GEE BEE RACER

BACKGROUND: Perhaps the best-known of all "Golden Age" American racing aircraft, the Gee Bees were produced by the five Granville Brothers and their associates. The "Gee Bee" name was derived from the initials of the manufacturers.

Beginning in 1929 with biplanes, the Granvilles soon turned to construction of low-wing sport aircraft, with a sideline excursion into a canard experimental machine. Competition types were the next step, and as the result of early successes, work began during 1932 on the R-1 and R-2 racers, which were structurally quite similar. The R-1 was powered by a Pratt & Whitney Wasp Sr. engine, rated at about 800 horsepower. The R-2, designed for use in cross-country events, featured a Wasp Jr. engine of approximately 550 horsepower, which enabled a less bulky cowling to be fitted.

The wings of both aircraft utilized an M-6 airfoil, and were covered with plywood, which in turn was covered with fabric. Fourteen coats of lacquer were applied for a high-gloss finish, and markings added by painter George Agnoli.

The R-1 was first flown during August of 1932, by Russell Boardman. After the initial flight, modifications to the fin and rudder were performed to improve directional stability.

Although Boardman was scheduled to pilot the R-1 in the National Air Races, he was injured in another aircraft, and temporarily put out of action. Thus, Jimmy Doolittle took over, and proceeded to capture the world's speed record, with an average of 296.287 miles per hour. Soon afterward, he won the Thompson Trophy Race over a closed course.

Lee Gehlbach, piloting the R-2 sister ship, placed fourth in the Bendix cross-country race, fifth in the Thompson Trophy event, and third in a competition limited to aircraft with engines of 1,000 cubic inches or less displacement.

SPECIFICATIONS: (R-1)

Wing Span: 25 feet	Fuel capacity: 160 Gallons
Weight fully loaded: 3,075 pounds	Wing Area: 100 square feet

We are proud to present this brief quotation from one of the builders of the original Gee Bee racers:

"As a former member of Granville Bros. Aircraft Inc., I feel honored to be asked to add a few words to this instruction sheet.

The R-1 and R-2 Gee Bee Super Sportsters were the result of the best engineering knowledge and workmanship known in their time period. They were also flown by five of the greatest test and race pilots of that time, namely Jimmy Doolittle, Lee Gehlbach, Russell Boardman, Russell Thaw, and Roy Minor. In the 1930s, actual flying qualities became known only by flying the craft involved.

I am sure you will enjoy assembling this beautiful kit."

Robert H. Granville

IMPORTANT: READ BEFORE STARTING ASSEMBLY: This kit should be approached with patience and care. Remove any "flash" that may be present, and using a sanding block, dress all mating surfaces until they match perfectly. A suitable sanding block can be made by gluing No. 400 sandpaper onto a flat scrap of wood.

Before assembly, clean all parts in lukewarm water and liquid detergent, so that paints may adhere properly. Use only cement suitable for styrene plastic, and avoid excess amount, which might damage the plastic's surface. For safety, follow cement manufacturers' instructions and cautions exactly. Check the fit of each part BEFORE applying cement. Small parts may be painted while still attached to their "trees". Separate only as needed to reduce risk of loss. When cementing components onto already painted surfaces, first scrape off paint in joining area, to permit good adhesion.

CONSTRUCTION: Decide which configuration you prefer, the R-1 or R-2 racer, and study the differences carefully. Easily detectable variations are the cowlings, markings and tailwheel arrangements. Less obvious distinctions are the slight differences in the fin and rudder contours, shape of the paint scallops, and use of fuselage and wing lights on the R-2. Note: Spacer "A" used behind engine on R-2 model only.

The kit moldings are of R-1 configuration. To convert them to more nearly resemble the R-2, filling and rescribing will be required. Note differences in forward panel lines and louvers. The fin/rudder revisions involve slight reshaping and smoothing. The tailwheel unit will also need revising to correct shape as shown in the illustration.

COWLING AND ENGINE: Select the appropriate cowling for your chosen subject, (No. 1, R-1, or No. 2, R-2) and paint. Also paint engine parts, and assemble as follows: Install propeller shaft (No. 3) into crankcase front section (No. 4). Add crankcase part No. 5, being careful that No. 3 shaft is free to turn. Add engine cylinders (no. 6, nine required) being careful that they are correctly aligned. Add rear crankcase part No. 7. Next cement on the nine exhaust stacks (No. 8) to the back of each cylinder, and align them uniformly before the cement sets. Cement engine into cowling. Push engine in until small tabs on cylinders rest against step inside cowling.

