

# GEEBEE SENIOR

## part 1

IT HAS been four years since my first Model Y Sportster appeared in the March 1976 issue of Model Aviation. This first Model Y was flown in many contests and proved to be a consistent winner. I followed this with a model of the Model D Sportster which also added

impressively to my trophy collection. In searching for documentation of these first two Gee Bee models, I came in contact with Bob Granville who was one of the five famous brothers who designed and built these aircraft in the early 1930s. Bob and I became very good friends and he loaned me good pictures of these little-known aircraft which I have had copied.

Bob and I got together on many occasions at his home in Maine, at my

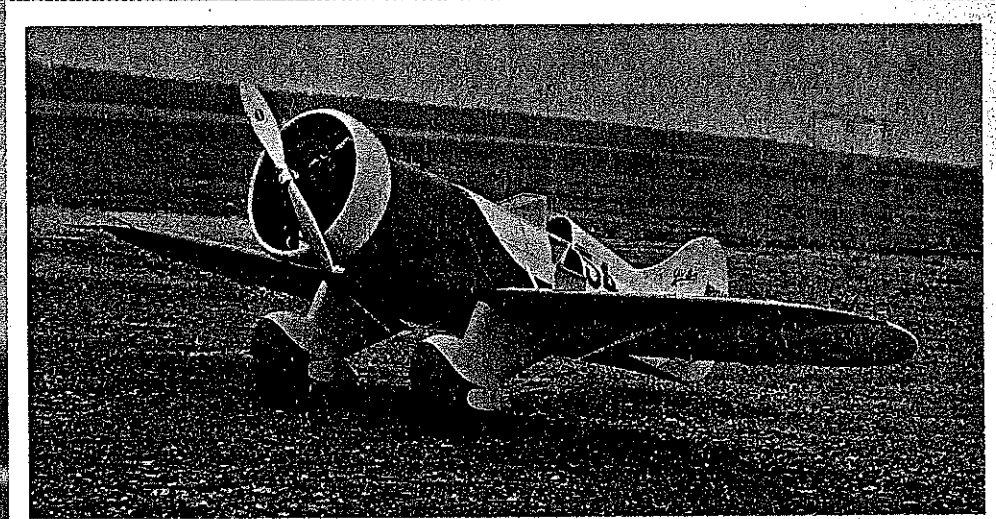
home in NJ and also in Springfield, MA, where the Gee Bees were built. Bob also attended the first two Rhinebeck Classic Contests with me where he called my flights for me as I flew models of the aircraft that he and his brothers had built. We began doing research on the history of the Gee Bees in preparation for writing the real story of these colorful aircraft. We located quite a few of the pilots and men who owned and flew these early Sportsters and learned many



# SPORTSTER MODELY

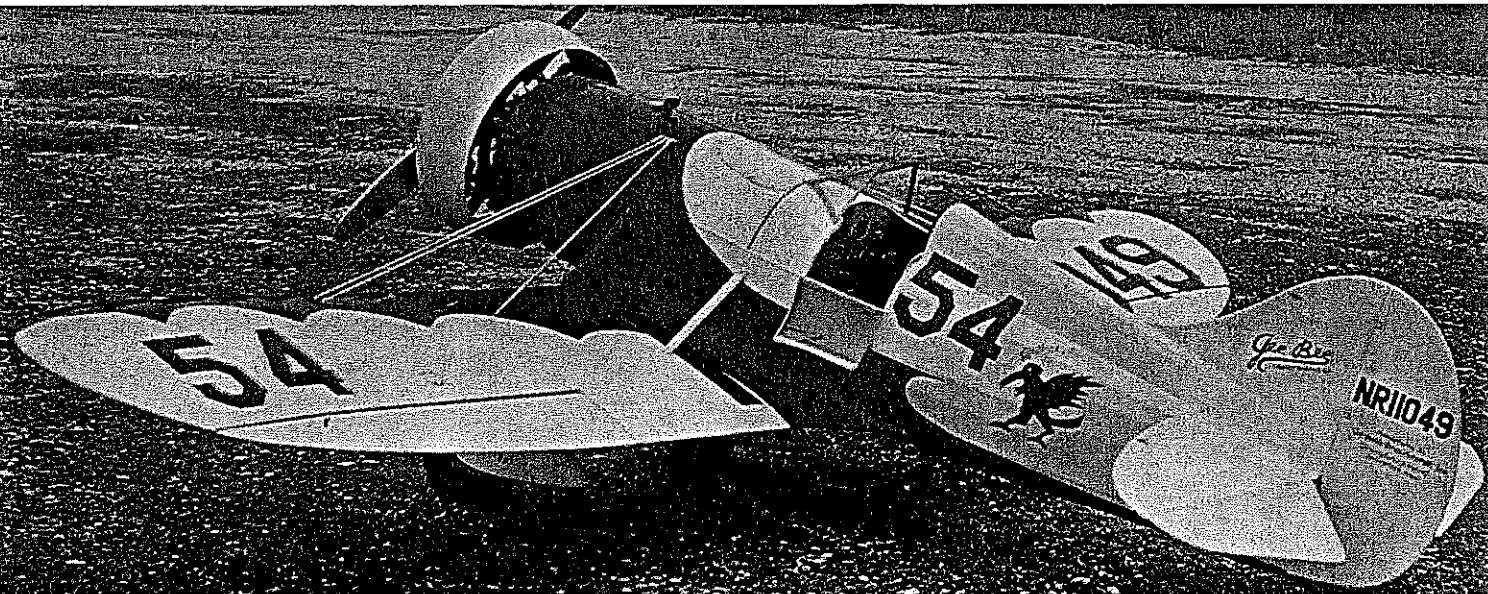
Anything we might write about this 1/4-scale, 90-powered jewel would be an understatement. The subject—perhaps the best flying of the real Gee Bees—the design and construction, and outstanding flight characteristics and performance, make it an airplane to be remembered.

Previously unknown facts  
With the pictures obtained from Bob's collection I became even more interested in doing models of these great



The best flying of the author's Gee Bees, the Senior Sportster was considered by the Granvilles to be the finest machine they had ever built. With excellent flying and landing characteristics, it was not a racer—but won more races and money than any of their better remembered machines.

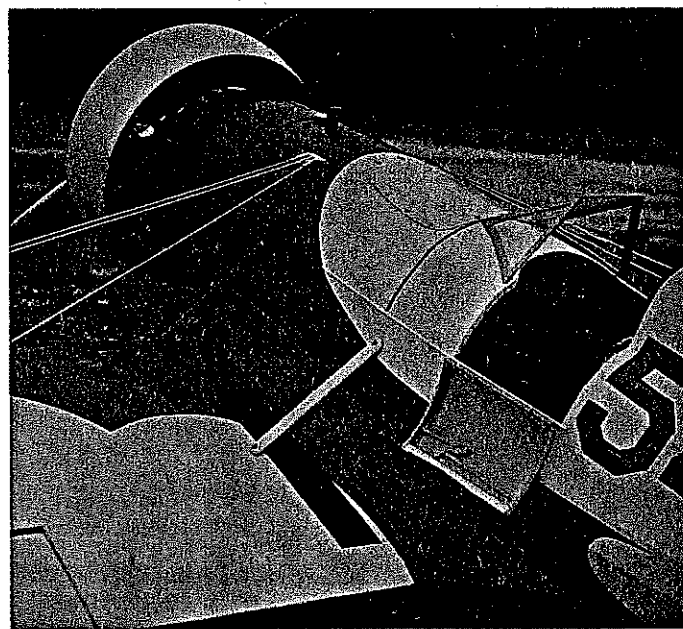




Seen from any angle, the Senior Sportster makes a beautiful picture. Unlike the later all-out racers, it does not have the stubby look the name Gee Bee evokes for most people. Slimmer, it has a planform—and plenty of area—and moments that qualify it as a superb flying model.



With scale propeller for static display—and note the manufacturer's emblem on blade—one would be hard put to say model or real thing.



The open cockpit door seems to invite the flier to step in and take the stick. The Senior Sportster first saw light as a tandem two-place.

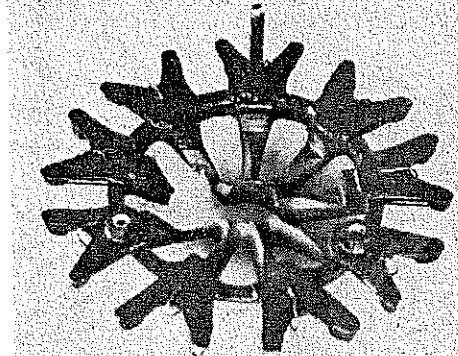
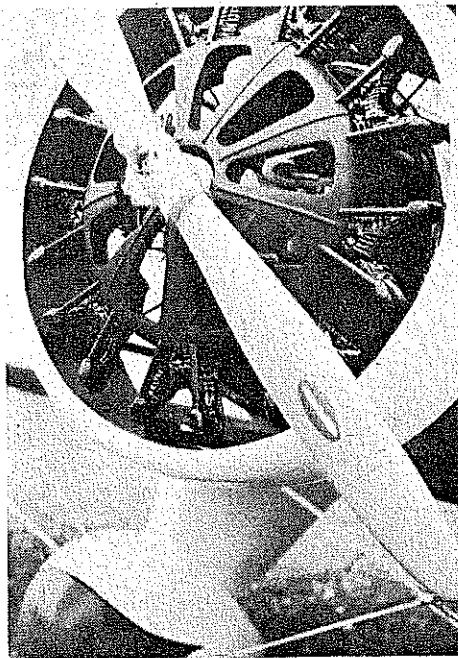
aircraft. I designed a model of the best-known Gee Bee-built aircraft in the famous R-1, R-2, and R-1/ R-2 Super Sportsters. A couple of friends built the R-1 from my plans and I did the R-1/R-2 "Long Tail Racer," as it was known. Again, I found I had a remarkable contest winner and a season's flying added to my already large collection of Gee Bee trophies. Of all of the Gee Bee aircraft my favorite was still the first one I built, the Senior Sportster Model Y.

With the great pictures I had collected of the aircraft I was able to design and build a much more accurate model of it than the first one, and while I was at it, I decided to do this new one in 1/4 scale.

When your editor expressed interest in having me do a construction article on the 1/4-scale Model Y Sportster, I asked Bob Granville if he would like to write the background story on the Senior Sportster for the article, as I felt his story would be more interesting than mine. Bob received my letter on November 14 and that evening showed my letter to his son, Robert, and told him that he was looking forward to writing this part of the article for me. However, it was not to be.



Bob Granville, right, holding Henry's smaller version of the "Y" (March, '76 MA)—with the author at Rhinebeck. Granville was to assist with this article, but passed away. (Jay Duncan photo.)



Above: Even close up, the scale dummy Wasp engine hides the big Webra 91—case may be seen to right of prop hub. Like a Hollywood set front, the realistic Wasp doesn't have much, if anything, behind it, as seen below.

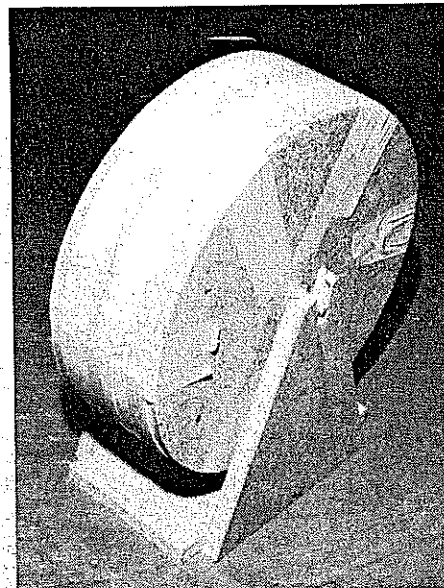
The next night I got a call from Beverly Granville (Bob's daughter-in-law), telling me that Bob had passed away earlier that evening. The aviation world had lost the last of the famous Granville Brothers, and I had lost a very dear friend. Also, you readers missed out on the chance to read about the Senior Sportster in the words of one of the men who had built the ship in 1930. In his later years, Bob Granville had written many articles on the various Gee Bee

*Editor's Note: Henry's smaller version of the Senior Sportster, published in the March 1976 Model Aviation remains the most popular plan MA ever printed. But it is far excelled by this 4-scaler. At the beginning of its flying life, the latter already has won firsts in Non-Military Scale, WRAMS; Best of Show, Southern NJ Clubs Static Competition; Grand Prize Winner, Bealton, VA; tops in Static and Flight points at AMA District II RC Championships. Radio failures prevented second flights at the Rhinebeck Classic (4th place), and Brandywine, MD (2nd place).*

*Although the wealth of material compels us to run this subject in two issues, complete plans are given this month. Wings, Finishing, Detailing, and Flight will be covered next month. A picture collection of historic variants of this subject, and their famous pilots, are included in the final installment.*

aircraft which he and his four brothers had built. Bob and I were in the process of putting material together for a book which would tell, for the first time, the real story of the Gee Bees and the men who built them. I have promised Bob's family that I would finish the project we had started and will get to writing the book as soon as I gather final facts that I am seeking.

