

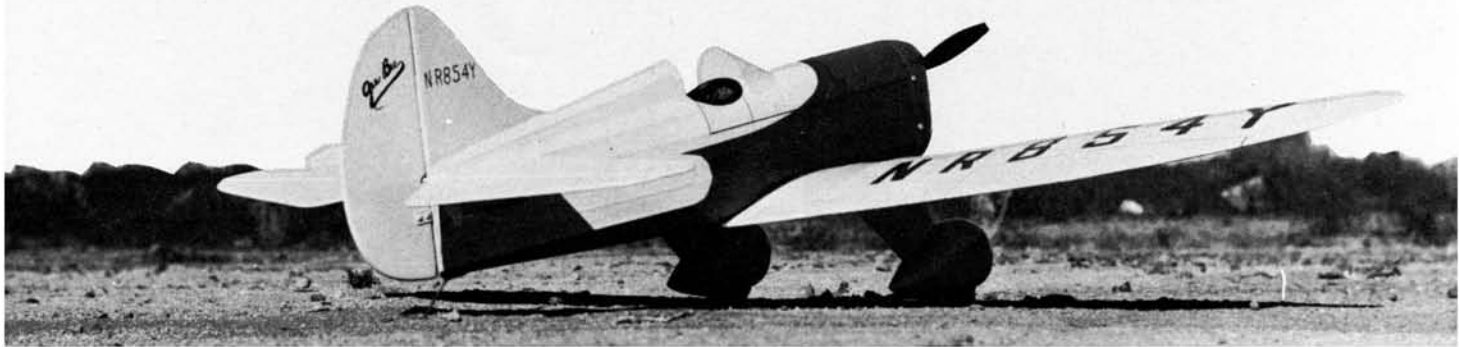
GEE BEE SPORTSTER

By Don Srull



RCM CONSTRUCTION FEATURE

This 1½" to the foot, 37½" span single channel scale model of the famous Gee Bee Model D Sportster is a snappy machine on a TEE DEE .049. Designed for Galloping Ghost equipment.



FOR the past several years, I have been flying a couple of .049 powered sport-racing GG airplanes. As they become oil-soaked and ready for retirement, I began thinking about a replacement. It still had to be a compact, racy ship — preferably one which would fit the Midwest/RCM Air Races Class A requirements. But I also wanted the new ship to look a little more like a real airplane than the previous balsa boxes. The Shoestring, Bonzo, and most of the other famous Goodyear racers had been much used recently, so I held out for something a little different. I found it in the Profile Publication #51, "The Gee Bee Racers." The Model D Sportster detailed there is a snappy machine and provides the basis for a beautiful little single channel ship.

The prototype quickly jelled as a 1½" to the foot, 37½" span model, ideally suited for the newer light weight GG systems like the RAND GG PAK, or miniature pulse equipment like the Airtrol RE-1 Digipulse. While the airplane probably could be flown on pulse rudder only, I would recommend rudder & elevator control systems, especially with the hotter engines. The airplane will fly nicely on a Cox Golden Bee or a Medallion .049; it is a scorcher (and a lot more fun?) with a Tee Dee .049 or .051.

First a few words about the real Model D Sportster. The Model D was designed in 1930 by Granville Brothers Aircraft Inc. of Boston, Mass. and intended as a relatively low cost and docile sporting machine. As fliers of that period were prone to do, however, they often made minor modifications to their Sportsters and used them for racing. These machines can be recognized by their "Restricted" class registration

number prefix NR instead of the usual NC designation. The standard Model D had a 25 foot span and sported a 110 hp American Cirrus engine which gave it a 145 MPH top speed and 125 MPH cruising speed.

In the interest of improving single channel performance, a few minor deviations from scale were made in the model. These included a slight increase in dihedral and enlarged horizontal tail area. Aside from this, the prototype was pretty close to scale and modeled after a specific sportster shown in the Profile Publication. The color scheme chosen was cream and brown, trimmed in the traditional Gee Bee manner.

