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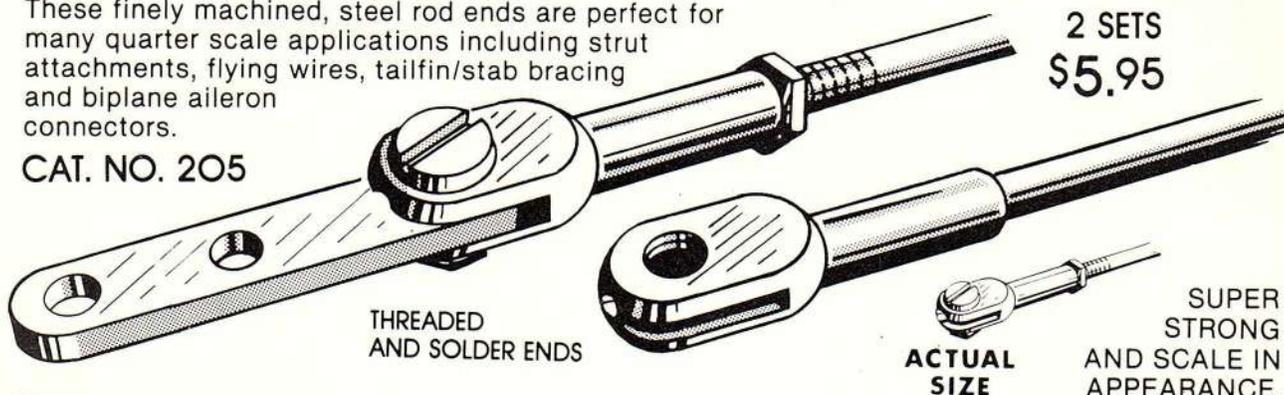
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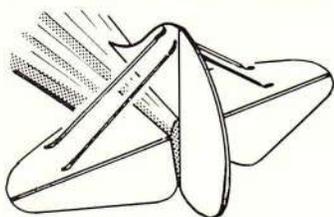
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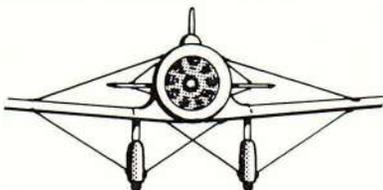
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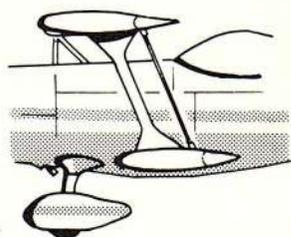
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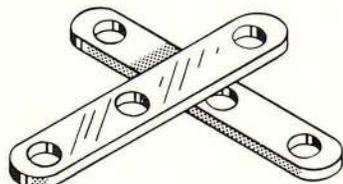
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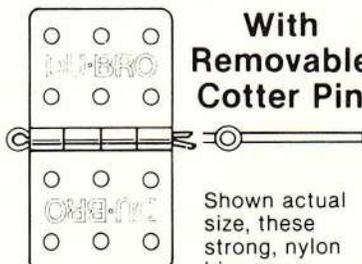
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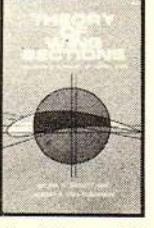
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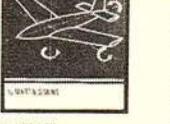
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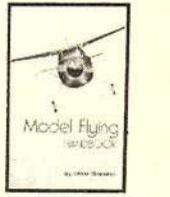
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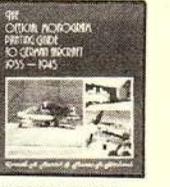
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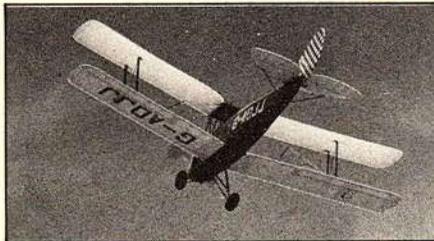
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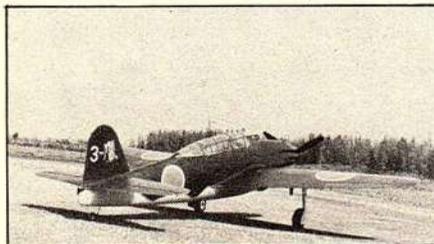
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COVER:

Few planes stir the imagination like a well-done big biplane. John Pahlow's latest is the epitome of what we're talking about. Not only is it a great machine, but it's available as a top-quality kit. See the feature article in this issue.

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SCALE R/C MODELER

VOLUME 7, NUMBER 6

DECEMBER 1981

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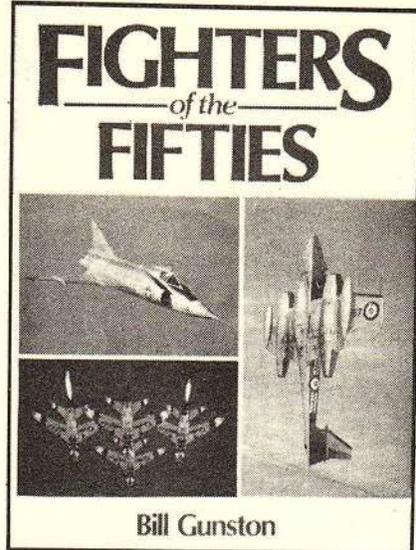
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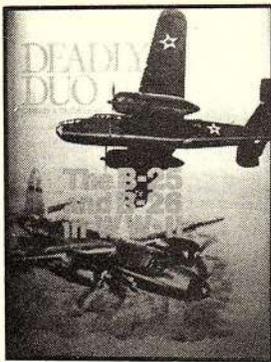
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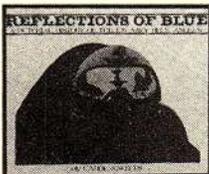
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BADGER FILM AND FILTER

Badger Air-Brush has released two new products which will prove to be invaluable accessories for the scale modeler. Their new Foto/Frisket Film is the perfect solution to the problem of how to make stencils for insignia and markings. Unlike contact papers, masking tapes and all the other items we've come to live with, Frisket Film has a very low-tack adhesive on the back, so that it will lift off any previously finished surface without damage. Not only is it ideal for such applications, but it is thin enough to go around compound curves reasonably well, an dit will contour to panel lines, etc. It cuts readily with an X-Acto knife, and gives a sharp clean paint line. You can write on it with an acetate marker, so that laying out the design can be done right on the material, and it is transparent enough to allow tracing. Because you can see through it, aligning the artwork over previously painted areas is facilitated.



Foto/Frisket Film can be purchased either in a ten-sheet pack (8½ x 11") for \$7.00, or in a roll 12" x 15' for \$12.00. A large 24" x 15' roll is also available for \$22.00, which is ideal for giant-scale applications.

Also new in the Badger line is a much-needed little goodie known as the Fluid Filter. This is a neat little microscreen "sock" which slides over the pick-up tube in the Badger spray paint bottles. No more will a nice paint job be interrupted by a clogged nozzle. Now the painstaking job of pre-filtering and screening the paint can, if necessary, be eliminated. Without all that tiny crud clogging up the spray equipment, the quality of finished job will improve.

The Fluid Filter can be cleaned for reuse, and it retails for \$4.00. Check for both of these items at your hobby outlet, or write for more data to: Department PF-6, Badger Air Brush Co., 9128 W. Belmont Ave., Franklin Park, IL 60131.

* * * * *



HOT STUFF DISPLAY

No longer is it necessary to roam around the hobby shop, looking for replacement applicators for the bottles of Hot Stuff. Now, Satellite City is putting everything on one self-contained display rack, so that the modeler can serve himself. There's even a place for the popular Hot Stuff "Tips" booklet, which is free for the taking. Furthermore, even the giant-size 2 ounce Hot Stuff is vended on this display, so you'll have a chance to save money by buying in "bulk." Look for the new display at your dealers now.

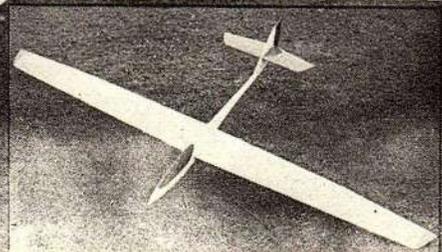
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SPECIFICATIONS	
Span	64
Wing Area	780
Length	51
Engine	60-.90
Channels	4-8
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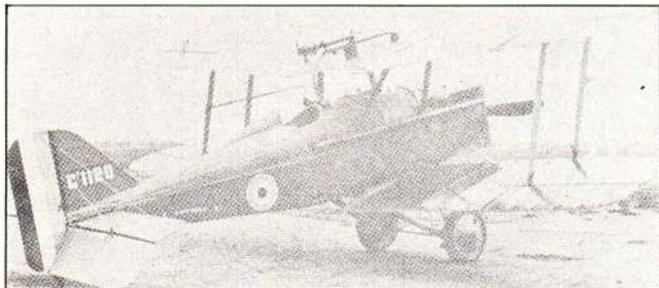


BIG FAN SEMI-KIT

One of the big hits at last year's Nats and Scale Masters events was Tom Cook's huge twin-fanned F-4 Phantom. This monster only has a span of 58", but the length is 85 3/4"! With 1,185 sq. in. of area, the big fighter is reasonably low on the wingloading scale at 16-17 pounds. With two Turb-Ax fans and tuned-piped K&B 7.5s, the model is capable of speeds in excess of 100 mph. The plane can be retract equipped, and has optional flaps and drogue chute available (with 7-channel operation).

The big bird comes as a semi kit, with a glass fuse, air inlet ducts, a set of engine cover caps, assembled stabilizer pivots for the full-flying stabs, and a pair of 1/64" ply exhaust tubes. The wings are foam cores, as are the stabs. No wood is included, but the canopy and drawings are. This plane has exhibited single-engine operation, with complete safety. Tom has come up with some pretty successful mods to the K&Bs for reliable fan operation, as well, and for a price he will gladly rework your engines (write for details). The Phantom sells for \$329.95, and this is a limited production kit, available only direct from: Jet Model Products, 304S Silvertop, Raymore, MO 64083. Phone (816) 331-0356.

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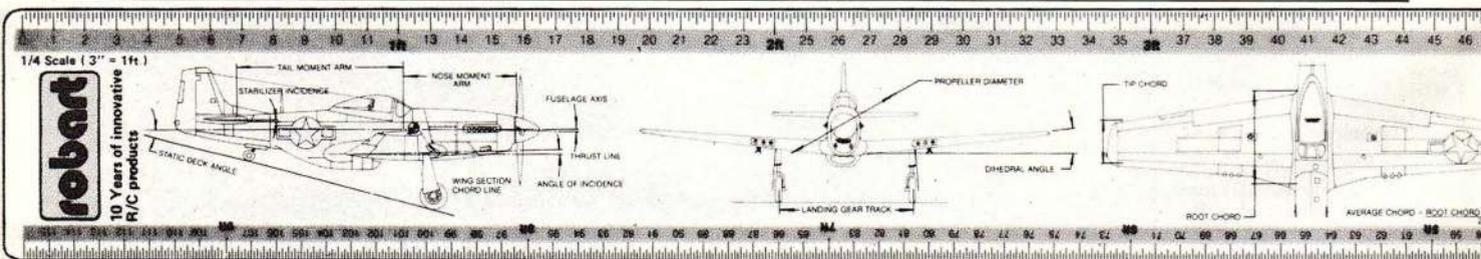
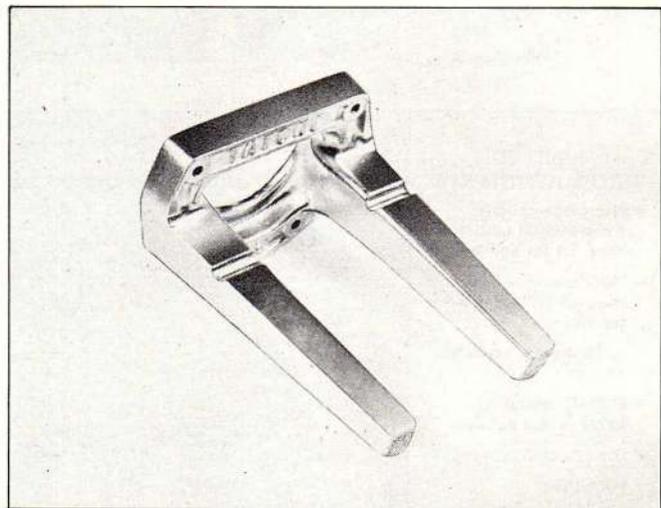
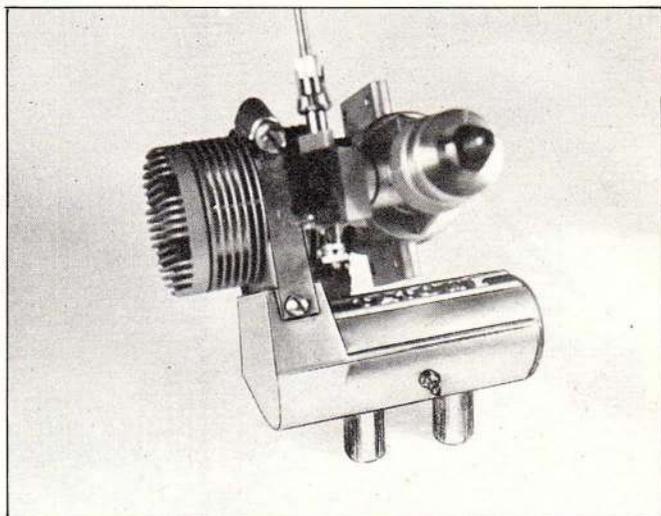
SE5a

Avco Model Supply is manufacturing a 1/3-scale kit of the famed SE5a. The kit includes cut ply and balsa formers, stripwood and enough wood to start a lumber yard! The huge plans come rolled, and an excellent 11 x 17" cutaway is in-

cluded, as well as a 3-view. The model is built exactly like the full-size prototype, in every detail. Vacu-formed Vickers and Lewis machine guns are in the box, as well as a formed radiator, headrest and a set of 10" covered wheels. This is a deluxe kit intended only for the serious builder. Price is \$280.00 (plus shipping).

Avco also has a catalogue of cockpit kits for 1/4 and 1/5-scale. Coming soon are 1/4 and 1/3-scale J-3 Cub engine kits, and a 1/4-scale Kinner engine. For more details, write directly to: Avco Model Supply, 1885 Dyson Street, Muskegon, MI 49442. Phone: (616) 726-3400.

* * * * *



MODELERS SCALE

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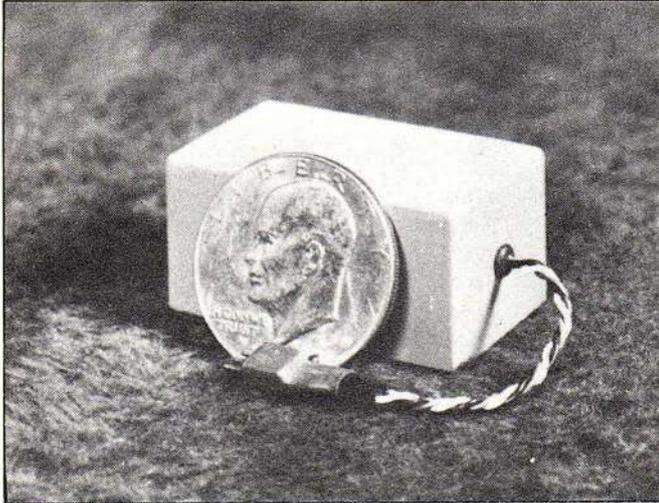
MUFFLERS AND MOUNTS

Tatone now has an enlarged version of their famous "Pitts" muffler available. This one is designed to fit most .90 engines, in a side mounted configuration. The layout of the muffler routes the exhaust gasses downward and out the bottom of the cowl, in prototypical Pitts fashion. The muffler clamps in place, and two neoprene tubes allow the exhaust to be channeled in any location. Tatone also makes this same style muffler for .29-.40 engines and .45-.80 powerplants. Since the unit is cast in two shells and because of its circular airflow design, the Pitts muffler is ideal for smoke systems. Price is \$21.95.

Tatone is also shipping their new engine mount for the Rossi .90. This is a cast aluminum mount, which has been heat treated for increased strength. Price is \$19.95.

See these items at your hobby shop, as manufactured by: Tatone Products, 1209 Geneva Ave., San Francisco, CA 94112.

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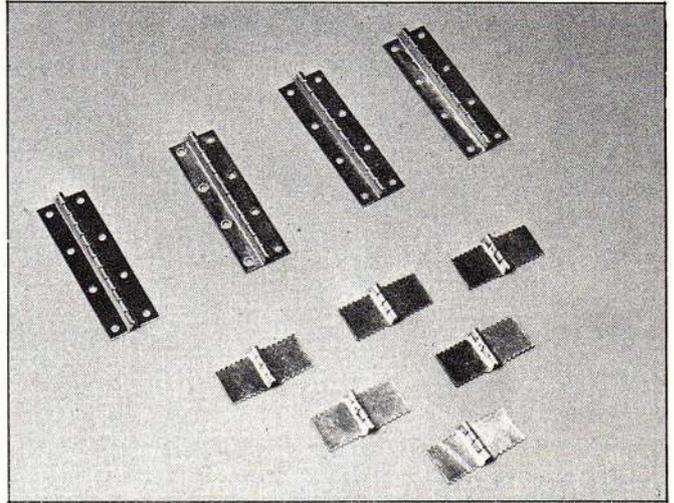


PLUG-IN STABILITY

How many times have you wished that you could just plug in a little module and make that squirrely model fly with hands-off stability? Well, here's the little gadget that will do just that. With a simple change of a component in the elevator servo, and by just plugging in the Watson Stabilizer, the model will immediately fly in a pre-determined pitch mode indefinitely . . . no matter where the model's C.G. is (within reason, of course). Imagine, doing perfect 10-score fly-bys, time after time! This is the ideal lifesaver for a new and untried airplane design, of course. The more you think about the possibilities, you begin to wonder why radio manufacturers don't build them into radios.

Actually, the cost is prohibitive for unit production by radio manufacturers, but for those who realize that the money would be well spent if it even saved one crash, the \$275 price tag is not out of line. The self-contained stabilizer is designed around the piezoelectric vibrating beam technology,

and the company makes units for full-scale aviation. The stabilizer weighs only three ounces, and has a working life of 10,000 hours. Current drain is 1/4 watt, so it can be driven from the receiver pack. The electrical design is totally compatible with all makes of radios, and the stabilizer does not interfere with normal elevator operations. The unit could also be used for aileron, if desired, but please specify this option with the manufacturer. Watson Industries will modify your elevator servo, if you send it to them at the time you place your order. Write directly to: Watson Industries, 3041-G Melby Road, Eau Claire, WI 54701.



SCALE HINGES

Especially designed for 1/4-scale applications, these new metal hinges are perfect for doors, cowl hatches, etc. These are offset hinges, which means that, when the door or hatch is closed, the hinge pin aligns with the surface, yet the hinge arm is recessed 1/8" deep into the material. When viewed on end, the hinge arms make an "L" near the pin. The longer 2" continuous hinges are 1/8" recessed at the pivot, and they are 5/8" wide. Price is \$1.50 per pair, in chrome plated finish.

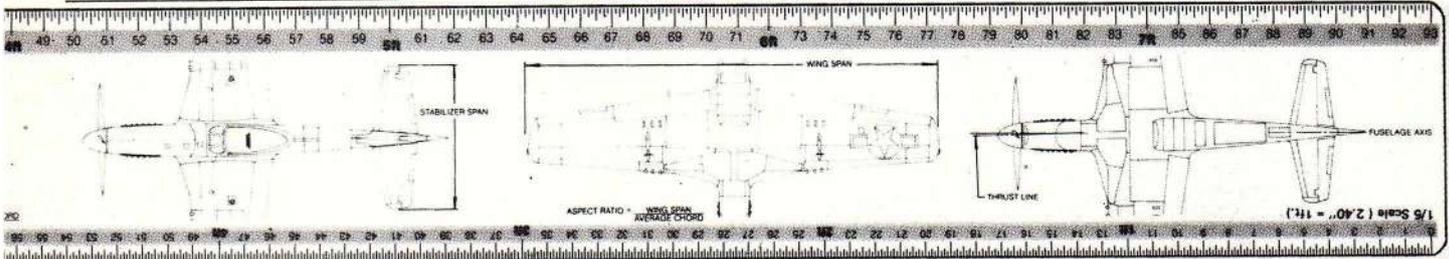
The smaller brass hinges are about the same size as a standard nylon hinge, but the edges are saw toothed, so that, once inserted, they are difficult to pull out. These also are 1/8" offset at the pivot point, and they are 1" wide and 1/2" long. A set of six sells for \$1.50.

Order these items direct from: Lee Richter, 14026 Maple Ridge Rd., New Berlin, WI 53151.

* * * * *

DUAL RATE FOR EVERYONE

If you have always wanted to try dual rate, but just couldn't see your way clear to invest in a deluxe radio, then here's a simple and inexpensive way to modify your existing radio. The L. R. Taylor mod kit is a small 1 x 1 1/2 x 3/4" unit which can be mounted right inside the transmitter. Simply solder the three wires to the stick pot and the radio has a



This precision scale is specifically designed for the scale modeler and scale judge.

It provides an accurate means to measure: Chords, spans, thicknesses, etc., in feet and inches directly from a 3 view drawing. It features four scale sizes:

1/8" - 1 1/2" = 1' (Most .60 scale) 1/4" - 2' = 1' (larger .60 scale)

1/8" - 2.4" = 1' (.90 size, Zirolti/Platt) 1/4" - 3" = 1' (Nosen, etc. 1.20 and up)

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dual rate function. Nothing could be easier, and the unit allows the same reduced throws as are available on the expensive deluxe transmitters. The unit sells for \$19.95, and one unit is needed for each function to be converted (typically elevator and aileron on most scale ships). Currently, the unit is available for most of the Futaba radios, and the Cirrus and Aerosport series of transmitters.

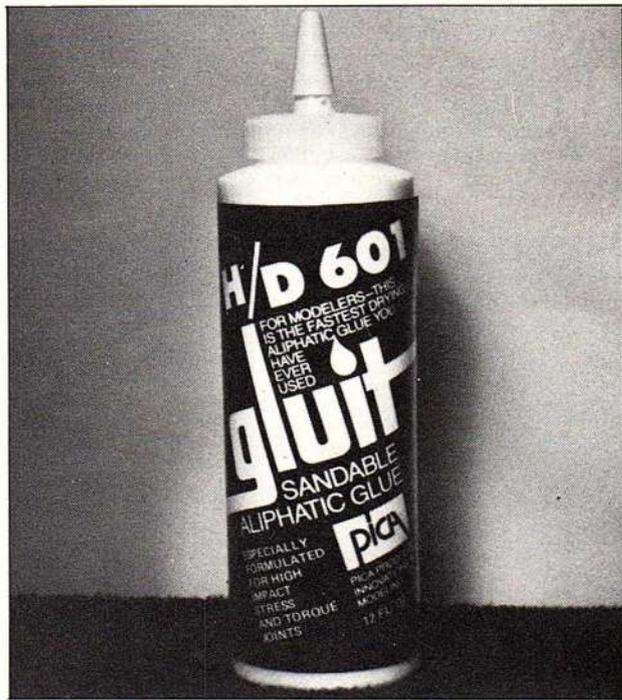
Check at your hobbyshop for this electronic goodie, as manufactured by: L. R. Taylor, 20831½ Roscoe Blvd., Canoga Park, CA 91306.

* * * * *



BETTER GLUES

Pica Enterprises has introduced a new set of modeling adhesives which they are touting as better than everything else around. The new E/P 105 5-minute epoxy is 100% uncut industrial strength resins, for maximum bonding power. It is also totally compatible with resin covering materials, which means no more uncured fiberglass mess where the epoxy joints are. It is also easily sandable, and comes in convenient flip-top dispensers.



BADGER...

Tools to help you finish like a pro.

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.

BADGER'S FOTO/FRISKET FILM can be used on most surfaces that are to be painted without fear of damage to the surface or previously painted areas. This 2 mil vinyl is extremely easy to cut and prevents the modeller from cutting through the film into the surface on which they are working. FOTO/FRISKET FILM has a translucent backing which makes it possible to lay over lettering, logos, insignias, etc.,

and see through to pre-cut stencils. FOTO/FRISKET FILM will not buckle when sprayed on—thus preventing underspray. Available in sheets or rolls.

BADGER'S FLUID FILTER was designed for use with the air-brush that uses jars or bottles. The microscreen filter eliminates lumpy paint or foreign particles that would normally pass through the air-brush and cause plugging. The Fluid Filter slides on and off easily for quick cleaning.



Ask your favorite Hobby or Craft store about BADGER. For a complete color catalog BA 300 send \$1.00 to cover postage and handling to Dept. 841. Prices slightly higher in Canada.



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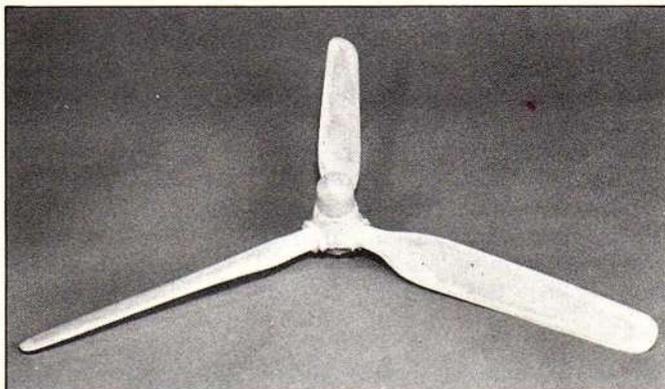
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Their Gluit is now sold as Gluit H/D 601, presumably meaning it's a heavy-duty formulation. It's fast drying, sandable and works well on hardwoods and plywoods.

Check for these better glues at your retailers, as manufactured by: Pica Enterprises, 2657 N.E. 188th Street, Miami, FL 33180.

* * * * *



SCALE PROP

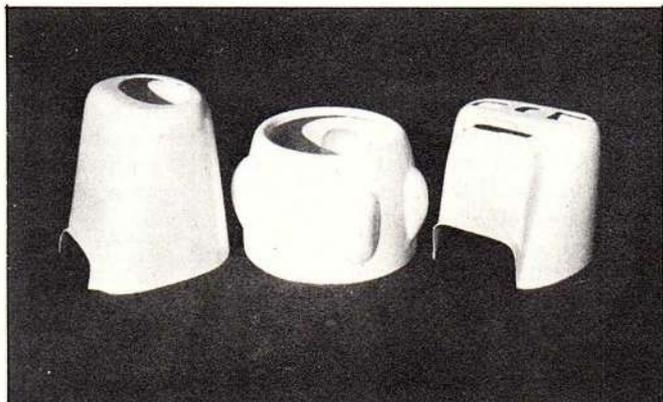
Let's face it, no scale model looks quite right without a scale prop. Yet we constantly see models static judged at contests with a plain, wooden flying prop . . . and that's got to cost some points. Well, if you're in that dilemma with your latest F4U Corsair, then thank Bob Holman for coming to your rescue. His latest offering in fiberglass is a very attractive 3-bladed prop that is ideal for the Corsair, and many other WW II warbirds.

The unit features hollow glass blades, which just require light touch-up sanding and a bit of filling to get perfect. The hub is a one-piece affair, which is also molded of glass. The hub assembly detail is fairly good, although our

sample needed a bit of touch-up on the fine items, like the bolt assemblies that hold the fore and aft sections together on the real thing. A little filing and grinding with the Dremel was all that it took to make the hub assembly perfectly acceptable. Since the base on the hub is solid resin, it can be drilled and tapped for the engine's prop shaft.

This, and other scale goodies are listed in Bob's very comprehensive scale catalog, which is available for \$2.00 (refunded with your first order). Contact: Bob Holman, P.O. Box 741S, San Bernardino, CA 92402.

* * *



MORE COWLS

T & D Fiberglass is again expanding their line of fiberglass cowls for giant scale models, with the addition of cowls for Wendell Hostetler's Skybolt, Jungmeister and Liberty Sport. These are all in 3"=1' scale, and are designed for strength and maximum scale appearance. There are dozens of cowls (and wheelpants) in the T & D line, so drop them a request for a price sheet. Write directly to: T & D Fiberglass Specialties, 30925 Block, Garden City, MI 48135. □

CESSNA O-1E BIRD DOG

by MARUTAKA R/C MODEL

1/5 SCALE



\$219.95

DESIGN FEATURES:

Two piece wing with operating scale flaps—Operating cockpit door—Fully cowled engine—Radio installation hidden from view allowing optional full scale cockpit detail—Semi symmetrical scale airfoil allows limited aerobatics.

KIT CONTAINS:

Balsa and plywood construction—Fully sheeted wing—Die cut parts—Fiberglass cowl—Scale spring steel tailwheel—Moulded windcreens—Full size plans—Heavy duty aluminum landing gear—Hardware package with control horns, strut attach brackets, screws—Building instructions—(Additional hardware required)

SPECIFICATIONS

Length	59.35 in
Wingspan	88.90 in
Wing Area	1038 sq in
Weight	12½ lb
Engine	60-90 glow, 120 4 cycle, 20 cc gasoline
Radio	5 channel
Scale	1/5



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When a professional skywriter painted our lead photo in the bright California sky on Sunday afternoon, the "Have a Happy Day!" face was a good omen for a handful of the scale fliers who stood below it at Mile Square Park. Those who were smiling were the five men who fought through six rounds of flying to gain a place on the Scale Masters Championships' Fly-Off in Louisville, Kentucky. And believe one's stars, that smile didn't come over anyone's face in Sport Scale Expert Class until the last landing was scored.

