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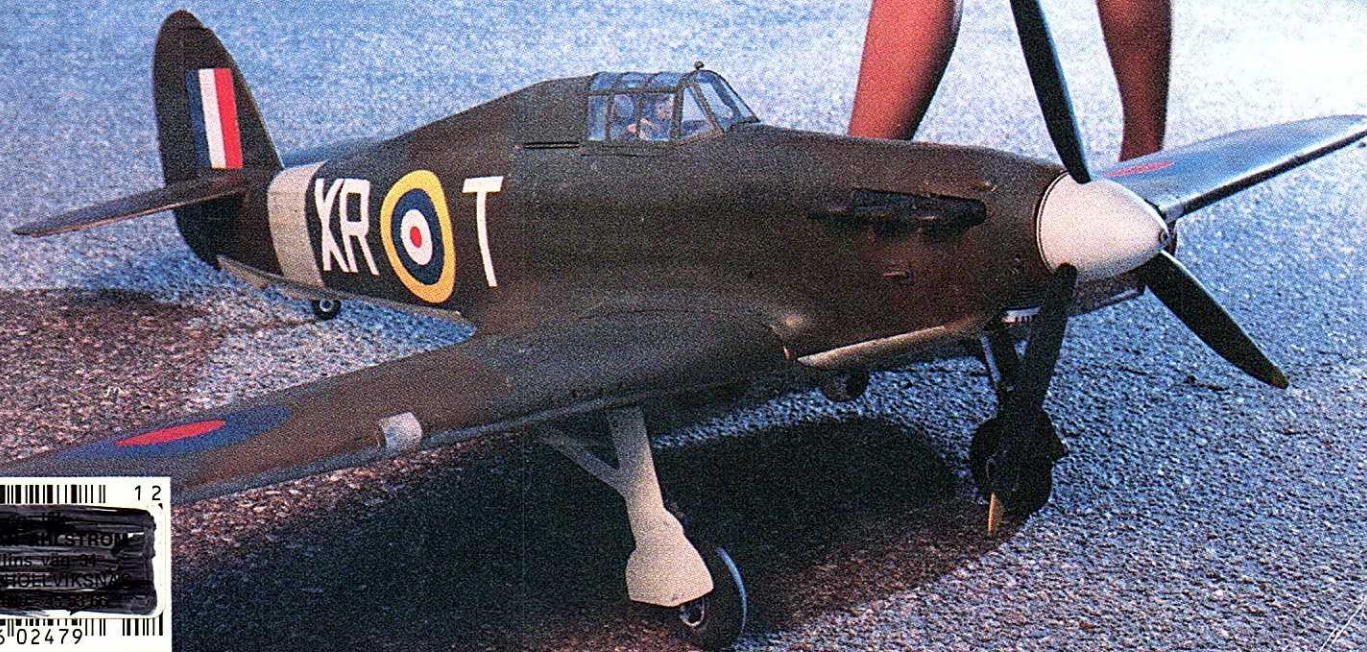
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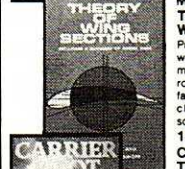
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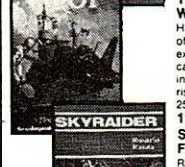
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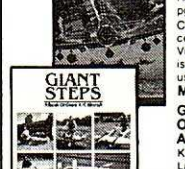
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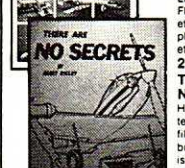
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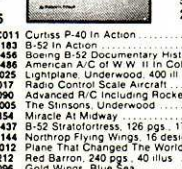
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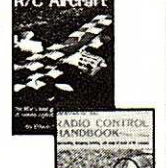
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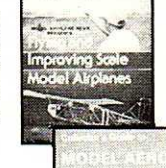
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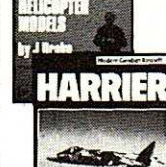
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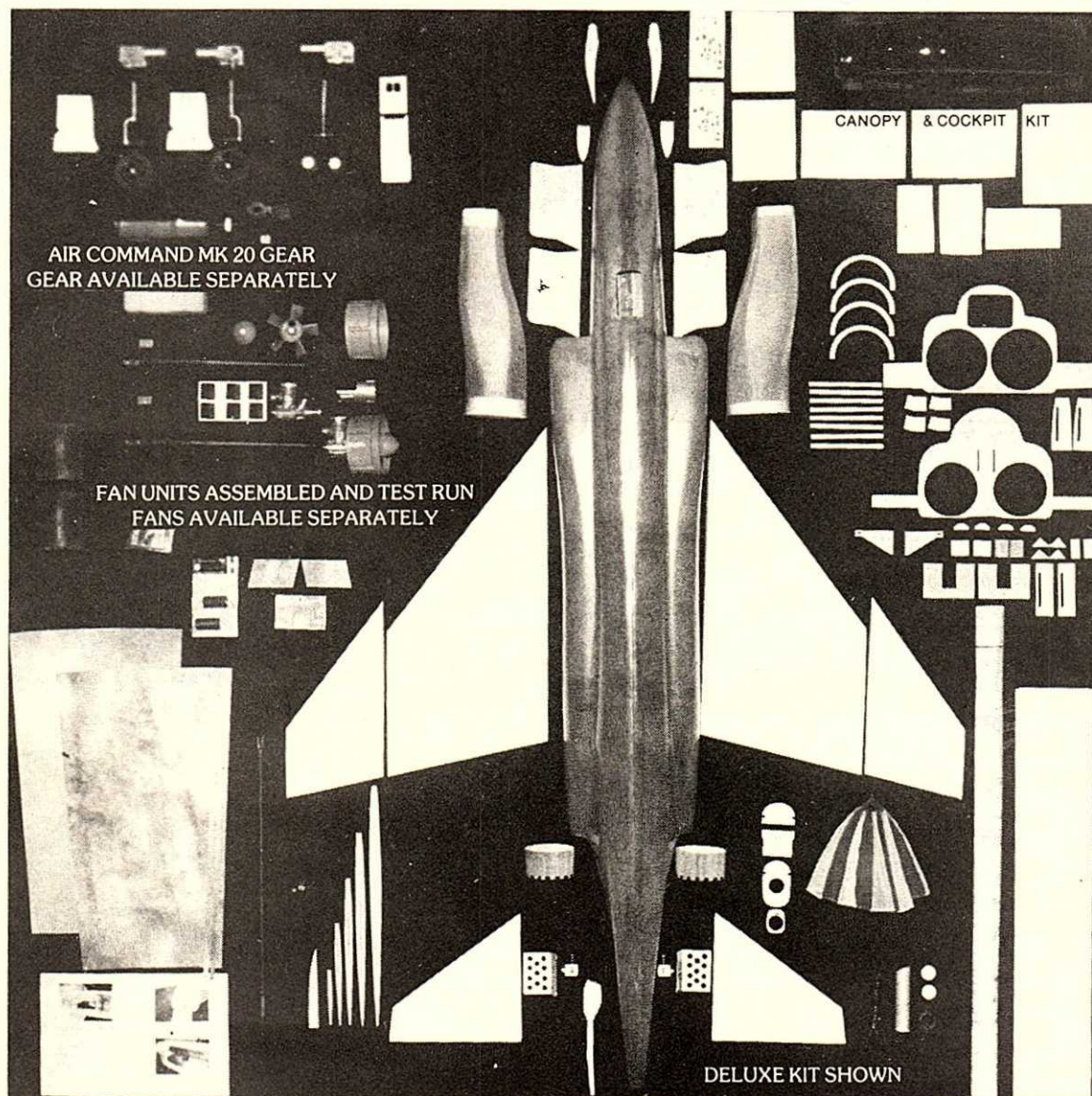
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England's premier scale fun-fly weekend

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COVER:

Ms Annette Spiranac, a professional dancer, salutes the Eighth Air Force. The entire story of this historical Hurricane is in this issue. Annette is wearing a 1/8th Air Force shirt. Brian O'Meara, who built the Hurricane, is a member of this famed Phoenix, Arizona scale group. (David Goetz photo)

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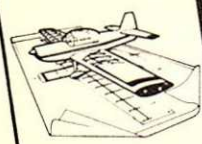
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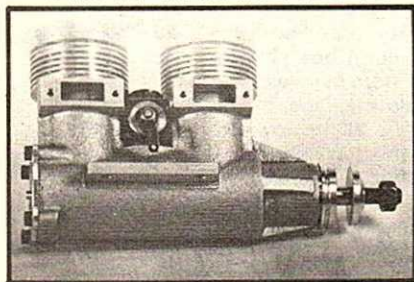
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British fighters based at home had their upper surfaces painted Dark Green and Ocean Gray (Ocean Gray replaced the Dark Earth of the pre-1942 camouflage schemes). The undersurfaces were done in Medium Sea Gray.

England's day fighters based at fields abroad were finished in the same Dark Green and Ocean Gray upper surfaces, but with Sky Type "S" undersurfaces.

Day fighters used in the North African campaigns were painted in

Dark Earth and Middle Stone on the upper surfaces, with Sky Type "S" on the undersurfaces.

We have already given the formulas for Dark Green, Dark Earth and Sky Type "S" in the June 1983 issue. Therefore, the new paint mixing formulas we need to complete the RAF fighter colors are:

MEDIUM SEA GRAY — Three Parts H70 Gray, One Part H10 White.

OCEAN GRAY — Seven Parts H70 Gray, Two Parts H81 Black, One Part H33 Stinson Green.

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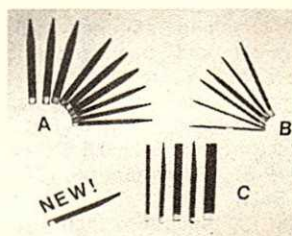
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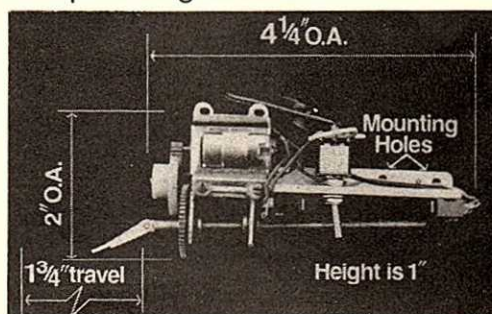
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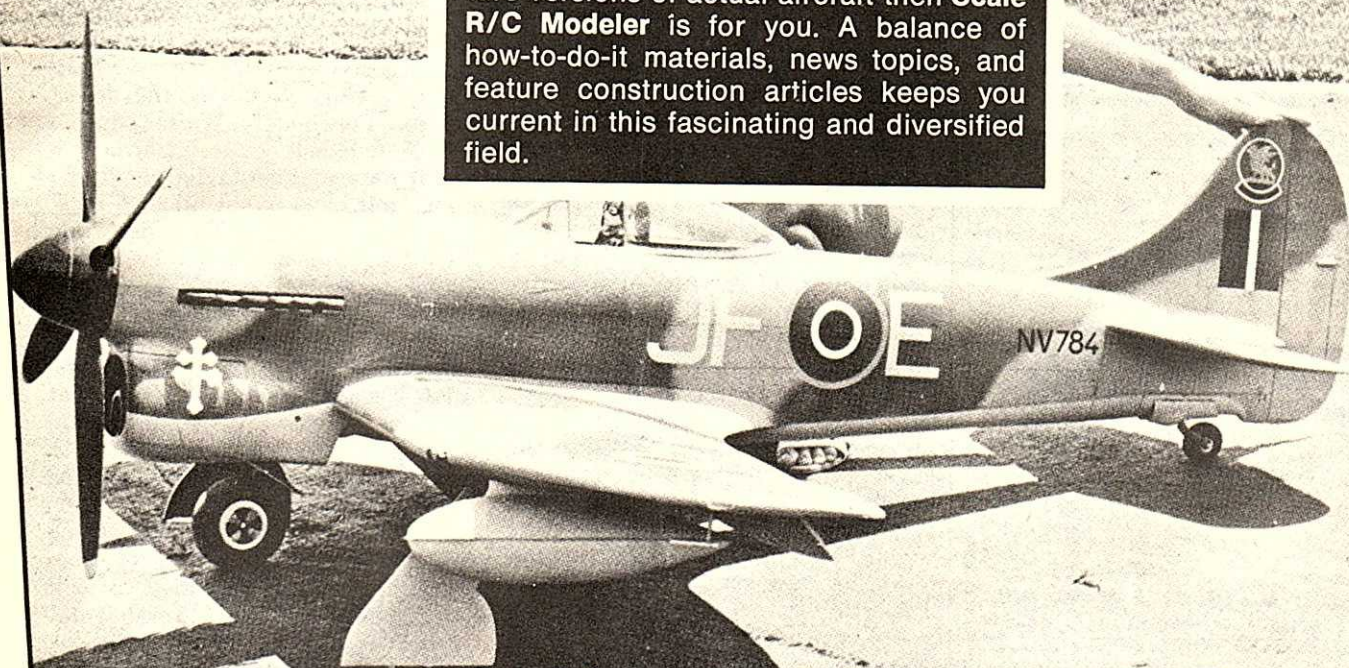
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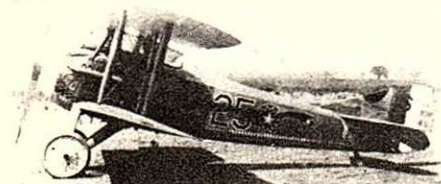
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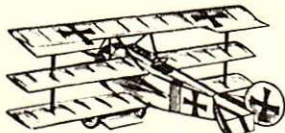


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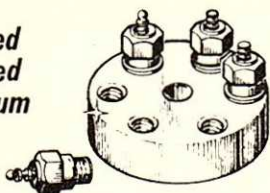
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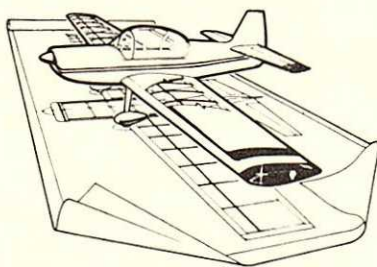
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Book Notes

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the builder of the model.

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Following close on the heels of his very successful finishing techniques book *There Are No Secrets*, and his *Handbook of Miniature Engines*, Harry Higley has just released his new title: *Master Modeling*. This book is a compendium of techniques for the scratchbuilder. There are sixteen chapters, covering everything from the art of carving, to specialty applications for fiberglass fuses, cowls, and even glass props.

The book is slanted toward the special needs of the scale modeler, with not only traditional balsa and ply techniques covered, but also the latest composite construction technologies. These 16 chapters will make scratchbuilding a lot less mysterious, and the book is easy to follow. There are profuse photos (over 325 of them!), so that even the neophyte can learn to scratchbuild. There are also chapters on aircraft design, plans, wing construction and foam techniques.

Harry's books are always popular because they are clearly written, well illustrated and full of useful information. *Master Modeling* is no exception. With this book in your library, you too can become a master builder.

As published by Harry Higley & Sons, and available directly from: Model Agency Press, 7021 Vicky Avenue, Canoga Park, CA 91307. Price \$10.95 (plus \$2.00 postage).

* * *

THE INCREDIBLE T-6 PILOT MAKER



Walt Ohlrich and Jeff Ethell

Several years ago, when the Bridi kit of the AT-6 Texan became available, it was a real hassle to find documentation on this training craft. Books tend to zero in on the glorious fighters and bombers, relegating the tugs and trainers to footnotes. Those who had models of the T-6s wound up painting them in racing colors, for it looked as if the Texan's only claim to glory was over the desert in Reno. Fortunately, Walter Ohlrich and Jeff Ethell have unearthed a ton of data and nostalgia about the AT-6, and have put it all in a book called *Pilot Maker: The Incredible AT-6*. Within its pages we find Israeli markings on a T-6, as well as a Texan done up in Chinese markings.

I didn't realize myself that the AT-6 was such a versatile bird. What about an AT-6 with Meteor-like tip tanks, and a streamlined cowl with rocker arm bumps on it? There was a biplane version of the North American trainer, made by bolting on another set of wings above, for crop-dusting. T-6s were modified to look like the Jap Zeros in "Tora! Tora! Tora!," as well as the P-47s in "A Bridge Too Far." Who says that they all have to be basic yellow or red?

Lots of good black and white photos support the interesting narrative of this book, but there is not the faintest hint of any color shots, which is really a major blunder in such a promising title. At least the modeler can get some supporting photos from the book, but where are those magnificent line drawings and reprints from the pilot and service manuals which every self-respecting author culls? "My kingdom for a cockpit photo, or landing gear detail!"

Pilot Maker: The Incredible AT-6 is a well-recommended addition to anyone's basic scale library. These types of books are often only in print for a limited time, so getting one now makes good sense. Overlooking the lack of color documentation and drawings, the book still stands on its own as a significant contribution to scale presentations. The book is available direct from: Zenith Aviation Books, P.O. Box 2, 729 Prospect Avenue, Osceola, WI 54020. Price \$17.95.

* * *



Bob Beckman has made a name for himself as the Giant-Scale columnist in *Model Aviation* magazine. He has put his knowledge and experience into a new book, titled *Building and Flying Giant Scale Radio Control Aircraft*. The book is billed on the cover as a "Complete how-to-do-it guide," and it pretty much lives up to that. Written for someone who has had no exposure to radio control at all, there are the usual mandatory chapters discussing radios, kits, etc. The real meat of the book is in the virtual step-by-step sequences for building the Great Planes Tomahawk. Bob uses this model to illustrate not only basic construction procedures, but also those handy hints and shortcuts which make this book so helpful.

We found some faults with the book, such as the rather sophomoric discussion of aerodynamics, and things like attempting to make scratchbuilding something separate and different than "plan building." But, as a primer for big airplanes, this book presents a common sense

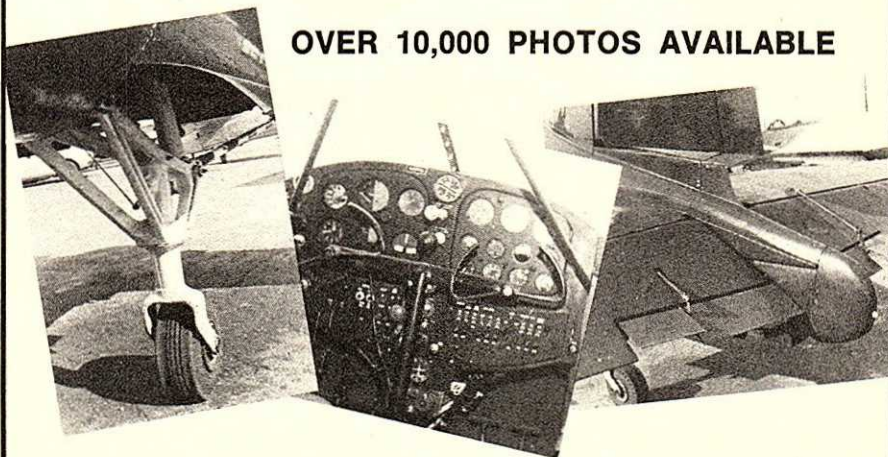
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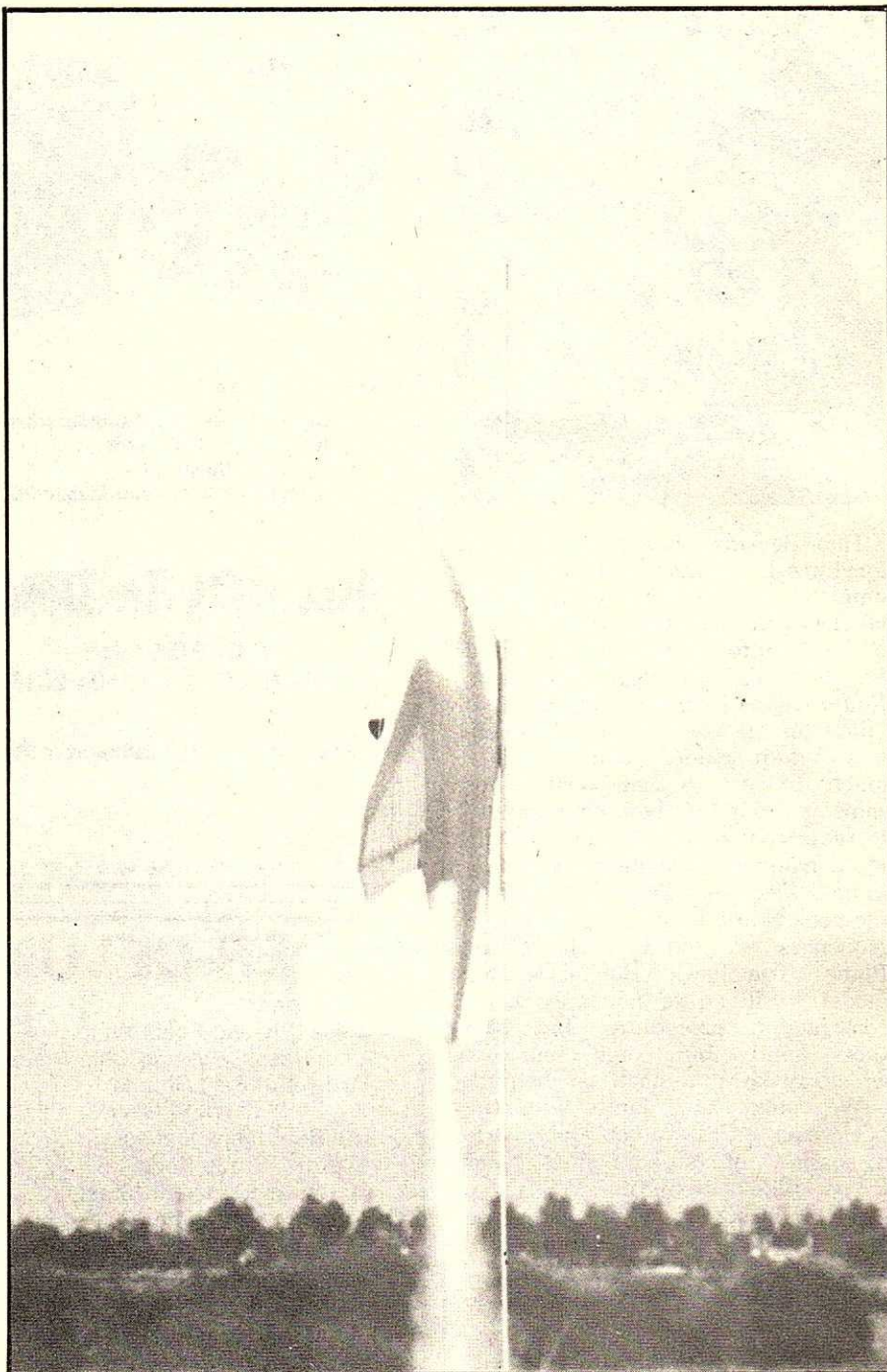
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for the author,
who is just a little bit
crazy, anyway!

By Harry Apoian
Photos by Forrest Edwards, Jr.

*The mini-163 streaks skyward, under true
rocket power. The small model is
capable of reaching maximum altitudes
of 200-400 feet, depending on the size
of the rocket motor.*



Some people think that I'm a little crazy. I don't ever build "normal" aircraft, but I'm always out at the flying field with something offbeat, unique . . . or, shall we say "odd!?" I guess it's my background in free flight (that's not to say that free fliers are crazy . . . but it sure helps to be). I enjoy seaplanes, WWI scale (we know how crazy those gents are, don't we!?), and reworking engines.

When I get bored, or get the itch to build something, I start searching the outer fringes of the history books to find my subjects. The more odd-ball they are, the more intrigued I become. That's why I got particular enjoyment out of the Me 163 project. I have a background also in sailplanes, having done a lot of contest flying. Because of my love for a silent model, the concept of a rocket-powered Komet, which would glide back to earth, seemed right up my alley.

For those of you not familiar with the Komet, it was really the first practical rocket-powered fighter. This wasn't a jet, but rather a true rocket, with a Walters pulse-jet propulsion system. The little flying wing (flying wings fascinate me, and I compete

every year in the Northrop flying wing contest) was a killer. The rocket engines were temperamental, and often exploded. Even landings could be disastrous, since the aircraft touched down at a very hot 137 mph. The pilots graduated from rudimentary basic training in sailplanes, to the single-seat cockpit of the rocket fighter, with no transitional instruction whatsoever.

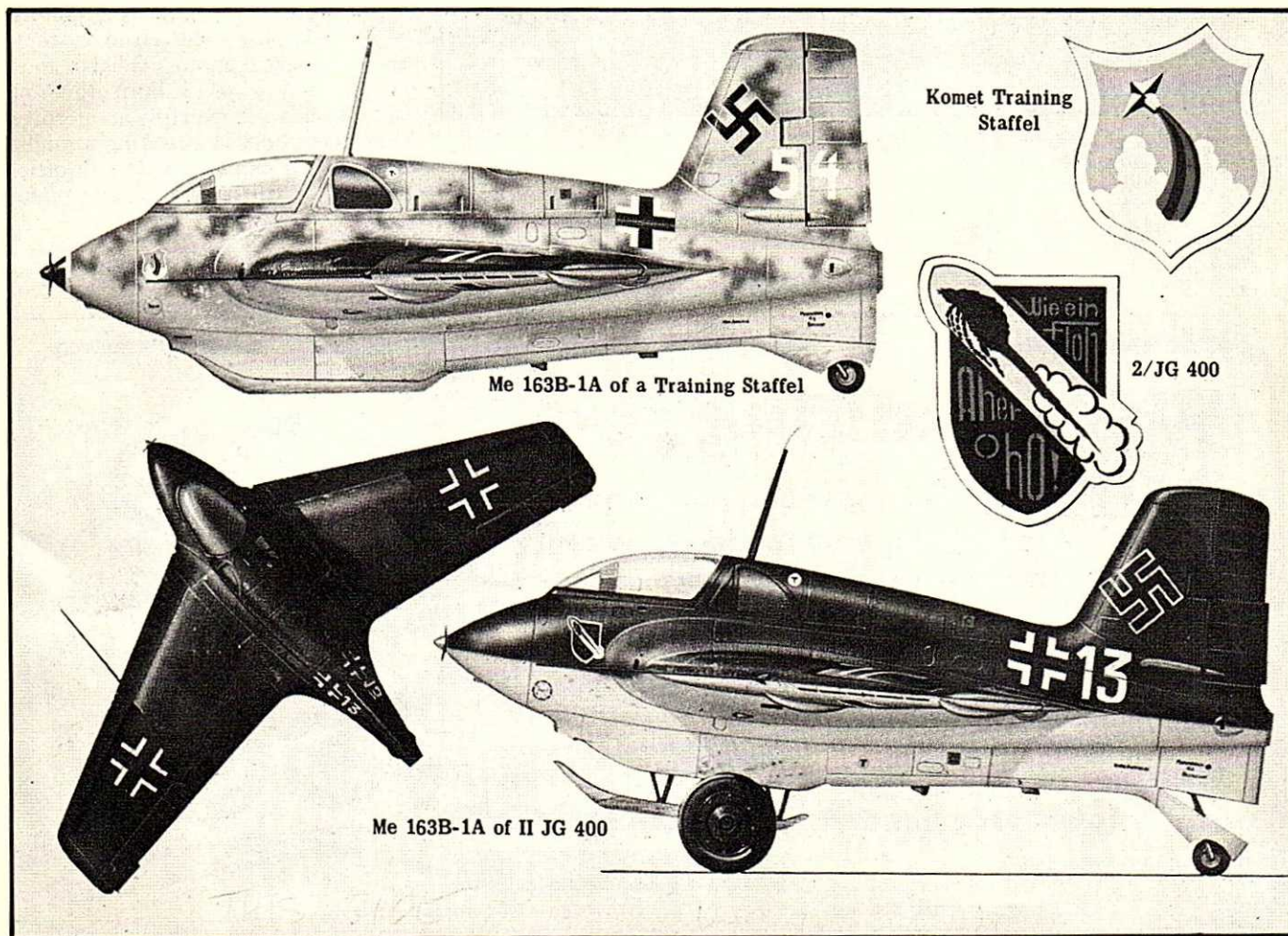
The Me 163 was too good. It flew too fast. The idea was a rapid take-off, after which the little rocket literally climbed straight up to get above invading bomber formations. The engine was then shut off (there was a crude form of throttle, but the risk of the plane exploding if it was used usually cancelled that idea), and the pilot would glide . . . at speeds often in excess of 500 mph . . . down into the formation and attempt to shoot a target. The trouble was that, at those closing speeds, the Komet pilot had only split seconds to aim and shoot. If he missed, it was senseless to pull up to try for another pass, for then he had lost the advantage of his excess speed, and he became a vulnerable, slow-gliding target. All he could do was to glide back to earth and, if he and the

machine survived the landing on that rigid skid, he could try to get refueled and airborne again.

