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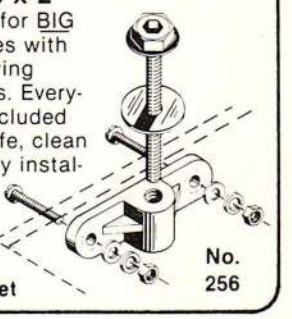

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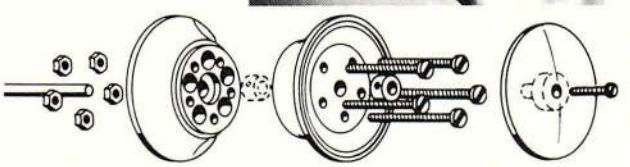

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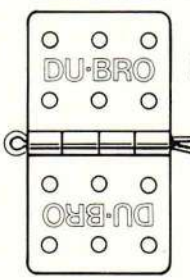

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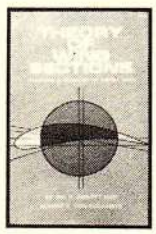

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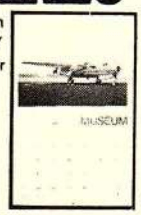

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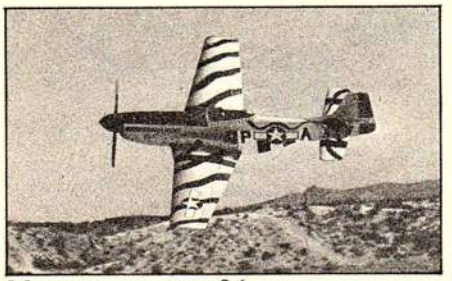
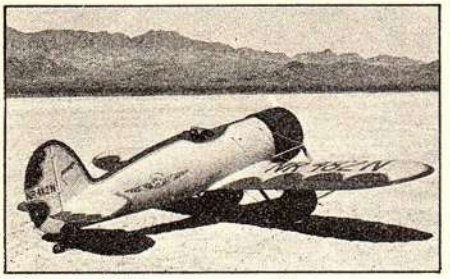
Gee Bee . . . page 26



Mustang . . . page 34



Mystery Ship . . . page 42

COVER:
The big Byron Mustang, with that four-bladed prop that sounds so mean in the air. We finally got the first kit off the assembly line into the air, but we are reserving judgment on the model. See Part I of our exclusive review in this issue. (J. R. Naidish photo)

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VOLUME 7, NUMBER 5 OCTOBER 1981

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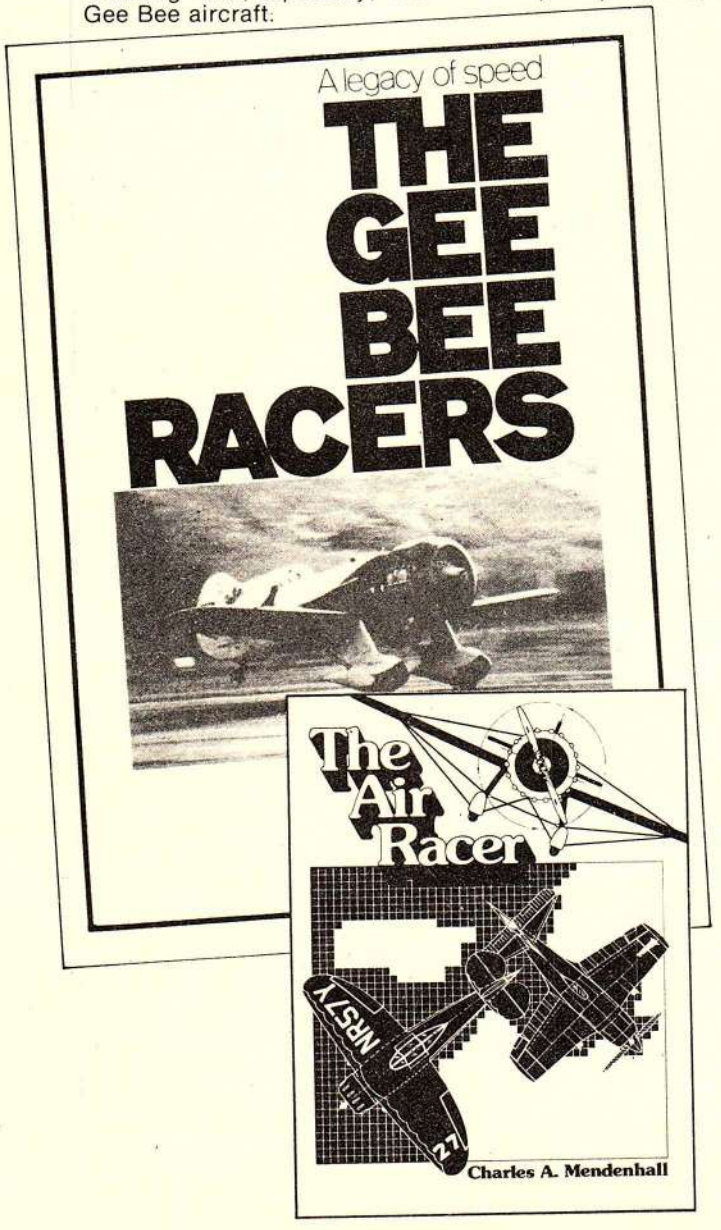

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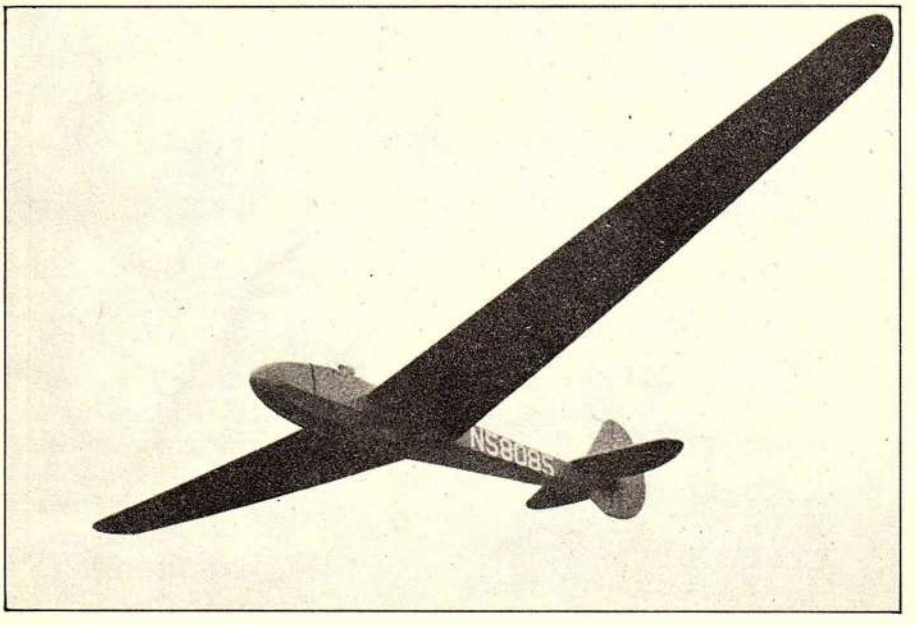
scale SOARING

After a brief absence, our sailplane columnist returns with some ideas about tow hooks, and some new sailplanes and books.

By Jim Ealy



Jack Hiner's flat-top LK-10 is scratchbuilt. Model is towed from a double bridle which attaches to two towhooks, one at each spar root under the wing. (Jack Hiner photo)

We hate to open our column this month on a note of tragedy, but we must pass on to the soaring community the sad news that one of the heroes of soaring is no longer with us. Hi Johnson lost his life in an unexplained full-size soaring accident, when the newly refurbished sailplane he was flying suddenly became erratic on the tow and then started to shed parts. No definitive cause for the accident has been determined.

Hi was the "grand old man of soaring," and his contributions were far more extensive than the soaring items we are familiar with today. He was heavily into control line, years ago, and was instrumental in developing linkages and hardware for Ukie flying, as well as engine development. His company did vacuform work for many of the industry's largest kit makers, and you've probably used a Hi Johnson canopy and didn't even know it. Hi was about to release his latest kit, a scale PIK 20. Hi Johnson knew more about soaring and the theory of flight than most of us can ever hope to learn, and he was always willing to share it.

* * * * *

The soaring scene is looking more and more active, when it comes to new developments in scale. Circus Hobbies, of Nevada, is doing a fine job of importing the Graupner scale sailplane line. The Cirrus '75 and Mini-Nimbus are two superb examples. They have composite construction fuselages, which are about the strongest thing going. The modeler gets the wings pre-skinned with veneer. These kits have been proven to be reliable performers, but they admittedly do fit into the category of Stand-Off Scale, because of their lack of scale detail and mediocre outline. We have seen these planes subtly modified to be highly competitive in the static scores, and still retain very docile flight characteristics. The flight performance is due primarily to the use of true Wortmann-type airfoils. These slightly undercambered sections, with their pronounced Phillips entry, give a very good lift coefficient, and these wing sections seem to be at their best in the 18-24 oz./sq. ft. wing-loading which these planes exhibit.

At the time of this writing, we can't guarantee that Circus Hobbies is still going to continue its exemplary policy of importing scale sailplanes. Gerry Nelson, who had been heading up this new organization, and who has been a soaring buff since way back when, is no longer affiliated with the company. It will remain to be seen as to whether Circus Hobbies will continue to be counted among the nice guys of scale soaring.

Kenn Rolin, of the Sailplane Factory in Pennsylvania, has been deeply involved in getting just about everything he can get his hands on from overseas, to stock in his shop. If he is even partially successful in getting the extensive line of merchandise he was touting at Toledo, there will be a sudden and dramatic growth in scale soaring.

Kenn has also been instrumental in forming an organization specifically for the scale soaring buff. The North American Scale Soaring Union (NAS^{2}U) is expected to get involved in coordinating Scale events at major soaring contests. The group will be representational of not only the modern glass ships, but also the vintage machines. For more information, write directly to North American Scale Soaring Union, P.O. Box 341, Red Lion, PA 17356.

I received a long and interesting letter from Jack Hiner, which went into some length about the proper position for the tow hook on a scale sailplane. Jack has designed and flown a number of vintage scale ships. These planes tend to have very deep fuselages and, as a consequence, the relationship between the attachment point for the tow ring and the Center of Gravity has been a source of dispute for many moons.

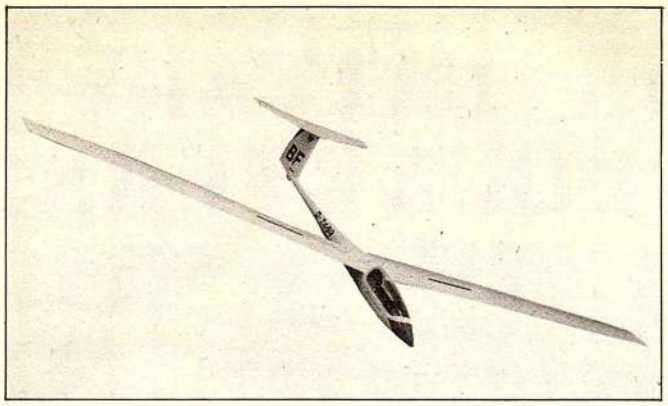
Some modelers maintain that the tow hook should go directly under the C.G., so that when the plane is

under tow, the downward vector (pull of the line) is straight down from the pivot point (C.G.). Others say that the tow hook attachment should be 15-25 degrees ahead of the C.G. (with the C.G. measured straight through the fuse). As one can imagine, as the fuselage on the sailplane goes from 2 inches (on a typical glass ship) to 6 inches (for a deep-bellied vintage ship like the Grunau Baby), the tow ring could wind up being pretty far forward. The more forward the hook, of course, the harder it is to "rotate" the model into a nose high position to get the maximum tow from the launch. The further back the hook, the model will lose some lateral stability (it can virtually spin about its C.G.). The further back the tow hook, the greater the stress on the wings, as well.

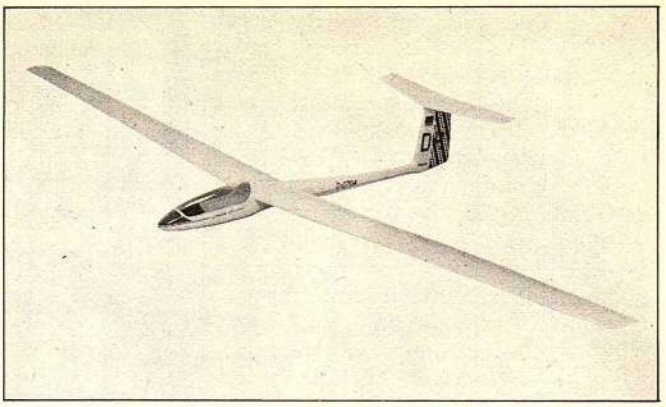
So what's a modeler to do? If the tow hook is too far forward, the model may have such a poor rate of climb that it actually tries to overrun the winch line. But, on the other hand, a heavy scale model on an aftward tow position is almost asking for a crash. The best tow hook position, in the final analysis, must be determined experimentally for each sailplane. Always start at about 20 degrees ahead of the C.G. Remember to measure from a theoretical C.G. which is located in the center of the wing's thickness (no matter whether the plane is a high or low wing design. Find the theoretical Center of Gravity on the side view, then measure along a line 20 degrees ahead of this.

Actually, this wasn't the gist of Jack's letter. His comments were directed to the correct vertical location of the tow hook on the fuselage. As mentioned, a deep fuselage creates problems because the tow position is actually changing as the model rotates at the launch. With the model parallel to the grond, the tow hook may be oriented more than 20 degrees to the C.G. But, as the nose picks up and the sailplane starts to go up the line, the angle of pivot approaches the 90-degree angle. Imagine, if you will, a fuse that is some 3-4 *feet* deep, and how radical the tow characteristics of the model would be!

As usual with scale ships, the position of the tow hook typically coincides with the placement of the landing wheel (for the same reasons). In the full-size soarers, it wasn't unusual to have the tow hook inside the wheel well. Most often, of course, the towing was done from the nose of the airplane, even when bungee launched. Since we can't ac-



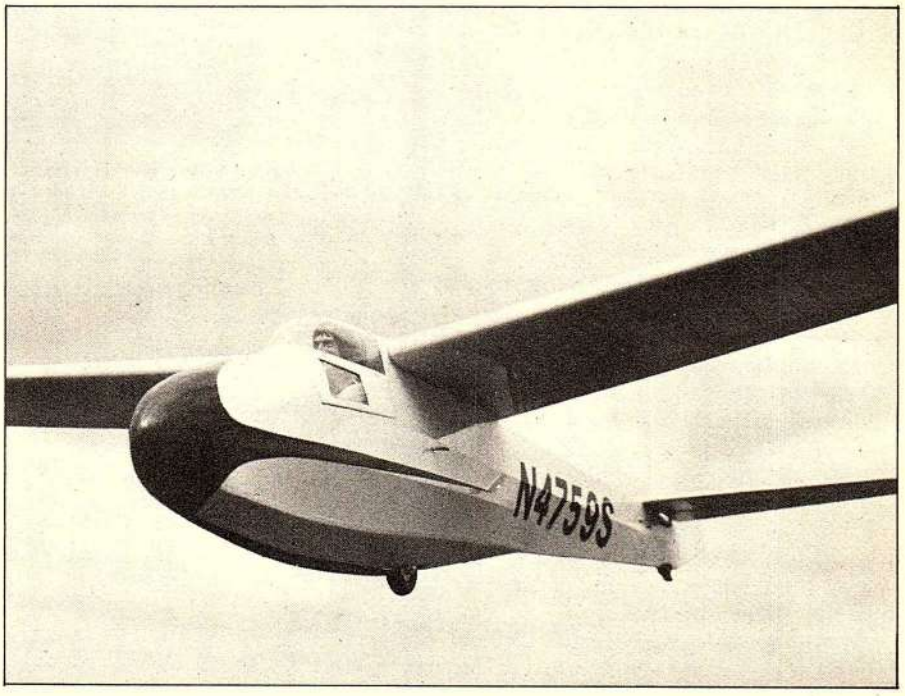
The Mini-Nimbus, from Graupner, is pre-fabbed. Span is 11'6", and the kit features an epoxy fuse, pre-skinned wing, and ability to use up to 6 functions (flaps, ailerons, elevators, spoilers, landing wheel and towhook). (Circus Hobbies photo)



Graupner's Cirrus 75, has an epoxy fuse, and veneered foam wings. The span is 9'3½". (Circus Hobbies photo)

commodate any of these options, the towing location must be somewhere convenient, so that the wheel or other protuberances don't foul the towline, and it should hopefully minimize the vertical component of the C.G./towhook inter-relationship.

What Jack is presenting is nothing new, but it is worthy of consideration. Attach two towhooks, one on either side of the fuselage. But, instead of hooking them up to the belly of the fuse, or even the sides, the tow hooks are attached to the *wing*. The idea here is to absolutely cancel out any deviation from the



Jack Rakusan's K-8b, from the Svenson kit. Note the small towhook attached at the side of the fuselage. Only one hook slews the model sideways, while a hook on each side gives a smooth tow. (Hiner photo)

C.G. tow location, and this system should do it.

Some fliers have compromised with an off-center tow hook mounted on the side of the fuse, halfway up. This seems to create a terrible yaw on ships with only minimal side or fin area. so it does have its disadv[illegible]s. But, I've noted that most mod[illegible]ith a tow hook 2-3 inches below the wing start to get radical on pitch-up if the hook is on the bottom of the fuse. This short 2-3 inch moment arm is enough to make those first few seconds of launch a real terror. Typically, the plane surges upward, as the tow hook position causes the plane to pitch nose up, then the line goes slack for a second as the initial momentum is lost. In that split second, the model is lost.

The wing-attachment system works very well, providing that there are no struts to get in the way. Since the tow hooks are glued right into the spar area, the fuselage doesn't have to be reinforced to take the towing loads. Don't be concerned about getting the two tow rings to release, for the bridle enables this to happen easily every time. You can also use the bridle concept with two tow hooks halfway up the fuselage.

No matter where you decide to place the tow hook (or hooks), the actual launching procedure is the real key to a safe and successful flight. A good heave upward at 60 degrees, with the winch at full power, is what's needed. The launch height is determined within the first 20 feet of the flight, so get all the energy you can into that throw. Don't be afraid to stress the wings too much at this point, for power and acceleration are what's needed. After the plane has reached about 100 feet, the winch power can, if necessary, be reduced. Sometimes it may be even necessary to apply a slight amount of down elevator to keep the model moving through the initial transition form the launch throw to the winch power.

The other option is to ROG. Some models are too flimsy to hand launch well. This is especially true of the vintage machines with intricate fuselage bottoms. Also, those large and heavy machines like the growing breed of 1/3-scale and ¼-scale aircraft, actually can only be launched via a rise off ground. I didn't believe it, either, but just a few launches this way will make you a believer, too. Remember to stand on the winch, and let the line get only reasonably tight. The plane will slide a short distance, then rotate nicely

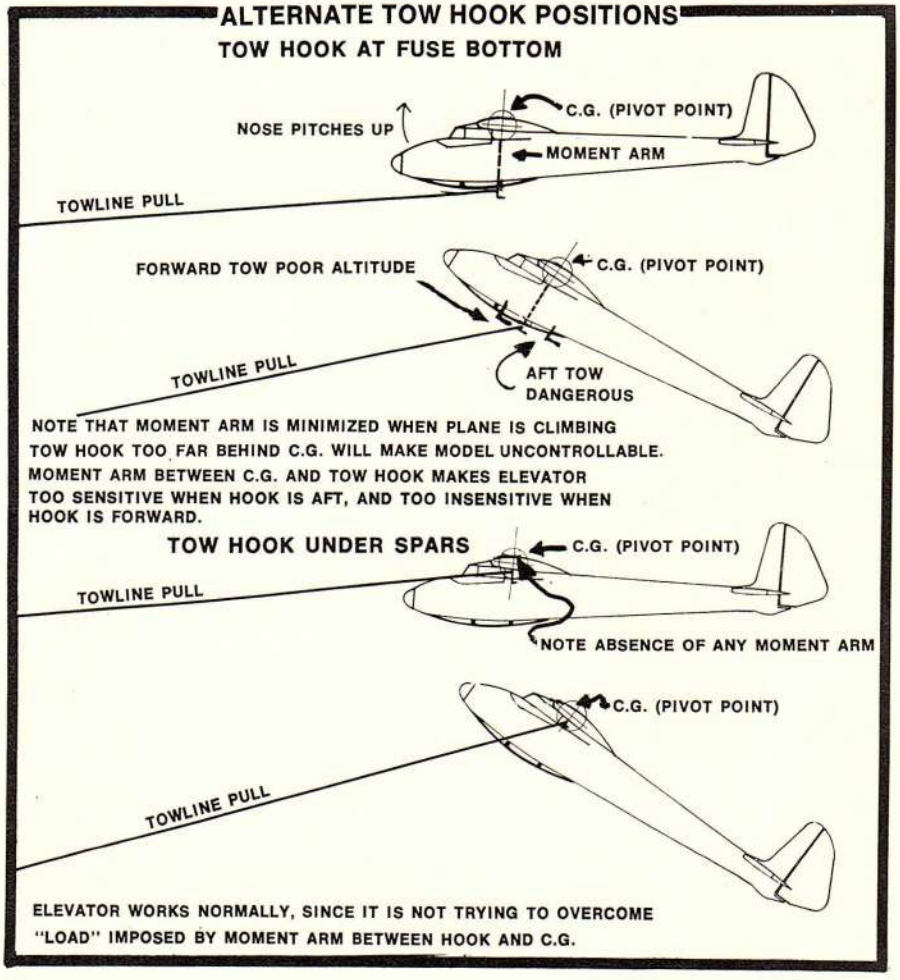
Eugene Bornoski's Twin Astir is an original design. The 120" span model weighs only 5½ pounds. (Hiner photo)

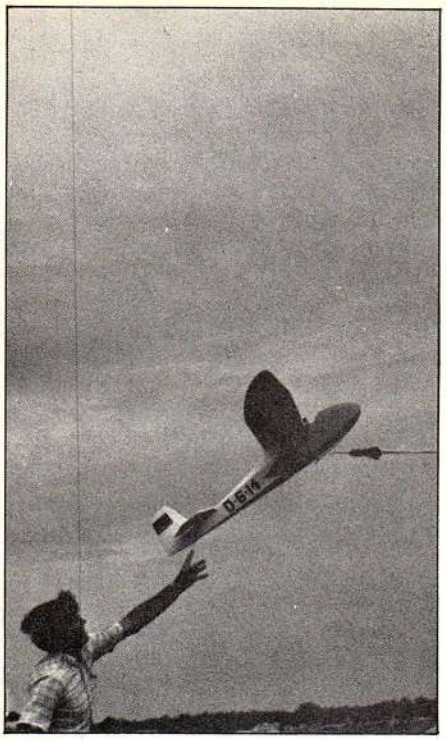
to the correct upward angle. Keep the winch power on until the plane is well clear of the ground.

I have launched deep-fused planes like the Grunau Baby and Zogling with a bottom tow hook position. I did it with an ROG launch, and the launches were the easiest I've ever had, and the most scale like, to boot.

* * * * *

As many of you know, Solent Sailplanes, of England has gone out of business. This is too bad, for they were a good source of scale sailplane products. Let's hope someone else will take over the molds and production rights to some of their superscale machines. On another front, Pacific Sailplanes, while keeping a relatively low profile, is still going strong and is expected to be releasing some new designs at any time. There's still a lot of banter around the local flying fields about judging scale sailplanes. Here's a new twist from down under in New Zealand. Snow Fenn, Editor of the New Zealand Soaring Society *Journal,* has written of an idea which has proven itself well in contests there. The





Earl Kennedy's Grunau Baby IIb, being launched at the '80 Nats. Note the high angle of attack and good acceleration at the moment of launch. Model from the Archaeopteryx Avion kit. (Ealy photo)

system is a variation on the pilots-judge-each-other concept. Each entrant gets two score cards at the beginning of the meet. After all flights are logged, he uses one to vote for the model which performed the most prototypical scale maneuvers. The second card is used to record his choice for the most scale-like machine.

Obviously, the idea is to eliminate the slow morning drag of sitting around waiting to get the static judging out of the way. On the other hand, the flight judging is done by those who are in the same peer group; and who can bitch about the winner when he's selected this way? Since both static and flight judging are somewhat subjective, anyway, the system has some inherent merits.

Some of the immediate drawbacks we see are that each and every flier, now that he's a judge, must watch every flight performed by every model. How successful can a pilot be in determining the winner if he spent most of the day trying to repair his model, or if he was getting a beer when a particularly hot pilot was in the air? It would seem to me that the secret under such a system would be to fly almost last, so that your flight was fresh in everyone's mind. Then there's always the "buddies" who vote for each other, etc. The pros and cons of the system would have to be weighed in each particular situation.

Kenn Rolin had proposed here on the East Coast, that the sailplanes all be judged only once at the beginning of the year, and that they not be rejudged unless improvements were made. This proposal was never adopted, which I think was a great loss to scale soaring. Many overseas Editors and correspondents have written to me saying how great the idea was. Oh well, the best laid ideas of mice and men, I guess.

* * *

I have had some inquiries about the address of Uwe Gewalt. The full address is: Uwe Gewalt, Flug, Schiffs-und Automodelbau, Albstrasse 22, Reutling, 7410, West Germany.

Martin Simons, Editor of *Australian Gliding* magazine, has just published a book of sailplanes. He has thoroughly researched over 100 sailplanes, along with 3-views and photos. He did his homework, and he has corrected a lot of previously inaccurate information. The price of the book will be $30, and I expect to have a reasonable supply of them available under the Archaeopteryx Avion address.

Here are four other books I'd recommend. *Motosegeln,* by Helmut Penner; *Start in Den Wind,* by Peter Reidel; *Die Segelflugzeugs in Deutschland,* by Dietmar Geistmann; and *Die Geschichte des Segelfluges,* by Georg Brutting. These are obviously all with German texts, but the photos and 3-views are well worth it. All these titles are available from: Motorbuch Verlag, Postfach 1370, Stuttgart 1, West Germany, 7000.

That's it for this issue. Keep those cards and letters coming, as well as the reports on scale activities in your area. "May the wind be at your back, except at launch!" □

In 1979, one of the big hits of the Toledo Show was a big 108″ span Cessna 172. The Skyhawk was just a prototype, sitting on the display tables. The fluted aluminum ailerons and flying surfaces, the authentic oleo-strut nose gear and the other scale features (such as optional operational flashing beacon), were getting so much attention that the man responsible for designing this monster Skyhawk decided to kit the model. Ordinarily, such an occurrence is everyday fare at Toledo, but the difference here was that the man behind the airplane was none other than four-time South African Scale Champion Chris Sweatman.

Actually, the response to the big nine-foot Cessna back home in South Africa had been so tremendous that Chris was pretty well determined to make a few kits for the locals. Those who had seen it fly just had to have one. After all, anyone looking at so large an airframe would immediately start looking around for a way to hide the head of the chain saw engine under the cowl. Chris' home field is 5,500 feet above sea level, and the Skyhawk virtually leapt off the grass runway. Boy, what a big engine that must be!

What sold the local modelers on the Cessna was that it wasn't a 2.4 c.i. gasoline engine in the 172G . . . nor was it a twin, or even a belt-driven .90. The model actually flew on a stock Webra .61 Speed! At 14 pounds. that's really all the power needed to get decent performance.

Much of the success of the Cessna is from its light weight. How many giant-scale models can look so big, yet fly on so little power? Chris had gotten the idea from the six-foot Cessna 172 which he had built from the Complete-A-Pac kit. The whole

The big Cessna is exact-scale, yet it weighs so little that it flies well on a .60.

QUARTER-SCALE CESSNA 172G SKYHAWK

A pleasant surprise, a 108″ span model which doesn't need a gas-burner to fly. Believe it or not, a good .60 provides enough horsepower for this ultra-deluxe kit. By Len Salter **Photos by the author**

secret was wingloading, and Chris felt confident that he could develop a kit and still keep the weight under 20 lbs. Even at that extreme weight, the model should fly well on a good .90.

Naturally a man of Chris' stature doesn't just jump into a venture like this. The Skyhawk would have to be impeccable in scale detailing. What would happen when the full cockpit interior (the plane would look barren without one) and all the goodies were added? First, expert scale researcher Doug Burchell was contacted to verify the plans. They were deemed very accurate, so the wood for a prototype was cut. Charles Goedhals and Keith Bowles volunteered to do most of the construction.

It was agreed that the emphasis would always be to keep wingloading light, so that scale speeds could be maintained. However, since this was to be a mass-produced venture, the practicalities of mass production had to be remembered. It wouldn't be possible to carve out a cowl block, but rather the parts would have to be supplied pre-finished. Chris had built enough kits where corners had been cut to save a buck, so he vowed to keep everything first class. The landing gear would come pre-soldered, and wheels, tank and all hardware (the flaps have a scale operating mechanism) would be included. All proof of scale would be there, of course, since the plane could qualify for any scale competition because of its low weight. The nose gear strut would be a functional oleo one, and the wing struts would be aluminum.

This was a pretty tall order, for a model of this size can take yards of balsa wood. The sheeting alone is a stack of wood almost a foot high! The forests of South Africa yield a very unusual wood. It's got some properties of balsa, great strength and resilience, and it shares some of the properties of bass or ply. Called Mugongo, it's an amazing building material, and this has to be one of the few kits in the world which uses it. Once you've tried the stuff, you'll be tempted to go to Africa on a wood safari.

Work went slowly, for it was necessary to fabricate master templates and patterns. Molds were made for the wheel pants, and a plug carved for that huge cockpit windscreen. The fuselage was almost as long as an average man is high. When all the dust settled, there were over 200 pre-cut balsa and Mugongo parts slated for the kit. The structure was extremely strong, and it looked as if the final weight would be under the projected 20 lbs. Prototypes tend to get heavy, since one is always learning the hard way—by adding two pieces where one would have done the job.

