

# HOME BUILT

BY PAT TRITTE | PHOTOS BY PAT TRITTE

## Gee Bee Model-D

### The last of the inline Granville racers



Probably the best-known Golden Age air racers were the plans designed and built by the Granville Brothers. Their series of racing monoplanes was very successful. It all began with the 110hp Model-X Sportster. Power came from a super-charged 4-cylinder Cirrus engine.

Eventually, the basic design culminated with the Model-D, featuring fully faired landing gear, enlarged fin and rudder and a 125hp Menasco C-4 engine. There was only one Model-D built, though a Model-C was later modified and re-designated as a Model-D. The D was the last of the in-line engine-powered Gee Bees, which gave way to the Warner Scarab radial-powered Sportster Model-E.

#### THE MODEL

Having been a Gee Bee fan for many

years, my favorite is definitely the Model-D, so it stands to reason that *my* first Gee Bee would also be the D. To keep it light, I combined features from both free flight and RC models with a little extra strength added here and there to make the D a great flying model. The horizontal stabilizer was enlarged to tame pitch sensitivity typical of short coupled airplanes and the ailerons were enlarged to increase their effectiveness. Using less throw eliminated adverse yaw often encountered with this type airplane.

#### ON THE BUILDING BOARD

Begin by cutting out all the parts using the patterns provided. You can also save time and effort with a laser-cut parts pack available from Pat's Custom Models ([patscustom-models.com](http://patscustom-models.com)). Next, form the outlines for the rudder and wingtips using the bowing templates shown on the plans. Make the bowing patterns from  $\frac{3}{16}$ -inch artist's



The GeeBee is honest and very easy to fly. The model grooves beautifully, and is gentle and predictable on the controls.



The little Gee Bee sits proudly on the runway, ready for her maiden flight.

#### SPECIFICATIONS

- WINGSPAN:** 32 in.
- LENGTH:** 23 in.
- WING AREA:** 165 sq. in.
- WEIGHT:** 8.6 oz.
- WING LOADING:** 7.5 oz./sq. ft.
- MOTOR:** 4:1 GWS IPS Gearbox ([gws.com.tw](http://gws.com.tw)) w/ 4900 KV Feigao 12mm motor ([bphobbies.com](http://bphobbies.com))
- ESC:** 10 amp ESC
- PROP:** GWS 8x6
- BATTERY:** Intellect R/C 2S 800mAh LiPo ([intellect-battery.com](http://intellect-battery.com))
- FLIGHT DURATION:** 20+ minutes

foam board, and bend the outlines around them using the wood sizes shown.

The rudder and elevator assemblies are framed directly over the plans. Once assembled, remove them from the plans and sand the outlines to a radius. Hinge the control surfaces with  $\frac{5}{32}$ -inch-wide strips of lightweight CA hinge material, but don't glue them until after the frames are covered.





## WING ASSEMBLY

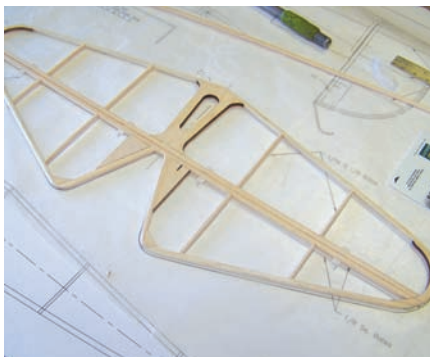
Construction begins with building up the spar assemblies using the landing gear mounts and the drawing details provided. Pin the spar assemblies over the plan at the center section. Glue ribs A1 and the bolt plate A-4 in place, followed by the leading and trailing edges, and the balsa front servo rail. When dry, remove the pins from the assembly, rock it up onto the left panel and pin the spars to the plan. Fit and glue the ribs in place, followed by the leading and trailing edges. Fit and glue the tip bow in

place centered on the leading edge. Build the aileron in place on the wing assembly. Finally, glue the landing gear mount assembly and the balsa rigging blocks in place.

When dry, remove the pins from the left panel and rock it over onto the right wing plan. Block up the left panel to prevent breaking the spars during assembly and build the other wing panel. With both panels complete, remove the wing assembly from the board and sand it to shape. Cut the ailerons from the wing assembly and

sand them to final shape. Make and install the  $\frac{5}{32}$ -inch-wide CA hinges, but don't glue until after covering.

