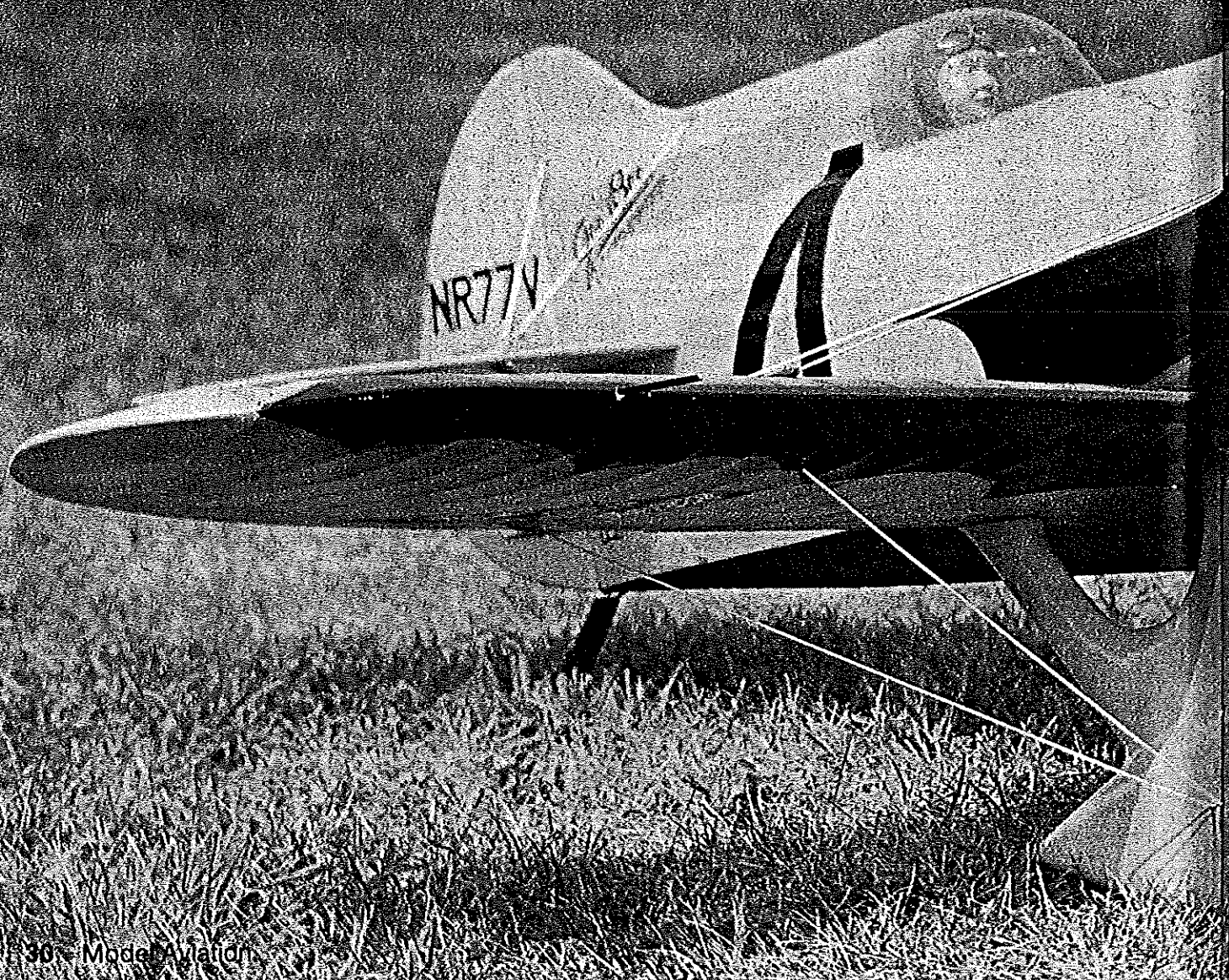


The Granville brothers saw the big prizes in air racing as a means of keeping the company afloat during the dark depression days. In only a matter of months, the Model Z was designed by Bob Hall and built by the Granville organization just in the nick of time for entering the 1931 National Air Races at Cleveland, where it won all five of the events it flew in. The RC model is Quarter Scale size for a .90 glow engine. Part 1 ■ Henry A. Haffke

GEEBEE Seniors



THE GEE BEE Model Z City of Springfield was the only one of the Gee Bee Sportsters that I had not built and flown. I started building these fantastic aircraft in model form in 1975 and have flown them all in many contests over the intervening years. They have won many trophies and prizes for me and have been a great joy to fly. I had built my first models in .40-size versions. After building several I decided to try a Quarter Scale Gee Bee. The Model Y was my first "big" one, since then I have built the Model D,

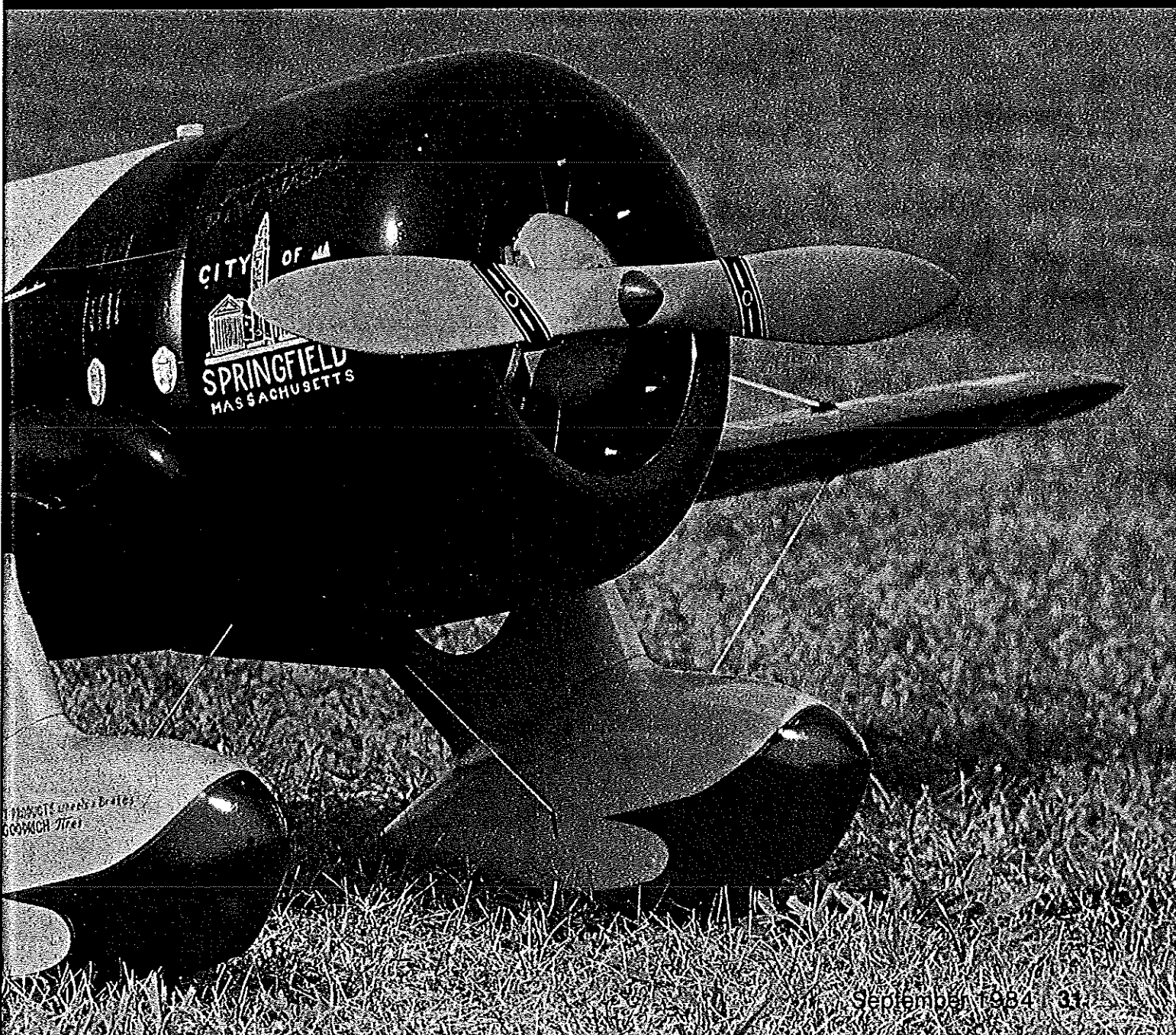
Model E, and R-1 in Quarter Scale size. All have been fantastic flying models.

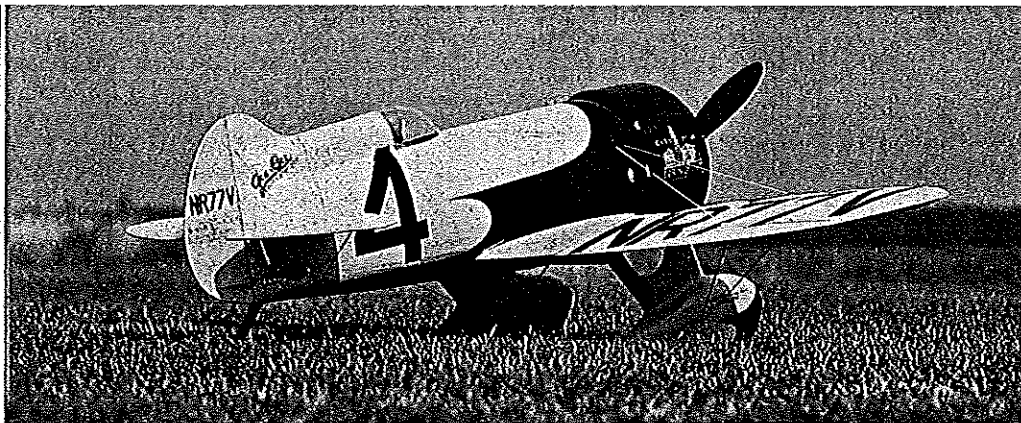
With the announcement that the 1983 National Championships would be held at

Haffke's Gee Bee Z certainly has that classic shape. In Quarter Scale size, details such as the scale propeller, large wheel fairings, landing and flying wires, and dummy Pratt & Whitney engine can truly be appreciated.

Westover Air Force Base in Chicopee, MA, just a couple of miles from Springfield, I decided that someone had to build a model of the City of Springfield for that meet. I had planned to build an AMA Scale model of one of the other Gee Bees for my 1983 project, but scuttled that plan and got busy drawing up plans for a Quarter Scale Model Z. This then developed into a project of one delay after another for various reasons and required the burning of the midnight oils the last few weeks before the Nats. I finally got the model to

Sportster Model Z





Looking much like the full-size airplane, the stubby racer seems ready to go—and it really goes. Model's 80 mph flight is right on for scale speed. Prototype once reached 315 mph.

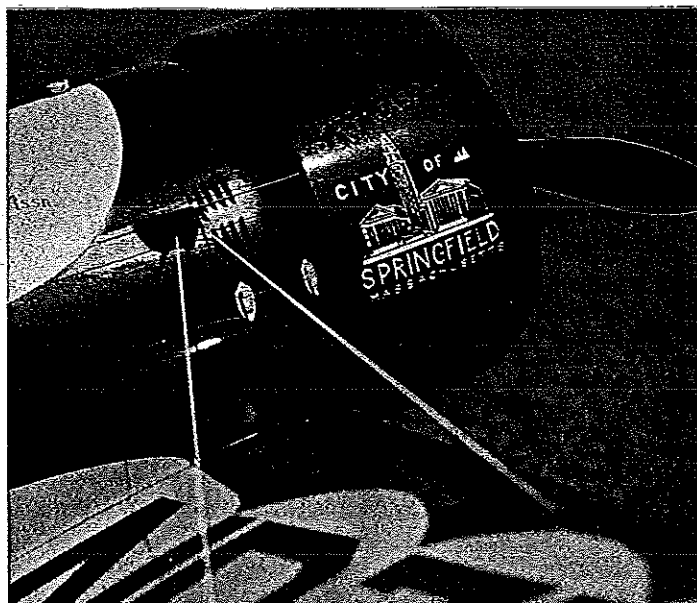
a flyable state (although it wasn't finished) the weekend before the big event.

My good friend Sid Clements, who has test flown most of my model designs over the years, made the first flights for me. (His fingers are much steadier than mine at a time like that.) After carefully going over the model and setting the engine to his liking, Sid ordered the tank topped

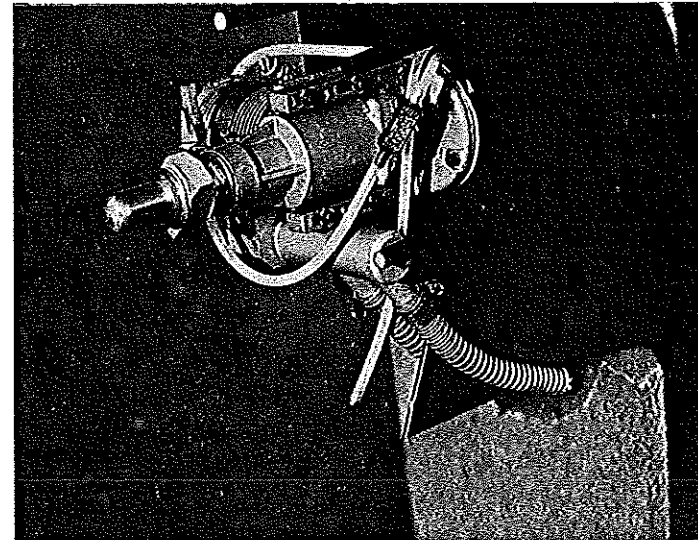
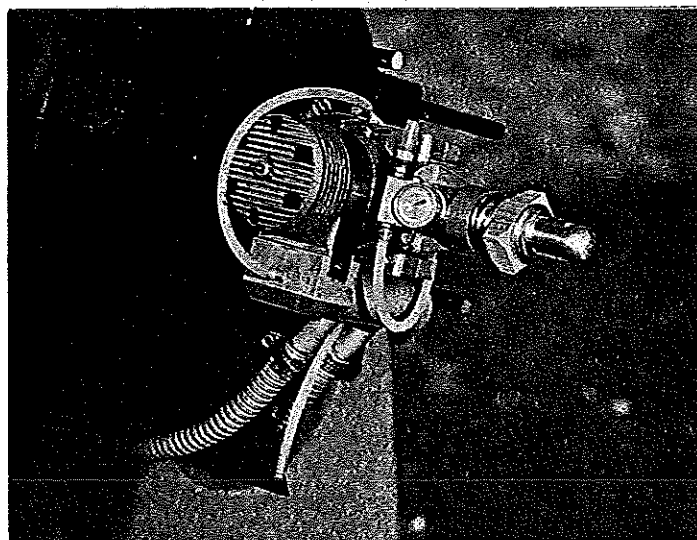
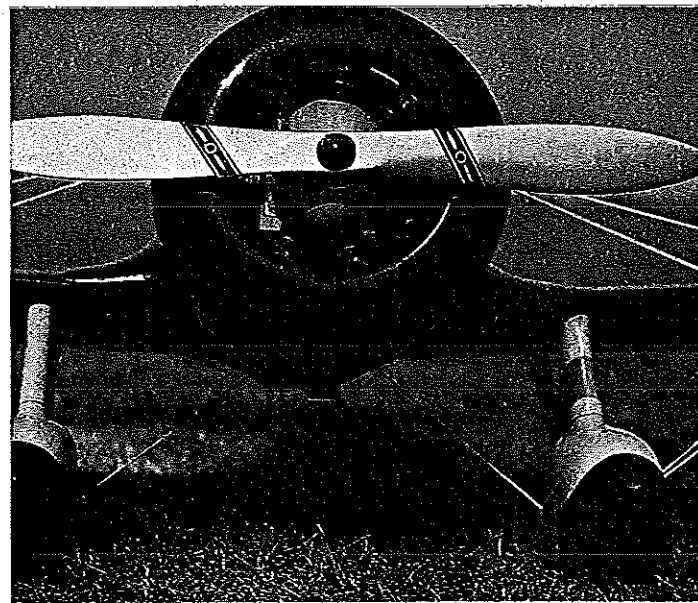
off, and it was ready to go. The first flight was as smooth as silk; just a little aileron trim was needed. Everything else was perfect. Sid finished the flight with a flawless landing, and I was overjoyed with the results of the test. It was much like the situation with the real one in 1931 where the craft was finished just in time for the races. It had to fly right the first time,

since there would be no time for any modifications.

We made the minor aileron change to get the trim lever back to neutral. Sid also wanted to try a little more engine offset, so we added one washer under the front engine bolt (the engine was side-mounted on an Edson mount with a regular Edson thrust wedge behind it). On the second flight, Sid felt that no further improvements should be made and handed me the transmitter. I am usually very shaky with a new model after all the many hours I have spent building it, but for some strange reason, I was very relaxed in flying the new Model Z. I flew it through the maneuvers required in the Scale flight pattern. I left the low flyby till last, doing the other maneuvers with a little altitude as I got the feel of the new ship. I came around and set up for the flyby. It was all lined up just where I wanted it when, all of a sudden, the engine quit. I would not have hesitated to make the landing myself, but Sid reached for the transmitter,

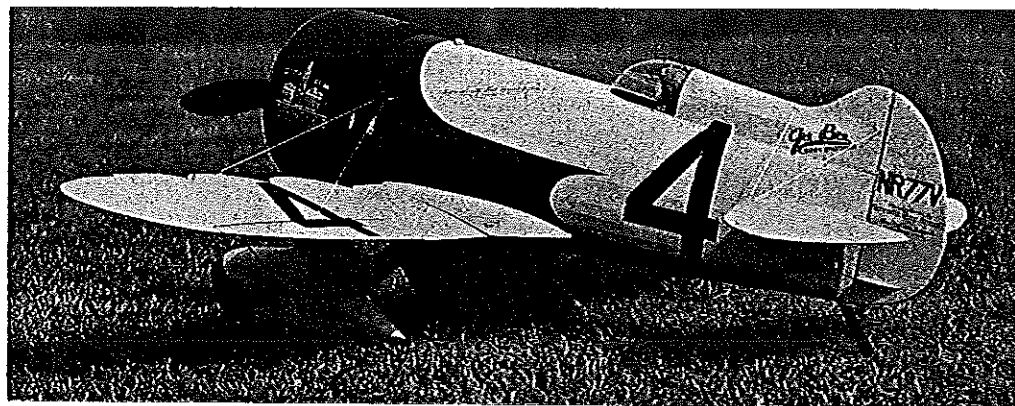


Left: All markings on the model were painted by hand, the cowl taking many hours. Do note the detail of the louvers, cowl buckles and wing wires. Right: The propeller for static judging (not flying) is a replica of the Curtiss that the Model Z used to win many races.



