gee bee

The hottest racer of its day, the glamorous Gee Bee Super Sportster is here converted into a successful control-liner by one of the country's top hands. Brother, don't ask for more!

by LES McBRAYER

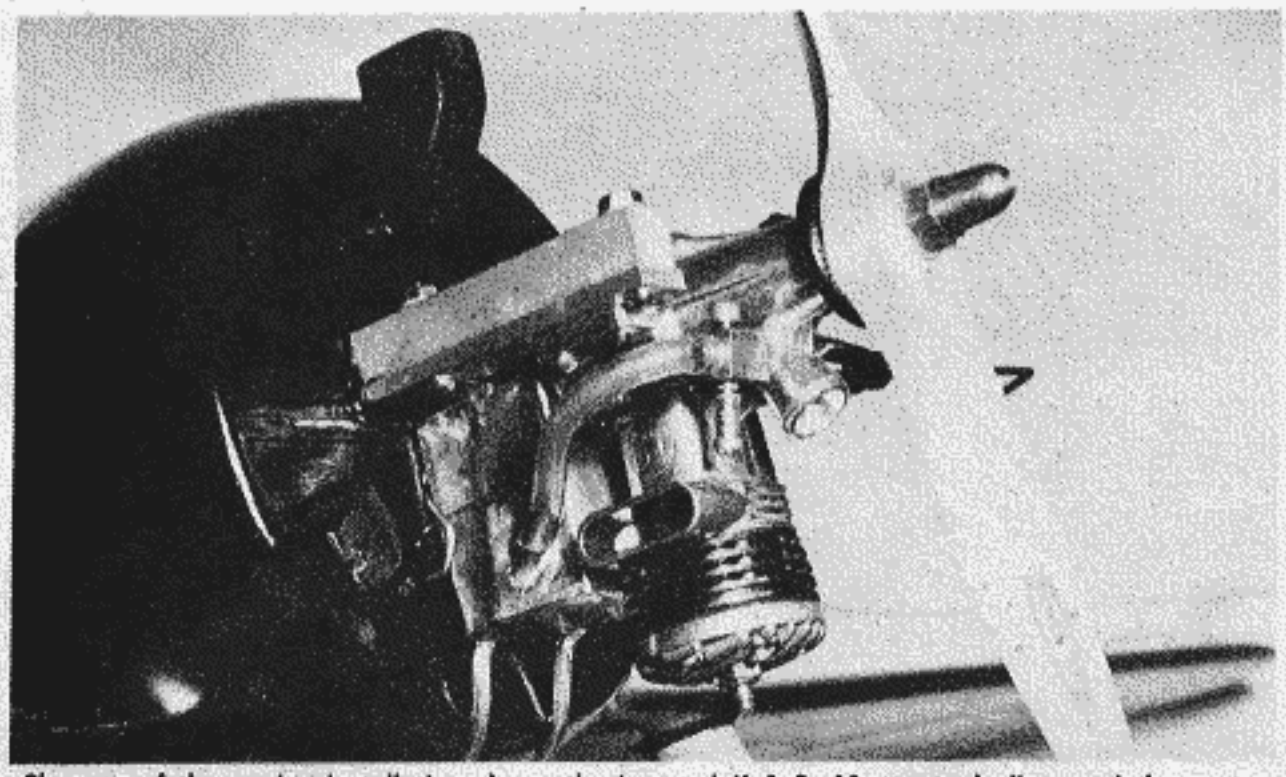
The amazing realism of the miniature racer will make scale fans wet their lips. It's more than a looker, too, because performance is on the ball.

One of the most famous of all racing airplanes, the *Gee Bee* with its short, stubby design makes an unusually attractive control-line model. Although a little harder to construct than some models, the builder will be rewarded with a smooth, easy flying model which can be used for Scale or Team Racing contests. The *Gee Bee* will attract great attention wherever it is flown.

