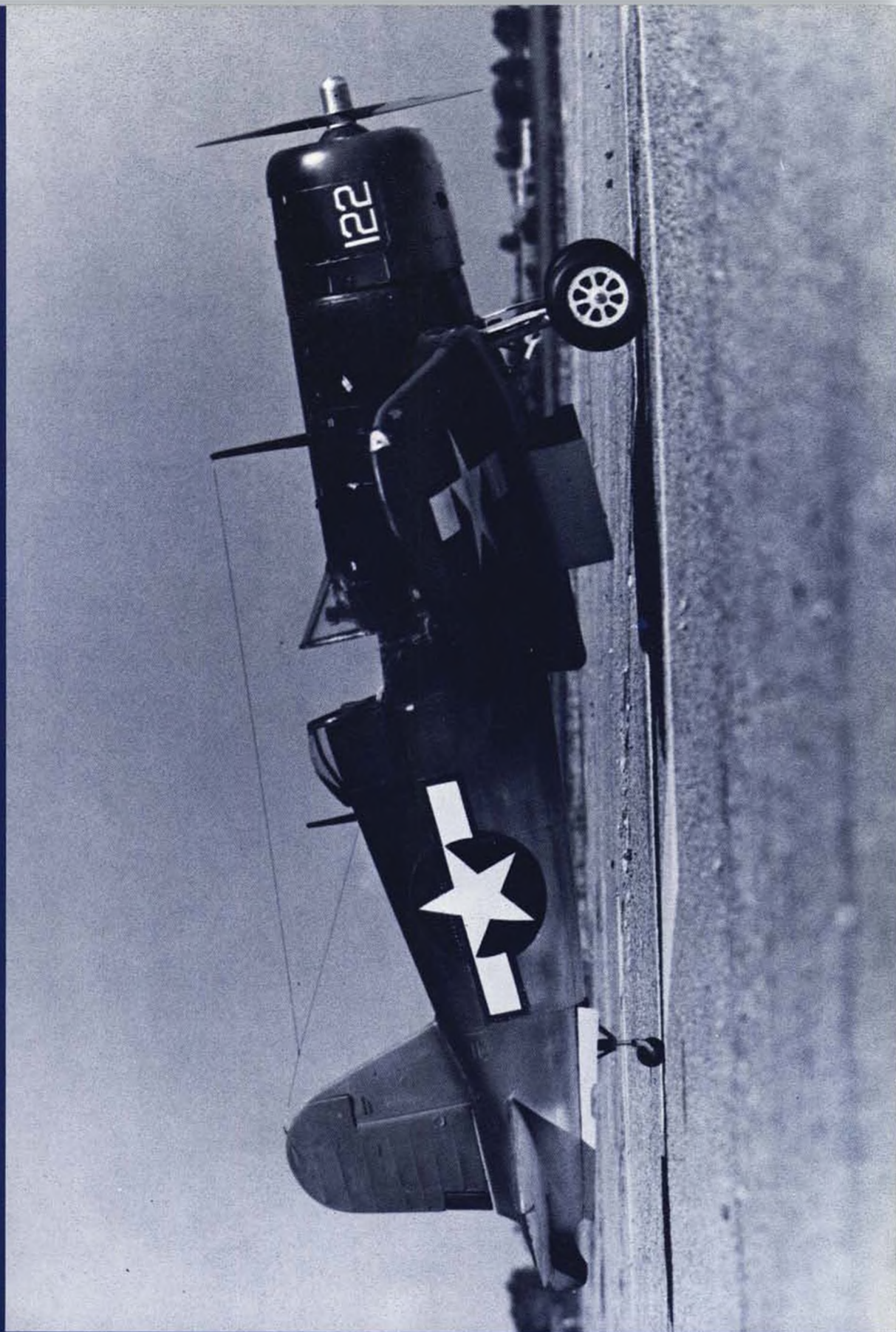


# The MODEL BUILDER

OCTOBER 1972

volume 2, number 12

65 cents







# CARL GOLDBERG

## NEW RANGER 42

The Versatile Almost-Ready-To-Fly Fun Model.



\$1995

Takes Single To 4 Channel Proportional Radio. Molded Fuselage... One Piece Molded Wing, Stabilizer and Vertical Fin. Also Free Flight. Span 42". Weight 26 oz. For .049-.10 Engines.

## SKYLARK 56

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1-Piece Full-Length Sides

Now With 1-Piece Full-Length Sides. Takes 2 to 4 Channel Proportional. Span 56". Weight 3 1/2-4 1/2 lbs. For .15-.19-.35 Engines.

### FEATURES:

- Semi-symmetrical wing section
- Coil-sprung nose gear... formed main gear
- Shaped and notched leading and trailing edges
- Cleanly die-cut ribs, fuse sides, formers, etc.
- New simple "Symmet-TRU" wing construction

## JR SKYLARK

For Single or 2 Channel, Pulse or Digital. Span 37" Weight 18 oz. For .049 Engines. - \$8.95

## Skoestring \$2995

The Goodyear Racer With Enough Area and Stability So You Can Fly It! For 4 Channel Proportional. Span 54"; Area 540 sq. in.; Weight 4 1/2-5 lbs. For .19-.40 Engines.

### FEATURES:

- Shaped leading edges plus sheeting
- Symmet-TRU wing construction
- Full-length sides, sheeted trailing edges
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- Formed spring aluminum landing gear
- Semi-symmetrical wing section.



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"Enclosed is a photo of a model of your SKYLANE 62 which I have just completed. I enjoyed building this plane, it is the first model that I have built in 25 years. Several months ago I observed a group of men flying some R/C models and this rekindled my interest in model planes. Having never built an R/C and this rekindled my interest in model planes. After some investigation I settled on your kit and I was not disappointed. It was so different from anything that I had built previously and I must say that it went together very easily. The plans were complete, left nothing to guess work. I followed the plans exactly with the exception of the motor and I installed a slightly larger motor, a Max OS 40. I am very pleased with the results. I felt I should write and let you know how much I appreciate this kit and I hope to be able to build all of your planes eventually. Again thanks for such a fine kit."

Arnold B. Johnson  
Troutville, Virginia

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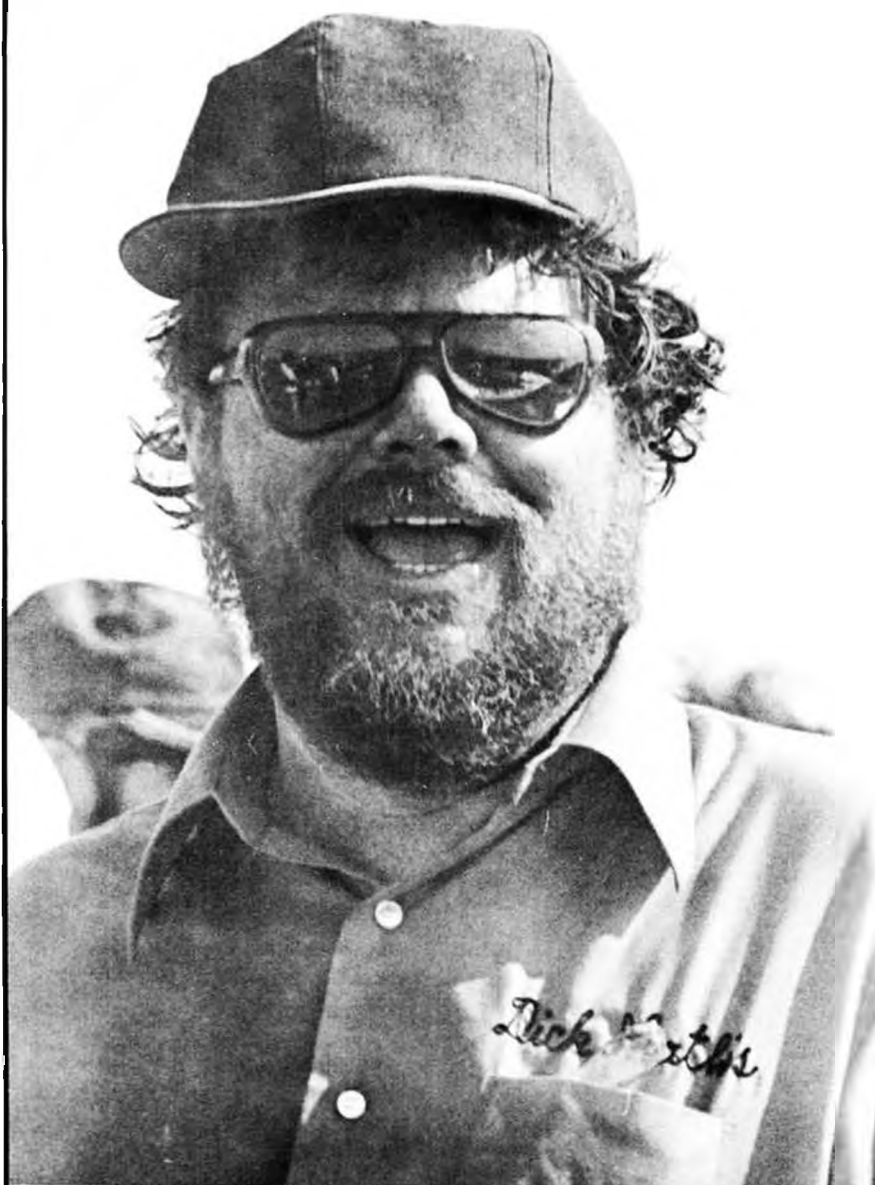
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will tell  
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# The MODEL BUILDER

OCTOBER

1972

volume 2, number 12

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Cover: Bob Karlsson, Wilmington, Delaware, placed 11th at the 1972 Nats with this 1-3/4" scale F4U-1 Corsair. Ship weighs 14-1/2 lbs., span is 71", O.S. Max .80 power, 14 x 6 Top Flite prop, Orbit radio. A machined steel shaft extension and spinner add 12 oz. of much needed weight to the nose. Flaps and retracts also operate. Fuselage is a balsa box with carved foam planks covered in 1/16 sheet. Ship threw spinner weight and crashed at the Nats, but is now repaired and flying again. Photo by Bill Northrop



*"Darn right I believe in the Builder-Of-The-Model rule. I let my old man build this H.L.G. for me, and look what happened the first time I went for an official!"*

John Stubblefield, age 3, Houston, Texas

## from Bill Northrop's workbench . . .

● It is with a great deal of pride and satisfaction that we announce the official recognition of The MODEL BUILDER as a magazine to be reckoned with in the model hobby publishing business. In case you hadn't noticed, and this is very possible, we have been named to that exclusive clique of "limited circulation" publications by another member of the clique, which, by the way, is truly limited, in that it deals with only one phase of our great hobby.

Because of this limited subject matter, and also because of its apparent inability to find cover material which pertains directly to the hobby, we had discontinued regular reading of this "model" magazine several years ago. However, in the last few days we have been receiving phone calls and letters from modeling friends who were quite disturbed about some statements by the editor, in the October issue of this magazine, pertaining to The MODEL BUILDER.



"The day shift at Lockheed." Almost any time of the day, or night, this was the scene in the AMA hangar at Glenview Naval Air Station, north of Chicago, Illinois, during the Nationals.



MB's editor in some mighty good company: LCDR Al Geimer in whites, and CDR Bob Needham. They were THE NAVY at Glenview.



"Happy 5th Anniversary," somewhere over Texas. En route to the Nats, aboard a Navy DC-6, Alex and Marlene Chisolm celebrated.



"We had some rain..." Fourth place C finalist Norm Page appeared to be used to such things. Note xmitter "baggie." It really poured down!



"... and we had some sun." Deputy chief judge Bob Upton checks up on judges Watkins, Lane, and Sitko. Jim Whitley calls for Steve Buck.

Curious to see exactly what it was all about, we attempted to buy a copy, which turned out to be rather difficult since many shops in the area had discontinued carrying the publication. We finally located a copy and actually were quite pleased with what we found, as mentioned above . . . Incidentally, MB's General Manager took one look at the cover and immediately put herself on a strict diet.

Oh . . . just one more thing. Though we appreciate the publicity and are no doubt expected to continue interpublication editorializing in the future, we feel sure that modelers are more interested in reading about the hobby, all phases of it, and therefore will not take

any more space in this or future issues for the purpose of continuing this "limited interest" debate.

\* \* \*

On page 55 of this issue you will find a copy of the "Model Aircraft Operating Standards," an advisory circular just released by the Department of Transportation - Federal Aviation Administration.

John Worth, Executive Director of AMA makes the following comment in connection with this circular, "Please keep in mind that [AMA] is not endorsing the circular. There is much in it we don't like and hope to change when it is reviewed. But our job right now is to make everyone aware of what



"Sorta looks like that there Statue of Libertine, don't he, Maude?"



Officials and helpers assembling the Contestant Kits at AMA Headquarters the night before registration started.



"Chief Cook and Bottle Washer," Kemp Bunting, checks over the official's lunches while Hank Waechter keeps tabs on Ready Boxes.



This was a real "Do-it-yourself" Nats. Here, official Walt Forbes and Class B winner Ellis Newkirk (foreground) pitch in for the big cleanup.

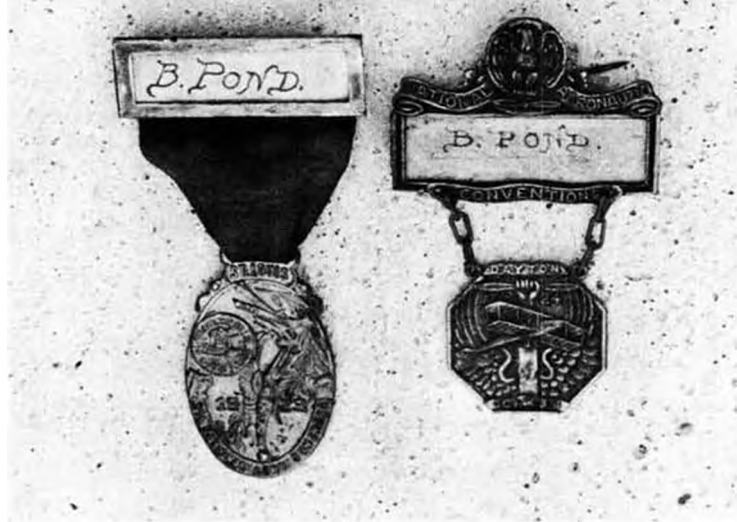


No one that helped erect or remove the snow fencing will soon forget it! Navy was truly amazed at the excellent civilian hard labor forces.





Famous old-time modeler, Bert Pond, holding a famous old-time model. These A-frame twin-pushers were the backbone of early F/F.



Here are Bert's medals, earned at the 1923 and 1924 "Congress" and "Convention" of National Aeronautics, St. Louis and Dayton.



"Good Grief, Charlie, is that a Viking with a Holland Hornet? Who is it? See page 12.

is in it, and to promote trying to live with it."

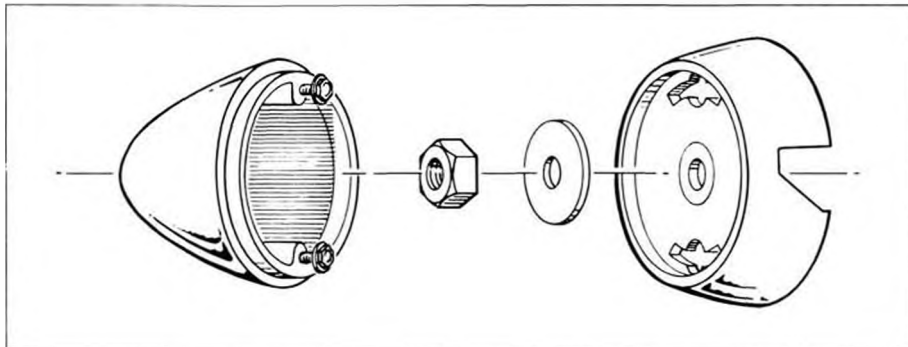
John goes on to point out that the FAA is *concerned* any time we fly more than 400 above the ground. They're not saying we can't go higher, but they'd like us to contact the nearest FAA tower or representative whenever we do. Experiences to date have shown that FAA people are pleased to get the info and have not made any attempt to limit or control modeling activities. As John points out, "... the FAA circular is a means with which we can help our-

selves to prevent irresponsible government action from interfering seriously with our activities.

#### PLUG 'EM UP

A lot of noise has been, is being, and will be (end of tense lesson) made about noise, in relation to the sounds being emitted by model engines. As time goes on, and fields are lost, modelers are becoming more and more aware of the need for mufflers, whether someone orders them or not.

Fortunately, engine manufacturers are finally beginning to realize that if they



The new Williams Bros. spinner is designed for electric starter operation, in addition to being unmarred by screws or holes on the outside surface. Available in many sizes and colors.



The Old-Timer event drew lots of spectators. Charles Zutell, of Kenosha, Wis., releases his Super Cyclone powered Bombshell.



Lee Webster, Manchester, Tenn., launches his New Ruler 168. This ship is currently available in kit form.

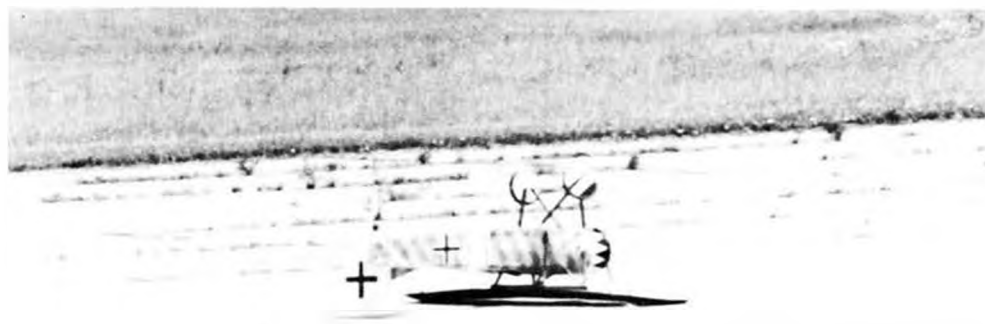


Ralph and Jean Brooke are justifiably proud of son Steve, who flew his Kaos (Pro-Line, HP 60, Superpoxy) to 1st in Class A and Best Jnr.

don't make it easy for modelers to quiet down their engines, there won't be modelers to buy engines. The thing that many people seem to forget, ignore, or are totally unaware of, is the fact that excessive noise damages hearing, not only on a one shot basis, but also accumulatively.

If you're in an area where mufflers are not yet required, or if you're involved in Formula I racing, there's nothing you can do about the noise emission, but there's something you can do at the receiving end of the noise. Frank Schwartz, Nashville, Tennessee says,

"Best thing I've found are the sporting good stores shooter's earplugs. No bigger than the old fashioned swimming earplugs, they are made of very soft rubber and contain a tiny cylinder which has somekind of sensitive piston which closes on noise peaks. You can stand behind all four pylon race planes in one heat and they don't even bother you . . . more amazing than that it is possible to carry on a conversation with someone else using the same plugs at that very time in a perfectly normal voice . . . those poor guys without them are screaming at each other over the din and still don't get heard. Apparently these little marvels



"Ach Himmel, Fritz! Ain't you undershtooden das uppsidedownner zoomen ist VERBOTEN! Or maybe you ben vorgetten das veels ist vrom der BOTTOM hungen . . . joik!"

cut off the noise peaks and only let the low intensity sounds come through. Bob Reuther and our bunch who ran pylon racing at the Nats used them all the time and they saved the day. Anyone who wants more information can contact me."

You can catch Frank at 2400 West End Ave., Nashville, Tenn. 37203. These plugs might be a good item for the better hobby shops to stock.

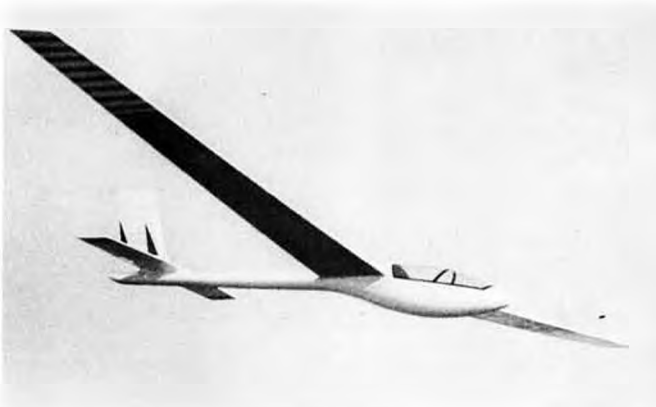
#### ANOTHER KINDA PLUG

In a recent issue of the American

Miniature (Tethered) Racing Car Association Newsletter edited by Mrs. Martie Fairabend, 53166 Franklin Dr., Utica, Mich. 48087, it was reported that a company in Denver, Colorado, is interested in knowing how many people would be interested in obtaining 1/4 x 32 spark plugs.

Of course, the majority of tethered race car operators use ignition engines, but when you add to this the growing

*Continued on page 53*



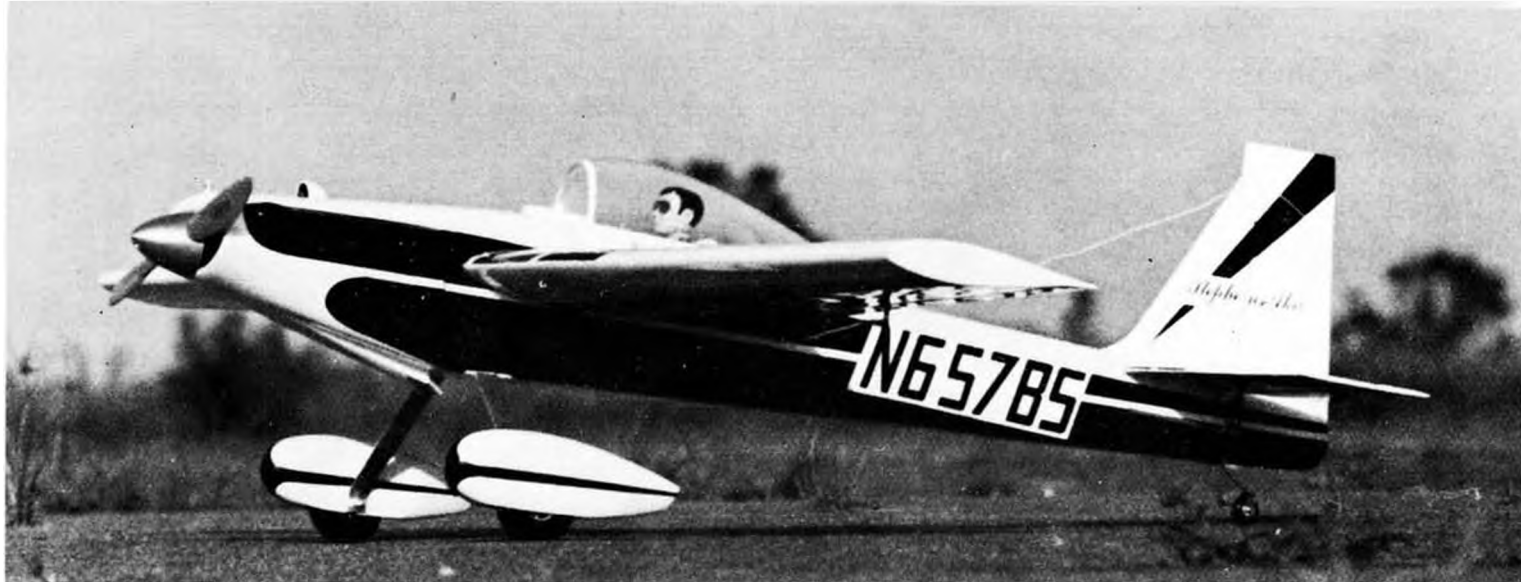
Harley Michaelis' "Spirit of Freedom" sailplane which is being partial kitted by Hartman Fiberglass.



Tatone engine and D-T TICK OFF timers are back, with improvements. The FLOOD OFF engine timer will be along in 1973.







# STEPHENS AKRO

By Brad Shepherd . . . A real classy scale, sport, or pattern ship, using an economical .35 or .40 engine. Construction is all balsa and ply . . . conventional.

● The beginning of this very satisfying project goes back to the May 1968 issue of the then popular "Sport Flying" magazine. Under the heading of "Sport Flying Country Store", there was a short commentary about a new aircraft, written by Gerald T. von Aspe. I quote, "Attention home builders, plans for the STEPHENSAKRO midwing monoplane designed specifically for competition aerobatics will soon be available. Aerobic aviatrix Margaret Ritchie will enter her STEPHENSAKRO in the 5th Biennial World Aerobatic Championships at Magdeburg, East Germany, this year,

and many see success for this fine little airplane." As you who keep up with full scale flying know, Marge 'Grandma' Ritchie went to her rest while practicing at an airport in Orange, California while preparing for the Championships.

Directly under the commentary by Mr. von Aspe there was a tiny partial 3 view of this airplane. Being a mid-wing "nut", it struck me as a good project with the exception of the front end: I just couldn't get fired up over it. One of my RC buddies, Leon Folse, and I, did some quick calculations from the tiny drawing and that's as far as the project got for 4 years.