I will do my best to tell you the story of the Senior Sportster as best I can, using as many of

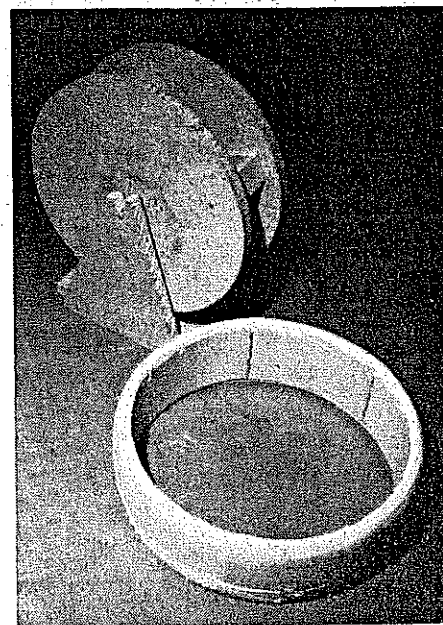


Simple cowl forming device with first layer of ply taped in place while the glue dries.

Bob's words from his articles on the Gee Bee as is possible.

The Gee Bee Model Y Senior Sportster was a fabulous machine and was felt by the Granvilles to be the best aircraft they built. They stated that it flew and landed beautifully, and won more races and won more money than any of the other racers that they built, even though it was not designed as a race plane. Let's go back a few years to find out how the Model Y Sportster came about.

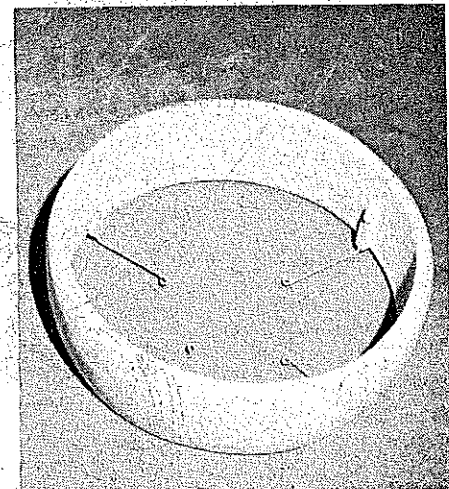
Zantford Granville, still not 20 but oldest of the five New Hampshire-born brothers, left his home



Cowl removed from form, and after lay-up and rough shaping. Note that filler is applied to smooth out irregularities.

in Madison, and opened a garage and Chevrolet dealership in Arlington, MA, near Boston. Tom joined him around 1920 and later took over the garage. This gave Zantford the opportunity to become a mechanic for Boston Airport Corp. at what is now Logan International. He took part of his pay in flying time and got his private license. Soon after this, he quit the big company and started his own aircraft repair business, setting up a portable repair shop built over the chassis of a large truck so that he could go to the site of a downed plane and make necessary repairs.

His business flourished and eventually the five brothers were working together. I remember Bob telling me of joining his brothers in 1928, being thrilled at the prospect of making the 50 cents an hour that Zantford had offered him. A short time after, Grannie, as he was known, designed an airplane that they would build. They built the two-place biplane in about three months and Grannie test flew it on May 2, 1929 on a terrible stormy night. It was shortly after midnight when the storm seemed to let up a little and he decided to do it right then. Bob told of his disappearing into the murky sky and they all thought they wouldn't see him again as the weather was so bad. However, Grannie somehow brought the new biplane back and there was jubilation among the brothers. The craft was a success and Grannie decided they would go into production-building airplanes.

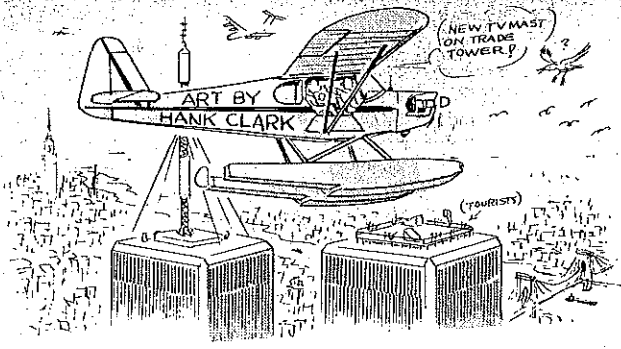


Completed cowl showing "L" brackets which are used to attach it to the firewall.

They needed a place to build, and money for backing. Grannie wrote letters to various places trying to interest someone in their venture. Around the first week of July, 1929, the four Tait brothers, of Springfield, MA, took them in, and they set up shop in what had previously been a dance hall on one edge of the Springfield Airport. They built a number of their biplanes, but things were not the best for any business in 1929.

In 1930, Grannie and Bob Hall, who was their first engineer, decided to design and build an aircraft around the Cirrus engine to compete for some of the prize money offered by the Cirrus company in their Cirrus Derby. This was a 5,541-mile race which started in Detroit, the motor capital of the world, and went as far west as Los Angeles and back to Detroit. Grannie and Hall designed the ship; it was built and given the designation Model X Sportster. This was a low-wing, single-cockpit sport plane and proved to be a very beautiful flying craft. Its big problem was in landing as it had no shock absorbing gear and depended on a new air wheel to absorb the jolts of landing. It took a good pilot to get it on the ground without bouncing like a jackrabbit.

The little black-and-white sportster was flown

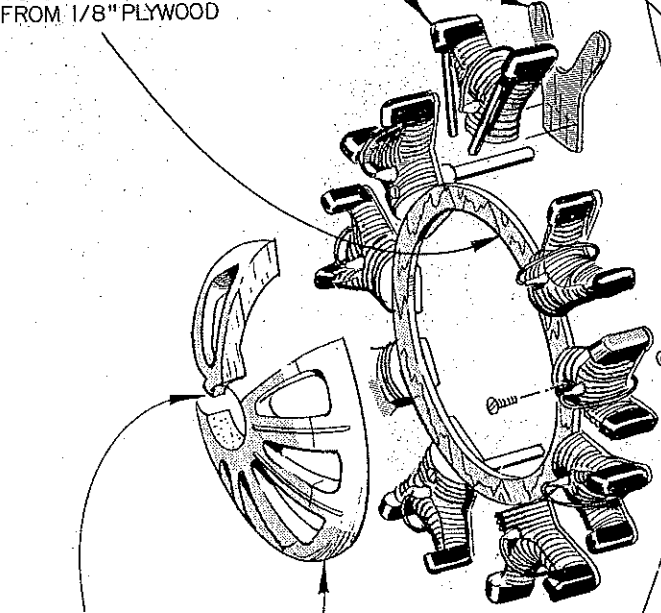


RING COWL LAMINATED UP FROM 3/32" PLYWOOD BASE WITH 1/8" Balsa BUILD UP

WEBRA .91 SPEED ENGINE ON EDSON MOUNT

DUMMY SCALE CYLINDERS VACU-FORMED FRONT HALVES GLUED TO 1/16 PLYWOOD BACKS

WHICH THEN GLUE TO BACK OF RING FROM 1/8" PLYWOOD



NOTCH OUT TO CLEAR ENGINE CARB.

TWO 1/2" Balsa SHEETS SHAPED TO FORM FRONT COOLING BAFFLE

1/4" TUBING OR DOWEL POSTS SUPPORT CYLINDER RING TO WALL

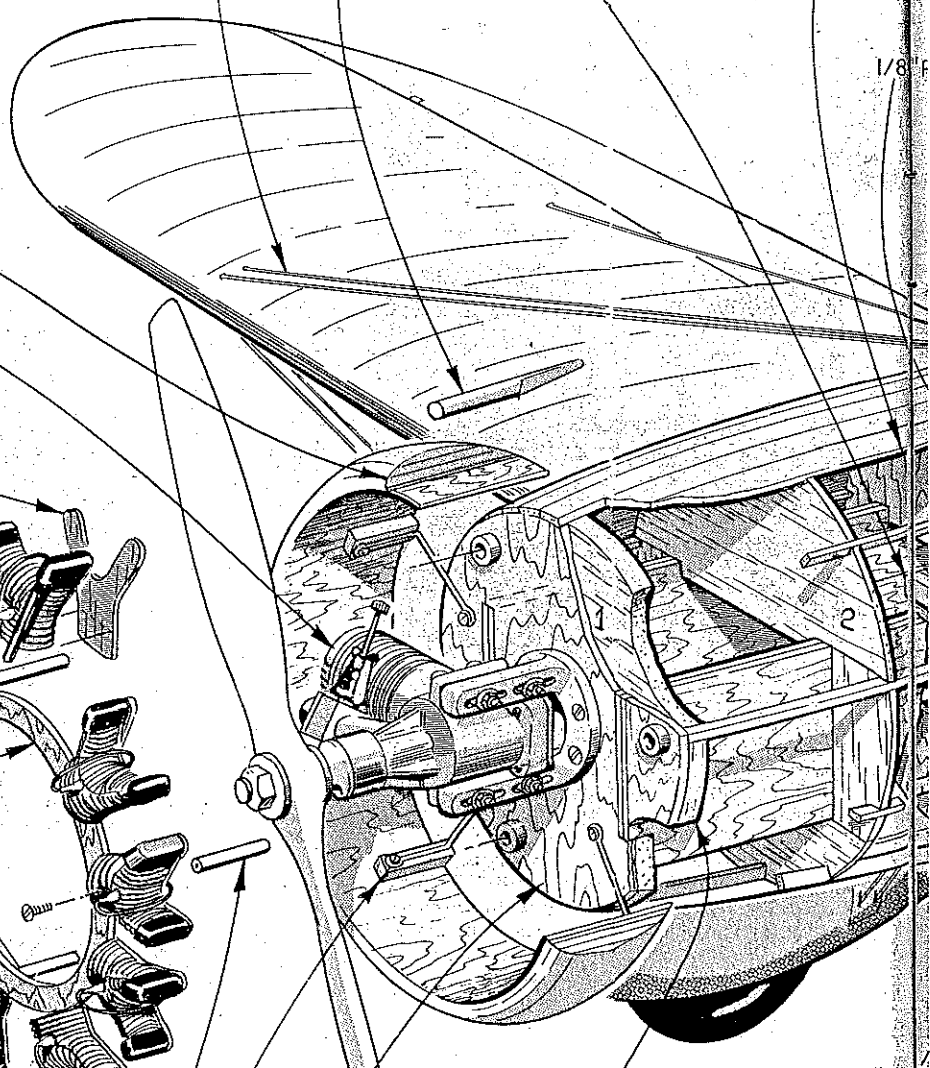
1/16" WIRE LOOPS SUPPORT COWL RING TO FIREWALL ON FOUR WOOD BLOCKS IN RING

1/4" PLYWOOD FIREWALL

FLYING WIRES TO SUIT SCALE

DOWEL EXHAUST STACKS (9)

SERVO TRAY ON CROSS RAILS



3/32 STIFF

1/8"