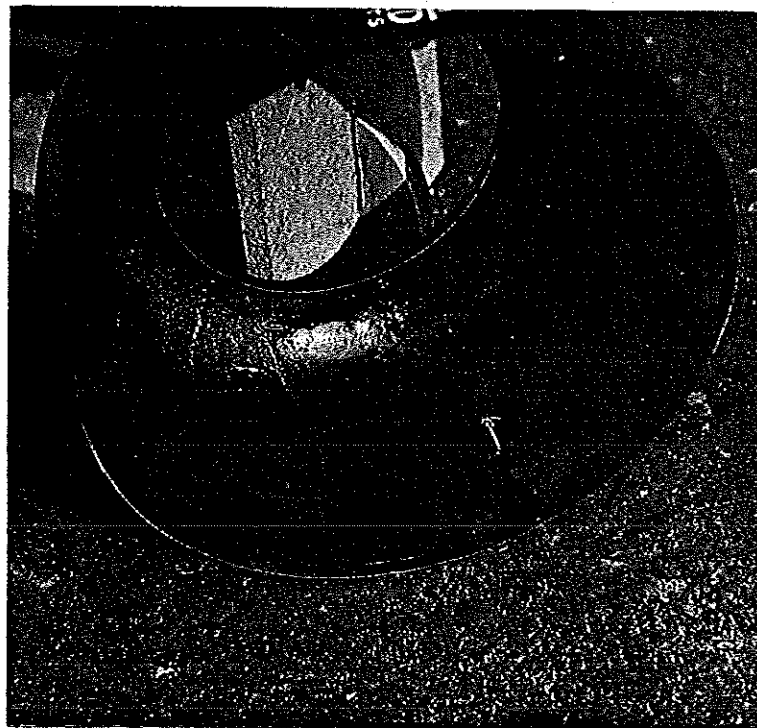
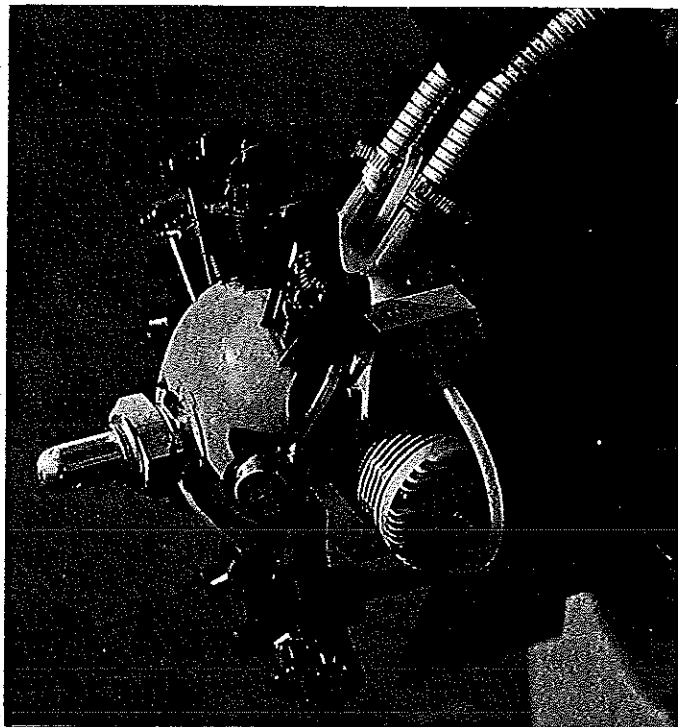
The author's model was powered by a side-mounted Webra .91 engine fitted with a Slim Line muffler. Wood dowels extend forward for mounting the dummy P&W engine. Picture on the right shows the flexible exhaust extension and Robart pump. Reliable operation required.

Yellow and black paint scheme of the Model Z gives a striking appearance, as does the large racing number. One of the plane's features, obvious in this view, is a very large tail skid.

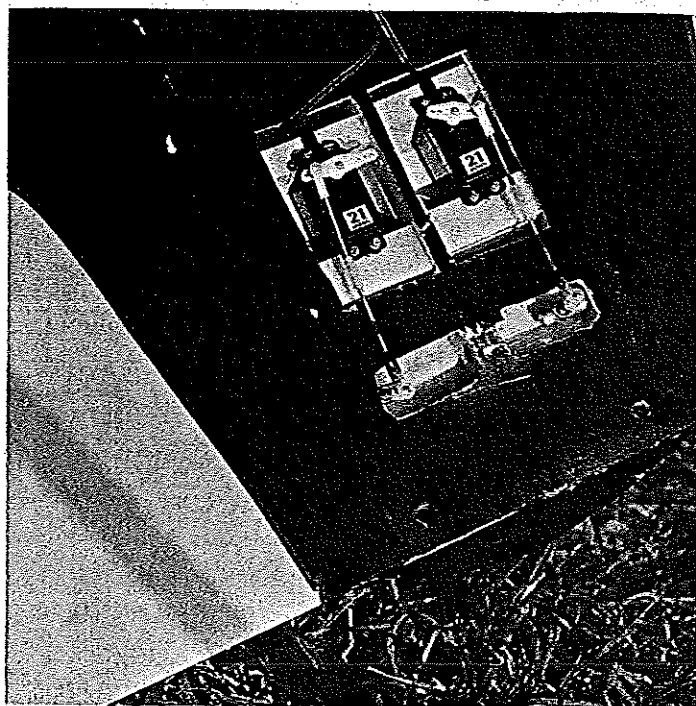
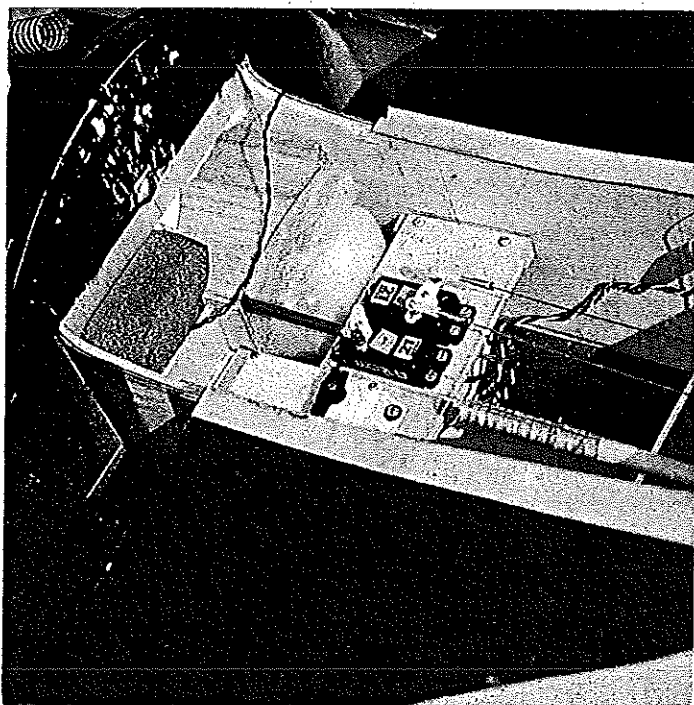


and I let him make his normal beautiful landing.

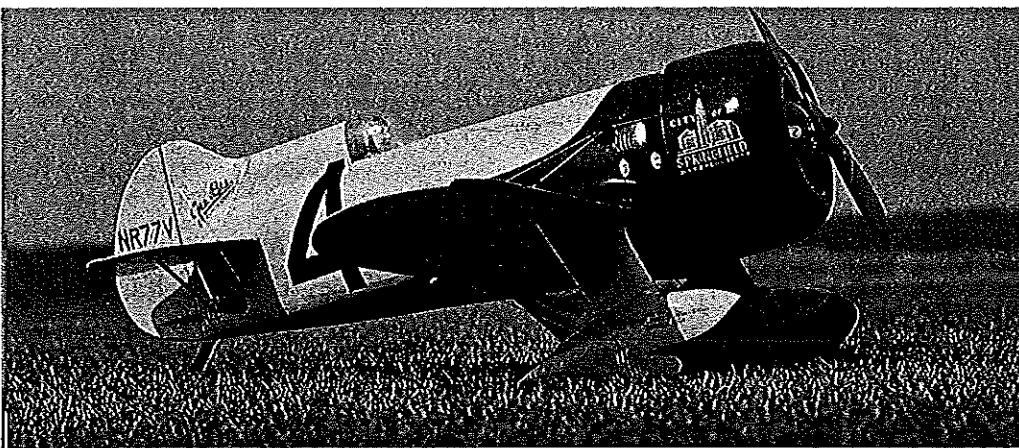
As I wiped the model off, there seemed to be a lot of fuel all over the bottom. I decided to take the wing off and take a look inside. Good thing I did. I had a ruptured tank. There was raw fuel all over. Fortunately, the foam rubber around the



Left: This is what the dummy P&W engine looks like before the cowl goes on. It's built of balsa and plywood, and uses Williams Bros. Wasp cylinders. Haffke used a Martin Industries carburetor on his engine, says it runs great. Inside view of the cowl shows mounting tracks and spring-loaded retaining rod; a wheel collar adjusts the spring tension. Mounting tracks are made from triangle stock.



Left: The radio gear is installed as far forward as possible, battery alongside the fuel tank. Servo board of 1/8 ply mounts the elevator servo beside the tank. The rudder servo has cables in true scale fashion. Throttle servo is in the middle. Right: Each aileron has its own servo that you see mounted in the wing, connected to the receiver with a Y-cord. Ailerons are actuated by means of torque tubes.



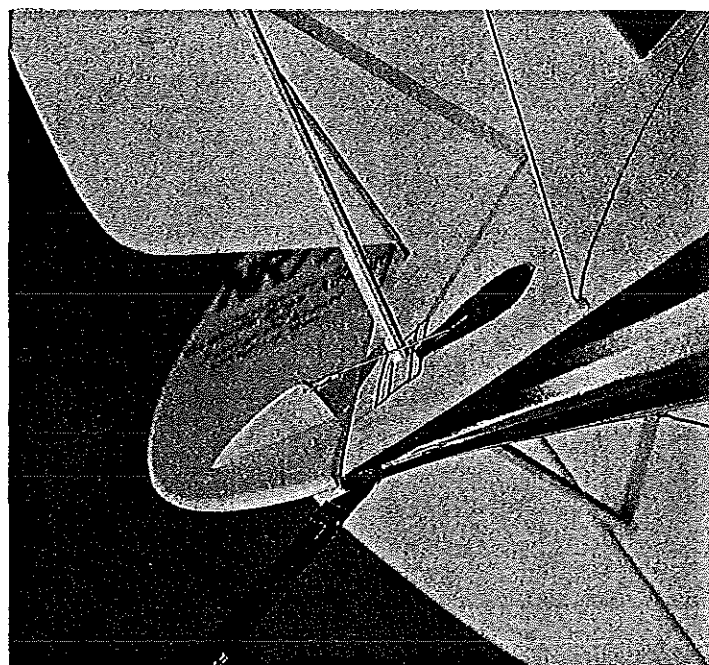
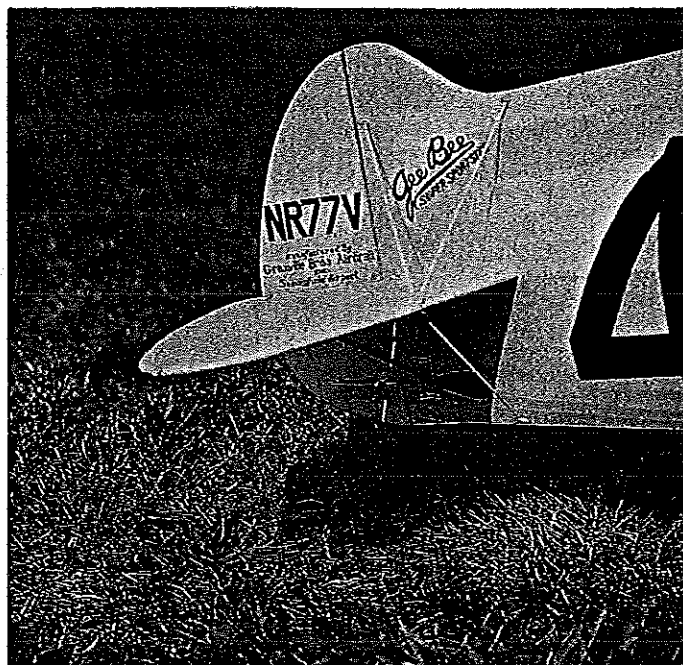
The massive landing gear fairings of the prototype model were built-up from plywood and balsa. Now, fairings and fiberglass cowl are available from T&D Fiberglass Specialties.

tank had soaked up most of it, and none had reached the radio components. That ended the test flying for the day, and I got back to work finishing the model.

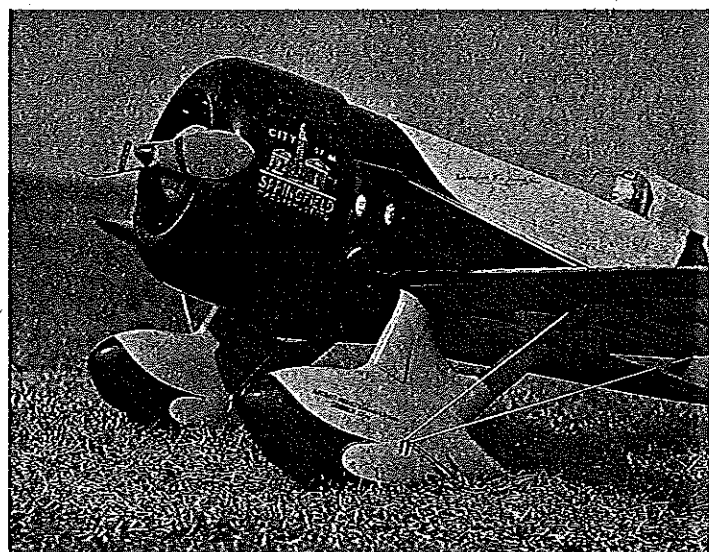
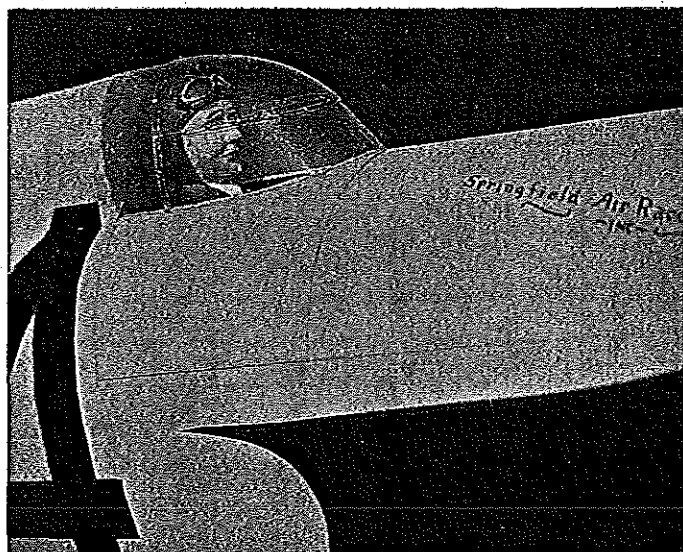
The next big job was the building of a

dummy Pratt & Whitney Wasp engine. Final detailing was (almost) finished a few days later. I met Sid at the field. He flew with the dummy engine in place and found that it was no problem. He handed

me the sticks again, and I flew the model for the second time, handing him the box for the landing. Now, it was my turn. I made a slightly hairy takeoff. I was concerned about not lifting it off too soon, and kept it down until I was quite close to the end of the strip we were using. The rest of the flight was uneventful until I got ready to land, when I pulled a stunt that I am guilty of quite frequently. I throttled down but didn't pull the throttle trim down. When I wanted to cut the power to low idle, I had to reach for the trim lever and take my eyes off the model. I pulled the trim down and looked back at the model which then had its nose up at an alarming angle. I had enough speed to correct the mistake and still made a smooth landing, but I was a little shaken at that point. It was good to find out that the model behaves very well even when I don't.

