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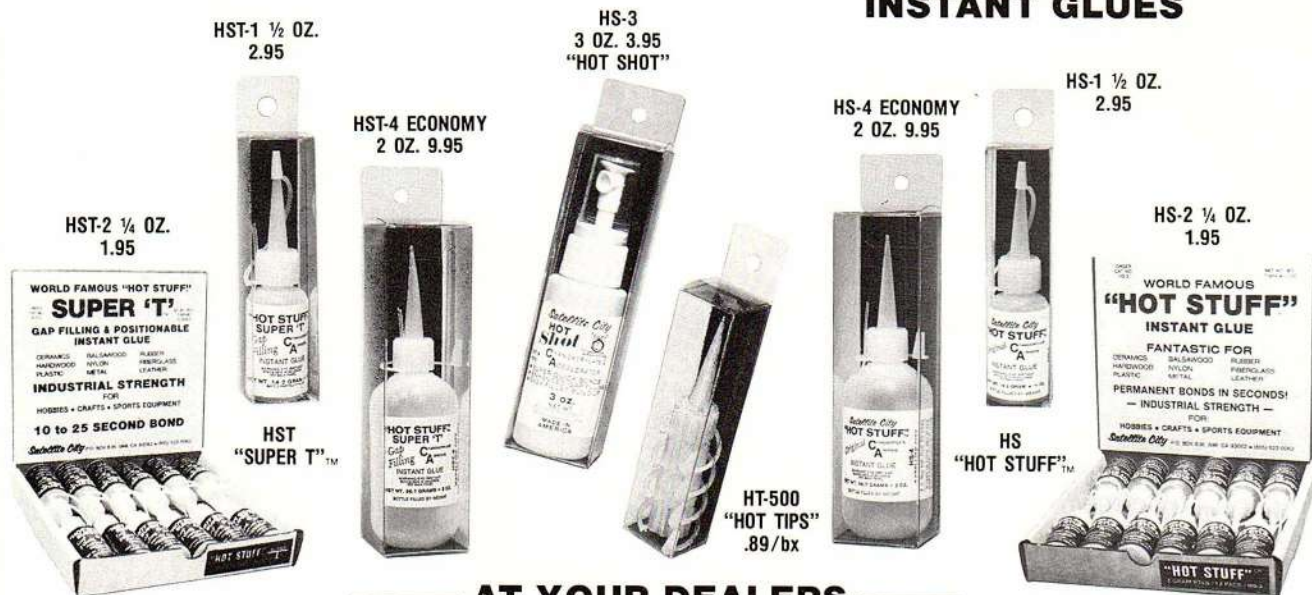
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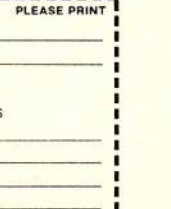
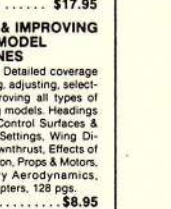
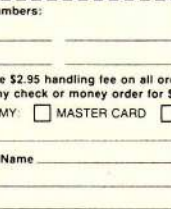
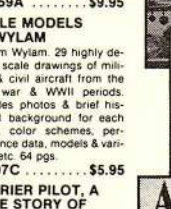
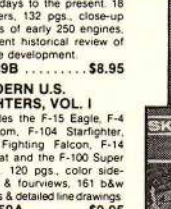
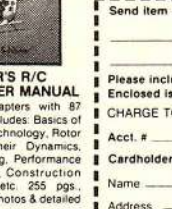
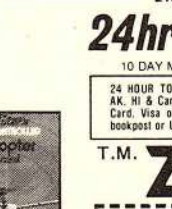
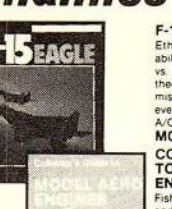
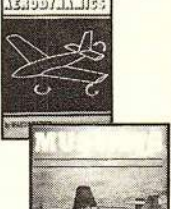
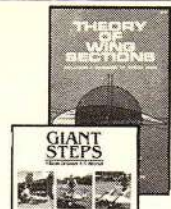
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SCALE R/C MODELER

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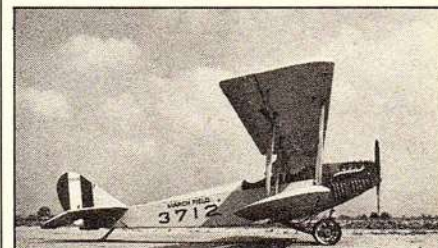
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COVER:

Chris Casados poses with Don's Custom Models' Super Chipmunk. The scene is Long Beach, with the famed Queen Mary in the background. See the feature article in this issue. (J. R. Naidish photo)

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U.S. Scale Masters



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HOBBYPOXY MILITARY COLORS

Mixing three RAF colors

Information Supplied Courtesy Pettit Paints

Here's the fourth installment in Pettit Paint Company's continuing saga of Hobbypoxy color mixing formulas for the scale model builder.

This time we have three colors to offer, which will begin a series of Royal Air Force colors. The formulas presented this month are for aircraft in action during the early stages of World War Two, 1940 to 1941, which includes the Battle of Britain. Most Hurricanes and early models of the Spitfire were finished in these colors. The upper surfaces were painted Dark Earth and Dark Green, and the lower surfaces were painted Sky Type "S."

Here are the formulas:

DARK EARTH—Four parts H65 Bright Red, two parts H49 Cub Yellow, one part H81 Black and one part H70 Gray.

DARK GREEN—Six parts H66 Dark Red, two parts H33 Stinson Green, one part H49 Cub Yellow, one part H81 Black and one part H10 White.

SKY TYPE—Five parts H10 White, one part H26 Lt. Blue and one part H70 Gray.

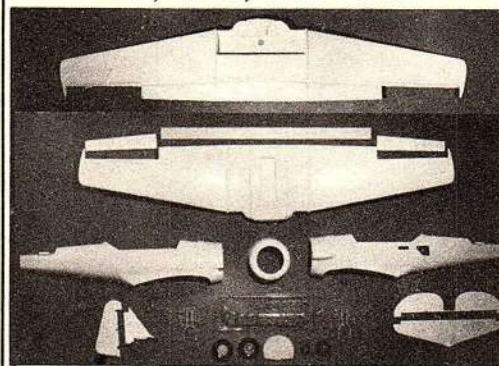
The reference source used to develop these RAF colors is *British Aviation Colours of World War Two* published in 1976 by Arms and Armour Press, 2-6 Hampstead High Street, London NW3 1PR.

The book was very generously loaned to us by Claude McCullough, who was instrumental in getting this color matching project started in the first place. We do not know if the book is still in print in England.

Next month we'll have formulas for German aircraft camouflage of this same early period in the war, for builders of Messerschmitt Bf 109E models who want to refight the Battle of Britain.

Following that, we'll return to RAF colors for the later stages of the war, and then Luftwaffe colors of the same period. □

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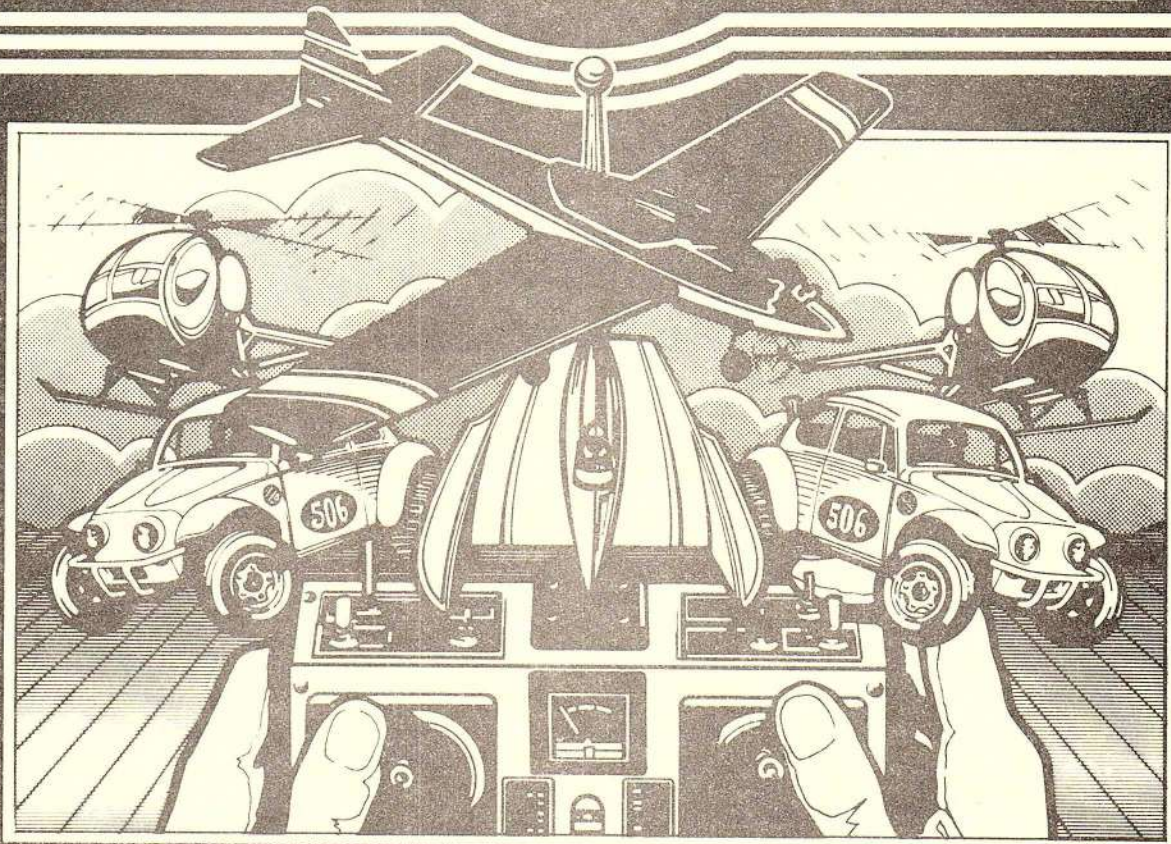
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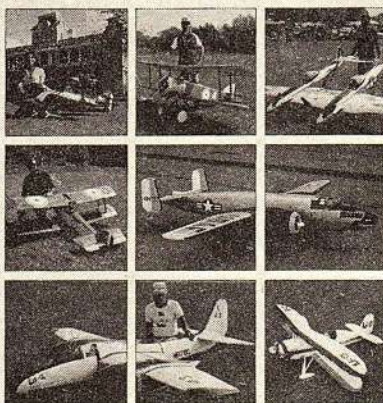
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Book Notes

Reading and research for
the builder of the model.

GIANT STEPS

A Book Of Giant R/C Aircraft



A MODEL AIRPLANE NEWS PUBLICATION

Giant Steps is an apt title for a book which is a complete overview of the giant-scale scene. This 160-page book accurately reflects the giant strides which have been made in monster models in the last few years. One only has to skim through the pages to realize that this title has brought together a very vast field of knowledge.

There are sixteen chapters. Each is dedicated to a specialized segment of the big airplane. Discussions of kits and plans, engines, props, wheels, radios, building materials, etc. are all explained in depth. Information on covering materials is included, as well as such specialty areas as smoke systems, floats, struts and rigging. There are guidelines for flying these mammoth models, as well. Each chapter gives the modeler enough information so that he can successfully tackle his own project. There's even a handy buyers' guide which catalogs sources for the items mentioned in the book.

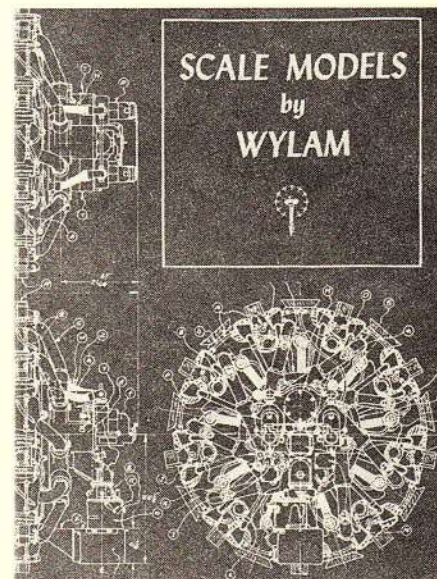
As if that weren't enough, there are special features on building from plans, kit-building techniques, and four projects which you can build. These articles add depth and a dimension of practicality to the other information, demonstrating how to put the theories to work in your own modeling.

The book is well laid out, with an ample amount of good photos and

sketches. The data is very current, so that you won't find that the state-of-the-art has left this title in the dust. A very worthwhile source book for anyone who wants to get into giant scale. The experienced big-scale modeler will also benefit from the myriad of handy hints and techniques in *Giant Steps*.

Available directly from: The Model Agency Press, 7021 Vicky Avenue, Canoga Park, CA 91307. Price \$12.95 (plus \$1.50 postage).

* * *



An often overlooked little volume of scale drawings is *Scale Models* by Wylam. Lost in the shadow of the larger compendium *The Best of Wylam*, this 64-page book has some remarkable offerings. Wylam's Vought SBU-1, Douglas O-46A, Henschel Hs-126, Waco C-6 and D-6, and the Swift P-31 are among his most interesting works, yet they are only available in this book.

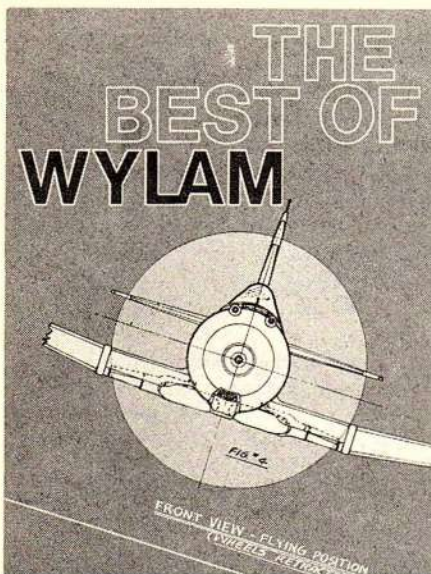
More significantly, this title offers those superb engineering drawings of the Twin Wasp, Jr. engines, as well as three pages on the Whirlwinds and as many on the Cyclones. Not only are these extremely accurate drawings, but there are even hints on how to model the engines, and some great drawings of the Hamilton Standard props. Those seeking documentation will want this book, as well as the collector who likes to browse through drawings in search of his next scale project.

The drawings are so detailed that museum-quality models can easily be built from them. There are twenty-six aircraft illustrated in this title, including such classics as Wiley Post's "Winnie Mae," the Grumman F2F and F3F series, Weddell-Williams #57 racer, etc. These drawings

were done between 1934-'43, and were often taken from the actual aircraft.

Available directly from: The Model Agency Press, 7021 Vicky Avenue, Canoga Park, CA 91307. Price \$5.00 (plus \$1.50 postage).

* * *



We're often wary of books which have "Best of" in their titles. They are often not the best, but rather the worst; repackaged so that they can be moved to an audience who didn't want them before. That's happily not the case with *The Best of Wylam*. This is a reprint of the old (1937-'55) original Wylam drawings and three-views, as they appeared in *Model Airplane News*. And, they are really the cream of the Wylam artistry, with such offerings as the S.E.5a, Curtiss Hawk, P-40, Douglas A-26, P-47D, P-51B, the Stinson series, Lockheed Vega and even the Wright Models A & B. There are a total of 60 aircraft illustrated.

Each of the planes is shown on four plates, with a three-view, then interior construction, detail sheets and usually airfoil and former shapes. The data is so extensive that any modeler could easily construct a museum-quality miniature from the plans. Wylam has often been maligned for his lack of accuracy, but fortunately, those poorer drawings do not appear in this 175-page volume. Indeed, these masterpieces are really Wylam's best.

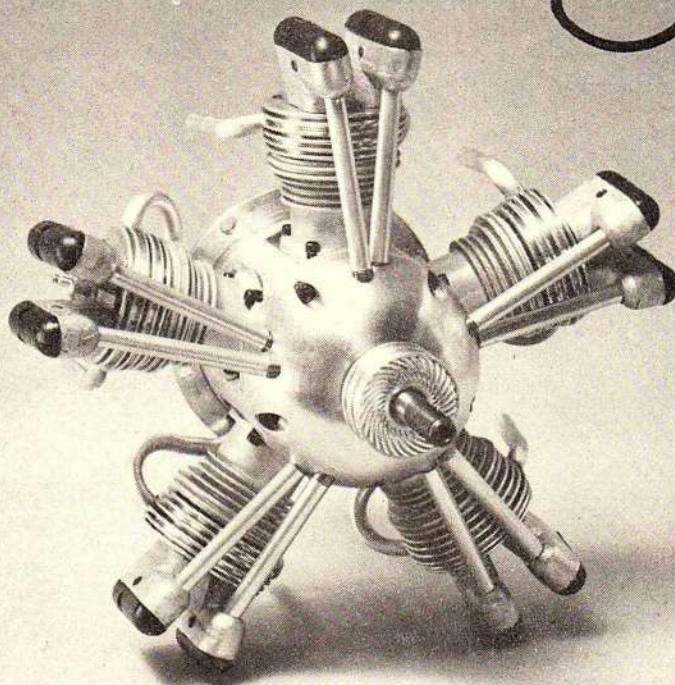
The price of the book makes it particularly attractive. For \$8.95, you get about 240 sheets of drawings . . . that's about 4¢ a sheet!

Available directly from: The Model Agency Press, 7021 Vicky Avenue, Canoga Park, CA 91307. Price \$8.95 (plus \$1.50 postage).

(Continued on page 81)

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EDITORIAL

By Patrick H. Potega, Executive Editor

WIN A TRIP TO ALASKA!

WIN AN ALASKAN ADVENTURE

Scale R/C Modeler seems to be becoming a sweepstakes and contest magazine. Our colossal "Super Scale Sweepstakes" will be closed by the time you read this. We hope that you mailed in at least one entry, and that maybe you'll be the lucky one to win one of the two Caribbean Cruises. Each cruise is for a couple, so there will actually be four very happy people getting a notice by mail or phone. The other prizes were not slouches either, with bicycles, radios, kits, engines, etc.

Why do we have sweepstakes and give away thousands of dollars worth of merchandise? It's all good will . . . our way of saying thank you to not only the lucky ones who snag a prize,

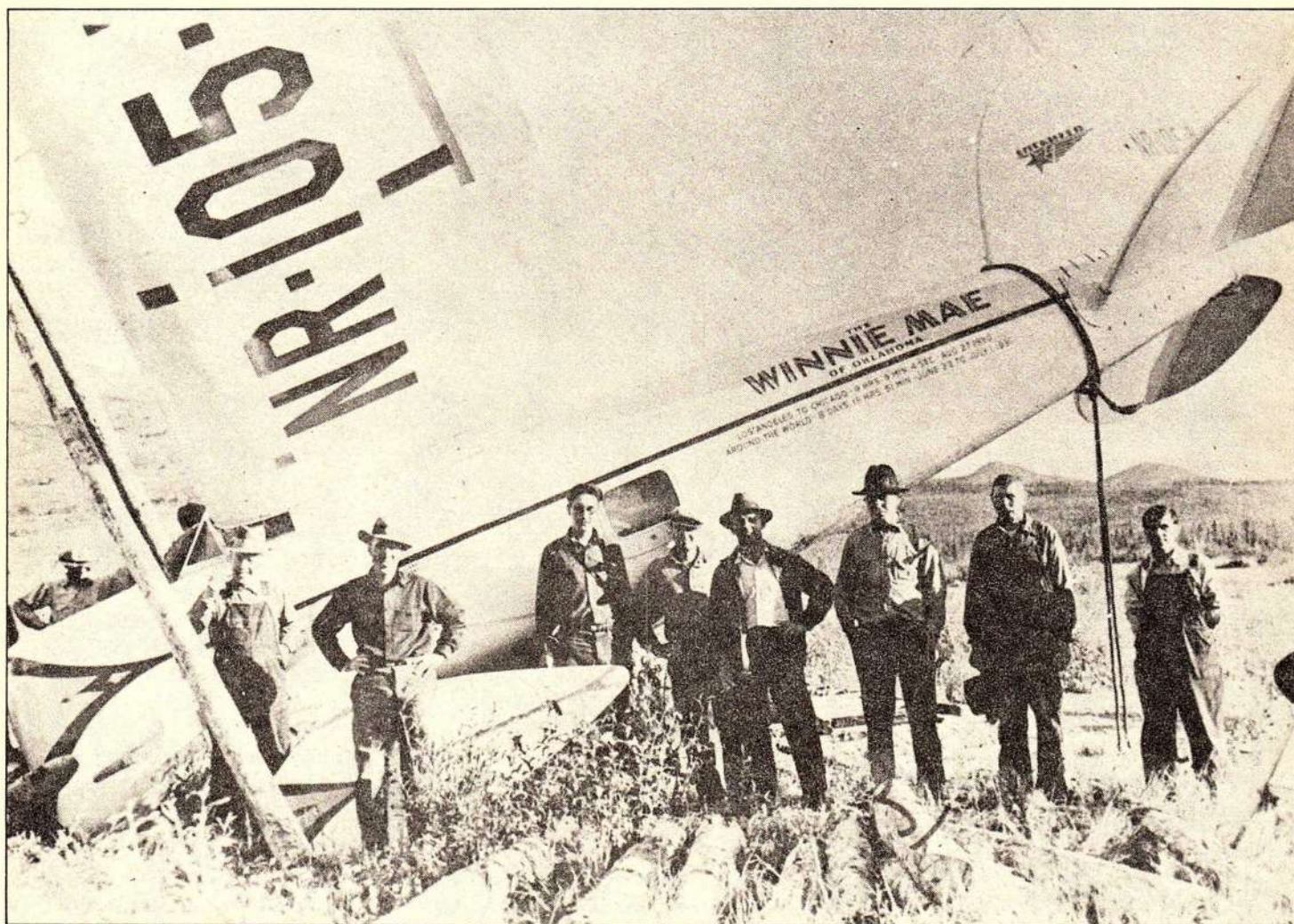
but to all of our readers around the world who enjoy our publication. Last year's sweepstakes had almost 80,000 responses! That doesn't help the odds much, but it sure shows the size of our mail room! At last check, this year's big giveaway was running about 20 percent higher in responses! We hope that you are all winners, but we already know that you are because you are our readers.

Now, you can win an exciting fishing or hunting wilderness tour in McKinley Park, Alaska. How about a bush pilot tour of the Alaskan interior? You can spend a full week at a professional tour lodge in the wilderness country, and all you have to do is build a model airplane! The brochures we received with the following information made our mouth water . . . this place is real God's country!

Here's all of the details, as presented by Lynn M. Castle, proprietor of Denali Flying Service:

Have you ever dreamed of seeing Alaska through the eyes of the bush pilot? Well, this may be the chance you've been looking for. SCALE R/C MODELER has been asked to solicit its readership for several museum-quality scale aircraft, which will be used as part of the permanent

One of the most famous aircraft ever flown, at the scene of one of the many "obstacles" which the plane met with during its career. The crash occurred near Flat, Alaska (July, 1933). Wiley Post and navigator Harold Gatty were airborne the next morning to continue their global circumnavigation. You can tour such scenic sites by winning an Alaskan holiday. See text. (Photo Courtesy Alaskan Historical Aircraft Society).





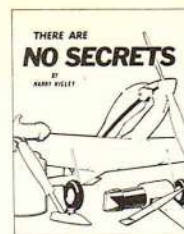
DEFINITIVE SCALE BOOK

At last, the scale modeler's sourcebook you have been waiting for. Eight information-packed chapters deal with topics for both beginners and experts.

If you are a beginner, you'll want to study the chapters on selecting a scale subject, and read the sensible advice in "A Word to Beginners." This one book can save you countless hours of frustration. You'll probably get back the price of the book in money saved on your first scale model.

For the experts, the chapters on "Aerodynamics Simplified" and "Documentation" are a must. There are two complete chapters on achieving "That Elusive Scale Finish," and "Paints and Painting."

From your first scale model, to that ultra-detailed contest ship, this easy-to-understand book will prove to be the best modeling tool in your workshop. As reviewed in the June '82 issue of *Scale R/C Modeler*.



THE BIBLE OF FINISHING TECHNIQUES!

All the secrets that win "Best of Show" are revealed in this comprehensive 16-chapter book. Every type of finishing system explained with photos and easy-to-read text. Lots of step-by-step procedures. Learn about everything that goes into a model, from adhesives to what makes paints work. Everything from fiberglassing to dope, and even iron-on materials are covered in detail.

There are no secrets anymore, for Harry Higley has revealed every technique the "masters" of painting and finishing have used to achieve show-quality models. Let the "bible" of finishing show you how. Now, you can be a pro, too!



NOW AVAILABLE!

GIANT STEPS is a complete overview of those exciting monster models. The book is packed with how-to-do-it articles on engines, props, radios, building materials. There are also chapters on covering, rigging and flying those big aircraft. The sixteen chapters cover everything on giant scale. Ideal for both beginner and expert. Handy buyers guide helps locate hard-to-find items.

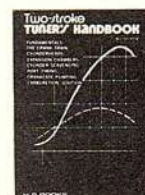
GIANT STEPS has specialized feature articles on building from plans or kits, with secrets of low-cost coverings and even plans for constructing four big models. One of the most comprehensive books ever done. Magazine format size, with 145 pages.



MODEL ENGINES A MYSTERY TO YOU?

This book explains how to get the most in power and reliability out of your engine. No confusing and complex charts and graphs, but an easy-to-understand book on making your engine run smoothly. Everything about fuels, break-ins, props, cleaning, needle valves, and repairs. Lots of photos & drawings, with 17 chapters dedicated to making you as knowledgeable as Clarence Lee.

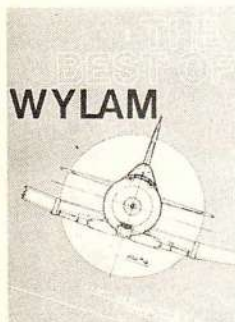
Learn how to hop up an engine, with secrets from the pros. Save money by doing your own engine overhauls and maintenance. Get peak rpm out of your engine, and learn how to pick the right prop for top performance. Written in down-to-earth everyday language.



FOR THE ENGINE PRO!

Especially invaluable as a reference source for chain saw engines, this book contains all of the theory and applications for any two-stroke engine. Superb treatment of tuned pipes, and advanced theory of Schenckle porting. Every part of the engine is discussed, with profuse charts and graphs showing optimum performance parameters. Ignition timing, carburetion, crankcase pumping, expansion chambers and cylinder heads are all detailed in this comprehensive 156-page book, which has long been acknowledged as a standard reference source.

Whether you operate glo or ignition engines, this book will show you how to get every last rpm and bhp out of your engine. Learn how to interpret all of those charts evaluating model engines in the magazines.



SCALE REFERENCE SOURCE

THE BEST OF WYLAM is a complete scale drawing collection in one book. Sixty aircraft span all eras of aviation, from the Wright Model A, to the WW II fighters. Each plane has detailed 3-views and scale drawings, expertly done by William Wylam. Inside are such classics as the S.E.5a, Curtiss Hawk, P-40, Douglas A-26, Northrop A-17, Black Widow, P-47D, Grumman F6F, Ford Trimotor, Lockheed Vega and Stinson Reliant.

All aircraft are shown on four sheets, and even the minutest internal and external detailing are illustrated. Each aircraft set computes at less than 4¢ per drawing sheet . . . a real bargain! Magazine format with 175 pages.

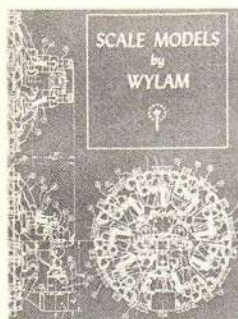
A great addition to any collector's library, or handy to have as a quick reference, or for documentation data. The drawings are so detailed and complete that a model could be built just from this one source. Historical background data supplied with most aircraft.

DOCUMENTATION BARGAIN

A collector's classic, **SCALE MODELS BY WYLAM** presents twenty-six aircraft in superbly rendered 3-view and highly detailed scale drawings. Airfoils, formers, internal construction and all scale details are included in this primary documentation sourcebook. Most drawings done from the actual aircraft, during the 1934-'43 era, by William Wylam.

Enough detail and information to build museum-quality scale models of the following aircraft is included: Grumman F3F, Curtiss SBC-3, Me 109J, Spitfire Mk. II, Douglas O-46A, P-35, Waco C-6, Winnie Mae, Hawk IIIC, and over a dozen more classic airplanes. Also presented are complete detail drawings of the Twin Wasp Jr., Whirlwind and Cyclone series engines.

The aircraft drawings sell elsewhere for \$2.00 a sheet, but the book brings them to you for less than 25¢ a set! Magazine-size format, ideal for documentation, with 63 pages.



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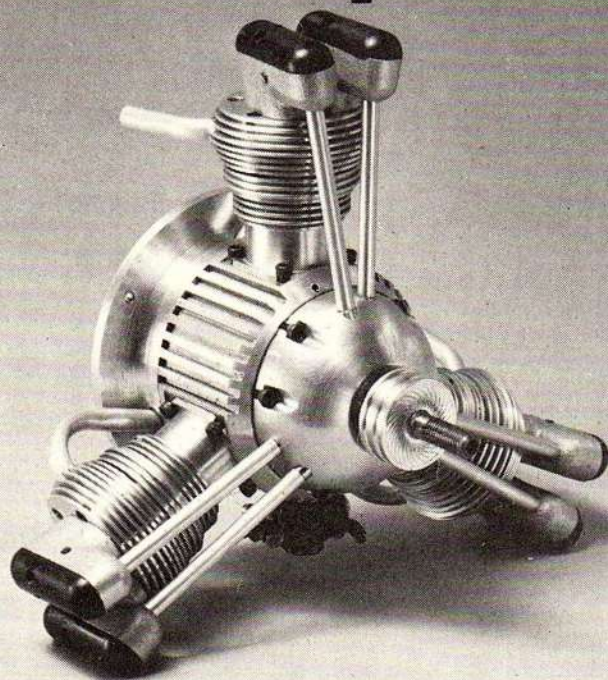
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Harold Gilliam's Pilgrim monoplane, ready for takeoff at Weeks Field in Fairbanks, Alaska in the early '30s. See the Editorial for info on how to win a trip to Alaska. (Photo Courtesy Alaskan Historical Aircraft Society).

display at a historical Alaskan aviation museum.

Alaska has been called the small plane capital of the world, and justifiably so, for nowhere on earth has the romance of flying been so closely linked with the development of the land. As early as the mid-1930s nearly one-third of all freight being moved in Alaska's bush was transported by aircraft. Even today, thousands of Alaskans are dependent upon bush aircraft (fewer than ten percent of our smaller towns and villages are accessible by road).

