped, the flaps may not fit correctly.

Fill in between the ribs at the trailing edge with 3/16 x 1/2 balsa. A 1/8 x 3/16 balsa spar is

BLUE RIDGE COMET

Type: RC Sport

Wingspan: 62 inches

Engine: .25-.29 two-stroke

Functions: Throttle, rudder, elevator, split flaps (optional)

Construction: Built-up

Covering: Silk, Coverite, or similar material

notched for the hinges, then glued on the bottom of the basswood section. The spar is then capped with 1/32 x 3/8 plywood.

The flaps are cut from 1/32 basswood. To strengthen the flaps and keep them from warping, I covered them with .75-ounce glass cloth and applied a thin coat of epoxy. The inside of the flaps are also given a thin coat of epoxy; fiberglass resin can be used instead. Before the epoxy sets up, cover it with Saran Wrap, weight it down, and allow it to dry.

A 1/8 x 1/4 leading edge is added to the flap; this is epoxied in place. If the flap has been finished with fiberglass resin, use the resin to attach it. The leading edge may need to be tapered slightly at the rear to fit into the wing.

The flap servo is mounted on 1/8 x 3/8 plywood rails, glued on the bottom of the wing. Standard aileron hookup hardware can be used to hook up the flaps.

I made the horn wires from .078 music wire. A recess is cut into the bottom sheeting for this wire. The wire from the flap servo is soldered to the ones coming off the horns, making a "Y" connection. Maximum flap travel should be about 40°. Make sure that both flaps deploy the same amount.

Outer Panels: These are constructed like the inner panels. After pinning down the leading edge, spars, and trailing edge, check them against the inner panel to make sure they align before gluing in the ribs. Rib W-2 (that joins the inner panel) can be left off until the panels are joined. The wingtip is laminated from very light 1/4 sheet balsa.

When the outer panels are complete, join them to the inner panels. Lay the inner panel down flat, and raise the outer panel to the correct dihedral angle. After everything is dry, add rib W-2, then the tip spar. This spar is cracked at rib W-3, where it bends down at the tip. Add gussets where indicated. The other inner panel can then be laid down and the procedure repeated.

Fuselage: The fuselage is basically a box of 3/16 square material with sheet balsa added around the nose. The sides are built directly over the plan. If you're using 36-inch material, splice the bottom longeron at the rear. This longeron also needs to be cut at the front as indicated. Crack the longeron in these areas, fill it with epoxy, and pin it down to follow the bottom curvature. It won't follow the curvature exactly at this point; it will be sanded to shape later. Just pin it in place so it overlaps the outline slightly.

After the framework is completed, lay Saran Wrap over it and build the second frame over the first. Add 3/16 sheet balsa between the frames where indicated. Very light wood is used, except around the landing gear.

A 1/32 plywood doubler is glued inside the fuselage with slow-drying cyanoacrylate (CyA) or epoxy. Weight this down until it's completely dry. Make sure you have a left and right side. Bevel the rear of the fuselage frames so they have a 3/16 thickness when joined.

The landing-gear plate is slid into 1/8-inch slots in the fuselage sides. Bevel the plate at the front, and epoxy it in place. Check to make sure the fuselage sides are true. Glue in former F-2, then pull the tail together. Epoxy F-1 in place and clamp the sides together until they're dry.

Bend the front landing-gear legs from 1/8 music wire and mount them in place with nylon landing-gear clamps. It's best to first bend the rear gear legs from soft wire (such as florists' wire) to obtain the correct angles. The rear gear legs are not bent at 90° angles where they join the front legs; this makes it hard to visualize the correct angles from the two-dimensional plan view. Bind the legs with copper wire and solder them together.

Drill the maple engine mounts for 6-32 bolts and install blind nuts. Slide the engine mounts in place and epoxy them. Triangular stock is epoxied behind F-1, extending up to the engine mounts. Temporarily add the engine plate and engine, then drill the hole for the throttle cable.