A fly-by at 5,500', as the designer proves his theories by flying the model at a field that is over a mile high.

The only thing remaining was the scale fluted flying surfaces. To eliminate these would defeat the whole purpose of an exact scale airplane. But, there were 289 flutes, and to ask the modeler to apply each one individually would be foolish. They had to be molded, but plastic was not suitable . . . too heavy and also subject to warpage. Fortunately, Tony Beck came to the rescue. An engraver, by trade, he quickly worked out a mold which would enable thin aluminum to be shaped in a fluted sheet. This proved the ideal solution, especially since many of the Skyhawks had natural aluminum finishes.

Chris got a call that his airplane was ready. By the time he arrived at the flying facility, the winds were whipping at 40 km/hr. What a predicament! Here was a lightly loaded model, which would probably have the penetration of a feather, and it was even untested, at that. The plane and the weather seemed totally incompatible. But Chris couldn't wait, and the model did have a .91 under the cowl. The decisive factor was that a cool-headed pilot like Sweatman was going to be at the sticks.

The wide main gear presented no problems on the taxiway. The plane almost leapt off the runway when power was applied, and the Skyhawk surprised everyone by climbing out smoothly through the ground turbulence. Penetration was no problem, and it was decided to try some maneuvers. But first the gradual turns were tried, and the Cessna flew without the need of coordinated rudder. Only at the lower speeds of a landing approach was the rudder even required.

Some stall turns were tried and, even in the gusty conditions, the model behaved admirably. The loops wouldn't have been winners in a contest, but they did show that the plane was tracking true and straight. The glide slope for the landing was kept unusually steep, and the 172 flared nicely just inches above the runway and settled in for only a slightly bouncy touchdown. We could tell by the smile on Chris' face that the kit project had just received his seal of approval.

Chris kept emphasizing the fact that most modelers have .60 engines, and that the Skyhawk had to be kept practical enough to be a rugged airframe, yet light enough to perform well on 10 cc. One prototype doesn't prove everything, of course, so it was decided to build another machine, using the kit jigs and templates to simulate the actual product the modeler would receive.

Paddy Hamilton stepped forward and said he would get the second machine done in record time. The World Championships were coming soon, and Chris wanted to have the plane on display at the meet. Everyone shook their heads in amazement when the model arrived only two months later—a remarkable feat,

The kit has over 200 pre-cut pieces of wood, as well as all the hardware and accessories.

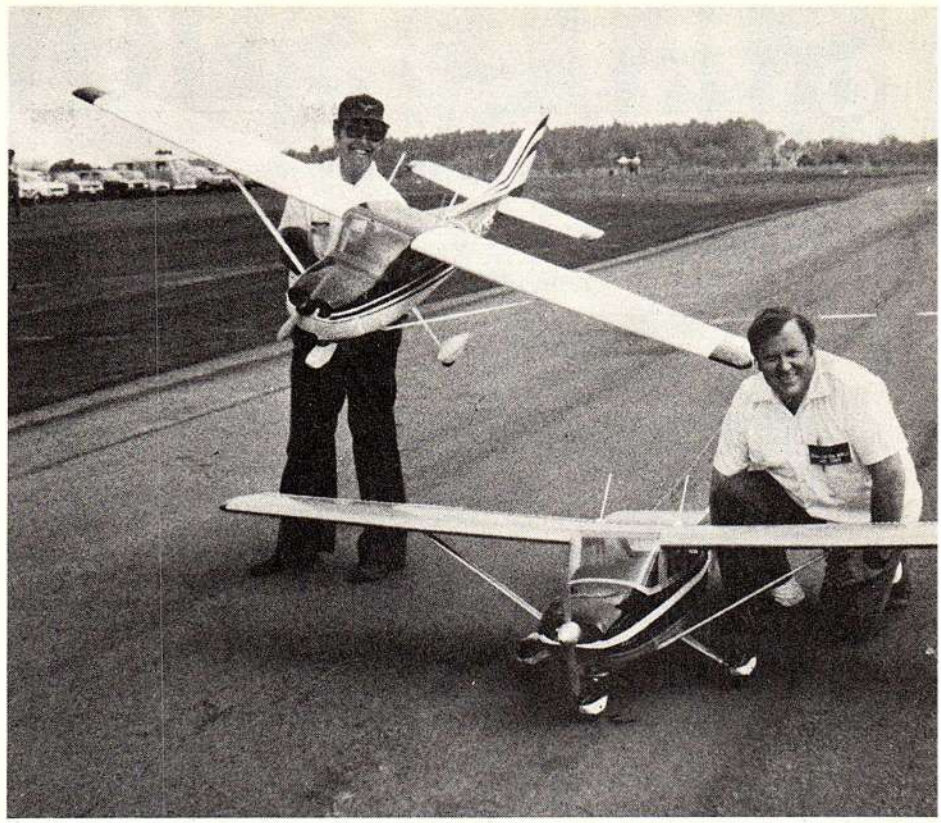
considering that each part had to be hand-cut from the templates, and there are over 200 components.

In the interim, Chris was running all over South Africa trying to get kit production going. There is no model industry in this country, so that Chris was re-inventing the wheel at every turn. As a matter of fact, the Cessna kit is probably better than most kits on the market because there are more handmade parts in those two big boxes than in most commercial kits. The kit is very expensive. Ralph Brooke imports the model in the U.S. for $395.95. Remember that the kit comes in two boxes, one weighing 14 pounds, and the other nine. Both are oversized kit boxes, and are packed solid with wood and hardware. As mentioned, the stack of sheeting would probably cost about

$100. All the deluxe extras make this a very good value.

The final proof of the pudding would be whether prototype #2 would fly at Chris' 5,500 ft. altitude flying field. The model was fully decked out, with all the scale trimmings. It weighed 7.5 kilos, which would be typical of the kit-built versions. The Webra .61 was fitted with a fine-pitched 14-4 prop. The Cessna got into the air gingerly, and climbed out well. There really wasn't much of a difference in flight speed between the .61 and .91 powered versions.

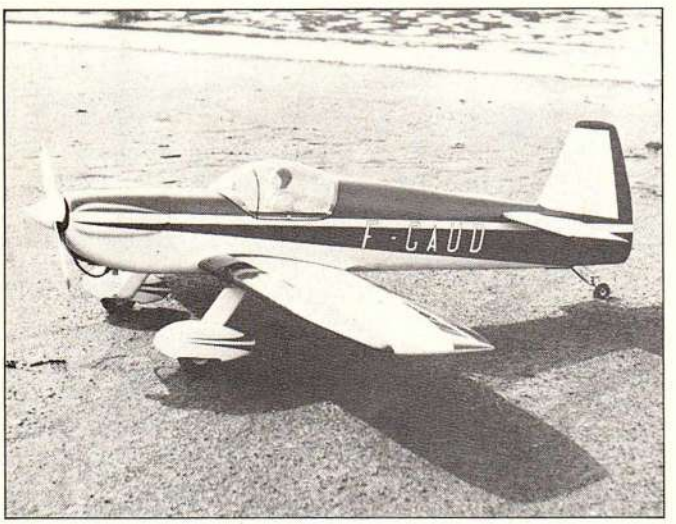
Where the lack of power did show up was in the loops and rolls. Considering the altitude, this came as no surprise, but the 172 would still do all the maneuvers on only a .61. Don't feel pressured into shoving a .91 under the cowl, for this is not one of those models that claims to fly well on a .61 . . . only to turn out to be a dog when you build it. The 172G is exact scale, and it is designed to be a full-fledged contest machine. The kit price may seem steep, but there are more parts in the kit than you can spread out on two workbenches. This Cessna is sure a winner . . . and in a big way! □



A little fuzzy, but the photo gives a feel for the size of the 108" span Cessna. Chris Sweatman is standing, while builder Keith Bowles poses with his version.

SCALE SHOWCASE

Items for the Builder of the Model



CAP 20-L MOVED AGAIN

Higgins Aero Company, whose giant-scale CAP 20-L we reviewed in the August issue, has had an ownership change. Now billed as "Higgins by Contempo Enterprises," the company is now at yet another address. For all of you out there who were inconvenienced because our article stated that the old Indiana address had been changed to a San Marcos, California, listing, then please excuse our further inability to keep you apprised . . . the latest address is in North Hollywood! All future correspondence should be addressed to: Higgins by Contempo Enterprises, 11611 Cantara Street, North Hollywood, CA 91605. Phone (213) 768-2800.

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JEMCO BECOMES MARK'S

Mark's Models has recently acquired the Jemco line of scale aircraft. Actually, Mark's had been handling most of the actual kit production for some time, so the merger of these two quality companies was almost an inevitability. What this will mean for the scale modeler is better service, more extensive availability of kits and accessories, and a high level of quality control. Already back orders are being brought up to date, and a good flow of product is guaranteed in the future.

All the .40-sized models are now being shipped under the Mark's Models/Jemco label. The SBD custom kit will still be retained by Jim Meister, since this is a virtually handmade kit of limited production. For more information on the full kit line, contact: Mark's Models, 1578 Osage Street, San Marcos, CA 92069.

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BYRON'S BANANAS!

While the title isn't necessarily a declaration of the mental state of the leading scale manufacturer in the United States, it is true that Byron does have a whole new line of "Bananas." The affectionate soubriquet of the Beech Bonanza, there are no less than five different versions of the famed lightplane available.

The flagship of the fleet is the time-honored F-33A Bonanza, which is the basic four seater that is seen at most airports. This is a 66" span machine, with a generous 700 sq. in. of area (it's no surprise that the same wing is used on all the variants). Designed to fly on a .60, the model accepts up to six channels, with optional flap and retract operations.

The only difference between the F and the A-36 models is the window configuration. Perhaps an academic difference, but you can't say that this isn't a full line of Bonanzas. All of the kits come with vacu-formed fluted skin detailing for the stab, elevators and ailerons/faps. Such goodies as a scale nosewheel struts and molded-in fuselage detail make these models more than the usual semi-A.R.F. products.

The famed V-tailed version isn't neglected, but you'll find that the stabs are a little on the large side. Still, this will probably prove to be the most popular of the Byron Bonanza line. The kits all feature fiberglass (polyester) fuselages, and foam wings and empennage. For a few dollars more, a nicely molded cockpit interior and instrument panel is available for the civilian versions.

There are two military variants in the line. The T-34B was the original military liaison aircraft, later to be updated to the turbo-charged T-34C Mentor version. Both options are available in the Byron kit line. We will be doing a kit review of the T-34C in a future issue.

The concept behind the Bonanzas is to offer the modeler a "complete" kit, with only engine and radio needed to get in the air. The other Byron kits have typically offered such extras as wheels, tank, hardware and some covering materials. The Bonanzas will continue this trend, with very complete packages. What is amazing about the models is that they are very traditional, with no belt-drives or other "gimmicks," and also that they are not giant-scale, but rather .60-powered machines.

We think that the most amazing thing about the full complement of Bonanzas is their price range. Considering that they are complete kits, the price range of $138.08 to $168.30 is amazing. That's quite a value for the dollar, and it looks as if they will all come out very light, and be easily within the 8-9 pound limit the factory is listing. This will make for some really fun aerobatic performance, with all the stability that makes the Bonanzas such universally accepted aircraft.

For more details, contact your local dealer, or write directly to: Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

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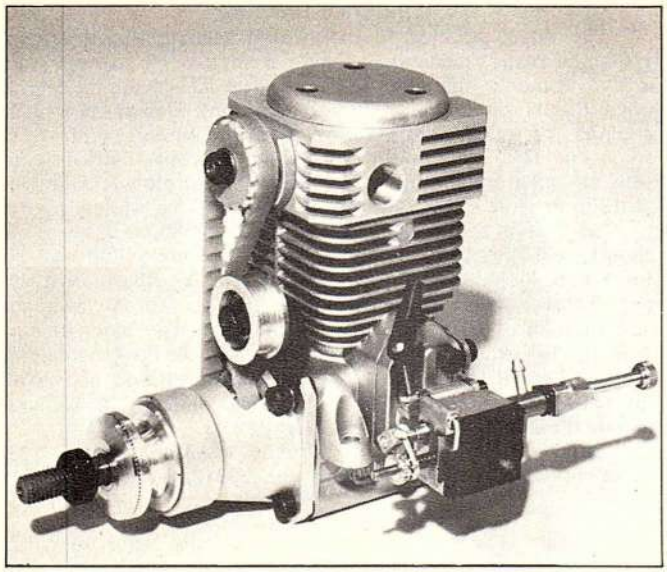
WEBRA 4-CYCLE

One of the big revolutions in power plants for scale aircraft has been the 4-cycle engine. Unfortunately, the gasoline engines and the advent of giant-scale have dwarfed the attention paid to these revolutionary engines. The 4-cycle engine runs quieter (they don't even need a muffler), has more brute power and runs smoother than the equivalent displacement engine. As a matter of fact, Peter Chinn recently commented that the Webra .91 4-cycle had the most power for its displacement class.

The Webra can turn a 14-6 prop at nearly 9,300 rpm. That's pretty heady stuff for a .91, and the engine seems to



respond better and better with more prop. Circus Hobbies, who are the U.S. distributors for the Webra line, now have engine mounts specifically for the 4-cycle available. The modeler can also get an in-flight mixture adjustment needle valve assembly, and there is a pump available on a special order basis. The engine uses a steel reinforced timing belt, which should prove very reliable and durable. The 4-cycle tends to be a bit on the heavy side, weighing 32.8 ozs. For most scale applications, the extra nose weight will be most welcome.

If you want an engine that will swing a large prop, make so little noise that it's hard to tell when it's running, and has one of the lowest vibration levels, then the Webra .91 4-cycle is worthy of your consideration. Look for this one at your hobby shop, as distributed by Circus Hobbies, 1241 E. Glendale Ave., Sparks, NV 89431. Price $319.95.

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¼-SCALE STINSON VOYAGER

Here's a big 101″ span version of the Stinson Voyager, one of the most deluxe passenger aircraft ever designed. The model is intended for a Quadra, and builds to less than 21 lbs. With functional flaps, a five channel radio is needed.

The kit is a deluxe offering. The doors are functional, and provide not only scale realism, but also access to the radio. The huge fiberglass cowl is big enough to house an on-board starter. The model comes with pre-shaped leading edges, and there are vacuformed control surfaces and other molded parts. Construction is very traditional, with plenty of balsa and plywood. The instructions are well detailed, with plenty of supplemental photos to aid the builder.

From the reports we've had, the model is extremely docile, yet has plenty of maneuverability. Its sheer size adds a lot of visual impact to the model's performance, and the Stinson

would make a good transitional airplane for the experienced builder.

Kits are available at hobby shops, or order direct from: Realistic Models, 4105 Wadsworth Ct., Annandale, VA 22003. Price $285.00.

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HUGE HAWK

Probably one of the most colorful biplanes was the Navy's Curtiss P6-4 Hawk. Its taloned wheel covers and gaudy paint scheme made it one of the classics in the biplane field. And Wendell Hostetler, who has already made such thrilling bipes as the Liberty Sport and the Skybolt available to the quarter-scalers in plan form, is now offering the P6-E as a full plan set. Designed to accommodate engines in the 2-5 ci. class, the model is of rather conventional construction, with balsa, ply and basswood. The bipe spans 84″ (1,798 sq. in. area) and is expected to build at 32 oz./sq. ft. in the wingloading department. There are a few subtle deviations from scale, in order to improve the aerobatic performance, but the changes are so slight that only the most trained eye will ever spot them.

The plans come on two profusely illustrated 42 x 88" sheets, and a well-written instruction manual and detailed sketches are included. All the hard-to-fabricate accessories, such as the cowl landing gear and wheel spats, are available separately from T & D Fiberglass.

The plans sell for $24.50 (postpaid), which includes the instruction manual. Write directly to: Wendell Hostetler, 1041 Heatherwood Lane, Orrville, OH 44667.

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1/6-SCALE HAWKER

The latest addition to the ever-increasing assortment of 1/6-scale planes coming available from this Florida designer is Vito Tomeo's beautiful Sea Fury. The 77" span model fits Dave Platt's outlines for 1/5-scale, being designed for .90 engines (or a .60 in a prop-driver arrangement). With 1,120 sq. in. of area, the Hawker will build to about 15-18 pounds, with all-balsa construction. The designer's prototype flies well at 18½ lbs. on a .60-powered Maximizer drive system.

Sold as a semi-kit, the plans come on three large 3 x 7' sheets, with plenty of detail drawings, including flap and retract data. Included in the pack are a canopy, fiberglass cowl, and molded glass wing oil and air scoops. Three-views and construction notes are part of the package. The modeler supplies all the wood. The semi-kit sells for $68.00 (postpaid in the continental U.S.). The plans can be purchased separately for $28.00 (postpaid within the continental U.S.). A 5" spun aluminum spinner is available for $22.95.

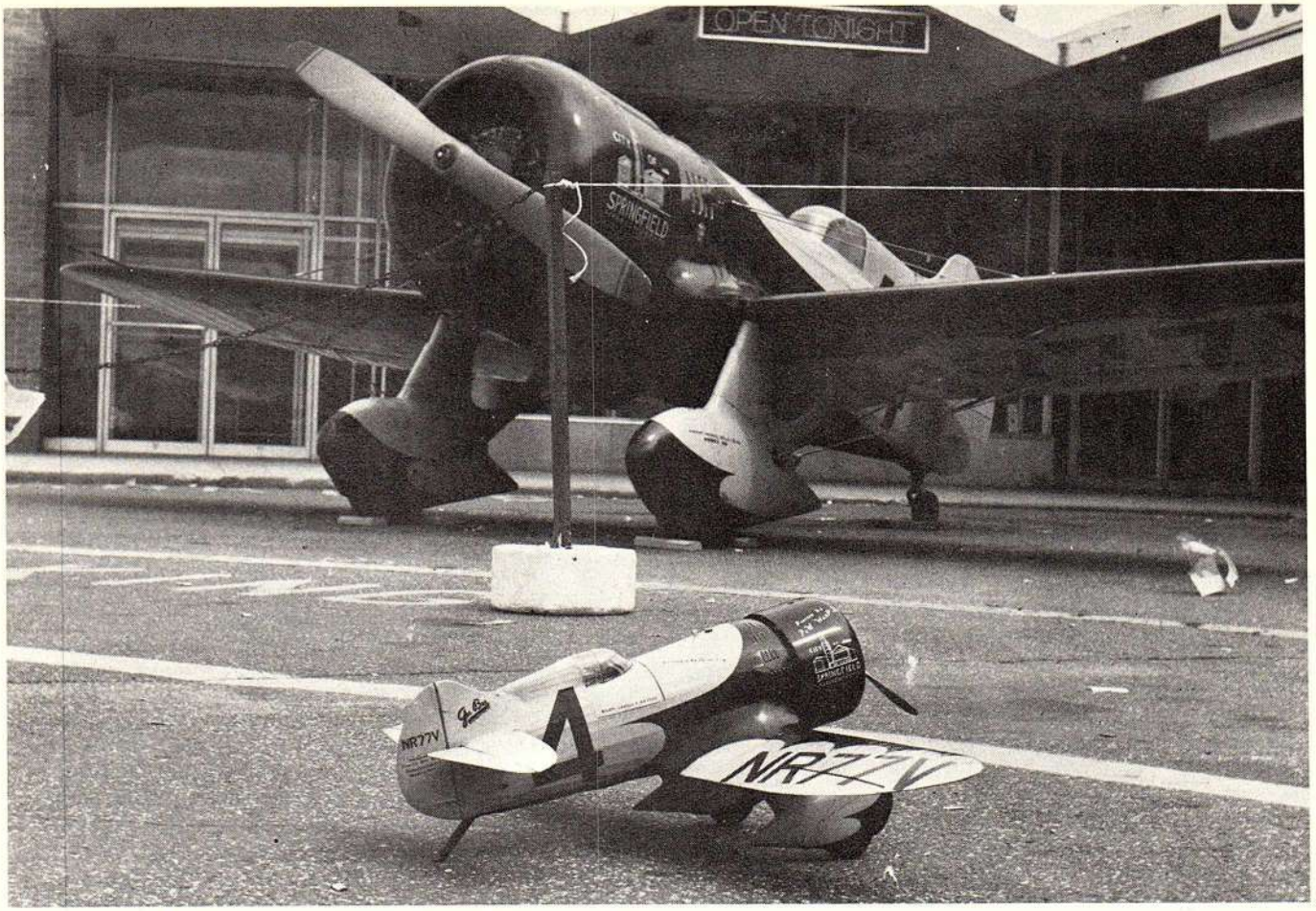
Send for further details directly to: Vito Tomeo, 1050 Alabama Avenue, Ft. Lauderdale, FL 33312.

* * * * *

ARI NOW AAA

Antique Replicas International, whose **Journal** has provided great scale data to numerous modelers, has been merged with the Antique Airplane Association. The Journal will now continue as the official news organ of the Association, disseminating information on replica aircraft, primarily of WW I. We assume that current subscriptions to ARI will continue.

For more information, write directly to: Antique Airplane Association, P.O. Box 127, Blakesburg, IA 52536. □



What it's all about! The R/C version of the Model Z Sportster takes a ringside seat to the replica machine of Bill Turner.

The author of the Gee Bee Model E Sportster article which appears on page 26, reminisces about the challenges of modeling the racers, and his relationship with two of the brothers who built the real ones. By Henry Haffke **Photos by the author and from his collection.**

Modeling the Gee Bees

For many years the Gee Bee aircraft, built by the Granville Brothers of Springfield, Massachusetts, have been shunned by model builders. This has been primarily because of the shoddy reputation they have been burdened with, as a result of the many writers who have reported unfounded accounts of these aircraft. This apparently came about as a result of the spectacular accomplishments and sensationalism caused by the appearance of the speedy racers on the air race scene in the early thirties. Air racing, at that time, was probably the biggest spectator event in existence. Writers were quick to put down in print the stories of the colorful speedsters, always adding bits of sensationalism to the actual facts.

When Lowell Bayles was killed in the Gee Bee Model Z which had won the 1931 Thompson Trophy Race, a national hero had been lost and the grandest of stories were written. Then came the 1932 air races and the two new Gee Bees, the R-1 and R-2. The R-1 set a new world speed record and won the prestigious Thompson Trophy Race. Again, writers had a field day writing about these sensational craft which emerged from the tiny Granville factory at the Springfield Airport.

The two racers were improved for the 1933 races and unfortunately both were eliminated from the races that year when the R-2, making an unscheduled landing at Indianapolis during the Bendix race, had one of

the troublesome aerol struts collapse on landing, causing a ground loop which damaged a wingtip, putting it out of the race. The R-1 arrived, and its pilot, Russel Boardman, became very upset as a result of the R-2's unscheduled landing and subsequent damage. Russ was the boss of the Springfield Air Racing Association, owners of the two craft, and had counted on the money they would win during the races. After refueling and talking to the R-2 pilot, he hurridly boarded his ship and started his takeof run with the heavily ladened R-1. He apparently pulled the craft off too soon—before sufficient flying speed had been attained—and a sudden crosswind gust flipped the R-1 on its back and it ended up skidding down the runway inverted. Boardman was badly injured and died the next day in the hospital. Writers wrote their headlines after having heard of the crash and made up their own reasons for it, not having been present to get the facts. It was actually not known for sure exactly what happened at Indianapolis until about two years ago, when Bob Granville came in contact with an eyewitness to the accident who was able to give an accurate account of what happened in extensive detail.

Through the years, later writers have editorialized about the Gee Bees after having read what those before had written. The stories have gone on and on so that today's aviation buffs know only what they have read, and they naturally believe the stories about the Gee Bees. I was no different, and I also believed what I read. As I became more interested in the subject, I read everything I could dig up on the Gee Bees. I found material in old magazines I went through and, as I read article after article, I noted that from time to time I would read an account of the same situation which would contradict the account of the same thing in another story. This made me curious as to which was correct.

I designed and built my first Gee Bee, a model of the Model Y Senior Sportster as flown in the 1933 Chicago International Air Races by Florence Klingensmith. The model was one of the finest flying R/C craft I had ever flown. I wanted to be able to fly it in scale contests, so I needed documentation on the aircraft. I had only seen two relatively poor pictures of the full-size prototype in an article on the Gee Bees. I started hunting for pictures of the ship, and contacted the normal sources for such information.

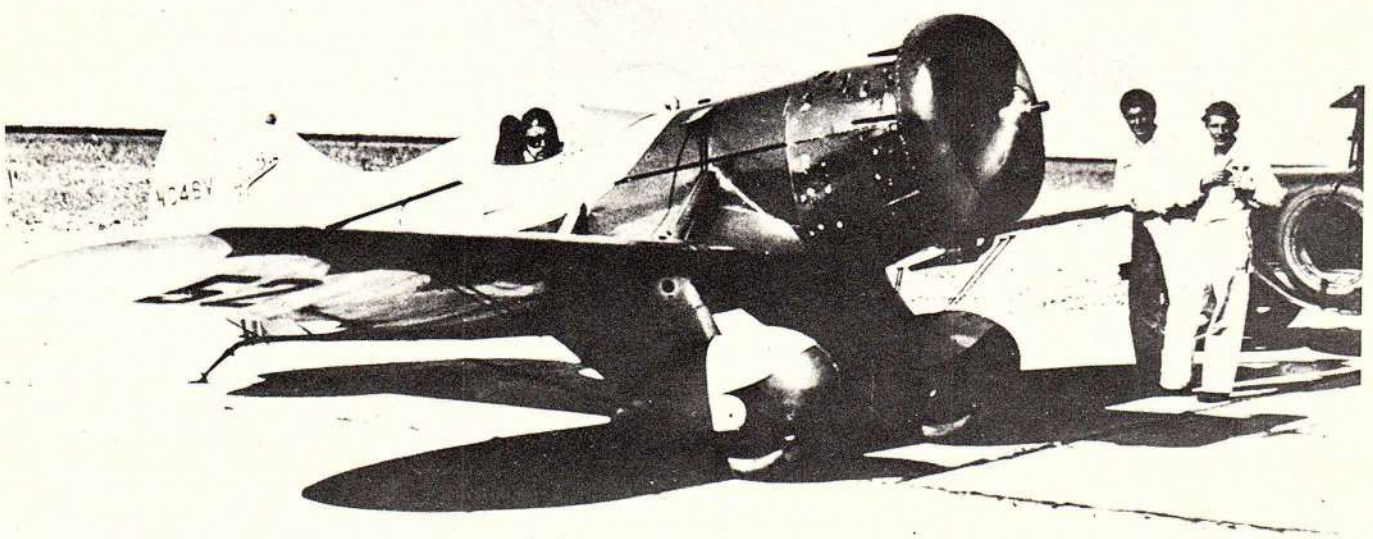
Knowing that some of the Granvilles worked for Pratt & Whitney, they became my first place to inquire. The Smithsonian was contacted, and they had only one picture of the subject, as well as one picture of its sister ship. They suggested three other sources to investigate. I did, and came up with two good pictures from one of them. As my mother and sister still lived about a mile from the site of the Gee Bee plant at the old Springfield Airport, I had them inquire around to see if they could find out if any of the Granville people might still be around.

A year and a half of searching turned up relatively nothing, other than the two pictures from the Smithsonian and the two from another source. Then came the big break when, through the EAA, I came in contact with Bob Granville. He, in turn, put me in touch with his other living brother Ed. I told them both of my needs and asked them many questions concerning the discrepencies in the things I had read. A wealth of information was received from them which only whetted my appetite.

A short time after I contacted these two great aviation pioneers, Ed Granville fell victim to a fatal heart attack. Ed had promised me that when he got his belongings unpacked (he had recently retired from Pratt & Whitney) and had a chance to go through his pictures, that he would loan me the ones that I was looking for. After his passing, his widow, Charlotte, gave them to me.

Bob and I continued to write to each other as fast as the postal system could transport our letters. As I found out the straight facts on things I had read, I became more interested in checking other things and my interest rekindled Bob's activity

The plane which is illustrated (twice) as a scale model in this issue. NC46V had lots of flying time on it before Russ Boardman had a mishap with it.



A moment that made it all worthwhile, as the author prepares to takeoff with his Model D Sportster, as one of the five brothers who built it looks on. Bob Granville said the model flew just as good as the full-size plane.

in the Gee Bee history. Bob tried, and was successful in contacting several old timers who had been involved with the Gee Bee aircraft. From each of them I gained new facts, all of which increased my interest in the subject. For the past three years, I have been collecting and compiling all of these bits of informtion and gathering every picture I could get my hands on.

I had decided that I would write a book telling the real story of the Gee Bee airplanes, but I wanted to tell the story of the Granville boys, as well. Nothing had ever been written on their younger days, and I felt it was an important part of the real story. In discussing this with Bob Granville, he agreed to write this part of the story for me, and we would co-author the book. Bob was very excited about doing the book. I was very saddened when he passed away just a little over a year ago when he suffered the same fate as the other Granville men—a fatal heart attack. At his funeral, I promised his family that I would go ahead with the book. I am still seeking a little more information on their youth which will finalize my research.

After becoming good friends with

Another Model E (#4 in the line) is done in Army yellow and blue. Zantford Granville was killed in this machine, while delivering the plane to a customer.

Bob Granville, my interest in building models of the Gee Bees intensified and, over the past five years, several different Gee Bee models have been built by myself. Four of my friends have built Gee Bees from my drawings. Among us, we have built models of a good variety of the various Sportsters. As mentioned earlier, my first Gee Bee model design was of the Model L Senior Sportster, as flown by Florence Klingensmith. This model was the finest flying R/C ship I had ever flown. It was very aerobatic, but very gentle.

I immediately started building a second model—the other Model Y, which was frequently flown by Maude Tait (and in which she won the 1931 Aerol Trophy race). This also proved to be a fantastic performer and became my contest bird. Both models were .40 powered ships. The models were scaled from the three views in Charles Mendenhall's *National Air Racers in 3-Views*. Later material I received showed these three-views to be not as accurate as one might like. From pictures and other information which I had accumulated, I undertook the job of doing new three-views.