When did the first airplane come to Alaska? Where did pioneer aviators get parts and fuel? How did early bush pilots get their aircraft started, much less to fly, in the extreme Alaskan winter conditions? Once in the air without radio or navigational aids, how did they ever find their destination?

These and other bits of Alaskan aviation history are currently being gathered for inclusion in the exhibit and associated historical tour which will be offered by Denali Wilderness Air.

As part of the display, several 1/24 to 1/4-scale model aircraft of museum quality are being solicited. The needed models must be of aircraft from the 1920-1930s. Program director, Lynn Castle hopes to find aircraft such as a Fleet, Eaglerock, or Stinson Detroit biplane which could be exhibited mounted with skis. In addition, a later model such as a Lockheed Vega, early Stinson, Bellanca or Fairchild 71 is needed. The aircraft will be required to have a paint scheme depicting authentic Alaskan heritage (for which reference photographs can be provided). Each aircraft will be displayed along with a photograph and short biographical sketch of the modeler.

(Continued on page 76)

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Outstanding, but ill-fated, P-47 by Roy Vaillancourt. Scratchbuilt ship snagged the high grass on a low fly-by.

All signs indicate that the Somers R/C Club's Mammoth Scale Fun-Fly, born four years ago, was a blessed event. Not even as much as a drop of rain has ever marred the two-day competition.

The contest, started as an easy-going weekend get-together, has grown from a gathering of largely New York, Connecticut, and New Jersey fliers, to a major Northeast area scale event.

When we first looked in on the contest four years ago, it had just come off the drawing board. Quarter-scale and bigger ships were starting to gather a national wagonload of fans, but area modelers were only beginning to sense the momentum of what was to come. The event was intended to build club enthusiasm, gain some friends among local non-fliers, and to serve the hobby with a relaxed new event.

There was some historic precedent for big scale ships in New York's Westchester County, where the event is held. One of the Somers members had started flying WWI quarter-scale craft ten years earlier. Though chain saw engine conversions and other latter-day gas-powered successes were tried and proved workable at the time, best reliability was found in glow engines of about .80 c.i. displacement.

FUN IN THE SUN AT SOMERS

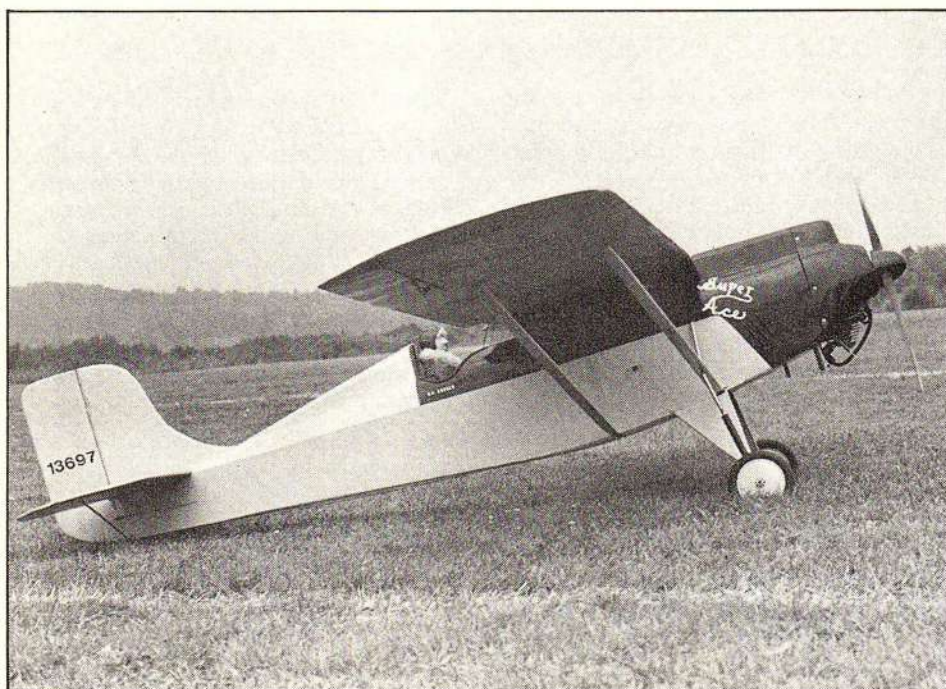
A Mammoth Scale Fun-Fly that is growing each year.

By Hank Nielsen

Photos by the author and Frank Pagnello



Nick Zirola, Jr. (left), points to damaged rudder caused by Bill Zimmerman's AT-6 prop during slight mid-air.



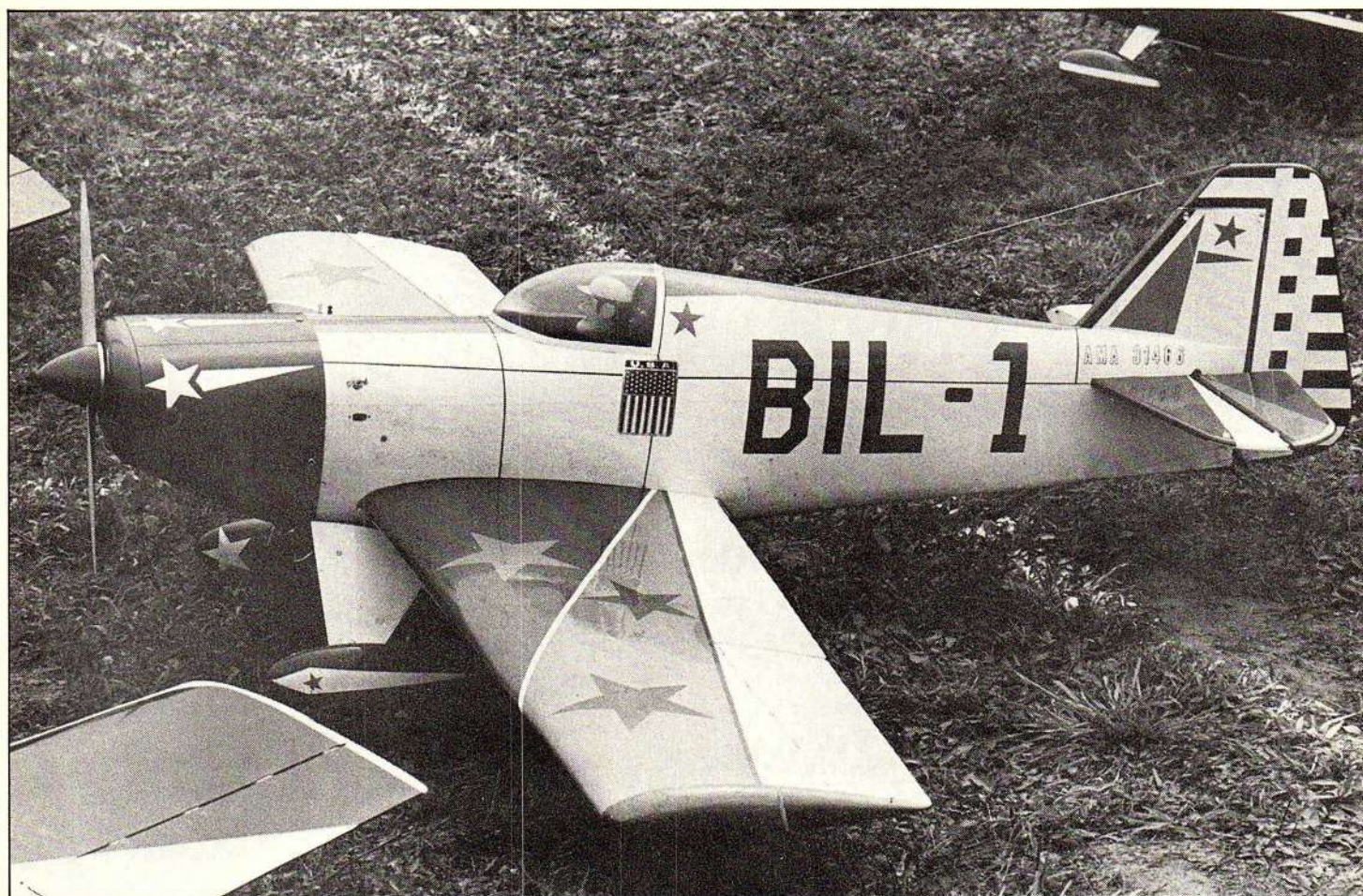
Corben Super Ace, in 1/3-scale, by Joseph Wcela. Span is 108", and it weighs 20 pounds.

But the lingering smoke from the gas burners worked some kind of magic, and the first mammoth competition in 1979 drew substantial interest. Pioneer large-scale fliers like Don Godfrey were on hand with fresh designs, and others with a good many pioneering giant aircraft like those kitted by Bud Nosen. The big-throated engines sounded a new note and the mammoth planes looked imposing. They drew high praise from spectators, drawn by local newspaper publicity, and evoked much thought from modelers who hadn't previously considered the potential of big scale. Over the first few years, the registration list grew steadily.

This year, the event drew a total of 77 entries. And the roster included many nationally-known fliers, including the Nick Zirolis, both Sr. and Jr., Wendell Hostetler, Pete Reed, Frank Tiano, Leon Shulman, and Norm Rosenstock, among others. The secret of Somers' success probably lies in its combination of the low-key approach and emphasis on fun flying, but with just enough competition to whet the creativity and flying skills of any entrant.



It may not look it, but this P-40 weighs 32 pounds, and has a 95" span. A Kawasaki 3.15 does the hauling.



Adolph David's colorful Kraft Super-Fli. The Quadra uses a lawn mower muffler.



Chris Dascano's Ercoupe was built from a kit. The 92" span ship uses a Quadra for power.

It's a worthwhile exercise to look at an event like this and review the popularity of models and powerplants. We found that the most pop-

ular scale subject was the Piper J-3 Cub, with a total of six entries, or nine if you include three Clipped Wing Cubs. Second, with five entries, were the AT-6, Citabria, and the Kraft Super Fli.

Next in line were the 1929 Fleet

biplane, PT-18 trainer, Jungmeister, Bristol Scout, and CAP 20L with three representations each. And two entries each were logged for the Super Stearman and the Corsair.

(Continued on page 78)

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The BADGER 400 Detail/Touch-Up Gun is the perfect tool to use for finishing larger R/C models. You can blend, shade and stipple... achieve special effects such as camouflage, smoke, fire and weather damage, etc. This lightweight tool bridges the gap between the small precision air-brush and the larger guns with bigger spray patterns. Adjust for round or fan spray. Available with fine, medium or heavy spray tips and can be operated with air-compressor, CO₂ tank or pressure tank.

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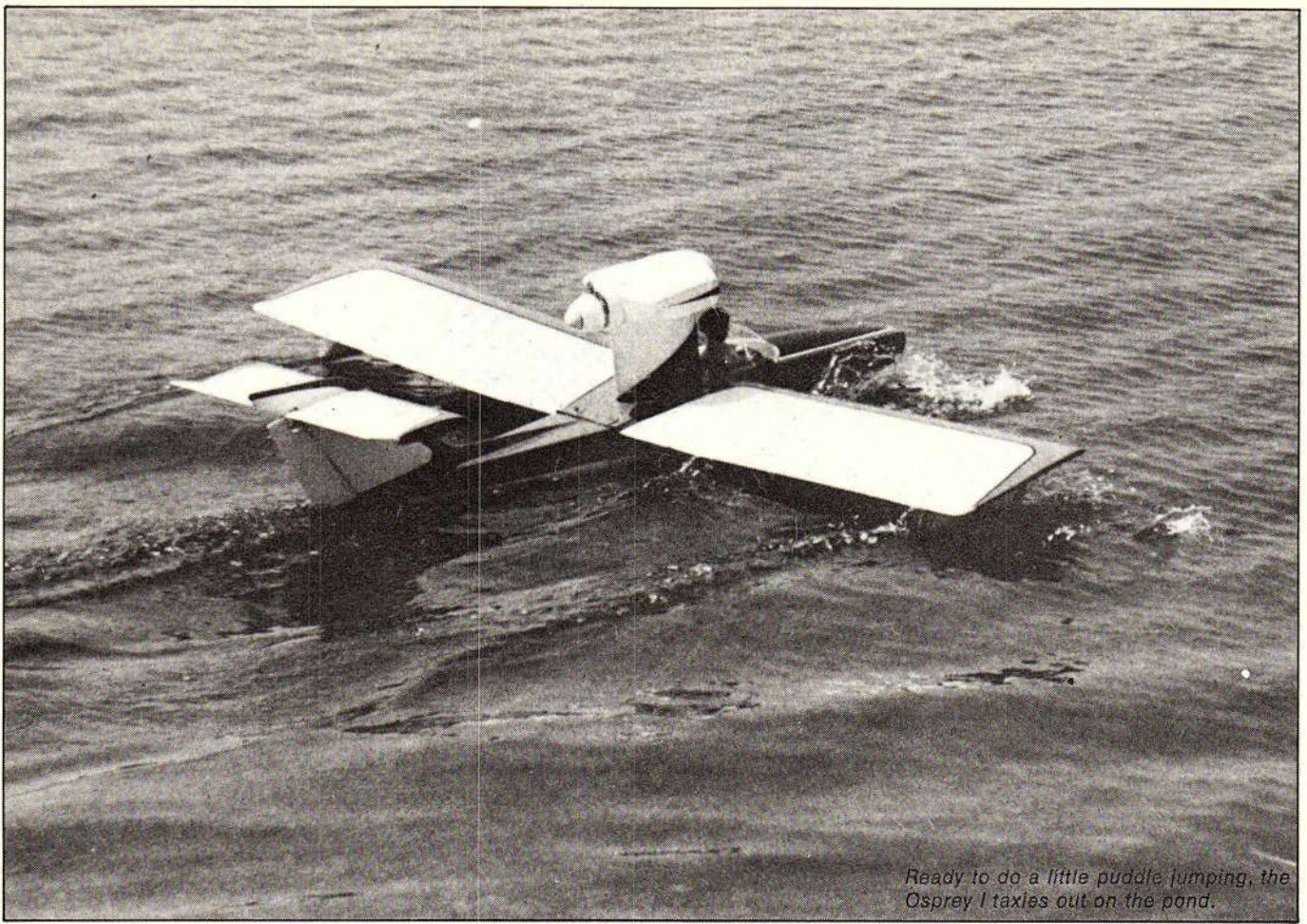
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Ready to do a little puddle jumping, the Osprey I taxis out on the pond.

OSPREY 1

For a change of pace, try some scale modeling on the wet and wild side.

By Wally Zober

Photos by the author

If you live on Long Island and fly R/C airplanes, you are eventually going to get involved in R/C seaplane flying. On this big narrow sand bar, called Long Island, we have some of the greatest lakes. In the middle of Long Island, we have Lake Ronkonkoma. It has about eighty or ninety acres of fresh water for seaplane operations. A few miles east, we have Artist Lake which is about fifty acres of fresh water; but is predominantly used by R/C boaters. Out at the east end south fork we have Watermill Pond, which is well over 100 acres of fresh water.

Now, if you are not afraid of flying off salt water, which I do occasionally, you will find dozens of bays and quiet inlets along the coast.

Eighteen years ago, I started the first AMA sanctioned R/C seaplane contest at Watermill Pond. It was a great hit and has been successful for the past eighteen years. After about nine years, I moved the contest westward to Lake Ronkonkoma to make it easier for out of town contestants to get to.

I've been flying seaplanes for many years using floats on Pattern ships, Quickie 500s, fun-type aircraft, etc.

I always wanted a flying boat. They seem to handle better on the water and in the air. A good example of these types of flying boats are Henry Struck's "Sea Kat," or Don McGovern's "Custom Privateer." The only thing I found wrong with these airplanes was that they were not scale. I'm at that stage in my model building life where I want my models to look like real airplanes.

One day I was going through some old magazines. I came across the 1970 Fall issue of *Sport Flying* magazine, and on the cover was a picture of a single seat pusher type flying boat, the "Osprey I." It looked just like an R/C model airplane taking off of a pond. The designer, George Pereira, had the same motivation I had to build a flying boat.

The capitol city of California is situated in a large central river basin



The author and his handiwork. Pusher engine is best started with electric starter.

of the state at the junction of two major waterways, the American and Sacramento Rivers, which head downstream to San Francisco Bay Delta country. There are a maze of sloughs, ponds, creeks and calm rivers—just right for seaplane flying. That's George Pereira's country, and

the birthplace of the Osprey.

Well, I wrote a check out for the information package. Two weeks later my package arrived. I opened it and found all the information I needed to design a sport scale model of this flying boat. I cleaned off my drafting board and started laying out the Osprey I.

After the plans were drawn up, I ran off some prints and began cutting out parts. It took me about two

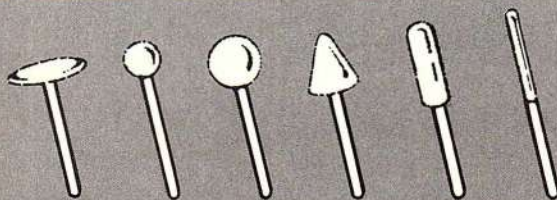
months to build and finish the model (I'm a slow builder). The model looked great and I was quite pleased at the way it turned out. Now the proof of the pudding is in the tasting, and the proof of a good design is how it performs. Well! I made arrangements for the test flight.

I selected Watermill Pond as the place for the first flight and I borrowed a boat for retrieving. I asked my flying buddy, Sal Izzo, to give me a hand. He's our local expert for tuning model engines. We got out to Watermill Pond at 10:00 a.m. Saturday morning. I took all the static pictures I needed, Sal made some final adjustments on the Webra .40, and we were ready to go!

The Osprey I came in a little on the heavy side (8½ lbs.), with 693 sq. inches of wing area. I knew it would fly, but would it get off the water? If I were to say this airplane flew perfectly on the first flight, that would be untrue, as I ran into the same problem that the real airplane had. In the water it handled beautifully; however, in the air it had a tendency to porpoise. At full throttle the nose would pitch down and,

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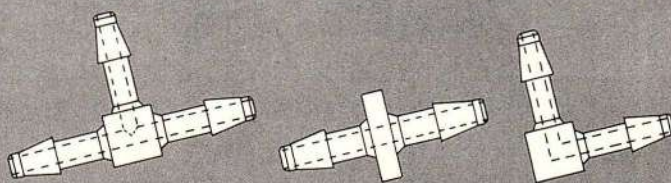
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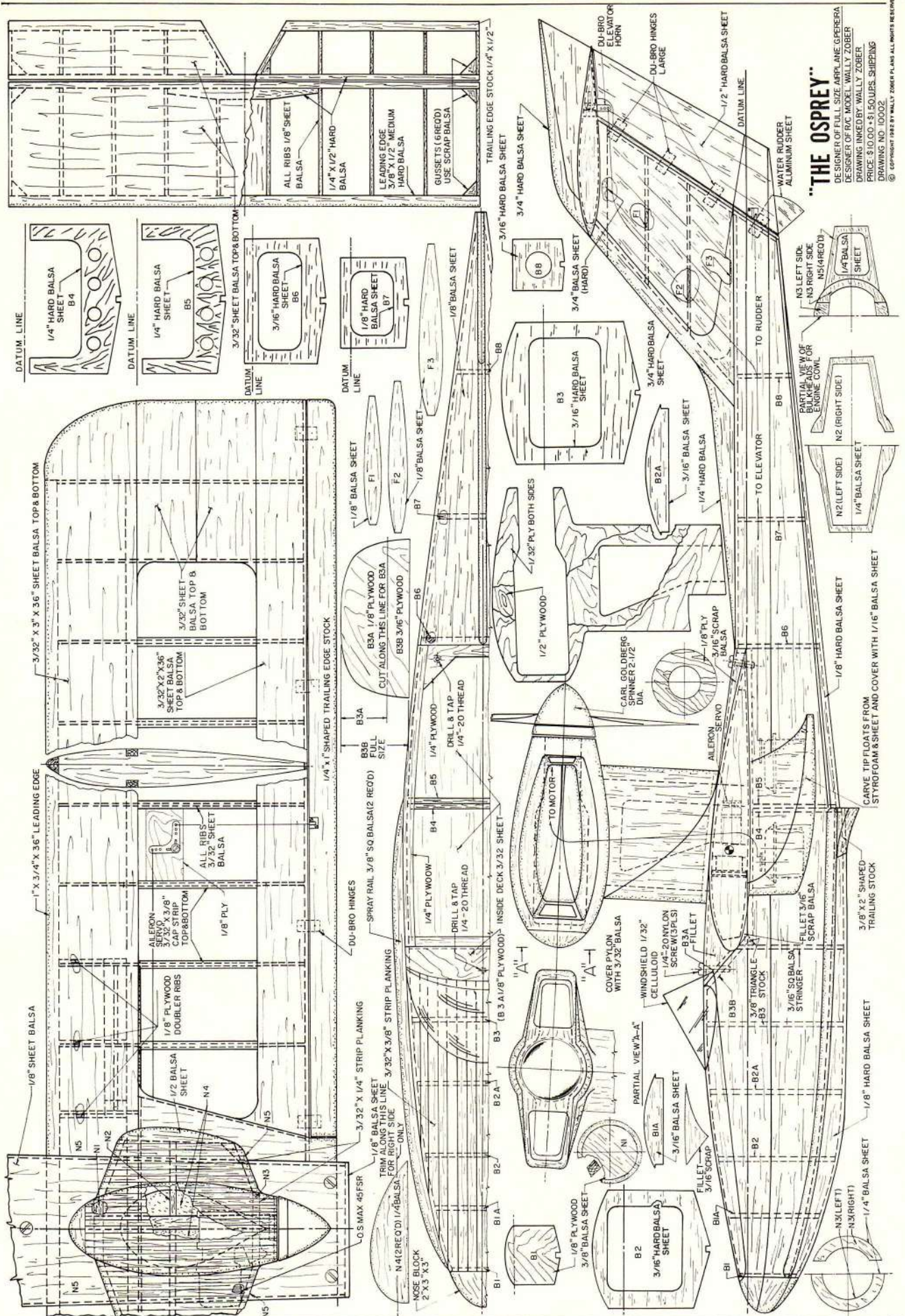
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at low throttle, the tail would drop. Also, my Webra Black Head .40 engine was new and not broken in as yet, and it was not putting out the way it should. Osprey was flying on the back side of the power curve and was a bit hard to handle.

While it was in the air, I let my friend Tom fly it and he stalled it on a downwind turn. The model went into a spin and dove into the water (minor damage). Water can be forgiving! I took the plane home, made the necessary repairs and added more positive incidence to the engine. This helped to dampen the porpoising effect; however, you have to set this airplane up slightly differently for takeoff, straight flight and landing. You can do this with the trim tabs. On takeoff use *full* up trim, then straight and level flight at cruise speed have neutral trim, while landing requires three-quarters of the down trim. Now, if you have an emergency situation where you have to go around and must hit full throttle, then be ready to add up trim. If you don't, you may have a hairy moment or two.

CONSTRUCTION

For those of you who have never scratchbuilt a model from plans, I have a suggestion for you. Kit the model first. That is, cut out all of the wing ribs, bulkheads, slab sides, etc. When you have done this, you can start building the model. I have a good reason for doing this. If you are like me and you are not too crazy about cutting out parts, you will want to get it over with quickly. Also, I find that, once I start building and gluing parts together and see my airplane beginning to take

shape, I don't want to stop and start cutting out detail parts. It's like you stopped the production line. I also believe this is why so many modelers have so many partially completed models hanging on their cellar walls that are only partially completed.

Once you have all the detail parts cut out and neatly stacked on your uncluttered work bench, the plans spread out, pinned down and covered with wax paper, you are ready to go. Now there is nothing that can stop you from completing the project. So let's get started.

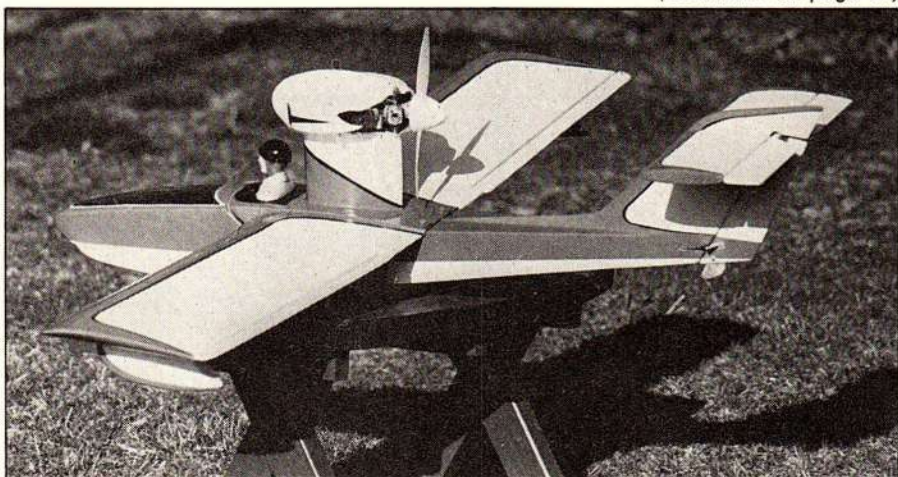
One thing more, I don't believe in giving step-by-step instructions as this article would be too long, and you would get bored reading it. If this project is going to be your first step into model building, I suggest you buy this plan and put it in a good dry place for a future date, then go out and buy a good R/C trainer kit. This will give you a chance to learn how to read a con-

struction drawing, how to match up and identify parts which are called out on the drawing. You will also know that all of the building bugs have been worked out of the model. When you are working on prototypes, a new design, or developing a kit or building from plans, a mistake, a construction procedure or a slight change in the design may occur. This does not happen all the time; but every now and then a designer who is deeply wrapped up in his project may omit something. An experienced scratchbuilder will have no problem working around this type of situation.

WING

Let's start with the wing. It's big and, when it's done, you will feel like you have one half of the project completed. The wing is built in three sections. Build the right wing panel as shown on the plan. Sheet the

(Continued on page 61)



The Osprey is very simple to construct, having very rudimentary lines.

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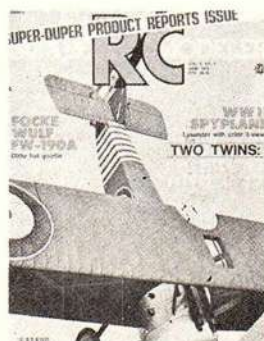


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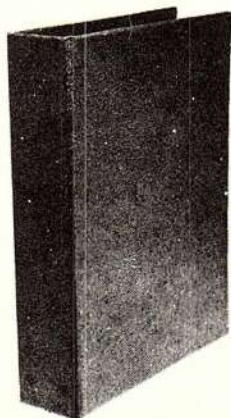


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WHY DOESN'T SOMEBODY BUILD... THE PILATUS TURBO TRAINER

Photos and Data
Courtesy Pilatus, Ltd.

No matter what your modeling expertise, this unique project has something to offer you.

By Orin Humphries

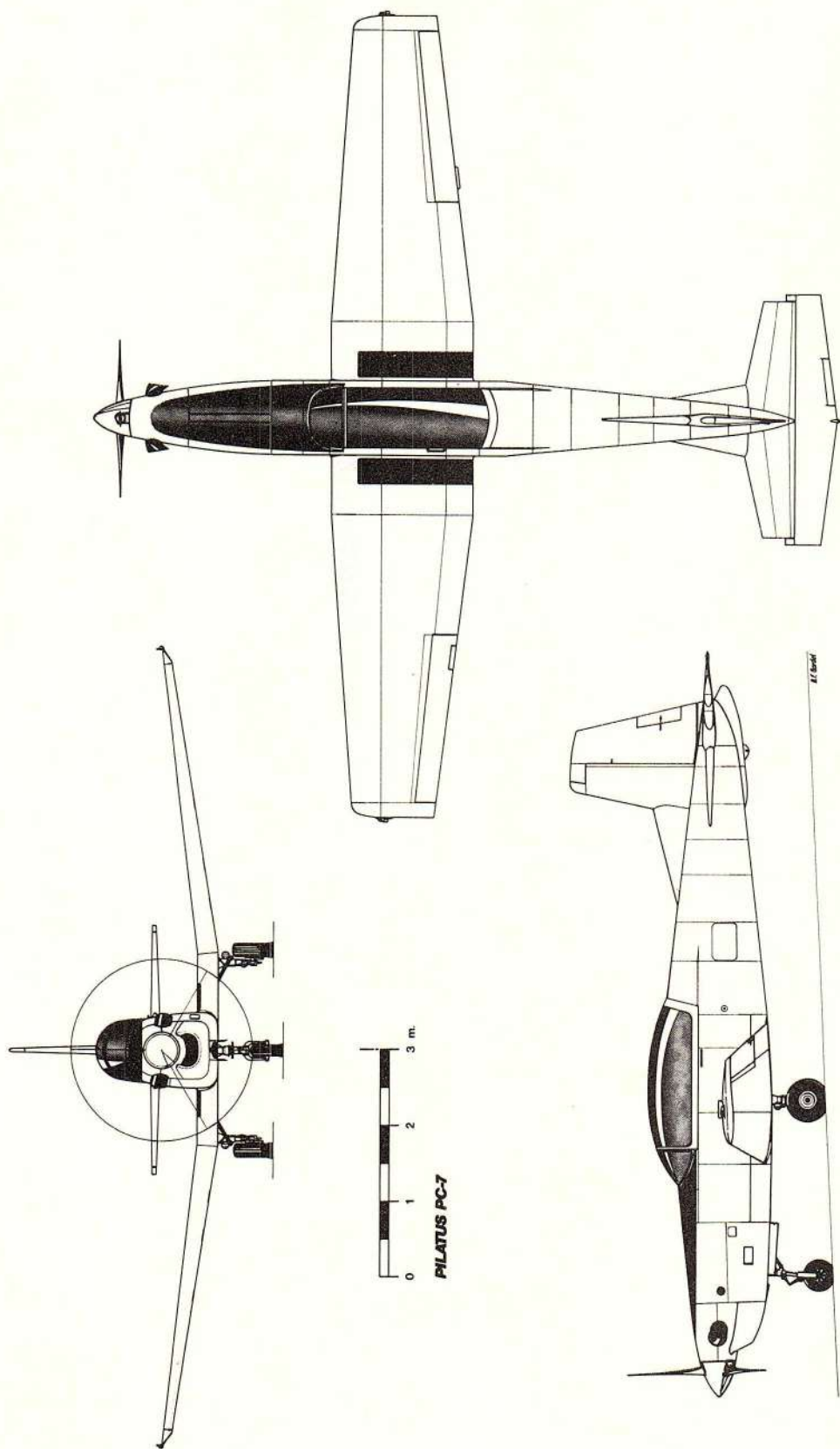
In this article we turn our attention to a single-engine subject . . . the latest Pilatus aircraft. Pilatus is famous for their Porter, the world's best STOL aircraft for operating from high mountain glaciers. Pilatus has also recognized a need which many air forces feel will eliminate one step from the basic training program; the transition from piston engines to turbines. The PC-7 Turbo Trainer shortens the training syllabus by having a turboprop engine in a basic training airframe. Ninety-eight percent of the graduating pilots will be assigned to turbine engine aircraft in their squadrons, so this aircraft is finding wide use around the world.