One solution to the problem, and a very ingenious answer for the time, was to mount a set of five vertical-firing tubes on the aircraft. These each contained a 50mm shell, and the salvo was triggered by the Me 163 flying under a bomber, and the bomber's shadow actuated a photo-light cell. This technology accounted for only one kill, but the system was only fitted to a dozen aircraft. Had the Luftwaffe done this a little sooner, the air war over Germany could have been an entirely different matter.

The Me 163 has been modeled before. Bob Holman has the plans for a very nice .60-powered one, with a big prop spinning on the nose. I wanted mine to be more "pure," so I decided to design a rocket-powered version. I investigated the rocket field, and discovered that some of the rocket engines were capable of delivering some tremendous amounts

Drawings courtesy
Squadron/Signal Publications.





The author has had great fun with his project, but he does not endorse rocket power. Local ordinances usually classify them as fireworks and ban them because of the real fire hazard.

of thrust. But, the model would have to be small and light to take advantage of the thrust potentials.

I drew the plans to 1/12-scale. This gave me about an .049-sized airframe. I used four-pound, closed-cell foam for the fuselage, as well as the planking on the wings, etc. This is a dense foam sheeting, about 1/8-inch thick, and not the foam blocks you are familiar with. The stuff can take quite a beating, since it will flex in any direction. I made a rocket motor mount by rolling a piece of 1/64-inch ply. The plane is finished with tissue and dope (the polyurethane foams are not affected by the solvents in the glues or paints). I'm not publishing a set of plans because this is supposed to be an article reporting on a state-of-the-art design, and I really don't want to encourage anyone to emulate my project. Rockets are banned by many municipalities, and they can pose a real fire danger if not used with adequate safety precautions.

By using a Cannon radio, I was able to configure a two-channel system at a total airborne weight of only four ounces. With the tiny radio aboard, but less a rocket motor, I had a total airframe weight of only 11 ounces! The rocket motors weigh more than the radio system. An "F" sized motor weighs four ounces, and gives a burn time of nine seconds... which is an eternity when the model is streaking straight up and you can't chop the throttle. This motor will take the little plane

(Continued on page 76)

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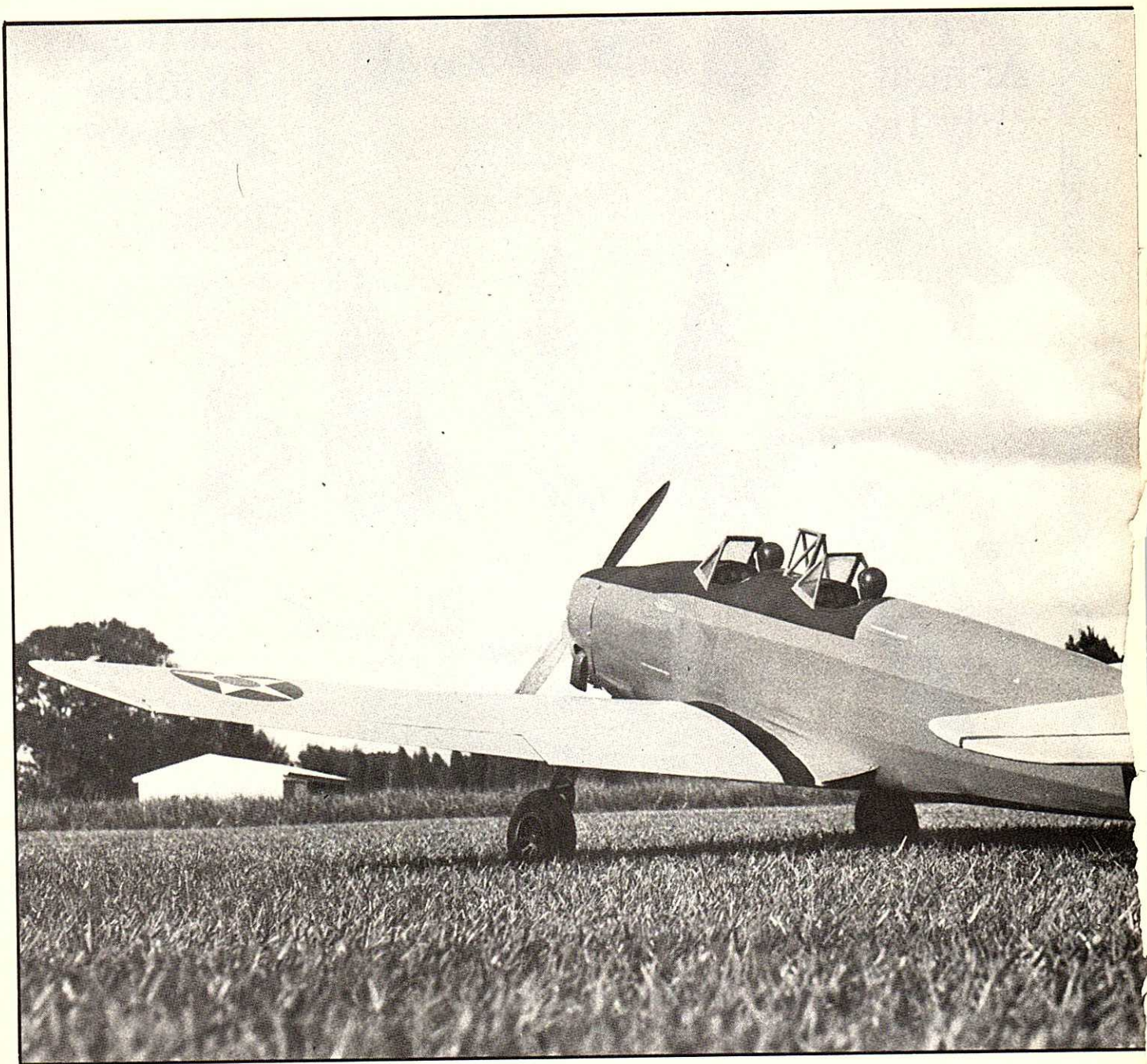


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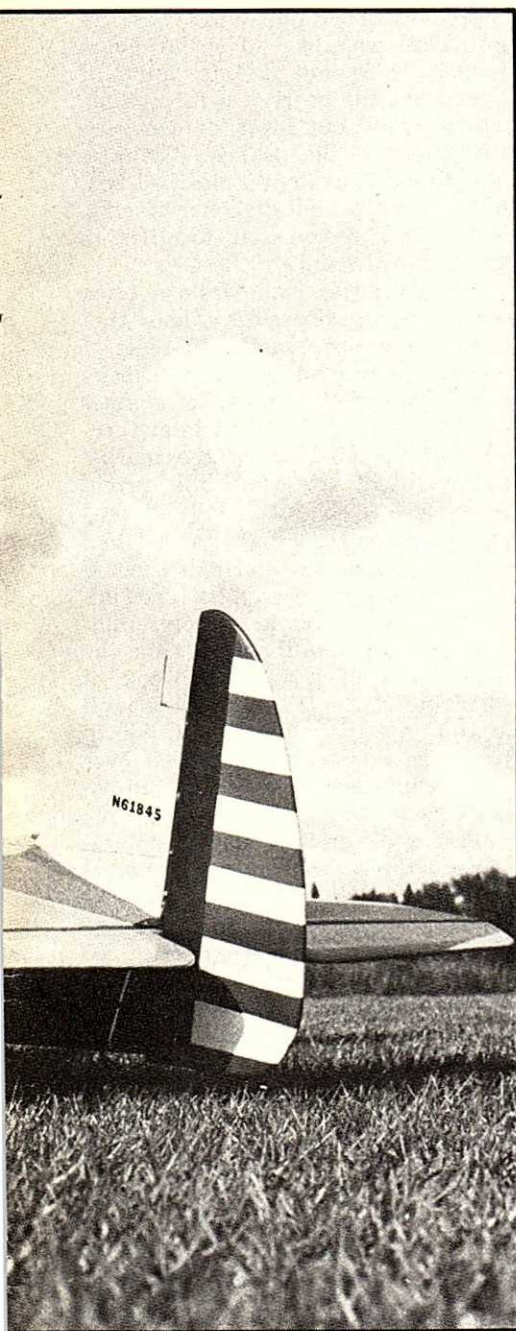




GIANT-SIZED PT-19

By Bobby Daniell

Photos by the author



A huge 108" span model of the Cornell, this plane is from a monster-sized kit. Read the author's woes in getting his prototype airborne successfully . . . the plane even got run over by a car!

Initially designed and built by Fairchild, the PT-19 (the designation meant *Primary Trainer*) appeared in three versions: the first PT-19 model, then the PT-19A and PT-19B. The original was powered by the 175 hp Ranger engine, while the A variant had an L-440-3 (200 hp) Ranger. The B model was nothing more than the old A, with provisions for a blind hood to teach fledgling pilots night and instrument flying. The PT-19 was so popular that three factories worked on the contract, with a St. Louis plant, as well as the Aeronca facilities and Fairchild each chipping in. They built a lot of them, too, with some 4,889 coming off the production lines.

In 1942, there was a cry for more power (probably because the instructors wanted more stuntability to brighten up their otherwise dull paced routines), and Fairchild modified the airframe to house a 220 hp Continental radial. To most purists, the rounded nose ruined the superb styling of the plane. Fairchild must have agreed, for they redesignated the machine the PT-23. About 1,126 of these craft were built by various manufacturers, including Aeronca, St. Louis, Howard, and Fleet (Canada).

Another variant occurred, the PT-26. This one had a fully enclosed greenhouse, instead of the two wind-screens. Since almost all of these were built and flown in Canada (production was done by Fleet Aircraft), a scale model could be done in Canadian markings, instead of the very trite blue and yellow of the U.S.

The PT-19 was a hot machine, with more speed than the Stearman biplane trainers of WWII. It could hit 130, flat out, and would whisk through the maneuvers as smartly as you please. The wide-track landing gear made even the most neophyte pilot look good on that final flare out. Unfortunately, the fledgling pilots stepped from the docile PT-19 to the ground-looping AT-6s, so they had a rough transition.

The Fairchild trainer was a huge success at training newcomers to flight. It did its job well, and many of the aircraft survived to find their way into museums and local restoration projects. Rarely do trainers have the smooth, graceful lines of the PT-19, and offer such great potentials for scale modeling.

It was that big bug, known as the giant-scale movement, which got me off my duff and looking for a scale model to build. I wanted something huge . . . something that would make 'em all sit up and take

notice. As I thumbed through the model magazines, I found an old three-view of the PT-19. It had always been a favorite of mine, because I liked the looks of the plane. It was a nice compromise . . . something between a Cub and a WWII fighter. The Fairchild had a character of its own, and it looked as if that long cowl could fit just about any engine under it.

As I sat and mulled over the three-views, my mind took me back a few years to a local airport. My friend had a beautifully restored PT-19, and he had offered me a ride. It was an exhilarating experience, and the PT had more guts than I would have suspected, yet it was so gentle on the controls that it would almost fly itself. I took the stick for a few circuits of the field, and that ball-bearing-mounted joystick was a real pleasure. I could see why both students and instructors praised it so highly.

What a thrill it would be to fly my very own PT-19. If the full-size machine flew that well, then I always contend that the model would fly as well, or even better. I was not to be disappointed on that score. I was totally unaware, at the time, that Jim Foline had plans available for a model of about the same proportions I wanted. I did know of the Jemco kit, but that was far too small, being for a .40 engine. In the back of my mind, the idea of a possible kit loomed as a distinct possibility, but I didn't get too wrapped up in that, since the plane was still an unproven commodity.

My personality is the type who hates to build . . . that sounds funny, since how can a scale modeler not like to build? As with many modelers, my real forte is jockeying the sticks. I'm not big on panel detail, rivets and all of that time consuming stuff. The quicker I can get a bird out of the building room and into the air, the happier I am. The choice of the PT-19 seemed like a natural for a lazy builder like me. There was very little surface detailing to be done, and I could engineer the plane so that a lot of other laborious and time consuming procedures could be eliminated. I wanted the quintessential, no-frills giant-scale model. Of course, I didn't want it to come out looking like a "plain plane-Jane." There had to be the potential for winning some contests. It almost seemed like too much to ask for . . . a prize-winning airplane, without any of the sweat it takes to get one!

I began scaling up the three-view



We didn't get the young lady's name, but she sure looks rather tiny beside that oversized airplane.

The giant-scale PT-19 has been a real Albatross around the author's neck. Jinxed from the onset, the model did more crashing than flying for its first four flight attempts.

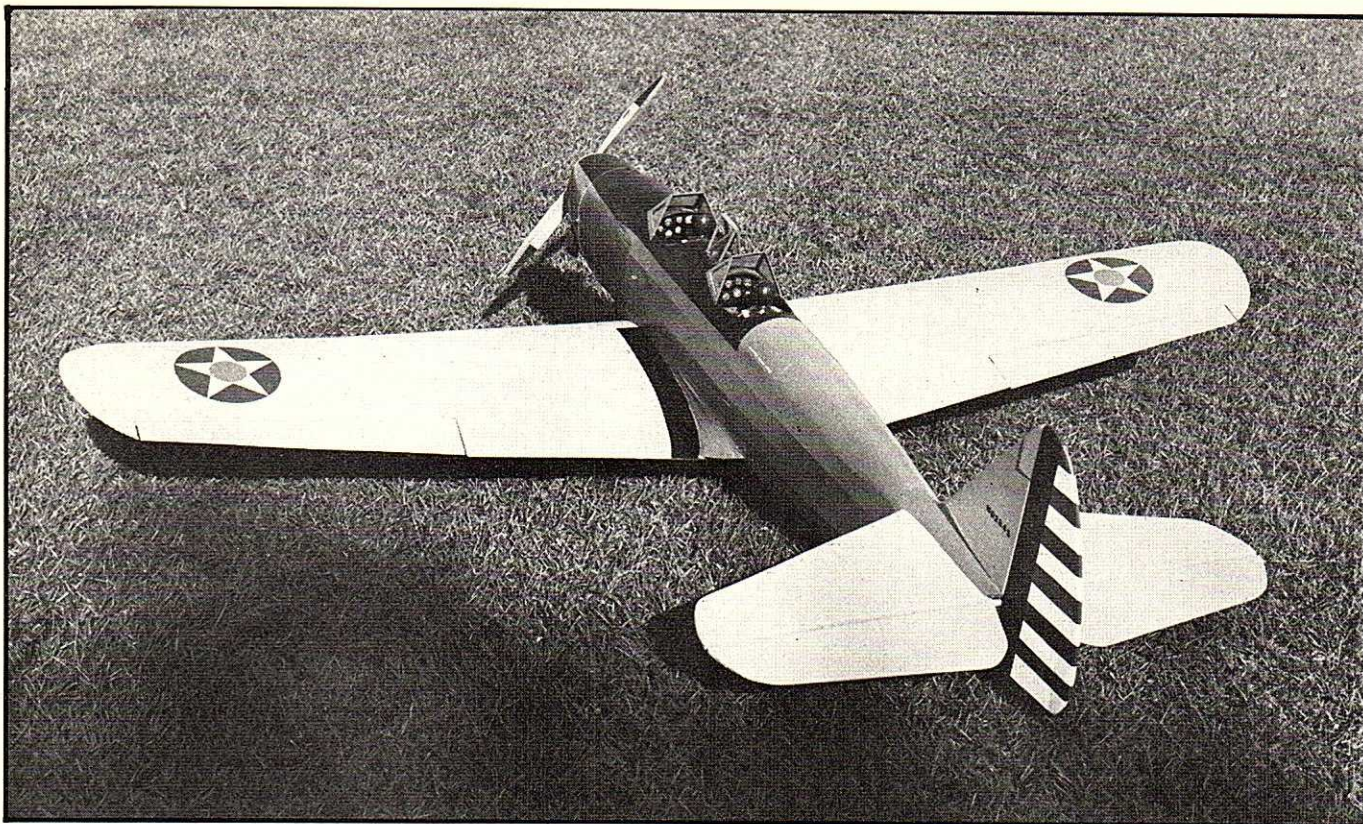


I had and, as I put lines on paper, I engineered the model for fast and simple construction. Wing ribs are for those who like to spend hours indoors with an X-Acto knife. I traced out the basis of a foam wing, which would cut loads of construction time off the project. The fuse is nothing more than a glorified box, with longerons and diagonal bracing. You can hammer that together in about two evenings.

The cowl was made from a plug, done up in fiberglass. The first cowls were not exactly to scale. I fudged them a bit in order to make sure that all the possible engines available would fit. As it later turned out, the engines on the market today will fit nicely into the correct scale cowl, so the kit I am producing now contains the proper cowl. I had the foam cores cut and half sheeted in a couple of evenings. The tail feathers took a couple of more building sessions, and the fuse took the better part of a five-day week of evenings. Since I was working with a prototype, there was a lot of "down time," as I scratched my head over parts dimensions, structural integrity, etc.

Two weeks after I started enlarging the three-views, I had a sanded airframe on the table, ready for covering. I suspect, with the kit, that you can cut several days off that. I didn't realize how big a 108-inch wing was until I tried to cover it. I engineered it as a one-piece affair, to avoid the bother of a hefty spar structure for a plug-in system. Since I had no idea what kind of weight parameters to shoot for (this was back in the days when only the Quadra was available as a power-plant), I just "guesstimated" as I went. After covering and doing the traditional blue and yellow training colors, the model was at 26 pounds. With the 108-inch wing, the wing-loading was still within tolerances (and I was later to see that the model flew well at as much as 32 pounds!).

As I mentioned, those were the days when a Quadra was about it in the engine department. I faithfully strapped one in and headed for the flying field. I was pretty much on my own with the plane and engine. No one in the area knew too much about these monster-sized machines, so I was literally going on a wing and a prayer. I fired up the engine, and pointed the Fairchild's nose into the rather stiff wind that was blowing. The gusts were enough to get the PT-19 airborne, but that was about it.



This 108" span model requires a Kawasaki 3.1, or equivalent, for proper power. Total weight is 26-32 pounds!

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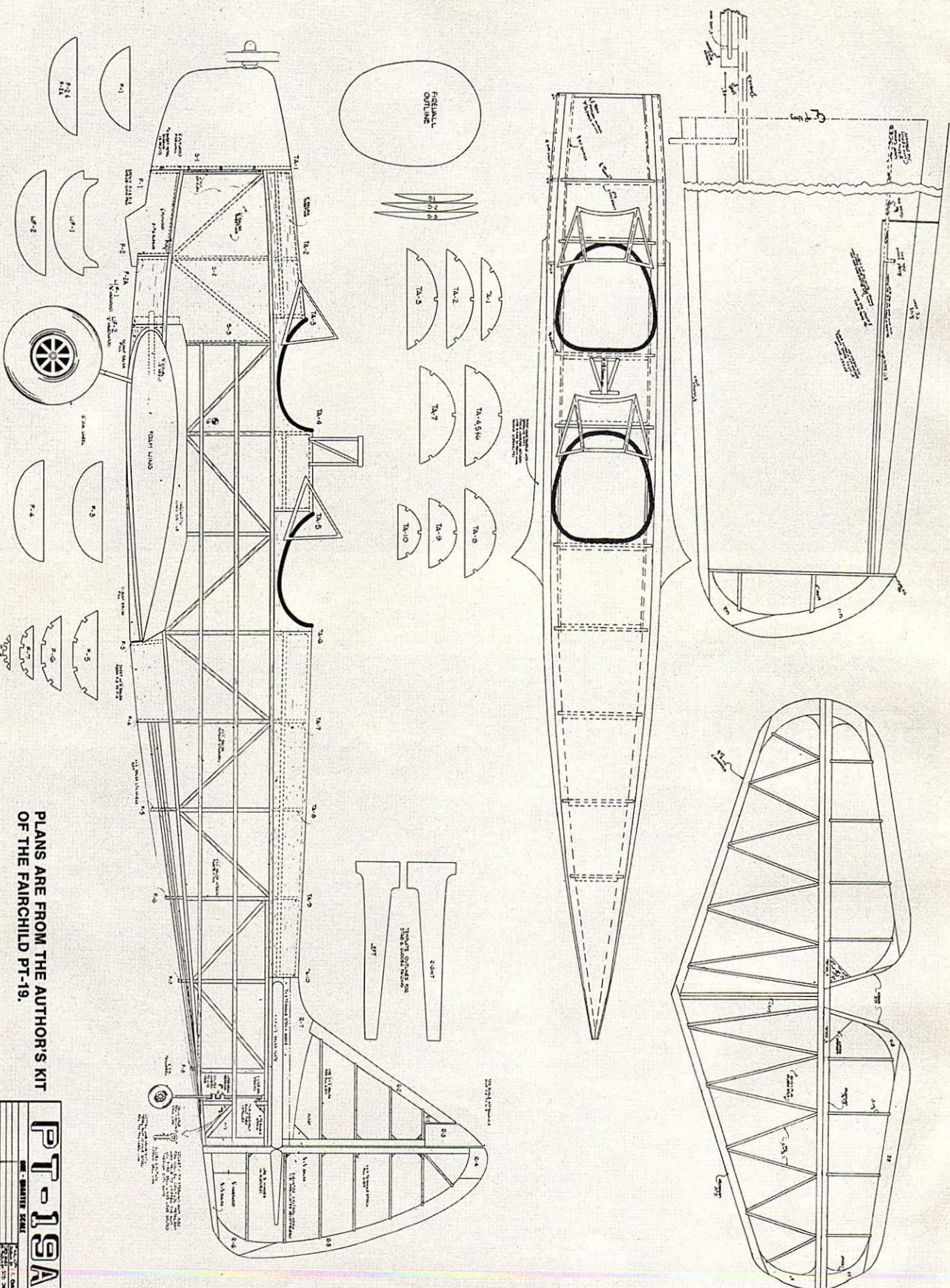
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PLANS ARE FROM THE AUTHOR'S KIT
OF THE FAIRCHILD PT-19.

PT-19A
 1/48 SCALE
 1/48 SCALE
 1/48 SCALE



After rebuilding the model several times, the author finally got some justice and recognition by winning "Best of Show" at a local contest.

The plane was making slow headway, but not climbing much. The lump in my throat told me that I was about to get into serious trouble. The trees at the edge of the nearby pond loomed ever closer, as the model droned slowly on toward them. I didn't dare attempt a turn downwind at this low altitude. I was already too high to be able to land short of the trees, but my only hope was to chop the throttle, and hope the plane would settle down along the edge of the pond. If I was really hot on the sticks, I could land it right on the edge of the pond.

Murphy's Law was really against me that day. There was one sole concrete block on the shore, where my father likes to sit and fish. That's the only obstruction anywhere in sight along the edge of the pond. Once I had navigated the PT-19 through the trees, I figured that I had it made. The Fairchild came in for what looked to be a near-perfect landing, but the nose locked in on that concrete block as if it were a computer-controlled missile! The noise was tremendous!

I saw the wing fly up, and go

spinning end-over-end into the pond. It looked like a huge yellow whale floating out there. I figured that I was about to spend a few weeks in the building room again. To my surprise, there was only superficial damage to the fuse, and the wing had a gouge taken out of the leading edge. Being a foam wing, the fill-in repair was done in a matter of a few hours.

Once I had everything back to looking pretty again, I began to search around for a more suitable powerplant. While I was assuming that I was in the stone age of giant-scale, the outside world had advanced centuries. The Kawasaki 3.1 was available. What a honey of an engine! The brute power was awesome, and it even snuggled inside the cowl in an acceptable manner. It took only one flight to convince me that I had found the perfect match of airframe and powerplant.

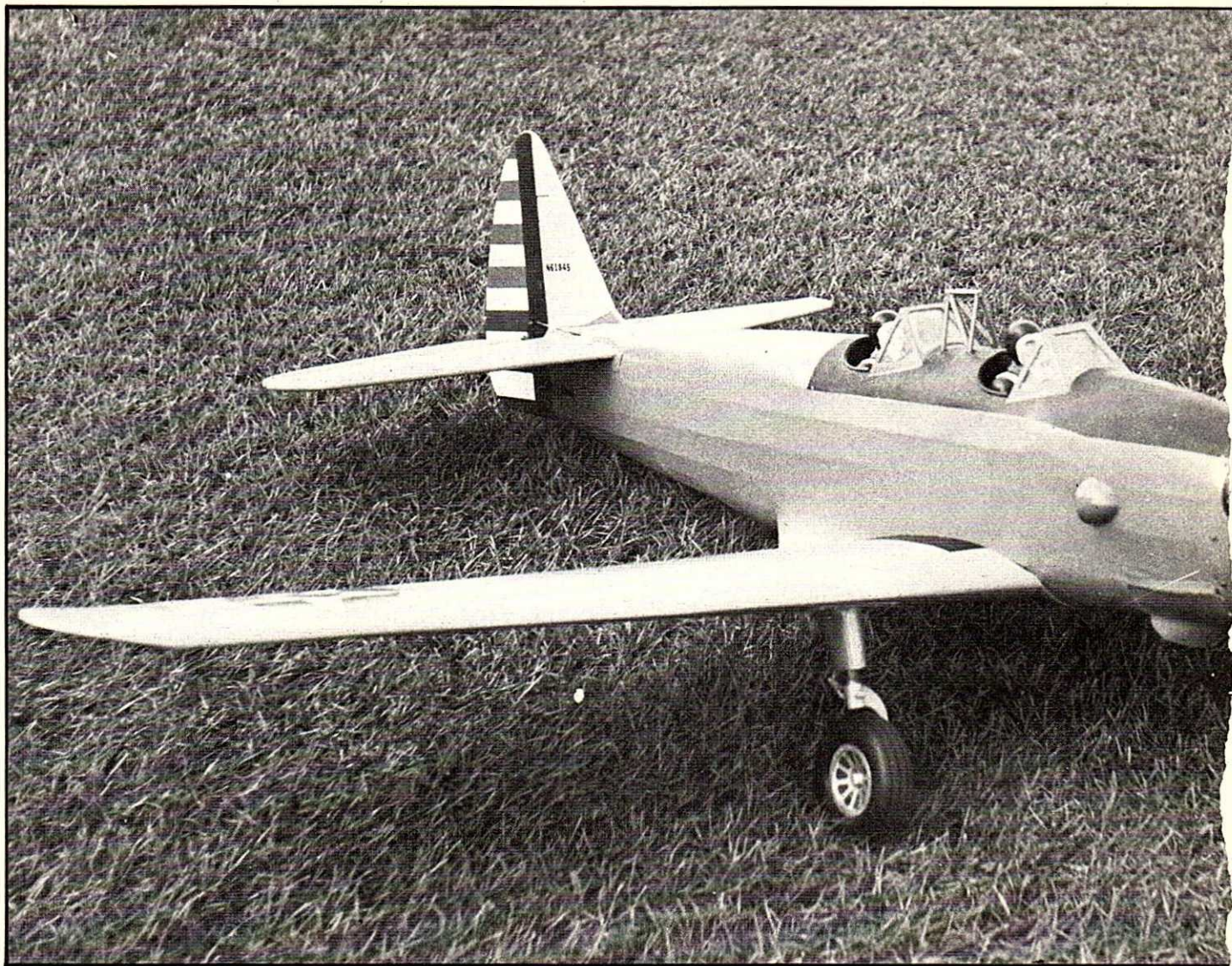
The model was flying great. I was already doing aerobatics on the second flight. For so large an airframe, I had doubts about the servos' ability to deflect those huge control surfaces. Only the primary controls or ailerons, elevators and rudder use heavy-duty servos, while the throttle is a standard servo. If you don't know how to do good hinges, or can't put an aileron torque tube in without a bind, then consider using one servo

for each aileron. This is a big, heavy airplane, so don't cut any corners in the control department . . . safety first!

I was having a ball with the PT-19. On the third flight, a friend asked to have a try at it. I handed the transmitter to him and sat down. In the meantime, he passed the transmitter on to a friend who wanted to try it. Murphy again showed up at the party, as a buddy in the pits turned on his transmitter . . . guess whose frequency he was on!

The guy flying the airplane panicked, and tossed the transmitter back to my friend. He now had a big model screaming straight for the ground. All he could do was pull back on the stick until it was about to bend. It looked as if the plane was going to make it, then we all realized that it was dead-bore sighted on a nearby house, surrounded by a stand of fir trees. I shut my eyes, and waited for the inevitable crunch. The moments passed, and I could still hear the engine running. I looked, and saw that the big bird had somehow magically cleared every fir tree. Could I have cheated Fate?

The Fairchild missed the house, and was starting to climb again, having missed the ground by what must have been millimeters. Everyone was starting to breathe normally, when the model suddenly did a wild gyra-



To get the optimum strength in the landing gear, the author abandoned wire struts, and installed Annco retracts, which are permanently locked in the down position. Beefier struts make for positive ground handling and control.

tion and we heard a tremendous crunch. When we got there, we discovered that there was a fence which was impossible to see from our vantage point at the field. The model had taken out two 1x8-inch cross-pieces in the fence. The wing was a total mess, the fuse was no better, and the impact had been so severe that both pilots had been broken in half. Back to the repair shop, and the plane had only four flights to its name.