3/8" DOWEL HOLD DOWN

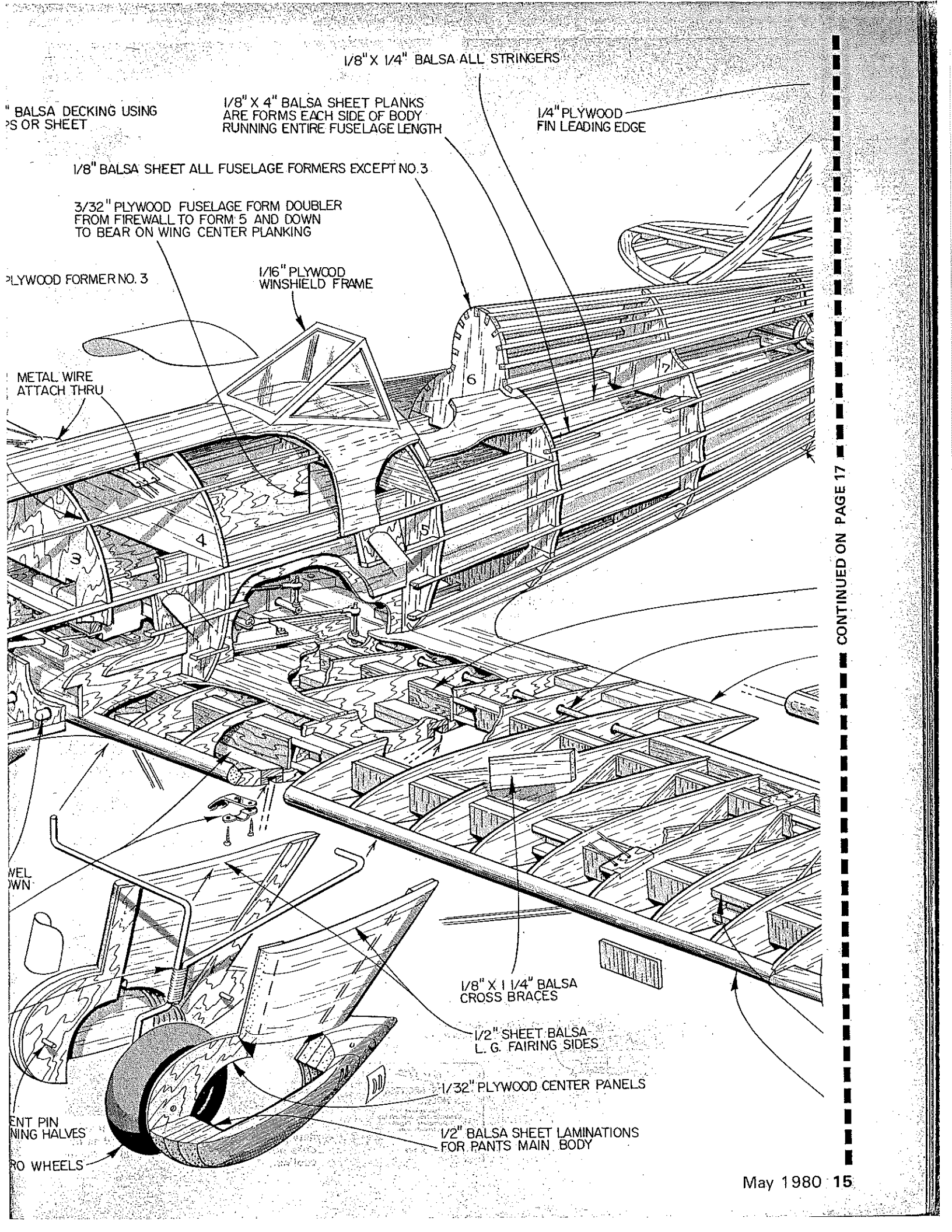
1/2" Balsa FORMER NO. 1

1/4" HARDWOOD BLOCKS THRU 4 RIBS TO SUPPORT L.G. WIRES AND CLIPS

3/16" WIRE FOR BOTH LANDING GEAR STRUTS BIND AND SOLDER AT JOINT

ALIGN FOR JOINT

6" DUAL



1/8" X 1/4" Balsa ALL STRINGERS

1/8" Balsa DECKING USING  
1/8" X 1/4" Balsa SHEET

1/8" X 4" Balsa SHEET PLANKS  
ARE FORMS EACH SIDE OF BODY  
RUNNING ENTIRE FUSELAGE LENGTH

1/4" PLYWOOD  
FIN LEADING EDGE

1/8" Balsa SHEET ALL FUSELAGE FORMERS EXCEPT NO. 3

3/32" PLYWOOD FUSELAGE FORM DOUBLER  
FROM FIREWALL TO FORM 5 AND DOWN  
TO BEAR ON WING CENTER PLANKING

1/16" PLYWOOD FORMER NO. 3

1/16" PLYWOOD  
WINDSHIELD FRAME

METAL WIRE  
ATTACH THRU

WEL  
DOWN

1/8" X 1/4" Balsa  
CROSS BRACES

1/2" SHEET Balsa  
L. G. FAIRING SIDES

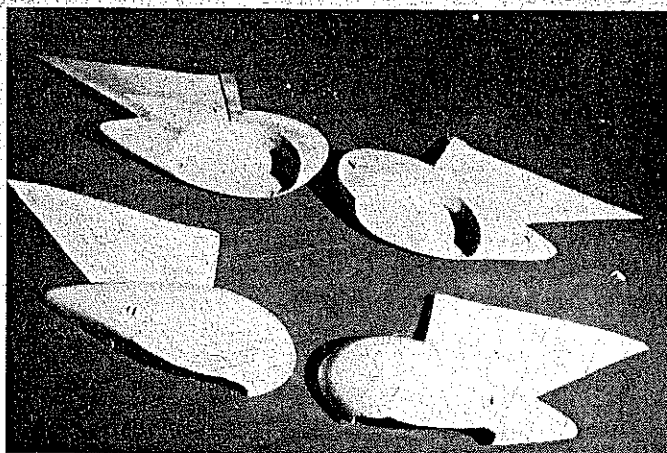
1/32" PLYWOOD CENTER PANELS

1/2" Balsa SHEET LAMINATIONS  
FOR PANTS MAIN BODY

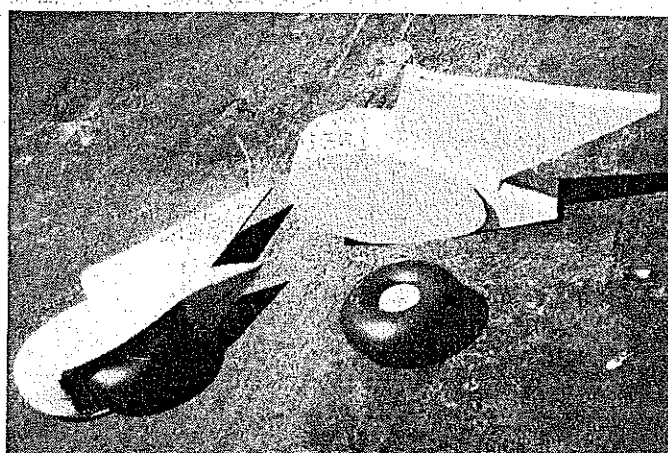
ENT PIN  
NING HALVES

RO WHEELS

CONTINUED ON PAGE 17



Finished landing gear fairings—note alignment pegs on inside of the opened fairing. Robust, nice looking, but not too difficult to make.



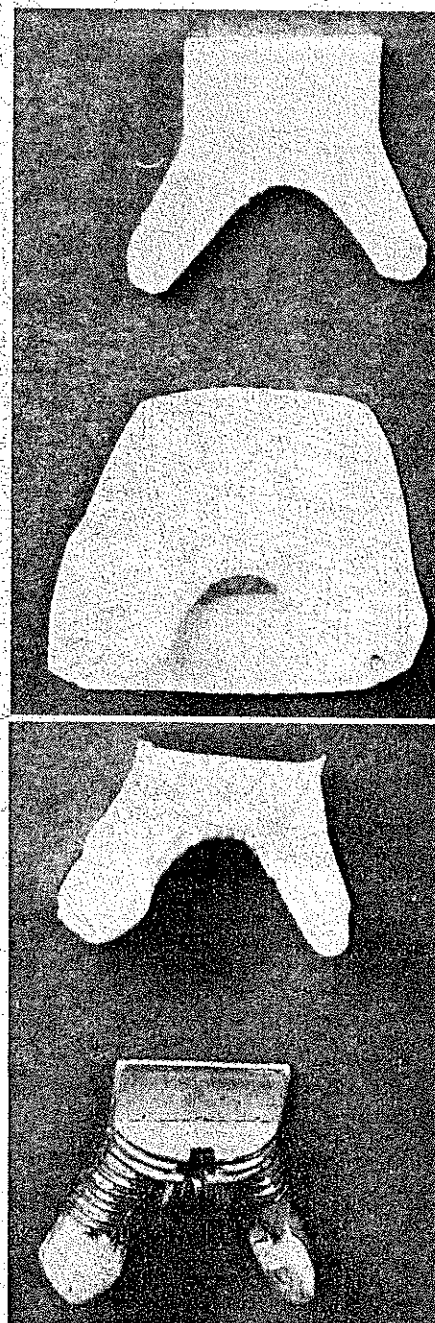
Built-up landing gear fairings with 6-in. Du-Bro wheels. One fairing has been roughly shaped; other in lay-up state before carving.

by Lowell Bayles in the derby and placed second, which netted the young company a nice piece of change. Several wealthy sportsman pilots wanted one of the little 25-foot-span sportsters and a total of eight were built. Some had the Cirrus, some Menasco, and some the Warner radial engines. Various versions were known as Model B, C, D, and E Sportsters. All were very aerobatic and extremely fast for their power, and in various racing events of the day, nothing in their class could stay with them. They were not built as racing planes but soon proved to be unbeatable in their class.

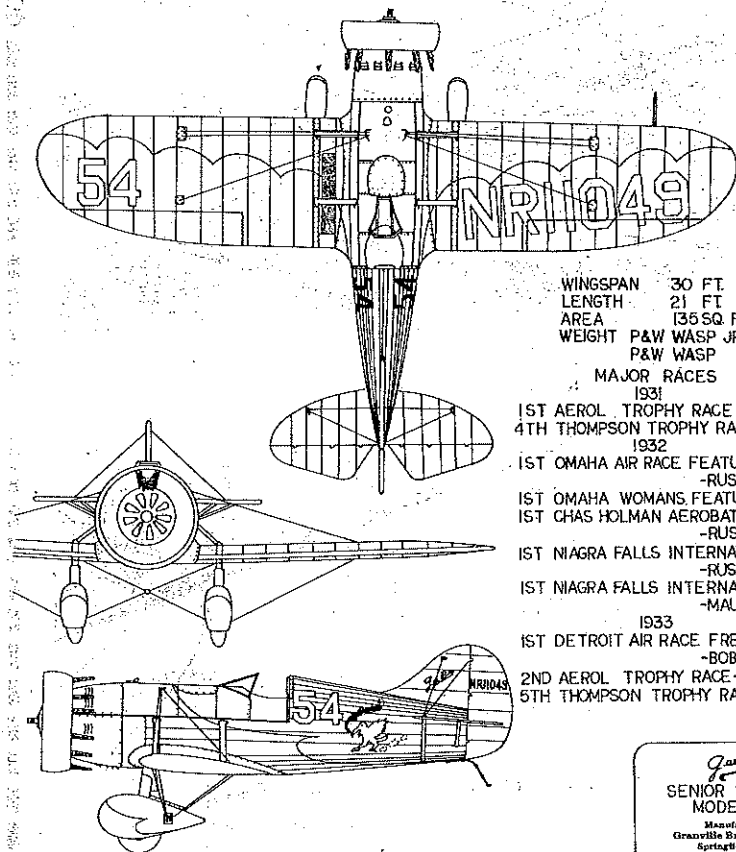
Bill Sloan, who owned two of the Model E Sportsters, tells me that racing with them was "like taking candy from a baby." In trying to find something that would make money for the company, Grannie thought that a two-seat version of the Sportster might be the answer and here is where the Senior Sportster Model Y was born.

NR11049 was built in 1930, a delightful ship to fly. It was powered by a 350-hp Pratt & Whitney Wasp Jr. It had fantastic aerobatic capabilities and was extremely fast. Maude Tait, daughter of one of the airport owners, flew the craft a lot and won many races with it. She set a new women's closed-course speed record of 187.6 mph in winning the Aerol Trophy Race at Cleveland, in 1931. Bob Hall flew the Senior Sportster to fourth place in the Thompson Trophy Race that year. The race was won by the Gee Bee Model Z Sportster, which was the first of the aircraft designed specifically for racing by Grannie and Bob Hall. The Model Y Senior Sportster won many races in both women's events, piloted by Maude Tait, and also many men's events, piloted by Russell Boardman.

The two would fly to a race site and remove the front windshield and cover the front cockpit with a special metal cover. In 1932, Russell Boardman



Steps in the making of a cylinder—see text for details. Dummy engine adds a little drag but does not hinder the model's flying or engine cooling.