The Southern California Scale Squadron was, as usual, thoroughly prepared for the big weekend, and they were determined to uphold the tradition of the Scale Masters by hosting a top-notch regional qualifier. Needless to say, they are experts at contest running, and this year's event went off without a hitch. The fliers, too, were in dead earnest about "making the team," and many of them were there for a full day of practice on Friday, and a few ardent enthusiasts actually showed up in California as early as Tuesday. Even though there is a qualifier in Texas this year, there were still entrants from there, as well as New Mexico, Arizona and Nevada.

Through some royal screw-up, the contest conflicted with the I.M.A.A. Fun-Fli in northern California, so that may have kept the attendance down a bit, but the fliers still numbered 43. There were 13 in Expert, and 18 in Sportsman (which was run as an unofficial event). Only two planes showed for AMA, but that's probably because this is an F.A.I. qualifying year and the fliers were holding onto their machines for the Nationals. The remaining eight fliers were entered in the unofficial Team Scale event, while two modelers decided to participate in Giant Scale (a very poor turnout for a geographic area that sports two Q.S.A.A. chapters, but the big I.M.A.A. event undoubtedly decimated the ranks in this event).

For a contest of this magnitude, the turnout was great. Aircraft attrition had accounted for a handful of would-be contenders who would spend the weekend on the sidelines. Because of the impact of qualifying for the Masters, the tenor of this

meet (which is in its ninth year) has changed. No longer does everyone who can dust off a scale machine which was hanging in the rafters show up . . . that's what the bi-annual "Un-Contest" is for. To illustrate a point, only three aircraft in Expert were static judged below 89, and there were nine of the 13 entrants in that class which scored above 91. Obviously, the word "Expert" is taken in its purest sense, as these are the cream of the cream in Scale. The fliers who aren't competitive usually show up and volunteer to help in running the contest . . . but they never consider flying, because the competition is just too good.

Several of the regionals around the country reported relatively low attendance numbers this year. But, this comes as no surprise, not only because the middle echelon of modelers in the skill hierarchy tends to stay away, as noted, but also because the Masters concept is still seeking its level. Four (of the eight) regionals this year were new, so the entire process is still sorting itself out. But, the overriding factor is that the Masters did *double* its exposure this year, and the *cumulative* total of fliers who participated in an eliminations program to select a truly representational national champion in Scale has exceeded the total number of pilots who ever participated



Mike Mann walked off with the Sportsman Class, flying this superb F6-F. Static score was 93.5, which would have been good enough for Expert. His final score would have placed him fifth in Expert!

Perennial winner "Cowboy" Kent Walters again proved that a solid model and consistent flying are an unbeatable combination.



WESTERN SCALE NATS

in any AMA Nats Scale program. In other words, more modelers are getting the chance to compete in an equitable program for selecting the king of the hill in Scale. As a matter of fact, over 200 modelers have participated in the program this year and, while the Nats has yet to be held as of the time of this writing, it is doubtful that there will be even half that number competing there.

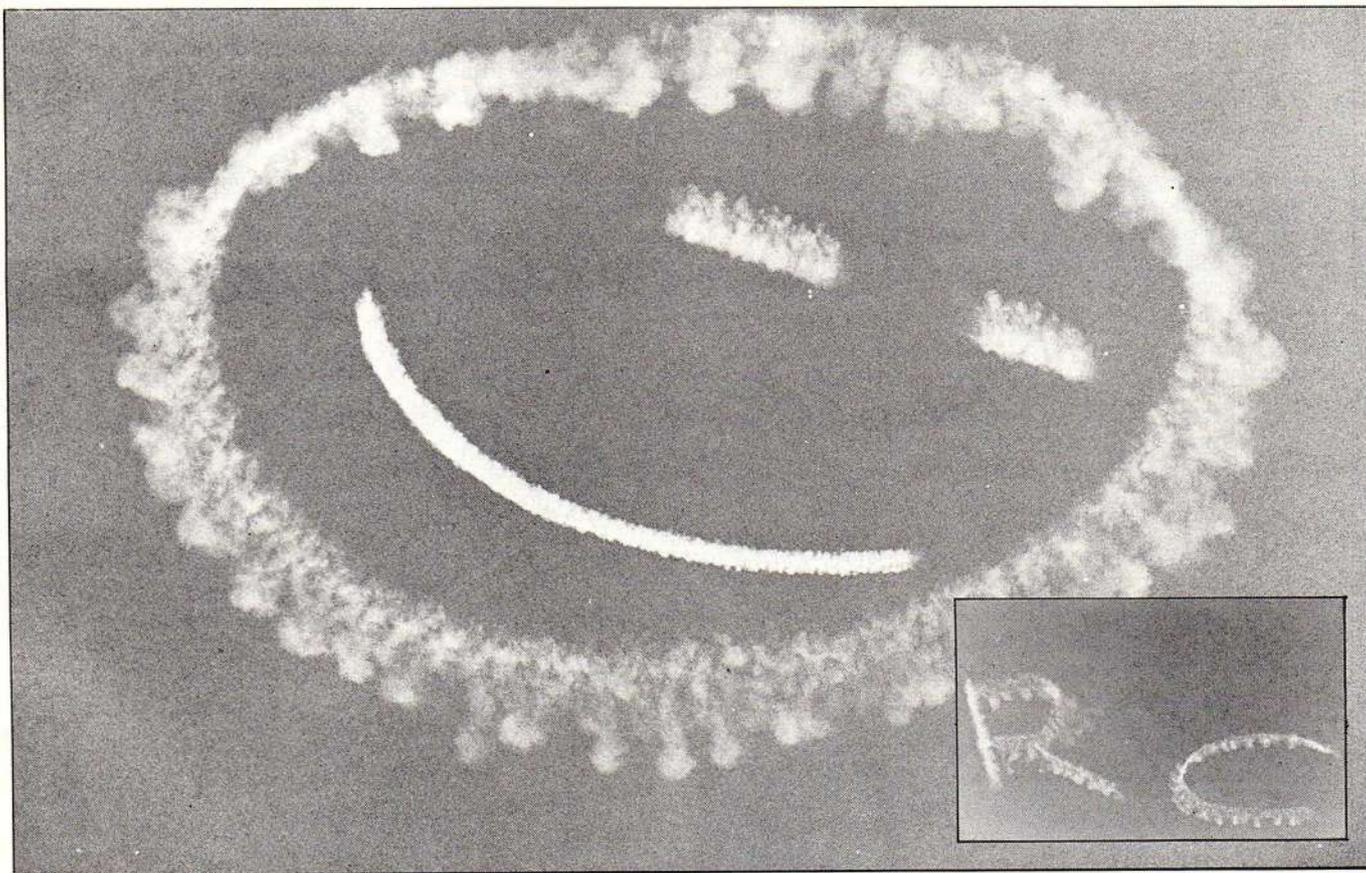
We're not disparaging the Nats, of course, for this major meet is actually another qualifying event for the Masters. But, there are certain realities that the Masters program has already brought to light. The most critical are time and money. Few modelers have had the luxury of taking a week or so to attend the Nats, and the expense of traveling any great distance to do it is becoming prohibitive. While gasoline prices may have dropped a few pennies, the cost of the large vehicles required to transport a modeler and his paraphernalia to a meet has more than offset the slight fuel savings.

To hear of a half dozen modelers driving from Florida to Maryland to compete in a Masters regional smacks of the true flavor of competition that the Masters is developing. Many modelers will be going to the Nats this year only because they missed a qualifying berth at their local regional meet, and the Nats is the last chance to qualify. But such contest travel is rapidly becoming a thing reserved for only the few who can support the time and finances for such luxuries. The Masters has brought national-level competition to many modelers who may have otherwise never had a chance to get involved in such an event.

As a matter of fact, we have to give some careful consideration to what the future may hold. If the trend toward expensive transportation increases (and there's little to indicate that getting the van or camper from point A to B will ever get cheaper), then the Masters may have to show the flexibility such a program can offer by actually going

to semi-finals in geographic areas, and then a big (but selective Fly-Off). Actually, the ultimate solution may be to have an "East" semi-finals, and a "West" semi-finals, and have the final Championship qualifier be a highly select handful of modelers.

Last year's big Fly-Off may be a bad example, because the program was so new, but the only trend we noted in who showed up to fly was that the farthest geographic regions had the worst attendance. We'll see how that goes this year, since the meet is a little more centrally located in Kentucky. In brief, we are already exploring the same discussions that have been going on with the Nats for the millennium . . . should it be central, split up, move around the country, etc.? We have those lessons to look at for examples in formulating the Masters, and the Masters has the flexibility of being run by the modelers, so we can change the venue as needed to meet current situations.



The Western regional for the U.S. Scale Masters Championships program saw no surprises. Here is a discussion of many of the issues the Masters program has raised.

Staff Report

J. R. Naidish photos

U.S. Scale Masters

Championships

We personally like the idea of a semi-finals on each coast, for several reasons. First, it further reduces the concept of dumb luck in choosing a true national champion, as dependable performance becomes more a factor (if the Masters ever gains the position of becoming the team selection program for F.A.I. Precision Scale and/or Sport Scale, the dependability factor will breed a more competitive international team). Consistency has been shown to be one of the most critical factors in any competitive event, and Kent Walters, the reigning Masters Champion, is a perfect example of that. We have, for the past four years or so, been reporting with almost boring regularity, that "Walters wins this, or that." The man is an extension of his model, and his plane is thoroughly debugged and 100 percent reliable. While other modelers are in the pits tearing the guts out of their cowl to figure out why the blankety-blank engine won't run, Kent is on the sidelines (usually aiding a fellow contestant, by the way) seemingly ignoring his model. Kent beats 'em in the pits!

In considering a semi-finals concept, the idea of reducing travel time and expenses would be strongly

weighed as a factor. While the industry has been most supportive of the Masters, there is still room for growth before these "extra" events can be considered. The fund raising potentials of the Masters regionals concept has yet to be fully realized. If the meets are exposing more and more modelers (something sponsors like to hear), the regionals are undoubtedly exposing more and more spectators, too. Last year's Masters Fly-Off at Mile Square Park (near Los Angeles) packed in over 3,000 spectators *in one day!* That can't hurt the image of our hobby at all.

Let's face it, the Nats has Scale on Saturday and Sunday because they are the showcard prestige events. The spectators identify with these realistic models, and they offer the variety and fun (bomb drops, strafing passes) that get people into the modeling game. Suddenly, there are eight meets around the country getting exposure for the hobby . . . and it's the best possible exposure, for it's the pros doing their thing. Think of the impact on spectators. What better thing than to go for even more exposure through a well-publicized semi-finals. This has to be better than trying to turn on the world by having a major meet at

some remote abandoned aviation facility in Louisiana or Texas! We haven't even scratched the surface in terms of public exposure to the hobby through the Masters program.

Again, please understand that we're not throwing stones at the Nats. The AMA's event is saddled with so many restrictions that to even pull off a major event like that each year approaches a miracle. The Nats has to satisfy the requirements of virtually every facet and activity of modeling, from indoor to sailplanes and free flight, so the only course they can steer is the one they are on. But the Masters, having the flexibility of a broad reaching series of national events, can open up new vistas of exposure and publicity.

Back to fund raising. By harnessing all this latent talent in terms of manpower (eight full clubs putting on the Masters program each year!), and spectator exposure (potentially over 25,000 people getting some share of the activity, *not* counting the exposure within the modeling community itself). We figure that, *in toto*, the Masters probably will touch about 100,000 to 150,000 people's lives, in one way or another!

So the reality of a big national

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This is the Gee Bee which was featured in the December '77 and February '78 issues of **Scale R/C Modeler**. This R-1 has had all the nasty flying characteristics designed out of it, and it was reported as being one of the smoothest and most stable scale models to ever take wing. It's also fully aerobatic on any .60 engine.

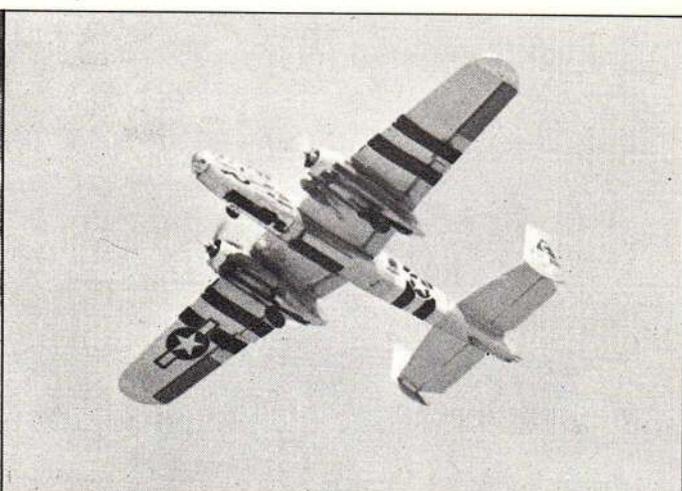
The Gee Bee semi-kit sells for \$129.95 (Shipping charges: \$4.00 for West Coast, and \$8.00 East).



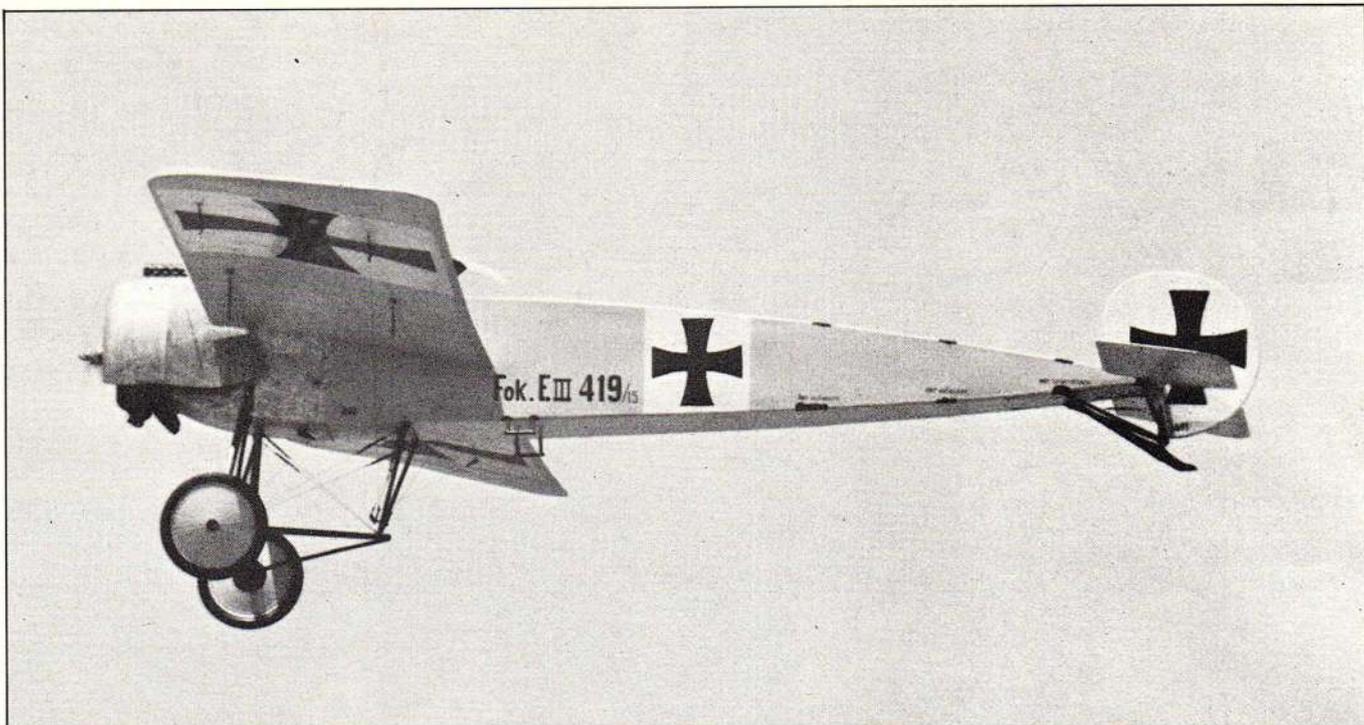
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**1****5****2****6****3****7****4**

1. Shane Cramer's 1/5-scale Zero, from the Scale Flight kit, loses a gear leg on takeoff. He rolled the model into a ball at the end of the flight by overshooting the landing. 2. Roland Baltes' Wirraway digs in a wing tip on landing. Plane was featured in the August issue. 3. Mike Peck's Liberty Sport finished third in Sportsman; from the Sig kit. 4. Rich Westlake's Ercoupe is from the Stafford kit. A nice Sportsman-type entry. 5. Bob Purcell and Frank Kelly put on quite a show with their B-25 "Executive Suite." Second in Team Scale. 6. Jerry Ortego plans to kit this .90-powered FW 190. Very impressive! 7. Nice B-model P-51, but we didn't catch the pilot's name.



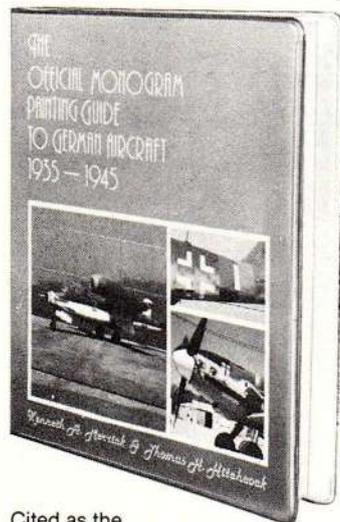
John Lockwood took top honors in the crowded (two entries) AMA Precision Scale event with this giant-sized Eindecker E-III.

sponsor makes some sense, as do programs like national raffles to raise money. Last year's raffle got off to a late start, and the coordination left a bit to be desired, yet the monies raised were substantial. Just imagine how much money could be

raised if every member of the eight clubs in question sold only five tickets!

What we're leading up to is that the Masters may be, in the future, in a better posture to look at alleviating some of the burden on the fliers

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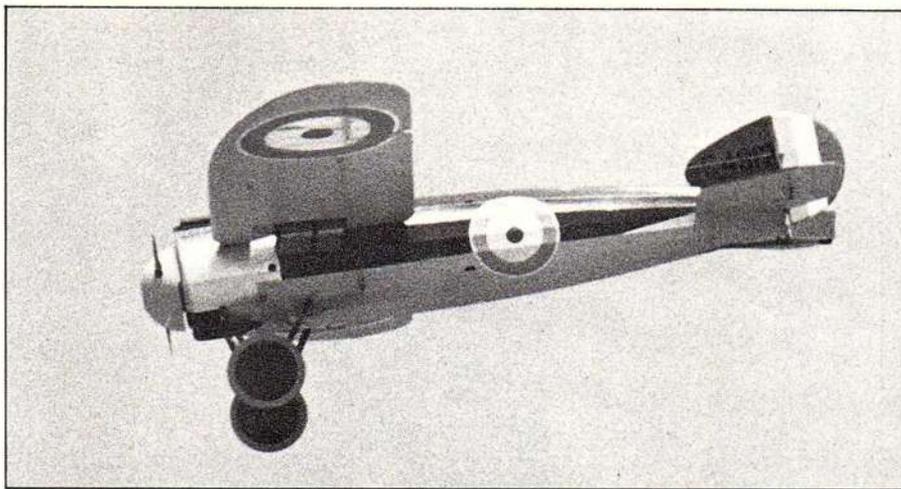
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to attend the big finals Fly-Off. Remember, this is both a qualifying and "invitational" program, where the only ones who can fly in the Masters are those who earned the right and/or who were invited (last year's Champ, etc.). The program is already attempting to pick up the tab for getting judges from all parts of the country (to avoid local favoritism, as well as to give modelers a chance to learn how things are being done in other parts of the country, i.e., to promote progress toward unified judging).

If the Masters can get on a self-sufficient economic leg, the idea of deferring half of the contestant's travel expenses for the finals would be realistic (and perhaps essential). We already heard some of those who trophied at the Western Scale Nats bemoaning the fact that it was a Pyrrhic victory, because they just couldn't afford a trip to Kentucky. We have to admit to these realities, and be prepared to underwrite the cost of making sure that the Masters stays representational of the best fliers fighting it out. Seeding in local contestants to fill the ranks at a Masters is a waste of time and manpower.



The provisional Giant Scale event had only two participants, and Harry Apoian cleaned up with his Bristol.

By having a semi-finals within a reasonably accessible distance, the number of fliers who would have to attend a more remote finals fly-off would be decreased to a manageable number. If the semi-finals cut it down to 16 contestants who could vie for the Championship (two from each region, essentially, although that may not be the way the distribution actually would come out), then the finals would be a comfortably small

contest (by contrast, this year *Scale R/C Modeler* contributed 50 "Eagle" trophies to the fly-off).

If our original concept in starting a Masters program (i.e., to get the best models from around the country competing in a controlled contest environment with the best judging), is to be preserved, then we must come to terms with the reality of a limited participation program that can be underwritten by the Masters program itself. The manpower and potentials of eight clubs working together should be enough



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- Optional flaps and retracts (Platt)

Kit includes: Epoxyglass fuse, cowl, and wing machine gun blisters; foam wing, stabs and fin cores; all sheeting and wood included; hardware package, plans and building instructions. Spinner available separately from Bob Holman.

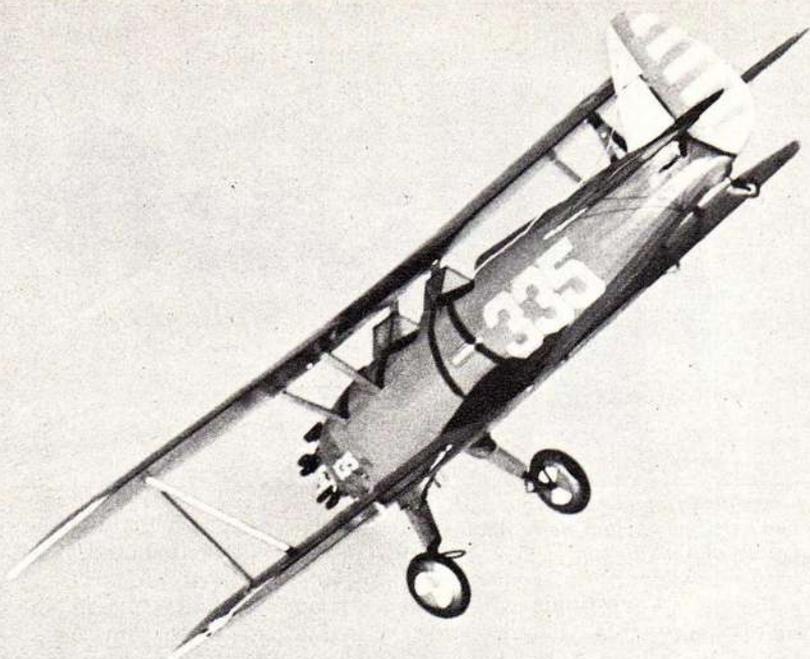
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to move mountains, so the informal meeting which is to be held on Friday evening at the Louisville contest this year will probably be a planning meeting to lay down the guidelines for future Masters programs.

But, enough of the discussion of the Masters, as a concept. The Western Scale Nats didn't really hold too many surprises this year: "Cowboy" Kent Walters had his SBD Dauntless in its usual rare form, and he showed the pros that to be the best is simply a matter of outflying everyone else. Kent not only had the highest static score of the contest (96.5, which is the same score his plane had last year), but he also posted the two highest flights of the meet. His first flight of the six round event was a solid 89, while the last flight of the meet duplicated that score, to cinch the victory.

Until that last flight, it looked as if a relative newcomer to the contest circuit would steal the prize, as Garland Hamilton (also of Arizona) put in an 88.5 flight to back up his 94.0 static score. But, try as he might, Garland just couldn't put that final edge on his flying (F4-U1 Corsair), and Kent held onto the victory.

As a matter of fact, the victory at the Western Scale Nats this year wasn't one for any particular pilot (although Kent deserves all the credit for two days of magnificent flying), but it was more a matter of a thorough trouncing of the Squadron by the boys of the 1/8th Air Force. The top three places went to "that rowdy Arizona crowd," as they are known in Southern California. It wasn't a matter of competitive spirit (or the lack thereof) which kept the Squadron out of the limelight, but it was more the influence of preparedness and reliability. The Squadron's hot shots had mechanical problems to no end. Jerry Heaton lost his brand new .90-powered FW 190 just the day before (four gorgeous airplanes in as many months!), while Jerry Ortego's sister ship was plagued with engine problems. Jerry plans to kit the short-nosed FW, by the way, and it should be competitive, with a static score of 93. Only Jim Meister, who is now semi-retired with the Mark's Models' takeover of the Jemco line, managed to vindicate the Squadron by holding onto fifth place.

There's no sense even reporting Precision Scale, except to note that John Lockwood's Eindecker beat Granger Williams' Gee Bee. This isn't meant to sound disparaging toward this prestige event, except to ponder why those who bemoan the demise of AMA Scale are always

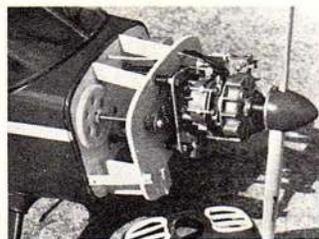


Denny DeWeese fires up the engines on his immaculate Me 110. Too far out to hear, an engine quit on the first contest flight, the twin went into a death spin.

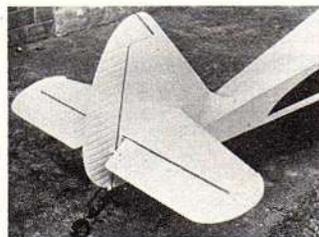


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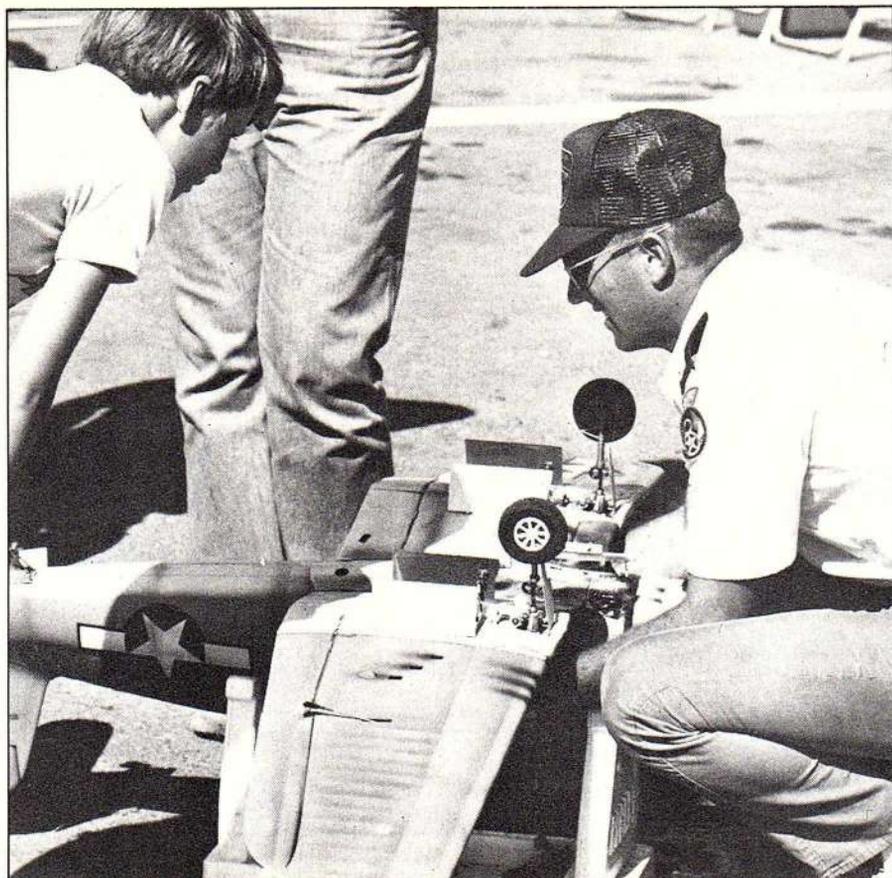
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Try as he might, Garland Hamilton couldn't get his beautiful Corsair to give consistent flight scores. He finished second in Expert. Only three years in modeling, however, so watch out!

the last ones to show up at a contest with a Precision quality airplane. If AMA Scale is a dead issue, it's because the fliers themselves made it so. Pilots like Lockwood and Williams are to be congratulated to have the nerve and dedication to stand up in an empty theatre and put on a program.