I could tell that the model was beginning to take on a little weight from all of this patching and repainting. Lifting the wing was becoming a chore. I decided that I would start with a new wing, and just rebuild the fuse. Thank goodness that it's a foam wing, because I would have never had the patience to have done a second built-up struc-

ture. A few days later, I proudly took my new wing out and set it on the driveway for the sun to help dry the paint.

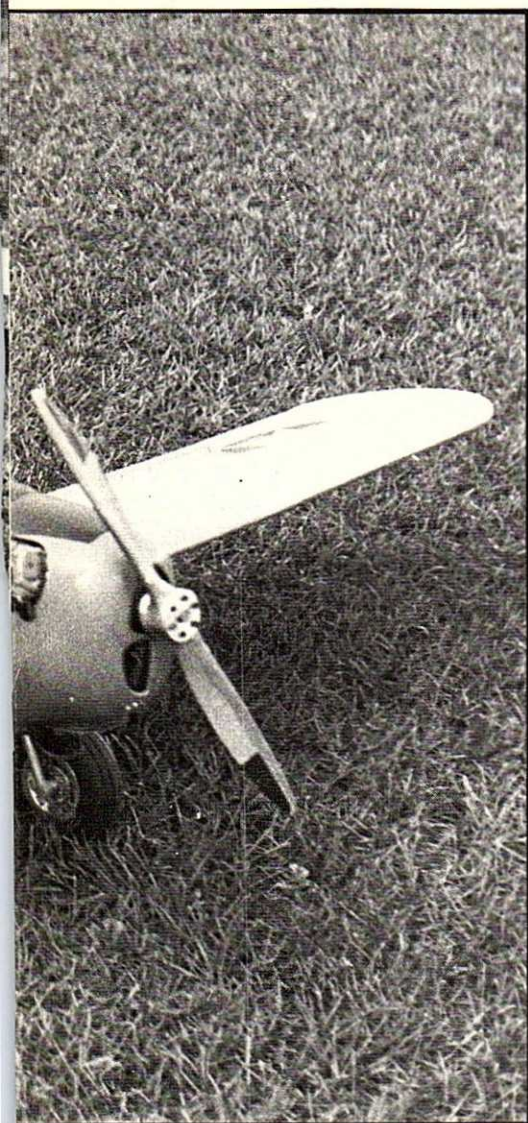
The phone rang, and by the time I answered it, I heard a car horn blaring outside. I ran back outside to see my mother backing up over the wing she had already run over. Run over not once, but *twice*! When I inspected the damage, I was surprised that all that was necessary was to resheet the plywood on the left panel. The weight of a car going over it twice didn't even bend the torque rod! Murphy seemed to be putting in overtime just for me.

While I was at the repairs, I decided to replace the wire landing gear, which never did work too well, with the Annco retract units. I know that the PT-19 has fixed gear, but the Annco units have such superb scale detail and superb shock-absorbing capabilities that I use the gear in the permanently down and locked position. This has dramatically improved both the looks and ground handling of the model. The steel

gear I supply in the kit will work fine, being much heftier than my originals, and the 5/32-inch prebent tail wheel assembly is great.

What did all of this do to the weight of the PT-19? I thought that the original 26 pounds was a mind-boggler, but the re-engined and rebuilt version tipped the scales at 32 pounds! With the Kawasaki, it flies great, and has a very decent rate of sink for landings. Of course, the kit version will build much lighter, and I project that the average builder will get a model in the 28-pound range. That will deliver a very light wing-loading, and a tremendous power-loading for great aerobatics.

Even at the staggering 32-pound weight, the Fairchild does beautiful Hammerheads, Stall Turns, Loops, etc. I made one modification to the controls, adding a second servo to the elevators, tied together with a helicopter ball link. This gives very positive elevator control for landings and helps eliminate nose-overs, and it also gives more throw, necessary for inverted flight.



Once I had all the bugs worked out of it, and when good ol' Murphy finally quit playing his games on me, I had a lot of fun with the Fairchild. It's one of the easiest flying planes I've ever handled, yet it can really pull through the maneuvers. The kit makes it simple to build. You get all the wood necessary to complete the model, which includes ply wing sheeting. The plans are on two large sheets, and you get the pre-made torque tubes and cowl. Where necessary, the parts are band-sawn for accuracy and a good fit. I have had a lot of positive feedback from satisfied customers, so I know that the product is good, although somewhat expensive at \$300. If you are interested in the kit, contact me directly at: CFI R/C Supply, 9180 Hall Road, Lakeland, FL 33805. Phone (813) 858-2658.

The model, even though there weren't hours of detailing put on it, took the "Best Plane" award at the last meet I attended. That, in itself, made all of my woes and ran-over wings worth the trouble! □

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SCRATCH A PLANE SCRATCH A PLANE SCRATCH

ALL~SCALE DAYS

**AEROMODELLER Magazine sponsors
this weekend of Scale activity at
Old Warden aerodrome.**

Photos by the author

By Peter Miller

The date, 18th and 19th of June, the scene is a small grass airfield in Bedfordshire, England. This field is Old Warden, home of the Shuttleworth Trust, and houses a collection of rare and famous aircraft. These are all in flying condition or being restored to flying condition. The place is England's equivalent of Rhinebeck. For two days each year, the airfield is handed over to scale models: F/F, C/L and R/C. The models range from museum quality masterpieces, to knocked-together weekend flying models. No one makes nasty remarks, no one is over-awed by the better models . . . they are there to fly and have fun. There are prizes, but no formal judging. The judging is done while the models are flying, and no one even knows who the judges are . . . and nor do

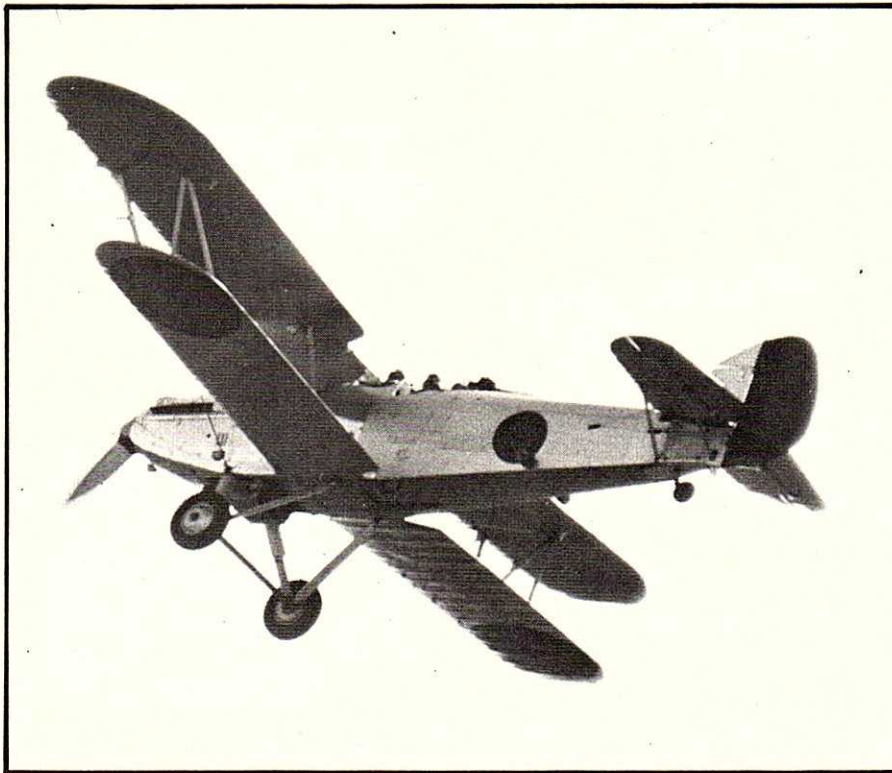
they care, flying is the name of the game.

Reporting this event in the normal way is almost impossible. One can only pick out the highlights and try to get a word with some of the modelers. Consider this: flying takes place over eight hours of each day, each hour is divided into five slots, and in each slot there will be six (and sometimes seven) models airborne. Over the two days this year, 143 models made a total of almost 500 flights. The model park is vast, and many models are not registered, and so will not fly. The number of models actually present is greater than the figures given above. The owners of the aircraft which are not actually flying are wandering 'round the trade stands, or talking to old friends from previous years, or have

gone to watch the free flight or control line. So where does the reporter begin? Well, he picks out models in flight, and catches the owners before they vanish into the crowds. He takes pictures of models in the park and tries, usually in vain, to find the owners. From this, he puts together his view of the day's events.

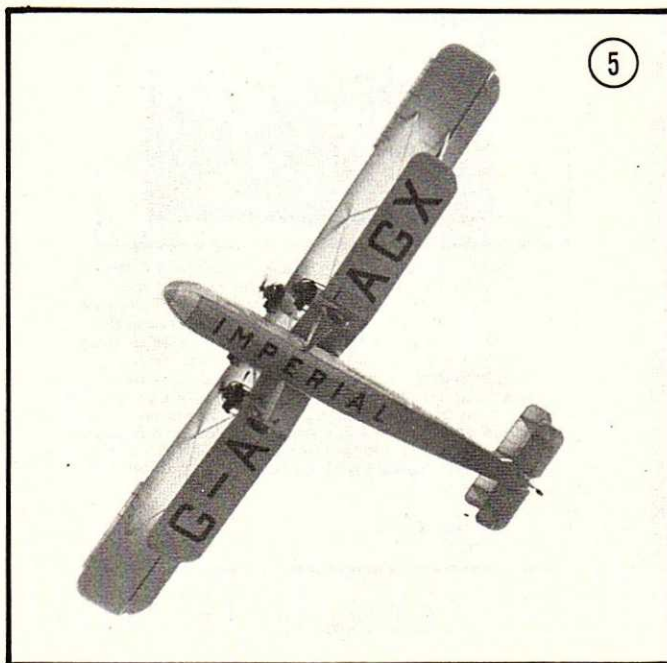
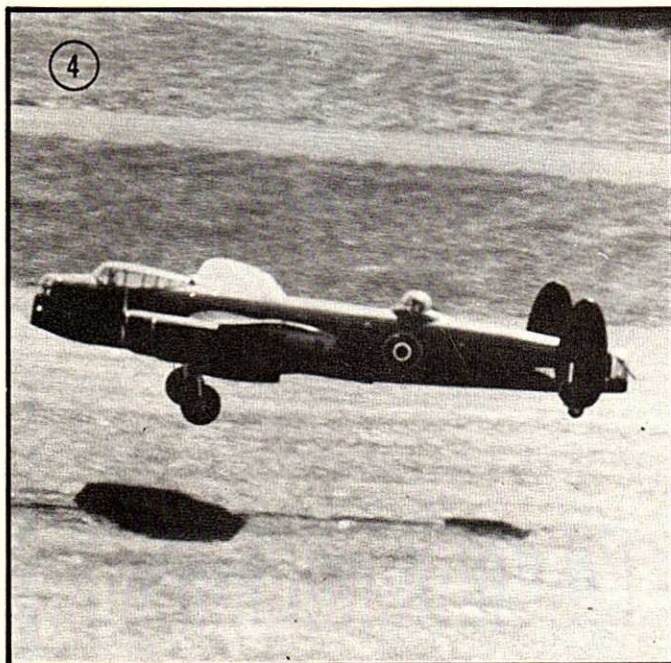
The Scale Days seem to be blessed with good weather. Sometimes the wind is a bit strong, and occasionally there are showers, but that is the worst. This year the weather was perfect, with hot sun and some wind, which was a problem to the lighter and smaller models, but nothing to worry about. I got down there at 10 a.m. on Sunday. The car park was filled fast, and the first models were getting airborne. Then came a slight interruption—the only Hawker Hart in flying condition in the world had to take off for a display elsewhere. Every camera in sight was aimed at it. It rolled for perhaps 70 yards and lifted off, and several thousand scale fans let out a great collective sigh of pleasure.

A walk 'round the model park produced the usual variety of models. There was a 1/3-scale Balsa U.S.A. Fly-Baby and a few Sopwith Pups, a small DC-3 (which was not flown, as far as I know), the usual crop of Piper Cubs in all sizes, a bunch of Druine Turbulents (again in several sizes), a superb Piper Pawnee Model D and a Pawnee Brave, and a de Havilland Dragonfly. This is a rare subject and was very like the Dragon Rapide, but only a five-seater, it has very sharply tapered wings, but the big advantage from the modeler's point of view is that the engines are mounted on thick stub wings, with the normal thin biplane wings beyond the nacelles. The full-size Dragonfly was a ground-looping fool, but the model handled beautifully and flew like a dream. This model was built by Jim Ayling, but I never did manage to find him.



*Not a photo of a model, but rather
the only flying Hawker Hart in the
world, taking off from Old Warden.*

1. Fourth place went to Duncan Maclure's 1/3-scale Luton Minor. 2. Kioritz-powered P-26A took third place for Lloyd Ressler. 3. Terry White's 1/4-scale Pawnee flew superbly, and did a realistic dusting job. 4. Eyk Rusticus brought this Lancaster all the way from Holland. 5. Pete Neate's Hannibal drones overhead. Airline name strategically placed, because planes used railroads as guidance in bad weather.





The all-time favorite at the meet was Pete Neate's HP 42 Hannibal. The 103" span model is powered by four O.S. .60s.

One model in the park that did not fly was Roy Pitts ASK-18 glider. This model is perfect. It is truly the full-size sailplane shrunk down, with every detail there, even in areas that cannot be seen. The model is so perfect that the manufacturer offer-

ed Roy a full-size glider in exchange for the model. Roy says that he has to take his young son with him to help assemble the model . . . he cannot get his hands in to make all the connections.

This year there was a drop in the number of ducted fan models. I only saw one and I did not see it fly. It was a Hawker Siddeley Hawk which placed 6th and was flown by

Paul Gray.

The main attraction is the flying, and there is always something interesting in the air. Six and sometimes seven aircraft in the air all the time means that you tend to go home with a twitch from trying to watch them all at once. Surprisingly enough, there are very few mid-air collisions. This year there were none and, in the past, only one or two

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Watch future issues for more new products from Ace!!

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A beautiful Piper Pawnee, by Terry White. Lots of detail and an excellent finish.

over the weekend.

Star of the flying, from the point of view of sheer spectacle, must be Peter Neate's Handley Page 42 "Hannibal." This 130-inch span 1/12-scale model was powered by four

O.S. .60 four-cycle motors, all controlled by one servo. The corrugated sheet fuselage is perfect but must have seemed easy after his Ju 52 of last year, which is all corrugated. The model handled well in the breeze in spite of the vast wing area. It weighed only 30 pounds. This model

placed first.

Lloyd Ressler, a Canadian living in England, put on a fabulous display with his 1/4-scale P-26A, this model is all balsa, skinned with fiberglass. It weighs 26 pounds and is powered by a Kioritz 40cc engine. This model made its third and fourth flights ever at the meeting and really looked the part. On the fourth flight Lloyd was performing loops, hammerhead stalls and perfect rolls, and he placed third.

Eyk (pronounced Ike) Rusticus brought his huge Avro Lancaster over from Holland and put on a demonstration that held everyone spellbound, this 118-inch span model weighed 22 pounds and was powered by four Supertigre .45s. The flight was very stable but rather too fast for scale realism. It placed seventh . . . no small achievement in such company.

These were the highlights of a great flying display but the continuous stream of Moths, Bucker Jungmeisters, Piper Cubs, assorted WWI fighters and bombers (with occasional Zlins, Pawnees, a Bede 8, Fieseler Storchs, a small Leoning amphibian, a Fairey Long Range Monoplane, Fw 190s and only one B-17) kept the interest up until it was time to leave.



Our new MiG 25 Foxbat 1" = 1' scale model for R/C ducted fan is offered as a semi-kit, buy the fiberglass fuselage with all formers installed, hatch cut, and a full set of assembly plans. Pre-sheathed foam-core wing panels can be bought separately. Designed to use two Boss 602 fan units with .60/.61 size engines (not included).

W/span 46.5", Length 75", RF Weight 14 lbs.

Price: Fuse, plans: \$159.95 + \$10.50 shpg.

Wing panels: \$42.50 + \$5 shpg.



The Northrop F-20 Tigershark makes a beautiful 2" = 1' scale model for ducted fan R/C. This complete kit comes with fiberglass fuse with all formers installed, pre-sheathed wings and stab, canopy, decals, plans, main gear struts, torque rods, text, and all necessary hardware for assembly. Designed to use the Byro-jet ducted fan with .61 to .81 engine.

W/span 52", Length 88", RF Weight 10.5 lbs.

Price: complete kit, \$289.95 + \$16.00 shpg.

3 NEW kits for R/C ducted fan!

The F11-F1 Tiger and the TWE-6 trainer are available in plan form (see plan list) for built-up construction but also have optional fiberglass fuselages and foam-core, pre-sheathed wings available, both of these models are designed to use the Boss 602 fans with .60 to .61 size engines (not included).

Also available is our 1" = 1' scale U-2 Spyplane, offered as a complete kit for R/C ducted fan. W/span 80", Length 52", RF Wt. 8.5 lbs.

Price: complete kit, \$219.95 + \$16.00 shpg.

R/C DUCTED FAN PLANS

	W/span	Length	Price
F11-F1 Tiger (plans only)	50"	63"	\$18.50
TWE-6 Trainer (plans only)	58"	57"	18.50
SR-71 Blackbird	55.4"	107.7"	35.50
F9-F5 Panther	35.5"	49.5"	18.50
F-4J Phantom (Dyna-jet only)	37"	51.5"	18.50
F-8J Crusader	38"	53"	18.50
U-2 Spyplane	103"	52.5"	18.50
F86D Sabre	43"	47"	18.50
F86L Sabre	37"	37.5"	18.50

Optional fiberglass fuselage available for F11-F1, and TWE-6 only, foam-core wing panels also available. Price: fuselage, \$98.50 each, wing panels, \$42.50 each. Add \$10.50 shipping for fuselage, \$5.00 shipping for wings.

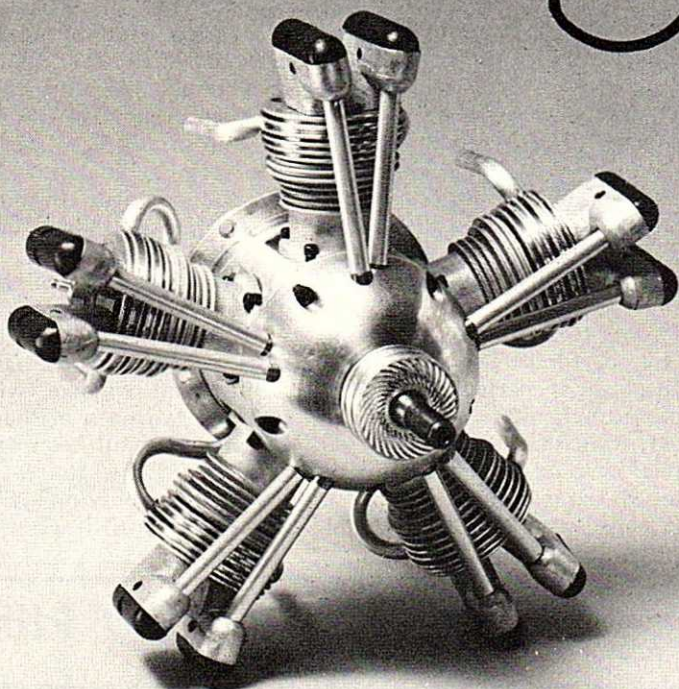
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Unfortunately, the largest model present was unable to fly, this was Dr. Jeremy Shaw's 15-foot span Grumman Albatross, Jeremy is known for his large scale models, powered by exotic engines, but the Albatross is his most ambitious yet. The model weighs 72 pounds and is powered by two Magnum 45cc three-cylinder four-cycle engines, each fitted with its own on-board starter, the model has working flaps but as yet has not had the landing gear made — this was the reason that it was grounded. Dr. Shaw has a custom made transmitter, it is UHF 459 Mhz and is actually two transmitters in one so that in the event of R/C failure, it can be switched over to operate the duplicated airborne system which includes two servos per control, one of which idles when not in use. Separate throttles are used for each engine, with the controls set side by side as per full size practice. The demonstration of running the engines was a show stopper, even if no flights were made.

I hope that I have managed to give an impression of the Scale Days, if you are coming over to England next year, make sure it is in mid-June and bring a scale model (or at least plenty of film) and come and see the biggest scale event in the World. Oh, yes, the museum is there to see as well, and that is worth the visit on its own.



Unusual de Havilland Dragonfly by Jim Ayling. Flew well, and placed fifth.

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Plans with documentation and instructions, \$30.00

These kits include rolled full size plans, building instructions, documentation photos and specs, moulded heads and hands, wing building jig for quick accurate scale-type wing frames, sheet aluminum, copper and brass preprinted, sheet ply preprinted, spruce, balsa, rigging, etc.

GEORGE MARSDEN
7621 Mary Cassett Drive,
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Museum scale, at its best, as exhibited by Roy Pitts' ASK 18. Roy was offered a full-size ASK in exchange for the 100 percent scale (even internal structure) model.

Results: 1st—Pete Neate, H.P. 42 Hannibal.
 2nd—John Day, Sopwith Pup.
 3rd—Lloyd Ressler, P-26a.
 Shuttleworth Trophy for best model of an aircraft on display in the museum:
 Rob Cavell, DH 82 Tiger Moth. □



Dr. Jeremy Shaw's 15-foot Grumman Albatross used two Magnum 3-cylinder 45cc engines, with auto starters. Model weighs 72 lbs., and has two radios on board, for failure protection.



Detail shot of Pete Neate's Hannibal HP 42 shows extreme attention to scale fidelity.



Dennis Tapsfield's large Bede 8 was fully aerobatic on a Magnum .91 four-cycle.



Terry White's Pawnee was one of the neatest planes at the show.

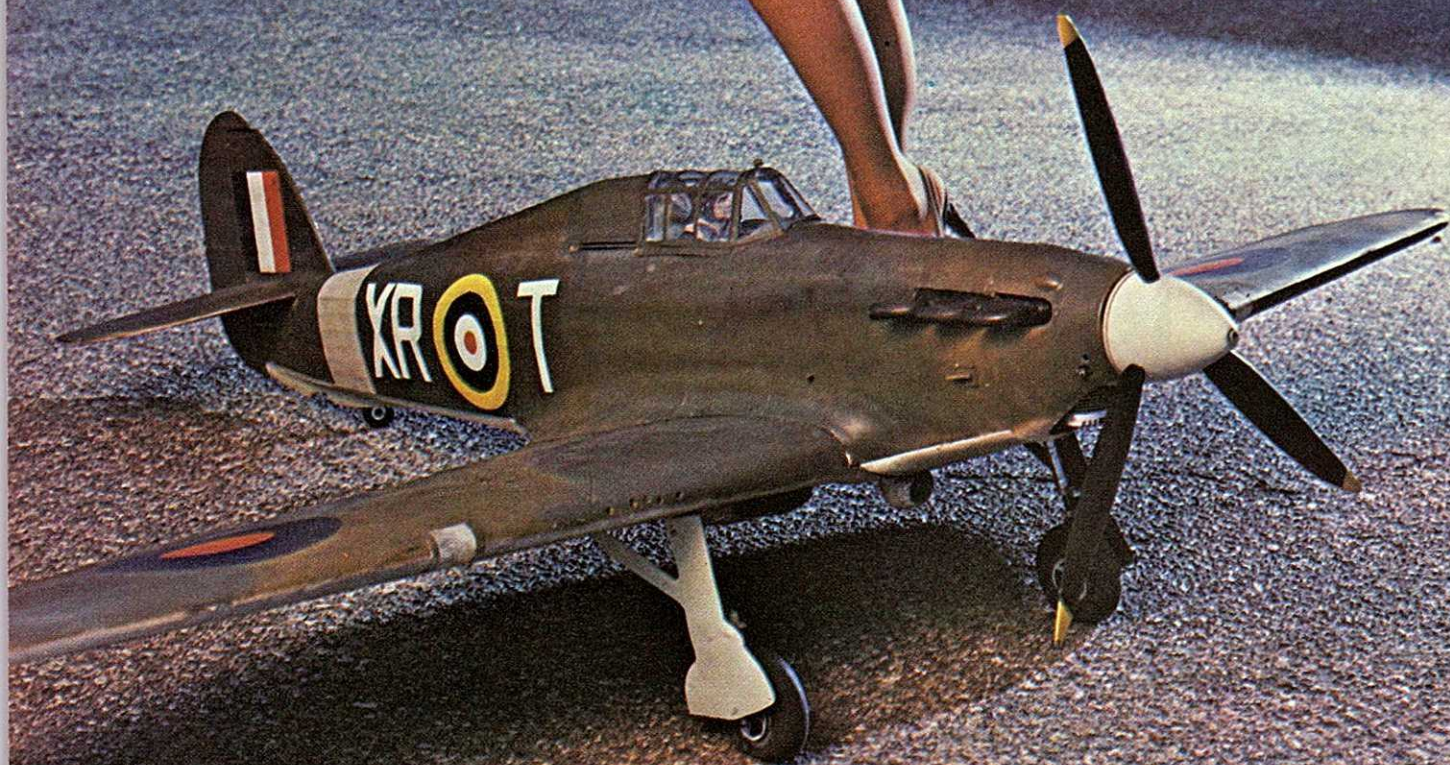
HURRICANE REVISITED

A revised look at the
Mick Reeves Hurricane
kit from England.
You can now order semi-kits
direct from the manufacturer.

By Brian O'Meara

Photos by the author, Tom Weemes and Dan Parsons

*Ms Annette Spiranac, a professional
dancer, poses with the Hurricane.
(David Goetze photo)*



*On a low pass, the "Hurri" proves its stability. The author likes to fly 'em fast and low, the way the full-size birds moved when lightly loaded.
(Tom Weemes photo)*



Born in Denver, Red Tobin moved to Los Angeles as a child. At the age of 20, Tobin's love of flying brought him to volunteer for Finland's Air Force. However, after spending four weeks in Paris and Tours, before any plans could be made, the Finns had fallen to Germany, so he decided to fly for France. By this time, Hitler was only days away from Paris. So, Tobin, along with two other Americans and two Czech pilots, tried to steal a French bomber to get to England. The plan didn't work, and both Czechs were killed by the French. The three Americans escaped and, at St. Jean-de-Luz, the American pilots barely got on board the last ship out of France. The date was June 22, 1940, 18 months before Pearl Harbor.

The three pilots, Red Tobin, Andy Mamedoff and Shorty Keough would finally be able to fly and fight against the Luftwaffe, as the Battle of Britain was only a month away. America was not in the war, thus it was illegal for American citizens to fight against Germany. These volunteers were not only risking their lives for Britain, but also risking the wrath of the American penal system for fighting the Germans.

After a quick four-week indoctrination in a Miles Master advanced trainer, his first assignment was with the 609th Squadron. Time was of the essence, as Hitler was determined to bring England to her knees before the snow flew.

The attack of the Eagles of "Adler Tag" began August 13, 1940. Two days later, with an estimated two

thousand German planes attacking British seaports, Red Tobin saw action for the first time and scored hits on a Messerschmitt. He took on Me 110 fighters that were escorting German bombers, and was credited with the drowning of two of these.

On September 15, 1940, Hitler threw every plane he had against the British and, because of the high losses of the Luftwaffe, Hitler called off the planned invasion. That date is now a national British holiday—Battle of Britain Day. It was on this date that Gene Tobin shot down a Dornier bomber and most probably an Me 109. Four days later, the British formed the 71st Squadron, made up of American volunteers. September 19, 1940, Squadron 71 (or the Eagle Squadron), was formed

with Tobin, Mamedoff, and Keough as the first three pilots.

Eventually, 240 American pilots would volunteer, serving in three Eagle Squadrons, the 71st, 121st, and 133rd. The Eagle Squadron became one of the best groups in the RAF, and in September, 1942, the three squadrons were transferred to the USAAF and became the Fourth Fighter Group of the Eighth Air Force. This Fourth Fighter Group formed from the Eagle Squadrons became the highest scoring group in the USAAF.

Red Tobin would not know this as, on September 17, 1941, after flying for over a year for Britain and only three months prior to Pearl Harbor, he would be killed in action. The Squadron would have been flying Hurricanes for a year and, on this date, the Eagles would be issued new Spitfires. They would take off with only nine planes, as opposed to the normal twelve.

They would cross the French coast at 22,000 feet, destination Bologne, France, when unbeknown to them, about one hundred Me 109s would climb to 29,000 feet, thus trapping the squadron inland. This would be the most fierce attack the Eagles had encountered, and would end with Red Tobin giving his life.

Red Tobin was not only my father's first cousin but, in my opinion, a fine American. He gave of himself during a time of world war, for a cause that he believed in. Thus, I knew that I had to build a flying replica of his Hurricane not only in his memory, but in tribute to the other American volunteers in the Eagle Squadron.

Jesse Taylor, the current President of the Eagle Squadron Association, and Bill Dunn, America's first Ace, were instrumental in providing information on Red Tobin, the Eagle Squadron, and the planes they flew.