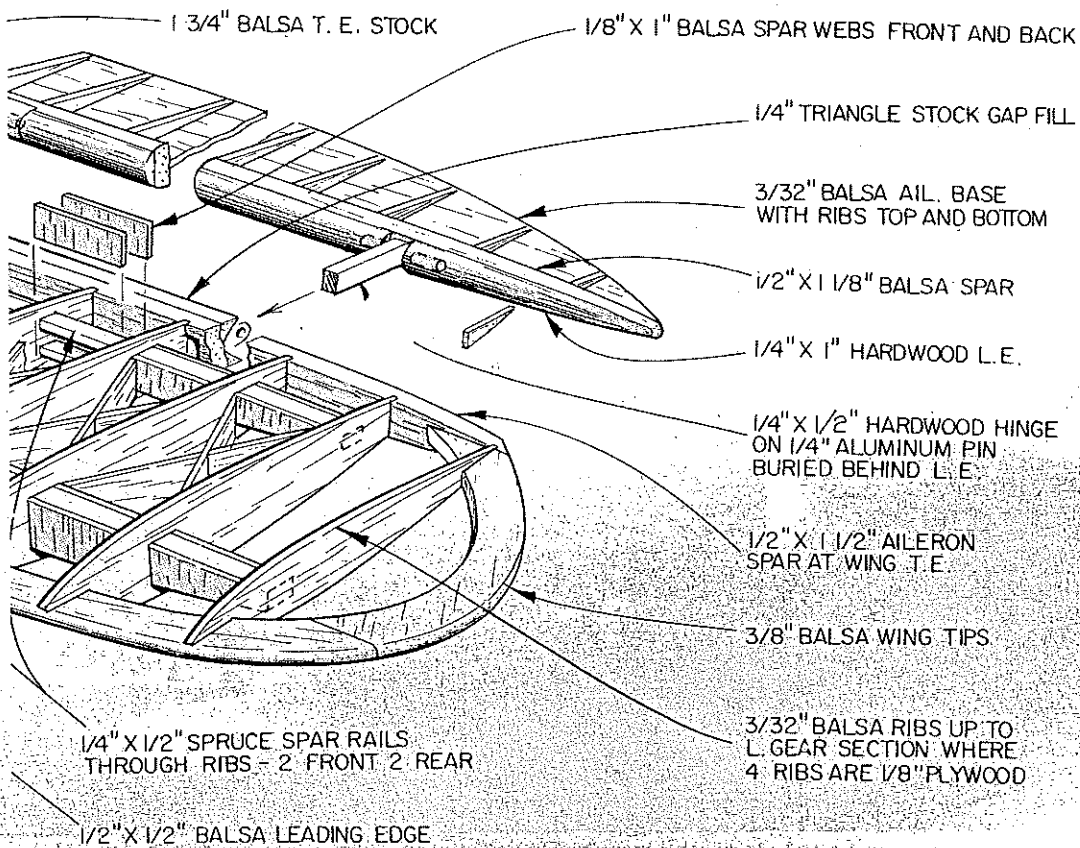
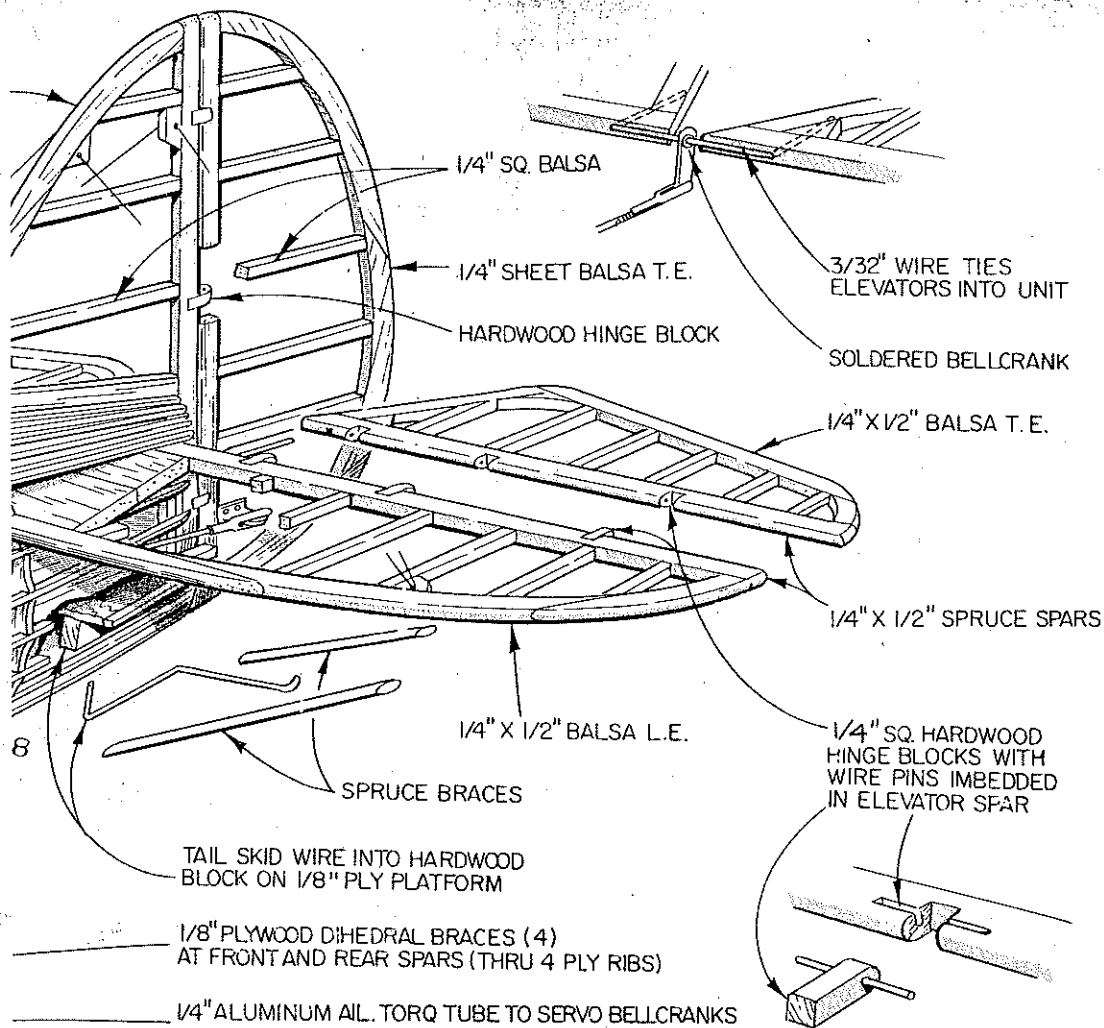
WINGSPAN 30 FT  
LENGTH 21 FT  
AREA 135 SQ FT  
WEIGHT P&W WASP JR 1500 LBS  
P&W WASP 2000 LBS

MAJOR RACES

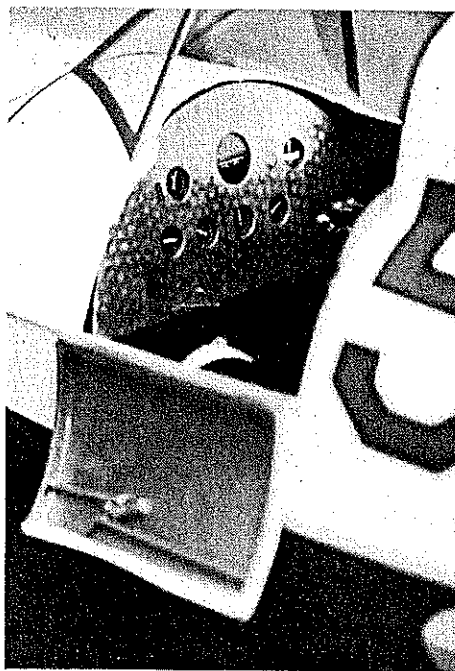
- 1931  
1ST AEROL TROPHY RACE - MAUDE TAIT  
4TH THOMPSON TROPHY RACE - BOB HALL
- 1932  
1ST OMAHA AIR RACE FEATURE FREE FOR ALL  
-RUS BORDMAN  
1ST OMAHA WOMANS FEATURE-MAUDE TAIT  
1ST CHAS HOLMAN AEROBATICS TROPHY  
-RUS BORDMAN  
1ST NIAGRA FALLS INTERNATIONAL AIR RACE  
-RUS BORDMAN  
1ST NIAGRA FALLS INTERNATIONAL AIR RACE  
-MAUDE TAIT
- 1933  
1ST DETROIT AIR RACE FREE FOR ALL  
-BOB HALL  
2ND AEROL TROPHY RACE - MARTY BOWMAN  
5TH THOMPSON TROPHY RACE ZANTFORD  
GRANVILLE

*Gee Bee*  
SENIOR SPORTSTER  
MODEL Y  
Manufactured By  
Granville Bros. Aircraft Inc.  
Springfield Airport  
Springfield, Mass.

Henry A. Haffke 6-17-33





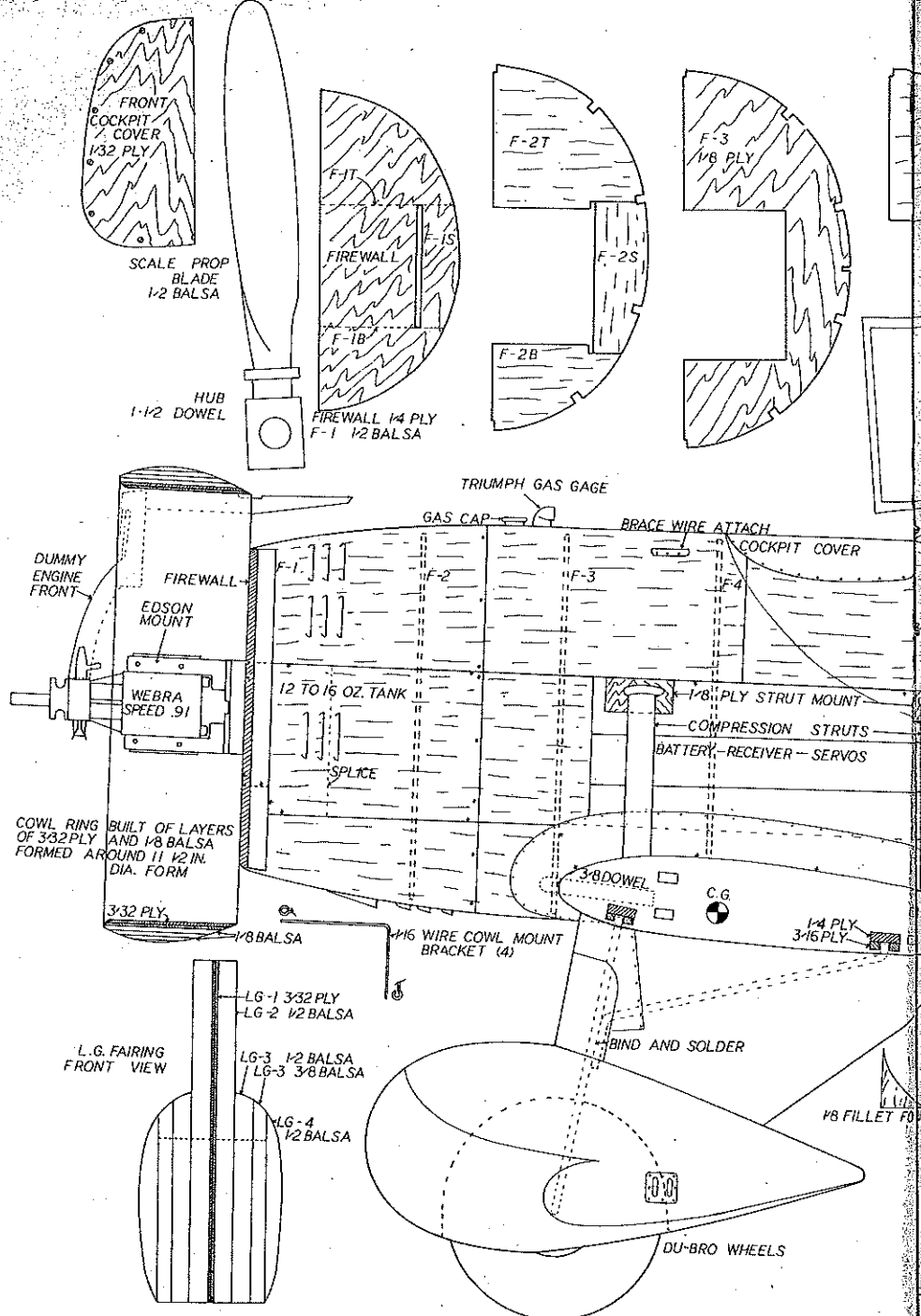


Open cockpit door reveals the buried aluminum instrument panel. Quarter-scale instrument faces are now on the market.

and Maude Tait swept the men's and women's events as they won the Omaha Air Races. Then Boardman strapped himself into the Y again and won the Speed Holman Trophy as he won the National Aerobatic Championship. He also made a fast, record-breaking flight, after midnight, from Chicago to Newark, to bring east the newsreels of the Democratic national convention. His time was a record 3 hrs. and 38 min.