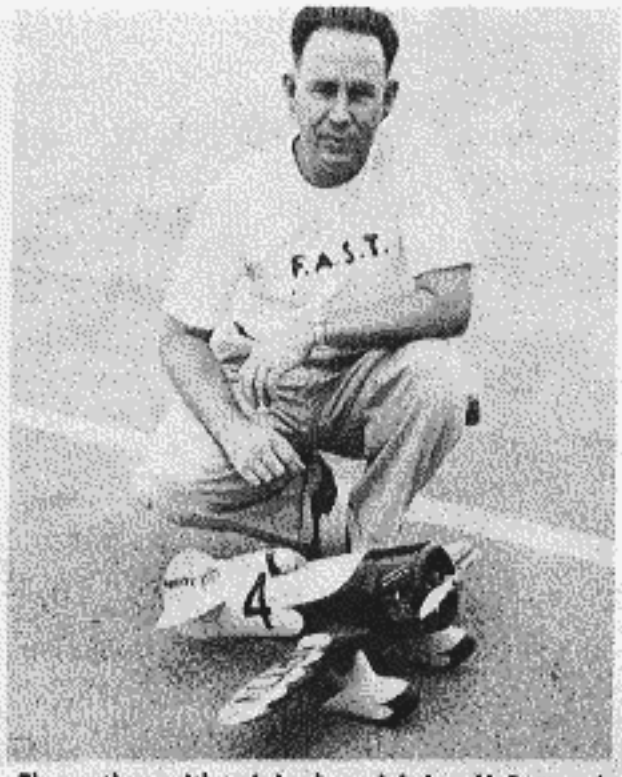
Gee Bee NR-77V was built by the Granville Brothers in Springfield, Mass. It was powered with a Pratt & Whitney *Wasp Jr.* engine developing 525 horsepower. The unusual design immediately earned it such nicknames as the *Flying Silo* and *Flying Milk Bottle*. Lowell Bayles flew the *Gee Bee* in the 1931 National Air Races at Cleveland, Ohio. Flying in the Shell speed dashes he averaged 267 mph. This qualified the *Gee Bee* for the 100 mile Thompson Trophy Race. Flying a beautiful race, Bayles won the Thompson at an average speed of 236 mph, breaking the old record by about 35 mph.

Late in November 1931 Bayles flew his stubby yellow and black racer, now equipped with a larger engine, in an attempt to set a new world's landplane record. He was unofficially clocked at 307 mph but timing difficulties prevented a new record.

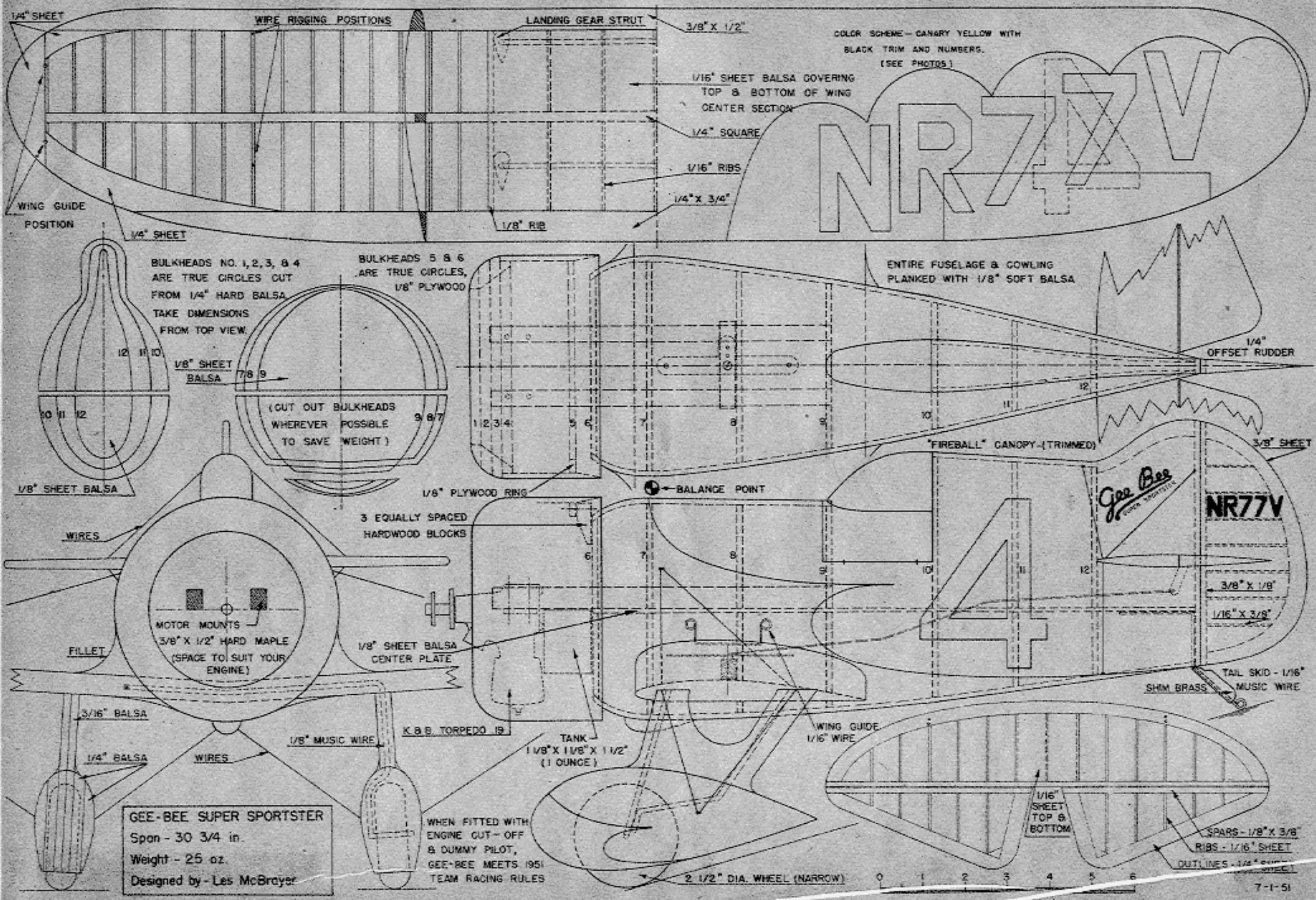
On December 5, 1931 while making another record attempt at a speed of about 325 mph the *Gee Bee* suddenly disintegrated in mid-air and hit the ground in a ball of fire. Lowell Bayles had no possible chance to escape. So in the space of a few short months (*Continued on page 36*)