A set of drawings were scaled up to do a more accurate model of the second Model Y (in three inch to the foot scale). I figured this would be a real attention getter, and I started construction. I cut out two complete sets of parts, so that I could also do a model of the other Y. This was before the big move to ¼-size models. It was finally finished early this year, and it has proven to be a fantastic model. It has won both static and flying contests, usually getting the highest flight score. It failed to win in only two contests, when radio failure prevented getting in the required two flights.

Between the smaller version and

(Continued on page 63)

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TWO BIG

HAFFKE'S MODEL E

The man who has designed more Gee Bee models than anyone else, turns his talents to the Sportster E.

By Henry Haffke **Photos by the author**

Five years ago, I built a model of the Gee Bee Senior Sportster Model Y, which turned out to be a beautiful flying craft. In searching for documentation on the aircraft, I eventually came in contact with Bob Granville, who was one of two surviving members of the famous five-brother team which designed and built the great Gee Bee aircraft of the early 1930s. Bob put me in touch with his other brother, Ed, and the two of them answered my request for documentation on the Model Y.

Ed passed away a short time after I first wrote to him, and I never met him—except through our correspondence. However Bob Granville and I became very close friends and I gained a wealth of information on all of the aircraft that the Granvilles had built. Few are familiar with all the aircraft that emerged from their tiny factory at the edge of the Springfield Airport in Springfield, Massachusetts. As I became aware of all of this, my interest intensified and I probed for more information. Bob's interest in what he and his brothers had done was rekindled by my inquiries and together, we searched for more minute facts on the history of these aircraft.

We planned to write a book together, telling the whole story, which has never really been told. The story would be based on facts, not the garbage that has been written, read, and rewritten by authors over the years. My dear friend Bob Granville passed away over a year ago, and I have promised his family that I would complete the book. I need only a few more details about the youth of the five brothers before

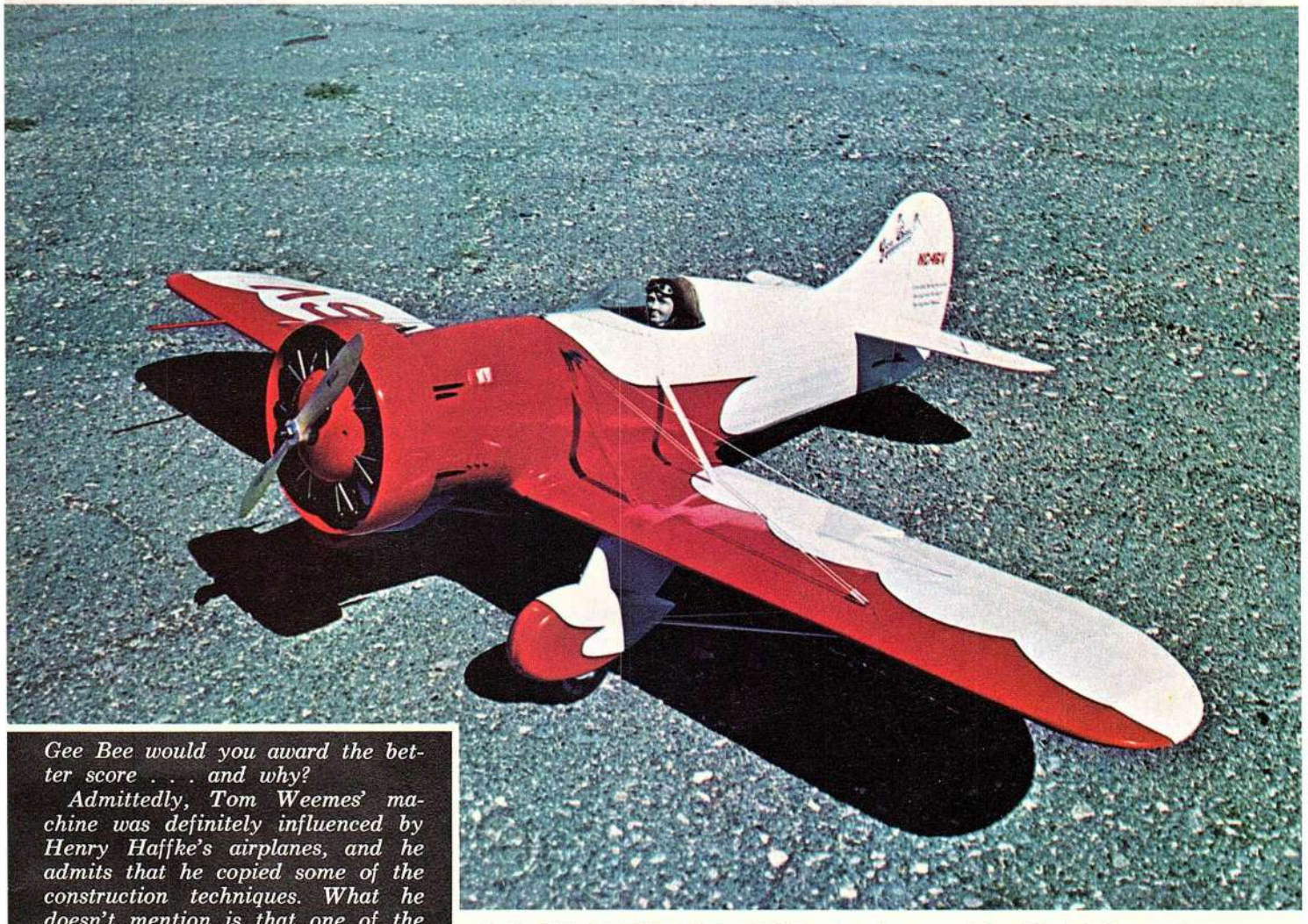
(Continued on page 66)

EDITOR'S PREFACE

Some of our readers may question our sanity in presenting two Gee Bees in the same issue. Not only are the two aircraft the same Model E variant of the Gee Bee Sportster series, but they are even painted in the same identical schemes. Well, we sort of felt that the old saw of "Twice as much is better" applied here; but it was more important to give our readers a chance to compare two independent works. One would think that anyone scaling a specific airplane would wind up having the identical model as anyone else who was doing the same thing. After all, a ¼-scale Gee Bee Model E should look the same, no matter who builds it.

But, the plans show some amazing differences. We urge our readers to order both sets from Hal Osborne, and compare for yourself. The differences may be subtle, as you'll see, but they are there. If nothing else, this set of two parallel articles show just how non-parallel two "identical" airplanes can be. These two machines point up the graphic problems any judge is confronted with. The real question is: If you were a scale judge, which

GEE BEE Es



Gee Bee would you award the better score . . . and why?

Admittedly, Tom Weemes' machine was definitely influenced by Henry Haffke's airplanes, and he admits that he copied some of the construction techniques. What he doesn't mention is that one of the reference sources he was working from was an old set of plans for a Model E done by Henry in FLYING MODELS some years ago. In a way, both modelers are updating some old data!

No matter which model wins your nod for the more accurate airplane, you'll find either one a rare treat. Haffke opts for a .60-powered airframe, for more realistic contest performance, while Weemes shoves a .90 under the cowl, to get hot aerobatic performance. We've seen Tom's model fly, and the .90 doesn't seem like a bad idea, no matter which model you select.

Also, we urge our readers to enjoy Henry Haffke's insights into his background in modeling the Gee Bees. He's met the men who built the machines, and has had that rare opportunity to rub elbows with greatness. Henry's article appears just before this one in the magazine.

(PHP)

WEEMES' 1/4-SCALE SPORTSTER "E"

Here's a Gee Bee that will take all the old myths about how bad these racers fly and turn them into silly superstitions. This .90-sized machine deserves to be classified as a Pattern ship.

By Tom Weemes **Photos by J. R. Naidish**

There's just something innately beautiful about Golden Age aircraft. They all look like they were designed after a bullet. One gets the feeling that they are flying, when they are sitting on the runway. WWII took all the beauty out of airplanes, as they became efficient killing machines, so the Golden Age is only a sweet memory of what real airplanes were all about.

The Granville Brothers were the professors of the school of aerodynamically clean airplanes. Everything they made looked as if it was patterned after a fish or waterdrop. The lines on their airplanes looked as if an artist had brushed them in place . . . they were truly poetry in motion. The striking color schemes, with scallops and bright shiny finishes, made them ideal can-

didates for modeling. The original Gee Bee Model E, for example, had fourteen coats of handrubbed dope. They did this to minimize skin drag . . . but, for me, it served as a good excuse for putting on a showy finish.

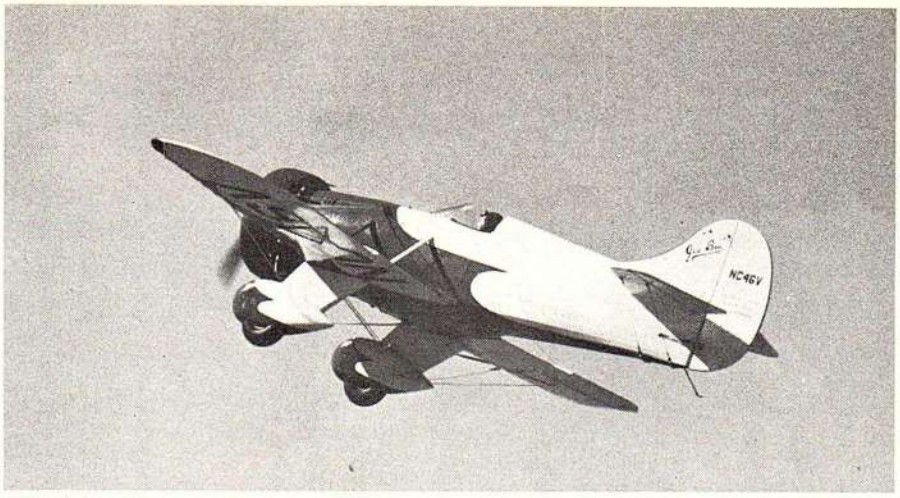
Many modelers like the Gee Bee R-1 and R-2, because they have become the recognized definitive versions of the Gee Bee. But the earlier Sportster series of machines was perhaps more in keeping with the reality of what a '30s airplane looked like. The Sportsters had either NACA ring cowls, with chunky radials hanging halfway out; or they sported in-line engines under squarish-looking cowls.

The Model Ds were the first to use the big, fat wheel spats. The Es were smaller planes, in an attempt to get a better power-to-weight ratio, and they continued the same basic outlines and airframe configuration. The Model E was to become the most popular of the Sportster series, and five of the nine Sportster models were the radial-powered E variant. The paint schemes were either red and white, or Navy blue and yellow, or green and cream. There's no lack of interesting paint schemes in this model.

Henry Haffke has done more to bring the Gee Bees to the attention of the modeling public than any other force. It was actually his two-part article on the giant-scale Gee Bee Model Y in *Model Aviation* magazine which turned my attention toward these magnificent models. Henry's Model Y was a 90″ span machine, designed for a .90 engine. I personally felt that such a large model with a limited amount of power wouldn't suit my style of aerobatic flying. After all, these were to be race planes, and to see one lumbering around the sky would not be prototypical.

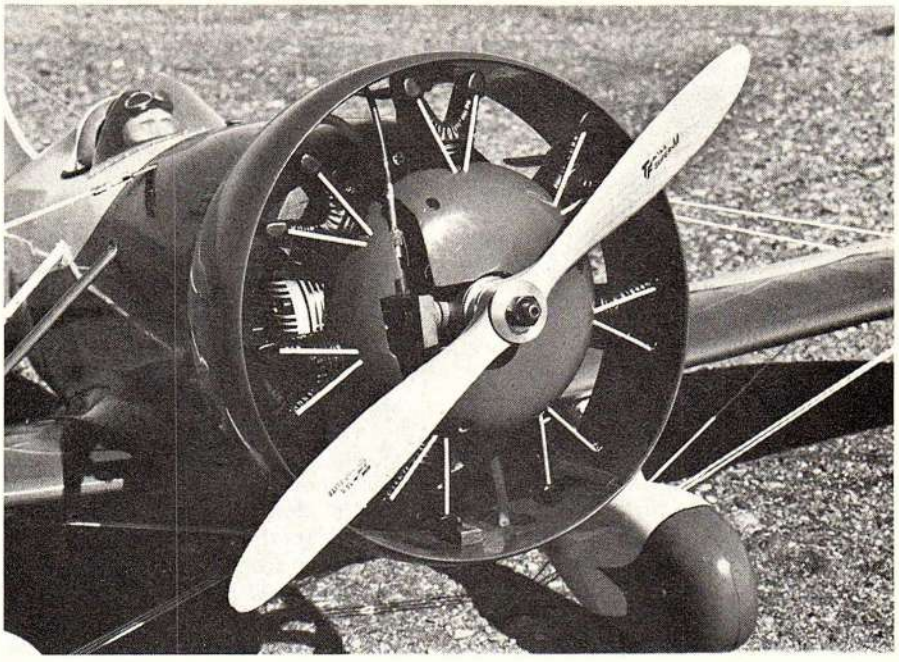
There was another concern, of course: The model had to be easily transportable. I didn't want to get into the stationwagon syndrome associated with 90″ span models. I ferreted around in my reference materials, and finally came up with the idea of a ¼-scale version of the smaller prototyped Gee Bee Model E. It resembled the Model Y in most every detail, yet it would yield a model of about 75″ span. Now, with a Webra .90 under the cowl, the plane would fly with some authority.

I would caution the purists out there (the Gee Bees seem to breed a cultish fanaticism) that the model photographed here does have some deviations from scale. I knew there



With a .90 under the cowl, the Gee Bee really hauls. It's as aerobatic as any Pattern ship.

If it looks like there's a lot of drag there, then you're right. Model flies even slower without the wheelpants, of course.



The cowl is made on a jury-rigged lathe. Dummy Scarab cylinders are vacuformed. The .90 is nicely concealed.

All the flying wires are functionally rigged, even though they are structurally unnecessary. They must all be "tuned" to the same tension, to avoid a warp.

were loopholes and gaps in my documentation, but I made the dumb mistake of going ahead with the model. Later, when I got data from places like the E.A.A. Museum confirming the suspicion that my wing planform was wrong, I was stuck with an incorrect model.

But, rest assured that the plans which are available from Hal Osborne have had all the corrections done to them, so that you are getting the most accurate model possible. I've learned the oft-repeated, but ususally neglected, lesson of making sure all the documentation sources are in before progressing. The Gee Bees have had a lot of misleading and inaccurate data published, so one must be extra careful when modeling these Golden Age machines.

You'll find the construction techniques very similar to Haffke's, since I didn't feel like reinventing the wheel. The fuselage is basically an interior box, around which are hung the formers and stringers. Take some extra time when fabricating the interior box, since it determines all the thrust and incidence angles. Be sure the engine and stab are at 0-degrees to each other, while the wing sits 1-degree positive. Check and recheck these measurements before progressing. This model is highly aerobatic, but it will become a real dog if all the angles aren't correct. Don't think that "I can always just trim in a little elevator." A plane that has to rely on elevator trim is out of rig, and it will never track the same when the transition from upright to inverted occurs, such as in the rolls.

The wing construction is typical model aircraft "D-tube" style. The leading and trailing edges are sheeted, and cap strips are used over the ribs. No matter what other methods of wing construction I try, I always wind up coming back to this tried-and-true method for lightness and warp-resistance. The one small inconvenience with this type of construction is the installation of the dihedral brace. I usually apply the top sheeting, but leave the bottom pieces off. Before gluing the center ribs in place, I score them where the dihedral braces will go. Later, it's a simple matter to cut or break out this area. It is acceptable to glue the brace into one panel while building it, so that it only has to be installed in the other panel. Since the lower sheeting is removed, it's easy to get plenty of glue around the brace, or to even apply doublers where the fit between the spars is loose.

The stab and rudder are a bit unusual, in that they use a lightweight core of *very* soft 1/8" balsa, which is then outlined with 1/16 x ½" balsa for shape. On my model, I used rigging wire to support the stabs. I used steel wire and homemade turnbuckles. My wife thought I had gone off the deep end as I patiently sat there and tuned each rigging wire to the same musical note! I suspect that this isn't at all necessary, of course.

The wheel pants were somewhat of a challenge, since they are designed to split lenthwise, as on the full-size prototype. I had little choice but to make a mold for a set of fiberglass ones. The 4-40 bolts hold the half shells together. In a pinch, the modeler might be able to make use of

A comfortable-sized airplane for ¼-scale, the Gee Bee and its designer come head to head.

With Ted White at the controls, the Gee Bee rockets skyward. Model did 3-point rolls, among other things!

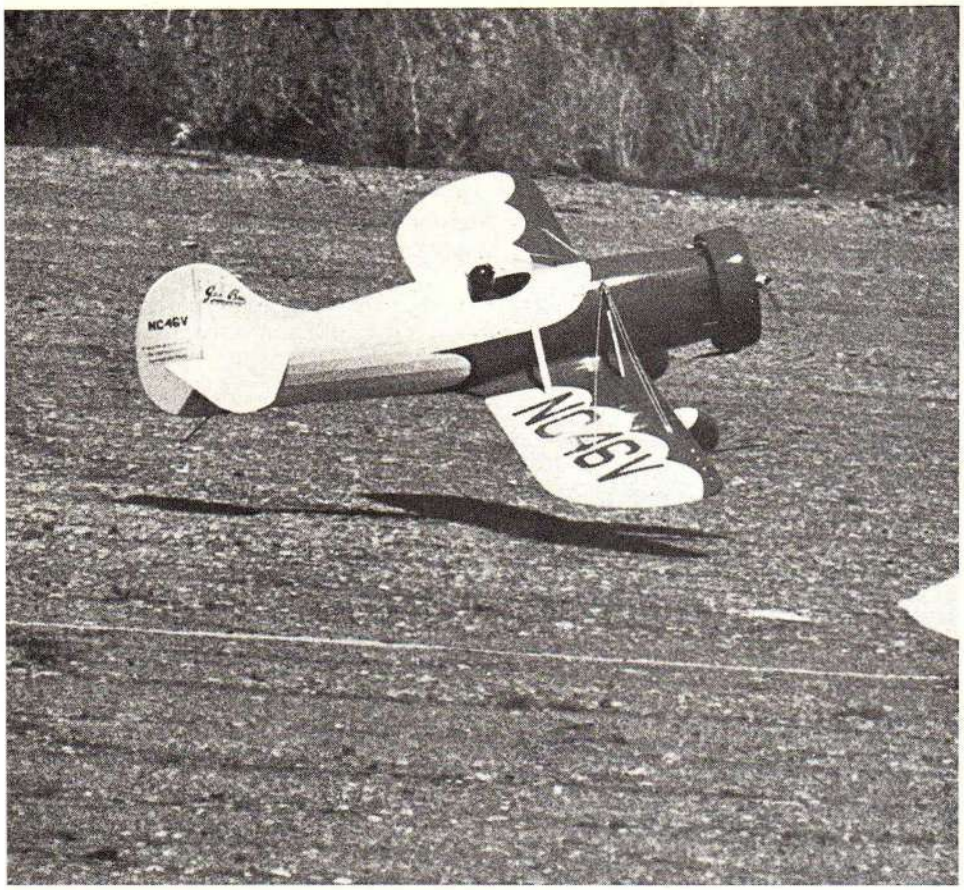
the set of wheel pants Steve Crowe uses for his .60-sized Gee Bee R-1. These are available from Bob Holman, but I can't guarantee that they are the same size and outline shape.

The cowl is also *a la* Haffke. Make a simple form by cutting two circles of ply or masonite, and put spacers between them to get the depth of the cowl correct (3″ wide). A small stand is made so that the drum can sit like a prop in a balancer. This is sort of the way they unroll wire from those large conduit wheels. A 1/8″ wire axle is used, so that the big 9″ discs can be rotated slowly with a variable-speed drill. The cowl can now be fabricated. I used strips of balsa, laminated together. You could also lay down several layers of 1/64″ ply as a base, then glue on pieces of urethane foam. With the disc turning at a slow speed, use sandpaper to form the final circular shape. This primitive lathe method works well.

You'll have to do a little vacuforming to make the dummy Warner Scarab engine. The cylinders are vacuformed plastic, which are glued onto a ring piece of 1″ balsa. Aluminum tubing is used to simulate pushrod covers and valve stems. The engine on this model is very conspicuous, so take some time and make it look good.

Super Coverite is the covering material I recommend for a model of this type. Two coats of *nitrate* dope were applied before the coat of

If the words "Gee Bee" give you visions of scary flying models, then here's one that will change your mind.



SuperPoxy primer. The paint is SuperPoxy. I mix the paint 25% Part A, and 25% Part B, then 50% thinner is used. Some may think this too radical, but I find that if you know how to paint and can avoid runs, the SuperPoxy flows out much more nicely when mixed in these ratios. Do not use such proportions in cold weather . . . always spray at a *minimum* of 72 degrees. Once you have sanded the primer and washed the model down with alcohol or acetone, never again touch the airframe with bare hands. The oil from the fingers will cause "fisheye." Use surgical gloves. Also be sure the tac rag you're using is silicone free and says that it is usable with epoxy paints.

Gerald Martin took the test hops on the Model E, and all that was required was a bit of aileron trim. The model tends to be a bit of a floater, but the light weight is a big help in the vertical maneuvers. Gerald is a full-fledged Colonel in the Confederate Air Force, and has stick time in such real Warbirds as the Me 109 and the Spitfire. He did

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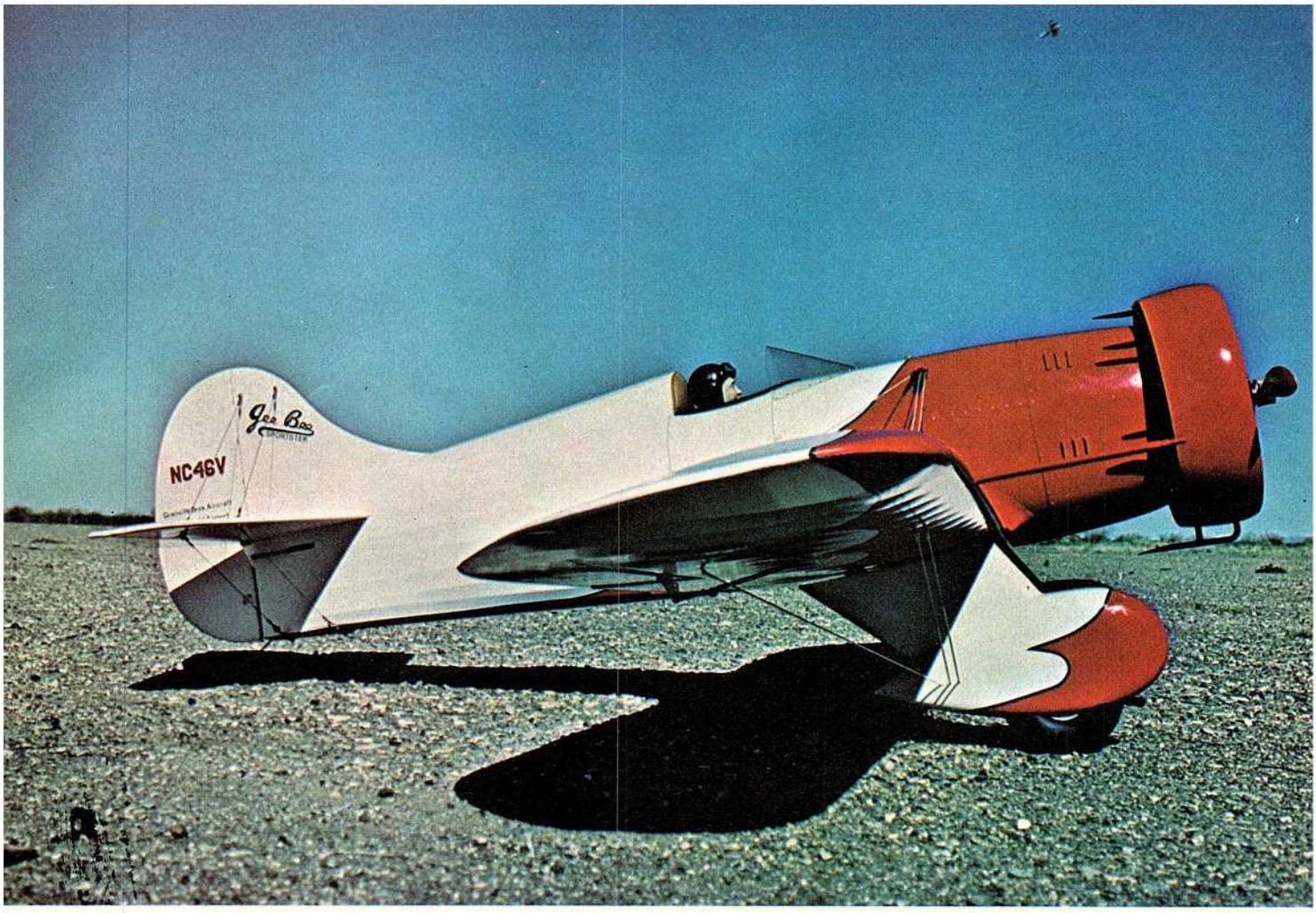
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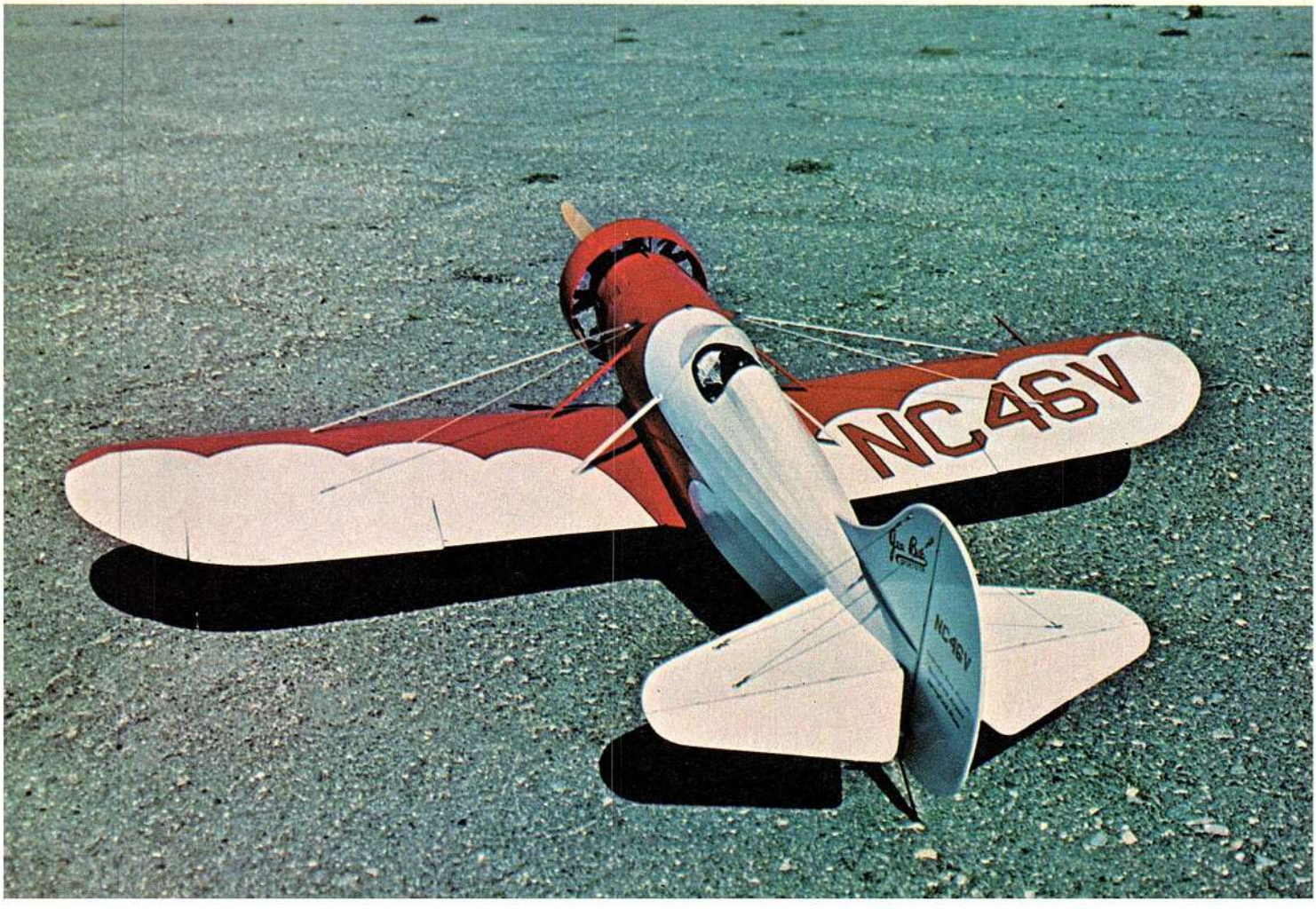
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Byron's Big Mustang

At last, the 1/5-scale Byron Originals P-51D is on the market. Here's our exclusive evaluation of the Mustang, with a blow-by-blow description of the corrections in the construction instructions. We're still reserving judgment on what this big and expensive airplane is all about.