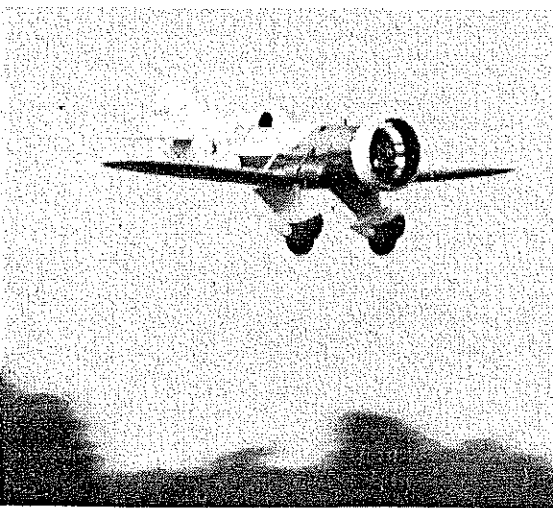
The Senior Sportster was truly a remarkable aircraft. It was just plain fun to fly and in a race the other competitors had to watch its tail end. It was flown all over the country, as it served as the support aircraft to the racers in 1931, '32, and '33. Unbeatable in its class, it could more than hold its own against the bigger, more powerful Thompson Trophy racers. It was flown in the Thompson twice and finished in the money both times, being piloted to fourth place by Bob Hall in 1931, and to fifth place by Zantford Granville in 1933.

After the R-1 and R-2 racers suffered misfortunes in the 1933 Bendix race at Indianapolis, Zantford Granville, who was in Los Angeles with the Y waiting for the racers to arrive, flew to Indianapolis, where he met a contingent of irate

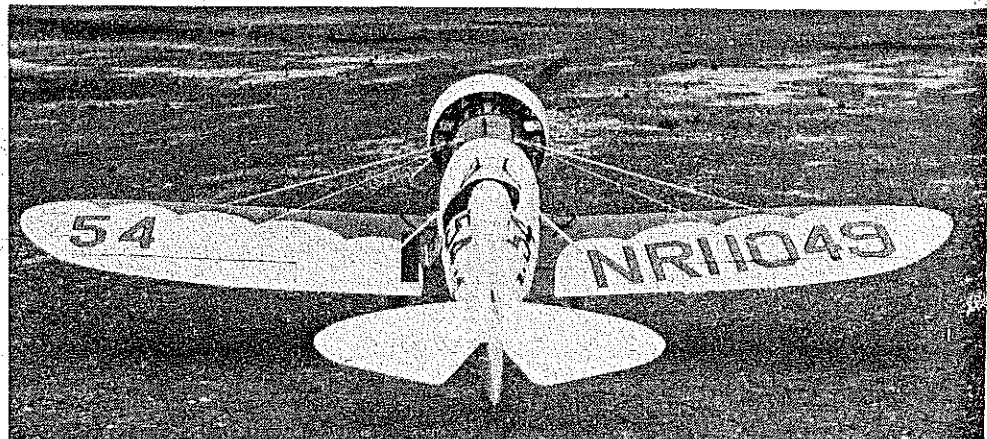


National Aeronautics officials who were investigating the accident that took the life of Russell Boardman. These officials grounded the Y when

they saw fit to condemn the three-year-old fabric on the aircraft. Zantford finally made arrangements with them to be able to fly the ship home to

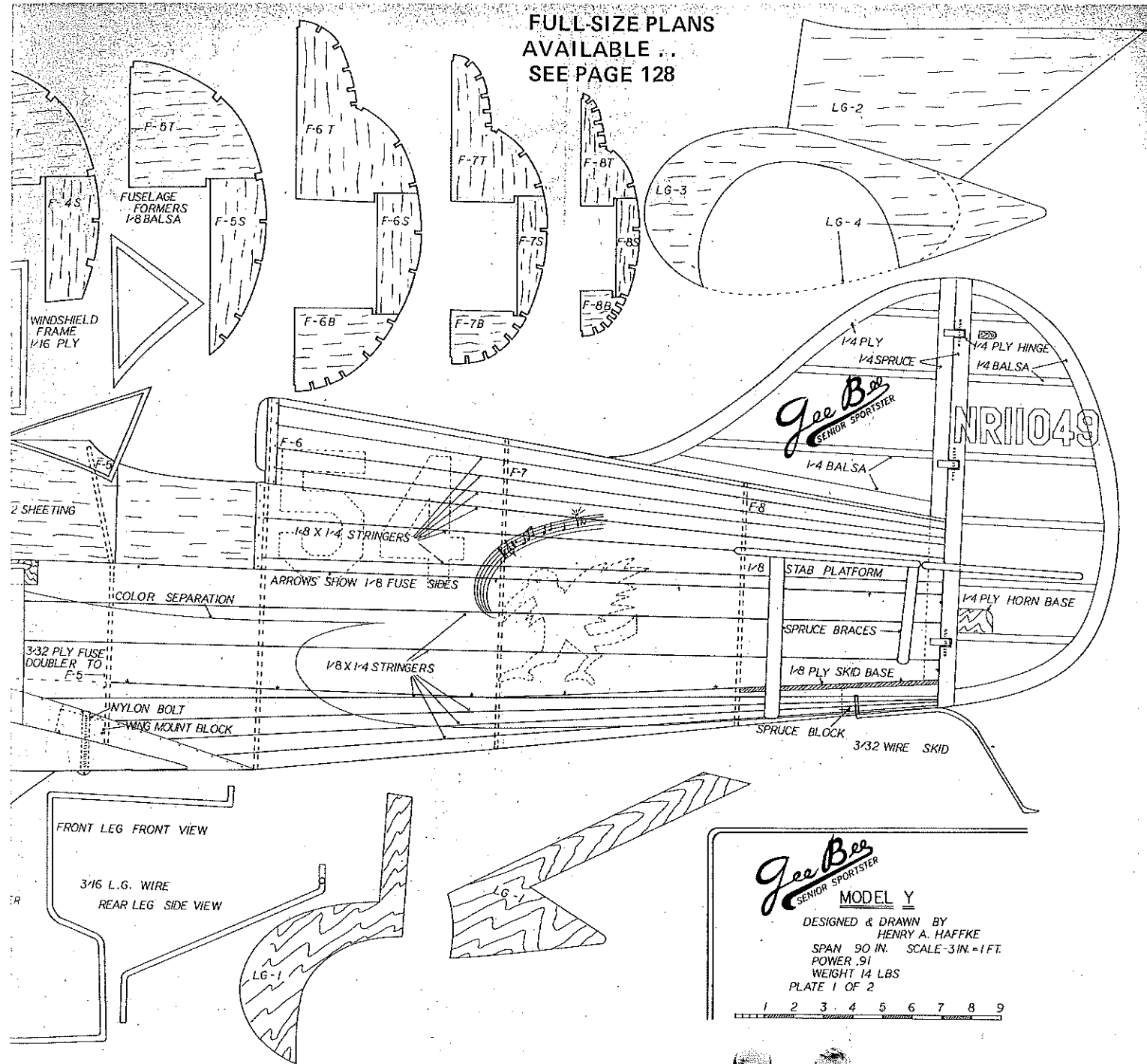


Our Senior Sportster caught during one of its low passes at Clayton R/C club field.



An unusual rear view shot affords interesting comparison of the ring-cowled engine with the airframe. With that dihedral the plane probably would allow some pleasant hands-off flying.

FULL-SIZE PLANS  
AVAILABLE...  
SEE PAGE 128

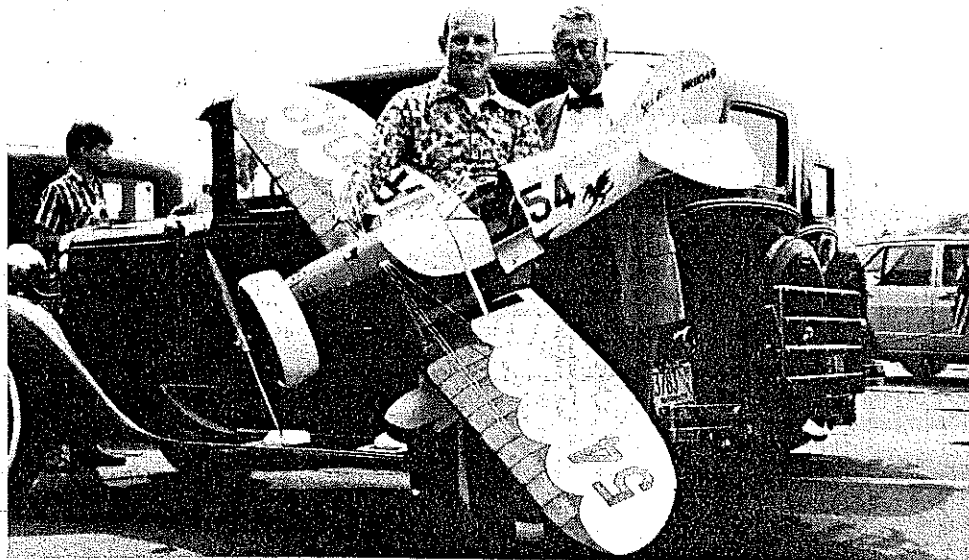


Springfield.

In February of 1934, Zantford Granville was killed in a landing crash while en route to deliver one of the single-seat sportsters. Things went bad for the Granville Aircraft Company and everything was sold at the sheriff's block. Bandleader Harry Richmond, of New York, acquired the Senior Sportster and completely recovered it and installed a new engine. Shortly after its overhaul was complete, the craft took off from the North Island Airport (La Guardia Field) and soon thereafter its propeller came loose. Vibration tore the engine from its mounts. It is not known who the pilot was. Even though he was wearing a parachute, he rode the aircraft down safely as it flat spun into Flushing Meadow with little damage to the aircraft. Before it could be removed, it was destroyed by vandals. A very sad way for such a great aircraft to end.

A second Model Y Sportster was built on special order for the Cord Automobile Co., to be used as a test bed for the Cord-produced 215-hp Lycoming R680 engine. The Granvilles were

*Continued on page 95*



Gee Bee pilot Bob Hall with Henry and the 1/4-scale Senior Sportster at recent 50th anniversary of the Gee Bee Company at Springfield, MA. (Photo by George Beifus.)



never paid, another example of the financial difficulties that plagued the small company. In 1933 this second Y (NR718Y) was re-engined with a 450-hp Wright Whirlwind and modified by Art Knapp and Bob Hall for the 1933 Chicago International Air Races. After placing second in the women's Free-For-All race at 189.4 mph, Florence Klingensmith entered the "big race," the Frank Phillips Trophy Race, the men's Free-For-All. Many erroneous stories have been told of the aircraft shedding fabric and breaking up in the air. I was given an eye-witness account of what actually happened. She was traveling in excess of 200 mph as she led the race on the seventh lap. Each time around, as she banked around the near pylon, the fabric could be seen bulging out between the ribs. Rounding the pylon on that lap, the fabric was seen to pop open between the first and second inboard ribs with a loud noise. It is suspected that she could have been frightened terribly by the noise, fainted, etc., and apparently she froze at the controls. Not out of control, the plane simply flew off the course into a shallow descent into the side of a knoll quite some distance from the course, killing the pilot. Bob Hall has told me that during a race in the other Model Y he clipped a pylon, shearing over three feet from the left wing tip and had no trouble continuing on and making an uneventful landing.

The Senior Sportsters were truly remarkable aircraft and it is hoped that we have not seen the last of them. I know of at least two men who are contemplating building a Model Y Senior Sportster and, hopefully, we will again see this great aircraft take to the sky along with the Model Z, which has been recreated and flown by Bill Turner in California.

**Construction**

The drawings basically are for the first Model Y Senior Sportster NR11049 as flown by Maude Tait in winning the 1931 Aerol Trophy Race. However, the plans can be used to do a model of the other Model Y, NR718Y. Two versions of NR718Y could be built, as it looked quite different with the 1933 engine change. The factory version of NR718Y had a smooth cowl and the landing gear fairings were open, while the 1933 modification had rocker housings on the cowl and also had the landing gear fully faired. This version also had a long gentle sloping windshield. Basic structure was the same for all versions. Engine installation was the main difference. Color of the NR718Y was cream and red, while NR11049 was white and red. Exact colors as picked out for me from color charts by Bob Granville were Randolph Tuscon Cream and Sunset Red for NR718Y, and Juneau White and Sunset Red for NR11049.

**Fuselage:** The basic sides were prepared from 1/4 X 4 X 48 balsa. It will be necessary to add a short piece at the front, where splice is shown on the plans, to make fuselage sides long enough. At the wing saddle location an additional section is added below the main side sheet. The one-piece 3/32 ply forward fuselage doubler is added from the front to F-5 location. After the basic sides have been laminated, slide F-3, of 1/4 ply, into position and then locate the one-piece firewall on the sides. Epoxy these parts and line up everything by weighting this structure upside down on a flat level surface.