Close-up of the engine installation shows the inverted K & B .19, the tank, line, and the vents. A good flier on the K & B .19, the *Super Sportster* does still better with the larger McCoy .29.



The author with original model. Les McBrayer is one of the original members of the F.A.S.T. club.



FULL-SIZE PLANS FOR BOTH "RINGMASTER" AND "GEE BEE" AVAILABLE. See Page 50.

Scrap Box

(*Continued from page 5*)

abolished completely to prevent the "pirateer modeler" from ruining a swell sport and hobby. Eliminate the possibility of three people combining their talents to walk off with the National Champion Trophy. Opinions and facts are wanted from both sides. Another opinion is voiced—"Sure, some builders never fly. Dizziness, age, and a host of other things may prevent an ardent modeler from getting the thrill of seeing his ship win." And "How about one swell trophy for the winning high point team entry and that's it," says another. All points well presented and taken fellows. We agree, the National Champ who builds the ships and flies the events himself deserves the title.

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The radio boys are organizing out west. Plenty of ships are getting in the air and a bunch more are in the process of being built. A get-together meeting was held at an abandoned airstrip near Santa Ana, California to start the organization rolling. Everyone got so wrapped up in flying that not much was accomplished. Designs and equipment were closely scrutinized and a darned interesting "bull session" developed. Yours truly is even finding out where all the wires are supposed to go and why. Colby Evett had his modified Ehling designed *Paragon* out for a session. The ship was designed originally in 1942. Colby's ship has the two channel rig set-up and also sports a new British receiver. The ship has elevator, rudder, engine, and a bomb release control set-up. The Fox .35 carries two needle valves for engine control adjustment with a relay type K & B shut-off. The shut-off is much the same as Harold Bonner's. This ship is the same one Evett flew at the Nationals. Bill Butler was out with his two ships and was doing a nice job of flying until someone decided to try his transmitter while Butler was in the air and on the same frequency. The ship wasn't damaged too much but a few faces were very red.

Two newcomers to R.C., the McHuen brothers, made some of the best flights of the day with their *Good News*. This little job carried on Arden .099 for power and sported the very popular Aero-Trol radio. We saw the first flight these boys ever made, and it was very sharp. Everything was right out of the book and worked perfectly. These lads believe in small ships and rightly so, judging from all appearances and performances.