In Bill Dunn's book *Fighter Pilot*, America's first Ace described the Hurricane as follows: "Actually the Hurricane was easy to fly and had no bad habits. It was light and maneuverable; and had a tighter turning radius than the Me 109 and Fw 190. As a gun platform, it was steady as a rock. Stalling speed in level flight, with gear and flaps down, was 70 mph IAS and, before it reached a high speed stall, it gave the pilot a long shuddering warning. Because of its low stalling speed and rugged, wide undercarriage, the Hurricane was ideally suited for small, unimproved fields. Aerobatics with the Hurricane were a real delight to perform, and she could do them all with equal grace."

After crashing my P-47 at the '81 Scale Masters, and thereby inheriting Frank Tiano's "Being Last Sucks!" T-shirt, I needed a new model. The model I built was based on Mick Reeves' 80-inch kit highly modified, using Bob Holman's blown up plans of Brian Taylor's Hurricane. Mick Reeves' kit had some drawbacks as noted in an earlier article in *Scale R/C Modeler* (June '82) but as with any competitive scale model, changes must be made. None were serious.

The kit comes with a construction book, but no plans. When I first embarked on the project, I mentioned this to Bob Holman and he said no problem, as he had just enlarged Brian Taylor's Hurricane plans to 80 inches—the exact size of the kit. So, I now had a set of plans.

The kit also comes with a slab balsa tail section. With the above mentioned plans, a built-up structure was fabricated. The fuselage built from the kit is all stringers behind the wing and once completed, is gorgeous.

The obechi-covered foam wing has a tendency to crack with changes in humidity and temperature. It seems British modelers expect their wings to be precovered by the factory. I would recommend cutting a new foam wing and covering it with balsa.

As with any scale subject, a good three-view is a must and the book *Camouflage and Markings* provided in the kit is the three-view I used.

The kit, when imported several years ago, was in the \$200 range, and is no longer available from the importer. I have written Mick Reeves and asked him if he would sell a semi-kit, without the wings but with all fuselage parts, wing template, cowl, two canopies and tail surfaces. He has agreed to sell this semi-kit for \$50 and will send it air freight.

Do I think this is a good deal? Well, I have ordered two for myself plus several more for some friends. Reeves will sell them for \$40 each, if three are ordered. His big cost in the original kit was the labor to cover the wings and the freight for the giant box required by the wings. I also asked him to delete the engine mount, fuel tank, fixed landing gear, etc. I do plan to build another one someday. He also noted that he now has scale wheels for \$8 per pair, and scale propeller blades. Now he tells me, after I carved mine! You can write direct to: Mick Reeves Models, 10 The Avenue, March, Cambs, England.

The plane weighs 15 pounds, powered by an O.S.-90 and controlled by a Kraft Signature Radio. The

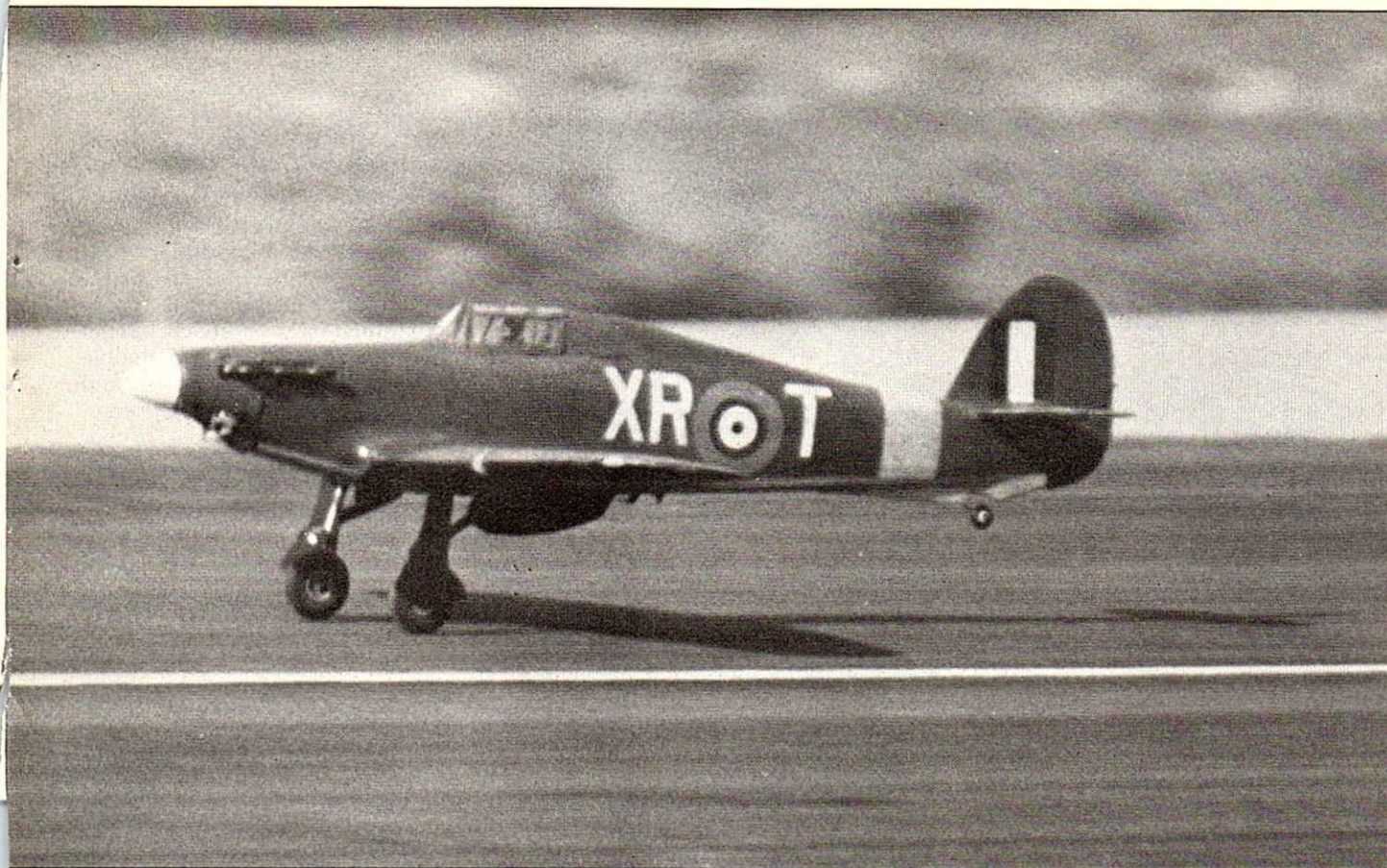


The Hurricane greases in for another perfect, tail-high landing. See the text for the proper way to get the fighter on the ground, using flaps.
(Tom Weemes photo)

split flaps are very effective on landing and are driven by a KPS 16 180-degree servo. Each wing has a small inboard and large outboard split flap. I pull the outer flaps down by a cable and the inner flaps are keyed by a wooden dowel. I always pull both flaps down on any plane. If a bellcrank is used, make sure that you are *not* pushing one side and pulling the other, because there is *more* give when the bellcrank is pushed rather than pulled. If you have a push-pull on the flap bellcranks, the plane will be impossible to trim with the flaps down.

The landing and navigation lights are functional and are micro-switched from the flap servo. There are no gaps on any of the flying surfaces. Robert Hinge Points were glued with the hinge imbedded about 1/4 inch in the leading edge of the flying surface. The flying surface leading edge is rounded with the trailing edge of the wing or stab sheeting to extend over the leading edge of the aileron or elevator.

The canopy frame was duplicated by cutting out the framework of a second canopy and gluing it over



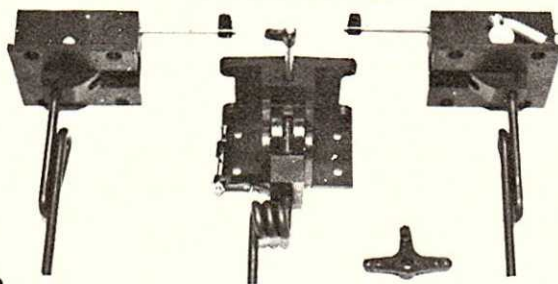
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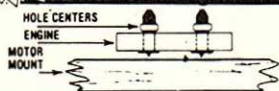
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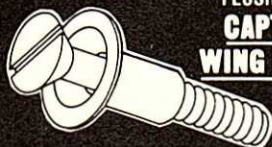
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The Hurricane sits on the ramp, with the split flaps partially lowered. Author found all of the "fixes" to correct the problems with the Reeves kit, as discussed in the June, 1982 issue of this magazine.

the original canopy. Of course, it is easier if the frame is painted prior to gluing. The inside of the canopy is reinforced with 1/32-inch ply on the bottom and a 1/4-inch ply inner frame glued to the front of the sliding portion, where it meets the front windshield. The rear canopy slides on square brass tubes

glued to the bottom of the 1/32-inch ply frame.

The rear view mirror has a wood screw that goes into the 1/4-inch inner ply frame, to hold it shut. The functional scale exhaust was made for me by Slimline mufflers. The engine has a tendency to load up when idling and, consequently, belches gobs of white smoke while taxiing.

Both the pilot and retracts are Dave Platt products. And boy, was I pleased with the results of the pilot by following Platt's instructions. The oxygen hose was made

from the elbow portion of drink straws and painted flat black. The retracts work great.

The entire fuselage, behind the pilot, was stringer and cloth on the original and thus was duplicated with stringers and Coverite. The many rivets on the wing and front fuselage were duplicated with white glue applied with a toothpick. Machine gun access hatches are printer's aluminum glued in place, with small railroad screws added. Panel lines were made by laying a double layer of masking tape down and brushing on a thick coat of primer. Next, sand and feather the primer up to the masking tape and then remove the tape. This leaves a sharp, permanent panel line.

Landing gear doors were duplicated by tacking down Monokote over the wheel well, and then laying up three layers of fiberglass cloth. When you untack the Monokote and cut out the doors, you have a strong landing gear door, that fits the contour of the wing perfectly.

The entire plane was covered with Coverite and painted with Perfect camouflage paints. All markings were painted on by utilizing clear

(Continued on page 71)

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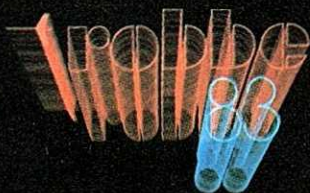


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Viva il Falco!

(Part I)

A speedy Italian lightplane for either contest work—there's even a military version—or for weekend fun. The building plans are the most elaborate this magazine has ever presented.

By John S. Shenk Photos by the author



My search for a scale aircraft which combined aesthetics with speed and aerobatic performance was ended when I discovered the Italian SIAI Marchetti Super Falco. Primarily because the plane has not had much exposure in this country, scale enthusiasts have apparently overlooked this tempting subject. The flowing lines, the big canopy,

trike gear and the generally pleasing contours of the Super Falco are just too good to be true. A fringe benefit is that this hot little Italian civilian aircraft is also available as a military machine (with slight modifications). Rake the rudder hinge line back, add some sexy tip tanks, and you have a full-blown camouflaged fighting machine. The SF 260

is made available to military powers as either a trainer (SF 260 M), or a COIN (counterinsurgency) fighter, gunnery practice ship or surveillance aircraft (under either the "Warrior" or "Sea Warrior" labels). Numerous nations have purchased the SF 260, so there is a plethora of national markings available and some distinctive military paint schemes.



The Falco family sort of offers the best of all worlds to the scale modeler. You can go either military or civilian (including aerobatic, as depicted by the model presented here), and I even recently saw a photo of a stretched-nosed turbo version of the SF 260! To me, this looked like the perfect candidate for a 1/4-scale project. I envisioned a model with about an 80-inch span, with a gross weight in the 16-pound range. It would optimize the larger .80-1.20 glo or gasoline (non-chainsaw) engines. After checking the size of the cowl, it was ascertained that even the larger powerplants, such as the Tartan Twin and Quadra, would fit. This project was just too good to pass up!

Before discussing the details of the modeling project, let's look at the full-sized Falco. The aircraft is distributed in the U.S. by the Sequoia Aircraft Corporation (900 West Franklin Street, Richmond, VA 23220). I wrote to them and, for \$10, received a number of brochures with color photographs, dimensions, speci-

fications, and even a small three-view. These sales brochures will provide essential information to anyone building the Falco, and I strongly recommend sending for them. A couple of years ago, the company released the plane as a homebuilders' project. There are over 200 being built in some 20 countries around the world. If you really want to go whole hog, you could purchase the full-size building plans from Sequoia (they are rather expensive), and execute an exact-scale Precision version of the Super Falco. The model plans presented here were expertly done by Bob Sweitzer, and they are a faithful reproduction of all of the external dimensions of the Super Falco (more on these exceptional scratchbuilders' plans later).

The Falco's designer was Stelio Frati. He was born in Milan, Italy, in 1919. Frati had established a reputation for designing lightplanes which possessed astonishing speed and power. The first Falco (Hawk) was flown in 1955. The F.8L Series I (with the 135 hp Lycoming engine)

was the first production model. The final version was the Super Falco Series IV, with the 160 hp Lycoming engine. That's the version we are concerned with here. Stelio Frati has the reputation of being the world's best designer of high-speed light aircraft. He can get more out of an engine and wing than any other designer.

The F.8L Super Falco (which is the current homebuilt version) is a side-by-side two-seater. It offers a combination of high-speed cross-country travel, with complete aerobatic capabilities. The huge cabin is comfortable, with plenty of head room and unobstructed visibility under that bulbous canopy expanse. The Falco is capable of unlimited inverted flight, and can execute the full range of aerobatic maneuvers when outfitted with the Christen fuel and oil system. The Super Falco can reach 200 mph in level flight at full power, and will cruise at an amazingly efficient 180 mph at 75 percent power . . . all on a 160 hp engine. One look at the streamlined contours



The author obviously didn't want to get grass stains on the wheels of his freshly-completed Falco, so he used a blanket! The model is a nice size, even though it is 1/4-scale.

of the airframe shows why the plane can achieve such phenomenal statistics.

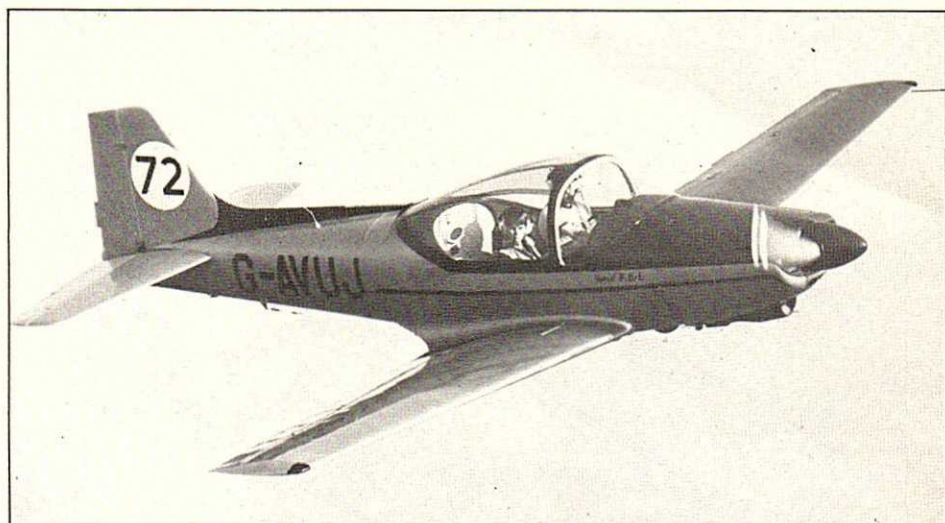
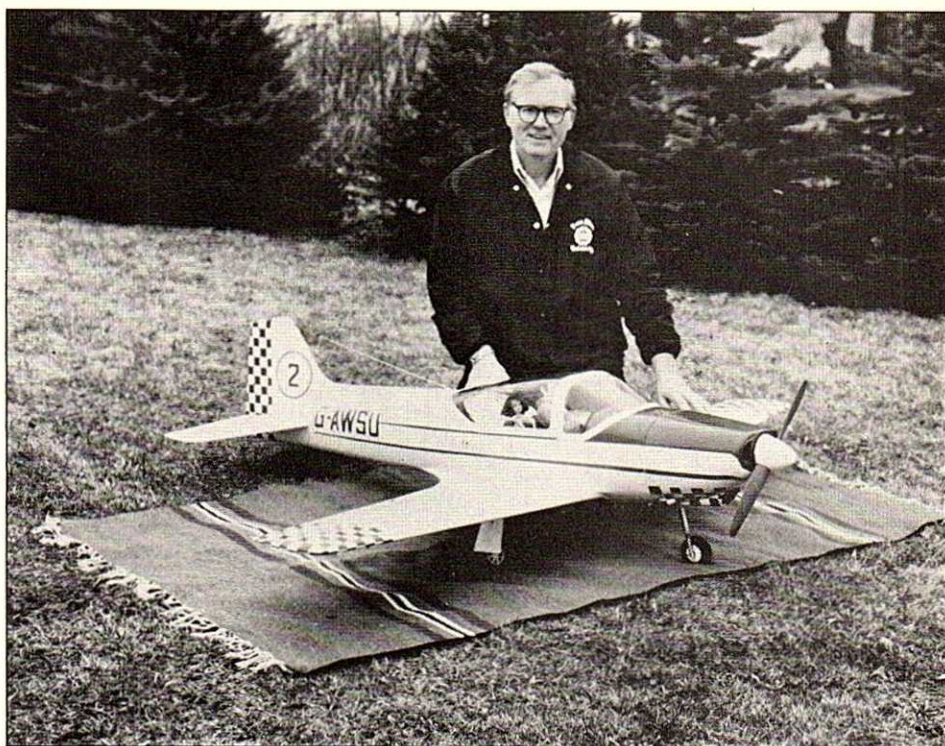
The letter sent to prospective homebuilders by Sequoia's president, Alfred Scott, states: "If you don't want to build a Falco, don't go for a ride." My comment is: "If you don't want to build a 1/4-scale Falco, don't read Sequoia's literature."

A number of unknowns had to be solved before the 1/4-scale Falco could emerge. First, a strong, durable tricycle landing gear had to be found. A phone call to Dave Platt solved this problem. Dave said that, if I was willing to make the necessary modifications, his retracts should do the job. I'll give the details on the mods to Dave's gear elsewhere in this article.

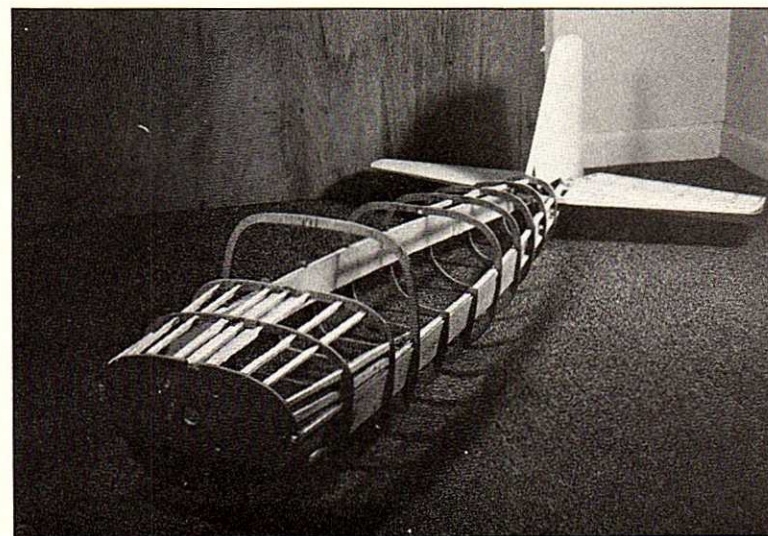
The second unknown was the engine. Since I didn't have much experience in designing models, I really couldn't project the final weight of the Falco. I sort of "guess-estimated" that a Quadra would handle it, assuming that too much power wasn't a disadvantage in so large an aircraft . . . especially since it was supposed to be aerobatic. To avoid potential confusion, I must interject a note of explanation here. The model shown in the photos is the prototype, which turned out to be totally over-engineered. It came out weighing a phenomenally heavy 21 pounds! Even the Quadra was groaning at that weight.

However, the expert hand of Bob Sweitzer went to work on my drawings. He revamped the structure, and trimmed about seven pounds off the gross weight. As shown on the plans, the Super Falco will build in the 14½-17-pound range. That would be spectacular with a Quadra! So, as you read through this article, please bear in mind that the plane shown on Bob's plans is a vastly improved version of my original heavyweight. The Editor has carefully combed my manuscript to make sure that all of my building comments correspond with the revised plans, but, if there's a conflict, the drawings are definitive.

We can't say enough about Bob Sweitzer's skills as a draftsman. He took what was, at best, a sketchy set of "working" drawings and turned



Michael Slazenger's full-size Super Falco, which the author copied. The plane is used in aerobatic competition, thus the #72.



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them into one of the most extravagant model plans I've ever seen. When I began unrolling the four-sheet plan set, I couldn't fit them on my building board, and I had to use the length of the living room floor in order to see the entire sheet. Three of the sheets measure some 11 feet (!) long, and they contain all of the building information, including some superb isometrics on assembling the fuse. The fourth sheet has all of the markings and paint scheme of the aerobatic Falco which I modeled. There's even a full-size view of the cockpit interior. The drawings, as shown here, are still in an incomplete stage, and Bob plans to add a lot more detail.

Bob is selling the plans for \$43.50 a set (this includes postage, mailing tube, complete list of building materials and a three-view). Add \$4.00 for Air Mail, and \$18.00 for overseas orders. By the time you read this article, a fiberglass cowl and a molded canopy will be available. For ordering, or information, write to: R/C Sweitzer Enterprises, P.O. Box 834, Hillsboro, OR 97123.

I also wondered if so large a canopy could be hand fabricated, and then be made to open and close. I had to undergo the drudgery of inconveniencing two other people to help me drape pull that huge bubble canopy. Lucky for all of you, Bob Sweitzer is currently working on a mold, so that you'll be able to order yours already done. Among all of the unknowns, one thing was an absolute certainty... I would finish the Super Falco in the festive aerobatic trim of Michael Slazenger's machine, which is based in Dublin, Ireland.

The Super Falco presented a real challenge from a design, construction and engineering point-of-view. Each of the unknowns envisioned at the beginning of the project were solved as construction proceeded. As new or unexpected problems arose, new solutions and/or compromises were found. The final product is a very sturdy aircraft, as the flight report will reveal. As a Stand-Off Scale project, it is a sure winner. The Sweitzer plans have exact scale outlines and, if you are a Precision Scale perfectionist, the brochures provided by Sequoia will give you ample documentation (plus, the availability of full-size homebuilders' plans).

The Falco is not a gargantuan model, compared to today's behemoth 1/4-scale machines. It's more the semi-compact package we have come to associate with the .90-sized,

(Continued on page 64)

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SOPWITH TABLOID

Perhaps not the greatest fighting machine of World War One, but a plane worth modeling. Plans are available in either 1/5 or 1/4-scale.

By Tom Polapink Photos by the author and Pete Polapink



Late in 1913, a sleek, compact biplane made its first public appearance in Hendon, England. This machine, which was piloted by the soon-to-be Ace, Harry Hawker, had just completed official trials at Farnborough and arrived at the Hendon Field where a flying "meet" was taking place. Hawker, who had built this prototype aircraft, astounded the 50,000 spectators who had gathered there by doing two low-level passes across the field at speeds greater than 90 mph.

This design was the result of the joint efforts of Thomas Sopwith and F. Sigrist, and was called the Sopwith Tabloid. The original machine had a balanced full-flying rudder without a fixed vertical stabilizer. It utilized wing warping for lateral control, and

was built as a two-seater arranged side by side in the single open cockpit.

In the early months of 1914, the Sopwith Tabloid was put into production for the Royal Flying Corps. The basic design had to be altered to make it more efficient as a scout-type aircraft. The balanced rudder was changed to a fixed fin and separate rudder, and the wing warping system was replaced by ailerons. The landing gear was modified, and the passenger seat was deleted. Even with these changes, the Tabloid failed to get the recognition as a fighter that it should have. A dependable synchronization mechanism for the machine guns had not yet been developed by the Allies.

* * *

In August of 1981, I had the opportunity to visit Nick Zirolì in his spacious workshop. Nick, who is noted for his one-fifth scale designs such as the F4U "Corsair," AT-6 "Texan," Curtiss P-40, and the F8F "Bearcat," was readying his 1/4-scale Sopwith Triplane for the annual Rhinebeck Jamboree.

I had always been interested in aircraft of the World War One era, and noticed an unusually-shaped fuselage atop a room divider. I questioned Nick as to its origin, and he informed me that it was a Sopwith Tabloid that he had started about ten years earlier. He was forced to discontinue work on it temporarily because of business demands. When he finally found the time to work on it, he had developed interest in





Carol Polapink, the author's sister, adds an attractive dimension to this 1/5-scale model.

other types of aircraft and, as a result, it was never completed.

My next question pertained to the availability of plans for it. Nick graciously gave me a set of roughed out blueprints for it and, two days later, the basic fuselage structure had been completed.

At this time, I felt it necessary to start the search for good documentation. Finding a three-view drawing for the Tabloid was not a difficult task, but finding color documentation was another story. Fortunately the journal, *World War I Aero* had an article on a Sopwith Tabloid which had been constructed by Don Cashmore of Notts, England. I contacted Don by mail and, within a week, received a reply, with color photographs of his authentic Sopwith. It was decided that I would use this aircraft as the basis for my model. But, as I continued construction, I ran into some problems which led to a temporary halt on the project.

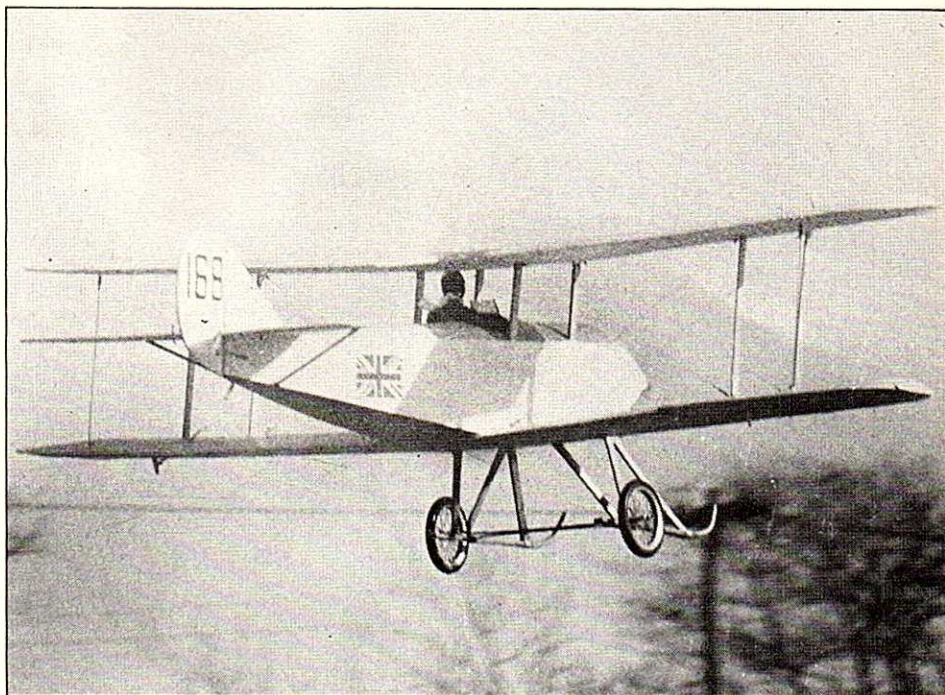
In January of 1982, the WRAM's show was rapidly approaching, and I wanted to have the Sopwith ready to display there. I resumed work on the Tabloid until it was completed about four weeks later. I met my WRAM's show deadline, and the model took First Place in its category.

Since then, the Sopwith has flown in its share of contests, and it has proven to be a successful design. I am very pleased with its performance, and I honestly feel that it is one of the most docile planes I have ever flown. Even as this article was being prepared by the magazine for publication, I was honored to take top prize in the Senior division of Scale at the '83 NATS.

The design of this model was kept fairly simple so that it would enable a large variety of modelers to construct a reasonably accurate scale model of an unusual airplane of World War One vintage.

The fuse sides are built directly over the plans, in a fashion typical of most box-fuselage models. The fuselage sides, from the cockpit forward, are made mainly out of 1/4-inch plywood. This provides the cabane struts with a strong foundation. The cabane struts provided me with many hours of head scratching and fingernail biting, but the configuration which resulted has proven itself through one year of rigorous, competitive flying.

Start by cutting 1/8-inch diameter wire to the lengths shown on the



Cruising past, the Sopwith Tabloid proves itself to be the kind of model that you can fly every weekend. If strenuous aerobatics are anticipated, the full rigging wire system should be employed, just in case.



The nifty nose skid adds a nice touch to the author's model, but don't expect it to prevent too many noseovers.

plans. Crimp and silver solder electrical wire terminals to the ends of each of the four wires making sure that all of the joints are sound. The 1/8x3/4-inch plywood strips (two per strut) for the cabanes should then be cut and routed out to accept the 1/8-inch wire. Sandwich the wire between the plywood strips and epoxy it all in place. This procedure must be done three more

times, for each of the remaining cabane struts.