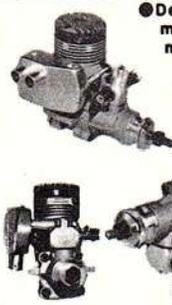
The old hue and cry used to be that there just weren't enough contests to make building AMA Scale worthwhile, yet now that there's an entire program ready and waiting for the participants, there are trophies which are going to waste. If there's going to be a Renaissance of interest in Precision Scale, it's going to have to happen with the fliers. The George Roses, Lockwoods and Williams can't alone reverse a growing disinterest in Precision Scale. Instead, we need the pilots out there showing their masterpieces, getting a dialogue going with the next generation of potential builders, flood-

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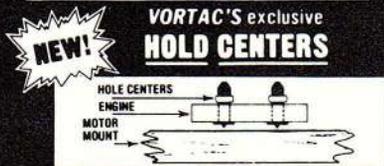
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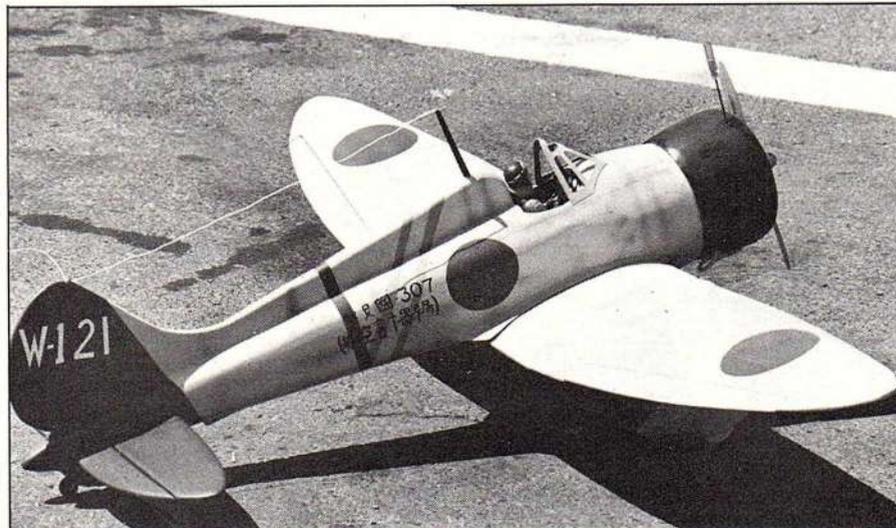
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Impeccable Stafford Twin Comanche, by Mr. Webster, was flawlessly executed. Took first in Team Scale.



A memorial flight of Marty Moad's Me 410 was put on to give tribute at the passing of so magnanimous a modeler.



Most original entry of the meet was this A5M4 "Claude," by Paul Sepulveda. Small in size, it flew like a racer.

ing the magazine pages with photos to stimulate interest, and showing everyone that the event isn't a dead issue. Sure, this is a team selection year, but must we continually look forward to these types of models only coming out of mothballs every two years, to be flown only once at a site where the majority of modelers never go?!

Our attitude toward the issue has changed drastically in that last year. At first we thought it was the fault of the contest system that AMA Scale was dying, but now we see that it is really a situation promulgated by the participants, themselves. We now must ask ourselves if the Masters system is proving anything by even continuing the Precision Scale event. Actually, we may be doing damage to the event by continually pointing out how low the attendance figures are.

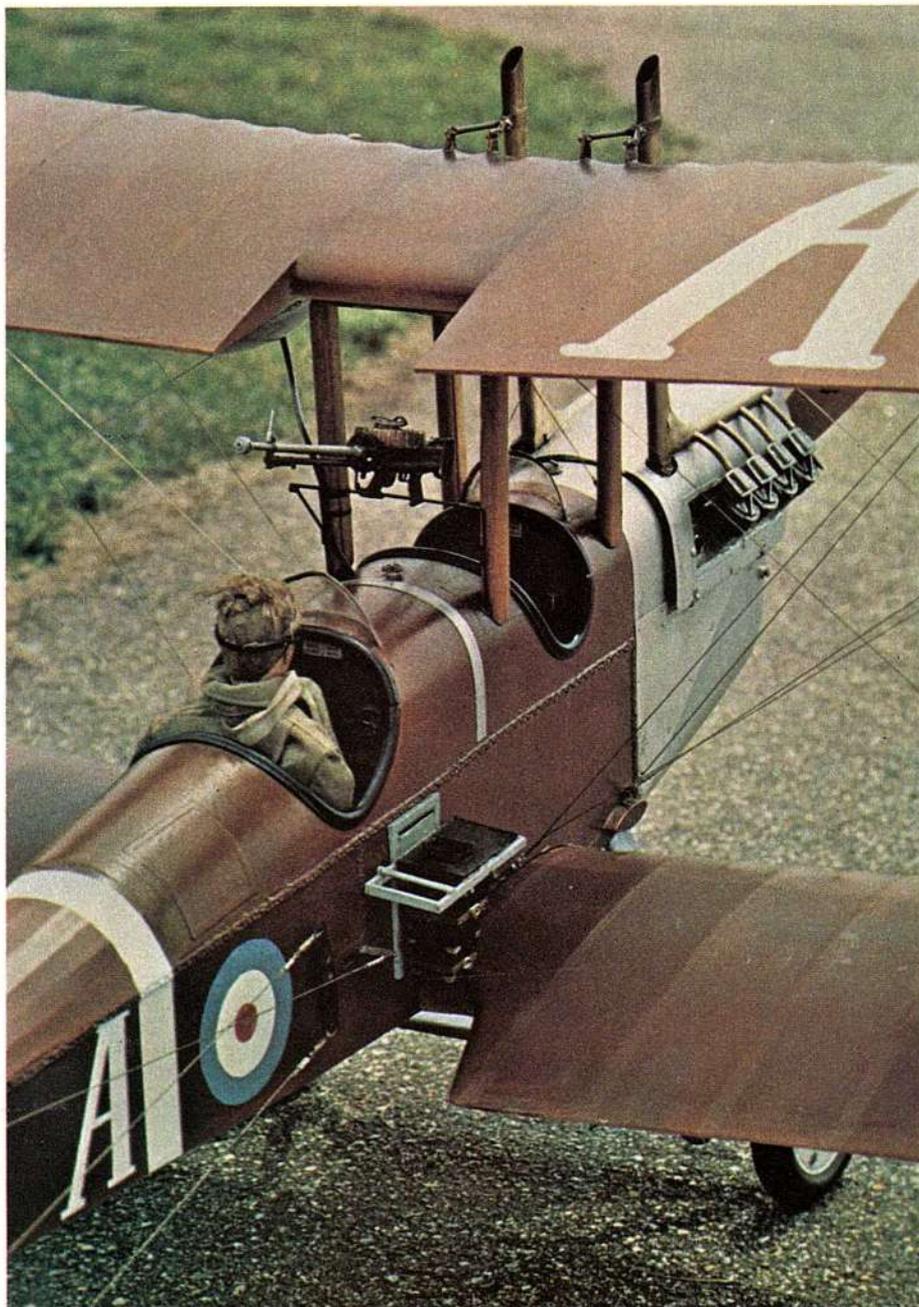
With this in mind, perhaps it would be more logical to assume that Precision Scale might be an open attendance event at the finals, with no participation (or optional for the sponsoring club) at the regional events. Perhaps, some day the Masters program will be able to serve as the official team selection system for both F.A.I. international teams. Then, we might reconsider reinstating Precision Scale at all the regionals, but right now we're just wasting trophy funds and judging time. Every event such as the Masters program must be subject to evaluation . . . if the event isn't achieving its goal of increasing interest and/or participation in an activity, then maybe the game should change accordingly.

If it seems that we've spent an inordinate time editorializing, instead of contest reporting, it's because the Scale Masters Championships program is in a critical period of its growth cycle, and many of the issues which are coming to light in this second year are crucial to the continued success of the event. We wanted to make some of these thoughts known, so that all the scale modelers could have a chance to react to the issues. By the time you read this, the 1981 fly-offs will have been history, and we will have all come away with a new perspective on next year's program. We will also know who will be coordinating the Masters for next year, and we will be urging all of you to contact these representatives and let them know what you want to see in the Masters program. After all, this is an event designed for the scale modelers. Stay tuned to our pages for any updates. □

EAST COAST REGIONAL REPORT

The qualifying meet for the U.S. Scale Masters on the East Coast was a smashing success. Entrants came all the way from Florida to try to make the cut. By John Preston

Photos by the author



Don Srull's 5-year-old B.E.-2e is a marvel of scale detailing, albeit the plane is a Sport Scale entry.

U.S. Scale Masters



On a warm weekend in June, the Prince George's County R/C Club (located in the Maryland suburbs of Washington, D.C.), played host to the first East Coast Regional qualifier for the U.S. Scale Masters Championships. Of the three major R/C clubs in the D.C. area, PGRC has by far the best flying field. Located on county owned property, the field has two paved runways (each 420x35 ft.) plus paved taxiways and pit areas. The nearest adjacent property owners are about a mile away, in any direction. With this great site available to its members, it's no small wonder that this club has attracted the majority of the area's competition-oriented modelers to its ranks.

The East Coast Regional was the brainchild of Phil Sibille, PGRC member and nationally known Sport Scale contestant. In his other life, Phil is a pilot for Eastern Airlines. For this contest, Phil assisted CD Bill Hinñant, who may be better known as Mallory Models, producer of the well known Laser 200 scale kit. Together, these two, with the able help of the other club members, ran a contest of which they could be proud. If there were any complaints, this writer didn't hear them. Perhaps the only thing that could have seen an improvement was the weather. For some reason the sticky heat of August arrived in June this year. Heat and humidity conspired to make it a rather uncomfortable weekend and both days were terminated by a thunderstorm—fortunately not during the flying activity.

Early arrivals to the contest scene on Saturday were greeted by ex-astronaut and current President of Eastern Airlines, Frank Borman. He and his wife were given a demon-



1



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3



4



5

1. Art Johnson came from Florida to post the highest flight score of the meet with his big F-82. Winner in Sport Scale Expert. 2. Dave Platt flew his Macchi, with a .90 engine. Placed third. 3. Mario Yederlinic also made the trip from Florida, to enter the provisional Giant Scale event with his Fairchild PT-19. 4. Frank Tiano campaigned the same P-51B which earned him a spot on the team last year, but he could only muster a fifth place (good enough to qualify, but only by less than 3 points!). 5. Bill Lepley's Citabria put on a fine show in Giant Scale.

stration of what an aerobatic scale model can do in the hands of an accomplished flier. PGRC club member Joe Solko performed the demonstration with his Mallory Models Laser 200 (powered by a pair of O.S. .60s teamed together on a Cass reduction drive). As an ex-modeler, Col. Borman appeared to be favorably impressed by the advancement in the hobby, since the years of his involvement.

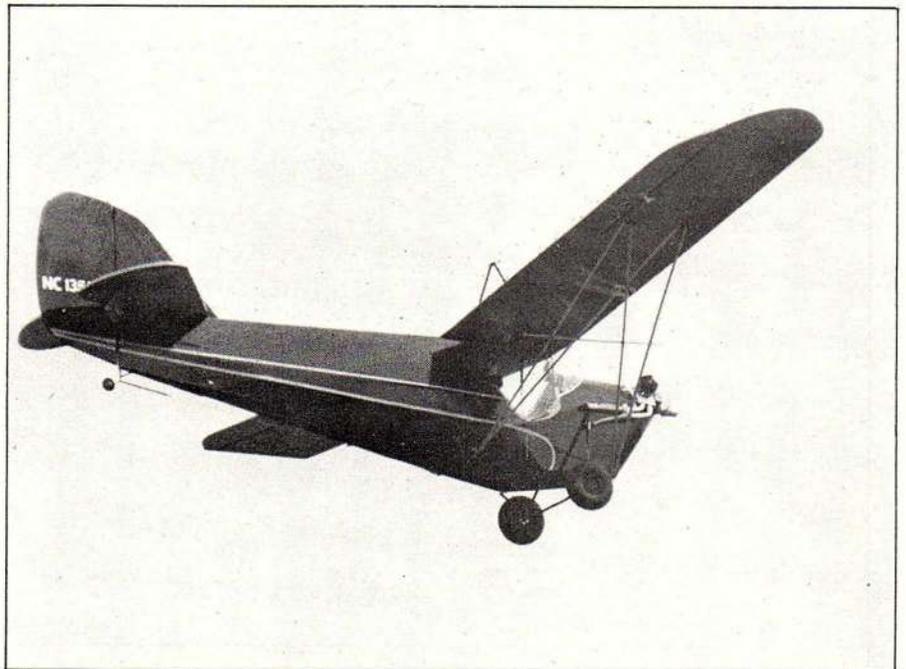
In addition to featuring categories for Precision Scale and Sport Scale Expert, the contest also had events for Sport Scale Sportsman and Giant Scale. These latter two events are not a part of the Scale Masters series of contests, but have proven to be popular at previous Scale contests in the area. As it turned out, only two models were entered in the Sportsman category of Sport Scale. Perhaps local modelers were put off because they anticipated only the highest caliber of scale models to be present. Giant Scale was a little more popular, with six entries which ranged from a 1936 Tiger Moth, entered by Mike Wintas and built from the Canadian Bud Barkley kit, to Joe Solko's model of Leo Loudenslager's 1980 International Aerobatic Championship winning Laser 200.

It was expected that there would be as many as four entries in the prestigious Precision Scale category, however, only two ultimately arrived. One of these was George Rose's P-6E Hawk that so narrowly missed (by 1/2 point) winning the Scale World Championships in Canada in 1980. This model also had the honor of taking the Toledo Show Best of Scale Award in 1981. With those credentials, it was no small wonder that George won the Precision Scale event at this contest.

The other entry, a Heath Baby Bullet by Dan Santich, had to take top honors for realistic sound. It was equipped with the O.S. Gemini horizontally opposed twin cylinder engine and, without a doubt, this has to be the sweetest sounding model engine ever produced. In addition to its realistic sound, this engine also has a very scale-like appearance; but, in Precision Scale (where the judging is performed at point blank range and points must be awarded for craftsmanship in duplicating the appearance of the full-scale aircraft's engine) even the most perfect store-bought engine is at a disadvantage. Had the Gemini been installed in Roy Smith's entry of an Aeronca C-3 in Sport Scale, the story might have been different. At 15 feet this engine would be a pretty good fac-



Well deserved winner in Giant Scale was this scratchbuilt P-40 by Col. Art Johnson. An O.S. .90 powers this 15-pound model.



Roy Smith's Aeronca C-3 is from the House of Balsa kit.



George Rose's P-38 returns from a mission. The 81" span model is to be kitted by Mallory Models.



Mario Yederlinic's Nieuport 28 lifts off. A Webra .91 provided plenty of power.

simile of the Aeronca J.A.P. twin of the full-scale machine.

There were a total of only eleven contestants in Sport Scale Expert. A surprisingly small turnout for a contest that could ultimately result in the victor gaining the title of Scale Masters National Champion. As with the majority of Sport Scale contests, models of military aircraft were predominant. Only two of the entries were of civil aircraft—the previously mentioned Aeronca C-3, and a Christian Eagle from a Pilot kit that was entered by Tom Veloskey. Tom deserves special mention since, at the tender age of 14 years, he was by far the youngest contestant, and he had been driven to Maryland all the way from Kissimmee, Florida by his parents. A static score 30 scale r/c modeler

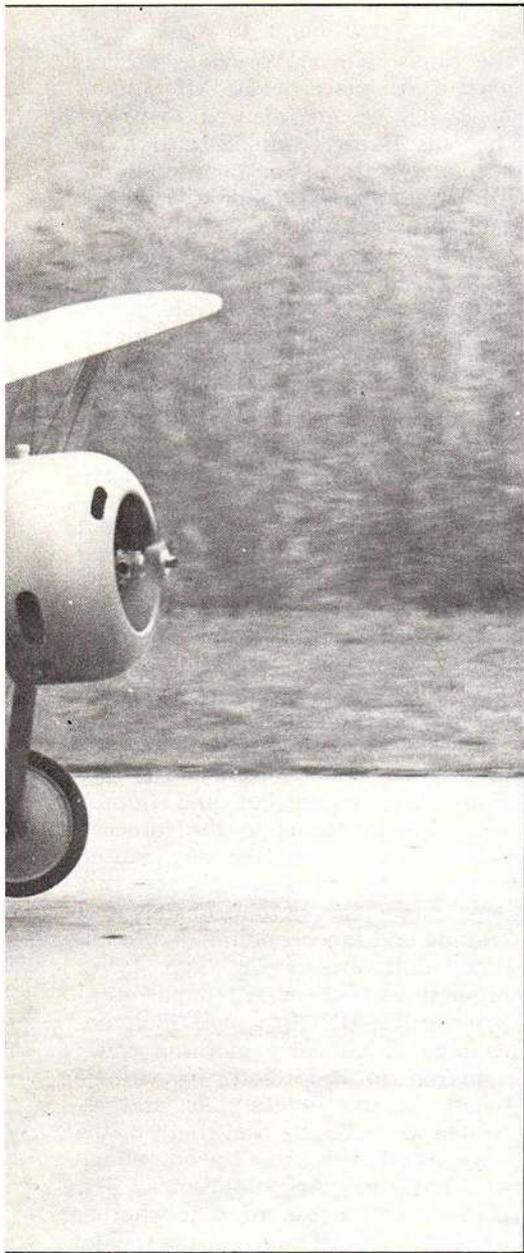
of 86.5 shows that Tom knows how to build a scale model, and we predict that his name will become well known in the not too distant future.

The highest static score in Sport Scale not surprisingly went to Dave Platt with a 1/5 scale Macchi 202. Like all of Dave's models, this aircraft was hard to find fault with. Some skeptics might say it should have been entered in Precision Scale. This writer however happens to believe that, if the Sport Scale rules are correctly formulated, a Precision Scale model should not be at an advantage over a model built strictly for Sport Scale and intended to be viewed no closer than 15 feet. At this distance, details in cockpit, wheel wells and engine cowlings are not discernible, nor are minor discrepancies in dimensions. In fact, a Precision Scale model—because of its generally higher weight—is penal-

ized in Sport Scale. We are sure that there will be those that would argue with our beliefs.

Other static scores in the 90s went to Art Johnson, the ultimate winner with an F-82E (91.83 points), Don Srull with the same BE-2E that netted him a second place at the 1976 Nats, and Mario Yederlinic with a 1/4-scale Nieuport 28 from the Proctor kit. Both Srull and Yederlinic received 91.16 static points.

The first round was flown in light but very variable winds, which caused some crosswind takeoff and landing problems for models with low wing loadings and/or less than ideal ground handling qualities. It is no accident that the most popular aircraft designs seen at Sport Scale contests tend to be WWII era or later military fighters. Although most of these aircraft were taildraggers, they almost always have superior



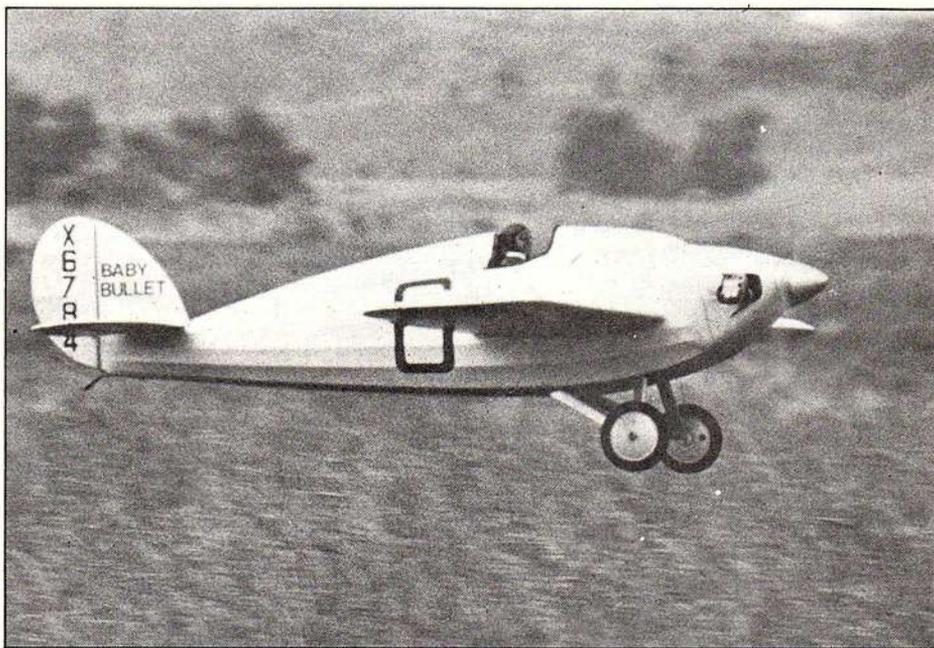
manners on the ground. We sincerely hope that the current rules change proposal that would require a taxi-out and taxi-back in Sport Scale does not pass the final vote of the Scale Contest Board. This would most definitely restrict the types of aircraft that would have a sporting chance of winning a Sport Scale contest.

At the end of the first round, it was clear that the Colonel from Florida was the man to beat. Art Johnson recorded a flight score of 93.66 to add to his high static. Perhaps it's Art's AMA show team experience that helps him nail down those high flight scores. As a photog-

Dan Santich's Precision Scale Baby Bullet performed most realistically with a Gemini Twin engine.

rapher and reporter, we were permitted to remain on the flight line and it was very evident that Art is both a showman and an accomplished flier. The judges are treated to a running commentary of what his model is about to do . . . is doing . . . and has done. It leave no doubt in a judge's mind about what the model is supposed to be accomplishing, and in which piece of airspace. In Art's case, that airspace is always right in front of the judges. We suspect that Art will be a man to watch at the finals in Louisville.

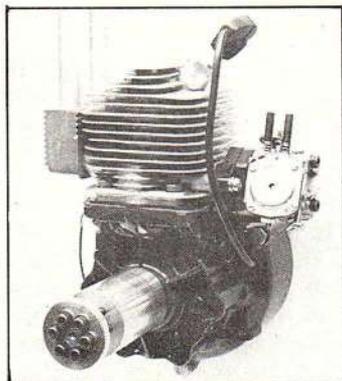
Another model from the same era as the F-82 was Garrie Taylor's F8F Bearcat, built from a Royal Kit. Garrie, a member of PGRC, is also a proficient flier and recorded the second highest first round flight score with an 85.83. This contest was Gar-



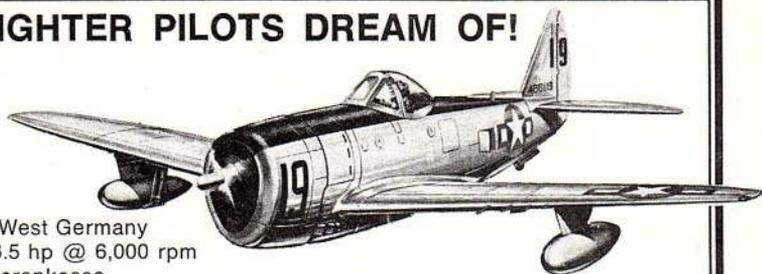
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T2-12/81

rie's second attempt to make it to the finals. He had previously managed a 7th place at the Mint Julep meet and we are pleased to report that his flying, coupled with a respectable static of 85.83 earned him a 4th place, and no doubt we will see him in Louisville.

Only two rounds of flying were accomplished on the first day. As with the majority of scale contests, flying did not begin until static judging was completed and an early termination was scheduled to enable a trip to the Smithsonian Institution's Paul Garber Restoration Facility at nearby Silver Hill. This had been previously arranged and is the facility where all of the aircraft that ultimately end up at the National Air & Space Museum receive the tender loving care that transforms them, sometimes from derelict wrecks, into the immaculate and very often unique examples of aviation of a bygone era.

Sunday morning's weather was pretty much of a repeat of the previous day. Again hot and humid, with thunderstorms in the forecast. Wind shifts during the day caused a number of runway changes and, once more, the lighter models lost landing and takeoff points due to unpredictable crosswinds. Top scorer in Sunday's first round (round three) was Snull's BE-2E which took advantage of an early morning calm; managed to drop both its vintage bombs at the judges' feet and recorded an 81.66, its best flight of the meet. While this wasn't good enough to challenge Art Johnson's first place, it was a toss up as to whether the BE-2E could hang on to a second or be bumped by Platt, Taylor or Frank Tiano. The latter was burning up the sky with a very pretty P-51B. Two others still in the running for a place were Yederlinic's Nieuport, and a Top Flight P-47 entered by Bill Lepley.

A couple of rain showers were strong enough to briefly hold up flying activity, and were no doubt a disruption to those in the air at the time they arrived. Perhaps it was the weather that had some influence on a number of off-field landings necessitated because of dead engines. In the case of Art Johnson's Giant Scale P-40, it was suspected that two forced landings with a quiet engine may have been caused by a broken fuel pickup or missing clunk in the tank. Two almost flawless flights on Saturday were followed by a run of premature engine stoppages

(Continued on page 72)

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1



2



3

1. Garrie Taylor's Bearcat flew well enough to tie down fourth place. 2. Don Srull's immaculate B.E.-2e captured second in the Expert Class. 3. Platt's Macchi 202 proved that big airplanes can be competitive, by capturing third in Expert Class. 4. Joe Solko had a bit of bad luck with his Mallory Models' Laser 200, and finished dead last in Giant Scale.



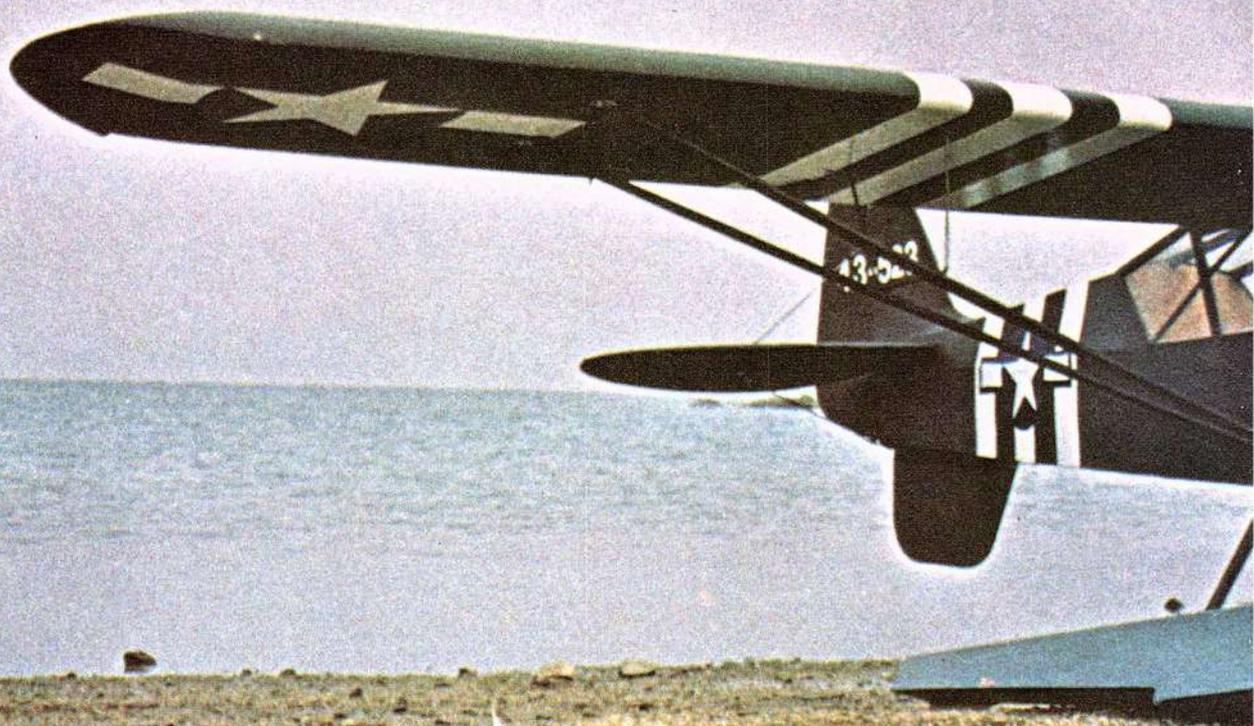
4

GRASSHOPPER PLAGUE

Either scratchbuild or modify a kit to get this versatile and attractive L-4 military version of the Piper Cub.

By Ken Runestrand

Photos by Lee Taylor



A plague is upon us! A "grasshopper" plague . . . the Piper J-3 Cub in uniform. Everyone is familiar with the Cub, of course. The L-4 Grasshopper is the military version of the Cub, with a greenhouse cabin area.

Beginning in 1941, 5,673 L-4 versions of the Cub were mass produced as wartime observation aircraft. Originally intended as the Army's own air support for Field Artillery battalions, utilization soon branched out to include surveillance, liaison, medical evacuation, message delivery, agent landings and VIP courier service. Then there were unusual missions, those devised in the field,

such as mounting six Bazooka tubes onto the struts and going after German tanks. Successful? One pilot got five kills to his credit.

An L-4 brought a message to General Swift, Commander of the 1st Cavalry Brigade. The crusty old warrior told the pilot "You looked just like a damned grasshopper when you landed that thing out there in those boondocks." The L-4 remained a "Grasshopper" from then on.

In flying a full-scale size L-4, take-offs are the first surprise. You leave the ground almost before the throttle is fully opened. You creep upward at 400 fpm doing 55 mph, with 2,150 rpm from a 65 hp Continental en-

gine. Realistic cruise is 75 mph. A power-off stall comes up at 35 mph and the nose falls away before the wing can stall and drop a tip. Power-on stalls produce buffeting and just about nothing else happens . . . she simply will not snap. If you really force it, the L-4 may gently shudder back into level flight. Landings are tricky, it porpoises. Bouncy landings are scale!

The flying characteristics of the L-4 make it a natural for giant-scale. Having flown the Bud Nosen J-3 Cub with both a Fox .78 and a SuperTiger powered Du-Bro propdrive, I found the type of flying I liked, but I wanted more power.



Then the Quadra came along. I sold the Cub. It's still flying. I ordered a J-3 kit from Balsa U.S.A. I decided to model the L-4 military version to avoid being "just another yellow Cub" on the flight line. That was over two years ago and, after much pressure, a set of plans evolved for the scratchbuilder. I also detailed the necessary changes for the builder to modify a Bud Nosen or Balsa U.S.A. J-3 kit into a first class quarter-size, Quadra-powered model.

How about having a 110" span trainer that you can't keep away from the experts? A show plane that flies all day on 50¢ worth of fuel, floats forever at 1/4 throttle, and does scale maneuvers . . . yet you "barnstormers" can do a Figure 8 or Knife Edge, or 8-Point rolls and all with floats mounted on it! Interested? Read on.