Our greatest trouble, when making the first flight, was reversing rudder positions when the ship was coming toward us. E. J. Brown gave us a solid tip for the beginner. When testing a new ship, let it get up high enough before trying a turn. Of course, be ready to correct your flight attitude as soon as the ship is airborne just in case. Have your control box in the right position so you will know what control is coming up first. For gosh sakes, leave the engine a bit rich on that first flight and don't put too much fuel in the tank. We had a four minute screaming run on our first flight and got about 1500 feet in the air in short order. Would have sold the crate and equipment cheap about that time but all ended well and we're still flying the old *Bug*.

We were interested in a discussion about the KD2R3 *Drones* (target ships) and the type of equipment they use. These jobs carry a 72 h.p. engine. The KD2G2 carries the pulse jet (110 lbs. static thrust). Both ships carry the RPR1 receiver. Transmitter is an RC56A, and is a one frequency job as is the receiver. The transmitter put out five different tone signals which the receiver picks up one at a time. Each of the five tubes in the receiver respond to certain tone (cycles) signals which energize their circuit. This in turn operates its particular relay. The relays are hooked to servos which operate the various controls: right, left, up, down, and neutral. When no tone is sent out, the parachute is dropped out and the ship settles down safely to earth or sea which ever the case may be. All radio equipment is in a watertight compartment. Flying one of these 200 m.p.h. hot rods is an art. The *Drone* will do anything a big ship will do and probably much faster due to size. The cat and mouse game goes on—target ship vs. firepower. The enemy of the *Drone* is anything from a five incher on down. These ships have a 138" span, 147" fuselage, 50" stab, and the prop is about 44" in diameter. Gassed loaded weight is approximately 320 lbs.; are weight 150 lbs. The ships are launched from a compressed air catapult.

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Toshihisa Watanabe gave us a rundown on some of the model activities being held in Japan. We were surprised at some of the times turned in at Matsudo (former aerodrome). Sponsors of the meet were the Model Airplane Federation of Japan and the Maimichi Press. The contest was held under adverse weather conditions with a 5-7 meters per second of wind blowing. Rain also made its appearance but the meet went on. At the Fourth All Japan Model Airplane Contest the following times were turned in: Hiroshi Sawada turned 104.40 with an O. S. 29 in B Speed, Kanejiro Kondo turned 133.33 with a K.O. 60, and Kikuo Takechi burned the circle with his O.S. jet to the tune of 137.40 m.p.h. We've had the opportunity of seeing some of the Japanese made engines and they seem to be made very well. The Plymouth Motor Corporation through the Anzen Automobile Company, supported a Plymouth eliminations to chose winners to make the "big meet" in the states.

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Jetex is a favorite with Bill Byshyn of Brooklyn. Bill's efforts have been turned toward the scale jobs, his latest being an Heinkel *He-162*. This ship is powered with a Jetex 100. Span 17-1/2", length 23". It deviates from scale in increased wingspan and a bit more stab area. It was found that the cowl on this ship caused too much internal turbulance so the ship was flown without it. Bill has drawn up about every type of fighter (jet powered) in the books and is still going strong.

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The Wakefield committee did a bang-up job of organizing the eliminations and finals. Although the United States didn't win at the "big" meet, at least all hands know that an all-out effort was made to get the best ships to Finland. To everyone concerned, from the fellows who got out and flew to the committees that did all the leg work and tabulating, we sincerely wish to say "well done." Hope to see that "mug" come to the good old U. S. next year.

—by JIM SAFTIG

The Gee Bee

(*Continued from page 32*)

the *Gee Bee* left its marks in aviation history. It undoubtedly was the fastest landplane of the day even though it never held the official record. Other *Gee Bees* followed from the Granville Brothers workshop and these tricky but fast racers were always a threa in any race they entered.

WING: Cut 36 wing ribs from 1/16" balsa and two from 1/8" balsa. The eight center section ribs are cut down 1/16" top and bottom to allow for the sheet covering. From 1/4" balsa cut out the wingtip parts. Assemble each wing panel separately. Pin leading edge, spar, and trailing edge to a flat board, then cement in the ribs. Add the wingtip parts and cover the upper center section with 1/16" sheet balsa. When dry, sand the panels to final shape. Cement the wing panels together, blocking both wingtips to a height of one inch to form correct dihedral angle. Cut a 3/8" x 1/2" x 2" block to fit the center section and cement in place to form the control plate mount. Leave the center section bottom uncovered. Bend the wingtip guide from music wire and cement in position. Cement a 3/4 ounce lead weight in the right tip.