By Patrick H. Potega, Executive Editor
(In cooperation with Rick Lewis)

J. R. Naidish photos

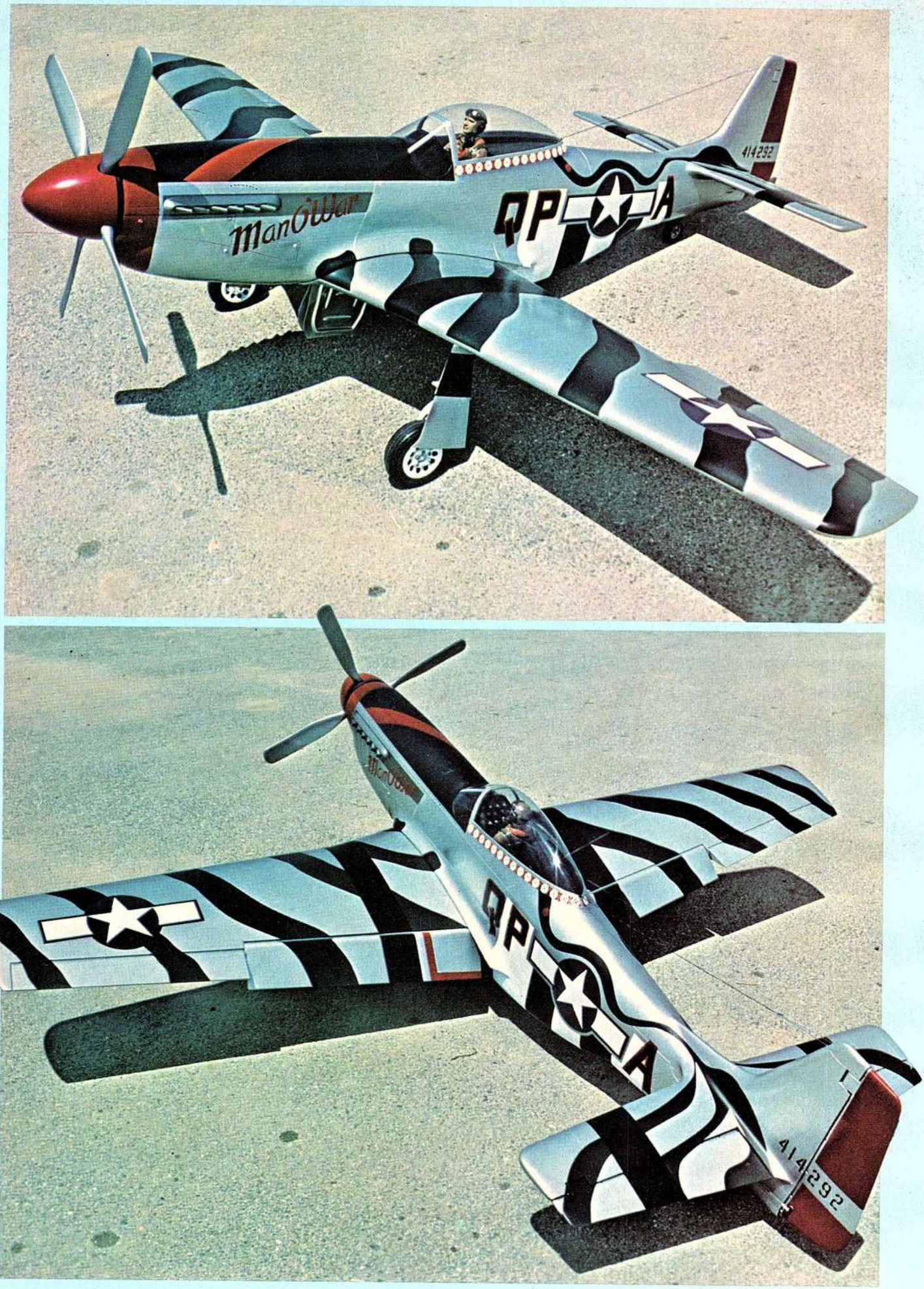
(PART 1)

At last, after all this time, we are finally writing the product report on the long-awaited Byron Originals' P-51 Mustang. We first announced the model in our special *Giant Scale Models* issue in 1978. Since then, not only were there delays after delays, but there were also major changes in the airplane. The basic parameters of the machine remain about the same, with an 85" span (1,300 sq. in. of area). The concept of a fiberglass fuse and foam wing still remains the heart of the construction. But, after that, the model is a whole new animal as it rolls off the production lines in Iowa. day.

Originally, the model flew on the Byro-Drive, with a belt-driven .60 swinging a four-bladed scale prop. We had the opportunity to fly one of the very early versions in Iowa in 1978. The Mustang performed nicely, with fixed gear. The vertical performance was satisfactory, but once the extra weight of the retracts (which still hadn't been perfected at the time) was added, the .60 engine just couldn't hack it. The original expectation was for a model in the 15-17 lb. range . . . as we shall see, today's production machine comes in at over 22 lbs.

In the intervening years, the Mustang has had several engineering changes. The power system went from a belt-driven .60 to a .90, then finally to the current Quadra engine in its own custom-designed belt-drive unit. The big paddle-bladed four-bladed prop is still there, but now it's a course pitched 25-15 affair. The power module comes already assembled and premounted in the fuselage.

Today's P-51 has one of the most sophisticated sets of retracts ever seen on a scale model. The struts are functional oleo-types, with spring loaded cores for impact resistance and realistic performance. The inner gear doors are set up to cycle independently of the main gear. The sequence is just like that of the full-size Mustang, as the inner gear doors open, then the main gear falls to the down position, and then the inner gears again cycle closed. When the gear are down, the inner doors are closed (don't let the photos accompanying this article fool you, for the doors were left open to show off the nicely executed detailing which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MAN O' WAR at work! This one photo makes all the temporary inconveniences we've had with the model worth the effort.

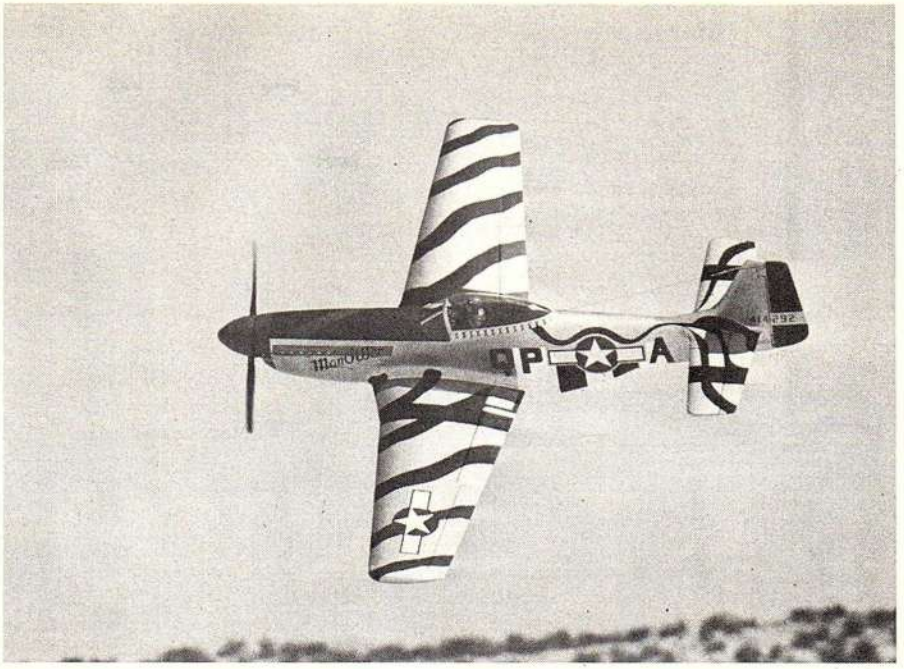
is stamped right into the aluminum gear doors supplied with the kit). As the gear come up, the inner gear doors again momentarily cycle open, then close up as the gear fold home inside the wells.

The retracts are a marvel to see, and we spent hours just watching them work like some magic trick. Even better, the kit includes a set of authentic scale wheels specifically made for the Mustang. The retracts are one of the most impressive features of the Byron kit, and we will discuss them in more detail later in this review.

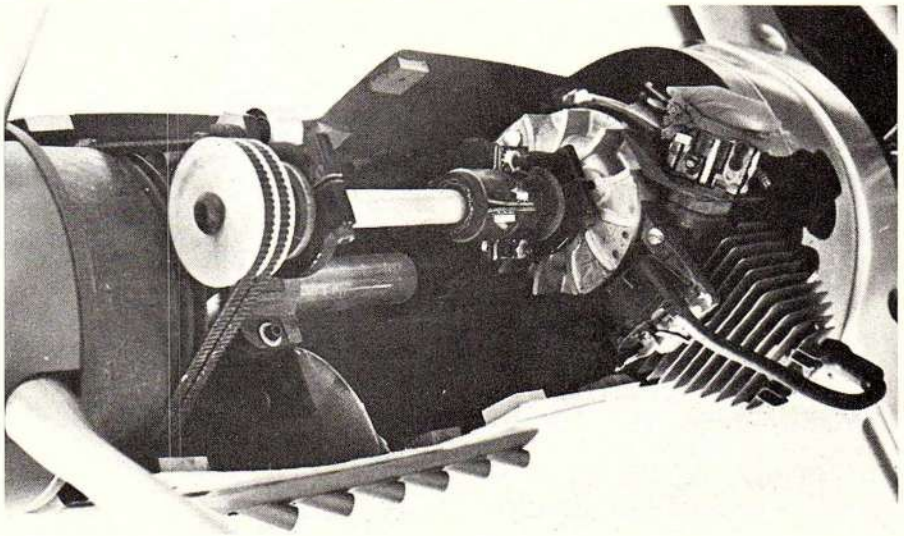
With all of these changes, the Byron P-51 soon came to be not only one of the most complex kits on the market, but also one of the most complete and most expensive. With its belt-driven Quadra turning a functional set of four-bladed props, the drive system is one of the most impressive and potent of any kit. The retracts are an optional item in the kit (no one should even consider building the model as a fixed gear machine, since all the scale flight realism would be lost), and add $144.45 to the price tag. The basic kit carries a mail order price of $594.96, which makes it the most expensive scale kit going.

If for no other reason than the sheer price and magnitude of this project, we are doing the review in a comprehensive two-part article. To spend over $700 on a model is a big investment, and we at *Scale R/C Modeler* want our readers to be able to honestly evaluate the worth of this kit. Also, the complexity of the kit necessitates more than a gloss-over of the high points. We found some questionable items in the instructions, and we'll be the first to admit that we still haven't worked out all the bugs in the P-51. As we did with our comprehensive review of the Byron Pitts, we want to bring some matters of import to the readers' attention, and possibly enable the modeler who is building this kit to get better and more enjoyable flying from the model.

This article is an "evaluation," and we simply haven't had enough stick time on the model as of our press deadline to really give a full appraisal of the Mustang. After only



Early morning in the California desert, as a bleary-eyed Editor gets ready for the first test hop. Site is near where the Space Shuttle landed.



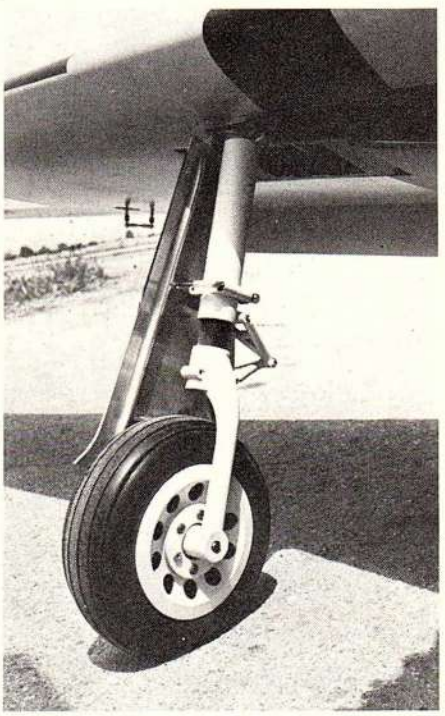
Here's the way the power plant is received by the customer, except that you have to bolt on the prop blades and spinner. 3,000 rpm on a four bladed 24-15 prop.

three flights, our off-the-cuff evaluation is that the Mustang is one heck of a model . . . it is big, powerful and a real show stopper. The noise of that four-bladed prop in flight sounds very much like the real thing.

The other side of the coin is that we've had so little flight time that we really haven't gotten all the gremlins out of the model, yet. We have been having some real headaches with the retract system, with gear legs folding unnecessarily and door sequences not working correctly. On the third flight, we discovered some unexpected flutter, but we haven't had the time to do more testing to trace down the source of the problem. These inconveniences don't seem to be restricted to just our test model, either. At least one other reported case of wing flutter has been noted, and most everyone we have talked to has had some frustration with the landing gear.

Lest the reader jump to the hasty conclusion that we are making a blanket condemnation of the P-51, let it be clearly understood that such test and evaluation articles are done to unearth problems such as these, and we usually come up with a fix. Flutter can often be corrected just by turning in a few cranks of up

Tail high and running, the Mustang is about ready to rotate. The tail comes up quickly, and the P-51 will roll easily on the mains for extended periods.



Note the nice scale detailing on the glass-filled nylon gear. Oleo strut is functional. Scissors are the only thing which keeps the wheels pointed straight. Gear doors are stamped aluminum assembly, with ply laminate.

aileron, so that they stay loaded during flight (this is a common trick with pylon racers). The landing gear folding syndrome may be as simple a fix as using less toe-in, or cleaning the strut axle. As things now stand, we just haven't had the time to work out all the details.

However, we did want to alert the consumer who may be working on the P-51 that there may be a *potential* headache or two. At this point, we strongly suggest that the wing glassing procedure outlined for the kit be followed religiously, and that there be at least one more *extra* thickness of cloth run through the center section on the bottom of the wing all the way back to the trailing edge (where the aileron servo tray is located). Our wing cracked through at the center section joint only on the bottom of the wing, behind the wheel well. This was a result, we assume, of the harmonic vibration in the wing panel during the flutter. We are going to add a 1/64" plywood plate between the wing bolts at the back of the wing, since our wing is already done. But, adding an extra layer of cloth in the center section would help. The wing glassing instructions do not show the cloth going full chord at the center on the bottom of the wing, but we

suggest that all three layers encompass the full center section area back to the trailing edge.

We are not quite sure, at this point whether we had aileron flutter, or wing flutter (or maybe a combination of both). If it was wing flutter, the cure could require work inside the wing, such as the addition of a full-depth spar to break up the "C-tube" open cell of the foam core. We'll know more by the time you read our final report in the next issue. Right now, our inclination is toward aileron flutter, with the suspected cure being to readjust the counterbalance of the ailerons, or maybe to strengthen the torque tube.

If your P-51 is just too close to completion to wait for the next installment of our review, then we suggest that before you fly you make sure that the ailerons are static balanced. Adjust the position of the counter weight until the aileron stays at neutral, no matter which way it's moved, or rig the weight so that the aileron is positive-loaded, i.e., the weight will draw the aileron upward with the linkages disconnected. Also, start off with about 1/16" deflection upward on *both* ailerons. This will keep them under positive pressure during flight, as well as supplying a bit of washout to the wing.

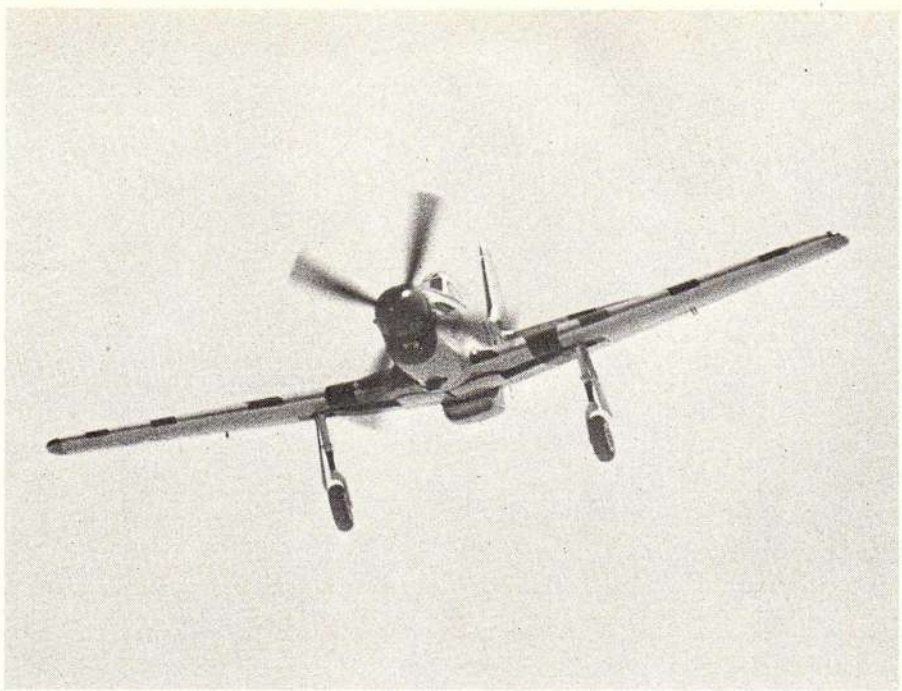
Our wing began to flutter after pulling out from a loop. Enter the first maneuvers high, and throttle back in situations where there may be an unnecessary speed build up. If flutter occurs, chop throttle immediately, and pop the gear down (to create more drag and lower the airspeed). If the flutter persists, *carefully* lower the flaps to change the center of pressure on the wing. We doubt that you'll have any problems, but an ounce of prevention, etc.

The retracts are unique in that they incorporate a "fail safe" device to keep both the struts and the wing from being damaged in a bad side-load situation. The strut is a friction fit onto a drill rod support arm. The retracts are best visualized as a scaled-up version of the Goldberg main gear, even to the point of using the same pin and slot locking system. The instructions for the retracts suggest to really torque down on the bolt which crimps the main strut onto the support shaft. Under side loads, instead of stress being transmitted to the foam wing, the gear strut is supposed to fold.

Unfortunately, these gears were developed for the grass fields of Iowa, and the added friction when flying off a paved strip seems to

Sorry this shot had to be gear down, but we couldn't get the gear to cycle. Note that tailwheel is jammed inside the well, because we lost the centering spring on the Rhom unit. Landing was so slow that only a sliver of paint was scratched from the rudder.

The distinctive kill marking on Kinnard's Mustang. He eventually went on to claim 26 kills, 13 of which colorfully decorate MAN O' WAR's canopy frame. Panel lines come molded in the fuselage.



A little staccato machine gun fire please!

cause a leg collapse almost every time. We have talked to several modelers who are flying the Mustang, and all of them report some degree of problems with the gear folding. One thing that helps is to put a bit of toe-*out* in the wheels. Toe-in only pulls the gear legs under the plane, while toe-out keeps the struts extended.

The trouble is, of course, that toe-out looks really bad on any model. Actually, it may not even be a matter of using toe-out, but perhaps only *not* using any toe-in. According to the factory, the way one adjusts the wheels is to assemble the plane, and roll it forward several feet. Then pick up one wing tip, while watching carefully to see which way that wheel springs. If the wheel springs back from a toe-in position, you have too much toe-in, and the same holds true if it looks as if the wheel is springing back to neutral from a toe-out stance. Try to get the wheels about straight ahead, so that they don't look as if they are changing at all when the wing is lifted.

Be sure to lift each wing after the model has been rolled *only forward*. After checking the left wheel, roll the plane ahead again before checking the right wheel. It is helpful to have an assistant along, so that you can be right in front of the wheel when the wing tip is lifted.

The instructions tell you to not sand or file the pivot axle. However, the problem is in the friction fit of this piece to the Upper Strut Attachment Arm (see "Detail F" drawing, as supplied with the kit). You just can't get this friction fit assem-

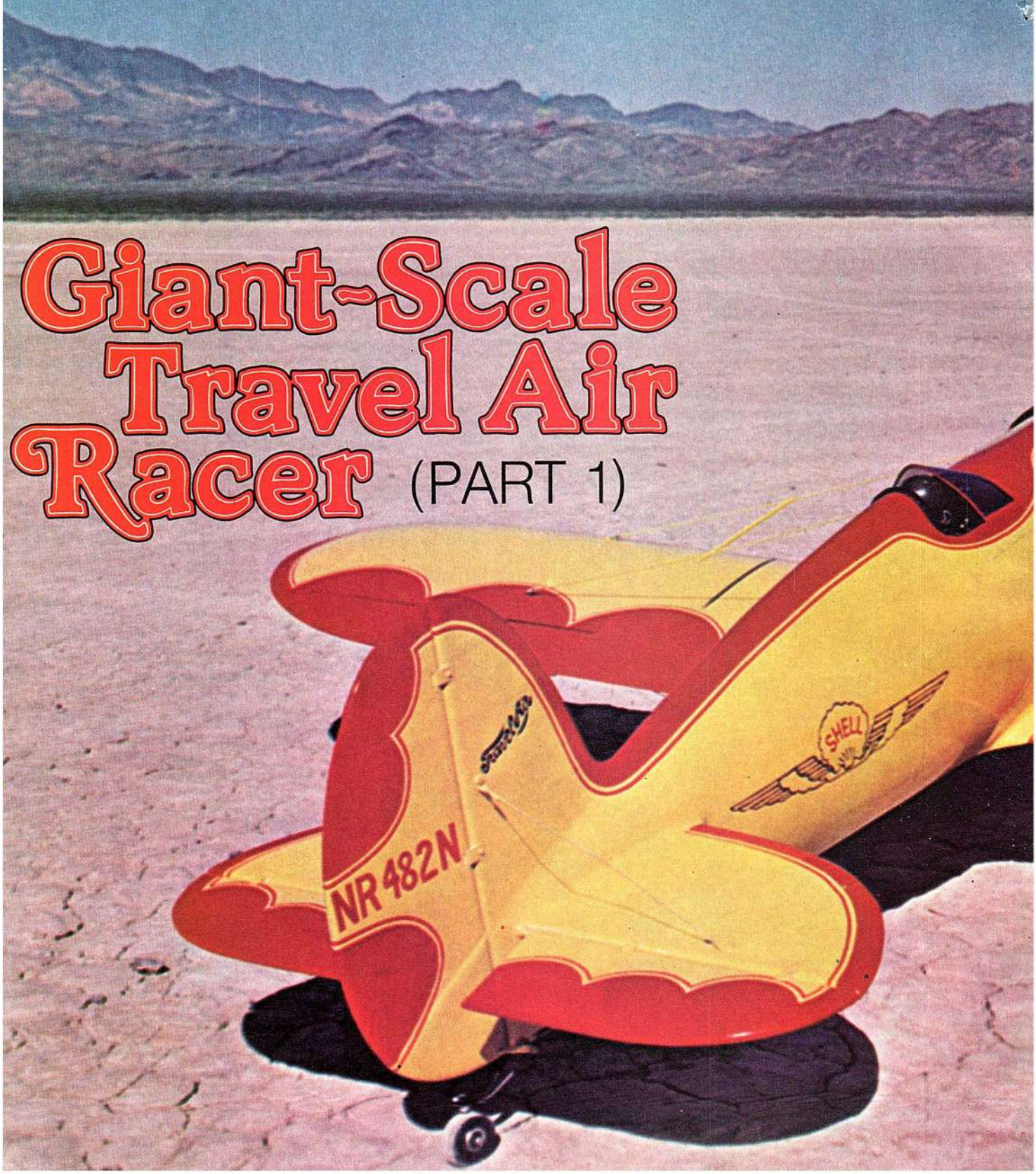
(Continued on page 74)


Man O' War

Giant-Scale Travel Air Racer (PART 1)

We modelers are all caught up in a time warp. By some fluke of history, time, economic condition, or other factors, we cannot fulfill our innermost dream of sitting at the controls of some long-past prop-driven airplane. That elusive moment has escaped us, an ephemeral bubble in time that has burst and dissipated. Something has been left inside us . . . something which needs expression. But, we are men without our calling—fish out of water. We can only hope to feel those hidden sensations by some vicarious act. That's where modeling comes in. We bridge that time gap with a miniature replica of the airplane we all know Fate has kept us from.

The manifestation of this inner demonic urge can take some time to surface. Often, as a teenage adult, we get those stirrings, and our eyes turn skyward. Like Icarus, we yearn to tackle the Sun, but the flame burns out quickly. Real life intervenes and our dreams of flight get the wet blanket of existence thrown over them. My own dream was a flickering candle on the back burner of my day-to-day existence for 29 years. Then, with a baby on the way, something came out of my subcon-



scious and bit me on the back end.

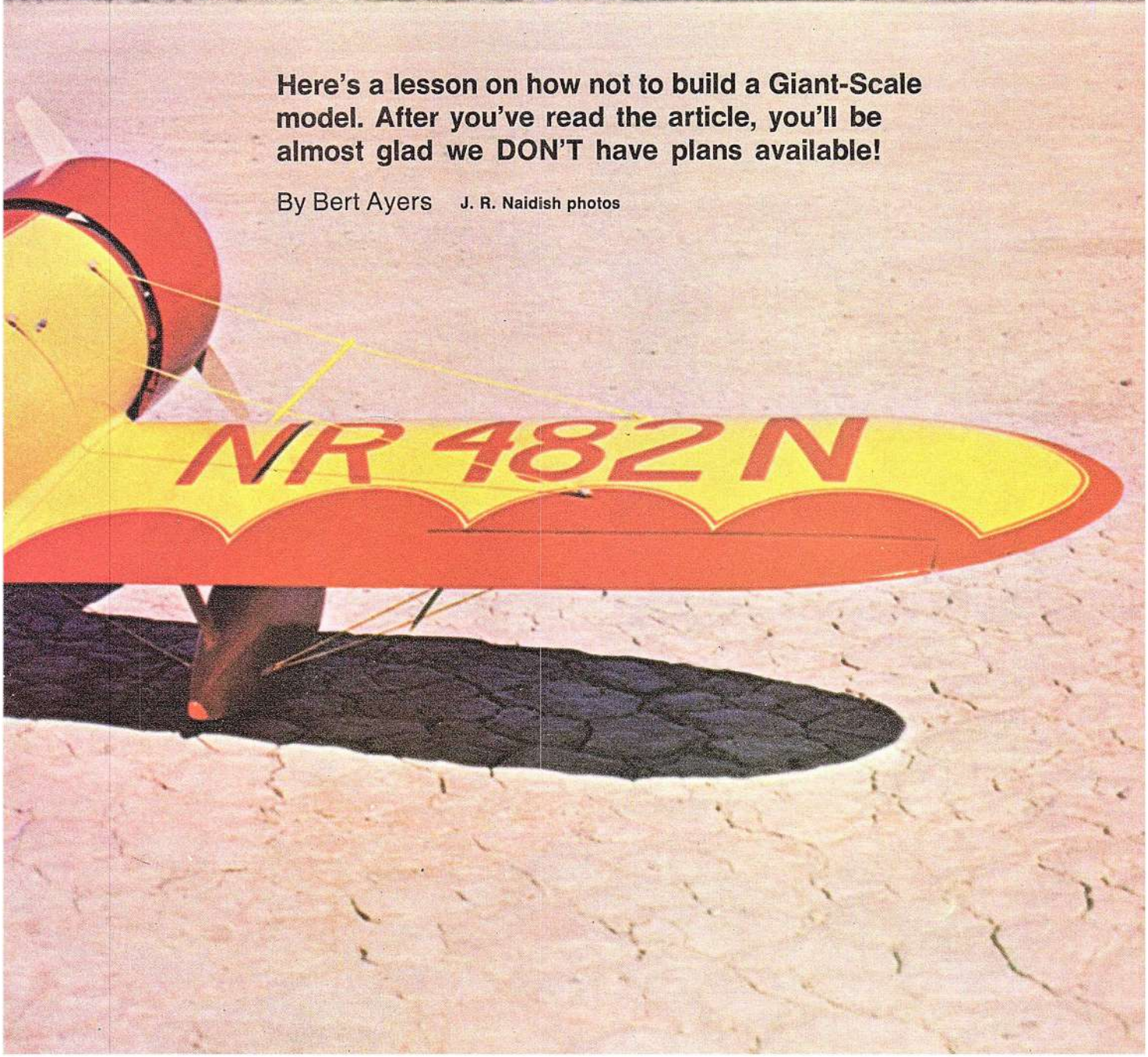
I had been a small child when I was being taken on a tour of the Chicago Museum of Science. I could only stare at the gleaming cream and red airplane suspended from the ceiling. The big wheel pants, fat cowl which snuggled against that huge radial, and the long round-tipped wing were like seeing a miracle. I couldn't believe that anything so beautiful could serve such a utilitarian purpose as flight. The machine was more like sculpture than a functional object.

I wanted to build the Model R in the worst way, but I was heavily into Free Flight, and my attempt at the Travel Air Mystery Ship was nothing to brag about. But the potential was there, so my next phase of modeling (control line) saw me again trying to capture the quintessence of the Mystery Ship. I came close in a .35 McCoy powered version, but it just wasn't that same spirit of flight that the museum airplane typified.

The years passed, and the old "itch" would surface now and again. By 1979, I had still not built the plane of my dreams. I was already heavily into R/C Scale, and was in-

Here's a lesson on how not to build a Giant-Scale model. After you've read the article, you'll be almost glad we DON'T have plans available!

By Bert Ayers **J. R. Naidish photos**




NR 482N
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SHELL

vestigating getting into ¼-scale. A Wedell-Williams racer was on the drawing boards when I ran across a 3-view drawing of the Mystery Ship in *Air Classics* magazine. My ship had come in, and I was already working on a set of working constructional drawings by the time the news came that I was going to be a father.

Strangely enough, while my first love was the Texaco Mystery Ship #13, I actually decided to model the Shell Oil Travel Air, which was yellow and red. For those modelers who share that same dream with me—to model one of the Mystery Ships—you should be forewarned that there are no actual construction drawings for the plane represented here. I built my model from a set of Bob Holman's .40-sized Mystery Ship plans, which I scaled up. Since no article was anticipated at the time, I did not keep any of the materials used for my ship.

So, please consider this article more a frank discussion of some of the trials and tribulations, as well as successes, I encountered in building the ¼-scale Travel Air. It's not difficult to put the Holman plans in an overhead projector and scale them up to the desired size scale. I will be discussing structural concepts in the article, so that the modeler can anticipate the alterations to the existing structure. Bob Holman has the capability to enlarge drawings through his reproduction machine, so I would suggest writing him and asking him to supply you with the plan sheets already enlarged to the appropriate size.

The Travel Air Mystery Ship is an almost ideal plane for R/C. The generous tail moment, thick airfoil, and wide-chord straight wing make it a smooth flying ship. I was a little disconcerted about the short-looking nose moment, so I decided to move the cowl ahead an inch. This wouldn't do too much for the aesthetics, but it would ensure better flying. Later, I discovered that simply hanging four pounds of Quadra engine on the front definitely guaranteed that the model was not going to be noseheavy.