The engine chosen for the PC-7 is the new P&W PT-6A-25, which is to the turbine world what the Rolls-Royce Merlin was in World War Two. If I had a dollar for every PT-6A operating today, I'd have a six-pack of Kraft radios. The PT-6A is sea-level flat rated to 550 shp, and can produce up to 650 shp.

You may want to draw a red line under the next sentence for the judges in a contest, if you build this model and compete with it. The PC-7 is rated for all positive and negative G aerobatic maneuvers, including spins. This will give you

Painted red and white, the Pilatus Turbo Trainer makes an excellent scale project.





point options when competing against civilian aircraft like Cubs and Wacos, which are not fully aerobatic. You can hold your own against the more-familiar military jobs, as the PC-7 has six underwing hard points for droppable stores. Write the factory for details on that.

As you can see, this bird has the sleek lines of a modern, light aircraft. It is largely devoid of those small, attached structures that make judges ask, "Why didn't you put this on it, or that on it?" It's clean. It doesn't even mess with wheel well doors. The only doors are for the nosewheel shock strut so all three wells are open. Look how long the nose is. Nobody is going to build a tail heavy PC-7.

Let me give a few quick facts about the Turbo Trainer. It has a span of 34.1 ft., length 32 ft., height 10.5 ft., and a wing area of 178.7 sq. ft. Its empty weight is 2,822 lbs. gross, and with droppable stores it's 5,952 lbs. At normal takeoff weight, it can clear a 50 ft. obstacle with a run beginning only 1,017 ft. away. Its max speed is 270 kts., and cruise is 235 kts., and its ceiling is 31,000 ft. Let's turn, now, to the model.

I recommended a scale of two inches-to-the-foot for the PC-7, giving a span of 64.2" and an area of

715 squares. I would imagine a strong .40 engine or larger would be appropriate. The root and tip chords are 12.375" and 7.33", respectively, and the thickness at these two places is 1.7" and .79". Some might want to thicken the wing, but that shouldn't be necessary. The flat center section of the wing has a span of 16.5" giving the landing gear good ground stability. The ailerons have a span of 14.75".



This Turbo Trainer is orange and black, with a polished metal wing and white pin striping. Note easy access panels

The flaps are the split style and don't appear to extend all the way to the trailing edge, stopping 0.7" short in the two-inch scale. They are in two panels on each wing, and have separate hinge lines. While this isn't optimum for modeling, it is no problem. Put a piece of music wire on top of the center flap section at the outboard trailing edge corners, so that the wires will force down the outboard panels when the center

for engine and tank compartments. There's enough room ahead of the cockpit to do the radio installation.



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panel lowers. Either lightly spring-load the outer panels back up, or put a small bracket on them so that the wire will lift them up when the center panel retracts. I had a Martin Mauler with flaps this way, which flew for 12 years without problems.

The landing gear makes it look awfully close to the ground, but that's deceiving. A 12" prop on a .60 engine would clear the ground by 4.2". That's plenty. If you wanted

more clearance or wanted to install retracts, you might need to know that the struts compress a long way with a load on them. The mains extend another 1.83" from their compressed length of 3.83" (axle to wing surface). The nose strut stretches about 0.9". The main wheels, when retracted, are separated only by the keel structure. The main tires are 3.5" dia. and the nose wheel diameter is 2.83". All of these figures are at

the two-inch-per-foot scale.

Let's look at the fuselage where all the goodies have to go. That long nose will stow engine, tank, and radio, and still leave room for as much cockpit detail as you desire. The tail servos could go aft of the cockpit, keeping it clear of push rods. There are scale access doors on the aft fuselage for them. Max width of the fuselage is 6.45" and, at the canopy, it's 5" wide.

The prop is 18" ahead of the leading edge! Your spinner is a convenient 3.0" dia., and the fire wall 4.375" wide and 5.8" high if located 4.6" aft of the prop. An inverted engine would be all enclosed, with cooling air exiting, perhaps, through the nose gear well. The scale prop diameter is 15.5".

The empennage is ample, with a span of 21.45" for the elevator, nearly one-third that of the wing. It is far aft of the wing, and with so long a nose, it shouldn't need enlarging. The root chord of the horizontal tail is 9". The vertical tail rises 10.5" and has a root chord of 9.5" at the juncture with the fuselage.

We have seen photos of five separate paint schemes. I'll discuss two of them, both seen on aircraft license No. HB-HOZ. You could write the factory for the colors of HB-



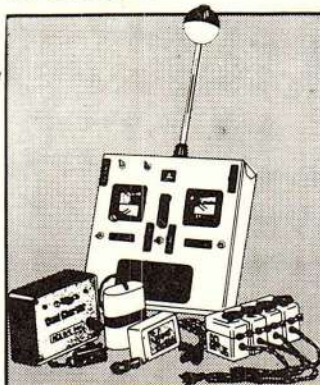
Civilian versions have a clear bubble canopy, while military ones have a reinforced cage.

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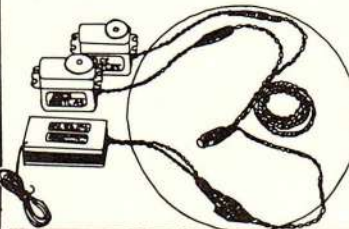
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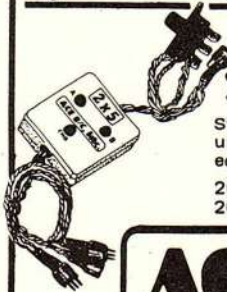


2x5

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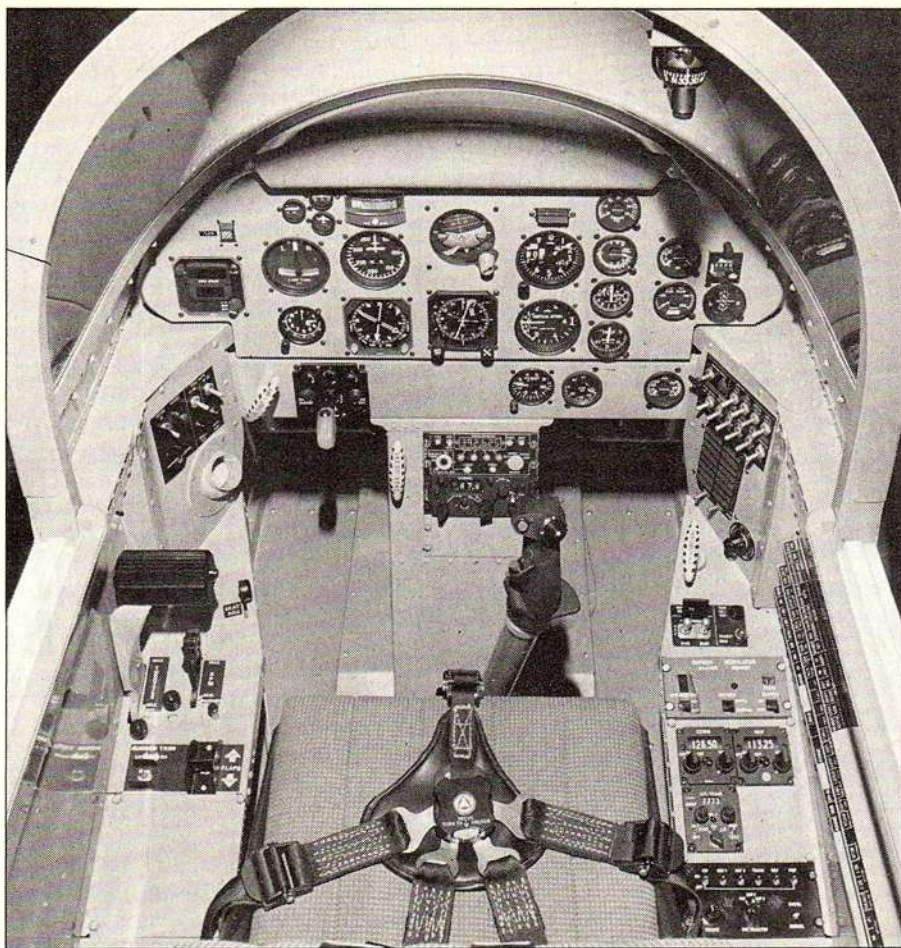
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HON. One photo shows HB-HOZ with a red and white gloss fuselage and black matte anti-glare. The wing and tail plane are alike, being white with red tips and bands. The center section under fuselage is red: the vertical tail is red, and the call letters are black.

Other photos show HB-HOZ with a gloss orange and black fuselage in a different design. The wings and tail plane are polished metal with red tips, while the lateral fins on the stabilizer are black. The top 64 percent of the vertical tail is red. Other PC-7s have different designs or color combos. Some have clear bubble canopies, and others have re-inforced ones.

As always, write the factory only if you are seriously going to build the model, and it would help to send them a photo of the completed project. It is best, also to offer to pay for the materials. Write to:

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As a scale project, the Pilatus offers superb potentials, no matter what your level of accomplishment. The simple lines make it a great candidate for an FAI contest model, in either Sport or Precision Scale. The lack of complexity also makes it a good choice for a first scale project. The fuse is square enough to be built almost like a simple box. Lots of dihedral also will make it a fine flier for the new pilot. That deep

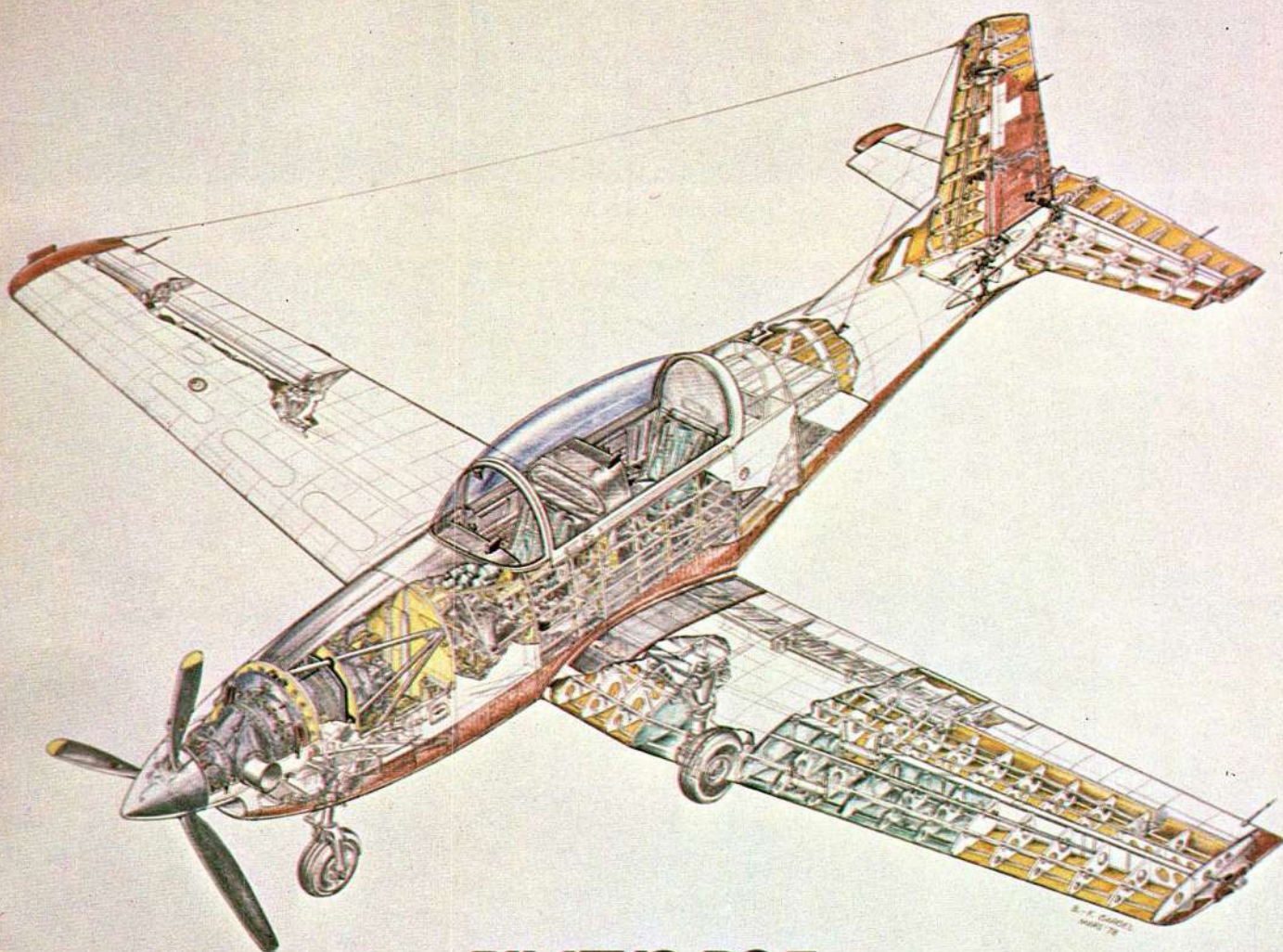
chin allows for a totally concealed engine installation.

Features like trike gear also add to the favorable reaction this plane should get from the modelers. Two visible cockpits make for an excellent opportunity to do some nice scale detailing. The big bubble canopy looks as if it might even be adaptable from a commercial unit. Most modelers have discovered that modeling a canopy is no big deal.

The generous air scoop will eliminate any engine cooling problems. It looks as if one could leave the stock exhaust stubs open for extra air circulation. If you are a contest buff, don't forget the previous mention of ordnance capabilities.

Whatever your motivation, the Pilatus Turbo Trainer deserves your attention. With everything it's got going for it, we can only ask ourselves why someone doesn't model it.

□



PILATUS PC-7



Giant Scale Sopwith Pup was Best WW I winner at last year's Q.S.A.A.

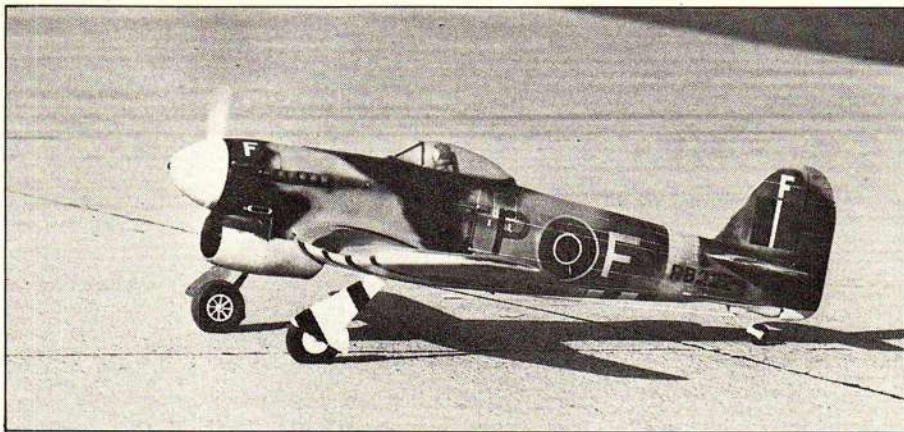


David New's Cessna is immaculately done, with lots of attention to scale detail both inside and out.

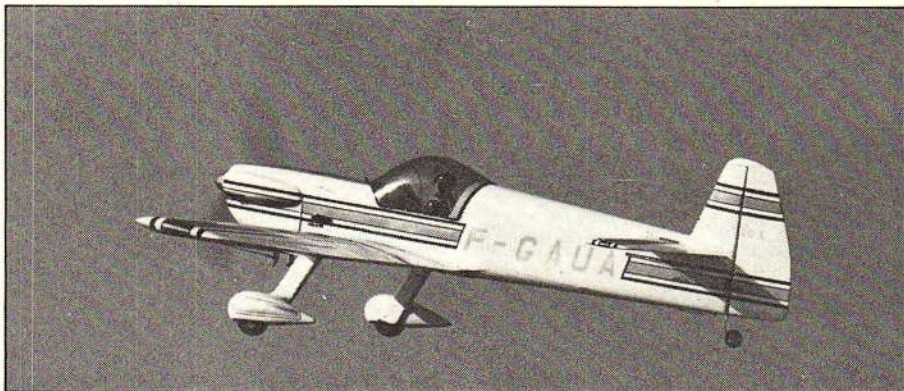
It's the old story . . . there's some bad news, and some good news.

The bad news is that Mile Square Park, one of the most densely populated flying sites in the United States, is going the way that many such locations have gone in recent years. Not only is this facility the home of the Southern California Scale Squadron, but also numerous clubs which provide recreational activity for the people of the greater L.A. area. Not only is the field heavily used for R/C activity, with a wait for frequencies even on week days, but there are also Control-line and Free Flight areas (both of which also get regular traffic). Our personal estimate is that several thousand modelers will be influenced by the "phasing out" of this facility.

What we find particularly amazing is that this action is occurring in an era when we modelers are assuming that there is enlightenment. The local modelers, in this instance, were the epitome of everything the AMA says we must be to get and keep flying sites. A steering committee of modelers attended the planning meetings of those who controlled the site. They were professional in planning activities, acquiesced to pressures from other user groups when necessary, policed our activities, etc. You couldn't have found a more ideal working relationship. But, almost virtually at the whim of those in power, it was (or is, technically, about to be) swept under the rug. Our last input was that some mega-buck corporation had



Typhoon, by Jerry Kitchen, really tore up the sky.



CAP 20L, but we didn't get the name of the pilot.

offered to "trade" the property to develop a commercial area on the site.

Although I shouldn't, I can't help but take this all very personally. It's not the old "I pay taxes, too" reaction. I've long ago learned that there really is no such thing as

real rights. It's the PR aspect of this all that galls me. Several decades ago, when I started modeling, I understood that we were, as a group activity, "greater than golf." I almost believed it, myself.

Then, my local club lost a flying site, the local school system banned model flying at the school grounds, etc. The club fought hard. We called the national organization. They were not much help. We managed to get a permanent flying site, but I still feel that we were just lucky.

I relocated to another geographic area. The events were a repeat. The real irony this time was that the site was right under the AMA's nose, in Washington, D.C. Some of the

SCALE UNCONTEST '82

Held at a new facility, this year's gathering of the scale clan was the biggest yet.

By Patrick H. Potega, Executive Editor

J. R. Naidish photos

members even worked for the official organization. I was a little disillusioned, to say the least.

Since then, I have lived in at least three other states. The record was the same in each situation. Now, here in Southern California some twenty years later, it's happening again. I must ask myself, whether modeling has progressed at all during this time. One thing I know, is that our national organization's ability to effectively educate the world as to the need for modelers has been a real goose egg. We build new buildings, have cross-country flights, raise money for charities (the So. Calif. clubs were the number one fund raisers in Toys for Tots last year), and we still wind up being a negligible cipher in the scheme of things. I really don't mind not having any rights, but I do object to looking at the potentials of another couple of decades without even an image.

The local modelers did everything right. What went wrong? All I can see is that no one knew who we were, or ever imagined that we were important enough to be concerned about.

A big cheer for the AMA! They just got us a whole bevy of new frequencies, so that even more modelers can now participate in our activities. Now, if we only had a place around here to use all of those frequencies. It's like finally getting

your driver's license, and somebody takes all the streets away!

So, the bad news is that the Scale Squadron has just about lost the original site for the Masters, as well as a place to hold all of its local flying activities.

The good news is that we have found what may perhaps be an even better facility. The Tustin Marine Helicopter Air Station (L.T.A.) was the new site for the annual Fall Scale Squadron Uncontest.

The L.T.A. is not only a pleasant surprise from the point of view that it's a much better facility than the Mile Square area for scale flying, but also from the point of view that it's a military base. This harkens back to the "good old days" when the military and the modelers worked together. The big contests and the Nats used to always be held in conjunction with the military. Of course, many modeling events, such as Control-line Carrier, actually grew out of such involvement. It's nice to see both groups getting back to basics together, again.

The tone of the meet was immediately evident when we pulled up to the front gate. A huge sign was prominently displayed on the front fence, notifying all that there was a modeling meet going on. The Marines deftly handled traffic control, parking, and the food concessions. Bleachers (!) were erected along the

edge of the pit, the field was properly cordoned off, and they even prepared a great display of helicopters in front of the old blimp hangar for the spectators to crawl over and through. We really felt as if the proverbial red carpet had been rolled out for us.

The Base Commander, Col. R. G. Mitchell (USMC) was even good enough to take time out from his schedule to address the crowds during the noon break. A plaque of recognition was awarded to him, and we must admit that he deserves a "well done" for his efforts. Particularly refreshing was his personal knowledge and interest in the models . . . it's always nice to find someone who speaks the same language.

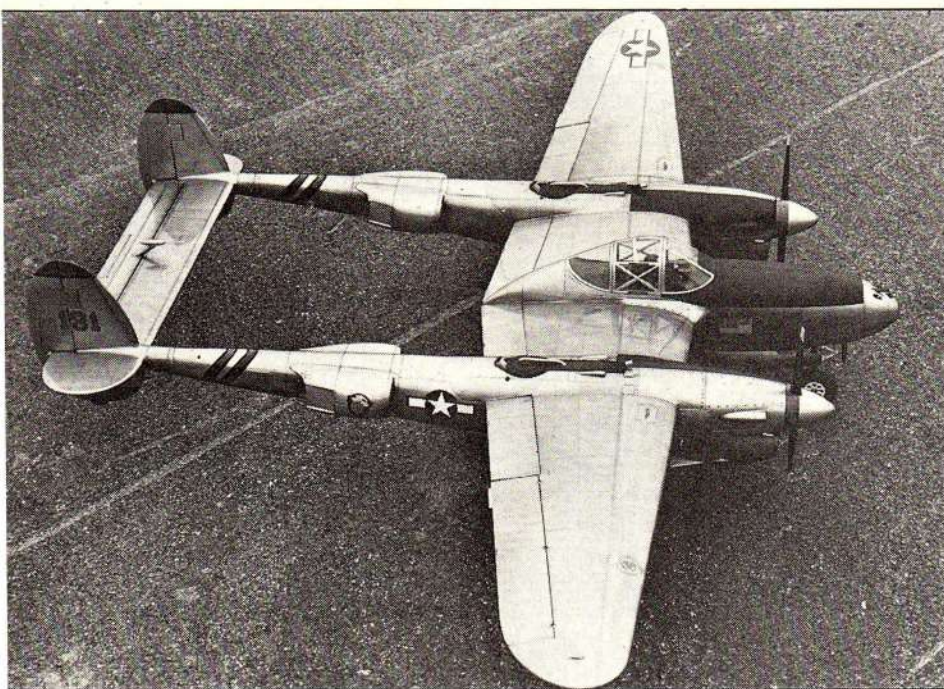
From a practical point of view, the L.T.A. facility is not only better managed, but it's also a safer site. The Mile Square facility was adjacent to a golf course and public park. We had to observe strict hours for running engines, and the fear of a fly-away always loomed. The Marine area has miles of unobstructed open fields, so prototype flying and giant scale operations are much more practical there.

The Scale Squadron could not argue. Freed from the ordinary tasks of patrolling the area, handling the food concession, etc., the club members actually had some time to be modelers. Until that weekend, I didn't even know that some of these guys even built or flew airplanes! A few of them were actually standing still for more than a few seconds at a time!

To say that there was a major turnout of models would be an understatement. We never did get an actual head count, but we're sure that the previous year's attendance record of 151 models was easily broken. The models were so thick that walking through the pits was a real challenge in navigation.

For those who don't know what an "UnContest" is then you are really missing something. The get-together is an informal affair. Fly only if and when you want to. There are no judges and no rules. Surprisingly, it isn't utter chaos. Modelers are such a social and sociable group that most of them would rather hangar fly than get their own model oily.

For most, it's a great opportunity to learn how other modelers do things. Building and flying tips are exchanged. You can watch the best pilots do their thing, then stand around and ask them lots of questions. We overheard some pretty heavy conversations, about everything from glues to covering mate-

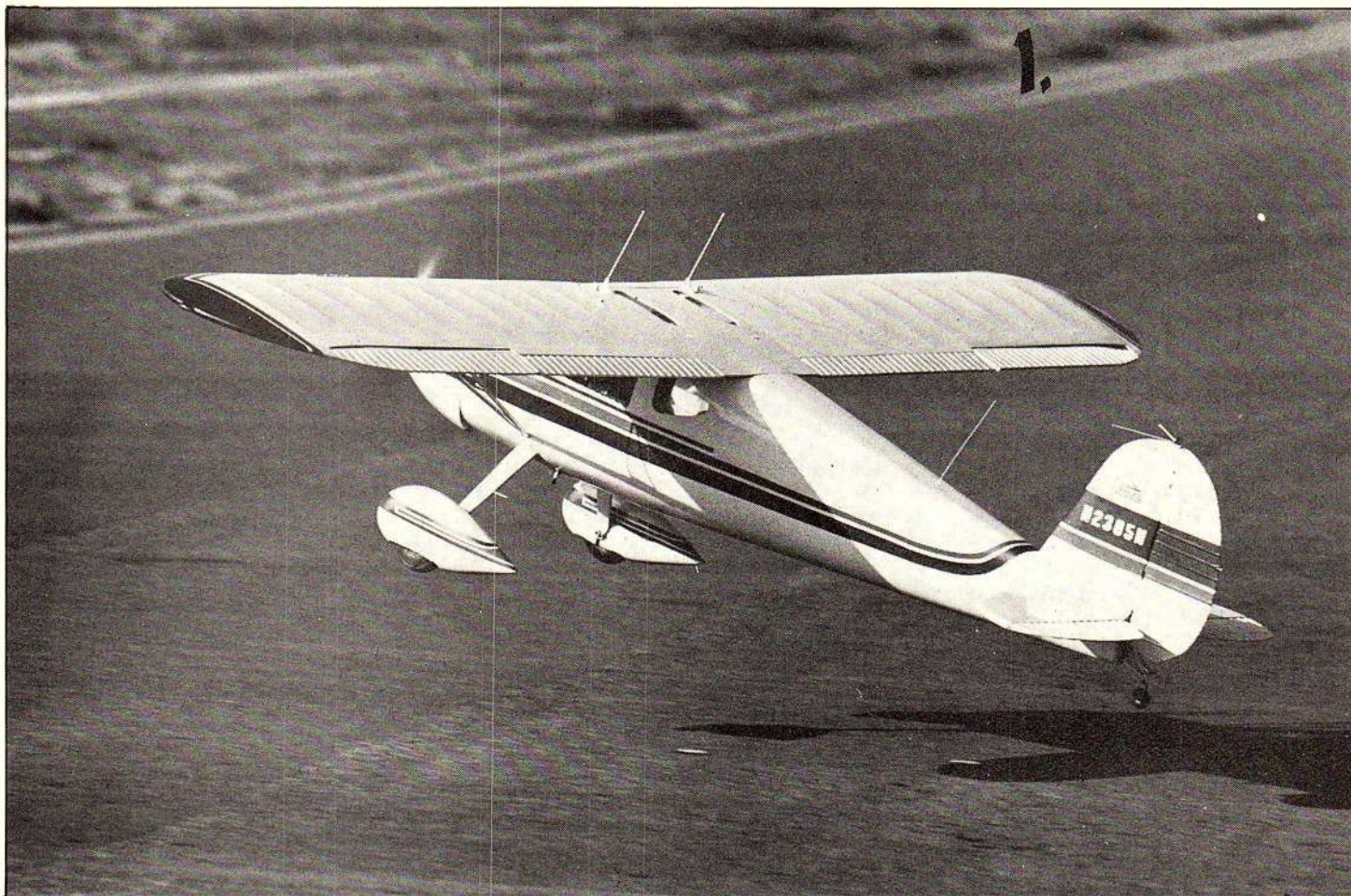


Jim Burnett's Royal P-38 is loaded with rivet details and handmade markings and insignia. A real work of art.



2.

3.



1.



4.



5.

1. Dave New's Cessna flies as nice as it looks. 2. Waco YMF, by Bob Richards. 3. Colby Evett flew this retract-equipped F-16. Rossi engine really was screaming. 4. Dave New did a full aerobatic routine with his giant-scale Cub. 5. John Haggart's Corbin Baby Ace.

rials and techniques. If you could listen to and remember it all, you could probably become an expert in just one day at the flying field.

When modelers get together, it's usually a structured activity. We go to a club meeting and, just as we get into a small assembly in the corner which is discussing something interesting, the meeting is formally called to order. We show up at a contest and everyone is too busy getting or keeping their act together to chat. Whether it be a banquet or any other gathering, we always wind up doing something else than talking and learning about modeling!

The UnContest solves that dilemma. That's why the attendance is so large . . . because it's filling a definite need to communicate. Sometimes, we're just too organized for our own good. If your club is stagnating, try one of these casual gatherings.

It's always amazing the amount of technology and development which is going on behind the scenes. We saw some state-of-the-art materials and techniques at the UnContest which probably won't surface for years. Developed in garages and building rooms, some of these things are almost phenomenal. Had this been a contest, such individual efforts probably would never have shown up or, if they had, they would have been lost in the melee of the meet.

We saw a lot of emphasis on giant and 1/5-scale. We aren't just referring to the weekend fun machines, but to the contest-caliber models which we will probably see in com-

petition next season. With big engines hitting power potentials never before dreamed of, we can expect to see a lot of exciting developments during the next generation of big models.

It was a real dichotomy to find spectacular contest machines parked in the pits next to everything from foam A.R.F. trainer models, to the average weekend fun machines. They are all scale, of course, if the definitions are kept as liberal as possible. What has always amazed me is that the best models are not necessarily built by the competition-oriented modelers. Some of the nicest planes at the get-together were built and flown by modelers whose only ambition is to go out on the weekend and bring the model back in one piece. Only UnContests bring such talent to light.

The contest fliers use the UnContests to sort of "feel out" the competition. Much time is spent seeing what the next guy is doing, or trying to find out what is being built for next year. More often than not, these fierce rivals wind up exchanging advice as to how to improve each other's aircraft. The one thing that has always amazed us about this hobby is the friendly approach everyone takes to contest participation. Although each of them is out there to win, that's never an excuse for not helping the next guy to have a better shot at the top spot. At an UnContest, where everyone's defenses are down, the true feeling of this mutual sharing can really be appreciated.