Reinforce the firewall with triangle stock inside the fuselage sides. When this structure is completely cured, remaining fuselage formers are

Continued on page 98

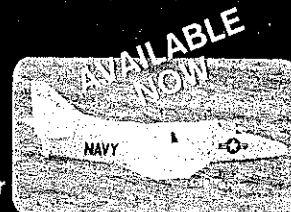
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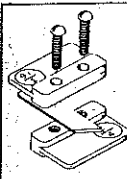
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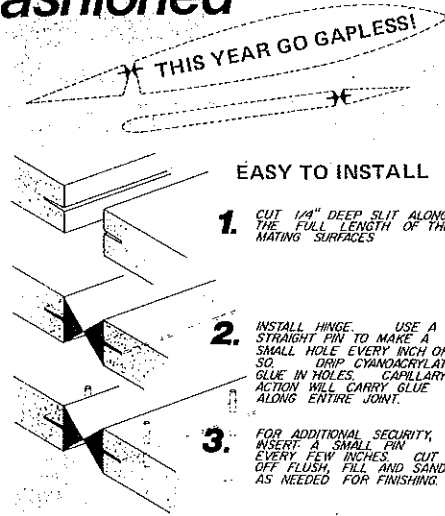
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leading edge. Rudder trailing edge is cut from 1/4 balsa. Scale hinges are installed as shown on the drawings. These are made of 1/4 ply and are epoxied into the trailing edge of the fin, and one into the lower aft end of the fuselage. You can use your favorite commercial hinges in place of the scale hinges shown. A 1/4-ply insert is built into the rudder as a base for the rudder horn.

The tail surfaces have no airfoil and are simply rounded all the way around. The fin and rudder may also be built of solid 1/4 sheet balsa if a simpler structure is preferred. Weight is no problem. The model will probably come out a little nose-heavy as was the case with the real aircraft. The real aircraft had a 50 lb. anvil mounted under the stab to bring the CG where it belonged.

To be continued.

## RC Aerobatics/Van Putte

continued from page 26

if it was okay to use fuel that had turned blue (it was originally red). It turned out that he had left his airplane with a full fuel tank in the fall and the fuel had reacted with the brass tank tubing, turning it blue. Chances are you more or less emptied your tank last fall, but even a little bit of fuel can do peculiar things in a fuel tank. Filters can clog up, fuel line gets soft and gummy and sediments can develop in the bottom of the tank. Castor oil based fuels can give real problems since the oil tends to spoil, actually turn rancid, in storage. The moral is to flush out the tank and check out the fittings and tubing for problems. If you have any of last year's castor oil based fuel left, pour some into a clean container and look for little white flakes suspended in it. Those flakes are castor oil which precipitated out of the fuel mixture. I wouldn't use it, but I don't like castor oil in fuel anyway because of the brown mess that gets all over the head and cooling fins of the engine. There are a lot of good commercial products for cleaning engines with baked-on castor oil. I just cleaned a dozen such engines, bought from a flier getting out of the hobby, with a quart of GMP Motor Kleen. It cleaned the last engine as nicely as the first one. *Whatever you use, don't try commercial oven cleaner! It attacks aluminum.*

After you've done everything else, check to see that the engine and servos are securely bolted down. Then, settle back and enjoy the good feeling that confidence in your equipment can give.

Clubs have all kinds of awards, but I never heard about the "Crasher Trophy" until reading the Bell Air R/C Flyer (Bellingham, Washington). Their new award was announced in a recent newsletter as follows:

"We now have a Crasher Trophy. The basic rules are as follows . . . To receive this award you must crash in the presence of the current holder of the trophy. To get rid of the trophy you must be present when the next guy crashes and you must present it to him immediately; that is to say, you must have the trophy with you. If you should happen to earn this award, you will not be allowed to fly without bringing the trophy with you."

Boy, that's rubbing it in!

I've been reading in quite a few newsletters that the FCC is making refunds to Citizen Band operators who paid up to \$20 for licenses in the years 1970 to 1976. To get the special booklet you need to apply for the refund, write to the FCC Fee Refund Program; Box 1788, Hyattsville, MD 20788.

Ron Van Putte, 12 Connie Drive, Shalimar, FL 32579.



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added, then the main stringers along the sides. Leave off the rear top stringers until the tail surfaces are installed. Omit the bottom rear stringers until the wing is fitted to the fuselage later on. The top forward section and lower forward section are sheathed with 3/32, or can be planked, using 3/32 strips.

Add the 1/8 ply plates for mounting the compression struts and the 1/8 ply skid base. A spruce block, cut to support the tail skid, is added. The engine installation is now completed. I used the Webra .91 on an Edson adjustable mount, with one of the Edson thrust wedges to give right-thrust offset.

After the wings and tail surfaces have been built and installed, the fuselage is finished by adding the rear stringers on the top and bottom sections.

**Wing Fillet:** After the wing has been installed, a 1/16 ply base is glued to the wing saddle, extending 3 inches out from the fuselage sides. The wing is assembled to the fuselage, so that the base will fit properly the dihedral angle. The forward section of the fillet is built up of 1/2" balsa blocks cut to fit the curve of the fuselage and airfoil. Fill in behind the wing to bulkhead #6 with a 1/2 soft balsa block to form the aft end of the fillet. Cut fillet bulkheads (4) of 1/8 balsa and install. The fillet is planked with 1/8 X 1/4 strips. A little final carving and sanding completes the fillet.

**Engine Cowl:** A form is necessary to build the cowl. It is easily made around an 11 1/2" form. I could find nothing that size so I cut two ply discs, spaced to give a 4"-wide form. When mounted on a stand it is easy to work on. A layer of 3/32 ply is wrapped tightly around the form and a second layer is added over the first with the joints staggered. Use masking tape to hold the ply in place while the glue dries. Layers of 1/8 balsa are

added (4) to the ply. After each layer is added, a couple of large rubber bands around the structure will keep them pressed together until dry. The completed cowl structure is slid off the form, then carved and sanded to final shape. Cowl is attached to firewall with four L-shaped music wire brackets. These are permanently mounted to the inside of the cowl and fastened to the firewall with sheet-metal screws. Exhaust stacks are formed from aluminum tube and mounted to the inside of the cowl with spruce blocks.

**Wheel Fairings:** These are built up of laminations of ply and balsa. When the layers have been glued together, weight or clamp heavily, and allow to dry completely before carving to shape. Also before shaping, align the two halves of each fairing with dowels at front and rear of the fairings. Spot-glue the halves together and carve and sand to final shape.

Landing gear legs are formed from 3/16 music wire. Both forward legs are identical, but the rear leg must be formed for a right and a left part. Drawings show side view of rear leg. From the front it will have the same upper bends as the front leg, except that one side will bend right and the other side will bend to the left. The front and rear legs are mounted to the wing mount blocks with straps and screws. Bind the two legs together with copper wire and solder. It is preferable to use silver solder for this joint. Du-Bro 6"-dia. wheels are retained on the axles with a wheel collar on each side of the wheel to assure proper centering. The wheel fairings are fastened together over the wheel and legs, and held together by spot-gluing, or can be screwed together with short screws if you prefer.

**Fin and Rudder:** These vertical surfaces are built up from 1/4 sq. balsa and 1/4-ply fin leading edge, with 1/4 spruce for the fin trailing and rudder

henry harrke

# GEE BEE SENIOR

We can't call this beauty and the beast, the big "Y" being a beauty in its own right. It may seem a bit of a beastie to rubber scalars. It flies beautifully, too, no-hands takeoffs and landings. Extraordinary, we'd say. The young lady is Karen, our "cover girl."



## SPORTSTER MODEL Y part 2

Last month the author described the fuselage, engine cowl, and landing gear—complete plans were presented for your convenience. Now he completes the structure, describes the finishing and discusses flying techniques.

IN THE previous issue we went through the procedure for building the fuselage, engine cowl, and landing gear. Now we will complete the construction, finishing and detailing and then flying the craft.

**Wing:** All ribs are cut from 3/32 balsa except for the four 1/4 ply ribs A-1 which support the landing gear mount. The four 1/2 X 1/4 spruce spars are marked for rib positions and the ribs are slid onto the spars. Support the bottom spars on two equal size blocks (3/4 sq. or similar). Use one block near wing root and one near the D or E rib. This keeps the structure true as it is worked on.

Weight the spars to the blocks to keep them in

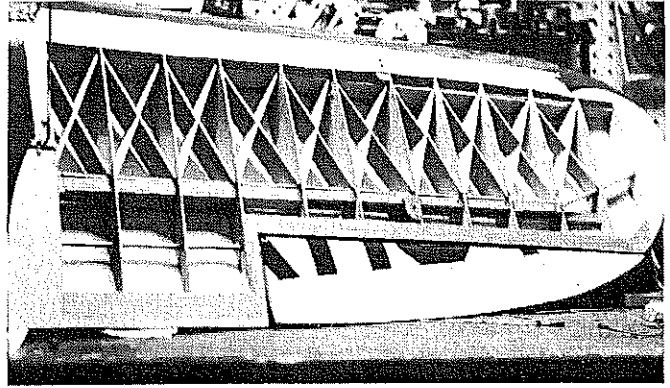
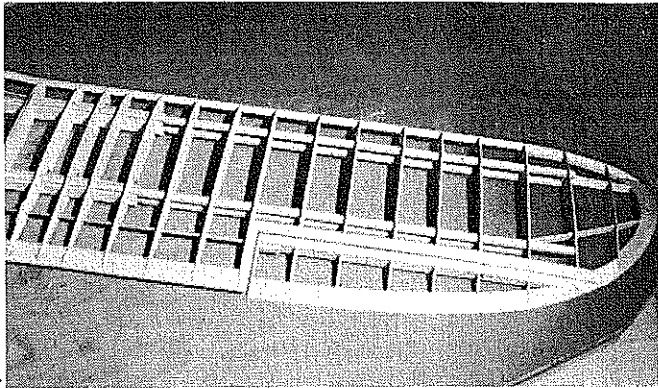
line and make sure that the building surface is true. Once all ribs are positioned on the spars, they are glued. Add the 1/2 sq. leading edge and the trailing edge. Add the tip parts cut from 3/8 balsa. Webbing is installed between each rib outboard from the ply ribs. Webbing is 1/8 X 1/4 on the front spars, and 1/8 X 1 on the rear spars. When the webbing has been completed the cross bracing (1/8 X 1 1/4 balsa) between the ribs is added.

Add the 1/8 ply plates for attachment of the compression struts and brace wires. Strut plates are necessary only on the top surface, the brace wire plates required on both top and bottom surfaces. Ailerons are now built.

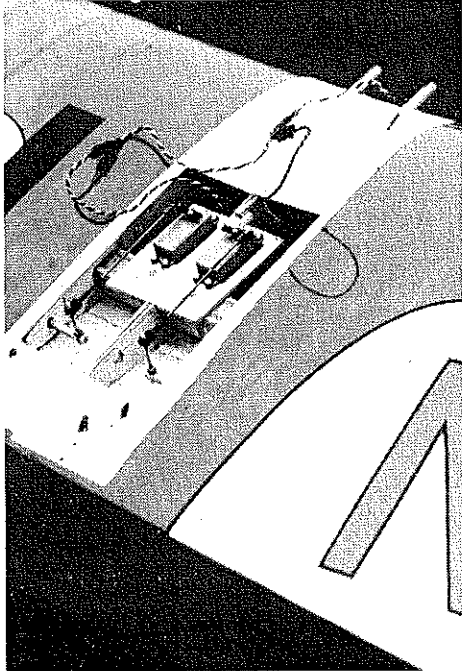
Laminate the two parts of the aileron leading edge and carve to a round shape at the front edge. This can be spot-glued to the wing trailing edge and the 3/32 aileron base added. When dry, the ribs are added top and bottom, and the structure sanded to final smoothness before cutting aileron apart.

The landing gear support blocks are built up of 1/4 ply and 3/16 ply as seen in the side view and are epoxied into the notches in the A-1 ribs. This completes the basic wing structure.