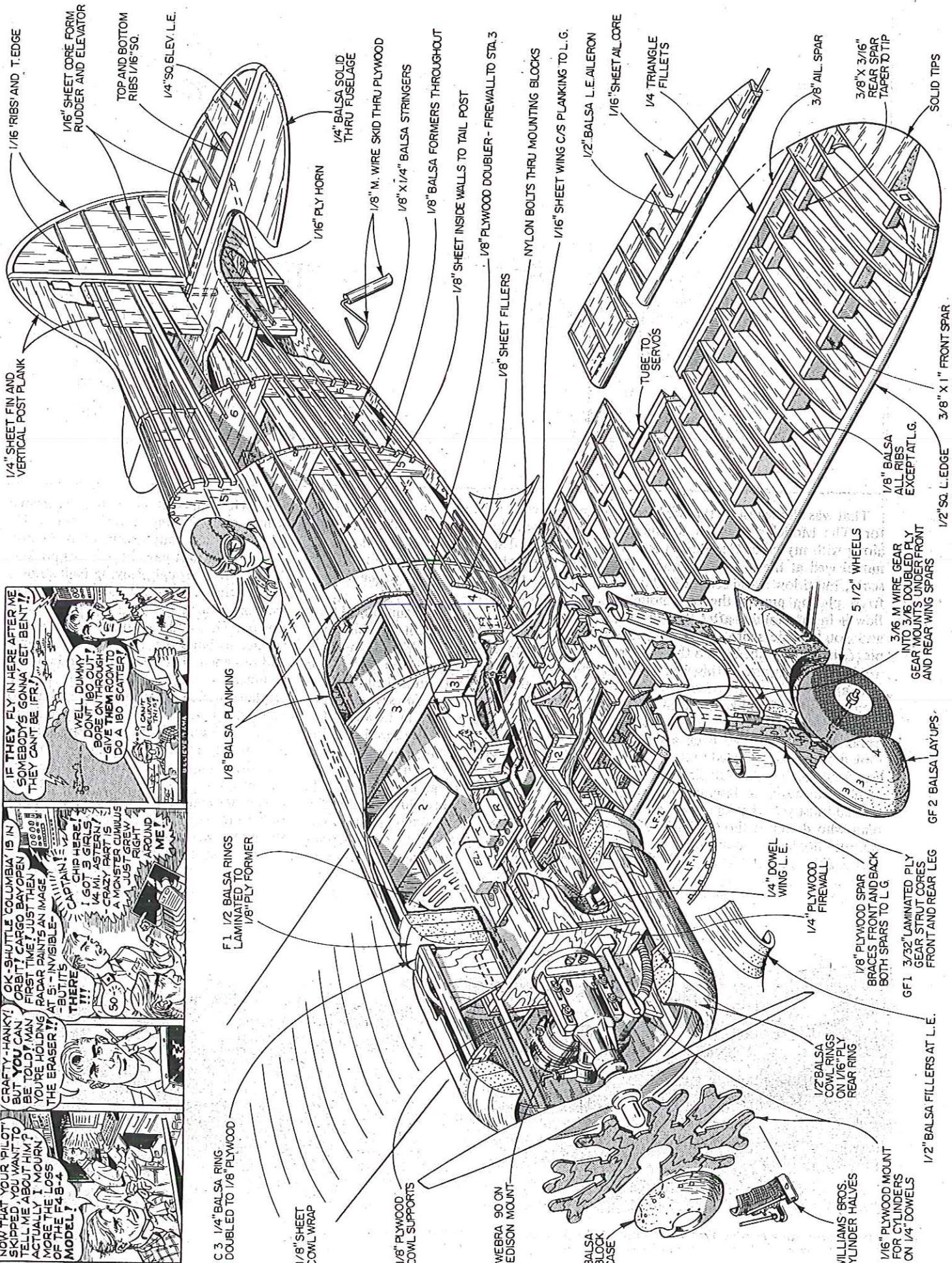


Left: The fin falls smoothly into the turtledeck. The Gee Bee logo was cut from pressure-sensitive Mylar trim material. Right: The rudder horn made of plywood and the control cables are to scale. The stab struts are made from streamline-shaped aluminum tubing.

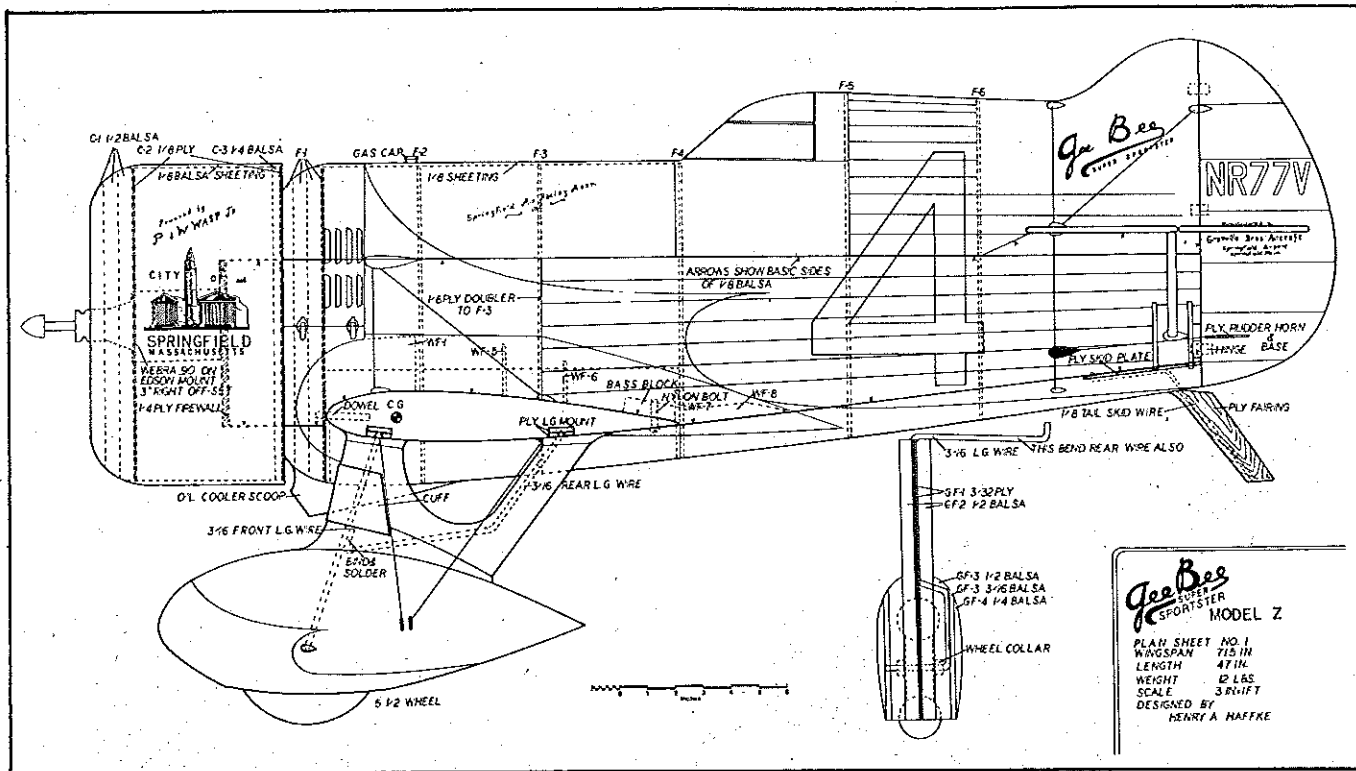


Left: That could be Lowell Bayles wearing helmet and goggles who we see through the three-piece wind screen. Short sections of common straight pins simulate rivets which joined the wind screen sections. Right: Cowl fastening buckles were carved from basswood.

CHUCK WOOD by Hank Clark



- 1/16" RIBS AND T. EDGE
- 1/16" SHEET CORE FORM RUDDER AND ELEVATOR
- TOP AND BOTTOM RIBS 1/16" SQ.
- 1/4" SQ. SL. EV. L.E.
- 1/4" SHEET FIN AND VERTICAL POST PLANK
- 1/16" PLY HORN
- 1/8" Balsa Solid THRU FUSELAGE
- 1/8" M. WIRE SKID THRU PLYWOOD
- 1/8" X 1/4" Balsa STRINGERS
- 1/8" Balsa FORMERS THROUGHOUT
- 1/8" SHEET INSIDE WALLS TO TAIL POST
- 1/8" PLYWOOD DOUBLER - FIREWALL TO STA. 3
- 1/8" SHEET FILLERS
- NYLON BOLTS THRU MOUNTING BLOCKS
- 1/16" SHEET WING C/S PLANKING TO L.G.
- 1/2" Balsa L.E. ALLERON
- 1/16" SHEET AL CORE
- 1/4" TRIANGLE FILLETS
- 3/8" AIL SPAR
- 3/8" X 3/16" REAR SPAR TAPER TO TIP
- SOLID TIPS
- 1/8" Balsa ALL RIBS EXCEPT AT L.G.
- 3/8" X 1" FRONT SPAR
- 1/2" SQ. L. EDGE
- 1/8" Balsa PLANKING
- 1/2 Balsa RINGS LAMINATED TO 1/8" PLY FORMER
- 5 1/2" WHEELS
- 3/16 M WIRE GEAR INTO 3/16 DOUBLED PLY GEAR MOUNTS UNDER FRONT AND REAR WING SPARS
- GF 2 Balsa LAYUPS
- GF 1 3/32" LAMINATED PLY GEAR STRUT CORES FRONT AND REAR LEG
- 1/4" DOWEL WING L.E.
- 1/4" PLYWOOD FIREWALL
- 1/8" PLYWOOD SPAR BRACES FRONT AND BACK BOTH SPARS TO L.G.
- 1/2 Balsa COWL RINGS ON 1/16" PLY REAR RING
- 1/8" Balsa COWL WRAP
- 1/8" PLYWOOD COWL SUPPORTS
- WEBRA 90 ON EDISON MOUNT
- Balsa BLOCK CASE
- WILLIAMS BROS. CYLINDER HALVES
- 1/16" PLYWOOD MOUNT FOR CYLINDERS ON 1/4" DOWELS
- 1/2" Balsa FILLERS AT L.E.



That was all the testing that we had time for. The Model was taken to the Nats along with my other Gee Bees. I flew the model well at the Nats for a good flight score, but a low static score of 80 kept it from placing among the top models. I flew it in one contest after the Nationals and got a static score of 93 for second place, just one point behind the winner. I am looking forward to this year's meets. It is an exciting model of a very famous aircraft, and it flies like a dream.

Some history. Let's go back and have a look at the events that led to the designing and building of the full-size aircraft in 1930. The story is fascinating. At this point I must give thanks to the son of the man who designed the Model Z, since it was his books of notes (three of them) that enabled me to write this very accurate account of the building of this colorful aircraft. Bob Hall, Jr. had given me these

notes over a year ago to help in writing the book I will do on the Granvilles and their Gee Bees. The story of the Model Z is the story of Bob Hall and his joining forces with the Granville brothers to make aviation history.

Bob Hall was born in Taunton, MA on August 22, 1905. He spent his childhood summers in Cosco Bay, ME and wanted to be a sailor. He developed a love for yachts and was the unofficial photographer for a yacht club for several years. He attended high school in Lowell, MA, where he was a member of the ski jumping team. He later graduated from the University of Michigan with a bachelor's degree in aeronautical engineering. He went to work for Fairchild Aviation Co. on Long Island; while there, he met Eugenia Zeller who was working in a Coney Island restaurant. She was a graduate of Cornell and would later become Mrs. Hall.

Things were too slow for Hall at Fair-

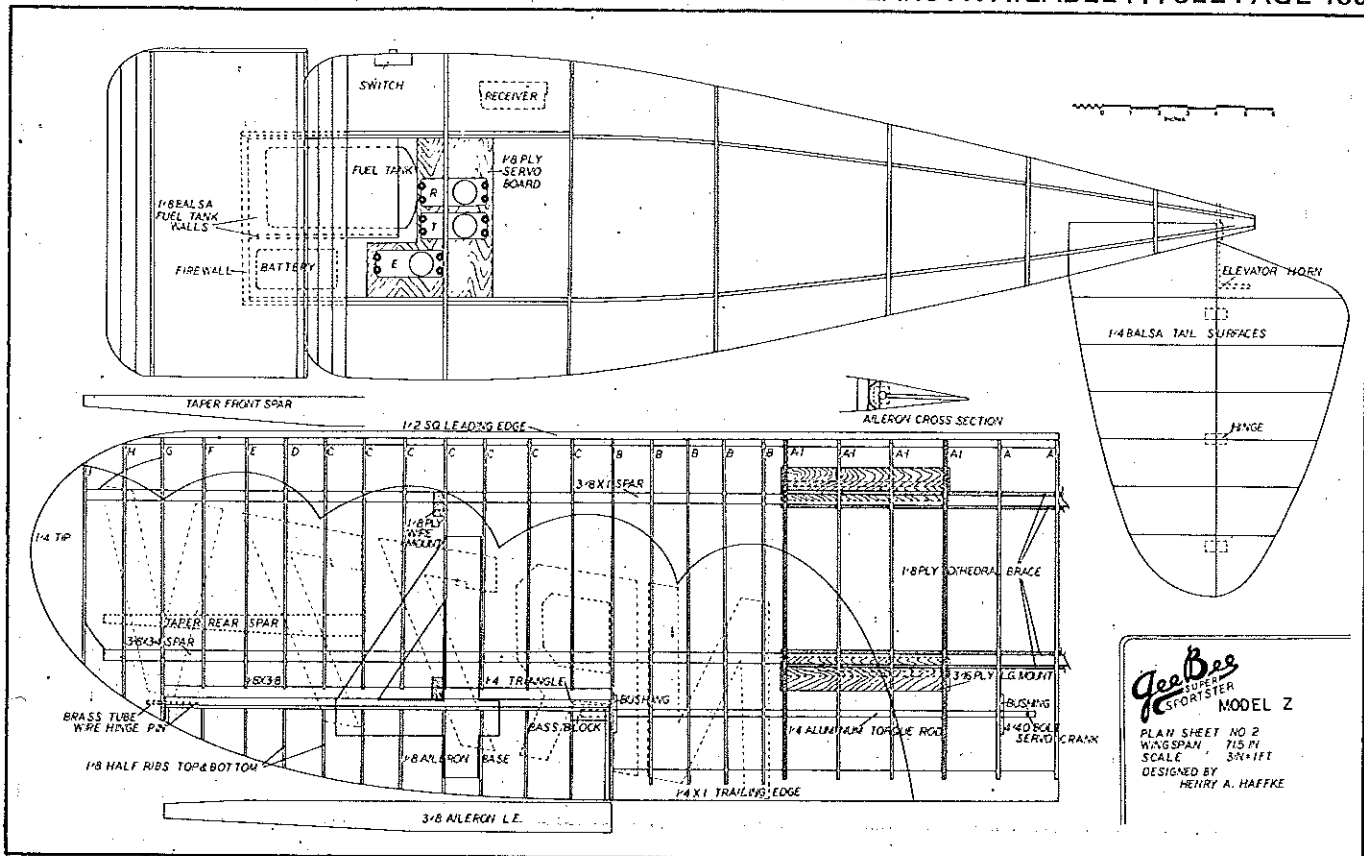
child. He jumped at the chance to design a seaplane for Skyways Ltd. in Boston. He left the big company's security for Boston with only his last pay check in his pocket. The job fell through, leaving Hall stranded. At this time, the Granville brothers were operating an aircraft repair service in Boston. They had just found a backer and a place to build the biplane that Grannie had designed. They had an abundance of technical knowhow, but to be in the airplane building business, they had to have an engineer. Bob Hall was their man.

This joining of forces in Springfield, MA of the very young Granville brothers and the equally young Bob Hall was one of those rare combinations of talent that create aeronautical history. The aircraft that were to emerge from the talents of these men were to become a legend in the annals of aviation history.

The Tait brothers had offered to back the Granvilles, setting them up in an old



Left: Lowell Bayles sits atop the wheel of the Z in this old picture taken at Springfield Airport. Note the old car in the background. Right: Another shot of the original airplane—with a lot of spectators watching. Large crowds gathered at the airport every single day.



dance hall on one side of the Springfield Airport. They went to work building the Gee Bee Model A Biplane. It is unsure just how many of these aircraft were built, but records seem to suggest that eight to 10 of them rolled out of the Granville shop, one of which can be seen today in the Bradley Air Museum in Windsor, CT.

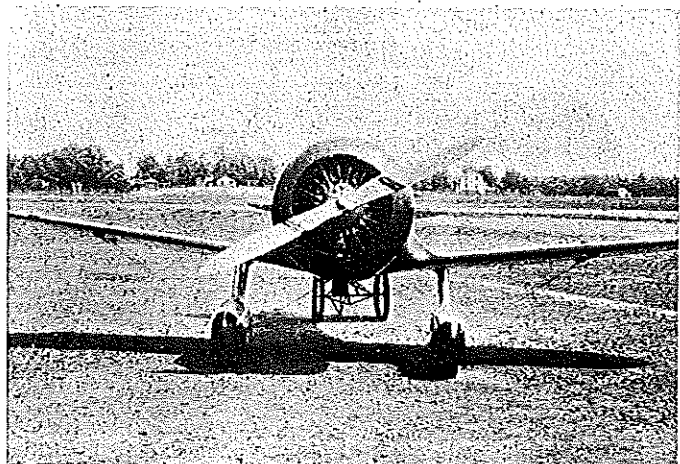
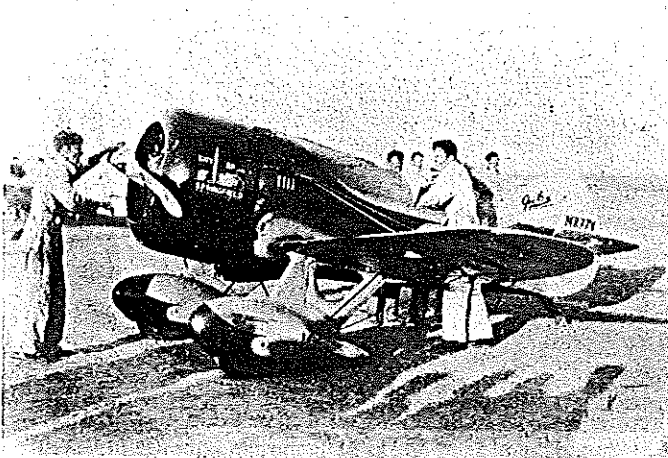
The year 1929 was not the best time to be in the aircraft business. Airplanes were hard to sell. The ingenious Granville organization always seemed to come up with something to keep them in business, despite the hard times. The announcement of the Cirrus Derby, to be run in 1930 by the American Cirrus Company, prompted Grannie and Bob Hall to design and build an aircraft around the Cirrus engine. The plane would compete in a 5,541-mile endurance race from Detroit, down to the

south, west to Los Angeles, and back to Detroit. The design was a small single-seat aircraft that they called the Model X, with a 25-ft. span, powered by a 95-hp inverted Cirrus engine. The craft had a rigid landing gear and depended on a new balloon tire to absorb landing shocks. The ship was a delightful aircraft to fly, but excellent piloting was necessary to get it on the ground smoothly. Lowell Bayles, of the Brinton-Bayles Flying Service located at the Springfield Airport, flew the new Model X with registration NR49V in the derby. He finished second (winning a sizable sum of money for the company) behind the Command-Air Rocket, a racing plane piloted by Lee Gehlbach. Bob Hall and the Granville brothers got their first taste of air racing.