The first step is to secure the plans from Taylor-Craft Ltd., and decide whether to scratchbuild or modify a kit. Personally, I feel it's a toss up, both in terms of expense and

time. I hate cutting out ribs—and bending landing gear wire can be a pain! The two kits in question are among the most inexpensive large scale models available. When they are constructed according to the L-4 plans, you have a perfect Quadra-powered "biggie," without the monster expense. Construction is a marriage of common modeling techniques and full-scale home-built practices. Materials include balsa and plywood, with hardwood stringers and spars, and plywood gusseting of joints.

I won't go into step-by-step construction, since a scratchbuilder should be an experienced modeler. If a kit is used, the manufacturer's instructions should be followed, with all of the building done on the L-4 plans (and with modifications, as shown).

Let's confine ourselves to details and points of interest, along with the whys and wherefores, many of which will apply to other construction projects.

Starting with the needed materials, all stringers and spars are of hardwood. Redwood, spruce and pine are all fine but must be straight-grained. Stock up on 1/8", 1/4" square, and 1/4x3/8" especially. A four-foot piece of pine or redwood can be ripped on a Dremel table saw with no problem. This table saw is not a toy, and is very useful for large model building. I found a supply of clear straight-grain pine at a local lumber yard. Their "pre-hung" door shop had cast-off pieces of door casings that were perfect for my needs. While you are there, pick up a plywood door skin. Usually 1/8" mahogany, the plywood is 3x7' and inexpensive. It is used for vertical webbing in the wings, and you'll find plenty of uses for the extra wood. Some 1/16" ply will be needed for gusseting joints, as well as 1/2" ply for the firewall (where two 1/4" plies can be laminated). Kit builders will also need extra 1/8" ply ribs. Cut up some 3/8" hardwood triangular stock for firewall and bulkhead reinforcement.



I found aluminum aircraft tubing at a trailer/RV repair shop, to make the plug-in wing panel assemblies.

I use an old hollowcore door as a building board, with a "Cellotex" sheet on top. "Cellotex" is a fiber composition board available at lumber yards, also sold as "Builder Board." The whole board is then covered with clear plastic film, leaving one end open so plans can be slid in and out under the plastic film. Painter's drop cloth, garden ground cover plastic, or any cheap, clear plastic may be used.

Slide the wing plan under the plastic and let's get started. Hardwood spars are difficult to pin down, so use tape. Telescoping aluminum tubes are used to make the plug-in wing panels. The wing center section/cabin top, takes 1/2" (outside diameter) tubing and 3/8" tubing is mounted in the wing. While providing tremendous strength to the center section, the tubing also makes field assembly of the model much easier. Although the root rib and cabin rib templates show tubing hole locations, don't glue in the tubes yet. Alignment can be a problem. Leave the alignment until the plane is completely framed up, then secure the tubes.

A servo is used in each wing panel, with hard wire pushrods to the ailerons. Extension cables are made with Ace R/C hookup wire and Deans plugs. All wires are twisted in a hand drill for stress relief. If chokes are used in the extension wires, you will have to use a large battery pack, such as the 1,000 or 1,200 mah packs which are now available. With such large control surfaces and chokes in the extension wires, my regular size Kraft battery pack would die in about four 10 minute flights. As the battery got low, servos on long leads ceased to operate or lost power. Usually, this is first noticed on aileron inputs. This happened to me once with the L-4. Luckily, the battery still was able to make the elevator and rudder servos operate since they were plugged directly into the receiver and had no in-line chokes. I was able to quickly set the plane down without incident. Now, with a large 1 amp battery pack, discharging after a flying session shows that the current drain time is again equal for both the flight pack and the transmitter.

The extension cable in the wing has a male Deans plug fixed in the root rib, so that it automatically mates with the fixed female plug in the outside rib of the cabin area as the wing is installed. The two female



The author and his machine. With a 110" span, it's no small aircraft.



Ken hands the transmitter around at the Las Vegas Q.S.A.A. Fly-In. What an ideal trainer! (J. R. Naidish photo)



The invasion stripes sort of make this model a sheep in wolf's clothing, for the L-4 is the quintessence of docility.

With a clean spray from the floats (also available as a plan or kit), the L-4 demonstrates its versatility. It's even more aerobatic on floats!

plugs are tied together on a Y-harness to the receiver. Slide the wing on, and the aileron servos are automatically plugged in.

Aileron hinging is with Klett pinned hinges. Align and install the hinges, but don't glue them until the covering and painting are done. Then glue in the hinges and double pin them with steel straight pins. A small drop of Hot Stuff is then put on top of each pinhead. Robart steel pin "hinge points" also work fine. Add soft balsa blocks, so that the hinges have plenty of meat to dig into and install them after covering and painting.

For the craftsman, C.B. Associates has a line of hinges that cannot be beat. There are strap hinges, butt hinges and a combination hinge. A hinge area, such as a vertical stab trailing edge must be built up, with hardwood sandwiching 1/16 balsa (which is slotted for the hinges). Small wood screws are then used to secure the hinges and surfaces together. The hinges and surfaces are



no ballooning and no trim changes with varying speed changes. The laminated motor mount block is offset on the firewall, so that the prop hub exits the center of the cowl. I am a believer in a solid mounting system on a strong frame, and I have never had any problems with parts failing from vibration. The L-4 has been the most trouble-free model I have had in over 20 years of modeling.

The "special for Quadra" cowl is available from T & D Fiberglass Specialties, 30925 Block, Garden City, MI 48135. The cowl is made to fit the L-4, as well as the kit J-3s from Nosen and Balsa U.S.A.

Tail weight is necessary to get the correct Center of Gravity. This allows the radio compartment to be in the tail section of the fuselage. The rudder and elevator servos are then close enough to use hard wire pushrods directly to the surfaces. This also leaves a large empty cabin area, that a scale buff can go nuts with. Quarter scale instruments from Midwest Products or Hobby Lobby Int'l., a pilot (not just a bust) from Taylor-Craft Ltd. 216 Willow Ave., Roseville, CA 95678; and all the details you can think up. Extension wires are hidden under the floor or in built-up balsa channels along the window frames and across the spars. The cabin interior is painted and detailed before the windows are installed.

When all of the framing is complete, the 1/2" aluminum tubes can be fixed in the cabin center section. Trial fit the 3/8" tubes into the wing panels and mount the panels to the fuselage. Jig the fuselage level, checking with a small torpedo level. The horizontal stab and the flat bottom of the wing should both be dead level. Notice I said bottom of the wing. A flat bottom wing has incidence at the airfoil's mean aerodynamic chord line, and this method will yield the proper incidence. Now use a Robart incidence meter to check the installation of the wing struts . . . be sure you get the same incidence reading near the wing tips and at the root ribs on both wings. I have found it unnecessary to experiment with wash out.

Take your time aligning the tubing and wing incidence. Along with CG location, these are the most important factors in any model construction. If reasonable attention is used, you cannot make a bad flying L-4.

The windows are now installed. The sides and tops are easy, but take your time and trim small amounts to get a good curve on the windshield. First get the bottom

trimmed and curved with a good fit. Mark a centerline point on the fuselage and window, to make any slips noticeable. Now fold the top back over the center section to the spar, to be used as a glue surface. Trim the window flush to the cabin sides and down to the front of the airfoil. Now trim small darts in the area near the wing until the windshield sides can be curved and fitted to the window frames. Try to make natural curves, with no pressure or distortion. A heat gun may be used to carefully warm the butyrate and it will curve easily. The harder you force anything here, the worse the window will look. With the buried wire in the cabin frames and windows installed, the cabin becomes super strong, even with all that glass area. I haven't tried it, but I think you could sit on it without damage.

Ready to cover? You have a variety of choices. The original had MonoKote, which lasted two years, and worked fine. It was easy to patch those holes made by rough country sticks and rocks. As I also wanted to use the L-4 on floats, so I subsequently recovered it with polyester fabric. Super Coverite is perfect, but any fabric covering will make the L-4 that much stronger. Recently, radio interference put the L-4 straight in from about 60 feet . . . its first real crash! No covering was replaced. A new cowl, prop, windows and cabin top was all it took. One wing panel had a little three corner tear in the bottom. The tear was closed with a bead of Hot Stuff.

If fabric is used for covering, painting is necessary. Start with at least two coats of clear Butyrate dope. The controlled shrink of the dope will keep the large covered areas tightly stretched for the life of the covering. The finish can then be applied, as desired. (N.B.: Some finishing products require a nitrate dope base. PHP.) I am very lazy and hate painting so I used Pactra spray can polyurethane paint, flat Olive Drab. One coat is fogged on the doped base coat, then a wet coat is all that is necessary. Invasion stripes are painted on. The Stars and Bars are a homemade decal. Cut the Stars and Bars from white EkonoKote. They are then ironed onto the blue TrimKote background before the backing is removed from the TrimKote.

Dummy engine cylinders are now available from Sig and Air Design (549 Appian Way, Napoleon, OH 43545). My original cylinders are balsa. Small blocks were cut to shape and the fins were cut by turning the blocks against a hacksaw blade which

removable, so that finishing can be done without the usual hinge problems.

When framing the fuselage sides, I cut out parts two at a time. One side is built up, then a piece of MonoKote backing or plastic film is laid over it and the second side is built atop the first. Be sure you build one right and one left side . . . the door is on the right. Don't forget that the fuselage sides are a different length, due to the offset firewall. When assembling the fuselage, mark centerlines on the formers and cross pieces, then assemble over the centerline of the plans.

The kit tail surfaces are balsa, so any strengthening done in the area is a large plus. The wire bracing struts on the surfaces are functional. Vibration seems to filter to the tail on large models and can be a problem when the surfaces are weak. Weight in the rear is no problem when you add that Quadra on the front.

The firewall has built-in side and down thrust (approximately 3° each direction). This produces a plane that handles beautifully through the whole range of engine speeds, with



At rest on its pontoons, the Grasshopper offers a whole new angle in giant model flying. Because of its size, it will handle choppy water well.

was held atop stacked balsa sheets, to fix the various cutting levels. A balsa rod was made to form exhaust pipes, and the cylinder heads added. Light aluminum sheet was bent and shaped to form the air scoops.

When the radio is installed, check

the control surface throws. The ailerons need differential, and all the throw you can get. Adjust until you have twice as much up as down. You will need 1½"-to-2" of elevator (each direction) and all the rudder throw you can get. Don't worry, you'll be using it. Large scale models fly different from Pattern planes.

Now check that Center of Gravity. Locate the proper CG from the plans, and lay that torpedo level on the

horizon stab. While the plane is supported at the CG, add weight to get the tail level. With the weight of the level on the tail, you will have a slightly nose heavy condition. Test fly, and then adjust to suit yourself.

Ready to fly? Let's go! You are going to have a crowd there unless you've kept your project a secret. If this is your first large scale model, have someone else check it over (alignment, CG, aileron direction, hinges etc.). If you are an accomplished pilot, have no fears. But, if you have doubts or bad nerves, have your local "monster" flier test it. Be ready to fight him to get it back.

Got the engine adjusted and running well? Check your radio and control surfaces at all engine speeds. No jiggles, weird sounds (such as vibration hum), and are the control surfaces solid? Good. Make a habit to check this before every flight.

Ready? Try a tail high taxi at 1/4 or 1/3 throttle. Watch out for the drag of the grass on the wheels. Apply a little up elevator, let the plane lift a foot or two and cut throttle, holding elevator, and let

(Continued on page 76)

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Jack Aycock with his 70" B-25 K&B 40's. Kit by Royal Products Corp.



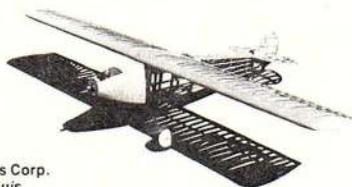
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I only wish Hot Stuff and Super 'T' had been around when I started building 40 years ago. If I had a dime for all the wasted hours using ordinary glues on countless models, I'd buy an oil well and retire."

Jack Aycock has kept very busy with all types of aircraft throughout his 40 year modeling career. A retired Air Force test pilot, Jack has been intimately involved with planes most of us can only dream of and model.

Because of his 40 years experience (29 of which have been in R/C) and as a former hobby shop owner, Jack has had the opportunity to help many a novice through the transition from first trainer to advanced models.

Jack builds totally with "Hot Stuff" and Super 'T' and as any pro would do he recommends them to his friends as in his many construction articles and product reviews. Currently, Jack is the buyer and general manager of a major R/C wholesaler in Denver.



Jack's Royal Products Corp. Spirit of St. Louis 80" Span, Veco. 61 Hot Stuff throughout

Best regards,

Jack

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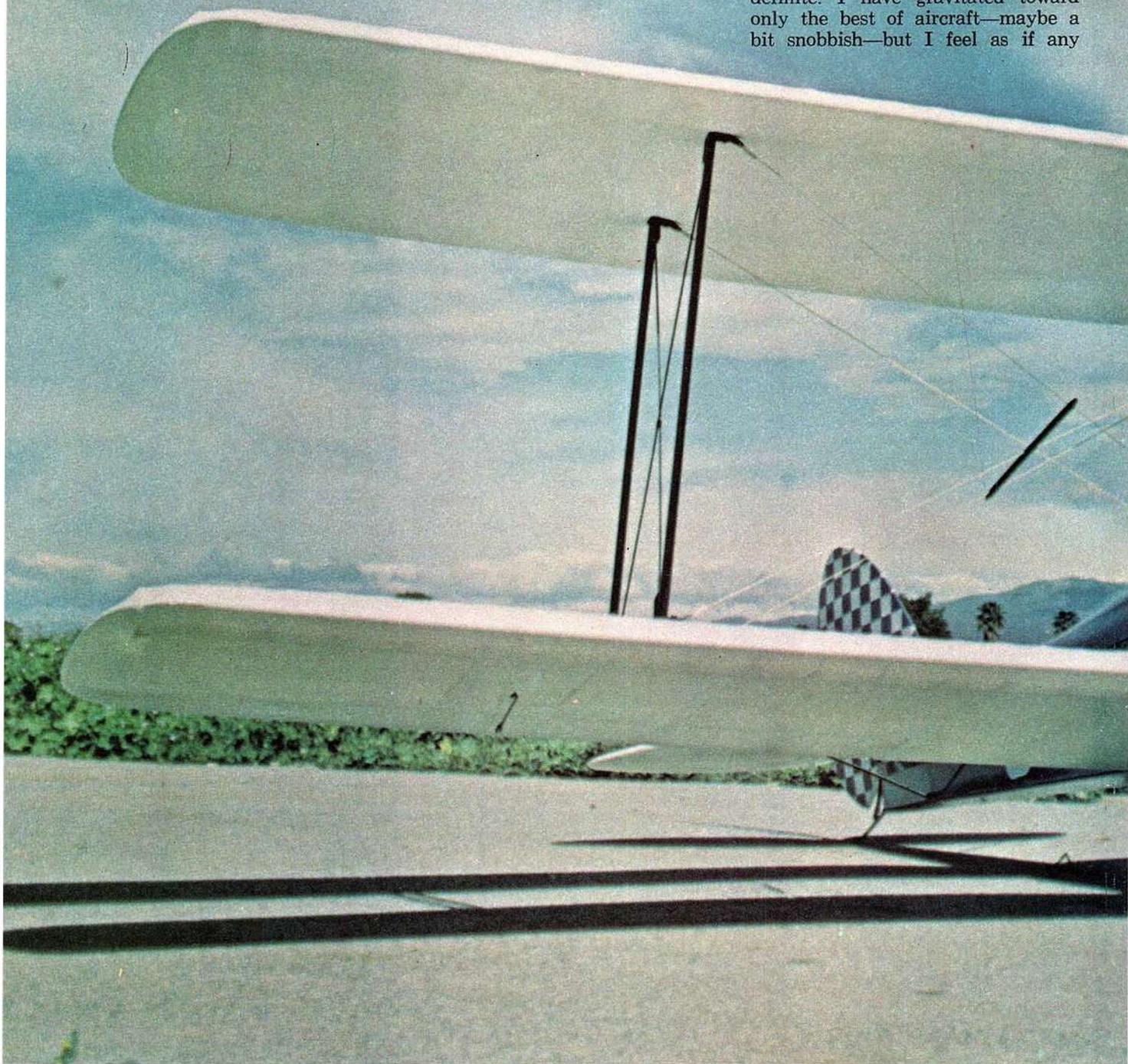
Tremendous Tiger

One of the nicest giant-scale kits on the market, this 103" span Tiger Moth is also one of the biggest bipes around. This machine proves that bigger must be better.

By John Pahlow J. R. Naidish photos

I am totally dedicated to building giant-scale aircraft. My Spirit of St. Louis long-distance endurance record has become part of modeling history, and I have also been fortunate enough to have had some of my planes featured in the model magazines. In all, I'd say that big models have been very rewarding for me. But, it's also a fact that too much intense modeling, especially the highly specialized type required when building duration aircraft, or show-quality models, tends to quickly burn one out.

I'm not saying that my enthusiasm for giant-scale has diminished . . . as a matter of fact, it's never been so intense. But, still, I find my tastes in modeling subjects very fixed and definite. I have gravitated toward only the best of aircraft—maybe a bit snobbish—but I feel as if any



level of proficiency requires a high degree of challenge. I don't want to waste my valuable building time on second-rate projects . . . no one wants to do that. Give me a fine quality kit and I'm happy, for it's the completion of a kit that's enjoyable to assemble which is one of the real thrills of this hobby.

Even though the big airplane movement has made giant strides in past years, the number of really premium-quality kits on the market are amazingly few. When it was time to start on another building project, I really had to look around to even find a handful of candidates. There are lots of nice kits, of course, but I wanted a design with that little extra "something."

One particular model stuck out in my mind. The ad for a huge 106" span Tiger Moth from Practical

Scale (West Germany) almost jumped right out at me from the pages of *Scale R/C Modeler*. I had built the smaller counterpart of the Tiger Moth a year previously, and the plane was so well done that I was honored to have the biplane featured in the August '79 issue of *Scale R/C Modeler*. The thrill of flying the de Havilland 82A as a .60-sized machine was really the epitome of excitement. I wondered if this larger, Quadra-powered biplane would offer comparable performance.

In my way of thinking, 106" of wing on a biplane is almost too much for a Quadra, since this gas engine typically is used to power biplanes in the 80-86" range. But my fears were to be assuaged when I had the pleasure to run into Tony Clark, the designer of the big Tiger, at the Las Vegas Q.S.A.A. Fun-Fli. Tony had

flown in from Germany, and I had a long conversation with him about the big Tiger Moth. As luck would have it, Ralph Brooke, who imports the kits here in the U.S., was on hand with his own model of the Tiger (34315 194th St., Seattle, WA 98188. Phone 206-824-5440). What a huge model! The top wing was almost waist high! From the streamlined cowl to the scale tail feathers, the Moth looked splendid, with plenty of scale realism.

The Quadra in Ralph's machine didn't seem to be laboring, as the big biplane effortlessly flew through the maneuvers. I realized that this aerobic performance was being achieved out in the middle of the desert on a very hot day, which probably made the density altitude about a mile or so. Later in the day, Ralph was in the middle of a roll, when the air-





plane just stopped rotating. The crash was a total wipeout, and one of the theories as to what happened was that the biplane lost so much airspeed during the first half of the roll that there simply wasn't enough airspeed left to complete the maneuver. That's what density altitude will do to you. I suspect that the aileron servo just quit, since the plane had done the same maneuver countless times with no problems.

But, I had seen enough to convince me that this big biplane was to be my next scale project. Tony assured me that kits would be readily available in this country, but that they wouldn't be cheap. This would be a complete kit, with accessories like the fuel tank, wheels, etc. all in the box. The model was basically an enlarged version of the smaller Moth, with features like a functional shock-absorbing landing gear. The model measures out somewhere between 1/4 and 1/3-scale . . . it's actually 3-1/3" = 1' scale.

By the time the freight shipment arrived at my home, I had forgotten how big a model I was expecting. The kit box measures 13x10 1/2 x 52". Just finding a place to unpack all the contents was a real problem. It was pretty obvious that I had a bit of a building task ahead.

I am somewhat of a "persnickety" type of person (my flying buddies call me "Sanitary John," because I'm so meticulous), and I can usually pick out even the smallest flaws in any kit. Not so with this plane! I can honestly say that the quality and completeness of the Tiger Moth leaves nothing to be desired. For example, the wood pieces which are related for specific subassemblies are marked and taped together. All parts are pre-sanded, and they appear to have been weight-graded, so that the density of a particular piece is correct for that application. Each part has a number stamped on it, which corresponds to the building plans.

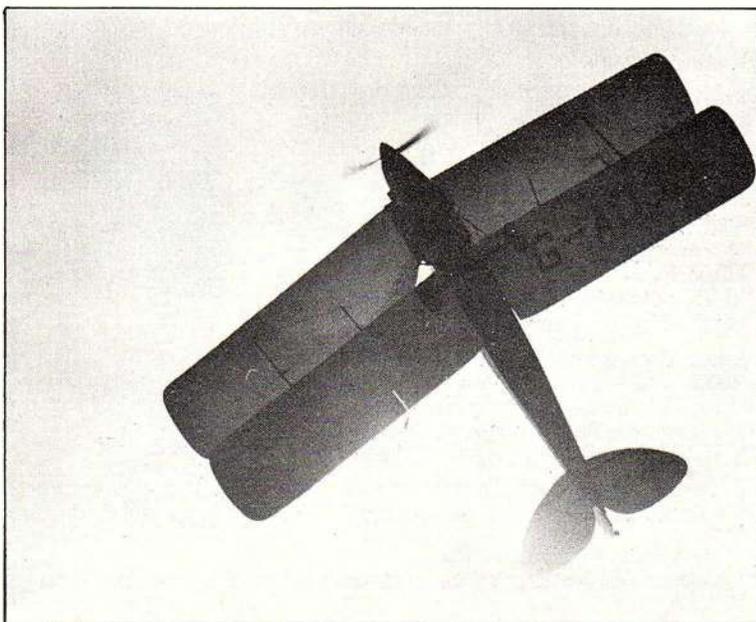
All the small parts and miscellaneous hardware are sorted and conveniently bagged. I was particularly impressed with the pre-bent heavy wire parts for the landing gear and canopies. The fiberglass work was flawless, with a perfect cowl and a nice ribbed upper wing center section fuel tank being the prime examples. The big balloon tires have a fill valve to adjust their pressure. A lot of metal parts and fittings are included in the kit, as well as instrument panels and other hardware. The kit may be expensive, but adding up the price of all these extras makes it a very honest bargain.



The Editor about to get a hair cut! Later, he learned that pilot Tom Cone made this low takeoff intentionally, to get the best camera angle. Telephoto lens actually compresses distance, and the model was quite far away.



Nicely executed instrument panel from the kit. Open cockpits make such detail necessary, but it's easy to handle in such a large scale.



The grandiose size of the Tiger and its slow-motion flight are captured in this photo. Cruise speed is about 50 mph, which is slower than most AB INITIO trainers.



John installed a small wheel in the "spoon" of the scale tailskid, to facilitate ground steering on paved runways.



The giant Tiger Moth has good aerobatic potentials, for such a large machine, but don't expect a lot of vertical performance with a Quadra.

The construction drawings deserve special comment. There are no written instructions on the plans, *per se*. No cluttered notes to get glue smeared over, or cut up and lost. Instead, each part is numbered, with a corresponding parts list. The written building instructions are separate, and each step makes quick and convenient reference to the numbers on the parts. There are separate draw-

ings for each wing panel, to help speed construction. The wings build as four panels, which plug in, very much in true prototypical fashion. To me, one of the real joys of building a good kit is to have a set of good drawings, and the Tiger Moth has one of the best plan sets I've ever seen.

Surprisingly, although the Tiger is such a monster of a model, the

Quadra engine just barely fits inside the cowl. The Moths had a very streamlined fuselage, and the fuses were some of the narrowest ever put on a biplane. The head of the engine is canted slightly to the 5-o'clock position. Even then, a small portion of the fins and the carb were hacked away to obtain clearance. Other chain saw engines might fit, but you may have to let some of the head protrude outside the cowl on the larger power plants.

The Quadra is probably the best engine to use, since there is a specific mounting system pre-designed into the firewall. No commercial engine mount is needed, but instead the Quadra is hung on four steel bolts which locate in pre-drilled holes in the firewall. A heavy aluminum plate is then secured to the bolts, and the engine is hung on that. The system could be modified to accept other engines, of course. The advantages of this system are that the engine vibration is dampened by two firewalls, and the engine can be easily moved fore and aft to allow for prop clearance at the cowl. The large bolts make it easy to dial in down or side thrust. The system is one of the cleverest I've seen, and it could be easily adapted to almost any giant model.

The fuselage construction is conventional formers and stringers. I did encounter one slight problem. The fuse sides at the nose are 5/16" balsa, which are slabbed between the spruce longerons. A plywood doubler is then contact glued onto this. Because the fuse tapers so rapidly near the cowl, this structure is too solid to permit easy bending. I had to soak the wood in hot water and ammonia to get the job done. If I had to do it

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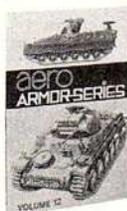
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again, I'd jig everything up and use thinner balsa, but laminating it until the desired thickness is achieved.

The four wing panels are supported on the model by heavy aluminum rods. Like a sailplane, these are pre-bent for the proper dihedral and sweepback. The top wings mount against the sides of the fiberglass dummy fuel cell, which is permanently mounted to the cabanes. This makes for relatively rapid assembly of the model, although the rigging wires must be mounted each time the plane is assembled. This is a simple task, once they are adjusted for the correct tension, and I can get the Tiger airworthy in about five minutes.

The lower wing panels not only have the aluminum tube mounting system, but there is also a plywood tongue which passes into the fuselage sides. There's a provision for bolting this tongue to a plate located directly below the cockpit. Needless to say, there's more than ample strength in this center section. I built a false floor in the cockpit area (just to keep everything looking "sanitary"), to have access to the wing bolts, as well as the rudder servo and the Y-harness plugs for the ailerons (there's an aileron servo in each wing). The floor in the rear cockpit gives access to the elevator servos, receiver and battery pack.

It's a good idea to build the fuselage and install the lower wing rods first. Cut the tongue openings at this time. Then a cardboard template is fabricated over the fuse side views. Slip this template over the dowels in the bottom wings, and the location of the top wing dowels is automatically established . . . thus making



A perspective of just how big the Tiger is, as the author taxis out. Wings can't be stood on end in an average room!

the correct decalage very easy. Don't cement the aluminum tubes into the wing panels until the mating of the wings and fuse has been completed.

The construction of the fuselage called for 1/32" ply on the decking ahead of the cockpit, and the same material as a covering on the turtledeck. I recalled having difficulty getting the one-piece front deck wrapping done on the smaller Tiger Moth. The ply pieces have slots and cut-outs so that it can be fitted around the cabanes. I decided to simply cut the plywood lengthwise in the middle. This greatly facilitated the oper-

ation, and once the seam was filled and sanded, it disappeared. For the turtledeck, I opted for the lighter 1/64" ply veneer wing skins. This isn't too flimsy, because there are numerous stringers underneath it for support. This is much easier to wrap than the 1/32" material supplied in the kit. After a coat or two of resin, the top of the fuse is very rigid.

Probably the most time consuming assemblies are the shock-absorbing undercarriage and tailskid. All of the rough metal fittings are furnished, but they have to be cut, ground, polished, etc. This isn't difficult work, but it is tedious. Also, there is need of silver soldering and/or brazing to join the subassemblies. You can't get the type of solder joint

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Stability could be the Tiger Moth's middle name, for the model proved capable of hands-off flight entirely across the field.

required on a gear of this size with a soldering iron or even a butane torch. I bought a Microflame torch at the hobby shop, and discovered a whole new world of fun. This combination butane and oxygen system produces a flame of several thousand degrees Fahrenheit. Special silver solder paste is also needed. I enjoyed the soldering with this handy little torch, and it's been something I have wanted to try for years.

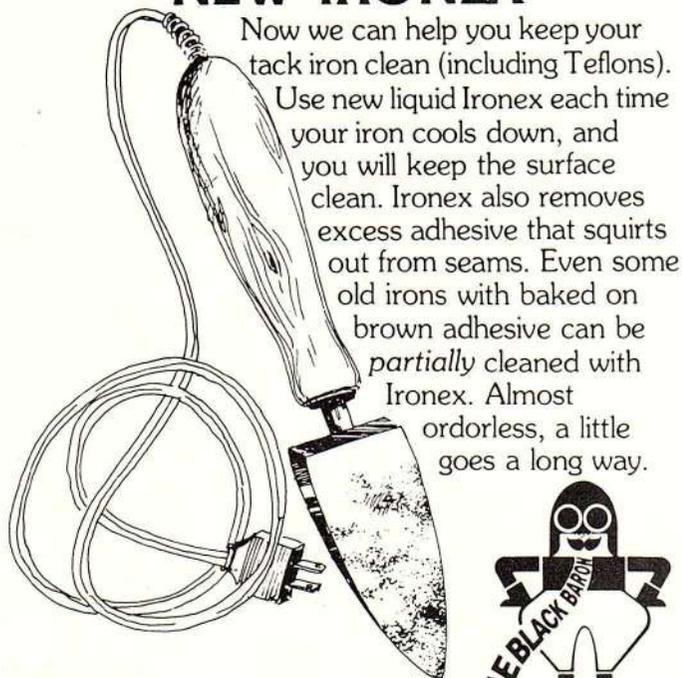
The creation (that's what it really is, for it is like the creative act of a sculptor working in metals) of the landing gear is very satisfying. All of the support members and braces are hinged, and the main struts are spring-loaded oleo types. The intricacies of movement are astounding, and you couldn't find a more realistic undercarriage. The tailskid is similarly fashioned, and it's also shock absorbing. I mounted a tiny wheel in

the tailskid's "spoon," to improve ground handling on paved runways. It's hardly noticeable, and it doesn't detract from scale appearance.