Add 3/16-square top and bottom crossmembers. Glue 1/16 plywood under C-3, then add 10-32 blind nuts. Epoxy around the blind nuts for added security. C-2 and C-3 are now glued in place; C-3 should be cracked where the cabin angle changes. If your model has flaps, C-3 will need to be trimmed to clear the flap horns.

Cut the tank floor from 1/8 Lite Ply. Glue it in place, then add 1/4 triangular stock under it. A Sullivan four-ounce slant tank was used in the prototype. Fuelproof around the tank area with resin or epoxy.

Add former C-1; it's slightly oversize and beveled around the top. Plank with very light 1/4 balsa, adding the top piece first. This is cut to the approximate shape, then glued in place and sanded to match the side contour. The side strips are then added.

Glue in 1/16 sheeting on the forward part of the fuselage sides. I glued this sheeting to within 1/4-inch of the cabin windows, then added the windows and framing just before covering. This keeps the windows from getting messed up during construction. After the bottom sheeting is glued in place, scrap balsa can be added along the longerons to feather it in.

If you decide to use the cowling, carve one from a balsa block, and make it approximately 1/32 undersize. This is used to mold a fiberglass cowl using the balloon method.

To use the balloon method, glue a 3/8 dowel to the base of the block; this is used to mount the cowl block in a vise. Cover the cowl block with Saran Wrap, then add a layer of heavyweight fiberglass cloth. Smooth out the cloth, and hold it in place with thumbtacks (attached to the underside of the block). Apply a heavy coat of fiberglass resin over the cloth.

Inflate a balloon that's about twice the size of the cowl block. Stretch the balloon over the cowl block, slowly deflating it as you go. Make sure the balloon is big enough before you start, and make sure that you have more than one balloon!

After the cowl has dried, remove the fiberglass cowl from the form and apply a layer of heavyweight cloth inside the cowl. Afterward it can be trimmed and sanded down.

Glue the stabilizer and fin in place, and check their alignment carefully before the glue sets up. Add very light 3/16 balsa on top of the stabilizer and around the fin. Mount the tail wheel, using a Carl Goldberg (or similar) tail-wheel bracket. It can then be removed until the model is finished.

I mounted the rudder and elevator servos between F-3 and F-4, but the location may vary slightly for balance. F-3 is glued in place first, then the two side members S-1, and finally F-4B and F-4T can be added. Servo rails are 1/8 x 3/8 plywood. Pushrods are made from 1/4 dowels.

At this point, everything should be shaped and sanded in preparation for covering. Add the cabin windows and framing. Framing can be cut from 1/32 plywood. The fuselage side sheeting can be feathered-in to match the cabin window thickness. With all of the open framework, a strong covering material is recommended. Silk, Coverite, or a similar material would be a good choice. I used the classic dope finish on my model, giving it an "Old-Timer" appearance.

A 3/16 dowel is added for a front windshield support, followed by the windshield. I cut the windshield to shape, taped the edges down, and ran a hair dryer across it to "form" the contour. It's epoxied in place. Fuelproof inside the nose area with epoxy or fiberglass resin, then install the engine and radio.

Everything should be given a final check. I've used several sizes of engines on my model, and a .25 to .29 seems to work best. A .40-sized four-stroke would be ideal for this type of model.

Flying: For the first flight, wait until the winds are calm. Rudder control is a little sensitive, but other than that the Blue Ridge Comet flies beautifully and is very stable. Landings are a breeze, and it really doesn't matter if the engine is running.

If you're using flaps, I would suggest that you completely trim out the model first. Once you have some altitude, try out the flaps and get the feel for them. Approximately 10-20° of flaps works well for takeoff; if you use more than this the extra drag will offset the extra lift.

Be careful about retracting the flaps at low altitude and low airspeed. As the flaps come up, lift is lost; this could cause the model to drop or stall. Flaps seem to increase stability and allow the model to fly very slowly.

Well, that pretty much covers it. Take your time, and relax as the Blue Ridge Comet flies lazily overhead. It represents a time when things were simpler and not so rushed. I guess it doesn't hurt to go back there from time to time.

Special thanks to Bent Evans, chief test/crash pilot for the Greta Aeromodelers, for his assistance in the test flights. ✈