FUSELAGE: Paint the cockpit interior walls, bulkheads No. 9, No. 10, No. 11, structural frame members No. 12, and No. 13. Add instrument panel decal to bulkhead No. 10. Cement assembly together as illustrated. Note that frame No. 12 and No. 13 are different, and must be correctly located, as illustrated. Paint and install seat bottom (No. 15), control stick (No. 16) and rudder pedals (No. 17). Finally, install handwheel (No.18) and control quadrant (No. 19). Check assembly for good fit into fuselage half No. 20, and when staisfactory, cement into position. Pre-assemble fuselage halves to check fit, and adjust if necessary. Apply cement to mating edges, and place halves together. Rubber bands and masking tape strips are useful for holding parts in firm contact while the cement dries. No. 14 door may be installed in an open position, but is not moveable.

WINGS: Check wing components No. 22 (two required) and No. 23 (two required) for proper fit. If o.k., apply cement and clamp while drying.

LANDING GEAR: Choose between the all-plastic wheels/tires (No. 24, four required) and the flexible tire type. Hubs for these are No. 25, four required. Steel wool or fine sandpaper can be used to remove the gloss from the tires, for greater realism. The hub halves may be cemented and clamped while drying, with the tires stretched carefully over the hubs into position afterward. For the regular wheels/tires, simply cement the halves together.

Place the finished wheels onto axles inside wheel pant halves (No. 26, two required) and cement on opposite halves (No. 27, two required), and secure while drying.

COLOR INFORMATION: (See also box cover painting)

Overall: White and red with thin black separation lines
Headrest, Seat and upholstery: red
Canopy strips: White
Propeller: Natural metal
Engine crankcase: Grey
Engine cylinders: Black
Engine pushrods: Black
Intake Tubes: Black
Exhaust stacks: Natural metal
Tires: Dark grey
Rigging wires: Natural metal. Note: Monofilament may be treated with any of the metallic wax finishes such as "Rub 'n Buff"®, for a realistic effect.

PAINTING: Some modelers prefer to assemble the aircraft in advance of painting, but in view of the complex color scheme, it may be preferable to paint the individual sub-assemblies, and assemble them afterward. All seams should be smoothed prior to painting. Use only paints suitable for styrene plastic, as other types may damage the surface.

Spray painting is recommended, but good results can be obtained using high quality brushes. Regardless of tools or techniques, patience and care are the keys to obtaining a superior finish.

Flat white may be applied as a primer, and when thoroughly dry, sanded with No. 600 wet paper. Clean off the dust completely, and apply white paint. A flat or semi-gloss finish is suggested, so that a soft pencil may be used to draw on the scallop lines. Templates cut from index card stock may be used to assist accuracy. Narrow strips of masking tape may be applied along the color division lines. Tight curves may call for cutting sections of masking tape to the proper shape. Burnish tape edges down securely, to reduce risk of paint "bleeding" underneath. Some builders apply a thin coat of clear enamel along the tape to seal the junctures, before applying the colored paint.

Alternatively, any of the various brands of liquid masking films may be applied, using a pointed brush for best control. When the model has been suitably masked, apply the red paint. Some modelers strip off the masking agent immediately, before the paint has hardened which allows the edges to settle slightly. Others prefer to wait until the paint has dried, reducing risk of finger-prints, etc., but often resulting in uneven paint edges.

Leaving the masking material on the model too long may result in removal difficulties. When removing masking tape, slowly pull the tape back upon itself, at a low angle close to the model, rather than pulling straight out at a right angle, which might detach the paint.

After painting, the decals may be applied. Note the differences between the R-1 and R-2 markings and locations. The racers are represented as they appeared during the 1932 Cleveland Air Races. Photographs taken at earlier or later times will reveal differences. For example, the top fronts of the wheel pants and wing roots feature small "STEP" plates to protect the paint during servicing. In some photos, these appear as taped areas, but in others, the "STEP" marked plates may be observed.

A narrow black line separates the red and white colors. Executing this concisely is an exacting proposition, calling for skill and care. You may prefer omitting this detail. However, if you elect to tackle the problem, consider these approaches: Thin striping tape, approximately 1/64" wide, is available from larger art supply stores, as well as some slot-car outlets. This material may be applied to the model and carefully burnished down. The main disadvantage is its slight thickness which can be seen and felt.

