MODEL BUILDER

FEBRUARY 1974

volume 4, number 27

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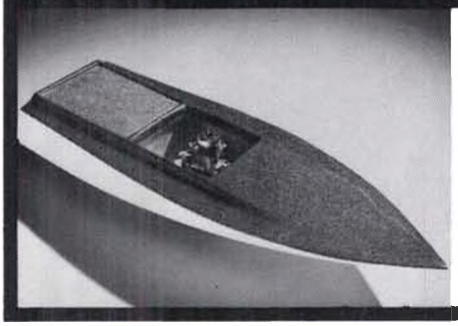

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November 1971

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Peanut Fokker D VI.
LSF Tournament story.
Bi-Prentice, R/C bipe trainer.

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R/C Twin Trainer 75" span, for .40's.
Peanut Laird LC-DC.
Volksplane 3V-1 3-views.
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January 1972

SHOCer F/F by Mel Schmidt.
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February 1972

Minnow U/C profile scale racer.
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Al Vela's E-Z Boy 1/2A
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Mar/April 1972

Yankee Gull R/C glider, 8' to 12' span.
Miss Cosmic Wind, QM R/C Pylon racer.
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Travelair 2000 2" scale R/C, by Editor.
Chester Jeep 3-views.

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August 1972

Bonzo standoff R/C sport pylon scale.
Counterfeit, tailless A/1 Nordic.
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Peanut Taylorcraft on floats, also big one.
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September 1972

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Baby Boomer, sport .020 F/F.
Paper (?) Glider, CO_2 jet.
Little Toot semi-scale R/C for .40 power.
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Mini-FAI F/F for .010.
Peanut Bellanca bipe.
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Electric power analysis.
Internats R/C pylon.

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November 1972

Torky 1/2A proto pro-file by Dale Kirn.
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Peanut Skyraider or 26 inch span.
LSF Tournament story.
Tethered cars.

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December 1972

Don Quixote R/C glider.
T.O.A.D. one-design R/C pylon racer.
Mather's Penny Plane.
49'er, rubber sport F/F.
Peanut Stahlwerk.
1912 Blackburn mono-plane 3-views.

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January 1973

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Spectral R/C glider for single channel.
Peanut Ole Tiger.
First "Plug Sparks" col.
Andreasson KZ VIII 3-views.

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MODEL BUILDER

FEBRUARY

1974

volume 4, number 27

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Cover: Col. Bob Thacker (Ret) has had a long romance with Betty Jo, the girl, and Betty Jo, the airplane. The former is his childhood sweetheart and wife . . . the latter was the full size P-82B in which he made headlines, and the model P-82B with which he is now winning trophies in Stand Off Scale. See page 24 for the whole story, and pictures of all three Betty Jo's. Transparency by Bill Northrop.

Jerry Otis at Lake Elsinore with his Atwood Champion powered Buzzard Bombshell, which is controlled by a Micro-Avionics radio . . . with no ignition interference! See text below.

from Bill Northrop's workbench . . .

● The photo at the head of our column this month should be of special interest to modelers who would like to put R/C in their Old Timers, but are reluctant to switch to the messier, noiser, less authentic, more-costly-to-run (but also more powerful per cubic inch) glow engines.

In the last couple of years, there have been numerous articles published on the problems of running ignition engines with radio control systems, particularly with the modern proportional radios that practically all of us are using. For the most part, the experimentation, instrumentation, and aggravation of attempting to cure the problem, has, to the majority of interested modelers, not been worth the effort. However, it could be that we're right on the edge of a very simple solution. We offer it to you who care to check it out further. Let us know the results. It doesn't appear to be a fluke.

We took that photo, and witnessed flight after flight by Jerry Otis with his Atwood Champion powered Buzzard Bombshell which had radio control on rudder and elevator. The ignition engine was controlled only by a timer shut-off. The radio being used was about a 4 year old Micro Avionics, the model with the wood grain finished transmitter. There were absolutely no "funnies" in the radio system at any time, and had there been, we would have seen them, because the controls were very sensitive and the plane very responsive when climbing under full power.

Now comes the rather amazing part . . . all that Jerry had done to cure the ignition interference problem was to install a piece of shielded or coax cable in place of the usual high tension lead from the engine's spark plug to the coil! That's all . . . and get this . . . the shielding was *not* grounded to *anything*, at either end. In fact, Jerry had tried grounding the shield to the engine and suffered radio interference.

It would appear that the shielded cable does have to be a certain type, one that is rated as 100 percent effective. Cable with shielding that is spirally wound, for instance, would not do. Braided shielding is better, and the type that is double braided with very fine wire would seem to be the best.

Jerry prepared each end of the coax high tension lead as follows: First, trim back the outer insulation, the inner insulation so as to expose about a 1/4 inch of the center conductor. Next, trim back the outer insulation and the shielding so as to expose about a 1/4 inch of the inner insulation around the center conductor. This step must be done carefully so as not to cut into the inner insulation, which might possibly allow the shielding to come in contact with the center conductor. Now solder your snap-on clips to the ends of the exposed conductor. Again, be careful that your soldering iron doesn't melt that insulation between the center conductor and the shield. Finally, slip a piece of shrink tubing over the solder joint and clip, and then a final second piece of shrink tubing over the whole of each end assembly.

There you are. Try it, and let us know if you like it!

THINGS TO DO

Word comes from Dr. Nino Campana that the Soo Modelers Radio Control Club, Sault Sainte Marie, Ontario, Canada, is again sponsoring the Upper Great Lakes Yearly R/C Meet, on May 24 and 26. The MAAC santioned contest is open to both MAAC and AMA members, and will feature Scale, Pattern, and Fly-For-Fun events.

Contact CD Don Flannigan, 41 Edinburgh St., Sault Ste. Marie, Ontario, Canada, for entry form and contest data. Don's phone is (705) 253-8246.

* * *

"Model - Expo '74," is the name that has been given to a two day exhibit of the modeling hobby, to be put on by 18 Orange County (California) model clubs under a joint effort headed by Chairman Mal Emhart, 311 Mesa Drive No. 6, Costa Mesa, Ca. 92627, (714) 642-3672. Purpose of the exhibition is to raise funds in support of the work of the Orange County California Unit of the American Cancer Society.

The two day show, scheduled to take place on March 30 and 31, at Mile Square, Fountain Valley, California will feature continuous demonstrations of radio controlled model airplanes representing many eras in the history of aviation, continuous performance of U-Control models from 2 or 3 circles, R/C car circuit and drag races, R/C helicopters, model rocket launchings, 1/4 midget R/C pylon races, day-long demonstrations of free-flight competion models, static displays of ship models and plastics, plus some unannounced "special events."

Y'all come on out!

* * *

The Torrey Pines Gulls will host World R/C Glider Speed record trials over a 3 weekend period in April, 1974.

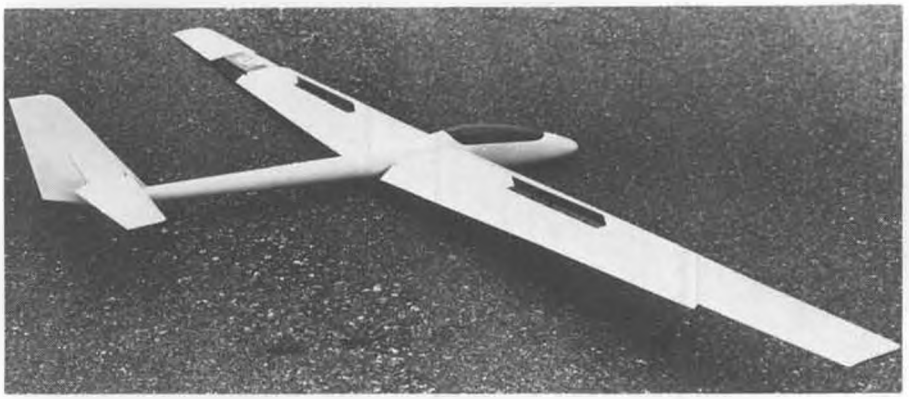
Continued on page 64

OVER THE COUNTER

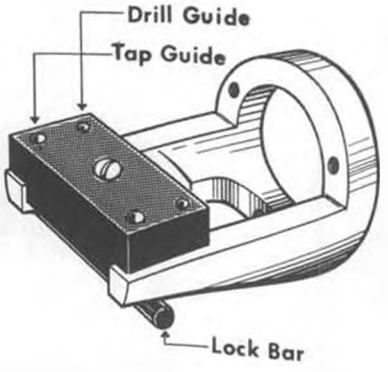
● Last month in this column, we described the Para-Pod, by Craft-Air, 5651 Kelvin Ave., Woodland Hills, CA 91364. Along with a sample of the product, Tom Williams of C-A had sent us a photo of the Para-Pod in action . . . taking an R/C glider aloft under power. From the angle of the picture, the glider looked exactly like a Pierce Arrow, and we so named it in the caption under the photo, which also appeared in this column.

Well, it pays to do a little checking. This month we show you the same glider from a different angle, and at a glance you can see that it's not Ed Slobod's Pierce Aero Company design. The name of the model is "Drifter," and it's Tom Williams design, and it's a new kit by Craft-Air! The kit features precision pre-machined parts, cross-grain empennage tips, rolled drawings, and a complete instruction booklet. The design features turbulator spars, Horner tips, raked rudder hinge line, and polyhedral with the outer break 2/5 of a half-span from the center.

The Drifter . . . 72 inch span R/C glider from Craft-Air.



The Maestro . . . 132 inch span R/C glider by Dodgson Designs. Flaperons and spoilers.



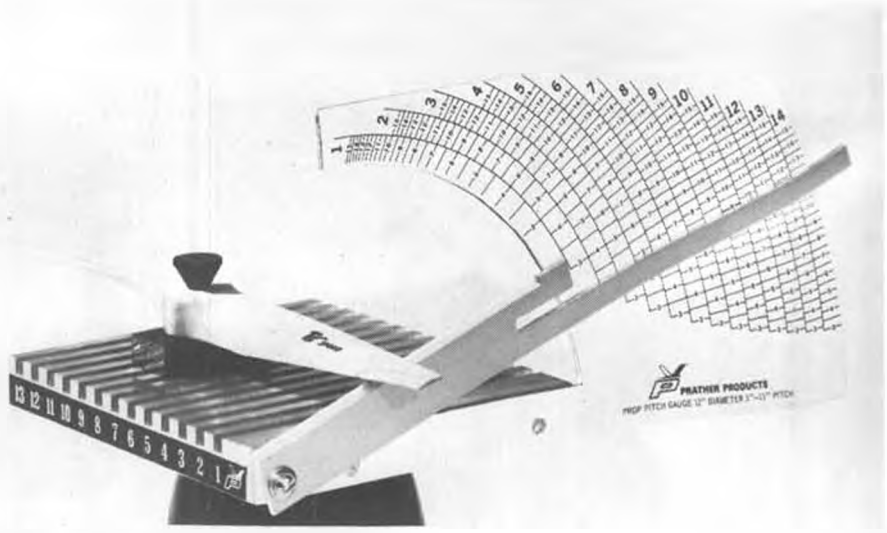
Drill-Jig Tap-Guide by Prather Products.

Best feature of all, is the $24.95 price tag.

* * *

Prather Products, 1660 Ravenna Ave., Wilmington, CA 90744, has added two more items to its growing list of precision products for modelers. Recently introduced, the Prop Pitch Gauge is an instrument for determining the pitch at any point along the blade of a gas model propeller. The gauge will accommodate props up to 12 inches diameter, with pitch range from 3 to 15 inches. Price is $24.95.

The latest item from Prather Products is a Drill Jig-Tap Guide engine template.



Propeller Pitch Guage by Prather Products.

Made from a case hardened steel block, the unit has a lock bar that grips your wood or metal motor mounts. Two drill guide and two jig guide holes in the block precisely locate the mounting holes and guarantee that they will be straight and true. The blocks, at $4.98 each, are available for 12 different engines, including K&B/Veco .15, .19, .40, and .61; HP 40 and 61; Enya and Webra 60's, OS 40 and 60; and ST-G 21/35, .40, .46, and G-60 Blue Head.

* * *

Malco, 316 South Bouldin, P.O. Box 508, Hamilton, Texas 76531, is offering a new R/C sailplane kit, the Eagle 134/118. As implied, the model may be built with either a 1200 sq. in., 134 inch span wing or a 1060 sq. in., 118 inch span wing.

The kit is highly prefabricated featuring partially completed fuselage, push rods, horns, plastic skid, tow hook, and all hardware. The wing has band-sawed ribs, spruce spars, balsa sheeting, with all hard wood parts cut to size. Wing divides in center when dismantled. Price is $75.00.

A smaller, 99 inch span Eaglet is under development, and will be available in the spring. More details later.

* * *

Scheduled for release by March 1, 1974, Dodgson Designs, 2904 So., West Camano Dr., Camano Island, Wash. 98292, is introducing a successor to its well-known Todi design. The new glider, called the "Maestro," is an 11 foot span ship with many interesting control features.

Flaperons, 4 feet long per panel, may be operated as flaps from minus 5 degrees to plus 30 degrees. When deployed beyond 20 degrees, top surface spoilers are automatically actuated. To allow for wing flexing, the flaps are stress relieved in the center, which prevents binding.

The Dodgson C-1 Coupler allows the flaps to operate as ailerons from any trim position. These, plus rudder and elevator, bring the total controls to 3 or 4 channels, depending on whether or not the rudder is coupled to aileron control. *Continued on page 70*

Newest Peanut Scale by Peck-Polymers . . . Clipped Wing J-3 Cub.

The Eagle R/C glider by MALco. 134 or 118 inch span. Eaglet (99 inch span) to come later.

Model Racing Products R/C Funny Car for .19 engines.

JoMac Products, formerly Jerobee, has released this 1/12 scale car.

Orbit's "System Analyzer," described in last month's Chopper Chatter column.

LITTLE TOOT

By GEORGE MEYER

Text by Bill Northrop

Exact 2-1/2 inch scale plans of one of the most famous homebuilt biplanes . . . by the original designer. Fits requirements of Jerry Nelson's Sport Biplane rules, also Stand Off and "Stand Close" Scale.

● If you've been keeping score, you know this is the third time that MODEL BUILDER has featured a Little Toot construction article. However, we haven't actually been stuck in that much of a rut. Our first Toot was a semi-scale R/C model for .40 engines, by Denny Elder, featured in the September 1972 issue.

In short order, we heard from George Meyer, designer of the full size Toot, and found out in the process that he has been an accomplished modeler for many years. George expressed the opinion that his biplane is a modeler's airplane . . . one that needs no modification to make it an excellent scale flyer. To prove his point, he designed and built the exact scale Peanut Little Toot, which was featured in the July 1973 issue of MODEL BUILDER.

George had previously drawn 3 inch to the foot plans for R/C scale. Glenn Cunningham, a modeling buddy from Phoenix, Arizona, built the ship and entered it in R/C Scale at the 1967 Nationals, but did not place. At 3 inch scale, the typically short bulky fuselage of a perky little homebuilt becomes a monster. The Toot was 8-1/4 inches wide at the cheek cowls, 6-3/4 inches wide at the cockpit, and 10-1/2 inches high at the head rest!

The plans published herein are at 2-1/2 inch scale, which seems to be just about right. Although a .40 or .45 would probably do the job, a sport .60 will do better; it'll provide additional *working* ballast to maintain a proper balance point and make available that extra poop which comes in so handy at times. In addition, a .60 allows plenty of spare power to overcome the effects of a really good muffler system; so essential in these days of noise abatement as related to keeping flying sites!

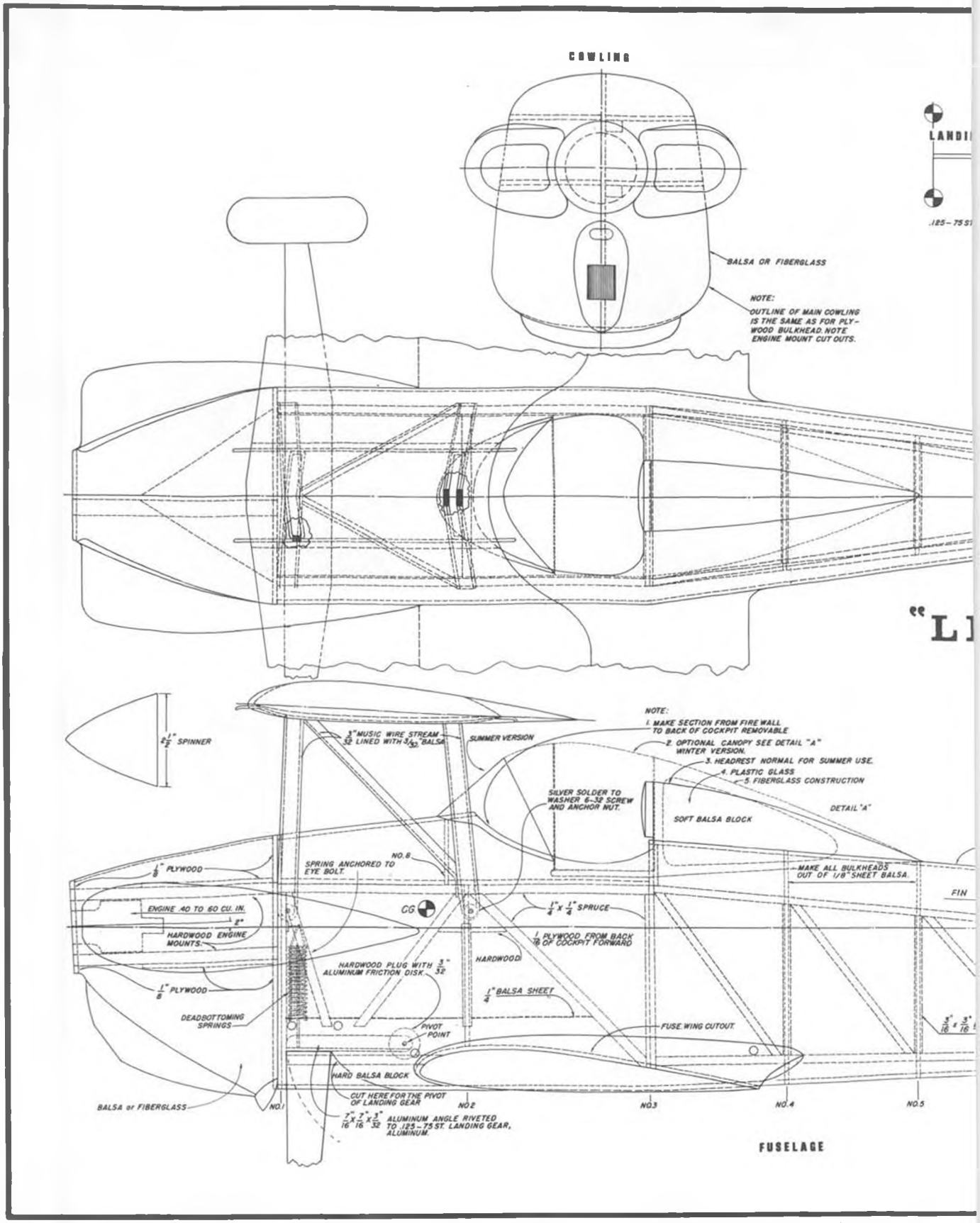
Dimensionally, the 2-1/2 inch Toot meets the specifications for Jerry Nelson's Sport Biplane event, and should be an excellent choice for this competition.

To the best of our knowledge, no ships have yet been built from these plans, but we felt they should be published now for those who would like to get started. Sometimes you can just look at plans for a model and know it's going to perform well. This is one of 'em . . .

CONSTRUCTION

This is truly a model for the advanced builder, in that the plans indicate the use of materials and techniques associated with a modeler who is capable of originating and carrying out his own construction methods.

Actually, most all of the basic structure is quite elementary. It's when you get further along into details that the going can become difficult. The fuselage, for instance, is shown as a stick-built, square frame skeleton, as basic as a 10 cent Megow Kit. However, once this is completed, you must cut out and install multiple-piece bulk-



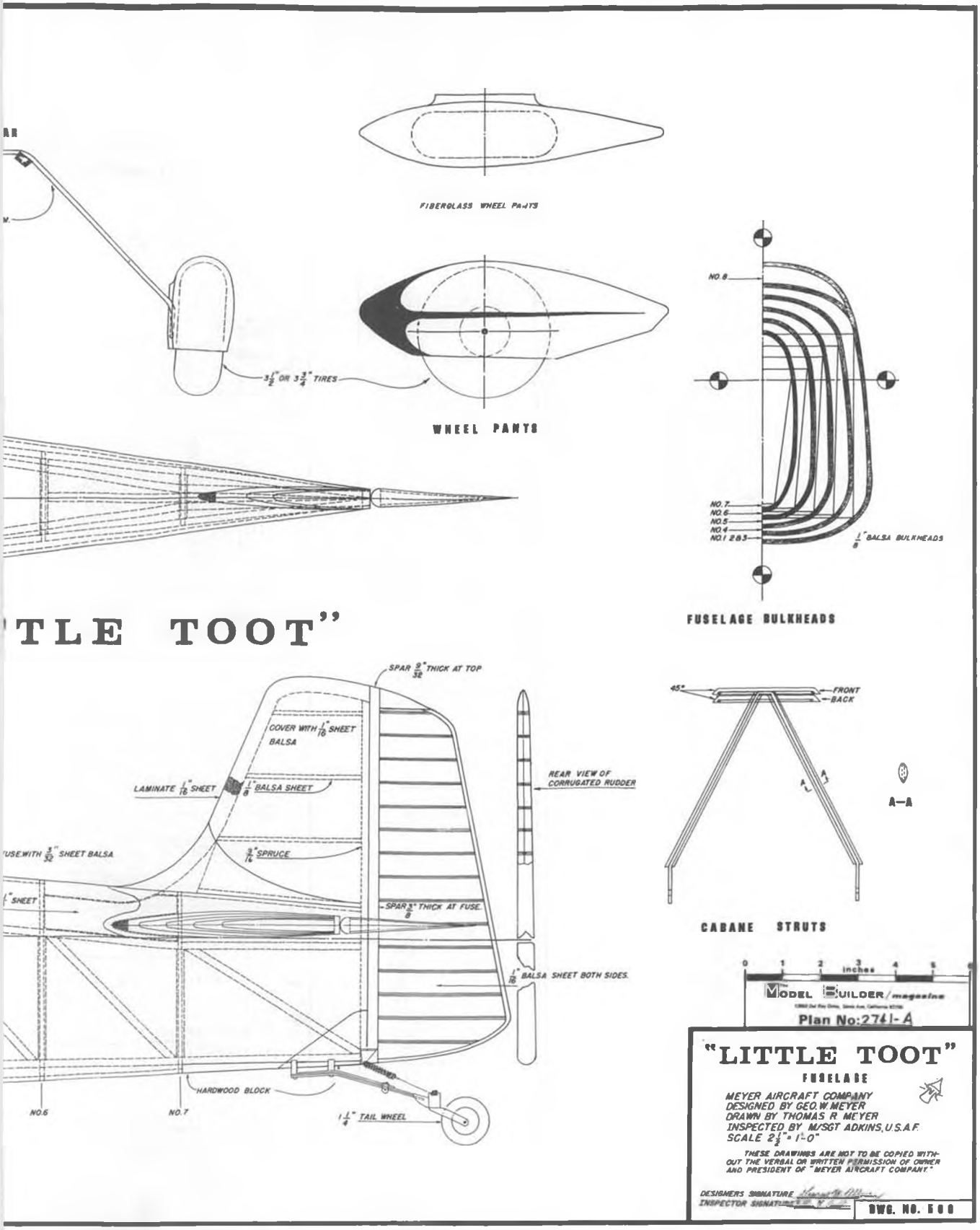
heads and then strip-plank the entire outer skin.

With the very possible arrival of the Sport Biplane event, it might be worth someone's while (are you reading this, Dwight?) to make a 2-piece fiberglass fuselage (separate cowl or cowl-half) available. This, plus exact scale wheel pants, would be a big step toward putting the Toot in the hands of more modelers.

Incidentally, although shown as pivoted and sprung on the plans, experience has shown that a fixed, one-piece; Cessna type Dural landing gear will be best for this model. You might also prefer to make the cabane struts out of aluminum sheet stock, with hardwood fairing strips epoxied on both sides. Also, nylon bolts should be used to attach both top and bottom wings.

Depending on whether you intend to use your model in . . .

Excuse the interruption, but let's

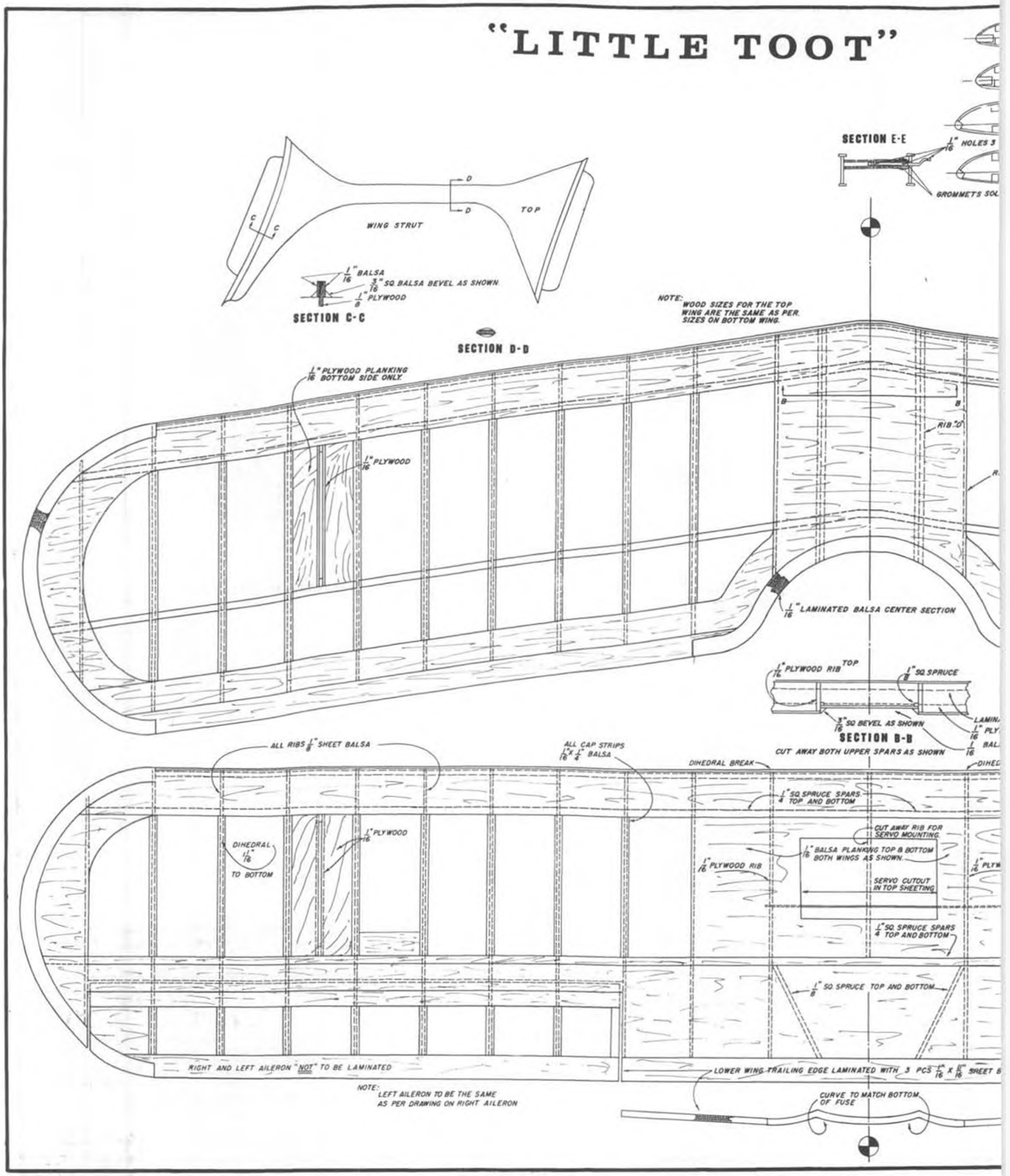


FULL SIZE PLANS AVAILABLE — SEE PAGE 72

get something straight. As Sport or Stand-Off Scale has now become an official event, we feel that so-called "AMA Scale" needs another name. To us, it sounds discriminatory to call one scale event "AMA Scale," as if to imply that the much more popular Sport Scale was secondary. Let's give the original, all-out scale event a new identification, such as "Museum Scale," "Absolute Scale," "Stand Close Scale" . . . or maybe rename both of them as "Fussy Scale" and "Fuzzy Scale."

Anyhoo, depending on how you intend to use your Toot, the tail surfaces may be built with or without corrugations. If you build it for . . . er, Fuzzy Scale, a few deft strokes of a felt tip pen will make quite realistic corrugations from 20 feet away. When installing the stabilizer, we'd suggest you keep in mind to trim all flying surfaces at zero incidence in relation to one another and maintain the 2 degrees

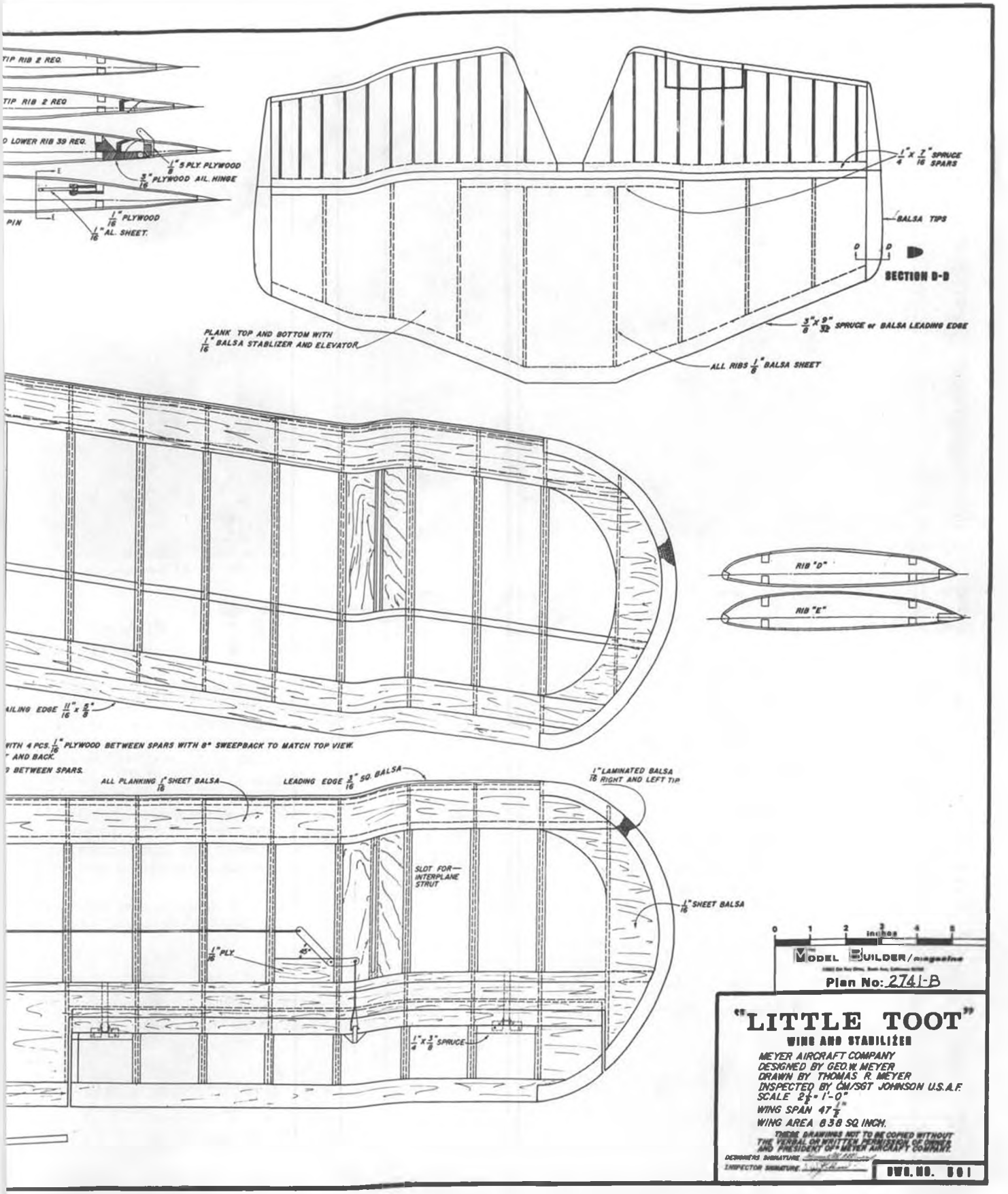
"LITTLE TOOT"



down-thrust. Also, allow for the possibility of adding some right thrust. (Our Sproose Goose needed about one degree of right, and the force set-ups of these two planes are quite similar.)

The top wing is built without dihedral, however, plywood joiners made of 1/16 ply laminations, bent to match the 8 degree sweep-back, are glued in between upper and lower spars. Though not shown, we'd also recommend installation of 1/16 balsa webbing from the center out to the strut bay, on both upper and lower wing.

What can be said about flying? With sensible surface alignment, and starting with the balance point shown, the first trimming flights should come off without too much panic. One important thing to remember . . . A short-coupled, short span aircraft such as this will



react to sudden throttle application by turning and/or rolling left. At takeoff, hold up elevator and right rudder until some speed is built up, then slowly let off on both controls so that the plane can leave the ground in a normal fashion. If you're shooting touch and go's and decide on a go-around without touching, apply throttle carefully and be ready to correct with aileron or you could buy the farm!

Once you get the feel of a tail-draggin' biplane on the ground, and during takeoff and landing, you'll find it the most pleasing type of airplane to fly. We *know* you'll like it. ●

FULL SIZE PLANS AVAILABLE – SEE PAGE 72

SCALE PHOTOS BY HARRY PETRICEK

At West Jersey Flyers WW II Scramble, Bob Karlsson's contest winning F4U Corsair. He's on US Scale Team for next World Championships.

RADIO CONTROL REPORT

FRANK SCHWARTZ

● As the end of the year approaches (at least when I wrote this!), I'm prompted to reflect a bit on the R/C hobby in general. And having been fascinated with R/C since I first read about it in a magazine back in the late '30's (I was very, very young, then, you know), I think it is a good time to look backwards before making New Year Predictions.

If ever there is an R/C Hall of Fame I hope I'll have the opportunity to make a few nominations. The late Howard McEntee was one of the pioneers, and remained active throughout his life, contributing to the hobby and our enjoyment by his activity and interest. Walt Good is certainly well known to anyone who has been in R/C for any length of time and Walt is still active and working to improve the state of the art.

Then there is Phil Kraft. I remember his first published receiver. One tube and two of the old CK722 transistors and a relay. I built a number of them and they worked to perfection. I once wrote him about the radio and received a two page typewritten letter from him which I still have in my "little treasure" file. This was when Phil was just another hobbyist; not at all involved in the R/C manufacturing end of it. Within what seemed a few short years, Phil emerged as owner of the largest R/C equipment manufacturing company in the world, and while he surely made a bundle of money, his contribution to the hobby by way of producing good equipment, highly accepted all over the world, was no small feat.

Then Ed Kasmirski, who designed the famous Top Flite Orion and Taurus.

Holland Stowe checks his K & B needle adjustment prior to heat at Charlotte (N.C.) Aeromodeler's Q.M. races. He placed 5th.

Line up of battle birds for WW II scramble at Lakehurst, N.J. Nick Ziroli's "Jug" in foreground; Lee Shulman's P-39 next.

Spitfire at Lakehurst by Jim Funduic.