Getting a little "burned out" designing quarter midgets, I looked at the STEPHENSAKRO again and realizing that Sig now had 1/64 inch plywood available, started putting things on paper. It looked good and had the possibility of staying simple in construction. The pictures tell the final story but I

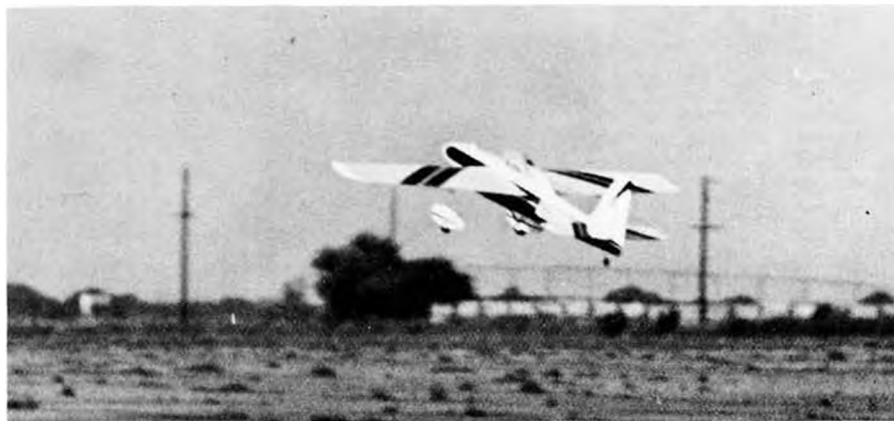
would like to say that it is simple to build, has the looks of the full size aircraft, and is about 2 1/8 inch stand-off Scale. It won't quite do a vertical 4 point roll with the .35 in it, so I'm planning to put a .40 under the cowl.

This may sound a little prejudiced, but this project has been a real "pleaser" from the time I drew up the plans 'till it went in the air on the test flight, so if your building appetite is whetted, start fuselage construction by laying out the basic sides on 3/32 inch sheet. Basic outline is all straight lines and can be laid out with a yard stick or straight-edge. Draw thrust line first (ball point works good) then measure from this to establish outline. Use the lines inside top and bottom sheeting, also lines inside top and bottom half inch front nose blocks, to give you the basic outline.

Draw a straight line parallel to and 3/16 inch above thrust line for wing cut out, use root rib and draw wing section



The author/designer, all decked out in flying togs, taxis the Akro to takeoff position.



"And awaaay we go!" The ship is a great combination for scale, sport, and aerobatic flying.





Ship is balsa and ply construction throughout. Even cheek cowl is formed of 1/64 plywood.



Only a few weeks old, and a trophy winner already. Akro placed second in scale at Corpus Christi Internats contest, was judged by well known scaler, Tom Dean.

outline 3/32 inch wider than root rib to allow for 3/32 inch sheeting on wings. Draw a line parallel to and 9/16 inch above thrust line for the stab location and make a 3/16 inch slot for this, or, cut top off (see photo) and use blocks to fair in the fuselage over the stab. Mark angles of front and rear of turtle deck piece.

Cut the side to shape, making wing cut out and angle for turtledeck (save turtle-deck piece.) Use the side just cut out as a pattern for the other side.

The doublers are cut to shape from medium grade 1/8 inch balsa. Making these with the help of a straightedge and square at bulkhead locations insures a straight and square fuselage. Glue the doublers to the fuselage sides, D-3 first, then D-2, using a scrap of 1/8 inch balsa to get a good fit where the B-1 bulkhead will go. If you elect to use a one piece firewall instead of the crutch arrangement, draw a line on the inside of each D-2 doubler, square with the thrust line at the locations shown, to assure 0-0 engine thrust when glueing firewall in place.

Gusset each side of firewall where it

meets fuselage side by epoxying 1/2 inch triangle strips to joint. Check notch in the bottom for 1/8 inch ply landing gear plate. Glue top 1/2 inch triangle pieces to side, and bottom 1/4 inch triangles.

Assemble fuselage over top view of plans by inserting bulkheads B-1 and B-2 in place and glueing, pin to keep alignment true while drying (I use 5 minute epoxy for this job.) Glue either the ply crutch assembly, or firewall-only arrangement in place. Epoxy the 1/8 inch ply landing gear plate in place, then the 1/16 inch ply reinforcing plates to inside of fuselage. Place bent and drilled landing gear over ply plate, position it so it is square, drill holes in ply and install 4-40 blind nuts.

Glue top rear sheeting in place and bottom fuselage sheeting (with landing gear bolted in place), butting the 3/32 inch sheeting against the aluminum LG for a smooth flush fit on the bottom when finished. Engine, (whether using crutch or radial mount system) should be fitted at this time, then the fuel tank.

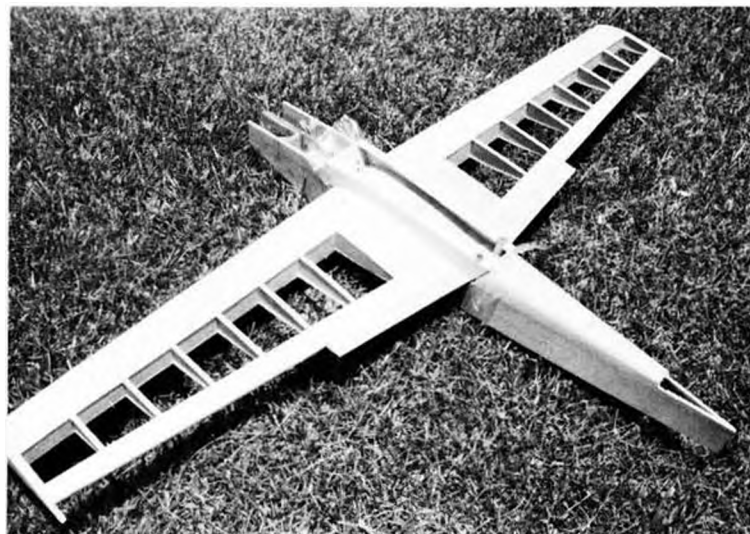
Use medium to light quarter grain wood sheet for the tail surfaces. For

the benefit of those who may not know, the difference in balsa wood grains, "C" or quarter grain (Sig stamps his as such) has a "mottled" effect and is very stiff, and will not bend without splitting the sheet. This keeps the surfaces straight and free from warping when finishing the "tail feathers" on your bird. If your friendly hobby dealer handles Sig balsa you can usually find some light "C" grain in his bin.

Due to the large elevators, I made up a long horn from K&S brass strip and 3/32 inch music wire as a connector between the elevators. Holes are drilled in the elevators and the connector/horn is epoxied in place. The brass strip shown is SILVER soldered to the MW connector. I used low temperature Sta-Brite for this job . . . it works well.

The tail wheel bracket/rudder drive assembly is made from a Rand/Ace strip aileron fitting. Solder a piece of K&S strip directly below the 90 degree bend for rudder drive, slip a piece of 3/32 inch brass tubing (the length of the Rand/Ace fitting) over the 1/16 inch collar on the bottom, tightening it so there is no

*Continued on page 46*



Use of Handi-Wrap permits exact fit and glue-up of turtle deck.



The almost completed bones. Cheek cowl is 1/64 ply wrapped around bulkheads shown here. Canopy is masked for protection.





Yup, that's who you saw on page 6: Carl Goldberg, making that traditional flight at every Nats. Looks easy, doesn't it?



Bruce Mathews launches his TD .09 powered SonofaWitch Doctor. He placed 2nd in Junior FAI with this modified Sig kit.

# FREE FLIGHT-72 NATIONALS

Our F/F Editor, Mel Schmidt, was unable to attend the Nats, but here are a few thousand words worth of pictures, mostly taken by George Bahrman.

## ● JUNIOR 1/2 A GAS:

1. F. Johnson, Ca.
2. B. Paillet, N.Y.
3. R. Faranda, N.Y.

## SENIOR 1/2A GAS:

1. C. Wiese, Mich.
2. W. Burgess, Jr., Ind.
3. G. Watson, Ill.

## OPEN 1/2 A GAS:

1. M. Heller, Ill.
2. R. Britzke, N.Y.
3. E. Wald, Minn.

## JUNIOR A GAS:

1. G. Comp, Pa.
2. K. Bauer, Ca.
3. M. Munger, Mich.

## SENIOR A GAS:

1. G. Fortin, Mich.
2. G. Turner, Tex.
2. L. McFarland, Tex.
3. J. Jerabek, Canada

## OPEN A GAS:

1. H. Faranda, N.Y.
2. A. DeMello, Canada
3. R. Johnson, Ca.

## JUNIOR B GAS:

1. D. Lang, Ill.
2. J. Mekina, Ohio
3. D. Mathews, Kans.

## SENIOR B GAS:

1. W. Burgess, Jr., Ind.
2. G. Turner, Tex.
3. M. Kummerow, Ill.

## OPEN B GAS:

1. R. Kluiber, Ohio
2. W. Burgess, Ind.
3. G. Schautz, Mich.



Wanna bet it's a Midi-Pearl? Dick and Mary Kay crank up the company plane. Mathis and Peadon kit this well tested design.



More proof that modeling is a family affair. Joe Mekina and father prepare TD .051 powered Starduster. Joe was 4th in A Gas.



Jack McGillivray, Toronto, Canada, and his unusual "Folder." Outer panels open up when engine stops. Drawings in Mar/April MB.



National Free Flight Society's Executive Director, Hardy Broderson. Quite a tail moment, wouldn't you say . . . on Hardy's Xc design.

#### JUNIOR C GAS:

1. W. Schlarb, Jr., Ind.
2. D. Mathews, Kans.
3. S. Schmelzer, N.J.

#### SENIOR C GAS:

1. M. Kummerow, Ill.
2. W. Burgess, Jr., Ind.
3. G. Turner, Tex.

#### OPEN C GAS:

1. R. Bloomquist, Iowa
2. G. Comp, Pa.
3. P. Kosmala, N.Y.

#### JUNIOR FAI GAS:

1. W. Fribbis, N.Y.
2. D. Mathews, Kans.
3. W. Schlarb, Jr., Ind.

#### SENIOR FAI GAS:

1. B. Webster, Ind.
2. R. Dunham II, Okla.
3. J. Naught, Tex.



Corky Wald, St. Paul, Minn., prays for a max.



Chris Watters launches his winning Junior Wakefield model. He's from Battle Creek.



Andy De Mello, Toronto, and his 4th place Open Nordic A/2.



Cameron Ackerly, Toronto, Canada, placed second in Open Wakefield.



Susan Wiesenbach shows the boys how!

#### OPEN FAI GAS:

1. B. Eggleston, Canada
2. D. Dock, Ind.
3. G. Versaw, Mich.

#### JUNIOR WAKEFIELD:

1. C. Watters, Mich.
2. S. Matteson, Mich.
3. K. Gordey, Ill.

#### SENIOR WAKEFIELD:

1. P. Lewis, Mich.
2. D. Wypych, Mich.
3. R. Dunham, Okla.

#### OPEN WAKEFIELD:

1. W. Smitz, Wisc.
2. C. Ackerly, Canada
3. J. McGillivray, Canada



Open A/2 Nordic winner Peter Allnutt, Mississauga, Ontario, Canada, at front of processing line.

#### JUNIOR UNLIM. RUBBER:

1. K. Bauer, Ca.
2. K. Gordey, Ill.
3. C. Watters, Mich.

#### SENIOR UNLIM. RUBBER:

1. R. Dunham II, Okla.
2. D. Wypych, Mich.
3. P. Lewis, Mich.

#### OPEN UNLIM. RUBBER:

1. P. Klintworth, Mich.
2. G. Perryman, Ga.
3. C. Sotich, Ill.

#### JNR./SNR. COUPE D'HIVER:

1. M. Keuhne, Ohio
2. G. Simon, Mich.
3. R. MacCleery, Mich.

#### OPEN COUPE D'HIVER:

1. G. Perryman, Ga.
2. B. Servaites, Ohio
3. J. Annis, Wisc.



Jeff Nix, Smithtown, N.Y., a Senior.



It's not too hard to tell that Warren Williams has made a slight modification to the fin on his Wakefield.



Bill Chenault, Dallas, Tex; Midi-Pearl.





Tony Naccarato uses a remote release for his F/F helicopter.



Bill Bennet looks a little strained as he helps son Andrew, who placed 4th in Junior Wakefield with "Billy Boy," from M.A.N. plans.

#### JUNIOR A/1 NORDIC:

1. G. Bennet, Mich.
2. J. Bayly, Ca.
3. B. Paillet, N.Y.

#### JUNIOR A/2 NORDIC:

1. M. Coates, Fla.
2. W. Friebe, N.Y.
3. D. Stainbrook, Iowa

#### SENIOR A/1-A/2 NORDIC:

1. B. Webster, Tenn.
2. R. MacCleery, Miss.
3. J. Lorbiecki, Wisc.

#### OPEN A/1-A/2 NORDIC:

1. P. Allnutt, Canada
2. R. Watson, Ill.
3. R. Mattes, Mo.

#### JUNIOR H.L.G.:

1. J. Mekina, Ohio
2. S. Matteson, Mich.
3. T. Wilson Jr., Kans.

#### SENIOR H.L.G.:

1. L. McFarland, Tex.
2. R. Dunham II, Okla.
3. M. Kummerow, Ill.

#### OPEN H.L.G.:

1. P. Kosmala, N.Y.
2. D. McKinzie, Iowa
3. B. Servaites, Ohio

#### JUNIOR ROCKET POWER:

1. R. Lyons, Ill.
2. K. Burner, Ind.
3. J. Bayly, Ca.

#### SENIOR ROCKET POWER:

1. C. Wiese, Mich.
2. P. Shailor, Mich.
3. J. Haught, Tex.

#### OPEN ROCKET POWER:

1. W. Jenkins, Tenn.
2. M. Richardson, Ohio
3. C. Sotich, Ill. ●



First in Junior Rocket, Bob Lyons, Libertyville, Ill.



Andy De Mello and 1/2 Nog, A Gas.



Lee Lieber, Moorestown, N.J. launches his Witch Doctor 800.



Red Johnson, West Covina, California.

	1	2	3	4	5	6	TOTAL	FINISH
BONETTI	405	370	359	375	382	403	808	10
WHITE	393	375	366	388	393	413	806	13
LEONARD	383	381	337	384	377	391	775	17
COLEMAN	421	367	371	419	378	406	802	3 X
KRAFT	179	403	34	399	389	412	816	6
LADY	357	37	37	350	388	37	775	16
BRIDI	373	315	373	37	37	37	775	15
WHITNEY	400	339	373	410	37	37	775	2 X
HELI	379	319	373	37	400	37	775	9
SMITH	377	385	403	406	370	372	806	12
BUCK	383	37	37	391	37	37	807	11
CHIDGEY	421	387	375	400	434	414	855	1 X
NOTELLING	302	383	379	350	376	363	763	19
PAGE	380	390	370	37	37	413	831	4
PENROD	37	377	379	37	414	384	825	8
BARRY	360	368	350	37	365	365	763	18
BROWN	392	391	305	40	37	37	804	14
MARTIN	377	377	373	370	37	407	814	7
AGEE	311	357	343	369	347	387	758	20
KIRKLAND	37	37	37	37	37	37	758	5

Here's the whole C Pattern Finals in a nutshell; the scores of each flyer for each round, the total of three judges. Best possible score is 480 points.

## R/C PATTERN AND SCALE - 1972 NATS

By Bill Northrop . . . . What better way to open a new feature department than a report on the biggest annual contest of all. We'll handle this chore in future issues, but hope to bring in many guest writers.

● Every other year, the Nationals R/C Expert Pattern Competition is *NOT* the major clash of the big guns in this oldest of radio control events. The 1972 Nats was a "NOT" year, as the "Rilly Big Shew" will be the R/C Masters Tournament FAI Team Trials in Huntsville, Alabama on September 22-24.

Though an anti-climax from the above point of view, the 1972 Nats R/C can

certainly claim some "firsts" and "lasts." For the first time since the two-site, four-line, back-to-back operation was inaugurated there were not one, but two mid-air, both occurring within a short space of time, in the same qualifying round, and at the same site! Both accidents were also complete "totals," all four planes being pretty much reduced to confetti before hitting the

ground. However, considering the total number of back-to-back flights accomplished over the past eight years, those in the know felt we didn't come anywhere near paying our debt to the law of averages.

Two other "firsts" were cases of radio interference, which, though not really the first in Nats history, were the first to occur in the recent, rapidly



And now the front view of the back view we gave you last month! The top three in C Expert: (l to r) Jim Whitley, 2nd; Ron Chidgey 1st (again!); and Don Coleman, 3rd.



"To the victor . . ." Ron Chidgey about to be congratulated by MB's General Manager.



Ralph Brooke gives moral assistance to his son Steve, who certainly needs no help in flying.



Harold Goldklank does a "4 Pernt Cuban 7-1/2 Gainer," and judge Tom Ewing begs for help!



To keep spectators informed, a new system was tried. Bonetti flies, Barry calls. (See below)



George Platteter calls for his son Bob, who was 2nd in Class A. They're from Rochester, N.Y.



Ellis Newkirk, Nashville, Tenn., took 1st in Class B, also won Best Senior award.



Judges write down score for Bonetti's maneuver, messenger relays them to board. (See below)



Scores for each maneuver are posted (Though scrambled) before pilot gets to next maneuver!



Ed Hotelling, 1st in C Novice and also top 20 qualifier, lends a hand to Joe "Kaos" Bridi.



Ernie Weiss, J & J Industries, placed 5th in C Novice. Royal Elect. radio, J & J Banshee.



We enjoyed meeting and talking with this well known news broadcaster, Paul Harvey.



Ralph Brooke blew a maneuver in his last flight, so just relaxed and let it all hang out!

expanding years of radio control competition. In both incidents, the fault was purely human error, and not a breakdown of the system that has served so well to provide lots of flying for lots of contestants.

The first situation came as a result of a last minute juggling of the well



"If you can find it, you better land it, Phil, the judges are leaving anyhow."





Frank Nosen's 1st place Skyraider taxis into the "hangar" at the end of a flight. Logictrol, Webra 61, 13 x 5-1/2 Top Flite prop.

established "two-frequency-platoon" system, developed, we believe, by R/C Director Kemp Bunting. This system allows simultaneous flying of R/C scale and C Pattern Finals on Friday and Saturday morning, one at each of the two sites. Basically, all of the frequencies in Scale are split into two blocks, and all of the frequencies in Pattern are split into two similar frequency blocks. Call them A and B. All frequencies in Block A, Scale, can be flown at one site

*Continued on page 56*



Tom Cook's B-17 makes a bomb run for the judges. Power is four Webra .20's, turning Grish nylon 3-bladed props. He won the Best Flying Achievement Award.



Claude McCullough's 6th place Shinn 2150 bores down the runway for takeoff. Sure looks empty in that big cockpit!



Not sure whether Dave Platt's famous SBD was taking off or landing. Arresting cable hook is down, but flaps seem to be only half way.



Ralph Jackson's Windecker Eagle is a real smoothie. Power is Webra, radio is Kraft, 12 x 6 Power Prop. Placed 5th in competition.



"No right rudder please, Ed!" Ed Ellis' Ryan M2 mailplane bears down on the photographer. Third place ship is OS 60 powered. Kraft radio.



Dick Graham flips his Liberty Sport after getting the inverted engine fired up. He only placed 14th, but won special EAA award.



Anita Northrop meets Fly Baby. Walt Moucha's ST 71 powered ship placed second. Kraft radio, 13 x 6 Rev Up prop.



Bud Phillips tunes up the engine in his Lockheed "Orion" while Alex Chisolm, Dist. X V.P. holds on. Line official Dwayne Brown watches.



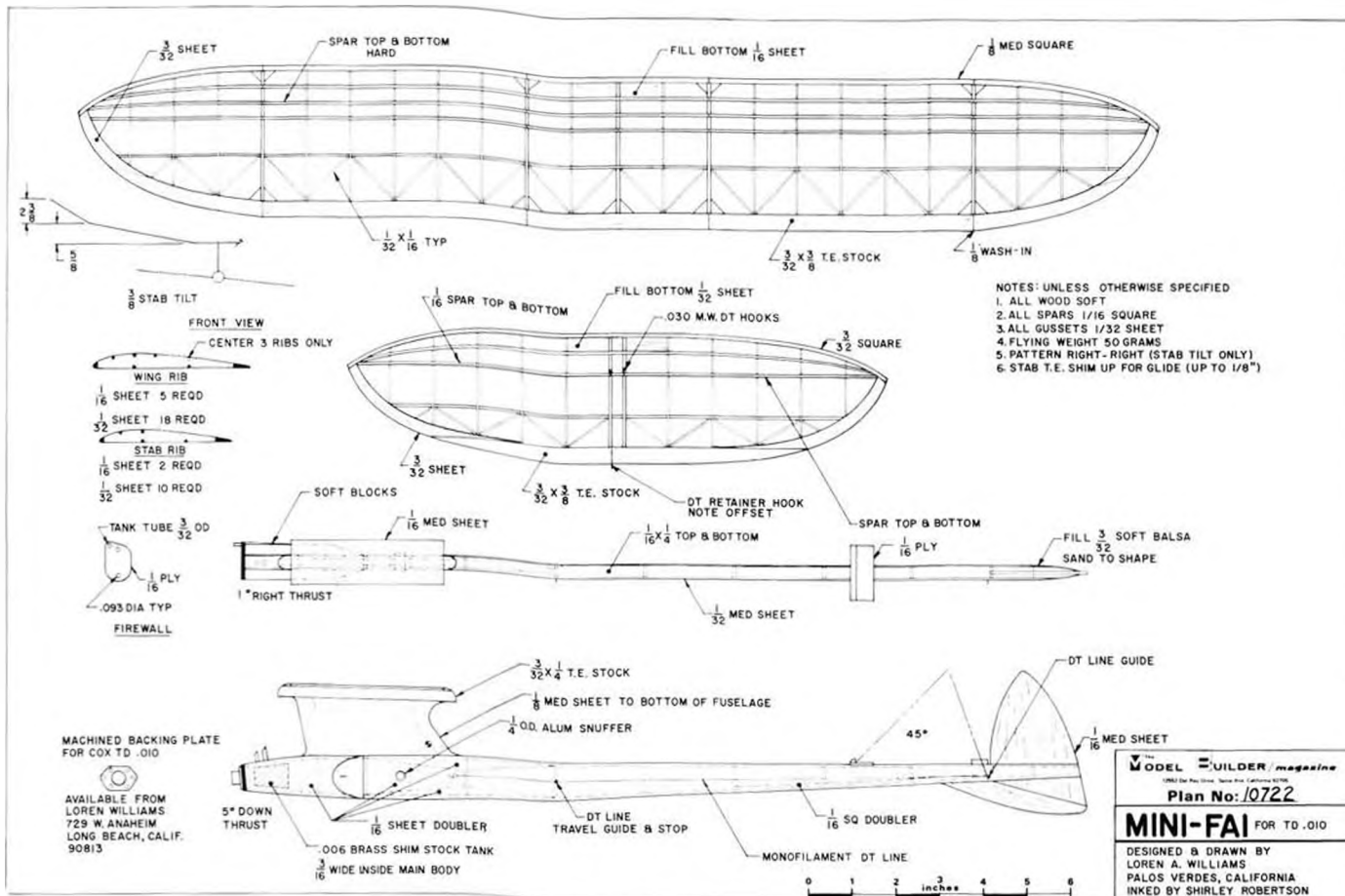
Bob Karlsson and his F4U-1 Corsair. Power is an OS 80, Orbit radio. Fuselage is foam planks over a balsa box, carved and then sheeted.



Joe D'Amico taxis his Martin B-26 down wind prior to takeoff. Ship (and Joe) is a smooth and consistent flyer.



Walt Glemser and Jack Steele (hand on wing) assist Bill Bertrand with his Handley Page bomber. He placed tenth.



# MINI-FAI

By Loren A. Williams

We published a photo of this plane in the February issue, and can now truly say, "By popular demand, we bring you . . . etc." The special engine backplate is available from the author.

● Thirty-eight years of model building has brought me to the conclusion that, there will never be enough time to build all the designs I dream of. Each month the major model magazines present us with enough plans to fill a year's sabbatical. The selection of your next model be it an original or a proven design, is based on the amount of time that can be devoted to that specific model (count your unfinished projects). We will automatically reject a plan that will take 3 months to build, daydream of our

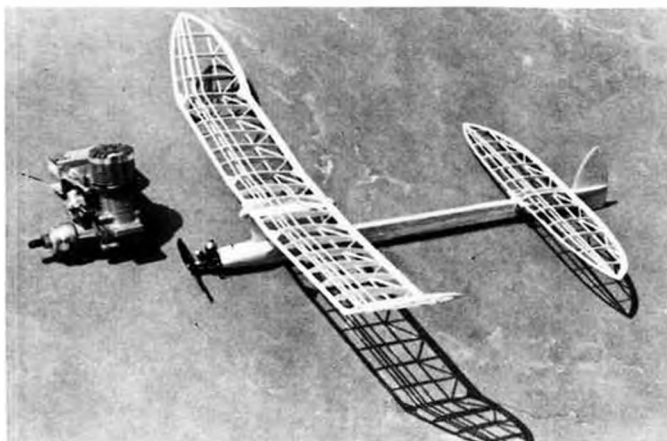
super job that will take at least a year, then turn to a 5 hour peanut scale to satisfy our craving.

The problem: Time.

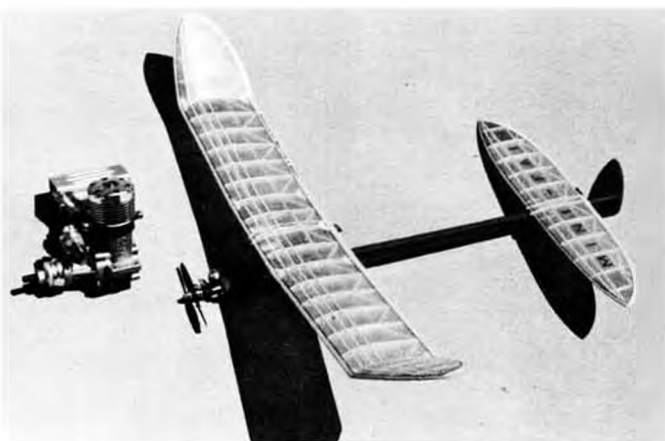
The solution: Shrink size and we shrink building time. Build a scale version of that project you have never started, to fit a Cox .010 engine. Most magazine plans need only be doubled.