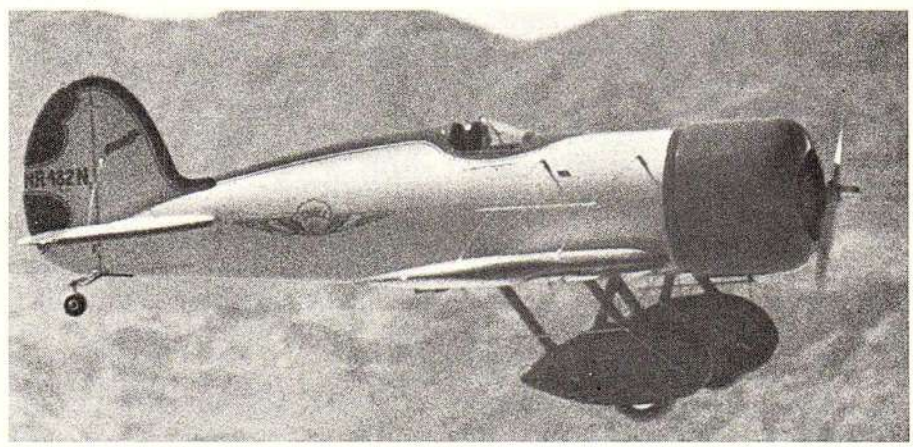
It must be kept in mind that I started this project when ¼-scale was merely a few guys experimenting with chain saw engines and large airframes. A lot of the mystery in my Mystery Ship was guessing how big or strong to make the components. In quarter-scale the plane comes out ot 87½" span. I modeled the larger cross country wing (29.15 feet) as opposed to the clipped racing version (27.75 feet). I don't think that going with the smaller wing would be critical, especially if you can keep the model under the 22 pounds that mine weighed. I overbuilt the entire airplane, so that my Travel Air would probably come out on top in an encounter with a brick wall!

Now that we have learned that these chain saw powered airplanes don't need to have spars that were ripped out of ceiling beams, we can be more practical in designing our airframes. You can see why, when the Editor approached me about doing an article, I honestly had to admit that my construction techniques were better used as an example of what not to do, and that for the draftsman to reproduce on mylar the structure of my model would be to take a good airplane and make it poor. Surprisingly, the Editor merely said: "Well, in that case, let's tell 'em what not to do, for we can often learn more about building an airplane by listening to the guy who did it wrong."

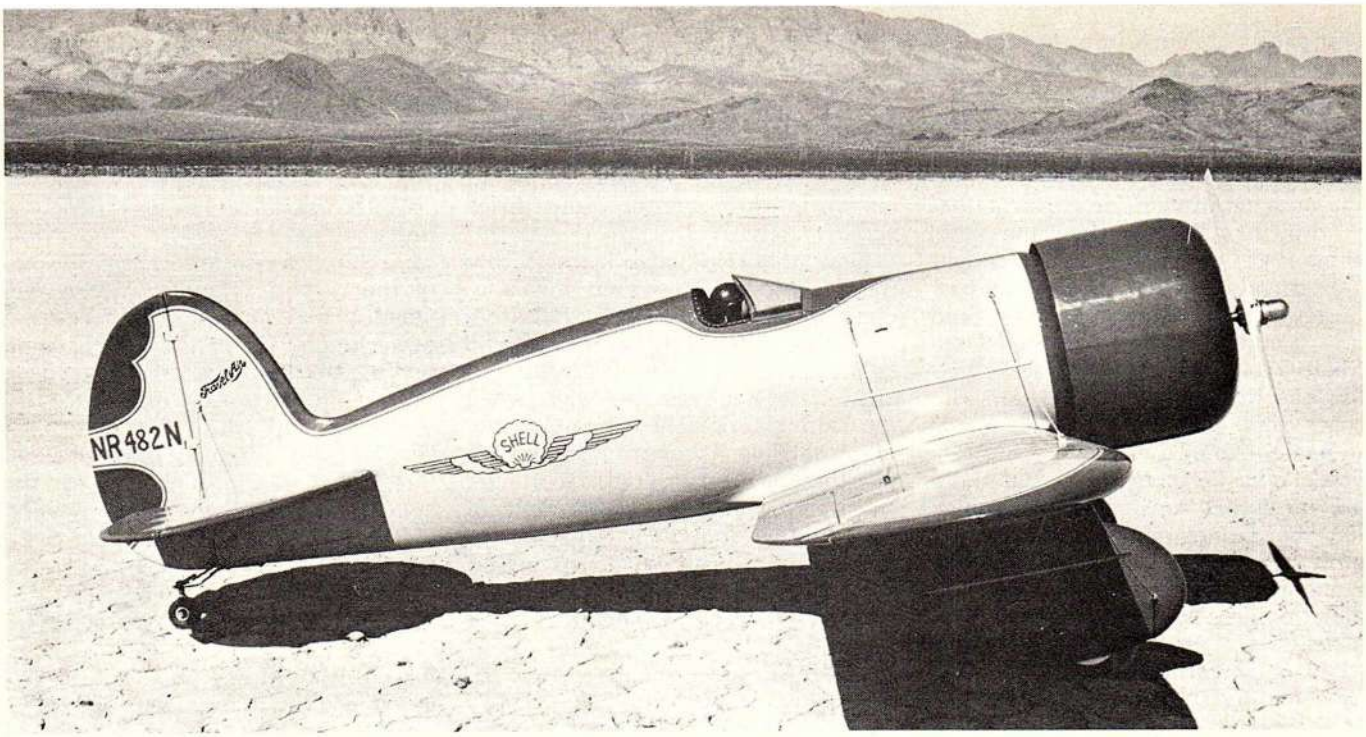
With the idea in mind that you are striving for a 17 pound Mystery Ship, please follow the odyssey of the building of my airframe. My Quadra was one of the very first ones, before Dario Brisighella stepped in and discovered that the vibration could be almost eliminated by overbalancing the flywheel. All Quadras now shipped from the factory have Dario's mod, and the engine is now as smooth as any good .61 engine. But, back then, the philosophy was to design an airframe which wouldn't shake apart.

Vibration is one of those gargoyles

The author wisely kneels behind his pride and joy, for to try to pick up the heavy Travel Air might be beyond human capability!



For all of its weight, the ¼-scale Travel Air is a respectable model, on Quadra power. Getting the weight down to 17 pounds would improve the aerobatic capabilities.



The Shell Mystery Ship is a simpler paint scheme than the #13 Texaco machine. See the historical article following this story, on page 50, for more data on both ships.

which seems to hover over every airplane. We read so much about it that we fear it like the darkness, yet we can't quite understand what it is, and how to prevent or cure it. We all went through the rituals of putting the heavy side of the prop opposite of the compression stroke, or balanced our props by sanding the front (or the back, depending on your school of thought) of the blades. We got into quarter-scale, and the ball game changed to one of super prop hubs, so that tracking could be corrected. The first Quadras were supposed to be hard-mounted, while other engines were introduced with custom Lords mounts to dampen vibration. What a confusion!

Naturally, the only recourse the average modeler had was to build the model as close as possible to the strength of the backyard picnic table, since the bench obviously stayed intact when the engine was test run on it. No one ever mentioned that the plane would probably have all the unpleasant handling characteristics in the air of a chain saw engine-powered picnic bench! The motto was go for strength, and to heck with weight. After all, these big quarter-scale models could lift a tremendous load.

Now, don't mistake my tongue-in-cheek comments as an endorsement of the other extreme. Even though today's Quadras (as well as the other chain saw type engines on the market) are smoother than ever, there is still a lot of stress on an airframe. If you can get the weight down to about 16 pounds, any of the belt drives will work great with a .60. That may also hold true for weights in the 17-18 pound class, but that will have to be your decision.

The landing gear is one place where some thought to added strength should be given. I used 1/4" wire, which was more than adequate to the task, but it did create its own set of problems. The 1/4" axles were not compatible with the Williams Bros. 5 1/4" wheels. Actually, the correct size wheel for the model would have been 6", but no one makes such an animal in a slim racing style wheel. By the time I bored out the wheel hubs to accept the 1/4" wire, the walls of the axle flanges were so thin that the wheels would actually collapse on landings. I went through two hubs in thirty flights. I can't fault Williams Bros. for that, since I had modified the wheels to work in my application. But, we do need a better selection of all types of wheels for these larger airplanes.

Actually, it would probably be better to make the gear out of 5/32" wire, using two pieces which are wrapped and soldered together. That would give a better axle diameter, or a third piece of wire to serve as a 3/16" axle could be incorporated. My second mistake in the landing gear area was to try to save some time by making the wheel pants out of wood. I didn't want to get into the whole hassle of doing a plug for a fiberglass set of spats, so I tried to do them in balsa. The trouble is that I held the tolerences too closely.

On the fourth landing, the ground contact was a little sharp, and the wheels flexed back and locked up against the walls of the pants. This was like hitting the brakes at full-speed, and the model went turtle. It wasn't a pretty site, with a crack in the wing, broken wheel pants, a bent prop bolt, a broken crankcase housing and ruined rear seal. Other than that, the damage wasn't too bad!

I quickly learned of the third mistake I had made . . . to fall in love with one's favorite dream airplane. Repairing something like this can become more emotionally involved than one thinks. As a consequence, I dawdled over the wreckage, feeling very sorry for myself. In building your model, strongly consider some sort of oleo-strut arrangement, instead of the piano wire landing gear. Solid wire is the worst item for twisting and flexing. Tubing is better, if you can machine the correct equipment to set up something like a fixed version of the Platt gear. Also, make the wheel pants out of fiberglass, and leave plenty of latitude for the wheels.

The wing itself was a true marvel of over-engineering. The structure looked as if the crew who did the Golden Gate bridge had done the stress analysis! Remember, this is only an 87 1/2" span. The spars were *four* 1/2"x1/2" pine pieces! There are 48 ribs all together. The ribs are spaced 2" apart, which may be fine for scale looks, but it's a closer wing

spacing than any .60-sized machine. Sixteen of the ribs are laminated to 1/8" plywood to take the load of the landing gear. The rib spacing could have been stretched out to 3", with ease, or even farther with false leading edge ribs ahead of the spar for a scale-like appearance.

The sheeting is 3/32", which would be fine if the rib spacing were taken out to at least 3". The center section is glassed with an 8"strip of glass (4 ounce stuff!) over the centersection. This could have been 1-3/4 ounce cloth. Four 3/4x1-1/2x 12" landing gear trunion blocks were used. As can be seen, one could throw this wing structure against a brick wall, only to do damage to the wall! I hope you aren't as overly cautious as I was when you build your wing.

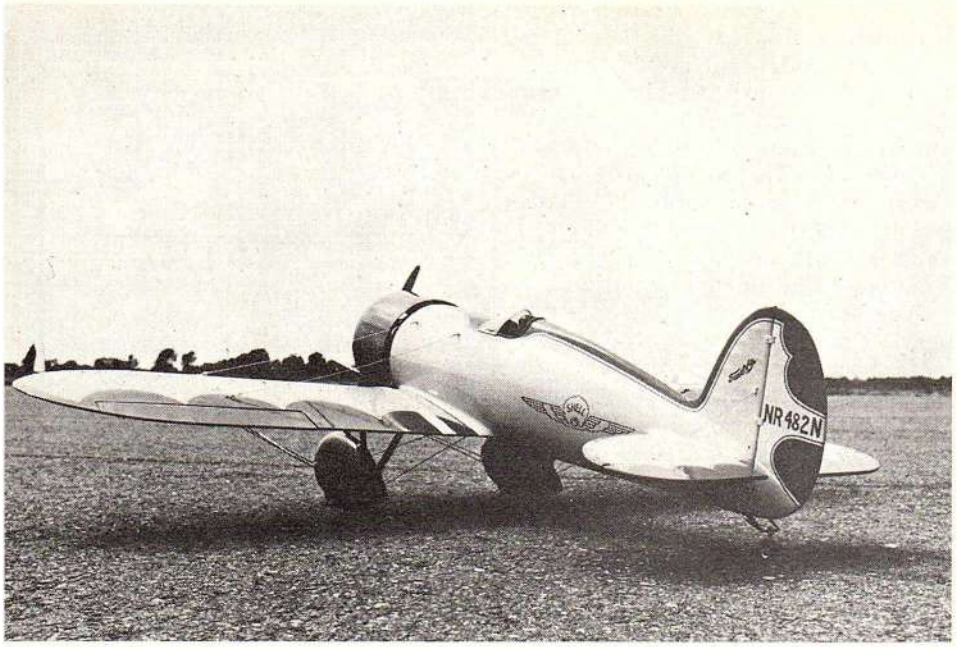
The airfoil was "borrowed" from Henry Haffke's fine-flying section, as used on his Gee Bee Sportster. This semi-symmetrical section provides a lot of lift, yet still affords an easy stall and good penetration. The original Model Rs had very thin airfoils, so don't go out of your way to copy them. We like our models to be more aerobatic than the full-size prototypes, so the use of the almost flat-bottomed airfoil of the originals should be avoided. I built 2 degrees of dihedral into the wing, and added some 6 degrees of washout at the tips. This may have been excessive, but the model I built was so overweight that the washout was probably the only thing that kept it from tip stalling on landings. As the wing loading goes down, the washout can be decreased. I wouldn't settle for less than 2 degrees of washout. Some stability on landing is helpful, but the more washout in the tips, the less aerobatic the model will be, as there is a sacrifice in inverted performance. I never dreamed that the Travel Air would be even looped (you can't imagine how big this model looked when I started to build it), I was overly generous on the washout. I built the ailerons to be fabric covered, just like on the prototype.

The fuselage was a big question mark. I had built a wing which could have been used as a diving board, in terms of strength. It somehow didn't seem right to fabricate a fuse which had flimsy stringers of mere balsa. Gosh, I kept thinking that chain saw engine sure runs rough, so I better give it a good solid mount. I decided on a primary box structure at the heart of the fuselage. This 24" long box would be 5" square, and entirely constructed of ½" pine. This wooden brick ran from the firewall to slightly aft of the cockpit. One could have used it for a battering ram, of course, but it definitely wasn't what one would classify as a flimsy structure.

To make matters worse, I lined the whole affair with 1/8" plywood. There must have been at least an extra pound of weight here. The fuse only measures 63½" from prop nut to spinner, so it's not too much bigger than some larger .60-sized scale ships. The remainder of the fuse was balsa (my one concession to weight savings), except for the formers, which were ¼" ahead of the wing, and 1/8" aft of the wing. These were plywood, but I know that balsa would have been perfectly fine.

Now, you are probably saying that this should have been a virtually

The model uses a "Haffke" airfoil, and has had the nose stretched 1" (which later proved to be unnecessary).



bullet-proof fuselage, but I wasn't done yet. I covered the whole big barrel-shaped affair with 1/8" sheeting. As if that wasn't enough, the whole thing was then glassed with ¾-ounce cloth. If the "Louisville Slugger" ever deserved a name, it belonged on my fuse!

We have to interrupt the narrative at this point, but we're sure that our readers can see where Mr. Ayers' story is leading . . . and the next installment will continue his commentary on what could be titled: "How Not To Build A Quarter-Scale Model." Surprisingly, as we shall see, Bert's plane flew amazingly well—but we don't want to tip our hand prematurely. In the interim, get in touch with Bob Holman (P.O. Box 741S, San Bernardino, CA 92402) and inquire about the availability of his Model R plans in ¼-scale. You may decide to go for a slightly smaller version, perhaps with about a 75" span, which can be flown on a .90. Whatever your choice, remember that you will have to start with the outline of the model, and do all the internal structural engineering yourself.

Good luck, and we'll see you here next time.

* * *

For more information on the Travel Airs, please see overleaf for a complete history and 3-views of the famous racer series. Next month, we'll present even more photos and data of the full-sized machines, along with a continuation of Bert Ayers' discussion of the model Mystery Ship. **(PHP)** □

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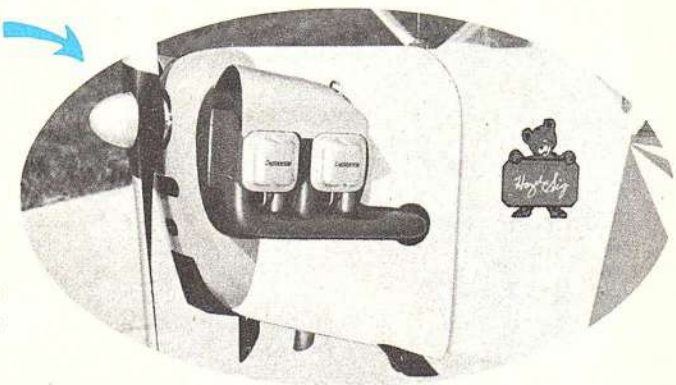

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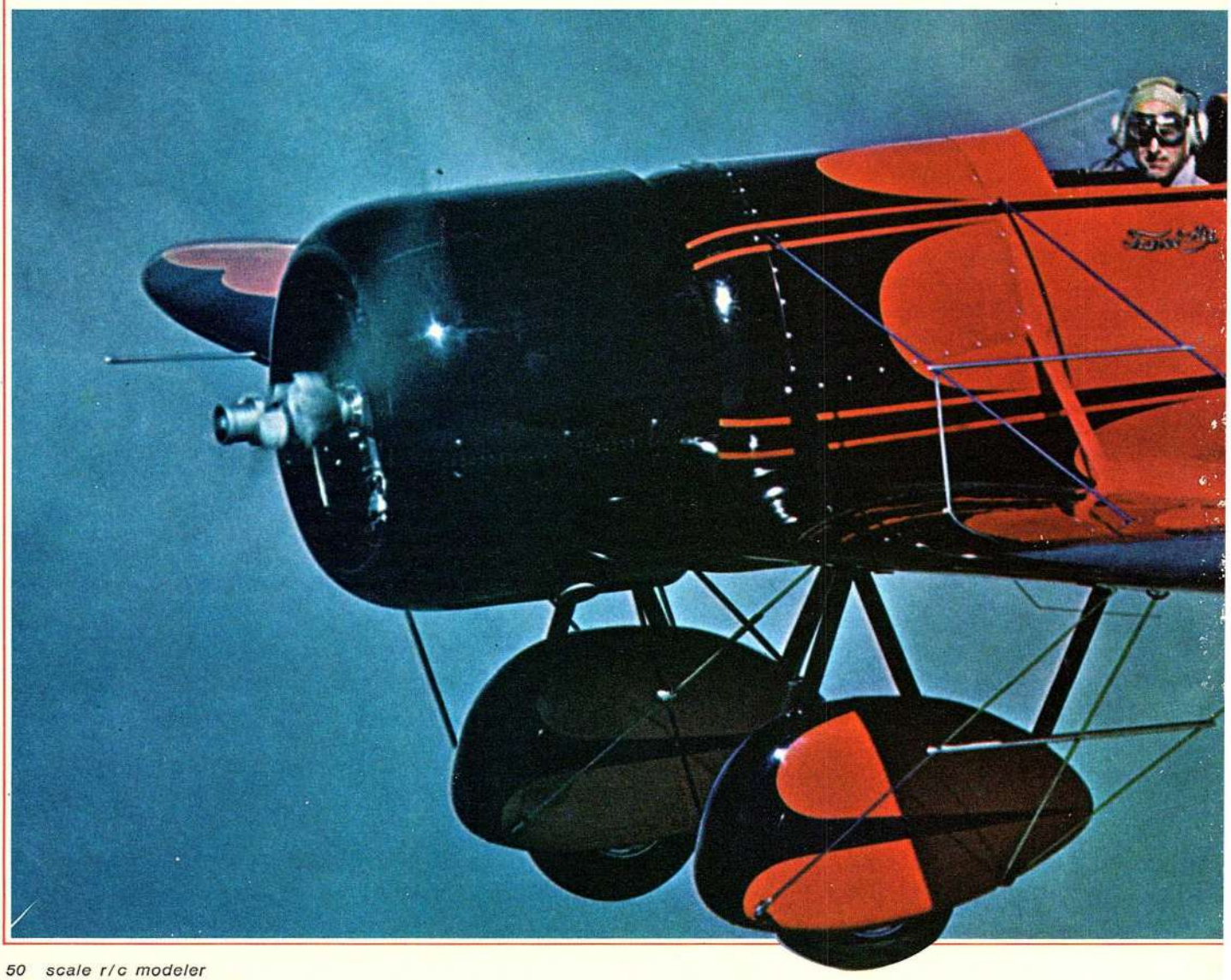
The Mysterious Mystery Ship

The airplanes which influenced the Gee Bees and aircraft like the P-26A Peashooter were the first of the "sleek" Golden Age racer designs.

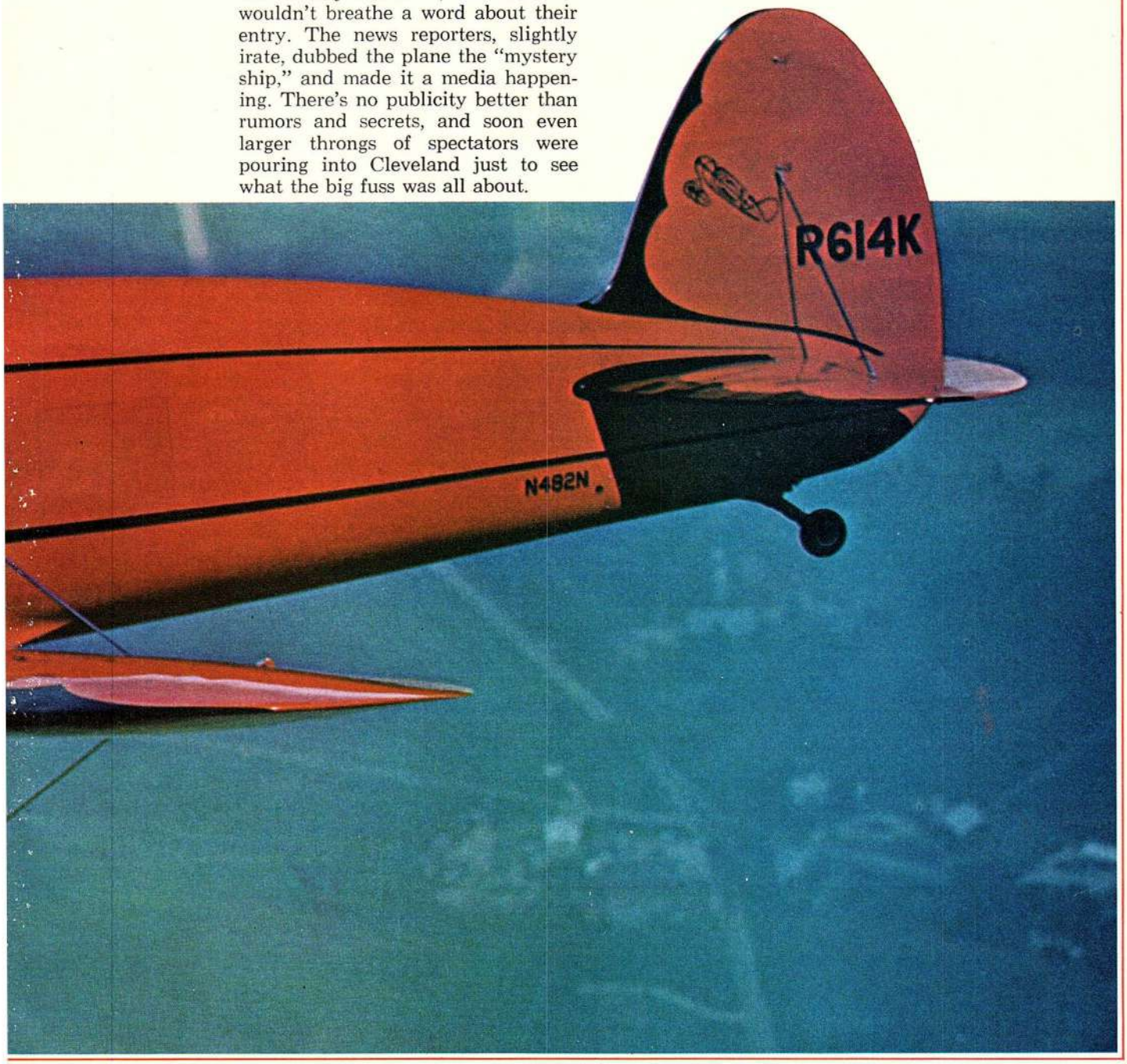
Staff Report



Jim Younkin at the controls of his replica Mystery Ship. (AIR CLASSICS photo)

It was 1929, and even though Wall Street had crumbled, the aviation industry was still riding high. The Cleveland National Air Races of that year promised to bring hordes of people—as many as 500,000—to see the hottest machines fight it out on the race courses. This was show biz, and Walter Beech's latest design (he was still, at this time, employed by the Travel Air factory in a little Kansas town known as Wichita) was mysteriously flown into Cleveland, then secreted away to a hangar. It was strictly hands-off, and the crew wouldn't breathe a word about their entry. The news reporters, slightly irate, dubbed the plane the "mystery ship," and made it a media happening. There's no publicity better than rumors and secrets, and soon even larger throngs of spectators were pouring into Cleveland just to see what the big fuss was all about.

Actually, the airplane was a low-wing monoplane, designed originally to take the in-line Chevrolair engine. There were two prototypes coming to Cleveland, in fact. R-613K had arrived first—the in-line equipped one. To follow within a few days was the modified R-614K version, which had a Wright J-4 Whirlwind under a large cowl. The modification to accommodate the round engine had been simple enough . . . the fuse had merely been faired out from about the mid-wing point.



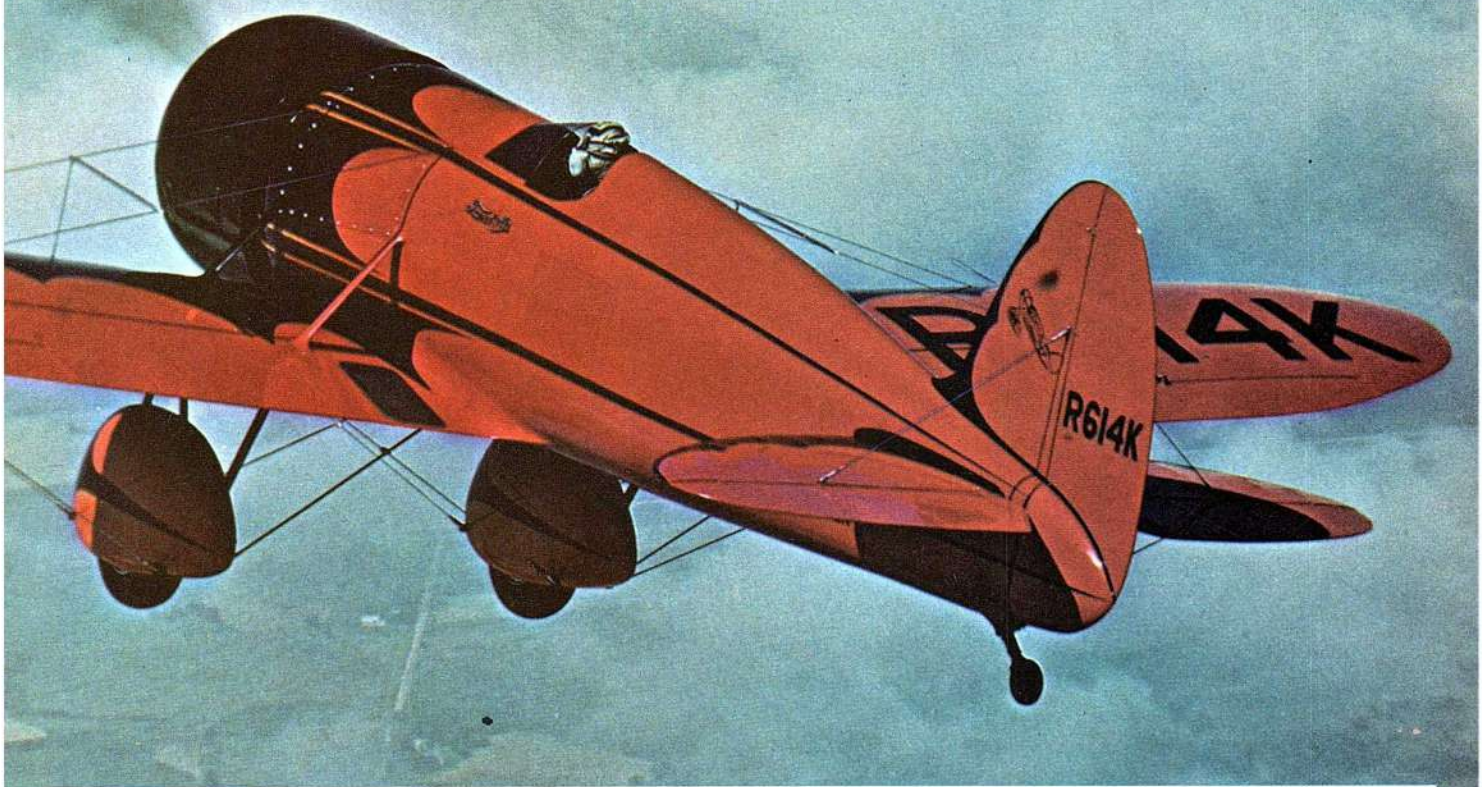
Both engines had been hopped up considerably for the races. True to the pattern of the day, test flying was completed just a week and a half before the Air Races. Perhaps, it was speculated, the "Mystery Ships" were kept coveted away not because there was some press "hype" going on, but because the planes needed some last-minute work. Whatever the reason, the effect on the public was astronomical. When 613 was finally rolled out of the hangar in preparation for the "experimental" aircraft race, the press got a chance to give it a careful going over. Actually, the hands-down best bet for the winners was the military. The big favorite in the Unlimited Race was Lt. R. G. Breene's P-3 Hawk biplane.

The Chevrolair may have been a little too hopped up (it was putting out 250 hp, instead of its normal 175), for it got sick during the race. But the Mystery Ship still took first, at 113.38 mph. The crowds were ecstatic. The snazzy-looking monoplanes with the big wheelpants were more than just hype—they had some bite under that flashy exterior.