Bob Karlsson's PT-22, winner of Stand Off scale at Lakehurst. Note operating flaps. Looks good enough for "Museum Scale."

It wasn't too long ago that if you weren't flying a Taurus, you just weren't up to date.

Hal De Bolt's kits and designs made it possible for countless balsa hackers to get in the air. Bob Elliott and Don Mathis, two exceptional electronics men, might turn out in years to come, to be unsung heroes of R/C design. They continue to quietly go about designing even better and better equipment. Remember, it wasn't too many years ago that if you got a single successful flight without radio problems it was quite an accomplishment. Now we take this fantastic electronic magic for granted, and if the equipment doesn't perform flawlessly, we become upset. It is so much better now than it was, that the difference is the same as between day and night.

Vernon McNabb, former owner of Citizen-Ship Radio and now retired, was the first manufacturer to have equipment for sale that was government type approved. It was on 465 megacycles and it really worked . . . and was reliable. That was in the early '50s. Back then, you usually made your own R/C gear or flew free flight. So many contributions by so many . . . I sure can't list them all . . . but to all of them . . . so many whose names I don't know . . . a resounding "thank you" from all the ranks of modelers who benefit from this great and rewarding hobby.

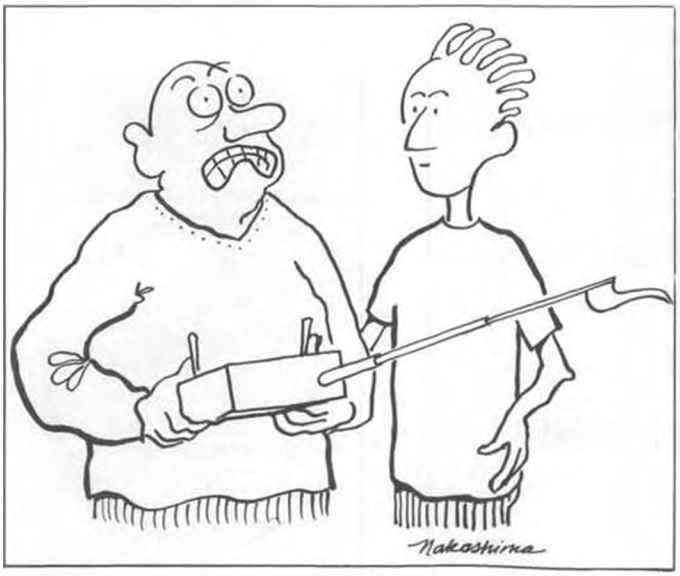
Savo Mele's P-38 noses in front of Shulman's P-39. Zero in back. If it wasn't for that starter . . .

Most likely, by the time this appears in print, the Toledo R/C Show will be about to commence. Hopefully, the gasoline situation will be relieved, at least to the point that it is possible for all of us to attend and see the new 1974 items presented by all the manufacturers. Strangely, this is the first month that I haven't received a single letter from a manufacturer about a new item. Pennies to dollars they are saving their real "goodies" for Toledo.

If the gasoline situation remains a reality, a look in my crystal ball (even though a bit cloudy) reveals that the hobby and craft business should be better than ever. People will stay home more and will seek more leisure pastimes . . . in the home . . . and that obviously will help the hobby business. Now if balsa prices just don't go out of sight . . . *(Don't you mean "further out of sight? wcn)*

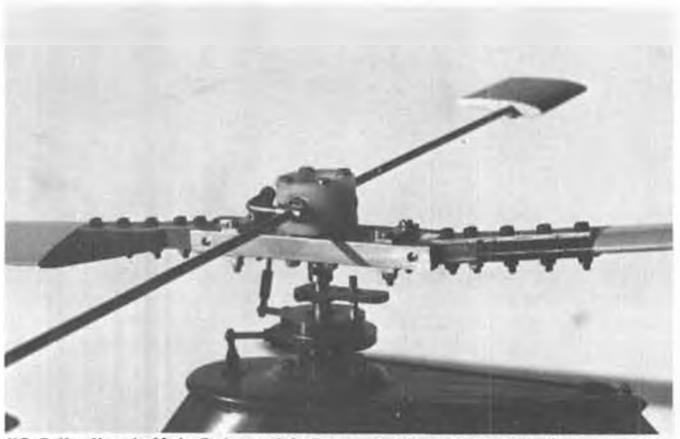
One interesting bit of news concerning a California R/C manufacturer. Had an interesting chat with Carol Maas of R/S Systems. R/S Systems is well noted for it's reliable equipment and it's super-small (pack of gum size) receiver. They tell me that 1974 will be a super year for them. They intend to have the finest equipment available, featuring the very latest electronic state of the art and still retain the hand-crafted attention that has insured their reliable equipment.

Continued on page 71

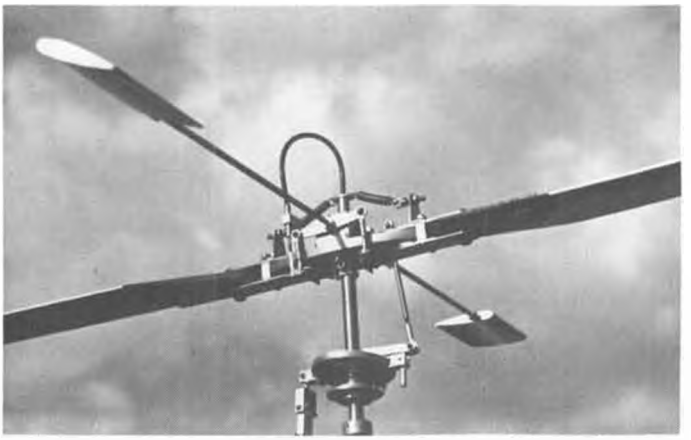


"Listen, this rig cost me over a thousand bucks . . . so I MUST be having fun!"

Charlie Smith, Snowmass, Colo. and his Curtiss Shrike. Flies it U/C, and then 30 seconds with a screwdriver and it's ready for R/C!



"C.C." editor's Kalt Cobra with Dieter Schluter's "S" head installed. Blade at right is being held up for illustration.



"Scorpion Two" main rotor head, featuring "Bowden Cable" control for collective pitch and Hiller system (cyclic).

CHOPPER CHATTER

By JOHN TUCKER

● Now that the long winter months have finally arrived and it's a little too chilly to make the early morning jaunt to the favorite flying site (with enthusiasm . . .), seems like it's better to concentrate on the workbench projects and perhaps log a bit of shop-time on those Christmas "goodies" you undoubtedly asked Mrs. Santa Claus for . . . I did, and I'm going to! This past month, I have been exposed to many new products and ideas that look good for the 'copter-clan,'so here goes:

NEW PRODUCTS

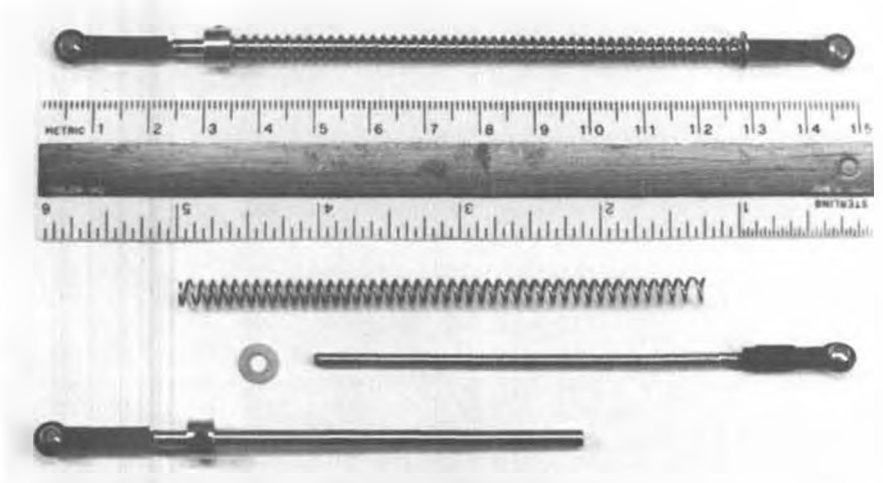
Dale Willoughby, of Model Helicopters in Tustin, California, presented a handful of gadgets for evaluation last week, among which was the Schluter "S" rotor head used on the latest Schuco-Hegi Enstrom F-28 based, DS-22 R/C helicopter. Using the past year's production experience and unlimited flight tests, the "S" rotor head was chosen for its excellent flight characteristics and simple maintenance.

After hearing many pros and cons, I decided to give it a "rough" test on my son's Kalt Cobra, which of late, has been very susceptible to low RPM vibration (almost to the point of uncontrollability). The parts kit is neatly packaged and simple to assemble . . . about 30 minutes later we took the Kalt into the back yard (our heli-pad test site), and fired up the ST.51, and stood back for action.

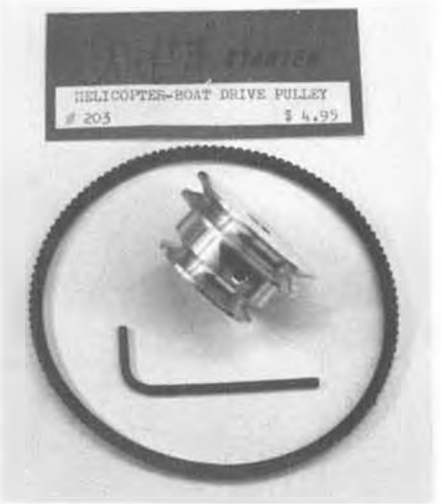
At lift-off RPM, the blades were 1/4 inch out of track, so a few additional moments were taken to correct them, in the conventional manner. The first hovering flight left nothing to be desired, the stability was better than any other rotor head tested to date, and the control response was excellent in all planes of motion. Pattern work and high-speed runs were next on the list, with the same positive results achieved.

The "killer" with previous rotors occurred when the chopper managed to work its way up to high altitude and the only way to get it down was to reduce RPM and hope for the best . . . this usually resulted in some pretty wild maneuvers as the "egg-beater" tumbled out of the sky! Not so with the "S" rotor! As the power was reduced, the machine simply descended as it should . . . no shakes like the morning after . . . and completely under control at all times!

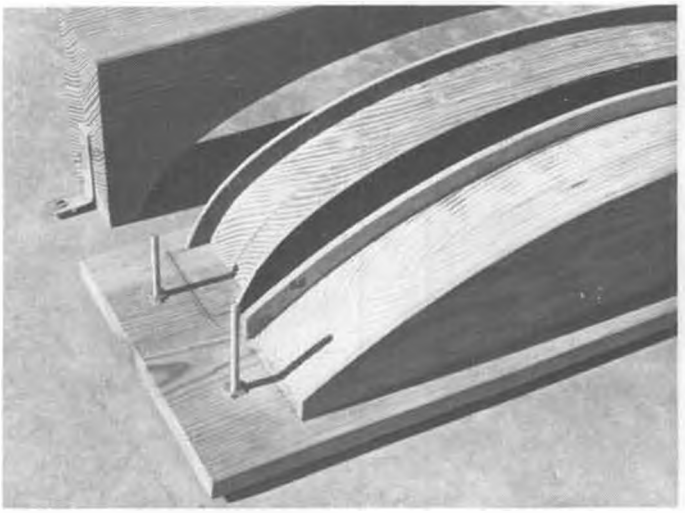
In the earlier days of R/C helicopters (like 3 or 4 years ago . . . ha!), the teetering rotor was predominate, since the chopper responded very quickly to the pilot's actions. The disadvantage was a certain degree of instability which made



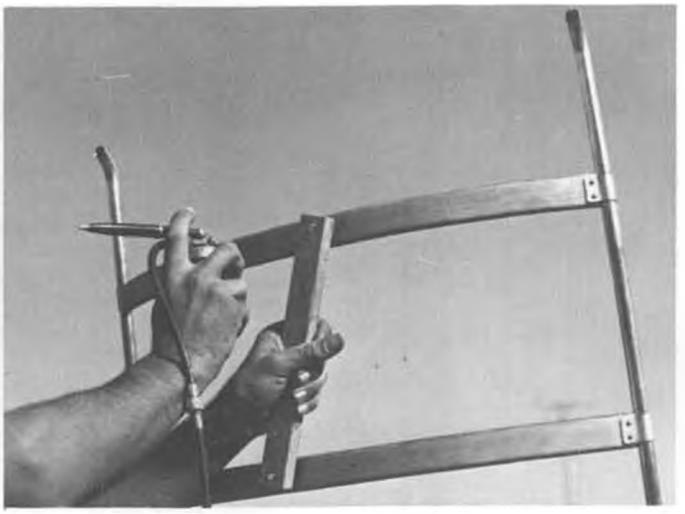
Kavan rotor dampeners. These were built by the "C.C." editor. Full description in text.



Helicopter/Boat drive pulley and belt by Sonic-Tronics, to use with "Challenger" starter.



Wood molds for fiberglass landing gear construction. See text.



Jig for spray painting of landing gears. See text.

it difficult to learn R/C helicopter flying techniques. The next step was an offshoot of the Lockheed rigid-rotor principle. With this system, the teetering action was locked-out completely and the rotor energy was directly coupled to the fuselage through the main shaft. This meant the entire machine tilted with the rotor plane of rotation rather than being suspended, much like a pendulum, beneath the rotor blades. Naturally, the stability was greatly improved and most flights were "rock-solid" . . . this was achieved however, at the expense of maneuverability. The helicopter reactions generally lagged considerably behind the pilot control inputs, but it was a great time saver in learning to fly.

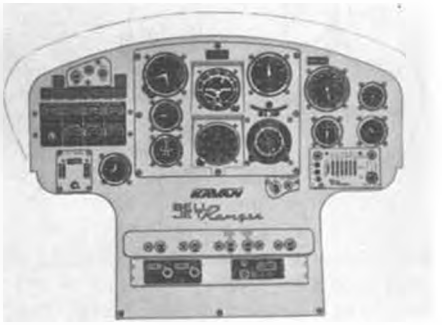
A more recent modification was to add teetering "springs" to a teetering head; the springs being a compromise between a rigid rotor and the teetering rotor principle. In effect the springs kept the rotor rigid until the pilot applied a control movement, at which time the springs allowed the head to teeter, thus providing quicker response. When the control was released, the springs returned the head to a semi-rigid configuration, with excellent stability characteristics.

The new "S" head appears to have all of the advantages of the previous systems, since it allows either blade to flap (like the real ones), and any variations in lift or drag are automatically compensated for by the flapping action. A few knowledgable onlookers were quite concerned with the "droop" of the blades when not turning, and stated flatly that any lift developed would fold the blades like an umbrella turned inside out . . . a few words about centrifugal force and a flight demonstration quelled any doubts about that! I absolutely recommend this rotor head as being everything it's advertised to be.

Since West Germany is undoubtedly the home of the model R/C helicopter, it's no surprise to find the new Graupner Bell 212 Kit to be a significant introduction to collective pitch rotor control. Examination of the kit was a surprise, with the mechanics being supplied as completed sub-assemblies, and an amazing light fibre-glass body molded to perfection! Construction details have been adequately covered by Ernie Huber in an M.A.N. article, so we won't go into that data now. However, I want to leave the subject with the thought that this kit is really tailored for assembly by the average modeller rather than the model engineer or machinist! I really believe one could build the model just by looking at the diagrams without reading a word in the instruction booklets, and the flight capability with collective pitch control is the "only way to fly". The Graupner Bell 212 is now on the dealer's shelves.

Hank Hankinson, of Sonic-Tronics Inc., was kind enough to send the company's latest additions, namely a Super-Tuff Helicopter Starter Belt No. 204, Boat Starter Belt No. 205, and a special two-step Drive Pulley No. 203 which replaces the standard drive cup on their Challenger Model Electric Starter. Each of these items retail at $4.95. Owners of the Sonic-Tronics Starter will be pleased to know that the new pulley will easily start the 60's, and by using the smaller of two drives, I can turn over my O.S. 80 . . . and that's a real chore with other starters.

Orbit Electronics is presently marketing two new items of interest for applications in all phases of modelling. The first item has been mentioned previously in "Over the Counter," but is described here again because of the exceptional use in helicopters. It is a special clamp or connector for installation on Servo-Arms to permit instant adjustment of a 1/16 inch music wire push rod. Very handy for those applications which require constant alignment and frequent adjustments. The second item is a modification of the old standby connector that we solder on the end of a wire push rod to permit the threading-on of a Kwik-Klip, and is called a "Clevis and Coupler." The hole has been drilled *all the way through* the connector and a slot has been milled full length for good solder-flow! No more broken or bent connectors with this new set-up, since it's stronger than the steel push rod wire soldered inside. Check your local dealer for more information and availability. *Continued on page 68*



New Kavan Jet Ranger instrument panel. Available soon to registered owners . . . free!

John Minasian flying his Hughes 300 built from DuBro kit.

Beautiful Solarfilm covered Super Buccaneer built by Dr. Dee B. Mathews. Supertigre .56 power. Weighs 7 pounds. It's R/C.

PLUG SPARKS

By JOHN POND

LAKEHURST PHOTOS BY DON LAMKIN

● Easterners are tough! Regardless of what you hear about the wild, woolly west, easterners are a hardy breed! They endure and fly in weather the westerners would normally say the heck with. Flying areas are such that only the most dedicated modeler would put up with the inconveniences. Of course, on behalf of the western modeler, it must be recognized that there are just too many good places and nice days to fly to risk one's model on poor conditions.

The latest report from Don Lamkin of New Jersey reiterates the same rough story of eastern flying conditions. The Clayton R/C O.T. F/F November 4 meet at Lakehurst Naval Air Station featured temperatures that got *up* to 50 degrees, with 30 mph winds and 40 mph gusts! Probably the most spectacular smash happened to Alvin Place on his last flight. Immediately after takeoff, a particularly vicious gust snapped the wing of his Super Quaker. Those concrete runways are absolutely merciless on models and equipment. Major rebuild!

Don further notes that there were three real "goodies" into the concrete. He also stated the best R/C flyers were the winners, as thermal activity was nil. No good boomers to help level out the competition. This also held attendance to 17 entries, when 45 is more the order of the day. A lot of guys spent most of the day in their cars!

Arising on the east coast as the most consistent winner, Dave Jaggie took three places in this Clayton R/C meet, with Jack Bolton following on his heels with a first and second. Jack, incidentally, as a Naval Commander and copter pilot at Lakehurst Naval Air Station, has been most instrumental in making the base available for the S.A.M. Old Timer Nationals and the F.A.I. International Flying Scale Contest. We can use more men like Jack!

Also received an excellent report of the activities from Cdr. Bolton, with photos of the other half of that dynamic duo from Lakehurst, Cdr. John Kelly. Not too much praise can be heaped on these boys for the work they have gone to in making the base available for model flying. They have even joined the Old Time Eagles Club for the sheer

Russ Barrera, owner of Russ-Craft model museum cranks winds into his . . . see far right . . .

Al Novotnik runs a Gold Head O.S. 60 in his Powerhouse, designed by Sal Taibi.

. . . Earl Stahl designed Gipsy, which is being held by Glen Snavely. O.T. event at Elsinore.

Tom Laurie with his Bert Pond designed compressed air model. Flew at Elsinore.

John Haggart, London Colony, England, and his Kiel K.6 powered Saddler Pacemaker. Isn't that Irwin Ohlsson's AMA number? This is his 7th O.T. Note SCAMPS decal. They sure get around!

enjoyment of models!

Bolton commented on the proliferation of events, e.g., the partitioning of cabin and pylon type models into separate classes with additional separation into engine classes. (This also occurred when Old Timer Free Flight was first introduced). The Antique Event, which features ten seconds of motor run for every pound of weight of model appears to be working well. Indications are that the Old Time Eagles will submit this event as a rule change and run it at the Old Timer Nationals.

The latest gimmick will be to stage an .020 powered R/C O.T. F/F event. Won't that be something? Is it possible to come up with a six or seven ounce R/C model? Talk about boggling the mind! You'll see 'em at the Lakehurst NAS on Fourth of July! Just another reason ya gotta get to this exciting meet.

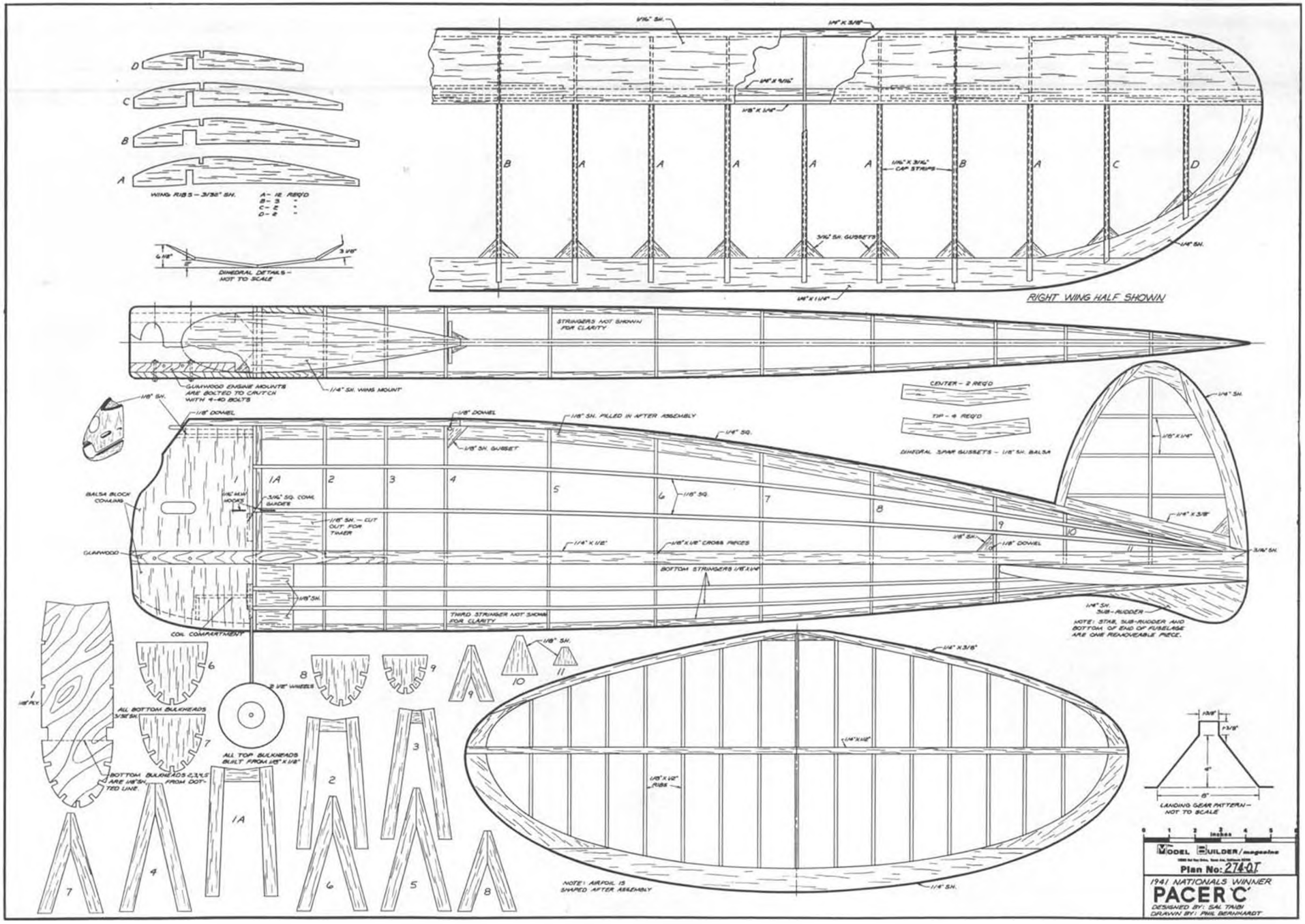
Jack Bolton further points up the easterner's toughness by noting that Al Schwankert stacked his wind-blown Tee Dee 15 powered Playboy Junior into the arm of his big brother, Dave, who was flying his Sailplane at the time. Despite the bruised arm, Dave continued to

Cdr. Jack Bolton, U.S.N.A.S. Lakehurst, N.J., uses "electric chicken stick" on his Scientific Coronet. He won Class A event.

Cdr. John Kelly (left), also at Lakehurst, and Dave Schwankert hold their Rossi 60 powered Comet Sailplane. Won Class C. Some climb!

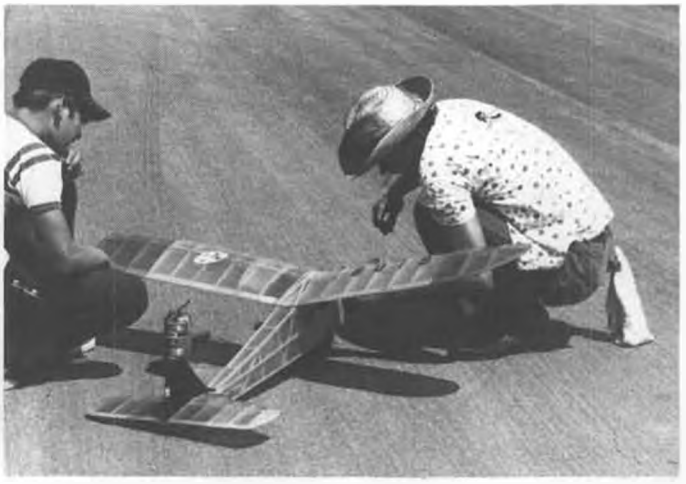
Dave Jaggie's Playboy Senior makes quick takeoff in 30 mph wind, note wheels off ground. Keith Crate makes very unassisted release.

Ever hear of the Super Quaker? This one by Alvin Place was rubble just moments after this shot. Old flying buddy Vince Bonema times.



FULL SIZE PLANS AVAILABLE – SEE PAGE 72

Bill Burgess, Muncie, Indiana, must wear a belt and suspenders; his Super Cyke powered Foote Westerner has ignition and fuel timers.



S.A.M. Secretary, Tim Banaczak, works on his Berkeley Brigadier. Ship originally designed for 1940 Air Youth Program.

fly until relieved. Luckily, neither Dave nor Al's model was badly hurt. Wild!

CONTEST, CONTEST, CONTEST!

Hey! Howdya like to have three contests on one day in December with weather of 65 degrees or better? Eat your heart out, Easterners!

All kidding aside, this did occur on December 9 at Lake Elsinore; with the SCIF club putting on their "Year-ender" meet, the Thermal Thumbers with one of their "Silent" meets, and the Flightmasters with a flying scale meet. Brilliant sunshine and warm gentle breezes were the order of the day. It was simply great!

Probably the biggest excitement was generated by that peerless retreiving team of Gene Wallock and Sal Taibi,

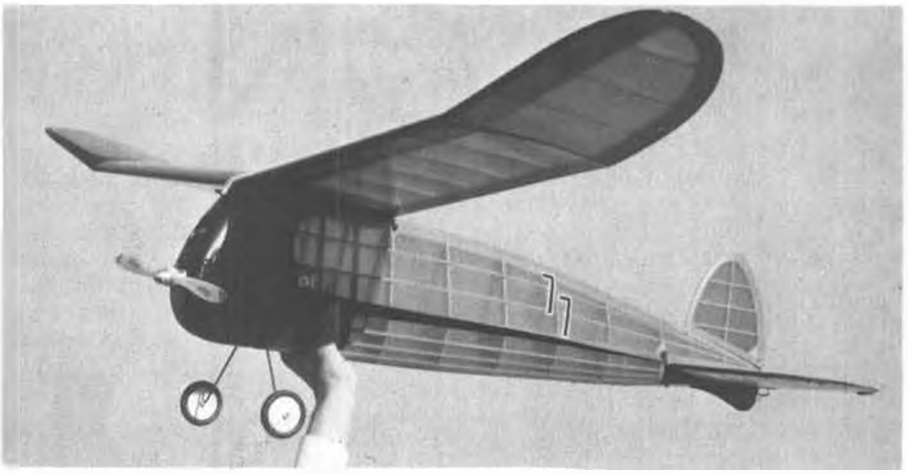
Continued on page 60

SAL TAIBI'S 'PACER C'... Old Timer Model of the Month.

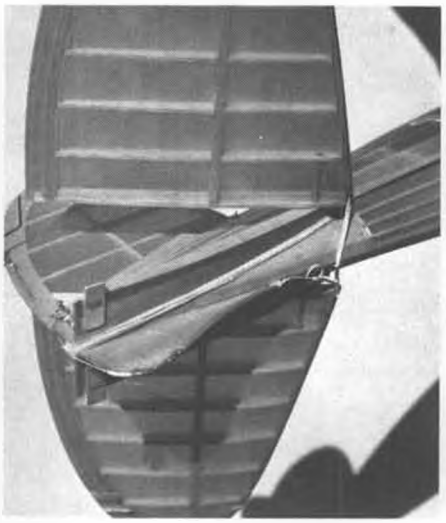
● So many of Sal Taibi's designs have been famous, it's hard to pick one out and say that it was his "most famous." However, if you add to that description, "the one which was built by the most modelers," then the Pacer just might move out in the lead. Of course, this statistic was helped along by Bay Ridge Model Airplane & Supply Company, which kitted both the 'B' and 'C' versions. Incidentally, those kits sold for $3.95 and $4.95 respectively, including Streamlite wheels . . . Oh well, eat your heart out . . .

The Pacer owed ite beautiful transition and glide to a most unusual aerodynamic freak. With practically a zero nose moment, the balance point came out just ahead of the trailing edge of the wing. As a result, Sal found that in his larger prototype Pacer, the transition was usually about a 100 foot dive into the glide! The wing simply could not overcome the effect of the huge lifting stab. One day, in desparation, Sal inverted the stab, added positive incidence until he got a floating glide, and there it was! Sal still considers it the best thermalling ship of all of his designs. The second prototype, the Pacer "C" shown here, incorporated the inverted stab and was simply a smaller version of the first Pacer. Normal flight pattern is right circle under power, wide right transition, and then a left glide turn.

The prototype 60" Pacer won the 1941 Nats Class C Gas event, and was powered by a Vivell-made Comet 35. It was later lost for ever at Langley Field, Hampton, Va., where Sal spent four of his years with the Civil Service.

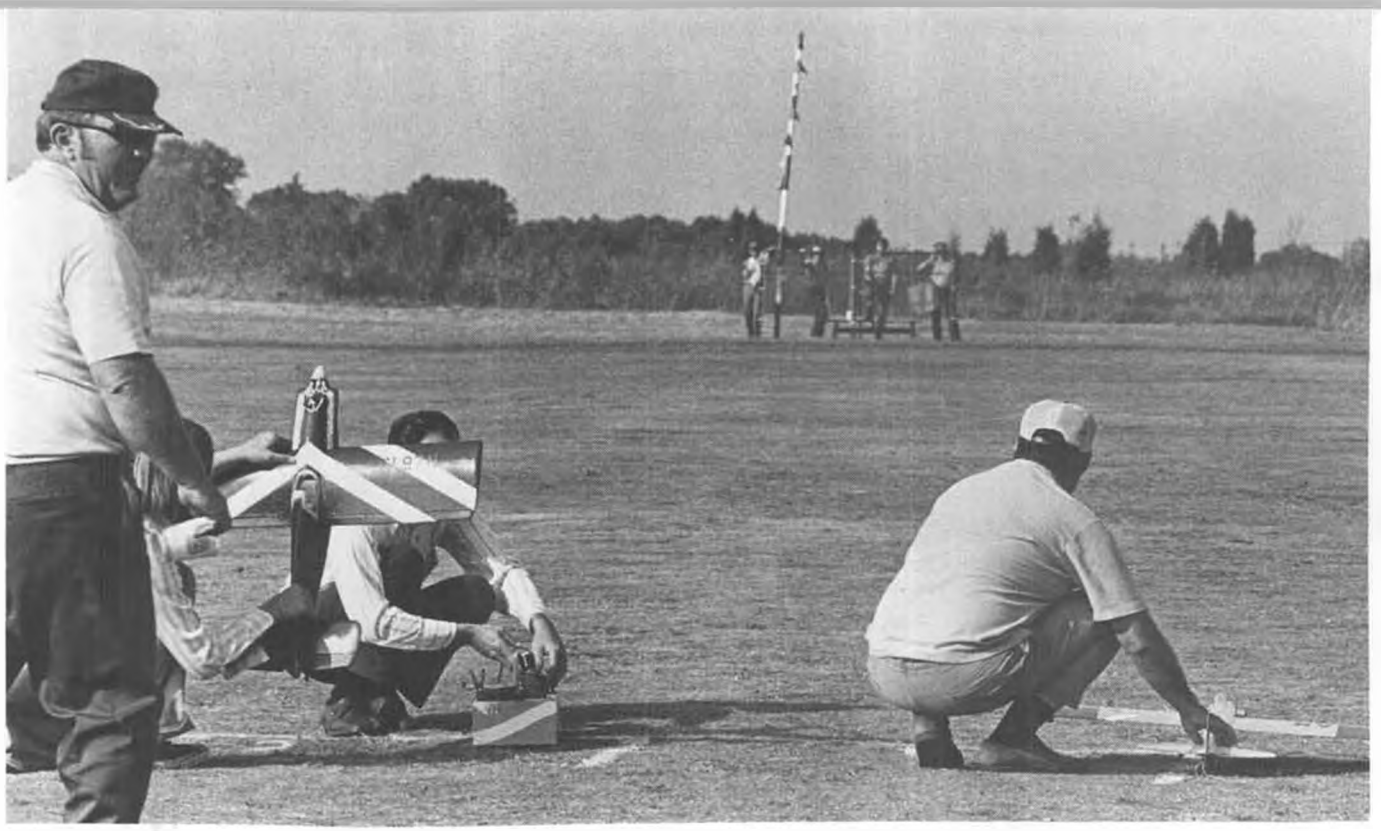


Pacer "C" as built by Otto Bernhardt. Hand "coming out of the washing machine" belongs to our draftsman, Phil Bernhardt. Short nose moment brought about the inverted stab. See text.



D.T.'s on some O.T.'s can be a problem. This one neatly solved by Otto. Note laminated TE.

The well known stubby Pacer nose. Cowling carved from balsa block. How unique!



Just before the start of a heat at the Charlotte Aeromodelers' November Q.M. races. Jim Nickles holding his Casutt up to check engine, while Austin Leftwich holds Gail Jacobson's Little Gem in readiness for starter's flag.

PYLON

By TOM CHRISTOPHER

● Building season is once again upon us! In most parts of the country, the weather is driving many of us to our clean, well organized work benches and shops to prepare for the coming season. This past season was a most successful one in that we noted an extreme rise in a new racing class . . . you know . . . Quarter Midgets!

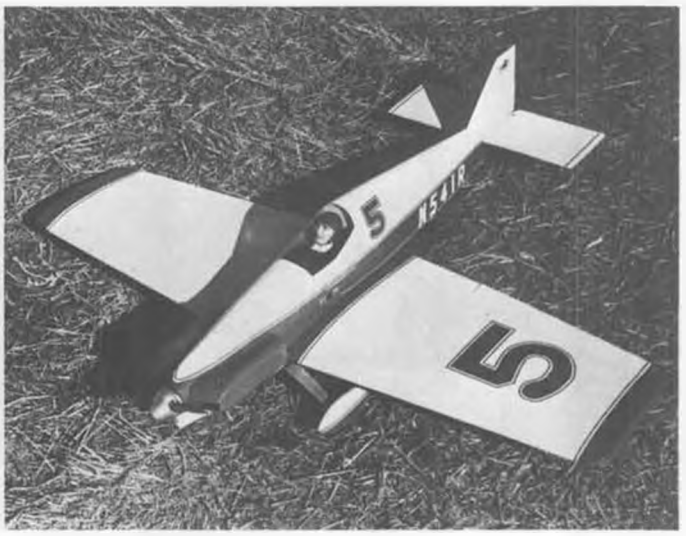
We have known of only a few who tried QM and didn't like the event. Frankly, we would prefer to see the QM event placed beside Formula I in dual contests, replacing the now dying FAI Pylon class! Once again, we would like to recall a statement made by Ron Schorr, a noted Pylon Racer in the Southern California area, "Why penalize so many so a few can fly pylon internationally?" Needless to say, this echoes the sentiments of quite a number of competitors. So why do we still tolerate the event? Already, we have seen quite a number of QM racing pilots move up to Formula I and do quite well in the event. This is great for both classes! Oh yes, the avid QM racer just *adds* Formula I to his repertoire in most cases; very seldom will he drop the QM event!