Applying the lines with a brush by hand is to be discouraged, as satisfactory results are difficult to achieve. But, those with artistic ability and a steady hand may care to deliniate the black trim with india ink and a draftsman's technical fountain pen. Be advised that inking around compound curves is quite exasperating, but can be accomplished. First, dull the area to be inked, using a mild abrasive such as a pencil eraser. Next, obtain from an art store, india ink formulated for use on acetate or plastic film, which contains a non-crawl ingredient. If a mistake is made during application, the ink can be removed with water, at no risk to the surrounding paint.

When ink has been applied to your satisfaction, it may be sealed and waterproofed with an application of clear enamel. This will also serve to seal the decals in place, and provide a uniform gloss to the entire model.

ASSEMBLY: Check the fits of wings, stabilizer halves, and other components. When satisfactory, cement them in position, checking for correct alignment.

PROPELLER: (No. 28) The Gee Bee racers were equipped at various times with different propellers and hub types. The one furnished with the kit is appropriate for the 1932 Cleveland Air Race installations. After painting and decaling, prop may be cemented to the engine shaft. Apply cement sparingly so that prop may revolve freely. Engine, prop, and cowling assembly may now be cemented in position on the fuselage.

FINAL DETAILING: Add landing gear legs, tailwheel (No. 29) and pitot tube (No. 30). Paint cockpit canopy framing or apply thin tape strips to them.

Install cockpit canopy using a minimum of cement to avoid smears.

If an R-2 is being constructed, add the fuselage and wing lights (No. 31, six required).

Finally, add the streamlined rigging, which may be undertaken as follows: Measure the distance between any pair of holes to be spanned, and cut a piece of monofilament slightly longer. Note that two different widths are furnished. The widest type is used for the lower forward wing and landing gear braces, while the remaining rigging employs the narrower type of monofilament. Note that not all types of cement will adhere to monofilament. Thus a type suitable for nylon should be used. For safety and best results, follow adhesive manufacturers' instructions and cautions exactly. Insert one end of monofilament into a hole and carefully apply cement. When dry, insert opposite end of monofilament into the appropriate opening. Apply cement and hold rigging in position until the cement will retain it. Be certain that rigging does not have any twists in it, which would spoil its appearance. Repeat installation until rigging has been completed. If "wires" are slightly slack, they may be tightened with judicious application of heat from a tiny soldering iron held near the rigging. CAUTION: Excessive heat may damage the monofilament, paint or plastic. Next, add the small spreader bars (No. 32, four required) and the kingposts, (short sections of monofilament) using the rigging adhesive.

NOTE: The spreaders and king posts were not featured when the R-1 and R-2 were first manufactured.

CONVERSIONS: A skilled modeler might care to convert this kit to another variation of a Gee Bee, such as the original bob-tail R-1 or later hybrid R-1/R-2. Details of these and other possibilities could be gleaned from photographs in THE GEE BEE STORY, by Charles G. Mandrake or other references.

REFERENCES: Aero Digest, July 1933

GEE BEE SPORTSTER R-1, by Harry Robinson (Published during 1965 by Aeromodeller magazine, England)

NATIONAL AIR RACES, 1932, by Charles G. Mandrake, 1976 ($7.45 postpaid, from Mandrake, Box 955, Ashtabula, Ohio 44004)

GRANVILLE GEE BEE R-1, drawings by Vern Clements, 1964

JIMMY DOOLITTLE AND THE GEE BEE (Men and Ships), by Roy Cross (Published in Model Airplane News, May, 1958)