The Cox TD .010 turns 27,500 R.P.M. (FAI enthusiasts take note), enough power for our scale version to simulate the most competitive of large engines.

The scale FAI presented in this article is a merger of highly desired design factors, which result in a model that reaches full flying speed almost instantly, climbs in a controlled vertical spiral, and flows smoothly into a floating glide pattern. MINI-FAI has 100 square inches of total flying surface (wing and stab areas combined) and a total all up flying weight of 50 grams (1.8 ounces). A special machined aluminum plate, for low profile, replaces the bulky plastic tank. See Workbench section for avail-



The prime for that Enya 60 would probably run the 010 for half an hour! An interesting visual comparison.



Same scene as at the left, but now Mini is dressed.





Try this on your 8 pound R/C toad! The clean, functional lines are very evident in this photo.

ability.

Only 25 hours of building time required. Ready to start?

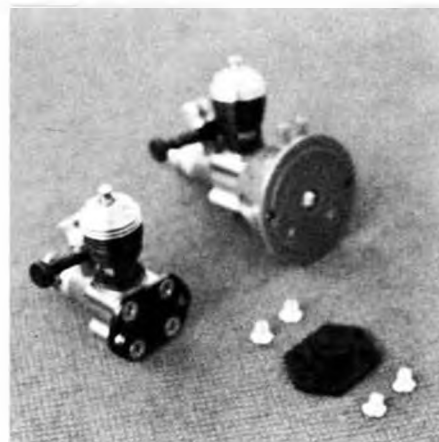
**CONSTRUCTION:** The key to fast building is to accurately fabricate *all* components to their exact finished shapes. All your planning of how the model will go together is done during this stage. Although this article will be broken into basic assemblies, read each one carefully and pick out all components that can be prefabricated. The author even goes so far as to cut all tissue pieces to size before assembly of model begins. Careful selection of wood should be made to produce as light a structure as possible. When construction begins, there is no lost motion; there is always something to put together while something else is drying. Ambroid fast drying cement was used for all joints, except the firewall which uses Titebond.

**FIREWALL AND TANK:** Cut 1/16 plywood firewall to shape shown on plan. Drill engine mounting holes from backing plate and fuel outlet tube (3/32 O.D. brass tubing). Epoxy small pattern 2-56 nuts on rear of firewall.



At last! A picture in which Bill Brown's CO<sub>2</sub> engine doesn't look small.

The tank is fabricated from two U-shaped pieces of .006 brass shim stock usually available from automotive parts stores. The first U-shape is the 2 sides and the bottom, the other being the front, top and rear. All 3/32 tubing holes are drilled before forming. After tack soldering all corners of assembled U-shapes, complete soldering of seams. Place tank and firewall on top view of

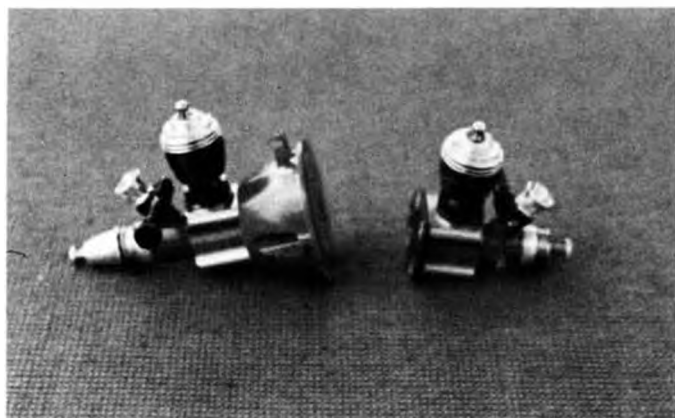


The relative sizes of the standard tank mount and the special back plate show up here.

plan to solder fuel outlet tube to correct angle. Solder filler tubes to top of tank. Don't worry about pin holes in your soldering, as entire assembly is final painted with epoxy.

**WING CONSTRUCTION:** Cut all ribs oversize, pin together, block sand to final shape, and notch. Trim each tip rib to size. Taper leading edge from tip

*Continued on page 50*



From this angle, the comparison of frontal area between the stock tank mount and the special backplate is obvious.



Here's the photo that started all the fuss. Published in the Feb '72 Model Builder, Loren got many requests for plans. Here they are!



First in Senior Stunt, Dennis Adamisin, Taylor, Mich. 489.25



First in Junior Stunt, Mark Bauer, Norridge, Ill. 324

## CONTROL-LINE

By Phil Granderson  
and Bart Klapinski

First hand reports by two observers of C/L at the Nats. Phil as a contestant, and Bart as one of the event directors. All stunt pictures were taken by Bart.

● Arriving at the hangar early Monday morning, I was surprised to see so much activity. By 11:00 a.m. virtually all hangar space had been consumed. Monday was a day for paper work, unwinding from a cross country trip (2,200 miles), greeting old friends and meeting new ones, telling stories and speculating as to the outcome of this year's competition.

No official flying was scheduled for Tuesday but unofficial competition was going full bore. The weather was cool and windy and the familiar sight of airplanes circling around pilots was everywhere. Out on the runway, three of the nation's best stunt flyers were practicing

for Friday's competition. I went over to pick up on the conversation which went something like this:

Gene: "Whatdoya think, Bob?"

Bob: "I don't know, Gene. I'm a nervous wreck!"

Gene: "Yeah, me too!!"

Bob: "How 'bout you, Bill?"

Bill: "Well, I'll tell ya Bob, I think we're all nervous wrecks!!!"

Thus began a day in the life of competitive stunt flyers.

Over on the other side of the field, some speed flyers were testing engines and fuel, trying to find the right combination for success in their particular

event. Combat planes were all over the place. These man-made freaks of aviation fly at speeds in excess of 100 mph and maneuver in a fashion that is impossible to describe in writing.

The hangar was aglow with model builders and airplanes. The scene was one of pure delight to any model aircraft enthusiast and one of probable disgust to any model boat fans who may have been there. Planes were being constructed, rebuilt, and even flown in the hangar. The U.S. Nats is the only place you can see everything model aviation has to offer, under one roof. You can see and talk to beginners and world champions



Second in Senior Stunt, Mike Jackson, Long Beach, Ca. 488.50



Third in Senior Stunt, Mike Thompson, Modesto, Ca. 483.75



First in Open Stunt, Al Rabe, Irving, Texas. 627.75



Second in Open Stunt, Bob Gieseke, Irving, Texas. 625.75



Third in Open Stunt, Bill Rutherford's P-51. Yup, he's from Irving, Texas! Good to see scale airplanes breaking into this event.



Lew McFarland, Lexington, Ky., flew this Akromaster to fourth in Open Stunt.

alike, and all have two things in common: glue on their fingers and balsa dust in their hair!

Competition is not just flying; it also involves psychology as can be demonstrated by this typical conversation between two hot combat flyers from different parts of the country:

John: "How ya doing this year, Bob?"

Bob: "Oh, pretty good but I always have engine trouble when I come to Glenview. Must be the humidity."

John: "Gee, that's too bad!!"

Bob: "How's your stuff this year?"

John: "Well, my engines are really honkin' but my planes don't seem to be flying so good. I guess it's the fat air!!"

Bob: "Fat air??"

John: "Yeah, in my part of the country, if your airplane weighs more than 12 ounces it just falls out of the sky, but they won't ever penetrate the air around here!"

Bob: "You're right, John. The air is kind of thick around here! See you later!!"

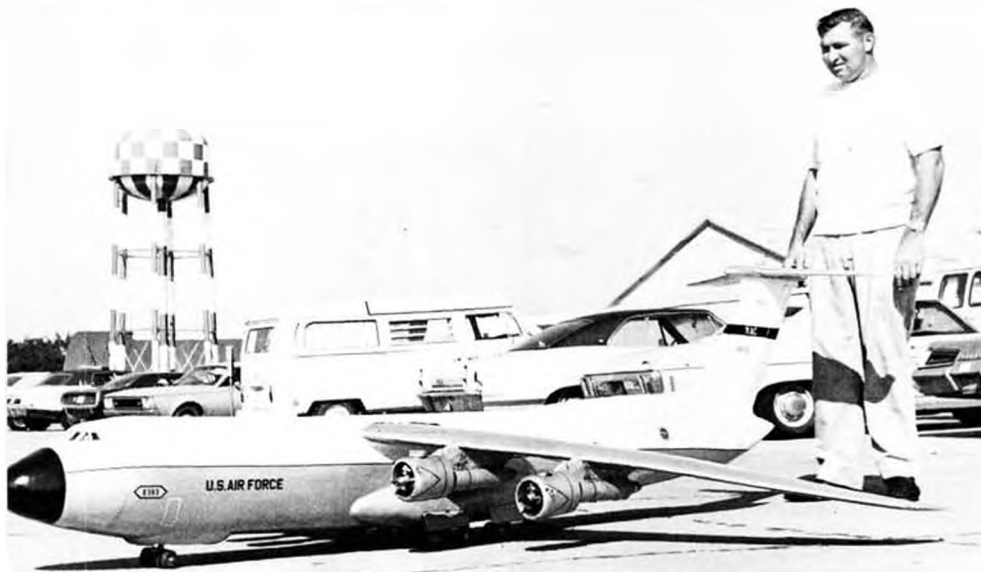
Wednesday was the first day of official flying and suddenly the weather turned into duck soup. It was cold, rainy, and windy in the morning and got worse as the day progressed. Nothing can keep a good man down, as was the case with Brian Pardue who was burning up the Seniors in 1/2A Speed. With a speed of 102.00 mph, he turned the fastest time of any age group. He was followed by Terry Herron and Jim Wade. "2-4-6-8-10 MaryLou just beat the guys again!!" That's right, folks. MaryLou Brown has struck another blow for the women of America. This time it was in Open 1/2A Speed. With a mark of 98.43 mph, MaryLou fried the team of Jett/Upton and down in third place was the Baughman/Kantrow team. In Junior, Jimmy Clem was the winner, upsetting Glen Vansant and Pat Hempel. Half A Proto saw Dennis McGraw, Terry Herron, Warren Kurth finish 1st in Mr., Sr., and Open respectively.

Over in the Rat Race circle, Bill Keller of Centerville, Ohio, managed to ward

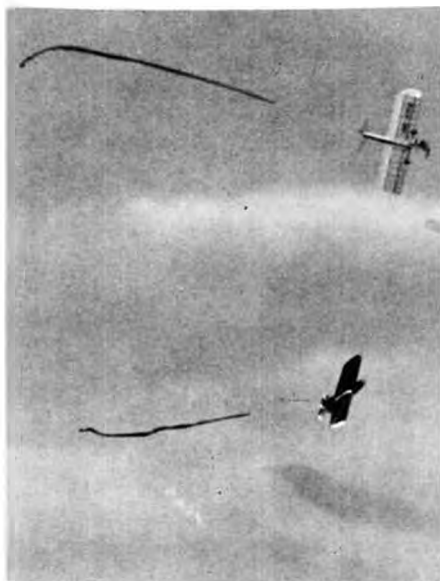


A flock of Tempests, including Junior Stunt winner, foreground. Bart Klapinski's design.





T/Sgt. Gordon Ford's huge C-5A, which was featured at Transpo. Ship weighs 38 pounds. Flew at post-Nats Air Show.



off stiff competition to win Open Rat. He used an HP 40 in his "Boss Rat". The new Schnerle Port engines seem to be making news in Rat Race circles everywhere. Second place went to Ron Esman with a Super Tigre. Third place was captured by George Cleveland with another HP.

In Junior Combat, Doug Harris got buried by Jim Flake, flying his "Undertaker". Jon Norwood of Shreveport, La. battled his way to third flying a Voodoo and a Fox 36XBB.

Sr. Stunt has been dominated by three young men for the past two years. Mike Jackson, Dennis Adamisin, and Mike Thompson seem to always end up flying away from the rest of the competition. This year was no exception. With a mere 5 1/2 points separating 1st and

3rd, it was Adamisin 1st, Jackson 2nd, and Thompson 3rd. If you think the point spread between 1st and 3rd was close, just have a look at 1st and 2nd: Adamisin - 489.25; Jackson - 488.50. Only 3/4 of a point separating the two!!

Thursday started out as a carbon copy of Wednesday in the weather department. Jr. Rat was Rodney Lyons of Plainwell, Michigan reign triumphant over Mark McEndree of Irving, Texas and Mike Mangan of Willowick, Ohio! Rodney used a Tiger G-21 40 in his original design. In Sr. Rat, Bernie Varnaw, last year's Sr. combat champ, socked it to Dale Calvert and Stan Stoy. Bernie was flying a "Boss Rat" powered by a K&B 40.

As the weather got better, so did A-Speed. Jimmy Clem was the class of the Juniors. Senior saw Terry Herron of Wichita zip by at 153 mph with his "Kosmic 15" powered model. Second place went to Rick Wisniewski. Third place was held down by the team of Camerford/Langlois of Greensboro, N.C.

Open combat had 135 entries and promised to be one helluva bash!! All the big names were there: "Honkin Hard" of Lafayette, Ind., "Slippery Harold" of Hersey, "Bubbling Burch" of Chicago, Jerry Houpt, Bob Baldus of Des Moines, and the list goes on. These eyes have never seen better combat flying anywhere!! Things started on a slow note, but when the sun came out so did the stars of Open combat at the '72 Nats. There was action everywhere!

In the air, on the ground, at AMA Headquarters, protests, arguments, a sit-



FAI and Slow combat were tried on Friday after official flying.



Bill Werwage, just back from the World Championships for C/L Stunt, which he won! Congrats!



Fifth in Open Stunt, Gene Schaffer, Astoria, N.Y. 601.75



Gerry Flaughter flew this Mustang B.



Mig 3 by Richard E. Jonas. Max .35, 53 inch span.



Lew Woolard's Cobra II. Fox .40

down demonstration, and at times absolute chaos. With all the sex appeal of a James Bond movie and the excitement of a thousand fleas in your armpit, Open Combat had a message for contestants, spectators, and officials alike. That message being: Combat '72 just "Socked-it-to-you". The finish saw Michael Wheeler and Jeff Hollfelder in one of the rip-snortingest matches of the meet. When the smoke cleared Hollfelder had done an outside loop about six feet too low and Wheeler won with a design called the "Spoiler". Third place went to Warren Sanders of College Park, Md. It's a shame that only one person could win because nearly all the flying was top notch. Maybe '73 will see better flying but I find that hard to imagine.

Friday was "Rossi Day" in Scale Racing. Mark McEndree won Jr. with a Rossi 15 powered Little Rebel. Sr. went to Dennis Williams of Dallas, Texas, flying a Rossi 15 powered Buster. Open was captured by Kerry Turner also of Dallas flying a Falcon Special powered

by, you guessed it, a Rossi 15.

Speed was the word of the day as Dennis McGraw whizzed by Glen Vasant and Pat Hempel to lock up B Speed in the Jr. division. In Sr. it was Brian Webster over the team of Camerford/Langlois, and Jim Wade was 3rd. A speed of 181.20 was what it took to win in Open. The team of Shelton/Harris of Baton Rouge was 1st, Finn/Martin team finished second followed by John Deaton of Ft. Worth, Texas. B Proto went to Glen Vasant, Terry Herron, and BARTLEY/Garner/Huff team in Jr., Sr., and Open respectively.

Sr. Combat was almost a repeat of Open Combat on a smaller scale. More action, protest, arguments, and chaos! What a year for combat! Last year's champ, Bernie Vernaw, almost did it again this year, but was stopped by a hard hitting fellow from Dallas, Texas. J. Russ Green dominated Bernie in the fly-off and made it known that Texas is still the Combat Capital of the U.S.

*Continued on page 59*



Jack Sheeks flew this Fly Baby. McCoy .40



First in Free Flight Gas. Harold (Bill) Warner's 1936 Waco YKS-6. Rebell .06 diesel. From Paul Matt 3-view drawings.

# FREE FLIGHT SCALE 1972 NATS

The whole idea in the first place was to build models of the big airplanes . . . so here they are . . . indoor - outdoor, rubber - gas, Junior - Senior - Open . . . the works! By Fernando Ramos

● This month we will try to give you a brief sketch of all the F/F flying scale activities that took place at the 1972 Nationals.

Indoor flying scale began the first day and was held off base at an armory in downtown Chicago. All scale models were submitted for judging, including Peanut scale. (Peanut scale is not an official event; it is presently considered provisional.) The judging was handled by the very capable Detroit Cloudbusters Club, headed this year by George Lewis.

Once the models are judged, the flying begins. Probably in no other event are there more untested and untrimmed models, since most modelers do not have access to suitable indoor flying sites. Fortunately, most were able to get

their qualifying flight in with little difficulty.

Fulton Hungerford (Florida) and his Boeing Trimotor biplane drew the most interest from the competitors and spectators. The incredible amount of work that goes into each of his models is staggering. Fulton spent most of his time graciously giving out information on how he constructed his models. Quite a remarkable individual. Even though his Boeing scored on the high end of the static judging, it failed to gain any flight points.

Tom Stark (St. Louis), a familiar name in flying scale, won the event with a Dehavilland 29. He also placed 2nd in Peanut scale.

For those who may not be familiar

with scale judging for the outdoor events at the Nats, I would like to cover this briefly. All flying scale models, whether F/F, R/C, or C/L, have to be submitted for judging not later than a prescribed time, usually Tuesday morning. This gives the judges about two days to complete their work. There are nine judges in all; three for each event. The models are kept in what is appropriately referred to as the "Scale Cage". All the judging takes place within the confines of this chicken wire enclosure.

Judging, in the opinion of many, is considered nothing but hard work, however, I have found that judging gives a scale modeler some real insight into the way scale models should really look. When you can sit down and very care-



Richard Bruning's rubber powered Phillips "Aeroneer," Took first place in Open F/F Rubber Scale.



Keith Ward and his magnificent O.S. 15 powered Gere Sport. No room now, but we'll show you some detail photos next month.





Bill Wargo's Douglas 046-A, from Wm. Wylam plans. T.D. .051 plane placed 4th in Open Scale Gas.

fully examine a model to see how it is constructed, detailed, and finished, you are really learning what flying scale is all about. Another good learning situation comes from the scale presentation, which includes documentation, three-views, photos, etc. In most instances the modeler's presentation is quite poor, having only a 3-view and a photo. I believe that most modelers competing in scale aren't really aware that a maximum of 50 points is possible in the presentation alone. On the other hand there are many who are really well-organized, giving the information necessary to adequately and fairly judge a model.

If you ever get a chance to judge at any scale contest, do it; you'll become a better modeler for it.

One of the most highly detailed and well constructed models entered in F/F gas was the Gere Sport Biplane submitted by Keith Ward. Keith's Gere is one of the finest F/F scale models I have ever seen. There were no flaws to be found



Andrew MacIsaac prepares his American Eagle "Eaglet." Plane was stolen at the end of one flight, but still placed 3rd . .



Bill Warner, Arleta, Ca., and his Waco. Well known scaler directly over cabin is Frank Beatty. Man in dark glasses is Jay Gerber, NFL cameraman/producer.



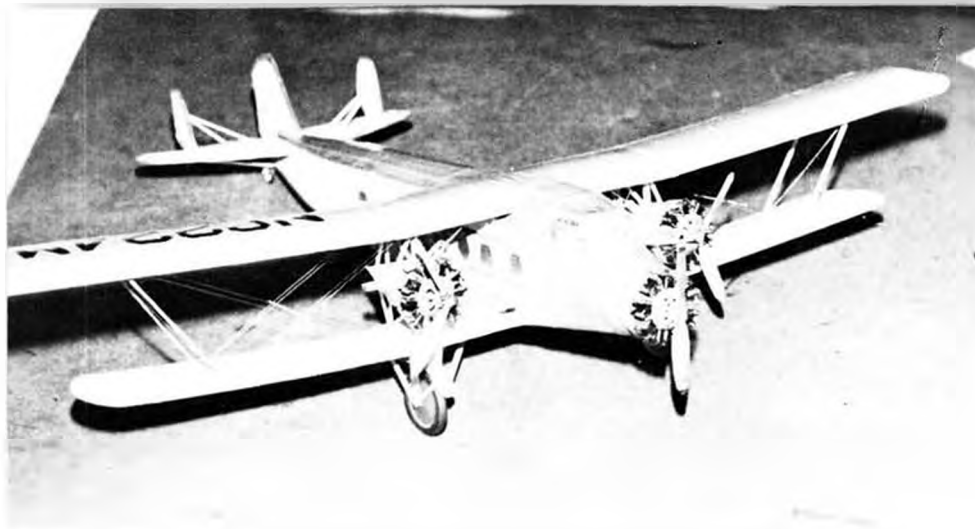
Tom Stark repairs R.E.P. Type K, which was 2nd in Scale Gas. Is that a bobbie pin!?



"Old Propeller Mouth" Mike Kuene winds up his Kingfisher for a flight.



Tom Stark and his Mr. Mulligan, which placed first in Open Rubber Scale.



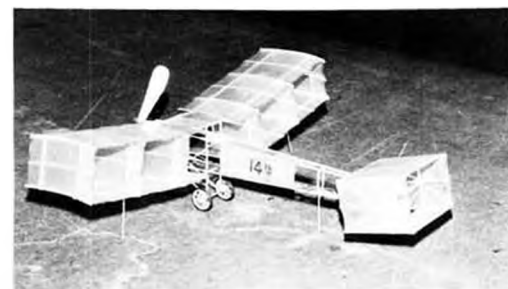
Fulton Hungerford's indoor rubber scale Boeing 80A1. He's the F/F "wire" wheel man.



Tom Stark's winning indoor rubber DeHavilland 29. Not pretty, but it flies!



Andy MacIsaac's PT-19 peanut.



Hungerford's indoor Santos Dumont. It goes thataway! (To your right.)



Ralph Kuenz built this Folkerts "Toots" P-nut

anywhere in craftsmanship, and the detail was exquisite. Keith has set a precedent in flying scale that will be hard to follow. Harold Warner (California) also had a magnificent WACO YKS-6 that flew as good as it looked.

By Wednesday evening, all models were ready to be returned to their build-

ers. Thursday morning was the scheduled time for rubber and gas F/F Scale events, and as usual, for these events, the weather was miserable. It had rained all day and part of the evening before, so by flying time it was cold, damp, and windy.

Harold (Bill) Warner and his WACO was the first contestant to fly and get qualified. He hand-launched his model, which is the usual practice, as this is much easier to do than to try an R.O.G. first. In Harold's case it proved to be a wise move, because the transition from power to glide was rather abrupt, with the glide angle much too steep. Fortunately, his WACO landed in some tall grass saving it from any damage. After a minor adjustment, he tried an R.O.G., and the WACO took off most realistically. This time the transition from power to glide was just right.

Tom Stark had a very fine model of the R.E.P. 7 and he too, hand launched for his first qualifying flight. However, Tom overfilled the fuel tank and by the

*Continued on page 49*



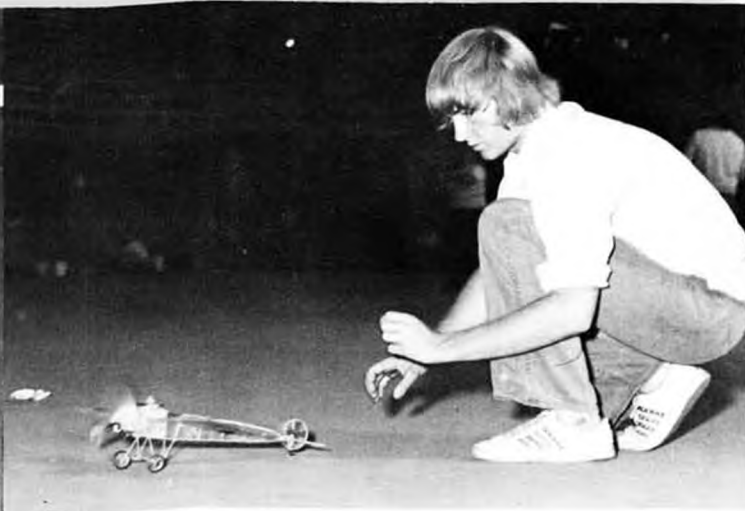
Bill Warner releases his SE-1 peanut canard. It also goes "thataway."



"Now y'all stop pickin' on that poor little SE-5A!" Ship is Bill Bell's 5th place Open F/F Gas entry, which was built from the Paul Guillow kit.



Jimmy Clem launches his Paper Tiger. He won 4th place in Junior Indoor Stick. Ship is condenser paper covered.