Anyway, by scheduling QM events, the sponsor can be assured of a sizeable number of entries and an interesting race with good spectator appeal. Before we proceed further I would like to say that at this point, I am expressing views that are common to the Pylon Editor! We have been told by a few that we should just cover events, stick to the facts and leave or let the cards fall where they may. Frankly, that is exactly what we thought was happening! Be assured of one thing: as long as I am permitted to write this column, I will write what I please! So once again, GOODBYE FAI!!!! *(No comment, wcn)*

The Chula Vista Model and R/C Club held an excellent QM race DEC. 8

Officials Harley Condra, Bob Nickel, and Stan Terry (l to r), stand behind winners at Chula Vista; (l to r, 1, 2, 3, 4, 5) Merle Hoem, Tom Christopher, Gary Hawk, Ramzi Thomas, Steve Ellison.

Adolph and Steve (l to r), the Sica racing team. Good competitors.



Fred Reese's Deja Vu. House of Balsa wing. Had problems at Chula Vista.

and 9 at their new flying field. Chula Vista is a few miles south of San Diego, California, near the Mexican border. The club has a beautiful facility that sports an ocean view, unlimited approach space, and one heck of a fine membership, with some of the most avid competitors that we know! Ramzi Thomas was Contest Director of what he hopes will be an annual event known as the Regional Invitational Championships. Ramzi was ably assisted by one of the best organized group of workers that we have seen at any QM event. They really had all their stuff together! It was unique in that this was the first two day QM event to be scheduled in Southern California area. With the fuel shortage in effect, there was concern on the part of a few contestants who lived quite a distance from the race site. The problem was solved by one of the club members (who is also a good QM pilot). He opened his service station to those who needed fuel to return home for the weekend! Really, this club thought of everything!

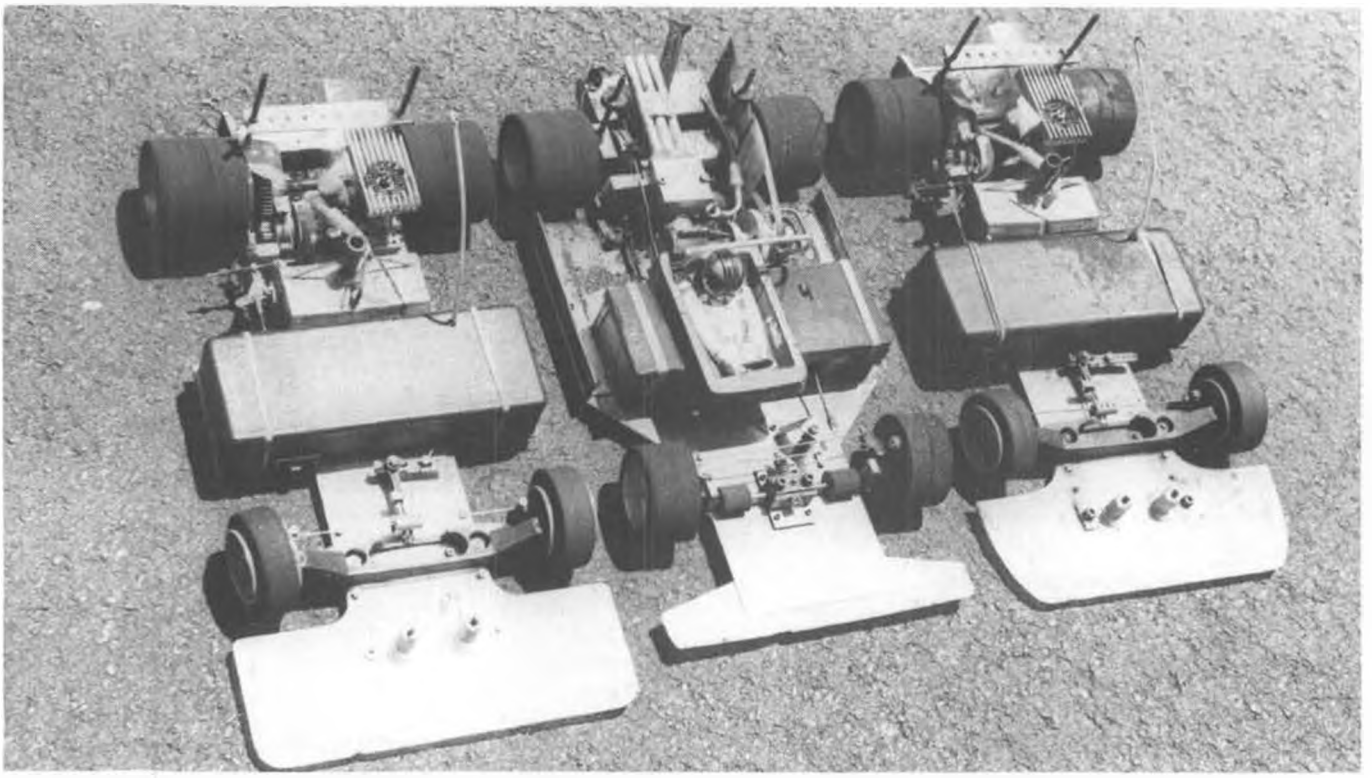
The race itself was held under some of the most beautiful weather conditions that we have seen. For December, this was something else! Temperatures were in the mid-seventies, with gentle ocean breezes right down the runway. At the end of two days of racing, completing ten rounds, Merle Hoem of Vista, California and Tom Christopher (atsa me!), of Marina Del Ray, California, had identical scores of 37 points. Hoem had taken second in two heat races and had two dead stick landings, which dropped him three points.

Christopher had a cut in one heat . . . which he won . . . that dropped him to 4th place. QMRC rules allow only the maximum of one point if you have a cut . . . no matter what place you finish! This required a fly-off for the overall win. Hoem evened the score, avenging an earlier heat win by Christopher, when he won the fly-off quite convincingly, dropping Christopher to second place. Hoem flew a very consistent race with a scratch-built Cosmic Wind Minnow, powered by K&B. His times ranged from 1:39 to 1:45. To round out an excellent combination, he used a REV-UP 400

Continued on page 65

Gail Jacobson proves that the radio only does 90% of the flying, and the tongue does the rest. Came in 2nd behind Leftwich in Charlotte.

"Fastest Quarter Midget combination in the East!" Austin Leftwich and his Little Gem. We'll feature this Doubler mod next month.



The 1st, 2nd, and 3rd place cars of Morrissey, Thorpe, and Amedo at the '73 West Coast Champs. Forward placement of radio box rquired by fuel tank in Taurus and by lay-down engine in Thorpe. Front suspension and adjustments in Thorpe can handle forward weight.

R/C AUTO NEWS

By CHUCK HALLUM

PHOTOS COURTESY OF "RACING CIRCUITS"

● Before I get started on this month's topic, I'd like to make a few comments on national R/C car rules. In general, these rules have been made to set uniform standards for everyone, to originate classes of racing required to provide and keep competition alive, and to maintain a degree of realistic appearance in the cars. Obviously some car classes will always have better handling characteristics than others. Making the poorer handling cars operate properly is part of the challenge. To me, realism of the cars is a necessity so that there will be some challenge, and so the cars are recognizable to the spectator.

Where possible, R/C car rules should borrow from the experience of the real cars. Some people here in Southern California are talking about some changes to the Stock Car rules (because of handling problems). The proposed changes are likely to alter the appearance of the cars and not help the competition ability of numerous models. Why not do what they do in big cars . . . limit the carburetor bore to say, .156 in. dia? The cars would handle better and there would be more even competition. Drivers would have to concentrate on driving ability and efficient pit stops. Reliability and cost (Super engines, blown engines, and time) would be improved. I think closer competition is the factor that will help make the interest in the various classes grow, rather than allowing variations that will expand the difference between competitors. It appears to me that the same approach might apply to oval cars, leaving the sports car class unlimited, such as the Cam Am series.

Cost is another reason I think something like limited carburetor bore is *necessary*. It appears to me that at least here in Southern California, the cost of racing has escalated over $100 per year for engines. Even in the amateur class, to be truly competitive, you have to spend a fortune on engines. First you have your engine ported (flow path and timing changes) and the sleeve hard-chromed. If you use the Vecos you have to expect to blow one or two engines a year. The new McCoys don't blow, but you'll have to expect to use a couple of piston/ring assemblies and have at least one chrome job on your cylinder liner each year. Cost and time for engines is really "goin' outa sight." End of editorial . . . Now we can get on with this month's topic . . . R/C car chassis adjustments.

Front end and rear end chassis adjustments can alter the performance of R/C cars to a greater extent than in real cars. The reason for this is that handling improvements are magnified

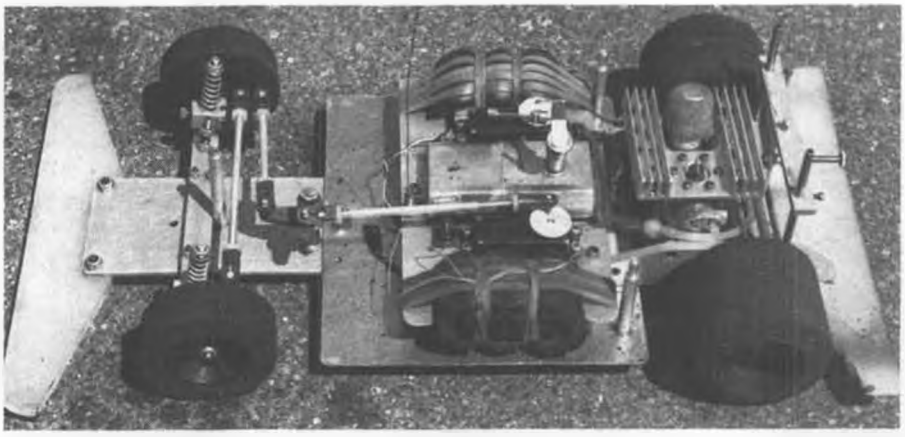
Del Fisher's sport car chassis displays an extreme amount of front wheel caster. Gives better low speed directional stability. Weight added to wing posts helps rear traction.

as we are not in the cars. A small improvement allows us to do much better because our mistakes are not amplified so much. For example, if you were driving a real car, you could feel the rear end lose traction, and you'd back off the throttle. With R/C cars, you have to wait till you can see and recognize the mistake and then it may be too late.

We can look at the problem the other way also. Suppose we have a car that normally works good and then track conditions are a little off (dusty) or there is some wind. We look like beginners again. One thing you have to be careful about when adjusting a car is to get the car working well under the type of track conditions that will exist during racing. We believe that chassis adjustments can be made during reasonably close track conditions (temperature, dust on track, wind, etc.), and then only minor changes to tires, carburetor and wing adjustments need to be made on race day.

The adjustments that can be made to the front end are: caster, tread width, and camber (vertical C.G. is mentioned later). I've placed the adjustments in decreasing order of noticeable handling effects. Most model car manufacturers don't consider these adjustments important enough to provide means of changing them . . . or telling you what they do.

Caster is the horizontal difference between the mechanical front wheel pivot axis intersection with the ground and the tire contact point when viewed from the side. Caster can be obtained two ways, either by perpendicular offset or king pin inclination angle when viewed from the side. Figures 1 and 2 show the perpendicular and angular methods of attaining caster. Most R/C car kits have some perpendicular caster and a few also have angular caster. The two methods of providing caster give different handling characteristics. Both methods of caster give directional stability. However, the angular method also gives some increase in front tire cornering force.



Arturo Carbonell's hot Delta car placed 2nd in Expert Road Race at '73 Nats. Front end is sprung and has high kingpin/wheel offset, but no Ackerman action. Toe out might help.

Why does caster give directional stability? Look at Figures 1 and 2 and you will see that tire contact with the ground is to the rear of the king pin axis intersection with the ground, for positive perpendicular caster and positive angular caster. The drag forces of the rolling tire tend to straighten (weather vane) the wheel and point it forward. (This happens with both perpendicular and angular caster).

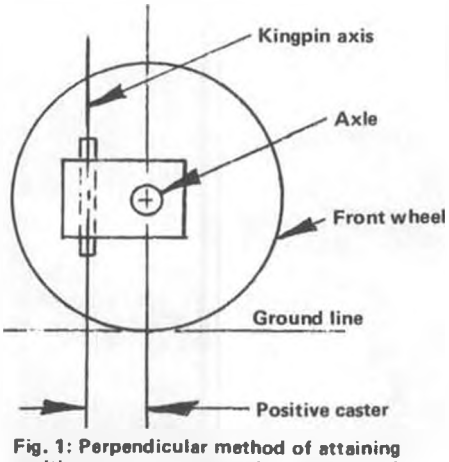


Fig. 1: Perpendicular method of attaining positive caster; moves vertical kingpin axis forward of wheel axle and tire contact point.

With perpendicular caster, when the wheels are turned, the wheels do not move vertically. With angular caster, the wheel which is on the inside of the turn moves down, hence the inside front wheel has a greater vertical force, tending to balance the front wheel loads during cornering. Since there is less weight transfer, the front side force cornering capability is higher (see October '73 M.B.). Perpendicular caster is built in, and cannot be changed unless you make new steering blocks. Hence, the normal way to change caster is by angular settings of the front axle and kingpins.

One car manufacturer provides initial caster (Marker) and another offers set screw adjustments for caster (Thorp). To adjust the caster on most of the cars, shims are added toward the front of the axle mounting screws or brackets. Just be sure the shims cannot come out and that the set screws cannot loosen due to vibration.

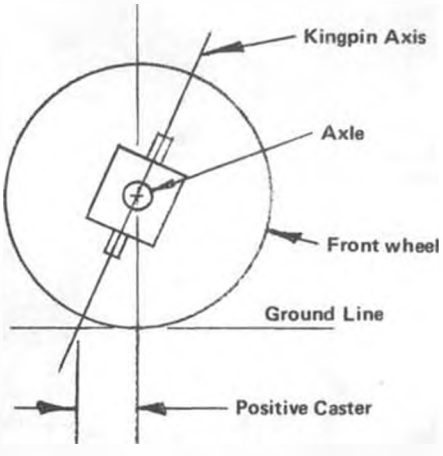
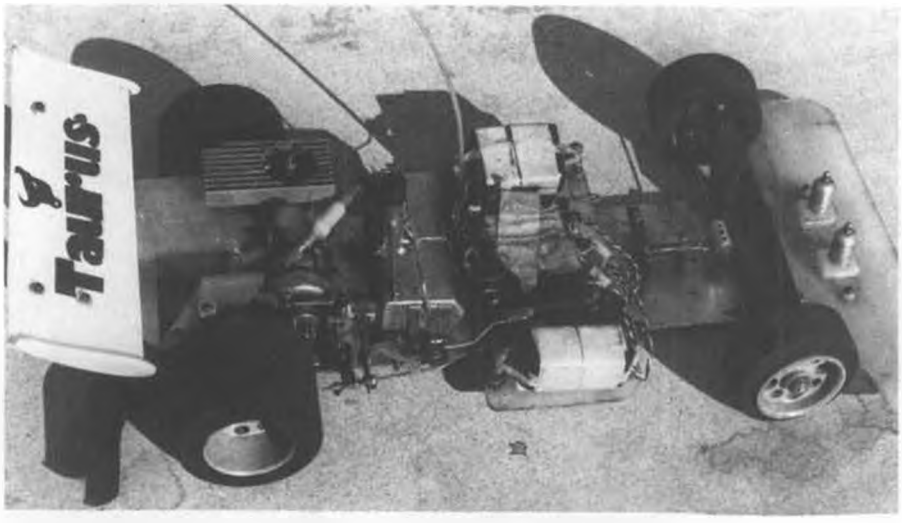


Fig. 2: Angular method of attaining positive caster; rotates kingpin axis to intersect ground ahead of tire contact point.

With positive caster angle, the lower part of the kingpin pivot is further forward than the upper part. A positive caster angle improves low speed stability and steerability and also increases high speed steerability. Even though positive angular caster increases steerability

Continued on page 52



Morrissey's oval car, as well as his sports car, has weight well porward. Lots of toe-in required to compensate for lots of Ackerman action. Forward weight should tend to give understeer.

Col. Bob Thacker's gloss aluminum Monokoted P-82B sitting on the apron at Orange County Airport. Two counter-rotating K & B "Sporty Forties" furnish the power. Although a sport scale model, there are no variations to the full scale outlines.

COVER STORY.... COL. BOB'S P-82B

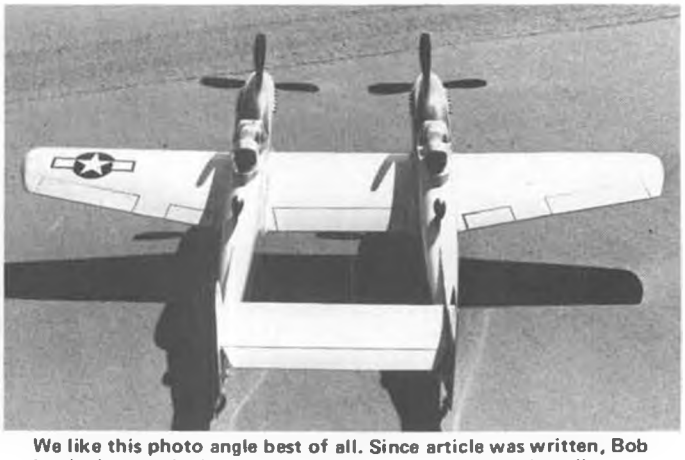
By BILL NORTHROP

Col. Bob Thacker had all sorts of good reasons for selecting the North American "Twin Mustang" P-82B as a Stand Off Scale project. His record-setting flight from Hawaii to New York was one of them . . .

● On February 27, 1947, a "Twin Mustang" P-82B Fighter took off from Hickam Field, Honolulu, Hawaii and flew non-stop across the Pacific Ocean and the United States, landing at La Guardia Field, New York, 14 hours and 32 minutes later, a distance of 4,969 miles. Average speed was 342 mph. It was the longest distance ever flown non-stop by a fighter type aircraft, the first non-stop flight from Hawaii to New York by any type of plane, and it was the first time that a fighter had taken off with so heavy a load; nearly seven tons of gasoline (2,215 gallons). The flight received front page headline attention in newspapers throughout the country.

In command of the co-piloted aircraft was Lt. Col. Robert E. Thacker, flying in the left seat . . . or in this case, left fuselage . . . and in the right . . . fuselage was First Lt. John M. Ard. The Twin Mustang, so named because it appeared to be two P-51 Mustangs stuck together with a common stabilizer and wing centersection, was actually a totally new and much larger aircraft, designed and built from the ground up by North American Aviation, Inglewood, Calif-

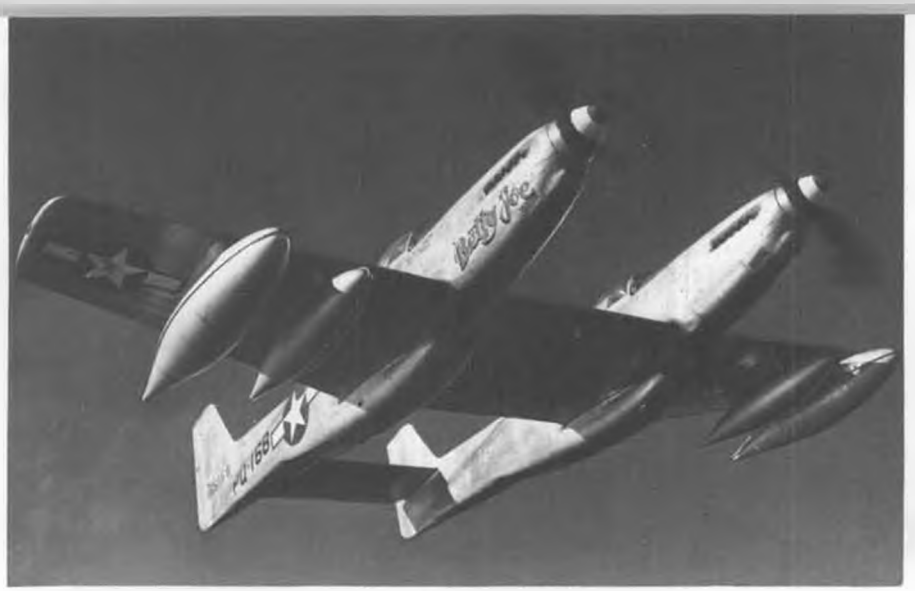
Complete airplane is built up. No fiberglass; no foam. Bob worked from only rough outline drawings, using Willis Nye 3-views in MAN.



We like this photo angle best of all. Since article was written, Bob has had some single engine experience . . . no big deal at all.

Bob pilots with both feet on the ground these days, but there was a time . . Probably didn't realize then, that he was gathering scale info.

Two of Bob's three Betty Jo's. Guess which one he has known the longest.



The "Betty Jo" on one of many test flights . . . before the miss-spelled name had been corrected. Ship took off on record flight with 2,215 gallons of gas. Bob, this shortage is all your fault!!

Dapper Bob shows Goldberg retracts, operated by variable travel World Engines servo.

ornia (later North American Rockwell, and now Rockwell International).

The ship was designed for, and the flight was made to prove that fighter type aircraft could escort bombers on long-range missions. Almost 300 of the aircraft were built. The first XP-82 test flight was made on July 6, 1945. From that first model the design went through 8 variations, including day fighters, night fighters, an APS-4 radar, search radar, and a winterized version. A P-82G (search radar type) shot down the first enemy aircraft in the Korean War.

General specifications of the P-82 are as follows: Span 51 feet 2-3/4 inches, overall length 39 feet, normal gross weight 20,775 pounds. Power for the P-82E (shown in 3-view) was two 12 cylinder, liquid-cooled, 60 degree V-type Allison engines. Thacker's B model was powered by Packard-built Rolls-Royce engines, developing 2,200 horsepower each.

The epic flight took place with only minor problems. Weather delayed take-off from Hawaii for quite a few days. Three of the four drop tanks carrying extra gas refused to drop, resulting in unnecessary drag and an excessive trim problem. And finally, the counted on tail-winds dropped in velocity, and in some areas, reversed into headwinds! The landing at LaGuardia was made with only 60 gallons of gas remaining.

Today, Bob and Betty Jo (after whom the record setting plane was named) live in San Clemente, California where Bob is leisurely engaged in enjoying his recent retirement from a full time career (since 1939) in the U.S. Army Air Corps and the U.S. Air Force. One of his primary sources of entertainment and relaxation for many years has been model building and flying, and since his retirement, "Col. Bob" has been thoroughly wrapped up in R/C modeling, primarily soaring and scale.

Nothing then, could be more logical for Bob to tackle as a scale project than the plane with which he had such a memorable association. Being more of a flier than a builder ("I don't care if I am retired. Hundred percent scale building takes too damn much time!) Bob designed and built his R/C P-82B for Sport or Stand-Off Scale. However, no

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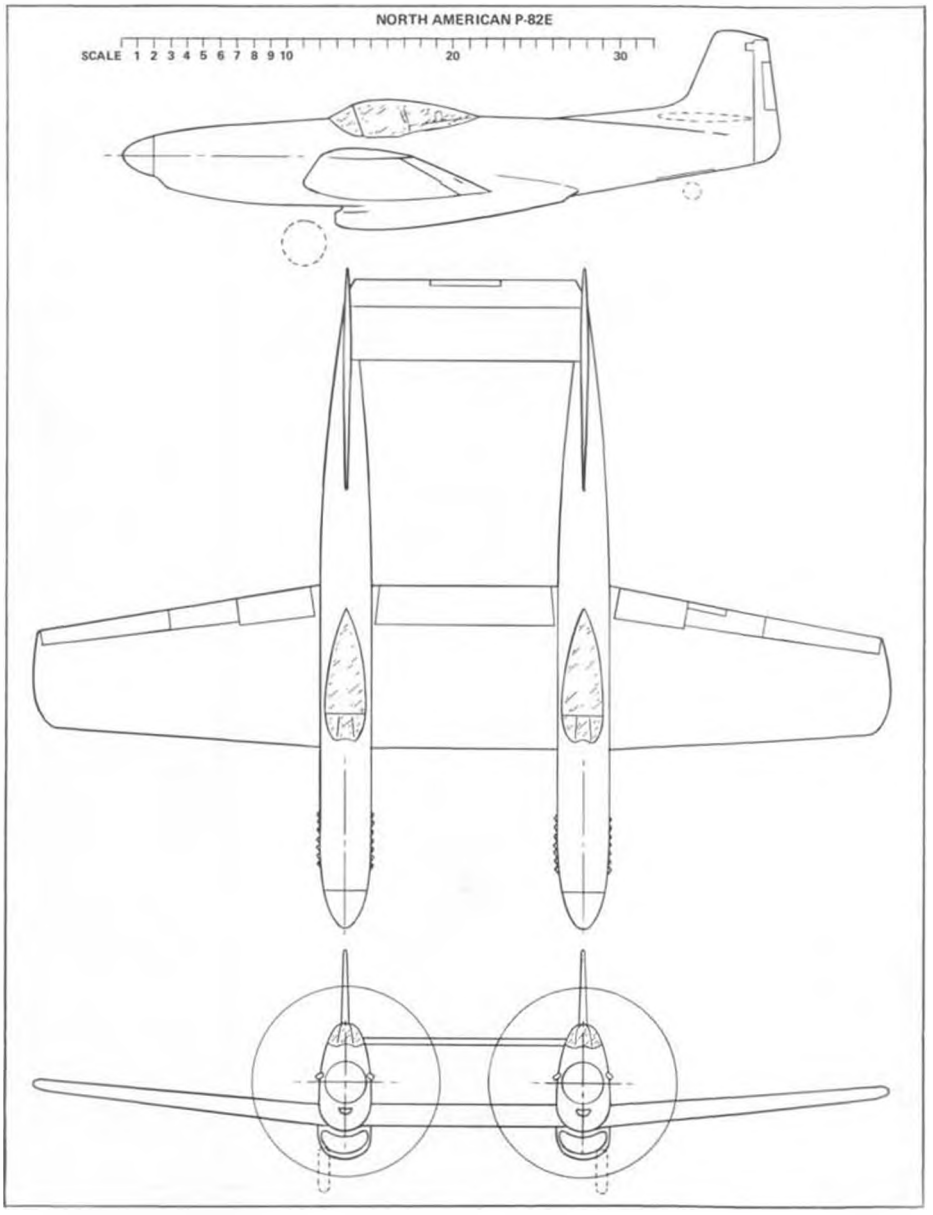
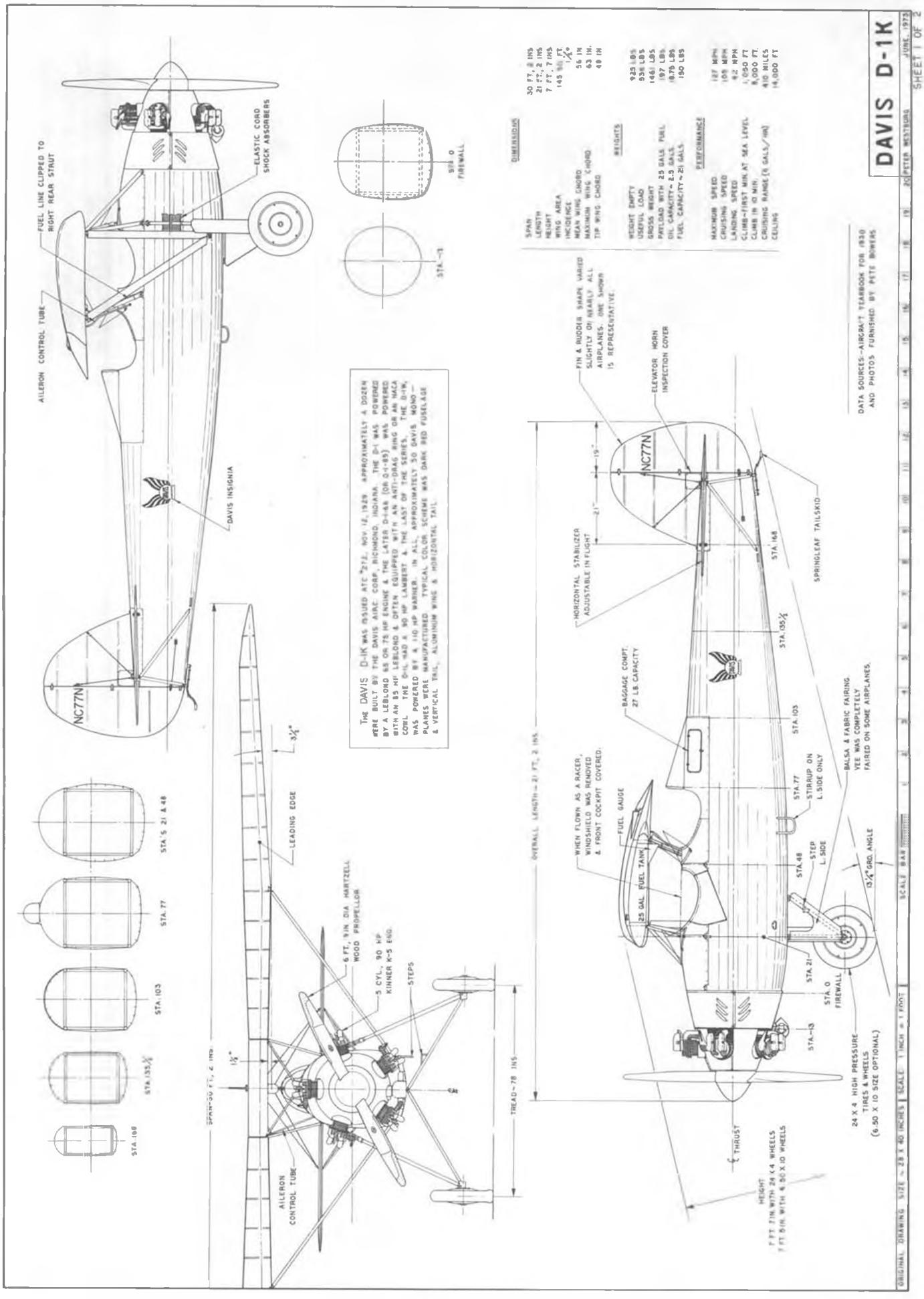




Copies of the original 28 x 40 inch drawings of the Davis D-1K are available at $3.00 per set.
Order direct from PETER WESTBURG, 834 Seventh St., Santa Monica, California 90403.

The Davis D-1K with a Kinner K-5 engine of 90 hp. It had a top of 125 mph and an initial climb rate of 1200 fpm. This was the most popular Davis, and sold in 1932 for the unbelievably low price of $2295. Peter Bowers photo.

DAVIS D-1K

By PETER WESTBURG

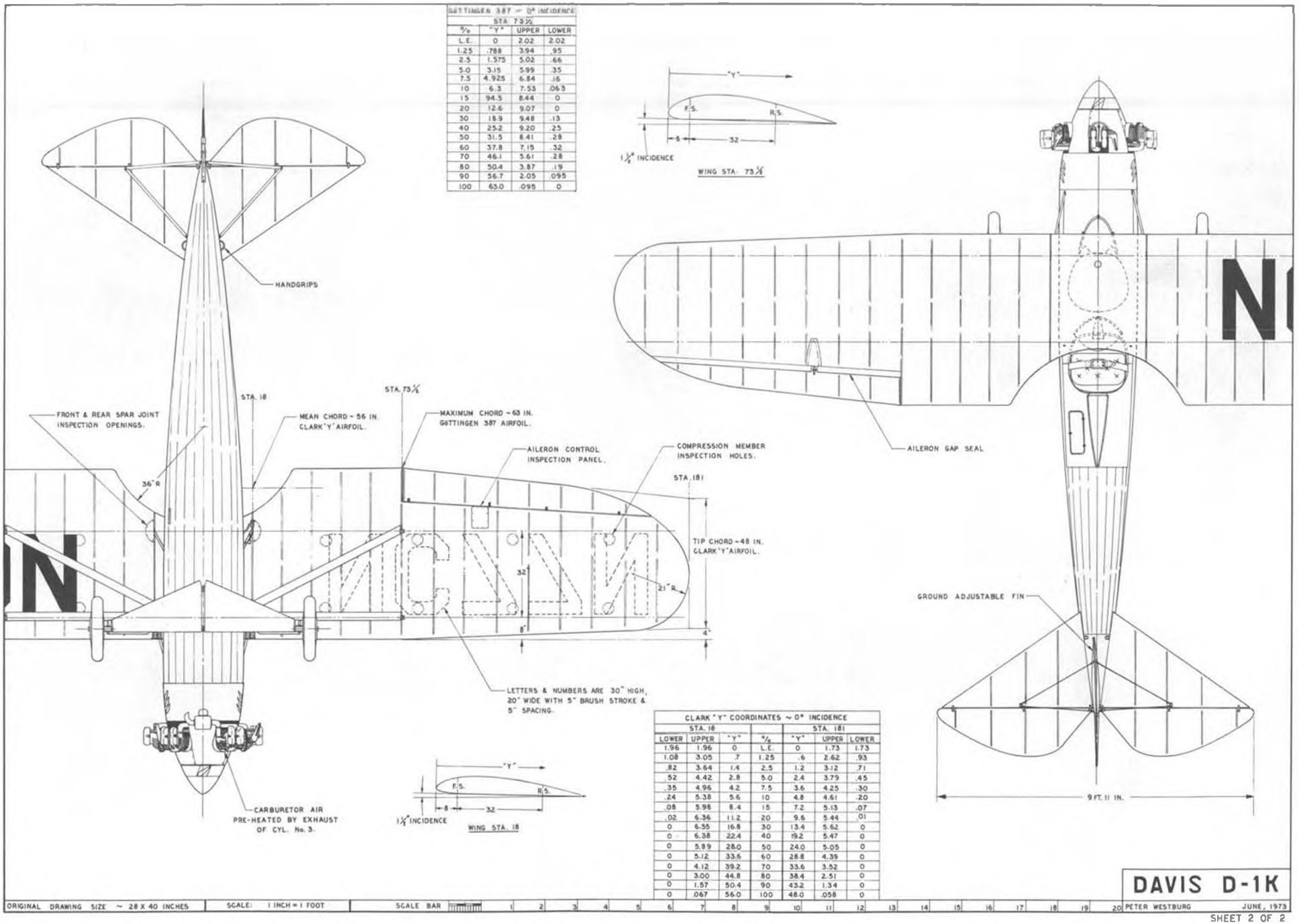
● "Grass stains on the wingtips? That's hard to believe, fellow, especially on a high wing monoplane like the Davis."