Many vacu-formed parts come in the kit. These include the windshields, cowl, airscoop, oil pan cover, footholds, instrument bezels, etc. Almost all of the scale detailing is thus provided for. I did some extra goodies on my own. I used pinking tape to simulate the rib pinking on the covering. I used leather to fashion crash pads over the instrument panels and on the seats. I added a gas tank filler cap, vents, fuel gauge, pitot tube, venturis operating air-speed indicator, and operating latches on the cockpit access doors. I even took tiny bits of mirror and made a neat rearview mirror. Detailing these giant models is easy, because you're making objects about the same size as for a doll house.

The wing's interplane struts can be assembled in several different ways, depending on your modeling preferences. Some modelers may wish to align the wings on the model, then carefully cut and trim each strut. The "X" interplane rigging cables also must be soldered between the struts (silver solder again). I opted

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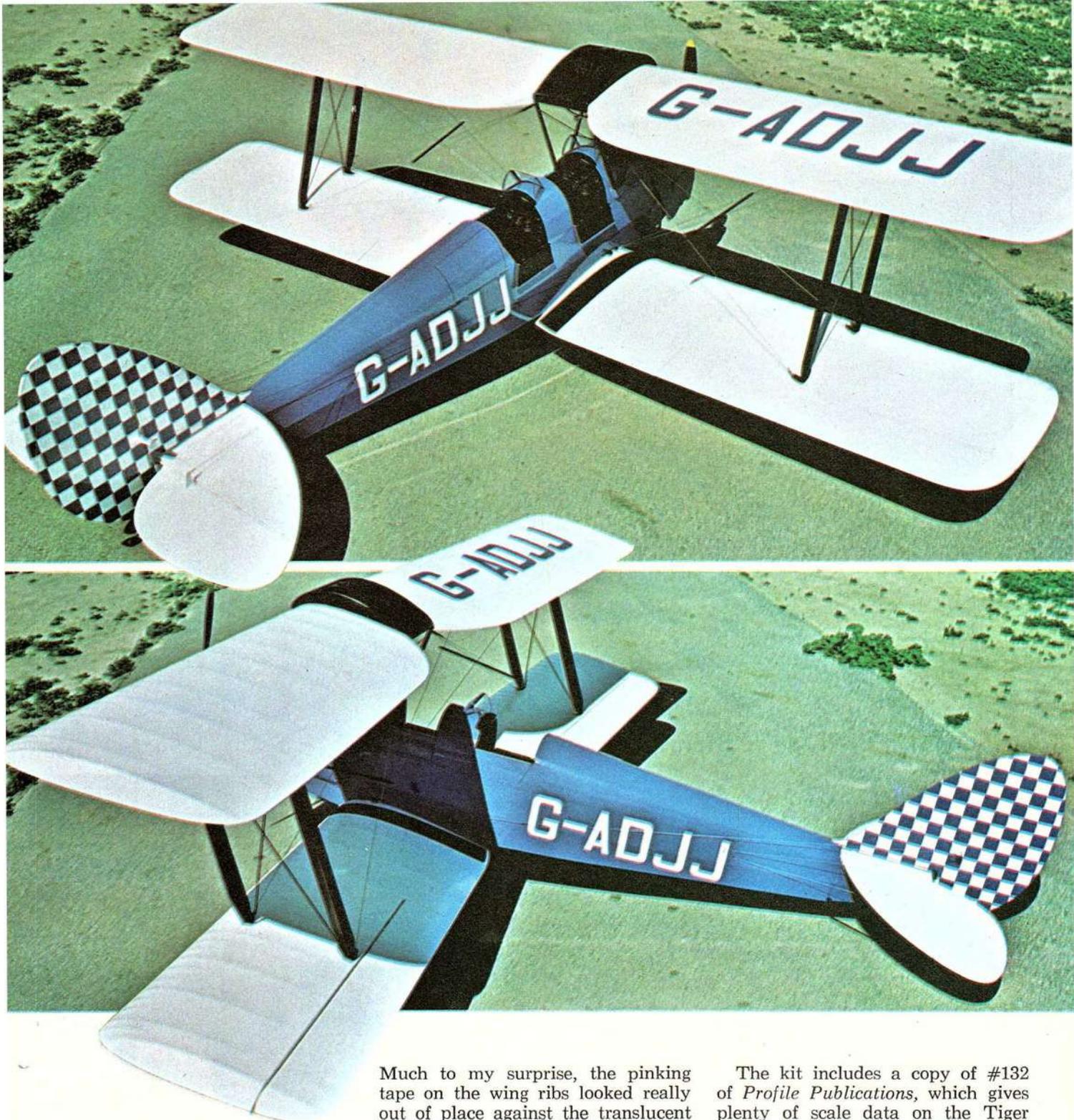
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to make a picture frame jig from the sideview drawing on the plans. I then placed the components of the struts in the jig and assembled them while working flat on the workbench. It was much easier to solder the rigging wires this way.

I decided to use Permagloss Coverite on all the flying surfaces, with Super Coverite on the fuselage sides and bottom (open areas). This was my choice because the fuse had to be painted the specific blue of the Magister Flying Group's machine.

Much to my surprise, the pinking tape on the wing ribs looked really out of place against the translucent texture of the Permagloss Coverite. Much to my consternation, I also had to paint the flying surfaces! I mixed the K&B Superpoxy with 50% Gloss catalyst and 50% Satin.

The fuselage was painted with Pactra's Formula-U polyurethane enamel. I brushed this over their white primer, and was very pleased with the results. The paint has hardly any odor, so it can be used comfortably in the house (with proper ventilation, of course). It dries to a hard, glossy finish, with a minimum of brush marks.

The kit includes a copy of #132 of *Profile Publications*, which gives plenty of scale data on the Tiger Moths. In addition to the photos and history of the machines, there are two pages of color schemes. I fell in love with the blue and white checkerboard rudder of the Magister Flying Group's training machine. However, since this was a training aircraft, the top wing slots and anti-spin strakes on the fin had to be deleted on my model. The parts for these are included in the kit, of course.

The control runs are exact scale, with cables to the rudder and ele-

(Continued on page 80)
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Byron's Big Mustang (Part II)

We got all the bugs out of our test model of the 1/5-scale P-51 winner now. Here are our suggestions for getting the most out of this beautiful giant fighter.

By Patrick H. Potega, Executive Editor

Photos by J. R. Naidish



In the last issue, we began our evaluation of the 86" span Byron Originals P-51 Mustang. To capsule our report, we were pleased with the exquisite engineering of the big fighter, but there were a few problems which were preventing us from getting repeatable performance with the model. We simply ran out of time when the October deadline rolled around, for we spent an inordinate amount of hours troubleshooting a retract dilemma, and then we unexpectedly developed aileron flutter only days before we had to get the article written. Frankly, we were frustrated, for the model behaved so well in the air, yet we were going through props (at \$22.00 a set for replacements) like crazy.

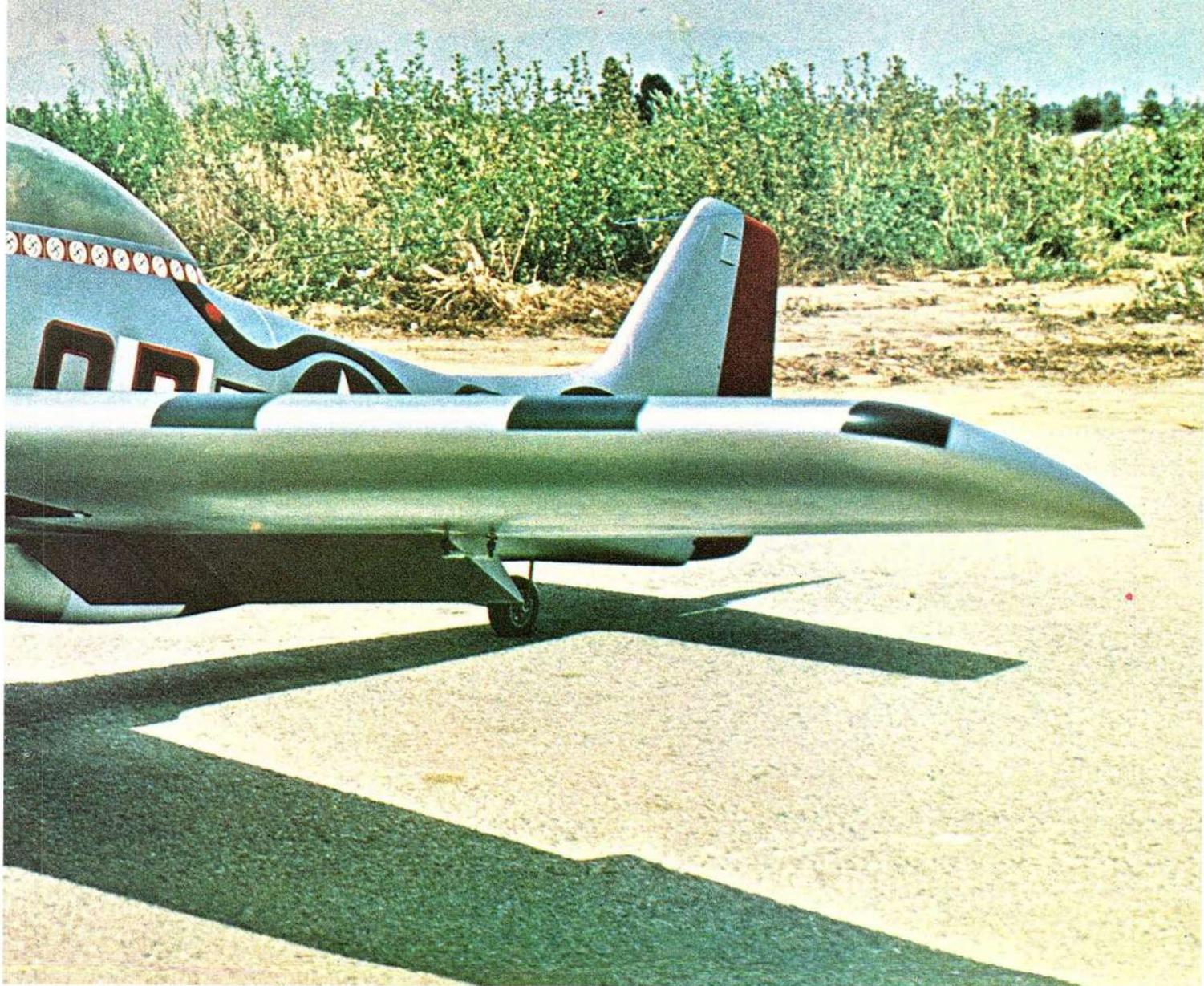
Let us explain. The prop tips would get chewed up on the black-top when the gear legs folded, because the friction failsafe feature on

the strut tops would work too well. The gear would fold at the slightest hint of a side load, so that even when taxiing, the plane would suddenly start to sag down, as if someone had hit the retract switch. By the time we could chop the throttle, the blades had already had their tips ground a bit. On some of the blades, we carefully trimmed the very ends, and salvaged them. Since one of the beauties of this kit is that the blades can be replaced individually, you can simply bolt a new blade in place instead of putting on a whole set. Naturally, to avoid unnecessary vibration, one should never use unmatched prop blades.

The blades, themselves, are a very nice molded synthetic, very reminiscent of the Cox black plastic props used for racing. Unlike the glass-filled props on the market, these blades are extremely flexible. They

are so bendable that I have seen Byron take his own Mustang and run it across the grass at full speed, with the tail high and the props throwing up divots. No damage to the blades at all! Of course, this trick doesn't work too well on a paved surface.

So there we were, with a gorgeous airplane, which had all the runway grace of a fractured duck. The whole problem was that the aluminum piece which forms the top of the oleo strut mates to a steel axle. The machine marks on the steel axles, since this part is turned on a lathe, are in the same direction as the strut wants to go when the friction fit lock fails. No matter how tightly you torque down the split aluminum strut piece around the steel axle, the aluminum distorts more and more, until the struts get so loose that you can push the airplane over with a hard shove



against the end of the wing.

Most modelers don't realize the tremendous loads that an airplane's undercarriage must endure. I queried Jack Stafford about this, since he's an acknowledged expert on aircraft stress and design. Being an aircraft engineer, Jack rattled off the formula for calculating how much side load a plane must take in even a routinely good landing. Simply

put, it's the weight of the aircraft, multiplied times a factor of 10 for landing G-loads. Then this is again multiplied by a factor of 10, which is the allowance for side load Gs. Thus, our very heavy 26 pound P-51 stacked up as follows:

$$26 \times 10 \times 10 = 2,600 \text{ lbs.}$$

Imagine! Over a ton of side gear load on a model airplane! No wonder those struts kept folding up, with only an inch of aluminum to support it. It seemed futile to think that the concept of a slip fit on the assembly was a feasible idea. Our final analysis was that the failsafe feature would have to be done away with, in order to preserve the integrity of the gear system.

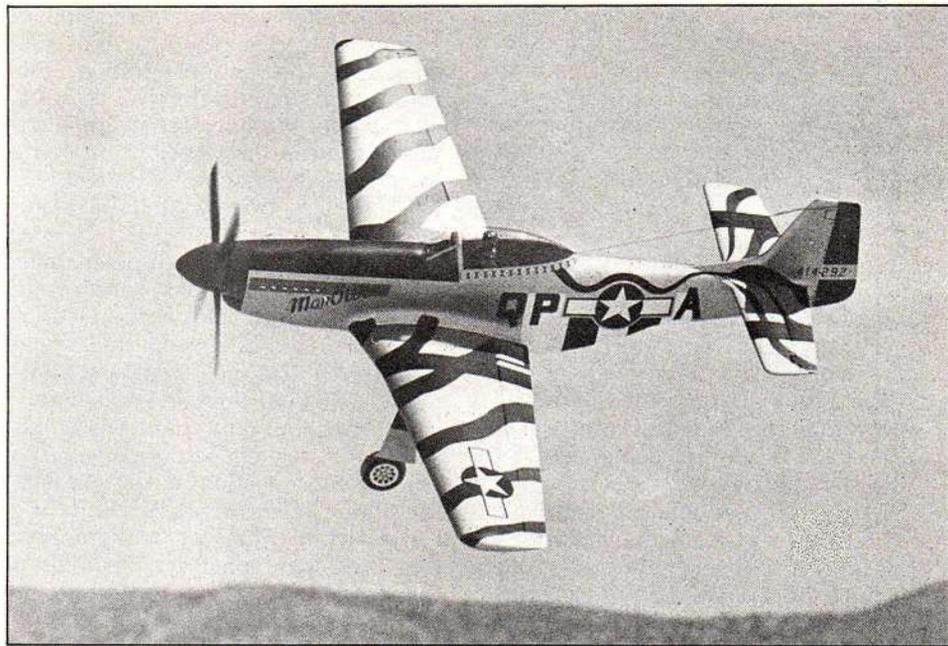


Actually, there are several possible options the modeler can exercise. Pat Ventola, a skilled modeler from Missouri, was instrumental in developing these modifications. The first option would be to permanently lock the aluminum strut piece to the axle by drilling a hole through the center of the aluminum piece, and being careful that the tip of the drill goes into the soft metal outer casing on the axle shaft just enough to leave a depression. The actual inner axle is tempered drill rod, so don't try to drill into that. Use the correct drill size for an 8-32 tap, since you will be threading the aluminum piece. Simply screw in an 8-32 set screw (the type used on wheel collars, for they already have a tapered tip), and the screw will lock into the dimple in the steel axle casing. That strut will never move again!

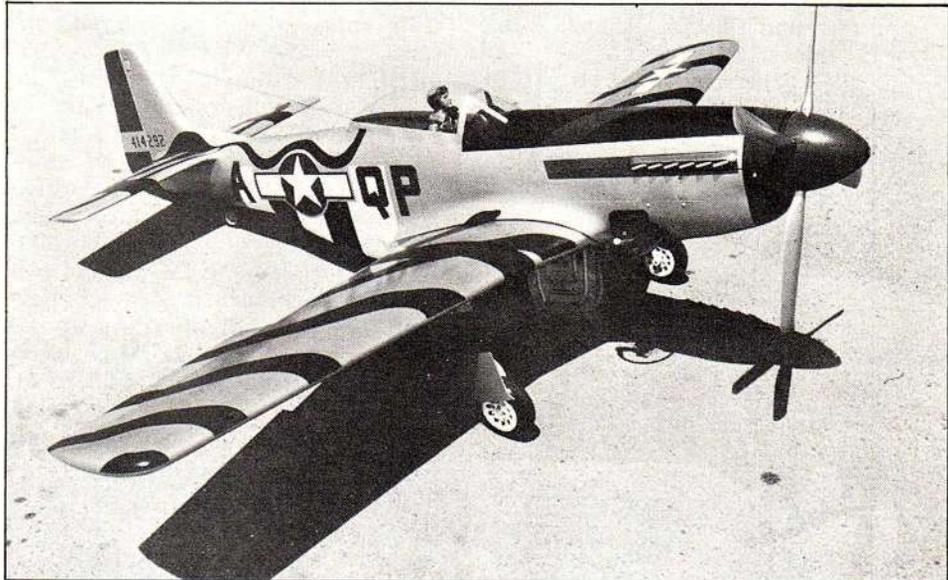
With that last remark in mind, please be very careful to properly align the struts in the wing so that the correct 90 degree angle with the ground is maintained before beginning any of these mods. You'll have to take the retract mechanism partially apart, in order to get the aluminum piece and the strut out for drilling. Just be careful not to move the correct strut angle setting. It helps to torque down on the original locking bolt in the aluminum as tight as possible before handling the retracts.

The second method is the old filing a flat system. This flat works satisfactorily, but it's a little trickier to do because you have no way to check that you are filing it in the correct spot to get the struts back on straight. The benefit of this system is that the slippage feature of the retracts is still somewhat preserved, albeit a pretty hefty side load is needed to get the set screw to slip off the flat. Once it does fail, however, you may find it more difficult to reestablish a proper tension setting, so that buying replacement parts from Byron may be required.

The final method, and the one we feel may be the ultimate solution in terms of the best all-around compromise, is to put a light knurl on the end of the axle casing. Only .002" would be needed. The increase in friction against that aluminum would be tremendous, and the modeler would be able, by prying open the jaws of the aluminum piece, to have a reasonable amount of adjustment on the struts. To maintain that fail-safe feature, the knurling would have to be light enough to let the strut slip at a pre-determined load. Too heavy a knurling pattern, and the joint will be as good as welded,



The intricate O.D. striped paint scheme was done by the trained hand of Rick Lewis, a virtuoso with an airbrush. Paint is all automotive lacquers, to minimize weight.



The P-51 has a span of 85 in., with 1,300 sq.in. of area. The prop spinner is almost knee-high!

while too light a knurl will merely cause the aluminum to slip. Frankly, this data should be either computer calculated, or determined by actual testing. We have recommended this to the Byron factory, in that this is the only cure we have found which could be implemented at the manufacturing level.

You may never have trouble with your gear system . . . we understand there are guys out there who are flying up a storm and the retracts are not slipping. If you fly off grass, this will probably be the case. But paved runways put a tremendous load on the tires, and the wheels

really can pull at those struts with more force than you can with both arms. We couldn't believe that the stresses were so great, until we tried to restraighthen a sagged strut. Even with both hands and all of our 200 pounds of weight, we couldn't even budge the assembly! That's one reason why giant-scale retract systems have gotten such a bad reputation . . . we just don't realize how much strain they are subjected to.

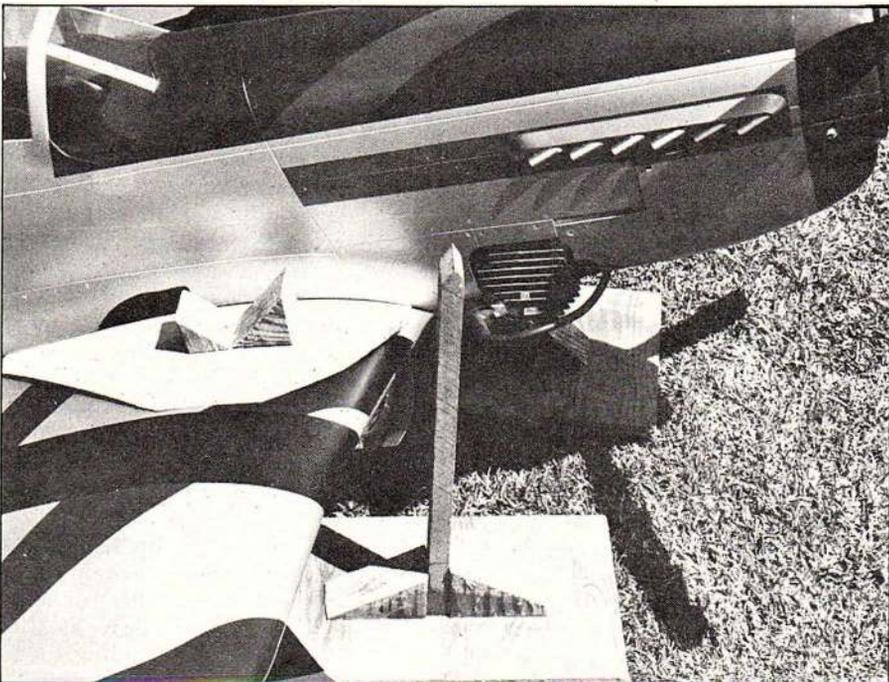
Let the modeler be cautioned that any mods to the strut axles will be at his own risk. The slip feature of the gear was designed to help keep the stresses off the actual strut legs. By locking the gear solidly at this stress relief point, the landing loads will then have to be transmitted

elsewhere. They could even get into the wing, where only two large ply ribs are holding the gear. In our way of thinking, we'd rather have the predictability of a good set of gear legs under our model, and worry about a landing that would be so bad that we would deserve to have some damage.

On our second flight, we knocked the 8-32 nylon bolts out which hold the retracts in the wing, and both gear sets went flying out from behind the model. After reviewing the video tape, we realized that we deserved this, for the P-51 hit pretty hard. We were originally going to replace the nylon bolts with steel ones, but we decided that this breakaway feature was worth leaving in. We suspect that we overtightened the bolts a bit, too, so be careful when torquing them down . . . settle for snug!

In the last issue, we suggested using a bit of toe-out on the model, to avoid the gear collapsing. We must have been up pretty late when we penned those words! Obviously, if toe-in will cause the gear legs to pull up underneath the model, toe-out will cause the legs to fold outward! Further tests have shown that only the slightest amount of toe-in is needed, if any at all. The Mustang ground handles very well, if you stay

The Editor's great invention (from small minds come strange things!). Cut bits of 2x4 on the table saw, and glue triangles to a scrap of 1/64" ply. Slide this under the wing saddle, locate the correct C.G. position at the "V", and then prop supporting pins (ahead of wing here) into "V"s while model is inverted. Sort of like a big Goldberg balancer. We found that the C.G. can be shifted aft a bit.



on the rudder. Because of the wobble permitted by the oleo struts, as discussed in the last installment, getting toe-in to be effective is a bit of a hassle. We have set just enough toe-in to keep the wheels from going to a toe-out position. You actually have to look twice to tell if there's any toe-in at all.

Actually, the retract problem suddenly became a minor concern on our third flight. Coming out of a loop, the right aileron started doing that feared jitterbug known as flutter. We chopper throttle immediately and landed, but only that few seconds of flutter was enough to crack the wing center section clean through the three layers of glass cloth. We turned white when we realized how close we had come to shedding a wing panel!

In the last installment, we recommended cranking both ailerons up a bit to pre-load them. In talking to Jack Stafford about this (he's also heavily into pylon racing), he said that won't do a thing to avoid flutter, since the natural air flow over the wing tends to load the ailerons upward, anyway. What he did recommend was carefully balancing the ailerons for total neutral stability in the static mode.

By mistake, there was an extra set of the little plastic cups which Byron uses for hinges in our kit box. We used these to balance the aileron, setting them on the edge of two vertical bars, much like a razor-blade prop balancer. To my surprise, we had to add another 60% weight to each counterbalance. We did this by purchasing some 1/4x3/4" cold rolled steel bar stock, and cutting it too

long, then we trimmed it until the aileron was in perfect equilibrium. Add extra length toward the tip end of the aileron, for the pocket in the foam wing has a bolt on the root side which is a nuisance to have to trim. Once we got the weights correct, we were able to do any maneuver in the books, with no hint of flutter.

As we mentioned in the last issue, we probably have achieved some sort of dubious distinction in building the heaviest P-51 on record. At 26 pounds, the model definitely flies like a heavy model. The stalls are a real eye-opener. We decided that, since there was some time between issues, we could rework the tail wheel and maybe shave off some ounces in the nose too. The old Rhom nose gear unit was mounted to two 1/4" ply rails about 6" long. We should have had the foresight to have purchased a firewall-mounted style, instead of the belly mount. We weighed various nose gears and, while the Rhom was among the lightest, the Goldberg unit came out a half ounce lighter. Actually, probably by the time the weight of the pushrods are included (versus the Rhom's airlines and cables), the two units are comparable. But we figure the weight savings would come from the elimination of the rails.

We made a 1/8" ply mounting plate for the Goldberg unit, since the bulkhead already installed in the fuse was too small. Much to our surprise, when all was said and done, the change in C.G. was almost inconsequential. We could only shave about an ounce and a half from the nose weight. We only lowered the plane's total weight by four ounces, which was hardly worth the effort. We used the extra air outlet on the Byron air valve to drive the tail wheel, by mounting a Sonic cylinder in the servo compartment.

Speaking of servos, we used the ACE Atlas heavy duty ones for all primary control functions. One servo adequately drives both ailerons, and it can handle the big rudder with ease (be sure to use two Ny-Rods to the rudder). We used a separate regular servo for the tail wheel steering, via a Y-harness (to avoid stripping servo gears when knocking about the tail of the model). The ACE servos are ideal for these big models, and we were very impressed with the transit time, torque and especially the low price. These are one of the best servo buys we've seen.

While we established the C.G. originally at the point called for in the instructions, we have already

shifted it aft about $\frac{1}{4}$ ", and we're considering moving it again by the same amount. While the model flies reasonably well in the original condition, we found ourselves needing lots of down elevator for inverted flight, and when the prop stopped turning, we could barely get enough elevator to flare on landing. If you decide to play with the Center of Gravity, remember that the model might get a little hairy with the flaps down, so practice flap operations at a safe altitude.

We must admit that giant-scale has taken on a whole new meaning with this large-size fighter. It's 1/5-scale, but it behaves like a machine twice its size. That Quadra in the drive system is one of the best power systems we've seen in a long time. What engine do you know of that can swing a *four-bladed* 24-15 prop at about 3,000 rpm? Just holding onto the airplane takes both hands. There's definitely no lack of power here.

Speaking of holding onto the airplane, you'll quickly learn that this is a two-man machine. It helps to have an assistant along, because operating the sophisticated Mustang by yourself is difficult, especially when

adjusting the engine. We personally feel that, when operating *any* giant-scale aircraft, the buddy system should be used, for often a second opinion, or a second set of eyes looking for problems, can save a bad situation.

When you advance the throttle on the Mustang, there's a kick in the pants of power that gets the model up on the mains within a few feet. Be prepared to walk on the rudder a bit, for the plane will want to swing left (even with all of that right thrust). By playing with the elevator here, you can keep the model on the mains for the length of the runway. Just a breath of up, and the model will gently transition from ground to air. The takeoffs of the Mustang are the most breathtaking we've ever seen. Don't try to horse it off early, or you may be in for a shock.

Speaking of shocks, we had quite a noticeable one when we fired up the Quadra for the first time. The vibration levels at low throttle were so severe that the pilot figure got fipped on his back, as the glue joint let go. We advise filling the pilot with silicone adhesive, and set a dowel rod in place (sort of like making a Platt pilot popsicle!). Drill a

hole through the cockpit flood and anchor the dowel rod underneath with a washer made of plywood. We had to do all this from inside the fuse, since the model was already built. The vibration has already accounted for unscrewing a motor mount bolt (in spite of the Loctite), unloosening the belt pulley tensioner, unscrewing a wood screw which was holding in the nose weight, and unthreading the nylon bolts which hold on the cowl. Some of this is normal attrition which would happen on the shakedown flights of any model, but to think that all of these items worked their way loose in less than five full flights is pretty scary.

Please make every effort to do a sanitary radio installation. Properly torque down the grommets on the servos, and wrap the battery pack and receiver in lots of foam. There's plenty of room in there, so don't skimp on the radio installation. Also, avoid mounting the on/off switch directly to the fuse side—use a switch mount internally. Don't let servo leads rest against solid surfaces, but instead wrap them (especially the plug connectors) in a thin layer of foam.