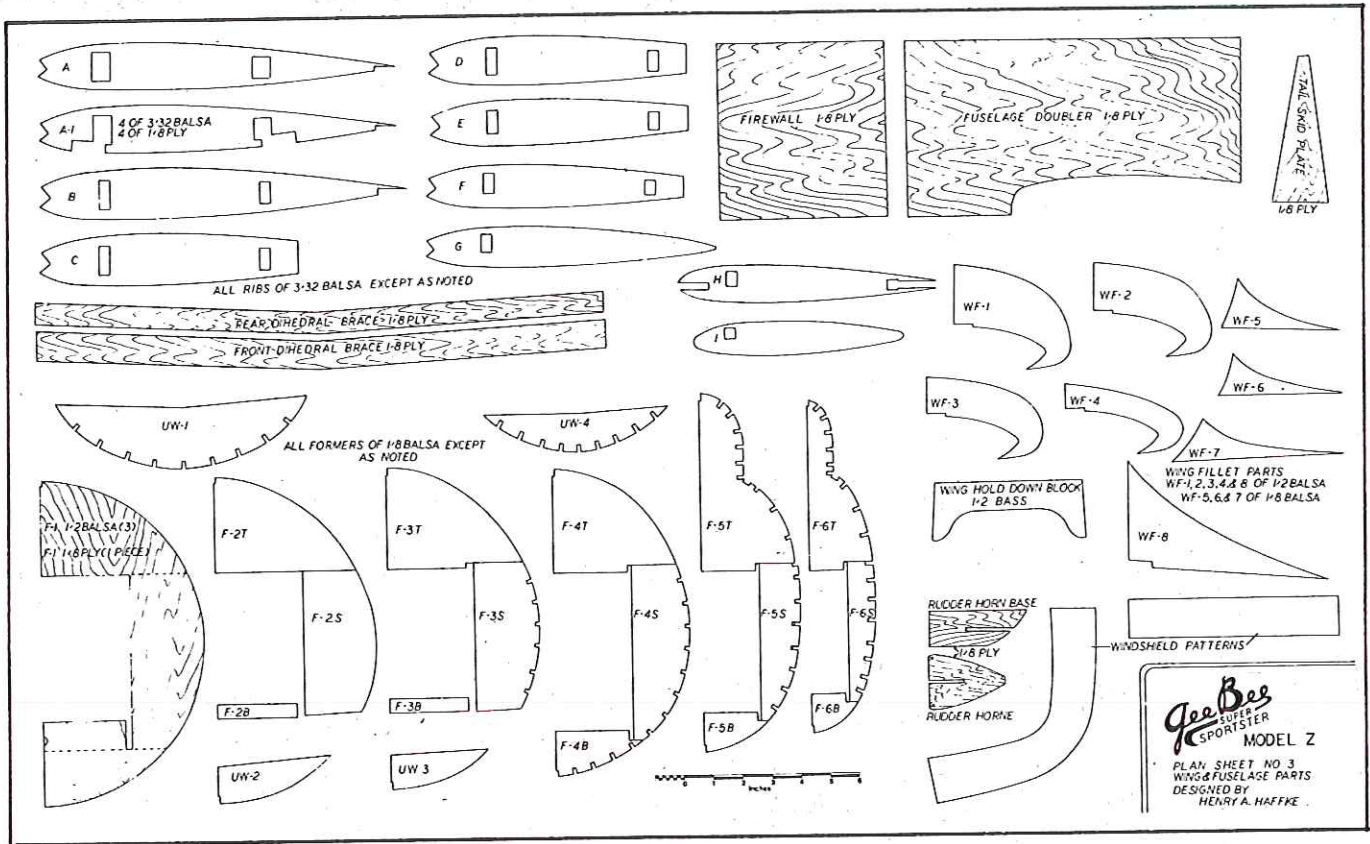
The Model X Sportster was not a race

plane, but destiny was to create a race plane image for all of the aircraft produced by the Granville organization. Several sportsman pilots wanted one of the sporty little Gee Bees, and a total of seven more single-seat Sportsters were built. Another was built with a Cirrus engine for Harold Moon, and one with a Menasco for George Rand. Then a Warner radial-engined Sportster was built, followed by another larger Menasco-powered craft which was tested and received its commercial licensing. Three more Warner-powered Sportsters were built, one for Skip Tibert and one for Bill Sloan, while the third remained with the Granvilles after Bill Sloan had returned it so that it could be raced in the 1930 Ford Air Tour.

At this point the orders stopped. Grannie and Bob Hall came up with what



Left: Mark Granville at the prop and Ed at the cockpit, about to fire up the big Wasp engine. Right: Note the big prop and huge fillets fairing the wings to the fuselage. Seeing the tail resting on a dolly, apparently the Model Z had just been rolled out of the hangar.



seemed like a good idea. They thought that a two-seat version of the Sportster would be a more sellable aircraft, so the Model Y was born. This proved to be a fantastic aircraft, a delight to fly and very easy to land. It was powered by various engines, though a Pratt & Whitney 350-hp Wasp Jr. was most-often installed. It was designed as a sport plane, but the Model Y soon became a frequent racer and could not be beaten in its class. It also more than held its own against the big unlimited racers. Appearances in the Thompson Trophy Race in 1931 and 1933 found it ending up in the money both times, coming in 4th in 1931 (the Model Z was first that year) and 5th in 1933.

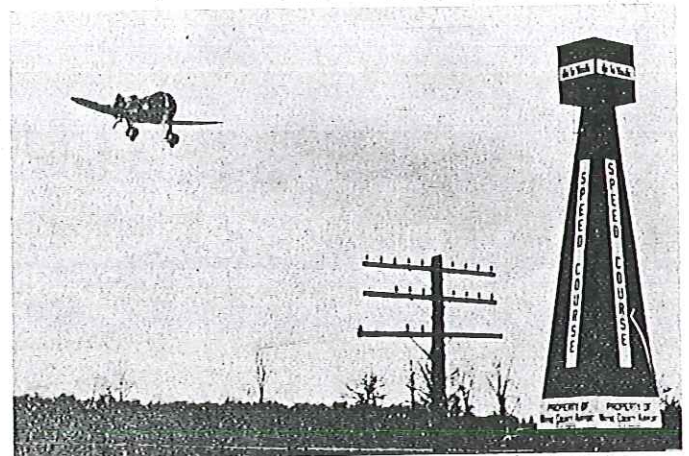
Two Model Y Senior Sportsters were built. The second was for the E.L. Cord Automobile Co. as a test bed for their

215-hp radial aircraft engine. The Granvilles were never paid for the craft. This was typical of the hardships endured by the young Granville organization.

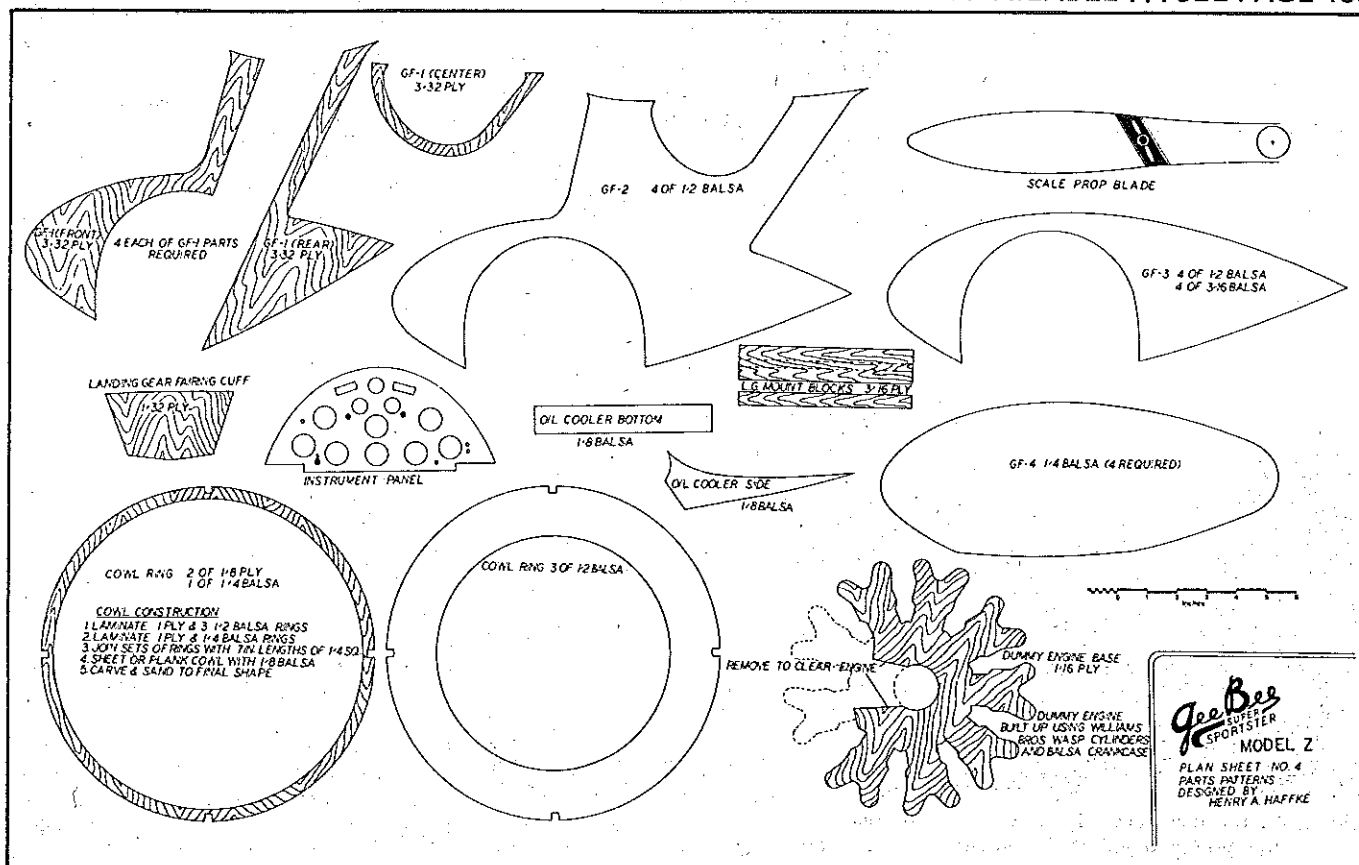
By this time, Granville and Hall were thinking in a new direction. Their sport planes had been more than successful in racing events, so their thoughts turned to the possibility of designing and building an aircraft especially for racing. Air racing had become a very big sport, and there was big money to be won at the National Air Races. This decision by Hall and the Granvilles was to start the creation of a series of aircraft which would rock the aviation world.

Times were tough, and Zantford (Granvie) Granville took to the road to see if he could drum up a buyer for an airplane somewhere. Bob Hall sat at his drafting

table with little to do. His thoughts turned to the large sums of money that would be given as prizes in the upcoming National Air Races. He decided that, with a little money and a little luck, he could design a race plane that could win some of the bigger prizes. He started on the preliminary design work. When Grannie returned from his trip, Bob presented his proposal for approval. Hall had already contacted friends at Pratt & Whitney. P&W was anxious to make a name for itself. They were impressed with Hall's plans for a new racer, and agreed to install a supercharger on the 535-hp Wasp Jr. engine that had powered Jimmy Doolittle to the 1930 Bendix victory in the Laird Super Solution. Bob's next chore was to get Hamilton Standard, another young company in the area, to loan him one of their



Left: Bob Hall poses in the cockpit after winning a race at Cleveland. Hall duplicated this pose in Bill Turner's replica 48 years later. Right: This is the last known photo of the original No. 4, snapped as it flashed onto the speed record course in Detroit on December 5, 1931. Shortly afterward, the gas cap came loose—causing the Model Z to crash, totally destroying the plane and killing the pilot.



new steel props. Another call to a friend netted Bob the pledge of the loan of cockpit instruments. Now, with all of the big items pledged, the costs of building the craft would be easier to finance.

Money had to be found to pay Bob's salary and the craftsmen in the shop who would build the plane. The answer to obtaining sufficient funds for the project came in the forming of the Springfield Air Racing Assn. and the selling of shares in the association. The shareholders were promised a fat profit if the plane won any of the big money at Cleveland. Racing was not a new idea to Grannie or to the Tait's. As a matter of fact, Maude Tait, one of the Tait brothers' daughters, wanted to race. They all bought Bob's dream, and

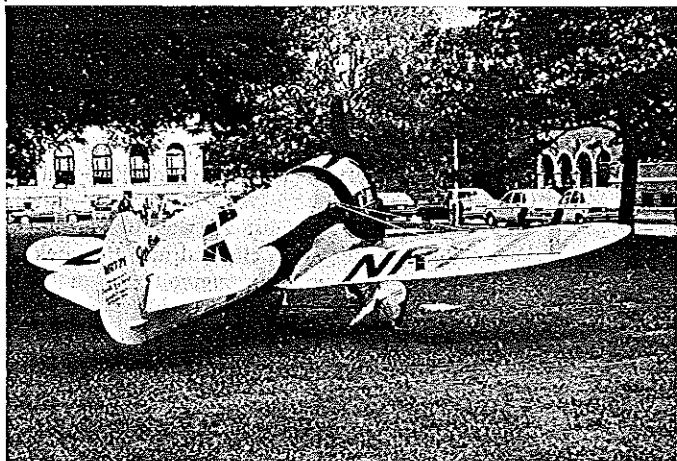
the project got started. Lowell Bayles, who had piloted the little Sportster in the Cirrus Derby, was so excited about the project that he bought \$500 worth of stock, buying himself the right to fly the new racer in the big race. Since Lowell was a very light person, some weight could be saved by designing the cockpit around his slight frame. (Bill Turner found that his 6 ft., 5 in. size was a very tight fit in his reproduction, and there was no room for a crash helmet under the cockpit canopy.)

The Tait's were probably responsible for naming the plane the City of Springfield, realizing the good public relations it would create. They were not wrong. Many local businessmen and citizens gladly contributed money for shares in the exciting

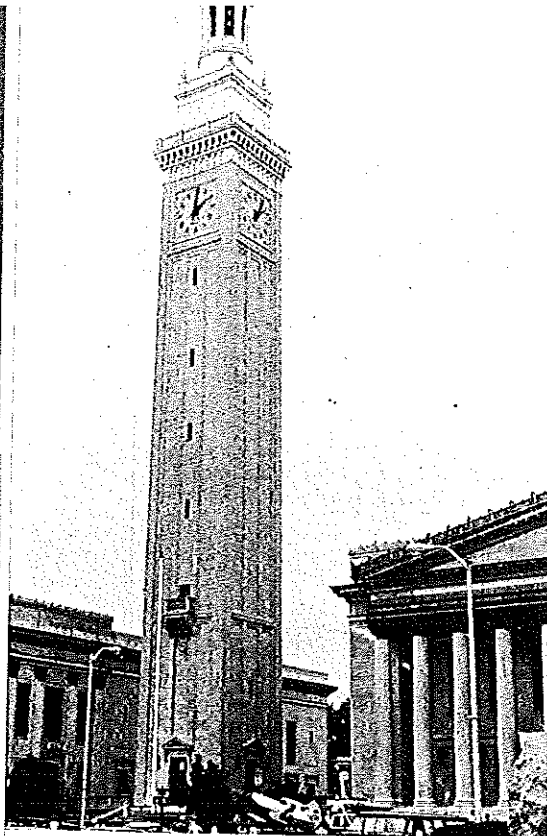
aircraft.

Construction was started on June 23, and the races were scheduled to start at the end of August. Hall knew that his new, radical design had to fly just right the first time it left the ground. There would be no time for any changes. The Granville team was going to attempt the impossible: designing and building the new plane in a matter of days, a monumental task. Fortunately, the teamwork and loyalty of their fine crew far exceeded the norm found in most companies.

Many of the shop crew were (or would become) members of the Granville family. I have come to know several of them personally, and they are a fantastic bunch. Hiram (Hi) Jones, who did most of the



Left: Bill Turner's reproduction of No. 4 on the Springfield Museum Quadrangle in June of 1982. A Springfield group, headed by Don Foster, is raising money to buy the airplane to be put on permanent display in the Springfield Museum of Science. Donations from interested modelers will be deeply appreciated. Right: Henry Hafkke (L) and Bob Hall with Turner's Model Z at Bowles Airport, Agawam, MA. The occasion was the 50th Anniversary Gee Bee Celebration. The week-long affair attracted thousands of aviation enthusiasts.



BOB HALL

Aeronautical engineer who tests and perfects some of the Navy's finest planes. He has dived the latest fighter at 615 miles per hour.



Above: A WW II photo of Bob Hall from a Lucky Strike tobacco ad. Bob was an engineer and test pilot for Grumman. Retired, he now lives in Hilton Head, NC. Left: This is the Springfield City Hall, a drawing of which appears on the cowl of the No. 4 City of Springfield. Look closely, and you may see Turner's reproduction at the base of the tower. Picture was taken in August, 1979.

The job progressed with the draftsmen barely keeping ahead of construction in the shop. Bob Hall and Grannie made their daily rounds of the city trying to sell more shares in the Springfield Air Racing Association. Much of the existing tooling used in building the Model Y was used in fabricating the new craft even though it was an entirely new design. The Model Z was not a souped-up Model Y, but neither was it a craft of completely untested construction.

In those depression days in Springfield, the people wanted a dream. The Granville organization was offering that dream, and

welding on the new racer, is married to Gladys, the youngest of the Granville girls. His recollections of working on the project are fascinating. Bob Granville's widow, Eva, was the sister of two of the factory workers. It was a real family relationship. They would stop at nothing to get a job done.



Gladys (Granville) Jones, youngest sister of the Granville brothers, with Henry Haffke and the model featured in this article at the 1983 National Contest in Chicopee, MA. Gladys and her husband, Hiram, have attended the Rhinebeck Classic Contest with Henry and his Gee Bees. Hiram did most of the welding on the original Z—a Gee Bee mechanic, as well.

as difficult as it was, they kept getting more money from shares sold in the dream. It became a peoples' project and the populace of the area was as excited and proud as the Granville group. The amount collected each day was regularly reported in the newspaper, and the enthusiasm continued to climb.