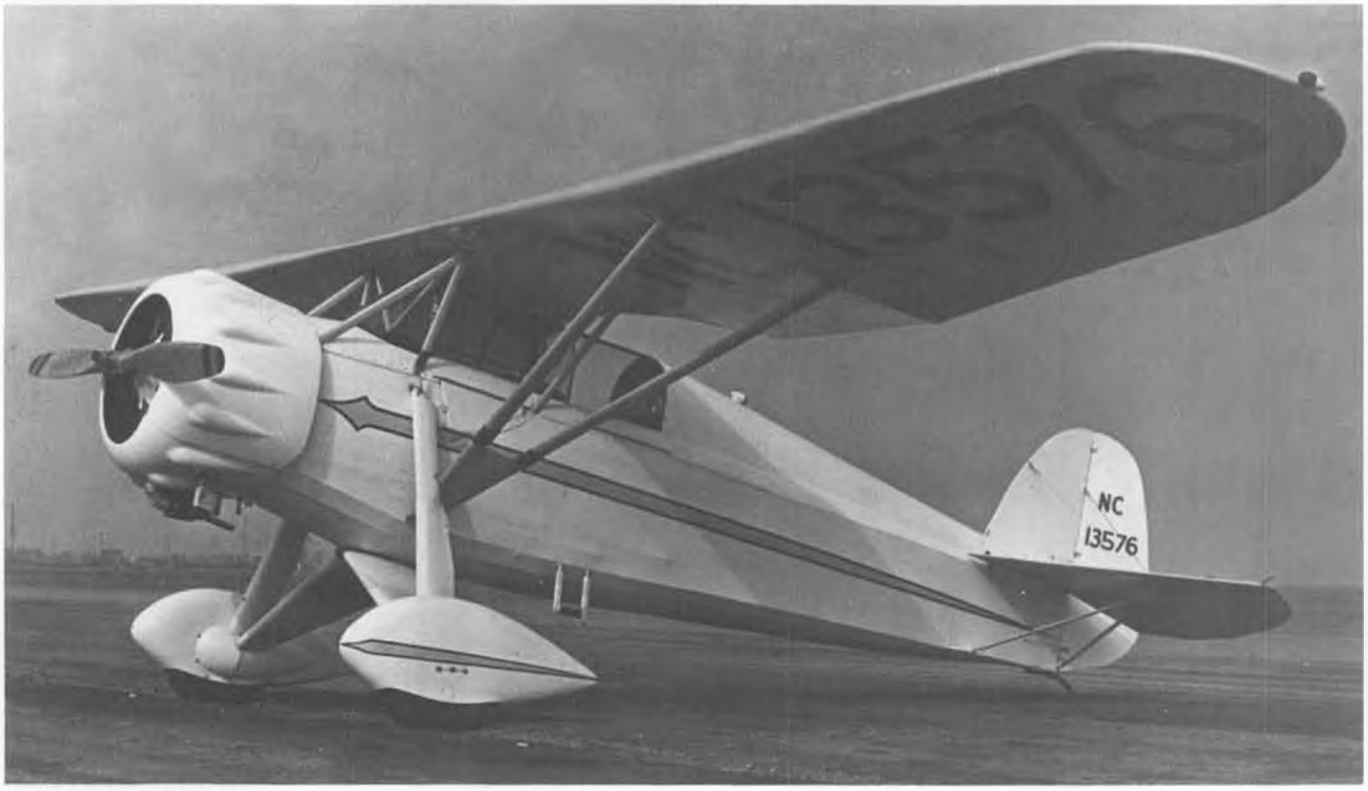
"Honest. The National Aerobatic Champion of Mexico did snap rolls in his D-1K so close to the ground that his wingtips brushed the grass!"

The dialog illustrates what kind of performance the Davis was capable of, and according to more than one report from pilots and modelers alike, it was a one-of-a-kind natural . . . an airplane born to fly. It had the performance of a pursuit plane, yet it was easy and forgiving of ham-handed flyers. The Davis could fly itself out of a jam, always

A classic of its time, the Davis V-3 was both an aerobatic plane with quick responses, and also stable and docile for the average pilot. Top speed of this LeBlond powered model was 95 mph.

N-854N, a Davis D-1W, was rebuilt in 1965 by Joe Pfeifer of Columbia, California, with a 145 hp Warner and wheel pants from another plane. This and above photo from Pete Bowers.





Davis D-1W, NC-13576, originally the personal airplane of Walter Davis. Once owned by movie actor Richard Arlen, it is now the proud possession of Don Lovern, National Airlines captain, who has converted it back to open cockpits.

coming back to normal flight like a cat landing on its feet. The reason, of course, being that the center of lift was well above the CG.

The Davis is still so highly regarded that out of a mere 50 or so built, more than a half dozen are still flying in this country, and the one with grass stained wingtips is still flown regularly in Mexico by Agustin Fernandez, the son of the Mexican National Aerobatic Champion.

Most of the Davises still flying have been modernized with oleos replacing the rubber shock absorber landing gear and Warner engines replacing the Kinners. One Davis is flying with a 125 hp opposed Continental in the nose.

Standard finish for the D-1K was maroon fuselage, fin and rudder with white numbers and letters; the stripes on the fuselage were white with the inside area a dark blue or black. The wing and horizontal surfaces were finished in natural aluminum with black numbers on the wing.

Davises were also powered by LeBlond and Warner engines, but the Kinner powered version was the most popular. At one time, in 1932, it sold for the amazingly low price of $2295. ●

Davis D-1K flown by Senor Pelaez, the National Aerobatic Champion of Mexico. It is reported that he did snap rolls so close to the ground that his wingtips touched the grass.

PHOTOS BY GEORGE POLK

Some guys just don't pay any attention to the rules. It's the wingspan that can't exceed 13 inches, not the rudder height . . . dummy!

THE PEANUT THAT GOT OUT OF HAND.. By GEORGE POLK

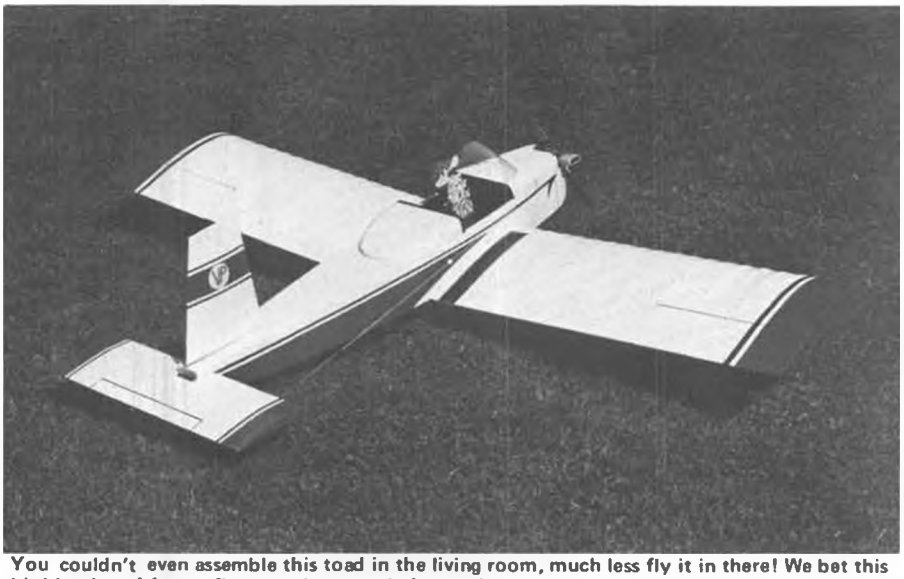
Ever hear of a peanut with thyroid problems? Or maybe it was exposure to atomic radiation, like on the science fiction programs. Anyway, there's a lesson to be learned . . . "Build . . . don't think!"

● I wish to file a protest in regard to the VP-2 article in the April '73 Model Builder. My original interest was a model to fly in the parlor. The results were . . . well, perhaps the pictures show better than I can explain. I can't even get the thing in the parlor. What help can you offer this novice? I certainly do not need all those flying instructions in the article. "Hand launch . . . " Who you kidding? Hear now my tale . . .

Building the flying tail presented no problems. Spruce covered with silkspan and two coats of Hobbypoxy.

The first hint of trouble was with the fuselage. The hole in my propeller was too large for the .040 wire hook; it was a perfect fit on my faithful old GHQ. Besides, the rubber band hardly reached the cockpit, two feet short of the rear hook.

Determined to complete one project I started, I persevered. My pile of dimension lumber forfeited a 4 x 4 and a 2 x 10 and that took care of the wing leading edge and spars. One fourth of a 4 x 8 sheet of 1/8 inch luan plywood yielded an armful of ribs. Local authorities halted wing assembly until a building permit was obtained.



You couldn't even assemble this toad in the living room, much less fly it in there! We bet this bird is a lot of fun to fly once the space is found. Scale speeds are more relaxing.

Spun coverite, and my usual "10-foot" two-coat Hobbypoxy finish applied with a push broom, wrapped up this stage. Onward . . . !

Airfoil is 12% Clark Y, thickened to 15% by tracing around the instep of a Potawatomi snow shoe. NACA 4412 is shown on page 28 of AAM January, 1968, I later discovered.

Scrap blocks of styrofoam, veiled in silken folds of spun Coverite, constitute the turtleback/headrest.

Test assembly indicated a propensity for empennage droop. Desperately I clawed ballast from the decorative one-foot-deep accumulation on my work bench, selecting finally a Heathkit GD-19 matched receiver-battery-servo combination for their color harmony. Perhaps my luck would change.

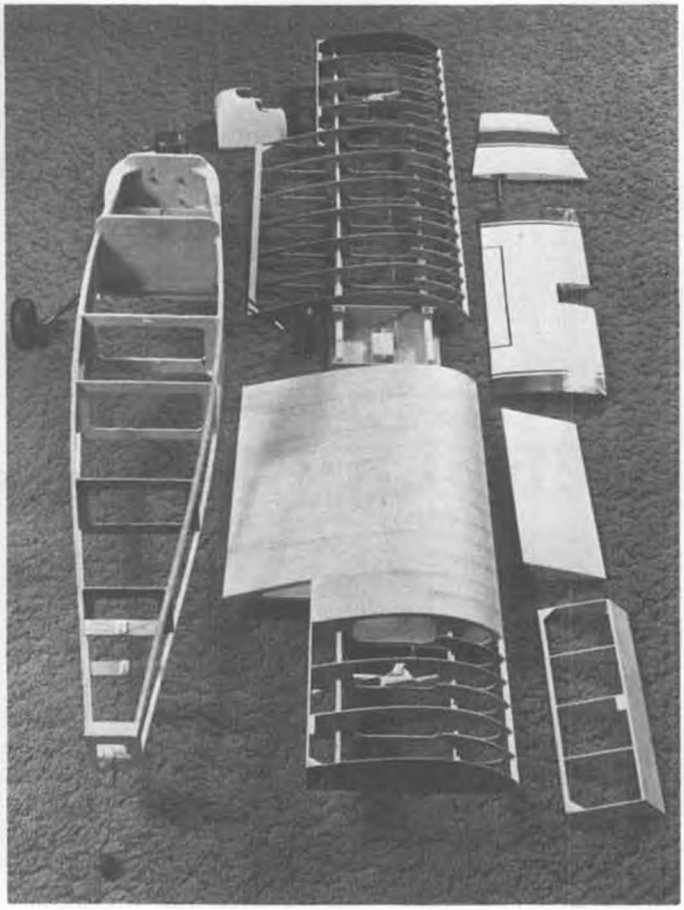
The cockpit detailing would be the envy of Maxie Hester, except I omitted instruments, seat, and controls to make room for the on-off switch.

Then Dame Fortune frowned again. I lost my GHQ muffler adapter and an Enya 60 was pressed into service (having recently been pressed through a fire-wall!).

Impatient with the lengthy prospects of a master, mold and fiberglass lay-up, I weakened and made the cowl of blocks of 1/2 inch Ecuadorean gold, the only balsa in this fouled-up butterfly.

Four weeks from the moment I drew the thrust line on the drawing board (next time I'll use paper), the bird was considered complete. Several ounces of

Florence Polk risks possible internal injuries in order to give you this idea of the size of George's vitamin-fed Peanut.



Interesting wing construction shows way to light construction in big models. Ribs of 1/8 Luan mahogany. Coverite fabric.

lead adorn the firewall and bring the weight to 9-3/4 tons . . . sans fuel. *(Oh my God! wcn)*

A friendly (for $50) contractor hauled the dismantled ship on a low-boy to nearby Atwater Aerodrome for appraisal by my Chief consultant and Test Pilot, Bruce Russell (R/C Kibitzer, MAN Dec. 1972).

No doubt fascinated by the tail (Bruce, you D. O. M.), his appraisal was not concluded with the recommendation to convert the creation to an unlighted chandelier . . . yet.

Confessing that I am still plagued by the problem of remembering left hand vs. right while concentrating on up and down . . . despite a well lettered transmitter case, tattoed hands, and color coded finger-nails, she was started down the taxi lane, while my score of flying friends watched bravely from beneath their cars. Shades of Walt Mitchell. As I neared the runway it suddenly dawned on me . . . I had not made my usual excursion through the parking area. Later, green with envy and grass-stain, my buddies re-examined and, vulgar rogues, pinched her rounded gear suspecting flanges or something since it tracked so straight. Those Veco wheels I bought 22 years ago.

When the Enya did not respond to coaxing, (having not fully recovered from the firewall incident) a new ST .60 Bluehead was installed, and lift off attempted after four tankfuls were gulped by the Tiger *(Gee, that must have been a long takeoff run! wcn)*

At this point, most articles state "She flew right off the board with just a touch of down trim." Well, in this case it was two turns of up trim. It hasn't flown "the full AMA/FAI pattern," and probably never will. Power-one and dead stick landings were both good.

Bruce seems intrigued with its peculiar stability and we are making a minor change in CG. I really can't testify as to its handling characteristics . . . I haven't flown it yet! (Bruce abhors tree climbing; I have more tree time than box time.)

Despite my troubles you will note I did get the Capp couple together for once. Perhaps there is hope for the world.

Yours for more clarity in construction articles and for parlor flying peanuts,

George A. Polk ●

How to make your Heath transmitter look real small! George, if you can't learn to fly R/C with this combination, you better give the whole schmeer to Bruce and build real Peanuts!

Lake Elsinore's great flying site. The airport is at the photographer's back, about a mile away, downwind. The lake is straight ahead, about a quarter of a mile away. Drift is always very light . . . sometimes non-existent . . . but there are thermals. This was December 9th, easterners!

FREE FLIGHT SCALE

By FERNANDO RAMOS

Lonnie Cope's Martin M-1 Jumbo Scale ship.

Hal Swanson (Modernistic Models) built this Jumbo Scale Fairchild 24.

● Whenever there is a contest scheduled in early December, the first possible problem to contend with could be the weather . . . Even in sunny California! The San Diego Orbiteers had scheduled their annual scale contest in late November, but it was postponed a week, because, of all things, rain! When December 9th rolled around, the date for the Flightmasters 5th Annual Jumbo Peanut Contest, weather turned out to be the least problem. To use an old cliche, the weather was letter perfect. The air was fresh, temperature in the low 80's, and the skies were 99.9% clear. (The last .1% was attributed to all the glow and ignition models that were dotting the skies). In fact, a story about the unusually beautiful day out on Lake Elsinore could literally take pages. That's enough work for the Chamber of Commerce, let's get on with the contest!

For those of you unfamiliar with "Jumbo", it is an event for rubber-powered models with minimum wing spans of 48 inches for monoplanes and 36 inches for biplanes . . . 10 points for the pilot, 45 points for scale, and 45 points for workmanship. Flying involves a 20 second minimum flight with a maximum not to exceed the scale points. All flights must R.O.G. For the first three years, the flying had a three minute max, but the border-line scale types were always winning. Last year, the rules were changed to their present form.

This was the first time that Jumbo had been held at Lake Elsinore, half way between San Diego and Los Angeles (previously, it was Sepulveda Basin, west of L.A.). It really saved the San Diego modelers many extra miles of driving. Unfortunately, the Elsinore site didn't have too many suitable places for a model to R.O.G. successfully. The surface is quite sandy, with stubble-like weeds that snag even the larger wheels. As a result of this problem, many of the highly detailed scale models simply couldn't qualify. Finally, someone pro-

Marlin Elbert's Longster. Nice scale FF subject.

Two year winner Ray Behrens and enlarged Stahl Skyfarer. Helper is Dick Siegfried.

Jim Hale placed second, with this modified Comet T-Craft.

Hal Cover's beautiful P-38 with counter-rotating props. All finished and he forgot the required pilot!

Don Wicks built this Mr. Mulligan Peanut from Model Builder plans.

vided a canvas tarp, and it was placed on one of the dirt roads facing into the prevailing wind.

Before continuing, I would like to digress momentarily. I seriously felt that perhaps 48 inches was too big for a rubber powered scale model, and with few exceptions, there are not too many plans or kits available in this size. That means that most modellers interested would have to draw their own plans. If the model turns out to be on the heavy side, it takes a pretty good hunk of rubber to power it. I felt that 36 inches for a minimum was a more ideal size. More old-timer plans are available in this size, making it easier for the modeler. *But*, I have to say that after seeing many new "Jumbos" at this contest, I had to change my mind. Honestly, there really isn't a prettier sight than seeing these large scale beauties in the sky. It is very similar to watching the flight of old-timer Wakefield models.

Ray Behrens, defending champ from last year, won again with his General Skyfarer. It is an exceptional flyer and well constructed. Second place went to Jim Hale, flying a much modified Comet T-Craft. Third was taken by Walt Mooney with his Russian Kalinan K-5, which he had built in less than a week! Hal Cover came in fourth with his superb flying Lanzo Puss Moth. Hal has taken a lot of ribbing regarding his winning "ghost" Moth. So, during the last couple of years, he has come out with some outstanding projects for Jumbo rubber. Last year he had a Focke Wulf and this year a remarkably detailed P-38. Unfortunately, he forgot the pilot requirement and left it out. (Luckily for the other contestants, but unfortunate for everyone who wanted to see it fly). Jim Adams flew his Cessna AW to fifth place. This is another one of the outstanding flyers and is very light. There were ten models officially entered in Jumbo, plus several others that weren't entered.

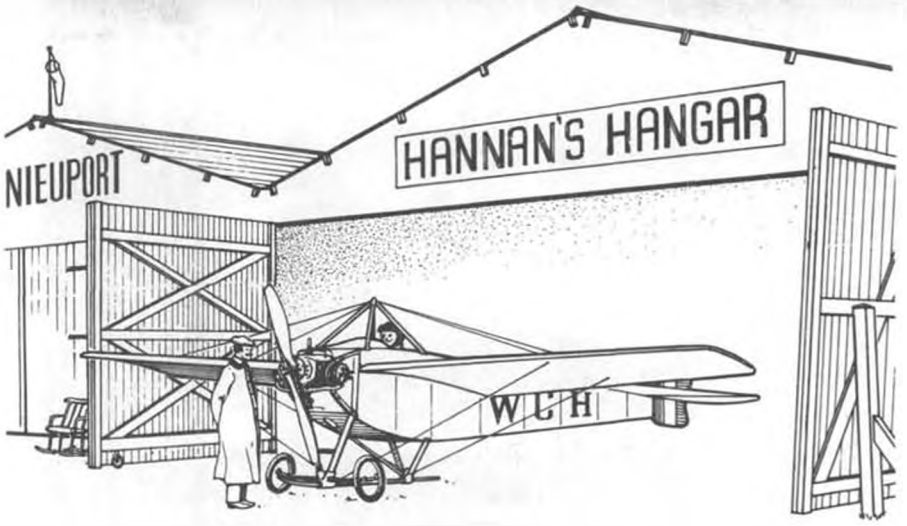
In Peanut Scale, there were twenty-one entries. The "Mooney System" was used for both flying and judging. Those of you interested in Peanut Scale realize

Continued on page 58

The ever-present Walt Mooney and his Jumbo Russian Kalinan K-5. Built in less than a week!

Just moved out from Pennsylvania, Ken Johnson, with his Gee Bee.

Our F/F Editor sneaks up on a couple of unsuspecting, wild Peanuts . . . down-wind, of course.



. . . only whisperings of sweet nothings, just for modeler's ears.

THE FLIER

Official newsletter of the UFO (Ultralight Flyers Organization) is called THE FLYER, and presents a monthly roundup of hang-glider activities in the Southern California area. Featured are photographs, editorials, handy hints and theory. Edited by Doug Fronius, who is also an active model builder, THE FLYER provides an easy way to keep up with the fast-growing field of hang-gliding. Details on subscriptions may be obtained from:

100 Stoney Knoll Road
El Cajon, CA 92021

THOSE GOOD OLDE DAYS

With all the current accent on advanced models constructed of space-age materials, we thought it might be refreshing to look back to the days when this hobby was still in its infancy. We have abstracted the following from the English magazine FLIGHT of July 27, 1912: MODEL FLYING IN AMERICA: "The first model aeroplane organization in America was started in February, 1907, and was known as the Junior Aero Club of the United States." The first outdoor contest was held November 6th, 1909, and the winning model travelled a distance of 92 feet. The year 1910 with Percy Pierce winning the A. Leo Steven's Year Cup with an R.O.G. flight of 222 feet, indoors.

A few other records mentioned, are as follows: 1,814 ft. 6 ins., set by Percy Pierce, flying a twin-prop monoplane weighing 1 1/2 ozs. (pretty light, eh?) in New York. This was beaten in San Francisco by R. G. Robinson's flight of 1,895 ft., and also by Armour Selly's 2,652 ft. distance. On December 29th, 1911, Pierce flew his "self-rising" model 412 ft., and his hand-launched duraction model for 91 seconds.

We also learn that J. F. MacMahon's model covered a distance of 2,003 ft. during an official contest. (Interesting to note that the 200 foot long rubber-power speed trap at the 1973 U.S. Nationals was considered too long by some entrants!).

END OF THE YEAR

That time has rolled around again . . . time to pause and reflect on the events of the past year, the completed (and uncompleted) projects, and all the interesting letters we have received here at

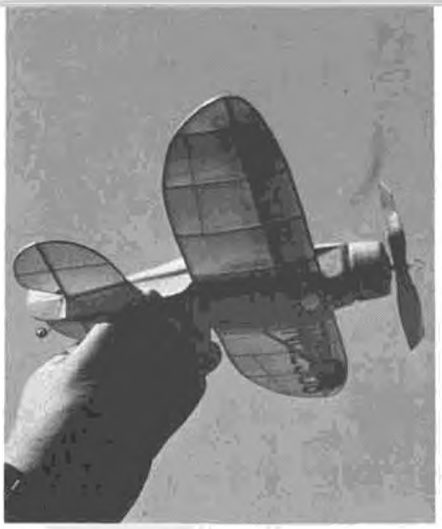
Continued on page 56

Beautiful Glenny & Henderson "Gadfly" constructed by Bob Clemens, who also took the excellent photograph. Rubber powered, the ship weighs 0.8 ounces.

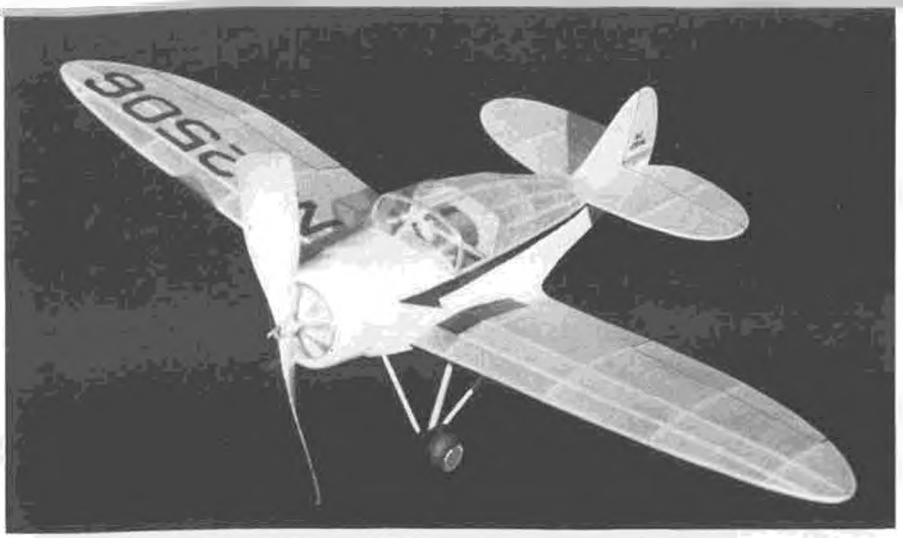
Chris Clemens launches his "No-Cal" (profile) Turbo-Porter, which took first in class at a Chagrin Fall meet in October. Clemens photo.

Great action shot. Paul Cherubini launches his Laird "Solution" at Chagrin Falls, Ohio. Rubber model photographed by Bob Clemens.

PHOTOS BY FUDO TAKAGI



About the most wing area you could get out of a 13 inch wingspan.



The Culver Dart's short nose moment was expected to be a problem in flying, but it wasn't. Turbulators were purposely added to the wing. Spars weren't notched into ribs.

PEANUT CULVER DART GW

By WALT MOONEY . . . The little Dart seems to offer further proof that turbulators are worth the effort. There are detailed instructions on making those beautiful, laminated curved outlines. Better read on . . .

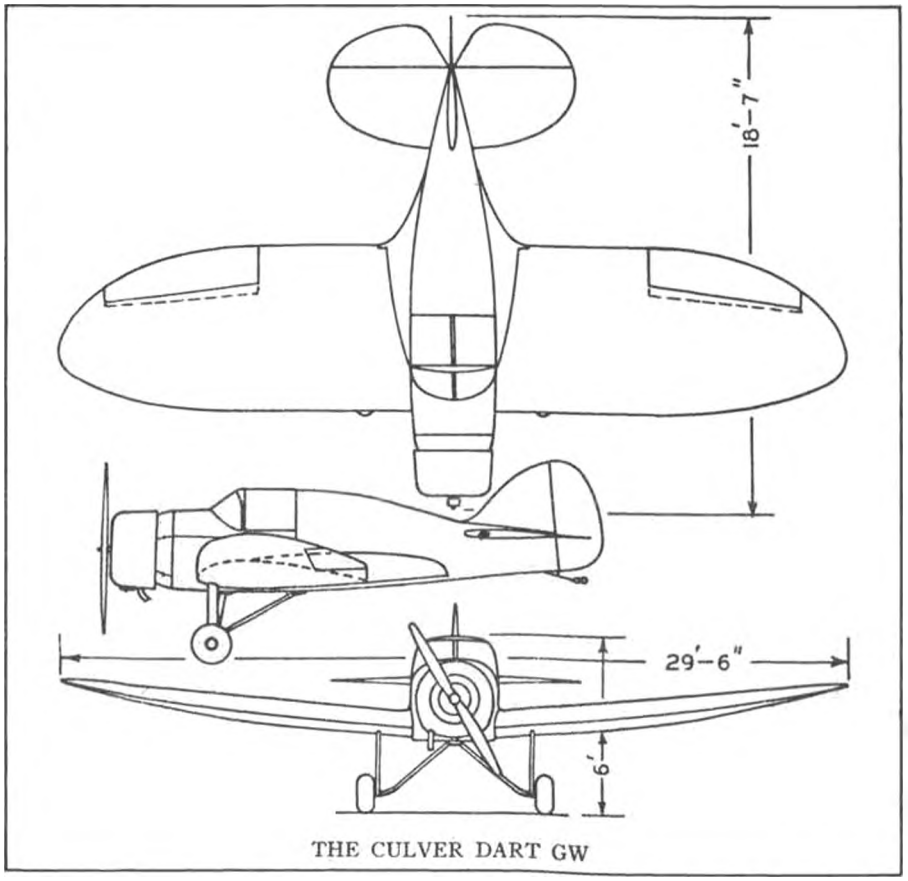
● The Culver Dart G.W. is a modern looking little lightplane that was designed just before WW II. Probably because of the war, it was never produced in any great numbers. Nevertheless, its cantilever elliptical wing and and its generally pleasing shape make it an intriguing model. It has a rather low aspect ratio, so that as a Peanut Scale model, it has quite a bit of wing area. The tail moment is rather short, so I expected the ship to be a little difficult to trim. The model in the photos was a pleasant surprise and flew easily, with the balance point at the C.G. indicated on the plans and about five degress of downthrust.

The outlines of the surfaces will probably be the greatest challenge to the average model builder, so we'll take the effort to give a good description of the method of making laminated outlines, while glossing over most of the other, more common balsa stick model structure.

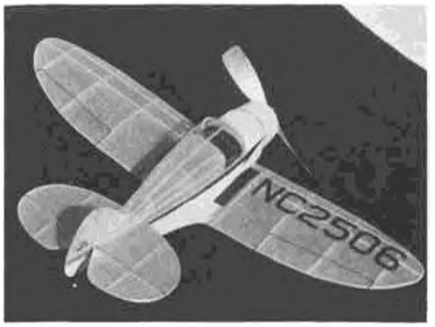
With a model such as this, it is probably best to start by making the outlines. The airplane in the photos had outlines laminated from model railroad basswood. This material is heavier than balsa, but it is also stronger, so by using smaller cross section material, there need not be much of a weight penalty. Use 1/64 by 1/16 basswood strips for the outline. If these are unavailable in your area, use 1/32 by 3/32 strips of balsa for the wing outline and 1/32 by 1/16 balsa for the tail outline.

There are probably some other glues that could be used, but the one I use for making laminated outlines is the com-

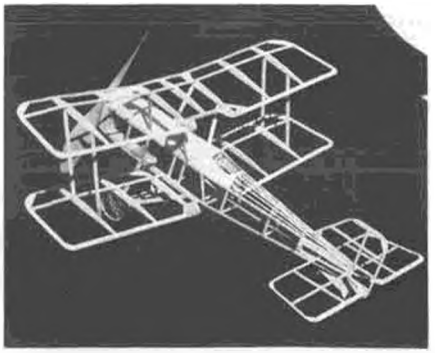
Continued on page 59



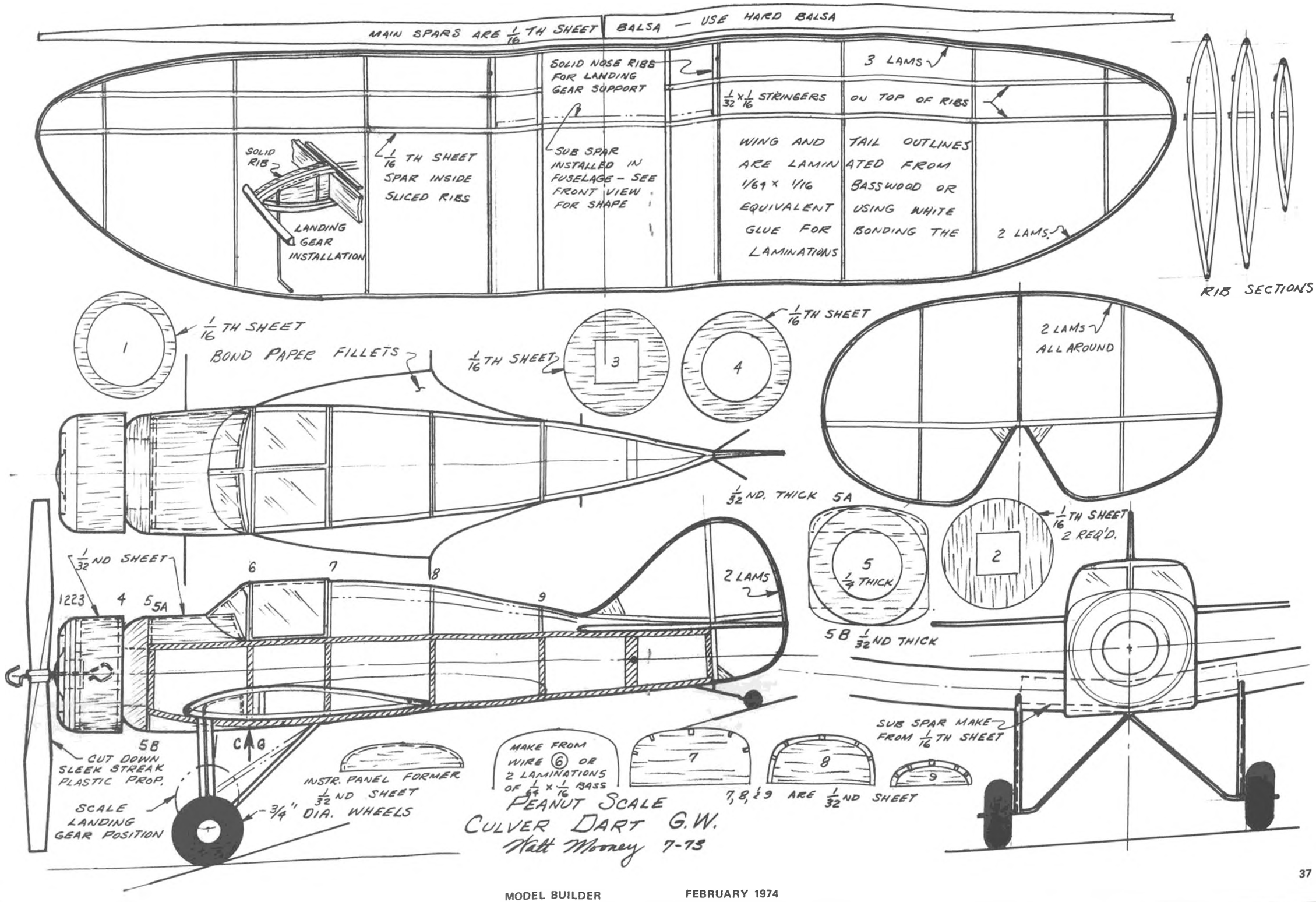
THE CULVER DART GW



Just 'cause it's a peanut is no reason to do without instruments! Note generous stab.



Coming attraction. Why overlook the obvious? Next month, the SE5.


MAIN SPARS ARE 1/16 TH SHEET BALSA — USE HARD BALSA
SOLID NOSE RIBS FOR LANDING GEAR SUPPORT
3 LAMS
1/32 x 1/16 STRINGERS
ON TOP OF RIBS
SOLID RIB
LANDING GEAR INSTALLATION
1/16 TH SHEET SPAR INSIDE SLICED RIBS
SUB SPAR INSTALLED IN FUSELAGE - SEE FRONT VIEW FOR SHAPE
WING AND TAIL OUTLINES ARE LAMINATED FROM 1/64 x 1/16 BASSWOOD OR EQUIVALENT USING WHITE GLUE FOR BONDING THE LAMINATIONS
2 LAMS
RIB SECTIONS
1/16 TH SHEET
BOND PAPER FILLETS
1/16 TH SHEET
1/16 TH SHEET
2 LAMS ALL AROUND
1/32 ND. THICK 5A
1/16 TH SHEET 2 REQ'D.
1/32 ND SHEET
2 LAMS
5 1/4 THICK
5B 1/32 ND THICK
SUB SPAR MAKE FROM 1/16 TH SHEET
CG
5B
CUT DOWN SLEEK STREAK PLASTIC PROP.
SCALE LANDING GEAR POSITION
INSTR. PANEL FORMER 1/32 ND SHEET
3/4" DIA. WHEELS
MAKE FROM WIRE (6) OR 2 LAMINATIONS OF 1/64 x 1/16 BASS
7, 8, & 9 ARE 1/32 ND SHEET
PEANUT SCALE
CULVER DART G.W.
Walt Mooney 7-73

PHOTOS BY GEORGE HOWARD

Brian Donn launching his own-design Wakefield. Has variable incidence surfaces. Seen at San Diego.

George Howard at Buckeye, Arizona, with unlimited rubber ship. Modified "Heeb" design. First at 1969 San Vallers annual.

FREE FLIGHT

By BOB STALICK

FEBRUARY MYSTERY MODEL

This 61 inch span model appeared originally in Air Trails of February, 1953. It was intended as an FAI Power model for the K&B .15 or as an A gas model with a .19. For a brief time, it was available in modified form as a kit.

JANUARY MYSTERY MODEL

For all of you sharp-eyed types out there who correctly identified the January M.M. as Frank Ehling's Super Phoenix, give yourself a pat on the back, a gold star and sit down for a drink of hot Ovaltine, because you're getting older than you think.