TAIL SURFACES: Cut stabilizer and elevator outlines from 1/4" balsa, spars from 1/8" x 3/8" hard balsa, and ribs from 1/16" balsa. Cement parts together and sand to streamline shape. Insert the 1/16" sheet covering flush with the center section as shown. Install

your favorite type of hinges and control horn. Note that the control horn is angled forward to provide sufficient clearance from the rudder post.

Cut rudder outline from 3/8" balsa, spar from 1/8" x 3/8" hard balsa, and ribs from 1/16" sheet balsa. Cement parts together and sand to final shape.

LANDING GEAR: Bend the two wire landing gear struts to the shapes shown in the front and side views. The use of a vise and a heavy hammer will help greatly in forming the heavy 1/8" dia. music wire to shape. This forming should be done slowly and carefully to insure proper alignment of the gear. The joint where the two struts meet should be wrapped with copper wire and well soldered. Place wheels in position with a washer soldered on each side. Check to be sure that the wheels can not rub against the struts.

Each of the wheel pants is made in a layer of four 1/4" sheets and two 3/16" sheets. Cut these parts out and cement together to form two right halves and two left halves. Temporarily tack cement the halves together, then carve and sand the wheel pants and struts to final shape. Split apart and hollow out to clear the wheels and the wire struts.

FUSELAGE: Due to the *Gee Bee's* short nose moment arm, the rear end of the fuselage should be kept as light as possible by cutting away the bulkheads and the centerplate wherever possible. From 1/8" sheet balsa cut the center plate of the fuselage to the size shown in the top view. It will be necessary to make this in two halves, cemented together down the center line. Mark the bulkhead positions on both sides of the center plate. Cut out upper and lower bulkheads numbers six to twelve from 1/8" balsa. Pin the center plate to a board with the rear end of the plate overhanging the edge of the board. Cement the lower halves of the bulkheads to the centerplate taking care that all the bulkheads are vertical. Cement the 1/8" x 3/8" rudder post in place at the end of the centerplate. Bend tail skid to shape and cement in place against the centerplate and rudder post. Later the tail skid should be sewed to the centerplate with thread. Start planking the fuselage with 1/8" x 3/8" soft balsa strips, beginning at the center plate and working both sides evenly until fuselage is covered down to the wing position. Now while the fuselage is still pinned down to the board, cement the wing in position, taking care that the wingtips are level with the board and that the flat bottom of the wing is parallel with the centerplate.

Install the landing gear in the center section of the wing. Cut away the ribs where necessary to make room for the gear. When the gear is fitted into position and properly lined up, apply two liberal coats of cement to all possible joints. Cover the wing center section with 1/16" sheet and add the remaining pieces of bulkheads seven, eight and nine. Remove the entire assembly from the board and install the control plate with a 4-40 machine screw through the mounting plate and the wing. Finish planking the bottom of the fuselage. Securely cement the balsa wheel pants in place against the landing gear wires and the wing.

Cement the motor mounts securely in position on the center plate, then cement the upper bulkheads in place. Plank the sides of the fuselage up to the level of the stabilizer. Mount the stabilizer in place and hook up the control push rod and the lead out wires. If an engine cut-off hook is to be used, mount an extra control push rod extending forward through the front bulkheads and into the cowl section. If a dummy pilot is desired, cement in a cockpit floor of 1/16" sheet balsa, instrument panel and other cockpit details at this time. Set in the top portion of the fin cut from 3/8" balsa and finish planking the fuselage. Cut out planking to form the cockpit. Cement the rudder in place with a 1/4" offset to the right.

COWLING: Cut bulkheads one, two, three, and four from 1/4" sheet, cement together with the grains running in different directions for added strength. Carve and sand to shape. Cut plywood ring number five from 1/8" material. Start assembly of the cowl by using four planking strips of proper length cemented at equal spaces around bulkheads four and five. Check to be sure cowl is lined up properly, then when dry, add the rest of the cowl planking strips. Carve three small maple blocks to shape for cowl mounting blocks. Drill holes through the plywood ring and the blocks, and using 4-40 machine screws and nuts, bolt the blocks to the cowl. Now apply cement to the rear faces of the blocks and pin cowl in place against the front end of the fuselage until dry.