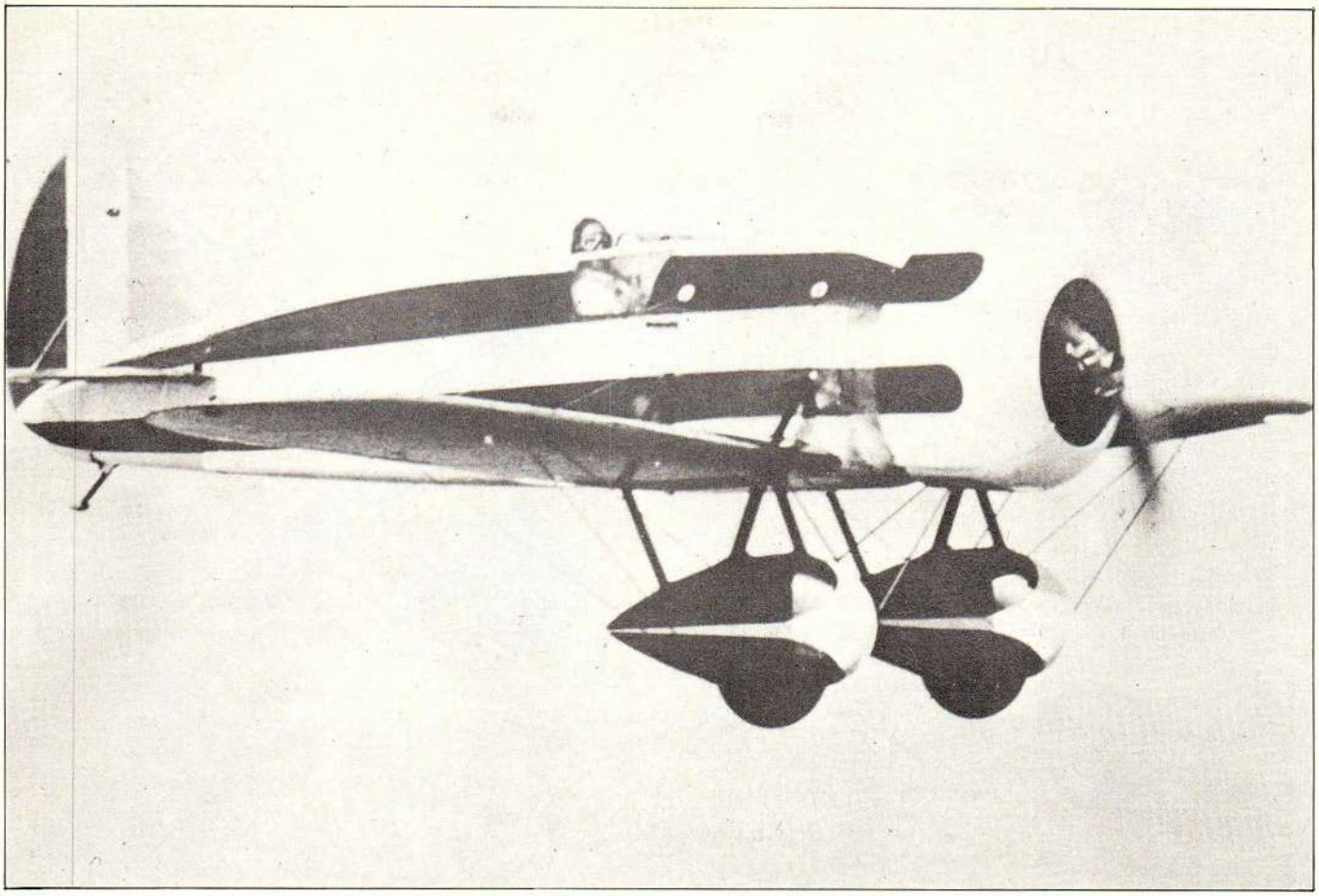
Model R-614K was now flying with a Wright R-975 engine, which had been "tweaked" to 400 hp. The red-and-black Mystery Ship looked the quintessence of speed, as it sat in the gaggle of racers for the racehorse start. In a cloud of dust and gasoline smell, the racers were in the air and struggling for supremacy. The Army's plane was out in the lead immediately, and it looked as if the titillation of the Mystery Ships from Travel Air were going to be a disappointment, after all. Doug Davis, who was piloting both of the Mystery Ships at the races, cut a pylon . . . and everyone's hearts and hopes sank. It looked as if the military would have the day, again.

But, Davis kept the radial firewalled, and everything seemed to be holding together. He kept cutting closer and closer to the pylon flags, standing the tiny monoplane up on a wingtip at each turn. Slowly, but surely, the red-and-black bomb was closing the gap on the P-3. At the last moment—in one of those finishes that made air racing so exciting—the Mystery Ship slipped past the Army biplane. The speed was 194.9 mph, and a civilian plane had wrested supremacy from the military might at the air races.

Winning the Nationals was more than just an ego trip, of course. The Travel Air company expected to get some monetary gain from their success, and it wasn't long in coming. Both Shell and Texaco (back in the days when they actually had to compete for business) ordered Mystery



The Younkin plane is an exact copy of the Mystery Ship which is still hangared in Lancaster, California, owned by the son of Pancho Barnes. (AIR CLASSICS photo)



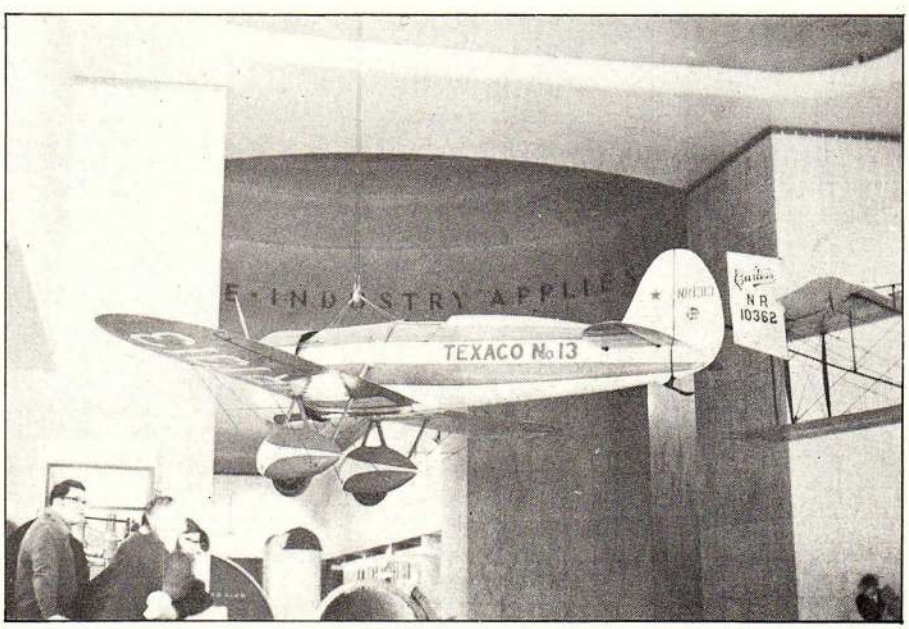
The mystery of the Mystery Ships actually has become the question of what happened to this Model R, which was sold to the Italian government. It may have become a Russian design! (Photo courtesy Ayers)

Ships. 613 was stripped of its in-line engine, and a Whirlwind was installed. Florence "Pancho" Barnes took possession of the machine. Gulf Oil took over 614K, but the company didn't race it. Instead, they repainted it and put on the Gulf logo, as well as the Curtiss-Wright logo (Curtiss-Wright had bought out Travel Air).

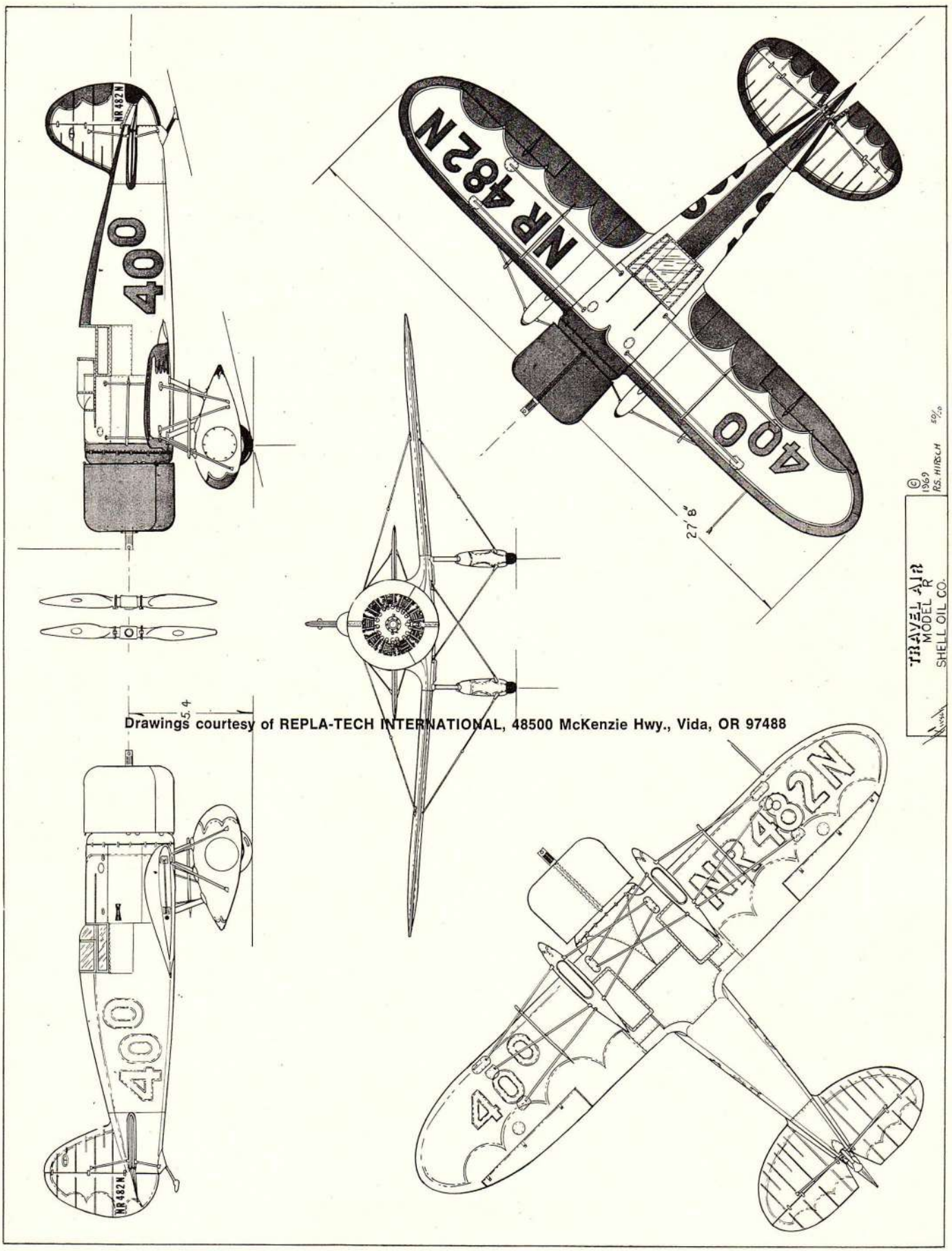
The 1930 National Air Races were a 10-day long affair, the highlight of which was the Thompson Trophy Race. This closed-course race consisted of 20 laps around a five-mile course, and the entries were unlimited in power or size. As it turned out, the Shell Mystery Ship would be pitted against the Texaco machine. Jimmy Haizlip would be at the controls of the NR482N Shell plane, while Frank Hawks was slated to do the honors in the Texaco #13 model. Benny Howard's Pete would be in the pack, as would the Laird Solution. It was going to be one heck of an exciting race! The all-out favorite, ironically enough, was the Army's modified Hawk.

This seemed to be the case, as the staggered start had Page in the Hawk almost lapping the field after only one circuit of the pylons. But, on the third lap, the Hawk suddenly pulled up and clear of the course. Engine problems had slowed the speedy biplane to a crawl, but the Army kept on racing (more for honor than for glory). Actually, if he could hold on, Page could still win the event.

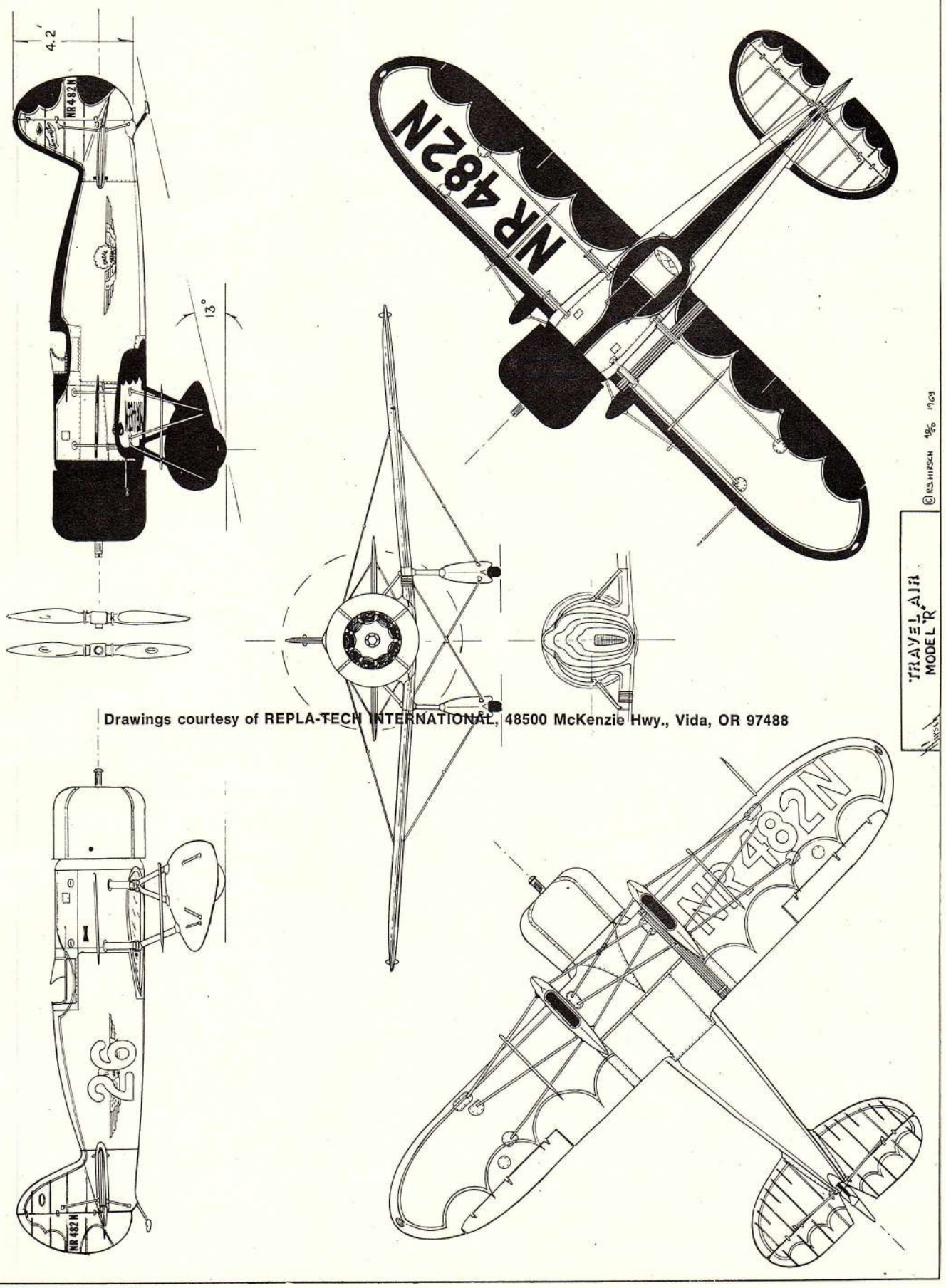
The Thompson was a grueling event. Flying 100 miles at full-bore around a pylon course required intense (almost superhuman) concentration. Page, only three laps from victory, succumbed to the smoke which had been pouring into his cockpit during most of the race. The Hawk plunged into the ground. The pilot died the next day.



The author's dream airplane is the Texaco Mystery ship, as it hangs in the Chicago Museum of Science and Industry. (Photo courtesy Ayers)



Drawings courtesy of REPLA-TECH INTERNATIONAL, 48500 McKenzie Hwy., Vida, OR 97488



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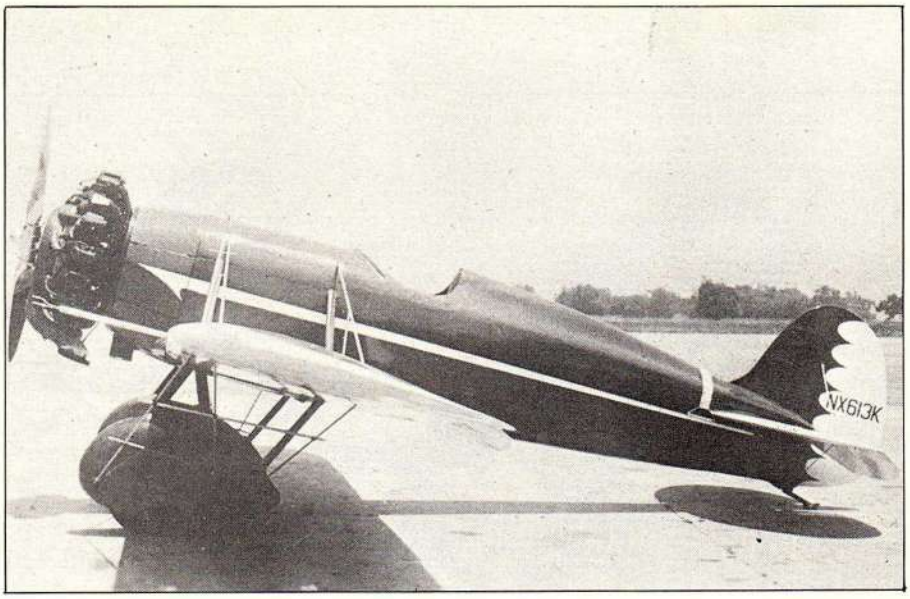

The original Pancho Barnes Model R, as it was taken over by stunt pilot Paul Mantz. The plane is expected to be restored to static display status by Barnes' son. (Photo courtesy Ayers)

Charles "Speed" Holman, flying the Laird Solution, managed to hold a bit of a lead over Haizlip, and won the event. The other Mystery Ship, flown by Hawks, had been forced out early in the race with a mechanical problem. But, the Mystery Ships had equitted themselves well. No one is ever excited about an airplane which finishes second, however, and no further orders for Mystery Ships were forthcoming.

The next year, 1931, the Nationals were obvious by the total absence of the Mystery Ships. Haizlip had done well at a regional meet earlier that year, virtually lapping the field twice. Shortly thereafter, he rolled the Shell machine into a ball. Shell wrote off the wreckage, but Jimmy Doolittle (who was working for Shell at the time) decided to rebuild the plane. This took several months, and Jimmy was putting in a few of his own modifications as the plane progressed.

On June 23, the Mystery Ship was again, Phoenix-like, raised from its ashes. Doolittle took the controls and put the plane through a thorough aerobatic regimen. The ship handled well, and the new fillets made the plane faster than ever. After a few stunts, the Travel Air was ready for a speed run. The airspeed indicator was pushing 300 mph when some loud noises resonated through the airframe. By the time Doolittle was floating to earth on his parachute, the wingless airframe had plunged into the ground. The ailerons had fluttered, and virtually torn the wings off the plane.

The other Mystery Ship, R-614K was slated for participation in the 1931 Nationals. The plane had been repainted black and orange. While practicing for the event, the Mystery

(Continued on page 72)

Authentic 1/5 Scale P-51

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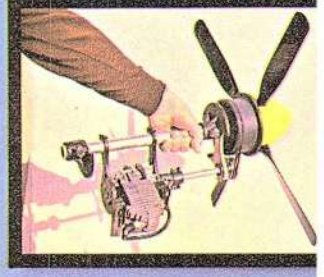

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After years of intensive research, testing and refinements, Byron Originals proudly announces the release of its truly remarkable 1/5 scale P-51 Mustang. This deluxe, super-scale kit, complete with factory-installed Quadra engine and prop reduction system, is unquestionably the most sophisticated and realistic scale reproduction ever made of this famous WW II fighter. The list of standard features and assorted hardware alone is far too extensive to attempt even a partial description. So in order for you to better appreciate this superb kit, we are offering a detailed information pack, complete with materials list, owners manual, parts price sheet and a miniaturized set of assembly plans and isometric drawings. Simply send us $2.00 along with your name and address and we'll forward your pack immediately. Once you review it, you'll understand why the P-51 from Byron Originals is being heralded as the greatest engineering achievement in modeling history.

COMPLETE KIT CONCEPT!

Kit includes detailed fiberglass fuselage, injection molded wings and control surfaces and **all** necessary hardware to complete model as shown. Four deluxe decal schemes, three view and detailed plans and isometric drawings also included. **NOTE:** Pilot, paint, covering material and radio gear not included.

SPECIFICATIO

WING SPAN 8
WING AREA . . 1300 sq.
LENGTH 7
Ready-to-fly weight . . 22½
CHANNELS. . . . . .
(6 for flaps & opt. retracts)

Actual photo of model on final with operational flaps and scale retracts extending.

Optional Pneumatic Retract System!
(Includes **all** necessary hardware)
- Sequencing gear & wheel doors
- Operational scale Oleo struts
- Scale tires & wheels
- Single servo actuation (Fully illustrated in plans)

Retract System
Suggested Retail Value . . $169.94
Mail Order Price $144.45
plus $2.65 shipping

Complete Power Package Included in Kit!
Consists of:
- Complete drive unit & mounting
- Scale 24x15 four-bladed prop
- Quadra's latest Schnuerle ported engine
- 5½" spinner

P-51 Kit
Suggested Retail Value . . $699.95
Mail Order Price $594.96
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CESSNA 310Q

If you are going to spend a long time making the giant-sized Nosen Cessna kit look good, you might want to consider the mods shown here for the 310Q.

By Art Marshall

Photos by Dewey Newbold

The primary intent of this article is not to serve as a kit review, but to recount some of my experiences in building a mammoth scale project. I hope that my comments will provide some insight for others contemplating similar projects. In retrospect, I can recommend this airplane to any experienced modeler seeking a supreme challenge in R/C . . . as well as all the rewards as well as frustrations that go with it. I don't regret building the Bud Nosen 310 at all; in fact, it has been one of the mose rewarding modeling experiences in my entire life. I'll think long and hard, however, before tackling anything of this magnitude again. If you're still interested, hang on and let's take a walk through a real modeling adventure!

About four years ago, my partner in the R/C business, Bob Shelton, and I decided to try something in the soon-to-be-popular quarter scale range. When contemplateing the extra effort and expense involved in building a large ship, it seemed prudent to choose a subject that would result in a truly eye-catching and spectacular aircraft. No giant Ugly Stiks for us!

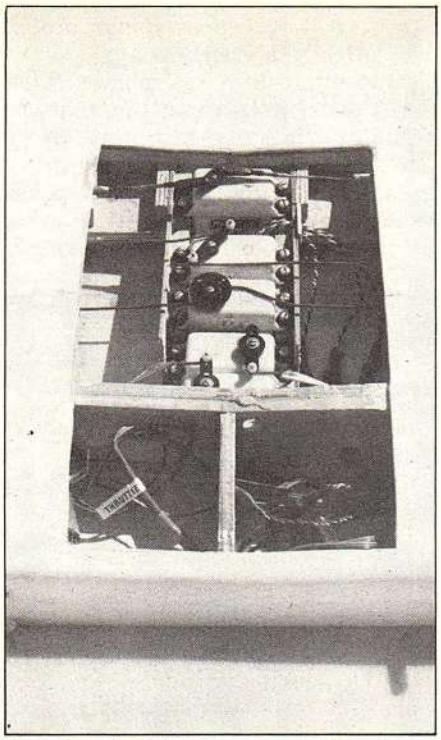
To begin with, we blithely purchased a Nosen 310 kit. The full-size bird has all the sexy good looks and appeal any modeler could want. Here also, was an already tested and proven design. Prudence seemed the key to survival, at that moment. Remember, no one had really done very much with large aircraft, so we were really going out on a limb with a plane whose wing was taller than we were!

We immediately decided the plane would simply have to have retracts. That decision almost caused us to prematurely shelve the project. Nosen's kit is patterened after the 1962 version (officially designated at the 310-G) and the kit nosegear is about 12" long and canted forward. No mechanism we knew of could withstand the loads of such a long strut, so it looked as if our project was already a bust.

Our enthusiasm was renewed when the Cessna folks came through with some drawings and brochures on the 1977 version (310-Q) that features a much shorter nosegear. This one also exits straight out the bottom when in the down position. In the bargain

The author poses with the project which took over four years of part time work to complete.

The model faithfully copies N87367, which is based at a nearby Texas airfield. Note that the nose has been lengthened, and the tail group reworked.



This is a shot of the servos in the wing cavity. From top to bottom, they control: #1 Outboard Flaps; #2 Inboard Flaps; #3 Inner Gear Doors; #4 Left Aileron and #5 Right Aileron. The two throttle servos are out in the nacelles . . . that's seven servos in the wing, alone!

is also a longer and racier nose, and a sexier tail. We were off and running again.

Modifications to the fuselage and empennage were extensive enough to require a complete re-drawing of these components. Now we were really in with both feet! The wing remains basically the same, but the engine nacelles hade to be lengthened at the trailing edges, the tip tanke were altered, and totally new cowls were molded from fiberglass (the kit cowls are plastic). The making of these molds could be a separate article in itself. Beginning to get the picture?

A few other miscellaneous details cropped up such as building two sets of ailerons (the first ones warped) and recovering part of the fuselage when some sheeting joints swelled. You can see why the Cessna consumed about six months worth of evenings and weekends, spread out over about four years. As the photos show, it pays not to rush, and the finished product is truly a work of art.

When we began construction, no one had dreamed of marketing retract units for a plane this size. We set out by modifying Kraft units to accept 3/16″ wire struts and 3 ohm motors. Dwayne Brown, of Kraft Greater Southwest, was extremely helpful during this phase. The 3 ohm motors give the units almost twice the lifting power of the stock units (and almost twice the battery drain). Thus modified, the Kraft units have no trouble lifting the four inch wheels.

The struts still remain a big problem, however. One set was made with no coils, and these still bend on every landing! By the time you read this, we hope to have a completely new system, possibly with some sort of oleo arrangement. I don't mean to berate the Kraft units in any way. In fact the locking mechanisms have never failed, even in landings that completely destroyed the 3/16″ struts! I'm merely trying to point out the pitfalls involved in modifying a product to do something its designers never intended it to do. A separate servo and channel are used to operate the inner doors on the main gear.

Our 310 is controlled by a Pro Line Custom Competition 7 channel radio with standard size PLS 15-III ball-bearing servos. One servo is used for each aileron, two for the flaps,

one for the main gear doors, two for throttles, one for elevator, and one for the rudder/nosegear—for a total of nine. In the future, I plan to install a separate servo for the nosegear steering. No servo problems, broken output shafts, or control surface flutter have been encountered so far.

Finishing the Cessna turned out to be a real bear. Construction at this point had already consumed about $90 worth of epoxy and $150 worth of Hot Stuff. Add to this eleven packages of K&B glass cloth, six quarts of K&B resin and five large cans of white K&B Superpoxy (just for the base color). It appears that the hobby dealer would be well off to give you the kit for free, provided you agreed to purchase all building supplies and accessories from him. After numerous trips, I even started buying sandpaper in 100-sheet packs. The clear plastic supplied for the windshield was rather flimsy, and we replaced it with Sig .040 butyrate sheet for more rigidity, and to avoid cracking around the edges.

With radio gear installed and the finished paint job, final weight was crowding the 30 lb. mark. We began to have doubts about the two .60s we had purchased being adequate so we opted for two O.S. .90s. The .90s added about 3 lbs. to the overall weight as compared to the .60s, but the security of the extra power has been well worth it. The Cessna is not the least bit shy on power, and will maintain altitude on one engine with no problem. We're currently running Zinger 14-6 props and Sullivan 14 oz. tanks (with Cool Power fuel and the new Zinger plugs).

Test pilot chores were turned over to local Ace Ron Ables. By the time I had wrapped up so many hours in the plane, I was incapable of being anything more than a blithering idiot in its presence. Ron is one of those guys who always gets handed everybody else's overweight and crooked toads and always seems to

The finish is Superpoxy, and the author says that the paint job came to about $150 in materials.

get them down in one piece. I really don't know where this hobby would be today without fliers like Ron.

Ground handling was initially a real disaster. After three sets of wheels were tried, the new Fox scale wheels were the only ones capable of supporting the Cessna's weight without the tires rolling off the rims.

Once free of the ground however, our Albatross became as graceful as any eagle. Flight is extremely stable and smooth. Loops and rolls (that's right I said loops and rolls) are absolutely breathtaking. A low pass with the gear up is guaranteed to bring tears to any scale modeler's eyes. If not, you better take up Quickie 500s! As I stated before, the Cessna will maintain altitude on one engine. There is a tendency to drift to one side, but with the Pro Line 270° trim wheels, this is no problem to overcome. I can't say that we have a lot of single engine time on the airplane however, as the O.S. .90s have been extremely reliable.

After four test flights, liberal quantities of champagne were consumed and, on the next outing, it was my turn at the sticks. I was literally shocked to find it one of the easiest-flying airplanes I have ever flown. The sixth and seventh flights were also the Cessna's contest debut at the 1980 Winter Nationals, in Tucson.

Once again, some help from a fellow concerned modeler made the difference between success and disaster. Joe Zingali's razor-sharp ear got the O.S.s turned to perfection and his reassuring words during my two flights were invaluable. I was fortunate enough to come in 4th in Giant Scale, out of eleven entrants. Not bad, considering these were only the 6th and 7th flights on the plane and I received zeros on both landings as the 310 destroyed its landing gear struts. We managed 8s, 9s, and 10s in all airborne maneuvers. Fittingly enough, the trophy was sponsored by Bud Nosen Models.