In early August the aircraft was beginning to take shape. The engine was mounted, the craft was mostly assembled, and doping was going on. It had already been entered in the National Air Races in Cleveland. Each day saw large groups of interested citizens gather outside the Granville shop waiting to get glimpses of the dream becoming a reality. Hall's design work was nearly finished. His initial estimates of the craft's top speed was 280 mph, with the possibility of reaching 290. His major concern was the landing speed. He feared it might be too fast for safety and had planned on a set of modified wings which would lower the landing speed. Actual landing speed could only be determined by test-flying the ship.

A total of \$5,200 had been subscribed to SARA by this time. The ship was getting close to its first test flight, and a christening ceremony was planned. More people were gathering at the airport daily to try to see the new racer.

Hall was hoping to keep the exact day of the first test flight a secret so that the flight could be strictly a scientific test. This hope died young. There could be no secrets from the watchers who lined the fences every day. It was late Friday evening on August 21 when the mechanics tore the paper masking off the racer, unveiling the striking yellow-and-black color scheme. They rolled the sparkling plane into the open hangar doorway. A roar of approval from the large crowd and honking of auto horns greeted the new creation. The factory crew tightened the prop and fueled it up. Bob Hall climbed into the cockpit. The engine was started and revved up until Hall was satisfied that everything was OK. The first flight would be made the next morning. Hall's concern over the landing speed prompted the decision to land at Bowles Airport about six miles away, across the Connecticut river. Bowles had a much longer runway than tiny Springfield Airport. (I landed a T-Craft at Springfield Airport in 1944 and didn't have much spare room getting into the tiny field.)

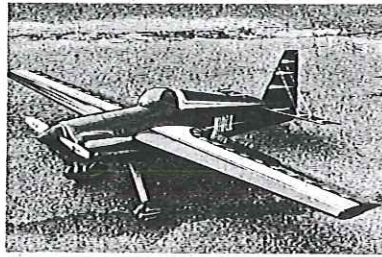
Saturday, August 22 was Bob Hall's 26th birthday. He climbed into the cockpit and started the engine. He ran the engine, making final checks on everything. The crowd grew. The man who was to fly the new bird in the Thompson Trophy Race, Lowell Bayles, watched from the seat of his auto where he sat with a woman companion.

The gleaming Gee Bee was taxied into position for takeoff, and Hall pushed the throttle forward. The little racer accelerated into the slight breeze, eating up the

Continued on page 140

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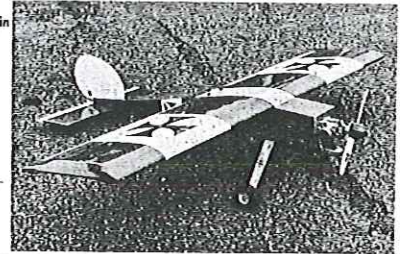


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For Fun/Winter

Continued from page 137

Sport Scale rendition of an uncommon 1930s lightplane. Hint: It had a five-cylinder radial." (Au.: I'm sure you'll like the photos of some of the many rarities in the Olympia, WA Air Force.)

Who am I? Can Englishmen be more American than Americans? British old-timers have me thoroughly confused. When I reviewed the first *SAM 35 Yearbook*, "dedicated to the preservation of vintage aircraft," I took issue with a stuffy review in a British magazine, and I forgot about it. Our own SAM people have built a wonderful movement, but SAM leans toward competition, while most of us fly Old-Timers and Antiques just for pleasure. They argue endlessly over philosophy, proper engines, and rules. That's OK in my book, too. But we have nothing like the *SAM 35 Yearbook*, nor is there anything like it in the world. The British, on the other hand, who thrive on arguments in letters to the press, and seem so serious from afar, don't overly mix historical planes and competition. Their Old-Timer/Antique historical buffs are a bunch of jolly "pirates." The *Yearbook* drips with nostalgia. It's a mixed bag of wonderful drawings of all sorts of stuff across the years, charming articles, unique drawings, and lovable flora and fauna.

A phone call from Marty Schindler tells me that, in a package addressed to him at

the "Toledo RC Show, he found my copy of *SAM 35 No. 2 Yearbook*. Between its stiff green-and-black paper cover, there's 144 pages of simply priceless things. My copy is inscribed by David Baker, saying: "To Bill Winter, a great friend of SAM '35' from all the SAM 35 fliers in the U.K." Three pages are covered by autographs from many dozens of folks, including writers, designers, and editors before my time. How did they manage that? One signature belongs to a guy who evidently has a program called *BBC TV Model World*. Don't look for anything like it on Channel 4, or 9, or even Public Service TV—not even Educational Service TV. Article by-lines were signed, too. I say truthfully you'll never regret getting a copy for yourself. It's that good. You can get one for \$7.00 from *SAM Speaks*, 2538 North Spurgeon St., Santa Ana, CA 92706, and that's also what it costs if ordered from Dave Baker, 22 Ellington Rd., Muswell Hill, London N10 3DG, England.

President John Grigg says that there have not been 22 AMA presidents as stated recently in this column, since he is Number 20. You might say, "That's from a higher authority!"

Bill Winter, 4432 Altura Ct., Fairfax, VA 22030.

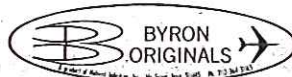
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Gee Bee Z/Haffke

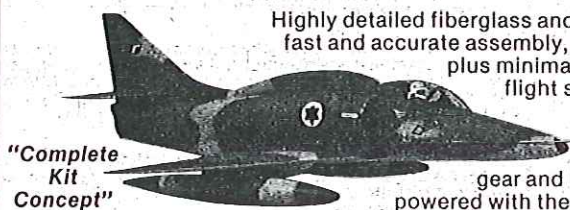
Continued from page 40

short takeoff area. It bounced along the rough ground and finally bounced into the air. There wasn't much runway left. (I remember one of the eyewitnesses telling me at the Gee Bee 50th Anniversary in Springfield a few years ago that Hall went under the electric wires at the edge of the field on that first takeoff. He even pointed out the wires to me. He must have imagined it.) As soon as the wheels left the ground, the aircraft torqued abruptly to the left. A fast control movement by the skilled pilot got the ship righted and back on its course. In the hands of a lesser pilot, the glistening City of Springfield could have been instantly reduced to a pile of rubble. Hall lifted the nose and climbed into the sky. The craft performed well except for a heaviness in the left wing, which a little right aileron pressure corrected. Hall figured that the wing wires would need adjusting. He was glad to know that the decision had been made to land on the mile-long strip at Bowles Airport.

He did not press for speed on the first flight but settled for cruising speed at 200 mph. He had lots of horsepower left. The air pressures created some damage to the cowl on the initial flight, which would have to be repaired. He brought the little racer in for a smooth landing at Bowles field. The landing speed was 80 mph at touchdown. The waiting crew from the



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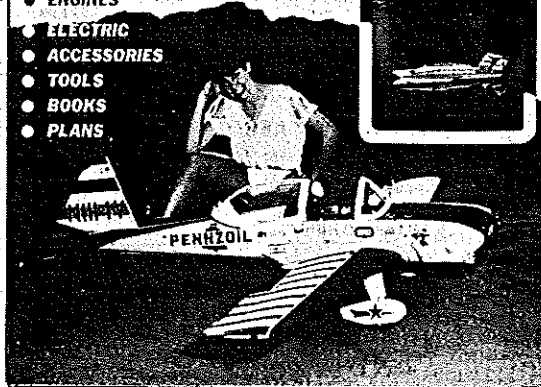
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Granville shop realigned the wings and fastened the cowling more securely. When they had finished, Hall climbed into the cockpit again and roared back into the sky. The wings were better now, but there was a little heaviness in the right wing this time. He increased the speed to 240 mph easily, and there was plenty more. He then increased the speed to 260 mph. The cowl began to tear loose again, so he reduced the throttle and headed back to the field. His first approach was too fast and too high, so he had to go around again; the next time, he made a perfect landing. The craft was trucked back to Springfield Airport, where the additional adjustments were made to the wing alignment, and the finish markings were applied (the initial flights had been made with a plain black-and-yellow craft with no registration numbers or other markings).

The National Air Races were only days away. That night the public had been invited to view the now-finished racer, and a crowd of better than 10,000 people crowded around the airport. Lowell Bayles and Maude Tait decided to put on a show for the enthusiasts. They went aloft in the Model D Sportster and Model Y Sportster to thrill the crowd. Maude made some high-speed passes over the field, while Bayles did some dazzling aerobatics.

On Tuesday Hall took the Model Z up for another test flight and found that he was not getting the desired rpm out of the engine. He decided that the prop pitch

was not correct for optimum power. There was no place locally that could repitch the prop. Hall and the Granvilles decided that Hall should fly the ship to Buffalo, NY on Wednesday where the prop could be altered at the Curtiss plant. That evening a large crowd again gathered at the airport for the formal christening of the City of Springfield. After speeches by the mayor and other dignitaries, Mrs. Henry A. Booth, wife of the president of the Board of Aldermen, smashed a 20¢ bottle of ginger ale against the propeller hub as the crowd roared its approval. Bayles again performed a dazzling series of aerobatics to delight the crowd.

On Wednesday, Hall headed for Buffalo. On the trip he developed a serious problem. The exhaust gasses being deflected against the inner cowling had burned through the metal, and dangerous carbon monoxide fumes vented into the cockpit. Hall became drowsy but managed to keep conscious by going over and over the things he had to do. He finally sighted the field and made a straight-in approach instead of the customary circling of the field before landing. Hall collapsed at the controls as the ship rolled to a stop. He had to be removed from the cockpit by airport workers. After he had

Continued on page 144

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Gee Bee Z/Haffke

Continued from page 141

recovered some, he telegraphed the shop in Springfield and reported events of the flight. He also wanted the shop to construct a new, heavier cowling. They worked all night and finished the new cowl early in the morning. Joseph Silverthorn started west with the new cowl by auto shortly after it was finished. Later in the morning the rest of the Granville crew of pilots and aircraft took off for the races in Cleveland, landing first in Buffalo where the new cowl was installed on the City of Springfield. Bayles, who had not flown the craft yet, got into it and flew it on to Cleveland as Hall switched to the Model Y.

The record established by the Model Z at the National Air Races was sensational. It was entered in five races and was an easy winner in all of them. Bayles flew the Z in the Shell Speed Dash and established a new record of 267.342 mph in the event. He made one pass at a sizzling 286 mph, the fastest speed ever recorded by a land-plane. The existing world speed record at the time was 278.98 mph. All 100,000 spectators were captivated by this fantastic flying machine in its striking yellow-and-black paint.

Next, Bayles won the Goodyear Trophy Race at a speed of 206.001 mph. Then, Bob Hall flew in the Mixed Free For All

and won at a speed of 222.623 mph. Hall was the pilot again for the General Tire and Rubber Trophy Race, which he won easily at a speed of 189.545—although he couldn't get much power out of the Wasp engine. The Granville crew went to work. They labored all night tearing the engine down and rebuilding it for the big Thompson Trophy Race the next day. They were still running-in the engine when race time arrived. Bayles climaxed the racing events by winning the Thompson Trophy Race with another record speed of 236.239 mph.

The City of Springfield had really electrified the air racing world, and success of the other Gee Bees at the races added to the already unbelievable success of the Granville organization. Maude Tait had set a new women's record in winning the Aerol Trophy Race in the Model Y, and Hall had placed 4th behind Lowell Bayles in the Thompson flying the Y. The other Gee Bees were also successful in the smaller races they flew in. Bayles had made an attempt at the World Speed Record, but engine trouble and a breakdown in the timing device foiled the attempt.

A large crowd gathered at Springfield Airport on September 9 to greet the returning victors. They had closely followed the day-by-day escapades of the Granville contingent at the races in the daily papers.

Shortly after 2:30 pm, the colorful #4 City of Springfield thrilled the crowd when it flashed across the field at a speed

of over 250 mph. Bayles pulled the nose up and climbed nearly out of sight. The stubby Model Z was followed by Maude Tait in the Model Y with its brilliant red-and-white coloring, and Bob Hall and Grannie Granville followed her, each flying one of the single-seat Sportsters. A big celebration was held when they had all landed.

Another attempt at the World Speed Record was scheduled at the Wayne Airport near Detroit. #4 was fitted with a larger 450-hp Wasp engine equipped with supercharging which boosted the power to near 800 hp. On December 5 the attempt was made. The first trials were unsuccessful due to breakdowns in the timing equipment, but a speed of 314 mph had been recorded on one pass. At 1 p.m. another attempt was made. As movie and newsreel cameras recorded the event, the racer roared through the speed traps at top speed. Suddenly, about halfway through the course, the nose came up abruptly. The City of Springfield shed its right wing panel and rolled into the ground in a spectacular crash. You may have seen the film footage of this crash. It has been used hundreds of times in movies where a crash scene was called for.

It was never determined exactly what caused the accident. The most likely explanation was that the gas cap, located on the fuselage top ahead of the cockpit, came loose and went through the wind-

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shield—striking Bayles in the face, causing him to pull back on the stick. Grannie studied the film footage frame-by-frame and could see something headed for the windshield just before the nose came up. Two young boys had brought in the gas cap and Bayles' goggles, which they had found on the course some distance from where the crash occurred. There was no way that the goggles, which Bayles always wore, could have left the enclosed cockpit unless the canopy had been shattered. This ended the short but spectacular story of one of the most fantastic aircraft in air racing history.

The Granville organization would go on to more spectacular air racing achievements, and the beautiful ghost of the City of Springfield would some day return to the city whose name it bore for another celebration. That was when Bill Turner brought his recreation of the Model Z to the 50th Anniversary Gee Bee Celebration a few years ago (but that is another story).

(To be continued.)

Radio Technique/Myers

Continued from page 43

Pylon Racing situation where pilots start dueling with their antennas. We put the test antenna about a foot from the flier's transmitter antenna, crossing it in the middle and perpendicular to it. Then, we rotate the test antenna until it is parallel to the flier's transmitter antenna. If the plane is still flying, we sweep the test

antenna all around the pilot's body, like an airport "frisk" operation.

In-flight 20 kHz adjacent-channel interference. Here, we simulate 1991 flying, using (from now on) the Kraft SRF transmitter modules.

The test transmitter antenna is moved around in a duplicate of the 10 kHz adjacent-channel test.

In-flight 40 kHz adjacent-channel interference. Here, we simulate 1983-87 flying, using either transmitters on the old frequencies, or on the new RC channels for aircraft only.

The test-transmitter antenna is moved around in a duplicate of the 10 kHz adjacent-channel test.

Third-order intermodulation interference ground test. Here, we simulate the situation of three pilots standing too close together, or a plane taxiing under someone else's transmitter antenna.

Using transmitters for three new RC channels in sequence (e.g.: RC50, RC52, and RC54), one of which will be the airplane's control transmitter, we'll have the three operators stand in a line, 30 feet from the airplane, with all transmitter antennas held parallel to the airplane's receiver antenna. All systems will be ON.

The two test transmitter operators will walk slowly toward the airplane, keeping their transmitter antennas parallel as

before. We will record the distance at which the servos on the airplane start to jitter. This is our test data.

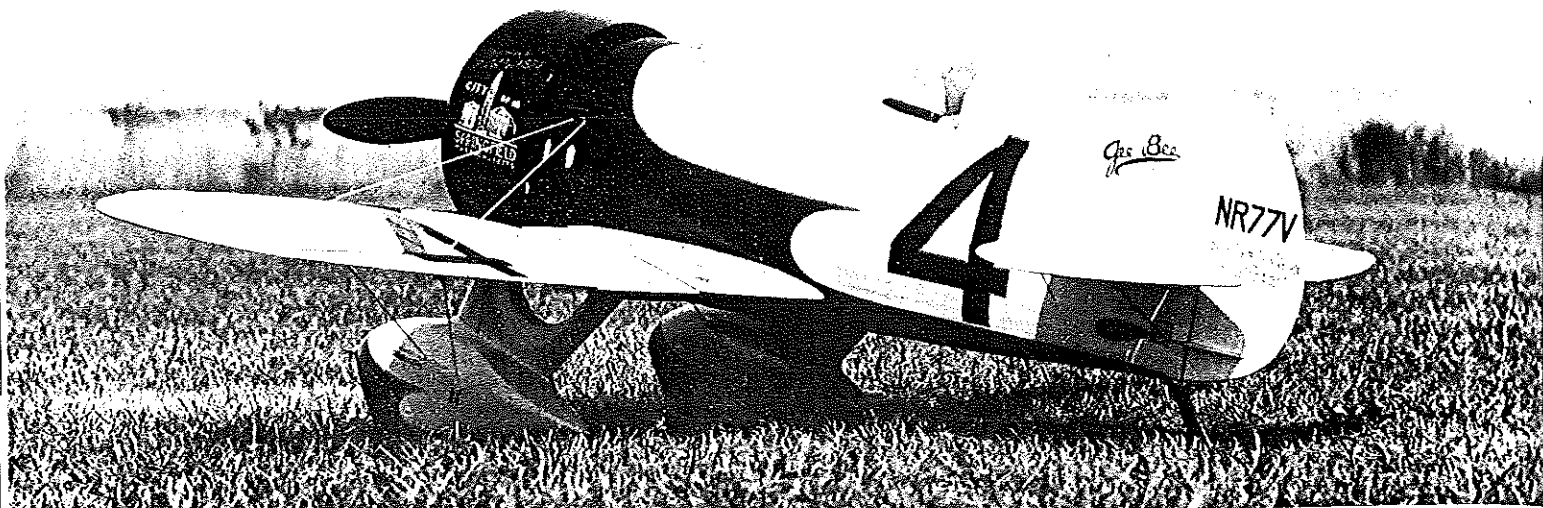
Phase-glitch ground test. With all neighboring transmitters turned OFF, we turn the test system ON and extend its antenna. Then, holding the transmitter antenna parallel to the ground, we walk around the airplane, pivoting around the tip of the transmitter antenna, which is held more-or-less fixed in space three feet above the airplane. We watch for servo jitters.