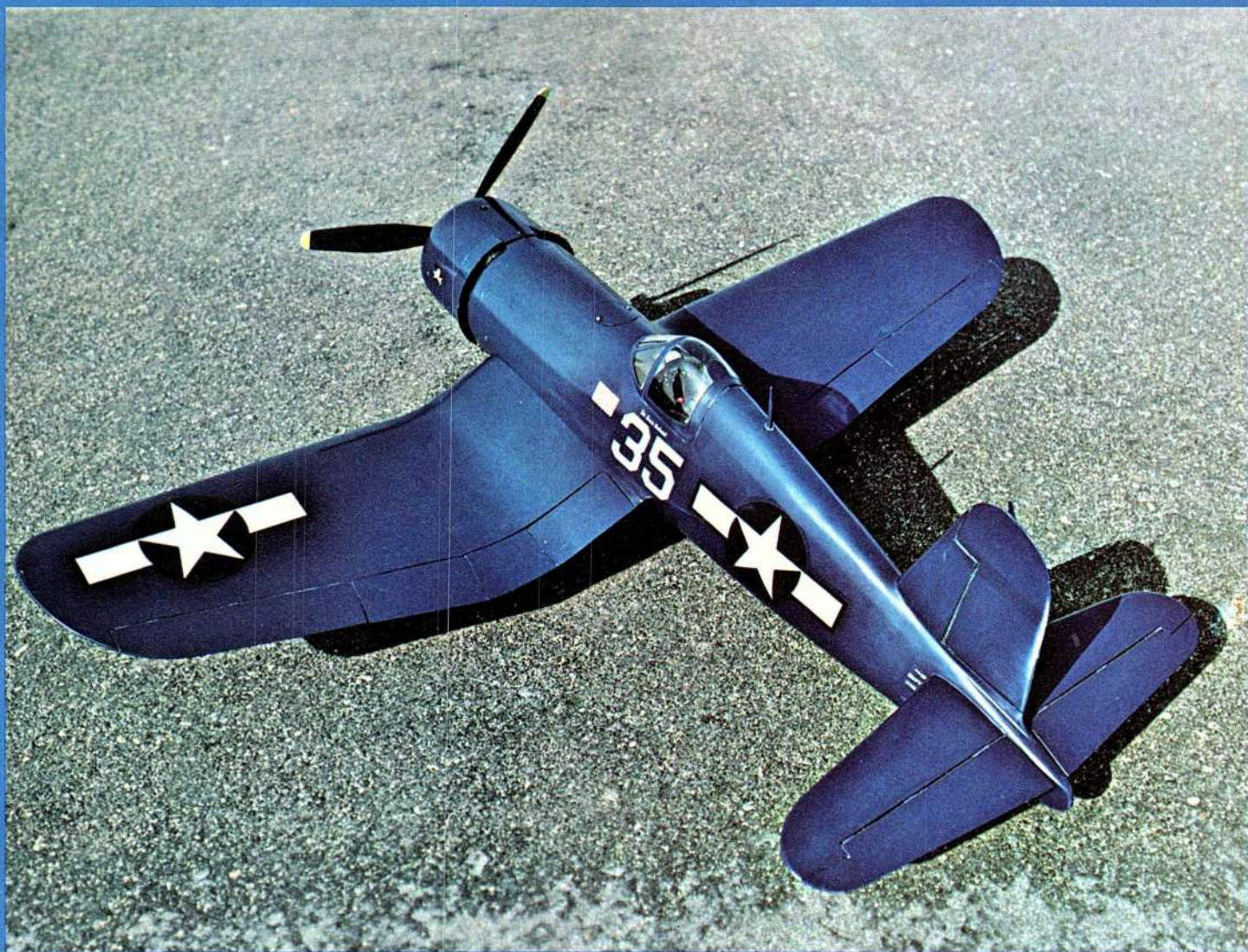
Most of the participants took advantage of the excellent flying field. Planes were in the air almost constantly. With so many models waiting to fly, the frequency congestion was the big problem. Green and White was so populated that the folks at the end of the wait list probably never did get a chance to fly. Those new frequencies will sure come in handy.

The facility looks like a natural for the Masters. With good crowd control and plenty of room, it will offer some definite advantages over Mile Square. With the cooperation of the Marines, we can project a major contest evolving from the already prospering Masters event. Important considerations, such as on-site housing, will play a major part in the complexion of the Masters. We have never known the Marines to do anything that wasn't first rate, and having them aboard as a big part of the Masters program can only be a positive factor.

Based on the UnContest, I'd say that our first cooperative efforts with the Marines was a mutually successful one. So, it looks as if the bad news of losing one of the best flying sites in the country wasn't all bad. The Marines helped take some of the sting out of what was personally felt as a real slap in the face. We can only say we hope that, someday, we can look back on such unfortunate situations and know that measures have been taken at the national level so that it will never have to happen again. □



Garland Hamilton's Spitfire, from the Holman plans. Garland was interviewed by the Marine newspaper, for a feature article. He's a Marine recruiter!



Rick Midthun's F4U Corsair.



Ryan STA, by Charles Richard, has functional cable control runs and working exhaust stacks.



Robert Kinne built this impeccable Gee Bee. Note wheel cover on tailwheel.

**Winner of the “Best of Show” trophy at last year’s
MACS Show, this JN-4D is true museum scale.**

By Ron Karwacky

J. R. Naidish photos



TROPHY~CLASS JENNY



In 1914, U.S. Army officials became very concerned over the poor safety record of the service's flying schools. The numerous crashes and fatalities were attributed to the inefficiency of the pusher type aircraft. The aft-mounted engines had a nasty habit of coming forward in a crash, usually obliterating the pilot and/or passenger.

The Army embarked on a program to encourage the manufacturers to develop tractor airplanes, with enclosed fuselages. Glenn Curtiss, of Hammondsport, New York, had already been working on such a concept before the ban on pushers took effect. He had decided that the most expedient thing to do was buy the needed knowledge, so he hired B. Douglas Thomas. Thomas had been a designer for Avro in England, and was with Sopwith at the time.

The first effort from the new designer was the J-1 Standard. It would use the Curtiss OX-5 eight-cylinder engine (90 hp). The proven Eiffel #36 airfoil was also incorpo-

rated. The first prototype was looked upon favorably by the Army brass, and production was begun under the new designation "JN." The letters soon became affectionately known as the "Jenny" by almost everyone.

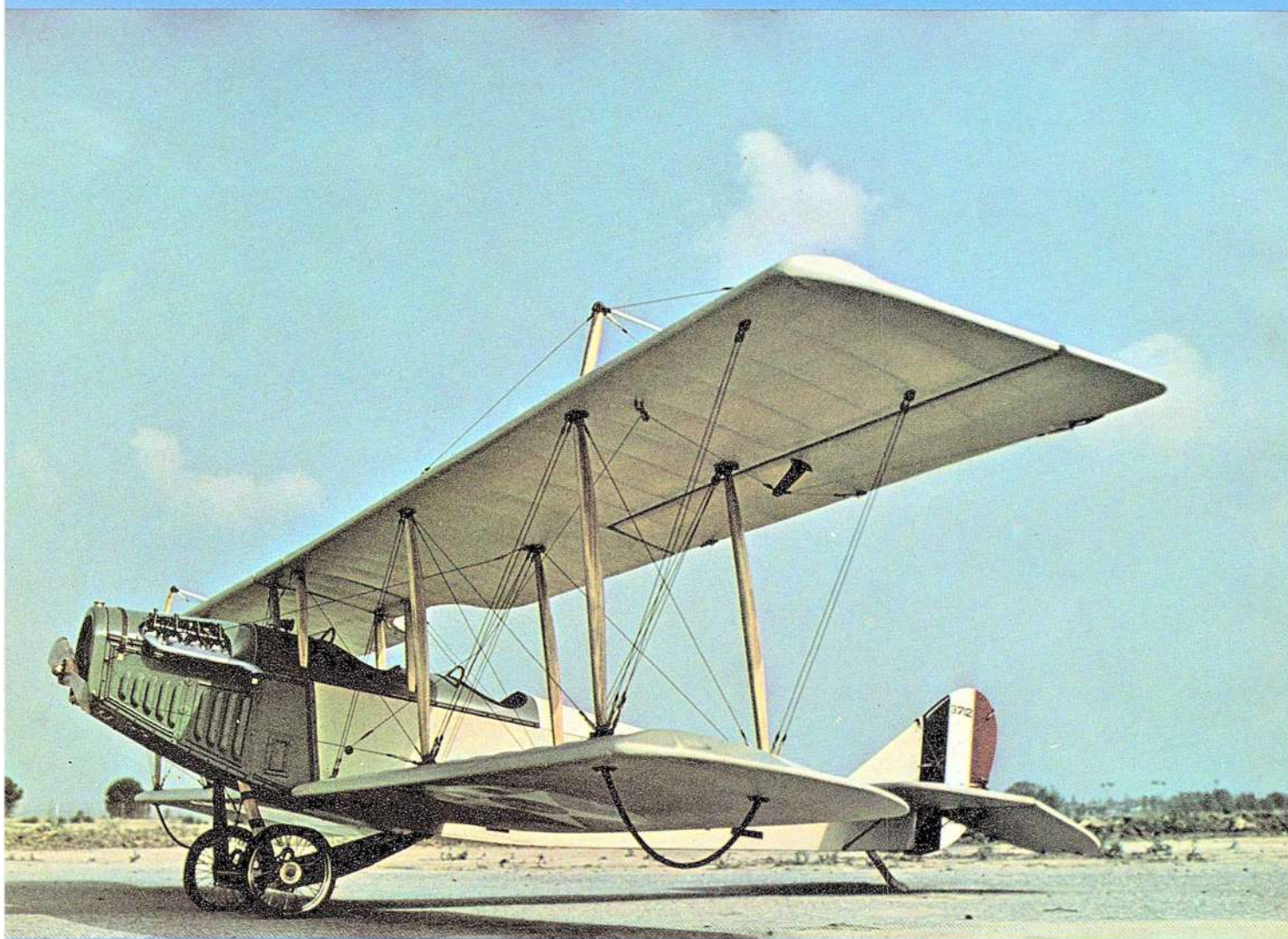
The plane handled well, and was updated several times. By 1917, the fourth variant was introduced . . . the redoubtable JN-4D. Of the almost 8,200 Jennies produced, 3,354 were the 4Ds. Curtiss and six other American companies actually manufactured the airframes for the Army. This was to be the Army's first-line trainer, but none were destined to see warfare. Both the Army and Navy kept them in the ranks until 1928, which was one heck of a long service career for this relatively primitive epoch of aviation.

We all know that the Jenny legend actually began after the war. Thousands of the crates were unloaded in salvage and auctions. Thus was born the era of barnstorming, where the Jenny was to really prove that she was no lady. Numerous

civilian pilots literally jumped into these rickety biplanes and taught themselves to fly. The original price tag from Curtiss was about \$5,100 (a fortune in those days), but anyone with the cash could take one away for as little as \$200. It has often been said that the unleashing of the Jennies onto the masses was the real reason behind the formation of the FAA. It didn't take long for the death tolls to soar from ill-equipped and maintained civilian Jennies, and the government felt that it had to intervene.

* * *

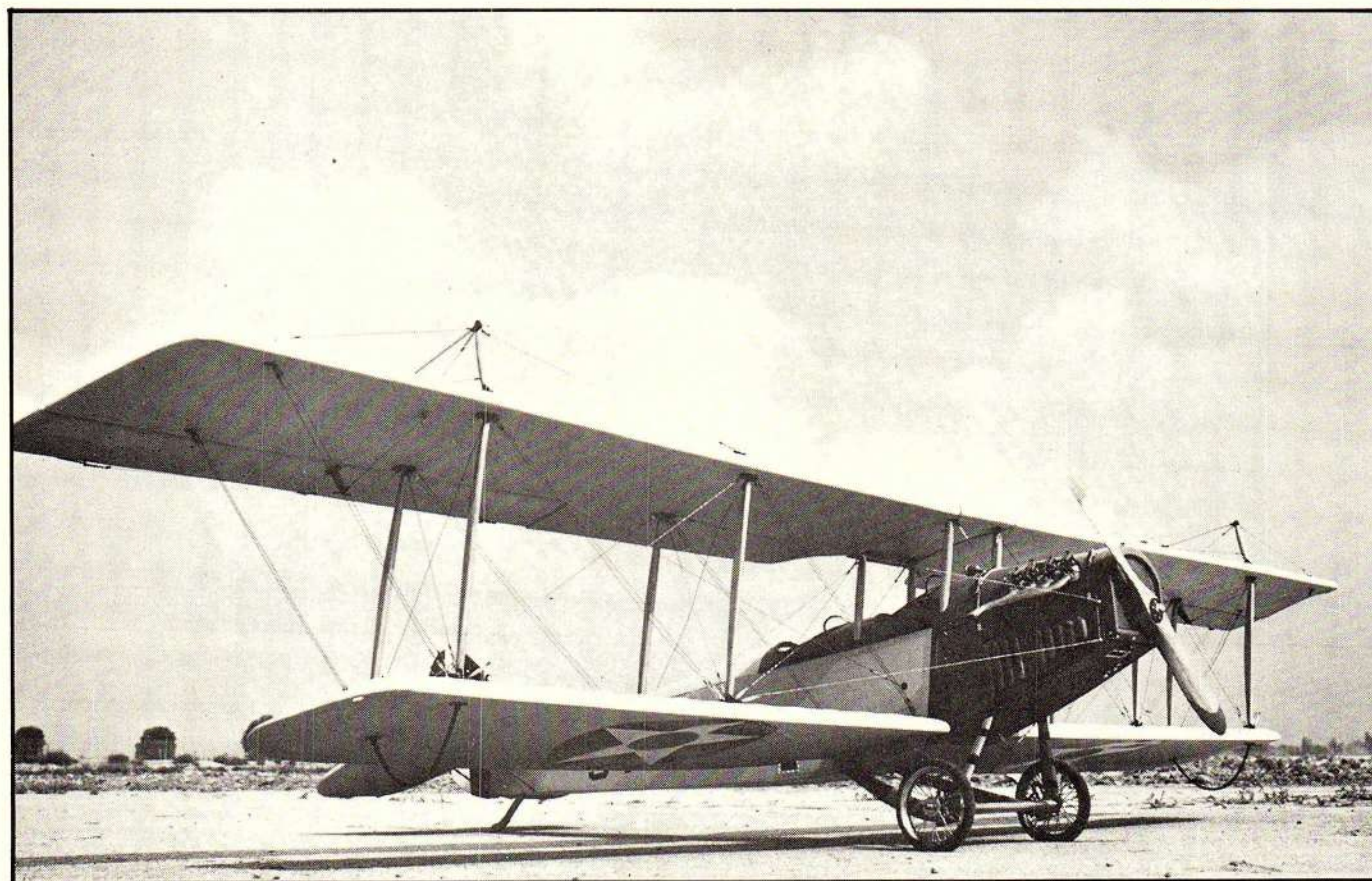
My love for the JN-4D is about the same as most modelers, verging on intense obsession. I am lucky enough to live nearby a beautifully restored Jenny, owned by Ray Folsom. The machine is hangared at Cable Airport, in Upland, California. This is a restoration of one of the original 96 machines delivered to the newly built Alessandro Airfield, later to be renamed March Field. The air-





Ray Folsom's restored Jenny, as it is currently seen at Flabob Airport.

The cockpit controls are fully functional, even to the miniature throttle advancing the carb on the diesel engine.



craft were delivered by rail, and some 250 soldiers helped assemble them in July of 1918.

I had been flying a Bud Nosen Jenny for over three years. The model has well over 360 flights on it, and is still going strong. "The Great Waldo Pepper" is powered by a Webra .91 four-cycle engine. The sound is a real crowd pleaser.

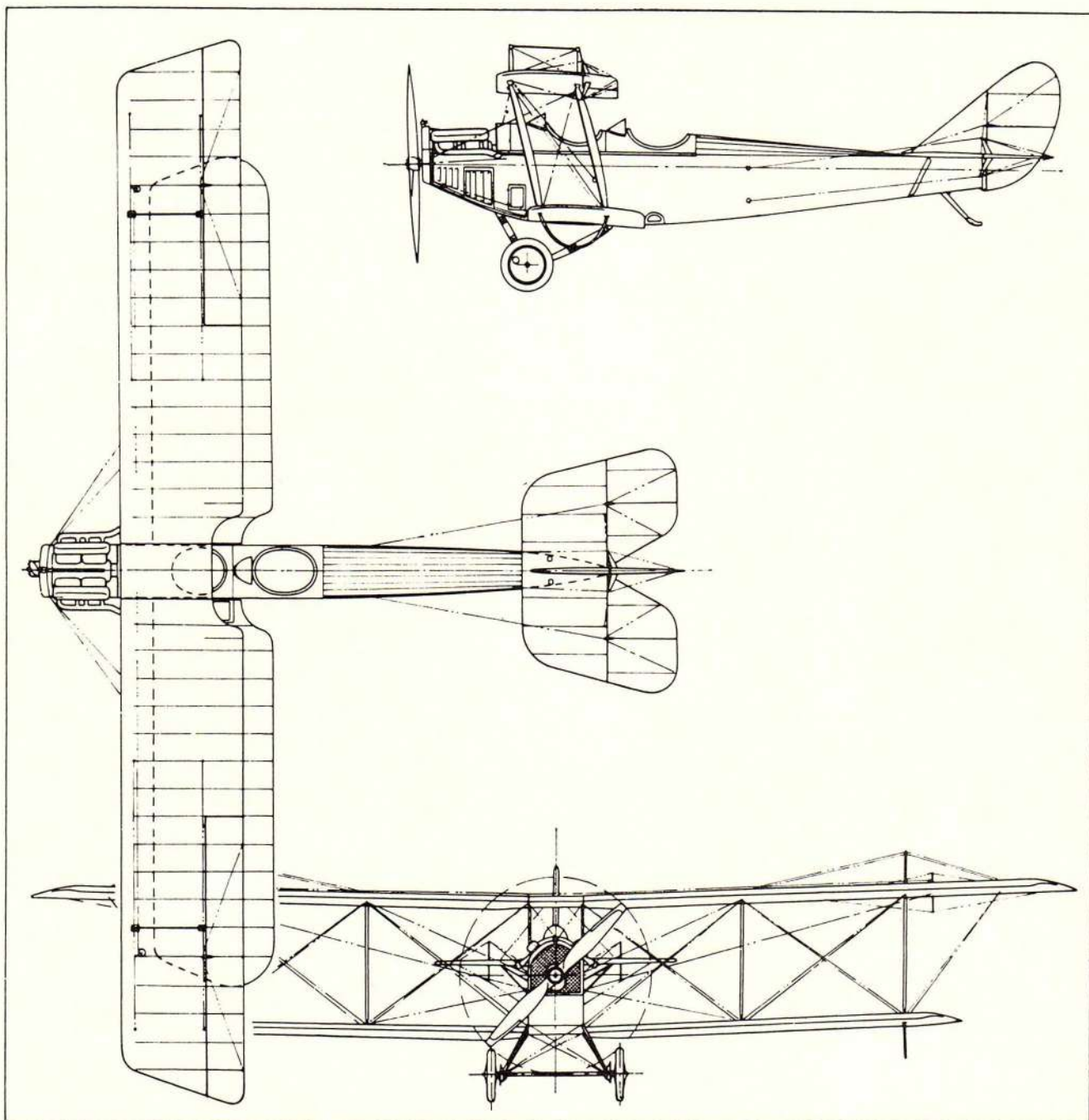
One day, during a visit to Jim Appleby's Antique Aeromotive at Flabob Airport (Riverside, California), I had an opportunity to see Ray Folsom's biplane. On the spot, I decided that this would be my next scale project. I sent to Lou Proctor for a copy of Ralph Beck's plans. I also fired off a request to the

Smithsonian (NASM) for a copy of Joe Nieto's Jenny drawings. When the Beck plans arrived, I decided that I'd prefer a larger model than the 1/6-scale version offered on the plans. I called upon my friend John Watson. Within two weeks, he had completely redrawn the Beck plans to the larger scale. For those interested in this larger format plan set, you can contact John directly (302 So. 2nd Avenue #6, Sand Point, ID 83864). If you are not familiar with the Beck drawings, they are a masterpiece, with every little detail accounted for, even the OX-5 engine.

My Jenny was not going to be just another model. I decided to

shoot for the moon with a full-blown museum quality airframe. Every built-up rib would be duplicated, every rigging wire and control cable. I didn't believe how major a construction project I had embarked on until I had done all of the 107 functional turnbuckles on the model, and rigged the 180 feet of wire which was used. These are all necessary to hold the plane together. It was said of the real Jenny that, if you put a pigeon between the wings and it got out, that there was a rigging wire missing somewhere!

I used instant glues throughout, to save weight. The only epoxy in the model is that used to seal the engine and tank area. The only





The author, his airplane, and the hardware. Taking Best of Show at the MACS is no mean feat, since the best models on the West Coast are in contention.

"cheating" I did was to substitute dowel rod for the brass rod bracing between the ribs. I also opted for dowel instead of bamboo in the fuselage. These are the only concessions made which keep the model from being an identical duplicate of the full-size machine.

The miniature OX-5 engine was an interesting challenge. I was originally going to make it from epoxy metal, poured into rubber molds. I later switched to antimony (pot metal) because it was easier to work. The molds were made from Dow Corning 3120 silicone casting compound. The hardest part was making all of the original components from which the molds were pulled.

All of the interwing struts, cabanes, kingposts and landing gear parts were made from .060 tempered aluminum, and covered with veneered pine. The entire model was covered with Coverite, and painted



The rigging and control runs used 180 feet of cable, and 107 turnbuckles!

Z-HINTS

#2

HOW TO MAKE "EPOXY SIZE" FILLETS IN SECONDS !

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1CA-

2 SPRAY
WITH
Z/P
KICKER

3 ALLOW
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with acrylic lacquer. Plenty of plasticizer was added so that the lacquer wouldn't crack and craze.

I desperately wanted to use a four-cycle engine, but I couldn't completely hide the head. I decided to use an O.S. .60 FSR, which was converted to diesel operation with the Davis head. I made a wood and fiberglass muffler for it, to help give a more realistic sound.

The cockpit has full working controls. Move the stick and the ailerons and elevators move. The rudder

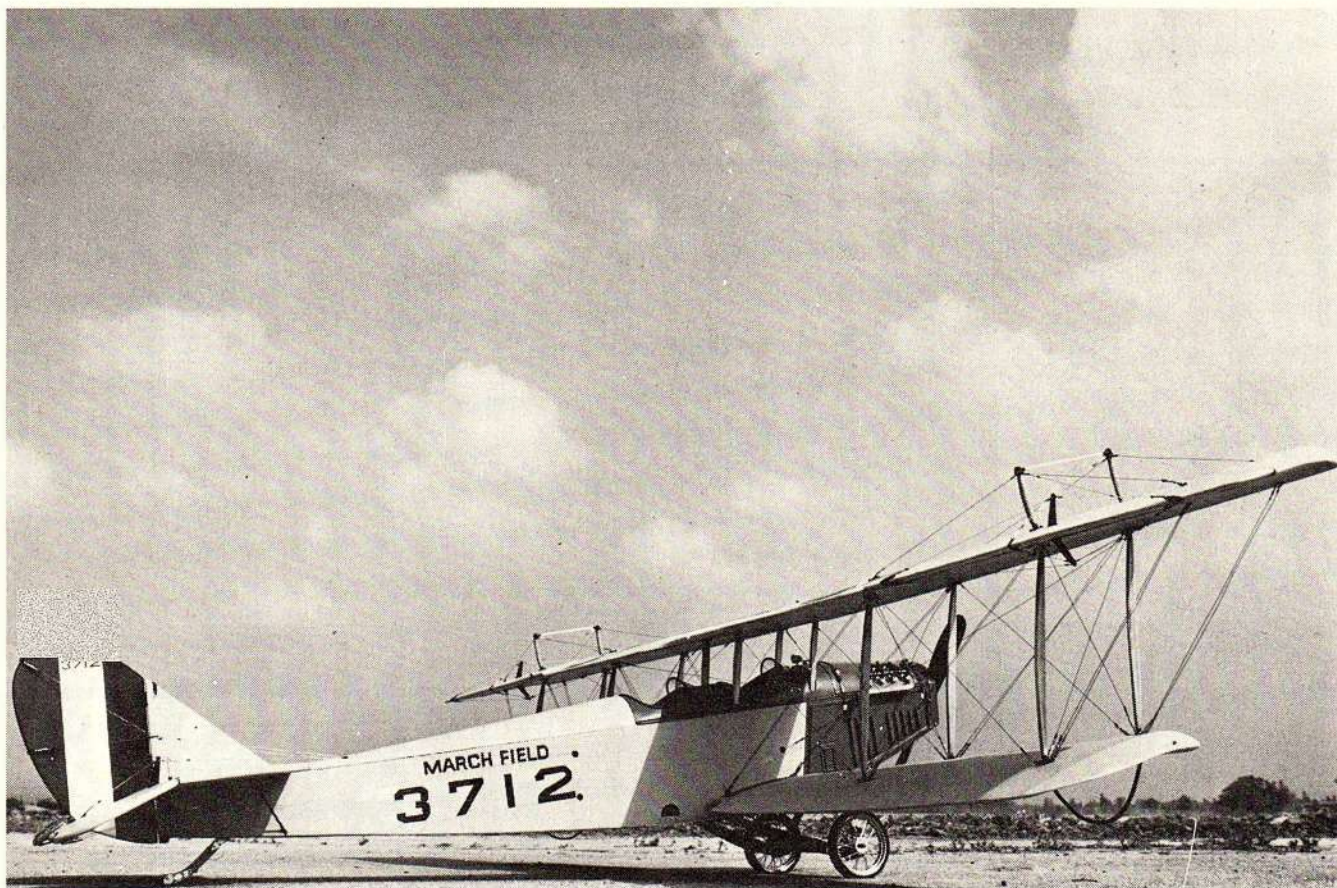
bars actuate the rudder, and the throttle is even positionable from the instrument panel.

The larger 1/5-scale format gives a 106" span model, which is happily big enough to make such intricate detailing slightly less painstaking than a smaller model would be. The fully ready-to-fly model weighs only 10 lbs., 4 ozs. So much for the myth that super-detailing has to add weight!

Did such an elaborate model take an eternity to build? Most modelers

Scaled up from the Beck drawings, this JN-4D spans 106".

guess at least two years, when they see the plane. In truth, it took only eight months to complete, which equates to about 950 man-hours of work. It seemed like a lot of labor at the time, but when I walked off with that huge Best of Show trophy from the MACS Show last year, the investment of time was suddenly all worthwhile. □



JENNY



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SENECA I





A gorgeous scratchbuilt twin that would make any modeler drool. A big 85" span machine, for two .40s.

By Gysgt. Garland Hamilton, USMC

J. R. Naidish photos





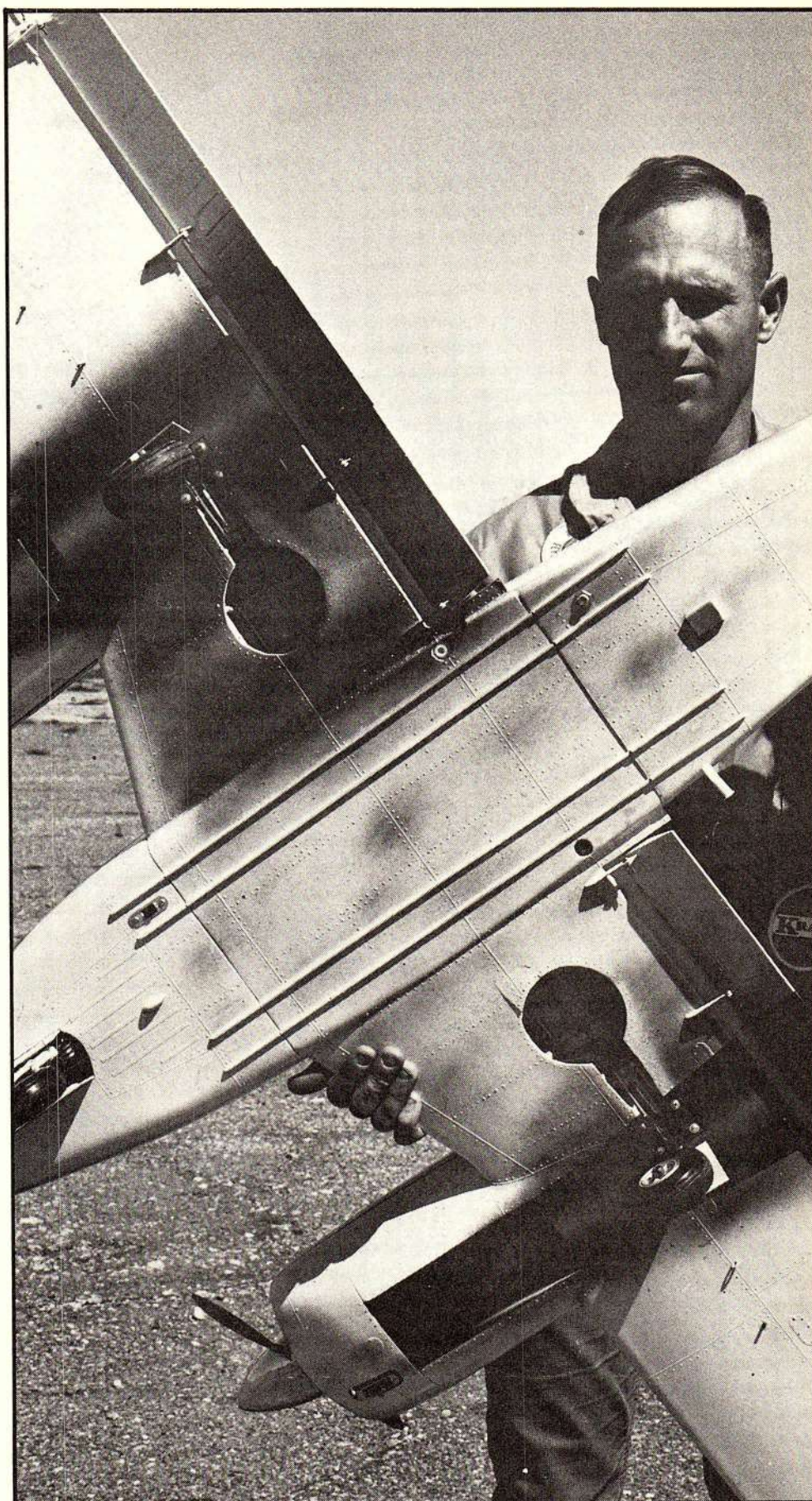
Twin-engine scale aircraft have always been such an "iffy" thing with most modelers. By that I mean that it will fly *if* the engines keep turning, and it will be perfectly safe *if* the props don't stop . . . just one "if" after another! Twins seem to be seasonal at contests. One season, they are everywhere, then the next season you don't see one. I can't account for why that is, but it always seems that way. One thing for sure, is that twin-engined models are very popular . . . whether they are ever built and flown or not. That may not make much sense, but the late Hal Osborne constantly reaffirmed that statement by noting that the best selling plan in his repertoire was the Piper Navajo Chieftain. Even some eight years after its original publication in *Scale R/C Modeler*, it was still the leader of the pack and being ordered on a weekly basis.