(Quite a few Ovaltine drinkers came up with the right answer, but the note from Harry Lowe, Hawthorne, Calif., a SCAMPS member, had the earliest postmark. His subscription has been extended one year. Be sure to send your answers direct to Model Builder. wcn)

DARNED GOOD AIRFOILS — THE NEELMEYER

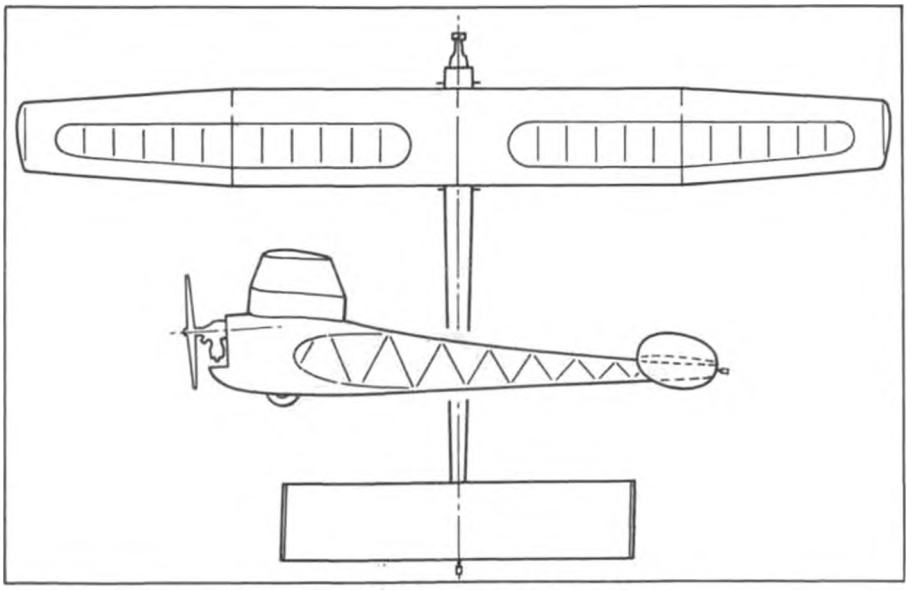
This month's DGA is just made for the FAI Power flier. In fact, that is what it's designed as. The Germans have used this section successfully in winning the Internats in FAI Power two times in a row. It is very similar to the Galbreath EROs section, which means it has a decent glide and a ripping climb. Might even consider using it as an AMA gas section, although it should be thinned down to around 8%. Try it, a little applied science never hurt anyone.

RUBBER MODELS and OTHER STRETCHY THINGS

Last month I spent quite a bit of space talking about gas models and designs. This is an era that has much interest in the free flight circles. But the granddaddy of all modeling is the rubber model. Of the many rubber events being flown today, the one offering the most opportunity for creativity in design is the Unlimited. This month's feature plan is of such a model . . . The Danger Mouse '72 . . . direct from the pages of S.I.N. (That's South Island News, from Down Under). The designer, Paul Masterman, has this to say about his model:

"This model is the latest development in a small series of Open Rubber models started in 1970.

"On my return to the aeromodelling



FEBRUARY'S MYSTERY MODEL

Judd Saba, kneeling, and "Chief" Brooks at San Diego. Unlimited rubber ship.

Lee Polanski holds for Tom Hutchinson at FAI Eliminations, Taft, 1969. Note plastic prop shield.

And Fudo Takagi, our regular Walt Mooney Peanut photographer, holds for Ed Dolby, at 1969 Taft Eliminations.

Darned Good Airfoil No. 2 - NEELMEYER

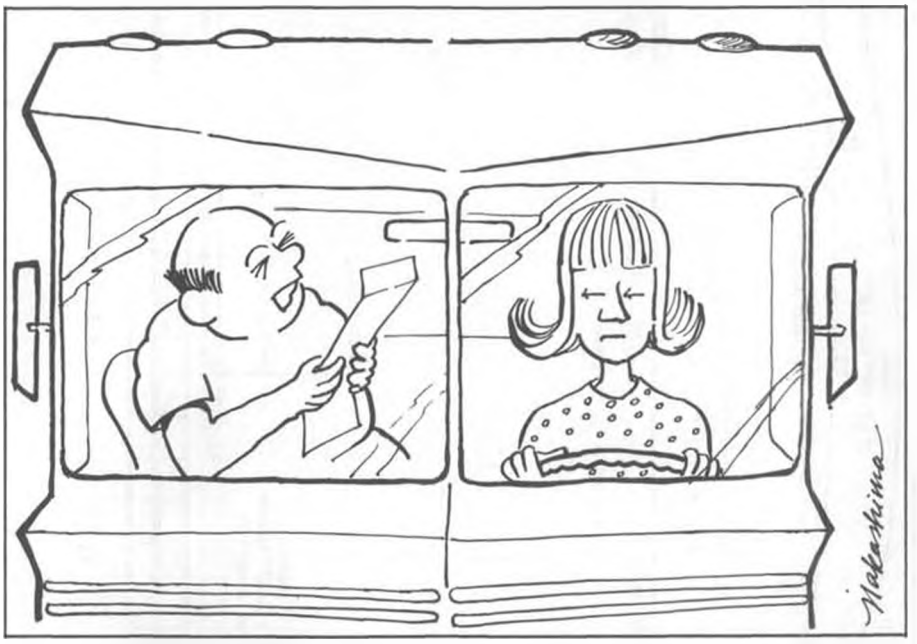
STATION	0	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	1.40	3.85	5.10	6.05	6.80	7.85	8.50	8.80	8.90	8.70	7.80	6.70	5.30	3.70	2.00	0.30
LOWER	1.40	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0

field in the late '60s, I decided that rubber was the most challenging (I never had managed any success with it in my long lost youth), and so I designed an Open Rubber model from scratch. It taught me a salutary lesson in that the model was an unspeakable disaster and hardly flew at all.

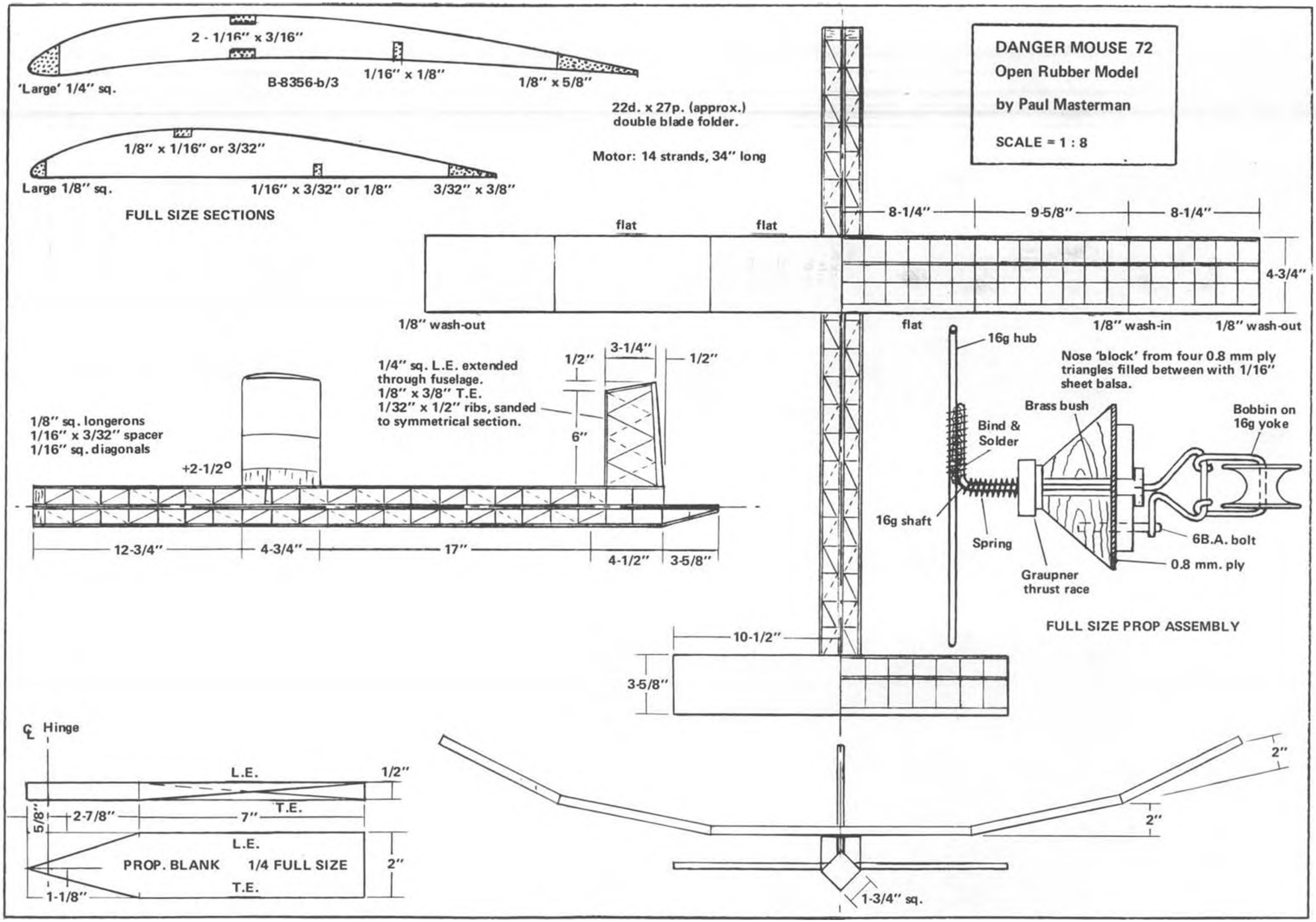
"My ego crushed, it seemed like a good idea to buy a plan from Aeromodeller and start again. The model chosen was Laurie Barr's 'Tripstick,' and its performance exceeded my wildest dreams. Its only fault was that the wing was very weak, having top and bottom spars of 1/16 x 1/4 set flat. These used to fail in buckling and produced an unusual wing top section profile, also the wing was extremely small, so my development of the original model had an increased span, with a slightly reduced chord, giving much more area.

"Right from the start, my 'Tripstick' development was a big improvement over the original model and started to

Continued on page 66



"Let's see now; sun tent, money, folding chairs, sunglasses, salt tablets, suntan oil, beer, water, battery, fuel, props, stopwatch, fuse, matches . . . . . Marcia, turn around . . . we've forgotten the Starduster !!!"


2 - 1/16" x 3/16"
'Large' 1/4" sq.
B-8356-b/3
1/16" x 1/8"
1/8" x 5/8"
1/8" x 1/16" or 3/32"
Large 1/8" sq.
1/16" x 3/32" or 1/8"
3/32" x 3/8"
FULL SIZE SECTIONS
22d. x 27p. (approx.) double blade folder.
Motor: 14 strands, 34" long
DANGER MOUSE 72
Open Rubber Model
by Paul Masterman
SCALE = 1 : 8
8-1/4"
9-5/8"
8-1/4"
flat
flat
4-3/4"
1/8" wash-out
flat
1/8" wash-in
1/8" wash-out
1/4" sq. L.E. extended through fuselage.
1/8" x 3/8" T.E.
1/32" x 1/2" ribs, sanded to symmetrical section.
1/2"
3-1/4"
1/2"
6"
1/8" sq. longerons
1/16" x 3/32" spacer
1/16" sq. diagonals
+2-1/2°
12-3/4"
4-3/4"
17"
4-1/2"
3-5/8"
16g hub
Nose 'block' from four 0.8 mm ply triangles filled between with 1/16" sheet balsa.
Brass bush
Bobbin on 16g yoke
Bind & Solder
16g shaft
Spring
Graupner thrust race
6B.A. bolt
0.8 mm. ply
FULL SIZE PROP ASSEMBLY
10-1/2"
3-5/8"
℄ Hinge
L.E.
1/2"
T.E.
5/8"
2-7/8"
7"
L.E.
PROP. BLANK 1/4 FULL SIZE
T.E.
2"
1-1/8"
2"
2"
1-3/4" sq.

Warren Hoaglund, Grand Junction, Colo., about to launch his Starduster 600-X. Kirk Kirkham timing. Retriever is ready to go!

Chicago Nats flier Gil Robbins' "N.G. Marcus Eureka" closely follows AMA Gas concept design shown in last month's column.

Chuck Peer of Arvada, Colo., adjusts needle as wife lights fuse on 1/2A Starduster. Colorado photos by Harry Sutherland.

NATIONAL FREE FLIGHT SOCIETY NEWS

NATS SITE APPROVED

By unanimous vote the AMA Executive Council has approved the Chennault Air Force Base in Lake Charles, Louisana for the 1974 Nationals. From the looks of the layout in Competition Newsletter, the site will be super for all types of models. Dates for the Nationals will be August 5th through the 11th, with the possibility of it being extended to 10 days so that provisional events may be included.

I would like to take this opportunity to thank Mr. John Embry and the other members of the Lake Charles Area Radio Kontrol Society for their thoughtfulness and hard work in bringing to all modelers across the country a site that promises to be fantastic. I wish the name of your club had been the Lake Charles Area Free Flight Society but it doesn't make any difference. As long as everybody in modeling works together for a successful NATS, then everyone benefits. From the looks of the map, I'd be willing to bet that at some time in his life, John Embry has flown a free flight aircraft!

CLUB MEMBERSHIPS

As this is being written, we still have a few days of 1973 left. The response to our club deal has been terrific. I have not had time yet to process all the memberships, but it appears that we have picked up a lot of new members and have a number of 100% NFFS Clubs. To those hard working officers out there . . . THANK YOU.

WINTER/SPRING POSTAL CONTESTS

January & February: Midwinter Iceberg Indoor Postal

March & April: Easter Rabbit Mini Postal

May & June: Spring Thermal Maxi Postal

These contests are sponsored by the Star Skippers Newsletter and are for young free flighters 15 years of age and under. The January issue of the NFFS Digest has all the rules, but if you are one of the unfortunate few who are not members of NFFS and don't receive the Digest, you may write to Mr. Richard Whitten, P.O. Box 176, Wall Street Station, New York, N.Y. 10005.

NFFS MEMBERSHIP AND RENEWAL APPLICATION

(Make checks payable to; National Free Flight Society)

Mail to;
B.J. Kelch, R.R.4, Box 475,
W. Terre Haute, Ind., 47885

			FEES 1 yr	FEES 2 yrs
RESIDENTS OF FOREIGN COUNTRIES			$6.00	$11.00
U.S. RESIDENTS	Age 19 and up	AMA Members	6.00	11.00
		Non-AMA Members	7.00	13.00
	Age 15, 16, 17, and 18 (Senior)		3.50	6.00
	Age 14 and under (Junior)		1.50	2.50
	Family membership*		1.00	2.00

All members receive NFFS Digest. Family membership fee includes all additional family members, but no additional copies of the Digest. Ages are as of July 1 of current year. Please circle applicable fees.

New Member ☐
Renewal ☐
Address Change ☐

Current expiration date:
Month Year

Name AMA No.

Address

City, State Zip

*Please list family members
Name

AMA No.

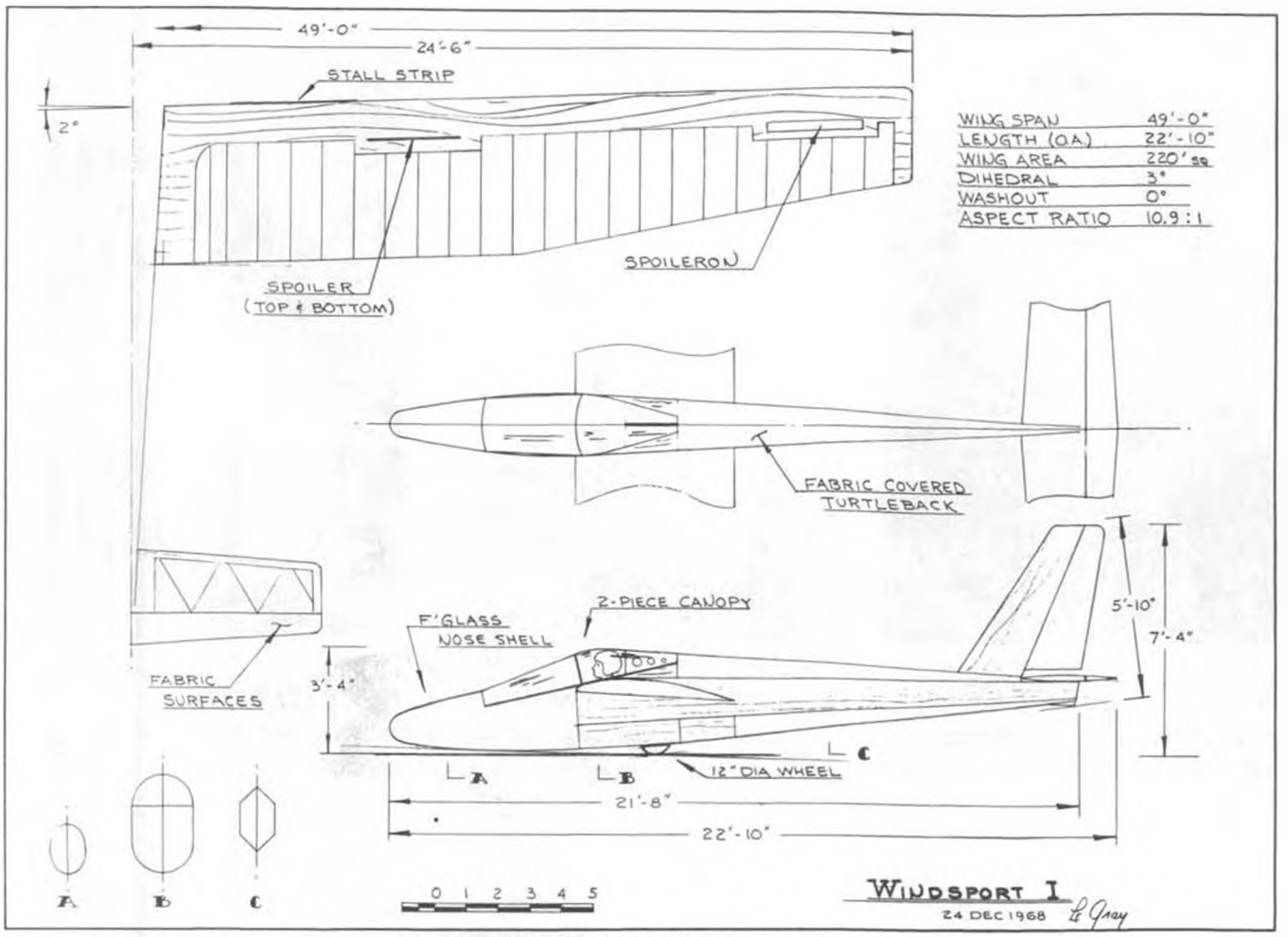


FIG. 3 - GENERAL ARRANGEMENT DRAWING

R/C SOARING

By LE GRAY

Original-design flying scale R/C sailplanes placate creative urges of the inner man . . . or, fun and games need not be just those of the parlor . . . or, Walter Mitty, let it all hang out!

● Modelers are doodlers. Put a pencil and a piece of paper in a room occupied by a modeler, allow a few minutes fermentation, and that paper will be filled with aerodynamic visions . . . imaginative and exciting.

Consider these folks to be aeronautical designers. And that they are. Frustrated, perhaps may be even misguided, and almost surely, unfulfilled. But if there's a common thread strung among us, it's that we're airplane designers. Unsung. Unrecognized.

Now any modeler will sketch away at his prime event type craft, be it free-flight, R/C pattern, pylon or soaring. These scribbles often are forerunners of eventual modeling subjects. As a matter of fact, most designs originate just this way. The majority of doodlers . . . make that designers . . . will often let their thoughts drift to the wonderful world of derring-do, where the throb of a mighty radial engine makes scallop-and-sunburst-doped fabric vibrate in anticipation of headline banner flights.

Or there is the soaring enthusiast whose sketches, which are considerably more sophisticated than doodles, conjure flights of fancy at L/D of 1 to infinity and sink rates less than the Goodyear blimp. Long, long wings . . . fuselage contours for an airborne sculpture . . . an optically perfect canopy reflecting the morn's rays. The pure and romantic world of the mind.

Every designer creates dream-machines, but the R/C soaring sportsman need not let his mind missions go unlaunched. Why not built it . . . a three-dimensional, fully operational, soaring original? This does not suggest a five-year commitment to the detail design, structural analysis, and laborious fabrication of a man-carrying vehicle. Rather, a flying scale R/C model of an original design. Why not? A lot of the full-scale designers and major manufacturers do it. Even Jim Bede and NASA . . . not necessarily in order of importance. But not necessarily not.

Obviously, some clown could put a bubble canopy on the front of a Zaic "Floater" and call it his dream ship, but that's hardly the intent of original-design, flying scale. Let's daydream some ground rules.

To be realistic . . . and meaningful . . . designs should be considered first as full-scale and second as models. Fuselage dimensions must be adequate to accommodate a reasonably sized and proportioned human form. Wing spans should recognize competition class limitations (15-meter maximum for Standard, no limit for Open Class); sport soaring categories such as the new 13-meter Class home-builts; or possible existing design modification. Wing as-

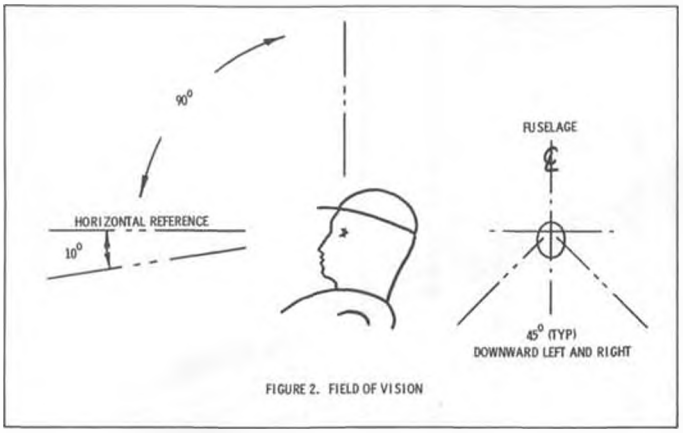


FIGURE 2. FIELD OF VISION

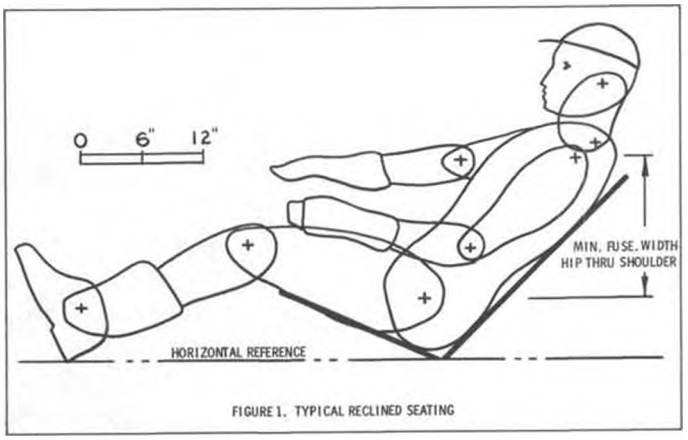
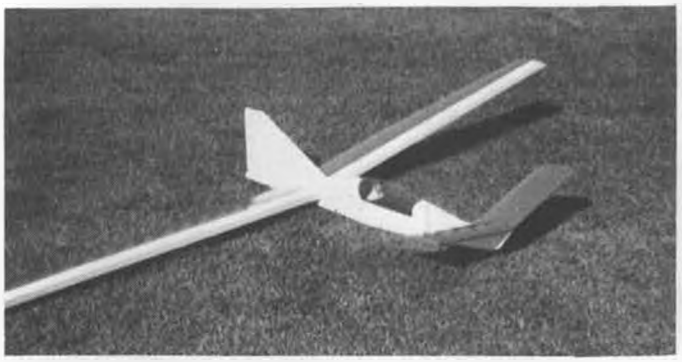


FIGURE 1. TYPICAL RECLINED SEATING



The "Duck" . . . English translation for "canard" had problems, the last of which was a hung up towline. A 500' outside loop to ground!

Le Gray's Gypsy Gull has typical Windancer lines, and is an excellent flier . . . Le told us to say that. Actually, it is. We used it for a while.

pect ratio, tail surface areas, spoilers, flaps, and landing gear should be planned with reference to the full-sized craft. Variations to make a practical model of the design . . . such as enlarging stabilizer area or increasing dihedral angles . . . should be initiated only after the full-scale features are fixed.

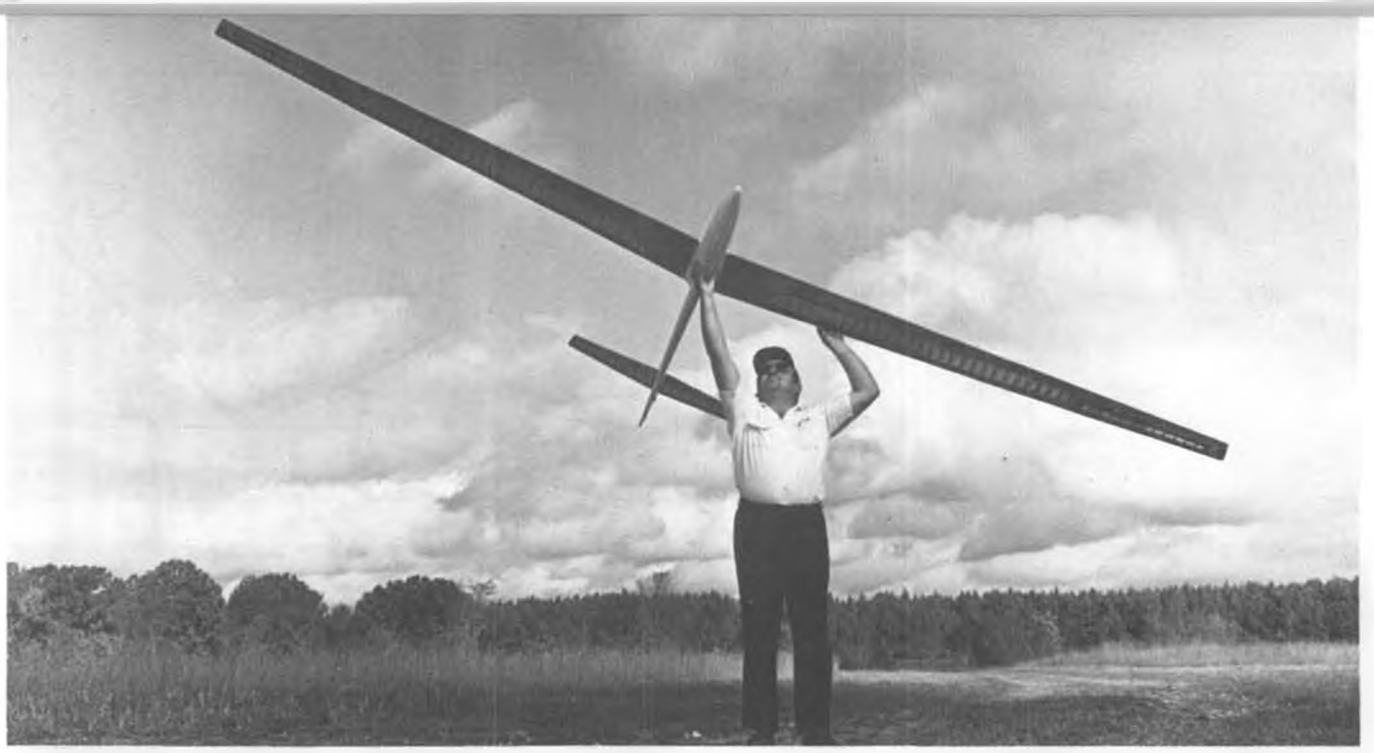
During the layout of the original aircraft, the designer must consider the capabilities and limitations of his production facilities. If the would-be-configuration is intended for the home-builder, typical woodworking tools and basic metal and fiberglass equipment should be assumed. If the design is of the ultimate, no-holds-barred, cost-is-no-object category, little thought need be given to engineering economics. The creation should be approached not only with a purpose and/or market in mind, but also with a defined manufacturing setup. An imaginary world must be created and accepted as fact. Then the task of the designer is not unrealistic, blue-sky, Star-Trekish synthetics, but rather, achieving logical and economical solutions to a specified problem. The approach and philosophy is much the same as that of a novelist. The writer . . . or in our case, the designer . . . creates a world of circumstances and characters in a time period according to his desires. He, or his cast, lives, acts, and reacts consistent with this world. And so does the designer.

There is no reason, for example, that the designer must accept "today" as his era. Though contemporary vehicle configurations may be popular with most sportsmen, the nostalgic appeal of aviation's golden or classic years might be attractive to some who grew up with Phineas Pinkham (if you gotta ask, don't bother). Lots of paper has been filled with round-engined, multi-winged craft, and in the world of silent flight, what has ever been more beautiful than the gull-winged, clear-fabric Minimoa? You know, it's just the kids that think a gull wing cranks downward.

So the first step is to establish the environment and era of which the design is created. Secondly, the ground rules for fabrication capabilities should be set. Thirdly, the criterion for the design must be defined. With these parameters established, serious . . . well, it's all in fun . . . effort can be expended to resolve design problems and create a practical and producible man-carrying soaring machine.

Probably the most frustrating area to a modeler-turned-designer is the seemingly outlandish fuselage dimensions associated with encapsulation of a human body. Compared with the sleek and slender model fuselages, a true-to-scale man-carrying configuration appears

Le's Hangar Queen was designed along the lines of gliders in general use during the 1930's. Le sure has a way with Monokote.



Chet Tuthill shows off his Dreamer II It's equipped with spoilers, ailerons, and R/C tow release. The soarer has a 16 foot wingspan and uses a Miskeet fiberglass fuselage (Fliteglas Models, 505 E. 6th St., Neoga, Illinois 62447). Photo by Roy Stephens.

absolutely obese. Small-scale sketches of pure visionary genius often come all unstuck when confronted with real people sizes. If direct scaleup is initiated, wing span often grows to 100 or so feet, and fuselage lengths stretch to 40 or 50 feet before a pilot's compartment is big enough to accept anything other than a midget or a carnival thin man.

The obvious answer is to start with the minimum envelope requirements. Figure 1 gives a usable human form outline. The exact posture for reclined seating can be adjusted by rotating the marked, natural pivot points. A bit of tracing paper can be helpful.

Since most human bodies are three-dimension (yea, for the third dimension!), the fuselage top view or pilot's compartment plan must also be considered. Basically, a two-foot width must be allowed for the normal pilot. This is an external dimension, and 21 or 22 inches are an absolute minimum from pilot hip to shoulder position. There also must be room for the pilot's feet and knees. Remember, the control column and sometimes instrument consoles are positioned between the pilot's legs. The control stick must have clearance for sideways movement, however, a control wheel can overcome this problem in extreme circumstances. The Baby Albatross, for example, used a wheel rather than stick for just this reason. The pilot must be able to see . . . forward over the nose, out each side, downard, and even rearward. Figure 2 shows some reasonable limits.

Some consideration should be given to landing wheel position and configuration . . . fixed or retractible. Is the machine to be equipped with spoilers, flaps, landing drogue chute? It's the designer's choice. What are the criteria to be satisfied?

With the personnel and equipment envelopes defined, the configuration characteristics specified, and the major airframe dimensions established, the preliminary general arrangement drawings can be started. A workable scale for these conceptual three-view drawings is 1/2" = 1'0" (one twenty-fourth-size). One point of advice: make your lines very light. There probably will be a lot of revisions before the final form is fixed. During this stage, tracing paper can be most useful for "over-sketching" to compare variations and try possible changes before committing to hard lines.

The final three-view, Figure 3, should be expanded to incorporate the primary dimensions . . . wing span, overall length, elevator span, dihedral angles . . . as well as two or three fuselage cross-sections. Major transition lines that indicate metal, wood or fiberglass verses fabric covering should be shown. Rib spacing and fuselage stringer positions, if approate, can add interest. Hinge lines for all moveable surfaces and compartment or access covers should be defined. As a final step, the general arrangement drawing should include a table of dimensions and areas.

The next step is to select a scale ratio for the R/C model. Many current scale sailplane kits and magazine designs favor 1/6 (2" = 1'-0") size. This usually provides a workable model . . . approximately an 8-foot span for a full-size 15-meter sailplane. A few enthusiasts go up to 1/4 (3" = 1'-0") size, but this can get rather huge . . . quick. Fuselage dimensions take on the values of a prize watermelon. There's a lot to be said for 1/5 size (2.4" = 1'-0") . . . as a matter of fact, a lot was said for 1/5 size in the January 1972 issue. You might want to review that dissertation. It was beautifully written . . . *(and skillfully edited! wcn)*

The primary advantage of 1/5 size is that it offers a significant increase in wing area . . . beyond that of 1/6 scale . . . without a corresponding jump in linear dimensions, because area increases by the square. Wings will still fit in a VW . . . wing panels, that is . . . and fuselage cross-sections aren't classified "R" for ridiculous.

From here on, you're in the model designing business. The December 1973 column covering tail volume coefficients and the like might be of some interest. Other than that, plan your structure, materials, and other construction features to best simulate the original, full-scale characteristics. Any internal details, of course, are to the discretion of the builder, but a realistic pilot's head form is essential for respectable in-flight appearance. Fortunately, the Formula I power pylon racing pilot heads by Williams Brothers are close enough to 1/5 scale to be useful, and 1/6 scale heads come in a variety of styles. Or you can carve your own.

Any scale R/C sailplane needs appropriate lettering, numbers, and insignia. Tasteful use of them will certainly add to the autheticity of an original design. It needn't be a big project. Amazing things can be accomplished with decals that are available from the local hobby emporium. Super Monokote and similar materials are great for large cutout letters, emblems and insignia. Just draw what you want on plain paper, pin it

Continued on page 68

The whole fascination of Peanut Scale is summed up in this photo of the author's P-9. The secret to success is getting detail without added weight.

BOULTON & PAUL P-9...BONUS PEANUT

By ED. F. HEYN . . .Peanut Scales are great . . . Biplane Peanut Scales are even greater . . . As we've had a bonus crop of 13 inchers this season, we figured it was time to double up. Plans on next two pages.

● In 1918, Boulton & Paul, LTD. of Norwich, England, produced a small squarish two-seater biplane powered with the reliable 90 hp. RAF IA engine. Designated P-6, it was one of the earliest examples of an airplane built specifically for full scale aerodynamic research, particularly for investigation of the characteristics of airfoil sections. The single aircraft constructed was later used extensively by the Boulton & Paul sales division.