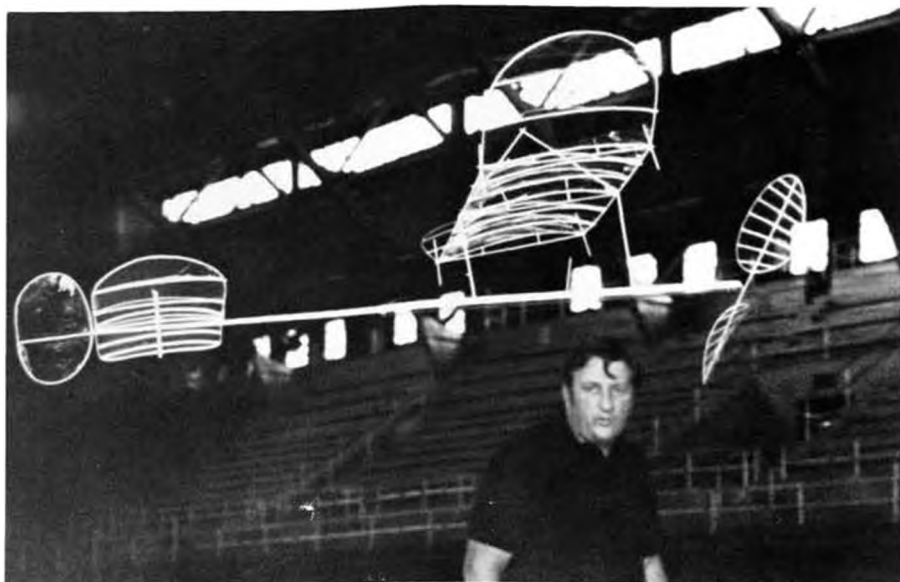
Brian Webster launches his Indoor Scale Fokker EIII. Modeler from Manchester, Texas took 2nd in event.



Bill Gough, well known indoor man, flew this canard "Penny Plane." Yep, it went thataway!

## INDOOR

No chance to get a story on the silent and slow ones . . . just some more pictures. At least you won't be able to say we didn't show you the Nats



Roland Anderson, Toledo, Ohio, checks his indoor microfilm stick job for proper trim.



Greg Simon flew his original design "Drifter" to 5th in Paper Stick.



Joe Sova's Penny Plane has very low aspect ratio



Jim Stone, Chicago Aeronuts and Penny Plane







The Bellanca's Wms. Bros. prop hauls it up for another calm and quiet flight. Undercambered wing has lots of lifting power.



Don has the right spirit about scale airplanes. There ought to be a pilot in every cockpit. These simple profiles drawn by son Darryl.

# PEANUT BELLANCA

By Don Butman . . . . Another modeler has been caught by the Peanut Tidal Wave! The search is always on for different and unusual subjects. The Bellanca Light Tractor certainly fills the bill.

● "Safety, efficiency and economy par excellence!" These words, plus "Simplicity and Grace," appeared as advertising descriptions of the Bellanca CE 2-Place Biplane in Aviation Magazine, dated May 15 and June 1, 1919. The model shown on the plans is of the single-place version powered by a 35-hp Anzani ("Dependable Wartime-Tested") engine. It utilized wing warping and had a balanced rudder.

Other interesting facts include a 11.5:1 glide ratio, which meant that if you could get to 4600 ft. altitude (stated time - 14 minutes, with 25 minutes to 15,000 ft.), you could glide anywhere "within a diameter of 24 miles". Further, only 6 hp was required for horizontal flight, or flight! The top speed was 86 mph with a landing speed of 32 mph.

The model is typical "Sticks and Tissue" construction, with the fuselage side shown cross-hatched. The spar-less

wings are highly undercambered (think my pencil slipped?) which makes covering the panel bottoms a bit tedious. The tissue must be stuck (glued, doped, or ?) to each rib bottom, and I found that a drop or two of water rubbed into the tissue along with the dope seemed to do the trick.

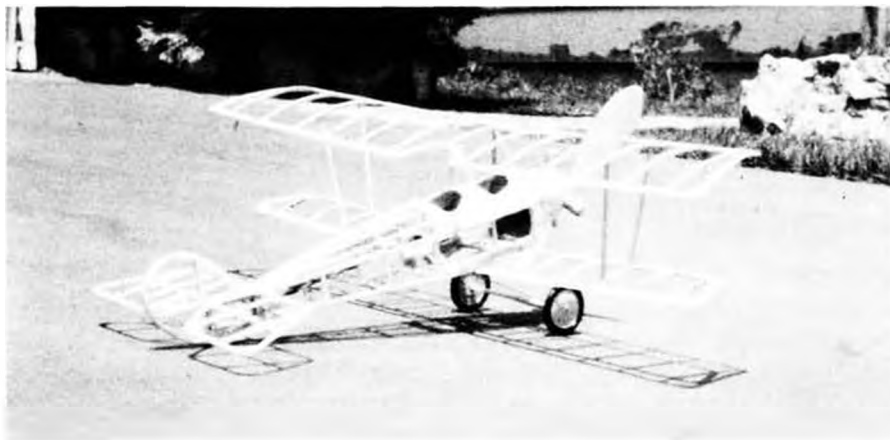
The use of 1/32 and 1/64 plywood (struts, fairings, etc.) in place of balsa eases the pain of cutting small parts. Actually, the 1/64 plywood may be easily and neatly cut with a pair of fairly sharp scissors.

The two profile "Pilotes" shown on the plan were installed in my model and really do add a touch of realism! There is just nothing nicer (well, almost nothing!) than a peanut scale model toolin' through the air complete with Les Pilotes! (*"Les Pilotes" are the artistic creations of the author's son, Darryl. — WCN*)

The model flew with no adjustments, which rather astounded me, since both wings warped a bit! But fly it did, until the "airplane-eating-tree" in my front yard caught it!

Oh yes, one last tid-bit of information from the past . . . Mr. Joseph Bellanca's early efforts were financed by the Maryland Pressed Steel Company. He was the Chief Engineer of the Aircraft Department, and Mr. Harry E. Tudor was the New York Sales Manager.

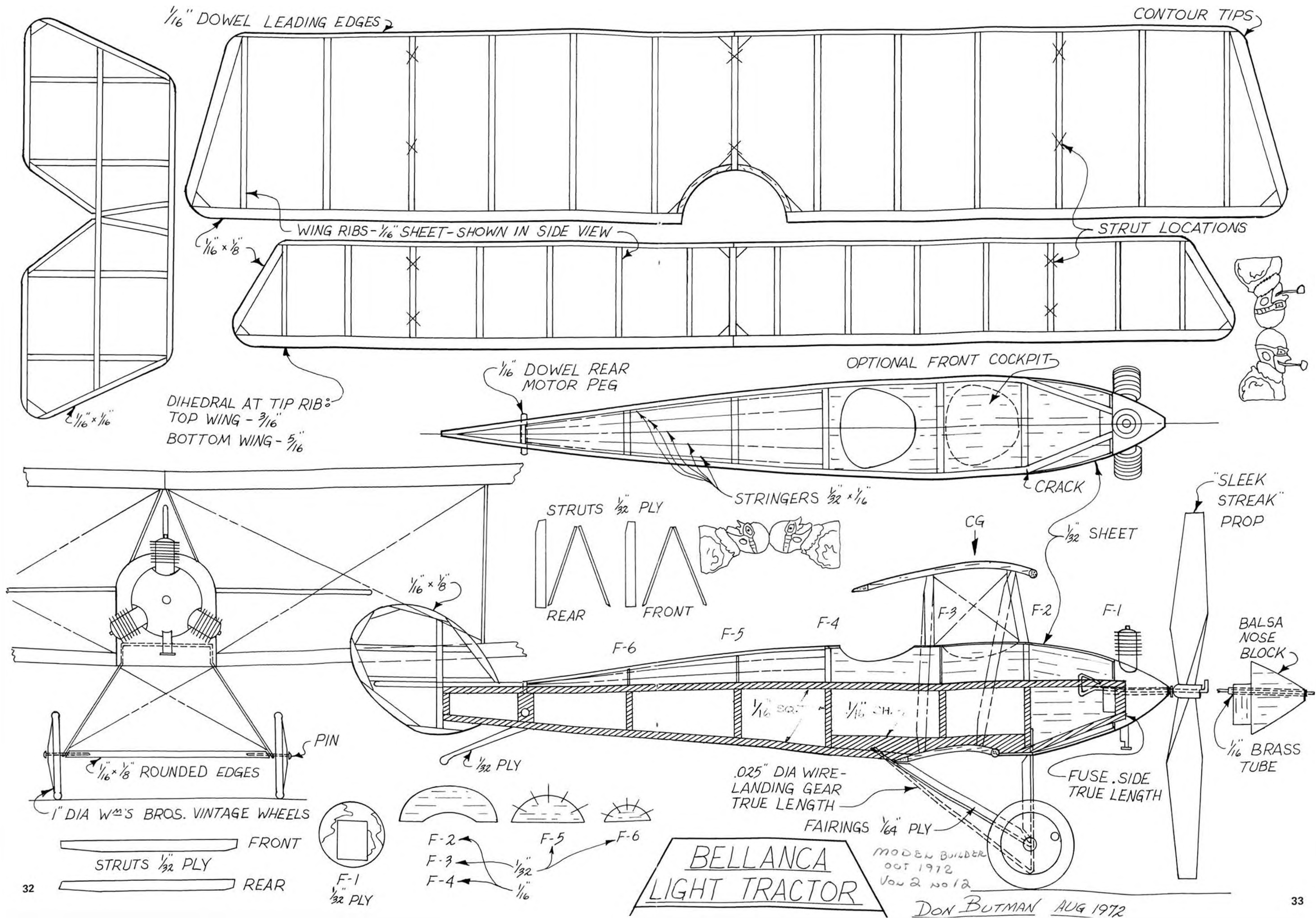
The information concerning this Bellanca aircraft was supplied by Mr. D.D. Hatfield, Aviation Historian, of the Aviation History Library at Northrop Institute of Technology. ●



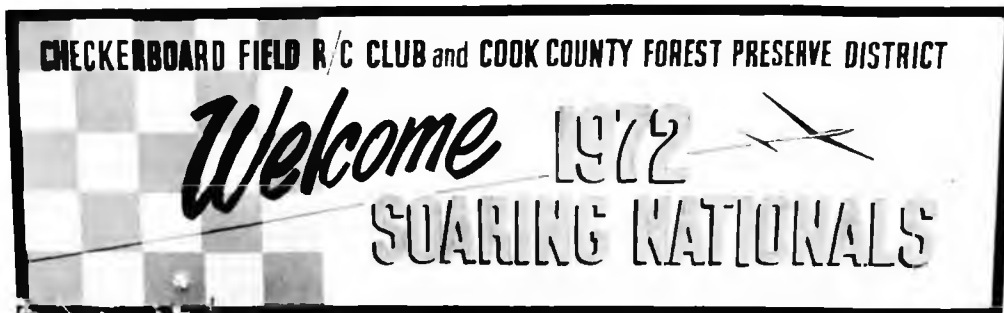
The Bellanca's bones show the simple, light construction. Wing leading edges are 1/16 dowel.



On its way for another fun flight, the Bellanca romps away from Darryl's launch.







By John Donelson . . . The largest, to date, R/C soaring meet in the U.S. took place in Chicago as the AMA Nationals were getting under way. One of the top placers tells you all about it.

● Hot muggy Chicago weather, 123 contestants (the largest yet for a U.S. Soaring meet) and midwestern watermelon, marked the Third Annual Soaring Nationals held at Miller Meadow, a beautiful large grassy flying site just southeast of Chicago's O'Hare Field. If this year's participation is any indication, "look out pattern and pylon, here we come!"

While R/C soaring is still on a provisional basis and will remain so for another year, there is no doubt that this year's Nats showed the powers to be that R/C soaring is a rapidly growing sport deserving of full recognition. With nearly twice the number of participants as the next to largest Nats R/C event, the Chicago SOAR club (Silent Order of Aeromodeling by Radio), with Dan Pruss

as CD, conducted 3 days of competition based on the provisional AMA rules. Events included precision, duration, speed and scale. Ray Vandierdonck of Detroit, Michigan emerged the grand champion, flying his original 13 foot Nimbus.

The final flying was very heated, with the lead changing hands 3 times in the last rounds, after Mark Smith had held the early lead. Vandierdonck was also on the championship three-man team, the Greater Detroit Soaring and Hiking Society; the team members placing 1, 3 and 21. Last year, this club sort of stood back and watched, but this time they came to win, and that they did, besting 17 other teams by a sizable margin. It was a popular win too, the members of the Detroit team not only being fierce

competitors, but also very good sportsmen.

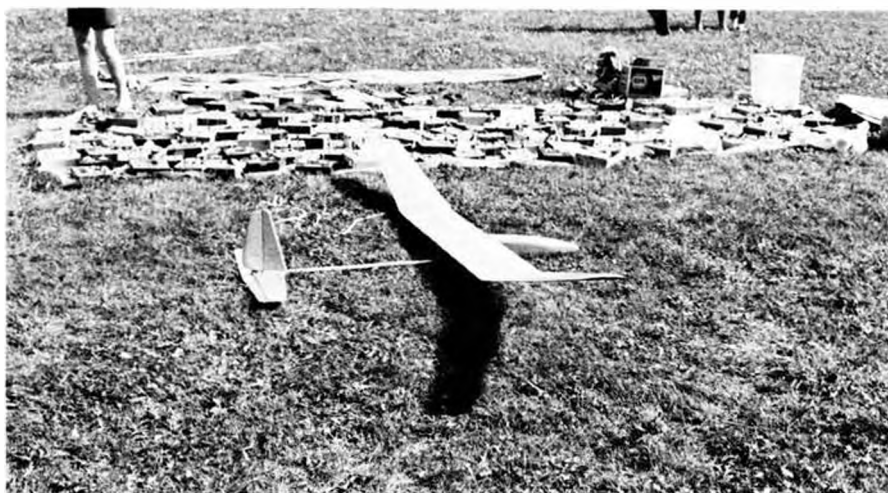
Bob Andris won the scale event, flying a military two-seater trainer Sligsby T-53B. It was interesting to note that all six scale entries were from California; apparently the scale event has not yet caught on elsewhere.

When we got off the plane from Los Angeles, we really didn't need the pilot to inform us that it was 95 degrees with 90 percent humidity. Suddenly we realized why we had left this land for sunny California some 13 years ago.

But hot weather means thermals. Right? And that's what we came for. My two sailplanes had come through the airline flight with nary a scratch, just waiting to try those Chicago thermals that were such boomers last year. We



MB's reporter, John Donelson, like others, found thermals a little scarce this year.



Whatta place for a berserk steamroller! The transmitter impound area, with Dave Burt's Tube-Too in foreground. Dave placed second in Open Speed with this glider.



Sid Axelrod flying the prototype Topsailer to be kitted in the future. Molded balsa body.



Yoshiro Sato and son, Bobo, came from Japan just to enter Glider Nats. Bobo, age 8, is about to take a flight. He won the Best Junior Achievement award.

were to find out that for the next three days they would be much tamer.

Niel Liptak of the SOAR club had conducted a survey earlier in the year among R/C soaring enthusiasts, including members of the E.C.S.S. and L.S.F., as well as those individuals who had competed in the previous meets, but were unaffiliated with either of the above mentioned organizations. The results indicated that most favored a three day meet, held during the AMA NATS, with two separate competition classes, based upon wingspan, as well as a separate Scale category. Also, a combined Jr./Sr./Open meet was favored and electric winches were the launching method most preferred.

The SOAR contest board decided that since interest seemed to be high, the individual contestant should be limited to one ship in either the Open (over 100 inch wingspan) or the Standard class (under 100 inch wingspan) plus a scale ship if he desired. Further, the board

selected the four events as follows: DOCUMENTED SCALE with emphasis placed upon flyability, DURATION (Task I option two of the provisional rules), PRECISION (Task III with the three minute time option plus Precision-Duration Task IIA), and SPEED (Task V). Also, the scale runway was selected to be used in the Duration and Precision events.

Four identical winches (6 volt) were built and used throughout the three day meet. A one minute limit was allowed for getting off the winch, but it appeared that no one had any difficulty in meeting this requirement.

Sunday dawned as hot as the previous few days, with the mercury topping 90. Although flying was scheduled to begin at 9:00 a.m., by that time there was still a long line-up for late registration. Dan Pruss explained that they had expected 80, a reasonable estimate based on last year's 55, but not 100 plus! As it worked out, the pilot's briefing was about 2 hours



Grand Champion Ray Vandierdonck receiving the silver bowl from CD Dan Pruss.



Here's all the loot and a list of names of the sponsors who paid for said loot. Big time R/C soaring is here to stay. Only a few contestants stayed on for AMA NATS.



One of the four duplicate winches used at the contest. Avoided many unqualifies.



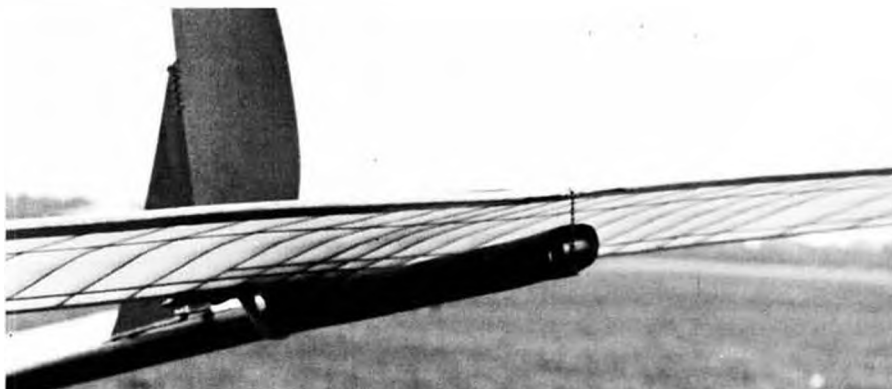
The winning Greater Detroit Soaring and Hiking Society team; Ray Vandierdonck (1st), Otto Heithecker (3rd), and Earl Pell (21st).



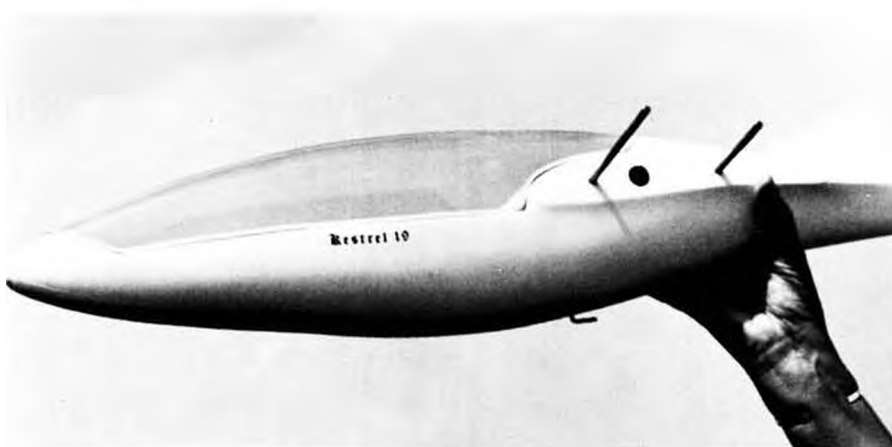
Jack Josaitis and son, Jason. Jack is Dist. VII vice president of AMA.



One dozen Cumuluses (or is it Cumuli?) line up for the camera. There were more than this at the glider Nats. A very popular ARF sailplane.



Interesting "flying stab" control system on Chet Lanzo's Nordic style soarer. DT type stab was operated by single line from servo.



Fiberglass fuselage of Kestrel 19 by Soarcraft. The \$69.95 kit also includes wing ribs, stab ribs, and complete fuselage hardware. Design was developed by Hugh Stock.

late. After a minute of silence for the late Howard McEntee, the instructions were given and the 3-minute precision task was underway.

One thing that was immediately noticeable was that an awful lot of pilots were flying the ARF Graupner Cumulus 2800. In the next three days there would hardly be a time when one wouldn't be in the air.

The second task for the day, 10-minute duration, was marked by spotty lift, but very good at times, a cursory count showing about 20 percent of the flights over 6 minutes. Whether you were one of the 20 percent or not, between flights you could cool off with lots of watermelon provided by Jerry Nelson and Midwest Model Supply. Because of the late start, flying was not terminated until about 8 p.m. in the middle of the speed round. It was decided to finish the speed round the next day prior to the duration task.

There was only one word to describe Monday's flying conditions . . . BAD! Shifting winds and overcast skies dogged this day. The winches were moved twice and not one max was recorded in duration. After completing the rest of the speed round and one duration round, Dan Pruss decided to call it a day. Duration times were averaging 3-4 minutes, with only 2 flights over 8 minutes.

Of course, as luck would have it, the Chicago TV stations were out to cover the affair on this day. They were particularly interested in little 8 year old Yoshinori (Bobo) Sato, who along with his father, had come all the way from Tokyo, Japan to compete in this contest. He didn't dissappoint the cameras either; the little fellow landed his big Albatross 3300 right in the center of the 100-point landing area. He was later to be awarded the best junior achievement award.

With all of the winch switching,

The MODEL BUILDER





Doug Munn, Sussex, N.J., and his original design "Intrepid." Ship spans 10-1/2 feet, won Best Monokote award.



Mark Smith, California, accepting 1st Place Duration, Standard Class Trophy donated by The MODEL BUILDER.

(try that with a mouth full of crackers) Monday's leisurely day gave us a chance to examine some of the sailplanes the contestants were flying. As mentioned earlier the Graupner Cumulus was very popular followed closely by the Graupner Cirrus. The Mark's Models Windfree was also popular, finishing 1-2-3 in Standard Class, all three finishing in the top 10 overall. They were in good company with Otto Heithecker's Snoopy, Rick Walter's White Trash (Jan. '72 Model Builder) and of course Ray Vandierdonck's 13-foot Nimbus.

There were several large sailplanes spanning 12 feet or more, probably the most unusual being Buck Zehr's Zehr Guut. This beautiful soarer looked like a fet fighter version of the Cumulus, only with more sweepback. In the 14-foot category, the Stratus and Strike-S also flew well.

One of the models that got a lot of attention was Chet Lanzo's standard class model. It resembled a free flight with its polyhedral, low aspect ratio wing. Throughout the contest you could see modelers examining the cord-controlled tail surfaces. Dave Burt's pod-and-boom Tube-Too showed its very effective spoilers, and Sid Axelrod (Mr. Monokote) flew the prototype of the Willard-designed Topsailer. It features a molded balsa fuselage which is very light (3-4 oz.). Sid says it will be some time before the kit will be available from Top Flite, but it should be a welcome addition to the current crop of sailplane offerings.

*Continued on page 52*



Dan Pruss "gets down" to the pleasure of presenting the Best Junior Achievement Award to Yoshinori Sato, 8 years old, from Japan.



Bob Andris' Slingsby T-53B, which won the scale event. Only six ships were entered in scale, all from California.



Our reporter, Fred Reese, with his El Bandito, ST .15. First Place in July 30 and Aug. 20 races. Timed 2:07 on 2 mile course.



Bob Novak, 4RS manufacturer, with his Little Mike, ST .15

# PYLON/4

By Fred Reese

● While watching a recent Formula I event I was reminded of statements made by some who say that Quarter Midgets are "going the way of Formula I," or that Quarter Midget is just a junior Formula I event." In many respects I think these statements are true and I don't feel about it now as I have in the past.

In Formula I there is a handicap system based on scale judging. Consequently, Formula I airplanes are well finished and detailed. The quality of quarter midgets is also getting better with better finishes, filleting and more detail added, but this is the pride of the modeler showing and not a class requirement. *(Editor's Note: Detailing aside, finish is not only for pride and/or judging. As speeds go up, finish becomes more important. A smooth, clean, well finished airplane "slips" through the air*

*with less surface friction drag than a rough one.)*

Also the speeds are increasing and the times are getting lower, but this is competition and flying skill. We are still using the same engines that were available a year ago. The main thing that differentiates Quarter Midgets from Formula I is speed. Quarter Midgets fly only one-half to two-thirds as fast as Formula I.

What about the future of Quarter Midgets and what will the speeds be a year from now? Certainly the speeds will be faster and will continue to get faster. We cannot stop the inventiveness of people where racing is concerned. As soon as the label "race" was applied, the competition began and will continue. Every person involved wants his airplane to be the fastest and will work to this end as long as the class exists. The

doomsday people have been predicting the end of the world and Formula I for a long time now. These same people are already predicting the end of Quarter Midgets. If they are right about the first, then the other two will probably follow. Quarter Midgets are young and healthy, but not without growing pains; these will sort themselves out with time, providing we all keep an open mind.

What I am saying is that our Quarter Midgets look good, they fly fast, and we fly ten laps around a measured course, four at a time. Appearances are similar except that our airplanes are smaller and cost less. The engines are stock and equipped with throttles which allow them to idle, and the airplanes must be landed under power or a penalty is assessed.

We must take advantage of the lessons

*Continued from page 47*



Bob Gadamer's QM Minnow



Bill McCalla, Alliance, Ohio, and his Bearcat.



Bill Gadamer's Cosmic Wind, ST .15.



Cliff Wierick gets his first "free ride" after many years of pylon racing. He went on to take first in Formula I.

Guest reporters Bob Upton and Loretta Hall give you their impressions of Pylon at the Nationals. Chuck Smith will be back next month with an analysis of the British Internats.