We'll never know how many of those plan sets were ever converted to actual models, but that doesn't really matter. What is important is that the modelers love twins. There's something almost magical about them, I'll confess. I can't quite put my finger on what it is, exactly. Maybe it's the racey lines of the long nacelles, or perhaps the raw power from those twin props . . . or maybe even the element of danger inherent in any twin is what attracts us.

I'd like to say that it was any or all of the above which drew me into my Piper Seneca II project. In truth, I was commissioned to build the model by the owner of the full-size Seneca. I guess I could have said no to the deal, so maybe there was some sort of magical attraction. I had never tackled such a large model, nor had I scratchbuilt anything so complex or different. I wanted to explore this region of modeling, and here was a chance to do so without too many elements of risk . . . after all, I'd be paid for my work. The one catch was that the model had to be proven airworthy before I got the check! I couldn't cop out and build a "Toledo Special," which had all the paraphernalia inside, but really would never take wing.

For the record, the Seneca II spans 85", with a wing area of 1,030 sq. in. It's designed for two .40s, and is 1:5.5" scale. The plans are very professionally done, and easy to use. They are now available from: Hobby Horn, 15173 Moran Street (S), P.O. Box 2212, Westminster, CA 92683. Phone (714) 893-8311.

With the obvious warning that this is not a beginner's project, let's



The author shows the detailed underside of the model. Note that the oil leak from the left engine is accurately portrayed on the model.

get into the construction details. I will cover these at some length because there are lots of details in building so complex a model which should be discussed. If you have no interest in the construction notes, I'd suggest that you flip to the flight report, to find out whether I completed the project successfully and was able to flight qualify the Seneca. Let's just say here that all of the static shots shown in this article were taken before that first flight attempt.

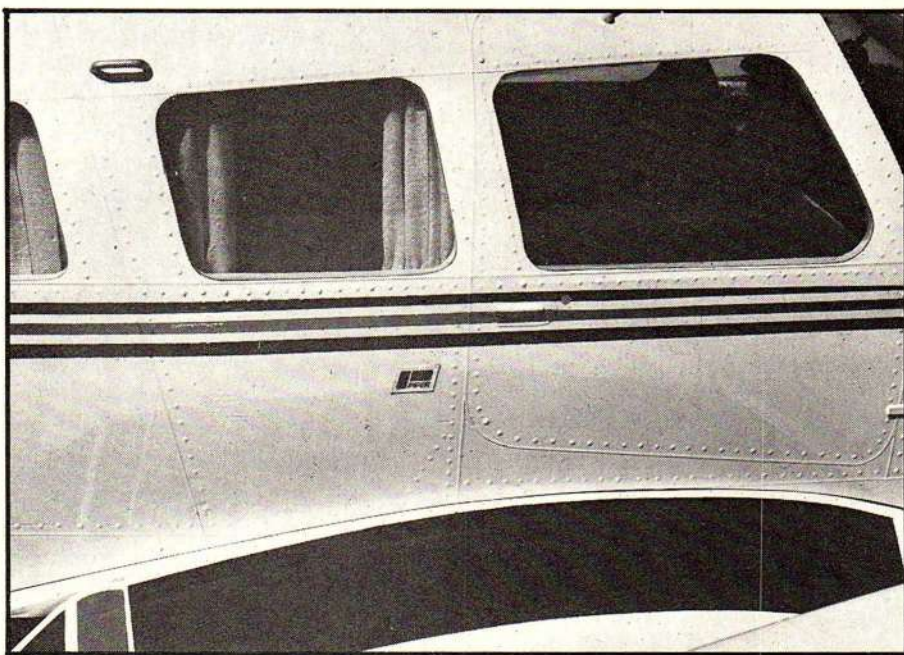
Let me start the building sequence with a hint. When you order the plan set, see if Hobby Horn can supply you with a reversed print of the fuselage views. The fuse is built in two halves, split longitudinally for right and left sides. Having the opposite plan view greatly expedites this procedure. The fuse views are laid side by side, and all of the 1/8" balsa formers are pinned down over the plans. The project begins to look as if you are building the hulls of two boats. Be sure all formers are at 90 degrees to the work surface. After placing the cabin framing and wing crutches in place, I found that several of the formers were undersized. I eventually resorted to using a piece of 1/4 x 1 1/2" balsa as a contour guide, to make sure that the formers flowed together in a smooth line. You'll find that F-3 through F-9, and F-27 through F-33 need to be built up and resanded to a better contour.

I opted for longerons where the sides meet the top and bottom planking, to facilitate shaping the fuse. Once the fuse is sanded to shape, the entire structure is planked. Only after the entire structure is sheeted and dried should the shells be removed from the boards. Take your time when aligning the two halves, and be careful not to build in a twist. When everything looks right, glue the halves together. Cyanoacrylate glues are a lifesaver in situations like this.

The cabin floor should be installed next. Fit the nose gear unit at this time, to save hassles later. I decided to build up the empennage and fix it to the fuselage at this point. Because the structure is so big, you may want to only test fit the stabs and fin, and finalize the attachment later. The nose cone should be fitted and shaped at this point.

The only way to construct the wing is in three sections, with a center panel, and the outboard sections. Remember to build 3/8" wash-out in each wing. The flaps and aileron sections are built up. They should be prepared at this time, but

46 scale r/c modeler



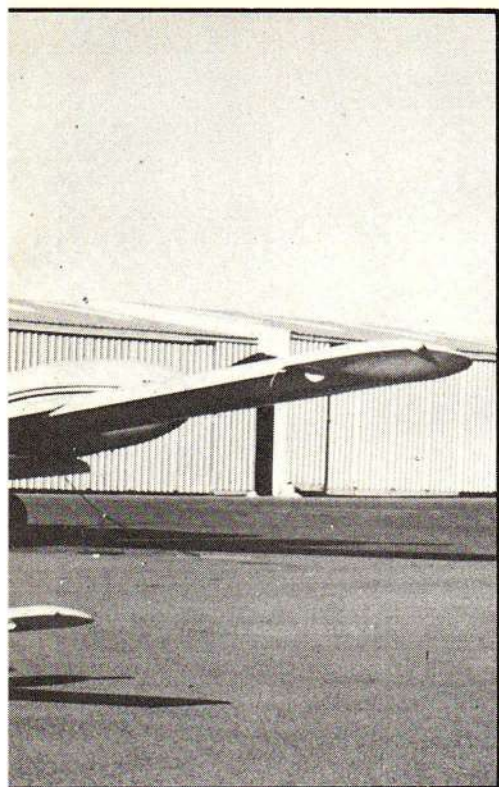
the top skins are left off. Join the three sections, then fit the nacelle crutches. Be sure that they are at 90 degrees to the wing and have neither up nor down thrust. Set up the retract arrangements at this point.

The ailerons and flaps are bell-crank actuated, so mount the linkages. Once everything is done, the bottom wing sheeting can be added.

The aileron and flap movements are done on scale hinges. These are made from phenolic material. I used 3/32" PC board material and cut the necessary pieces on a Dremel saw. The smaller hinge pieces were

cut from 1/16" K&S aluminum sheet stock. I drilled small holes in the hinges to improve glue adhesion when they were installed. Tack glue everything in place and do a test fitting before finalizing the installation with epoxy.

The nacelles are actually miniature fuselages, each mounting an engine. They should be treated as such, with good solid construction techniques throughout. Always check alignment, especially when installing the formers and motor mounts. Fit the fuel tanks carefully, making sure that the plumbing is flawless. The engines must be 100 percent reliable,



The miniature and the master are, at last, together. The author even measured the distance between the rivets on the real airplane to insure the accuracy of the model. (Hamilton photo)

so don't take any short cuts here. If you are going to use any form of throttle synchronizer or automatic ignition system, install and check them now. Make sure that the throttle linkages don't bind and deliver equal carb barrel travels to both engines. Check, then double check. Only after everything is working flawlessly should the sheeting be applied.

I elected to go with carved balsa cowl, instead of taking the extra time to make fiberglass ones. A 1/8" ply ring and two screws attach the cowl to the firewalls. Use the spin-

ner backplate for reference when shaping the cowl. Use a one-inch thick block behind the spinner, and two 3/4" chunks along the intakes are used to get the proper shape of the cowl. Add blocks as needed until the correct shape is achieved.

The Seneca uses a full flying stab. The stab is glued together over the plans, but the two center ribs should be temporarily omitted. The trim tab should be temporarily spot glued in place. The trim tab helps support the two halves during the fitting process. The stabs are slipped onto the pivot bars and the center ribs are fitted to get a close tolerance with the fuse. Brass strips were made to fit against the second rib from the center. Some small holes should be made to reinforce the glue joint. Align the stabs on the fuse, using the brass strips to help get a neutral setting on the stabs and pivot bar references. By silver soldering a wheel collar to each of the brass strips, the stabs can easily be slid on and off of the pivot bars, and secured in place. A small access hole should be left on the underside of the stabs, to allow access to the wheel collars.

The finished model was sanded overall and any imperfections filled. I use glass cloth (.6 oz.) and K&B clear paint (with gloss hardener), instead of using surfacing resins. This method gives ample filling and strength, yet I don't have to rush to get the material in place. I don't put any thinner into the paint, and I feel that this system gives a lighter finish than the resin method. The paint begins to set up on the model within 15-20 minutes, yet the pot life is hours. After the first coat dries, trim away excess cloth and give a very light sanding overall. Then apply a second coat of paint, after which everything should be wet sanded with 220 and 320 paper.

One of the little inconveniences of scratchbuilding is having to make your own canopies. Wood blocks are glued into the windshield area, sanded to shape, and filled to remove any imperfections. Use a thin piece of acetate to trace the window patterns off the plans. Slightly score the surface with a ball point pen when marking the windows on the model. These scribe marks will make referencing the molded plastic windows easier later.

Once the windshield has been sealed with K&B Primer and sanded smooth, the butyrate parts can be formed. I used Sig's .040" plastic sheet stock for the windshield, and .030" material for the side windows. The procedure is very easy. Staple the butyrate to a couple of scrap plastic blocks which will serve as handles. Get all the dust off the plastic, as well as clean the area to be molded. Heat the kitchen oven to 250 degrees. Hold the plastic in the oven until it begins to sag and flow (remember to wear mitts). If the pull doesn't come out right, you can simply reheat it.

Once the plastic looks right, quickly pull it down firmly over the appropriate area on the model. Hold a minute while the plastic cools, and it's done. If you make a thin outline around the windshield area on the model using thin drafting tape, you'll be able to see where to trim the plastic. The same procedures are used for the side windows. Again, the slight ball point pen scribe-lines will show up in the plastic and serve as trim guides. I tinted all of the windows (per the prototype) using Charcoal Gray Rit dye and semi-hot water. Be sure to wash the pieces with soap to remove fingerprints before dyeing them. The windows will always lighten a few shades out in the sun.

Trimming and fitting the windows

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QK-2

KIORITZ & KAWASAKI MUFFLERS



QK-15

QK-1

.90-.91. ENGINE MOUNT



QK-1 (MAX .90)

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The Seneca is a huge model, with an 85" span. Two .40s flew it easily at half throttle.

is an exacting process. I recessed the edges of the window frames, so that each plastic piece fit flush with the fuselage sides. I then applied Scotch tape over the entire window, and carefully trimmed each window so that a lip was left around each win-

dow. Auto putty is filled around the outside edges of the tape, to bring it into contour with the fuse sides. When done, each window looks properly recessed by the thickness of the tape. The cockpit detailing can either be done before the windshield is put in place, or the entire cockpit can be executed as a module, and installed from the wing saddle area.

After a good coat of primer was applied and sanded back off, the scale detailing was done. I spent a lot of time doing stab and flap cor-

regations, antennas, door handles, etc. My task was to deliver an exact museum-quality replica of the Seneca II to its owner, so I really went all out with the goodies. I worked from the full-size aircraft, measuring distances between rivets and the like. Transfer lettering would be used for all aircraft markings. The nav and running lights were made operational with grain of wheat bulbs. The paint was from Piper, and I even simulated the left engine's oil leakage.

(Continued on page 73)

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SUPERLATIVE CHIPMUNK

**A 1/4-Scale rendition of a world-class
aerobatic machine which has all of the
performance of the full-size aircraft.**

By Larry Jolly J. R. Naidish photos



Aerobatics!

The word sends chills up my spine just to see it in print. It's an adrenaline word. The heart beats faster and you feel a little giddy as the sensations related to aerobatics flow through your body. High Gs slamming you down in the seat, your neck being compressed and the jaw sagging. Debris floating in the cockpit as the forces turn to negative. The blood in your head straining behind the eyeballs in an outside snap! The fingers tingle on the stick through the Lomcevák, and it takes several seconds to reorient to the horizon after the violent maneuver.

All of these sensations and more . . . and I've never been in a full-size aerobatic aircraft in my life. But, my imagination takes care of the gap in my real-life experiences, as I haul back on the stick of my transmitter and put my quarter-scale Super Chipmunk through its paces.

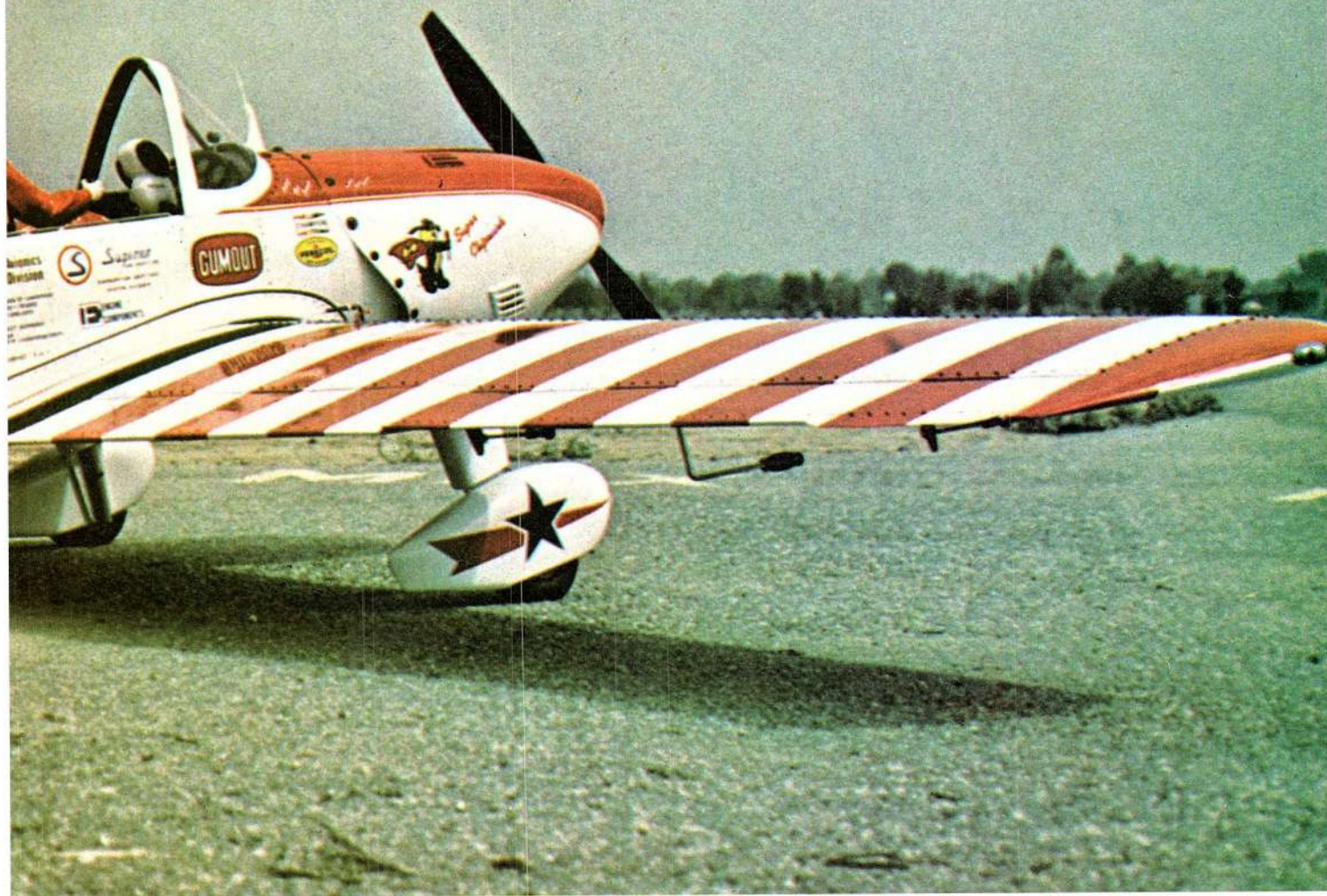
You only have to look at the colorful decorated Scholl Super Chipmunk to know that there's excitement on the wing. The red, white and blue paint scheme suggests the same color designs found on roller coasters, Evel Knievel's vehicles, racing cars and boats, etc. Even sitting on the ramp, the plane makes a statement about speed, performance and thrills.

Surprisingly, the Chipmunk didn't start its life as anything more than a mundane military trainer . . . a hack machine to get tyro fighter pilots around the patch in one piece. The de Havilland D.H.C.1 Chipmunk was the first de Havilland plane to be wholly designed and built outside of England. The Canadian branch office fabricated the machine to fill the need for a basic trainer for the RCAF. Other than having relatively clean lines for a trainer, the Chipmunk was nothing

exemplary. The 145 hp Gipsy Major in-line engine gave adequate power for rudimentary maneuvers, but no one ever dreamed that the machine had the potential to outclass the custom-built Yaks and Zlins in international aerobatic competition.

The Chipmunk was a stable airplane. It gave the fledgling pilot a sense of security to fly it. The first airframe took wing in 1946 and, eventually, over 1,200 of them were to be built. Over a dozen countries flew them, from Ireland to Iraq, and they were even manufactured under license in Portugal.

When they were declared surplus in the late 'fifties, the plane was still an unrecognized commodity. Some were converted to ag planes, equipped with spray tubes. The Aerostructures Sundowner sport single seater was the only attempt to bring the aircraft's true potentials to light, but the project never got very far.



As with most surplus aircraft, most of the Chipmunks were bought up by scrap dealers, or they were cannibalized for parts. Hardly the start of a glorious career as an advanced aerobatic airplane!

When the first World Aerobatic Championships was held in Czechoslovakia in 1960, the entire aviation

world began to pay attention to stunt flying as a profession. The United States started off with a definite handicap, for there simply were no world-class airplanes available in this country which could compare to the Zlin (and later Yaks). Sure, the Pitts Special had been around for decades, but a small biplane didn't seem like the right design for the maneuvers.

Art Scholl, who was already establishing a name for himself in aerobatic circles, stumbled upon the Chipmunk. Several pilots had upgraded the engine and had commented on the performance of the plane in doing maneuvers. The stock D.H.C.1 could hit 138 mph on 145 hp, so upping the horsepower to 200 or more really gave the plane some clout. Weighing only 2,000 lbs. the loading was light enough so that the ship could really haul in the vertical axis.

Scholl wasn't the only aerobatic pilot to experiment with the Chipmunk. Hal Krier flew a Ranger 200 hp version, and was the national champion in 1965/68. Except for the

engine mod, Krier flew the plane basically stock. The gear was fixed, so one can imagine what the drag bucket was.

But it was Scholl who, in 1966, took the potential of the Chipmunk, and maximized it. The machine got a relatively major overhaul. The gear was made to rotate back into the wing, the wing tips were clipped, and the vertical fin was enlarged to facilitate knife edge and hammerhead maneuvers.

The sunburst-bedecked Penzoil Chipmunk was soon joined by another, piloted by Skip Volk. Art and Skip thrilled thousands of spectators at air shows doing their famed back-to-back loops. Skip would go inverted, and join up with Scholl's Chipmunk so that the canopies and fins were almost touching. Thus mated, they would do a big open loop together . . . a true test of pilot skill and concentration. The Chipmunk was now referred to as the "Super Chipmunk" in aerobatic circles. It was getting publicity in all of the major aviation magazines, and was being touted as the great U.S.

Our cover girl, Chris Casados, with the super-sized Super Chipmunk.



hope on the international scene. The plane, and perhaps its pilot, had reached their peak at the 1970 World Championships, in England. Scholl's mount sported a 260 hp Lycoming under the modified cowl.

An extensive lightening project had kept the Super Chipmunk's weight down to 2,000 pounds (gross). The plane had a rate-of-climb of 2,500 fpm. Only three planes in the competition boasted better rates of climb. The Chipmunk had over double the rate of climb of some of the Zlins, and the Yak 18PM had only 1,968 fpm.

Scholl's routine was most spectacular in the Unlimited segment. There was a brain-bending Snap Roll, a big open Cuban-8, then a Vertical-8 (a sheer power maneuver), then an Outside Spin, Hammerhead Turn, 8-Point Roll, Tail Slide, and Inverted Ribbon Cut (cutting a banner strung between two poles). As if these weren't enough, Art threw in a Lomcevak and a terrific loop with a full snap at the top! It was the kind of routine which any judge would love, and which could put any spectator on the edge of his seat.

Ironically, the maneuvers had their own inherent shortcoming. The Vertical-8, Spins, Tail Slide and Lomcevak are maneuvers which require a lot of altitude loss when executed well. Unfortunately, Scholl was repeatedly downgraded for flying below the mandatory maneuver box area. That year, the U.S. finally did place in the money, but it was Charlie Hillard in an Akromaster who took third place. The Chipmunk was never to really achieve its full potential.

The Chipmunk is not a new airplane to R/C scale. Sig modeled the Krier version in kit form, and Jack Stafford had a sport/racer kit of the Chipmunk. But, these kits are dwarfed (both dimensionally and figuratively) by the Don's Custom Models giant-scale rendition. This design was one of the most popular entries at last year's Circus/Circus Tournament of Champions . . . the Chipmunk again is finding itself at home in its natural element of precision aerobatics.

I must admit that my experience with the big Chipmunk started out with a rather skeptical attitude. I saw John Bashore's beautiful presentation of the kit. John did it to perfection, with a full cockpit (including sliding canopy), rivet detail, etc. I had to acknowledge that it was one of the most convincing and beautiful scale projects I had ever seen.

Don happened to be on hand for



Loaded with decals, the Super Chipmunk makes a striking display wherever it is shown.



John Bashore really loaded down the model with scale detailing. Even the canopy slides, yet the model just weighs slightly over 20 pounds.



Off on another aerobatic flight, the Chipmunk can hold its own with the best of them. The preferred airplane at last year's Circus/Circus Tournament.

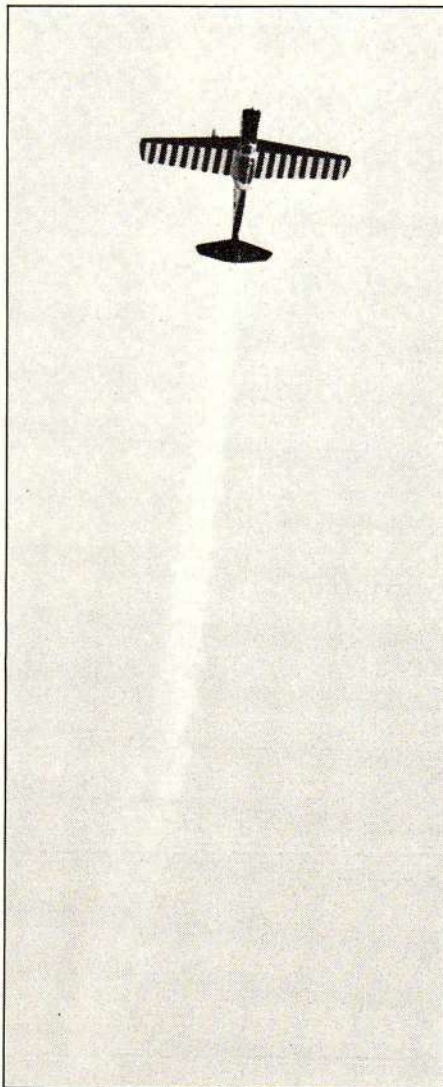


John did a great job on the paint scheme, with Super Poxys paints. Later flights were made with red, white and blue smoke systems on board.

the big unveiling, and he was thrilled with the prospects for the kit. He asked my opinion, and I guess that I'm oftentimes too candid. I confessed that I was frankly skeptical of the model's flight potentials. I had seen chain saw powered monster models. The lighter types of machines, such as the Mr. Mulligans, flew fine; but every high performance design has been somewhat of a lumbering slow poke. I admitted to Don that, given the choice, I'd probably pass on this project.

My remarks seem to just roll off Don's back. Undaunted, he merely insisted that I show up for some practice sessions the next weekend. Since I had already stuck my foot in my mouth, I figured the only way to keep peace would be to spend a couple of hours watching this underpowered whale wallow around in the sky. At least we had a top-notch pilot in John, who could handle a heavy and lumbering model safely.

When I arrived, the flight crew was already set up and ready. We made some small talk about the airplane, and again, I commented that the plane was rather large for the Kioritz engine under the cowl. The Super Chipmunk spans a very generous 101", making it one of the largest kit models. It just looked like too much airplane for the power available. The machine tips the scale in the 20 pound range, and I had yet to see any model at that weight



The vertical potentials of the Chipmunk are amazing. This climb out was done over the high desert at Las Vegas.

even do a decent loop, yet alone aerobatics.

John got ready, and Don fired up the Kioritz. I noticed that the engine was really humming. Don was maintaining a rather low profile. I could not tell whether it was because I had insulted his pet project, or whether he had something up his sleeve.

I should have known better, for Don is not a bluffer. The Chipmunk taxied out, and began its takeoff roll. Within five feet the tail was off. John let the model roll for about 75 feet on the mains, then he hauled it off. My heart leapt to my throat. The big model's nose came up sharply. "Look out!" I was about to yell. Get that nose down, or it will stall and snap for sure!

By the time I had shut one eye and braced myself for the inevitable crash, the Chipmunk had climbed to about 15 feet. It was still hanging on the prop. Then, as slick as could be, the model did a perfect snap roll and continued to climb out on a more shallow heading. With a look of astonishment, I shot a glance at Don. He and John were just standing there with the biggest grins I've ever seen. I had been had!

John then proceeded to present the most mind-boggling display of aerobatics I have ever witnessed. The Chipmunk had a Harris smoke system installed, so each maneuver was embellished with plumes of the white stuff.

John did some loops and rolls. The model grooved beautifully. The power was definitely there for most any maneuver. This was a real re-

versal of my opinion of giant-scale aircraft. This model flew more like a .60-sized Pattern ship. It was fast as a bullet, and could climb like a homesick angel.

Since I was familiar with the full-size Scholl Super Chipmunk, I began to call out maneuvers from his Aresti diagram.

"How about an Eight-Point Roll?"

The Chipmunk hit each point as if it was computer programmed.

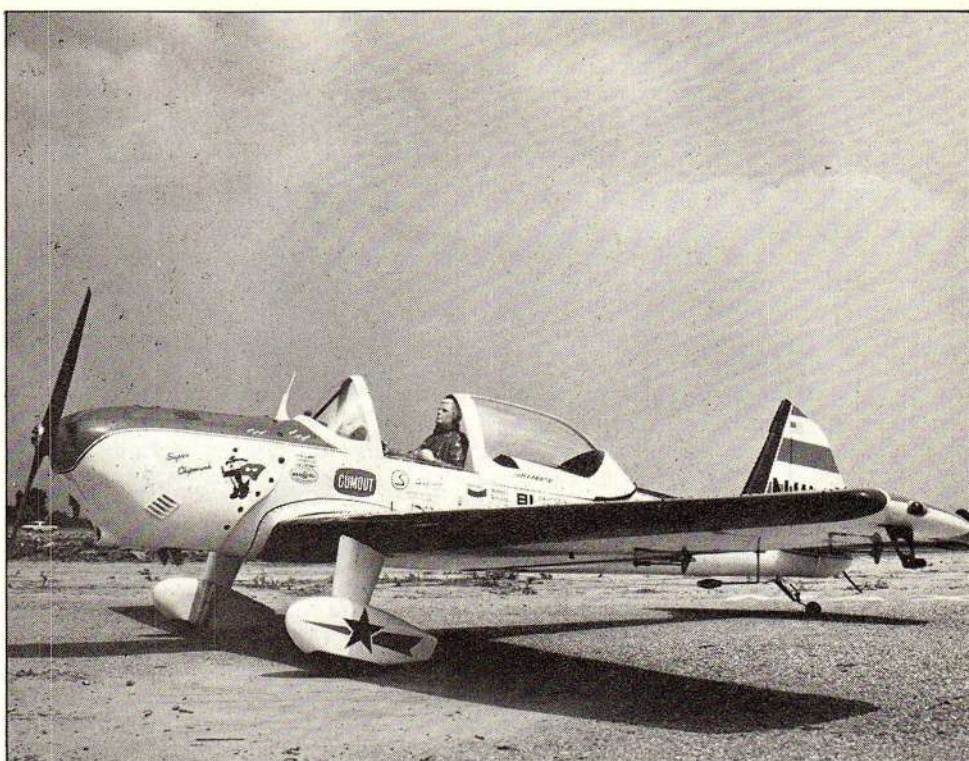
"Let's see the Cuban-8," I escalated the difficulty factor for the model.

John proceeded to do not only a regular Cuban, but also a reverse. My mouth was open wide, but John outdid even that by embellishing the maneuver with snaps at both tops!

That answered the loop-with-the-snap question, in fine style. Without much prompting, John then did the Hammerhead, spins and some other maneuvers of his own invention.

Seeing that the Chipmunk was capable of playing hard ball in the aerobatics game, I requested just two more maneuvers . . . the Vertical-8 and the Lomcevak. I figured that I had stopped John cold.

With plenty of altitude, the Chipmunk went up and over into a loop.



A model anyone would be proud of. Two control horns are used on the ailerons, as well as the counterbalances, to help combat the tremendous loads imposed by aerobatics.