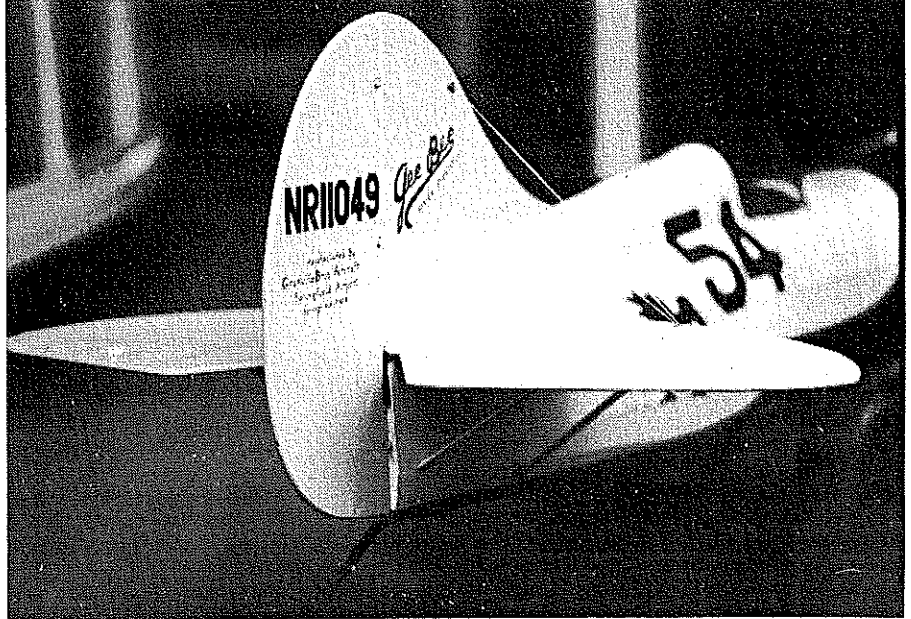
The left panel is built directly over the drawings, using the same procedure as used on the right panel, except that it is built upside down on the leveling blocks. When both halves of the wing are



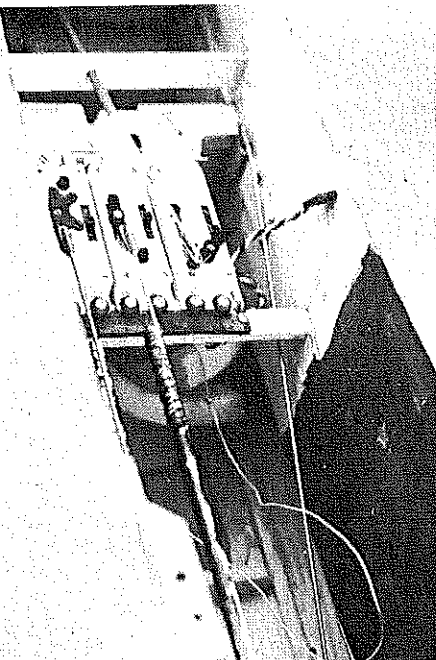
Left: At this point the wing structure looks as simple as any normally framed wing—note the aileron torque rod. Right: The diagonals lock it together as rigidly as a bridge. The full-depth Xs are important and probably something very few of us have ever thought about.



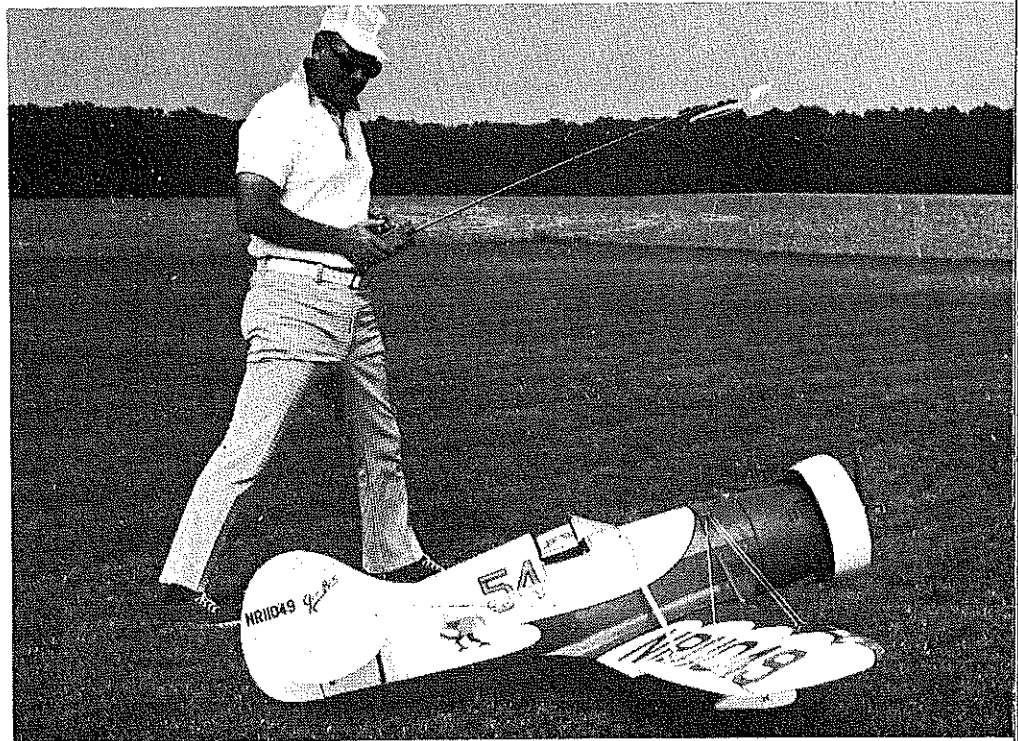
A great way to lick the servo in the wing problem and long leads—two servos side by side each operating a torque tube for an aileron.



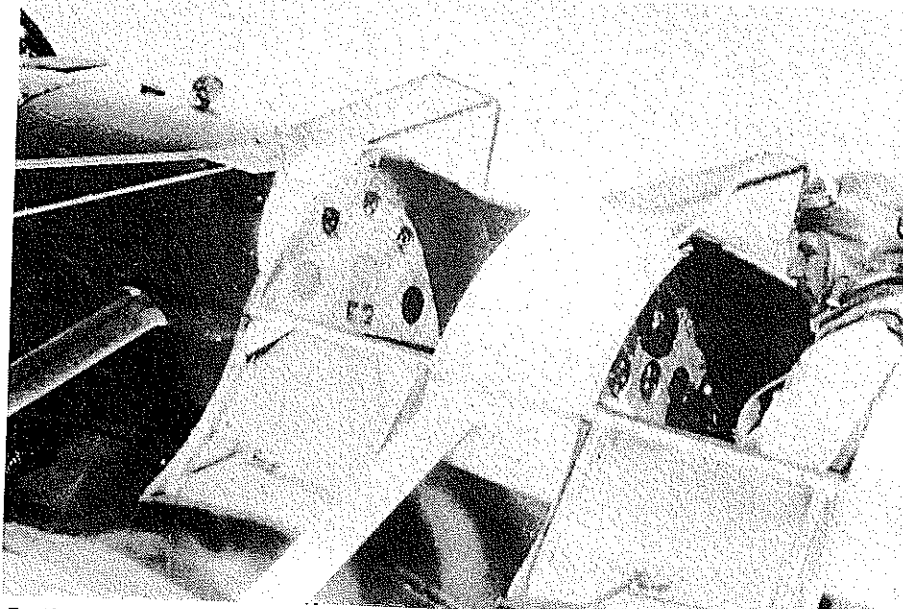
The empennage, as the French say, showing authentic markings of the real aircraft. Note two wires to rigidize the fin. Fast and maneuverable, the "Y" won the National Aerobatic Championships.



Although the fuselage article ran last month, it seemed a good idea to provide this picture of the fuselage installation. Nothing fancy.



As fine a pilot as Henry is he turned over the first test hop to Sid Clements, here checking control movements prior to the first hop. He had already turned thumbs down on a 4-in. pitch prop which bent under thrust loads. On approach he was holding transmitter down at his left side.



Zantford Granville runs up the Senior Sportster, which he flew all over the country as a support aircraft for the other Gee Bee racers. He flew it to a 5th in the 1933 Thompson Trophy Race.

complete they are joined with the  $\frac{1}{4}$  ply dihedral braces. There are two different braces for the front spars and rear spars. Two of each are required. These dihedral braces give the correct dihedral angle to the wing.

Support the wing on leveling blocks and block up one tip to hold everything square while drying. Finally, the center section is sheeted with  $\frac{3}{32}$  balsa. The aileron is hinged with a  $\frac{1}{4}$  ply hinge using a short length of aluminum tube as a hinge pin. A pine block is installed in the inboard front edge of the aileron to take the  $\frac{1}{4}$  aluminum torque tube. Use a 1-in. section of dowel in each end of the torque tube. Drill the pine block for the tube, and when all is lined up properly, a screw is installed from the bottom to go through the block and tube. A long 4-40 bolt is used through the inner end of the torque tube. Use one of the commercially available aileron connectors on each of the 4-40 bolts for an adjustable aileron crank.

I suggest a separate servo for each aileron as the ailerons are quite large and flight loads will be lessened by using two servos connected with a "Y" cord, instead of the normal single servo installation.

**Stab and Elevator:** These are built similar to the fin and rudder, as described in the last issue. They are built up of  $\frac{1}{4}$  balsa parts as shown on the drawings, or may be made of solid  $\frac{1}{4}$  balsa sheet. Scale hinges are  $\frac{1}{4}$  ply with wire hinge pins, as shown on the rudder drawings, or your

favorite commercial hinges can be used.



Maude Tait Moriarty today with Bill Turner and his Model "Z" replica. Picture taken at recent 50th Anniversary celebration of Gee Bee Company, at Springfield, Massachusetts.

Elevators are connected with a Sig elevator horn. Use the horn that is offset and it will make a completely internal installation. When the tail surfaces have been installed, and the wing has been fitted and installed, the stringers are added to the fuselage and everything sanded to final smoothness.

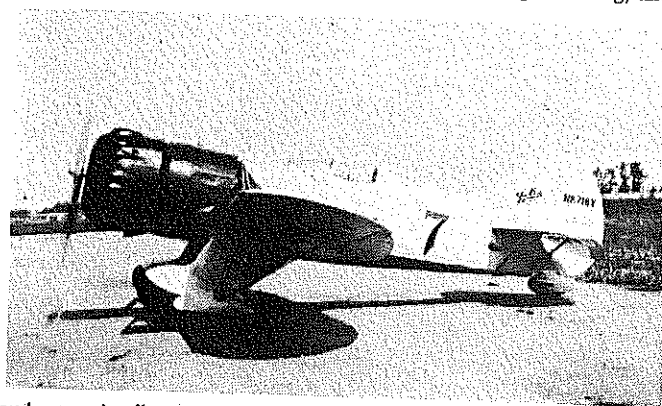
**Radio Installation:** The installation is made so as to get the balance where shown on the plans. Normally, servos and receiver go in the area between F-4 and F-5. The battery can be located wherever necessary to help the balance. There is plenty of room everywhere. Mount everything as recommended by the manufacturer, being sure the pushrods connect to give the correct movement in relation to the control sticks. Use stiff pushrods—at least  $\frac{3}{8}$  dowel.

**Finishing:** There are so many ways to finish a model with today's materials that it is always a problem for me to decide which way to go. I intended to go the full fabric and dope route on this one, but at the last minute decided to try to keep things as light as possible to stay under the 15 lb. weight limit for scale competition. The entire model was covered with white Permagloss by Coverite. Red Super MonoKote was used for the trim. Patterns are cut from paper for the wing trim so that all four panels will be identical. A paper pattern was also made to get the two fuselage sides the same. All markings are cut from red MonoKote. The Gee Bee logo on the fin is black MonoKote. Automotive striping tape was used for the pin striping.

The Permagloss Coverite is a very realistic appearing material and MonoKote for trim gives a very light finish. The only parts that were doped were the wing fillet, landing gear fairings and the engine cowl. This finish just got the model under the 15 lb. weight I was looking for. With a doped finish I would have gone over the limit.

**Detailing:** This begins with the compression struts and stab struts. The compression struts are cut from streamlined aluminum tubing available at most hobby shops. They are held in place with short sheet-metal screws. The stab struts are shaped from spruce; I suggest not omitting them if you have to build up the stab—they add considerably to its strength. The brace wires give a really distinctive appearance, and are made from elastic cord found in all fabric shops.

An aluminum bracket is made of thin aluminum that extends through the fuselage for the brace wire attachment. Bracket should extend outside the fuselage about  $\frac{1}{8}$  inch. Three holes are drilled in each end to take the brace wire ends. Use a quick-link on the end of each wire for a realistic looking connector. Brace wires are threaded through the wing and landing gear fairing, and



Second Senior Sportster built for E.L. Cord automobile firm. Smooth cowl, open landing gear fairings, faired tail wheel. The factory roll-out photo shows the front pit covered over. Right: The second model "Y" at Chicago International Air Races in 1933, after modifications including 450-hp Wright Whirlwind, full LG fairings, long windshield.



attached to base of the opposite landing gear mount block by an aluminum bracket screwed to the block.

If you are building the model as it was raced with the front cockpit covered over, the cover is made of 1/32 ply and attached with small-sheet metal screws. Louvers behind the engine cowl are formed from thin aluminum with a tab on each end. Slits are made in the covering and balsa for each louver and Hot Stuff makes them stay put. The long piano hinge on each side of the fuselage is made by slicing plastic tube and threading it on a length of music wire.