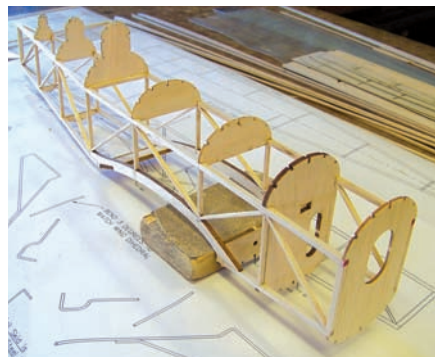
Fit the aluminum torque tubes into the wing and glue them in place. Make the bend on the outboard ends of the 0.056-inch steel wire aileron torque rods and insert it into the tubes. Now make the bends on the inboard ends. Construct the aileron control links using the detail drawings and glue them to the torque rods with 5-minute epoxy. Fit the aft aileron servo mount beam into the wing using the servo to maintain proper spac-



The horizontal stabilizer is built directly over the plans, sanded to shape and the hinges are then installed.



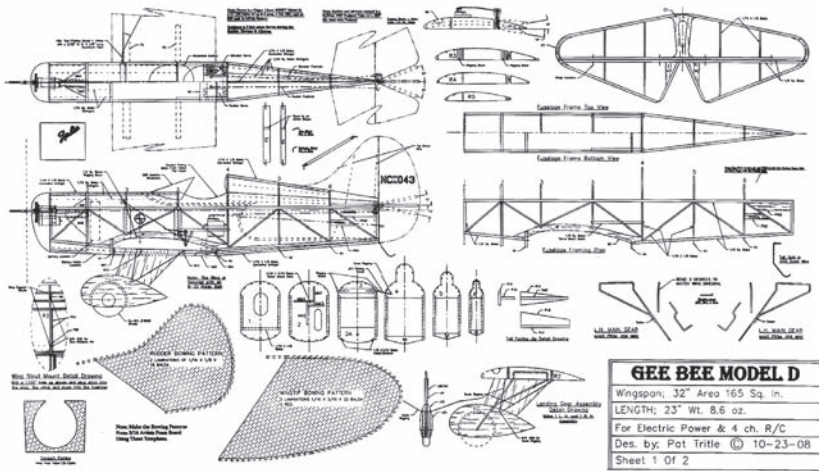
The two fuselage side frames are built directly over the plans.



With the side frames glued to the firewall and wing-bolt plate, the remaining formers are glued in place.



➔ To order the full-size plan, visit [RCStore.com](http://RCStore.com).



## K0909A GEE BEE MODEL-D

Designed by expert model designer and builder Pat Tritle, this lightweight electric-powered, sport-scale Gee Bee Model-D is intended for intermediate to expert pilots. The model uses traditional balsa and plywood construction and a laser-cut short kit is available from the author.

WS: 32 in.; L: 23 in.; Radio: 4-channel; Power: 10A geared motor w/ 8x6 prop; LD: 2; 2 sheets: \$21.95.

ing. Bend the pushrods to shape, fit the ailerons back in place and adjust the pushrods as needed.

## THE FUSELAGE

Build the fuselage side frames directly over the plans. Glue the pushrod exit slot pieces in place on the side frames so they fit flush with the outside of their respective frames. With the left side frame pinned to the framing plan, glue Former 2 in place. Be sure to orient the Former properly to accommodate built-in right motor thrust. Use a triangle or square to insure the former is perpendicular to the frame. Glue B2 in place, again using a square to insure proper

alignment, then glue the right side frame to formers 2 and B2. Glue the stiffener in place on Former 1 then align and glue formers 1, 3, 3A, and 4 in place.

Remove the frame assembly from the board and sand a bevel into the insides of the tail posts. Crack the longerons at former 4 and pull the tail together and glue. Glue formers 4A, 5, 5A, 6, and 6A in place, followed by the top stringers and the bottom centerline stringer aft of former 4A. Build up the motor mount assembly and glue it in place on former 2, followed by the balsa rigging block at former 3.