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At the bottom, the machine entered the outside loop, and returned to heading perfectly. The loops were big and open, and started from level flight. The Lomcevak happened so fast that I almost missed it. I've never seen a model so quick in the snapping modes as this one. It looks as if it is going to turn itself inside-out.

I had to admit that there really wasn't an aerobatic maneuver that the Chipmunk couldn't complete. As the plane settled in for a greaser of a landing, Don asked my opinion. You talk about egg on one's face and eating some crow! I was almost apologetic in my explanation. After all, big airplanes aren't supposed to fly that well. Within minutes, I began to sound as if I was a salesman for Don. I was touting the virtues of the plane to everyone within ear shot.

The next flight found me at the sticks. What I had only seen on the previous flight was now translated into the full gamut of sensations which can only be experienced when flying aerobatics with a high-performance aircraft. I now could really appreciate the precision of the model. John had it trimmed to perfection, and I could really experience the agility and smoothness of the control response. The control axes were well balanced. The ailerons were light and fast, and the elevator was just right . . . not too heavy, nor too quick. The rudder response was instantaneous, too. The model was actually a joy to fly.

By the time I landed, I was so impressed with the airplane that I took out my checkbook and ordered a kit right on the spot! Don remarked that it was strange that I showed

up that day expecting to see a loser, and I was leaving as an owner of the kit!

I had to admit that it was rare to see a model which could serve double duty so well. The Chipmunk was tricked out with every bit of scale detail, and would surely score high in any contest. Yet, it was so good a flier that it would be right up there at any aerobatic meet. One model actually had the best of both worlds.

Don personally delivered the kit, not wanting to miss a further chance to rib me about the events of the previous weekend. He admitted that I wasn't the first skeptic to get the starch taken out of him by a demo flight, and that the kit was selling so well by word of mouth that he was already being beset with orders . . . and he hadn't even advertised it yet.

There were plans to drop the new Contempo Magnum in the Chipmunk and take it to Las Vegas for both the Q.S.A.A. and Tournament of Champions meets. Several of the country's top pilots had already placed orders for kits for the Tournament event. As it later turned out, there were more Super Chipmunks at the Championships than any other aircraft type.

The kit itself is the essence of simplicity. It looks like an overgrown Bridi kit. There's an epoxy/glass fuse, cowl, wheel pants, tail cone and canopy frame. The flying surfaces are foam, and all of the necessary wood is supplied. There are full-size plans, and even mylar decals to do the Scholl paint scheme. Even documentation photos from Dale Willoughby's Scale Model Research company are supplied.

The model goes together quickly,

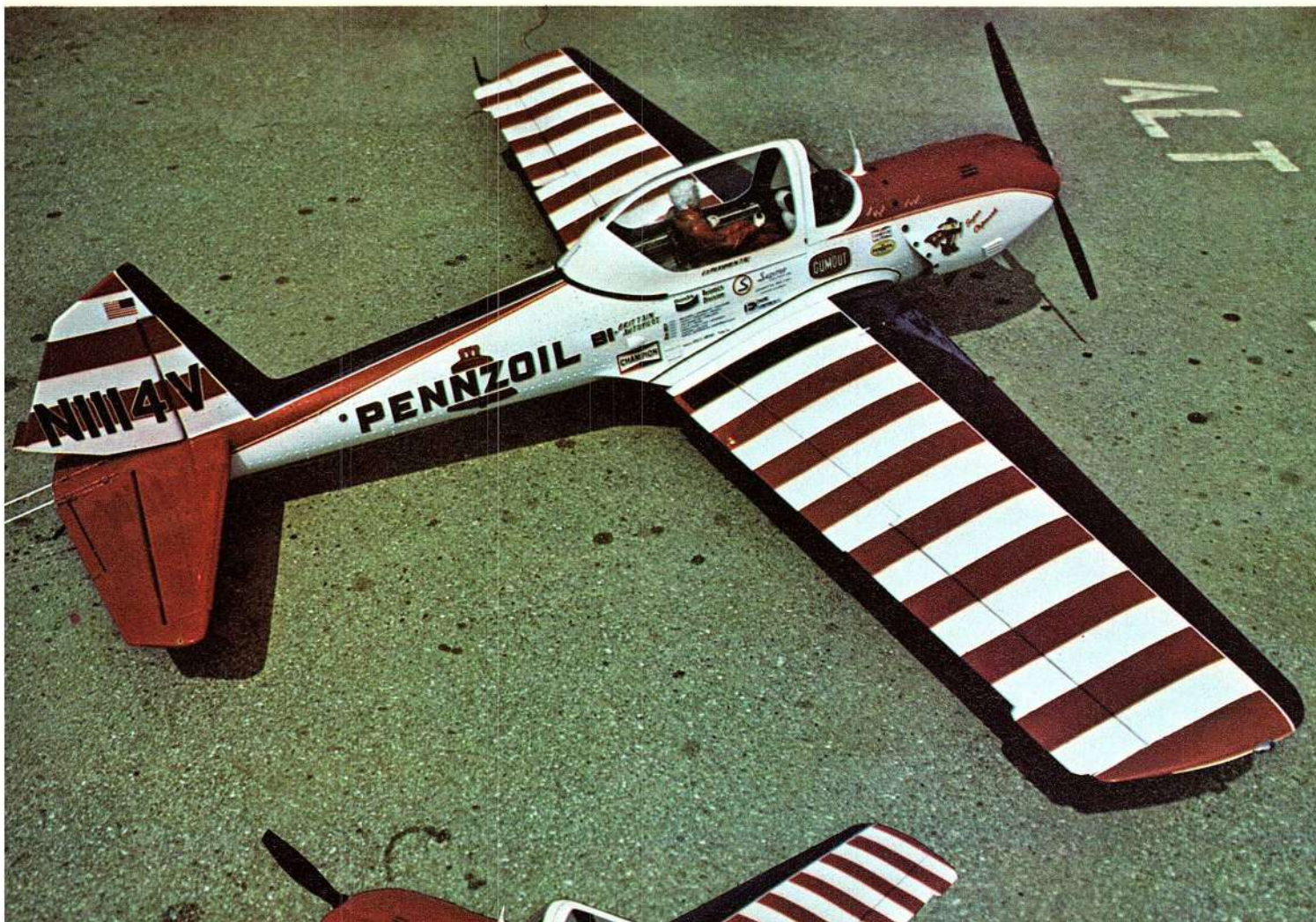
and there are no tricky procedures. If you have had any experience with glass and foam kits, this one will hold no surprises. Note that the model is of the earlier fixed gear version of the Scholl machine, so that there's no fuss with retracts. Because of the quality of the glass work, it's possible to fully detail the model, and still come out with an airframe which weighs about 20 pounds.

I'm not going to let any of you mislead yourselves into thinking that you can drop your trusty Quadra into the Chipmunk and go out and fly up a storm. A high-performance engine is necessary to get the vertical capabilities out of the model. The Kioritz and Magnum have proven to work well, and the Dario hopped-up Quadra should also work fine. Most of the pilots at the Tournament of Champions had their engines "tweaked" by one or another of the professional engine men in the country, but the average weekend pilot need not get so elaborate. Very good performance is available with stock Magnums or Kiortizes.

The kit is not cheap. The \$329 price tag is pretty much in keeping for comparable kits, and I think that you are getting some of the best glass work around in Don's kit. The model can only be ordered factory-direct from: Don's Custom Models, 18101 Redondo Circle, Unit O, Huntington Beach, CA 92648. Phone (714) 848-6244.

I predict that the Super Chipmunk will be the aerobatic model to watch in the coming flying season. Once you have built and flown one, you'll agree that there just aren't enough superlatives to heap on this superlative Super Chipmunk. □





Aviation Album

This section of *Scale R/C Modeler* is dedicated to you, the talented craftsmen who build those beautiful scale ships. You are invited to submit photos of your latest project for publication. Here is an opportunity to show the world your skills, and to allow those who most appreciate the time and effort involved in executing a scale subject to see that you have met the challenge.

Photos must be either black-and-whites, or color slides (no Polaroids). Please send relevant information and statistics about the model. We'll pay \$5 per photo published. Send your best shots to: "Aviation Album," *Scale R/C Modeler*, 7950 Deering Avenue, Canoga Park, California 91304.



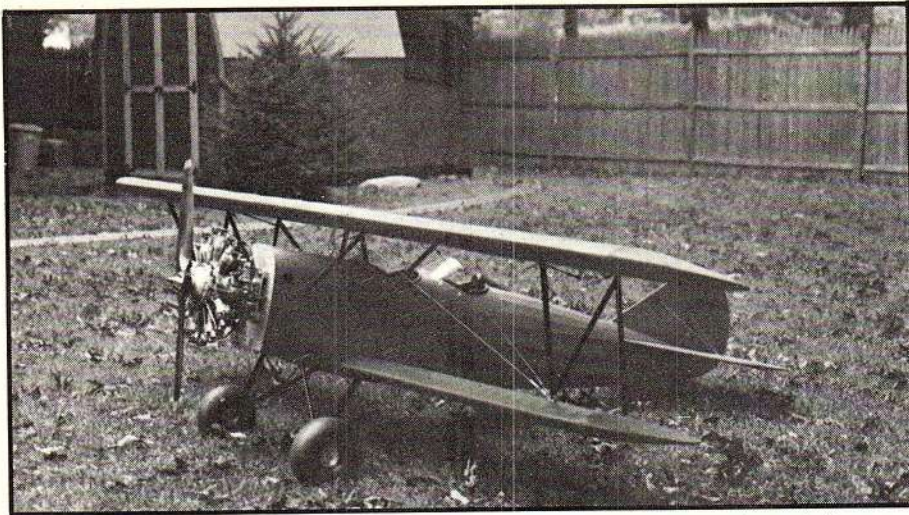
Ikon Northwest's kit of the Hurricane, as built by Walt Wilson. SuperTigre X-60 for power. Winner of many trophies.

Tony Kameen (Riverside, CA) sent in this shot of his Gee Bee Sportster D, from the Coverite kit. The model has several trophies to its credit.

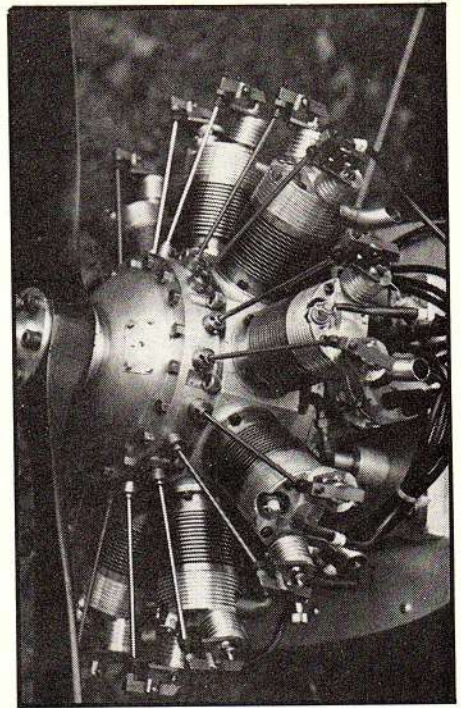


Bruce Boldner (Hampton, Australia) did a superb job on this VK Fokker triplane kit. Coverite finish and K & B powered.

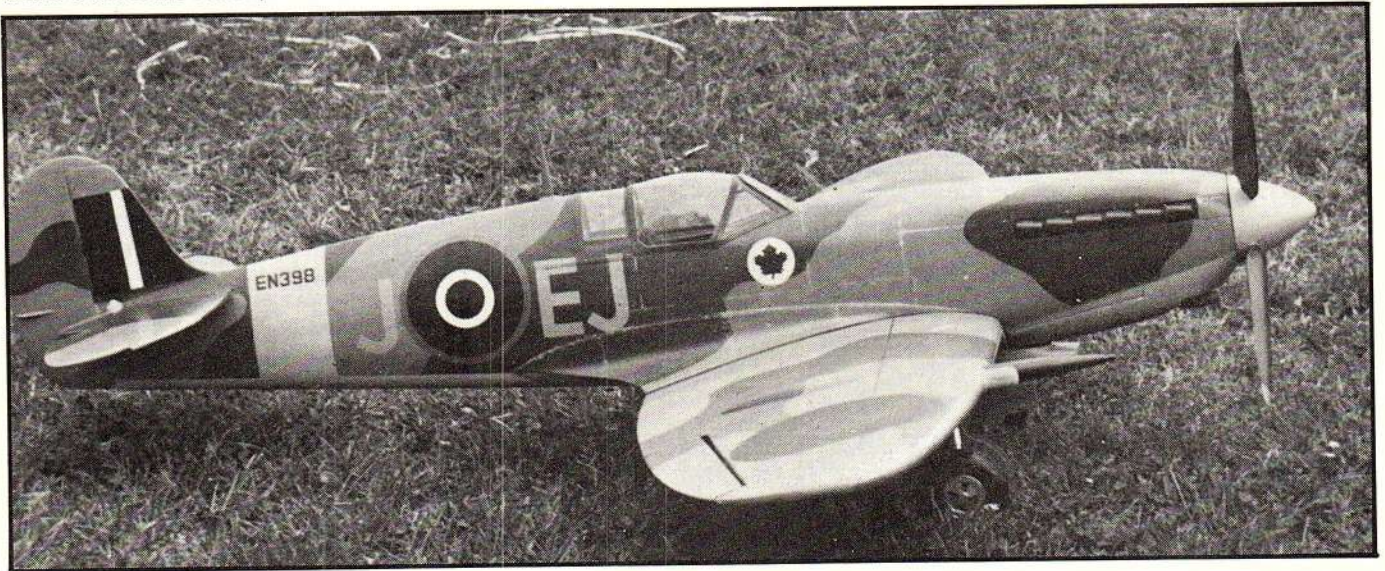




The scratchbuilt four-stroke radial by Roger Paul (North Kingstown, RI) is mounted on a Travel Aire 4000 from Jerry Behrens plans. The ignition engine uses two gear pumps for lubrication and crankcase scavenging.



From Bologna, Italy, Massimo Zuffi sent some shots of his Platt Spittfire.



Tom Polapink (Centereach, NY) scratch-built this 63" span Sopwith Tabloid. Plans coming from Nick Zirolli.



Royal F8F Bearcat, by Bob Strobel (Redford, MI) has won numerous trophies. Hobbypoxy finish, O.S. .80 powered.



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OSPREY 1

(Continued from page 20)



Ready for a flight, the Osprey gets christened.

leading and trailing edges and wing tip top and bottom. Cap strip all of the ribs. Do not sheet the wing panels where they join in the center section. It will be sheeted when the two wing halves are joined. Also, leave off the inboard wing ribs, as they will be added later. After the right wing panel is framed out, set it aside and frame out left wing panel.

You will note on the drawing that only half of the wing is drawn. When you build the left wing panel, you will have to build it upside down. I don't like building wings in this manner. I usually trace the wing panel off the drawing and have a reverse print made. This will give you a mirror image of the wing panel. If you don't have access to a blueprint machine, then trace the

wing half onto thin transparent velum or mylar, turn it upside down and you will have a mirror image.

WING CENTER SECTION

The wing center section may look complicated, but it's not. Locate ribs R1 and R2 on the drawing. I show a template for the wing ribs. R1, R2, R3, R4, R5 and R6 are made from this template and trimmed accordingly. After the ribs are cut out and located, install the 1/8" plywood dihedral brace. Epoxy all parts in place. After the epoxy has cured—join wing panels together making sure you have 1 1/2" of dihedral—measured at the bottom of the last rib of the outer wing panel. You will also note that rib R1 is offset to the left of the center line of the wing and fuselage. This is done so that, when the engine pylon motor

mount is added, the thrust line of the engine will be located on the centerline of the fuselage. After the three sections are joined together, install the engine pylon. Then sheet the top and bottom of the wing, as shown on the plan, and install the 1/8" plywood plate for the bellcrank and install the landing gear block.

EMPENNAGE

This is probably the simplest part of this project. The most important thing is to build the components accurately and without warps. Also, drill 1/4" dia. holes in the fin ribs for the Golden Rod tube installation. I used Du-Bro Kwik Links 30" steel push rods for rudder and ailerons, and Golden Rod for the elevator and motor.

FUSELAGE

Now we're into boat building—after all, this is a flying boat. This hull is very easy to build. Cut out all the formers and trim them to the datum line. Bulkheads B4 and B5 are shown cut below the datum line; but when you cut them out, leave the amount shown between the top of the bulkhead and the datum line. Later, this amount will be trimmed off. On bulkheads B1, B2, B3, B6 and B7, trim off the portion above datum line, and mark it so that it can be identified later when it will be glued back. Now take all these bulkheads and lay them over the plan view of the fuselage (upside down or bottom up). Glue in the 1/4" spruce keel, locate fuselage sides and cement in place.

Do not use water-base glue on this airplane, for obvious reasons. I used ambroid and epoxy throughout. Sheet the bottom of the fuselage as shown on the plan. After the adhesive is cured, remove the hull from plan. Glue on parts that were trimmed off bulkheads B1, B2, B3, B6 and B7. Trim off extension from bulkhead B4 and B5. The rest of the hull construction is straightforward.

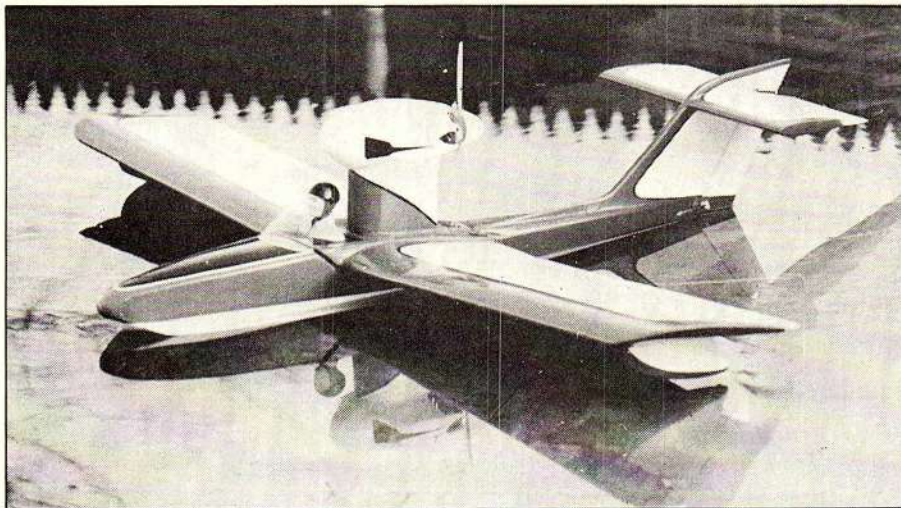
ENGINE NACELLE

This is probably the hardest part of the whole project. You will have to call upon your building skill. I suggest that you build the nacelle as a plug and use the balloon method for making a fiberglass engine nacelle.

COVERING AND FINISH

I covered the wings with Silk-Spun Coverite. I sealed the entire airplane

scale r/c modeler 61



with Balsarite (three coats) just before covering. As the directions on the Balsarite can states, I began covering within forty-five minutes of application for best adhesion of the Coverite to the balsa wood structure.

I sealed the hull with Softglass resin. This stuff is great, because it sands so easily and gives a dynamite finish. I painted my Osprey with automotive lacquer, with a 50/50 combination of fire engine red and orange. Eyeballing my finished color against the cover picture on *Sports Flying* magazine, it came out pretty close. I added about 20 percent retarder to the paint mixture in order to slow down the drying time and to preventing blushing. This also lets the paint flow out more, which cuts down on the wet sanding and compounding time.

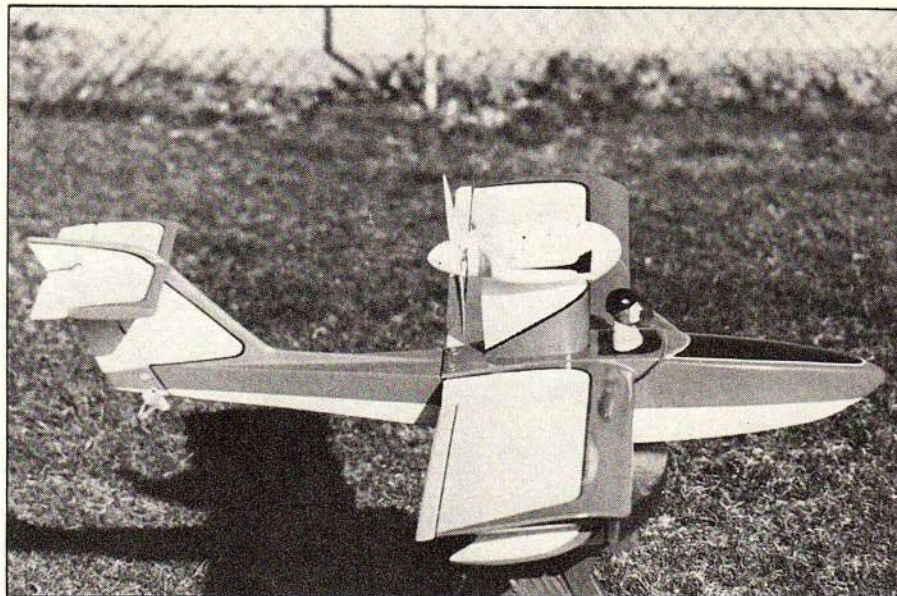
TIP FLOATS

These were hand-sawed out of low density foam, then sheeted and glued to the bottom of the wings, as shown on the plan. Also, you will note on the plan, that I show landing gear blocks located in the wing if you want to put wheels on the airplane. I made mine a tail-dragger. It handles a lot easier on grass and dirt fields.

TRIMMING AND FLYING

As I stated earlier in this article, trimming the airplane was a chore. One problem I had was water spray while taxiing. This was solved with the addition of spray rails. Another problem I had was with the step—it wasn't deep enough. I corrected this by adding trailing edge stock.

The Osprey has a lot of character, with its swept tail, yet square wing.



You will see this on the plan. It also created a better burbling effect at the step, which helped the model break free from the suction of the water and made the takeoff run shorter. After these problems were worked out, I found I had a nice flying airplane.

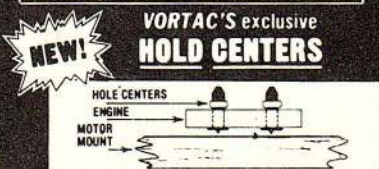
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FIND IT



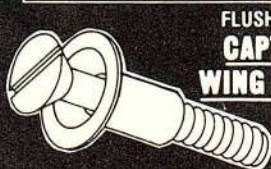
• **SIMULTANEOUSLY LOCATE AND MARK ALL FOUR BOLT HOLES FOR ANY ENGINE THAT MOUNTS USING 6/32 BOLTS.** (MOST ENGINES WITH SMALL BOLT HOLES CAN BE DRILLED OUT FOR 6/32 BOLTS.)

• **SIMULTANEOUSLY LOCATE AND MARK BOTH 1/4" (AND LARGER) WING DOWEL HOLES, FROM THE BULKHEAD OR THE WING.**

SET OF SIX PRECISION STEEL HOLE CENTERS & 4 RETAINERS

\$2⁹⁸

CAPTURE IT



• **THESE 1/4" x 20 BOLTS STAY IN THE WING AFTER IT'S REMOVED FROM THE FUSELAGE.**

• **2" NYLON BOLTS CAN BE EASILY CUT TO ANY LENGTH.**

COMPLETE 6 PIECE WING MOUNTING SET INCLUDES 2 BOLTS, 2 SLEEVES AND 2-1/4" x 20 BLIND NUTS.

\$1⁸⁹

REPLACEMENT BOLTS

4 PER PKG. **\$1.09** NOW AVAILABLE

CHOKE IT



VORTAC'S MANUAL CHOKES

(FOR GIANT SCALE GASOLINE ENGINES)

- FITS WALBRO AND TILLOTSON CARBURETORS
- INSTALLS IN SECONDS
- LOCKS POSITIVELY IN ANY POSITION
- EASILY MODIFIED FOR SERVO OPERATION. (COMPLETE INSTRUCTIONS ON THE PACKAGE)
- SAFE. KEEPS HANDS AND ARMS OUT OF THE PROP ARC

(SEE YOUR DEALER)

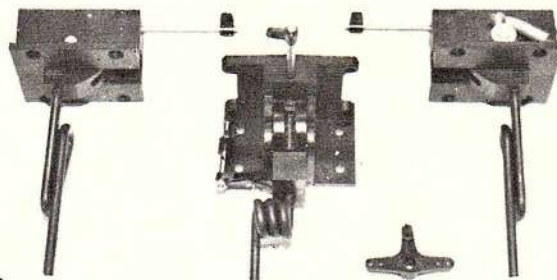
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Durable Mechanical Retracts

- Low Profile
- Positive Up & Down Locks
- Lightest Weight w/one Servo
- Nose Unit — Firewall or Belly Mount
- Tempered Coil Struts
- Foam Wing & Firewall Install. Kit available

Also available: Complete Pneumatic Systems



U.S. PATENT #375242

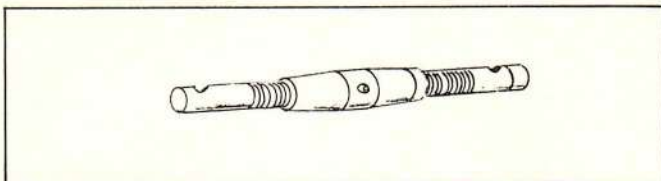
\$49⁹⁵

B&D Enterprises

Route 81, Box 7, Ballard, W. Va. 24918

SCALE SHOWCASE

Items for the Builder of the Model



STEEL TURNBUCKLE

C. B. Associates has released a new, all-steel turnbuckle for giant-scale aircraft. These will take all the tension and vibration a big biplane can dish out. They are already pre-drilled for safety wiring, and the cable attachment can be either crimped or soldered on. These work best with flat clock spring steel for the flying wires.

Look for these heavy duty steel turnbuckles at your local hobby shop, as manufactured by: C. B. Associates, 21658 Cloud Way, Hayward, CA 94545.

* * * * *



DREMEL—ON THE LIGHT SIDE

Dremel Manufacturing has released two new items which are a great boon in the building room. They are two lights, which are designed to swing arm, just like those used by engineers and draftsmen. It's amazing how many problems such a simple thing as a good lamp can solve. When glassing or painting, the Dremel lamp easily adjusts to show surface irregularities. How many times have you gone running for a flashlight to see inside a fuse cavity? Since the lamp head can be rotated in any position, it's easy to push it out of the way when not needed. The better you can see the work at hand, the better job you can do, and this is especially true with scale builders, who must do lots of detail work.

The other lamp is a magnifying lens type. This has a fluorescent ring light and a 4" lens with a 3 diopter lens. It is great for everything from putting on rivets, to soldering electronics. We've used it for engine work, checking servo gears, and other miscellaneous jobs in the building room.

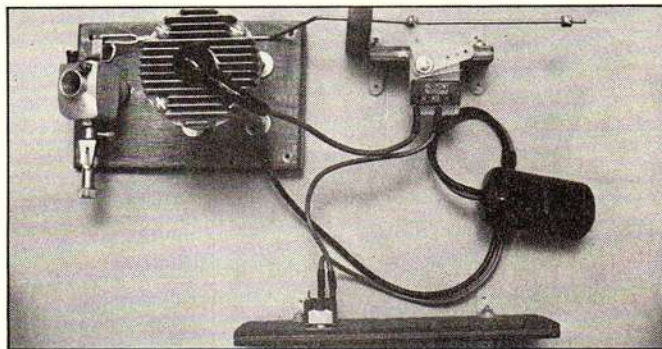
Check both of these handy accessories out at your hobby shop, as manufactured by: Dremel, 4915 21st Street, Racine, WI 53406.

* * * * *

SWITCH 'N GLOW

Great Planes has introduced an on-board ignition system which scale modelers will welcome. The Switch 'N Glow is designed to turn on the glo-plug at low throttle only. Its simple design uses a micro switch, which is actuated by a bellcrank on the throttle linkage. Every time the engine goes to low throttle, the glo-plug is being driven directly by the separate on-board battery pack. This system virtually eliminates dead sticks because of a fowled plug during a low speed maneuver, such as a touch-and-go.

The external switch enables the system to be used as an



auxiliary starting set-up. Leave your starter battery in the flight box, for the Switch 'N Glow will take care of that task.

Check at your hobby shop for this item, or order direct from: Great Planes, 706 West Bradley, P.O. Box 721, Urbana, IL 61801.

* * * * *



EAGLE RIDES AGAIN

Last year, we did an article on the timers available from Electric Eagle. They now have two new timers available. Their model EE1 features a countdown in hours, minutes and seconds. The timer has an improved, louder alarm, a stop watch with split functions, and the unit can also serve as a standard watch, with calendar and even alarm. The timer comes with a spare battery, and is priced at \$24.95.

Their TC02 timer, which was available in their previous product line, now sells for \$19.95.

The units can be purchased through hobby dealers, or direct from Electric Eagle, 25 Weeping Wood, Irvine, CA 92714. Include \$1.50 for direct orders.

* * * * *

WACO "ARE"

One of the finest aircraft ever to come out of the Waco factory was the elegant "ARE" biplane. Dario Brisighella, Sr., is now offering both plan sets and semi-kits of this popular nostalgia aircraft. The model is slightly larger than 1/5-scale, with an 87" span and 1800 sq. in. of area. With a gross weight of 20-24 pounds, the manufacturer recommends engines in the 34-50cc class. Dario did the plans from actual measurements taken of the only remaining "ARE" in the world. Dario's plans are noted for their craftsmanship and attention to detail.

The plan set can be ordered for \$30 (postpaid). For those who don't want all of the fuss, there is also a semi-kit, which offers all of the cut wood parts (no straight wood stock included). No accessories or hardware are included, but everything from the cowl to landing gear are available from other



manufacturers. The semi-kit sells for \$125 (prepaid U.P.S. shipment included).

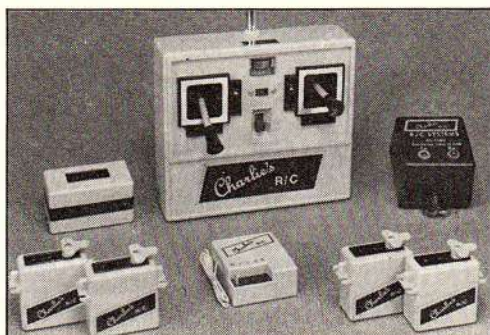
Order directly from: U.S. Quadra, 1032 E. Manitowoc Ave., Oak Creek, WI 52154. Phone (414) 762-7155.



TWEEZER SET

One of the tools which we are always fumbling for in our flight box are the tweezers. There always seems to be a screw that needs holding, a fuel line that needs pinched, or a dropped widget inside the fuse, etc. Here's a great way to get all of the tweezers you've ever needed . . . enough different types to do any job. This set includes a 4 3/4" stamp tweezer, 4 1/2" sharp pointed tweezer, 6" retrieving tweezer, 6" curved tweezer and 6 1/4" self-closing tweezer. You also save money by getting them as a set.