After each of the strut assemblies has been made, lay them over their respective locations on the fuselage side-view plan and, with a pencil, mark off where they exit the top of the fuselage. Using rough sandpaper radius the corners of the struts from where they exit the fuselage, to where the terminals are. Doing this step now saves a lot of time later, and is much easier to accomplish while the parts are still separate from the fuselage. Carefully



The Tabloid is covered with Super Coverite and painted cream, except for the aluminum areas around the nose.



Detail of the gear area reveals functional rigging wires holding the skids in place. Spoked wheels and scimitar-shaped prop are a must.

epoxy the struts to the fuselage sides, making sure that you have made both a right and left side (all of the terminals should be facing outward).

After the two sides have thoroughly dried, remove them from the plan, and pin them so that they rest vertically in place over the top-view drawing. The nose should be propped up to allow the bottoms of the fuselage sides (from the back edge of the wing cutout, rearward) to rest flat on the plan. Epoxy the $\frac{1}{4}$ -inch plywood firewall in place, and epoxy the back ends of the fuselage sides together. Cut the remaining $\frac{1}{4}$ -inch square balsa crossbraces, and glue them in place.

Add the $\frac{1}{8}$ -inch balsa formers to the top of the fuselage. This will allow you to lay the $\frac{1}{8} \times \frac{1}{2}$ -inch balsa turtledeck stringers in place. After making sure that these stringers taper evenly toward the back of the fuselage, they may be glued in place. The nose (from the cockpit forward) should now be sheeted with $\frac{3}{32}$ -inch balsa as shown on plans.

The cowling on this particular aircraft is unlike that of most of its contemporaries. To duplicate it is not as difficult as one might think. I started by sheeting the top of the forward fuselage with $\frac{3}{32}$ -inch balsa. A balsa block was then temporarily glued in place on the firewall. The block was then shaped and sanded. Following this, the block was removed and hollowed out, using a Dremel tool and various types of X-Acto blades.

Drill the holes for the engine mount (I used a Kraft mount) and epoxy 6-32 blind nuts in place. I would suggest that the engine mount be screwed in place at this time, because the upper nose block will prevent you from being able to get the two upper screws for the mount in place. Make sure that you have drilled and tapped out the four holes in the mount for the engine before screwing it in place.

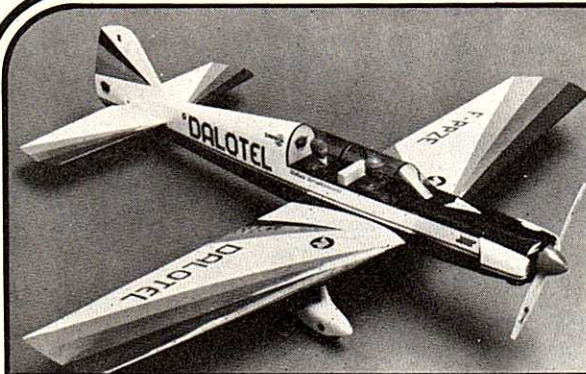
Now that the engine mount is in place, the upper nose block may be glued on. One piece of litho sheet metal was used to duplicate the lower portion of the cowling. A pattern for this is given on the plans, but I would recommend that you first make a paper template to ensure a proper fit.

The slight hump on the top of the fuselage, directly in front of the cockpit was built simply by gluing a former, namely F-2A, on top of the sheeting at the location shown on the plans. A piece of $\frac{1}{16}$ -inch balsa sheeting was then cut in the shape of a parabola and glued in place. Hobby Pox "Stuff" was then ap-

The Sopwith gets going on another mission. Nick Zirolì is selling plans for this 1/5-scale size, as well as a full 1/4-scale version for chain saws.

plied to form a smooth fillet in this area, and was also used to fill in all of the small dings and dents that had developed during construction. All of the parts of the fuselage that were going to come into contact with the covering were given a coat of Coverite's Balsarite and, after a light sanding with No. 400 sandpaper, the entire fuselage was covered with Super Coverite.

When the fuselage has been completed, construction of the tail surfaces should be started. I opted to laminate both the rudder and leading edge of the stabilizer, mainly because this technique gives the surfaces rigidity and keeps the structure light. Remember, you are building a model of an early World War One biplane with a forward center of gravity. Keep the taillight, and this will automatically reduce the amount of weight you will have to put in the nose. Laminations are easy to make, and if you have never tried it, I would encourage you to use this method on your next model, if applicable. The tail surfaces, like the



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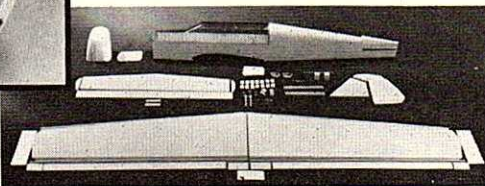
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The engine head just protrudes enough from the cowl to allow proper cooling. Four ailerons give very solid lateral control and maneuverability.

fuselage, were coated with Balsarite and covered with Super Coverite.

The wings should not present the average modeler with any problems. Each wing is built as three separate

components. The center section and the two outer panels are all held together by the 1/8-inch plywood dihedral braces.

The aileron should be built into the wings, and later cut out. This makes them less susceptible to warp-age during the construction stage, and it allows you to form fit each

aileron to its wing panel (Note: The early Tabloids did not have ailerons).

The wings, after construction and installation of pushrods for the ailerons, were coated with Balsarite and covered with Super Coverite. The

(Continued on page 68)

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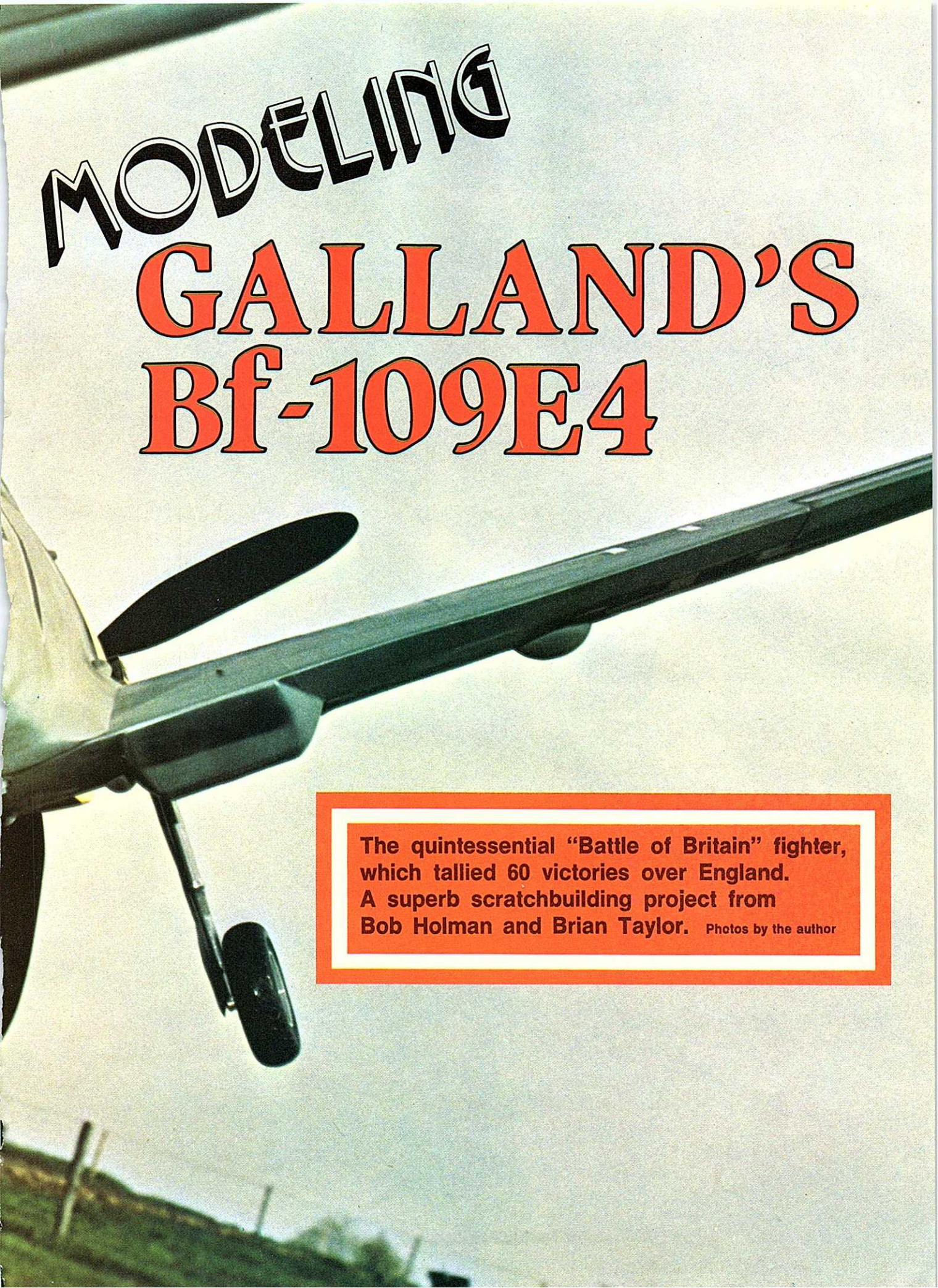
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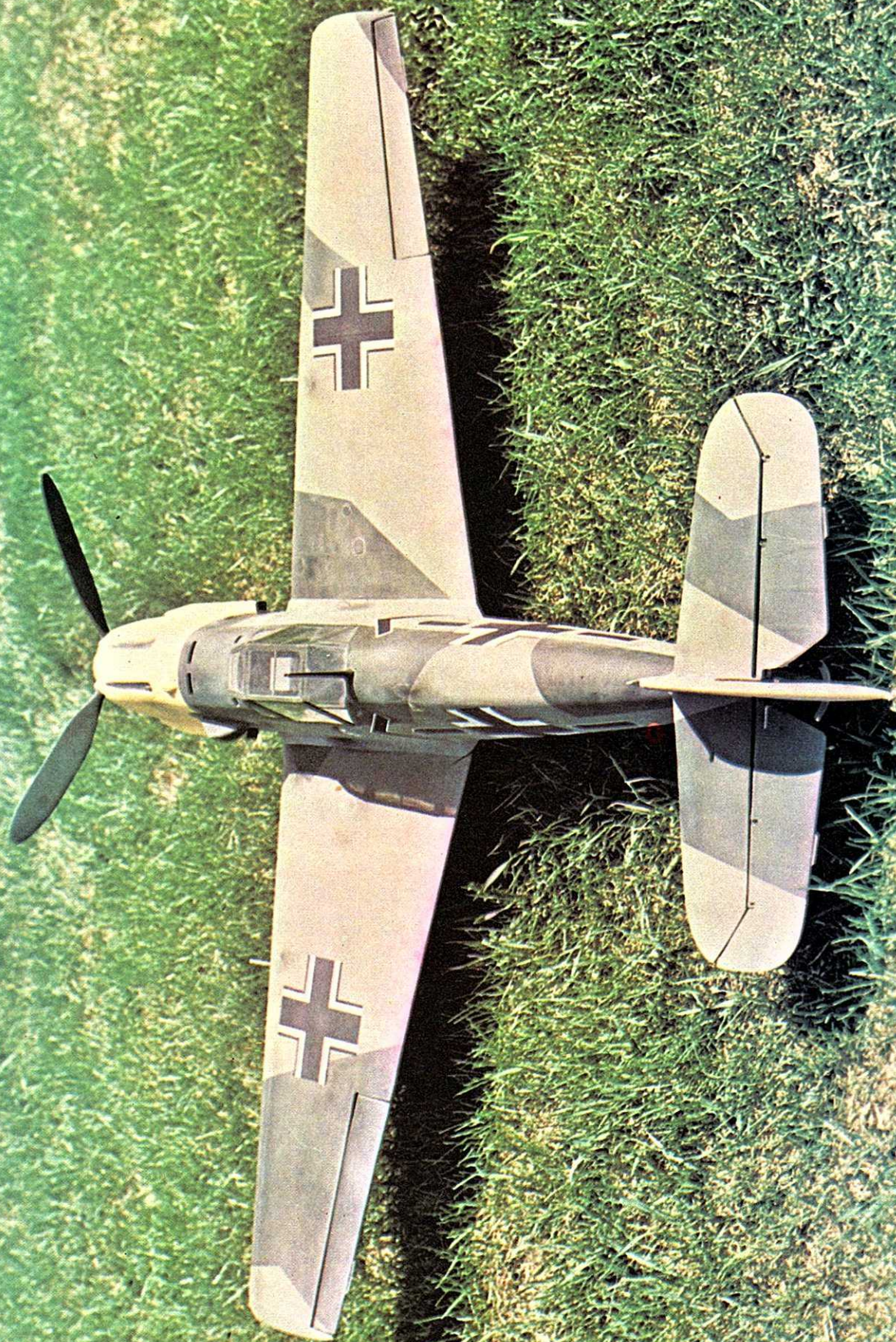




MODELING

GALLAND'S Bf-109E4

The quintessential "Battle of Britain" fighter, which tallied 60 victories over England. A superb scratchbuilding project from Bob Holman and Brian Taylor. Photos by the author



Born Adolf Galland, in Westerholt, to the man who was the bailiff to the Graf von Westerholtz, the child was of a family which had emigrated from France in 1742. Adolf, who was a crack shot when hunting on the Westerholtz estates, began his flying career at 17, when he took up glider flying. This was the rage at the time, and he was so proficient that he was permitted to go on to airline pilot training.

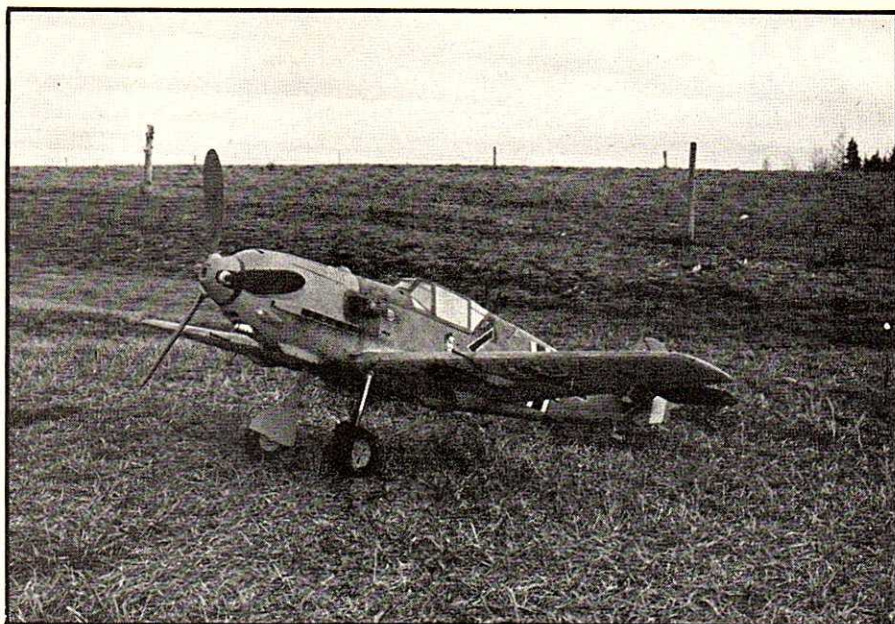
By 1933, the "unofficial" Luftwaffe was secretly training pilots in Italy, and young Adolf was among them. That year, Hitler consolidated his power and became absolute ruler of Germany. Hermann Goering was put in charge of developing the blossoming Luftwaffe. The Fatherland started to rearm at a feverish pace, to fulfill Hitler's grand scheme.

In 1937, Adolf Galland volunteered for the Condor Legion, to fight for Francisco Franco in the Spanish Civil War. This "war" served as the perfect test bed for Germany's weapons and tactics. During his tour of duty there, Galland worked his way up to commander of the flight which was eventually taken over by Werner Molder. Galland and Molder were to become friendly rivals, both high-scoring Aces. Molder went on to become Germany's youngest Wing Commander, while Galland was sent to a desk job. As the war broke out in Poland, Lt. Galland would find himself a ground support pilot. After the fall of Poland, he was to be promoted to Captain, and reassigned to the 27th Fighter Wing, in the west.

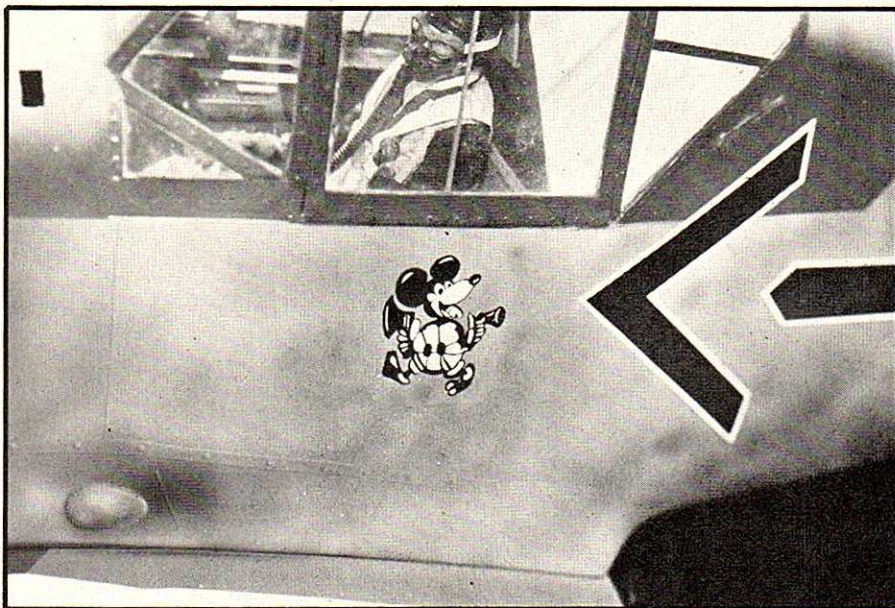
The war on the Western Front finally got rolling on May 10, 1940, and Galland was to claim his first victory two days later. He downed a Hurricane, flown by a Belgian pilot. He next downed a Blenheim bomber, then felled a Spitfire in the final days of the Battle of Dunkirk.

The 27th Fighter Wing was transferred to Abbeville, in northern France, for "Operation Sealion." This was to be the final assault against Britain. The boys from Abbeville wanted the British to know against whom they were pitted, so they painted the noses of their Bf 109s a garish yellow.

Captain Galland's plane, which I have modeled here, went on to be painted with over 60 kills during the fighting over England. Molder was transferred back to Berlin, to become Inspector General, while Galland went on to achieve the distinction of being the leading Ace of the



Looking as if it were stationed at Abbeville, France awaiting the Battle of Britain, the Me-109e4 looks lean and mean in its wartime paint scheme.



Galland's personal emblem, the "Mickey Mouse" was specially handpainted by the author's son's art teacher.

Western Front. The Mickey Mouse was Galland's personal emblem, which was painted on every 109 he flew. Molder was tragically killed in an airplane crash, ironically on the way to the funeral of Ernst Udet, where he and Galland were to be pallbearers for the fallen hero. After the funeral, Galland was promoted to Molder's position of Inspector General.

Galland fought a useless battle to defend Germany against the bomber attacks. While he vainly tried to bolster the defense of the western sectors, his reserves were frittered away in other battles in Africa, Malta, Crete, etc. General Galland became a staunch supporter of the Me 262 jet fighter. He saw the

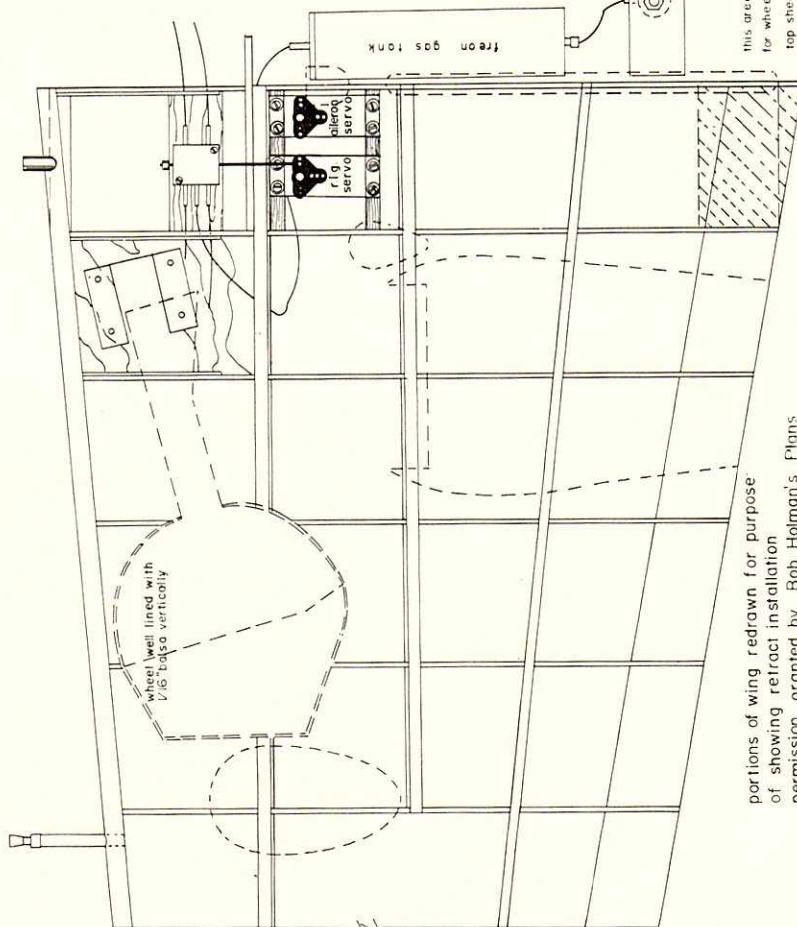
potentials of this amazing weapon, but Hitler was still talking offensive strategies, and was determined to make the plane into a bomber.

Galland finally had a falling out with Goering, and was relieved from his post. He spent the remainder of the war commanding a squadron of experts flying the jet fighter in defense of Germany. With 103 confirmed kills, he was awarded the country's highest award, the Diamonds to the Knights Cross.

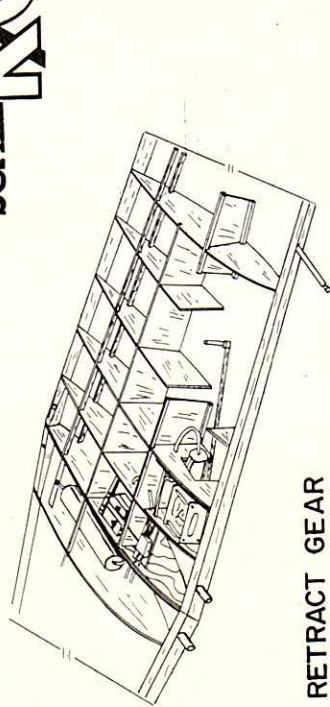
Most of Galland's kills were racked up in the machine he flew in the Battle of Britain, which is the Bf

Messerschmitt Bf 109 e

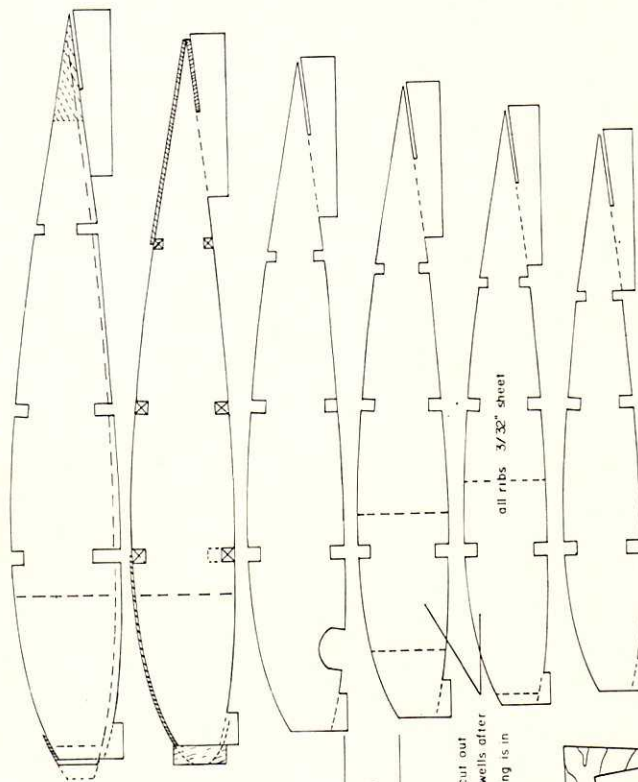
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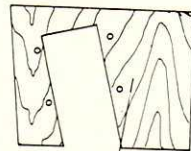
portions of wing redrawn for purpose of showing retract installation permission granted by Bob Holman's Plans 3/19/83



RETRACT GEAR ISOMETRIC



this area cut out for wheel wells after top sheeting is in place



1/4" ply mount make 2

All pertinent and dimensional information located on original Brian Taylor's drawing

109E4 I have modeled. The philosophy behind the fighter was quite simple . . . merge the smallest possible airframe to the biggest possible engine. The powerplant was a Daimler-Benz DB 601A, twelve-cylinder inverted V, rated at 1,150 hp. All of this horsepower was shoved into a 34-foot wingspan airframe. The success of the airplane led it to become the longest production run aircraft in the world.

The model shown here was scratch-built from Bob Holman's plans, as drawn by famed British scale modeler Brian Taylor. You can buy the plans from Bob for \$16.95, and he

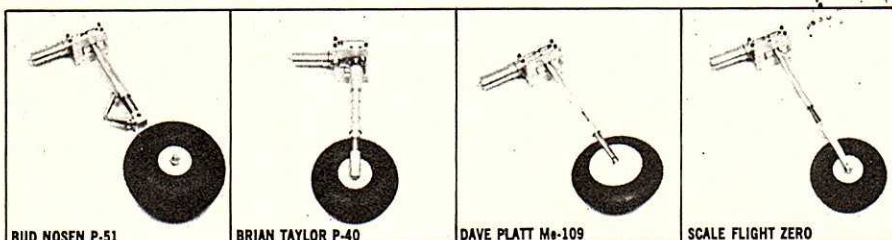
also has such accessories as the fiberglass cowl, canopy, spinner, etc. The accessory pack sells for \$29.95. Bob also has the plans for a Bf 109F for \$18.95. I must comment that Bob Holman's plan service is one of the best companies in our hobby. He has great drawings, three-views, and lots of other goodies. Write him directly at: P.O. Box 741 SM, San Bernardino, CA 92402.

As with any scratchbuilding project, the first thing to do is cut out all of the parts, so that you fabricate your own kit. I opted to make the hard balsa ribs from ply. I constructed the wing on a jig, so I re-

moved all of the alignment tabs.

I would like to spend some time discussing the installation of the retract system in the Messerschmitt. The gear is unique, in that it is severely raked back in the up position, and spread out to get good tracking in the down position. This makes getting the gear installation correct a time consuming matter. I have redrawn the center section of one wing panel to illustrate the

The classic looks of the Messerschmitt have appealed to scale modelers for decades. It was such a good fighter, that it still remains the longest production military aircraft in history.



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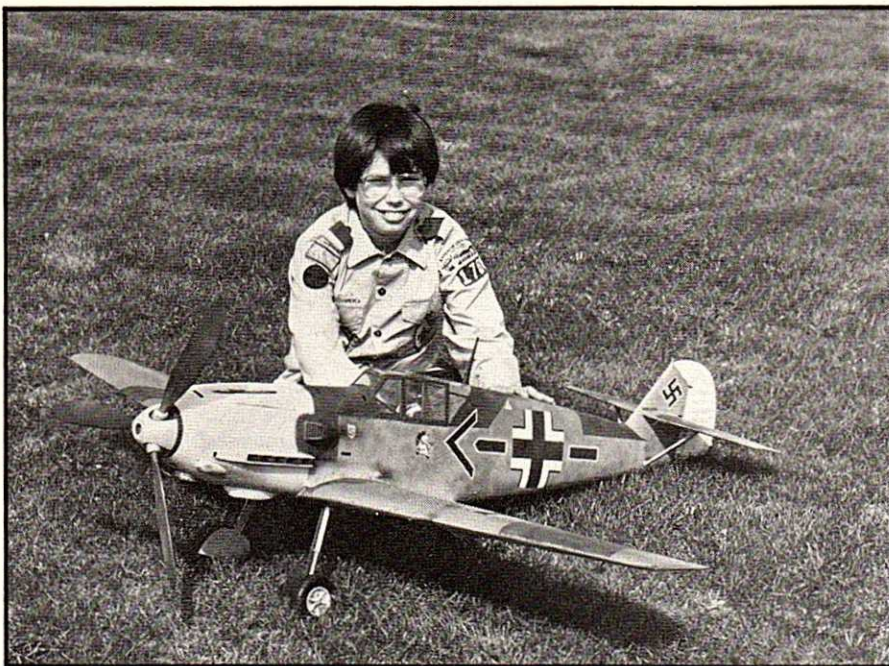
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The author's son takes a moment out from his scouting duties to pose with Dad's just-finished scale project.

proper retract installation. All of the dimensional data is to be found on the Brian Taylor plans, and these drawings are only to illustrate relationships and the concepts.