# pylon

By Chuck Smith

● Qualifying for the top 20 slots, whether it was for the Formula I event or the FAI event, was extremely tough since there were over 75 entries in Formula I and close to 50 entries in FAI. This year it was an honor just to be admitted

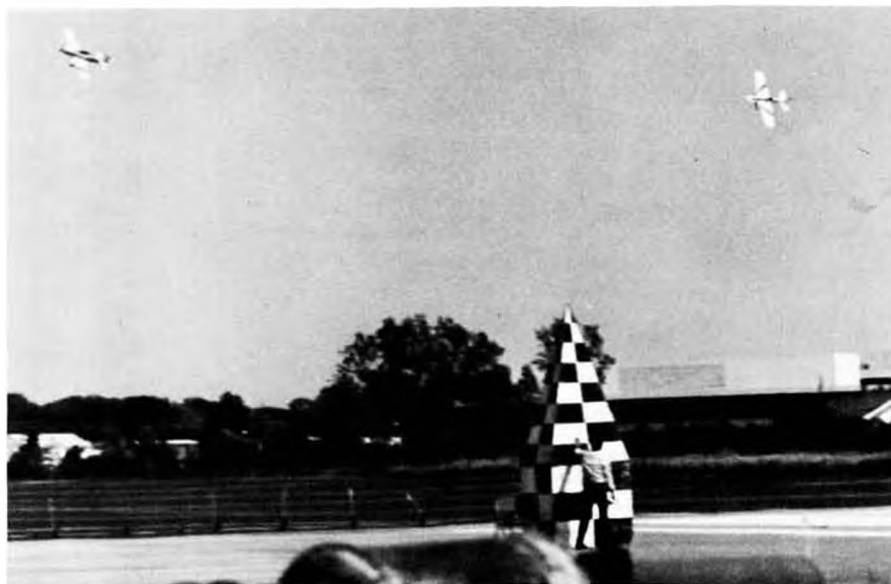
into the rank of the top 20 in either event. In Formula I it took a time of 1:40.0 or under to qualify. There was only 12 1/2 seconds separating the fastest from the slowest! Bob Smith turned a fantastic 1:27.5 to top the

list of qualifiers. *(Bob's brother Chuck, our regular Pylon columnist, has since dropped the official record to 1:27! — WCN).*

In FAI, the team of Telford and Violet led the field with a very fast 1:45.7. Only 20 seconds separated the fastest from the slowest in this event.

Many notables were conspicuous by their absence in the finals of Formula I, including your reporter (would you believe a 1:45.5 placed me around 23rd or 24th in the list of qualifiers?) Somehow qualifying times are always slower than actual race times, undoubtedly due to the increased adrenalin flow during a finals race. Apparently the incentive to whip the other guy isn't there during qualifying heats.

Formula I finals wound up with Cliff Weirick once again back on top of the heap, proving, I would say, that we old guys in the "Over the Hill Gang" ain't whipped yet! Cliff has an uncanny ability to fly best when the pressure is the greatest. The mark, I might add, of a true champion. Larry Leonard earned a well deserved second while Harold



Terry Prather leads Kent Nagy around Number 3. Sturdy pylons a comfort to officials.





The winners in FAI, the Korpi/Roy team with John Brodbeck, Jr. and a certain duck.

Coleson was third. A tie between Larry and Harold could not be flown off because of a frequency conflict, so Larry ended in second with the help of his fastest time of 1:33.5, breaking the tie.

The Smith brothers (Bob and Chuck) had bad luck, with Bob failing to get off the ground due to a radio problem and Chuck, while doing very well, wrecked his beautiful Miss Dora in a collision with a runway light, thus knocking him well down in the standings.

This is the year of the K&B Schneurle ported engine, in that 8 of the top 10 fliers in the Formula I finals were running them. Needless to say, John Brodbeck was one happy fella. I think it can be safely stated that this engine was primarily responsible for the fan-



Helpers awaiting the starter's flag in a Form I heat. Official Howard Nupen holds ears.

tastically low qualifying times in the Formula I event.

FAI competition was won by the Korpi/Roy team (K&B) while Terry Prather of Supertigre fame came in a close second. Third place ended up in a three-way tie between Chuck Smith, Pete Reed and myself. There couldn't be a fly-off because of a frequency problem between Pete Reed and myself, so the tie was broken using fastest times. Thus Chuck Smith ended up in third place with a 1:56.3.

Racing at the Nationals has never been better and the efficiency and professionalism exhibited by Glen Spickler, Jan Sakert and all the others assured a well-run contest.

The following comments were solicited from Loretta Hall, girl pylon flier and enthusiast. Loretta and her husband, Ken, were among the team that helped run the Pylon affair.

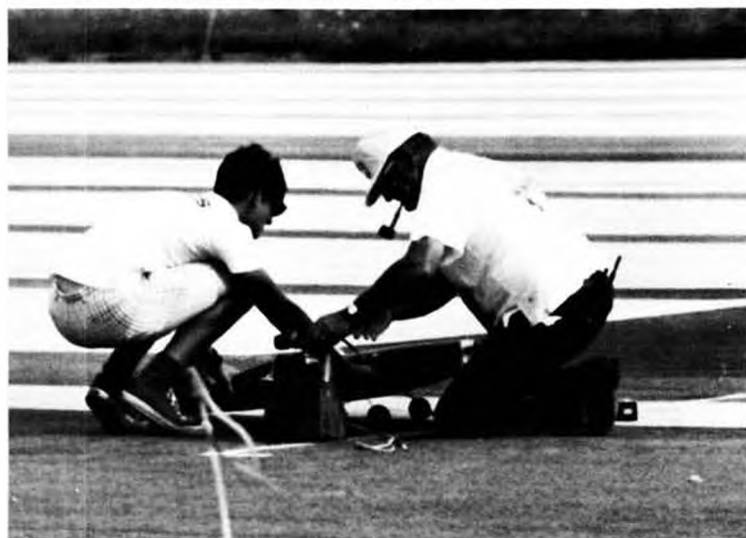
The 25th Nationals. A kaleidoscopic  
*Continued on page 49*



MB's Pylon editor, Chuck Smith



Model Builder's west coast advertising



In case you don't recognize the corncob pipe, that's Buffalo's Hal deBolt, starting up his FAI Caudron racer. He placed 7th.



Larry "The Hat" Leonard stays loose between heats. Note "Baggie" over that very valuable Schnuerle K & B .40.



shows unusual restraint in releasing



rep. Bob Upton, who placed 5th



Basil Derrough, St. Thomas, Ontario, Canada, keeps his "Miss Canada" P-51 down low around pylons 2 and 3. His P-51 is original.

# Dear folks

Wed. Aug. 30, 1972

● The flight over was perfect, though we weren't sure that the runway was long enough for lift-off. Doug (Spreng) was in England with the VW van to meet us and we dropped our planes off at Skyleader Radio (they arrived with no damage). We then checked into a small hotel just outside London in East Croydon. The first thing we noticed was that the beds were as soft as pillows and there were no showers.

We then took the train and subway on Tuesday and Wednesday to tour London. We were on our own on Tuesday, but on Wednesday, we got on a free bus tour which included a delicious free lunch at the Hilton. The tour was for Americans only, and was sponsored by a real estate company which then showed us the advantage of buying land in Florida!

Overall, London is a great place to visit but I wouldn't want to stay for any length of time. The weather was fairly decent while we were there.

We went up north to Birmingham on Thursday and stayed in a little better hotel (but still no shower). On the way up we stopped at Hemel Hempstead where Radio Models is located. It is a really nice, modern, small town and is the one place I saw in which I wouldn't mind living.

Friday morning we went to an RAF airfield with Terry Cooper to test fly. Jeff (Bertken) was the first to fly and everything went perfect until interference caused his plane to roll in on landing, tearing up the wing, and fuselage. Doug and Terry (Prather) flew and were both getting hit, so that ended the test flying.

We checked in at Cranfield around 5:00 p.m. and started things out wrong at the pilot's briefing. They took a vote whether or not to have race-horse starts and the Swedish team said no. They then said that each clock would be started when each plane was released and the order of finish was to be determined by time. Needless to say, the American team came unglued and we had a big hassle over the interpretation of the rules exactly as we had at Mile Square for the BIRD's race. This was finally solved by convincing the Swedes to go along with everyone else.

The next point they brought up was the rule that we had 6 minutes to finish a race. But the way they interpreted this was that if you didn't get started in two minutes, you still had six minutes to start the engine and finish the race! Also, if you nose over on takeoff or had your engine quit in the race, you could restart and finish the race provided you could do it in six minutes! Another big hassle, but we couldn't come close to changing their minds.

One of the English flyers asked if there was any limit to how low we could fly. The Contest Director said no.

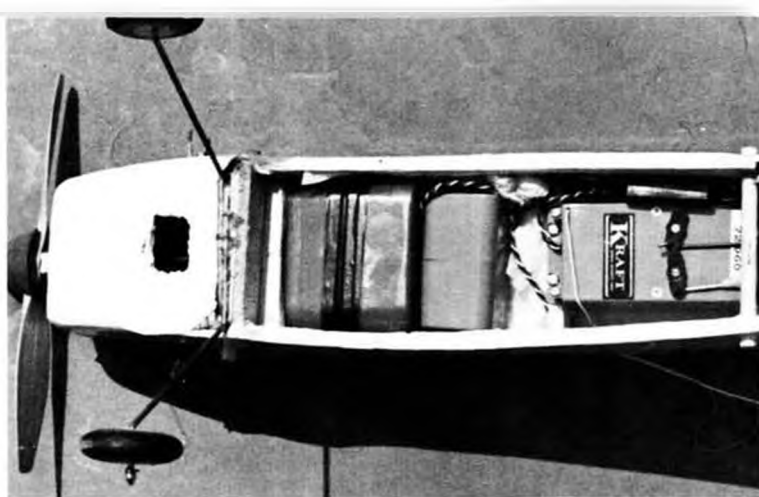
There was a lot of partying afterward and we didn't get to bed until 2:30. The accommodations were excellent. We each had our own room *and there was actually a shower!* We finished repairing Jeff's plane about 1:00 a.m.

On Saturday, we had 45 minutes in the morning and 45 minutes in the afternoon for test flying. The British went first, and Tony Dowdeswell and Alan Mann both crashed on 26.995 (mine and Larry's (Leonard) frequency) and Peter Pillsworth flew through the Number 3 pylon. Whit (Stockwell) and Jeff both had good flights. Larry's flight went OK until he got a down glitch on landing and really bounced hard. I got two laps on my first flight when the plane pulled up and rolled inverted at No. 1. I got it back and landed OK. Gary Korpi flew and only had intermittent control. Terry and T-V (Telford and Violet) both flew with no problems. In the afternoon, Doug flew and also had interference problems. I flew again and got the plane trimmed out, but got hit bad again. Whit flew again and was all over the sky. He had all kinds of excuses until he landed and found out he had Terry's transmitter! After Saturday, none of us had any confidence in

*Continued on page 54*



Roland Boucher's semi-scale Akromaster with Astro-10 electric power. No throttle on this one, just rudder and elevator.



Ship is not exactly a flying battery pack, but it is hauling quite a load of portable electricity. Tests show it is all very feasible.

# LISTEN MA...NO NOISE!

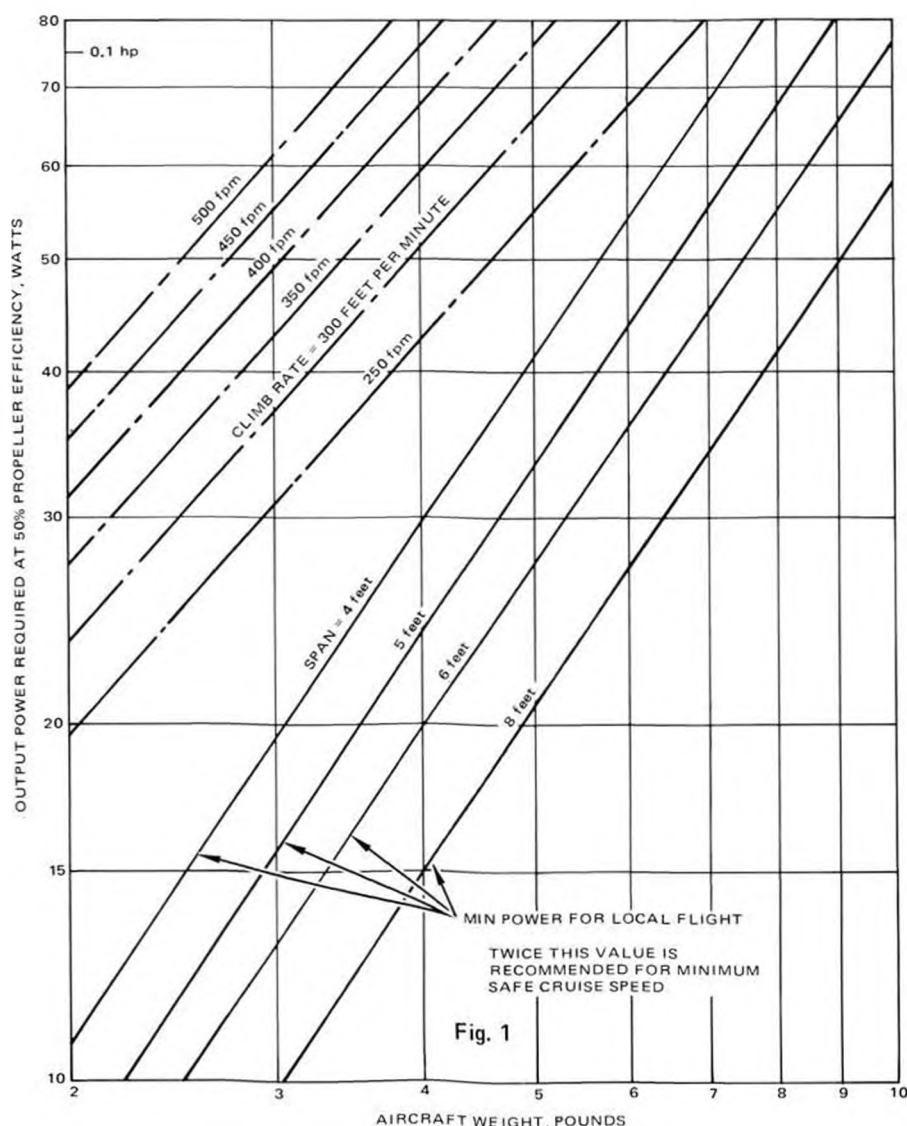
An examination of the basics of model flight using electric power. A possible answer to the noise and air pollution problems. It has been proven practical. By Bob Boucher

● Two years ago, when first examining the feasibility of electric powered flight, the power-to-weight ratio of the battery and motor combination was the first consideration. A simple calculation showed that nickel cadmium batteries can usefully deliver over 10 times the energy of a rubber motor and about 1/6 the energy of glow fuel. Since the fuel load of the average R/C ship is minimal, and since rubber powered planes have been flying for years, eventual success was assured. The development of a practical power plant took well over one year and is not the subject of this article. Its virtues of near absolute silence, instantaneous starting and in-flight restarts (for powered gliders) are counterweighed by nearly a 10:1 decrease in specific power (watts/lb).

For the aerodynamically inclined, this new challenge of power-limited flight could breathe new life into model aeronautics. This article will deal with the principles of power-limited flight and develop guidelines for those who may wish to take up this new and challenging branch of aero-modeling.

The basic parameters important in the calculation of the power required for flight are wing loading (Q); aircraft weight (W); aircraft velocity (V); coefficient of lift ( $C_L$ ); and coefficient of drag ( $C_D$ ); and thrust (T). The secondary parameter of aspect ratio ( $A_r$ ) and wing span (S) is also important. The power required for level flight is the product of the thrust required to overcome drag and the flying speed of the aircraft. As shown in equation No.1,

$$(1) \quad P = FV$$



Aircraft Power Requirements for Level and Climbing Flight



$$(2) F = W \left[ \frac{C_D}{C_L} \right]$$

$$(3) V = \sqrt{\frac{840 Q}{C_L}}$$

$$(4) Q = \frac{\text{Weight}}{\text{Wing Area}} = \frac{W A_r}{S^2}$$

$$(5) C_D = \frac{C_L^2}{\pi A_r} + C_{DS} + C_{DF}$$

$$(6) P = \sqrt{\frac{840 W^3}{S^2}} \times \sqrt{\frac{A_r}{C_L^3}} \times \left[ \frac{C_L^2}{\pi A_r} + C_{DS} + C_{DF} \right]$$

$$= \sqrt{\frac{840 W^3}{S^2}} \times K_1$$

$$= \left[ \frac{29}{S} \right] W^{3/2} K_1$$

where:

P is power in ft/lbs/sec

V is velocity in ft/sec

Q is wing loading in lbs/ft<sup>2</sup>

C<sub>L</sub> is coefficient of lift

C<sub>D</sub> is coefficient of drag

C<sub>DS</sub> is wing section drag coefficient

C<sub>DF</sub> is fuselage section drag coefficient

A<sub>r</sub> is aspect ratio of wing

S is wing span

F is thrust required to overcome drag in lbs.

The other principle parameters of thrust, velocity, wing loading, drag coefficient, are determined by equation Nos. 2 through 5. The first term in the drag coefficient equation No. 5, is the familiar induced term which is strongly affected by aspect ratio; the second term is the sectional drag coefficient which is a function of wing profile and Reynolds number; and the third term is a function of fuselage and tail design. Fortunately, for most of us, none of the above need to be calculated to obtain a reasonable estimate of the power required for level flight.

By a judicious combination of equation Nos. 1 through 5, an equation for the power required can be obtained in which only wing span and weight are important. This is shown in equation No. 6. (*We were afraid of that!* — WCN). The minimum value of the factor K is nearly independent of aspect ratio and

can be approximated by a value of 0.2 for model aircraft. For indoor rubber models the coefficient might be doubled. For real aircraft, it might be halved. Using this minimum value of K and converting from power in ft/lb/sec to watts, reduces equation No. 6 to:

$$P_{\min} = \frac{7.5 W^{3/2}}{S}$$

This value is plotted in Figure 1 as a function of aircraft weight for a number of wing spans (a propeller efficiency of 50 percent is assumed). Any excess power can also be used to increase aircraft speed in level flight. Figure 2 shows the ratio of power available to minimum power which will be required as a function of relative flight speed. These figures can be used to predict the performance of new designs. To clarify their use let's look at a series of Astro Flight test aircraft, in the order in which they have evolved.

Table 1 shows these aircraft and their performances. The first aircraft specifically designed for electrical power was a Fournier Milan which was demonstrated at the Model Airplane Trade Show in April 1971, later in England, and at the 1971 AMA Nationals. Its performance was good, but the long wings prevented any serious aerobatics. The second ship was a stock Astro Flight kit. It flew much better but its rate of climb was poor, requiring constant energy management as maneuvers were attempted. This ship raced against 1/2 A pylon ships and placed third in one such contest.

The third ship, a Midwest All-foam Cardinal, flew well with a better climb rate than a long wing RF-4, demon-

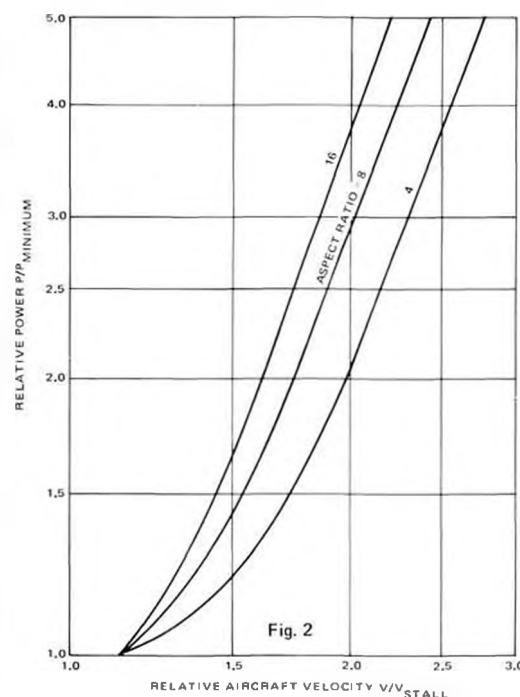


Figure 2: Aircraft Power Required as a Function of Flight Speed for 3 Aspect Ratio's

strating that weight is the most important single parameter. Since the Midwest Cardinal weighed over one pound empty, further improvements could be expected by building an all balsa ship of the same general size. The Spirit of St. Louis was constructed and flew better than anything previously attempted. The last three of these aircraft were demonstrated at the 1972 MATS show. At this show, Midwest announced a new radio battery, the use of which would reduce weight another 10 percent. We are looking forward to having some of these to test.

To further clarify the use of Figures 1 and 2, let's go through the calculation. *Continued on page 63*

TABLE 1  
Astro Flight Test Aircraft, ASTRO-10 (75 watts)

AIRCRAFT	span feet	wing area sq.in.	weight lbs	Pmin (Watts)	V/V stall	rate of climb	flight time
Fournier Milan	8	625	3.5	12	2.3	345	3
Fournier RF4	5-1/2	414	3.5	18	2.2	260	3-1/2
Midwest Cardinal	4	290	3.0	20	2.3	290	3-1/2
Spirit of St. Louis	4	300	2.5	15	2.6	450	5

TABLE 2  
Comparison of ASTRO-25 and ASTRO-10

AIRCRAFT	span feet	weight lbs	P min (Watts)	V/V stall	rate of climb	% power plant	% radio	% structure
Spirit of St. Louis (10)	4	2.5	15	2.6	450	55	25	20
RF-4 nicads (25)	6	5.0	27.5	2.6	500	50	15	35
RF-4 (25) world record	6	6.5	39	2.4	450	70	12	18



A typical fast start in the Expert class at Briggs Cunningham Museum track, during the ROAR Nationals. Proper carburetion keeps 'em rolling.

# R/C AUTO NEWS

By Dean Brown . . . A look at the carburetion problems faced by R/C car enthusiasts, plus a few words on what it's all about.

According to many experienced enthusiasts, the best thing that has happened to R/C car racing is the availability of an effective carburetor for the Veco 19 engine. Some even go so far as to say that the discovery of an import unit in early 1972 and the more recent appearance of a U.S. made unit designed specially for the engine, kept them from (a) jumping off a cliff during a fit of frustration trying to make the engine run at idle and low speeds, (b) being pushed off the cliff by friends who couldn't stand to see a grown man cry every time the engine died in a turn, or (c) junking the whole idea of R/C car racing and taking up a less frustrating activity such as stacking ping pong balls during a hurricane.

The early years of R/C car racing were terrible times when it came to keeping an engine running lap after lap. The experts of the day barely managed to complete a race with only one or two

"flameouts". The amateurs usually divided a race into equal parts of racing and time spent in the pits restarting the engine. The novices rarely got out of the pits with the engine running. And the basic cause of all the trouble was the engine's carburetor. At least it was called a carburetor. But if you believed that it was a carburetor which would meet the unusual demands of R/C car racing, then you also believed in the Tooth Fairy.

The low-cost design of the carburetor, combined with a throttle coupled exhaust baffle, just doesn't work for R/C car use. The thing seems to work adequately for aircraft use, but it lacks some important features necessary to meet the needs of frequent low speeds, idle, and acceleration of the car engine . . . without giving up top speed performance.

Engines in cars must perform equally well in the range of operations from

idle at approximately 300 rpm into a corner, up to the vicinity of 20,000 rpm on the straightaway. The engine must decelerate and accelerate smoothly and not load up when the throttle is suddenly closed.

Such demands of engine carburetion  
*Continued on page 62*

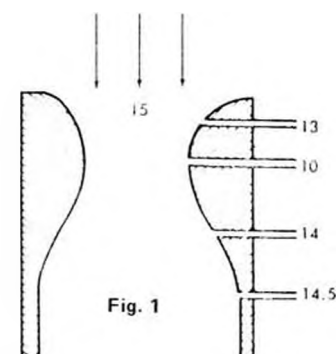
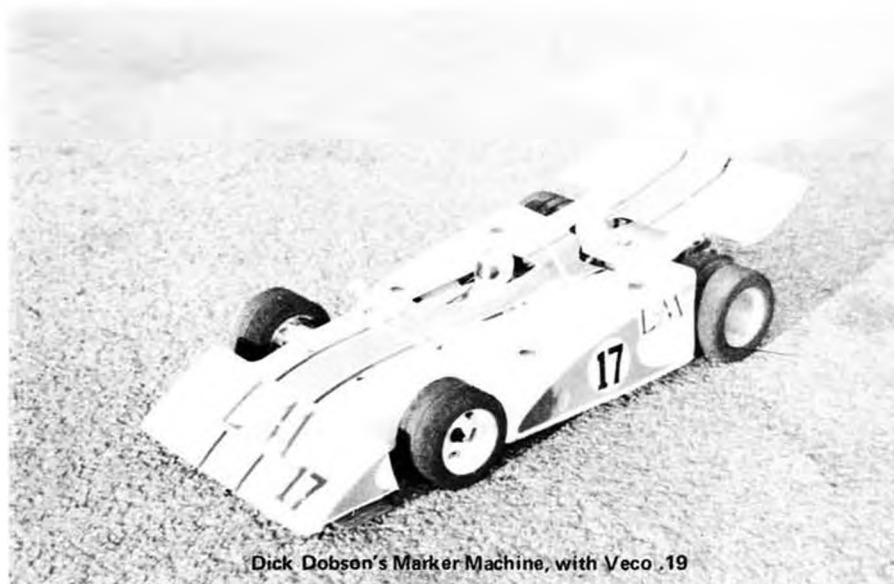


Fig. 1

Numbers indicate relative pressures.