ENGINE & TANK: The original model was powered with a K & B Torpedo *.19* which gave very satisfactory performance, having a speed of about 75 mph using a 10-6 Power Prop. Any *.29* engine or powerful *.19* engine may be used to power the *Gee Bee*. In order to mount engines having rear rotary valves it may be necessary to cut away part of bulkhead number six for additional room. Make up a one ounce tank and mount it on the motor mounts with the fill and vent tubes coming down and out the space between the cowl and the fuselage. Cut holes in the cowl for access to the glow plug and for the needle valve. No exhaust hole is needed if the interior of the cowl is cleaned after each flight to prevent possible fires.

FINISHING: The original model was built entirely with fuel-proof materials: Aero-Gloss cement and plastic balsa, Butyrate dope, and *Sta* colored dopes. Sand entire model until it is smooth and then cover all parts, including the fuselage and cowl, with silk. Give the model several coats of Butyrate dope until the pores in the silk are filled. The large fillet between wing and fuselage may be easily formed by using a combination of silk and a surfacing putty. First make as good a fillet as possible using wet silk and then after it has been doped, smooth out the low spots, etc. with applications of a putty such as Aero-Gloss *Plastic Balsa*. This type of fillet can be made very light and very smooth.

When model has been sanded, doped and sanded to a good surface, paint entire ship with yellow *Sta*. Three brushed coats should be sufficient. With a soft pencil, draw the scallop design on wing and fuselage. Mask off the design with narrow masking tape, and paint with black *Sta*. Use black decals for all

numbers and letters. Strip some black Trim-Film to 1/16" widths and mark the aileron, rudder and cockpit lines. *Gee Bee* is put on the fin with a small brush and black *Sta*. The small words *Super Sportster* are put on with India ink and a pen. If the cowl markings are desired, they can be painted on with white *Sta*. These markings consist of a group of three buildings with the words *City of Springfield* and *Powered by P & W Wasp Jr.* See photos and details. Use a thin coating of clear *Sta* (sprayed or very carefully brushed) over the letters and decals to seal them down. Cement bubble in place. If flying and brace wires are desired, use .008 dia. music wire and thread wires through the model as indicated on the plans.

FLYING: If your *Gee Bee* is to be a stable and smooth flying model, it is essential that the balance point is as marked on the plans — 3/8" back from the leading edge. Add weights to the nose or tail if required. Be sure all surfaces are at zero degrees incidence. Make certain that the rudder is offset 1/4" to the outside of the circle. Be sure that the wheels turn in the pants freely and that the model rolls straight on the ground.

Due to the *Gee Bee's* short fuselage and the high angle of attack when sitting on the ground, it is necessary to hold the controls in the full "up" position at the beginning of take off to prevent a nose-over. As soon as the model starts to roll and gain speed, neutralize the controls and let the *Gee Bee* take itself off. This method will give the long, low take off so necessary for team racing. *Gee Bee* will be smooth, yet responsive in the air and will have a good glide after the motor quits. However, since the landing gear is completely rigid, it is best to make smooth wheel landings. In other words don't stall it in, but fly it right down to the ground and "grease it on" like a speed model. Like most models with wheel pants, *Gee Bee* should be flown on asphalt or hard dirt fields.

BILL OF MATERIALS:

2 — 1/16" x 3" x 36" Balsa Sheet.
3 — 1/8" x 3" x 36" Balsa Sheet.
1 — 3/16" x 3" x 36" Balsa Sheet.
3 — 1/4" x 3" x 36" Balsa Sheet.
1 — 3/8" x 3" x 12" Balsa Sheet.
1 — 1/8" x 6" x 6" Plywood.
2 — 3/8" x 1/2" x 12" Hard Maple.
24 — 1/8" x 3/8" x 36" Soft Balsa.
1 — 1/8" x 3/8" x 36" Hard Balsa.
1 — 1/4" x 1/4" x 36" Hard Balsa.
1 — 1/4" x 3/4" x 36" Trailing Edge Balsa.
1 — 1/4" x 1/2" x 36" Hard Balsa.
1 — 1/16" x Dia. Music Wire 36" length.
1 — 1/8" Dia. Music Wire 36" length.
1 — "Fireball" Bubble Canopy.
1 — Pair 2-1/2" Narrow Wheels.
1 — Bellcrank and Control Horn.
1 — Square Yard Silk Covering.
Machine screws, liquids, decals.