The first thing to do is to make sure that you cut the plywood mounting plates just right. This solves one angle in the retract sequence for you, since you will get the proper fit of the wheel in the folded position. The Rhom retracts rotate a full 90 degrees, while the prototype gear only swung 87 de-

grees. To cure this, add a small washer to the pneumatic shaft, between the housing and the sliding block, to restrict travel. If you look closely at the full-size gear, you'll see that the wheel axle is canted downward, so that the tires make proper ground contact. The struts are raked outward, and the axle angle compensates for this. The best way to achieve this is to use Goldberg's adjustable axles. I also used Rhom struts without the coils, to maintain better strut alignment. These can be ordered from Rhom Air.

The outline of the wheel well drawing is to scale, so this is what you will remove from the bottom sheeting. Once the mounting blocks are fitted, you will have to experiment with angling them to get the proper gear-down positioning. This is strictly a trial-and-error affair. Be patient, and you'll get it right with no problems. Remember that the plywood mounting plate is recessed 1/16-inch from the bottom sheeting.

I modified the aileron installation to use torque rods, not wanting the slop created by bellcranks and linkages. I relocated the aileron servo

(Continued on page 73)

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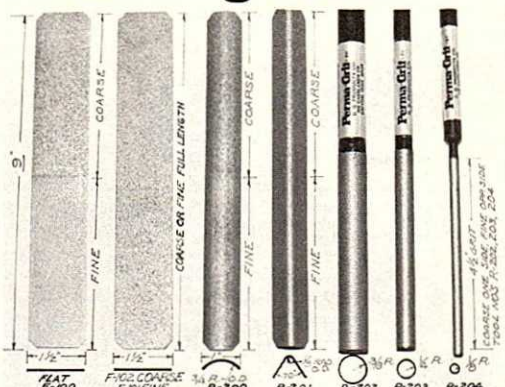
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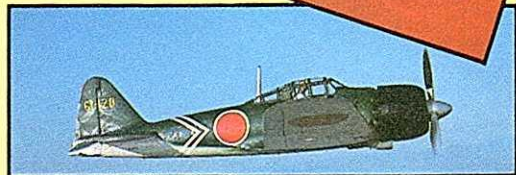
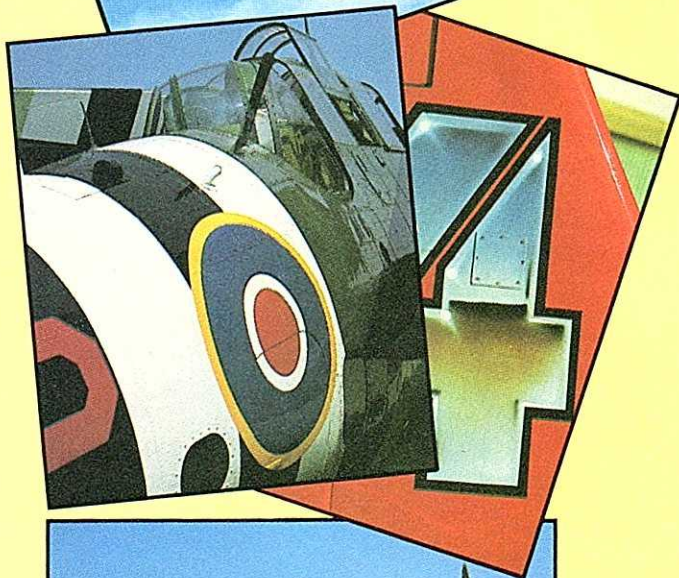
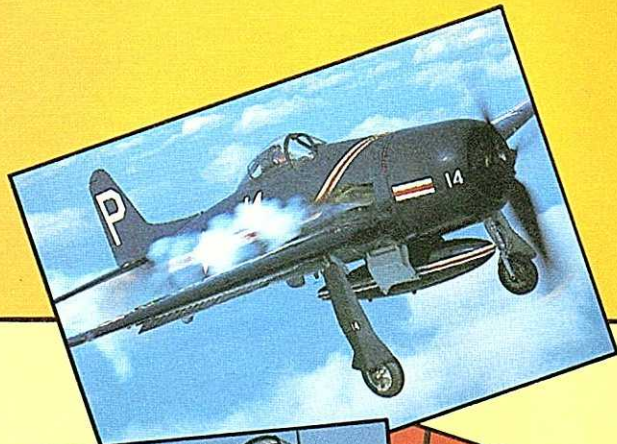
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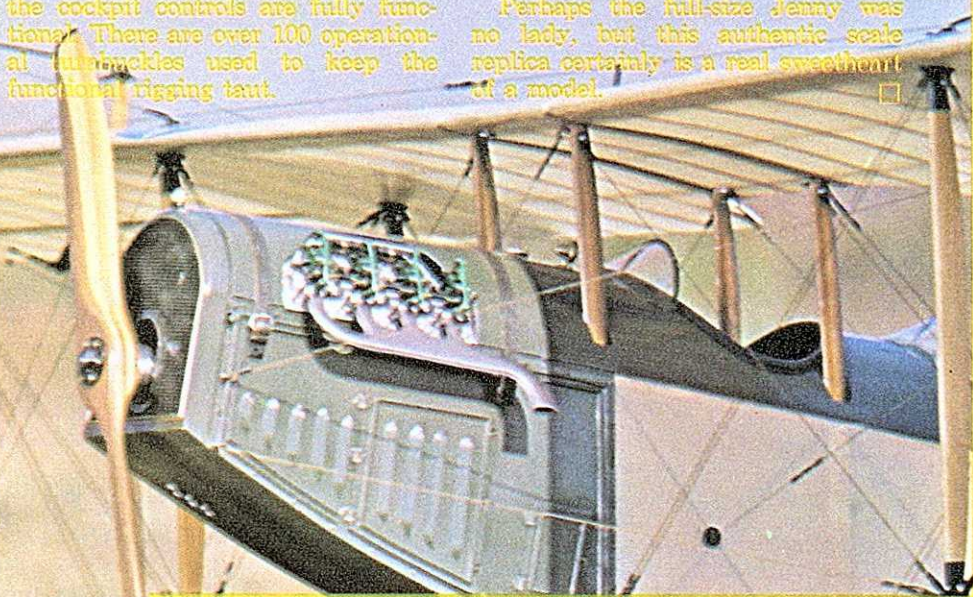
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Scale R/C Modeler salutes that fine old lady of the skies, the venerable JN-4D Jenny. This superb rendition by Bud Voss has won many awards in Japan. From Ralph Beck's super-detailed drawings (available through Lou Proctor), the model is 2"=1' scale, and weighs 4.8 kilos. Power is an O.S. Max .60 Goldhead, and the biplane is covered with Super Covarite, then sprayed with semi-matte polyurethane varnish.

Construction is just like the original, being primarily spruce and ply. Detailing is so extensive that even the cockpit controls are fully functional. There are over 100 operational subhacks used to keep the functional rigging taut.

With such an elaborate model, you'd think that it would be a real hangar queen, yet Mr. Voss routinely flies the plane in weekend contests . . . and he doesn't hesitate to sport fly the intricate biplane. He feels that models should be flown, otherwise they're not worth having around. After ten months of building, Bud was rewarded with a plane that proved very slow and forgiving in flight. The Jenny is a real rudder airplane, requiring coordinated turns and lots of timing to get the decent roll.

Perhaps the full-size Jenny was no lady, but this authentic scale replica certainly is a real sweetheart of a model. □



A championship
Concours
d'Elegance model
of the famed JN-4D
which is routinely
flown as a
sport machine.

SALUTE TO JENNY

By Howard M. "Bud" Voss, Jr.
Photos by the author

There's nothing worse than a scale model which doesn't behave like its full-scale counterpart. One of my firm principles of aeromodeling is that the model must behave like the real thing not only in the air, but also on the ground. We've all had the thrill of witnessing a spectacular flight of a superb scale model, only to watch it bounce around like some hyperactive duck on the runway. Typically, the landing gear is so stiff that the model either springs back into the air, as if propelled off a diving board, or the undercarriage is so spongy that the plane looks as if it has broken something.

This effect is particularly noticeable on the smaller aircraft. Since I like to work in 1/8-scale, I have had more than my fair share of troublesome and awkward gear systems. The smaller models lose a lot in scale effect. Just compare the relative grace and beauty a giant-scale model exhibits when landing and taxiing, as compared to a jittery little .10-powered ship. The machine's light weight, small tires and stiff wire gear make for a poor combination. There just is no art to ground handling the smaller models, so we tend to aim them down the runway, hit the throttle and go. Upon landing, we learn to fetch the airplane, which makes us more like free flighters than R/C pilots! I honestly believe that these problems were one of the prime contributors to the demise of "Schoolyard Scale" in the United States.

The solution seems relatively simple. Build functional suspension and torsion systems into the gear, just like the full-size ships. When your total airframe weight is measured in ounces or just a few pounds, you quickly learn to fear even an added gram of weight. Functional gear systems tend to be heavy, and devilishly complex to handle in these small sizes. Just making them substantial enough to not fail or bend on every flight is a task.

I have devised some rudimentary methods of making even the smallest landing gear functional. The weight additions are so small that the advantages far outweigh the penalty of an added ounce or two. By using one of the systems shown here, you'll find that you won't be ripping the gear wires out on every bad landing (and small models sure seem to make more of those than the larger craft!). Taxiing will become an everyday affair, and it might even prove enjoyable.

Figure 1 shows a typical gear system as might be used on a small J-3 Cub, Aeronca or other fuse-mounted

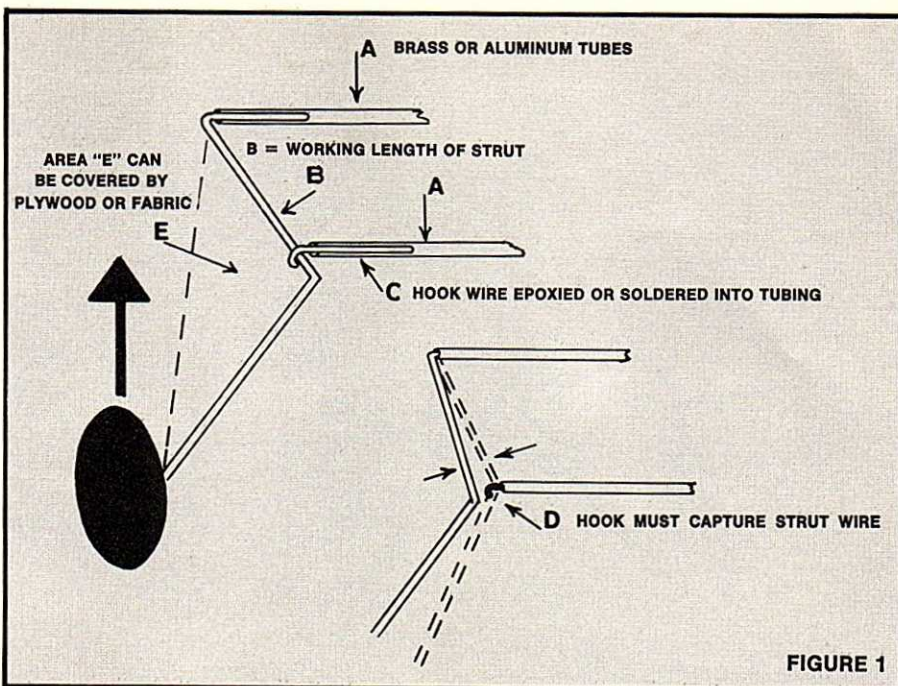


FIGURE 1

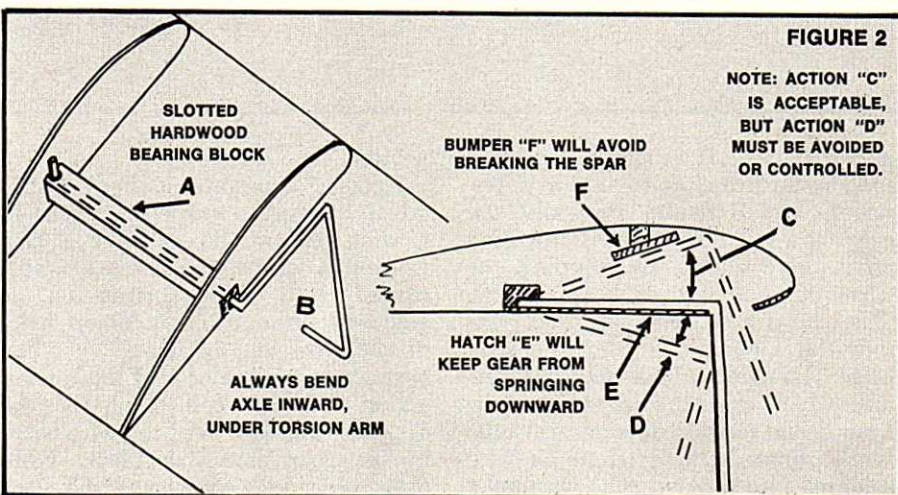


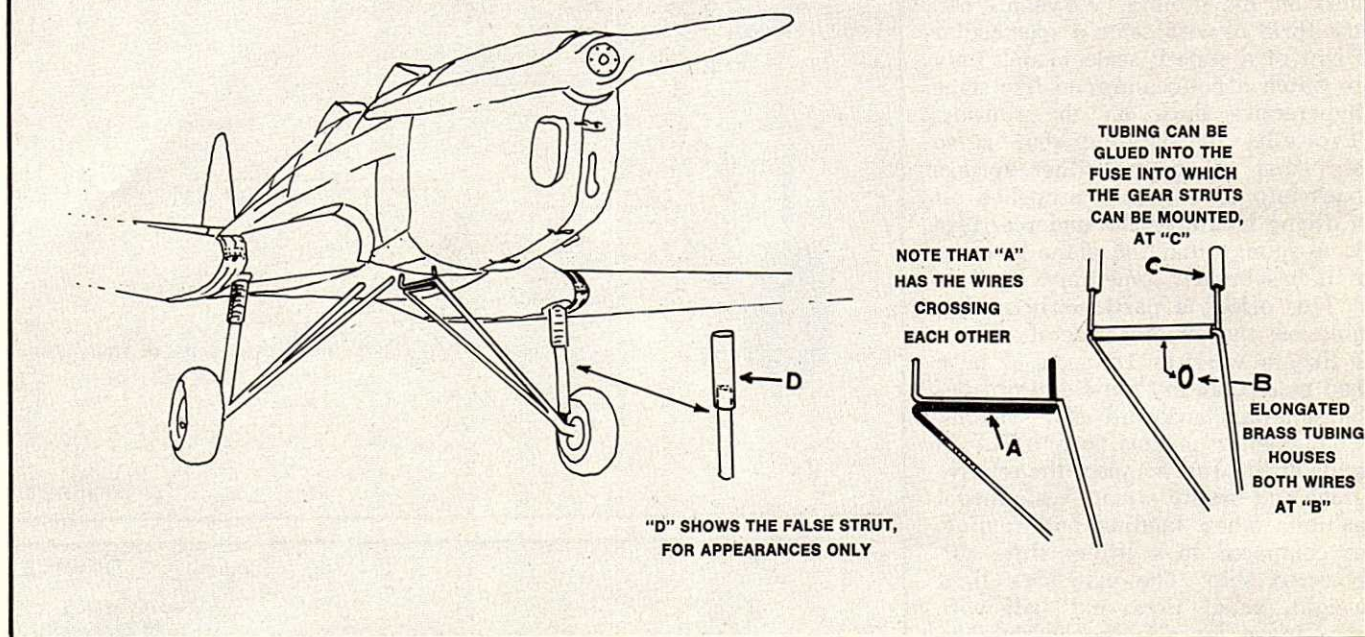
FIGURE 2

NOTE: ACTION "C" IS ACCEPTABLE, BUT ACTION "D" MUST BE AVOIDED OR CONTROLLED.

Some simple techniques to make your model more shock absorbing. Primarily intended for small models, the technique can be applied to any scale subject.

SIMPLE SCALE LANDING GEAR

By Par Lundqvist



undercarriage. It employs the basic torsion bar principle found on Volkswagens and Renaults. Basically, the gear wire must have an aft pivoting point, here shown by slipping the wire into a length of brass tubing. The wire can be silver soldered right into the tubing, and then the next larger diameter tubing used as bearings which are attached to the airframe. The forward torsion arm tube is also brass, with a length of wire soldered into the end. The wire must have a hook bent at the very end, which engages the main gear strut. The fit should be snug, but not so stiff that the gear strut wire can't pop out of the hook on severe impacts.

Note the geometry, with the wheel actually being directly under the aft suspension point. We want the strut to move down and back on severe impacts, so the wheel must be canted back behind the forward hook point. If the wheel is left in a position forward of this, the gear strut arm will attempt to travel upward, instead of downward. This system works best in fuselage-mounted configurations, but it can be adapted to wing installations. If you mount it in a wing, or in a fuse which has a low-wing configuration, be aware of the risk of the wheel swinging back and punching a nice hole in the wing. The solution is either to make the hook attachment point permanent, or use a third piece of wire, positioned below strut "B" to act as

a stop.

Figure 2 illustrates a simple method of hanging a suspension gear in a wing. All we do is make a new gear strut wire which has a forward-canted arm. The suspension is achieved through the torsional twist of the wire length along "A." The springiness or firmness of the torsion action will be controlled by the diameter and length of the wire within the gear mounting block. Note that the side view shows the gear mounted inside the wing, under the wing skins. It is prudent to install some sort of bumper to take up any excessive impact loads, lest the wire impinge on the spar and do structural damage. A small ply plate will do the job nicely. The shorter you can keep the forward-protruding arm, the simpler it will be to keep the forces on the torsion bar within reasonable limits. This will be a matter of trial and error, since the total weight of the model and other variables will change how a particular length and diameter of wire would react in a landing or under normal taxi conditions. This same system was used by Sonic Systems when they developed their shock-mounted retracts for giant scale. Unfortunately, in so large a machine, the torsion bar had to be so big that it occupied almost the length of the wing panel, making installation a problem.

Figure 3 shows how to cope with the perpetual dilemma of gear legs that splay out. What look to be the

main struts on this Ryan STA are really dummies, made from wire, tubing and some flexible rubber hose line at the top. The wheels are really not supported by this piece at all. Instead, the two fuse-mounted wires are doing the work. Note that the two wires must be passed through a mutual piece of tubing, so that they work in unison. If you already have your gear wing mounted, then it would still be acceptable to add the fuse-mounted strut braces as further reinforcement.

I have presented the dynamics of several gear mounting alternatives for smaller models (the same laws of physics apply to larger models, so there's no reason the same mechanisms can't be used for even the largest models). Don't be discouraged if your first attempt at setting up such a system doesn't work perfectly. Getting the wire lengths and diameters just right takes some trial and error. But, the results will be worth it. Your little model will handle like a sports car on the pavement or grass, and you'll spend far less time doing field repairs on an undercarriage that has been ripped out. We here in Sweden still get a lot of pleasure from "Schoolyard Scale" models, and we have used the landing gear systems described here with great success. So, if you are the kind of scale buff who thinks small, then these gear are for you.

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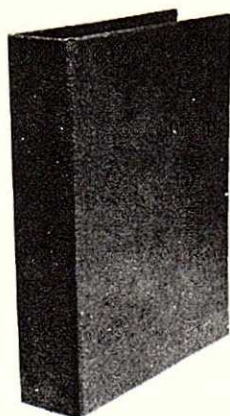


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Viva il Falco!

(Continued from page 41)

1/5th-scale models (yet, it is a true 1/4-scale rendition). The 79-inch span wing builds in one piece, but the plane still fits comfortably in any compact car. On the flight line, the Super Falco appears just as large as most giant-sized models, primarily because of that huge canopy and the rotund fuselage.

If you just can't seem to get turned on by a model this size, look into the Waco Meteor kit which is available from Circus Hobbies. For all intents and purposes, it is the twin brother of the Falco, and it is a superb kit. I realize that there are those who don't like to scratchbuild, so the Circus Hobbies kit is the perfect answer. With a little ingenuity, you could kit-bash the Circus Meteor and convert it to the SF 260 military version of the Falco.

Since the Falco is retract and flap equipped, it can hold its own in any contest environment. Depending on the "mind set" of your judges, you may want to make some quick mods and opt for the military version, to keep you in contention with the fighter jocks. Add some radar pods (maybe some gunnery ordnance for strafing passes) and you should be able to get some high static and flight scores. If the judges are into flight maneuvers in your area, do the aerobatic version and

simply outfly anything else on the field.

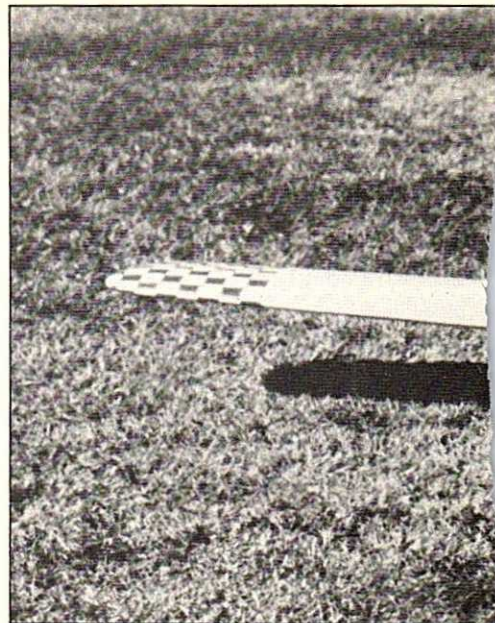
Let's get going with the building procedures. One look at the plans will tell you that this is not a beginner's project. The construction is not complex, but there are a lot of pieces to be glued together. Getting that fuselage straight isn't something for someone who hasn't had some building experience. Let's get started.

FUSELAGE CONSTRUCTION

Bulkheads F-2 through F-8 are plywood, with balsa top sections. All remaining formers are cut from 3/16-inch sheet to save weight. If you really wanted to do the job right, the new Magna-Lite carbon fiber composites which Bob Violett is marketing would be an excellent material for the formers. You could probably save at least a pound by going to this material.

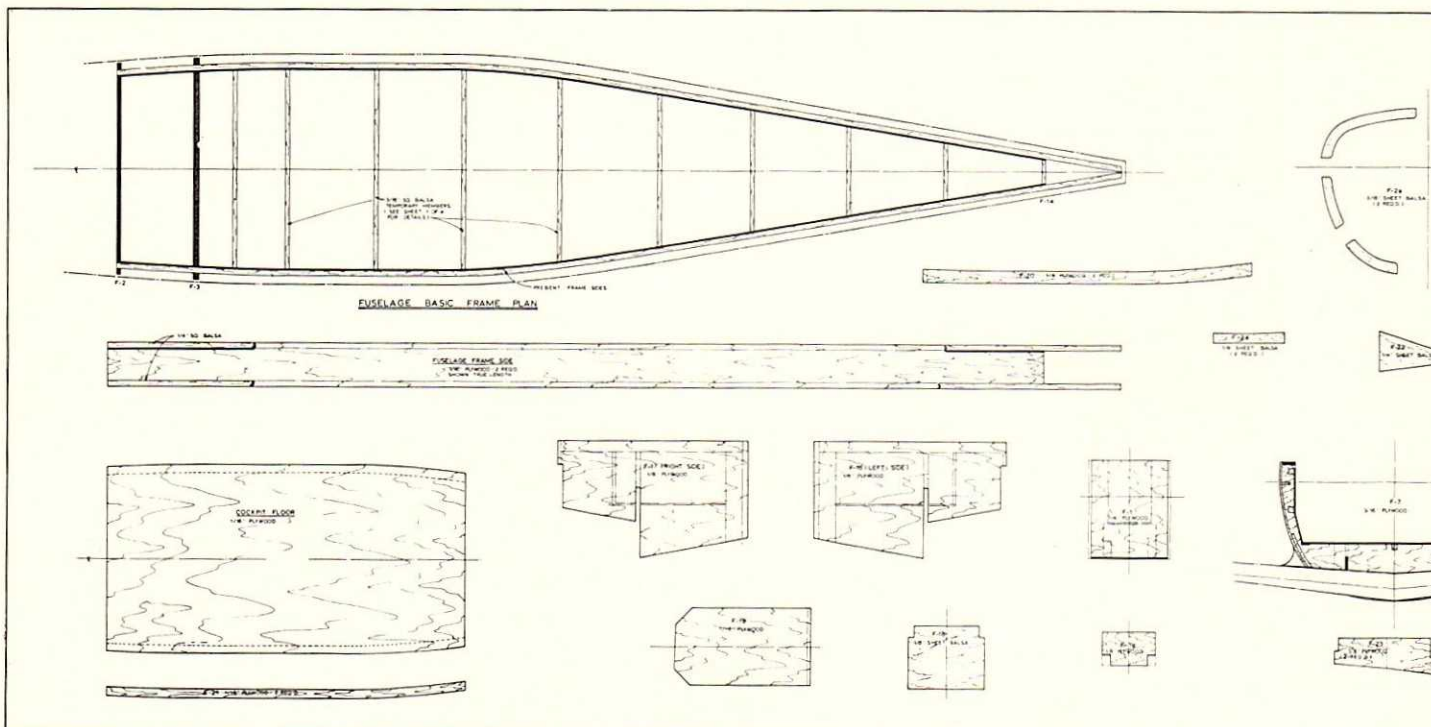
The lower formers are glued in a crutch, as are the top formers, then the two shells are joined along their lateral seams. Longerons, with webbing reinforcement, provide longitudinal stability and warp resistance.