Dick Dobson's Marker Machine, with Veco .19

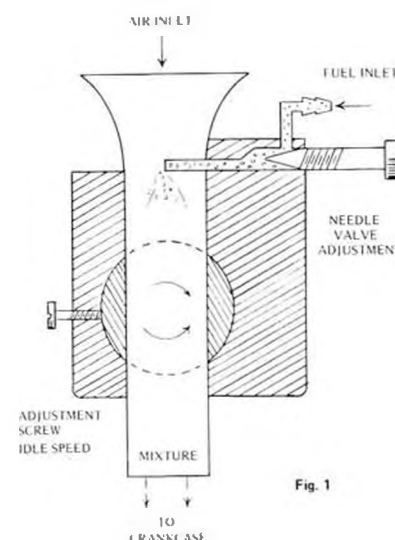
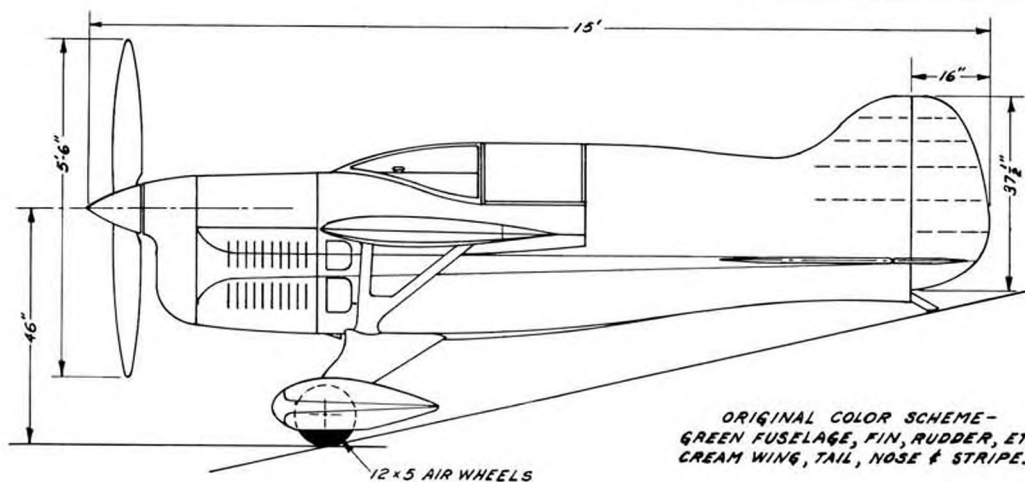


Fig. 1

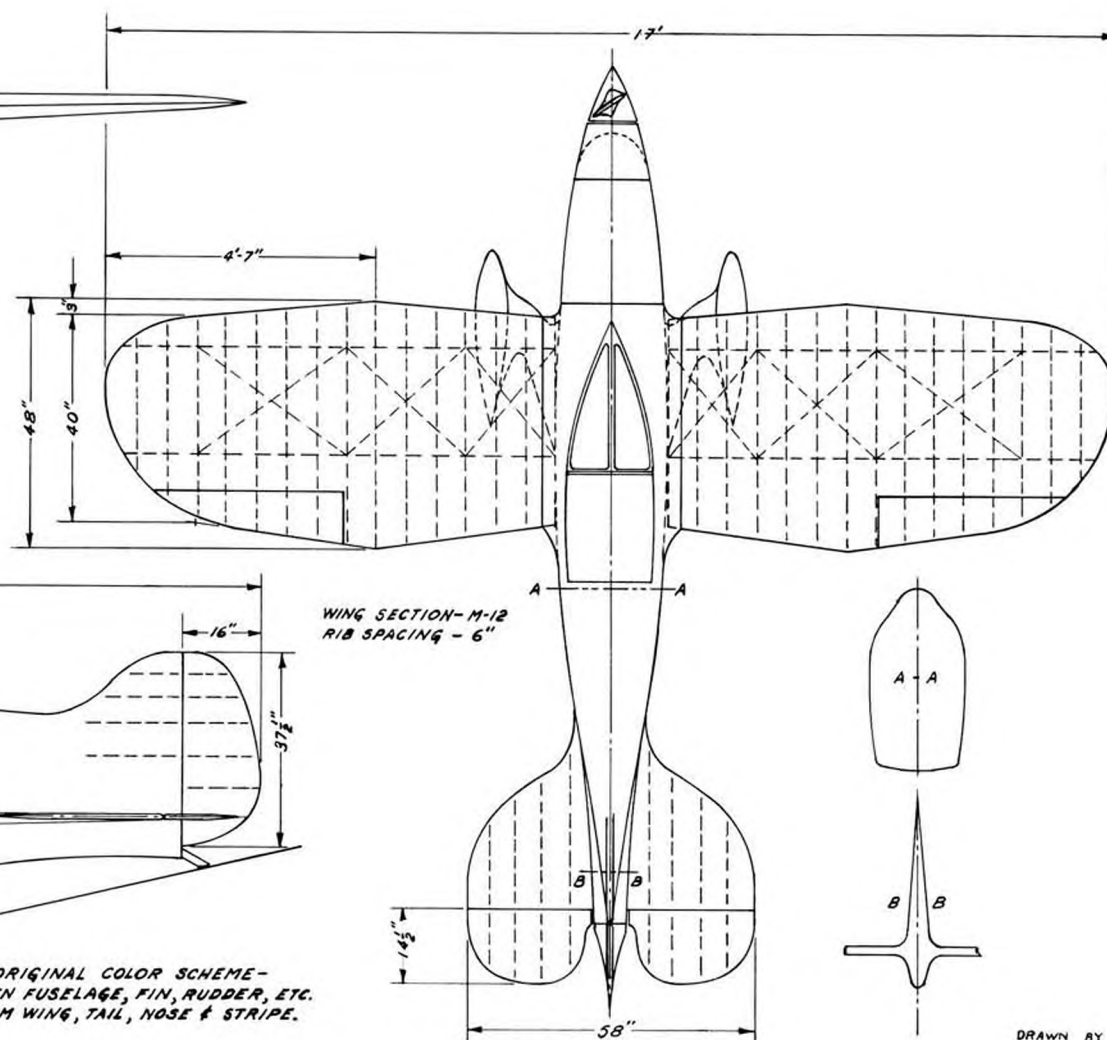
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Akro . . . . . Continued from page 11  
play up or down on the assembly in the aileron fitting, and make a 45 degree bend under the collar. Either make a fork from brass strip, which looks quite realistic when soldered to the wire as shown on the plans, or simply bend the wire to accept the tail wheel.

The wing is built using a 1/8 inch sheet full depth spar with a 1/8 x 1/4 inch cap on top to form an inverted J type spar beam. When combined with the "egg-crate" type panel construction, sheeted at leading edge and trailing edge, the results are a very rigid wing that is difficult to twist even before the

covering is applied. It is simple and quick to build, giving a light weight wing when completed.

Cut the two panel spars exactly alike from the same sheet of medium to hard straight grained 1/8 inch balsa. Glue the 1/8 x 1/4 inch cap to each of them taking care to end up with a right and left spar.

Pin the spar upside down over the plan. Pin the 1/4 inch square jig strip over the plan at location shown, check each rib to see that it fits before glueing in place to the spar, (use a 90 degree angle when glueing root rib). Pin ribs to spar and the 1/4 inch jig. Glue the

3/8 inch square leading edge in place. Lay the 3/32 inch leading edge sheeting in place and trim off the excess where it overhangs the spar toward the tips. Use this piece, trimmed off from the root rib outward, to finish off the leading edge sheeting.

Cut the trailing sheet pieces from light to medium wood, "C" grain preferred, glue the 1/16 inch square to one edge of one of these, check trailing edge of ribs at this time for alignment to the plans, glue the trailing edge sheet with the 1/16 inch square on the ribs, butting the 1/16 square up against the back end of ribs, and pin firmly in place. Sheet center section of panel, add cap strips to ribs and let panel dry good before removing from bench.

When dry, turn over and pin spar down to plan at location and also to the jig. Glue top leading edge sheeting, trailing edge sheeting and rib cap strips in place, and let dry.

Draw a straight line on your work bench (or FLAT board) slightly longer than the total span of the wing, lay the panels upside down on this line (wing is flat on top, dihedral is built into bottom), make a mark at No. 10 rib for the jig. Lay a short piece of 1/4 inch square down at the position shown on the plans for the jig at No. 10 rib and pin in place. Make a mark where the jig should be for the root ribs, and lay a scrap of wax paper on the bench where the center section will be to keep the epoxy from sticking to the bench. Position the panels and check the root ribs for alignment with each other, sand if necessary, pin one panel down on the line and to the jig, mix up some 5 minute epoxy, smear on the root rib, join the panels and pin to bench. Cut a slot the full depth of the spar 1/16 inch wide, directly behind the spar at the root ribs, check the 1/16 inch ply joiner for fit, smear with 5 minute epoxy, and slide in place.

### OPTION ON BUILDING WING:

If your workbench is long enough to build the wing in one piece, join spar while pinned down straight on the bench with the 1/16 inch ply joiner, place the 2 pieces of 1/8 x 1/4 inch cap spar in position over the plans, glue the 1/8 inch full depth spar to the cap, fit and install the ribs, and glue all the bottom sheeting and caps in place, along with the 3/8 inch square leading edge.

When well dry, remove and pin one panel down over plans with the 1/4 jig in place, apply sheet and cap strips, then pin other panel down, sheet and cap strip, glue center section sheeting in place, and the wing is finished with

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**ASTRO-10**



1/4 HP @ 9,000 rpm  
WEIGHT 40 oz.  
DURATION 8 min.

\$79.95 (INCL. BATTERIES)

**ASTRO-25**

Astro Flight, Inc., pioneers in silent flight, demonstrated the world's first successful electric powered R/C aircraft at the 1971 MATS show in Anaheim, California. A revolutionary, quiet, clean, reliable, and economical power plant, the 1/10 horsepower motor used in this aircraft has now reached production status as the Astro 10. On February 5, 1972, the Astro 25 powered Roland Beucher's Fournier RF 4 model to a half hour world record closed course distance flight of 19.26 miles. These precision machined ball bearing motors have been thoroughly tested in more than 1000 actual and simulated flights. Special nickel cadmium batteries supply the energy and can be recharged in the field in just fifteen minutes from a standard motorcycle battery, at a cost of about one cent per flight.

the exception of the 1/4 inch sheet tips and the 1/4 x 1 inch trailing edge. Install the dowels in the wing with epoxy. Cut B-I-P slightly oversize, drill holes for dowels, fit wing in place on fuselage, lining it up for square, trim B-I-P to fit fuselage side, and epoxy in place.

Glue hardwood block inside fuselage back corners, fit wing and check for alignment, pin wing to keep from shifting, drill down through 1/16 ply and through hardwood blocks for nylon screw hold downs. I have never had any trouble using the No. 8 screw (if you feel safer with 1/4 inch, by all means use 'em). Tap the blocks, screw the wing in place, epoxy the paper/epoxy tubes in place, and glue the turtle deck sides on using saran or polyethylene sheet at LE and TE to keep from glueing turtledeck to fuse. After turtledeck is sheeted, fit canopy, doing whatever your "creative bent" causes you to do inside the canopy for realism.

Cowls are now built using nose ply plate, formers and strips: the picture shows it better than I can explain it. Glue the top of the 1/64 inch ply on first, when dry, wrap and epoxy the ply around the formers (rubber bands help here), checking for a good smooth fit at the bottom of fuselage. Smear the inside of the right cowl with Sig epoxy to fuel proof, this side is functional, the left one, a dummy.

The exterior finish is up to you!

A few years ago there was a fellow using Mighty Midget motors wired into the relay on a single channel receiver and flying what was then called Galloping Ghost. He had a model called, if memory serves me, "The Square Hare". This fellow was from Delaware (Correct — WCN) or Maryland or someplace where they eat hot steamed crabs and drink beer. He apparently had a window in his shop right over the work bench. Some modelers who design are lucky enough to have a new one fly "right

off the board", this fellow's design "flew right out the window!

*(Would you believe? There's a Square Hare out in the garage right now, covered in ten colors of Monokote scraps, powered by an Enya 19, and equipped with a 1970 Micro-Avionics "Proportional Ghost." — WCN)*

DATELINE: July 30, 1972. Witnesses, the BW and 2 offspring. I have to drive about 7 miles to get to our local field (I don't have a window in my shop anyway). After range checking, getting the engine running, checking controls once more, I taxied out and lined up, opened the throttle, watched as the SA tracked straight for about 60 feet then broke ground and climbed quite steeply. Tapped some down trim and it leveled out OK, made a turn back . . . needed left aileron and left rudder trim to make it fly straight . . . a few more turns to feel it out and then some "cavorting" (hmmm) over the field. It does everything an aerobatic model should do with a .35 in it. With a good .40 (which I plan) it should do vertical 4 point rolls and anything that suits your style of flying, with ease.

Remember, this is a "Sport Scale" model of competition aircraft and you will not be limited by an FAI pattern (I respect you guys who spend hours perfecting your routine. No sour grapes, but that's just not my bag). Try a 45 degree ascending, inverted, outside snap (full size ones do it in competition).

The landing pattern and approach is what you would expect of any symmetrical airfoil, high performance model, but it does slow down nicely without "falling apart" for beautiful 3-points (a good one of these is worth the trip to the flying field).

I would not recommend this as a first model, but if you have a couple of experiences in your log book, like the medium range engines, enjoy a realistic looking model, I think you will find a lot

of pleasure in building and flying this one. Who knows, the judges might even award you a trophy for your efforts!! It does fly well and it has been a pleasure developing it. ●

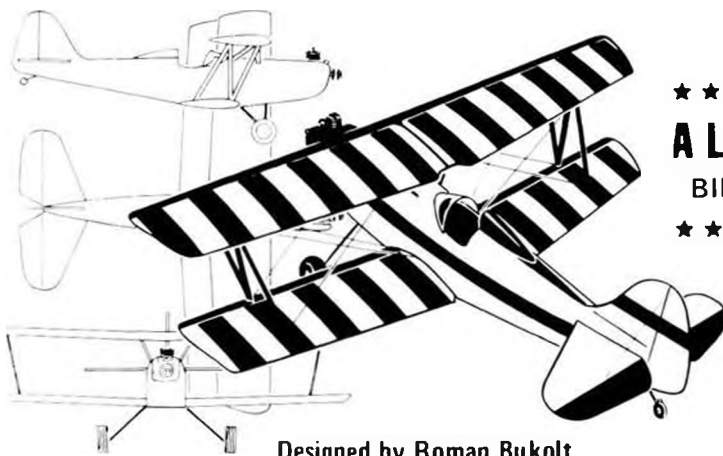
pylon/4 . . . . Continued from page 38

learned from Formula I, as they too used to have throttles, but stopped using them as there was no provision in the scoring for the use of the throttle.

We also must be careful concerning quantity of engines or parts manufactured. In Formula I it was thought that a hundred engines manufactured would be enough, but as proved this year, a hundred engines can be distributed and still not everyone has one. (On the other hand, it could be that not everyone wants a particular engine.) Five hundred would be better but still would not be enough to make the engine generally available. Supertigre has imported several thousand RC .15's, yet they are still hard to find many places. By setting the engine limits at 1000 units of the RC version available in the U.S., we will at least have a chance. The situation is somewhat perplexing, as we want to race in a manner similar to Formula I yet still be different.

The QMRC has revised its scoring procedure, and although the changes are logical, they were derived by trial and modification. Several months ago, we increased the penalty for a cut pylon but did not change the positions at the finish nor the scores of the others in that heat. The earlier system worked but was not equitable.

The modified scoring is as follows: four points for first, three for second, two for third and one for fourth, with a 1/2 point deducted if an engine quits before the wheels touch during landing. If a pilot cuts one pylon and still finishes the race, he can only receive one point, no matter what his final



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standing is in that heat. Two cuts result in a zero. The flyer who cuts one pylon is automatically relegated to fourth place and the others who do not cut are advanced in place accordingly. If the first place finisher cuts once, the second place finisher gets the win and all four points instead of three points for second. If all flyers have one cut, they all get one point, no matter what the order of finish. If the fourth place finisher cuts once he still gets one point, as he is still last and finished the race. If a flyer does not finish all ten laps he gets a zero. This revised scoring system is more equitable for the flyers who finish without cuts, and progressively increases the penalty for a cut depending on the place of finish.

As I mentioned in the last issue, we flew a two mile triangular course on August 20th, and as expected, some liked it and some didn't. The course had two 450 foot straightaways with 156 feet between pylons two and three. The pilots stood 300 feet from number one. The course was an attempt to compromise between the 515 foot course of the MARCS and our previous 350 foot short course. The MARCS course is a fifth of a mile in lap length, so we wanted to try that distance but vary the

course to better suit our preferences. The 156 foot short leg presented some problems, but the longer straightaways gave more time to set up for pylon number one, which was easier. The longer straightaways gave an advantage to the faster airplanes but this advantage could be lost negotiating two and three. The course will be analyzed at our next meeting to determine what will be done at the next race. The biggest complaint was the long 156 foot distance between two and three. One hundred feet would probably be better. However, a wide area must be maintained where the pilots and other personnel stand, for safety sake, and to allow wide spacing of the airplanes if race horse starts are to be used. Twenty feet between airplanes is adequate.

I suspect that the consensus will be to shorten the course again, although not necessarily as short as it was before. The fastest time around the two miles was 2:07, but the averages were around 2:30. I think the average times should be closer to two minutes, which would mean adjusting the course length. I feel that the course length should not be dictated by an arbitrary figure that sounds good, but rather by one that is comfortable to fly, is safe for the people involved,

and is easy to set up uniformly, anywhere. A simple solution might be to use the same dimensions for pylons two and three and the start-finish line as in Formula I and II but shorten the distance from the start finish line to pylon one from 506 to 300 feet. This would certainly simplify multi-event race days and bring the average times closer to two minutes. First though, we will have to try it.

Racehorse starts were also tried at the August 20th race, and although there was a collision in the first heat, there were no more the rest of the day. During previous races, there have been takeoff collisions even when using a staggered start. Those who were worried waited a second before releasing their aircraft. Racehorse starts were written into our rules so as to be used only when the majority of the pilots wanted it. In normal fashion, the decision was democratically railroaded through on this date but I was glad for the chance to try it and the problems presented were easily overcome. In fact, it was nice to be able to take off at the same time as my rivals instead of one or two seconds later.

The results of the August 20th race held at Mile Square in Orange County, California were: (Distance: two miles.)

- First: Fred Reese, ST .15, El Bandito, 2:07
- Second: Tom Melshimer, OS .15, Cassutt Special, 2:23
- Third: Chick Brown, OS .15, Minnow, 2:15
- Fourth: Bob Novak, ST .15, Little Mike, 2:33
- Fifth: Bob Johannes Sr., ST .15, Minnow, 2:13
- Fastest time was 2:07.

On July 30th the MARCS tried out a variation on their two pylon course with two more pylons in the middle spaced 85 feet apart to force the airplanes around the pilots and provide a safety area. They had mixed emotions about the course and decided that more practice was needed. Distance was two miles.

- First: Ken Oakley, 2:17
- Second: Eddie Nobora, 2:34
- Third: Bill Gademer, 2:39
- Fourth: Bob Gademer, 2:42
- Fifth: Bernie Old, 2:42
- Sixth: Mike Penko, 3:52

The MARCS Fourth of July Quarter Midget race had Ed Nobora first, with Bob and Bill Gademer second and third. No times were given. ●



pylon . . . . . Continued from page 40  
series of sights and sounds and impressions and emotions.

Excitement and wonder; knowing that we were on our own. Could we do it alone? Could we set up the whole show and then run the whole show and then take it all down and clean it all up and get all of these things done in the allotted time?

Frustration; Putting up the last few yards of crowd control fence while the first 300 yards was toppling over like dominoes.

Triumph . . . It was ready! The pylons were up, the fences were standing and we were ready to go.

Anticipation: The look on the face of each and every contestant who came by the entry desk that said, "Maybe this year!"

Agony: Watching Whit Stockwell, with only one more heat left to qualify for Formula I, having engine trouble on the flight line and not getting started. Then further agony sweating it out while the same thing happened to him three out of the four heats in FAI finals. He will not have to worry about bad luck any more, he spent his full allotment at the Nats.

Joy: Watching Cliff "Over the Hill Gang" Weirick dance a jig and whoop and hollar after flying one of the "gut grabbing" races of all time to beat Larry Leonard and take first place in Formula I. Then more joy at the banquet when 450 people gave him a standing ovation as he accepted his trophy.

Disappointment: When Bob Smith crashed on take off in the first heat of the Formula I finals after qualifying with the fastest time. He had done an encore of his world speed record time of 1:27.5. Further disappointment when his brother Chuck, who was tied for first place, plowed into a runway light on landing after getting another first in the third heat.

Amazement: At the "ask no quarter, give none" competitiveness of the well-known Telford/Violett team.

Pride: In the excellent showing that a guy named Ed Hoteling made. Reasonably new to the racing game and with a plane that was always last off, he somehow managed to hang in there and come up with a ninth place in Formula I.

Prejudice: In the happiness the California people all felt when the R/C Grand Championship was again brought home to roost on the shelf of our own Larry Leonard.

Add to all of these the further impressions of pleasure at working with

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total professionals like Glen Spickler and his crew, Jean and Gerald Christenson, Howard Nupen and Jan Sakert got it all together in a hurry and the whole thing was run like a well oiled clock: The "after the ball" feeling of loneliness while walking around an almost deserted field picking up trash: the anger when the trash was an empty glow plug card or a racing prop, but the philosophical feeling when it was an empty coke bottle or a hot dog wrapper.

And last but not least, the feeling of exultation that came when we found out we indeed could do it without the Navy! We will certainly miss them but

now we know that we can make it on our own. ●

### F/F scale . . . Continued from page 28

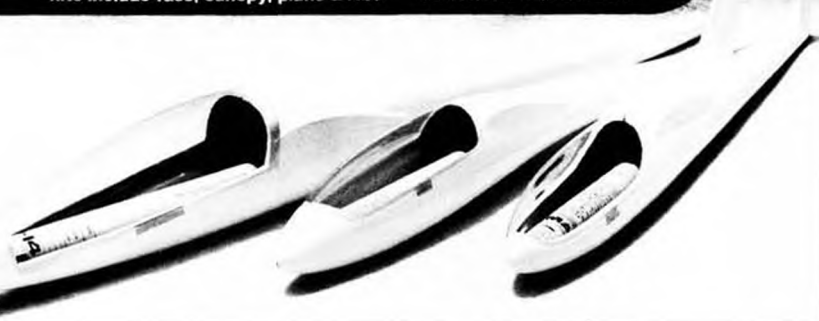
time the engine quit, the R.E.P. had flown over the barracks. The model literally fell out of the sky when the engines finally stopped, sustained quite a bit of damage, so Tom returned to the main hangar to do his repair work.

Meantime, Keith Ward and his outstanding Gere Sport was readying for the first official. Keith had flown this model many times, so he chose to try an R.O.G. Unfortunately, it only ground-looped, failing to take off. He tried again and

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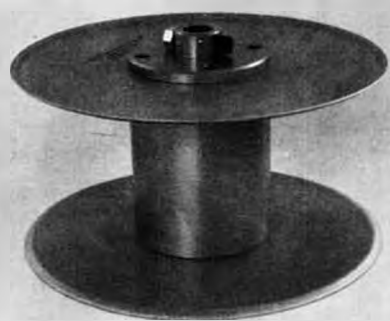
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\*Featured at '72 LSF Tournament

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still no take off. While Keith was on the sideline starting his engine for a third attempt, another model trying to take off taxied at full speed into the Gere Sport. The pretty biplane sustained damage to the lower wing, so Keith hurried off to the main hangar to make some rather quick repairs.

By this time, Tom Stark had returned from making repairs on his R.E.P. 7, and was ready to make his second flight; this time an R.O.G. His model took off beautifully, but again it was over-fueled, and again it flew toward the barracks. Tom was unable to find it this time; but fortunately, someone turned up with it early in the evening.

Andy MacIsaac (Michigan) didn't have that kind of luck! Andy was flying a pretty little .020 powered American Eaglet and he also over-fueled his model. The combination of too much fuel and the high wind sailed his model over the barracks area. From here it was stolen! (Someone reported seeing a man load the model into his pick-up.)

Keith Ward returned with his repaired model and tried a hand launch for his third attempt. Unfortunately, the Gere did not fly, and on his fourth attempt he damaged the model extensively. A real shame. Keith's previous flights were

all made in dead calm conditions which never occurs during official scale flying at the Nats!

Just to indicate how strong the wind was blowing, Chuck O'Donnell (New Jersey) had his Sopwith 1 1/2 Strutter ready to launch, when the wind literally took the model out of his hands.

Winners of the gas-powered scale event were Harold Warner 1st, Tom Stark 2nd, and Andy MacIsaac 3rd.

I cannot report very much on the rubber scale event because I was personally involved officiating gas, and rubber scale was being held at the same time. I can only say that the rules favor flying and most of the models reflect these rules. Preston Bruney (Michigan) had a beautiful Philip's Aeroneer which placed second. Tom Stark (Mr. Mulligan) was first and George Lewis (Pilitus Porter) was third.

In closing, I would like to personally congratulate Tom Stark for his accomplishment as Category Champion in Scale. He managed 2 firsts, and 2 seconds, as well as qualifying in R/C Scale!

If you have never attended the Nationals — do so! It is a wonderful and thrilling experience that words alone cannot describe. ●

mini-FAI... Continued from page 21  
dihedral break to 3/32 square at tip, soak in warm water for ten minutes, pin to plan and allow to dry overnight. Glue tip trailing edges to T.E. stock and sand to final shape. Pin trailing edge assembly to plan, add the two bottom spars and cement in all ribs, except in dihedral breaks.

After allowing time to dry, remove the wing panels from the plans. Next, carve and sand the leading edges to shape. Pin the main wing panels down and block the tip panels into place at the correct dihedral angle. When in position, add the dihedral joint ribs.

The top tip spars are now cut to length and glued in position. Next, pin the centersection panel down and repeat the blocking and glueing procedure with the main panels. Cut and glue all other top spars into place.