Get busy with the Loctite on all

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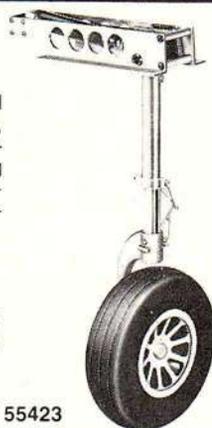
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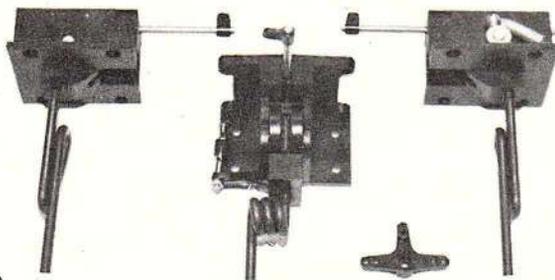
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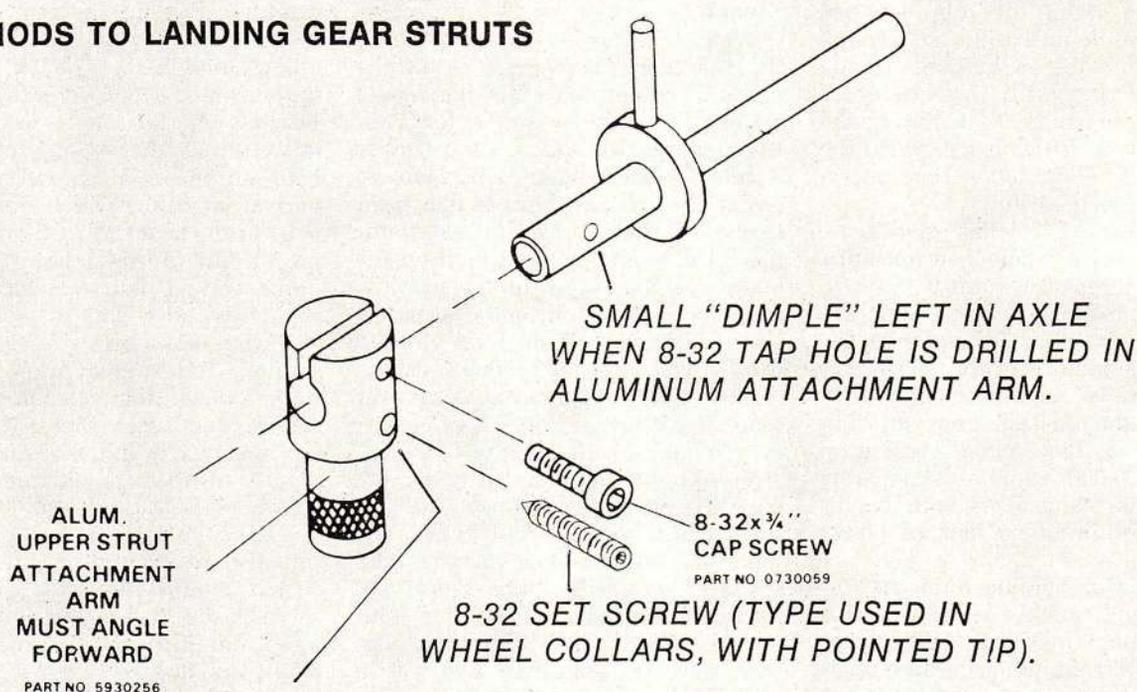


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the bolts and nuts on the airframe, paying particular attention to the items in the engine compartment. Don't overlook items like the threads in the linkages, especially ball-joint connectors, etc. The factory doesn't recommend prolonged running of the engine at low throttle, nor extensive taxiing. All chain saw engines have a rough spot near the low end, and you may have to settle for a higher idle speed just to avoid hitting that maximum vibration rpm setting.

After about a half hour's running with a 20:1 mixture with Bell-Ray MC-1 oil, we switched to the recommended 50:1 ratio, only to find that the engine just wouldn't respond in the mid-range. Only when we changed to an RCJ-6 plug did the problem cure itself. The lower the number on a spark plug, the hotter it runs. Because of the belt-drive and the weird sound of the four-bladed prop, we have learned to rely on a

Royal Pro Tach for the correct engine setting. At 26 pounds, you need all the rpms one can muster! Remember the Byron instructions, and keep the prop covered with a rag when out in the sun.

Both Rick Lewis and ourselves are still shaking our heads and wondering how we managed to get a 26 pound P-51. In hindsight, it was all that body filler we had to use to fill the multitude of pin holes in the fuselage. We don't mind a light bit of glasswork, to save some weight, but why pull a thin and/or dry fuse at the factory—thinking that it is going to give the modeler a light airframe—only to have the builder put back the weight in spot putty and primer? The best glasswork is the type which requires no body filler, and only a whisper of primer . . . even though the glasswork might be a little thicker and heavier. If you can make it thin and light, and

still achieve the same results, then you have achieved modeling perfection.

The Mustang was done up in acrylic lacquers, because these evaporate a lot of volatiles, leaving very little for weight build-up. The Ditzler line of auto paints gives exceptional results, and the gasoline obviously won't hurt them. Ditzler DDL 2593 Silver Poly for Ford is a beautiful match for aluminum on the model. We highly recommend using the Badger #400 spray gun for airplanes this size. This is the perfect combination of a touch up gun and a full-size spray rig.

The instructions erroneously say that Fabrikote can be used on the foam. In all honesty, this is somewhat of a mistake, since the iron temperatures will tend to melt the foam. Just to make a liar out of Syd Axelrod and ourselves, the Mustang in the Byron booth at the shows

sported Fabrikoted control surfaces! We do recommend Econokote, however, since this is a low-temperature material which will keep the weight down. This winter, we are going to build all new control surfaces for the P-51, with built-up structure and Fabrikote. This should shave off a healthy chunk of weight on the model, and they should look authentic, too.

Now that we've licked a few minor problems, the Mustang is really becoming a fun machine. Admittedly,

we are still trying to get all the trim settings dialed in correctly, but the loops are getting straighter on each flight, and the rolls have been beautiful from day one. That four-bladed prop is deceptive, for it really doesn't look as if the Mustang is going to make it through the loops, but even though the airspeed drops off quickly as the top of the circle is approached, the prop just pulls the model right on through. If you've ever been in the full-size airplane, you know that this is exactly the way it does the loops.

We haven't experimented with the

flaps too much, primarily because we haven't felt the need to use them. The instructions warn you to practice up high, to get the feel of them, and our few explorations into this area revealed a flap response which was akin to hitting a brick wall. Be prepared to get the nose down to keep the airspeed up, for the flaps in the fully deployed position will almost make the Mustang hover in a slight breeze. For landing approach, it seems like only half flaps would be more than enough, unless you want to look as if the Mustang is diving for the runway.

The one critical thing to watch out for with the Mustang is the

(Continued on page 71)



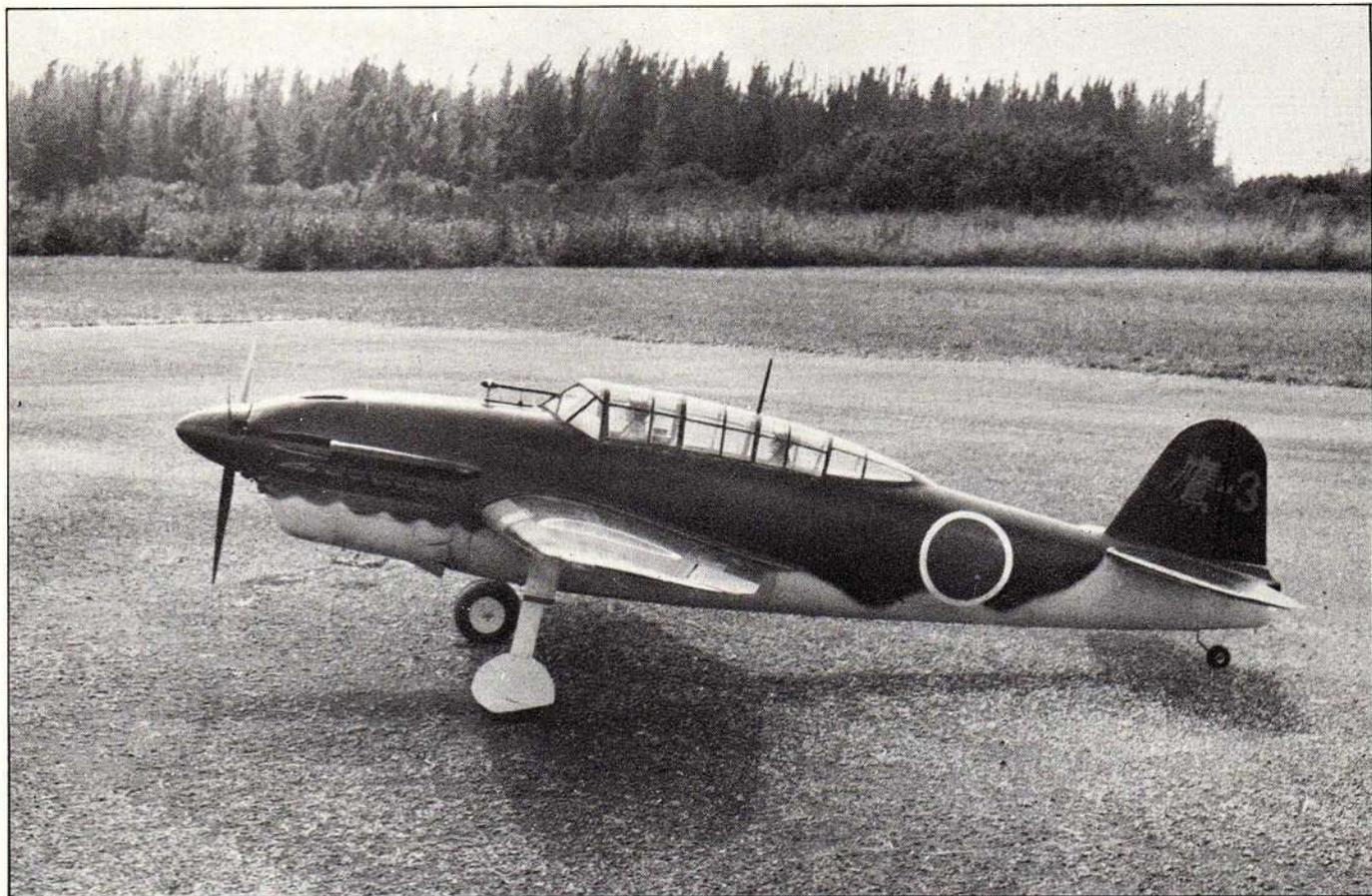
A 90" span 1/5-scale Japanese dive bomber for those who want the unusual in big aircraft. This one can accommodate a chain saw engine.

JUDY! JUDY! JUDY!

By Bob Taylor

Photos by Pat White





"Judy" was the American code name for the Japanese Yokosuka D4Y Suisei (Comet) carrier-based dive bomber. The "Comet" designation seems more apropos, since the aircraft had a rapid ascendancy to glory, only to glimmer briefly and fade out. It was one of the most beautiful airframes designed by the Japanese, and it was one of the first airplanes to fade into obscurity after the war.

The Judy started off as a design effort to improve upon the German Heinkel He 118 bomber. The Japanese Navy believed that they could get better performance, and they also wanted to avail themselves of the Atsuta 12-cylinder liquid cooled engine. The concept was to keep frontal drag to a minimum with the streamlined liquid-cooled engine. Other than the Ki-61 Hein, the only other aircraft in the Japanese inventory to use this in-line engine was the Judy. Because of the unreliability and vulnerability of the liquid-cooled power plant, the Judy's career was plagued with engine problems, until the eventual transition to a radial was made with the Mk. III version.

As a dive bomber, the Judy was unique, in that the designers kept the span short enough so that no wing-folding would be necessary for carrier operations (this also helped save weight). Actually, the wing was comparable to the Zero's, yet the

plane was actually faster than that fighter. Dive brakes were fitted ahead of the flaps, and the gear were well forward to keep from interfering with the spars. By making the Judy a mid-wing design, the bombs could be stored internally, while the Heinkel had to carry its ordnance externally. With a 500-pounder in its belly, and a few lighter 60-pound bombs on the wing, the Judy could travel great distances . . . making it the ideal carrier-based bomber.

Unfortunately, early testing revealed wing flutter and spar fatigue in the diving mode, so the Judy was hastily reequipped with cameras and used for recon missions. It was in this lesser role that the machine was to make its debut aboard the carrier *Soryu*, in the invasion of Midway. With bad luck still plaguing it, the carrier was sunk early in the engagement, before any of the aircraft could be deployed.

In the battle of the Marianas, some 141 D4Y1s were launched against the U.S. fleet from remote island airstrips. The total lack of armor plating for the crew and/or the gas tanks (the light weight of the Judy was the key to its payload and speed capabilities), the mission turned into a slaughter, and all aircraft were lost. Later in its career, the Comets became perfect fodder for the notorious Kamikaze missions.

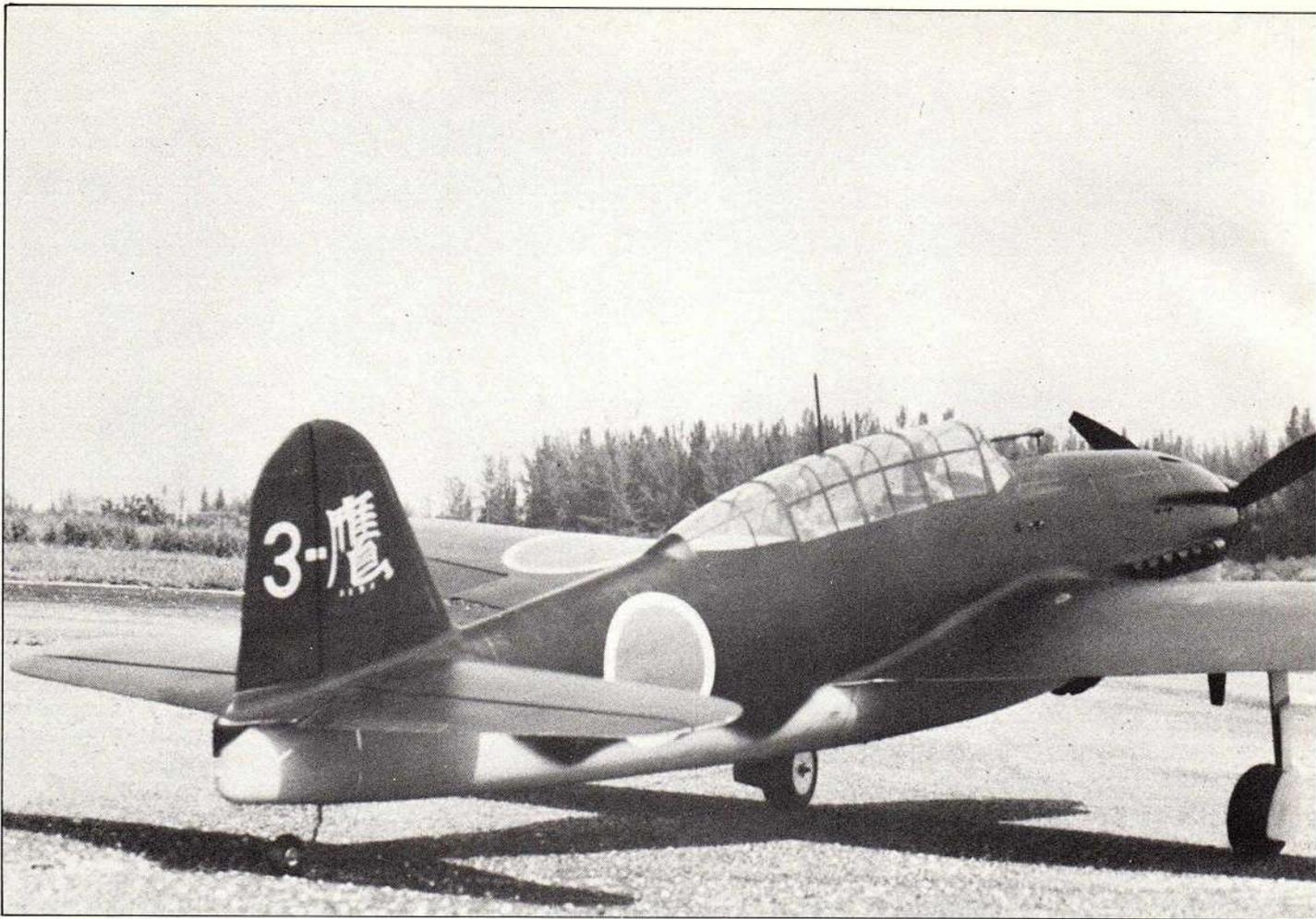
Once the spar and wing problems

were remedied, the Judy went on to become the fastest dive bomber of the war. But, like most Japanese designs, the machine was to be a multi-purpose airplane, serving in night fighter, attack and reconnaissance roles, as well. The radio operator usually had a 13mm machine gun in the rear cockpit, and two machine guns were fitted in the fuselage decking behind the cowl. But, with a top speed of 360 mph, the Judy's best weapon was the defensive tactic of running away.

When the in-line engine was finally abandoned as being a total nuisance, the Judy's charm and beauty were lost. The radial engine made the plane look awkward and grotesquely fat. It is undoubtedly because of the cosmetic changes that occurred when the round Daimler Benz was fitted which contributed to the quick demise of the Comet as a memorable fighting machine. By the end of the war, the only thing the Judy was known for was its almost total obscurity!

* * *

After many months of pondering and trying to make a decision for a scratchbuilt project, I finally decided on the Judy. It was the result of a process of elimination from a list of ten aircraft which were interesting subjects that were seldom, if ever, built as a model. Reference books by



The Judy's pleasing lines make it one of the nicest of the Japanese WW II aircraft.

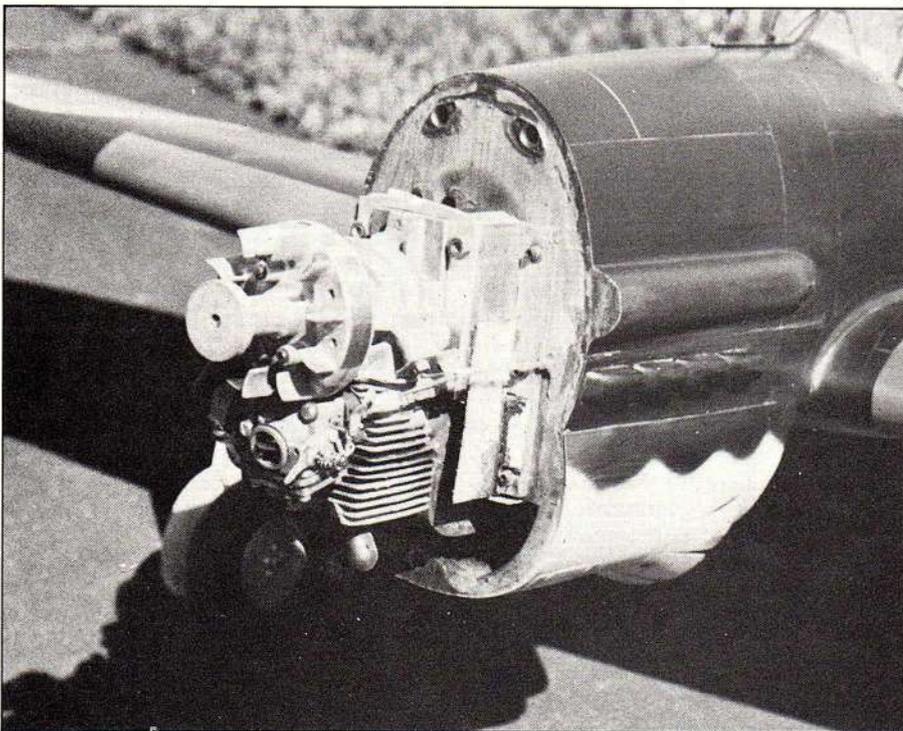
the dozens were studied on all types of aircraft, but the Japanese designs intrigued me most of all. These aircraft seemed so perfect for models,

because of their huge wing and stab areas.

The question was settled, it would definitely be a Japanese airplane. The Judy won out! She had the most beautiful configuration of them all, with the mid-wing and long moments. This just had to be a beautiful and stable flying model. The big air scoop for cooling, the wide track landing gear and small wheels made it a perfect subject.

The next decision was what size would this model be? I wanted a big airplane, but it had to be a model that would fit into my station wagon. Small airplanes were commonplace and no longer a challenge. Big had to be beautiful. The result—an exact 1/5-scale model with a wingspan of 90½". The wing area is 1,486 sq. in., length 81", stab span 40" and the projected weight is about 21-to-24 lbs. Wow!! What a model this was going to be.

This size presented some design problems, such as: What engine should be used to power this monster and what landing gear would support the weight of the model and still retract a pound of wheels? I had a Webra .90 on hand, but I knew this would not do the job. Perhaps a gear reduction unit for the .90 might



The McCulloch Husky engine fits nicely in the Judy's cowl. Prop drives didn't have enough guts.

60 scale r/c modeler



be the answer. I opted to try it with a Maximizer. (This was later found to be inadequate due to the overheating of the Webra and was replaced with a McCulloch "Husky".) Dave Platt was in the process of designing his "Y-lock" retracts, and I decided we would give these a try.

With these decisions made, drafting of the plans was started. The design was scaled up from a 1/50th scale three-view found in *Koku Fan* #4. (Please, won't someone translate these marvelous books into English?) This is a beautiful book with lots of pictures but, unfortunately, I couldn't read it. A Japanese girl working in a restaurant helped me decipher some of the picture captions and various excerpts.

The plans were finally completed and the construction of the fuselage started. This is basically a mono-coque structure, with 1/8" balsa bulkheads which is skinned with 3/16" balsa sheeting.

The engine cowling was made of fiberglass by shaping a block of urethane foam and laying up the fiberglass mat over it. The foam was then dug out from the inside. The cowl is attached to the fuselage with three camlocks, two of which are accessible through the gun troughs and the other through the air scoop. A Zinger 5" aluminum spinner is

the exact size and shape, and works quite well for this model. The fuselage is built upright on the bench, using jig tabs for perfect alignment. The top half is sheet covered while still pinned (nailed) to the building surface.

The wing is the usual egg crate type construction with 1/8" balsa sheeting. The gear doors were laid up with fiberglass cloth over Mono-Kote (*a la* Dave Platt) before cutting out for the wheels. The stab and fin are built up and sheet covered with 1/16" balsa.

The fuselage and wing were covered with 2 oz. fiberglass cloth and K&B resin; the stab and fin the 3/4 oz. cloth and resin. The fuselage belly pan was later constructed with the wing bolted into place—Mono-Kote was ironed onto the wing to prevent glue adhering and the belly pan built right on the wing. The belly pan is attached with two 3" 6-32 bolts, through a 3/8" dowel and into a knurled blind nut mounted in the wing. Two rubber servo grommets were used as washers to keep the bolts from vibrating loose.

The canopy was made in five sections from .040 clear acetate (used for doll house windows). A one piece fiberglass framing was first laid up over a mold sculptured from urethane foam and glassed. The windows were then cut out with a Dremel tool, leaving only the frame webbing. The clear sections, also formed from the same urethane mold by heating in the oven at 300 degrees until soft, were stretched over the mold. These sections were then Hot Stuffed into the fiberglass frame. The reinforcement framing for the canopy was made from 1/16" copper-coated epoxy circuit board, which made a solid support for the 30" canopy. It also provided a solid mount for the dummy antenna, which was also made from laminated circuit board.

The engine cowl fins were made from .040 gray plastic mounted to the fuselage, and covered with fiberglass cloth and resin.

The entire structure was primed with Dupont 100 S automotive primer, and acrylic lacquer color coats were sprayed. It was then wet sanded with 600 wet or dry paper, weathered, and then clear coated with K&B satin finish SuperPoxy.

The moment of truth was finally here—the Judy was ready for her maiden flight. Art Johnson was asked to be the test pilot (yours truly had a case of "first flight jitters"). The weather was perfect, with a 10 mph wind in exactly the right direction. The engine was started the controls checked, and down the runway it



The author and his design. That fuselage is 81" long!

went (at what looked like 5 mph). Art was ready to abort the takeoff, but noticed airspace between the wheels and the asphalt: "What the heck—let it fly." It was short of unbelievable, seeing this monster fly at about 10 mph, and just as stable as can be. However, the following day

I went down to see Jim Homer, who revamps the McCulloch chain saw engine and markets it as the "Husky." I purchased one of these 2 cu. in. engines and immediately installed it in the airplane.

Next flight—absolutely beautiful, with about a 50 to 60 mph airspeed.

The roll rate is slow and realistic. The loops are elliptical, just like the real thing. The Judy is so docile, I believe it could be used as a trainer. Judy, Judy, Judy—she is so beautiful and easy to handle. She's a dream come true.

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Ignominiously coming in with one gear hung up, the Judy prepares to land. Because of its low airspeed, the airframe suffered no damage.

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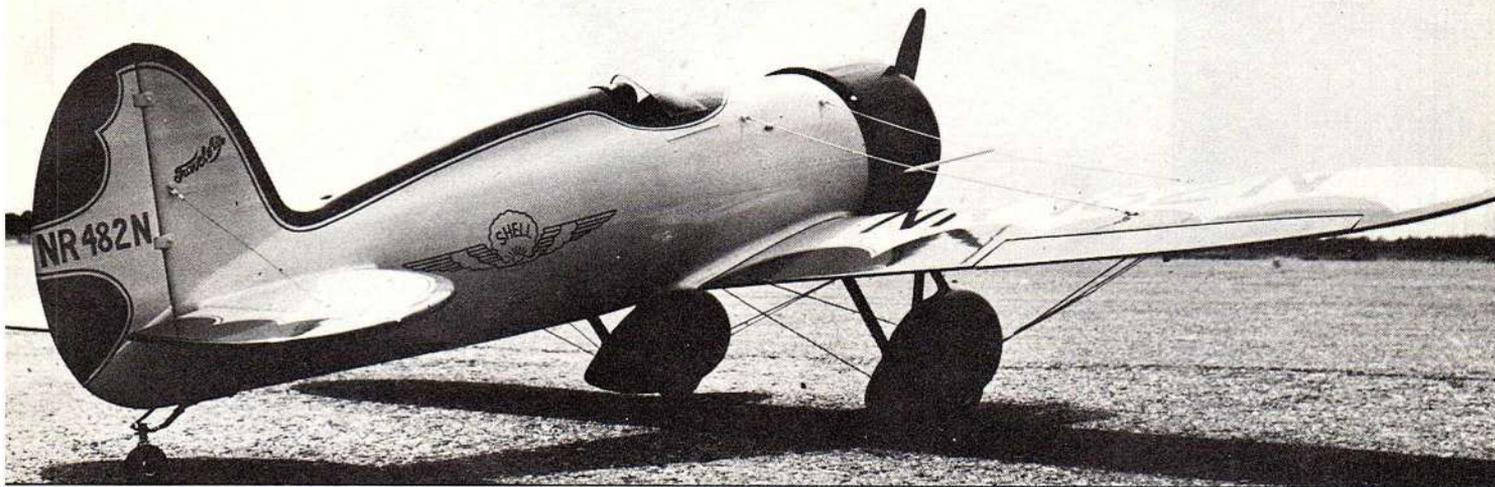
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Giant-Scale Travel Air Racer (Part II)



The conclusion of our saga on the improperly built giant-scale model. In spite of all the mistakes, the first flight was... read on, and see.

When we last were discussing the Mystery Ship in 1/4-scale, we had already come to terms with most of the basic framework. We remind our readers that Mr. Ayers' aircraft is being presented without plans, because the model shown here was totally overengineered. Bert started by scaling up the .40-sized plans for the Model R Travel Air which are available from Bob Holman, and we urge our readers who are interested in building a model of this Golden Age racer to do the same. Bob can enlarge the plans to almost any wing span desired (be sure to specify), but be cautioned that the plans so supplied are to be used for external sizes only. The structure will be too flimsy, because the wood parts do not scale up proportionately.

With that in mind, let's continue with the saga of how to build an overweight model. (PHP)

* * *

In the first installment, I had just completed the fuselage, which turned out to be strong enough (and heavy enough) to serve as a pillar on a house. The heavier I engineered

a component, such as the wing, the heavier still the accompanying item seemed to need to be. Thus, I got caught in a downward spiral of heavier and heavier items, with each subassembly heavier because it needed to be.

So, now that I had a fuse which weighed about six pounds empty (it would have probably been fine at 4 1/2) and a wing which tipped the scales at about the same, I built a set of tailfeathers which were correspondingly heavy. I made the built-up stab by laminating six thicknesses of 1/8x3/4" balsa, then sanded it to shape. Most aircraft of this size get along pretty well on beefed-up 1/4" tailsurfaces. I had heard so much about how vibration bothered the stabs, that I figured I better make the tail pretty meaty. I made scale hinges by using 1/16" music wire as a hinge pivot, inside inner Ny-Rod tubing.