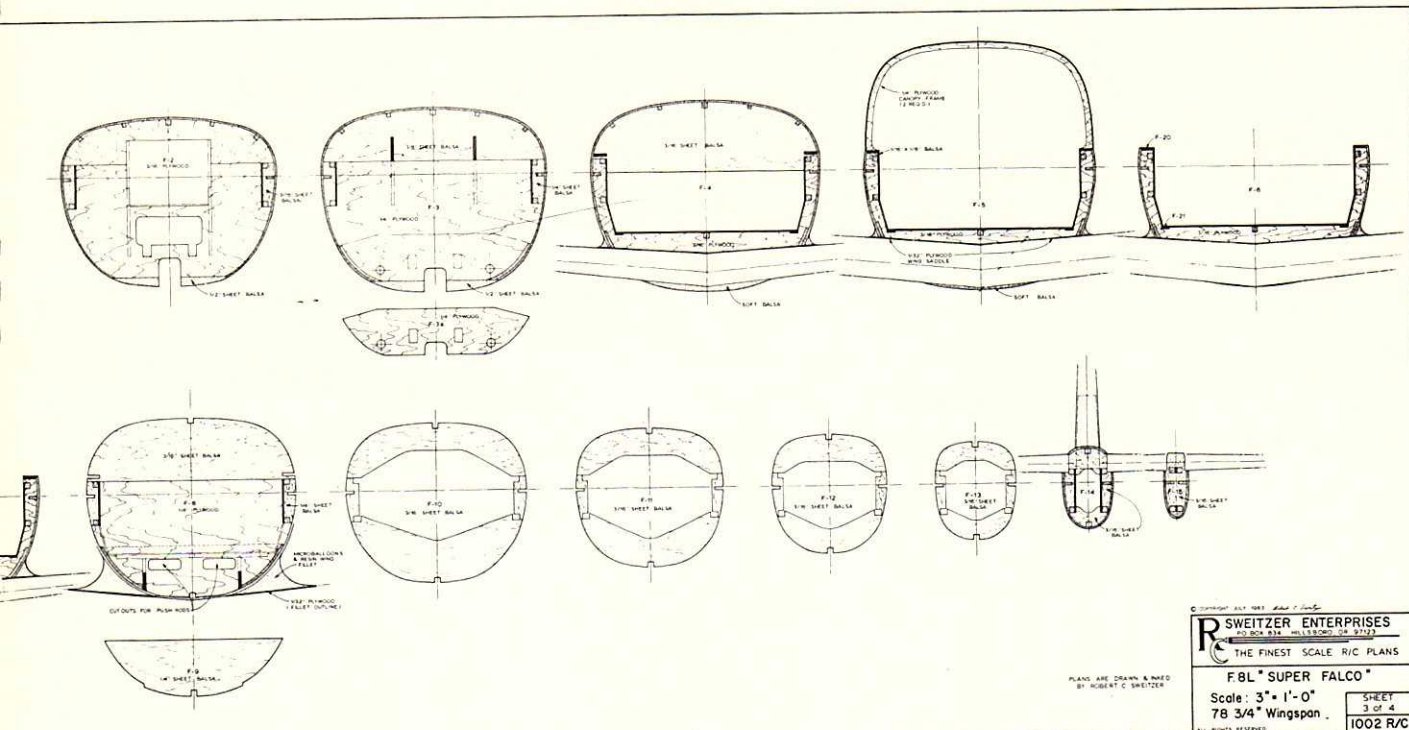
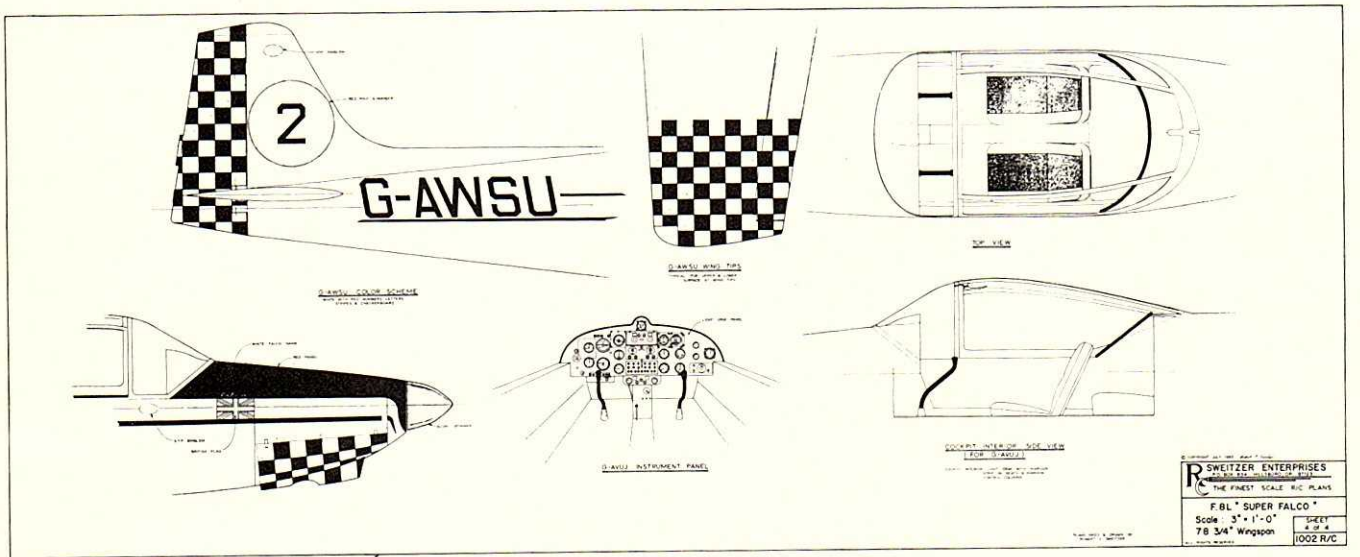
Mark all of the bulkhead positions on the 1/4-inch sq. longerons, then mount formers F-1 through F-14, using clothespins to hold them in place. Carefully check the alignment as you glue them. Cut the 3/16-inch sheet webbing into two-inch strips and glue it inside the longerons. Note that the entire structure is shimmed above the building board



FULL-SIZE PLANS FOR THE SUPER FALCO ARE AVAILABLE DIRECTLY FROM: R/C SWEITZER ENTERPRISES, P.O. BOX 834, HILLSBORO, OR 97123. PRICE IS \$43.50 (INCLUDES FOUR PLANE SHEETS, 3-VIEW, MATERIALS LIST, SENT IN A MAILING TUBE). AIR MAIL ADD \$4.00, AND OVERSEAS ORDERS ADD \$18.00. WRITE FOR PRICES ON A FIBERGLASS COWL AND MOLDED CANOPY.

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The canopy has been removed to expose the full cockpit interior. Bob Sweitzer is making canopies and cowls available. Pilot is Du-Bro's figure, and lady friend is Barbie.

This view of the SF 260 shows small winglets on the inside faces of the tip tanks. Barely visible is small radio mast halfway along the dorsal fin.

by 3/16-inch spacers. To save time, you may want to make a duplicate copy of the top plan view, so that you can be building both the top and bottom sections of the fuse simultaneously.

The nose gear provided by Dave Platt requires a number of modifications. First, the leg length must be altered to match the configuration shown on the plans. Secondly, a 6-32 screw is added to the pivot block, and a corresponding 110-degree slot is cut into the leg, to permit greater retraction swing. Then, 1/4-inch down from the pivot block, a 3/32-inch piano wire is inserted through the leg, at right angles to the wheel. This wire is 1 1/2-inch long, with right angle bends 1/2-inch from both ends. To these arms are soldered 1/2-inch lengths of 1/8-inch brass tubing. These tubes serve as the tiller arms for the steering pushrods. If you really don't feel like butchering a set of Dave's gear, then Airways Retracts is making a special set of gear for the Super Falco. Order these direct from: Airways Scale Retracts, 5778 Sky Meadow, Riverside, CA 95209. You can order either a nose gear and/or the mains.

Note that the engine and nose gear are mounted on a cantilevered "box," to position the prop in the correct location ahead of the cowl. This box must be built extremely sound, with plenty of beefy wood and proper glue joints. The plans currently show only the basic box, which



also houses the fuel tank. However, it was decided that, especially for the larger .90 and 1.20 twins, additional reinforcement to help dampen any vibration would be advisable. Therefore, the plans which will be shipped to modelers will show large gussets and diagonal braces to tie the box into the firewall along the sides. This will totally eliminate any oscillations which may occur in a sideways direction from the mass of the engine's piston. Treat the dimensions of the box as relative, depending on the overall length of your particular engine. Verify the position of the spinner and prop before cutting out these parts. Chain saw engines will probably not need any box at all, being mounted right to the firewall.

Also, if you opt for anything larger than the 16-ounce tank shown, then the box will have to be altered accordingly. The plans show the tank permanently enclosed, but I recommend allowing access to the tank through F-3. Simply tie a string onto the neck of the tank, and let it dangle out the back of the box. To remove the tank, just give a tug on the string. This same method also works well for battery packs in tight places.

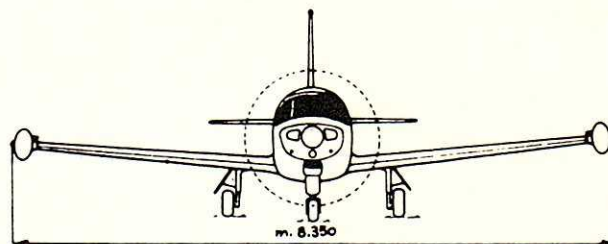
Insert the 3/8x1/2-inch nosewheel rails in place, then drill the retract mounting holes and install the nose

(Continued on page 78)

Turbo version of the SF 260 shows elongated nose. This shot gives a good perspective of the swept fin on the military version of the Super Falco, as well as the tip tanks.

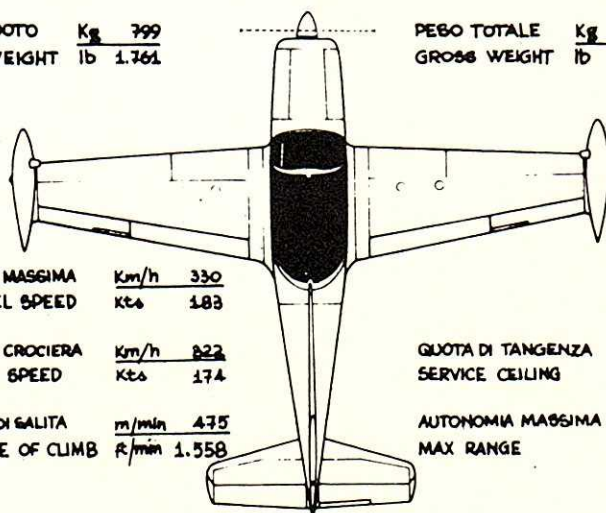
SF. 260

LYCOMING O540-E4A5 260 hp



PESO A VUOTO Kg 799
EMPTY WEIGHT lb 1.761

PESO TOTALE Kg 1.400
GROSS WEIGHT lb 2.425



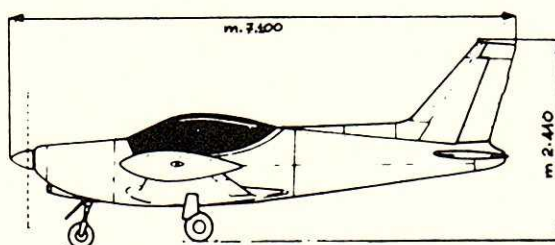
VELOCITA' MASSIMA Km/h 330
MAX LEVEL SPEED Kts 183

VELOCITA' CROCIERA Km/h 222
CRUISING SPEED Kts 174

VELOCITA' DI SALITA m/min 475
MAX RATE OF CLIMB ft/min 1.558

QUOTA DI TANGENZA m 4.665
SERVICE CEILING ft 15.300

AUTONOMIA MASSIMA km 1.650
MAX RANGE nm 890



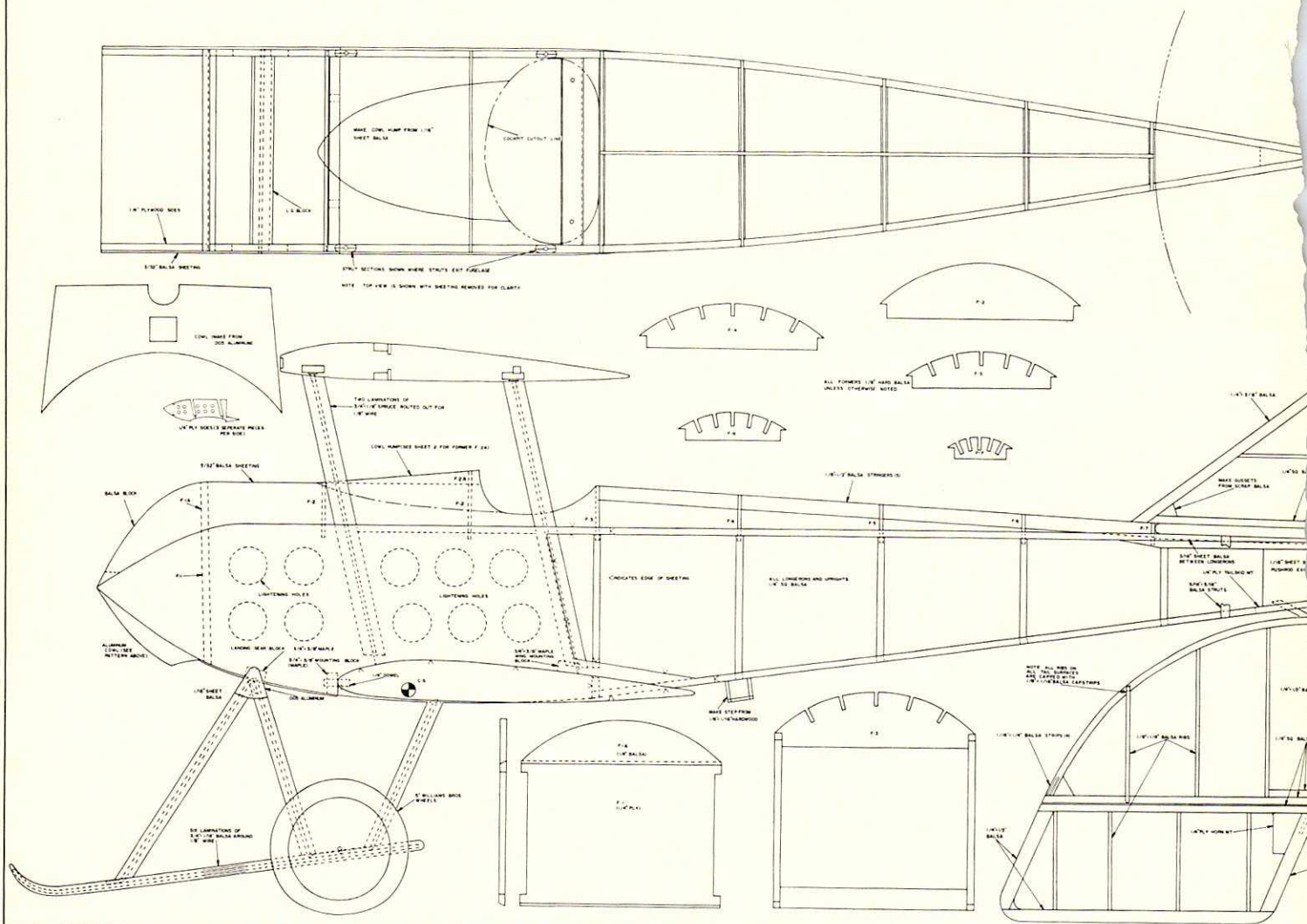
The Schneider Cup racer version of the Tabloid is illustrated on the 1/4-scale plans from Nick Zirolì, while the 1/5-scale plans show the stock military configuration built by the author.

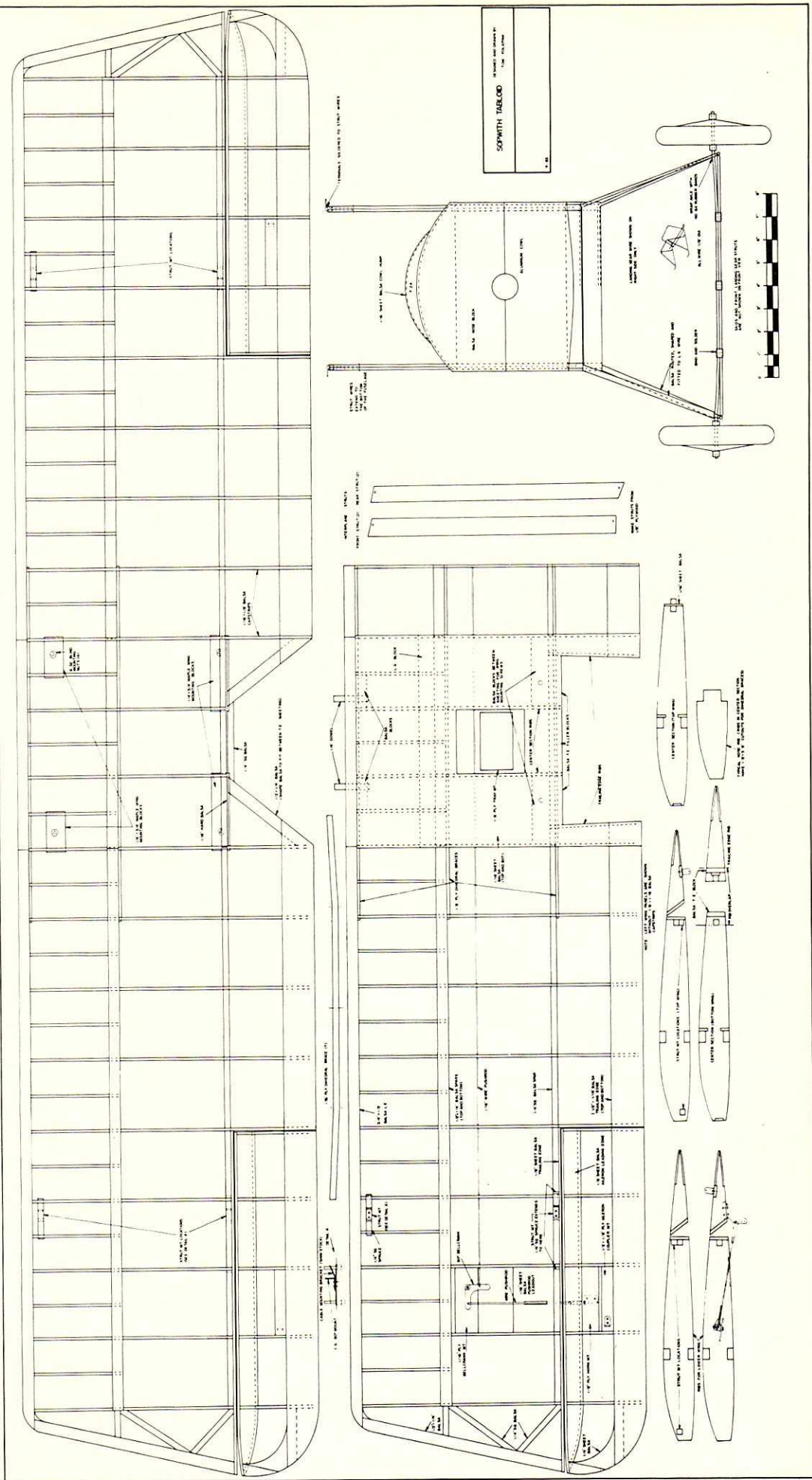
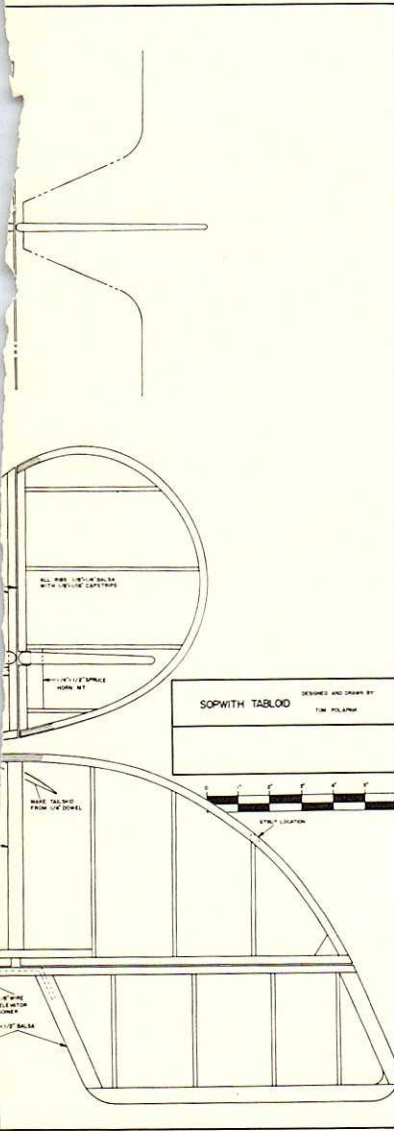
SOPWITH TABLOID

(Continued from page 49)

entire model was then given three sprayed coats of Sig Clear Dope, thinned 50-50. Two coats of full-strength dope were then applied to all of the areas where there had been overlaps and seams in the covering. After the dope had thoroughly dried, the entire model was lightly sanded with 400 grit wet sandpaper, and

**FULL-SIZE PLANS AVAILABLE FROM:
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then given a final coat of clear dope (which was again thinned 50 percent). All of the remaining minor unconformities were sanded out and filled in, and two light coats of Sig Tan Cream paint were applied to the model. Everything is this color, with the exceptions of the nose (which was painted with Sig Aluminum), and the cabane struts (which were stained and clear doped).

Scotch Tape No. 810 was used to mask off all of the markings, and the colors were then sprayed on. To reproduce the lettering on the rudder, I used dry transfer lettering.

Although the price of dry transfers is high, they do come in a variety of lettering styles, and your local drafting supply store should have the type you want. They do make the model look more "professional" and, for this reason, they are well worth their cost.

My Sopwith is equipped with full rigging. I used Sullivan pre-stretched U-Control wire to brace the wings, and Proctor turnbuckles to anchor each wire in place. For those of you who aren't interested in investing in turnbuckles, and would rather not get "tangled up" in what seems to be endless yards of wire, the Tabloid with extra internal bracing (spruce spars, webbing, etc.) should be able to take the strain of everyday flying without the wires. Even though the original Tabloid was the Pitts Special of its day, it wasn't known to perform Lomcevaks and Top Hats. If you plan to ring out your Sopwith on Sundays at the local club field, I would recommend the use of flying and landing gear wires.

My Sopwith is powered by an old Webra .60, and weighs nearly 11 pounds. Although the wing loading comes out to be a mere 13 oz./sq. ft., all of the drag produced by the multitude of wires and struts tends to limit its aerobatic capabilities.

The Tabloid will perform all of the basic rolling and looping maneuvers but, in most cases, each maneuver should be preceded by a shallow dive to gain airspeed.

The most impressive maneuver, and the most consistent point-getter at contests for me, has been the three-turn spin. The Sopwith does not have any violent stalling characteristics, but if you try hard enough, you can get it to stall. With full up elevator, and full aileron and rudder control, it will enter its spin. Immediately upon release of the sticks, the Tabloid straightens itself out.

The plans for this model are available from Nick Zioli, 29 Edgar Drive, Smithtown, NY 11787. Price is \$16.00 (postpaid in U.S.A.). Nick will also be offering a plan set for the Sopwith Tabloid in 1/4-scale. The 1/4-scale Tabloid is constructed basically the same way as the 1/5-scale version presented here, but it is powered by a gasoline engine. That plan-set shows details for the Schneider-Cup racing version of the Sopwith.

I would like to thank Nick Zioli, Don Cashmore, Joe Wcela and Mark Glassman for all of their help, and my father for all of the encouragement and support he gave me, to make this article possible. □

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HURRICANE REVISITED

(Continued from page 32)

sticky-backed shelf paper as a stencil. The multiple round stencils were cut out by a circle cutter that I purchased from Brookstone Tools, 127 Vose Farm Road, Peterborough, NH 03459. It sells for \$10, and is invaluable when cutting round stencils.

After all of these ramblings about the pilot and the plane, you are probably asking whether it flies. After seventy some flights, I must admit that it flies like a homesick angel.

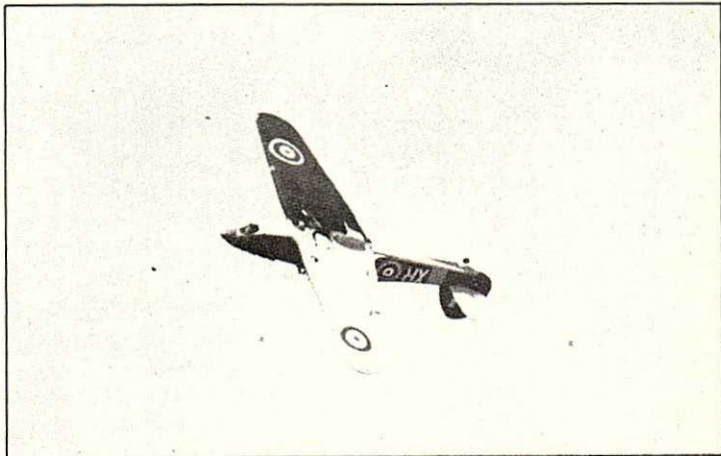
I am frequently asked why I fly my scale models after months of research and building. I usually answer by making an analogy of a mermaid. A mermaid is lovely to look at with a lot of emphasis on form, but none on function. An airplane was meant to fly, not to sit on the ground and look pretty. How would you like to be in love with a mermaid? So it is with a scale air-

plane that does not fly. I build them to fly and this one has 70 flights, so far.

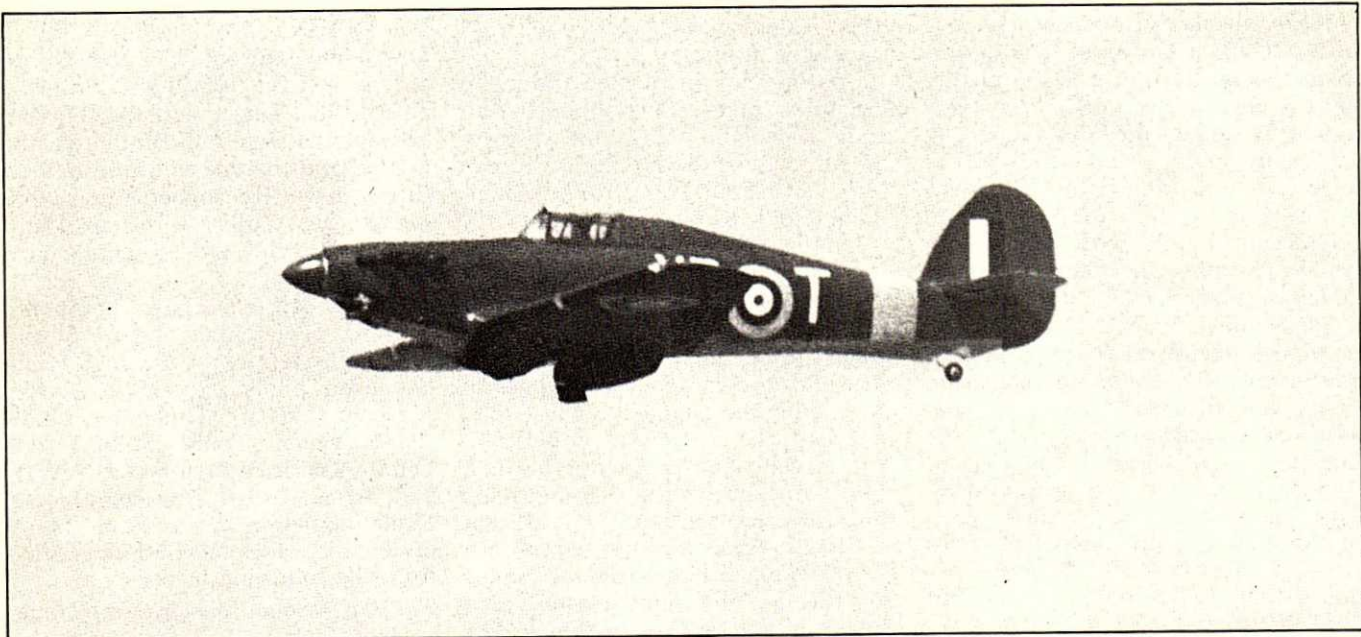
My personal challenge in scale modeling is to execute the flight of the model in prototypical fashion. I believe fighters should be flown fast and low, while bombers should be high and slow. A fighter that was not loaded down with drop tanks, bombs, rockets, etc., was fast and highly maneuverable. Of course, a P-47 that was loaded with the above-mentioned paraphernalia should appear to lumber through the sky. It seems to me that the 70- to 80-inch models have a much smoother flight



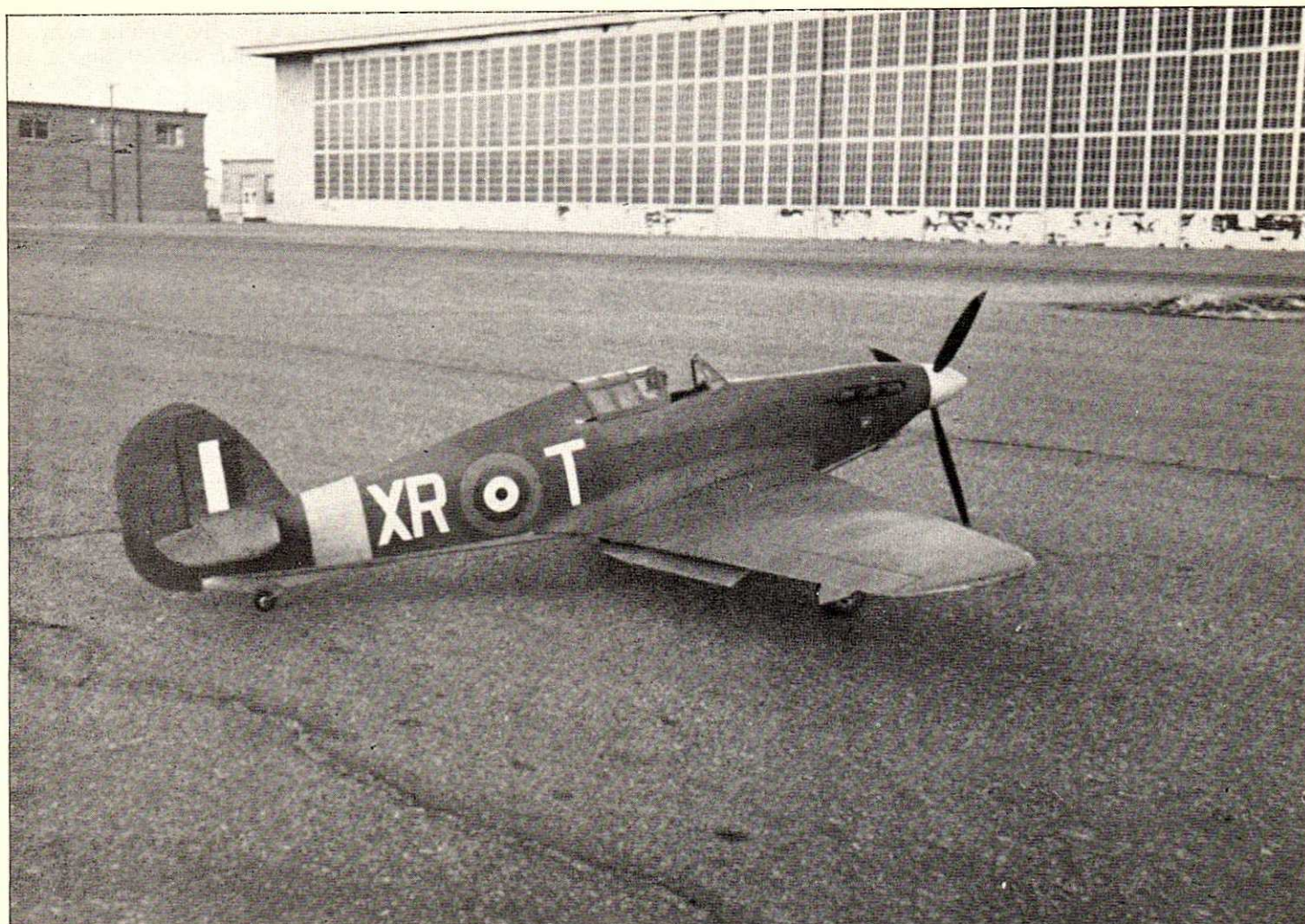
The model is for contest work, so a full cockpit is installed. The engine exhaust stacks are functional, being a Slim-line custom-made muffler.