Fit the wing into the saddle and drill the hole in the leading edge for the hold-

down dowel. Glue the dowel in place then drill the hole in B2 and tap the hole for an 8-32 wing-hold-down bolt. With the wing bolted to the fuselage, fit and glue the center section formers and stringers in place followed by the remaining front fuselage stringers.

Glue the servo rails in place to fit your servos and then run Sullivan no. 507 pushrod tubes ([sullivanproducts.com](http://sullivanproducts.com)) into place. Support them at the front the center using the PRG wire guides shown on the plans.

The motor mount details shown on the plans are for the Fiegao brushless motor ([bphobbies.com](http://bphobbies.com)) using a 4:1 IPS drive. Set up the motor and ESC then test run to ensure proper motor rotation. Slip the drive onto the mount and secure with a small dab of silicone sealant. Build up the tail-fairing blocks and carve them to shape. Either balsa or blue foam can be used. The nose bowl is also done using blue foam.

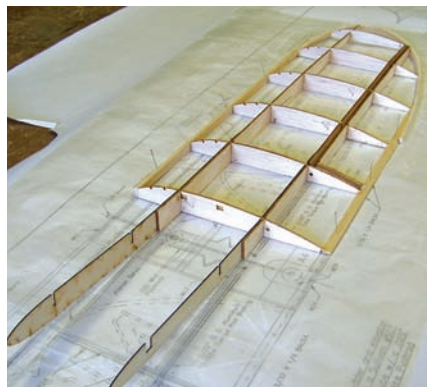
## LANDING GEAR AND STRUTS

Bend the landing gear struts from 0.056-inch steel wire and solder the struts together as shown. Glue the parts for the wheel pants together and capture the landing gear inside the wheel pants halves. Don't forget to put the wheels in place. Carve the pants to shape and sand smooth. Fit the lower section of rib R2B into the landing gear and tack glue in place with a drop or two of CA. Don't glue the landing gear assembly into the wing until the model has been covered.

Build up the wing struts and then drill the holes in the fuselage and wing as shown to fit the struts making final length adjustments as needed.



The motor mount assembly is assembled and then glued to the firewall. The right thrust is built into the mount gussets to insure its accuracy.



The wing panels are assembled directly over the plan. The "egg crate"-style construction insures a good fit and ease of assembly.



The wheels are assembled into the pants, then the assembly is carved and sanded to final shape.

## COVERING AND FINISHING

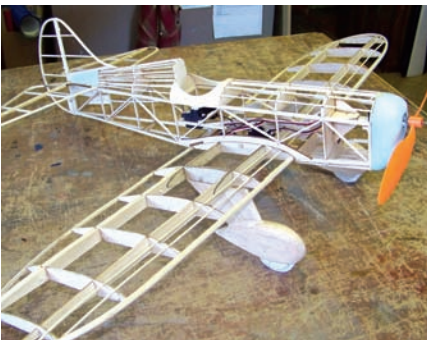
For smaller models like the Gee Bee, I use Nelson Litefilm, or Coverite's Microlite (towerhobbies.com). However, since the number of colors is quite limited, some paint work is required. The Microlite can be masked and sprayed with enamels, or brushed with Model Master Acryl or a water-based craft paint. Since some painting is required for the scale color scheme, Doculam material is also a good covering choice. Markings and graphics for the original Gee Bee color scheme are available from Callie Graphics (callie-graphics.com/airplanes.php).