Look for this tweezer assortment at your hobby shop, as manufactured by Maxon, 750 Washington Avenue, Carlstadt, New Jersey 07072.

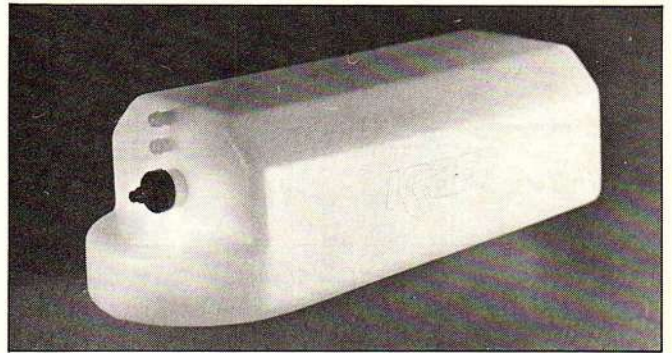


CHARLIE'S RADIOS

If you are in the market for a quality radio at a very affordable price, then check out the systems offered by Charlie's R/C. They have radios from 2-5 channels, with prices as low

as \$144.95 for a 4-channel rig. The systems have nicads throughout, open gimbal transmitter sticks, a very small and light receiver (1.15 oz.) and a battery charger. These radios are particularly well suited for very small aircraft.

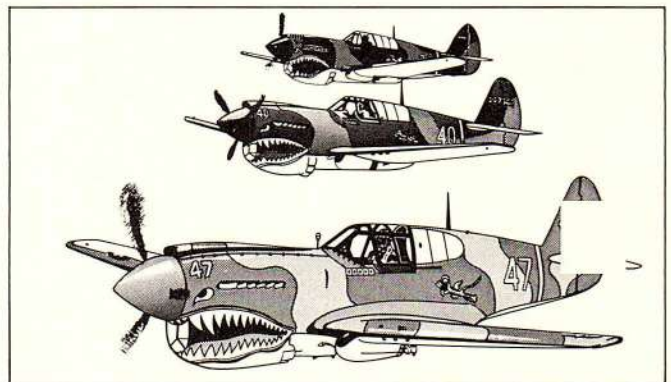
For full details, write directly to: Charlie's R/C, P.O. Box 192, Van Nuys, CA 91408.



KRAFTSMAN GOODIES

Kraft Systems has branched out into an extensive line of hardware accessories. Under the Kraftsman label, they are marketing everything from servo tape to engine mounting bolts. While some of the accessories are related to their radio line, such as servo output wheels, most of the products are very similar to those already in most hobby shops. Check at your local dealer for this new line of accessories.

Of particular interest is a 24 ounce fuel tank, especially suited for giant scale aircraft. This unit is compatible with all types of fuel, gasoline and diesel fuel. The tank sells for \$6.49.



THE LONG AND SHIRT OF IT

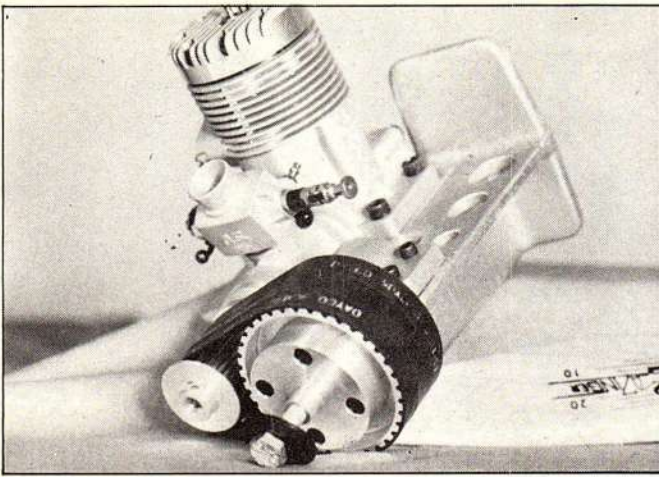
Some of the nicest aviation Tee shirts we have seen come from All Phase Art. Those who have been to the Nats are familiar with these unique shirts. The aircraft illustrated range from the P-40, P-51, Corsair and P-38, to the Fokker D-VII, Pitts Special, Christen Eagle and Decathlon. They can even put your own model on a shirt, or jacket, baseball shirt, football jersey, hat, etc.

For the complete catalog, send to: All Phase Art, 17102 Earlham Ct., Upper Marlboro, MD 20772.

PROP DRIVE

Prop drives are growing in popularity throughout the scale community. At the Reho World Championships, an amazingly large number of entries used some sort of drive system to reduce the rpms and increase engine torque to swing those large scale props.

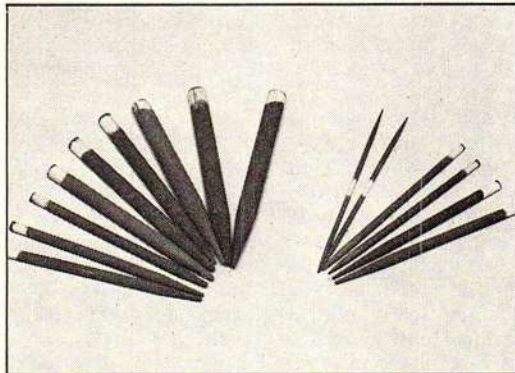
The latest addition to the prop drive parade is the R-96 unit, developed by High Torque. The prop pulley features two shielded ball bearings, for smooth and maintenance free operation. Two toothed timing belts are used on the .60-size version, while three belts absorb the torque on the .90 unit. The cast aluminum mount accommodates most .50 to .90 powerplants. Mounts for the O.S. or Webra .90 can be ordered pre-



drilled. The R-96 is 6" long, and weighs 16 ounces (less engine). The gearing ratio is 2.4:1.

The .60 unit is introductory priced at \$94.95, while the .90 unit is specially priced at \$109.95. Order direct from: High Torque, 5710 Langmore Lane, Erie, PA 16505.

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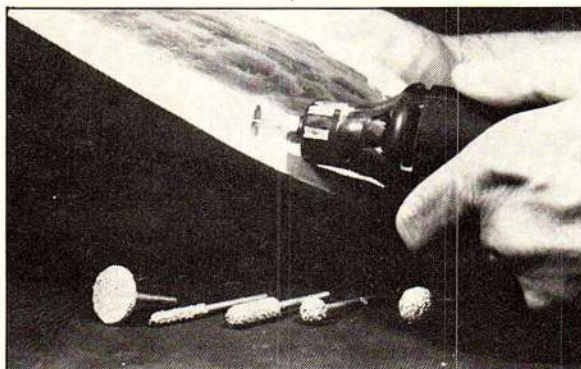


GET ON THE STIX

If you have been frustrated by fillets and other hard to get at areas of a model when trying to sand and finish, then get on the Stix. Speed Stix are a new formed sanding tool made to get into tight spots. They are like dowel rods which have been impregnated with abrasives, and the larger ones come in 1/4", 3/8" and 1/2" diameters, with color coded grits of #100, 120 and 180 sanding grades. The Mini Speed Stix come in 1/4", 3/16" and 1/8" diameters, with #120 and 180 grit. These can be used wet or dry, and they will handle many hard to sand materials. They are really handy for those odd sanding jobs.

Speed Stix come in a nine-piece assortment (three of each grit) for \$4.85 postpaid, and the Mini Speed Stix come in a six-piece set for \$2.95 postpaid. Order these directly from: Precision Sanding Tools, 2930 Skyview Ave., Pueblo, CO 81008.

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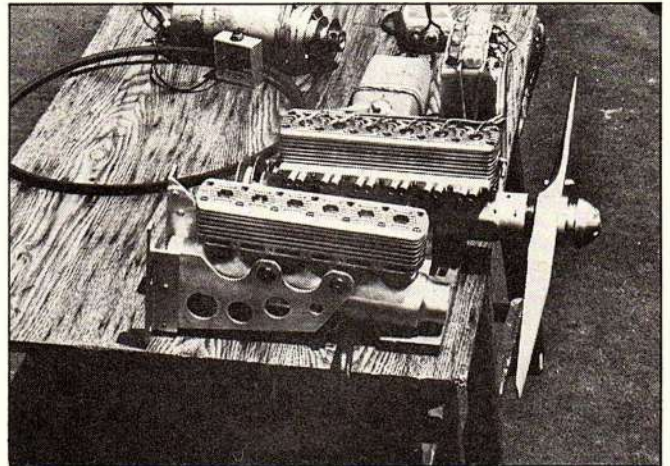
CARBIDE CUTTERS

Robart refers to its new tungsten carbide cutting and grinding tools as "bulletproof." That description is very accurate, for these little tools, which are designed to fit the Dremel,

will chew through anything you have in the workshop. Unlike standard carbide tools, these will eat through hardwood without overheating or loading up. They last much longer than normal grinding tools, and they save wear and tear on the Moto Tool. These come in six popular shapes, designed to fit almost any job. These tools are intended for rough cutting, and not final finishing or polishing.

You'll find these carbide cutters at your hobby shop, as manufactured by Robart, 310 N. 5th Street, St. Charles, IL 60174. The tools sell for \$5.95 each, or a set for \$32.95.

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IN-LINE SIX

If you have a special giant scale project that just won't look right without an in-line six cylinder engine, then we just happen to have the answer to your prayers. You can purchase the castings and instructions for building your own operational glo-powered engine. The two-cycle engine has a length of 11 1/4", and stands 4 1/4" high, with a width of 2". The engine is rated as capable of 8,500 rpm on a 20-8 prop. If you want more information on this engine, write directly to the manufacturer. We have seen the engine run, and it really performs well. Robotronics, 15850 E. Main Street, La Puente, CA 91744. Phone (213) 333-1027.

* * * * *



MASTERS CHAMPION PHANTOM

Tom Cook upset the modeling world in 1981, by winning the Masters Championship with a twin-ducted fan F-4 Phantom II. This is a huge model, with a seven foot fuselage! Those two Turb-Ax fans ran to perfection, and Tom put on some of the most spectacular flights ever seen at any contest. According to Tom, the model flies so well because it is big and stable. There is plenty of power to do most any maneuver. The Phantom even deploys a scale drogue chute upon landing.

Tom has had so many inquiries about the model that he has finally relented and will be making a limited number of kits. Tom is virtually making each by hand, to his own rigid specifications. He wants each one to have the integrity and workmanship which made it possible for him to become

scale r/c modeler 65

Scale Champ. We have seen the glass work, and it is jewel-like.

The Phantom will be offered in two versions. The deluxe kit will include the fiberglass fuse, and air inlets, plus foam cores for all flying surfaces and the wood needed to sheet them. The cockpit is complete with all interior and exterior components. The flying stab mechanism, drogue chute ejector and hardware, aluminum radio and wing servo access doors, etc. are all included. A hand built set of Air Command MK20 landing gear (scale struts and tires) is in the deluxe kit. The nicest feature of the deluxe kit is a set of pre-run and tuned K & B 7.5 engines mounted in Turb-Ax fans, with pipes installed and tuned! You get Tom's specially modified and bench tested engines, so all that's needed is to install them, crank 'em up and go fly. When Tom reworks those engines, they are easy to start and they run like Swiss clocks.

The engine and fan assembly can be ordered separately, for \$250 per unit. The MK20 retracts are also separate accessories, for those not ordering the deluxe kit, for \$200 without the scale struts, and \$250 with the struts.

These optional accessories are sold separately because the Phantom II can be ordered as a semi-kit. You get the fiberglass parts, foam components, canopy, exhaust ducts and stab mechanism. The semi-kit sells for \$300.

The deluxe kit can be ordered for \$1095.00. That sounds steep, but those who do the math on two K&Bs, a set of Turb-Ax fans, plus the kit and a set of \$250 retracts will realize that it's quite a bargain.

Here's a chance to fly the model that the Scale Champion flew. Order direct from: Jet Model Products, 304 Silvertop, Raymore, MO 64083. Phone (816) 331-0356.

* * * * *



SUPER SOLVENT

Several manufacturers have released instant glue debonders recently. The latest one is Golden West Fuels, of California. The reason that a fuel manufacturer is making a glue release agent is that nitromethane is a perfect solvent for these glues. Ultra Super Solvent is pure nitro, and it eats through any instant glue like crazy. Amazingly, nitro is not that dangerous. It has no significant toxic effect if absorbed through the skin, and is chemically more stable than gasoline. We, of course, expect that the user will treat it with respect (especially around open flames), but we were surprised to find out that nitro isn't a very nasty substance, if treated with the proper respect.

Our tests showed the nitro to be exceptionally fast acting. Most bonds were broken almost immediately, and it took only slightly longer to remove all residues. It doesn't evaporate as readily as acetone, and it's nowhere near as toxic.

Ultra Super Solvent may not be in your hobby shops yet. Send directly to: Golden West Fuels, P.O. Box 6400, Woodland Hills, CA 91365.

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ZAPPERS

Pacer has been in the instant glue business for years, but they sort of died out of the hobby field in the last couple of years. Now, they are making a strong comeback with a very full line of adhesive products.

Their basic cyanoacrylate is called ZAP/CA, and our user tests have shown it to be as good and workable as any of the instant glues. We like the add-on spout which comes with most of the adhesives, but we found the little metal-tipped cap to keep the glue from curing in the bottle a bit tedious to handle. The tapered spout is easy to clean, should a clog occur.

We particularly liked their SLO-ZAP, and the ZAP-A-GAP. The first one gives plenty of working time to position parts before the bonding occurs. The ZAP-A-GAP is amazing, for it will not only fill relatively large gaps between surfaces, but it also has the capability of bonding just about any materials. It will even adhere oil-soaked balsa, or fiberglass parts which still have traces of mold release agent. All woods, even the hardwoods, will bond with this cyanoacrylate. This is the adhesive we found ourselves grabbing for most often, and it's the ideal one to take to the flying field for quick repairs. It even bonded some materials which most other adhesives couldn't tackle.

Pacer also makes a full line of support equipment, including an accelerator to speed up the bonding process (ZIP-KICKER), and a debonding agent (Z-7). One can also get a very exceptional instant glue for plastics, thread-locking compounds, extra dispensing tips, and an ultra-strong adhesive for firewalls and the like called Z-MAGNUM (which requires pre-coating the surfaces with a special primer).

The next time you are at the hobby shop, look at all of the adhesives available under the ZAP label. Manufactured by: Pacer Industries, 1600 Dell Avenue, Campbell, CA 95008.

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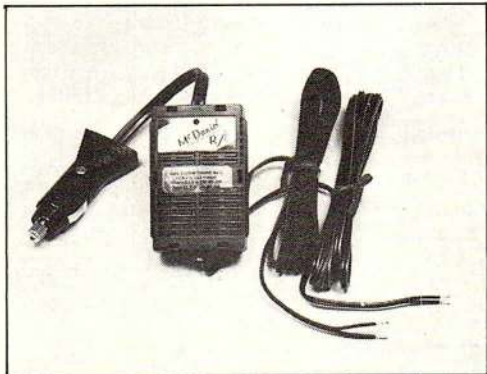


FFC

ACE R/C has introduced a charging system that is a real life saver. This FFC system is a dual rate charger designed to work from a DC power source, such as your car, camper, etc. Because it's a dual rate charger, there's no fear of an

overcharge. A typical receiver pack gets 85% of its charge in the first hour, then the FFC automatically goes to a trickle charge to keep the pack charged without damaging the cells from venting. It's set up for the typical 4.8 Volt and 9.6 Volt packs, and comes without connectors.

The kit version sells for \$29.95, while the assembled FFC is \$39.95. These are available at your retailers, or direct from: ACE R/C, Box 511, 116 W. 19th Street, Higginsville, MO 64037.



SYSTEM CHARGER

McDaniel R/C has released a very compact field charger for getting those transmitter and airborne batteries back up to snuff. Simply plug the unit into the car's cigarette lighter, and add the appropriate plugs to adapt to your charger circuits. The unit is fuse and diode protected, so there is no fear of damaging the batteries from an incorrect hook up.

The System Charger is a constant-rate device, which means that it will cook those batteries if left on too long. In most situations, those airborne or Tx batteries are reading low, so you are starting from a known condition and there's little risk of damage. The charger will get a Tx back up to snuff in about two hours, or make an airborne pack usable again in about 90 minutes. The unit is very compact and can be easily stashed in a corner of the flight box.

Look for the System Charger at your hobby dealers, as manufactured by McDaniel R/C, 13506 Glendundee Drive, Herndon, VA 22071.



INSTRUMENT PANELS

Ed Morgan, the founder of the Q.S.A.A. movement, is manufacturing some very impressive giant-scale instrument panel kits. These are deluxe kits, with all materials (except glue) furnished to make a variety of panels. He makes panel kits for the PT-19, J-2 or J-3 Cubs, Mooney Mite, Waco YMF-3, Aeronca, Rearwin Speedster and Taylorcraft. Most of the panels can be modified to other aircraft types with no problems. If desired, optional toggle switches can be added to the panels to give functional electrical operations. These panels are first class, and the instrument details are very clear and accurate. Each kit contains a sheet of photographically reproduced instrument dials, a sheet of 8mm

plywood, a sheet of celluloid, O-rings and two dozen machine screws. Price \$8.95 (plus 50¢ postage).

Ed also has some great .025 nylon coated cable for either rigging wires or control runs. This cable is stranded, and is virtually unbreakable. You can either swage metal crimps onto the ends, or use the 3/32" swaged balls to connect them to some optional Kwik-Links. When used this way, they make superb connections for control runs. You get eight 5½ foot lengths of the cable for \$5 (plus 50¢ postage).

Order these items directly from: International R/C Specialties, 2310 Cimarron Road, Las Vegas, NV 89117.



MUSTANG REVISED

Ralph White's P-51 Mustang won the Nats several years ago, with a nearly perfect static score. The Fliteglas kit, which Ralph manufactures, has long been a standard of quality. The kit has been on the market since 1968, and Ralph says that the model has won more contests (both Scale and Pattern) than any other kit in the country. Not only is it a natural in these events, but it has also won four of the last six Warbird Races.

The kit includes a beautiful fiberglass fuse and foam flying surfaces. An aluminum spinner is included, landing gear wires (for fixed gear), canopy and exhaust stacks. If you prefer, the deluxe kit can be ordered. This gives you all the balsa needed to complete the model, as well as a complete hardware package.

Ralph has upgraded the kit to include new plans, plus a twelve-page instruction booklet to facilitate building the model. Retracts are now fully illustrated on the plans, and even a retractable tailwheel is shown.

The basic kit sells for \$121.95, while the deluxe kit is \$166.95. Check at your local dealers for this great scale project, or order directly from: Fliteglas Models, R.R. 1, Box 392, Neoga, IL 62447.

THE WORLD OF R/C

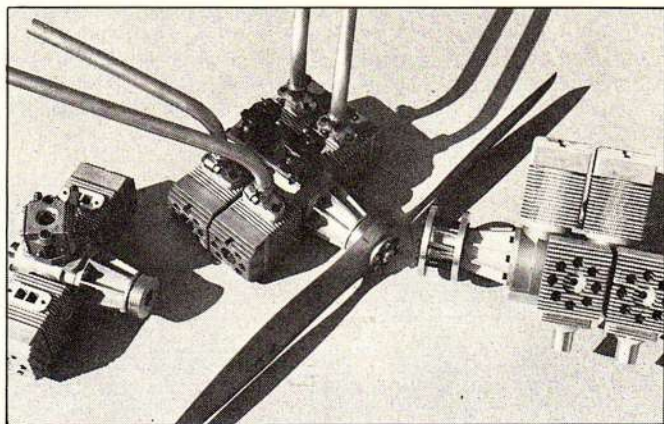
We usually don't review such things as video tapes in this section, but they are becoming such an accepted and normal part of our lives that we are going to break with tradition. Old friend Roman Yurema got out of the hobby business several years ago, and started in the video business. He has now put his new talents to work in a very professionally done movie about what this R/C hobby is all about. When he told us of his project, we figured that it was going to be another of those club movies we've all been bored to tears with. Here's four hours of our last slope soaring contest (yawn!), taken right after the wind stopped blowing (double yawn!).

To our surprise, the well-edited movie tells you everything you want to know about the hobby in a little over 20 minutes. And it's just not airplanes, but boats, helicopters, cars, etc. No novice venture, there are some really good flight sequences. It's the kind of tape each club should own for those inevitable PR projects. Show it at mall displays, air it for the local politicians, etc. The shop proprietors would do well to have it on hand. When the request comes from a customer to show him more about R/C flying, you won't have to send him to the flying field where the locals usually wind up referring this new client to a mail order discounter).

The tape wisely avoids a lot of the intricacies of how and why the radios and other equipment works, but it gives a solid feel for what we modelers do, and leaves the viewer

with a sense of understanding and appreciation. The tape sells for \$49.95, and is only available direct from: World Video Productions, 7888 Ostrow Street, San Diego, CA 92111.

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ROSS IS BACK

One of the nicest engines we ever owned was the Ross Twin. Made years ago by MRC, the powerplant was an opposed twin, and it was the smoothest running piece of precision powerplant we ever flew. The engines disappeared, primarily because they were rather expensive. Last year at the Las Vegas Q.S.A.A. get together, we stumbled upon a booth . . . and there sat Lou Ross, himself!

We were shown some of Lou's latest engines, all handmade multi-cylinder jobs. They still showed that excellence of design and superlative craftsmanship which made Lou a legend in the engine field. Mr. Ross is back in business on a low-profile basis, making engines by hand only upon request. His multi-cylinder systems are perfect for those big airplanes. If his new engines are anything like the old Rosses, these will be the Porsches of the powerplants.

Write to Lou for more information: Lou Ross, 1010 South Plummer, Tucson, AZ 85719.

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THREE WORLD ENGINES

World Engines has three new powerplants available, each one of special interest to the scale modeler.



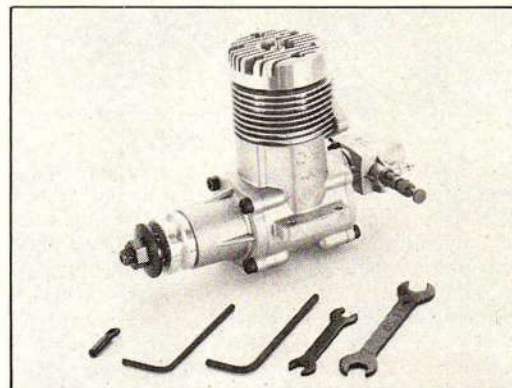
The first is the fondly remembered Wankel rotary engine. This was available several years ago. Some users swore by them, and others swore at them. The rotary concept is beautiful for model applications, for the engines are shaped correctly to fit a cowl (radial, of course), don't run hot, and are extremely quiet and fuel efficient. The older versions had seal problems on the rotor lobes, but we understand that the new engines have been revised to give longer wear and minimal maintenance. A brief note: Don't ever try one without an electric starter. The engine has a displacement of .30.

The second engine is the Tartan twin 2.6 c.i. powerplant for giant scale models. This engine made quite a hit at the Las Vegas Tournament of Champions. It is available in either glo or gas versions. This engine was specifically developed for model use, and is not a rewarmed chain saw powerplant.

68 scale r/c modeler



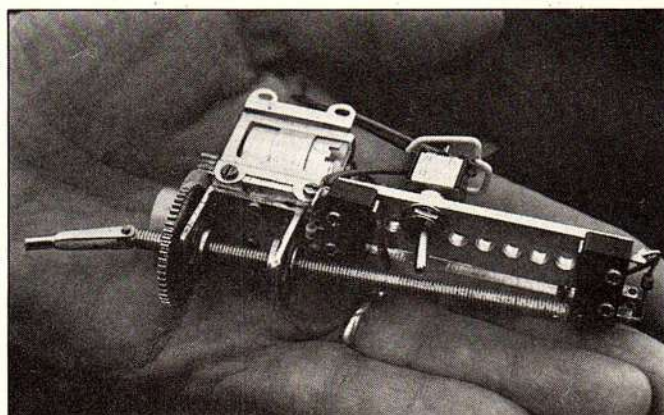
The unit weighs five pounds (add six ounces if the optional pull starter is used). The factory rates the power output at 3 bhp. The ignition is electronic, and nicely integrated into the rear crankcase housing. We have heard nothing but praise from users of this engine.



The last engine is a specialized .65 for the ducted fan crowd. The O.S. Max .65 VR DF is a modified version of the marine version of this engine. The exhaust timing is advanced, to give lots of horsepower at some pretty snazzy rpms. This is all achieved without increasing the exterior dimensions of the powerplant beyond those of a normal .60 (they rebored the same case to a .65). Check this one out the next time you need a sizzler of an engine.

These engines are at your hobby retailers, as manufactured by: World Engines, 8960 Rossash Avenue, Cincinnati, OH 45236.

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JACKSCREW SERVO

Years ago, Wing Mfg. introduced a unique retract actuation system to the market. This retract was a jackscrew servo. The torque produced by this screw thread device was astronomical, but it wasn't until it had been withdrawn from production that the modelers discovered how great it was.

The jackscrew servo is again available. Janaco is producing a quality linear servo with brass and delrin gears. Designed for special applications like hoisting mechanical retracts, lowering large flaps, etc., the jackscrew servo produces a

solid 10 pounds of thrust. With a standard 9 Volt transistor battery, 7 pounds of thrust is about normal.

Because it is a worm drive mechanism, the speed is just right for scale-like operation. It takes about eight seconds to get the 1 3/4" of travel available on the servo.

The unit weighs four ounces, and measures 1x2x4 1/4". The unit uses a limiting switch, which is actuated by a regular servo. The switching system can easily be wired to "cascade" several units, using one to drive the gear doors independently, for example. The unit is well made, and should prove quite durable in operation.

If you can't find the Jackscrew at your hobby shop, order it direct from: Janaco, 2316 Brown Bark Drive, Beavercreek, OH 45431. Price \$79.95.



KINNER SPORTSTER

One of the real classics of the "Golden Age" was the Kinner Sportster (1933). D.G.A. Designs now has plans available for a giant-scale version of this classic. The model spans 117", and is intended for chain saw engines. The plans were drafted from actual measurements of the only remaining flyable Sportster in existence.

Construction is primarily spruce, bass and plywood (there's a little balsa). The wing panels remove for transportation, and the plane can be rigged at the field in about five minutes. The designers report that the Kinner flies just like a gentle J-3 Cub. Proper turns can be made without coordinated rudder. The wide stance gear makes landings a breeze.

The plans for the Kinner are shipped rolled, and come with a complete instruction booklet. Price \$25.00 (postpaid).

Also available is a set of twelve 35mm color prints of the full-size Kinner. These are ideal for documentation, and the set sells for \$7.25 (postpaid).

Send all orders directly to: D.G.A. Designs, 135 East Main Street, Phelps, NY 14532.



COWL PROFUSION

T & D Fiberglass Specialties has more cowls than Carter has liver pills! They are cranking out these glass beauties so fast that we can't get the new listings into print quickly enough. Here, to date, is what we have as new additions to a list which must already be in the hundreds: Biz-Cap

plans of the Super Cub, Nieuport 17, Fokker D VII, Fokker Dr.I and D.VIII. There is also a cowl and pant kit for Ken Runstrand's Pober Pixie. Dan Santich's P-26 Peashooter now has a cowl, wheel pant and wheel spat set available from T & D.

Send an S.A.S.E. for a complete listing of the cowls and glass accessories available, but don't be surprised if that list is outdated by the time you get it! Write directly to: T & D Fiberglass Specialties, 30925 Block, Garden City, MI 48135.

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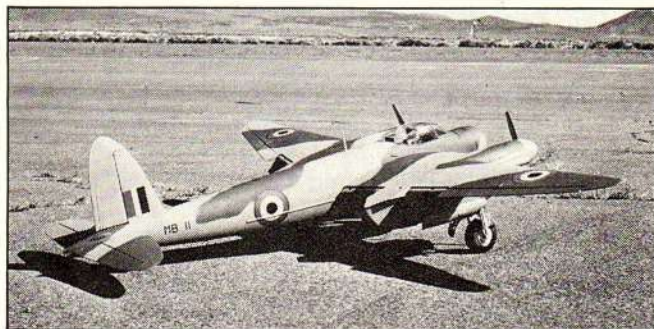


PIPER SUPER CUB

Jerry Nelson now has plans available for his 1/4-scale Super Cub. The plans come on two sheets, each measuring 36x60" and 36x72" respectively. The model builds from standard hobby shop products, and the cowl is built up, so no glass work is required. Ease of construction is emphasized, and the fuse sides are 1/8" sheet, with the stringers and longerons faked with 3/16" dowel.

Jerry took the dimensions from a full-size aircraft, and he says that the model's outlines are very close to totally accurate. The plane is designed to fly on anything from a .90 to a chain saw engine. The flaps make a five channel radio necessary. There is plenty of room for a full cockpit interior, but no retail for one is shown on the plans. Jerry reports that the plane handles very gently, and is a real ball to fly.

The plan set can be ordered direct from: Jerry Nelson & Co., 3510 San Mateo Avenue, Reno, NV 89509. Price \$25.00 (plus \$3 postage).



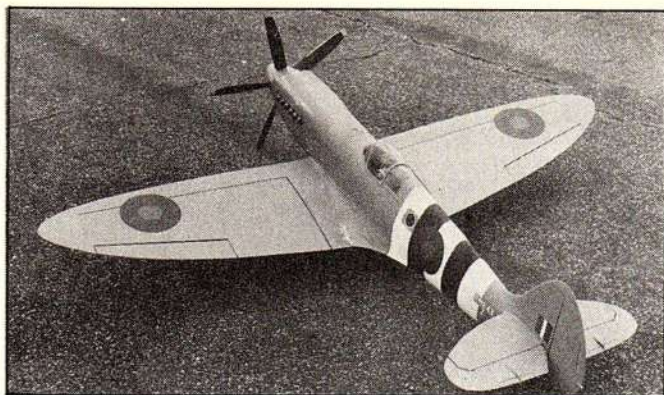
MOSQUITO

Many modelers don't realize that the de Havilland Mosquito, which won the Sport Scale Class at the Reno World Championships, was a Bob Holman product. Bob sells the plans and accessories for this Brian Taylor model. The Mosquito also took second at the 1980 British Nats, and scored the highest flight points.

The 71" span twin engined bomber/fighter uses a six-function radio, and two .40s are ample power. At the high density altitude of Reno, this Mosquito (there were actually two of them in competition) handled better than many lightly loaded aircraft.