7 & 11 GEE BEE, by Robert H. Granville, December 1977 SPORT AVIATION

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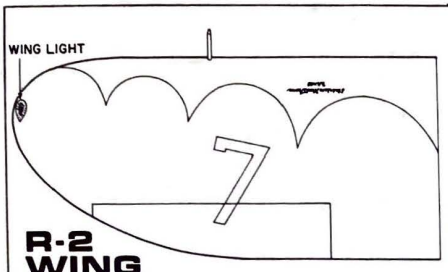
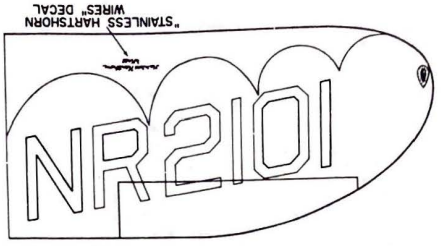
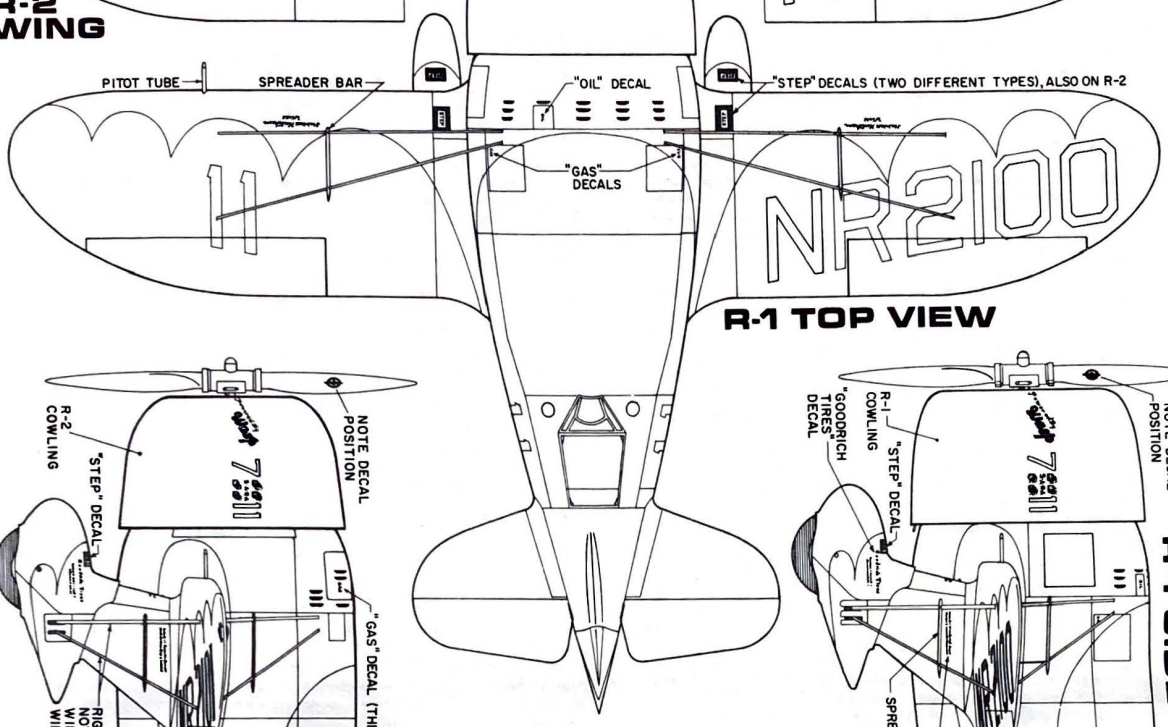
GEE BEE RACER