In-flight range test. With the airplane at the maximum altitude and distance for our conditions, one of us collapses the control transmitter antenna until either the plane shows loss of control or the antenna is completely collapsed. The guy doing the antenna work has to keep out of the pilot's line of sight and be prepared at all times to yank that antenna out in a hurry, without pulling it apart.

In-flight weak signal adjacent-channel interference tests. Here, we repeat the adjacent-channel tests above, but add the In-flight Range test. It's a lot more work.

Power output tests. This is a qualitative test, just to be sure that the power outputs are more-or-less equal. We use the RS clip-on Field Strength Meter that I have

Continued on page 148



Henry A. Hafke

GEE BEE Z

The finished City of Springfield Quarter Scale Gee Bee Model Z at the South Jersey RC Society flying field. Last summer the yellow-and black beauty was flown in the National Contest at Westover AFB. The author's admonition: For best flying qualities, build it light.

THE BACKGROUND and history of the full-size and my model Super Sportsters were presented last month. Now, we're ready for construction. Before beginning, remember one very important fact: the model should be kept as light as possible. With its short moments, you could find it very tricky to fly if the wing loading gets too high. At 12½ lb. it's a very stable flier—very positive on the controls, without any over-sensitivity. With care, your model can be built even lighter than my prototype. The bulky fuselage has a lot of material in it, so use lightweight wood where practical. This can add up to a substantial weight savings when the model is

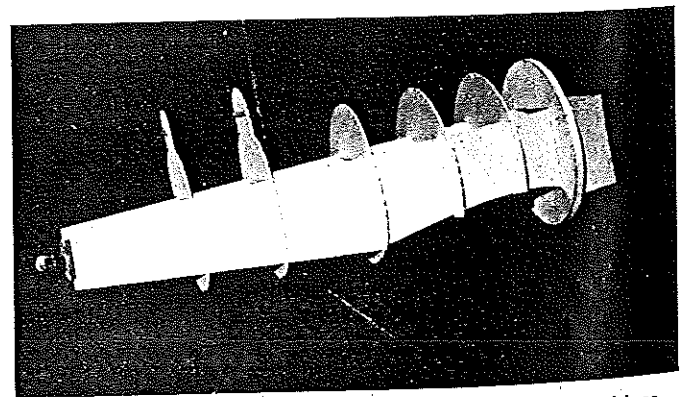
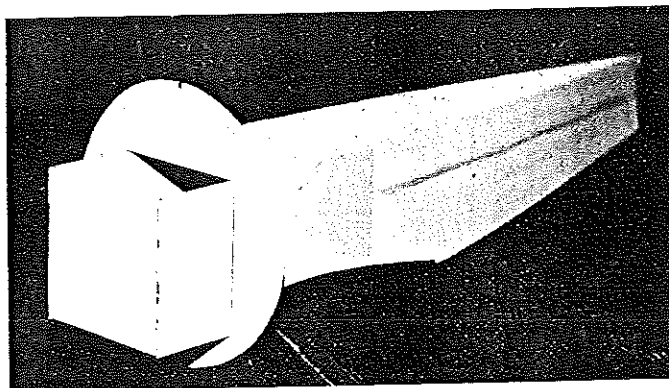
finished. Remember that weight and torque are the two big enemies of this aircraft.

Fuselage. Cut the sides from ¼ x 6-in. balsa sheet, or you can edge-glue two 3-in. sheets together. Cut the forward doublers from ¼ ply, and laminate these to the sides. In the bottom view, note that the ply doublers extend ¼-in. forward of the balsa sides and that they are on the outside of the structure. When this has dried, the firewall can be epoxied in place. The full-ply bulkhead, F-1, is also glued in place at this time. Clamp the tail end together, and make sure that everything is square while the glue sets. Triangle stock

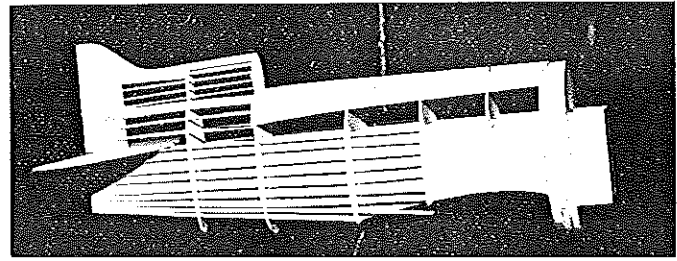
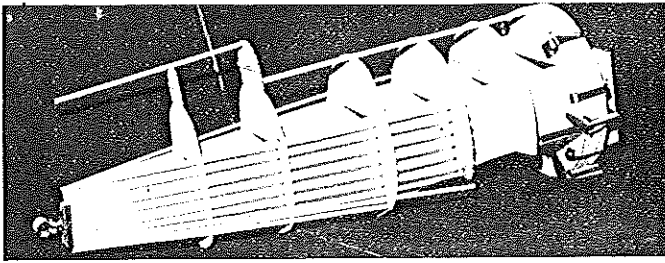
can be used behind the firewall to further strengthen this joint.

When the glue has properly cured, the remaining fuselage formers can be added, making sure that they are all square to the structure. Add the top, center stringer to the forward section of the fuselage. Also add the top turtledeck stringer. The fuselage aft end can be glued using a wedge to fit the joint. Add the side stringer from F-3 to the aft end. The ½-in. balsa F-1 formers are now added to the forward end. Make sure that these are clamped tightly to the ply F-1 until the glue dries.

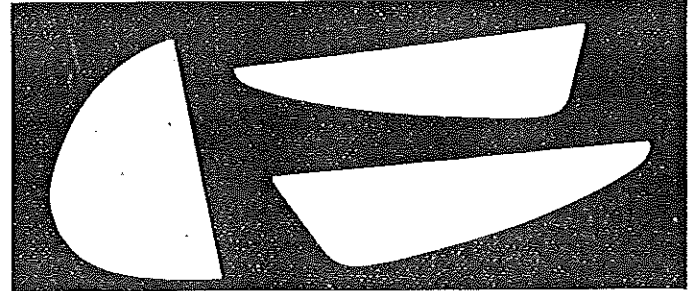
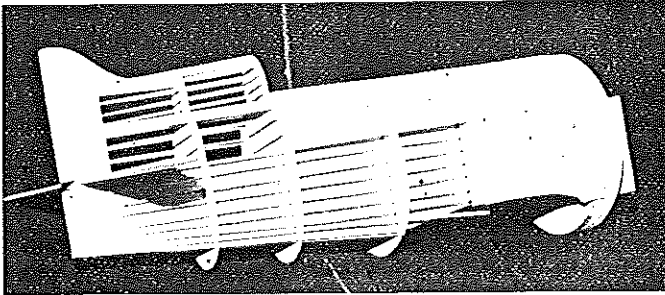
At this time the engine should be mounted to the firewall and the fuel tank



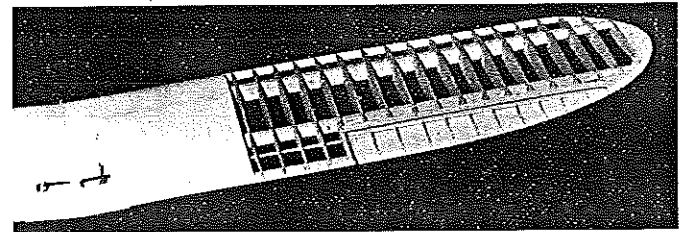
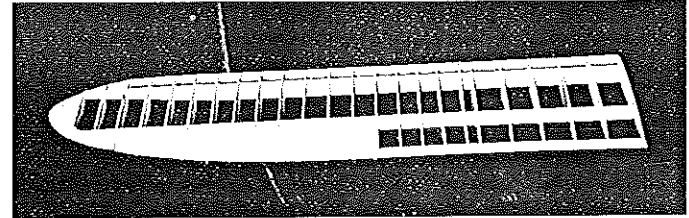
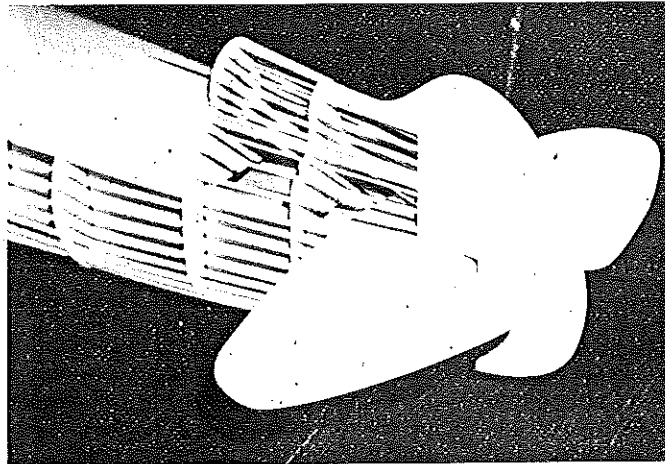
Left: First step in building the fuselage is installation of the firewall and F-1 between the basic fuselage sides. The plywood doublers are on the outside of the ¼-in. balsa sides. Hold this structure square while the glue dries. Right: The remaining formers have been added to the basic sides. Note that the rear of the fuselage is still held together with a clamp (a paper clamp was used in this instance).



Left: A wedge has been glued between the rear fuselage sides, the clamp holding the joint together. F-1 1/2-in. balsa formers have been glued and clamped in place, and the side stringers and the very top stringer have been added. Right: The fin and stabilizer have been installed, and the top headrest stringers have been glued in place. The 1/8-in. balsa planking has also been started at the nose, top front.



Left: The 1/8-in. planking has been finished, straight pins used to hold the planks in position while the glue dries. Right: The rudder and elevator surfaces, shown here, were built-up on a 3/32 sheet balsa base. Ribs and 3/32 edges were added to the tops and bottoms, then sanded to shape. Author says that these surfaces could be cut and shaped from 1/4-in. very soft balsa if the builder wished to do so.

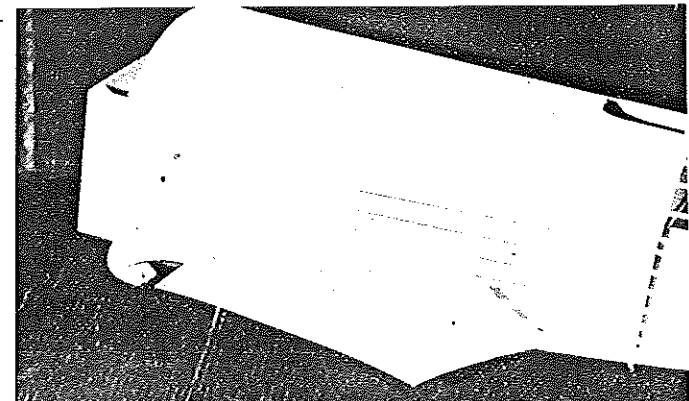


Left: The aft end of the fuselage has been completed. All the stringers and control surfaces are in place. Top Right: The basic wing structure. The aileron is tack-glued in place while the main structure is being built. It isn't cut away until after the completed wing has been sanded to shape. Above Right: The right and left wing panels have been joined with the dihedral braces, the torque rods and cranks for aileron control have been installed, and the center section has been sheathed. Photo credit: All photographs by the author.

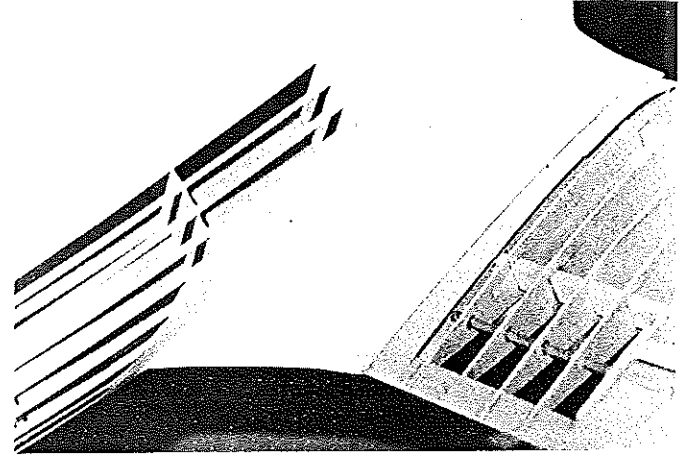
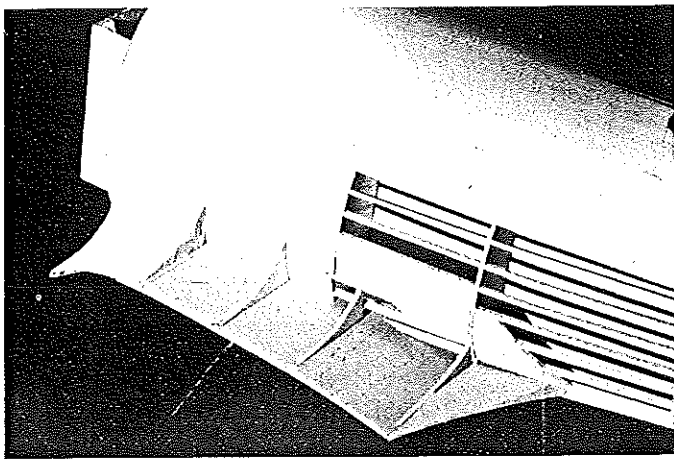
can be mounted where shown on the drawings. I would strongly suggest that you use a .90 glow engine as I did. The engine should be mounted on an Edson mount, using an Edson thrust wedge

behind it. I later added a 1/8 ply additional wedge behind this to give a little more engine offset. This offset keeps the ship straight when sudden bursts of power are applied.

Build the stabilizer and fin from 1/4 sheet balsa. The rudder and elevators can be made of soft 1/4 sheet or can be built up as seen in one of the photos. I used 1/2 sheet for the basic structures and built up 1/2-in.



Left: Hopefully you can see the aileron torque rod and cranks a little better in this picture. Cutouts for the servos haven't been made yet. Two servos will be used, one for each aileron, connected with a Y-cord. Right: The wing fillet has been started by gluing the 1/16 ply base to the wing saddle. The rear fillet block has been glued in place as have the first few forward fillet blocks (WF-1, WF-2, and WF-3).



Left: The remaining front fillet blocks (WF-4s) have been added, and the front of the fillet has been carved and sanded to shape. The fillet is now ready for the 1/8-in. planking. Right: The planking is complete, and the fillet has been carved and sanded to final shape.

ribs and outer edges on both the top and bottom for better scale accuracy and less weight. When finished, sand to final shape, and glue the fin and stabilizer in position. The turtledeck stringers can be added at this time.

The forward end of the fuselage is sheathed or planked with 1/4 balsa. The top front of the model is planked back to F-5, and the sides are planked back to F-3.

When glue has dried, the structure can be sanded to final shape.

The wing must be built before the lower fuselage can be completed. Select a piece of hard balsa for the spars and the leading edge. Cut all ribs from the appropriate materials, and test-fit the spar cut-outs. I like to take a short piece of the spar material and slip each rib on it as the rib is

cut out. In this way I can get very accurate spar cut-outs, and when all the ribs are stacked on the short spar pieces, they can be sanded together very easily. The tip ribs, which have smaller cut-outs, cannot be stacked with the others, of course.

Trim the spar tips as shown on the plans, and mark each spar for all rib locations. Slide the ribs on the spars, and locate each rib in its proper position on the markings. Make sure you are working

A "Ghost" Returns

IN THE SUMMER of 1929, the Granville brothers set up shop at the Springfield Airport in Springfield, MA. Fifty years later, a week-long celebration in Springfield commemorated the beginning of the Granville brothers' business. The airport is gone, the site now housing the Springfield Shopping Plaza. An L-shaped series of stores is located about

where the main takeoff strip still stands, but it now houses a sporting goods and boat sales company. The Granville shop on the Liberty St. side of the airfield is gone, the site now marked by a stand of evergreen trees.

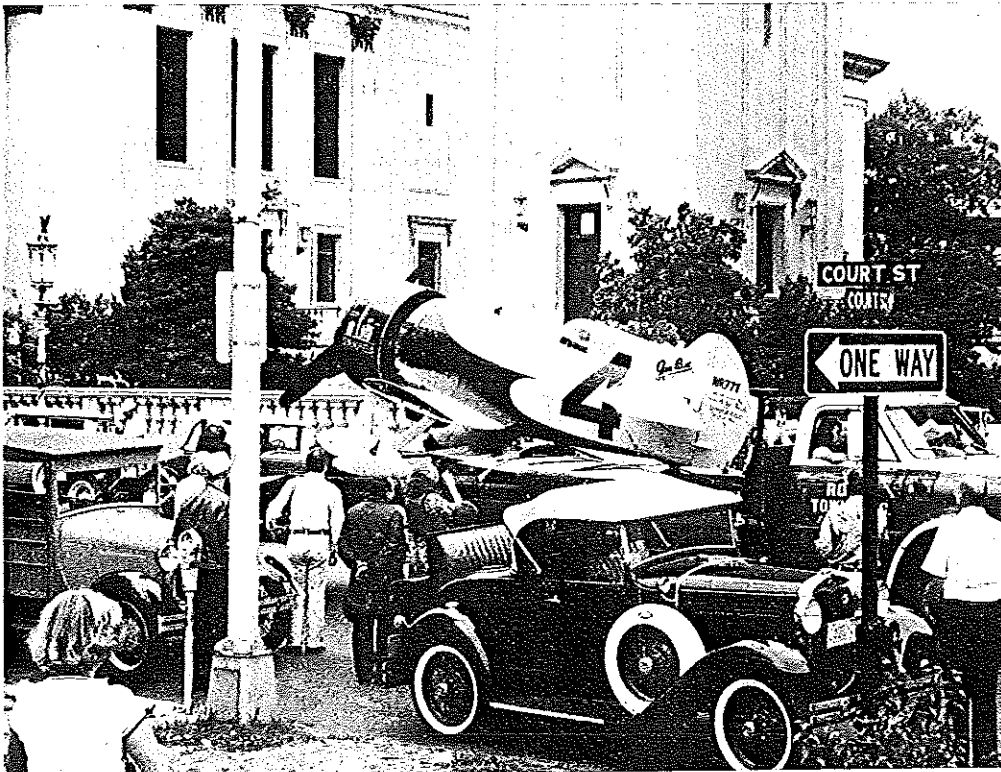
In the summer of 1979 the merchants of the Shopping Plaza joined forces with the local Experimental Aircraft Association (EAA) chapter

to plan a 50th anniversary celebration at the site. Don Foster (owner of Gee Bee Models) worked with the group to help make the arrangements. Bill Turner in California had built a 12-in.-to-1-ft. scale model of the 1931 Thompson Trophy winner, the Gee Bee Model Z Super Sportster. He had already flown it more hours than the original had flown in 1931. Bill agreed to bring his City of Springfield to the city for the celebration.