## FINAL ASSEMBLY

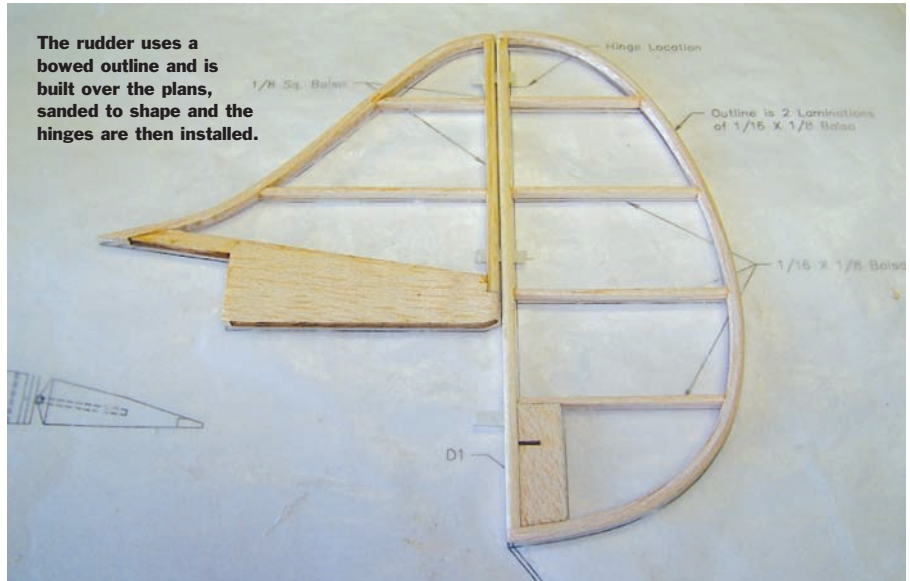
Glue the rudder, aileron and elevator hinges in place using Pacer Formula 560 Canopy Glue. Glue the landing gear into the wing, then bolt the wing onto the fuselage and use it as a reference for aligning and gluing the vertical and horizontal stabilizers and fairing blocks in place. Remove the wing, and install the 0.025-inch steel rudder and elevator pushrods. Make Z-bends in each end, and do final control surface alignment while gluing the control horns in place.

To install the Kevlar fishing line rigging, drill the holes in the bottom rigging block at the center section, wheel pants and the rigging blocks in both wings. Bend the wire hooks and glue them in place on Former 3. Now glue the rigging into the center section, then through the wheel pants and the rigging blocks on the wing, and up to the hooks. Slip the swivel over the hook and tie off the rigging using a small crimp. Check for the proper wing alignment and secure the rigging into the blocks with a drop of thin CA.

Add the remaining details to finish up



**With all the framing and sanding done, the airframe is assembled and the radio and drive systems tested for proper operation. If problems are found, now would be a good time to get them corrected.**



## BOWED OUTLINES

Making up bowed outlines is a little out of the ordinary, but it isn't difficult. Patterns are made from artist's foam board or cardboard to form the bows. The wood is soaked in water for a few minutes to soften it up, then formed (wrapped) around the pattern and glued together.

For best results, medium firm, straight-grained wood works best. The longer it soaks, the easier it will be to form. When pulling the wood around the form, tape one end to the form, then with firm, even pressure, draw the wood around. Then release the top layer and tape the inner layer at its end. Run a bead of glue along the inner stick and pull the outer back around and tape it in place.

Here's a trick to speed up the drying process. With the wood still taped to the form, place it in the microwave over for 10-12 seconds on High. If it comes out still a bit moist, let it cool, then put it back in for a second cycle. For more building information, go to [modelairplanenews.com](http://modelairplanenews.com)

the model. Balance the model 1 1/2-inches back from the wing's leading edge placing the battery and receiver to best accommodate the CG. Secure them in place with Velcro. Set up the control throws as shown to finish the model.

## IN THE AIR

The Gee Bee can handle breezy conditions quite well, but it's always a good idea to pick a calm day for test flights. Double check the control throws and direction and you're ready to go.

Line up the model on the runway and advance the throttle. As the model accelerates to flying speed it will hop on the mains a few times, then transition into a gentle climb at full power. Climb to altitude then trim for straight and level. The Model-D cruises nicely at about 2/3 power; handling is gentle, yet positive throughout its speed range. While still at

a safe altitude, check the stall. Mine slows down well and when it does break into the stall, it drops a wing. As soon as airspeed begins to increase, the model begins flying again. Due to prop torque, the Gee Bee turns a little better right than left. In a right turn, the model grooves beautifully. When turning left however, less aileron input is required as prop torque tends to roll the model into the turn more quickly. It's not bad, but there is a noticeable difference.

Landings are smooth and easy. Reduce power, set up your descent, line up on final and fly it down. Just before touch down, ease the nose up a bit and the D eases right into a 3-point attitude. Admittedly, I am a bit surprised that this little Gee Bee flies as well as it does. It acts more like a sport plane than a 1920s-era Golden Age racer. Give the Gee Bee Model-D a try, I'd bet you'll like it. ☉