If you're ready, we'll fill you in on some of the building wrinkles which should simplify the construction phase. Although the model is pretty straight forward construction-wise it does employ a little more built-up structure than normally found in this size model. We also used nylon bolts to hold on the wings instead of those greasy ugly-bands. The results are more than worth the slight additional effort. If you insist, you can easily substitute the usual dowel and rubber band system. One further suggestion — the performance of these little ships is affected seriously by their wing loading. For this reason, use the lightest wood you can lay your hands on for all components except as indicated on the plan. Try to keep the all up weight **below** 20 ounces. The prototype weighed in at about 17 ounces, and with a TEE DEE .051 its performance was just less than spectacular.

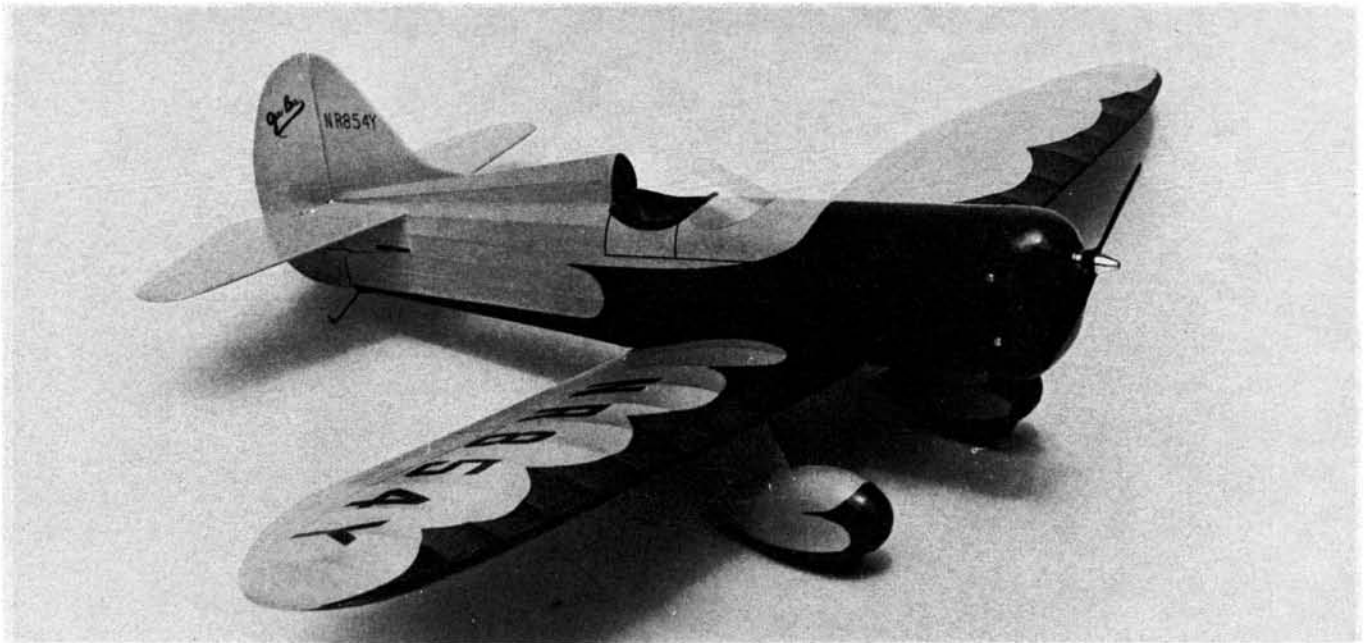
Before starting construction, decide on what equipment and engine you will be using, and lay out the installation accordingly. Next, cut out all the parts.

WING

Build the wing first, since it will be used in building the fuselage. Assemble both spars over the plan, including the plywood dihedral braces, and when dry drill the ⅜" holes in the front spar for the landing gear mounting clips. Next build one half of the wing by pinning down the spars in position (the other ends will be sticking up off the work bench), the bottom trailing edge strip, and block up the leading edge ⅛" in place. Glue in the ribs, the tip pieces and finally the top trailing edge strip. When this is well dried, simply rotate the wing center section down onto the plan and complete it. Repeat this process to complete the remaining panel. Finally, sheet the wing center section, making sure the 1¼" holes in the hardwood mounting blocks are carried thru the top sheeting. Bend the two landing gear legs from ⅜" piano wire and bolt onto the wing spars with the metal clips and 2-56 bolts. Finish sanding the wing and set aside to cure while the fuselage is being built.