When entirely dry, remove the assembled wing from the building board and add all gussets and diagonal braces. Sand the entire wing to a final, finished form. Reinforce all dihedral joints by rubbing three coats of glue into all joints for strength.

**STAB CONSTRUCTION:** Same as wing except all spars are installed on plan. Remove, carve leading edge to shape and add diagonal bracing. Install DT hooks, noting offset of rear hook.

**COVERING:** Prior to covering, give the wing and stab three coats of 50/50 dope, sanding lightly between coats. Cover the wing and stab with Japanese tissue, dry. Apply the tissue to the wing with thinner, which soaks through the tissue and softens the previously applied dope for adhesion, or if desired, utilize 50/50 dope in the same manner. Spray wing and stab with water to tighten the tissue. Brush on two coats of thin dope and then apply tissue numbers or trim with thinner. Finish doping the wing and stab, adding three more thin coats on the wing and two on the stab. Let the stab and the wing season for at least a week in a warm place. I prefer to pin the stab down for this period of time.

**FUSELAGE CONSTRUCTION:** Fuselage is built a la Starduster. Cut the two pieces for the pylon from medium soft 1/8 inch sheet, glue and pin flat to dry. Next, cut the pieces for the fin from the lightest 1/16 sheet possible. This too should be glued together and pinned down until dry.

Select good, straight-grained 1/32 sheeting for the sides. Trace the outline, cut both sides and pin one down

flat on an absolutely straight building surface. Next, cut 1/16 x 1/4 top and bottom strips, slot both for fin and glue and pin them in place. Note top strip is in 2 pieces, one forward and one aft of the pylon. Now cut 1/16 square doubler for the rear of the fuselage and glue in place. The bulkheads are also cut from 1/16 x 1/4 stock and should be glued in position at this time.

Cut the eight required doublers from 1/16 sheet for the front, side, and rear of the pylon. Glue and pin four of them in place as well as the 1/16 square fuselage top & uprights that support the pylon on one side. Now glue the pylon and the fin in position. Cement all the required pieces into place on the top of the pylon and fin. When all pieces are dry, remove from plan. Fill last half of fin on both sides with soft 3/32 scrap.

Tank and firewall are now installed, check plan for down and right thrust. Then glue other side piece in place.

The cheek cowl (pre-shaped) are now installed. When dry, the cheek cowl can be sanded to their finished form. Install forward D.T. hook at this time in left cheek cowl.

Glue lengths of 3/32 x 1/4 tapered trailing edge stock to the top sides of the pylon. Also attach the wing platform to the top of the pylon. Sand the fuselage to its final shape and smoothness. Install stab platform and 1/8 high incidence block, building in stab tilt per plan. Pre-dope the fuselage with at least three coats of 50/50 dope filled with talcum powder, sanding lightly after each coat. Finish with 2 coats of clear 50/50 and 3 coats colored dope. Rub out last color coat. Epoxy the snuffer tube and the D.T. line guides into place.

Remove tank from your T.D. 010 and replace with backing plate shown on plan (stainless flat head 2-56 screws furnished). Mount engine with 2-56 pan head screws with lockwashers and connect original fuel line.

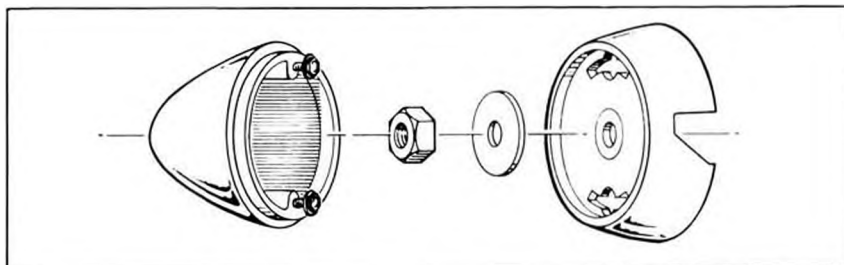
Make monofilament D.T. line, put small loop in rear to slip into stab hook, front "S" hook is shown in exact position for 45 degree pop-up with stab in flight position.

Assemble the entire model and align the wing by measuring equal distances from each wing tip to the rear of the fuselage. When properly aligned, key the wing in place with a split 1/16 diameter dowel. Key stab at trailing edge only. Balance the model to correct center of gravity as shown on the plans. Both the original and the second model balanced as built.

**WARPS:** After wing has seasoned a

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week or more, get out the tea kettle and let's either correct the present warps or set in the required one. These warps may be set in the following manner: hold wing over steam until the covering puffs and is covered with a light condensation, all the while twisting the panel an equal amount in the opposite direction.

Immediately after removing the wing from the steam, either rub your cheek across the surface of the panel, or rub the panel across your leg. This saps the heat from the wing in a sudden manner and sets the warp. Sight check the warp to make sure the amount desired is achieved. Repeat the steps to increase or decrease as needed.

In order to pattern this ship we must put in 1/8 wash-in in the right main panel. The same technique is used for setting this warp, with the exception that only the desired amount of warp is held into the panel.

**TRIMMING - FLYING:** With Model properly balanced, hand glide to obtain slow, floating glide to the right. Because of this ship's small size, a circle of 35-40 feet is desired. Shim rear of stabilizer, as required, for glide.

A point to remember when shimming on side positions, the amount under

the trailing edge of the stab for equal adjustments is just half of the side shim, be it adding or subtracting.

Since we have no fuel shutoff timer, take the time to familiarize yourself with your engine and tank duration. The tank shown will run, with engine peaked out, for just over a minute. Practice your release timing by starting engine, tuning, lighting fuse, then checking sweep hand on your watch until engine quits. When you become proficient at estimating various release times you're ready for your first flight.

Release first flight at a 60 degree angle; it will be at full speed in about three feet! The climb is a tight right spiral with right glide pattern. If further power pattern trim is required, use only thrust, wing warp, and stab adjustments: do not use any rudder adjustments. Since this is a high performance bird, take your time in making your trim adjustments. Unlike the javelin launch of it's big brothers, MINI-FAI VTO'S right now!

One final note: In selecting your takeoff site on a given field, it is mandatory that you be as close as possible to the Class D and D modelers so they may share the enjoyment of your 25 hours of labor. ●



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soaring . . . . Continued from page 37

Looking at the final standings, with three Standard class sailplanes (all Wind-frees) in the top ten (about the ratio of Standard to Open class), one might conclude that there is no point in a size distinction. My own opinion on the matter is that the larger sailplanes have an advantage in weak lift conditions, in that they can travel a large distance away, looking for lift, and still be kept in sight to get back. On the other hand,

I believe that the smaller sailplanes are easier to land. The large plane advantage was born out in the standings; Vandierdonck winning on his better duration times. Ray was one of the few to find some lift on the second duration task. With 40 in Standard class and 93 in Open it seems that most fliers prefer the larger span sailplanes (with the sailplane pilots buying most of the Monokote in the country, Sid Axelrod also prefers the

larger sailplanes!)

Tuesday dawned bright and clear, with a big relief in the temperature. Lift conditions were about like the first day, and tasks for the day were 3-minute precision and 10-minute duration. Mark Smith, who had held a comfortable lead from the very beginning, tossed the meet into a five-man race when he missed his precision landing. There was now less than 250 points separating the top five

## 1972 SOARING NATIONALS RESULTS

PLACE	NAME	STATE	CLASS	SAILPLANE	POINTS
1	R. Vandierdonck	Mich.	O	Nimbus	4722
2	J. Donelson	Calif.	S	Windfree	4681
3	O. Heithecker	Mich.	O	Snoopy	4640
4	M. Smith	Calif.	S	Windfree	4610
5	R. Walters	Calif.	O	White Trash	4312
6	D. Nutter	Okla.	O	Grand Esprit	3917
7	R. Kardian	Mich.	O	Original	3737
8	K. Hanson	Calif.	O	Grand Esprit	3734
9	J. Hiner	Ill.	O	Cumulus	3709
10	R. Smith	Calif.	S	Windfree	3670

### TEAM STANDINGS

PLACE	TEAM	STATE	POINTS
1	Greater Detroit Soaring and Hiking Society	Michigan	12530
2	South Bay Soaring Society	California	10351
3	Harbor Soaring Society	California	10287
4	Bay Bombers	California	9403
5	SOAR	Illinois	9098

### SCALE

PLACE	NAME	SAILPLANE	POINTS
1	Bob Andris	Slingsby T-53B	5074
2	Bob Thacker	Kestrel	4864
3	John Donelson	Phoebus C	4620

### SPECIAL AWARDS

Best Technical Achievement Award — Bill Wargo: Winch retrieval apparatus.  
Best Original Design — Ray Vandierdonck: Nimbus  
Best Monokote — Doug Munn: Intrepid  
Best Junior Achievement — Yoshinori Sato: From Japan, 8 years old.  
Best Performance by an American Kit — John Donelson: Windfree

### OPEN CLASS

#### PRECISION

1	R. Walters	2000
2	O. Heithecker	1600
3	R. Vandierdonck	1480

#### DURATION

1	D. Nutter	2567
2	R. Vandierdonck	2522
3	J. Hiner	2469

#### SPEED

1	H. Stock	1000
2	D. Burt	975
3	D. Hartman	808

### STANDARD CLASS

#### PRECISION

1	J. Donelson	1960
2	J. Walters	1900
3	M. Smith	1480

#### DURATION

1	M. Smith	2452
2	S. Miller	2304
3	R. Smith	2163

#### SPEED

1	B. Pell	762
2	J. Simpson	684
3	M. Smith	678

fliers; Heithecker, Smith, Vandierdonck, Donelson and Rick Walters.

Vandierdonck, Smith and Heithecker were all called to fly their duration round together. CD Dan Pruss was accused (in jest) of staging this, but he said, "Honest guys, it just worked out that way." All found good thermals in different parts of the field; Ray off the line, Mark slope soaring off a tree (honest!) and Otto way out over the trees. Watching Otto fly is a real experience. Here is a man who not only jumps up and down while he is flying but also talks to his sailplane (named Snoopy because of the dog in the cockpit); he literally talks his sailplane down into the landing spot. When all was done Vandierdonck had stayed up for 9 1/2 minutes, about 1 1/2 minutes longer than Smith and Heithecker, to win with a total of 4722 points out of a possible 6000.

The scale event was somewhat of a disappointment in that only 6 sailplanes were entered, all from the west coast. Bob Andris won the event with a multi-colored military Slingsby T-35B. Scale was judged on Sunday by the same judges who later judged Free Flight Scale at Glenview. Flight tasks were one round each of precision, speed, and duration, all flown on Tuesday.

Bob and I had discussed the scale rules with Dave Platt earlier, and it's obvious that there is some disagreement about the current rule. A lot of emphasis is placed on flying, as the flight tasks are flown right along with the non-scale sailplane. One argument is that, by doing so, a lot of types of aircraft are eliminated from being a competitive scale subject, for instance low-performance gliders or World War II troop gliders. These types would not be competitive in a speed task, for instance. Bob's T-53B is an excellent example of selecting a good subject tailored to compete with existing rules, a simple design with scale aspect ratio, plenty of room for cockpit detail and a good flyer.

All in all it was a fine meet, with nose-to-nose competition and good sportsmanship. The team championship was a big hit this year, 18 teams being entered from all over the U.S. I guess it was fitting that the Greater Detroit Soaring and Hiking Society should win it, as their club was represented by some 25-30 fliers.

"Just wait 'till next year, you mid-westerners!" ●

**workbench** . . *Continued from page 7*  
number of Old Timer model airplane enthusiasts, the demand might be high enough to rate action. The company

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The spinners are available in red, yellow, blue, black, white, and orange in all 8 sizes, ranging from 1 1/2 inch at 95 cents to 3 1/2 inch at \$5.45. The 3 1/2 inch size only is available in a choice of P-51 or P-40 type.

\* \* \*

Vic Cunnynggham, Jr., well known west coast free flyer, and president of Progressive Sales, P.O. Box 474, Charter Oak, Ca. 91722, is the man to contact regarding that great "Super Glider". This is a high performance hand launch glider featuring styrofoam wing and stab, tapered hardwood boom and molded nylon nose.

One glance at this glider, and particularly the instruction sheet, and you'll know that a knowledgeable H.L.G. man has been instrumental in its design and marketing. The \$1.29 "Super Glider" has already sparked a "commercial H.L.G. event" by several California F/F clubs.

Vic invites inquiries from dealers, wholesalers, and representatives.

\* \* \*

Dwight Hartman, of Hartman Fiberglass R/C, Argenta, Ill. 62501, is offer-

ing Miskeet designer Harley Michaelis' latest sailplane, "Spirit of Freedom". Span is 118 inches, area 723 sq. in., flying weight around 3 pounds. Partial kit for \$25.00 includes fiberglass fuselage, spruce spars and parts-pac. Send 24 cents in stamps for details on this, and other fiberglass kits available from Hartman.

\* \* \*

The Mini-FAI free-flight model featured as a construction article on pages 20 and 21 of this issue requires the use of a special backplate for the Cox .010. The backplate eliminates the bulky tank-mount supplied with the engine, permitting a slimmer and trimmer fuselage.

The Mini's designer, Loren Williams, is producing these plates in black anodized aluminum for both the .010 and .020 Cox TD's. Price for either size, including stainless steel flat head mounting screws, and postage, is \$5.50 each. Order from Loren Williams, 729 W. Anaheim St., Long Beach, Ca. 90813, and allow two to three weeks for delivery.

\* \* \*

Tatone timers are back! After being off the market for about a year and a half, the "Tick Off" and "D-T Tick Off" are again being made. The "Flood-Off" units will follow later in 1973.

The new timers feature selected brass gears, black anodized steel pinion shafts, and brass bearing plates. The main spring is heat treated clock steel.

The fuel shut-off time runs from 0 to 30 seconds, weighs 3/4 oz., has a dial to indicate length of engine run, and a positive acting ON-OFF switch. It em-



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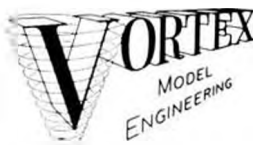
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plays the pinch tube system, and comes with a length of special surgical tubing; price is \$5.75.

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D.J.'s Multi-Stripe is the material you should ask for the next time you plan to decorate a model with colored stripes in 1/16, 3/32, 1/8, or 1/4 inch width. Literally like having a printed stripe coming from a roll instead of a bottle, D.J.'s Multi-Stripe is colored P.V.C. material with a pressure sensitive adhesive on one side.

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Contact D.J.'s at P.O. Box 41105, Los Angeles, Ca. 90042. Dealer and Distributor inquiries invited. ●

**Dear Folks . . . Continued from page 41** the radios. We got nine hours sleep that night and were ready to race.

The second heat on Sunday had Doug

and Korpi. Doug got two cuts and Gary had radio problems and had to land. It ended up that all of his problems were caused by the battery pack, which had been jammed too tight into Paul White's design. If the rest of us hadn't been having so many radio difficulties, Gary probably would have discovered the problem on the test flights. Jeff and I both won our heats.

Allan Mann and Terry Prather then had a real close heat with Mann barely winning at 1:47. The only problem was that the officials did not flag the finish of the race so neither of the pilots or the spectators knew when it was over! Terry and Allan kept racing, and on the 12th lap Terry crashed coming out of No. 1. We found out, from later incidents, that this was caused by pointing the transmitter toward the No. 1 pylon. (*Manufacturers have warned fliers not to point antennas at planes in flight. Under normal conditions it's probably OK, but where things are dubious, as in this situation, it's better not to point. T'ain't polite, anyhow — WCN*)

Larry was in the next heat and didn't get started. "Pressing on regardless," and taking advantage of the 6 minute rule, he finally got off after everyone had gone a lap. However, he retracted the gear right after takeoff and the plane belled

in. He noticed later that the plane tended to sink when the gear retracted, so I guess he just did it too low.

Tony Dowdeswell crashed his back-up plane in the next heat to complete a terrible first round. But this was nothing. There were still three rounds to go. To show how great Sunday was, I flew seven heats, won six, and ended up with only 12 points. Incidentally, after Larry flopped in from the quick retract he changed props and finished fourth with a blazing 5:15.0!

In the second round, Jeff won again and Larry beat Whit. In that heat, Larry never got a light at No. 1 and Whit had two cuts, so we chose to rerun the heat to give Whit another chance. When it was rerun later though, Whit did the same thing as Terry at the No. 1 (pointing) and crashed, with Larry still first.

I won my heat, but it ended up that the guy who finished third didn't get a light on his last lap and we all had to refly. On the rerun, Richard Nichols flew up underneath me on takeoff and his prop broke my stab so that the elevator was the only thing holding it on. I landed and we fiberglassed it back together. It's a good thing I was oversize in area, because I lost more than 3 sq. in. from the leading edge of the stab. We reflew and I won again with a 1:54.

Violett raced Mann in round 2 and Mann got two cuts at Number 1. You won't believe this, but the British put in a protest afterward that Mann's flagman was flagging late and therefore they had to anticipate, which caused the two cuts! The CD decided to refly the heat, but we got together, and wrote up a protest against the protest! After a lot of hassling, the British dropped the matter and things stood as they were. Korpi, using his back-up plane, raced Phil Greeno and was beaten.

We knew by then that the British had to make mistakes for us to do any good. Mann and Greeno were just as fast as Violett, and six other British were almost as fast, with HP's. Our engines sounded sick compared to theirs.

I won my next heat in Round Three, but again the lights didn't work for the third place guy and we had to refly. They switched to flags and I won the heat again.

Jeff had to race Mann, Korpi, and Whit. They hadn't re flown Whit's second round heat yet and he switched to Terry's engine. Korpi put a new battery in his Number 1 airplane and barely beat Mann with a 1:46.3. Jeff got hit twice by interference coming out of No. 1, so

*Continued on page 56*



# MODEL AIRCRAFT OPERATING STANDARDS

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION



## 1. PURPOSE

This advisory circular outlines safety standards for operators of model aircraft, and encourages voluntary compliance with these standards.

## 2. BACKGROUND

Attention has been drawn to the increase in model aircraft operations, and the need for added caution in the case of free-flight and radio-controlled types to avoid creating a noise nuisance or a potential hazard to full-scale aircraft and persons and property on the surface.

## 3. OPERATING STANDARDS

Modelers, generally, are concerned about safety and do exercise good judgment when flying model aircraft. However, in the interest of avoiding undue criticism from affected communities and airspace users, compliance with the following standards is encouraged by operators of radio-controlled and free-flight models.

- a. Exercise vigilance for full-scale aircraft (get other people to help if possible) so as not to create a collision hazard.
- b. Select an operating site at a sufficient distance from populated areas to avoid creating a noise problem or a potential hazard.
- c. Do not fly higher than 400 feet above the surface.
- d. Do not operate closer than three miles from the boundary of an airport unless permitted to do so by the appropriate air traffic control facility in the case of an airport for which a control zone has been designated, or by the airport manager in the case of other airports.
- e. Do not hesitate to ask for assistance in complying with these guidelines at the airport traffic control tower, or air route traffic control center nearest the site of the proposed operations.

*William M. Flener*  
William M. Flener  
Director, Air Traffic Service





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Whit beat him and had to settle for fourth.

Next came the heat which changed the whole contest. They had pylons which were twenty feet high, and one flagman for each pilot at the Number Two and Number Three pylons. Larry knew he had to fly tight so he flew low, sometimes only 10 feet off the ground, which had the flagmen on their faces. Larry had two cuts and Greeno won it, but the CD decided that that type of flying was too dangerous and made up a rule on the spot that any plane flying below the top of the pylons would be disqualified! So in the fourth round I won my heat but when I passed the second place plane I went below the Number Three pylon and was disqualified. I don't think I have to tell you how mad I was.

They disqualified Peter Pillsworth in this round too, so the British and American teams both put in written protests that night to the FAI jury, but the rule stood as is. Jeff and Larry both won their heats this round.

My flying went to pot on Monday, having to worry about how high I was. Also, whenever I came near to pointing the transmitter at the airplane, I got bombed by up glitches. My first heat was against Greeno, Telford, and Jeff. Cliff crashed when a servo went on the blink and Larry called two big cuts for me. We couldn't come close to catching Greeno and Jeff came in second.

I came in second against Violet in the next round and Jeff was half a lap in the lead when he cut the Number 3 and got a second. Larry, Violet and Pillsworth raced in round five and Larry and Peter had a beautiful mid-air about 15

feet off the ground after takeoff. Both planes just got tangled together and spun into the ground. Larry's fuselage was ripped in half, but we managed to epoxy it back together. The wing had to be epoxied to the fuselage and held on with a string because everything wasn't dry when he went out to the line for the next heat. Talk about micky mouse, this was it!

I raced Korpi, Doug and Pillsworth next. We agreed before the race that Doug and I would not finish ahead of Gary because he was tied with Jeff for third. Gary chipped his prop on takeoff and became a toad so we didn't know what to do. Doug finally decided the only course was to cut the Number 1 pylon and I accidentally followed him since I was right behind. A few seconds later Gary had to land when all of his aileron hinges vibrated out and he could only fly on rudder. Pillsworth won, Doug was second and I was third. (I couldn't fly 2 and 3 worth beans up high.)

Round Seven had the battle for first place between Greeno and Violet. They all got started but Cliff stuck his hand in the prop while adjusting the engine. A change of prop and a blood transfusion later, they got it started and the race was on. Greeno was just as fast as Violet, but on the second and fourth laps had big cuts at Number 1, which they didn't flag! Then Violet barely flew inside the Number 1 twice. This time the cuts were called! The American pits about came unglued. Finally, on the tenth lap, they called a cut on Greeno on Number 2 and he then cut Number 1 on the eleventh lap.

When the official results came in, though, I'm afraid there were some bad

feelings generated which may last a while. They didn't catch Bob's cuts and gave him first with a 1:41 and Greeno a zero. The British protested but the FAI jury upheld the results. We felt the heat should be reflowed but Bob made sure the results stayed. At this point, Jeff was only one point out of second with one round to go!

We all got firsts in the 8th round. Greeno had to fly the last round three times when twice there were mid-air. He still won.

Pillsworth forgot to go out to the line and missed the last heat. The engines were started when he got out there but they wouldn't let him race. He was quite upset, since that heat could have put him into 6th place.

### RESULTS

1	Violet	U.S.A.	Tigre	1:41
2	Greeno	England	HP	1:47
3	Jeff	U.S.A.	K&B	1:53
4	Wall	England	HP	1:53
5	Beaumont	England	HP	1:57
6	Korpi	U.S.A.	K&B	1:46
7	Griffen	England	HP	2:01
8	Smith	U.S.A.	K&B	1:54
9	Nichols	England	HP	1:58
10	Leonard	U.S.A.	K&B	1:50

**R/C Nats . . . Continued from page 18**  
while all frequencies in Block B, Pattern, are flown at the other. At a point midway through the period, all flying stops and then Scale Block B and Pattern Block A can be flown simultaneously. It may sound complicated, but when it's all laid out on charts and flying lists are made up, it falls nicely in line. A last-minute juggling of the Scale flight lists caused the error.

In the second incident, one line of Pattern finalists, as usual, was running faster than the other, and consequently the flyers finished their round before the others. Officials should have made the faster line wait for the slower line to finish before going on to the next round. By not doing this, they allowed the first man up on the fast line to turn on while a man on the slow line was still in the air. In this particular case, though not necessarily inevitable, the two were on the same frequency. Zap! Again, it was human error, *NOT* a breakdown in the system.

We have heard and read comments to the effect that frequency pins would have prevented both errors. Probably so, but can you imagine the delays and resulting loss of flying time while frequency pins would be shifted, exchanged, forgotten on antennas, and run back and forth almost a quarter of a mile between the two sites?


We mentioned a "last", and this of course would have to be the Navy support that we have leaned on in the past. However, another "first" came as a result of the "last". For the first time, officials not only did their usual jobs of running events, they also did the hard labor formerly handled by the Navy. If you want to know how to put up and take down several miles of snow fence, just ask one of the guys who was also judging flights, or calling contestants, or tabulating scores, or operating the flight lines, or punching stop-watches, or waving flags, or spending hours in the "Scale Cage."

Anyhoo, getting back to Pattern, the results of the Class C Finals are always sort of interesting to examine. Of the top twenty finalists, 14 were finalists in 1971 and 10 of these also made it in 1970. New faces in the top 20 this year were Steve Helms, Steve Buck (both from Phoenix, Arizona), Dave Brown (Mason, Ohio), Marty Barry (Vista, Ca.), and Ed Hotelling (Camarillo, Ca.).


The south and west still dominate, probably due to the year-round flying conditions; nine from the west, six from the south, three from central states, and two from the east coast.

As the old saying goes, "Save your Confederate money, the South will (and did!) rise again." The top three winners (if you don't know, through the fastest grapevine in the world, by now, you must really live in the "boonies") were Ron Chidgey (Pensacola, Fla.), Jim Whitley (Decatur, Ala.), and Don Coleman (Citronelle, Ala.).

The top twenty finished as follows, and after each name is their qualifying



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position, final score, 1971 final position and final score, and 1970 final position.