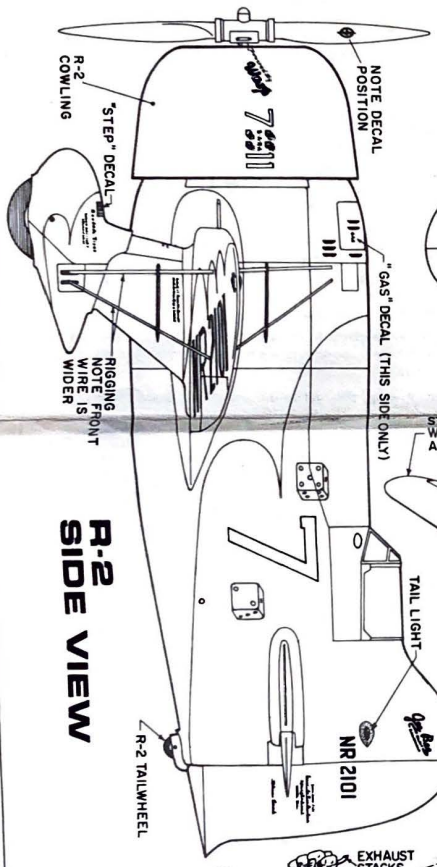


R-2 WING

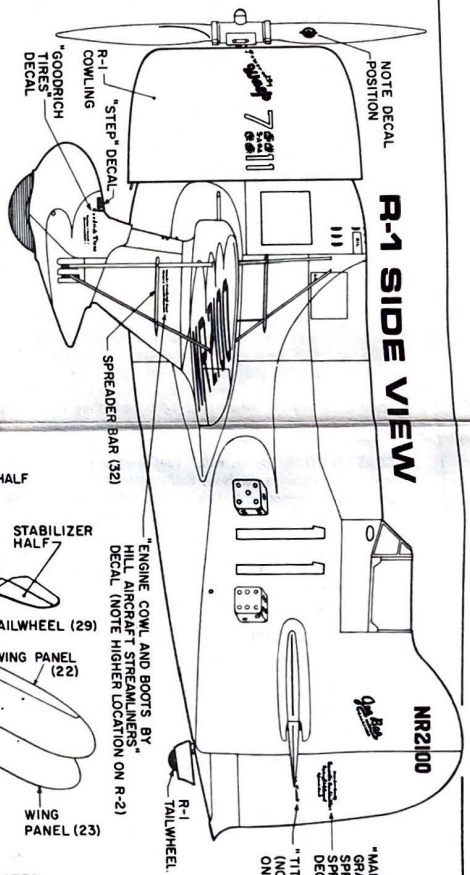




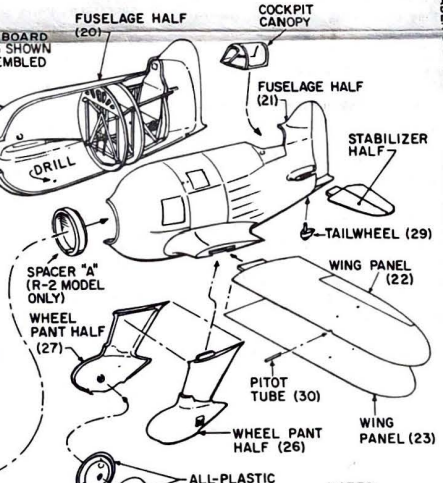
R-1 TOP VIEW



R-2 SIDE VIEW

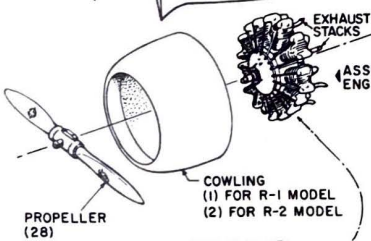


R-1 SIDE VIEW



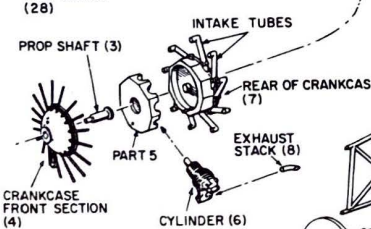
NOTES:
LOWER FUSELAGE RIGGING HOLES MUST BE DRILLED, AT THE POINTS INDICATED INSIDE HALVES. ALSO BE CERTAIN REMAINDER OF RIGGING HOLES ARE OPEN.

IF ENGINE IS AN EXCESSIVELY TIGHT FIT INTO COWLING, FILE ENGINE OUTER DIAMETER SLIGHTLY UNTIL IT WILL SLIDE IN PLACE.

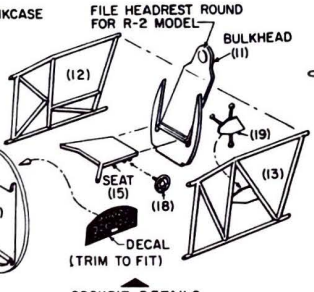


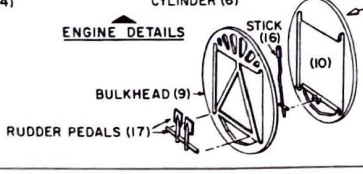
ALTERNATIVE WHEEL/TIRE

NOTE: IF DESIRED, DOOR MAY BE REMOVED FROM STARBOARD SIDE OF FUSELAGE, AND REPLACED WITH NO. 14 DOOR IN AN OPEN POSITION.



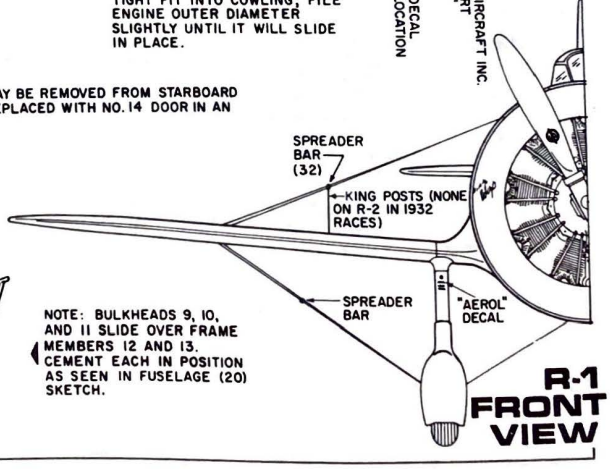
ENGINE DETAILS





COCKPIT DETAILS

NOTE: BULKHEADS 9, 10, AND 11 SLIDE OVER FRAME MEMBERS 12 AND 13. CEMENT EACH IN POSITION AS SEEN IN FUSELAGE (20) SKETCH.



R-1 FRONT VIEW