While I originally set up the stab and engine at 0-0, with the wing at two degrees of positive, I later added a degree of down thrust. The Quadra mounted easily on the heavy structure I had fabricated as a fuse, and I was very sure that vibration would not be a problem (after all, how

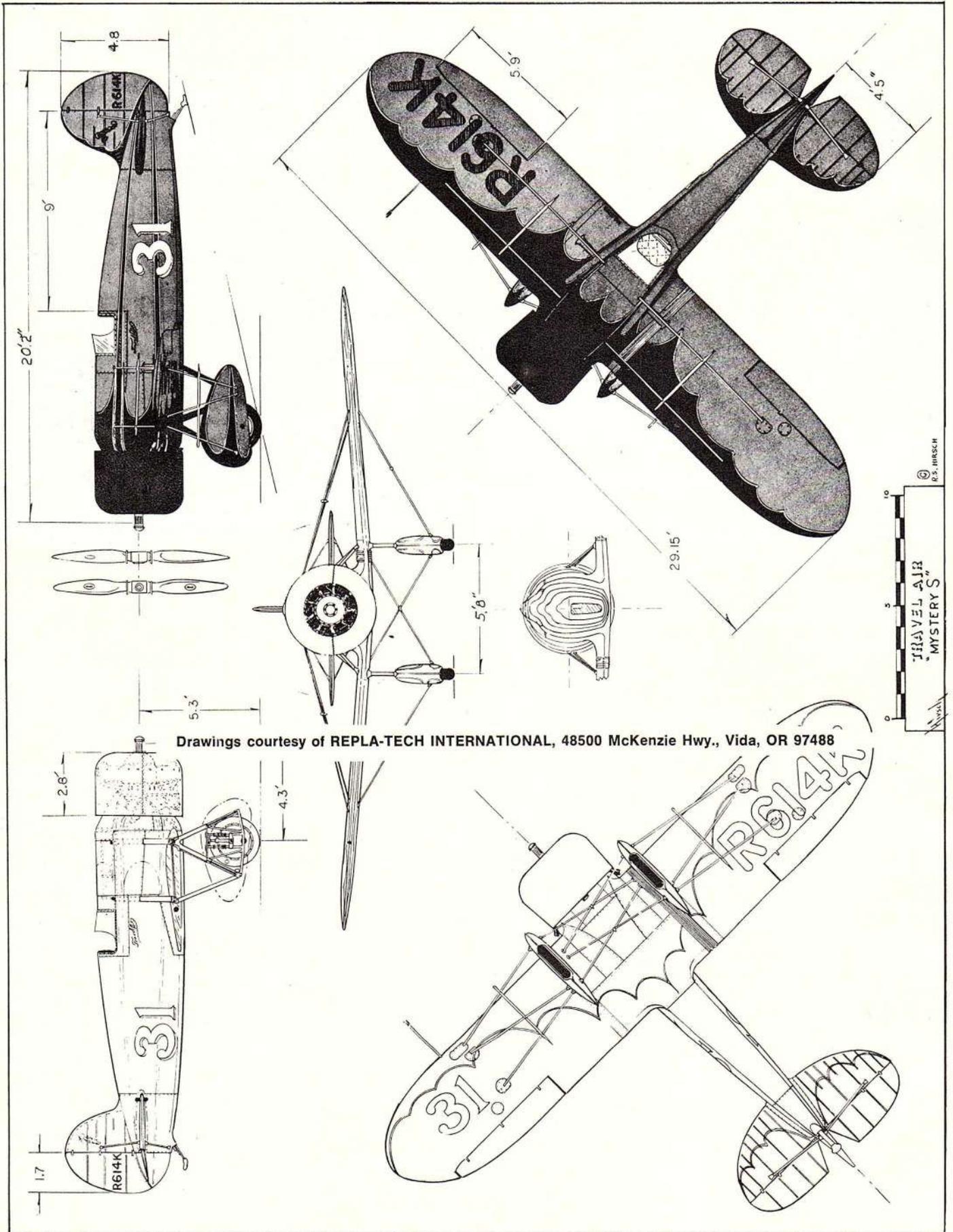
could the engine shake that big log behind it?!). The cowl was made by forming two plywood rings, over which were applied some stringers and sheeting, as well as 2 1/2" of solid balsa blocks at the front carved to shape. The cowl assembly came out a little heavy, but it was welcome weight, to help offset the heavy fuse and empennage.

I might suggest that a fiberglass cowl would be preferred when a lighter fuse and tail feathers are done. Carve a plug from foam, by chucking it in a big lathe or use a drill to form the piece. The cowl is 11 1/2" in diameter, and 9" long. The glass cowl will be easier to maintain, and a new one can be duplicated whenever necessary. I made the added mistake of mounting the cowl internally. I hid four 8-32 bolts inside the cowl, securing it to the firewall. Thus, every time I needed access to the engine (which, with a Quadra can be quite often), I had to hunt inside that dark cavity for the bolts. Mount the cowl with external bolts—they may not look as neat, but at least the model will be more convenient to operate.

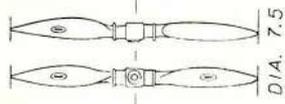
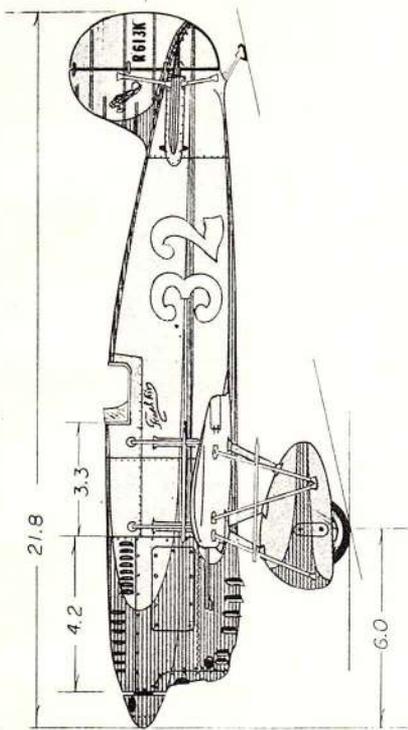
Naturally, I was a bit worried about what kind of radio such a large

By Bert Ayers

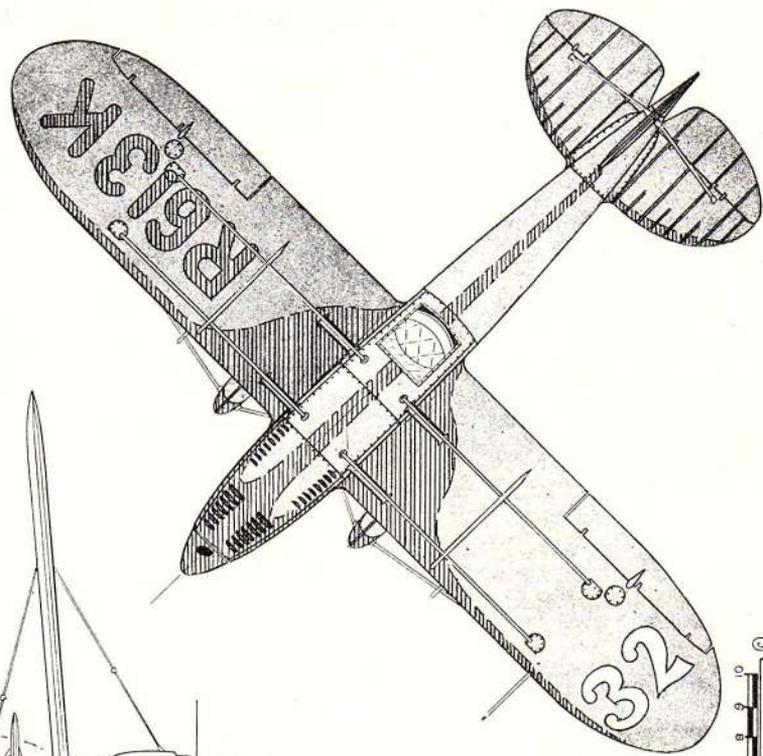
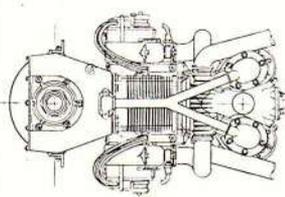
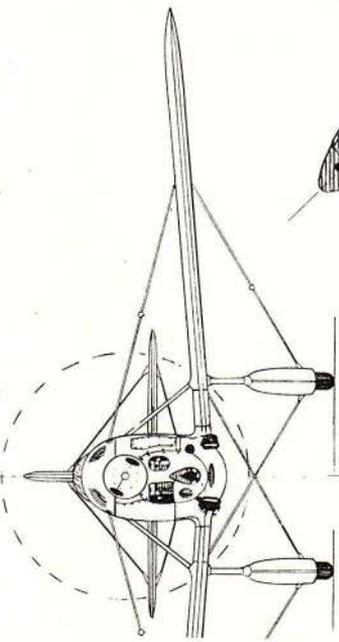
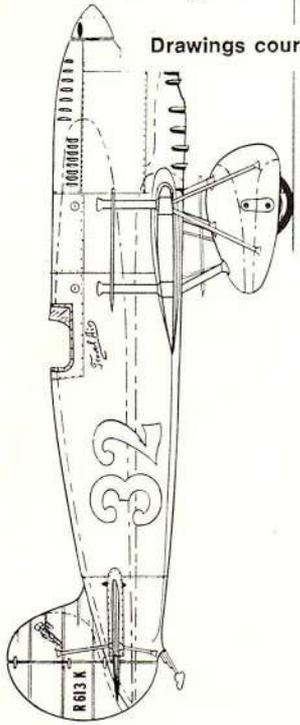
J. R. Naidish photos



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



6.2

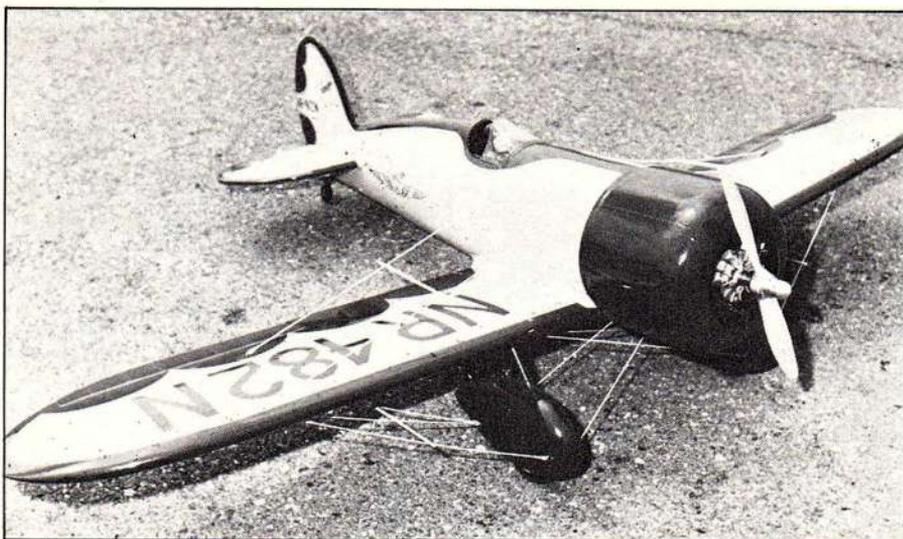


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1929

© 1988
 PS HIRSCH
 53/80
 TRAVEL AIR
 CHEVROLET POWERED
 MODEL R SHEET

COLOR: LIGHT RED/WHITE FOR
 WHITE # 32.



The Travel Air has a generous wing, and it has proven to be a fine performer, even though it was exorbitantly overweight.

model should have. I got an 1,800 mah battery pack from Consumer Hobby Corporation. I figured that the four large Kraft KPS-20 servos would need the extra current. After reevaluating the set up, I decided that maybe a standard 550 mah (not 475) would probably have been enough. This is hard to determine, since you really don't know what a servo might be doing in the air. A servo which sounds normal on the ground could actually be under such a load because of the air pressure on the surface, that it is almost stalled throughout the flight. I would suggest going for the biggest battery pack your plane can practically carry. I used one servo for the ailerons, which some giant-scale modelers might find questionable. The extra servo to drive each aileron independently wouldn't create that much ex-

The author's 22-pound nightmare, as it was flown at the Vegas Q.S.A.A. Fli-In. Small white marks on fin are entrant stickers for the meet.



tra battery drain, and would be definitely advised if you are planning any serious aerobatics.

While the full-size aircraft utilized a tail skid, I fly from a paved field, which makes a skid impractical. I cheated a bit, and used a C.B. tail wheel.

The finish is very traditional. Instead of SuperPoxy primer, I used acrylic lacquer primer. This was used to establish the panel lines, by building up a layer of primer adjacent to a piece of masking tape. Remove the tape, and the raised edge resembles a raised panel. The simulated Dzus fasteners were achieved by sharpening the end of a piece of brass tubing. This was lightly rotated into the primered finish just enough to remove a little plug of primer. A slot was then made in the depression with an X-Acto blade. The rivets were drops of Titebond. I find that the Titebond holds a better "crown" on a simulated rivet, while Elmer's seems to flatten out too much. The false hinges on the access hatches are done by scoring a half-length of brass tubing.

The canopy was made right on the

fuselage. I heated a piece of 1/16" acetate in the kitchen oven. I then pulled it right over the cockpit, back over the headrest. When trimmed, it had the proper angle and fit perfectly on the fuse. This sure saved the tedious task of carving a plug.

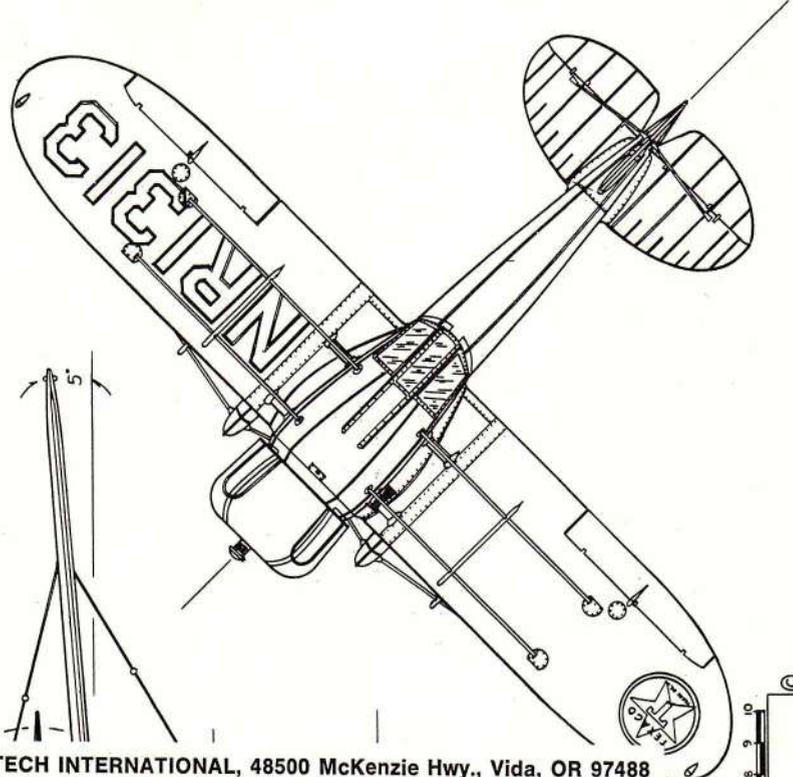
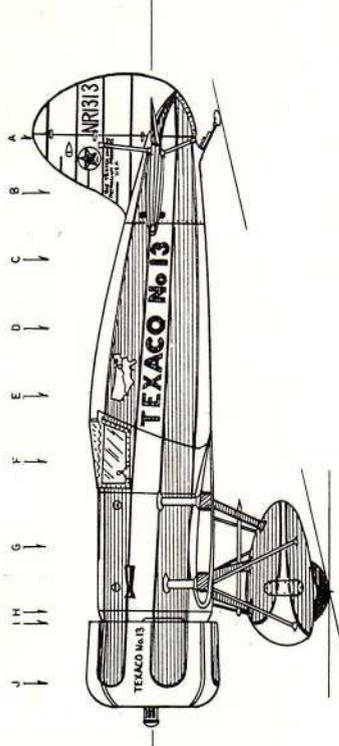
Many modelers inquired about the nifty looking rib tapes on the Mystery Ship. Actually, this is a commercially available pre-pinked tape called *Beauty Mark*. It is referred to as a "Professional Hair Styling Tape." It comes on a roll, and has an adhesive back. It can be easily laid in place and pressed down, and the pinked edge looks just about right to simulate the ragged edge on the full-size rib tapes. Since the tape is 5/8" wide, I cut a 1/4" width out of the center, then put the side pieces back together to form a 3/8" wide tape piece. The rib stitching is also Titebond, but the material is squeezed out of the hypodermic in a thin line. The flying wires are 1/16" piano wire, with solder links at both ends. All the other rigging hardware is from Proctor.

The paint was SuperPoxy. A little yellow was added to their basic red, and a little red had to be added to their yellow, in order to get the correct Shell colors. These paints seem to work the best, in giving a smooth and neat-looking finish. They can build up weight quickly on a model of this size, so it would be prudent to practice with as thinned a mixture as possible. One coat should give coverage, after an initial overall mist coat (which should not be allowed to dry).

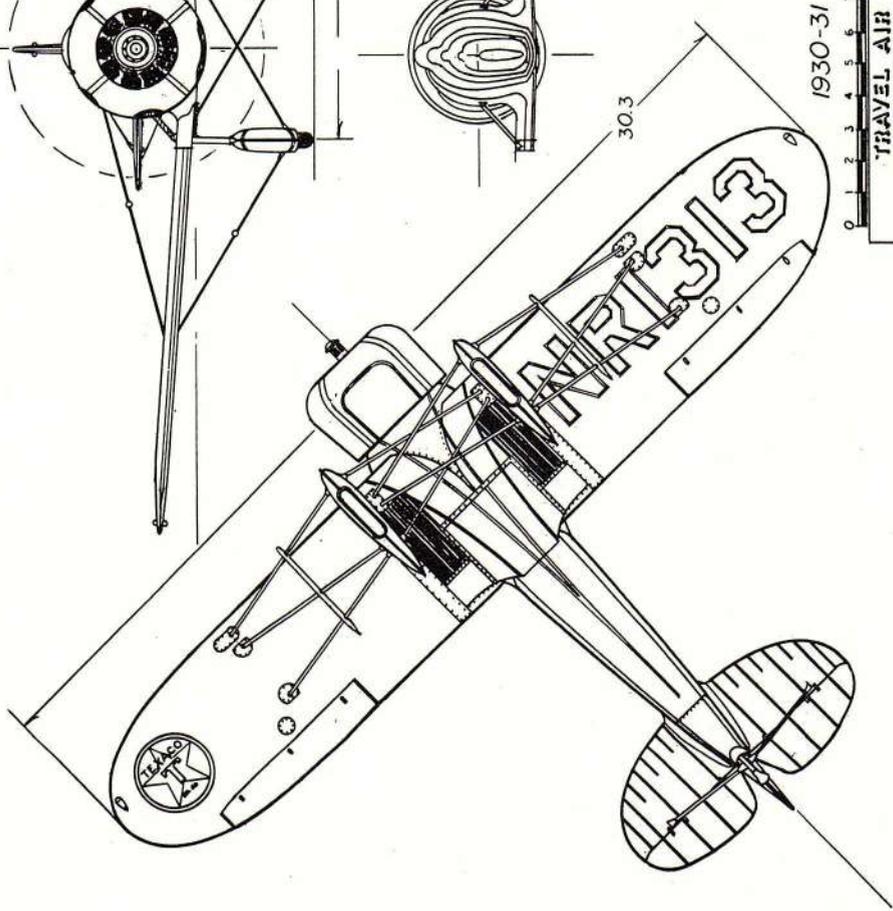
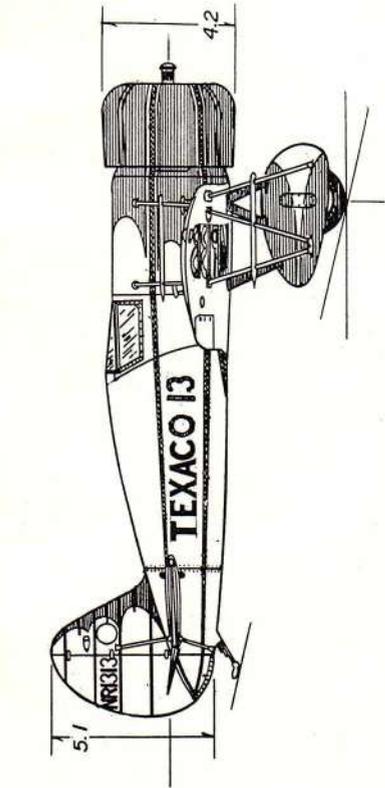
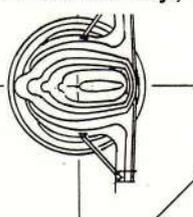
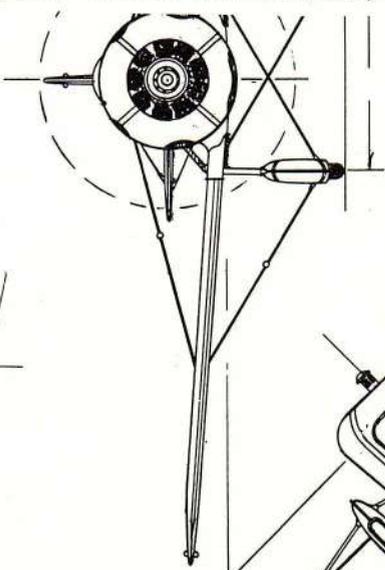
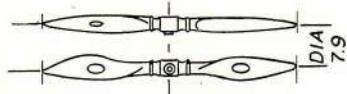
So, there I was with a 17 pound model which actually weighed 22 pounds. The thought of the first flight had been giving me nightmares for weeks. At most, there would be nothing more than a minor earth tremor when it impacted the ground . . . assuming that the Quadra had enough power to lug it off the ground in the first place.

As it turned out, all my fears were unfounded, as the Quadra easily pulled the big Mystery Ship off the runway. The model didn't feel at all heavy in the maneuvers, but I didn't get much of an engine run, so the flight was unexpectedly short. I couldn't figure out what was wrong with the engine. I suspected that I hadn't allowed enough egress area in the cowl, and perhaps the engine was overheating. I removed the cowl, but that didn't help. The engine would just sag and stop.

For some reason, the engine ran really great on the fourth flight, and I did every aerobatic maneuver I



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1930-31
 TRAVEL AIR
 MODEL "R"
 FRANK HAWKS SHEET 4
 © 1965

knew how. The big Travel Air did everything effortlessly, and I could only imagine what the plane would do if it were five pounds lighter. Now that I had it, seemingly, all together, this was the flight when Fate intervened. I had the bad landing on this one, and was forced to go home in a fit of depression, instead of feeling the exhilaration of a successful flight.

These disasters never seem to occur when there are weeks or months before the next contest. The Las Vegas Q.S.A.A. Fly-In was only a week away, so the repair and repaint were done in haste. I had to install a new engine, too, which probably meant that I was in for more unexpected landings. These suspicious were confirmed on the Las Vegas desert, as I made six flights . . . and had six dead stick landings. I had a long talk with Bob Cooper, of Quadra. He suggested that I could cure all my engine problems by switching to Bel-Ray MC-1 oil. This is a high-performance racing oil for motorcycles, and it can be used in a 50:1 mixture, instead of the usual 20:1 for other oils.

I couldn't believe that just a change of lubricants could make such a difference! The engine picked up

rpm automatically, and I could now run out every drop of fuel. Apparently, the other oil was allowing the engine to overheat, and it would just stop running. I also did some experimenting with props. After going through a small fortune in Zinger props, I discovered that an 18-8 was the right combination of pitch and diameter for this particular airframe/engine combination. Don't take someone else's word for the size prop you should use. Spend a few bucks and try a half-dozen different props. You'll know when you've hit the right one, for the engine will sound good through all the maneuvers, and the plane will have a nice balance of forward speed, acceleration and maneuverability.

I have learned much from my mistakes. The most important lesson is that quarter-scale isn't that different from standard-sized models. You still have to watch the weight! Structural engineering is important, for it's all too easy to just slap in large chunks of lumber where stress seems to be a potential problem. The next thing you know, the whole model takes on the form of a well engineered brick! Pay attention to landing gear, for they are not as simple as the legs on a .60-sized

plane. Make a more complete building plan, and have someone experienced in big airplanes check out the structure. Don't go crazy with weight on items like ribs, fuse sides, etc. which are there merely to provide shape. Learn to use technologies . . . fiberglass is a great weight saver, and can be done as quickly as carving from wood.

It is my philosophy that we should learn from our past experiences. We should strive to improve technique and craftsmanship with every model we build—that's how we improve. We should learn to keep an open mind, and look for new and better ways to do things. Scratchbuilding forces you to do that—it makes you work out each problem—and will prove an invaluable experience, whether you succeed or fail. I have the incredible feeling of success about my Mystery Ship. I feel good about it because I know I did it myself . . . right or wrong! My dream ship is still there, filed away neatly in some corner of my mind. This adventure has only stimulated and reinforced the memory of that Texaco racer hanging in the museum . . . the next time, it just may be the actualization of my dream that rolls out of my building room. □

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(Clipped-wing version shown -- plans also show full wing)

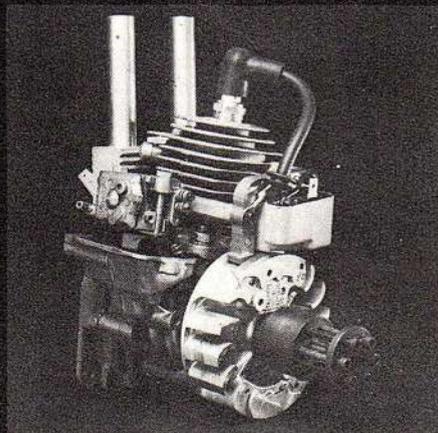
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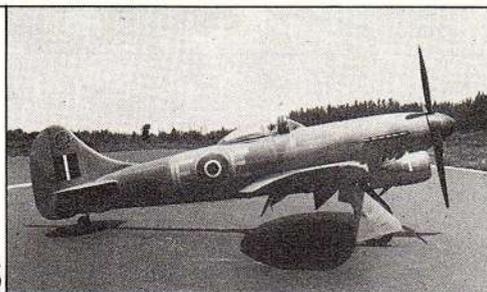


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Byron's Big Mustang

(Continued from page 57)

infectious way it has of making you want to take longer and longer flights. We find ourselves getting so engrossed in the machine (admittedly lapsing on occasion into a little Walter Mitty dogfighting) that we nearly run out of gas. The throaty roar of the Quadra, the whirr of the four-bladed prop, the thrill of watching those scale gear legs neatly fold into the wings, and the overall impression of scale speed—all add up to an experience in modeling that everyone should taste at least once.

To date, what's been missing in the giant-scale movement has been the excitement and performance of true WWII aircraft. Admittedly, the Mustang is only 1/5-scale, yet to put it in the same class as the .90-sized machines which are flying today is just not right. It's definitely a giant-scale machine, yet the fact that it has the performance of a much smaller model makes it a real breakthrough in the big airplane movement.



On a fly-by to check the gear on our third flight, we discovered that the tailwheel was hung up in the fuse. Landing was so soft that only a bit of paint was scratched from the rudder.

70 scale r/c modeler

But don't let talk of chain saw engines, belt drives and 26 pounds scare you off. The Mustang is one of the most mild-mannered aircraft we've flown. It handles well on the ground, but you do have to get used to steering with rudder. In the air, the model will track hands-off, all the way across the horizon. It's only doing about 65 mph, so there's nothing happening very quickly, at all. The control response is smooth, and we venture to say that a P-51 in the proper 22 pound range would be docile enough to serve as an intermediate trainer. We thought the prop drive would be a maintenance problem, but we get the easiest starts imaginable, with the engine purring after never more than two-three flips.

In the final analysis, we have to conclude that, even though it's the most expensive model kit on the market, and even though it had a few bugs which (fortunately) turned out to be easily fixable, the Byron Mustang is a good value and a wise investment. You're going to see a lot of these in the coming months, and we're sure the modelers will be coming up with more innovations and ways to get better performance out of this model. We'd like to hear from you about the ways you modified the P-51, and we'll pass on the best ideas to our readers.

MAN O' WAR LIVES ON



Elmer Ward jumps down from the cockpit of "Man O' War". The plane was an abandoned studio prop for years.

The odyssey of the full-size Man O' War is a strange story of an airframe that had almost been totally lost to the ravages of time, only to be salvaged at the eleventh hour and completely restored to pristine condition. The original Man O' War was the colorful mount of Claiborne H. Kinnard, Jr. He had taken over the renowned 4th Fighter Group upon Don Blakeslee's return to the States. Kinnard's P-51D was probably the most colorful Mustang in the ETO, with its olive drab zebra stripes and invasion markings. Kinnard had some 27 kills in the official records. Man O' War sports 13 swastikas colorfully decorating the edge of the canopy . . . a true testimony to the skill and bravery of its pilot.

Man O' War lives on today as an exact replica of the original fighter. Elmer Ward, who is primarily responsible for the restoration, bases his airplane at the renowned Chino airport in California . . . perhaps the most densely populated restored warbird resort in the world. Of course, the P-51 wasn't a shining piece of aluminum when Keith took possession of it. As a matter of fact, the term "junk" would be more appropos of the condition of the Mustang. This particular Mustang was manufactured in Inglewood, California in 1945 (ironically, less than 50 miles from its current base of operations!). Shipped overseas, the Mus-

THE FULL-SIZE P-51, AFTER WHICH OUR REVIEW PLANE WAS MODELED, HAS LED A STRANGE ODYSSEY.



"Man O' War" wings its way over California, resplendent in its shiny new war paint.

tang never got to see hostilities, but was shipped back after the Armistice to be used by the National Guard. When Korea came along, the Air Force once again took possession of the machine, but again the Mustang was to escape battle.

Back to the Guard went the P-51D, now set up as a two-seat trainer. The aircraft remained on the duty roster until 1956, when it was declared surplus. So far, so good, for the Mustang was still in very nice shape—and any civilian with a few bucks could fly it away. But, fate has a strange way with old airframes. Universal Studios was making a shoot 'em up war movie called *Battle Hymn*. Rock Hudson would play Col. Dean Hess, and there would be need for historic aircraft. A bailment or loan arrangement was worked out with Uncle Sam, so that the studios could have use of the winged piece of government property.

Unfortunately, the Mustang was to be a static prop on the sound stage. The Merlin and all the hardware were gutted, and an electric motor was substituted to turn the big four-bladed prop. The crew punched the plane full of holes, to simulate battle damage. What was to become a beautiful restoration was now a rather shoddy looking gutted hulk of an airframe. Ironically, the P-51D, which had escaped even a scratch through two real wars, finally got chewed to hell on a movie set!