Fokker E-1

(*Continued from page 20*)

momentous conclusion: you couldn't very well fly a plane and shoot a gun accurately at the same time unless the gun was attached to the airplane. On the ground, Garros bolted the Lebel rifle on top of the cowling in front of him, pointing forward. Where the line of fire cut through the propeller arc, he boldly attached some wedge-shaped steel plates to each blade. Enough bullets, he thought, would get through to do some damage. About six out of ten did get through—enough to knock down a couple of German planes.

This hit and miss proposition had one drawback—the bullets constantly pounding the propeller wedges put unusual stresses on the propeller which Garros cheerfully guessed might shatter the prop. That's exactly what happened to Garros. He was forced down behind the German lines one day through prop failure and made prisoner.

Anthony Fokker shortly was called in by German authorities to see Garros' Morane, and was asked to see if the shielded propeller idea could be improved on and put to use for Germany. A practical mechanic, Fokker immediately saw that the solution to the problem was not in protecting the prop from harm by the bullets, but lay in a method of causing the gun to fire only when the prop blades were out of the line of fire.

Fokker's system of cams and push-rods, by which the propeller was made to fire the gun, was attached to a single-seat monoplane scout plane he had built for the German Air Force. Subsequent tests proved the synchronizing mechanism completely workable and thus was the means for modern air-warfare born.

The first Fokker *E-I* was turned over to young Oswald Boelcke, a G. A. F. Lieutenant and former school teacher. On his third flight over the lines, Boelicke succeeded in bringing down a French plane. The Germans enthusiastically ordered as many Fokkers as possible, fitted with guns and synchronizing gear. The latter were hand-made by Fokker. A few days later Max Immelmann was turned loose in the second *E-I* and obtained immediate results. A month later a half-dozen additional *E-Is* were in action, taking a terrible toll of nearly every Allied plane they met in flight.

The advantage was on the side of the German pilots. They simply approached unsuspecting Allied planes from the rear, poured out a burst, and down they came. *E-I* pilots were forbidden to fly over the Allied lines in order to keep the synchronized gun from falling into enemy hands. The toll these stinging little *E-Is* wrought was terrific. For nearly five months, the Germans had superiority in the air and Allied losses mounted.

But one foggy morning a Fokker *E-II*—an improved type—landed intact on a French airfield and the secret of the gun was out. The German pilot simply had become lost in the soup.

Before the Fokker monoplanes of this period were retired from front line service, four distinct types were produced, *E-I* to *E-IV*, inclusive. All were very similar in appearance, differing only in size, weight and power. They were developed from Fokker's 1914 M-8 monoplane in which he looped and stunted all over Germany just before the outbreak of W. W. I. Pressed into service because they were available, the first dozen or so such single seat "scouting" planes fitted with the machine gun were called the *E-I*.

Although not designed as gun fighters, these little planes could not miss—they had no competition! The *E-I* was powered by an Oberursel UO model 80 hp rotary of seven cylinders. Overall length was 22 ft. 3 in.; wing span was 29 ft. 6 in., and height, 8 ft. 6 in. It weighed 787 lbs, bare (not to be confused with "empty" weight) and 1,240 lbs. fully loaded. The difference was made up in fuel, oil, the machine gun, ammunition, pilot and equipment. So loaded, the sea level top speed was 80.5 mph. The *E-I* climbed to 3,300 ft. in 7 min.; to 6,600 ft. in 20 min. and to 9,900 ft. in 40 min.

Models *E-II* and *E-III* were by far the most successful of the Fokker monoplanes. The two models were identical except for engines. The *E-II* was fitted with an Oberursel UI, 9 cylinder rotary of 100 hp, and the *E-III* carried an Oberursel UR II delivering 110 hp. More of these two types were built than any other of the Fokker monoplanes.

Fuselage structure—Steel tubing was used throughout the basic structure. Except for a few secondary members, longerons, uprights and cross pieces were joined by welding. The frame was cross braced with steel wire. In side elevation the fuselage was approximately symmetrical. It was flat on all four sides except forward of the cockpit, and finished off at the tail in a horizontal knife edge.

The curved coaming in front of the pilot was a segmental continuation of the engine cowl, forming the only protection from the wind for the pilot. Windshields were fitted, of course, but did little good and were often removed by the pilots. The coaming was formed of sheet aluminum resting on and attached to tubular steel formers and the longerons. Inspection doors, filler caps for the oil tank and for other necessary items were provided as needed.

The engine cowling was formed of sheet aluminum, cut away at the bottom so ex-

(*Continued on page 48*)