In any model with a radial engine a dummy engine is a must. The drawings show the pattern for the engine shroud and Wasp cylinders. I made a plug for the Wasp cylinder and formed the cylinders with a small vacuum-form machine. These cylinders were backed with 1/8 balsa and then glued to the rear of the shroud. The shroud is cut from two layers of 1/2 balsa with a ring of 1/16 ply for backing; 1/8 dowel is used for pushrods. The shroud is painted flat black while the cylinders are gloss black.

**Flying:** Flying a 1/4-scale model is a real joy especially if you have not done it before. I had flown a few of the high-wing 1/4-scale aircraft built by other club members, but a low wing model is something else. I should mention that this model came to be after watching Mr. Bertram fly his 1/4-scale Aeronca LB at the Dayton Nationals in 1976. That was absolutely the most realistic handling model I had ever seen. I was flying my smaller Senior Sportster (March 1976 MA) but right then and there I decided that I would have to do the Senior Sportster in 1/4-scale.



Lowell Bayles (1931 Thompson winner in the "Z") and Maude Tait (winner 1931 Aerol Trophy Race in the "Y"). Bayles killed two days later in attempt to break world's speed record when gas cap came off, shattered windshield, causing Bayles to throw craft out of control at over 300 mph.

The first flights were made at the Clayton R/C Club field. We were having an inter club pattern-event meet and after the meet in which I flew my smaller Senior Sportster (it does all pattern maneuvers), I engaged the services of our local test pilot supreme, Syd Clements. He has test flown many of my scale designs, and even though I have tested several myself, I have him do the job when he is available, since he is a highly

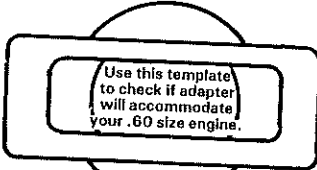
skilled pilot and can immediately tell you what will improve the ship's performance.

If it needs a little more engine offset, or other minor adjustments, he can tell this right away. I removed the dummy engine and cowl so that he could set the engine, which had a Robart Pump installed since its break-in flights on Syd's test ship. We were running a 16/4 prop but the blades

*Continued on page 112*

Maude Tait taxis back after winning the 1931 Aerol Trophy at Cleveland National Air Races—an interesting comparison with our model.





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the cable was slack, allowing complete freedom of slide position without affecting the carburetor.

A device such as this could be used to hold flaps up and down. A cable from the throttle or tailhook could pull the flaps down. The throttle could be checked on the deck since the flaps would need only to be pushed up to be reset—no latches to fool with.

Jim Storts of Chandler, AZ, once flew a two-line Carrier model using an over-center bellcrank for throttle control. The throttle bellcrank was connected to the elevator pushrod in such a way that up elevator would open the throttle from its fully-closed position. Full down elevator would push the bellcrank over center to the closed position.

Jim could fly two-minute low speeds with a Profile-sized model using this set-up, but the system is only practical for Class I and Class II since Profile requires three lines. I'll discuss other control system options in my next column, including some exotic systems as well as the more conventional.

I've had a chance to look at the Sterling F6F Hellcat kit which was introduced last year. The model has a 42 in. span, giving it a wing area of about 360 sq. in. The large wing should give good low-speed performance without flaps. The wood and die cutting were of good quality. The Hellcat should prove to be a good performer in Profile Carrier and is one of the few kits available which should easily qualify for scale bonus points while being readily available through local hobby shops.

Richard L. Perry, 416 Woodhill Drive, Goldsboro, NC 27530.

## Gee Bee/Haffke

Continued from page 43

were so thin that he was afraid to fly on it as the tips were flexing too much. The only other large props I had with me were Top Flite 14/6s. We tried one which didn't give the pull that the larger one did, but Syd felt that it would be suitable.

I reinstalled the cowling but left the dummy engine off for the test flights. A strong wind kept shifting

so no taxi turns were attempted. Taxi ahead into the wind was no problem. All seemed OK, so Syd opened the throttle, the tail came up immediately, and the model was airborne before we knew what was happening. It climbed out majestically, the most beautiful thing I had ever seen in the air.

Wing loading is very low, and very little speed is needed to take off. Syd flew it back and fourth a couple of times, moving the trim levers slightly until he was satisfied with the trim. It flew hands off straight ahead. Then he tried aerobatic maneuvers. First, he tried a roll and did it very nicely but reported that the ailerons were a little sluggish. Next, he tried a loop and received a big hand when the ship flew through it beautifully. It just flew right up, over the top, just like the real one used to do with a big P&W Wasp. Syd continued into a second loop, and then a third, and everyone agreed that no better loops were seen during the pattern meet just concluded.

Then he flew it inverted—which it does beautifully. He then made several low passes so that I could try to get pictures. After several passes, he set up for landing and reduced the throttle. As he descended, the engine quit and the first landing was dead-stick. Syd called attention to the fact that the model was hands-off. As he dropped the transmitter to his left side the ship maintained its rate of descent and kept straight ahead. Just before touchdown, he used the transmitter to flare the ship for a gentle landing on the grass strip. I found the tank was empty.

I then suggested that he fly a full-scale flight pattern so that we could check gas consumption, since I feared the 14-oz. tank might be too small for the Webra .91. Syd made a second flight, executing the maneuvers I called out as he flew a full-scale flight, then made another beautiful landing. The tank still had about 6 oz. left. A good reserve. Now it was my turn.

I started my first takeoff and it turned out a little rough as I suddenly found I had a floundering aircraft in the air without sufficient flying speed to have effective control response. I had held up elevator on the take off run as Syd had ordered but overdid it a little and the ship took off before I expected it. I applied rudder, which straightened out the left bank. I couldn't get out of with ailerons, then got the nose down to pick up speed.

Everything immediately straightened out. It climbed out beautifully.

I flew a complete scale-flight pattern without further incident. I had a beautiful flying bird that was very gentle but responsive except for the slightly sluggish aileron response. My landing was very smooth, with just the slightest little bounce followed by a smooth roll-out. I cleaned the ship, and loaded it into the station wagon. After removing the wing, we found the reason for the sluggish ailerons. I had left out two screws in the aileron servo tray which allowed it to flex considerably, and also had not tightened the lock nuts of the 4-40 bolts which went through the torque rods which actuate the rods. Between the two, the aileron movement was somewhat less than positive. The next flights were greatly improved by the proper securing of the aileron cranks and servo tray.

I took the Senior Sportster to the Rhinebeck Classic for its first contest exposure. They were adding a 1/4-scale event and the Model Y was to join my other Gee Bee models in this great contest. After the static judging, the Senior Sportster was on top with a score of 90, just two points ahead of another Gee Bee, a Model E Sportster built by my friend Joe Gallagher. My first flight was a thing of beauty, getting the highest flight score of the day. However, on my second flight as I was executing the figure-8 the craft suddenly rolled over to the right and went into the trees. Something went wrong with the new radio and I had no aileron control. Fortunately the damage to the model was minimal. It took only four evenings to make the repairs and have it flying again.

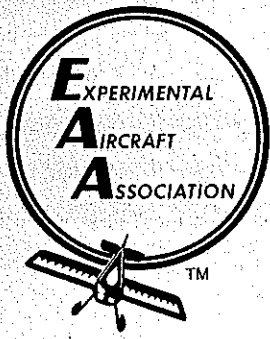
On the third flight after the repairs, the same thing happened again. Syd was flying it but it was over an open field and he was able to save it with rudder and elevator. I flew it in a contest the next day and again it went out of control, and again it was saved with rudder and elevator. I installed the radio in a test ship, and no trouble was encountered, but I decided to try another radio on the big Y and substituted an old reliable system.

I got it ready for the big Bealton, VA contest and had to test fly it the night before in less than desirable conditions. It was windy with high gusts and a little drizzle. I had found some bigger props and the tests were made with a 16/4 1/2 prop, which proved to be great for the engine and aircraft. Test flights went great, even in these bad conditions, and I felt the ship was ready for another contest try.

At Bealton, the model scored a 94 in static, and when flight time came, its first flight was beautiful from start to finish. The craft handled beautifully in the poor weather conditions—high, gusty winds and drizzle. Its second flight was even better. After the flying was over, the Senior Sportster had won the Quarter Scale event easily. It scored higher than the winner of the other events and was consequently awarded the contest's grand prize, a 5-channel system. I know I would have flown it even better but after the loss of aileron control on three previous occasions, I was still a little "gun shy."

The Senior Sportster is a lovely aircraft which performs beautifully, as did the real one back in the early 1930s. I hope that everyone who builds one will enjoy it as much as I have mine.

If anyone wishes to fly in contests with their Senior Sportster, they will need documentation photos which are very rare for this craft. I have, probably, the largest collection of photos of the craft in existence and will be glad to have copies made for anyone who needs them for scale documentation. I have both of the Senior Sportsters that were built in the various configurations they appeared in over the years. These pictures were



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mostly from Bob Granville and other members of the Granville family collection.

### Different Approach/Stoy

*Continued from page 46*

successful on my models.

2) A streamline method of applying the opening torque to the hinges must be found. Currently I use rubber bands.

3) A more streamlined q-trigger can probably be designed.

As with any new idea, its eventual impact is difficult to predict. For this approach to become popular it is essential that people begin to win with these designs, since many competitive free fliers simply follow the trends of winning models, feeling that they don't have time to experiment. If those readers who have the ability to design successful models become convinced that this approach is worthy of their efforts, I feel that free flight can become an exciting, changing category over the next few years.

If you want to become involved in building folding wing planes I would be most interested in discussing ideas and problems.

*Editor's Note: As many competition free fliers are aware, Stan Stoy has used these principles to achieve hand-launched glider times that demonstrate a great performance increase, so much so that at first few people were able to believe it possible. The power concept offers a quantum jump in performance, although development of mechanics poses a challenge—perhaps to be met by you. Jim Newman who did the illustrations remarks "The forces on an FF ship are enormous, witness the flutter and loss of components each year. I feel it wishful thinking to expect very low forces, involved with the Q-*

*trigger, to securely latch these panels. . . . I would favor the folding concept in conjunction with a good Seelig timer and a couple of force multiplying levers to latch the wings." This is indicative of the kind of thinking that may be necessary to turn this brilliant concept into a practical reality. Once that happens things will never be the same. Stan shows us a vision. We are confident clever free fliers can turn it into a physical reality. After all, this is not a "paper" idea. Stan's work has brought us half-way down the road. Why not begin with some half-A sheet balsa things. There is a pot of gold at the end of this rainbow.*

### FF Endurance/Meuser

*Continued from page 49*

after taping the wing to a piece of scrap plywood. I would imagine that a beginner might have a bit of a problem sanding four sections separately and getting the airfoils to match at the joints. The tendency would be to over-sand at the ends of the panels adjacent to the joints. The use of a large sanding block— $\frac{1}{2}$  x 3 x 10 in. minimum—would help. But here's a thought: if it works for ol' bumble thumbs here, it should work for anybody.

Tape the four sections together at the joints using chordwise strips of masking tape on the lower surface, and do the sanding as if the wing were in one piece. When the sanding is completed, and with the tape still attached, apply a glue of your choice to the opposing surfaces, prop the panels up to their proper angles, smear the glue that oozes from the top of the joint into a nice fillet using your finger, and let the chemistry proceed. The tape on the bottom will keep the excess glue from running all over town, and a glue-skin reinforcement can be added later.

Even if you elect to sand the wing panels separ-

ately, the masking-tape trick is a neat way to make mitered joints. I recently read of it in a magazine about fine furniture. I've been doing miter joints that way, both for fine furniture and glider wings, for some 40 years; I didn't know there was any other way!

The price of the Super Chuck is \$4, plus \$1.50 handling and shipping per box. A box could contain several Super Chucks, or other Blue Ridge kits or supplies, so if you intend ordering more than a single Super Chuck it might pay to check with Blue Ridge first. The address is P.O. Box 429, Skyland, NC 28776.

**For the library:** I'm sure Bill Warner will present a more complete run-down on Bill Hannan's recently published book, "Peanut Power," from the scale modeler's point of view; I'll just say a few things about it from the general free-flier's point of view.

The emphasis, of course, is on Peanut Scale with secondary emphasis on other forms of free-flight scale modeling. The sections on construction, covering, props, materials, ground-support equipment, flying, and so forth, and a handy trouble-shooting chart, are applicable to any small free-flight rubber-power model. A beginning free flier would find much of value here. I think a beginner would be better off starting with something a bit larger than Peanut Scale, such as a P-30, provided he has access to a large enough flying field. But, after seeing the book, he might decide that Peanut Scale is the branch of free-flight he'd like to pursue.

The price tag of \$7.95 makes it comparable with the price of four general interest (i.e., 85% RC) magazines. If your hobby shop doesn't have it yet, you can order it directly from the publisher, Historical Aviation Album, P.O. Box 33, Temple City, CA 91780. Include a buck per order for