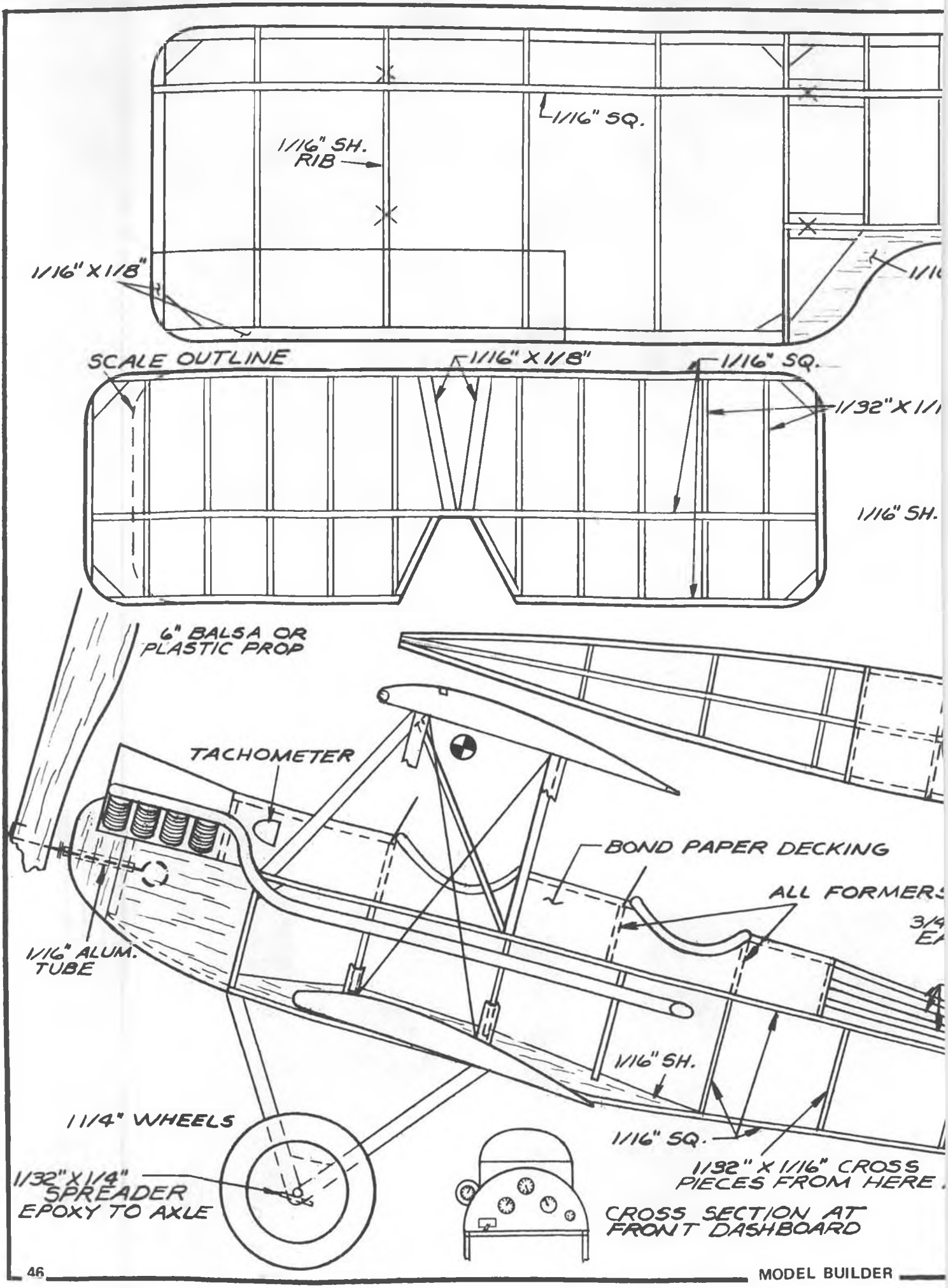
After the Armistice, the RAF IA engine was sold surplus, as was the comparable Curtiss OX-5 engine in this country. The Boulton & Paul P-9 was basically a slightly enlarged P-6 designed to utilize the surplus engine, with sales to the civilian market. Several P-9's were built in 1919-1920. However, it was in competition with many cheap surplus military aircraft and sales were not up to expectations. With 3 hours of fuel aboard, the P-9 could climb to 5000 feet in 8 1/2 minutes. It had a maximum ceiling of 14,000 ft., a top speed of 104 mph, and weighed 1770 lbs., fully loaded. In 1921, two P-9's were entered in the Kings Cup Race around England. One of these, G-EASJ, piloted by Mr. C. T. Holmes, is the subject of this article.

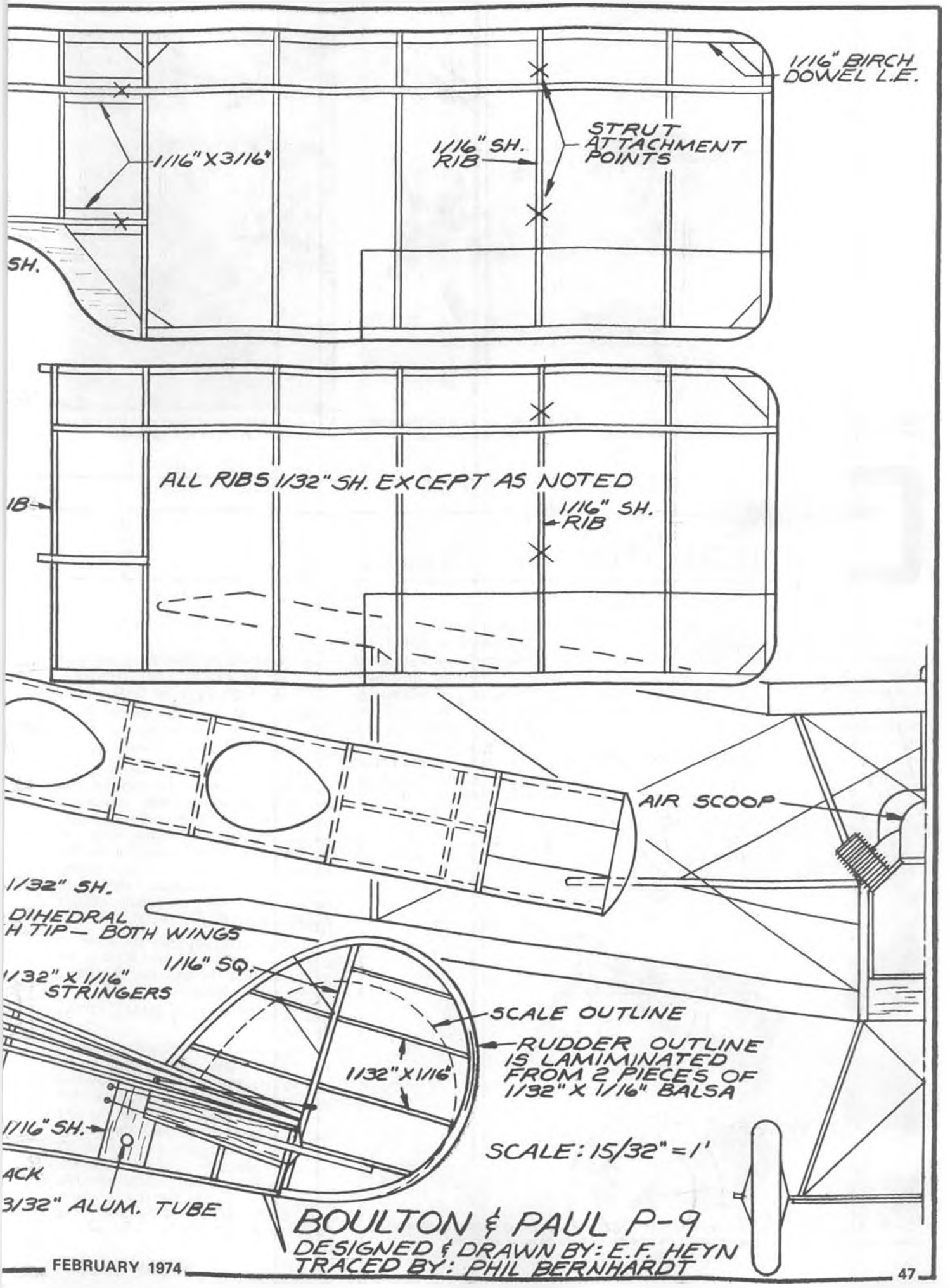
Construction of the P-9 is not difficult, but like all bi-planes, two wings adds up to more work and extra care in alignment than a monoplane. The fuselage is a square structure with 1/16 square longerons. Make both sides together. Note that lightweight 1/16 sheet is used in the nose, at the lower wing and stab supports, and also for the rear peg support. Don't worry about the nose sheeting, as it is more useful there than a blob of clay. Before separating the sides, drill through two 1/16 holes for the lower wing spar stubs, a hole for the rear peg, and cut in the slot for the stab. Vertical members are 1/16 square forward of the rear cockpit and 1/16 x 1/32 aft. Top formers are of

Continued on page 63

The pleasing lines of the Boulton & Paul P-9 are all evident in this photo, which first appeared in an earlier issue of Model Builder. Author tells how to use rub-off lettering on tissue.

Rudder's eye view of the cockpit. Exhaust pipes bent from aluminum tubing.


1/16" SQ.
1/16" SH. RIB
1/16" X 1/8"
SCALE OUTLINE
1/16" X 1/8"
1/16" SQ.
1/32" X 1/
1/16" SH.
6" BALSA OR PLASTIC PROP
TACHOMETER
BOND PAPER DECKING
ALL FORMERS
3/4
E
1/16" ALUM. TUBE
1/16" SH.
1 1/4" WHEELS
1/16" SQ.
1/32" X 1/16" CROSS PIECES FROM HERE
1/32" X 1/4" SPREADER EPOXY TO AXLE
CROSS SECTION AT FRONT DASHBOARD


1/16" BIRCH DOWEL L.E.
STRUT ATTACHMENT POINTS
1/16" SH. RIB
1/16" X 3/16"
SH.
ALL RIBS 1/32" SH. EXCEPT AS NOTED
1/16" SH. RIB
IB
AIR SCOOP
1/32" SH.
DIHEDRAL
H TIP— BOTH WINGS
1/16" SQ.
1/32" X 1/16" STRINGERS
SCALE OUTLINE
RUDDER OUTLINE IS LAMIMINATED FROM 2 PIECES OF 1/32" X 1/16" BALSA
1/32" X 1/16"
1/16" SH.
ACK
3/32" ALUM. TUBE
SCALE: 15/32" = 1'
BOULTON & PAUL P-9
DESIGNED & DRAWN BY: E.F. HEYN
TRACED BY: PHIL BERNHARDT

Testor's ready-to-fly planes are realistic looking, have muffled engines, and with the low pitch prop, fly slow enough to be easy to handle for the beginner. This little P-51 is typical.

Maybe not a confirmed modeler in the making, this shows what can be accomplished.

Control line

By DALE KIRN

● For the past few months we have been reporting on the achievements of modelers throughout the country. But what about the beginner in control-line flying? This month's column will be devoted to him. What is the best plane/engine combination for a "first plane"? What kind of problems do we know he will encounter? How can we help him?

Let's face it. The chances of a beginner having successful flights with a control-line plane are very rare. There are just too many things to learn all at once. Without the help of an experienced flyer, his chances of success are very slim. He must quickly master the following (but not necessarily in this order):

1. Give the correct amount of "up" and "down" without crashing;
2. Maintain line tension at all times;
3. Make sure the engine is not set too lean or too rich;
4. Take-off position must be right for the existing wind conditions;
5. Don't get dizzy the first time up.

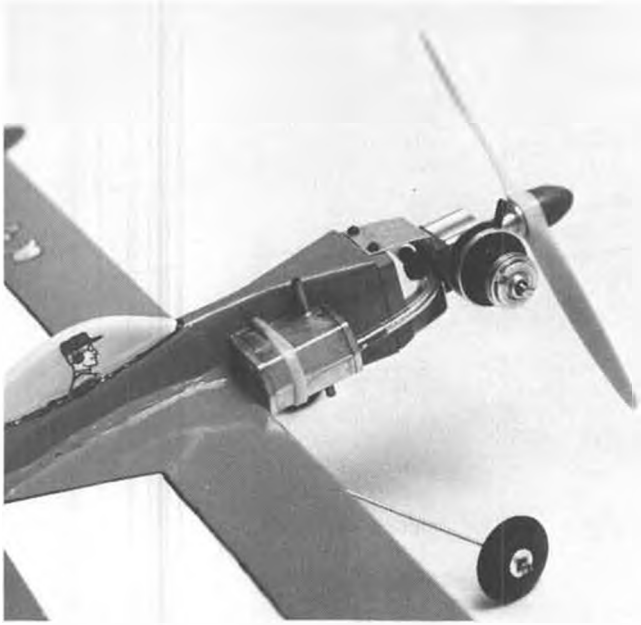
How about those for openers? *(To say nothing of just getting the engine started in the first place! wcn)*

And if the plane is a kit or home-made job, he must also consider the following important items: the right balance point, free control system, correct alignment of engine, wing and tail assembly, secure mounting for the engine, proper tank location and venting system, correct line diameter and length, proper line spacing on handle, correct handle adjustment, etc., etc!

Even if everything on the plane is absolutely perfect, there is still no guarantee that the beginner can fly it successfully by himself.

BIG PLANES VERSES SMALL (1/2A) PLANES

The experienced control-line flyer sez ya gotta learn with a big engine (.15 to .35), as they have enough pull on the lines to fly right. Can't argue with this reasoning, as it is true. But the cost factor is something else. You could easily spend thirty-five to forty dollars for a beginner plane. A large plane will penetrate the wind better and have less chance of slack lines, but it will require the correct amount of control for a successful flight.



Carl Goldberg Models "Wizard", with the Cox "QZ" (for Quiet Zone) muffled .049, is an excellent combination for beginning C/Lers who prefer to build balsa airplanes.

Dale Kirn doing his thing at a Chicago Nats. Cox and Testors introduce many this way.

On the other hand, we have the two types of 1/2A planes – the plastic ready-to-fly type and the balsa kits. The plastic plane is usually the first plane a youngster gets. These planes are quite difficult for a beginner to learn to fly on. The only thing going for them is the cost. A complete plane (plastic) with starting accessories sells for about ten dollars. Both Cox and Testors produce such planes.

The control response on most 1/2A planes is "quicker" than on a larger plane. This is especially true of extremely light weight balsa planes. Because of this, most beginners will "over control" and crash on their first time up. These planes should be flown only when the wind isn't blowing very hard (maximum of 8-10 MPH). The ideal weather would be absolutely no wind, with a smooth asphalt take-off area and grass for the remainder of the flight circle.

For training purposes, 1/2A planes are OK for calm weather, but use a bigger plane/engine if you must fly in moderate to strong winds.

CONTROL LINE TRAINING CLASSES

There is no question that every beginner should have the assistance of an experienced flyer when he goes up for the first flight. If an instructor is not available, there is ninety-nine per cent chance that the plane/pilot will not complete the first flight!

Some model clubs have training classes for beginners . . . with excellent results. Also, several Junior High Schools now have control line clubs being taught by dedicated instructors after school hours.

Unknown to most modelers are the teaching sessions put on by both Cox and Testors throughout the year. The majority of these sessions are done at shopping centers, usually tied in with a store that is handling the plastic ready-to-fly planes. Both firms put in many hours of such training flights at last year's Nationals. Sure would be neat if some of the balsa kit firms (who make control-line trainer kits) could do the same thing.

Plastic ready-to-fly planes is a big business. Nearly one-and-a-half million plastic planes are sold annually! Currently there are about twenty different types of planes available. These training sessions put on by Cox and Testors are good, but they unfortunately, just don't have the time to work with the youngsters for more than one or two flights. A few "flyers" will actually be successful, and will probably get one of these planes.

Testors has an interesting approach to the ready-to-fly planes. They make several small planes (P-40, P-51, ME-109, Zero, etc.) that are flown on quite short lines (approx. 8-10 feet). A low pitch prop is used to slow the plane down, and a muffler is included so they can be flown almost anywhere without a noise complaint. Hats off to Testors for that!

CONTROL LINE

Most of their planes are flown on full "up" and are very successful in calm weather. Very little problem with line tension on short lines, but this can quickly be offset by dizziness if the plane really gets going . . .

Cox makes larger planes, which fly on longer lines . . . twenty-five to thirty feet. Naturally, a larger flying site is required. These planes are more responsive to control than Testor planes. Cox recommends its PT-19 for beginners, but many of the faster planes (P-51, Sopwith Camel, etc.) are received by a youngster for their first plane. So what happens then? They will try to fly it, and usually with poor results. Nearly all of the Cox planes fly too fast for a beginner if the engine is completely leaned out.

CONCLUSIONS

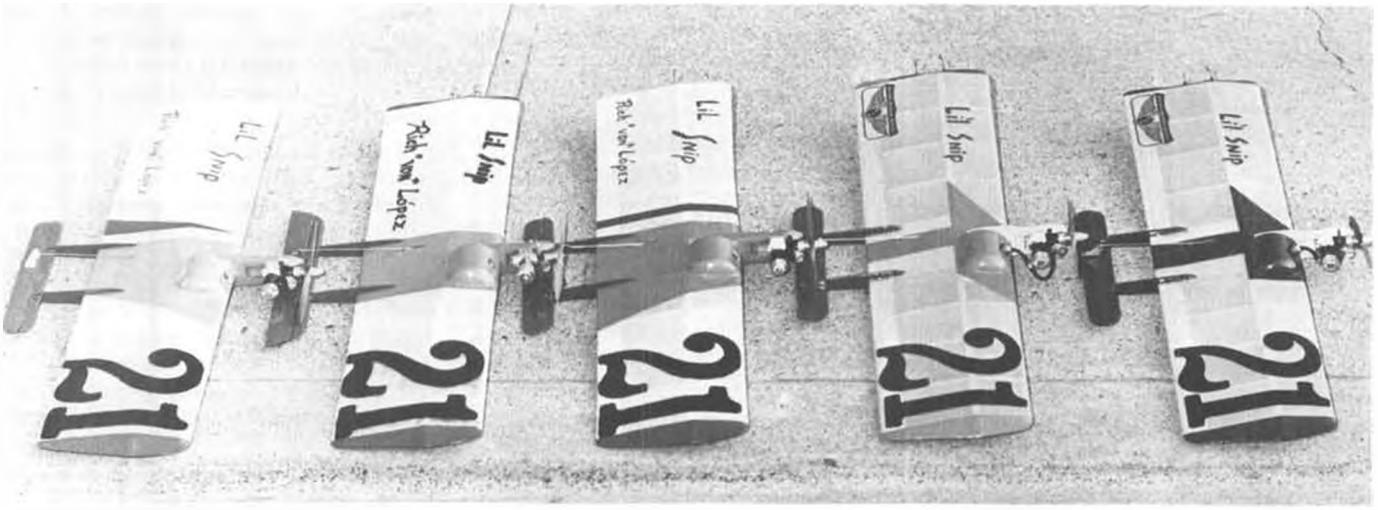
Thousands of ready-to-fly planes have just been received this Christmas. An overwhelming majority of youngsters will get their first (and last) exposure to control line planes (or modeling, in general) via this type plane. It is now up to the local clubs to institute a training program to help as many of these potential flyers as they can.

There is no short cut to teaching someone how to fly control line. It takes time, patience, technical know-how, and an unselfish attitude in order to qualify for a good instructor. Now is the time for you experienced flyers to pass some of your skills on. It isn't important whether you teach with a 1/2A or a larger plane. The important thing is that you start teaching.

Let us hear of your training programs and any suggestions you have on this subject. ●

"It'll never fly, Kirn!" Dale tries to take some of the mystery out of starting and adjusting an engine for interested onlookers. This is largest single bottle-neck to many budding modelers.

PHOTOS BY EDMOND L. BRIDANT



Rich Lopez builds Li'l Snips by the yard! Combat can eat 'em up pretty fast, so a quick and easy building model is needed for this event.

LI'L SNIP .... 1/2A Combat

This 1/2A combat ship was designed for Western Associated Modelers (W.A.M.) competition, in which it has held a record of 70 points since August of 1969. Construction is fast and easy. By RICH LOPEZ.

● The Li'l Snip was designed for Western Associated Modelers (W.A.M.) 1/2A Combat. The aircraft was developed with several things in mind; durability, good flying characteristics, ease of building, and limited expense. Combat has always had the reputation of being an expensive event. The Li'l Snip minimizes the expense, maximizing the flying time and pleasure.

We were prompted to design the Li'l Snip because of the fact that there are no serious 1/2A combat aircraft on the market . . . that is, aircraft designed around the powerful Cox Tee Dee .049 engine. The 1/2A combat aircraft on the market are designed for use with Baby Bee or Golden Bee engines. In W.A.M. competition, these do not stand any sort of chance. Cox Tee Dee .049's or Kirn-Kraft Tee Dee .049's are the hot tip in W.A.M.

The Li'l Snip's stability makes it a suitable aircraft for both the beginner and expert flyer. Half-A combat is the way for U-Control flyers to break into combat flying. Snip's are inexpensive to build and fly, as fuel consumption for the .049's is minimal. Cox Tee Dee .049's can be obtained from any hobby shop and custom Kirn-Kraft .049's are also available through special order. *(See ad in this issue.)*

Upon looking at a Li'l Snip, one can see that there is nothing difficult about the construction. It features a 12-rib diamond airfoil wing, a 1/4 inch square leading edge of either balsa or spruce, 1/4 x 1/8 top and bottom spars, and a planked trailing edge using 2 different sizes of wood (1/16 x 1 and 3/32 x 1).

The wings build flat on a board. We made a jig on a 1 by 4 foot fiberboard for their construction. It is simple but but very effective.

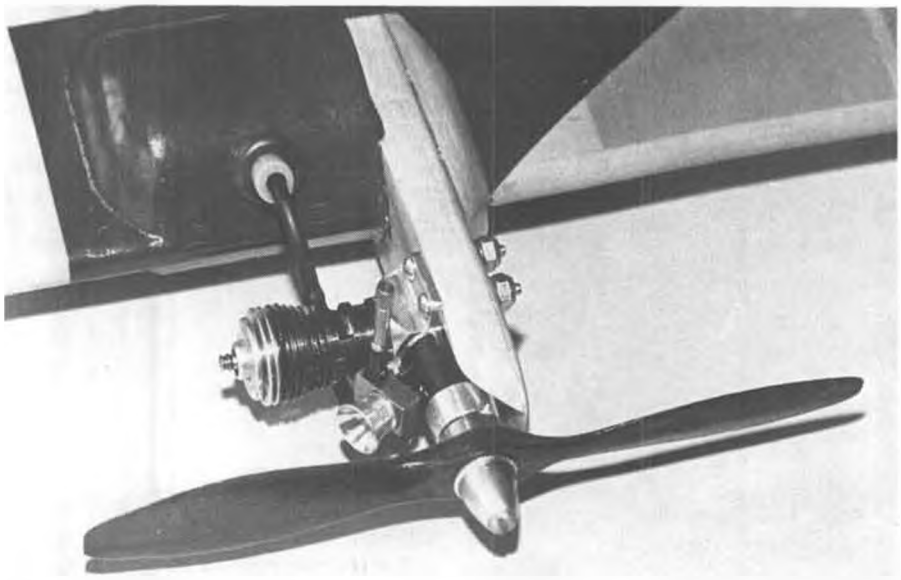
Li'l Snip uses a pacifier tank fuel injection system. It works quite well and the Tee Dee's really put out the power under this system. They love to run on good quality 20 to 40% nitro fuels. We use 5 1/2 x 3 Tornado nylon props, but you should experiment to find what suits you best. These planes are flown on .012 x 35' lines using a small E-Z Just handle. They carry one and one-half ounces of fuel for just under 6 min. of flying time.

The Li'l Snip is a winner and record holder. The record was set in Concord, California on August 10, 1969 and still stands at 70 points. This is the official W.A.M. 1/2A combat record.

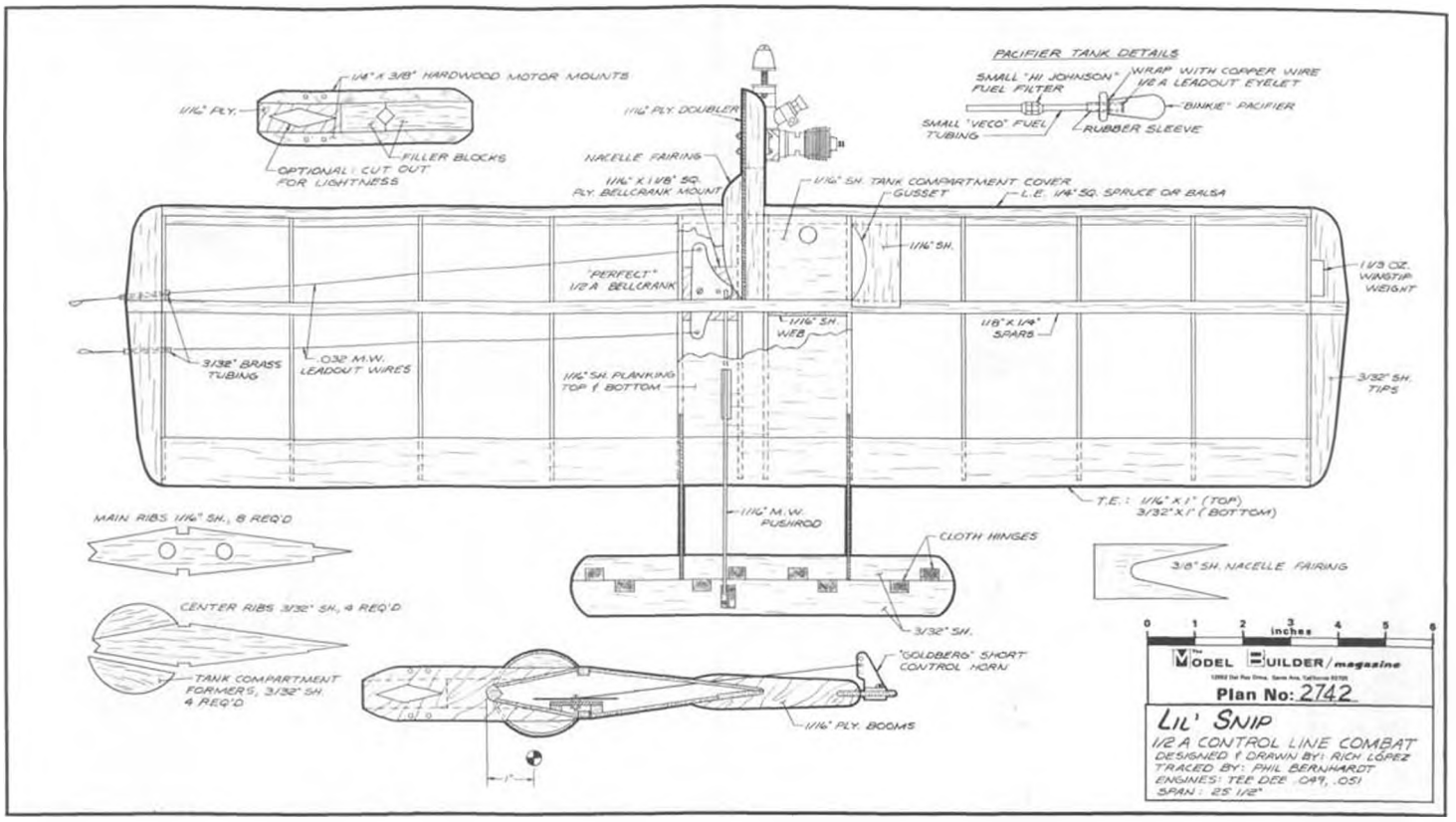
CONSTRUCTION

Study the plans and instructions carefully, and make sure you know how everything fits together. Then gather all the tools and materials necessary to assemble the aircraft. You will need glue, pins, longnose pliers, wire cutters, a drill and bits, sandpaper, and a good modeling knife.

1. The first step is to assemble the engine mounts. Lay the 1/16 inch plywood engine mount doubler flat on a table or workbench. Glue the engine mount filler block and the hardwood engine bearers to the plywood. Use Titebond or white glue and set aside to dry overnite. If you are in a hurry, use 5-minute epoxy. After the mounts are dry, drill a 1/4 inch hole against the front of the filler block. Carve this hole square so the leading edge may pass through. Using the engine as a template,



Kirn-Kraft custom Cox .049 Tee Dee in the nose of Li'l Snip. Plane was designed around the use of this engine. Combat reguires all the speed and power possible within the class limit.



FULL SIZE PLANS AVAILABLE – SEE PAGE 72

mark the location of the mounting holes and drill them out. Sand the entire unit smooth and to shape. Optional . . . a diamond shaped hole in the plywood doubler for extra lightness.

2. Mark the rib locations on the lower spar and the 3/32 inch lower half of the trailing edge. (A flair pen works very well). Pin the 3/32 lower half of of the trailing edge to a building board board or a flat work bench. Glue and pin all the ribs to the lower spar and lower half of the trailing edge. Allow the glue to set up, then glue the 1/16 upper trailing edge half in place and allow to completely dry.

3. Next, assemble the bellcrank unit. Glue 2 pieces of 1/4 x 1/8 to the underside of the bellcrank platform. Drill a hole in the platform and bolt the bellcrank to it. Using longnose pliers, attach the 1/32 inch leadout wires to the bellcrank. Drill out the bellcrank so the 1/16 inch pushrod wire will pass through, and fit it in place.

4. Remove the wing from the building board. Pass the 1/4 inch leading edge through the engine mounts, then glue and pin the assembly to the ribs of the wing. Glue a small filler block to engine mounts in front of the leading edge. Glue the pacifier pod formers in place. Glue the planking to the bottom center section of the wing. Do not plank the pacifier pod yet. Glue the wingtips in place. Then carefully slip the bellcrank unit, complete with pushrod and leadout wires, in place. Use lots of glue here. Glue the leadout eyelets to the wingtip. Glue the 1/3 oz. wingtip weight to the outboard wing. Allow everything to dry thoroughly.

5. While the wing is drying, assemble the elevator-stabilizer unit. Use cloth hinge and a liquid cement to make this assembly.

6. After everything on the wing is dry, glue the upper spar in place. Then add the wingtip supports. Glue a web between the spars behind the pacifier pod compartment. Notch the top and bottom spars alongside the pacifier pods and glue the planking extensions in place. Then glue the top center section planking in place. At this time, plank over the pacifier pod formers, top and bottom. Glue the pacifier pod supports over the planking extensions and up against the pod formers. Glue the half-fairing nacelle in place alongside the engine mounts. Bend loops in the lead-out line connectors.

7. After everything is dry, sand the entire model smooth and cover as desired. Original Li'l Snips used heavy silkspan or silray-silron and buytrate dope. If you wish to use mylar covering, we would suggest making all the ribs

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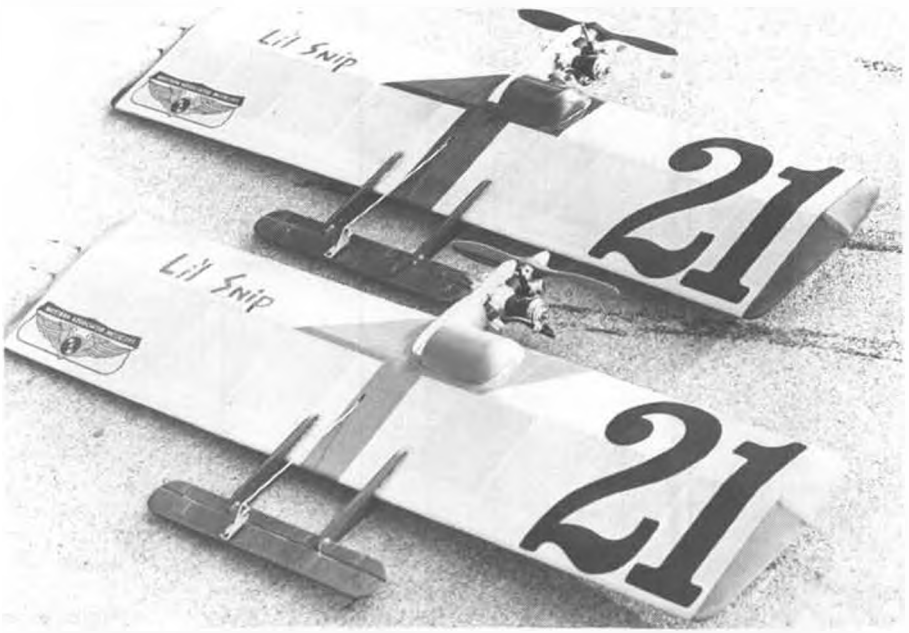

Pacifier tank fits inside balsa planked compartment. Nobody should have trouble reading Rich's number! Note W.A.M. insignia decal on left wing tip.

R/C Cars . . . . *Continued from page 23* (hence tends to give oversteer) it improves low speed directional stability because of the positive restoring forces of the wheels. Just set the car down when the steering servo is disconnected and watch the wheels point straight ahead. Then turn the wheels and watch the inside wheel (of the turn) pushdown and lift the chassis on that side.

Anyway, if your car does not turn fast enough at high speed, positive angular caster will help. If at low speed, acceleration causes directional instability, positive caster will help a little. Sometimes you only need to improve one thing . . . say low speed directional stability, but not high speed steerability. The thing to do here is increase the caster and go to harder (or narrower) front tires.

Tread width has an effect on weight transfer, which in turn, changes traction capability. A wide stance minimizes weight transfer, providing maximum traction. A narrow tread causes more weight transfer, lowering traction. *(There now, those Pontiac ads aren't all B.S. after all! wcn).* Most cars don't have adjustments for changing front tread width. (On one car, HRE, the front end can be parted and remounted to give a tread width change). On the non-adjustable front end cars, different front wheels must be used, or spacers can be inserted on either side of the front axle stub. But be careful here, because increasing the tread will move the tire contact patch further off center from the kingpin axis. Figure 3 shows the changes in tire patch offset (steering effect) when tread width is increased by wheel changes only. These two effects are opposite to one another; the greater

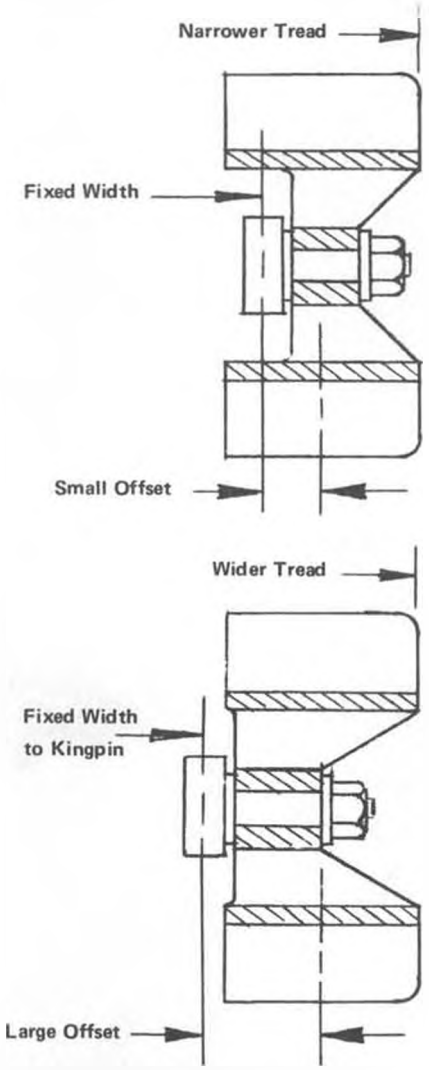

Fig. 3: Increasing tread width by changing wheels, increases offset. Restoring force on outside tire is increased. Servo system may not be able to turn wheel fully.

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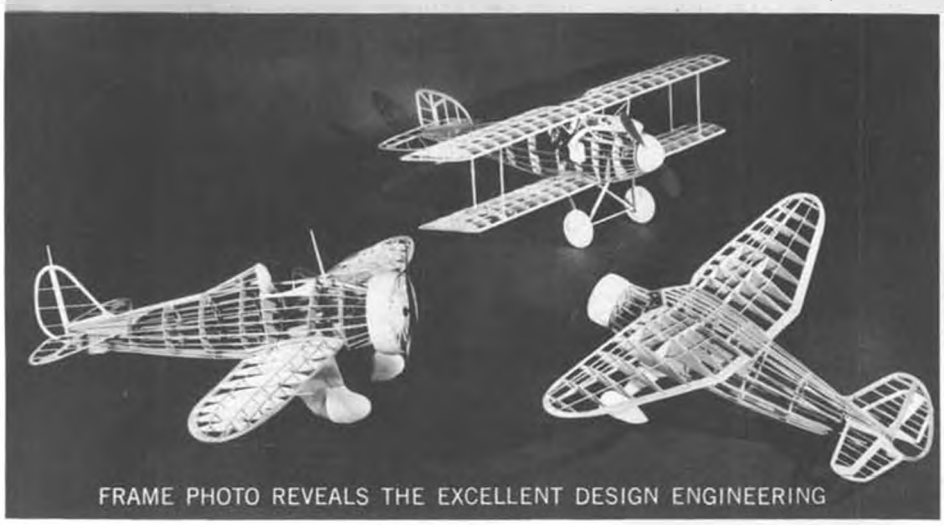

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tread width gives more steering and the off center tread contact patch gives more natural restoring force . . . hence understeer, depending upon servo force and servo-saver spring force.