Lest you think it will fit in your Honda Civic, here are a few statistics on the 310. Wingspan is 128", area 1,800 square inches, and the stabilizer span alone is 52 inches! Overall weight of our bird is 33½ lbs. Stock kit versions with fixed gear end up around 18-25 lbs. I would conservatively estimate around $1,500 spent on the airplane—exclusive of radio gear. A stock kit version should involve many fewer hassles than we experienced, but we were after something really special.

Would I do it again? I doubt it. Was it worth it? YOU BETCHA! □

Modeling the Gee Bees

(Continued from page 24)

the ¼-scale version of the Model Y, two other Gee Bee models were built. First was the Model D Sportster, which was an earlier design than the Y. It is a single seat sportster and has an in-line engine installation. This model was built in the same size as my earlier Model Ys, and also was powered with a .40 engine. The engine and muffler were completely hidden in the cowl, without any non-scale openings. The model was tested on a Saturday evening, and flown the next day in its first contest (which it won, against very formidable competition, including a member of our World Scale Team).

Its next outing the big Rhinebeck Classic contest for models of the Golden Era. The Model D was flown in all three events, and had the best overall record in the contest. It placed in the top five in all events, a feat that was unequaled by any other model. Adding to the impressiveness of the model's performance was the fact that my caller for the meet was Bob Granville. Bob attended the meet as a guest of my club, the South Jersey R/C Society. Bob enjoyed meeting the many scale modelers, and I am sure they got just a little thrill of shaking the hand of one of aviation's greats.

After flying the Model Y and D Sportsters in scale contests for three seasons (which brought an impressive collection of trophies to my collection), I decided to meet the real challenge and design and build a model of one of the Gee Bee racers. A friend had also asked if I planned to do one, as he wanted to build the R-1 and needed plans. I did the drawings for the racer so that any one of the three aircraft could be built from them. When the plans were done, I sent prints of them to both Bob Granville and also to Pete Miller, who had designed and engineered the racers. Both suggested minor corrections to the drawings, which I made. When the plans were finalized, both men signed their names to the mylar drawings, verifying their complete accuracy.

Building the model was a fantastic experience. Naturally, during the construction of the model, I heard all the bad things about the airplane and how it wouldn't fly. Two people told me it would fly, and fly well . . . they were Bob Granville and Pete Miller. Who should I listen to? The general crowd, or the men who designed and built the aircraft and really knew what they were talking about? As the model was completed, it continued to draw the normal and expected comments. The modelers in the area know that I don't build models to sit around. I build them to fly, but they all thought that this one was a foolish project.

Before it was completely finished internally, I took the "bare bones" to a contest. A magazine Editor (not Pat Potega) took pictures of it, raving as to how beautiful it was. After taking the pictures, he remarked, "You really don't expect it to fly, do you Henry?" I told him the same thing I had told everyone else, "I wouldn't have built it if I didn't think it would fly." I had done a planform layout analysis of all of the Gee Bee aircraft, and found that they are not what they superficially looked like. Their bulbous shape gives a false impression of their true moments. I found that I had already flown models with much poorer proportions.

The biggest encouragement—aside from Bob Granville and Pete Miller—was Granger Williams' success with his Model Z Gee Bee Super Sportster. Granger had shown that a Gee Bee racer would fly, and fly well. I checked many things with Granger while designing the racers, and his figures showed me that my model would be at least as successful as his. The Z actually has the poorest layout of any of the Gee Bees and certainly, if this one would fly, there was no doubt in my mind that my model would perform well.

The fact that I was building to a slightly larger scale than Granger's model also added to my confidence. My R-1, R-2, and R-1/R-2 design is close to 2¼ inch-to-the-foot, the same as my previous Model Y and Model D Sportsters. I decided to go with more power, however, as I knew the weight would be higher. My Model Y models weighed a little over five lbs. and floated. The Model D, even though it is the same size, came in at 6½ lbs. due to a scale finish with AMA-type detailing. All three flew very much alike, but the D handled much better on the ground and didn't float quite as much as the Ys had.

As I built the R-1/R-2, I hoped to come in under eight lbs. which I felt would be reasonable. The same size wing on the R-1/R-2 would actually have less effective area than on the others, because of the extreme width of the fuselage at the wing location. Pete Miller had mentioned to me however, that the fuselage on this aircraft contributed to the lift. With Granger's figures, Pete's information, and my own calculations, I felt I would have a very flyable model if I could keep it under eight lbs.

The final Model E in the line was Bill Sloan's NC72V. Bill flew some 995 hours on the plane, which is probably a Gee Bee record.

The author had the pleasure of having Howell W. Miller, the man who designed the original 1932 R-1/R-2, admire his model. Miller also authenticated the author's plans for this plane.

I believe most of us scale builders get a few butterflies in our stomach when flying a new bird for the first time, especially if it is an original design. I know I have flown many models over the years with very shaky fingers, sometimes wondering how the model survived that first nervous flight. However, for some unexplained reason, I was not a bit excited when making the first flight on the R-1/R-2. I really don't know why, but I just felt very confident of it.

The first flight was beautiful. The tail came up nicely, it rolled on the main gear and lifted off beautifully in a gently left climbing turn. I hadn't touched the sticks, and I just let it go until it came parallel to the runway. It needed right and down trim, and I didn't have enough of either, so had to hold a little stick pressure as I flew. I flew it around for several minutes just getting used to it in turns, and then I landed to make trim adjustments. I thought it would land like a brick but was fooled . . . I had to go around again. On the second try, the Gee Bee still landed much longer than expected.

After making the trim adjustments, a second flight was made, and the model flew hands off. Loops and rolls were executed, and a dead stick landing became necessary when the engine died on the top of a loop. No trouble was encountered, except for floating way beyond my intended touchdown spot again. It flew great and, after flying it in several contests, I finally got a chance to put it on a scale. I wish I hadn't, as it would have been better if I didn't know the model's weight. It tipped the scales at an even nine lbs. (without fuel). With 12 oz. of fuel aboard, I'm afraid to figure the wing loading. Pete Miller was right—because no model could fly so well with that wing loading. The fuselage contributes significantly to the lift. There could be no other explanation for it and since Pete was the chief engineer on the real one, he knows what he is talking about.

This model need not have been so heavy, but I chose to finish it with a real scale finish, using the fabric over wood covering as on the real craft. Many coats of dope were used to get the same super finish as the real one. My model also featured all scale details, including a full cockpit, and scale internal structure in the cockpit area. Pete Miller sent me a print of his original layout drawing for the instrument panel, along with other structural drawings

of the racers. You just can't get much better documentation than that! It is a beautiful flying model, in spite of its heaviness . . . it has amazed everyone who has seen it fly. It always gets a big hand on take-off—and a bigger one on landing.

My biggest satisfaction with the model, in spite of all the prizes it has won at contests, was seeing the expression on Bob Granville's face as he watched its first landing at the Rhinebeck Classic meet. That moment was worth all of the work I have done on all of the Gee Bee models that I have built.

After seeing my first Gee Bee fly, a couple of club members wanted to build one. Phil Barbaro was the first to complete a Gee Bee. He built a model of Lowell Bayles' Model X Sportster. Shortly thereafter, Dink Shahan built a model of George Rands' Model C Sportster from the same plans. A long time friend, Bert Williams built a Model Y from my plans; and flew it in the second Rhinebeck meet. Bert had previously designed and built a model of the Gee Bee Biplane, as well as a control-line version of the Model Z racer. Bert's first Y was of the one flown by Florence Klingensmith in the 1933 Chicago International Air Races. He has since built the same Y, but as it was when rolled out of the Granville factory in 1930. This was an entirely different looking ship, due to extensive modifications which were made on it for the 1933 races. Bert raves over the way both of these models flew.

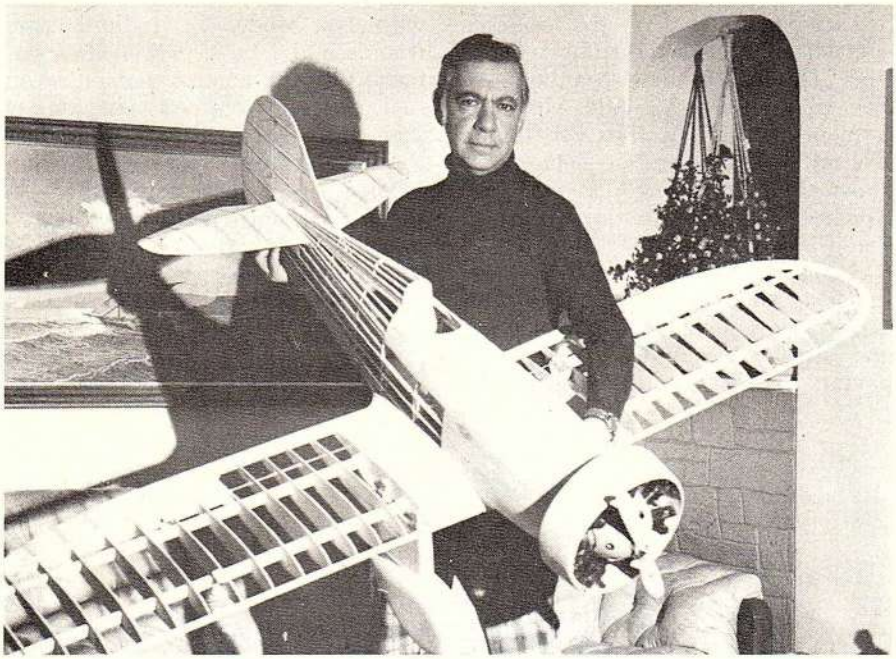
Another member of my club, Joe Gallagher, wanted to build a Model Y from my drawings. Joe was a good sport flier, but had never built or flown a scale model or a taildragger. I gave him my Model Y and told him to make his better than mine. He listened well. After finishing it, he attended most of the season's contests and beat me almost every time. He had to have another Gee Bee, and built a ¼-scale Model E from my plans. His flies very much like my ¼-scale Gee Bee Zeta (don't know about that one do you?) for which I still have to finish part of the drawings.

So, a group of fellow Gee Bee enthusiasts and I have built a total of 14 Gee Bee models of various types and sizes . . . and we have been having a ball with them. Eight of the models have been entered in contests, and all eight have come out winners. The Gee Bees were great aircraft in their day and, along with what Granger Williams has done with his Model Z, I think some friends and I have proven that they make just as good a model as the real aircraft were . . . so long as you don't listen to all the stories that have been told about them. I know of at least four other Gee Bees under construction, and at least three more in the planning stage. They were great aircraft, so let's put more Gee Bees into the air. □

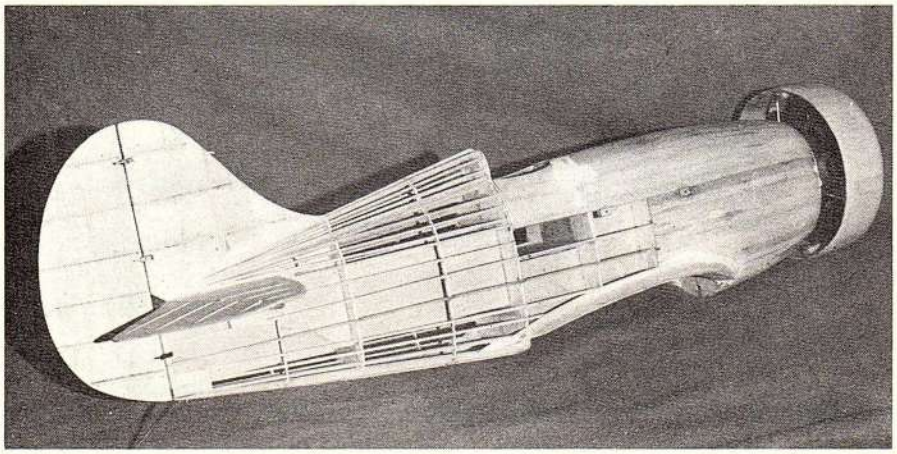
The red and white serial #6 Model E, built for Skip Tibert.

HAFFKE'S MODEL E

(Continued on page 26)



Joe Gallagher, who constructed the prototype, shows how big the Model E really is.



The fuselage framework shows a crutch-type structure, over which the stringers and sheeting are built. Note sheet empennage, with raised balsa slivers to simulate ribs.

putting it together. In our search for information, we were able to locate several of the men who owned and flew the Gee Bees. Also, eye witnesses to some of the accidents were interviewed and their stories were found to be very different from what had been written. One of those who were located was Bill Sloan, who owned not one, but two of the Model E Sportsters. Bill and I have carried on extensive correspondence for several years now. He has been extremely helpful in the research I have been conducting. There was always a question as to just how many of the Sportsters were built and Bill's records of the definitive serial numbers of his aircraft solved the long time question.

I have had other historians question my facts, because they misread things that had been written. Pictures had been found that gave false identites to some of the craft, creating subjects that never existed. For instance, there are a couple of pictures of NC11044 where the sun on the very shiny finish of the craft reflected out part of the last 4 and thus NC11041 was created. Later investigation proved that I was right and that NC11041 was indeed not a Granville-built craft.

Bill Sloan heard of a Gee Bee for sale and made a trip to Springfield, where he purchased the Model E (serial #7) NC46V. This craft had around 50 hours on it when he obtained it. He had logged an additional 50 hours on it, when Zantford Granville contacted him with a proposition. Grannie needed a ship to be flown in the 1930 Ford Air Tour, and there was not enough time to build one. He asked Bill if he would return NC46V, for which Grannie promised to build him a new one. Bill told me that the prospect of having an aircraft built especially for him was more than he could pass up, and he agreed to return his first aircraft to Springfield. Lowell Bayles flew the NC46V in the Tour and won his class. In August of that year, Bill Sloan flew his gleaming new yellow and green Gee Bee Model E Sportster NC72V (Ser. #8) from the Gee Bee plant in Springfield. Bill raves over the way the two Sportsters flew. He performed in a lot of air shows. Bill has told me that he did everything in the aircraft that anyone had ever done in a plane . . . and he also feels that he probably did some things that no one had ever done before. The Sportster would do anything, and was a real joy to fly. He participated in many air races held in the area, and says that the Model E could not be beaten in its class. "Racing the Sportster was like taking candy from a baby," he reports.

He logged 995 hours in NC72V before selling the craft to Jack Wyman, of Philadelphia. Times were bad and he needed the money. Later when he was able to purchase another aircraft, he could find nothing that satisfied him after flying the Gee Bees. His time in the two Sportsters totaled over 1,000 hours which is undoubtedly the most time anyone ever logged in Gee Bees. His NC72V was the last Sportster built by the Granvilles. After the aircraft was owned by Jack Wyman, it was purchased by Johnny Crowell of Charlotte, N.C.

Johnny was a well known air show performer of his day, and correspondence with him relates the same feelings as those of Bill Sloan. He remembers most that it was "A hell of a good flying airplane." Later, Johnny Crowell traded the Gee Bee to Bill Sweet and Don Walters for a biplane they had. Don flew the Gee Bee in Bill's National Air Shows, and also raves over the ship's flying characteristics. He was making a landing at an air show one day when a truck suddenly pulled in front of him. The resulting mishap wrecked the Gee Bee and put Don in the hospital. The man and woman in the truck were killed, but the baby the woman was carrying in her arms

was thrown clear of the wreck and emerged without an injury. This happened near the end of the air show season. After the last show, Bill Sweet got Don out of the hospital (against doctor's orders) and drove him back home with the wrecked Gee Bee on a trailer behind them. The Gee Bee was taken back to Springfield, where the Granville Brothers put it back in flying condition over the winter.

Don wrecked the aircraft again when the Warner quit on him while practicing aerobatics. He located a field and set up a landing, while trying desperately to get the engine started again. The engine caught just before he reached the field, and he pulled up. But the engine quit again, and this time the field he had to land in was not big enough and he ran into a fence . . . completely wrecking the Gee Bee, even though he was not hurt. The craft was used for parts and was not repaired. The red and white wing of NC72V is now in the EAA Museum.

I have not been able to find out for sure how this color scheme came about, and I can only assume that, when the craft was rebuilt after Walters' first accident that it was repainted in the red and white color scheme. I know that the craft was still yellow and green when Walters obtained it from Johnny Crowell. There is a picture of NC72V as "Miss Amoco" with their logo painted on the sides. The Amoco colors were red, white and blue, so I can understand the aircraft being red and white when appearing as "Miss Amoco."

Bill Sloan's first Gee Bee (NC-46V) was used as a demonstrator and air show ship at Springfield, and was not sold again. In 1932, when Russell Boardman test flew the R-1 without a fin and very little rudder, he requested more fin and rudder area. This addition was installed at Bowles Airport in Agawam, Massachusetts, just across the Connecticut River from Springfield. Bowles was the field where all of the Gee Bees were test flown after their initial takeoff from tiny Springfield Airport. The additional fin and rudder area was added to the R-1 by Bob and Zantford Granville over the weekend following its first flight. On that Monday morning Boardman was to make the second hop with the revised tail surfaces.

He climbed into NC46V for the short flight to Bowles Airport where the R-1 was waiting. He took off in the little Sportster (which some claim was his first time in the craft). He attempted a loop on takeoff, it

The Model E was one of the most popular of the Sportster series. There are four paint schemes from which to choose.

is reported, which he had done many times in the Senior Sportster Model Y. However, the Senior was powered by a 300 hp P&W Wasp and the 110 hp Warner was just not enough engine to do what the Wasp would . . . Boardman ended up in the woods off the end of the field. His injuries prevented him from making further flights at the time, and Jimmy Doolittle became the pilot for the R-1 in the 1932 National Air Races a few weeks later. The crashed Sportster was beyond repair, and thus ended the life of NC46V.

Two other Model E Sportsters were built. The first was serial #4 and was painted Army blue and yellow. This craft had the spatted landing gear, as it was built before the full fairings were used for the first time on the #5 aircraft built by the Granvilles (Model D Sportster). The other Model E was serial #6, and was built for Skip Tibert. This NC11044 aircraft was red and white and was washed out when the pilot let someone else take it up for a flight.

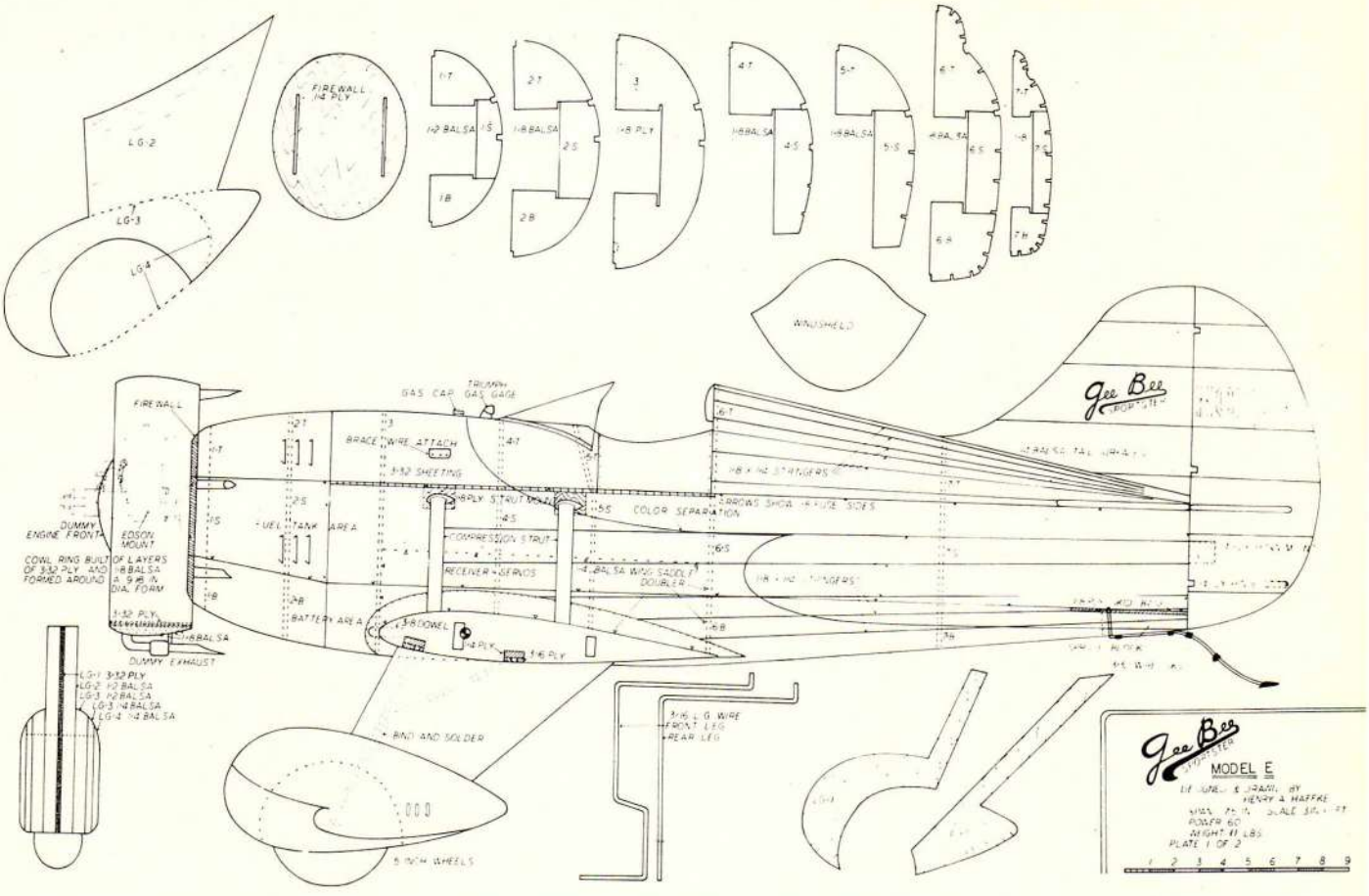
The #4 aircraft was being delivered to a customer in early 1934 by Zantford Granville when it met its end. Zantford was making an approach to Spartansburg airport in South Carolina when the accident occurred. Reports in the newspaper of the town tell of airport workers on the runway being seen by the pilot just before touchdown, causing him to pull up suddenly and losing control of the craft.

A female member of the Granville family has told me that she does not feel that this theory is correct. Grannie was too good a pilot to have lost control during an aborted landing approach. He was not scheduled to land at the airport where the mishap occurred. Her feelings are that Grannie may have felt sick, and was attempting to get on the ground at the nearest point. She feels that Grannie may have suffered the same fate that took the life of his father, and also the lives of each of his brothers—a fatal heart attack. The condition of Grannie's body when returned to Springfield, particularly the change in his hair, is what made her firmly believe that this is what may have happened.

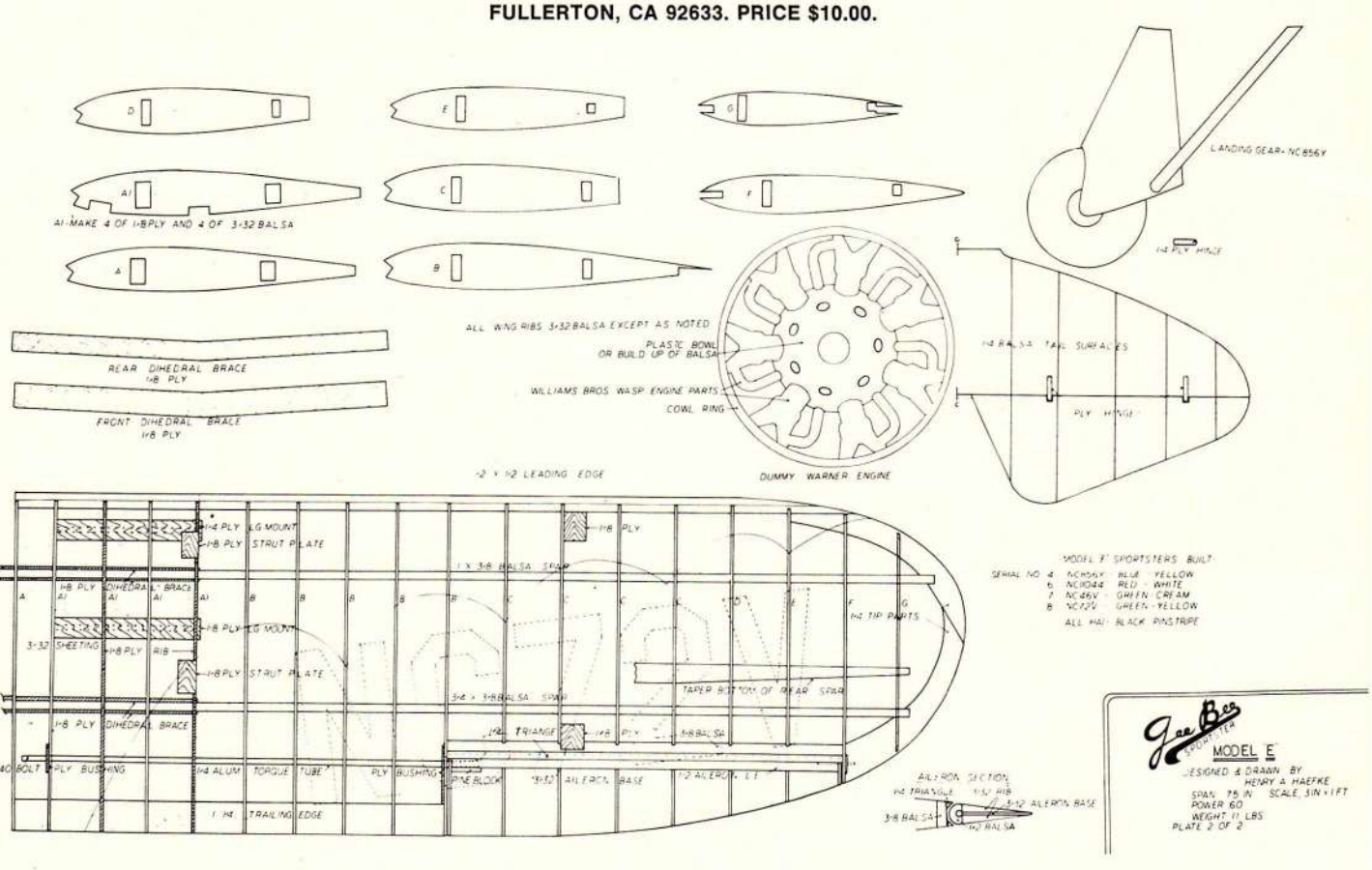
* * *

All of the Model E Sportsters are gone, but we can re-create them in model form, as they make superb flying subjects. They were truly one of the most outstanding aircraft of their type in the history of aviation. Their pilots raved over their performance, and the Gee Bees leave behind a record of unparalleled air show performances and racing victories in their class.

The Model E is not a difficult subject to build. Everything goes together quite easily and quickly. Any of the four Sportster E subjects can be built from the plans and the only real difference was the landing gear on #4 (which is detailed on the drawings). The other three aircraft all had the fully faired landing gear legs and pants. The only other noticeable difference that can be seen in some pictures is a difference in the engine cooling louvres—which differed in number and location slightly from one model to another. Each aircraft was a different color combination, so there is a nice choice when deciding which one to model.



FULL-SIZE PLANS AVAILABLE FROM:
HAL OSBORNE, 1932 CONEJO LANE,
FULLERTON, CA 92633. PRICE $10.00.



Fuselage:

Make up two basic fuselage sides of 4" wide sheet. Also make two ¼" balsa wing saddle doublers. These doublers are glued to the insides between formers #3 and #6. Cut out the one-piece ply former #3, and the ¼" ply firewall. Install them in their proper locations and let dry completely. While this is drying, put the structure upside down on a flat surface to keep proper alignment. Cut out the remaining formers and when the above structure is dry, install them. Add the top and bottom ¼" sq. stringers to the nose section, and add the side stringers of 1/4 x 1/8" balsa.

Prepare the tail surfaces of soft ¼" balsa and glue the stab and fin in place. The remaining top fuselage stringers may now be added. Taper the ends of the stringers where they meet the fin and stab. The lower stringers may be added after the wing is fit to the fuselage. Plank or sheet the forward section of the fuselage with 3/32" balsa. Add the 1/8" ply compression strut mounting plates. Glue the 1/8" ply tailskid base and cut a spruce or pine block for mounting the skid, and add this to the ply base. When all stringers have been added, the fuselage can be sanded to final smoothness.

Tail Surfaces:

The tail surfaces are simply cut from ¼" balsa and the edges are rounded. Scale hinges may be made of plywood (as shown) or your favorite commercial hinges may be used. The elevator halves are joined with one of the commercially available horns, such as those made by Sig.

Wing:

Prepare all ribs from the appropriate material and taper the bottom of the rear spar, as shown on the drawings. Mark the spars for rib locations and slide ribs on the spars. Support the spars on two leveling blocks between rib A, A-1, and between the last two outboard rib Cs. While the spars are supported on the leveling blocks (these blocks can be any height so long as they keep the ribs clear of the working surface), the ribs may be glued to the spars. Weight the top of the spars until the glue dries completely before proceeding. Add the ½" sq. leading edge and the trailing edge. Also add the 3/8" balsa block at the aileron location.

The tip parts can be cut from ¼" balsa and should be added now. When this basic structure is dry, it may be removed from the leveling blocks. The second panel can be built in the same manner, except that it is built upside down on the leveling blocks, so as to have a right and a left panel. The 1/8" ply plates are added for attachment of the flying wires and the compression strut mount. Flying wire plates are needed on both top and bottom surfaces, while the compression strut mount plates are needed only on the top surface.

The landing gear mounting blocks are made of 1/8" ply, and may be installed in the cut outs in the inboard ribs. The ailerons are built by tack gluing the aileron leading edge in place and adding the aileron base sheet. Half ribs are added top and bottom, completing the aileron structure. The aileron can be removed from the wing after sanding to final shape, and a pine block can be installed at the inboard end for attachment of the torque tube. Drill the block for the torque tube.

Torque tubes are made of ¼ aluminum tubing or similar, and are held to the aileron with a long screw through the bottom of the aileron. A 4-40 bolt is installed in the inboard end of the tube and this becomes the aileron servo crank. Use a ply bushing where the tube goes through the final rib B and a short piece of small tubing in the outer end of the aileron fits into a ply bushing at rib F. No hinges are needed with this installation as the aileron has bearing surfaces at ribs B and F. The two wing panels are joined after the aileron installation is completed.