Caught almost half way through an eight-point roll, the Hurricane again shows that it's a flying fool. The model won the British Nats, with designer Mick Reeves at the sticks. (Dan Parsons photo)



Like the Spitfire, the Hurricane should fly with the tail high. The full-size aircraft had a definite "step" on which it flew when properly trimmed. (Dan Parsons photo)



envelope than the 60-inch wingspan models.

Scale airplanes can and do fly like the full-size prototypes. A scale airplane looks as pretty as a picture on the ground, but must become airborne to take on life. The plane flies like a dream. It has an offset vertical stab like the original, and it seems to help in looping maneuvers and in takeoffs. I only wish an eighteen or twenty-ounce fuel tank was available, because the O.S.-90 drinks in a lot of fuel.

Models of World War Two fighters usually fly similar to the prototype, and the Hurricane is no exception. Takeoffs require easing the throttle open while holding right rudder, until the tail comes up. Make sure the wing is flying prior to pulling it off. I use only about 10 degrees of flaps for takeoffs, because any more than that tends to make her pull off prematurely. I like to takeoff at reduced throttle settings, about 60 percent at lower altitudes and 80 percent at Denver's mile high altitude. This allows the plane to ascend in a gradual attitude. Many pilots

have a tendency to yank the plane off the ground. Again, make sure you have flying speed before you ease it off the ground.

Coordinating aileron and rudder in the turns takes some practice, but tends to smooth things out. Once in the air, she will do anything you can dish out—Four-Point Rolls, Eight-Point Rolls, Cuban Eights, etc.

Landing a fighter with flaps is not as easy as landing a Kaos but, if you follow a few simple rules, everything will work out. First, start the approach rather high, drop the landing gear and feed in about 30 degrees of flaps. Pull the engine to a fast idle, and point the nose down—way down. You never want to be caught in a flat approach with the gear and flaps down, because the plane will stop in its tracks. Keep the nose down in a steep approach. The original planes did this for the same reason, plus the visibility was terrible in a flat approach, with the long fat noses of a typical fighter.

As the runway comes up, you should be at full flaps and slow-idle. Now start easing in up elevator with

the stick all the way back as you touch down. If you cannot get the tail to flare, give a quick blast of power and that should round things out. If you fly from a short runway as I do in Denver, pull the flaps up as soon as you are firmly on the ground and the tail will drop to slow things down. Remember, when landing any heavy plane with flaps, don't get caught with a dead engine in a flat approach!

As you can tell, I have thoroughly enjoyed researching, building and flying this replica of the first Eagle Squadron pilots' Hurricane. Again, I would like to thank the pilot's sister, Helen Tobin Maher; Bill Dunn, America's first Ace of WWII; and Jesse Taylor, President of the Eagle Squadron Association. Many of the historical facts were verified from the following books:

The Eagle Squadrons, by Vern Haugland.

Fighter Pilot, by Bill Dunn.

Escort to Berlin—the 4th Fighter Group of WWII, by Gary Fry and Jeff Ethell.

The Eagles War, by Vern Haugland.

GALLAND'S Bf-109E4

(Continued from page 56)

aft of the main spar, instead of the position shown on the plans. The freon storage tank is slipped between the spars and stringers in the first rib bay, then the area is filled in with webbing between ribs No. 1 and No. 2. I recommend that all of the air hoses be routed through the center section, so that you can have access to them. Slip wheel collars on the proper lines to restrict the travel of the gear, so that they slow down to scale speed. Adjust them so that one leg starts to fold, and then the other. Make sure that you have restricted the speed, otherwise you just might throw the wheel right through the top sheeting when testing the system . . . guess who learned that the hard way?! An interesting note is that the full-size plane's wheel wells were lined with leather!

The fuselage is straightforward. If you opt for a scale cockpit, you will have to relocate former "A" 1-1/8-inch forward on the crutch. Build the crutch, then add all formers, plus the laminated sides between formers No. 1 and No. 2. The stab should be attached at this time. I decided to conceal the elevator pushrod, using Ny-rod. The 1/2-inch laminated bottom fin will have to be hollowed out for this.

I installed the servos for rudder and elevator behind former "B," because there is no room for the installation in the normal location if you do a full cockpit interior. Now is the time to finalize the entire radio and engine installation. I used a Fox Eagle .60, on one of those beautiful Fox mounts. Get a detailed three-view drawing from Bob Holman, to see where to cut out the bottom of the cowl. The access to the engine is just below the exhaust stacks.

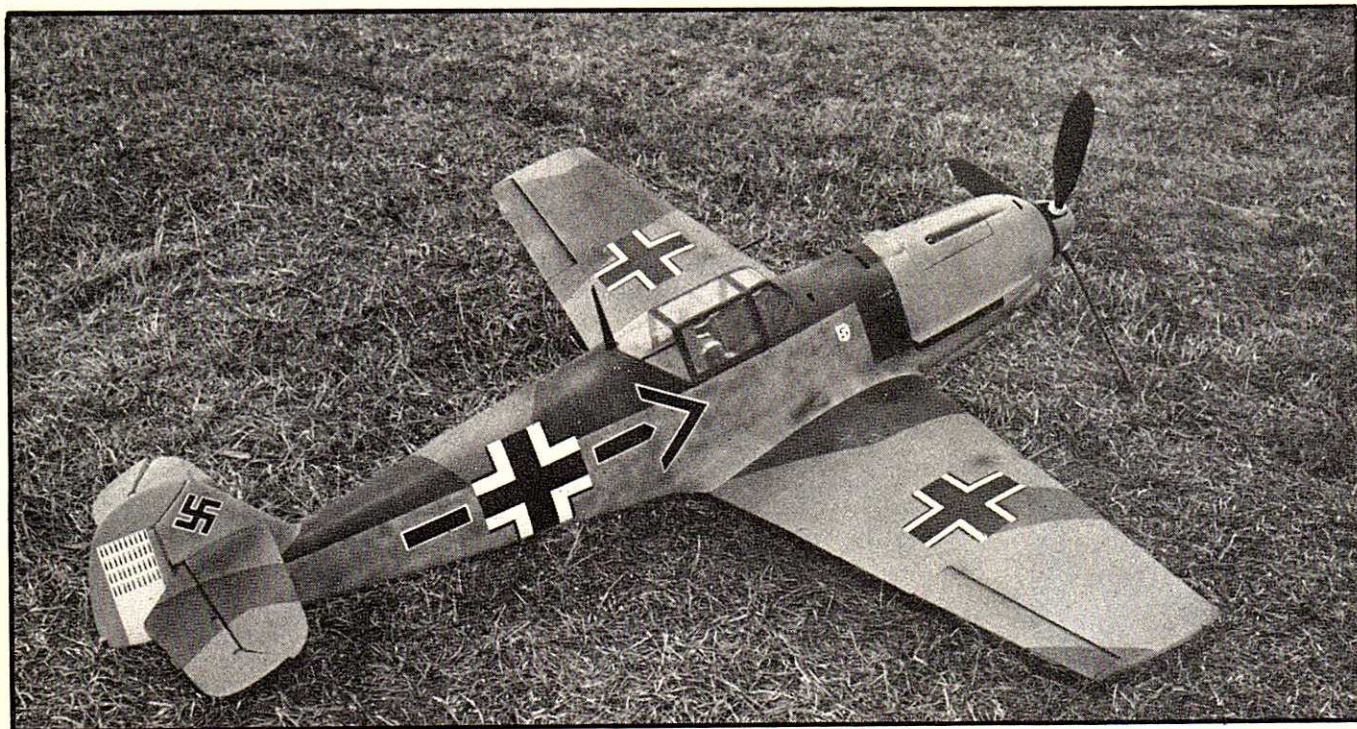
I finished the model, following Dave Platt's three-part series in *Scale R/C Modeler* (June, August and October, 1980). The only deviation is that I used Hobby Poxy glue and glass cloth, instead of the surfacing resin. I used a white primer, then sanded the entire airframe with No. 320 grit paper. I shot on a quick coat of Hobby Poxy silver, filled any imperfections with Hobby Poxy "Stuff," then shot another coat of silver. This silver will later be exposed to simulated weathering.

The full-size airplane had flush-mounted rivets and slightly raised panel lines. The rivet detail was simulated with a 24 gauge hypodermic needle, filled with white glue. When the glue dried, the areas were sanded lightly to give a more authentic appearance of flush rivets. I used J&Z trim tape to simulate the panels. The removable inspection plates and the slots in the leading edge were made from adhesive-backed mylar (trim Monokote works fine).

The Messerschmitt has lots of exterior detailing. The gun blisters, supercharger and other "bumps" should be formed and glued in place. The wing and chin radiators are not quite right as you get them from Bob. They can be widened with a slurry of microballoons and epoxy, then sanded to the proper shape. The model really looks impressive when this detail is added. A final coat of silver overall is then applied.

Chevron's "Perfect" paints were used. These camouflage colors are very accurate. During this time period of the war, the camouflage schemes were undergoing extensive changes. I highly recommend the *Official Monogram Painting Guide to German Aircraft*, available from: Monogram Publications, 625 Edgebrook Drive, Boylston, MA 01565. The undersides of the airplane are airbrushed with Chevron's PC-34 (Lt. Blue, Germany). Use PC-38 (Grau, Germany) over all of the top surfaces, after carefully creating a masked edge with flexible tape or Liquid Masking Film. The final camouflage color is PC-40 (dark green, Germany), over the top areas. Once I saw the dark green on the model, I felt that the color was a little off, and that a touch of black should be added to bring it closer to the color chips. I masked with tape and Liquid Masking Film before shooting this last color.

The text describes the paint application procedures, as well as some great hints on getting that tricky retract system to work just right.



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I applied wet newspaper to the top of the wing and, once they dried, I trimmed them to get a very easy mask. I then took the PC-38 light blue and blended the areas where the colors merged. The final touch was the gloss yellow nose and rudder. We all know that WWII aircraft had no glossy colors, so kill the shine on the yellow with PC-43 Flat Clear.

All of the markings, chevrons, Mickey Mouse, etc., were masked off with either frisket paper, or Liquid Masking Film. Mickey was hand painted by my son's art teacher.

Weathering was done only to the top surfaces of the model, and a mist of highly thinned medium gray was applied . . . but this should be almost invisible to the eye. You can use your own creativeness to do the full cockpit interior, since everyone has their own methods here. I use the Williams Bros. four-inch wheel for display purposes. This is a little thick, but the judges never catch it! I use the three-inch wheels for flying, as they fit better in the wells.

The Bf 109E weighs 8 pounds 14 ounces. It definitely is a show-class model, and I expect to do very well with it on the contest circuit this season. The weight surprised me, since I figured that the full cockpit



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would really add a lot to the gross weight.

At the time of this writing, the model has yet to take wing, primarily because of the weather. I'm not at all concerned about the way it will handle, because this design has been flown by some of the top fliers in the country. Every contest season, the 109s take a good share of the trophies. It is an honest airplane, with very predictable performance, according to those who have flown this design. The narrow gear really isn't that bad, if you take care and get the wheel tracking set just right. A touch of toe in is okay, but don't over-do it, and definitely don't have any toe out!

I'm glad I tackled the project. Brian Taylor's plans are really something, and you'll have no problem getting a good airframe from them, with no modifications. The parts Bob Holman supplies are first rate, and they sure cut the building time. I felt that it was almost a pleasure to scratchbuild this model, since all of the hard work had been done for me.

I can hardly wait for the weather to break, so that I can take to the air and start reliving the Battle of Britain!

□



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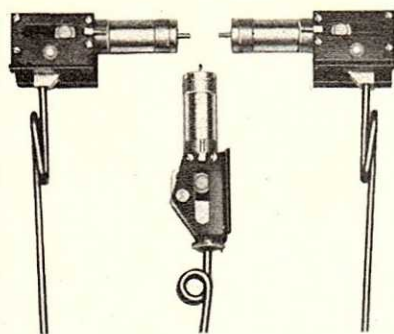
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KOMET

(Continued from page 12)

to about 400 feet, which makes it somewhat of a speck in the sky.

Because the weight and C.G. of the aircraft are changing as the motor expends its dry propellant, the plane must be retrimmed for the glide back to earth. The "F" motor weighs only two ounces after its burn out. The trick is to establish a C.G. which won't leave the model too nose heavy in the glide mode, and not too tail heavy in the rocket mode. When I switch to the lighter "D" class motors, I have to add lead to the aft end to re-establish the C.G. This motor weighs only two ounces before ignition, and one ounce after it's expended. Of course, you only get a 1.6 second power boost, but that's enough to get you up there.

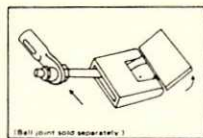
The model doesn't use anything fancy to gain stability. The full-size machine relied on a lot of washout at the wing tips to keep it stable, and I followed Alexander Lippisch's thinking and built in six degrees of washout. Only the outboard elevons are used for control, but I do use the rudder and inboard flap areas for manual trim adjustments.

The model is a bit tricky to fly. Because of the rapid and almost uncontrollable rocket burn phase of

Constructed of foam sheeting, the Komet weighs only 11 ounces, less rocket motor. Cannon radio provides two channels, at only four ounces.

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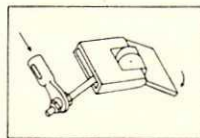
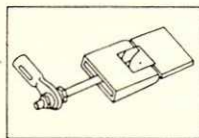
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the flight, I could not use the drop-pable dolly which the full-size machine had. Instead, I resorted to the traditional way of getting a rocket airborne, via a launching rail. This may not be prototypical, but the last thing I'd want would be a hot rocket engine frolicking around on the runway, as I tried to steer it straight. With the launch rail, the thing is pointed in the right direction, and I pretty much leave it alone, until it is high enough to be safe, and even then I only give minor correctional controls.

In the glide mode, the Me 163 is a real pussy cat. It is a very efficient sailplane, even though it looks stubby and squat. I don't think it could ever thermal, but it does acknowledge the presence of lift, and it handles with so much stability that it even surprised me. It got lots of comments at the flying wing contest, and everyone enjoyed the novelty of it. As I said, I don't endorse the rocket powered model as anything for you to experiment with. I always use a helper to launch the rocket, since it can't be done easily or safely by one person. The "D" motor gets it to about 200 feet.

I have had my share of mishaps with the Komet. The "F" motor literally pulled it apart in the air, and the model was totalled. I have also had two other crashes. Each time I fly the plane, it is just speculation as to what will happen.

The Me 163 project has been a real learning experience for me. It has shown that rocket-powered flight is practical for R/C, but that it is also not the type of activity which will ever amount to anything. I'm glad that I did it, but I doubt that I'd do it again. As I said at the beginning of this article, I am a little crazy. ☐



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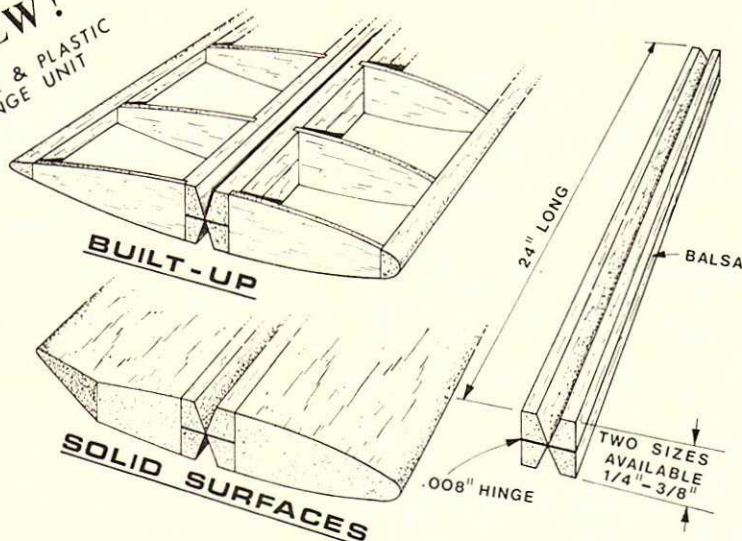
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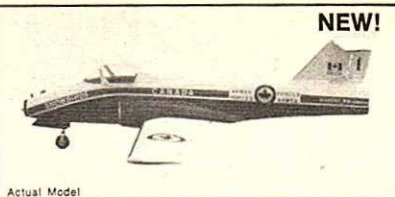
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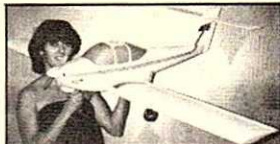
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Viva il Falco!

(Continued from page 67)

unit. Check the operation of the nose gear, and remedy any binding. Locate the position of the throttle servo and mount it. If you are using an ignition engine, be sure to mount a kill switch.

The plans show two degrees of right thrust. This is not ironclad, however, since some engine/prop combinations will give less (or more) torque (or P-factor). You may wish to start with 0-degrees of side thrust, then shim accordingly after some initial test flights.

Now is the time to decide whether you want a full-blown cockpit interior. This model has such a huge canopy that it looks very barren if the interior is left undone. A separate plan sheet shows the instrument panel, and even an interior side view of one version of the Falco. It is a good idea to rough in the cockpit interior at this time, but don't do a permanent installation. Only after the fuse is planked should all of the components be finalized and permanently installed.

Covering the fuse with balsa sheeting can now be undertaken. Before commencing, fit the cowl, and be sure that F-2 is a proper match for the contours (allow 3/32-inch for the thickness of the sheeting, of course). Begin planking at the nose section. Depending on the hardness and grain of the balsa, you may have to resort to hot water and ammonia in order to get the wood to flex in some tight spots. The best method is to pin or tape the wet wood in place and allow it to dry. Once dry, the part can be trimmed and then glued in place. Pre-sanding the balsa before application will avoid that "scallop-ed" look which results when sanding over formers. Only a light touch-up sanding should be necessary once the sheeting is in place.

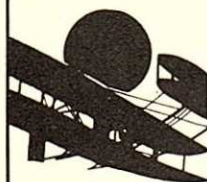
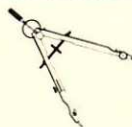
Once the fuse is fully sheeted, trim the area of the cockpit and finalize the cockpit interior. If you are going to have a removable, sliding canopy, then you may want to wait until the model is entirely painted before doing the interior. If the cockpit will be permanently closed, then wait until just before attaching the canopy to do the interior (and make sure that no little parts will come loose later from engine vibration!).

On my prototype, the stab and fin were built right onto the fuselage, before the sheeting was applied. This is tricky, since it is easy to get a

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twisted stab. You'll want to use the more traditional method of building the stabs flat on a building board. Select very light balsa for these parts, especially that solid balsa dorsal fin, which is over a half-inch thick at the base. Note that scale cantilevered hinges are used. If you are building the SF 260 military version, then you'll have to refer to your documentation to establish the proper rake for the fin.

There's enough room inside the tail cone to conceal the stab control horn, as well as the actuation mechanisms for the rudder. You'll only want to be this meticulous when building the Super Falco for contest work, of course. Using two pushrods or cables to the rudder, to dampen any possible flutter during high-speed aerobatics, is a good idea, but it's not mandatory. If you put all of the control connections inside the tail cone, be sure to allow inspection hatches.

Before finalizing the positioning of the stab on the fuse, it is a good idea to build the wing and fit it to the fuse. That way, you can get all of the alignment problems taken care of at once. Unfortunately, because this article is running so long, we're going to have to delay the wing construction until next time. If you are an experienced builder, you should have no trouble figuring out the wing. The only potentially tricky part is the fitting of the gear and their doors, since the Falco has its wheels on the outside of the struts. The Falco's wheels protrude from the wing about 1/2-inch in the retracted position.

By the time you get that information packet from Sequoia Aircraft Company, and get the plans from Bob Sweitzer, the second installment of the Falco should already be out. See you back here in the February 1984 issue for Part II. □

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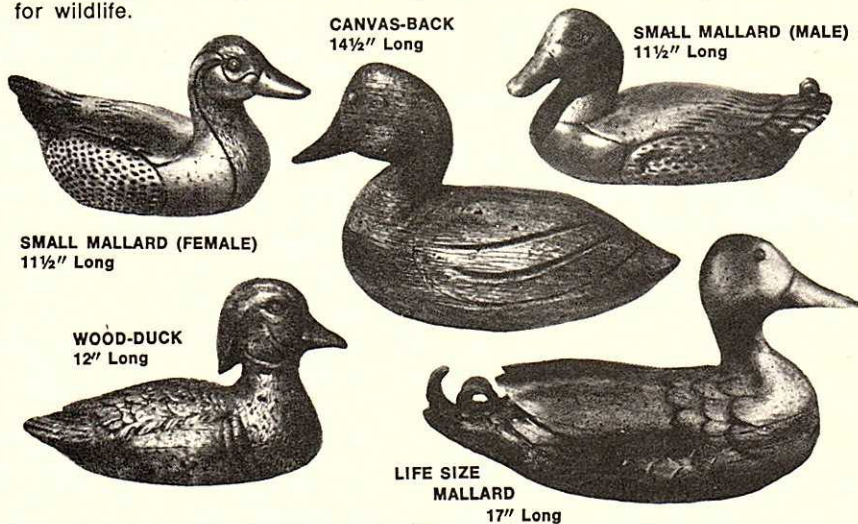
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Book Notes

(Continued from page 9)

and well planned approach to get you flying a giant-scale machine. The 88-page book is packed with good photos, and we'd recommend this one as a good addition to any modeler's library.

Published by Kalmbach Books, and available directly from: Model Agency Press, 7021 Vicky Avenue, Canoga Park, CA 91307. Price \$9.95 (plus \$2.00 shipping).

* * *



One of the real "loves" of the ducted fan crowd is the ever-popular F-16. And no wonder, for it's one of the sexiest jets to ever take wing. A glance through Bill Gunston's latest book effort, *F-16 Fighting Falcon*, will convince you of that. This is offering No. 16 in Motorbooks' "Modern Combat Aircraft" series. The entire series has not only the best authors, but some of the best photos and data to be found anywhere.

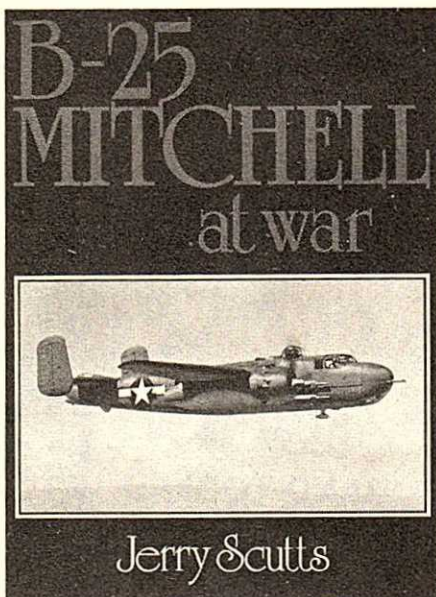
These are slim volumes, this one with 112 pages, but they are packed full of useful information and superb photos. In the criticisms department, I can only say that the three-views could have been at least a full page, but a good photo-enlarger will correct that deficit. The only other item found lacking is a good set of color 80 scale r/c modeler

profiles or three-views. There are ample color photos, showing numerous paint schemes, but the book would be enhanced even more if some solid color airbrush work were part of the package.

Such criticisms are really minor, and the scale enthusiast will find great benefit between the covers of this title.

Available directly from: Motorbooks, P.O. Box 1, Osceola, WI 54020. \$14.95.

* * *



With the ever-increasing popularity of twins, this new release from Motorbooks International will make a welcome addition to the research library. *B-25 Mitchell at War* is a very thorough study of perhaps the most famed bomber of the war. The 144-page volume thoroughly explores the intricacies of this military wonder, with plenty of good photos to back up a very readable text. There are no color plates and neither are there three-views, but those are the only minor flaws we could detect in an otherwise nicely done book.

The text does a fine job of stating facts and statistics, yet remaining entirely exciting and anecdotal. It covers a lot of history in those pages, and winds up leaving the reader not only informed, but entertained. Even if you never intend to model a B-25, we'd still recommend acquiring this title just for the pleasure of reading it.

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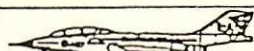
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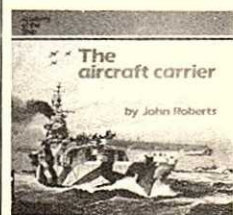


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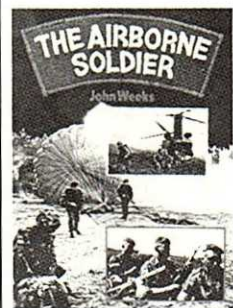
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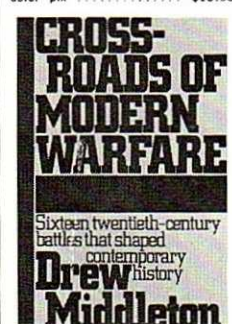
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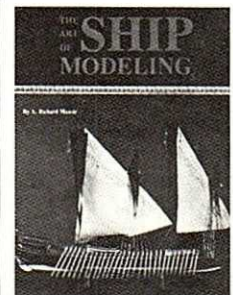


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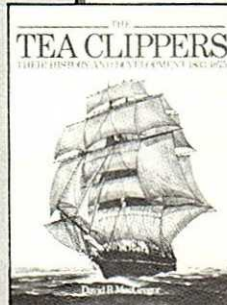
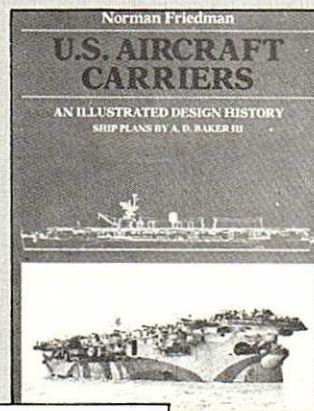


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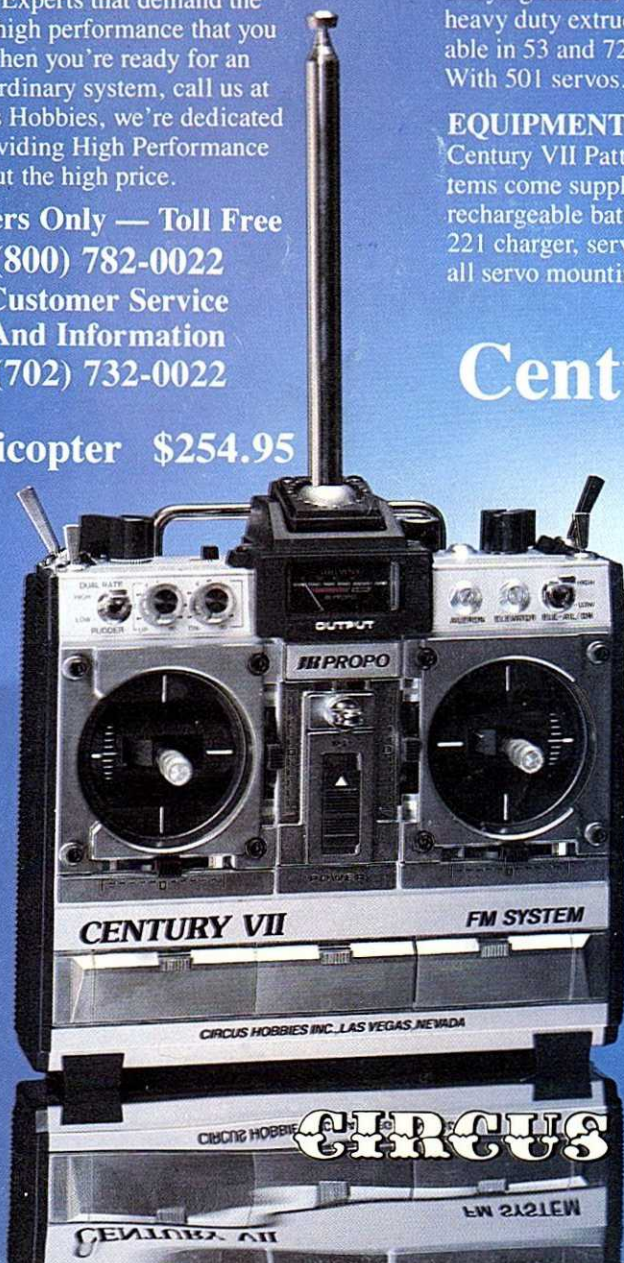
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