Camber is the angle of the kingpin, from the vertical, when viewed from the front, as shown in Figure 4. With negative camber, the upper part of the kingpin is closer to the car than the lower part. The effects of front king pin camber have not been fully examined. The primary effect of negative camber, when positive caster angle is used on a wheel is a tendency to keep the tread in better contact with the ground . . . on the wheel which is on the outside of a turn.

Front end camber of most cars can be adjusted by bending the front axle (Thorp, Norkar, Marker, Delta). HRE can be made fully adjustable by cutting the axle in half and remounting. On Associated cars, the front leaf spacer height is adjustable.

Ackerman action built into the steering geometry is also relatively important as to how you set up the front end. This action is the more rapid turning of the inside wheel, from straight ahead, which keeps the two front wheels working together and acting through the same turning center point. Some cars have only a small amount of Ackerman action (old Associated, Delta, Norkar, Thorp) and require the front wheels to be set straight ahead or with a little "toe out" to work properly in nominal corners. Some cars have a large amount of Ackerman action (Taurus) so that it is necessary to use a lot of "toe in" to keep the inside wheel from turning too far in nominal turns. The Ackerman action is built into the steering block and steering arm assembly. Figure 5 shows front end geometries with small and large amounts of Ackerman action. Again, you have to change steering arms or the king pin pivot point to change the Ackerman action.

On several cars there are adjustments for front end spring rate (Delta, Thorp, Norkar). Front springs decrease the amount of weight transfer on the front and increase the weight transfer at the rear, so that the front end gets better bite and/or the rear end gets worse traction. In general then, softer springs give more front bite, and oversteer . . . stiffer springs decrease front bite. The above is true for solid rear axles . . . Thorp says that he had to increase roll stiffness to get better front bite with his rear axle differential. It is suspected that a drastic car speed reduction is required when using the low front spring/roll rate, because the inside rear wheel lifts off the ground, completely unloading the rear

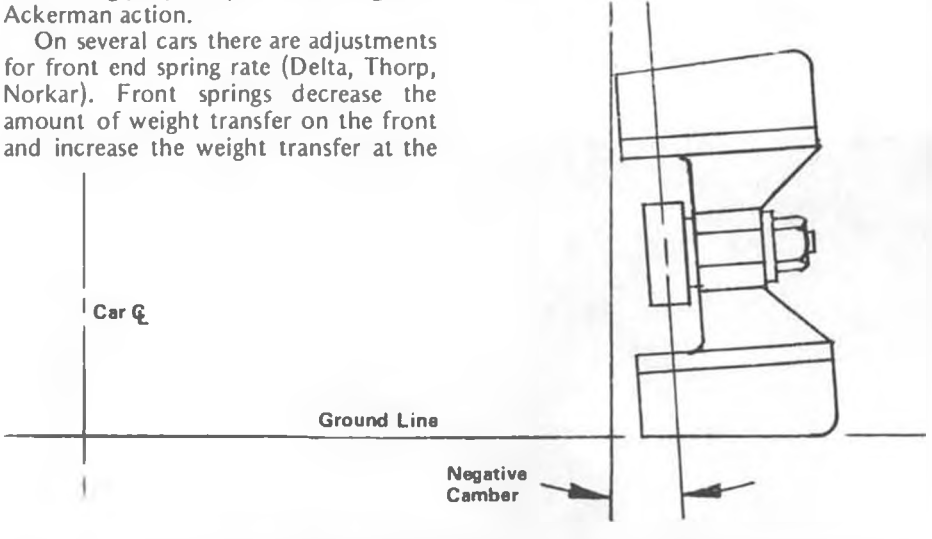

Fig. 4: With negative camber, the kingpin is angled so that the top is closer to the car centerline. Unless axle is bent, tire must wear to conform to ground line.

traction, and eliminating power oversteer, until the car slows down.

Adjustments that can be made to the rear end are not quite so numerous. The mechanical adjustments considered important are: rear C.G. height, and tread width. The C.G. height affects the amount of weight transfer fore and aft during acceleration, and side-to-side during cornering. The most pronounced visible effect is during acceleration. A high C.G. allows more weight transfer to the rear wheels (look at drag cars), giving better low speed straight line traction capability. But during cornering, there is also more weight transfer, which decreases the total cornering capability of the rear (see October '73 M.B., for article on tires).

From a practical standpoint, a high rear end (C.G.) gives good straight line stability when accelerating, and a low rear end induces more low speed power oversteer. So for best low speed stability, raise the rear C.G. To provide power oversteer, making the rear end a little squirrely, lower the rear C.G. The high C.G. may induce bounce at higher speeds in some cars when very soft rubber is used on the rear tires. The C.G. can be lowered, or harder rubber used. Also, be sure to glue the rings of rubber together on the rear tires.

At high speed, it is best to have the C.G. as low as possible, so that the side-to-side weight transfer is the least. Low speed power stability is best when the C.G. is high. As is normal, we have to compromise. We recommend having the C.G. as low as possible without getting too much low speed power oversteer. Bounce is minimized and high speed handling (rear end having best traction) is the best.

The front C.G. can also be raised or lowered to affect weight transfer during cornering. Very probably, the change of steerability with C.G. changes is less than for the other adjustments mentioned. Besides, we can only get the C.G. so low before we have to revert to the other adjustments to improve cornering ability.

Tread width changes at the rear affect side-to-side weight transfer during cornering. As in the front, a tread width increase cuts down on the weight transfer and maximizes cornering force capability. Tire hardness has some effect on rear traction because the tires provide some spring action and keep the inside wheel in contact with the ground during normal cornering.

Well now, lets tabulate the various chassis mechanical adjustments and their

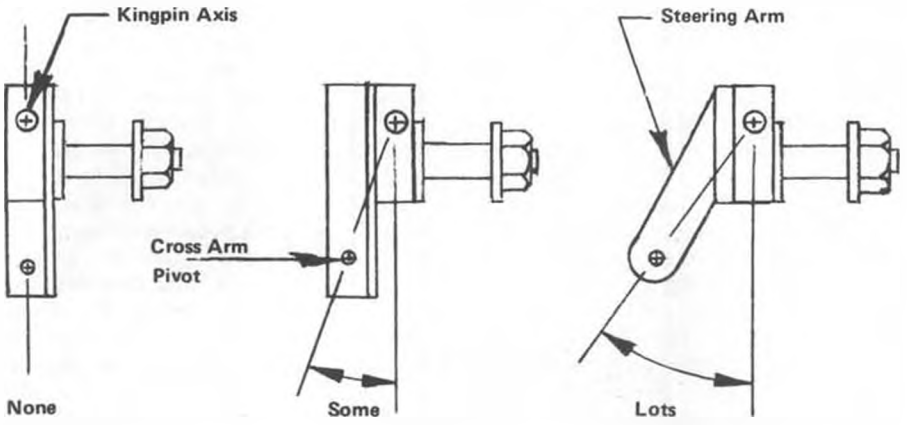

Fig. 5: Ackerman action is determined by the angular offset of the kingpin axis to cross-arm pivot from the wheel rolling direction. With large angle, a little cross-arm motion really moves the inside wheel.

effects so that we have it all in one place:

1. Front End Adjustments:
   a. Positive angular caster; improves stability and improves front cornering force.
   b. Tread width; increased tread width cuts down weight transfer during cornering and improves cornering capability (if done by widening axle).
   c. Camber; negative camber when used in conjunction with positive angular caster improves cornering capability.
   d. Vertical C.G.; raising the front C.G. increased weight transfer during cornering, reducing cornering capability.
2. Rear End Adjustments:
   a. Vertical C.G.; raising the rear C.G. increased weight transfer during acceleration, helping directional stability (reducing power oversteer); also increases weight transfer during cornering which reduces high speed cornering capability.
   b. Tread width; increasing tread width reduces weight transfer and improves cornering capability.

Well, that's "thirty" for today. It is hoped that our comments are helping you to get your car working better. If you have questions or comments be sure to drop us a line by writing to Chuck Hallum, C/O HRE Inc. P.O. Box 4658, Irvine, CA 92664, or C/O Model Builder. There is one more article on engine, gearing, and miscellaneous adjustments . . . then we're going to summarize it all in one article, including a computer program to adjust your R/C car. ●

Hannan . . . . . *Continued from page 34*

the Hangar. We want to thank those who sent in contributions, kind words, and photos, and even those who sent in the less than kind words! Your support is appreciated, and your letters do help to give us a sense of direction. Speaking of which:

THE PROPER DIRECTION

Ever launch your CO_2 or Baby Bee powered model with the engine running backwards? Don't laugh . . . it can happen quite easily, especially under "high-pressure" contest conditions. And in addition to being potentially damaging to airframes, it can be downright embarrassing! Captain Ken, F.A.C., comes to the rescue with this simple, yet effective idea: Simply fit a thin strip of tissue paper a short distance behind the airscrew, and note which way it is blowing before you launch. In the case of open cockpit scale models, this can take the form of a streamer on the pilot's helmet.

RUBBER-LUBE BOTTLE FOR PEANUTERS

A handy addition to your GSE (Ground Support Equipment) box is a handy rubber-lube dispenser, in the form of a Food Colors bottle. These tiny (2 1/4 inch tall) plastic bottles are perfect for dispensing a controlled amount of lube, and will not break when dropped, or leak all over your field kit, as glass bottles might. Four of 'em, complete with food colors, which you can present to the cook of the house, sell for about 35 cents.

TARMACS FOR SCALE MODELS

The San Diego Orbiteers came up with a good idea for their recent scale contest. A roll of indoor/outdoor carpet was used as a runway. Smooth enough for even Peanut Scale size wheels, it has the added advantage of portability, and may be simply hosed off to remove residue.

HISTORY OF FLIGHT

Most of us are familiar with the GAF (particulary the way Henry Fonda says it, wcn) "VIEW-MASTER" 3-D picture viewer, but did you know that a number of aviation reels are offered? One is titled "Modern Aircraft", another is devoted to the Air Force Museum, in Dayton, Ohio. But the one we particularly enjoyed here at the hangar, is the one entitled "History of Flight", this 3-reel offering features stereo pictures of such subjects as a Wright aircraft in Flight, Glen Curtiss in his biplane, a Ford Trimotor, the Graf Zeppelin flying over a pyramid in Egypt, the "Winnie Mae", and more (21 views in all). The term "reels" may be confusing, since these are not movies, but stereo still photographs of excellent quality. Another shot startling in its realism, depicts the dirigibles Shenandoah and ZR-3 inside a hangar. Some of the photos are of models, but the models are of very fine finish, and deserve close study.

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Locally, Viewmaster viewers and reels are sold in drug stores and a few department outlets.

HOWS THAT AGAIN?

Rumors of the soon-to-be-produced new twin-cylinder engine by Brown Motors, has prompted Frank Scott to label it the CO_2! ●

Scale F/F . . . . *Continued from page 33*

that the way the rules read now, a model really doesn't have to be very scale to win. Flying seems to be the main consideration. The Mooney System eliminates this problem in a very simple way. Even though Walt has mentioned it before in his column, I feel that it is worth repeating here. Here's the way it works:

Points are awarded in both the flying and the static scale portion of the competition, directly on a ranking basis, to ensure that FLYING and SCALE have equal weight. The top scoring model in flying gets one point, and the best model in static scale gets one point. The second best in each case gets two points, the next best gets three points, etc. After both the flight judging and scale judging have been completed, each model's ranking points are added to give its final position. The model having the *lowest* total is the winner, and so on. With such small digital scores, it's relatively easy to have ties. These can be resolved ahead of time by a decision as to whether the best scale or best flying score is to give a model the upper hand.

That's all there is to the "Mooney System." The static judging can be done in whatever manner the contest merits. If it is a strictly-for-fun-type, just line them up according to appearance. If it isn't, then use the traditional method of judging with 3-views, judge sheets, etc., with the best scale model getting ranked number one and so on.

We would certainly appreciate hearing from other groups willing to try this system at local contests. If enough clubs around the country are willing to try it and find that they like it, perhaps this could be the solution to the Peanut Rules as they exist today. The system is simple and does not detract from the spirit of the event as it was intended to be.

The Flightmasters used this system at Elsinore with complete success. At any given time during the contest, there were always several Peanut models on qualifying flights. Many had to be chased long distances. On top of the list of winners was Bill Hannan, flying a Miles M-18, followed by Walt Mooney and his Mexican Veloz biplane. Larry Moss came in 3rd after having to recover nearly all the fuselage and retrimming his Huntington H-12. My little Bücker Jungmeister came in 4th, followed by Bill Warner and his Vega Pietenpol. High time went to Clarence Mather with a flight of 74 seconds. Clarence can do this as regularly as others who consistently hit 25 seconds. Ken Johnson flying a very light Waco Cabin had another high time of 54 seconds.

All in all, it was a tremendous amount of fun just being outdoors and watching so many outstanding models take to the air. I'm already looking forward to this contest next year.

A point of interest for all military aviation buffs. The Chicago Scalemasters have really taken the bull by the horns by coming out with a color guide for current and World War II military aircraft. There are 159 individual color chips, very accurate, and matched to the best sources available. Included is a description of how to mix the colors and how to keep a record of the work. Air powers covered are as follows: USAAF and USN in WWII; current USAF and USN; RAF, RCAF, and FAA in WWII; Germany in WWII and the present; Japan in WWII; Russia, Turkey, Rumania, Hungary, France and Italy in WWII.

All this is available for $9.50 plus 50 cents postage. Send your order to Keith Ward, 636 Swain, Elmhurst, Ill. 60126. ●

Li'l Snip . . . . *Continued from page 51*

center section size and cap-stripping them with 1/16 inch balsa. Cover the pacifier pod with silk for extra strength.

After the model is covered, glue the booms and elevator-stabilizer in place. Then cut a hole in the pod for the pacifier tank.

8. Use a small Goldberg control horn on the elevator. Mount the Tee Dee engine with a 3-48 x 3/4 aircraft bolt set. Make your pacifier tanks using using 1/2A leadout eyelets, small Veco tubing, Binkie Pacifiers, and copper wire. Use a small Hi Johnson fuel filter. Your Li'l Snip is ready to fly. Have fun! ●

Culver Dart . *Continued from page 35*

mon water-soluble white glue (Elmer's or equivalent . . . any ten cent store has it), thinned with an equal volume of water. I either use a small water-color brush to apply it, or a "continuous dip" method, to be described later.

Forms are required for bending the outlines. This is an absolute necessity if you are working with balsa, and pretty nice to have if you are using bass wood. For this size model, cut the forms from 1/8 sheet balsa. They should match the inside contour of the outline desired. Make sure the edges of the forms are square. It's difficult wrapping laminations around a beveled outline!

Now, the glue that sticks the laminations together must not stick the laminations to the form! Therefore, there must be some type of parting agent between the form and the laminations. I like a good wax for this, and prefer the wax in Crayola crayons. They're easy to find, easy to apply, and the color lets you know when the edge of the form is completely protected. So . . . color the edges of the forms "Parting Pink," or whatever.

Next, you need something to hold the laminations to the forms while they are drying. The best thing I have found is 1/4 inch wide masking tape. Tear off about forty lengths of tape and stick them to the edge of your work bench where they will be easy to retrieve when you need them. Nothing can be more difficult than removing a piece of masking tape from the roll when you are holding a form, three laminations, and a glue brush!

A source of water to wet the laminations is nice, especially if you must use balsa. Saliva will work, if that's all you have, but only for Peanut Scales. Try it on a Jumbo scale and you'll know what it's like to be lost in the Sahara with an empty canteen!

So much for the preparations. Now for the actual lamination process, which consists of several steps: wetting the sticks, applying the glue, stacking the sticks, and wrapping the stacked sticks, (now called liminations), around the form, locking them to the form, and letting them dry. It's easier to do than to describe so stick with me.

If you are using balsa, wet the sticks and shake off the excess water. Now apply a thin, even layer of glue to one side of one stick, lay a second stick on top of the first and apply a layer of glue to it, add a third stick and glue, etc., until you have the desired number of laminations. Wet the surface of the last stick.

Getting a thin even layer of glue on a long thin stick is not necessarily easy. That's the reason for thinning the glue and it is also the reason for the, "continuous dip" method mentioned before, which is done as follows:

Get a very shallow container for the glue. A top from a mayonaise jar or something similar is about right. Fill this with your thinned glue, almost to the top. Now select a stick and start to slide it across the top of the lid so that it just contacts the glue. As it is slid across the top it will pick up glue from the surface, and the excess will be wiped off by the far edge of the cap. Presto! A nice, thin, even coat of glue. It may take a little practice at first, but it sure beats dipping a brush and brushing the glue onto the sticks.

Now you have a stack of glue sticks that are acting like a wet noodle. Using a damp rag, wipe off any excess glue, making sure that the laminations are perfectly stacked. Starting at the centerline of the wing, or at one end in the case of the other surfaces, attach the laminations to the form with a piece of tape, then, applying a slight amount of tension, wrap the laminations around the form, taping them down as you go along. It is important to keep tension on the laminations as they are wrapped around the form. If they should bend while out of contact with the form, they will break and make a kink and/or weak spot in the outline. The laminations must be continuous around the tips of the surfaces. Where the form is concave instead of convex, as at the leading edge of the vertical tail, use particular care and several pieces of tape, to hold the laminations to the form.

Now let the laminations dry. Overnight is good, or in a 120 degree oven while you build the fuselage sides, the engine cowl, and cut out the formers and ribs.

When the outlines are dry, carefully remove them from the forms and use them to build the flying surfaces.

Note the two stringers on the top surface of the wing. They are added without notching the ribs to provide aerodynamic turbulation on the top wing skin. Don't try to do without them.

The fuselage stringers are only notched into Former 7, and lay on top of Formers 8 and 9. The landing gear wire is cemented to the solid nose rib. It is

not attached to any of the other landing gear members in order to allow it to flex, and therefore not damage the other members in a hard landing.

The wing is built over the plans. Cut the ribs from sheet balsa. Make the top half of the wings first, with just the rib tops and the outline, then remove this assembly from the plans, and cut in half at the centerline. Add the main spar to each half and then add the lower half of the ribs. Add the solid sub-rib and then add the two stringers on top of the ribs.

Sand all structure well before covering. Cover the model with lightweight tissue, water shrink, and then give it one coat of thinned dope. Cut the fuselage tissue to allow the subspar to be installed and cement it in place. Poke a hole in the fuselage covering for the wing leading and trailing edges and the main spar, and install the wings. The root ribs will contact the fuselage structure only forward of the spar. The gap between the root ribs and the fuselage is covered by the bond paper fillets, just as on the real plane. *(of course they're not made of bond paper on the real plane, dum dum!)* Make the fillets by trial and error, using the plan view and the side view as guides.

A small Williams Brothers thrust bearing is shown in the plans, while the model in the photo used a large old fashioned one . . . take your choice.

Plug Sparks . . *Continued from page 19*

when they returned with Dick Chambers' model. He had launched the Orwick powered Sailplane with that classic, "I forgot to set the timer!" Gene and Sal were gone until the contest ended, but they got it!

Dick Chambers was so enthusiastic when they showed up with his model that he bussed both boys. He also notes as a sideline, that this column referred to his place of employment as the Flamingo Club. Tain't so, it's the Hilton Flamingo Hotel and Casino! How about that for class?

The writer was also impressed by the good flying qualities of a 1930 Joe Ehrhardt Wakefield winner flown by Ray Behrens. The old design's flying was simply spectacular! Don was second to Dick Siegfried's Lanzo by only 24 seconds. Gotta watch out for those oldies, there's plenty of life left in them!

The .020 event was taken by Bob Oslan with six perfect three minute flights followed by Gene Wallock with 14.25. As you can see fellows, any .020 powered Old Timer kit put out by Bob is a real winner. While discussing gas models, "Old Sandbagger" Larry Boyer showed up late, but not too late to again walk off with a first. Frank Swaney with his big McCoy 49 powered Sailplane was a close second.

Practically rubbing wing tips with the SCIFS, the Thermal Thumbers were putting on one of their all rubber contests, this time with a special event for Old Time Wakefields. Gene Wallock, who couldn't win the SCIF rubber event, walked over to the T-T desk and promptly beat out all the boys there. Those multiple type contests are great!

TEXACO

Without a doubt, the greatest event the SCAMPS ever revived is due again to be held on April 21 of this year. After discussions based on a letter of intent to the SCAMP Club, Sal Taibi informed the writer he would not allow R/C Texaco models to be in direction competition with the free flight versions. However, he will run a separate and parallel R/C Texaco Event.

That's a heckuva good start! The writer, of course, will put up two trophies for the best flying R/C jobs. If the interest in R/C Texaco continues to grow, and entries multiply with resulting higher competition, the writer foresees some real good-natured (unofficial) competition between the two types, just to show who is the best. *(R/C Texaco has some advantage in that the pilot may search for lift. However, he must remain at the takeoff sight. The Free-Flighter, if he hooks a thermal, may take his timer with him and follow his ship all over the surrounding country side! wcn)*

The Texaco contest is thoroughly enjoyable with some of the best fellows you would ever want to meet. So bring your pre-December 31, 1938 designs, whether it be free flight or "free flight with occasional radio interference" and join the fun!

SPECIAL ANNOUNCEMENTS

Model Builder magazine and the "No-Name" Club of San Diego (a group of R/C Old Timers) will co-sponsor a 20 second Old Timer Free Flight Radio control meet similar to that which has become so popular on the east coast. Any Old Timer design from before the December 31, 1942 deadline is eligible.

The reasons for introducing this type meet are multifold: the first being for those fellows who have R/C old timer models and have been unable to compete with them. Now you can take your Buzzard Bombshell out and power it up! Ten minutes is a "max" flight.

Another outstanding advantage to this meet is that the S.A.M. Championships at Lakehurst will feature these type events. Now is the time to get some experience at flying these hot free flight models using a beep box! It would be a shame for a Californian to go to the whole distance to New Jersey and not try to compete in at least one of the R/C O.T. events.

Probably the biggest advantage to this event is that it brings back the modeler who used to fly free flight and just couldn't be bothered with those long shags. Actually, this R/C event is a sneaky way of re-introducing

many erstwhile modelers to free flight again. Ya gotta look at it positively!

At present, there will be trophies, engines, merchandise, subscriptions, and you name it! No effort is going to be spared to answer the many requests for this type of meet. Right now, we're just planning on one category for all models, but if enough of each type is entered, the event may be split into Cabin and Pylon, plus an overall winner. No matter what, there are going to be so many darn prizes, it will pay you just to enter and fly. Besides, think of all the nice guys you are going to meet. In spite of many requests, even WCN is gonna be there! Now don't say you won't have some expert advice on hand! *(Whadya mean "advice?" This cat's gonna be too busy flying! wcn)*

The contest (gas shortages not ruining things) will be held at Taft on May 26 (along with the National Free Flight Championships which will also include about 6 O.T. Events.) If they are still closing gas stations on Sunday, you can drive to Taft on Saturday, and return home on Monday of the three day holiday. So get those irons ready! If you need a rule book, write this magazine; we'll see that you get the latest S.A.M.

Meanwhile, here is a capsule version of the rules that appear in the S.A.M. Rule Book, plus the modifications made for this contest:

1. Weight Rule: Planes must weigh 12 ounces per .10 cu. in. of displacement. In addition, wing loading shall not be less than 8 ounces per sq. ft.
2. Six official flights, three highest count.
3. All engine classes (A,B,&C) are combined. Maximum engine size is .601 (glow powered, no limit on ignition).
4. Model will rise off ground from three point attitude. The 20 second motor run is counted from release of model.
5. Spot Landing: 50 second bonus for landing in 75 ft. radius circle. Initial contact counts.
6. Flying will be on the round system; one hour allowed to register each flight starting at 9:00 a.m. Second round starts at 10:00. Final flight will be complete by 3:00 p.m.
7. Multiple entries will be allowed, however, all entries be declared at the time of registration. Only one prize per contestant will be awarded regardless of places taken. Entry fee will be $3.00 per model.
8. Maximum flight is ten minutes. The amount of overtime will be deducted from the ten minute flight. A 10 minute flight is worth 600 points. A 5 or 15 minute flight is worth 300 points!

Keep your eyes on this column. As more information on this contest develops, we'll keep you clued in!

MOTOR PARTS

Just received the latest MECA (Model Engine Collectors Assn.) swap sheet and note with considerable pleasure that Don Garafalow, 174 Main Street, Ridgefield Park, New Jersey, 07660, has embarked on a badly needed parts reproduction business that may help many an engine collector or old timer looking to complete his engine.

Don is producing hard-to-get parts such as Baby Cyclone exhaust stacks, timer housings for many makes of engines, timer brackets, etc. Unfortunately, he is not providing timer points. However, if the demand for parts continues, Don may continue to expand his line to encompass most of those easy-to-lose small items. Might also mention that all parts manufactured are completely bored, drilled, and tapped as per the original part. So, if you have parts problems, drop Don a line.

GIVE UP DEPT.

The writer has to admit maybe his idea to reduce power on radio control F/F O.T. models ain't so hot. All letters to date indicate everyone wants to control their model under power regardless of how little or great the power is. The fellows simply won't trust their beauties to the vagaries of the weather and those unforeseen bugs that develop in a model as it ages.

Latest letter from Don Lamkin indicates very apathetic response from his club, the Clayton R/C, of lowering the horsepower and allowing uncontrolled power runs. Jack Bolton also reports from the Old Time Eagles that the name of the game is altitude. This calls for a hot R/C engine which is commercially available to all modelers. No big power edges here. While the purists cry drop power, fellows like Al Schwankert put a Playboy Senior practically out of sight using only a .29 cu. in. motor. The question that arises, where do you draw the line? Jack sez you don't, competition being the driving force. The super lightweights are soon eliminated, as models must be made strong enough to resist wing flutters, etc. The general opinion expressed by the clubs is that the models are fully controlled, therefore quite safe.

So-o-o, until some group indicates a wish to modify the rules, the writer is backing off on any proposed rule changes to the present regulations.

STAND CORRECTED DEPT.

In the December issue, the author complained about the lack of publicity for the North-South contest. Just got a half hour long distance call from Jim Gerard, who was nominally in charge of the contest. Seems as though he was in the hospital for a month. As he put it, he got so sick he was afraid he was

gonna die, later on, he felt so bad, he was afraid he wasn't!! According to Jim, the preliminary announcements sent out to the various clubs received very little notice. Anyway, that's all water under the bridge now; let's plan for a terrific contest this year!

CONTEST SCHEDULE

O.T. Contest Schedule for Southern California area, 1974

Jan. 13: SCIF/SCAMP .02 Replica, commercial rubber, scale rubber. Elsinore

Feb. 16-17: San Valeers Winternats, combined with SCIF/SCAMP Kick-off. Taft. All Old Timer events

Mar. 17: SCIF/SCAMP .02 Replica, Comm'l rubber, Old Ruler. Lake Elsinore

Apr. 21: SCAMP Texaco. Taft

May 12: SCIF/SCAMP .02 Replica, comm'l rubber, scale rubber, Old Timer R/C. Elsinore

May 25-26: U.S. Free Flight Championships, Taft. Old Timer R/C

Jun. 16: SCIF/SCAMP R.O.W. Gas and Rubber. Elsinore

Aug. 24-25: San Valeers Annual. This year will include the regular O.T. events, plus scale rubber and Gas & R.O.W. Taft

Sept. 14: Thunderbugs Annual. Two O.T. events

Sept. 22: SCIF/SCAMP Las Vegas Old Timer. All regular O.T. events

Sept. 28-29: Fresno Annual. All O.T. events

Oct. 5-6: Flightmasters Annual

Oct. 26-27: Orbiteers Annual, including Old Timer ignition, glow, and rubber. Elsinore

Nov. 16-17: North-South Annual. All O.T. events. Taft

Nov. 24: Orbiteers Scale Annual CO_2, Rubber, Gas, Peanut. Elsinore

Dec. 1: SCIF Texaco. Taft

Dec. 8: Thermal Thumbers Wakefield including O.T. Wake. Elsinore

Dec. 15: SCIF/SCAMP .02, commercial rubber. Elsinore. Flightmasters Jumbo rubber and Peanut scale. Elsinore

This list includes contests which are all or in part Old Timer and scale. For contemporary and other type contests, contact the representing club secretary.

Come on, Easterners. Send us your O.T. activity schedules for the 1974 season. Let everyone in on the fun!

JUST IN TIME NEWS

Barely before press time, the writer received a notice from Harry Lowe of the SCIFS, announcing he was sponsoring an R/C Texaco type event by donating two trophies. Harry proposes to have the contest in conjunction with the Free Flight "Winter Nats" scheduled for Taft on Feb. 17, 1974. In capsule form, here are the rules:

1. *Any old timer with radio control as defined by the S.A.M. regulations is eligible.*
2. *All flights must rise off ground. Flights less than one minute may be declared an attempt. Two attempts constitute an official flight.*
3. *Two official flights; longest flight counts. Timer to remain on field within 200 feet of takeoff area. Flight is terminated when model lands or goes out of sight. Modeler may chase model.*
4. *Fuel allotment: 1/8 ounce of fuel per pound weight of model. Seven lbs. maximum allowable weight.*
5. *Re-entry or multiple entries allowed. However, the first time card is voided. You start all over again!*

The writer is particularly pleased to see that this phase of old timer modeling is taking hold, as there is no question in his mind that many of the old time free flighters can be coaxed out of retirement with this most relaxing form of flying. Besides, this meet will be an excellent warmup for the "giggle", the SCAMP Texaco Contest, April 21. So gettum out there, fellows!! There is no excuse now! Plenty of interest and activity developing!!

LAST WORD

Despite Bill Hannan's column, which led many modelers to an erroneous conclusion the writer had moved, you can still reach John Pond at the same old stand in San Diego, CA. 92117, at 4135 Avati Drive. If you telephone this (714-274-0671), remember, the writer is a working slob like the rest of you and cannot be reached until 5:30 p.m. PST (or Daylight time, whatever Washington, D.C. decides on). ●

Peanut P-9 . . *Continued from page 45*

1/32 sheet with one 1/16 square stringer on top to rear of baggage compartment. Install the five rear stringers of 1/16 x 1/32 before covering the forward decking with bond paper.

To simulate the plywood dashboards, we overlayed the two balsa dash formers with very thin mahogany veneer from a cigar wrapper. As a bonus, you can light D/T fuses with the left over cigar! Look through your old model mags for certain Tatone ads illustrating an instrument panel. Cut out some of the little instruments and glue to dash (that's cheating! wcn). The eight engine cylinders are made from soft balsa dowel wrapped with thread for the fins. The long exhaust pipes may be made from balsa, aluminum tube, or styrene tube and painted with Floquil Rust. The tail skid is a sliver of bamboo.

Cut a form out of Strathmore board, or other scrap, upon which to form the rudder laminations. Remainder of the rudder and the stab is constructed from 1/16 sq., 1/16 x 1/32 and 1/16 x 1/8 corner pieces, as indicated. Cover both with Japanese tissue. Apply the 'G' on the rudder prior to glueing it in place.

Use straight 1/16 Birch dowel for the wing leading edges. Saves much sanding and is virtually tree proof. Make six ribs of 1/16 sheet for the wing strut locations and the lower wing root; all others are of 1/32 sheet. Let the lower wing leading edges extend inboard 3/32. A second short length of dowel is inlayed between the first two lower ribs and directly below a short length of 1/16 sq. balsa. These two stubs project into the two holes previously drilled in the fuselage sides and should give an incidence angle of plus 2 degrees. If not, enlarge the front hole. Note that the rear spars have been eliminated as seen in the photos. Install the lower wings first, then, use two card-board spacers cut to fit between the wings to hold the upper wing in position. Install the cabane struts first, and when set, add the outboard struts.

The plans used originally came from a 1922 magazine and show the lower wing cutout as seen in the photos. Actual photos acquired later show that the lower wing trailing edge is straight to the fuselage, and this correction is shown on the plans.

Wing struts are of basswood, streamlined, and colored with Minwax Light Oak stain. Front and rear cabane struts are medium balsa with the diagonal strut being a piece of 1/16 O.D. aluminum tube epoxied in place after the top wing is installed. Aileron and tail hinge lines may be drawn in with a felt pen. Rigging was done with gray thread, but monofilament line will do as well.

Installing the landing gear last makes it easier to block up the wings for the proper incidence and dihedral. Make two vees of balsa or basswood and a speader bar of 1/32 ply. Fill in the bottom of the vee and cut in a vertical slot to guide the 1/32 wire axle as it springs up. Epoxy the axle to the spreader at the center only. The wheels were heat formed, using old wooden kit wheels as a mold. This requires four pieces glued together with tubing axles potted in.

So far, we have been unable to positively determine the original color scheme for this ship. Ours was covered all over with yellow tissue. After shrinking the paper with alcohol, apply one coat of 50/50 nitrate dope. The registration letters may be cut from black tissue or you may use Letraset dry transfer letters. Fuselage letters are 1/2 inch (48 point), while the rudder "G" is 1 inch (96 point) high. If using dry transfers, place the backing sheet under the letter and rub on a smooth

surface until the letter is 99% loose, then apply. You only have one chance with this method as there is no way to move a letter once applied, however, it does save trying to rub through to the other side of the fuselage to release the transfer! When in place spray the letters lightly with Krylon Clear Matte finish to set the edges. Photos show that there are no markings on the top or bottom wing as used on later aircraft.

Any six inch plastic prop may be used for flight, or you may carve a balsa prop from a 6 x 1 3/8 x 1/2 inch blank. We are now flying with a Williams Brothers plastic prop, which is giving the best performance to date. Use a 1/32 wire shaft and include a simple flip-over free wheeler as shown in the photo. Although very stable in flight this plane likes a lot of power and room in which to fly. We would recommend outdoor flying only! ●

Workbench . . *Continued from page 4*

The dates are 6-7 . . . 13-14 . . . 20-21 of April. Reason for scheduling a 3-week spread is to take advantage of the needed weather conditions available that month of the year.

To be held at the Torrey Pines Glider Port, La Jolla, California, the T.P.G.'s are allowing for the fact that in order to exceed the present R/C glider speed record of 113.24, held by the U.S.S.R., a very special type of aircraft will be required. And in order for that ship to perform satisfactorilly, it will need weather conditions usually available in April at the Glider Port slope site. During late winter and early spring, low pressure weather fronts move down from the Canadian border. These are usually preceeded and followed by high velocity west winds (as high as 50 knots) which, when rammed up against the 300 foot cliffs at Torrey Pines, will provide the lift needed to support the type of aircraft required to break the record.

Trophies will be awarded to the 3 fastest contestants, and in addition, committments have been made by prominent sponsors to provide merchandise worth more than $1,000.00, which will be awarded only to those making world record flights.

Contact Irv Stafford (714) 463-0176, or Paul Denson (714) 469-8595, for further details.

ONCE IS TOO OFTEN!