The wing panels are joined by sliding the dihedral braces into one wing panel and gluing, and, when this is thoroughly dry, the panels may be joined by sliding the other panel onto the dihedral braces and gluing. Using the leveling blocks under one

The big wheel pants are made from balsa. The rigging is all done with elastic thread.

panel to keep it square to the building surface, the other tip is propped up and supported in a square position until the glue has dried completely. The center section can now be sheeted with 3/32" balsa, and the wing is ready for final sanding.

Landing Gear:

The landing gear parts are formed of the proper size music wire. The front and rear legs are mounted in the wing blocks with straps and screws. Bind the two legs together with fine copper wire and solder. The landing gear fairings are built up of layers of ply and balsa. Refer to the drawings and laminate these parts together. Clamp tightly or weight heavily until completely dry. When dry, install a locating dowel in the front and rear of wheel fairing. Tack-glue the two halves of each fairing together and carve and sand to shape. Install the wheels with a collar on each side and then sandwich the landing gear fairing halves around the wire legs. The halves may be glued together, or may be held together with screws.

Cowl:

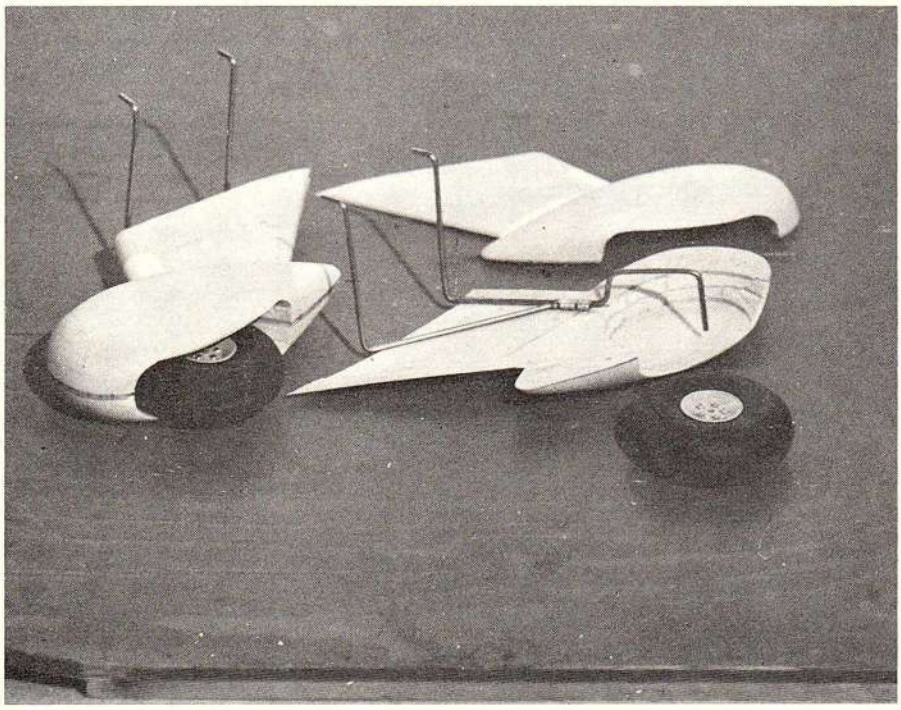
The cowl is formed around a 9¼" diameter cylinder. If you cannot find a cylinder of this size, a simple cowl forming device can be made by cutting two 9¼" circles out of ply. Join the two discs together with a spacer of proper thickness. Cut strips of 3/32" ply 3½" wide and form them around the cowl form. Add a second layer of 3/32" ply over the first—with the glue joints staggered from the first.

When the ply has dried, add three layers of 3/32" balsa, using the same procedure as with the first layers of ply. The layers can be held tightly in position with masking tape, or large rubber bands can be stretched around each laminate as it is added. This will hold the layer tight while the glue dries. When all layers have been built up and the entire structure is completely dry, it may be removed from the form and can be carved and sanded to final shape. The cowl is attached to the firewall with "L" shaped brackets of music wire. These brackets are held to the cowl and firewall with screws.

Dummy Engine:

Any model with a big radial cowl needs a dummy engine. The drawings show the layout for a very effective looking dummy Warner Scarab radial engine. The crankcase and shroud is made of a plastic bowl, or it can be made of a couple of layers of ½" balsa shaped as shown. Cylinders from Williams Bros. are glued to the crankcase, so as to form a snug fit inside the cowl ring. Trim the cylinders for this fit and the whole thing can be permanently glued to the cowl ring so that the cowl and engine are removed as a unit. They could be built as separate units if preferred, so that the model could be flown without the dummy engine in place when desired.

The carved wheel pants, with the landing gear struts exposed. Some wire bending and soldering needed, but nothing very complex.



Detailing:

Of course, the detailing of any scale model can be carried as far as the builder desires. The main thing with the Gee Bee Sportster is the wing struts and brace wires. These are the things which give the model its character. The wing struts can be made of streamline aluminum tubing, or may be carved from spruce or balsa. The material is not important, as they are strictly for appearance and are not needed for strength. The brace wires are also not needed for strength and can most easily be made from the elastic cord available from any sewing center.

Brace wires are made by making a small hook, which is attached to the end of each brace wire. This hook is used to attach the wire to an aluminum bracket which extends through the fuselage. Three holes are drilled in each end of the bracket for attaching the three brace wires. The brace wires may be threaded down through the wing and then through the landing gear fairings. They can be attached on the other end to a small aluminum bracket screwed to the landing gear mount block, at the base of the opposite landing gear fairing. By using the elastic material, the wires will be taut at all times and can be easily removed.

Finishing:

There are many ways to effectively finish any model, and you may have your favorite method. Our Gee Bee was finished in a unique way which cuts finishing time and weight. The structure was prepared by a smooth sanding, and then it was given a coat of Corverite's Balsarite. The model was covered with Permagloss Coverite, and trim was applied with one of the plastic covering materials. This finishing method works very well if you can get the proper colors of these materials for the particular model you are doing. This gives a very light and durable finish.

The colors of the various Gee Bee Sportsters are as follows:
Serial #4 NC856Y Blue and Yellow
Serial #6 NC11044 Red and White
Serial #7 NC46V Green and Cream
Serial #8 NC72V Green and Yellow

All of these had a black pinstripe dividing the colors.

FLYING

The Model E Sportster is not a large model, as ¼-scale airplanes go. It is just a little larger than

most .60-powered models. It is very peppy on a good .60, and more power is not needed. Be sure to mount the engine with about 1/8″ of right offset. The model is short coupled and, without the side thrust there will be a noticeable left yaw when going into the high throttle mode. If the engine offset is used and the model is balanced where shown, it will be a very stable flying craft.

I like to fly my taildraggers in the grass and, as our club field has both a hard top and grass surface, I always use the grass strip. The E will track very straight on grass, and the tail will come up immediately. It will lift off probably before you expect it to, as it has a very light wing loading and needs very little speed to fly. Mine fooled me on my first flight, and it was in the air with full up elevator (which I was holding to keep the tail down). It floundered a few seconds, until I straightened it out with rudder and down elevator, at which time it regained its composure and I got my breath back.

The Gee Bee climbed out nicely, and the rest of the flight was very uneventful. It did everything I tried, and I found that it was very gentle, yet would respond to the slightest control movement. The elevators, though not touchy, are very effective and require less movement than would be thought to execute a loop. The model is surprisingly fast, in spite of all that drag from the big radial front end, struts, and brace wires. It slows up very well for landing. To stretch the landing approach, a little power is needed. It is a very enjoyable model to fly, and any Gee Bee is a beautiful thing in the air.

If anyone wishes to use his Gee Bee for contest work, I will be glad to assist with documentation. I have a good selection of original photos of all of the Model E Sportsters, and will be very glad to have prints made for anyone who needs them. Write to me directly: Henry Haffke, 1038 West Elmer Rd., Vineland, NJ 08360. Good luck with your Gee Bee and I hope you enjoy it as much as I have mine. □

FULL-SIZE PLANS AVAILABLE FROM: HAL OSBORNE, 1932 CONEJO LANE, FULLERTON, CA 92633. PRICE $10.00.

Mystery Ship

(Continued from page 56)

Ship caught fire and pilot Walt Hunter had to parachute to safety.

The old Texaco #13 had been damaged by Frank Hawks several times, and was eventually retired from flying. The plane now hangs in the Chicago Museum of Science and Industry. Pancho Barnes flew her old 613K all over California, in the service of her hotel at Muroc Dry Lake. Paul Mantz later purchased the plane and used it in a number of motion pictures.

The Italian Government ordered a Mystery Ship, which was painted up like Hawks' machine and delivered to them. This one did, indeed, become an aviation mystery. The plane disappeared, with nothing again ever heard about it. A theory was once put forward that the Italians dissected the plane to see what usable ideas they could get for their military craft. Ironically, the 1934 edition of *Jane's* has a Russian AIR-7, which is a dead-ringer for the Mystery Ship. The big mystery finally turned out to be exactly what did happen to the fifth Mystery Ship!

The big mystery at the 1929 National Air Races was this machine, which was kept closely guarded in a hangar until just before race time. It beat the Army, which was quite a feat. (Photo courtesy Ayers)

There's one other Mystery Ship in existence today, as Jim Younkin finished his replica of Pancho Barnes/Mantz' R614K. Barnes' son bought the plane back from the Mantz estate some years ago and, to the best of anyone's knowledge, the plane is still in storage in Lancaster, California.

* * *

The following sources can supply data which will help you develop your Mystery Ship:

Air Classics, December 1979 (limited number still available from Challenge Publications at only $2.25).

Castle Graphics, Greenbank, WA 98258 (Photos).

Collect-Air Photos, Milwaukee, WI 53214 (Photos).

Repla-Tech Int'l, 48500 McKenzie Hwy., Vida, OR 97488 (drawings).

Sport Aviation, July 1980, Experimental Aircraft Assoc., P.O. Box 229, Hales Corners, WI 53130.

Wings, December 1972.

* * *

Our readers are asked to turn to page 42 for Bert Ayers' model of the Model R, Shell Oil racer. The next issue of SCALE R/C MODELER will have additional 3-views and documentation of the Mystery Ships. **(PHP)** □

WEEMES' SPORTSTER "E"

(Continued from page 32)

some breathtaking loops and rolls. The Gee Bee just loves to be tossed around the sky!

The Gee Bees have a reputation for being terrible groundhandlers. As a matter of fact, the full-size plane which I copied was the one Russell Boardman was injured in through a groundloop in 1932. But the model is very tame. It lands so slowly that you can really drag it in. Keep the wings level to avoid scraping the tips, of course. The rudder provides positive steering down to a complete stop, even on a paved runway.

I had an opportunity to take the model to the 1/8th Air Force Fly-In, and the famed Ted White was gracious enough to fly the model for me. That man is almost superhuman in his skills at the controls. He did slow rolls, 8-point rolls, Reverse Cuban-8s, Knife Edge Flight, and just about every other maneuver one could imagine. The Gee Bee never missed a beat, and several fliers asked me if the moment arms had been fudged to make the model closer to a Pattern ship.

I feel as if I have been following in the footsteps of giants, in copying Henry Haffke's efforts in modeling the Gee Bees. Henry has done much to open up the true potentials of these gorgeous Golden Age racers. I also want to acknowledge the kind help of Ben Owen, of the EAA, who verified the wing planform from the actual wing panel they have in storage.

The best sources for documentation on this plane are Charles Mendenhall's book *The Gee Bee Racers*, Specialty Press, North Branch, MN 55056. Ralph-Tech Int'l has a nice Robert Hirsch 3-view (48500 McKenzie Hwy., Vida, OR 97488). If you can get your hands on one of these out-of-print pamphlets, *Profile Publications* #3 has some good material.

If you have been shying away from the Gee Bees because you were afraid that they would be a disappointment, then here's your chance to get with it. This is one Golden Age racer that flies more like a contemporary aerobatic machine than anything else. □

FULL-SIZE PLANS AVAILABLE FROM: HAL OSBORNE, 1932 CONEJO LANE, FULLERTON, CA 92633. PRICE $10.00.

Byron's Big Mustang

(Continued from page 40)

bly tight enough. We thought of Loctite to give a little extra bond, or maybe PermaTex #1 (a gasket sealing material)—anything to give a little more "grab" at this joint, but still enable it to slip on a heavy side load. We are going to try less toe-in first and, failing that, we will probably go to a machinist and have a very light knurling put on the end of the pivot axle. All that's needed is to increase the friction about another five pounds of side stress. If you overdo it, the struts will break, or the wing itself will come apart. The eventual solution must still preserve the failure feature, but it must give more capability for slight sideloads, such as those encountered in normal takeoffs and landings on a paved field.

At this time, we only mention these items as matters of concern, but we certainly wouldn't suggest to anyone that they not build the P-51 because of these difficulties. Once these two "bugs" are corrected, the Byron Mustang will hold a respected place as one of the finest kits on the market. Normally, when we review a model that has troubles like this, we tend to abandon it and simply forget about the report. We alert the manufacturer of our findings, of course. But, the P-51 is such an exciting airplane that it's worth pursuing. To feel that power behind the four-bladed prop as the fighter sits up on the mains and rolls down the runway is to know that this is the closest thing you'll get to the real thrill of a full-sized warbird. The model handles well in the air, is aerobatic, and is surprisingly easy to fly. As we mentioned before, just seeing those scale gear cycle is a total thrill.

Of course, it may be that you could build a Mustang and have no difficulties at all. After all, this model has been under development for years. We'll guarantee you of one thing . . . if you follow some of the suggestions presented in this two-part article, you'll get 100% more out of your Mustang. We well remember our article on the Pitts, and now we learn that a revised kit is coming out—incorporating almost every mod we discussed in that article!

We had the good fortune to get kit number 001 of the Mustang. Rick Lewis, who has won Best of Show at the MACS, opted to do the basic building, while we were to do the radio installation and final set up. When you first open the kit, one can't but help marveling at the wonderful engineering that has gone into the model. The molded foam wings are beautifully executed, with a unique hollow core for added rigidity and a savings in weight. All the flying surfaces are also molded foam. The fuselage is a very thin layup of polyester glass. The formers and all internal wood are already glued in place—even the servo mounting tray. As mentioned, the engine and drive system are already aligned and ready to operate, all that's required is to bolt on the separate prop blades on the glass-filled nylon hub. If damaged, it's only necessary to replace the damaged prop blade, instead of the full set. Being nylon, the prop blades are very resistant to chipping or breakage . . . you can actually flex the blades without damaging them.

The kit comes in two huge boxes (probably the largest kit boxes on the market). The fuse is split just ahead of the tailwheel, so that the tailcone is glued onto the rest of the fuse (the total length is 76″). After looking through the instructions and perusing the six pages of drawings, one is amazed at the beautiful engineering in such items as the flaps and ailerons. These are hinged in a scale manner, aft of the leading edge of the control surface. Molded plastic bearings support the surfaces, and they can be fully removed for painting or repairs in a matter of seconds. Aerodynamically, this is the right way to hinge surfaces, and they look very scale-like. The entire control linkage system is accessible at the trailing edge of the wing.

The deeper you dig into the two boxes, the more goodies and hardware emerge, as package after package of extras come to the surface. When they advertise the P-51 as a complete kit, Byron Originals is telling it like it is. The fuel tank, fuel lines, air system for the retracts, wheels, special hardware, etc. are all included. You supply only pilot, radio, covering and paint and the model is complete. For the price, it's actually an outstanding value. Typically, an airplane kit of this size would be $250-$300. The retracts on the market for giant-scale models are at least $200. The Quadra and belt-drive system is worth at least $200. By the time you figure

in the custom prop, 5½" spinner, hardware and accessories, the asking price is very reasonable. Byron offers a complete information package on the P-51, which gives a lot of detailing information on how the kit is constructed. This is available for $2.00, and we feel that this would be a useful adjunct to understanding the remainder of this review article, since we are going to dedicate the remainder of the report to basically a point by point critique and evaluation of the instructions and building sequences. Send for this literature to: Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

Before we get into a blow-by-blow discussion of the model's construction, we feel it incumbent to pursue a discussion of the "philosophy" of an aircraft like the P-51. Any airframe has certain design considerations . . . the designer often must consider flying weight more critical than scale appearance, for example.

Those who have built the Byron Pitts can understand what we're talking about here, for both the Mustang and the Pitts share the common philosophy of building 'em light for optimum performance, even if it's at the expense of scale detailing. Those who, like ourselves, built their Pitts and used glass cloth and Super-Poxy for the finish lived to regret that mistake. The model was so large that it was easy to build up extra weight in the finish. Since it was a basically pre-fabbed model, there was really no way to save weight during construction . . . that's the most critical thing to remember when building any of the Byron machines: They are all pre-formed, and the modeler can only add weight to them, and never subtract any. Unlike a balsa airplane, where lighter wood, etc. will often save a few ounces, these fiberglass and foam airplanes offer no flexibility in reducing weight.

The modeler must fix his own personal goals firmly in mind before starting the project. While we didn't weigh the components of the P-51 right out of the box, we suspect that there are probably 18 pounds of raw airplane components sitting on the building boards even before any gluing begins. The factory says that 22½ is about the top limit for optimum performance. That doesn't leave much to work with, considering the weight of the radio and the finish (especially the finish). Our airplane, for example, sports seven servos and a 1.2 amp battery pack (the big pack is mandatory). Since the battery pack is ¾ pound, and

the remaining radio accounts for another pound, you would have to be capable of applying a 2¼ pound finish to the entire airplane. Remember that the wings are glassed with epoxy, and you can see how critical every half-ounce of weight can become.

We were very shocked to discover that, even after painful efforts to shave every small bit of weight on the finish, our *Man O' War* still came out a very heavy 26 pounds. Our real mistake was in not respecting and appreciating the philosophy behind the Mustang. We failed to understand that the model is intended for sport flying, and not contest work (more about this later), so we added a retractable tailwheel. Instead of putting Econokote on the tailfeathers, as recommended by the plans, we wanted a sharp scale finish, so we glassed the empennage. Of course, an airplane has to look great for a magazine feature article, so we put on a first-class finish.

The problem is that, as a scale modeler, you too are probably going to want to make the airplane look as good as possible. Rick Lewis is a pro at finishing, so he used the bare minimum of paint to achieve a superb look. Acrylic lacquers were used because they are mostly volatiles, which evaporate. The retractable tailwheel was considered more than a luxury, since any scale machine should have one. The bottom line is that, if you can live with a fixed tailwheel, and a finish that is ironed onto the tailfeathers, you'll get a better flying model in the bargain. We have heard reports of P-51s which came in at 19 pounds (!), so it can be done. We looked closely at the P-51 in the Byron booth, and you could see the weave in the glass cloth in the wing through the paint, so you will have to be prepared to accepting some compromises in terms of an impeccable finish in order to maintain good flying qualities.

If you do some quick math, you'll see that the 1,300 sq. in. wing area of the Mustang computes to about 40 oz./sq. ft., if the all-up weight is the suggested 22 pounds. At 26 pounds, our machine is at 45 oz./sq. ft.—that's already getting critical. So, remember that you are building to a *maximum* wingloading even when you meet the manufacturer's recommended weight, and you'll better appreciate the importance of keeping it light. As Dean Copeland, demonstration flier for the Byron models, so aptly put it: "Every pound you add to the Mustang in excess of the factory weight specifi-

cations will feel like ten pounds when you are flying the model."

We suggest that you plan your model before you begin. Decide whether that folding tailwheel is necessary, and carefully analyze your finishing techniques. Remember that Econokote can be painted by scruffing the surface with steel wool, and its also easier to repair than a resined surface.

From here on in, we're going to be making reference to the kit instructions and drawings, so it will help to have them in front of you. First, the "Balancing and Trimming Data" which gives the control throws, assumes that the measurements are for each direction of travel, i.e., the elevator travel is an inch of up and an inch of down, etc.

The item designated as "Wing Assembly" is to be ignored if the retract version is being built . . . this is a little confusing. When it came time to make the cutouts in the wing for the wheel well liners, the locating marks on the foam cores were hard to find. A simple paper template would have been a big help here. You will find that one wing appears to be bigger in total chord than the other panel. This will become obvious when you go to mate the center section and find that one wheel well sits further aft than the other. One panel actually appears to be slightly longer than the other, and we suspect that one of the molds is slightly oversized. Measure both panels, and trim the larger panel carefully at the root, if necessary.

If some of the remarks we are making here seem nit-picking, it's because there are small details which could create some unnecessary confusion. For example, the drawings of the aileron counterweights are vague as to the fact that the weight is a long bar with two attachment rods. In attaching the wing tips, we recommend doing Step #4 first by gluing the trailing edge stock and foam aileron tip to the wing, prior to cutting the aileron away. Also, watch out that you glue the correct wing bolt pockets in their proper front and back positions. The front pockets are angled and beveled, while the back ones are straight.

Step #9 is tricky in making the holes the correct size, so work carefully. Step #10 is confusing, primarily because there are four templates provided for the wing's trailing edge ply caps. Each of our templates was different from what should have been a corresponding piece on the opposite wing. Two templates (one top and the other

bottom) should have been all that was required. In using the templates for the ribs on Drawing #3, bear in mind that the inner core cavities of the wing panels are not correspondingly the same, so the gear mounting blocks will vary slightly on each wing panel.

In instruction Step #13, it should be noted that, while the strut parts which mate with each other inside the oleo strut are not to be sanded, all external parts must be sanded lightly if they are to be painted. We recommended putting a slight chamfered radius on the lower lip of the outer strut tube, that the inner strut can slide in and out of the outer tube more readily. When we set our model down, it is necessary to pick up the tail, so that the strut tubes can slide inside each other easily. Radiusing the edge of the outer tube will facilitate that.

While we're on the landing gear, we are very disturbed by the amount of rotational (side to side) movement possible at the wheel. Holding tracking is impossible, as the tires can go from toe-in to toe-out just in the "slop" at the wheel hub pivot. Other heavy duty gear use a pin and channel system to keep the wheels from moving around, while the Byron units use only the knee-action scissors for this alignment. We suggest that a simple factory mod to the molds for the strut tubes, to incorporate a key and channel arrangement (just like on the full-size Mustang) would go a long way toward making the airplane's ground-handling better.

The 180-degree servo specified for the retracts must have a 3-second transit time (minimum). We messed around with a Goldberg servo, but finally went out and purchased a Kraft KPS-16 servo, since the motion required to operate the spools of the retract valve is designed around the special stepped retract arm which comes with the KPS-16 servo. Simply set up the servo for the inner holes on both the elevator arm and one of the side arms, and the valve spool will cycle correctly if you adjust the linkage lengths so that both spools are flush with the end of the valve with the gear in the up position. We opted to drive the servo from an auxiliary *proportional* channel, so that we can slow the gear sequence (inner doors and mains, not actual transit time for the gear) as required.

The gear operate on a combination of pneumatics, springs and gravity. A separate air cylinder cycles the inner doors only, while

each main gear has its own pneumatic valve to pull the gear *up only*. The gear come down with a spring-assisted gravity fall. The idea here is to have a failsafe. If air pressure is lost, the wheels can come down for a safe landing.

The public has seen a video tape by Byron at the trade expositions, which shows a yellow Mustang coming in for a botched landing, with the gear up. In the midst of a cartwheel, as the plane is tumbling wingtip over wingtip along the ground, the gear pop out, and the model lands, seemingly intact, on its wheels. That may be fine for publicity, but we'd never expect to have more than shreds of foam and fiberglass if our model did that. On the second landing, we came in dead stick and a little hot. As our own video tape later revealed, the three slight bounces the P-51 had weren't critical, yet the four 8-32 nylon bolts which hold the retracts in the wing neatly sheared, which did a real number on the bottom of the wing.

Back to the construction: The stab and elevator assembly sequence is full of errors. First, be sure not to affix the tailcone piece of the fuselage to the front half. The stab is easier to work on with the tailcone free of the fuse. It is critical that the two stab mounting platforms molded on the sides of the fuse be kept parallel during the entire stab attachment operation. We inadvertantly squeezed the fuse sides together slightly when running the spars through, which resulted in the stab taking on a forward sweep. Since the instructions don't tell you how long the final stab span should be, or how much the fuselage spacing should be between the shoulders of the stab mounting platforms, you are almost guessing as the stab is put on. We recommend making the stab spar holes oversized, so that both lateral adjustments and pitch alignments can be made when mounting the stab halves. It might be better to mount and glue both stab halves at one time, with the tailcone taped temporarily to the fuse front, so that stab alignment with the wing can be checked.

The drawings have a serious error, in that they do not show the trailing edge stock for the elevator in either the cross sectional drawing, or the exploded view. Needless to say, Drawing #R should show the same precut balsa trailing edge as is illustrated on the ailerons and flaps. Be careful when gluing on the trailing edge stock onto any of the control surfaces. Building in warps at this stage can be very difficult to eliminate later. Always pin the parts flat on a work surface while the glue thoroughly dries.

The rudder post fits fine when it's slid all the way to the back of the fiberglass cavity of the fin, but when in its correctly recessed position, it's a bit loose and requires squeezing the fin.

We are already to page 7 of the instruction manual. Step #2 of the "Fuse Assembly" should read detail "M" instead of "Z". Aligning the tailcone of the fuse can be tricky, so work slowly here, and use a long piece of non-stretch string to check alignment of the stab to the wing, as well as the vertical positioning of the rudder. The edges of the air scoop are particularly vulnerable, and an extra layer of glass cloth should be installed prior to joining it to the fuselage. Use polyester resin for the best glue bond. We also like to use silicone adhesive for attaching servo rails, etc. to the polyester resin.

At this point, the wing and fuse should have been mated, to check for the alignment of the wing on the wing saddle. It's easier to reshape the foam wing, prior to glassing it, than to try to refit the relatively thin wing seat on the fuse. We didn't cut out the access panel for the elevator pushrod beneath the stab, primarily because we had sufficient access through the retractable tailwheel hole to get to the clevis. We found that a very long arm on the ACE Atlas servo was required to get the recommended throw on the elevator servo, and we wish we had thought to drill at least one hole on the elevator horn about ¼" closer to the pivot point, to get more throw.

* * *

In the second installment, we'll either have discovered the cures for the retract and flutter problems, or we'll have gone down in flames trying. If any of you modelers out there can contribute anything to this saga of the Byron P-51, please contact us immediately . . . we need all the inputs—both pro and con—that we can get. This Mustang is a very expensive and time-consuming project, so anything that we can do to help each other get the model going will benefit everyone.

While some of the remarks in this critique may seem negative, our attitude toward the P-51 is anything but that. Some of our personal feelings of frustration in having had to spend so much time fighting problems like the retracts have undoubtedly surfaced and supplanted our journalistic objectivity . . . for that, we apologize. One thing for sure, the Mustang is one of the nicest models we've ever had, in terms of personal gratification. The most telling commentary on the whole thing was when we took the model to a local Q.S.A.A. Fly-In. Since the model technically doesn't fit the strict definitions of the Q.S.A.A.'s quarter-scale flying rules, we were invited to demo fly the plane. The first attempt was a gear folder on takeoff, so we were a little red-faced.

The second flight got us in the air, but the flutter developed after about three minutes of air time. In

brief, we felt that the whole "demonstration" had done more to turn people off of the Mustang than anything else. But, when the lunch break came, and the spectators were allowed into the pits to ask questions, the Mustang area was swamped with interested modelers—even though the plane was already disassembled and ready to be packed up. We guess that's about the most significant commentary we can make about the Byron P-51 until the next issue.

As noted, we have probably built the heaviest Mustang to be recorded. One fellow we know in Texas came up with a 24 pound job, and he had a sliding cockpit! In the next issue, we'll discuss some possible ways to lighten the model (but not by much). We will be the first to admit that our two problems, i.e., retract pivot axle slippage and flutter, could both be possibly attributed to a high gross weight. But, we have built the kit in the "worst possible" configuration, which has lots of merit when testing an aircraft. Our attitude is that, if a 22½ pound airplane's gear won't fold under, then the gear is too super-critical if it takes only 3½ more weight to cause a failure. And the same with flutter, for that bit of extra weight couldn't translate into that much flutter-causing excess airspeed.

* * *

POSTSCRIPT:

The Byron P-51, being 1/5-scale is a sort of misfit in terms of modeling categories. While it swings a prop bigger than any quarter-scale airplane currently flying, and while it also uses the commonly accepted ¼-scale power plant (Quadra), the model is not recognized by the Q.S.A.A. True, it is acceptable under the I.M.A.A. guidelines, but it is not acceptable under current AMA Sport Scale rules because of its weight. This kind of leaves the flier in limbo. There's no logical reason to trick the model out in any semblence of a true scale paint scheme, because the documentation isn't needed . . . it's not a contest-qualified model. So, other than the I.M.A.A. events, where it is recognized, the Mustang is technically the world's largest, most complex and most comprehensive fun-flying weekend model!

Ed Morgan, of the Q.S.A.A., after seeing our model in perspective of the other comparable aircraft at a Q.S.A.A. get together, reacted favorably to allowing the P-51 to participate at Vegas this year. If you are in favor of this, drop Ed a line and make your feelings known. □

SCALE R/C MODELER ADVERTISERS INDEX

RETRACTION

On page 37 of the August issue, the caption to Col. Thacker's OMAC I model erroneously stated that the full-size machine was under development by Lear. Instead, the Stead facility at Reno is being used by OMAC, Inc. for development of the aircraft.

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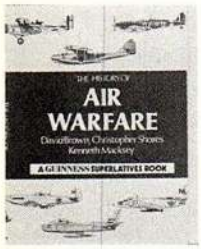

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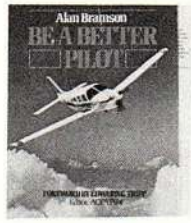

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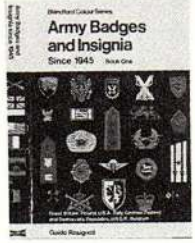

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