When all the film was in the cans, the Mustang was pushed into a prop storage lot and left to rot. It wasn't until 1971 that the Mustang again got some attention. Vandalized, rotten with age, the machine wasn't much to look at when Universal put it on the auction block in a clearance sale. Asher Ward (no relation to the current owner) picked up the P-51 for \$3,500. Not much of a deal, considering that the instruments were gone, the entire cowl was empty underneath, the flaps were just frameworks, and the overall structure was rotting.

As if that wasn't bad enough, the Air Force Museum wrote to Mr. Ward . . . there's the small matter of the plane they loaned to the studios, and which they now wanted back! Only after some heavy discussions and the final trade for a very rare helicopter of Mr. Ward's, was the Mustang officially released from the Air Force's inventory.

Asher spent a small fortune restoring the Mustang. It would have been simpler (and definitely cheaper) to have started from scratch in many instances. After four years, the P-51D was already back in the air, but the cockpit was still only makeshift, and wouldn't get refurbished totally until 1981. Elmer Ward bought the airframe from Asher Ward in 1976, and he completely tore down and again rebuilt the '51. As Man O' War now stands, it is a faithful and accurate duplicate of Kinnard's original Man O' War. Even the rare Spitfire rearview mirrors were obtained (new in their original boxes) through some rather mysterious ways. In 1976, the Mustang was flown cross country to the reunion of the 4th Fighter Squadron in North Carolina. One important stop along the way was to have former 4th crew chief, Don Allen, paint the words "Man O' War" once again on the cowl of a Mustang, just as he had done for Kinnard some 30 years before.

A photo session with the 1/5-scale version of the Mustang was planned upon its completion but, as fate would have it, Ward's full-size P-51 was semi-gutted for further refurbishing. A new cockpit interior is being fitted, and some major work under the cowl seems to be taking shape. But, even though the two machines have never stood side-by-side, these two representations of a famous fighter serve as a fitting tribute to one of the most colorful and victory-laden Mustangs to ever take wing. □

Just before press deadline, we received a note from Claude McCullough, who is a member of the Scale Contest Board. Claude was quick to point out that we were in error about our previous statement that the Mustang was an "orphan" aircraft, in that it didn't fit any parameters for contest work. The rules for the "Giant Scale" event certainly qualify the P-51 for this activity, since it weighs over 15 pounds, and also because it has an engine displacement larger than 1.25 c.i. We hope that we didn't create any confusion by our previous statement, and we should have been more concise when what we were really talking about was the Q.S.A.A. rules. The Mustang is still not legal for Vegas, of course.

In a conversation with Ed Morgan, of the Q.S.A.A., he informed us that there is a possible way to stay within the rules for the Vegas Fly-In, and still participate with the Mustang. There are a number of "man-carrying" half-scale warbirds flying around the country. These VW-powered planes could be used as documentation for the Byron model, so that the kit would be qualified as a larger than 1/4-scale version of a 1/2-scale replica of a full-size fighter! □

LAST MINUTE UPDATE

Just as we were going to press, we received a supplement from Byron Originals. This contains many useful pieces of information, and should be carefully studied. It's good to see the manufacturer responding so quickly to the customers.

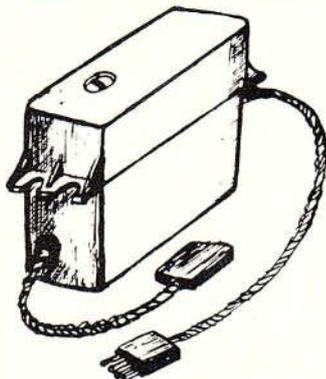
In the next issue, we plan to discuss engine and power train vibration in the P-51. We have already discovered that the Quadra supplied is only "Factory Average Balanced," and that the vibration levels will drop if you send the *flywheel only* to:

U.S. Quadra
1032 E. Manitowoc
Oak Creek, WI 53154

Follow the directions supplied in the kit for removal of the engine (it takes only minutes). The charge for the flywheel balance is \$15.00 (postpaid, same day service). We will also review the "hopped-up" version of the Quadra, which promises to give more power. This necessitates purchasing a new engine from U.S. Quadra, however.

If you have any ideas which will help our testing, please write or call. (PHP) □

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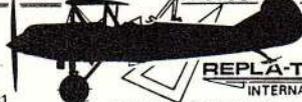
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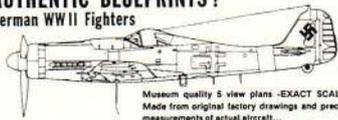


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EAST COAST REGIONAL REPORT

(Continued from page 32)



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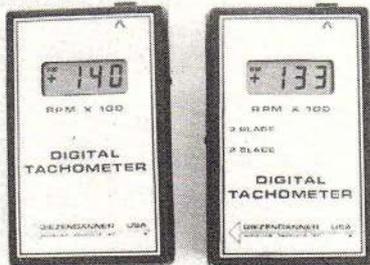
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Fantastic 17 lbs. F-4 by Tom Cook of K.C. MO 1980 Nat's Best Ducted Fan and Scale Masters Best Military Award. Tom's beautiful F-4 features Heavy Duty Electric Retracts.



Christen Eagle, by Tom Velosky, had flown only a few flights prior to the contest. At age 14, Tom was one of the youngest entrants.

on Sunday. One was almost amusing, when Art couldn't quite decide whether the model would make the runway or not. The gear must have cycled three times before the aircraft bellied onto the grass runway apron with the gear in an almost fully retracted position. No damage resulted, which is a credit to the robustness of Art's homemade retracts.

As with Sport Scale, Art's Saturday flight performance was sufficient to gain him a first in Giant with the P-40. This man is indeed a tough one to beat. A total score of 177.49 (Sport Scale scoring of 200 max was used) put him some 9 points ahead of Mike Winter's Tiger Moth. This latter model was one of only two in Giant to use a chain saw engine. The other was Mario Yederlinic's big PT-19, and both were equipped with Quadras.

Third place in Giant was taken by Bill Lepley's Nosen Citabria. This, despite two broken belts on its Du-Bro prop-drive during the course of the weekend. If a tough luck trophy could have been awarded to a Giant contestant it would probably have

FLASH! U.S. SCALE MASTERS RESULTS!

Here are the last minute results of the 1981 U.S. Scale Masters Championships, in Louisville, Kentucky.

SPORT SCALE

FIRST:	Tom Cook	189.25 points	F-4 Phantom
SECOND:	Bob Underwood	187.25 points	Stormovick
THIRD:	Kent Walters	185.5 points	SBD-3
FOURTH:	Bob Frey	184.5 points	Spitfire
FIFTH:	Cliff Tacie	183.5 points	Citabria

U.S. Scale Masters



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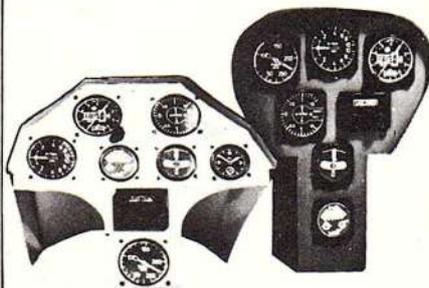
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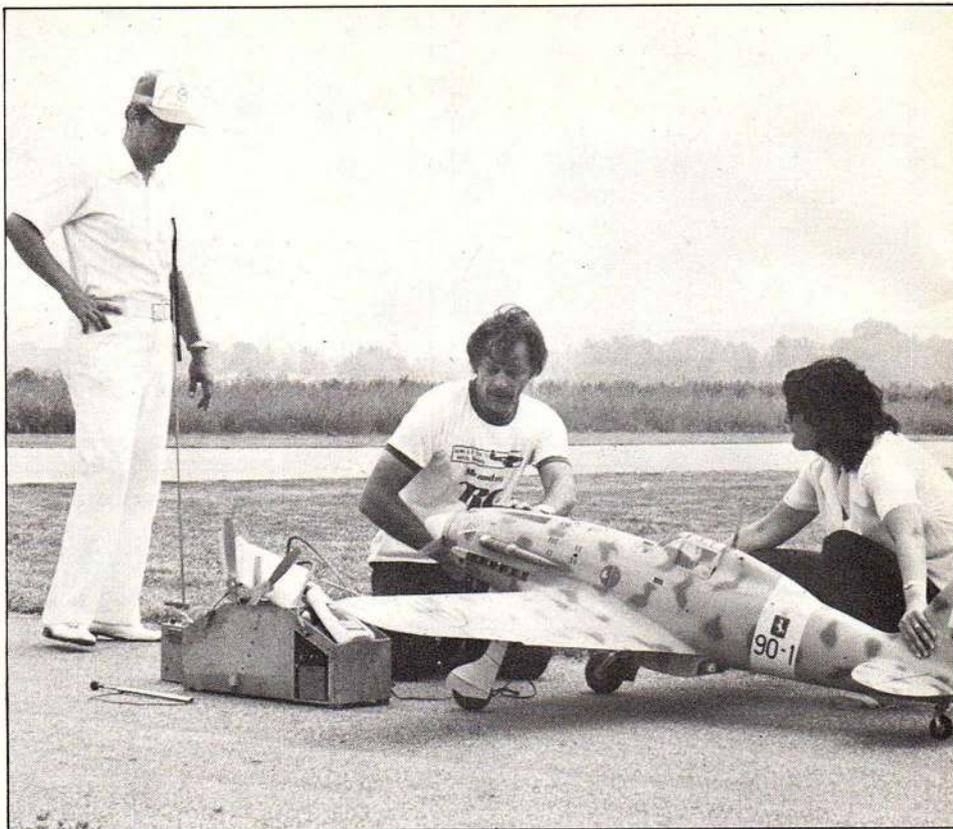
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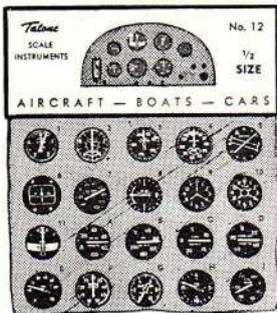
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gone to Joe Solko and his Laser 200. With the highest static score and an 84.33 first flight, it looked like he was going to have a duel with the P-40 for top honors. However, this was not to be. On his second flight, a misunderstanding with his helper caused one of its two OS-60s to be set overly lean. When it died in flight, its drag proved to be too much for the second engine, which also overheated and stopped. As it turned out, both engines were damaged to the point that another flight was not possible.

Another contestant who deserves special mention was Roger Rasner from nearby Richmond, Virginia. Roger won the Sport Scale Sportsman class with a T-28, and campaigned with a Bucker Jungmeister in Giant. This latter model was beautifully executed in yellow and black with Swiss markings, and it equaled the static score of the winning P-40. Its narrow landing gear, coupled with the short time that Roger had to practice with it, may have been its downfall. There were several times when this photographer appeared to have a viewfinder full of Bucker cowlings during one of its crosswind takeoffs.

The prizes that were awarded at the first East Coast Scale Masters contest could be best described by one word—lavish. Four radios, that were donated by MRC, Kraft and Futaba (two radios), were given to the first placers in each category. Other merchandise was donated by Dremel, Pica, Top Flite, Sullivan, Goldberg and Du-Bro. Instead of the usual trophies, that only collect dust when you get them home, clocks mounted in propellers were awarded to all placers (through 5th in Expert). A special mention goes to Tower Hobbies, who donated these very handsome awards.

This writer did not manage to find the time to note the names of all the people who turned out to make this contest the success that it was. We did note that one of the flight judges was none other than the President of the USPJA, Howard Crispin, and yet we never heard a single derogatory word from the contestants. Seems like the USPJA's recent name change must have worked. We conclude by offering our thanks to all who attended and, in particular, to the contestants who traveled from as far as Connecticut to the North and from Florida to the South. Remember, Maryland is famous for its Chesapeake Bay crabs, so who knows what may be in store for you at the 1982 East Coast Scale Masters. See you next year.

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it settle again. Did it lift level, and look right? If so, you are ready!

Now try a 2/3 throttle, tail high taxi. Let the airspeed build up and lift off. Gain altitude, and get it back in front of you, upwind. At 1/2 throttle, trim for hands-off flying. Now enjoy it. This is as close as you will get to heaven, as a modeler.

The ailerons should make effective turns. If a turn gets nose high, use a little bottom rudder and watch it correct. Loops will be easy, but tight rolls will require rudder. Snap rolls and spins will require power. If the CG is too far forward, the L-4 will fly out of a spin into a spiral. If CG is too far back, maneuvers will be very sloppy and you will porpoise on landings. The L-4 flies much like its full-size counterpart . . . it is hard to stall, and tough to spin. That's why you need a lot of control surface movement. A model this size will not do anything very suddenly, making flying relatively easy.

While the L-4 is an easy flier, the experienced pilot will be doing scale-like spins, barrel rolls, side slips and one wheel touch-and-goes. With full power, axial rolls and knife edge flight are almost as easy as inverted flight.

You will run out of gas almost every flight, because you'll be having too much fun. Panic? NEVER! At 100' altitude, do some slow flight practice twice around the landing



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PLAGUE (Continued from page 40)

pattern, with a side slip on final to lose altitude.

You will note a couple of details on the plans regarding a float mounting plate and sub fin. If you have access to any area with water that's bigger than a ditch, floats are a must! The L-4 is probably the most versatile large model you'll ever have. Would you believe it flies even better with floats on it?

So you'll have to order some Sid Morgan float plans and/or a float kit from Balsa U.S.A. The Morgan float plans are detailed, while the Balsa U.S.A. kit instructions are sparse for a beginner. The combination is okay. The plans are also available from Taylor-Craft Ltd.

On the L-4, the sub fin is made to bolt in place of the tail wheel and, with 15 mins. work, the plane can be ready to join the Navy. I used the kit floats, with the design of the water rudder, sub fin and mounting ideas from the Morgan plans. A servo is mounted in one float. With a Y-harness and extension to the rudder function, a fixed plug can be exposed through the bottom of the fuselage near a rear float strut. When the floats are mounted, you merely plug in the water rudder servo . . . neat and easy.

The Balsa U.S.A. floats are a little smaller than the Morgan floats. They will handle up to a 20 lb. plane. If yours is over 20 lbs. use the Morgan



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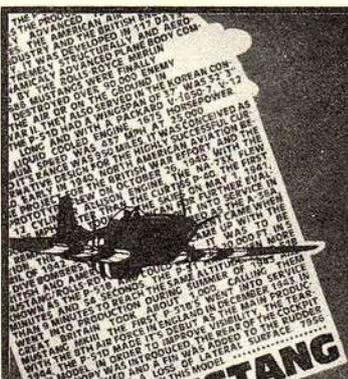
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F8F Bearcat	P-61 Black Widow	B-24 Liberator
AT-6 Texan	Fw.190	B-25 Mitchell
P-6E Hawk	A6M Zero	B-29 Superfortress

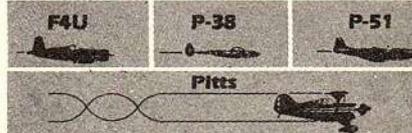


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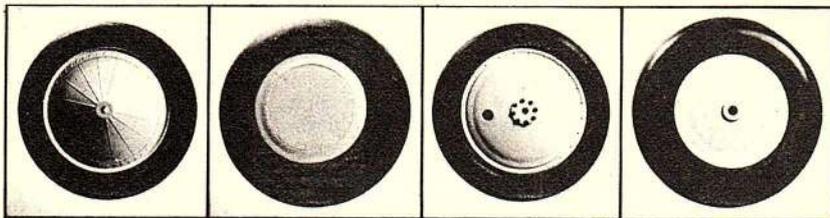
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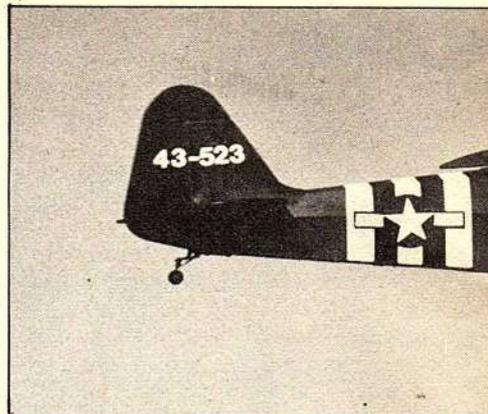


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floats. The deeper the floats ride, the harder the turns will be.

Alignment of the floats is another critical area where care really pays off. The floats must be parallel to each other and the L-4's wing bottom must be parallel or slightly positive to the flat top of the floats. The float step should be about 1/2" in front of the CG.

The radio hatch in the bottom of the fuselage, as well as the servo hatch in the floats, must be waterproof. Using silicone, put a bead around the edges of the open hatch as well as on the bottom edges of the hatch plate. With a piece of Saran Wrap over the open hatches, mount the hatch covers firmly but not tight. When the silicone sets, remove the Saran Wrap, grease the edges with some petroleum jelly and you have a tight fitting, waterproof hatch. If a cable is used on the water rudder, squirt some petroleum jelly into the tube to waterproof it.

Get the floats onto the the L-4, start the engine and set it onto the water. Hold about 1/3 up elevator and firewall it. The plane will come up on the step and sit there, tearing across the water until you give it a little more elevator.

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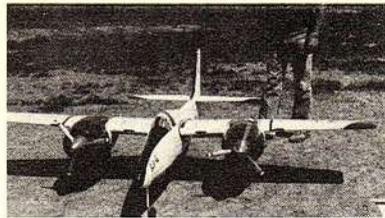
floats dragging in the wind. Handling and maneuvers will be even easier than without floats.

Ready for a "splash and go?" Put the L-4 on final, cut the power and settle to a foot or two off the water. As airspeed bleeds off, flare and the back of those floats will reach down for the water in a picture book landing. Now hold that 1/3 elevator (voice of experience speaking!) and apply power. When the L-4 gets on the step, a touch of elevator will break the floats loose from the water. Make it a banking climb as water streams off the floats in the sunlight. You may never put the wheels back on it. Make sure you have your photographer with you. You'll want those buddies that weren't there to see what they missed.

I believe everyone should have an L-4 so they can have as much fun as I do. Plans are available for \$19.95 (postpaid and rolled), from: Taylor-Craft Ltd., 216 Willow St., Roseville, CA 95678. □

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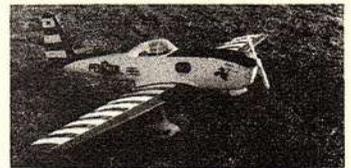
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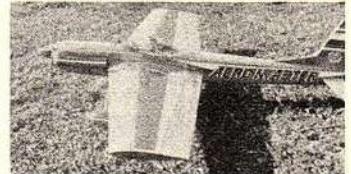
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Tiger

(Continued from page 49)

vator. Straight bellcranks in the fuse serve to attach the cables, while a simple pushrod from the servo to this bellcrank facilitates installation. This system keeps the cable load off the servo output arms, and also makes it easy to change a servo, since only a clevis need be undone. The cable system also keeps control loads from becoming excessive, which is an important consideration on a plane with such huge elevators and rudder.

The question of servos is always critical in a giant scale model. A ball bearing servo drives the rudder, while each aileron gets a heavy duty servo (connected by a Y-harness). There is a choke in each arm of the Y-harness, to guard against problems with the receiver's AGC. I used two medium-sized servos (KPS-15s) on the big elevators. These are on a Y-harness, as well, and they are mechanically joined by a straight piece of aluminum between the output arms. Thus, both servos are simultaneously pushing this bar, which connects to the pushrod. Should a servo fail, the other servo would still deliver 50% of the throw. This may not be much more elevator than to allow a controlled crash . . . but that's better than an uncontrolled crash. I tied together four 1/2-D size Nicads, to make a 2,200 mah pack . . . no fear of running out of battery here!

Make sure your Quadra has the overbalanced flywheel by Dario Brisighella. I fitted a Tatone (Quarter Headquarters) muffler to the engine, and routed the neoprene exhaust stack out the bottom of the cowl. A Zinger 20-6 prop (with the tips dressed slightly) seems about right for this model, but please experiment with props to see which one gives the best performance on your engine.

After all the pre-flight checks, the big biplane seemed more than ready to fly. The Quadra acted up during the test runs, but this was finally traced to some sour gasoline. Always use fresh fuel! I use an engine emergency shutoff, which kills the spark coil. This is a good safety feature.

There was some concern, prior to committing to the maiden voyage, about the amount of throw on the elevators. (1-3/16" up, and 1-5/16" down). It looked pretty slim but, because of the double servos, re-

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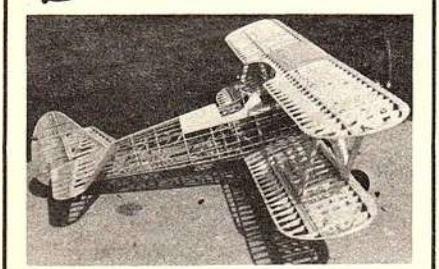
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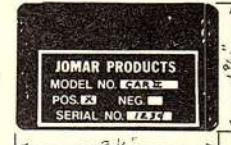


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adjusting it would be a total hassle. Tom Cone (test pilot) and the Editor and I all stood around discussing the matter. What a fix to be in . . . quite a crowd had gathered to watch the flight, and it seemed awkward to cancel out because of only a "probable" problem. "Well," said one, "there's undoubtedly enough elevator to at least get the plane up and around again." We all watched as I wiggled the elevator stick yet again. "Gee, it sure doesn't look like much!"

Finally, I decided to go for it. Tom taxied out, lined up the big Tiger Moth, and poured the coals to it . . . and proceeded to take off right over the Editor's head! Later, we learned that Tom did this intentionally, so that the Editor could get some good takeoff photos!

I think the term "pussycat" has been misapplied before the Tiger Moth, for no other plane has ever been so docile and easy handling. To call this de Havilland 82A a "kite" is probably the closest thing to a one-word complete description that I can think of. When I took over the controls, I was immediately relaxed and sure with the model. It lumbered through the air, but not in a sickly underpowered way. I guess it's more correct to say that it flew along in a slow and stately fashion . . . looking so realistic that it was almost uncanny.

But don't think that the Tiger Moth is a slouch. It did beautiful loops . . . big and open. The rolls were more gingerly than I expected, with very positive aileron response. For so big a plane, it is very nimble on the sticks, but I'd be the last one to tout the Tiger as a full-blown aerobatic biplane. It won't do three rolls running, and I doubt if anything more than the basic Immelmans, Chandelles, etc. are in the Moth's repertoire.

If you are looking for a big, lazy machine, the Tiger Moth is a fine choice. On landing the big biplane settled ever so slowly, and it was a joy to see that articulated landing gear do its thing as the weight of the plane left the wings. The second landing was so slow that the model virtually rolled less than its own length.

Of all the giant-scale planes I've built and flown, the Tiger Moth is my favorite. It's an honest machine, with no bad habits, and it's fun to fly. Couple that with the easy building and quality of the kit, and you have one unbeatable combination . . . that's what makes this a Tremendous Tiger.

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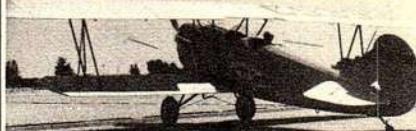
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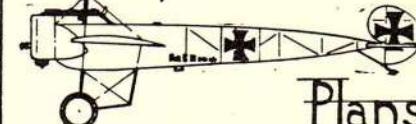
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AIR PROGRESS CLASSIC WARBIRDS 1982 CALENDAR

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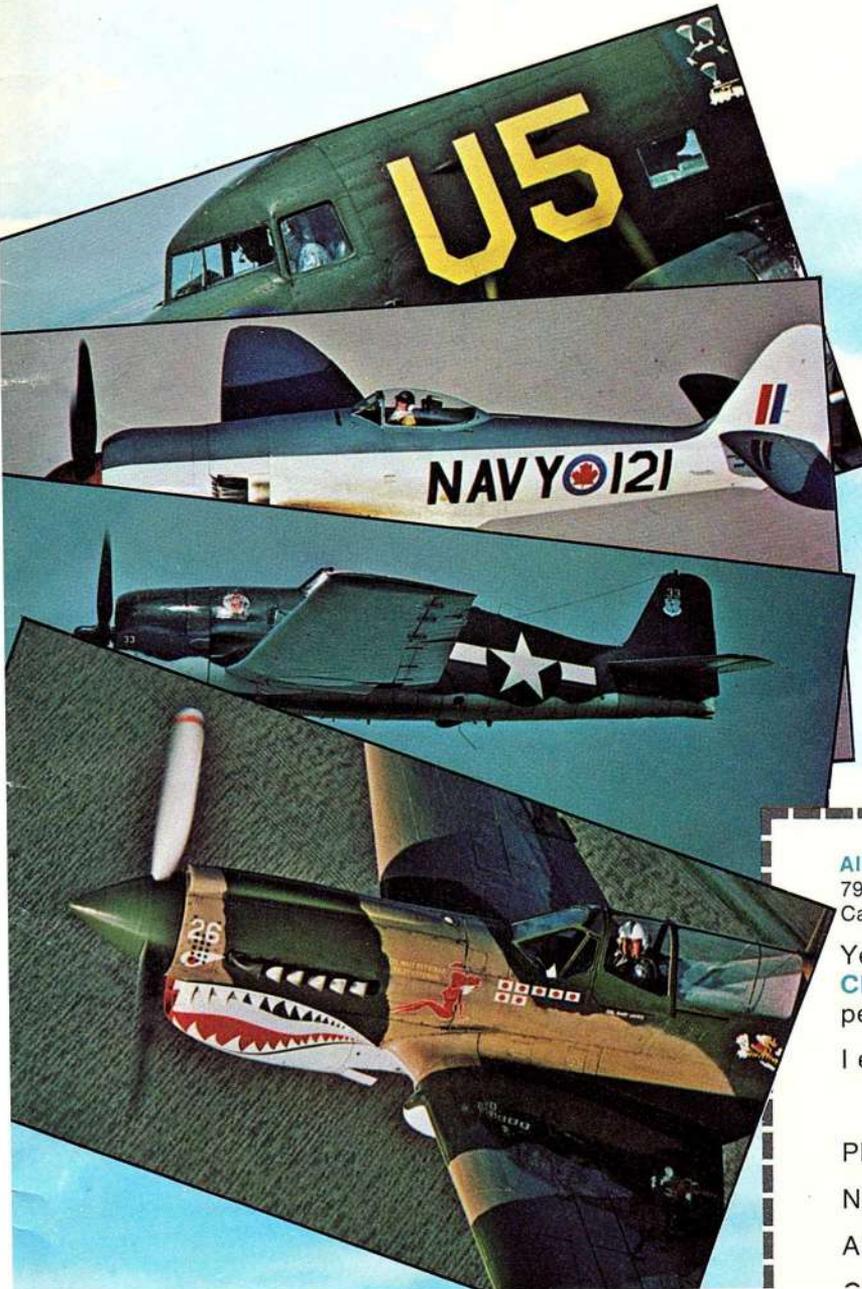
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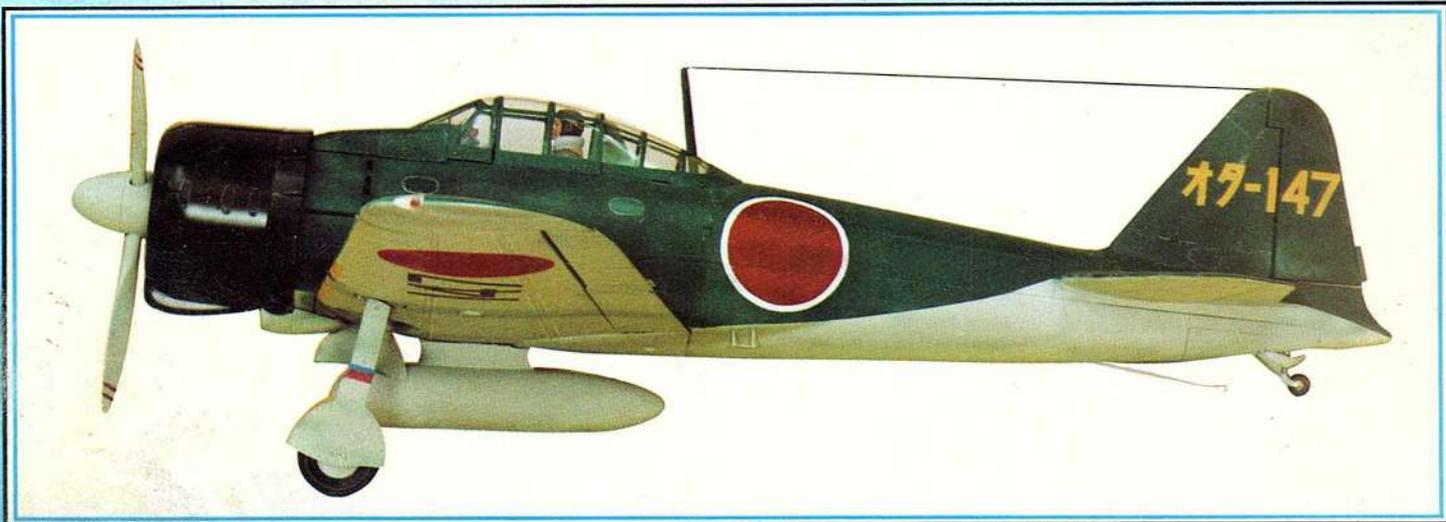
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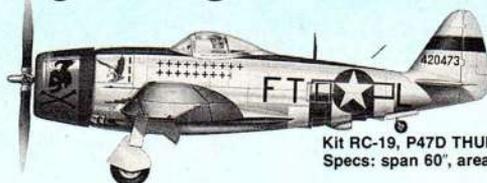
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