1	Chidgey	( 1)	855	( 1)	835	7
2	Whitley	( 2)	845	(10)	785	4
3	Coleman	(13)	840	( 2)	826	6
4	Page	( 3)	831	( 4)	819	8
5	Kirkland	(11)	822	( 5)	816	1
6	Kraft	( 5)	816	( 7)	814	3
7	Martin	( 7)	814	( 3)	825	9
8	Penrod	( 4)	813	(13)	775	—
9	Helms	( 8)	809	—	—	—
10	Bonetti	( 6)	808	(11)	783	10
11	Buck	(10)	807	—	—	—
12	Brooke	(12)	806	( 7)	800	—
13	White	(14)	806	( 9)	790	—
14	Brown	(15)	804	—	—	—
15	Bridi	( 9)	786	(15)	773	—
16	Lowe	(18)	782	—	—	11
17	Leonard	(17)	775	(14)	773	5
18	Barry	(19)	763	—	—	—
19	Hotelling	(16)	762	—	—	—
20	Agee	(20)	758	(16)	766	—

It is interesting to note the comparison between qualifying and final positions. For the most part, flyers remained fairly consistent in relation to each other, with the exception of Coleman, Kirkland, and Bridi. Coleman is consistent in his own way, however. This year he jumped from 13th to 3rd and last year he moved from 10th to 2nd. Must take Don a little while to work up a head of steam!

Joe Bridi's consistency works against him . . . consistently. In both 1972 and 1971, he qualified in 9th and finished in 15th! Actually, Joe doesn't fly worse in the finals, it's simply that guys like Coleman squeeze him down as they move up. There oughta be a law . . . !

Many of the airplanes showed some European influence, with large fuselage

frontal side area and weight in the eight pound range. Webra's pulled 14 of the finalists, most used Top Flite power props 11-8 or 11-7½, and Silenceaire dominated the muffler department.

Retract gears are now as much a part of pattern competition as the planes themselves. We don't recall a single finalist with fixed gear. The pressure, if you'll excuse the expression, is on the gear manufacturers to make their units as fool proof as possible. An out-of-trim airplane, an engine going rich or lean in the air, or a "glitchy" radio, can cause loss of points in maneuvers, but a collapsed landing gear results in a zero for landing *and* spot, potentially a loss of as many as 20 points. Failures, however, seemed to occur mostly in Scale, probably due to the excessive weight of the models and the generally rougher landing performed.

Ten Pro-Lines made the top 20, including the first four positions, as well as 7, 8, 9, 11, 12, and 20th. Kraft, Bonetti, Leonard, and Barry used Kraft, while Kirkland, Brown, and Lowe flew World Engines equipment. Bridi and Hotelling operated S&O (Salkowski & Oddino) units, and Ted White had his own Galaxie. Sixteen of the above were on 6 meters.

Class A & B patterns were flown simultaneously on Sunday morning, and it's a shame that all Nats R/Cers couldn't have been there to watch Steve Brooke, Ralph's eleven year old son, doing 8, 9, and 10 point maneuvers, one after another. It was sort of a funny sight, but also a real kick, to watch the Brooke clan before any of Steve's flights. As the plane moved from Ready Box 3, to Ready Box 2, then to No. 1, Ralph and Jean would get more and more nervous,

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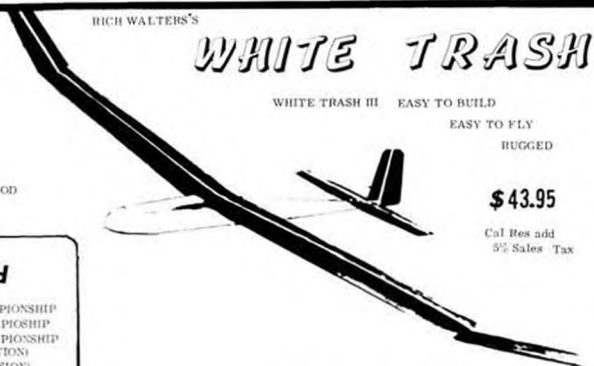
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1st 1971 LSF TOURNAMENT (PRECISION)  
1st 1971 LSF TOURNAMENT (OVERALL)  
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acing around, wringing hands, and wiping brows, and all the while, Steve was standing there as calm as a drug store indian.

Steve went on to win Class A (J, S, O), by a wide margin, over Bob Platteter (Senior), Don Gutridge (Open), Reuben Tyson (Open), and Gary Anderson (Open), and quite naturally also took home the Best Junior Trophy. Bob Platteter won Best Senior.

Ellis Newkirk, a Senior from Nashville, Tennessee took first in Class B by a clear margin over Mark Smith (Ill.), Jack Poppenhager (Ill.), Leland Peter-

son (Ill.), and Joe Hildreth (Ark.), all Open flyers, and also earned the Best Senior trophy for Class B.

Class C Novice awards were based on the C Qualifying scores, with Ed Hotelling way out in front (enough to qualify in the finals fly-off). Rhett Miller, who placed second, also won the best Junior trophy. Third, fourth, and fifth were taken by Kim Johnson, Don Sobbe, and Ernie Weiss. Incidentally, Rhett Miller loaned his Kirkland designed Intruder to Jim Kirkland after Jim's plane was wiped out in one of the aforementioned frequency mix-ups.

**SCALE:** R/C Scale and Pylon are always the biggest spectator shows at the Nats, and though we didn't actually count feet and divide by two, we're pretty sure scale drew the larger crowd. Among those present was Paul Harvey, who has plugged the hobby many times on his nationally heard radio news broadcasts. Paul is an active R/Cer, and like many others, stayed for a full day of scale flying.

In general, the scale fidelity quality has improved a great deal, with credit due to Dave Platt for having broken the line with his "weathering". Prior to the appearance of Dave's SBD in Olathe, 1968, scale ships were mostly unrealistic looking polished jewels.

Incidentally, Dave's Dauntless made its last Nats appearance this year, as it now occupies space in the U.S. Naval Aviation Museum, NAS, Pensacola, Florida. It was actually committed to the museum prior to the Nationals, but Dave's other project, a ducted fan ship, was not ready in time, so at the last minute he entered the SBD. Bob Blaikie, exhibits specialist for the museum, was a very nervous spectator as Dave made not one, but three flights to qualify and place seventh in the competition.

With flight points counting so much,

the trend, in recent years, has been toward the more conventional configuration of single engine monoplanes, so it was nice to see Tom Cook's B-17 and Bill Bertrand's Handley Page, four engined bombers from WWII and WWI, respectively. Tom placed eighth, and also won the Best Flight Achievement Award. The Fortress, though unscale-like in flying speed, nevertheless sounded beautiful with its four Webra .20's roaring away. Bertrand's Handley Page was more scale-like in the air, but had problems getting off without going through some fantastically rapid ground loops.

Joe D'Amico was back with his Martin B-26, this time with retract gear, which, in spite of relatively soft landings, continued to suffer from nosegear collapse.

In the winner's circle, Bud Nosen reversed last year's problems by damaging his beautiful Skyraider *after* getting in some official flights, thus capturing first place.

Walt Moucha putt-putted around with his World Championship Scale entry Fly Baby to earn second place. The Pete Bowers designed homebuilt is very realistic in the air and Walt does a nice flying job.

Ed Ellis has a thing about old Ryans and it apparently pays off. He took first and fourth in 1970 and 1971 with the Spirit of St. Louis, and came back this year to win 3rd place with the Ryan M2 mailplane. As with the Spirit, the M2 has no dihedral and a small stab, but at least appears to fly with a fair amount of stability.

Don Botteron's fourth place finishing Zlin Akrobat, built from the Sig kit, is already well known from Hobbyoxy ads and the article Don prepared for American Modeler on applying the epoxy finish with a brush. The paint job is truly beautiful and should encourage those who can't go the additional cost of a spray unit.

Ralph Jackson, a long time veteran of Nats R/C Scale, brought a "What's That" airplane to the Competition. The low wing, single engine private plane looked a little bit like most every aircraft of its type that you'd see at any airport, but the name had a way of causing a double-take to nearly all but the most informed individuals: Win-decker Eagle.

Just outside of the winner's circle were; Claude McCullough's Shinn 2150, which won Sterling's Best of All Scale Award; Dave Platt's Dauntless; Tom Cook's B-17; Bob Underwood's Bonzo, Bertrand's Handley Page; Bob Karlsson's

very popular F4-U featured on our cover; Joe D'Amico's B-26; Bud Phillips' Lockheed Orion; Dick Graham's EAA award winning Liberty Sport; and others. Over thirty in all.

Scale still has its traditional problems, the unflown or untested models, the fliers who almost of necessity spend much more time on building than developing their flying skills, and the continued over-spectator flying. But what really hugs us the most is to see an "unpiloted" model in action. Damn it all, if these are really scale models, then there ought to be a pilot in the "office" whenever the plane is in motion. Granted, you can't distinguish features of pilots in full scale aircraft unless they taxi up close to you, but you can usually see that *somebody* is at the controls as the plane taxi's out, takes off, lands, and taxi's back.

The amount of realism added to Dave Platt's Dauntless by having pilot and crew aboard is very noticeable. And to us, it's *also* very noticeable, almost spooky, to see Nosen's Skyraider taxi to the "hangar" and stop, to see the canopy slide open without the help of human hands, and *then* see that nobody's there!

We're not asking scale contestants to go out for sculpturing lessons, or to storm Williams Brothers for plastic pilots (Down, Granger! Down, Larry!). Even a profile would do. In fact, the pilot should not be judged nor need "it" be at the controls for judging, but by golly, a simulated pilot of *some* sort should be *required* in scale models when they are in action . . . unless of course the model is of a full scale, 100 percent, radio controlled, target drone. There's always a way to get around most anything!! ●

**electric . . . .** *Continued from page 43*  
tions for performance of the Midwest Cardinal. From Figure 1, a power of 20 watts was required at the 4 foot wing span and 3 pound weight. Doubling this minimum power to obtain a reasonable climb speed and subtracting the resulting 40 watts from the power available from the Astro-10 power pack, leaves 35 watts of climb power. Again, referring to the upper portion of Figure 1, it yields a climb rate of 290 feet per minute. Straight and level performance is obtained by noting that the 75 watts of power available from the Astro 10 is 3.7 times the minimum power required and noting that the aspect ratio is about 6 to 1, offering a level flight speed of 2.3 times the stall speed, or about 55 mph. (Stall speed equals 24 mph at the maximum wing loading of 24.5 oz/sq.

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**C/L . . . . .** *Continued from page 25*  
Third place went to Henry Graef after losing a hotly protested decision to Vernaw.

C Speed saw Glen Vasant, Charles Schubert, and Glen Lee, win 1st in Jr., Sr., and Open respectively. First and second in Jet Speed went to the Hoyt brothers, Mike and Bill in that order. Third place was awarded to Thomas/

Wade team.

Over on the Carrier deck, things were buzzing as Harvey Dickinson won Jr. Profile. Sr. Profile went to Bob Wright and Open was held by Harry Higley. Class I was won by Bob Sawicki in Jr., Terry Herron in Sr., and Ray Willmann in Open. Junior Class II was Bob Sawicki again, John Gerber in Sr. and James Finley in Open.

Sunday was FAI Team Race day. J.E. Albritton was the winner followed by James Vasant and Dick Orsterle. A model aircraft flying demonstration completed this year's Nats and was a crowd pleaser as usual.

See you next year at where ever the '73 Nats are held. Until then, keep 'em flyin'!! ●●

*Report on C/L stunt only, by Bart Klapinski:*

● Repeating last year's duties, Dick Williams (Kansas City, Mo.) and I were the event directors, and for those who have never run an event at a regular meet, let alone the Nats, it is quite an experience, to say the least. As anyone who was at the Nats can testify, the Naval Reserve did not supply the manpower they had in past years. Consequently all of the flying circles and pit areas had to be carefully marked



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#271

out according to previously drawn plans and then tape had to be put down, as the Navy requested that no permanent marks be left on the runways. The really big job, however, was putting up what must have seemed like an endless snow fence, particularly to those who did it. (Luckily Dick Williams and I were busy training the stunt judges.)

Training stunt judges can be a difficult task, as no one yet, in my opinion, has flown the stunt pattern exactly as the book shows. It is rather difficult to point to a maneuver in the book and then duplicate it in the air for the judges! The main reason for our difficulty was

the fact that Dick and I had just a few hours to work with the judges since there were many smaller but vital jobs that had to be completed, such as making enough score sheets, rounding up tables and chairs, clip boards, tents, adding machines (which was like trying to take gold from Fort Knox) and all the other small necessities. Without the valuable help of Dick's wife Donna, who not only helped with the vital jobs but also did much more than her share in helping to run the scoreboard and spent more than a couple of nights tallying scores... often until the wee hours of the morning... we would not have been able to con-

tinue our operation.

Tuesday evening, the Juniors brought in their planes for appearance judging. Although stunt is a tough event for the junior pilots, I was a little disappointed, as only nine entries were to show.

Flying began on Wednesday morning, and the weather was generally good with just a little wind in the afternoon. When it was all over little Mark Bauer, from Norridge, Illinois, came out on top with 324 points. He flew an original design "Das Kraut", powered with an ST .40. The plane looked like an early German monoplane, was silk covered, and finished with Sig and K&B epoxy. It spanned 52 inches and weighed 49 ounces. Propeller was a Rev-Up 11 x 5 and the fuel had 10 percent nitro. The ship also featured a shock absorbing landing gear.

In second place, with a score of 320 points, was Robert Peterson, from San Diego, California. His 54 inch Tempest weighed in at only 45 ounces (I wish mine was that light) and was powered by an OS .35 with Rev-Up 10 x 6 prop. It's hard to believe that the plane standing on a wing tip was taller than Bob!

Third place went to Kenneth Stevens, who hails from Lexington, Kentucky. His Oriental, built from magazine plans, was powered by old reliable Fox 35, using a Rev-Up 10 x 6 prop. His 55 inch span ship was finished with Aero Gloss dope and weighed 41 ounces. He had a score of 267.25 points.

That famous Mother Goose character, Chicken Little, had told me that on Senior Stunt day, the sky would fall. (Goodness, Bart, you DID work too hard! - WCN.) The chicken was right as the sky did fall and almost washed us all away! The last flight wasn't made until 6:40 p.m.

Dennis Admisin has been working very hard on a V-tail design about which many flyers were skeptical. Dennis

proved them very wrong, however, as he placed 1st with a score of 489.25 points. His semi-scale Fouga Magister jet had a wing span of 56 inches and weighed in at 55 1/2 ounces. He had a Rev-Up 10 x 6 EW tied on the "go" end of an O.S. Max 35. He used K&B 100 fuel and the finish was Aero Gloss.

In second place, with 488.5 points was Mike Jackson of Long Beach, California. His 54 inch Tempest weighed in at 48 ounces and was powered by an O.S. Max 35. He uses Sig fuel with a Rev-Up 10 x 6 prop and the ship is nicely finished with Sig dope.

In third place with 483.75 points was a fine gentleman by the name of Mike Thompson, who lives in Modesto, California. He flew a Gypsy, designed by Jim Silhavy. This very nicely finished craft had a wing span of 56 inches and weighed in at 63 ounces. It is powered by an O.S. '40 which swings a Rev-Up 10 x 6 EW. He uses a Sig finish.

Open Stunt saw a most beautiful array of planes, and it seems they get better every year. This reporter was pleased to see the wide variety of products used in all entries. There were all types of planes, finishes, building techniques, hardware and engines. Lew McFarland was using an H.P. 40 with muffler in his fine original Akromaster. It seemed to run very well.

The first day of Open Stunt was for qualifying, with the top six flyers from each of three circles slated to go into the finals. Weather was good, but the wind in the afternoon, although not strong, was nevertheless in evidence.

When the dust had cleared, the 18 finalists were:

#### CIRCLE ONE

1. Les McDonald	570½
2. Bill Werwage	527½
3. Al Rabe	518½
4. Gerald Soloman	450
5. Dan Shaffer	446½
6. Pete Simonson	445

#### CIRCLE TWO

1. Bill Rutherford	662½
2. Gene Schaffer	659
3. Bob Gieseke	628½
4. Frank McMillan	562
5. Lew Wollard	554
6. Bob Svoboda	551½

#### CIRCLE THREE

1. Gerald Phelps	571
2. Bob Lampione	570½
3. Jim Silhavy	568½
4. Lew McFarland	563½
5. Jack Sheeks	560½
6. Keith Trostle	552

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Finals day had the best weather of the meet . . . and practically no wind. Bill Werwage put up an early flight which temporarily moved him into 1st. Gene Schaffer flew shortly thereafter and took over second place. I wasn't able to see most of the flights and apologize for not giving a better account.

Al Rabe flew a big ST .60 powered Sea Fury which impressed everyone . . . it wound up in first place . . . Al did a beautiful job in building and finishing this complex airplane. The ship has a 62 inch wing span and weighs 77 ounces. The ST sported a concealed muffler and turned a 13 x 5 Rev-Up prop. The plane also had a shock type landing gear which was in evidence during landings. The Hobbypoxy finish was beautiful.

In second place was a real veteran of stunt, Bob Gieseke, who flew his well known Gieseke Nobler. Along with Bill Werwage, Bob didn't get in much practice as their planes arrived just in time from the World Championships.

Bob's Nobler has a 51 inch wing span and weighs a mere 39 ounces. He uses a Fox 35, Rev-Up 10 x 6, and Fox Super-fuel. It has an Aero Gloss finish over Japanese tissue.

Although it appeared to have some Rabe influence, Bill Rutherford's 3rd place P-51 Mustang is an original. The Mustang is powered with an ST .60, using a Rev-Up 13 x 5 prop. Wing span is 55 1/2 inches and it weighs in at 59 ounces. He used Sig dope on his nicely finished plane.

*(Editor's Note: Better find out what's going on in Irving, Texas, Bart. The first three placers all come from there. If it's the water, they ought to bottle and sell it!)*

Fourth place went to another veteran, Lew McFarland. Lew flew his own Akromaster which is powered by an H.P. 40, with muffler, swinging a 12 x 6 prop. The wing span is 57 inches and it weighs 57 ounces. Lew finished his plane with Sig dope.

Gene Schaffer flew his "Air Boss" to 5th place. He uses an OS Max 35 for power and a 10 x 6 Power Prop. His nicely finished model was painted with Sig dope. His plane has a 54 inch wing span and weighs about 43 ounces.

The top ten finalists were:

1. Al Rabe	627.75
2. Bob Gieseke	625.75
3. Bill Rutherford	624
4. Lew McFarland	605
5. Gene Schaffer	601.75
6. Bill Werwage	600.5
7. Les McDonald	596.5
8. Gerald Phelps	596
9. Jim Silhavy	585.75
10. Keith Trostle	559.75
Bob Lampione	TIE 559.75

For Dick Williams and myself I wish to express our gratitude to those people who gave so much of their time to help us. I would also like to congratulate our American FAI C/L Stunt Team. They won the Team Championship again this year, and Bill Werwage took 1st place honors for the second time in a row! It was a great feat by a great team. ●

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## SIMPLE CARBURETION AND CYLINDER CHARGING:

A carburetor is a mechanical device which provides a mixture of fuel and air to the engine induction system. The mixture is called the fuel/air ratio and consists of about 12 or 13 parts of air to one part fuel. When the ratio is something like 15 parts of air to one part fuel, the mixture is said to be lean. If the ratio is something like 10 parts air to one part fuel, the mixture is said to be rich. The engine runs best when the mixture is slightly lean.

The induction system of the Veco 19 consists of the port into the hollow crankshaft, the volume of the hollow crankshaft, the volume of the crankcase, the transfer passage, and the port in the cylinder wall which connects the transfer passage to the cylinder when piston travel uncovers the port. Shortly after the start of each upward stroke of the piston, the crankshaft port opens under the carburetor. Pressure in the crankcase decreases as the piston moves upward, which creates suction and causes atmospheric air to flow through the carburetor and into the crankcase after passing through the hollow crankshaft. Figure 1 illustrates one form of a simple carburetor. Typically, the carburetor is fitted with something called a venturi to multiply the suction effect for better regulation of fuel flow into the air stream.

## VENTURI PRINCIPLE

A venturi is nothing more than a restriction to air flow, but it is aerodynamically shaped to minimize air turbulence. In accordance with a principle of gas flow, air drawn into the carburetor increases in velocity and decreases in pressure as its path is narrowed progressively in the venturi inlet. Velocity hits its peak and pressure, therefore, is lowest at the narrowest part of the venturi. After this point, the venturi widens, velocity decreases, and pressure increases. Figure 2 illustrates the venturi principle. Although venturi inlet and outlet diameters may be the same, there is a slight pressure drop across the venturi. The mere presence of the venturi results in more surface area exposed to air flow, which means greater friction and some pressure loss.

To fully grasp the venturi principle, necessary for an understanding of basic carburetor action, look at the operation in another manner. For example, consid-

R/C Cars . . . Continued from page 44  
up to now have called for installation of the Perry 19 (40 or 60 by the engine wizards) or the Kavan units meant for the front rotor Veco 35. The Kavan 35 was the first widely used "lifesaver" and remains popular today.

Both the Perry and Kavan have a good approach to the problem. The instruc-

tions which accompany either carburetor will be of some help (those with the Kavan unit will help to avoid confusing it with a glow plug!) but the instructions say little or nothing about what a carburetor is supposed to do. This article is intended to provide helpful information about a few principles of carburation and to suggest some ideas on how

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er that a column of soldiers must maintain a fixed rate of march. Traveling four abreast, they encounter no difficulty until they come to a bridge that is wide enough for only two soldiers abreast. To maintain the same rate of march - a fixed number past a given point in the same amount of time - they must increase their travel speed while on the bridge. At any point on the bridge, their number (air pressure) is less. Their speed (velocity) is greater, however. After crossing the bridge, the group returns to marching four abreast, resumes the slower speed, and unless one or two fell (or jumped) from the bridge, the number is the same as before the crossing.

Air pressure after the venturi in a carburetor is not exactly the same as before entering, but the loss is negligible and unavoidable. (Still ties in to the soldiers, they're tired after double-timing across the bridge!)

The Perry carburetor employs full principle of the venturi. The Kavan carburetor relies more on the placement of the fuel discharge in an area of high air velocity through the carburetor.

As shown in Figure 1, a tapered needle, called a needle valve, threads in and out of a jet to provide adjustment of the amount of fuel to be admitted to the carburetor from the fuel tank. The throttle valve position controls the amount of air flowing into the carburetor when the crankshaft port opens under the carburetor.

When the piston has reached the top of the stroke and traveled downward a slight distance, the port in the crankshaft closes under the carburetor. The mixture now trapped in the crankcase is compressed more and more as the piston continues its downward travel. Finally, the piston uncovers the exhaust port, and then, the intake port. Exhaust gas escapes out one side of the cylinder while new mixture rushes in from the other side.

#### A FEW PROBLEMS AT LOW SPEEDS

Simple carburetion discussed thus far is workable when engine speed doesn't change. In fact, shaft-valve engines, such as for U-control, have only a venturi section which is located above the crankshaft port fitted with a needle valve assembly. But for car racing, a throttle valve is required for engine speeds through the range from idle to top speed, and there must be an adjustment for the fuel/air mixture ratio at idle and low speeds.

An idle mixture system is necessary because of the small pressure drop across

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the venturi at idle and low engine speeds, especially with small displacement engines. The suction created isn't enough to make sure of accurate regulation of fuel into the air stream. Typically, too much fuel enters for the amount of air. The mixture is too rich.

The Perry carburetor provides a novel adjustment of idle mixture. The adjustment consists of a disc which can be rotated a few degrees one way or the other from a theoretical best position. Rotation of the disc increases or decreases the fuel flow received from the needle valve assembly. At medium and high speeds, the disc has no effect. For these speeds, the mixture ratio is set only by the needle valve.

The Kavan carburetor provides an adjustment which increases or decreases a flow of "un-metered" air into the engine. This air is taken from outside the carburetor, sent past the tip of an adjustable screw sticking into a drilled passage, and enters the mixture stream after the point of fuel discharge. Effectively, according to Kavan, this method leans the mixture at idle and low speeds. The method is popularly referred to as an "air bleed". Unfortunately it isn't.

If either the Perry or the Kavan really had an air bleed, a big problem facing engine tuners would be solved. The problem is caused by an important difference in one of the properties of a liquid, such as the typical fuel for the engine, and a gas mixture such as atmospheric air. It happens that while the density of air decreases as its rate

of flow increases, the density of the fuel remains the same as its rate of flow increases. (Density is an expression of the weight of a substance per cubic foot of volume.) In other words, as the rate of air flow increases with opening of the throttle valve, each cubic foot of air - fraction of a cubic foot in the crankcase - becomes less and less dense. Because mixture ratio is a measure of the weight of air to the weight of fuel, the effect is that the mixture becomes rich.

The throttle valve controls only the rate of flow of air, it can do nothing about changes in the density of air. Consequently, without other adjustments, the tuner of the Perry or Kavan carbureted R/C engine must set the needle valve to stay lean enough when the engine speed is very high. This probably means that the mixture will be too lean at medium speeds, and this can have a bad effect on acceleration.

Carburetors for passenger car engines usually have an air bleed system to correct for the problem. The fuel passage at one point inside the carburetor is exposed to the ram air pressure which exists in the carburetor inlet. The effect of the air bleed is to successively reduce the flow of fuel in proportion to surface in the carburetor inlet.

Some model-engine carburetors have an adjustment for mixture ratio at medium speeds, high speeds, and low speeds. Maybe if the users of the Veco 19 shout enough, they can also get such good things. How about a timed-fuel-injection system? ●



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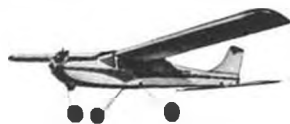


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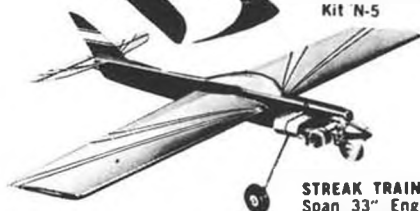
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