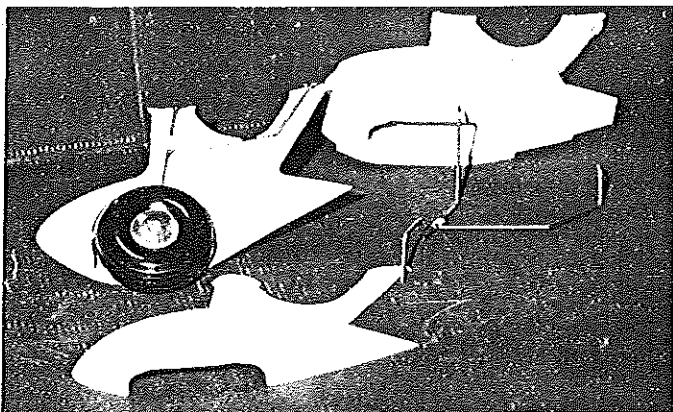
Bill had wanted a Gee Bee of his own since he was a young boy. In 1931 his father, who was a member of one of the performing air show teams at the National Air Races, took him to the races. Bill was enchanted by the bright yellow-and-black racer from Springfield, and his dad took him over to have a closer look. He met Lowell Bayles and was asked if he would like to sit in it. Bayles lifted the young future pilot into the cockpit; right then and there, Bill decided that he had to have that airplane. He begged his dad to buy it for him, but of course he couldn't. Bill was determined to have one some day.

Bill became a very skilled pilot. In the early 1970s, with the help of aircraft building specialist Ed Marquardt, he started work on the Gee Bee Model Z reproduction. With additional help from the last two living Granville brothers, Ed and Bob, he was able to build an exact copy of the famous #4 City of Springfield. Unfortunately, Ed Granville passed away over a year before the plane's completion, and Bob Granville died just a few days before the first successful flight. Bill attended many of the flying events on the West Coast with the craft before taking it to Springfield.

I was also contacted and asked to bring my various Gee Bee models and memorabilia to be used in the display that was planned. I was in the process of recovering from an operation a



Bill Turner's beautiful reproduction of the City of Springfield stops in front of the Springfield City Hall (the building drawn on its cow) amidst a collection of antique autos and a mob of newspaper and TV photographers during the 50th anniversary celebration.



Left: The landing gear wires have been bent to shape and the pieces bound together and soldered. One fairing is shown in the glued-up state, the other having been carved and sanded to final shape and the halves separated. Right: The completed and assembled airframe is a beautiful sight. It's almost a shame to cover it. But cover it, you must. Author favors Permagloss Coverite for light weight and appearance.

on a level surface. Support the spars over the plans on balsa blocks ($\frac{1}{4}$ sq. or similar) placed between the two A ribs and outboard in the last bay where the spars are still full depth (last two C ribs). Weight the spars over the blocks to keep everything true while gluing the ribs to the spars. Attach all ribs to the spars with cyanoacrylate (CyA) glue. Add the $\frac{1}{2}$ in. sq. leading edge and the trailing edge. Glue the $1\frac{1}{2} \times \frac{1}{2}$ -in. block in place at the rear of the ribs from outer Rib B to Rib G

after notching the block for each rib. Add the $\frac{1}{4}$ -in. balsa tip parts. Build up the landing gear mount blocks from $\frac{3}{8}$ ply, and epoxy them in cut-outs in Ribs A-1. Glue the $\frac{1}{4}$ ply wing wire mount plates on both the top and bottom of the wing.

Ailerons. Cut the leading edge for the ailerons from $\frac{1}{2}$ -in. balsa to the shape shown on the plans. Tack-glue this to the wing structure. Glue the $\frac{1}{4}$ -in. aileron base to the leading edge, centering it on both

ends of the aileron leading edge. Add the half ribs, top and bottom. When all glue joints are completely dry, the aileron and tip area can be carved and sanded to final shape. When this has been completed, the aileron can be cut free of the wing structure. Glue $\frac{1}{4}$ -in. triangle stock to the top and bottom of the wing trailing edge block between outboard Rib B and Rib G.

Round the leading edge of the aileron as seen in the aileron cross section view. Add the basswood block at the inboard end of

month earlier and had to fight with my doctor to get him to let me make the trip. He finally agreed to let me go, providing I got someone to drive me in a comfortable car. My wife had to drive my daughter to college that weekend, so she was not able to take me. I got my good friends George and Lillian Beifus to drive me to Springfield in my station wagon, which also carried my Gee Bee models.

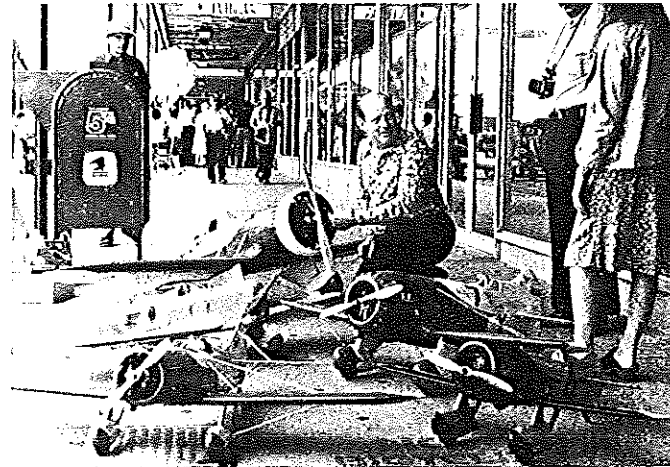
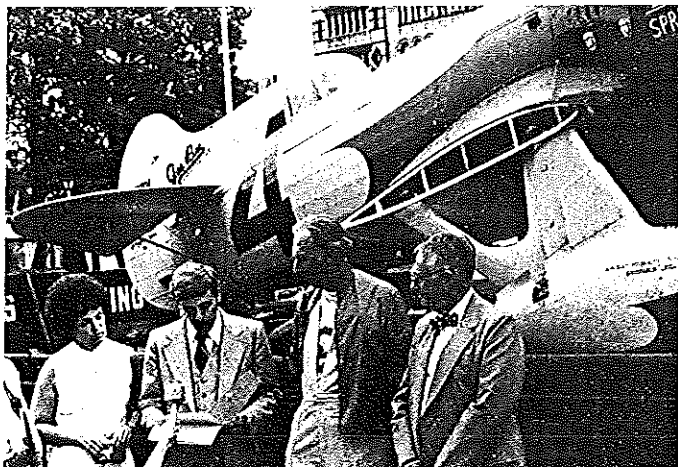
The affair started on August 20th, and the first scheduled activity was the arrival of Bill Turner's "ghost" of the City of Springfield at the city hall. However, for those of us who were involved, there was an unscheduled appearance (though hundreds found out about it) of the #4 guest of honor when it was made ready for the trip into the city. The plane had been trucked from nearby Hartford, CT to Bowles Airport in Agawam, MA (where the Gee

Bees underwent their testing in the early 1930s after being flown out of tiny Springfield Airport). The craft had been stored overnight in one of the EAA member's private hangars next to his gleaming Great Lakes. A small group of EAA members were on hand when the hangar doors were rolled open for us to get our first glimpse of the black-and-yellow beauty.

Long-time friend Bert Williams was on hand with his Control Line model of the Z which he had built over 30 years ago. Though I had never met Bill Turner before, we knew each other quite well from our correspondence. We finally got to meet face-to-face, and it was like meeting an old friend. After a close inspection of the aircraft and its fascinating cockpit, we rolled the wingless fuselage out of the hangar and began assembling the right wing panel to the fuselage for some historic pictures. Bob

Hall showed up with his sons, and it was decided to take some pictures of Bob and the plane he had designed in 1931. He was positioned in the cockpit, standing on the seat with his arms folded just as he had posed after winning a race in Cleveland in 1931. (I was caught without my camera at this point, as it was in my car, and George had left for a few minutes to pick up his wife who was a short distance away. I missed the chance to get pictures of this historic re-enactment, but later I borrowed negatives from Gladys (Granville) Jones and had prints made from her negatives.)

After the picture-taking session in front of the big hangar (which can be seen in many photos of the Gee Bees which were taken 50 years ago), the beautiful City of Springfield was rolled back inside the hangar where it had spent the night, and the wing was removed for

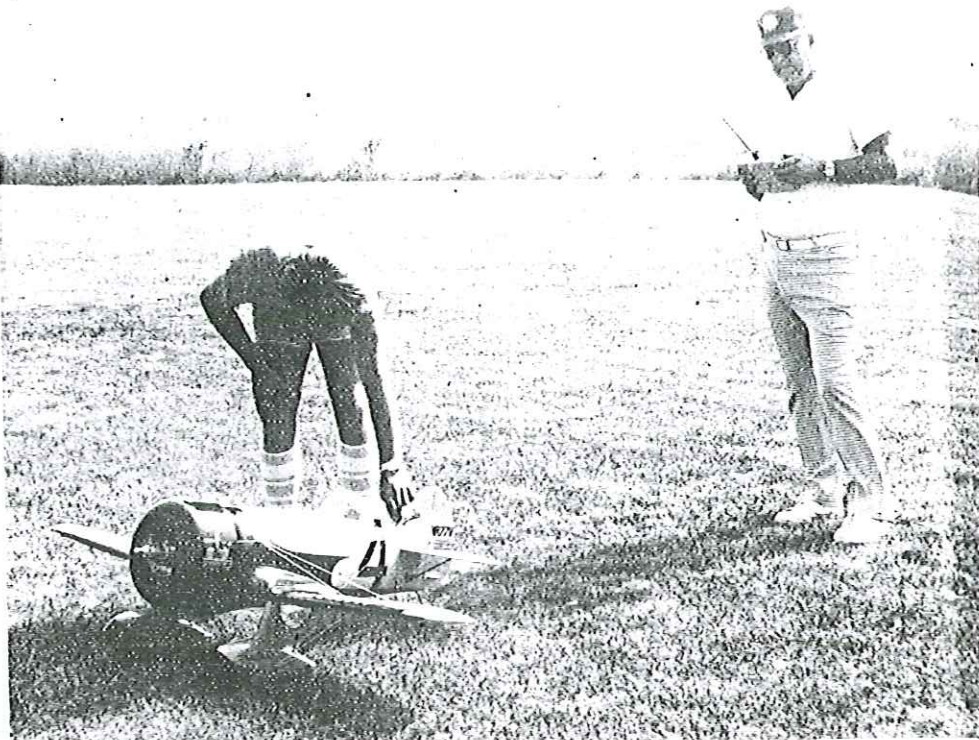


Left: Springfield's mayor was snapped while reading a proclamation naming Gee Bee Week in 1979 and honoring Bob Hall (right) for designing the Super Sportster in 1931 and Bill Turner (next to Hall) for recreating the famed craft and bringing it to the city of its origin. Right: Henry Haffke reads his many Gee Bee models at the Springfield Shopping Plaza where they were displayed for a week, along with Turner's full-size replica. The stores are located on the site of the original Springfield Airport, where the Granville brothers set up shop.

the aileron. Make the torque rod of 1/4-in. aluminum tubing and fit it to the aileron. Plug 1 in. of each end of the torque rod with dowel. Drill a 1/4-in. hole squarely in the bass block. Install a wire hinge pin in the outboard end of the aileron, and a short piece of brass tubing in the wing tip to take the hinge pin.

Make a nylon bushing for each end of the torque rod as shown on the plans. A 1/4-in. hole can be drilled in a large control horn section to act as a bushing. Mount the bushing on Rib A and Rib B as shown. Install the torque rod, and secure it at the aileron by drilling and installing a sheet metal screw through the bass block and aluminum tubing. Drill the inboard end of the torque rod, and install a long 4-40 bolt as a servo crank. This completes the left wing panel. The right panel is built the same way except that the panel is built upside down on the leveling blocks over the plans.

When both halves of the wing are completed, they are joined with the 1/8 ply dihedral braces. The dihedral braces give the correct dihedral to the wing structure. Glue the braces to one wing half. When dry, fit the other half of the wing. When everything has been trimmed for a good fit, the braces can be glued to the remaining half. Support one half of the wing on the leveling blocks used during construction, and support the tip of the other panel by blocking it up level to the work



It's do or die time. Henry's son, Raymond, holds the model while "Test Pilot Supreme" Syd Clements checks the controls prior to the first flight. Moments later, the model rose majestically into the air and flew perfectly. Takeoffs are easy with the Model Z, Haffke says.

surface while the glue dries.

Drill the leading edge and install the wing dowel. Finally, the center section is sheeted, top and bottom, with 1/2 balsa.

Install a piece of 1/8 ply, 1 x 8 in., on the underside of the trailing edge where the wing will be drilled for the nylon hold-down bolts.

CONT P 50

"A Ghost" Returns

the trip into Springfield. About this time the crowd that had gathered outside the fence of the airport had grown to a large number, reminiscent of the crowds that gathered outside the fence at the Springfield Airport in 1931 as they tried to get a glimpse of the Model Z being built in the Granville shop. Many old-timers were in the crowd, and Bill Turner was greatly touched by the scene. Tears could be seen in many of the eyes in the crowd as they stared at #4 and remembered. They had never expected to see the famous aircraft again after its disastrous crash in 1931 while making an attempt for the world speed record.

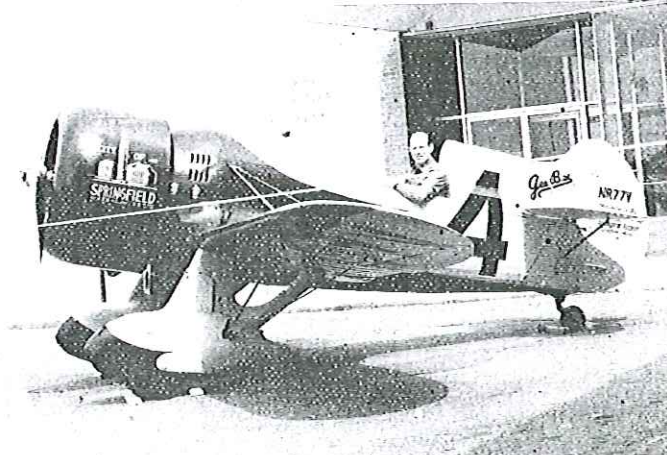
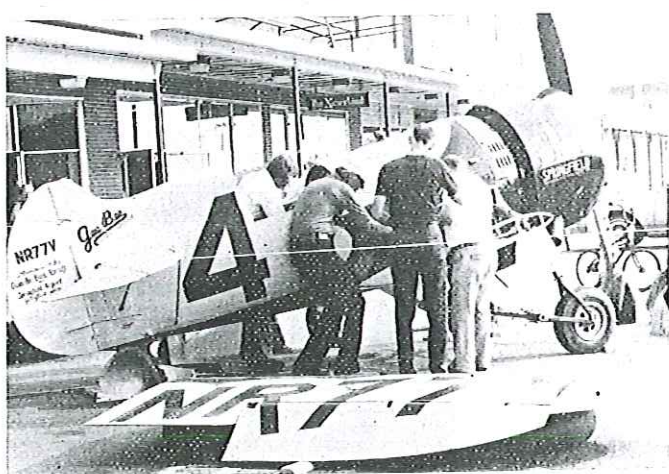
The Model Z was loaded on a flat-bed truck

for its trip into Springfield. It was to be escorted by a group of 40 antique autos which had been assembled by the Western Massachusetts Antique Auto Club. The procession started, and the six-mile trip took the Gee Bee and its escorts from Bowles Airport over the South End Bridge into Springfield. It then traveled down Columbus Ave. along the Connecticut River, and then turned onto Court St. where the City Hall is located. Court Square had been completely cleared of all traffic. After the truck carrying Turner's replica had turned the corner, it stopped and allowed the antique autos to park on alternating sides of Court St. When all of the cars were parked, the aircraft was

paraded up the street and parked directly in front of City Hall. A large crowd had gathered in Court Square for the affair. Television and cameramen by the hundreds were on hand. The mayor appeared with some other dignitaries. He read a proclamation designating the week as Gee Bee Week in Springfield. Then he read other proclamations commending Bob Hall for designing the Model Z, which brought great honor to the city, and commending Bill Turner for recreating the famous craft and bringing it to the city.

After the ceremonies at City Hall, the parade continued to the Springfield Shopping Plaza, which is on the site where the Springfield Air-

Continued on page 145



Left: Bill Turner (just in front of the cockpit) disassembles #4, with the help of members of the local EAA chapter, for a trip to Cleveland after its week-long stay in Springfield. Right: Our author, Henry Haffke, tries on the Gee Bee Z for size. He couldn't fly this one, but he's been promised some stick time in another Gee Bee replica that is nearing completion. Turner's has a tail wheel vs. original's tail skid.



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4 Cycle Glow .90 - 1.2
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Wing Design: Foam
Fuselage: Built-up
Cowl: F-glass
Span: 94"



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"VAGABOND"**
Wingspan: 84"
Wing Area: 1260 sq. in.
Wing Design:
Foam Cores/Balsa Sheeted
Cowl: Fiberglass
Flying Weight:
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Engines:
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4 Cycle .90 - 1.20



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Wingspan: 84"
Wing Area: 1135 sq. in.
Cowl: Fiberglass
Canopy: Formed Plastic
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Wing Design: Foam, Balsa Covered
Fuselage: Built-up Semi Monocoque Design, Balsa
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Cut away the sheeting between the in-board ribs for servo installation, and install the servo. It is a good idea to use a separate servo for each aileron, connected with a "Y" cord to the receiver. A nylon aileron crank connector can be threaded on the 4-40 bolts for connecting the servo-actuating rods.