In the December 1973 issue of MODEL BUILDER, we had a four page report on the 1973 R/C Aerobatic World Championships, which was held in Gorizia, Italy. Having been replaced this time by Maynard Hill as U.S. judge (we judged at Bremen, Germany in 1969, and at Doylestown, Pa. in 1971), we did not make the trip and so gained permission from Ron Moulton, publisher of RCM and E magazine, to use editor Tony Dowdeswell's excellent report on the contest. Photos were taken by Dick Penrod.

Unfortunately, obtaining information second or third hand may lead to possible inaccuracies, and though it can usually, at best, be considered a regretable slip, it becomes more than that when talking about the ultimate winner of the contest, particularly when the airplane and engine used are manufactured items sold in this country by one of the magazine's advertisers!

Roy Gelber, President of Model Rectifier Corporation (MRC), 2500 Woodbridge Ave., Edison, New Jersey 08817 (If you come to Toledo be sure to tell him how much you like MODEL BUILDER and how nice MRC's ad looks on the back cover!), recently telephoned and politely but firmly pointed out to us that our photo caption on Page 20 of the December issue incorrectly identified the aircraft used by the new World Champion, Tsugutaka Yoshioka, and implied that the engine was reworked!

Yoshioka's winning airplane was in fact a Blue Angel, built by him from a Kato Model Aircraft Co. kit. The Enya 60-III engine is the latest model, on

which the large-bore carburetor and pressure system are stock items. Both the Kato Blue Angel Kit and the Enya engine are of course imported in the US exclusively by MRC. A detailed review of both of these products will appear in a future issue of MODEL BUILDER.

IDENTIFICATION AT LAST!

Back in the July 1973 issue, we had an article about the Heath Company, manufacturers of the popular Heathkit R/C systems. One photo showed a Heath aircraft communication radio installed in the instrument panel of an unidentified plane. Just received a note from Don Belote, a member of the Toledo Weak Signals R/C Club which hosts the big annual conference. Don is somewhat partial to Aeroncas, and owns a 1941 Super Chief and a 1946 7 AC Champ. It was easy for him to identify the mystery cabin as that of an Aeronca II AC Chief, in which he learned to fly and logged about 200 hours. ●

P-82B . . . . . *Continued from page 25*

modifications whatsoever were made to the scale outlines of the aircraft, including wing and stab areas, fuselage width, dihedral, etc.

Scale of the model is 1.24 inches to the foot, which gives a 66 inch span, 12-1/2 inch center chord, and 735 sq. in. of wing area. The ship weighs a healthy 9-1/2 pounds, which results in a wing loading of 30 oz. per sq. ft.

Power for the model is two K&B front rotor .40's, one modified for clockwise operation to give counter rotating props (10 x 6 nylons, dyed black).

Landing gear is of course retractible. The two Goldberg units are operated by a World Engines retract servo.

Covering is shiny aluminum Monokote, plus Hobbypoxy . . . two coats inside and one outside for both fuselages.

A 6 channel Orbit radio operates the aircraft, with one servo in the left fuselage and the remainder in the wing cut-outs. The retract servo is in the wing center section . . . buried for life!

Bob reports that the P-82 flies great. Engines are offset for 2 degrees down thrust and 2 degrees "out" thrust (left engine has left thrust, right engine has right thrust). One degree of negative incidence in stab was apparently not necessary, as the final neutral trim called for 2 degrees of down elevator.

It appears that Bob's new P-82B, though a little smaller and 27 years newer, is setting out to make its own headlines. It has captured a 2nd and 1st in the two contests entered so far, and is still going strong.

Perhaps Bob will campaign with his twin engine fighter throughout the 1974 flying season and then allow it to retire along side of the full size original "Betty Jo," which now resides in the Air Force Museum. ●

Pylon . . . . . *Continued from page 21*

prop for pull and a Kraft radio for guidance. By the way, this was Merle's first QM race! Mercy! Go out and try *that* in any other pylon event! Christopher flew an ST powered Stafford P-51 to the best time of the meet in the third round, 1:32.7. This was on the short course used by QMRC. Christopher used the Top Flite pylon prop and an RS Systems radio. Gary Hawk, Ramzi Thomas and Steve Ellison rounded out the top five. Hawk and Ellison used K&B power while Thomas chose the ST. Thomas and Ellison used Kraft, Hawk went with the RS radio.

We had a chance to notice quite a variety of props being used. On the short course, the 7 x 6 props are still best. We personally think this is the best diameter and pitch to use on the current QM engines that are contenders . . . the K&B and ST. Our best time with the ST is a QMRC record of 1:29, using the 7 x 6 Top Flite Pylon Racing toothpick (stock). The new 7 x 5 wide blade TF racing prop made its appearance. We tired one, but didn't like it. The ST runs out of breath with it, unloading more than 18,700 in the air. We like to set up with the ST at 16,500 on the

ground, to unload at 18,500 in the air using a 7 x 6 prop. With the K&B, this should be around 500 RPM higher, static and airborne.

Races that are being sanctioned utilizing a major deviation from the AMA provisional idle rule are really only starting the first step in the decline of the event! We have attended some races that have been sanctioned (other than QMRC), whereby the idle rule was all but eliminated. The Chula Vista Club elected to go with an extreme modification of idle rule. Idling on the line was virtually eliminated. One could hold the aircraft, and the throttles were only pulled back to whatever might just change the sound of the of the engine slightly . . . and they called that an idle! Our thought concerning this is that QM racing is still in the dormant stages, with a set of AMA provisional rules as set forth at Toledo last year. The AMA rules state that the engines should be "Stock out of the box". As you know, we have hashed this around and around without any promising results. Again, the only way to run a STOCK event, is to gain access to a set of engine specifications with approved tolerance ratings from the manufacturer. These specs should be published in a rule book available to all racing members. It is the contestant's responsibility to see that his engine is stock and remains so. The major problem is to obtain spec sheets from the manufacturer. If anyone succeeds in the fact, by all means let us in on your secret!

Now, you are saying "What do you mean it's *my* responsibility to see that my engine is stock"? Let me put it to you this way! If you don't mess with it, it probably is and will remain stock! Okay, leave it alone, break it in correctly, then let's race!

As for the chap who is just going to bend the rules anyway, if you use a specification sheet for measurements, you at least have a tool whereby you can keep him legal . . . that is you define the words "stock" and "reworking" in the rules.

There is an alternate method that will eliminate the spec sheet and all the time and hassle pertaining to inspections and ill feelings. We will discuss this method in a moment. Back to the idle. *Do not ever delete this aspect of the QM event.* Once the idle is eliminated, we move closer to Formula I. There must be a contrast between these events! In both cases, the name of the game is preparation and practice.

Contrary to what some people would have you believe, there is a direct correlation to idling speed and top end. The ST and K&B .15 engines will both idle around 3800-4000 if the engines have the correct head clearance, good compression, reasonable carburation settings, and are well broken in. The top end will be around 16,500 for the ST and 17,000 for the K&B, using 7 x 6 prop on both. Sure, there are exceptions, but not to difference of more than 400 RPM. There is a relationship of 12-13,000 average between idle and top end. We have seen an ST turn 19,000! But, it wouldn't idle at less than 6,300.

What we are suggesting in this alternate method is to tach the idle! Once the manufacturer knows he has to have an engine that will idle, he will stress importance in that area as well as the top end. Oh yes, this is a race, and race means speed! But listen . . . QM racing has reached its level of popularity because of the differences from Formula I. It's a lot of fun to be able to go around on an approach, take the plane out for Sunday Sport flying sessions, taxi around and generally show the little bird off! There isn't anyone who enjoys a good race more than we do, but when it's no longer fun, forget it! We have entered our little bird in pattern events as well as "Hamming" it up at the local flying fields . . . FUN! So when in doubt, tach the low end, we promise you the high end will take care of itself!

REWORKED K&B ENGINES

Jim Nightengale, P.O. Box 603, Vista, California 92083, is now reworking both K&B .15's and .40's for R/C Pylon flyers. He prefers to start with a new engine. Price on a reworked K&B .40 (Jim supplying the new engine) is $80.00 . . . ready to go. Write him for further details. ●

Free-Flight . . . *Continued from page 39*

give success. This model employed a square fuselage . . . as opposed to a diamond . . . but I now used the diamond shape to give better visibility in fly-offs. The original Warren-girder fuselage has been dropped for ordinary crossbraces and diagonal compression struts, with an immense saving in weight and building complication.

"That the model is straight forward to build and fly may be gained from the fact that my wife, Trilby, has produced an example this year and found no real problems."

MORE RUBBER

Perhaps one of the most difficult supply problems facing the rubber model competitor in these days of shortages is a good source of rubber strip. Those who have "old" Pirelli are probably hoarding it and the new stuff, if you can get it (Filati, that is), isn't proving to be a reliable substitute. It appears that the best available source for a good quality rubber is FAI Model Supplies, Box 9778, Phoenix, Arizona 85068. Their rubber has a different "feel" than Pirelli, and it packs more power per

strand. So, if you have been flying with 16 strands, the new stuff will provide about the same power on 14. It does have a tendency to tear and nick more easily than Pirelli, however. Bill Gaiser is experimenting with heat sealing the edges to see whether this will solve the tearing problems. In the meantime, until we know about what we've got, this looks like the best stuff to use.

And since we don't know all we should about current power supplies, I would like to outline some data that would be useful for study:

1. Torque curve comparisons with FAI and compared to Pirelli
2. Capacity winding/breaking tests
3. Break-in procedures
4. Storage and aging tests
5. Solving the nicking problem
6. Propeller combinations that work best

I am certain that there are other test results which will prove valuable in the next year or so, and if you come up with any, I will look forward to hearing from you and promise to print any results which prove helpful.

While on the subject of rubber powered models, I would like to express a concept which may be more appropriate to John Pond's column or to Hannan's Hangar, but since it is a local idea, from fellow club-member Earle Moorhead, I'm going to express it here. Even with the proliferation of new events, there always seems to be room for the novel. The growth of Peanut Scale or the SCIFs .020 Old Timer Event are two cases in point. Earle's idea is to combine these two types and develop an event for Old Timer Indoor Rubber Scale. The thinking is to construct an in-character old timer to a scale which keeps the maximum wingspan at or below 24 inches. The model would be judged according to its fidelity to the scale of the original, plus duration.

I can visualize a 1/4 size Comet Clipper, a 1/2 size Korda or even a scaled down Wedgy, Ranger, Sailplane or Miss Philadelphia. With the increase in interest of Old Timers, Scale, and Indoor models, the event strikes me as a good addition to the indoor (and maybe even outdoor) scene.

At any rate, the Willamette Modelers Club, Inc., is going to give it a try at their February Indoor Contest. Hopefully, there will be several in attendance and some pictures can be included in a future MB F.F. column.

PHYSICAL CONDITIONING PROGRAMS FOR F/FERS

The following was written by Vic Nippert and published in the Conn-Tact newsletter:

"It is with extreme pleasure that I write these suggestions for F/F modellers who wish to enter the Mr. America and Mr. Universe body-beautiful competition; however, please don't become distracted as our primary purpose is to enable our models to go higher or to be retrieved from trees and the middle of pastures which are proudly defended by Brahma bulls.

"The following group of exercises should be performed at least once a month between April and October flying season, or as an alternate three times a year (or after the first 3000 miles whichever comes first.)

"1. STANDING. Standing is extremely important. You cannot throw a hand launched glider from a supine, position as this tends to jam the elbow of your throwing arm onto the runway, which will cause a poor transition at the peak of the glider's climb. Standing upright is also important to Nordic flyers, as this adds another 6 feet to the launch and improves the still air duration. Wakefield and power flyers need not practice standing as the models will probably loop after launching, and staying in the prone position will prevent serious injury to the flyer. Helicopter buffs may also ignore this exercise.

"2. RUNNING. This extremely strenuous exercise should be approached with bleary-eyed caution. Some modellers have been building up to running for some years now and have been very careful not to allow the desire to run overcome the natural motion of sitting or lying. It is important to practice exercise Number One before trying Number Two.

"If you feel you must run, I suggest building up stamina by walking from 2 to 300 feet each day. Be prepared to accept some pain and shortness of breath at this state of development; these discomforts will pass after you walk for a week or two . . . or give it up entirely.

"Running is an excellent way of getting to your car for driving downwind after launching a model; therefore, practice short sprints or jogs only. It is best to have some incentive when practicing this exercise, so quick dashes from the workbench to the refrigerator are very acceptable training methods.

"We suggest you adapt your training methods to approximations of your local field. The author once spent several minutes on his front lawn leaping and turning around left-over pancakes; this, of course, was an imitation of the "meadow-muffins" found in the pasture when I trim out my models. Unfortunately, this exercise was terminated when several neighborhood dogs stole the ersatz "pies" but I'm sure that you will see the possibilities of variations on this exercise.

"3. BENDING. Bending should be done by all modellers for a variety of reasons. I suggest you take it very easy when first attempting this exercise; remember a sprained back or a hernia

may require extensive medical care. Limber up for this physical skill by repeating exercise No. 1 once or twice.

"You should be careful to get maximum benefit from this exercise by keeping your feet straddled no more than six inches apart and knees locked. Bend forward from the waist while extending the arms in line with the upper body. You will now be in the correct approximate position necessary for the retrieval of an errant stabilizer that slid behind the spare tire of your Hudson Terraplane. Be careful not to rise too quickly lest you strike your head on the trunk lid.

"4. ELBOW BENDING. This is a most important motion to many adult modellers. The Free Flight Neophyte would do well to observe the skill displayed by the sage veterans of many years on the competitive scene. The author has personally travelled to many Nats and FAI finals, and I can assure you that most of our top modellers feel Elbow Bending is so important that they practice this motion for hours into the late evening before the meet, and again after the competition. Maximum benefit to the elbow can be obtained by using the 'Overload Principle' in training. One should hold a container with an easily reducible weight in the hand and as the modeller flexes the elbows some weight can be removed from the container. Continue this action until all the weight is removed (no cheating now, remember, it's good for you) and then repeat the phrase "Fillerup" until delirious.

"Anyone wishing for a more extensive physical conditioning program will find it in my latest book; just send me $15.00 and the book will be sent via UPS, in a plain wrapper. Ask for 'How I trained for the Indian Wrestling Championship of Snyder Swamp', or 200 Sneaky ways to beat Fast Richard."

WRAP-UP

Well, that about wraps it up for February. Keep them cards and letters coming. ●

R/C Soaring . . *Continued from page 44*

down over the Solarfilm (can't play favorites until the payoff deal is consummated), and cut through both the paper pattern and the film with a sharp blade. Cut a contrasting color at the same time, stagger (offset) the characters when applying them to the model, and you get a three-dimensional, shaded effect cheap and easy.

The crowning mark is your company logo. Make up a snappy name, then design something artistic and stick it on the tail. Go crazy. Remember, you're not only chief engineer, but also president and chairman of the board. You probably have a name in mind, but steer clear of Schweizer . . . it's been done. How about "Bowlus"? That has a nice, authentic ring to it.

No special trick to flying a scale R/C sailplane of an original design, unless it's a failure. Procedures for checkout, early test flights, and trim should follow proven routines. Take it easy. Don't press.

One part of the fun in creating original-design scale models is parking them on the flight line among legitimate scale sailplanes. If they seem to fit into the scene, the designer has done his job . . . successfully. When other sportsmen ask, "Is that the new German Heitenfluger HS-25?", you know ya got 'em. From there on, you're on your own, but a recommended response might start, "Oh, no, that's the 1968 Indian Charka EBS-2 . . . a one-off design. Three junior flight officers with BOAC based near Delhi designed it. However, a Pan Am captain named Anderson Armstrong bought the project and moved the whole works to the old Highlands Regimental Aerodrome south of Columbo, Ceylon where it was completed and test flown. Unfortunately, it was destroyed in the 1969 monsoon when the hangar collapsed. All photos were lost when the Empress Hotel burned later that year. The ship had some very advanced design features. If you'll note the . . . " And away ya go. It's easy once you get into the swing of it.

There's one nagging thought about this whole concept. Wonder if a guy could put together enough presentation material, scale drawings, and all that . . . maybe even some appropriately staged photos . . . actually to be accepted in scale competion? ●

Choppers . . . . *Continued from page 15*

HINTS & KINKS

The idea of the month comes from Franz Kavan . . . a spring damper for use with his popular Bell Jet Ranger. The drawing, supplied by Kavan, shows the method for supplemental damping of the gyro bars which allows the modeler to adjust stability and maneuverability to his own preferences. With a choice of different spring thicknesses, one can control the hardness or softness of the damping. The set I constructed for my Jet Ranger was made from 3/32 and 1/8 telescoping brass tubing, with Missing Links for each end. Naturally, I used the new Brunner connectors, mentioned earlier, to connect the parts, with music wire centers for greater strength! The springs are easily wound on a piece of 1/8 music wire chucked in a metal lathe turning at its slowest RPM. Use a 3 inch length of music wire, place one end in the jaws of the chuck and hold the other end under tension with a pair of vise-grips. When fully wound, remove the newly created spring and carefully stretch it to your own specifications. I made three sets, from .015, .020, and .025 wire, for soft, medium,

and hard damping. It should be interesting to see which set will be just right!

Another good idea was submitted for a "landing gear holder," for use during the painting process. A short scrap of wood is bridged between the opposite side gear mounting holes with long machine screws. Slip a short piece of tubing or bushing between the gear and holder so you can spray paint under the handle. By holding the assembly as shown in the photo, you can rotate the entire gear as you paint.

SPECIAL KAVAN REPORT

On New Years Eve, I spent several hours with Franz Kavan and was again impressed with this gentleman's knowledge and drive! Several new projects were discussed at length, along with details of approved and tested modifications to the Kavan Jet Ranger, which I will pass on to you in this issue.

First, the best news: The January issue of Model Builder magazine carried the first rumor of a new Kavan Kit in the development stages . . . well, it's no rumor and the kit is expected to be released sometime this summer. This little gem will retail for less than $200.00, is powered with a .15 to .19 engine driving a conventional rotor system! Rotor diameter is only 40 inches, so it is really a portable machine! I wouldn't be surprised if someone came up with a suitcase for the whole thing! Mr. Kavan anticipates starting production with 25,000 units in the spring. Flight characteristics with 4 channel radio are excellent . . . Franz says, Mit Der Electronic Gyro it flys verrry gute!" The gyro referred to is the rate gyro mentioned in the last issue . . . production models are now available at the Kavan service stations for about $50.00.

Another new project at the factory is a very large R/C helicopter with a 10 foot rotor diameter! All-up weight is approximately 50 lbs., and it carries an additional 50 lb. payload. This chopper will be completely assembled, equipped with radio and remote television telemetry, and can be purchased for 35 to 40 thousand dollars! Seriously, it's being outfitted primarily as a military observation platform, however, such a machine will undoubtedly find numerous commercial applications. The amazing thing is that two T.V. cameras are used . . . one for ground observation purposes and the other to "watch" the controls and gyros for controlling the flight from remote locations!

For your information, Kavan has already sold 13,600 Bell Jet Rangers all over the world, in his first 10 months of production . . . the major portion going to Japan markets. With this kind of sales record, his forecast of 25,000 new production kits does not seem unreasonable, particularly at the anticipated price!

The dampers (shown in this issue) are reported to be excellent additions to your present Jet Ranger according to Mr. Kavan. *However,* registered owners will shortly receive, free of charge, a modification kit which will obsolete these dampers! The mod kit is the result of dozens of experiments to correct the "right diving turn" problem which Jet Ranger owners have been experiencing during high speed flight. Even the full size helicopter exhibits the same characteristics and is placarded in this respect. No problems have been observed in other than the high speed regimes of flight.

Anyway, the kit is designed to modify your present gyro bar in such a fashion as to provide a new type of control input without detracting from its present function of gyro stability. There is even a good bet this new control (Kavan system?) might be applied to the full size helicopter. I would estimate it will take approximately 2 hours to modify your chopper with the new parts supplied. Flight tests have shown very high-speed 90° bank turns to the right to be completely under control and all-round stability to be greatly improved.

Production is now being set up, and the first modification kits should be shipped within the next 6 to 8 weeks. After the registered owners have been supplied, the new production Jet Ranger kits will be further modified to incorporate this control feature. The new kits will also have two new booklets (instructions and photos) to aid construction. I have seen these booklets and believe me, they leave nothing to the imagination . . . very, very complete.

Another hint: do not change the main rotor blade airfoil to a more "flat-bottomed" shape unless you will be flying your Jet Ranger at altitudes above 3,000'. The flat-bottom *will* produce more lift under high density altitude conditions, however, the performance will suffer at the lower elevations!

It is not recommended that you off-set your vertical stab (rudder) any more than is already molded into the fuselage shell. Such off-set is only to "unload" the tail rotor and will have no material effect on turns. The correct procedure is to install the mod kit which you will receive shortly.

Another news item: dozens of successful auto rotations have been completed on the Jet Ranger in recent weeks! Another modification/accessory kit will be in production in approximately 4 to 6 months and will sell for 25 to 30 dollars. A new clutch assembly will be required and a special one-way or free wheeling clutch device is installed in the second drive shaft. Loss of engine power will automatically decouple the drive mechanism and permit the main

rotor to increase speed about 200 RPM in autorotation mode. New take-off techniques must be learned (dead-man's curve) since it will require somewhere between 80 and 100 feet to successfully autorotate after engine failure. Available as an accessory, it is not planned at this time to incorporate autorotation into the standard production kits.

John Simone reports all Kavan spare/replacement parts are in stock at this time, including blinking position lights ($12.50), electronic fuel control ($15.00), rate-gyro ($50.00), heat sinks ($9.00), rotor blades, gears, etc.

New instrument panel decals, printed in 4 colors, are now available to faithfully reproduce the control console in your scale Jet Ranger. Molded plastic consoles will follow in about 4 to 6 weeks, and will exactly fit into proper location in the cockpit between formers 1L and 1R. Accessory price around $10.00.

I told you this Kavan outfit was on the move . . . now, do you believe me?

FINAL APPROACH

The final approach this month appropriately covers the landing gear for helicopters. All sorts of hints and kinks could be written on this subject alone, but I will confine this one to my own choice of gear construction. I have tried the golf balls-on-dowels routine . . . have made training gears from arrow shafts, etc. . . and have bent them from aluminum stock . . . they still break, bend or twist on a bad landing. Now, that's not too bad a repair job in itself, but making a new set of rotor blades after a bent or broken gear wipes out the "top-side" parts . . . wow! I hate that job! To my way of thinking, the laminated plywood spreaders supplied with most of the kits are the simplest and best looking. The only problem is they also break and are generally not long enough to provide a sufficiently wide space between skids for beginners. The practical solution is to laminate your own out of unbreakable materials and make them as long as you desire.

The first experiments were made by glueing together 5 to 7 layers and 1 inch wide strips of 1/16 inch aircraft plywood. Hobbypoxy No. 2 was used for slow cure during lay-up. Although very strong, they too broke, usually where the attach holes were drilled. To add strength, fiberglass cloth was sandwiched between plywood layers, and the usual building and surfacing resin was used to bond everything together. These didn't break and were light weight . . . however, after a few months, they became oil soaked and the layers started to separate.

The last experiment was to do the whole thing in glass cloth and resin . . . this was the total answer! The shape is a simple arch, and when finished, you can jump up and down on them or stomp them flat and they won't break. The all-glass gears weigh quite a bit more than those of plywood and glass, but if you can stand the few extra ounces, make them entirely out of glass.

The method is comparatively simple if you've ever worked with fiberglass (and any modeler who is ready for helicopters surely has!). Step one is to settle on the desired spread between scale and training dimensions. Besides, it exactly fits the rear deck of my 240-Z! On a sheet of paper, lay out the desired curve, or arch, either by eyeball or a long string and pencil to make it right. Transfer the lines to a large block of wood approximately 3 inches thick, 7 inches high, and 24 inches long. Carefully band-saw the block in two and sand mold surfaces smooth. After mounting on a work board, glue on side plates to trap the resin. (See photo). Simple angle brackets and wing-nuts will pull the two forms together during curing.

Either plywood or glass cloth strips are then cut and placed on the bottom form until the desired thickness is attained. Next remove the strips of glass and/or plywood and place them on a thin sheet of polyvinyl or saran-wrap, layer by layer, at the same time impregnating them with a *slow* curing resin mix. When all layers are saturated, fold the plastic wrap over to retain the resin and place the whole mess back on the bottom form. Finally, place the top form over the clamp arrangement and draw it down tightly with wing nuts. After overnite curing, the gear may be removed and sanded to shape.

Earlier, I specified a 3 inch wide form . . . it is desirable to make one wide strut, then saw it lengthwise to make two identical 1-1/2 inch struts . . . or you can run through this process twice if you want to! A final caution. *Be sure* to completely wrap the strips so that the resin does not spill out into the mold, otherwise you'll have to chisel the forms apart! Study the photo carefully and I'm sure you see the details better than I can write it . . . Incidentally, the photo shows two different molds, one of which is a constant radius arch, and the other a compound curve . . . any number of variations are possible. ●

Counter . . . . . *Continued from page 6*

As with the Todi, the Maestro fuselage is made up of a molded fiberglass front section and a pre-rolled 3/32 balsa tail boom. Wings are built with webbed spruce spars, machined plywood and balsa ribs, and 3/32 sheeting. Tail surfaces are machined

1/4 inch contest balsa.

The complete kit is expected to retail for $89.00, while a 2 or 3 channel version, without flaperons, will sell for $79.00.

* * *

JoMac Products, formerly Jerobee Industries, 12702-A N.E. 124th St., Kirkland, WA 98033, has released a new 1/12 scale R/C car kit. Though the total retail value adds up to $178.00, the selling price is only $145.00. The kit includes all features and accessories of the No. 105, High Performance MK-8B, with brass front wheel bushings, velvet touch brakes, Le Mans fuel tank, trued rear racing tires, and complete radio system.

The kit also has high performance Cox .049 engine with double ported sleeve, 2 reed valves, Challenger Cycloc body, lexan chassis, Cox head heat sink, extra experimental tires, extra gears, and various replacement parts.

Model Racing Products, housed in the same plant as JoMac, has announced an R/C Funny Car kit for .19 engines. The prototype car placed second in its class at the Nationals last August. Price, with either the Vega or Mach I Mustang body, is $109.95.

* * *

Just received a sample of the newest Peanut Scale kit by Peck-Polymers . . . the clipped wing J-3 Cub. Designed by Bob Peck, the choice of subject is a good one because it allows more area within the 13 inch wingspan limit than could be had with the standard, higher aspect ratio J-3.

Included in the kit is top-grade wood, proof-of-scale 3-views, step-by-step construction photos, nylon thrust bearing, rubber strip for motor, plastic propeller covering tissue, and wheels. An added feature is a sheet of two-color, mylar press-on decals. Price of the kit is $2.95.

FLASH

New LSF Officers for 1974 are: President, Dan Pruss, Plainfield, Ill. . . . Vice President, Barbara Henon, Pacific Palisades, Ca. . . . Secretary, John Neilson, Wilmette, Ill. . . . Treasurer, Hugh Stock, Saratoga, Ca. This announcement from Don Clark, Election Board Head of LSF. ●

R/C Report . . . *Continued from page 13*

I just bought one of their four channel sets and the bright orange transmitter really gets me. I usually paint my planes orange, so now I'll be color coordinated. Plan to use this set in a helicopter project where not even a single glitch or funny can be tolarated. Watch the future ads from R/S Systems and take particular note of their guarantees . . . probably the most comprehensive and complete ever offered . . . That's confidence!

Predictions for '74. More .40 sized sport and pattern planes. More interest in gliders . . . a few new names in kits and electronics should appear. Nothing especially new in pattern planes . . . more of another version of the latest version of the last version. Definitely more interest in just fun sport flying. Balsa prices higher . . . hence kit prices up somewhat.

Wouldn't it be wonderful column: If all manufacturers used the same size output shaft on their servos . . . If all manufacturers could get together and standardize on servo sizes . . . if prices on some R/C engines could drop far below that hundred dollar mark . . .

The following is reprinted from the "Hear Ye" newsletter of the Valley Forge Signal Seekers, Inc., Pennsylvania, and was written by Tom Jarick. We think it should be of interest to many R/Cers:

TUNING YOUR RC RECEIVER by SOUND

This is for those who do not know much about electronics, are having trouble with glitches and poor range on their radio systems, and are ready to try something different to clear up their receiver tuning problems. It has often been said that the best way to tune your radio would be right in the plane, the way you fly it. This has not been practical, so we do the next best thing and and send it back to the factory. Well, it can be successfully tuned in the plane with no fancy equipment and it can be done quickly, with very little experience. All it takes is an earphone like the one with your transistor broadcast radio, and a small tuning tool which can be purchased for less than a dollar, or even made from a piece of plastic . . . just so it will turn a tuning slug or an IF can.

The whole idea is simply to make that servo move when the transmitter says "move," and the servo wants the maximum signal from the receiver to do just that. The method is to connect the earphone to the receiver where a servo is normally connected (a spare plug and some clip leads will do), listen to the pulses, and tune until maximum range is attained. This has been tried on three different brands of radio and the results have been very satisfactory. My set is an EK Log 5, which has over 100 flights since tuning this way and has never worked so well.

This is the way it goes. With the →

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system installed in the plane and the wing removed, take the cover off the receiver and expose the electronics. Then unplug any servo and insert a spare plug with exposed terminals or wire ends. Next, turn on your transmitter and place it on the ground with the antenna collapsed or removed. Then clip your earphone to terminals of the spare plug and listen for the pulses. On my EK, I connected the earphone to the red and yellow wires (+ battery and signal leads). On 4 wire systems, the red wire is (+), the black is (-), and the center tap is white. Try your earphone across the black (-) and the 4th wire, whatever color your set uses. The pulses will be heard as a clear buzzing sound. If you have any doubts about the earphone connection on your system, connect a voltmeter across the receiver battery pack and watch the voltage. If it drops over 1 volt, disconnect the earphone and try again, you were on the wrong leads.

Once you hear the buzz . . . with your earphone in the ear, tuning tool in your hand, and plane under your arm, start walking away from the transmitter. As you move away, the buzz will eventually diminish and stop. Stop walking and back up a step or two or shift around until the pulses are again heard. The idea is to be at the extreme end of the range. With your tuning tool, begin tuning for maximum sound in the earphone. Start with the two coils and then go to the IF cans. (That's everything you see.) Repeat the process several times and then move further away and continue this until no further improvement can be made. As you get near the end, there is only a small tuning range in each adjustment where the tuning is good. At this point, you are done.

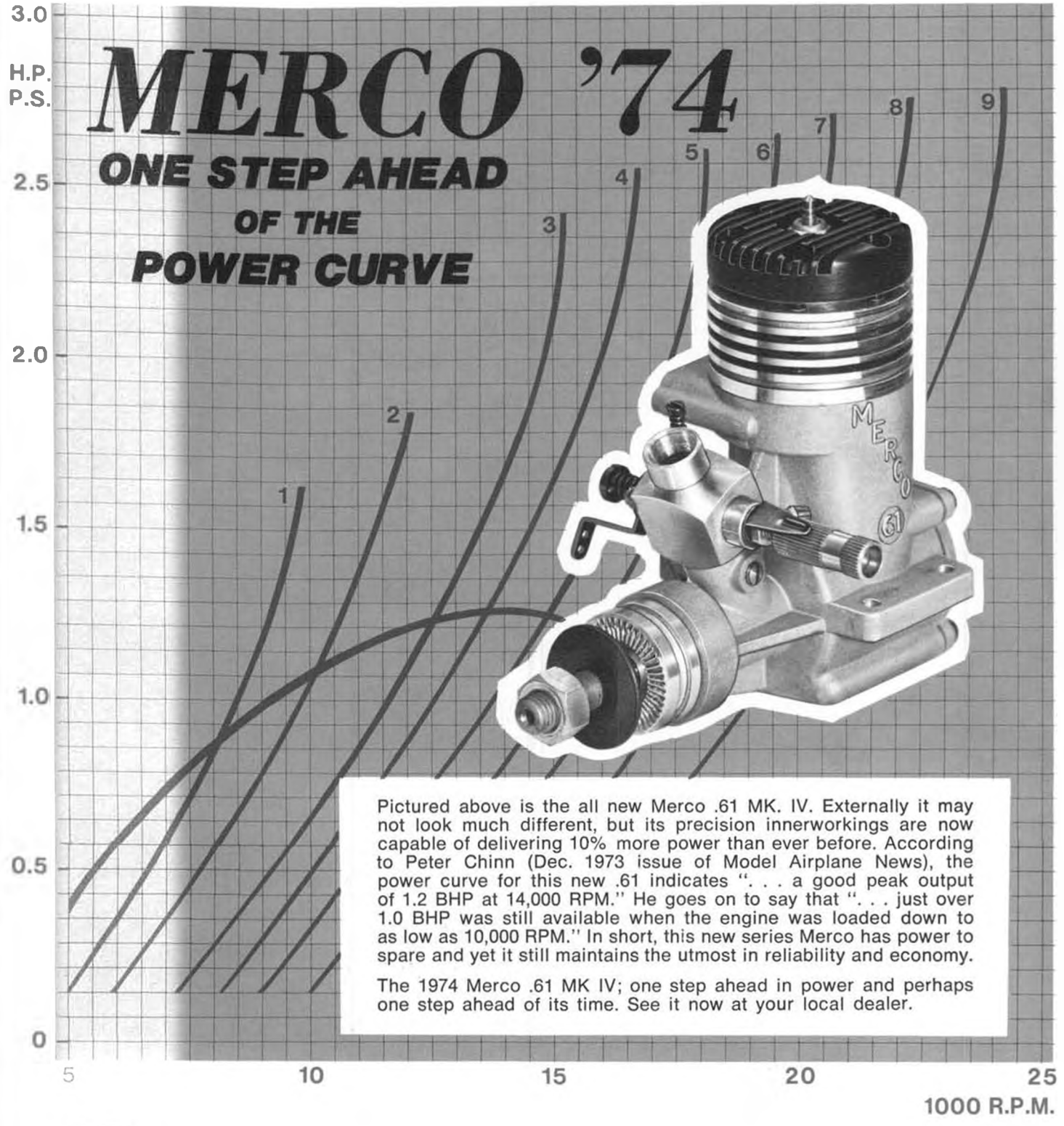
Disconnect the earphone and put the cover back on the receiver and check your range again. If you didn't make an improvement, you didn't need a tuning to start with. I think you will be surprised, particularly when you go out and fly down in those low areas where you were in the habit of getting glitched . . . or if you have one of those systems that gives you heart failure when you accidentally point the transmitter antenna at the plane. ●

EAST COAST SOARING SOCIETY

For additional information, a free copy of the ECSS Journal, 'SAILPLANE', and an application blank, forward your request to: Clive Sadler, ECSS Sec., 46 Oakcrest Drive, Dover, DE 19901.

MERCO '74

ONE STEP AHEAD OF THE POWER CURVE



Pictured above is the all new Merco .61 MK. IV. Externally it may not look much different, but its precision innerworkings are now capable of delivering 10% more power than ever before. According to Peter Chinn (Dec. 1973 issue of Model Airplane News), the power curve for this new .61 indicates ". . . a good peak output of 1.2 BHP at 14,000 RPM." He goes on to say that ". . . just over 1.0 BHP was still available when the engine was loaded down to as low as 10,000 RPM." In short, this new series Merco has power to spare and yet it still maintains the utmost in reliability and economy.

The 1974 Merco .61 MK IV; one step ahead in power and perhaps one step ahead of its time. See it now at your local dealer.

ROYAL PRODUCTS
CORPORATION

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DENVER, COLORADO 80223

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When you're about to trust your latest pride and joy to its element make sure that your R/C system has the reliability, control, accuracy and range to do the job.

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It's a business-like rig that gives you a solid link to your aircraft.

Compare and you'll know immediately just how much better we've built it. Truly the Mark V is nobody's kid brother!

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