You can order only the plans, for \$25.00 (and \$2 shipping), as well as the accessory package (cowls, canopy, spinners and door covers) for \$5.00 (plus \$2 shipping). An all-wood kit is available for \$175.00. Order these directly from: Bob Holman, P.O. 741, San Bernardino, CA 92402.

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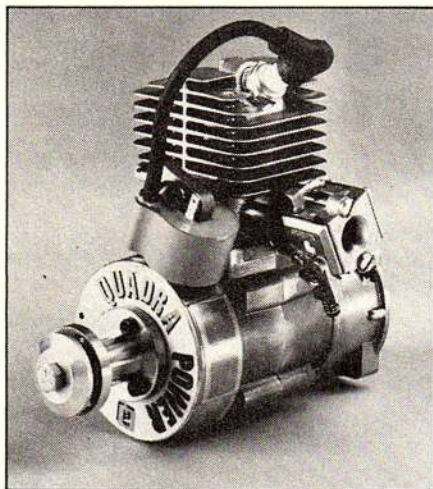
SPIRIFIRE XIV & XIX

Bob Holman now has available the Mk. XIV (or XIX) versions of Brian Taylor's popular Spitfire. The model is available as a semi-kit, with the plans only being priced at \$21.95 (plus \$2.50 shipping). The accessory package, which includes spinner, cowl and canopy, sells for \$50.00 (plus \$2.50 shipping).

Bob is also cutting rib kits for a select few of the various plans he has available. These are hand cut, with precision cut spar slots. Bob uses only Sig Contest Grade wood, which he says cuts the weight of the rib packages in half. Right now, the rib sets are available for the 75" F4U, but Bob is open to requests for just about any of his plan models. The rib set sells for \$18.00 (plus \$2.00 shipping).

Send \$3 for Bob's complete catalog. Bob Holman Plans, Box 741S, San Bernardino, CA 92402.

* * * * *



Q50

Quadra has formally announced their long-awaited 50cc engine. Named the Q50, this engine produces 3.6-4 hp at 8,000 rpm. This one is intended for the really big planes, in the 40 pound range. Several modelers have already flown prototypes of the engine, and we have heard some very good preliminary reports.

TML will have a new distribution system in this country, which should make these Canadian-manufactured engines more readily available at the retail level. So, check with your hobby dealer. Price is \$249.00.

Manufactured by: Trinden Manufacturing, P.O. Box 544, Huron Park, Ontario, Canada NOM 1Y0.

SPRAY HANDLE

Available for those who apparently find holding down the button on a spray can too much of a challenge is Coverite's Professional Spray Can Holder. This unit snaps onto the top of the spray can, and allows a trigger-type actuation to release the paint. Admittedly, it does take some of the discomfort out of one's finger tip. The unit fits any standard spray can, not only the Black Baron paints. Even if you 70 scale r/c modeler



don't wind up using it for model spraying, you'll find it handy for bug sprays and other aerosols around the house.

Available at hobby shops, as manufactured by: Coverite, 420 Babylon Road, Horsham, PA 19044. Price \$2.95.

* * * * *



NILITE II

Portable pocket engine starting batteries are very popular. You can get that balky engine going right on the runway, without having to cart the model all the way back to the flight box. Simply press the special "head lock" connector onto the engine, and it will stay there until you take it off. Slip the unit into your pocket, when not in use, and a special molded safety tip is included to keep the contacts clean.

You can purchase the igniter unit separately, from ACE R/C, or you can order it with a special wall charger, with an adaptor which fits right onto the head lock. This is a very convenient way to recharge the starting battery.

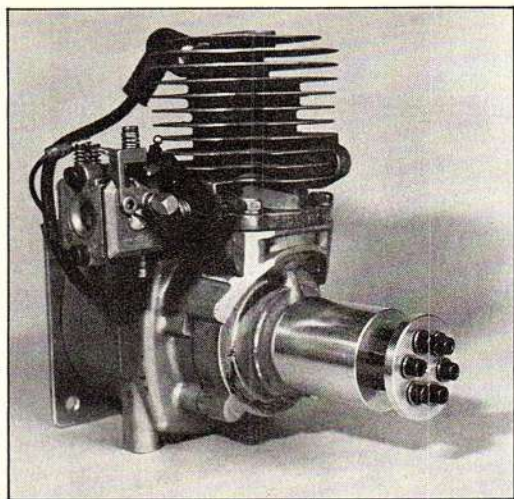
The Nilite II combo gives you both units for \$19.95, or get the igniter for \$12.00, and the charger only for \$10.00. Check these out at your retailers, as manufactured by: ACE R/C, Box 511, 116 W. 19th Street, Higginsville, MO 64037.

* * * * *

COBRA 2.3

Roush Mfg. has introduced a new engine to the giant-scale field. Their Cobra 2.3 c.i. powerplant is rated at 2.75 hp at 8,000 rpm. The crank and rod are chrome moly steel. Roller bearings are featured on both ends of the con rod, and ball bearings are used to support both ends of the shaft. The sleeve is chromed, and a standard two-ringed piston is used.

The Cobra is nice for many installations, for the large cumbersome flywheel is housed inside the aft end of the unit, as is the ignition system. A standard Walbro carb is



mounted directly to the side of the engine. Because the spark plug exits at the back of the head, the vertical profile of the engine is very small.

Except for the muffler, the Cobra is complete and ready to run. The price is \$149.95.

Order the Cobra direct from: Roush Mfg., 3405 Cleve Avenue, S.W., Canton, OH 44707.

* * * * *



HOT SHOT

Satellite City has added a new dimension to their instant adhesive line with Hot Shot accelerator. This spray-on liquid makes any cyanoacrylate glue bond instantly, even if it is a slow-curing formulation. The product also facilitates filling gaps, and fillet making is a snap with this accelerator. It comes in a 3 ounce bottle, with handy spray atomizer.

Satellite City has also changed their packaging. New Hot Tips spouts are on all of the products. This tapered tip helps retard clogging, and it also is easier to work with than the old wicking. The glues are now packed in individual plastic cartons.

Check out the full line of Satellite City adhesives at your hobby shop, as manufactured by: Satellite City, P.O. Box 836, Simi, CA 93062-0836.

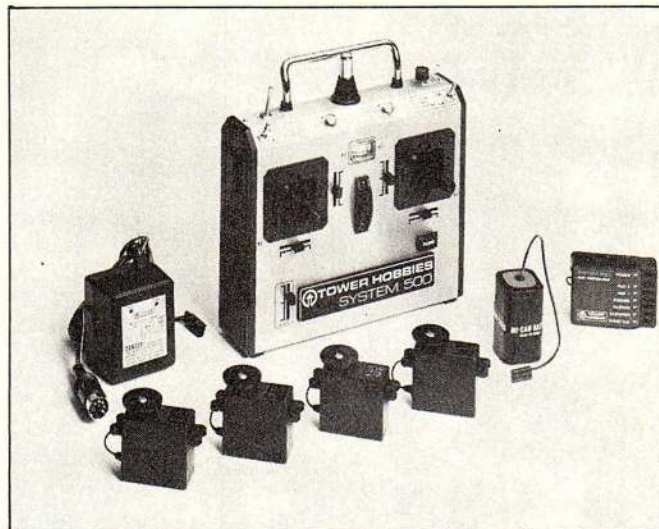
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SYSTEM 500

If you want a quality radio at a very affordable price, then look to the Tower 500 System. The radio is made in two versions, the Silver and the Gold series. The big difference between the two is that the Gold series has servo reversing on the four basic functions, as well as dual rate capabilities. For the scale enthusiast, we can't recommend anything other than the Gold version. The added flexibility

is just what's needed in most scale applications.

Some of the niceties of the System 500 are the very well designed open gimbals, with adjustable length sticks. The

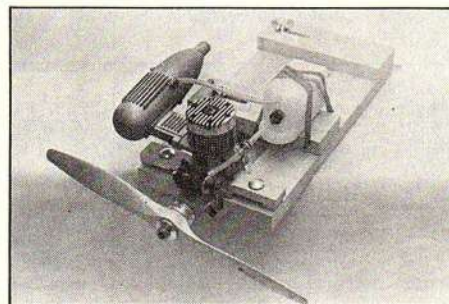


trim tabs are electronic, instead of mechanical, for more exact control. The radios have metal cases, carrying handles and many other human-engineered features.

Both four and six channel systems are available. Most scale fliers will want the extra capabilities of the six channel unit. The fifth channel is actuated by a two-position toggle switch atop the transmitter, while the sixth function is proportional, actuated by a lever next to the name label. The systems are available on all 72 Mhz frequencies, including the newly approved ones. A one-year parts and labor warranty is part of the package.

In our opinion, getting all of that for \$159.95 (6 channel Gold Series) is amazing. This system is Tower Hobbies' proprietary brand label, so it is not sold through hobby shops, but is only available directly from: Tower Hobbies, P.O. Box 778, Champaign, IL 61820.

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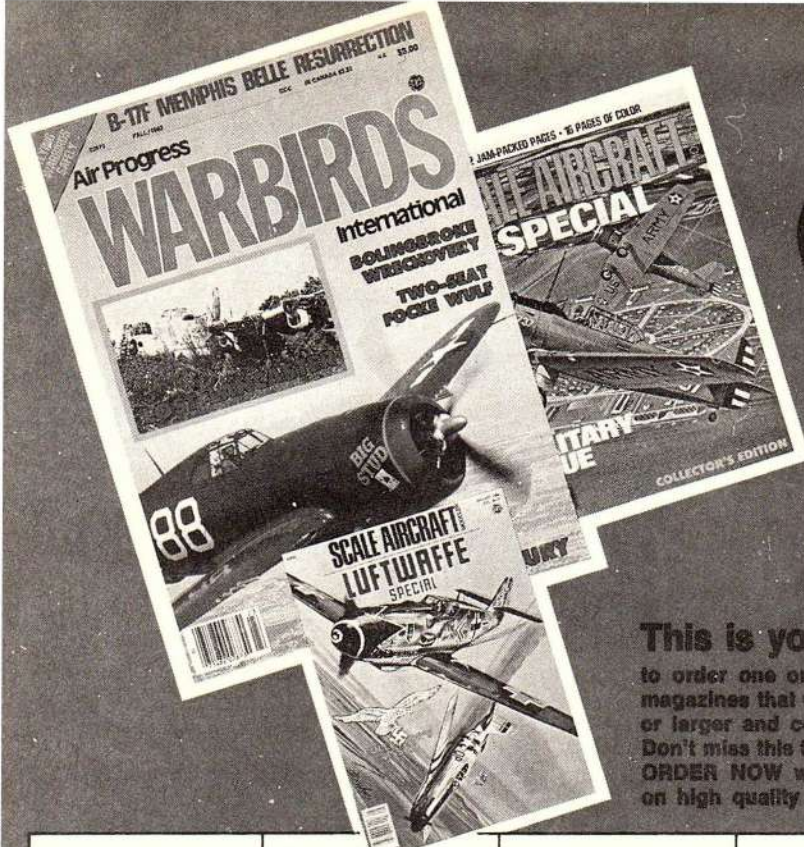


STAND FOR IT

In the magazine business, an engine test stand is just as important a tool as a typewriter. We are incessantly running engines for evaluations, or to ready them for installation in project aircraft. What does our test stand look like? There are several of them, each one slightly different . . . but they are all home made. There's not a commercial unit in the bunch, primarily because we never found one which would hold up to the demands we placed on it.

We had an opportunity to examine a new stand system, from Larry's Model Products. This "uni-beam" construction system makes it ideal for any size engine. The nice thing is that there's a place for the tank, and sufficient room to screw or clamp the entire unit to a firm support surface. Even though the unit is sealed to prevent fuel damage, we gave our engine stand an extra shot of clear polyurethane to ensure that the wood wouldn't get soft and spongy. This stand is made to last, and we were quite impressed by the design, as well as the quality.

If your dealer doesn't yet stock this product, order direct from: Larry's Model Products, 4300 West Genesee Street, Syracuse, NY 13219. Price \$14.95. ☐



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- ☐ Air Progress WARBIRDS INTERNATIONAL
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SENECA

(Continued from page 49)

When everything looked right, I used liquid masking film to seal the window areas, and the entire model received a final sealer coat of clear. The finished model was everything I expected of it, and the man who was about to take ownership was thrilled with the outcome. But, would it fly?

The maiden flight on such monumental projects is always such a feverish occasion. I'm not used to a twin, so I really didn't know what to expect. But, I had done my homework and I had broken in the engines and was 100 percent sure of their reliability. The Seneca II tipped the scales at 13¾ pounds. That seemed like a lot to me, but most modelers I talked to thought it was amazingly light for an 85" span twin.

I wasn't taking any gambles on that first flight. I had the owner of the full-size Seneca (and soon, hopefully, to also be the owner of the model) hold the plane while I revved the engines. I told him that I would run them up to half throttle and, if they were in synch, he was to acknowledge my request to release the model and let her rip. The engines came up beautifully, and they throbbed with that eerie sound that only synchronized twins can make. I nodded, and he released the model.

At half throttle, the Seneca was airborne in about 30 feet. The available power was tremendous, even at partial throttle. I opted to leave the gear down, in case of an unforeseen emergency. At altitude, I trimmed up the aircraft, and found that only a little up trim (probably from the gear down drag) was required for hands off flying. At full power, the model was really moving along, so I kept it at half throttle cruise most of the time for more realism. The model felt nice and light, and not at all as if it were heavily loaded.

I came all the way back on the power, and lowered the flaps. The model was retrimmed with some down, and the Seneca was almost motionless in a hover. The model was amazingly stable and easy to handle with just stabilator and rudder in this slow-flight mode. The transition back to the clean configuration and half power was just as effortless.

I made some low passes, to impress the new owner (as well as myself). The Seneca was truly beau-

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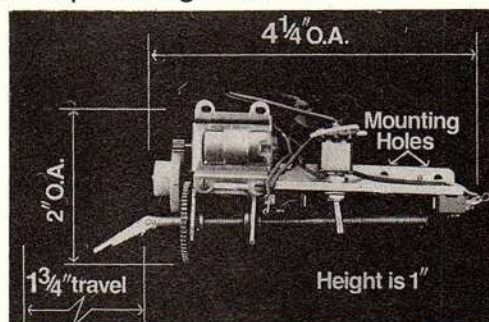
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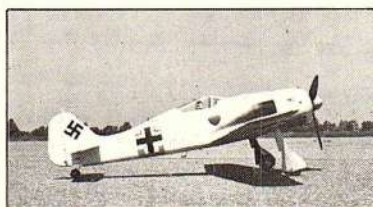
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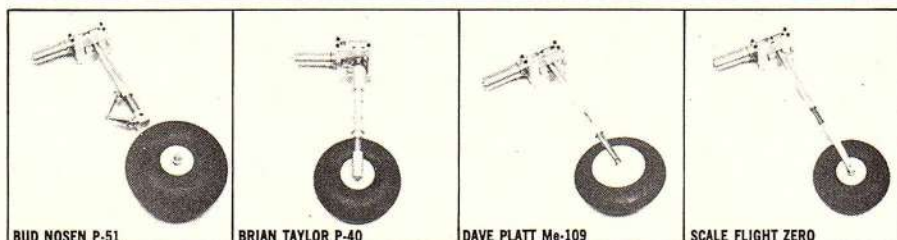
Lots of intricate scale detailing make the Seneca come alive. Full interior is included.



tiful. After about ten minutes, one of the engines began to sound a little ragged, so I decided to go for a landing. The power was brought back to about a quarter throttle. The flaps were lowered. The model felt as if on rails. I would mention that it helps to be an experienced rudder pilot when handling a twin. Minor trim corrections for variation in power settings between the engines are handled with rudder.

The Seneca came down the final leg effortlessly. The flaps slowed it down and gave a solid rate of sink, with no tendency to float. Just above the runway, some up was added to get the flare. The twin kissed the runway so tenderly that it was hard to tell the actual moment of ground contact. The model rolled about 20 feet before the nose wheel settled onto the runway.

The model was a totally pleasurable experience. There's a lot of



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The author's text adds many helpful hints if you are considering this scratchbuilt project.



work to building a twin, I'll admit that. But, the final result looks so different from anything else you typically see at the field that it's worth it. I can honestly say that the Seneca was a very simple and honest airplane to fly. It flew better than some of the WWII single-engined scale models I've built. I honestly don't know how hairy it would be with one engine out, and I really don't care to find out. If the proper precautions are followed, there's no reason to ever have a flame out with today's powerplants, so I wouldn't let the fear of a lost engine keep me from enjoying the thrills of seeing and hearing that big twin go whooshing by. □

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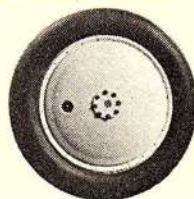
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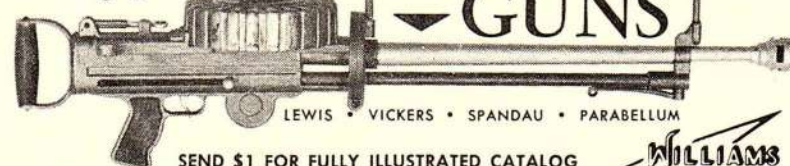
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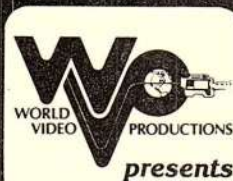
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SRC

EDITORIAL

(Continued from page 12)



Denali Wilderness Air is offering a unique package in exchange for the models. They will provide an all-expense paid, 5-7 day Alaskan Wilderness Adventure and Bush Pilot Tour (round-trip fare from Seattle included, for up to two persons). An option is available to extend the tour to two couples, or a family-sized group at discounted rates. The tour will be hosted by Denali Wilderness Air and Wood River Lodge, one of Alaska's best known and beautiful wilderness lodge and tour organizations.

In conjunction with the display, Lynn is also looking for information about early flights in the McKinley region, and would like to have old photos, stories or artifacts | early aviation in Interior Alaska particularly in the Railbelt or McKinley districts. Lynn will cover the costs of reproducing any photographs, newspaper clippings, posters, ads or scale drawings for early vintage aircraft which were used in Alaska, etc. which might be used in the museum, and all donors will be credited as part of the appropriate display. All donated materials or artifacts will, in the future, be available to the state's Alaskan Historical Aircraft Society. Donors will be extended credits for flightseeing and lodge tours, redeemable from Denali Wilderness Air.

Any readers interested in participating in this unique and worthwhile project should contact: Lynn Castle, Denali Wilderness Flying, P.O. Box 82, McKinley Park, AK 99755 or phone (907) 683-2261. Please include appropriate photographs, dimensions, comments, descriptions, etc. of any model aircraft offered in your initial

Carl Ben Eislson, Alaska's most famous pioneer aviator, climbs aboard one of the early Jennies, circa 1923. You can barnstorm Alaska by reading about the model building contest in this month's Editorial. (Photo Courtesy Anchorage Historical and Fine Arts Museum).



inquiry. Any posters, newspaper clippings or photos should be carefully packaged in cardboard or cardboard tubes. Once received these will be handled with extreme care and when reproduced will be returned directly to the donor in similar packaging.

We're sure that our readers will welcome this chance to win a trip to Alaska. If you don't think that the McKinley area is a wilderness, my first contact with Mr. Castle was by radio-phone! This museum project sounds exciting, and the magazine is glad to be a part of this worthwhile project.

* * *

In the flub department, our article in the February issue on fiberglassing had an error. The directions said to use 6-8 ounces of catalyst. Needless to say, this should have read *drops!* If you didn't catch the error, we're pretty sure that you noticed a discrepancy if you tried to add that much catalyst. Watch adding too much catalyst, since the heat generated from the reaction of the resin can cause a potential fire hazard.

We have had numerous inquiries about the reference to the 1.5 ounce glass cloth. While not readily available from hobby outlets, this weight cloth can be obtained from many commercial fiberglass supply companies, and often the boat repair companies can put you in touch with outlets which handle it. The particular company which Pat Kinney used is: Thalco, 6431 Flotilla Street, Los Angeles, CA 90040. This product is the 108 Valan cloth, which comes by the yard in 38" widths. □

when the model requires paint, the paint to use is HOBBYPOXY

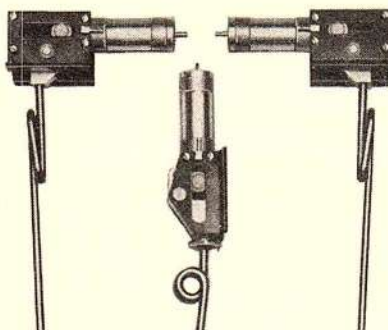


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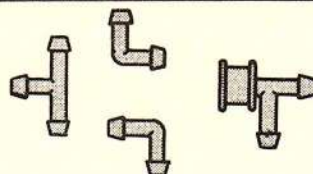
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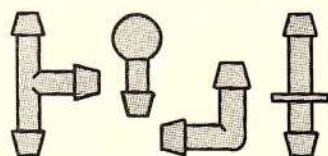
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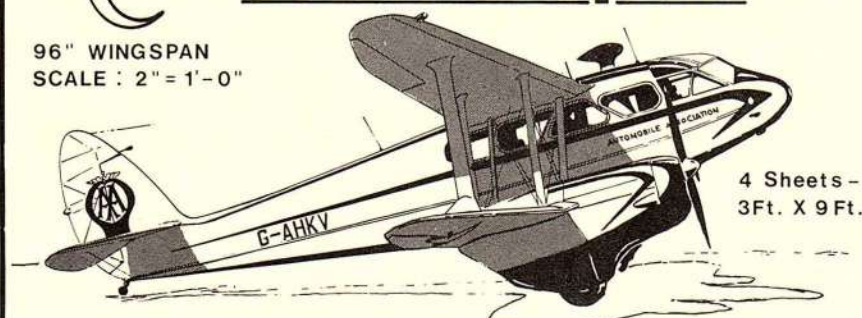
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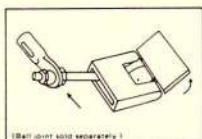
(Continued from page 16)



Jerry Behrens (the same as the plan service) scratchbuilt this Travel Air 2000. 104" span and 23 pounds.

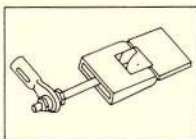
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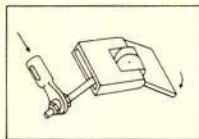
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The more than one plane group, as might be expected, placed more than average emphasis on the slower flying classics. There was substantial innovation to be found, however. Bob Grim, for example, powered his 112" scratchbuilt Clipped Wing Cub with a homemade twin-cylinder engine. The Grim Twin, a potent looking piece of machinery, swings a 22=8 prop. His 1/3-scale Cub weighed 30 pounds.

Most interesting among the one-of-a-kind mammoth scale ships presented were the Bearcat, Sopwith Pup, Aeronca C-3, Skybolt, Starduster Too, Piper Pacer, P-47, Corben Super Ace, Fokker DR-I triplane, Mr. Mulligan, Ercoupe, P-40, Pilatus (Fairchild) Porter, Laser 200, Druine Turbulent, Taube, Travel Air 2000 and Travel Air 4000D, Corby Starlet, Pitts S-1A, Pitts S-2A, Farman Moustique, Monocoupe 90-A, Jenny, Fokker D-VII, P-51, and a Taylorcraft. These represented fine sampling of all eras and also an exceptional outpouring of scratchbuilds (36 of the total entries).

Among the unusual projects in the group was a plan prototype Farman Moustique by Norm Rosenstock. The quarter-scale version of the 1936 French ultralight weighed 7¼ pounds, and spanned 80 inches.

Engines presented another interesting side of the entries. By far the most popular powerplant in the field of 77 mammoth scale ships was the Quadra. A phenomenal 32 engines were represented. Next in line among the converted industrial types was the Kiortiz, with 13 engines of varied displacement. The Kawasaki, in 3.2 cu. inch displacement, was found

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Sometimes mail-order buying can't be avoided, but what are you really saving when you support a company perhaps thousands of miles away? The next time you're in the market for a bargain, give your local retailer a try first . . . you'll be making a better deal in the long run. (This editorial comment printed courtesy *Scale R/C Modeler* magazine)

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in five planes, and a single converted Remington chain saw engine was fielded. One each of the new Contempo Magnum and R. M. Titan engines was seen.

Glow engines remain extremely popular for the big ships, it seems. Among the twins, O. S. Max was represented by four 4-cycle .60s. One Ross .60 Twin appeared, along with Bob Grim's homebuilt. Four O. S. Max .90s, three Webra .91s, and three Webra .61 Speeds were seen, along with single examples of the Ross .90, O. S. .80, Fox .78, O. S. .61, Enya .60, and the smallest of the powerhouse group was an H. B. .40.

The Somers contest encourages maximum fun flying, and the only restriction to this is the field safety rule forbidding more than four aircraft aloft at one time. An occasional jam-up occurs due to an over-popular frequency.

"Why is everybody here on red and white?"

Grousing is rare, nevertheless, even in spite of the constantly smiling five-master fliers. But, never mind, everyone knows the FCC is about to transform itself into the U.S. Cavalry.

While there is no obligation for contestants to do anything but fly and enjoy the weekend, Somers offers three major awards. The "Best Craftsmanship" award looks especially favorably at full scale construction methods, plus all the usual finish and fidelity criteria. The "Most Realistic Flight" award takes such factors into consideration as ground handling of tail draggers, engine sound, aircraft speed, and the inevitable plane-to-judge appeal. The third award is "Pilots' Choice," which calls for judging by one's on-the-line peers, and this prize is awarded daily.

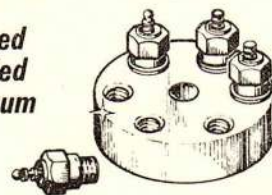
John Kovarik took a silver cup for "Most Realistic Flight." His fine Piper J-3 Cub sported an O. S. Max Twin 4-cycle and weighed just 15 pounds, 14 ounces. The ship, built from the Nosen kit, featured a camisole-clad young lady named Betty in the pilot's seat. Some realism. But the judges were too far away to notice.

Kerry Sterner won the honors for "Best Craftsmanship" with a scratch-built Bearcat, from Zirol plans. The big, yellow, beautifully-decorated aircraft spanned 88", and was powered by a 3.2 cu. inch Kawasaki, swinging a 22=8 Zinger prop.

Bill Zimmerman's Quadra-powered, scratchbuilt Corsair took "Pilots' Choice" on Saturday and Ray Hinds, with his Concept Fleet biplane (a

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500-flight veteran), took the award Sunday. Ray also tied with Tom Bogenski for the greatest number of flights during the meet, a special incentive award. Tom noted that his PU-2 design, high-winged and equipped to tow gliders and drop chutes, is slated to be kitted by Repla Kit (Inverness, Florida).

Safety is of foremost consideration at Somers. An intensive check is made of each aircraft for every possible flaw. Pilots also must affirm that their entries have been flight-tested in advance. But, despite any amount of care, incidents will occur and all flying is kept well forward of the flight line, even exceeding the usual guidelines.

Nick Zirol, Sr., with his scratch-built silver and red 1/5-scale AT-6, was engaged in a steeplechase flight with Bill Zimmerman's Corsair, when the big blue ship drew close enough to run its prop into Nick's rudder. Some crowd "ooing" followed the buzz saw noise, accompanied by the sight of a small shower of splintered balsa floating to earth. But both ships maintained full control and landed immediately, without incident.

In another more disastrous mid-air, the tail section of Vince Perillo's just-completed Taylorcraft was severed, resulting in total loss of the ship and Vince's decision to depart the hobby (for the fourteenth time). He re-enlisted the next day. The only other unfortunate incident was another totalled aircraft. Roy Vailancourt was beginning a high speed low pass with his beautifully-detailed P-47 Thunderbolt. The plane ran afoul of the waving tall grass at the edge of the field, some 50 feet short of the grass strip.

It's a measure of the sympathy of the crowd that they seem to feel the losses as greatly as the pilots, who know that occasional aircraft mortality is part of the hobby.

For four years in a row, the Somers weekend has been a memorable one for pilots and spectators alike. The weather was its usual sunny self, and we like to think that each of the participants in the fun-fly keep a bit of that sunshine with them throughout the year.

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(Continued from page 9)

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ERRATUM

The January issue's "Heart of America" article omitted mention of Dwight Smith as the photographer.

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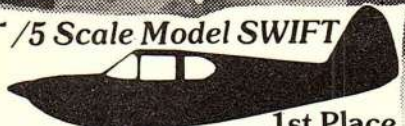
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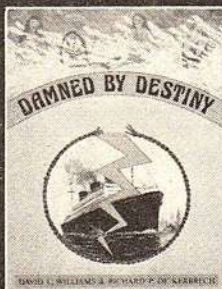
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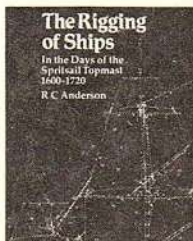
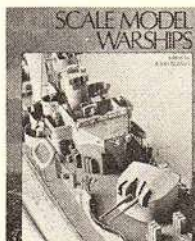
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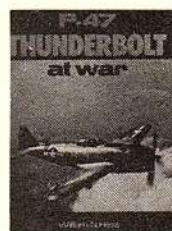
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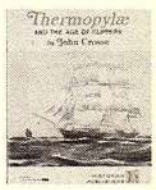
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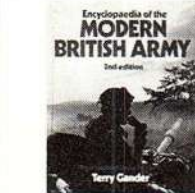
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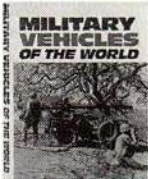


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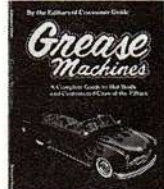


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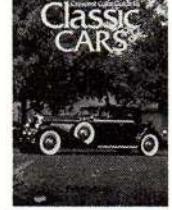
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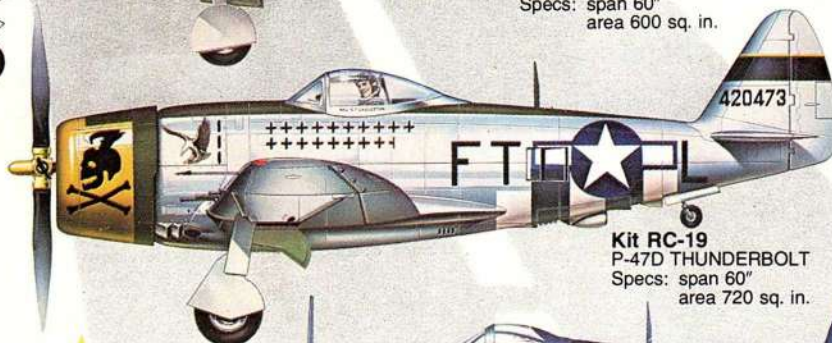
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