Install the bass wing hold-down block in the fuselage, and join the wing to the fuselage. Make sure everything lines up properly. Check the wing position by measuring from the tail post to an equal point near each wing tip. When all is correct, drill through the wing trailing edge into the bass block and tap the bass block for nylon bolts. Enlarge the holes in the wing trailing edge, and secure the wing to the fuselage.

Build the bottom fill-in section of the fuselage under the wing. When building this, make provisions for mounting the oil cooler scoop, as this scoop cannot be mounted permanently to the structure. It must be removed to disengage the wing. Also install a length of aluminum tubing through the bottom section where the brace wire from the landing gear will pass through. The tail skid plate with the tail skid installed should be added next. Install the bottom fuselage stringers. The wing and fuselage can now be sanded to final shape.

Wing fillet. This is one model that definitely needs a wing fillet. Many aircraft had small model fillets which, if left off a model, doesn't detract much from its appearance. The Model Z, however, had a very large wing fillet which is very prominent from any view.

Start with a section of 1/8 ply, 6 in. wide by 10 in. long, with the predominate grain running crossways. Glue this to the wing saddle from the very rear of the saddle, extending forward 10 in. When gluing this to the saddle, attach the wing to be sure of getting the exact angle for dihedral, and keep the wing attached until the joint has completely dried.

Fill in between the stringers behind F-3 with 1/8 balsa where the aft end of the fillet will meet the fuselage. Glue the fillet parts, WF-5, WF-6 and WF-7, in place as shown on the plans. Glue WF-1 in place against the fuselage, tapering the upper edge of it to fit the fuselage curve. This will leave a triangular-shaped opening inside and below where it is glued, and this will require using pieces of 1/2-in. balsa trimmed to fit this opening. Glue WF-2, WF-3, and several WF-4s to WF-1. WF-4s extend to the outer edge of the ply fillet base. Install the rear fillet block (WF-8) behind WF-7. When this structure has dried completely, the fillet can be planked with 1/4 x 1/4 balsa strips. Final shaping and sanding will give a beautiful fillet.

Landing gear. Bend the 3/16-in. wire landing gear wire parts. Bind and solder the front and rear wires together after installing them in the wings to be sure of proper

alignment.

The landing gear fairings can be built-up of ply and balsa parts as follows. Cut all parts from the patterns on the plans. Laminate the parts for each fairing half together, and weight or clamp firmly until the glue has completely dried. Use short sections of 1/8-in. dowel to peg the parts together, one dowel piece in the front and another in the rear section of the wheel fairing to keep the halves lined up properly. Tack-glue the two halves of each fairing together; carve and sand to the final shape. The fairing cuffs are formed and added after they have been permanently installed on the landing gear wires.

Install the wheels with a wheel collar on each side to keep them centered in the fairings. When finished, the wheel fairing halves are sandwiched around the landing gear wires and spot-glued in place. This allows them to pop apart in the event of a rough landing. I have not had this happen with this aircraft yet (a tribute to its fine handling characteristics) but had it happen on other models with similar wheel fairings. The cuff is added after final assembly.

Engine cowl. Cut the cowl rings of the proper material as shown on the plans and pattern sheets. Laminate the front and rear rings together, and join them with lengths of 1/4 sq. balsa. Make sure everything is square while this dries. When dried, the cowl can be sheeted or planked with 1/8 balsa. Carve and sand to final shape. For those who do not want to go to the work of building a set of wood wheel fairings and cowl, a set of fiberglass parts is available from T&D Fiberglass Specialties, 30925 Block, Garden City, MI 48135. Contact T&D for details.

Finish the tail surfaces, adding the elevators and rudder to the stab and fin. The plans show parts for a ply rudder horn; this is to the correct scale, and it works beautifully in connecting the rudder to the servo with steel cables as on the full-size aircraft. A commercially-available elevator horn can be installed between the two halves of the elevator.

Radio installation. Refer to the drawings and photos. Install the radio components as far forward as possible in the fuselage. I used a World Engines radio that I won at Toledo and installed the servos on a ply tray as shown in the bottom-view drawings. I used some of World's large servos on the elevators, and the regular-size servos for the rudder and throttle. The battery is located ahead of the elevator servo, alongside the fuel tank. The receiver is tucked in between the main fuselage side and the outer sheeting under the servo tray (looking at it from the bottom). I used a cedar arrow shaft for the pushrod to the elevator. The rudder is actuated by steel cables, as previously mentioned. A Ny-Rod actuates the throttle.

Continued on page 141

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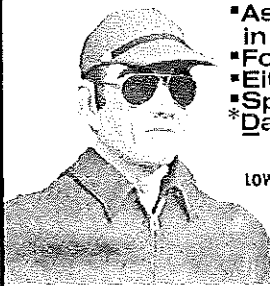
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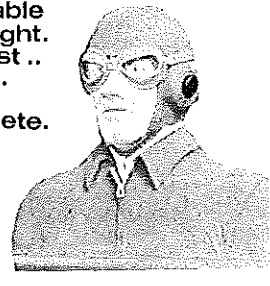
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I make no claims to computer expertise, in spite of the fact that I've been working with them since 1950. But, I have shopped around a bit, and those are my personal recommendations. There are hundreds of other computers to choose from, and you should know that the RC model flight simulators listed above only run on the Apple IIe. Each of those other computers was designed to suit a need, which may coincide with yours. If so, buy what you need—and no hard feelings.

Unless I run into serious opposition, I will try in the future to obtain and report on any computer programs offered in the model aviation field. Since I have a degree in Aeronautical Engineering and friends with Apple, Commodore, IBM PC, and Radio Shack computers, it should be possible to evaluate most of what comes along. What do you think of the idea?

George M. Myers, 70 Froehlich Farm Rd., Hicksville, NY 11801.

Gee Bee Z/Haffke

Continued from page 51

Finishing. There are countless ways of putting a good finish on a Scale model. In the case of the Model Z, a lightweight finish is important. The lightest way I know

of to get a real scalelike fabric finish is to use Coverite's pre-painted Permagloss fabric. The Cub Yellow shade was just right to match the color chips that Bob Granville had picked out for me to match the full-scale Model Z. I have used Permagloss on many of my other models and have always been very pleased with its weight, durability and good scale appearance. My Quarter Scale Model Y (May 1980 *Model Aviation*) is covered with Permagloss; it took first place in Sport Scale at last year's Toledo Show.

I gave the structure a coat of Balsarite and covered the entire model with the Cub Yellow material. In applying any covering over a sheeted area such as on the planked sections, it is important to apply it correctly to avoid getting bubbles. Cut a piece of material a little larger than the area to be covered. Lay the material in position, and start by tacking it down right through the middle of the piece. Then, working out from there in both directions, carefully pull the material tight, and iron it down. Do not hurry. Take your time, and work carefully. Don't attempt to iron down too large a section at one time. This process keeps you from trapping air under the covering, which causes you trouble later. Keep your iron temperature down to around 225° to

250° when ironing over sheeted areas, and you will find everything works much better. All you want to do is activate the adhesive on the covering.

When the area has been covered, you can trim off the excess material you used to pull it tightly by slipping a piece of thin cardboard or plywood up under the excess material. Use a straightedge and sharp knife to trim away the excess. Iron down the little edge you have left for a very neat job.

Always start covering on the underside of the model, work up the sides, and finish with the top. With a little care and planning, the final seams can be trimmed to match panel seams on the full-size aircraft for a very realistic look.

After finishing the covering with Permagloss, patterns were made from paper for the black trim on the wings and fuselage. These patterns were used to mark (in pencil) the outlines of the trim. The marked areas were masked off on both the wings and fuselage. The paper patterns assured identical trim on all four wing panels and both sides of the fuselage. When the masking was completed, a coat of Primex was brushed on the areas to be painted. Two light coats of Black Baron Black were sprayed on the trim areas. A coat of

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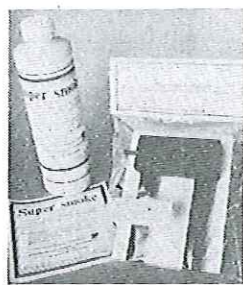


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Gee Bee Z/Haffke

Continued from page 141

Black Baron Clear was sprayed over the paint when dry.

The large numbers (registration and racing numbers) were cut from a pressure-sensitive Mylar material and applied to the model. They are pin-stripped with red striping tape. The rest of the small lettering was done by hand. The trim on the black painted areas was done with thinned K&B epoxy. The rest of the fuselage and landing gear markings on the yellow was done with Randolph butyrate dope, except for the rudder markings which were done with drawing ink. Clear Randolph dope was applied over the lettering to seal the edges. The finished model is very eye-catching with its bright yellow-and-black finish.

Detailing of a Scale model can be carried as far as the builder desires. I went all the way on this one, since I intended to fly it in the National Championships in Chicopee. Real Gee Bee country! Detailing starts with the installation of the flying and landing wires. These were made of elastic cord found in most sewing shops. Silver clevises were fitted to the ends of the top wing wires for attachment to an aluminum plate which extends about a half-inch through the fuselage skin. The plate is drilled to take the wing wire clevises and also to take the rod from the cowl which holds the cowl in position as it did on the original aircraft. A basswood fairing was carved to cover the wire attachment plate. This fairing is slipped in place after attaching the wing wires; the cowl rod fits through, holding it in place. Thin strips of Permagloss were cut with the aid of a metal straightedge and sharp modeler's knife. These strips were applied over every rib in the wing and tail surfaces to simulate the rib tape of the full-size aircraft. Streamline aluminum tubing was used for the stabilizer struts. A ply fairing was epoxied and held to the tail skid with three aluminum bands for a very realistic looking fairing.

The most difficult detailing to duplicate was the buckles which hold together the

metal panels just behind the cowl. These were regular trunk fasteners. After much thinking, I finally figured a way of making them. I obtained a real buckle and drew a 1/4-scale sketch of it. Using this as a pattern, I cut the flat base part of it from hard 1/2 balsa. The center raised part was made from a piece cut from basswood. I cut a flat-sided, oval-shaped piece from 1/2-in. basswood on a band saw and carved the top of this piece to look like the raised part of the real thing. When it was finished I sliced it off, carved the back of the lower part, and glued it to a base. A section of a regular paper clip formed the clamping wire over the top of it. A few drops of white glue simulated the screws which mount the buckle to the aircraft. It really wasn't as difficult as I had thought it would be, and I was almost baffled by its realistic looks. I was able to get all four parts out of the same piece of wood and had enough left over for a fifth part if it had been needed. These buckles were painted aluminum and epoxied to the model. They really attract a lot of attention.

The oil cooler is built-up from the patterns on the plans and has to be made removable. I installed a plate of 1/8 ply in the bottom of the cooler and drilled it to take a long sheet metal screw. This fastens it to a ply plate mounted in the structure under the wing-fuselage section. A 1/8 dowel near the aft end of the cooler keeps it aligned properly. A dummy engine was built-up of ply and balsa to form the crankcase. Williams Bros. Wasp Engine Cylinders were used around this crankcase. (Two cylinders were left off for engine cooling.) The dummy engine fits on three dowels which extend from the firewall. The dowels fit into receptacles on the back of the dummy engine. The engine is slipped into place on the dowels, and the cowl holds it there when it is installed. A dummy Curtiss prop was carved from basswood.

The cockpit cover on the full-size Model Z was formed from three pieces, and the one on my model was done in the same way. Patterns are given on the plans for the back section which is formed around the headrest bulkhead. A pattern is also shown for the bottom section

which curves around the cockpit opening back to the rear piece. These were installed using R/C 56 glue. The top curved part was cut from a molded canopy I got from Sig quite a few years ago. If you look around, you should be able to find a molded canopy that this place can be cut from. This piece was also glued in place with R/C 56 glue. When the glue was dry, I drilled tiny holes around the enclosure where the three parts overlapped each other and installed short pieces of common straight pin heads to simulate the screws which held the original one together. Don't forget to install a Lowell Bayles figure in the cockpit before installing the enclosure. Even though he is inside a closed cockpit, don't omit his goggles, since Bayles always wore them when flying.

Flying. If you have spent as much time on your model as I did on mine, you may hesitate to fly it. However, if you have built the model with no warps and have kept the weight down to 12 1/2 lb. or under, you will have no trouble flying it if you are a fairly competent pilot. Be sure that the model balances where shown on the plans, and *do not attempt to fly it if the balance point is behind where it is shown on the plans.* If everything checks out as above and you are still hesitant, it would be a good idea to get a good pilot of Scale models to test fly it for you. I know I am always too shaky with a new model, although I have done it a few times.

I really expected the Gee Bee to be squirrely because of its short moments. That did not prove to be the case. I was very surprised to find that it is one of the easiest models on the takeoff that I have ever flown. As a matter of fact, it handles just like my Quarter Scale Gee Bee R-1 (February 1983 *Model Aviation*) on takeoff. Apply power with just a touch of up-elevator to keep the tail down as it starts to roll. When it gets moving some, let up on the elevator. The tail will come up, and it will run a mile (if you let it) on the main gear. It runs as straight as an arrow, and it will lift off only when you give a touch of up-elevator. Just make sure you don't horse it off before flying speed is attained.

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stable—not at all touchy on the controls. It really grooves and will surprise you with its fine flying traits. Bill Turner has told me that his full-scale Model Z replica is a very stable craft in the air.

Ground handling with the full-size one was a problem, as the rudder was completely ineffective below 80 mph. Steering with the brakes was a must. The model, however, has acted fine in all landings. Bring it in a little fast until you become familiar with its characteristics, and you should have no trouble. Just hold it off until it slows up and settles. Every landing it has made on grass has been perfect; and it has been flipped over only once—on one of my flights at the Nats. I brought the model in very smoothly to the touch-down, but the crosswind must have had it crabbing a little; as soon as the wheels touched, it flipped on its back. The only damage was some scratched paint on the top of the cowl and top of the fin.

I have really enjoyed flying the Model Z, probably more than any other model I have ever flown. I am sure that anyone who builds one will enjoy it as much as I have. If you wish to compete with your model, I will be glad to help with documentation. I have many original photos of the original Model Z and many more of Bill Turner's reproduction if you want to build one with a tail wheel (which he has on his). Contact me at this address: Henry A. Haffke, 1038 West Elmer Rd., Vineland, NJ 08360.

"Ghost" Returns/Haffke

Continued from page 48

port had been (and where the Gee Bees had been built). The bright yellow-and-black City of Springfield was removed from the truck, and we assembled the wings, fairings, and flying wires. The plane was put on display just outside Steigers Department Store, where it remained for the week. An empty store adjacent to Steigers was EAA headquarters for the affair. My Gee Bee models were put on display

there, along with Bert Williams' models of the Gee Bee Biplane and his 30-year-old CL model of #4.

Later in the afternoon, a cocktail party was held in a restaurant on the plaza for invited guests. All of the members of the Granville family were there, as well as several of the workers who were employed in the Granville shop. The mayor repeated his earlier proclamations, and a few other dignitaries gave short talks. All of us who were involved with the celebration were publicly introduced. Highlight of the festivities was a speech by Bob Hall during which he told a few things about the Model Z and presented the trophies he had won at Cleveland in 1931 (in the Model Z) to the Springfield Museum of Science. Bob had shared the piloting duties with Lowell Bayles at the 1931 National Air Races, and he had won both races that he flew in. (The Model Z was victorious in all five events it was flown in.)

The display was open to the public from 9 a.m. to 10 p.m. each day during the following week. Bill picked me up at my sister's home about a mile from the shopping plaza each morning, as I had no car. He and I manned the display during the day—talking with, and answering questions for, throngs of visitors. In the evenings, members of the EAA chapter joined us; they showed aircraft building, and they let visitors operate a flight simulator. Many hundreds of people visited the exhibit and had a chance to relive their 1931 dream when the public of Springfield watched as the racer they sponsored by contributions of shares in the Springfield Air Racing Association was created on this very spot. Now they gathered again each day to view the gleaming beauty. A lot of the same faces could be seen each afternoon just standing and looking at the "ghost," which was the star of the exhibit; again, a tear was seen here and there in the crowd.

The final day of the display was on Saturday. EAA members helped with dismantling the Gee Bee and loading it back on the truck which would take it to Cleveland—where it would again be the star attraction when that city celebrated the 50th anniversary of the Thomp-

son Trophy Race. I built a wood rack to hold the wing panels on the truck under the fuselage. On the previous short, slow trip, the wing panels had just been laid on some inflated inner tubes, but that would never do for a trip to Cleveland.

When everything was secure, all of us who were involved with the exhibit went inside and were treated to a big pizza party by the Shopping Plaza Merchants Assn. It had been a very successful and eventful week, and Bill and I will never forget the reception we got and the love the Springfield people have for the Gee Bees. It was a great week with some great people—including Bob Hall, Hi and Gladys Jones (Gladys is the youngest sister of the five Granville brothers, and Hiram was one of their first shop mechanics), Charlotte Granville (Ed Granville's widow), Laurie Granville (Mark Granville's widow), Bob Granville and his family (son of Robert Granville), June Dakin and her family (daughter of Tom Granville), and Zantford Granville's two children, Robert and Norma. We all said our good-byes after the party, and Bill Turner took me home. He picked me up for the final time the next morning. He left with his beautiful "ghost" of the City of Springfield and headed for Cleveland. The EAA gang took me to New Jersey with my Gee Bee models in a beautiful Beech Queen Air.

Bill Turner was greatly impressed with the people of Springfield, and he was very touched by their reaction to his aircraft. He has flown it more hours than the original was flown, and he states that it is an excellent craft in the air, though poor visibility makes it a problem on the ground and during landings. Bill's surprised remark after making his first landing: "I expected to lose sight of the runway on final, but not the entire airport!"

Bill doesn't plan to fly it any more and would like to have it placed in a museum. After his visit to Springfield, that is where he would like to have it go. A fund is being raised in Springfield in hopes that enough money can be raised to purchase the plane for permanent display in the Springfield Museum of Science alongside the Zeta and other Gee Bee memor-