FUSELAGE

Build the left fuselage half over the plan, excluding the forward ⅛" sheeting and the ⅛" x ⅛" hardwood stringers. Before the ¼" sheet wing cradle pieces are added, trim them to exactly fit the top of the wing center section. When dry remove the left side from the plan and complete the right side. Now it's time to fit the wing — a little extra care in this operation will assure a well aligned and sturdy airplane. Temporarily fit the wing to the fuselage, trimming as necessary to get a perfect fit. Now epoxy the ⅜" plywood wing mounting plates in the fuselage. When dry mark the mounting plate where the nylon bolt will pass through. Remove the wing and



drill each plate with a $\frac{7}{32}$ " hole. Now, assemble the wing to the fuselage with the two nylon bolts and 8-32 nuts bearing on the wing mounting plates. When you are sure everything is lined up perfectly, lay a bead of epoxy around the base of each nut. You can now add the fuel tank, the prototype used a #12 Perfect metal rectangular tank, cut down in width to fit the fuselage. This gives 7 or 8 minutes run to the TEE DEE .051. A #6 $\frac{3}{8}$ ounce tank will easily fit without modification and will give 3 or 4 minutes run. Now you can glue on the plywood firewall (don't forget the blind nuts for the Tatone mount), sheet the forward section and add the $\frac{1}{16}$ " x $\frac{1}{8}$ " spruce stringers. Finally install your servo.

We built the cowl by the well known HobbyPoxy Easy Does It method, and found it to be a snap. First carve a slightly

undersize balsa form and use two layers of Easy Does It or light weight fiberglass. Temporarily mount the engine to determine the exact position of the cooling inlet, needle valve, and cooling exhaust holes.
GEE BEE

TAIL SURFACES

Cut the tail surfaces from straight, medium to light weight sheet and sand smooth. No need to try for an airfoil shape, just round the corners. Don't hinge the surfaces together yet, this will be done after covering and assembly.

COVERING AND ASSEMBLY

Give the whole airplane two or three coats of thin dope and sand smooth. The tail surfaces can now be covered with jap tissue and the fuselage and wings with either heavy silkspan or Silron. About the only problem you should watch out

for is in covering the rear fuselage immediately behind the headrest. Since there is a slight concave surface formed by the second stringer, the covering will tend to pull away from and bridge this stringer as the covering shrinks. This will be especially true if you cover the fuselage with Silron. To prevent this, give these stringers 2 or 3 extra coats of dope prior to covering, and use a mixture of half dope-half glue to secure the covering, (which should be applied wet here) to these stringers.

Apply two coats of thin dope to everything and when dry, sand. Next epoxy the fin and horizontal stabilizer to the fuselage, making sure they are lined up perfectly. Finally add the rudder and elevator surfaces with your favorite invisible-type hinges and you are ready for the final paint job. Whatever finish you select, try to keep it as light as possible. The finish I have used with good success is as follows: Two coats of sanding sealer brushed on everything, including the cowl; when dry sand almost completely off. Next spray on two very thin coats of base color, in this case cream or white. Let this dry well before masking off the trim areas. Again spray two very light coats of dark trim color—just enough to cover. Now add any detail stuff like names, registration numbers, etc., with India ink, dope, tissue or decals. When these are dry, spray on a final coat of clear dope to seal the finish and add a little gloss.

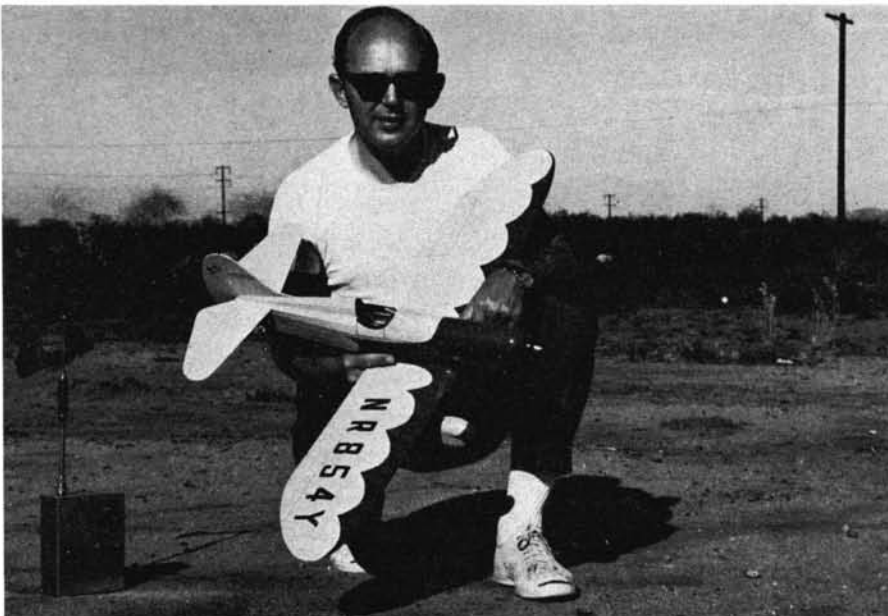
Install the equipment and add the windshield, combing, headrest and other details that may suit your fancy. To help you in these finishing touches I would recommend the Profile Publication mentioned previously as a reference.

FLYING

Prior to any test flying check for proper alignment of all surfaces. Also make sure the C. G. is within the limits shown on the plans. A little more toward the nose wouldn't hurt, but don't try to fly with the C. G. further aft than shown. On the original, the first flights were attempted (due to an error on the part of yours truly)

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The author with Gee Bee Model D and Min-X Galloping Ghost equipment. Rand Pak used.





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with the C. G. almost $\frac{3}{4}$ " further back than shown. It was a wild, vicious, power stalling monster! Luckily, I got it back in one piece, though slightly bent. A one ounce lead weight bolted to the firewall turned it into a well behaved, though very fast, little racer. For the very first flights, you may want to leave off the cowl until you get used to starting and adjusting the inverted engine. Unless you fly off of a fairly smooth concrete strip, the optional scale wheel pants should also be left off since they will tend to "trip" on grass or rough surfaces.

Since the airplane is very responsive in pitch, limit the elevator throw to + $\frac{3}{8}$ " or less by whatever means is most convenient. Even though the rudder is very large, rapid and precise turning control will require that you have at least + $\frac{3}{4}$ " on this surface. In the initial flights, have the engine running full out. With a good head of speed the Sportster will respond briskly.

On the other hand, trying to lug the little racer around nose high with too little power can lead to a complete loss of directional control and the almost inevitable power stalls and spins. By the same token, when the engine quits, keep a fairly fast approach glide and don't flair out until almost touch-down. Even though the Sportster has a fairly low wing loading, its thin wing and general clean lines make it want to fly and glide fast. Once you get used to this characteristic, you will find it easy to handle either burning up a pylon course on the deck, or stunting at safer altitudes. Good luck, and happy racing!

LIST OF MATERIALS

Lightweight balsa unless otherwise noted.

WING

- Two $\frac{1}{16}$ " x 3" x 36"
- One $\frac{1}{4}$ " x 3" x 8"
- Two $\frac{1}{8}$ " x $\frac{1}{2}$ " x 36" Hard Balsa (Spars)
- One $\frac{1}{4}$ " x $\frac{1}{4}$ " x 36"
- One $\frac{1}{16}$ " x 3" x 8" Plywood

TAIL

- One $\frac{1}{8}$ " x 3" x 36"

FUSELAGE

- Four $\frac{1}{8}$ " x $\frac{1}{4}$ " x 36"
- Two $\frac{1}{8}$ " x $\frac{1}{8}$ " x 36"
- Five $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36" Spruce
- One $\frac{1}{8}$ " x 3" x 36"
- One $\frac{1}{16}$ " x 4" x 36"
- One $\frac{1}{4}$ " x 1" x 10"
- One $\frac{1}{8}$ " x 2 $\frac{1}{2}$ " x 4" Plywood
- One $\frac{3}{32}$ " x 2 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ " Plywood
- One $\frac{1}{4}$ " x $\frac{1}{4}$ " x 4" Spruce or Maple
- One $\frac{3}{8}$ " x $\frac{3}{8}$ " x 1" Spruce or Maple

MISC.

- $\frac{3}{32}$ " Dia. Piano Wire
- Two 8-32 Nylon Bolts
- Six 2-56 x $\frac{1}{2}$ " Machine Screws
- Nylon Hinges