MODEL BUILDER

FEBRUARY 1975

volume 5, number 38

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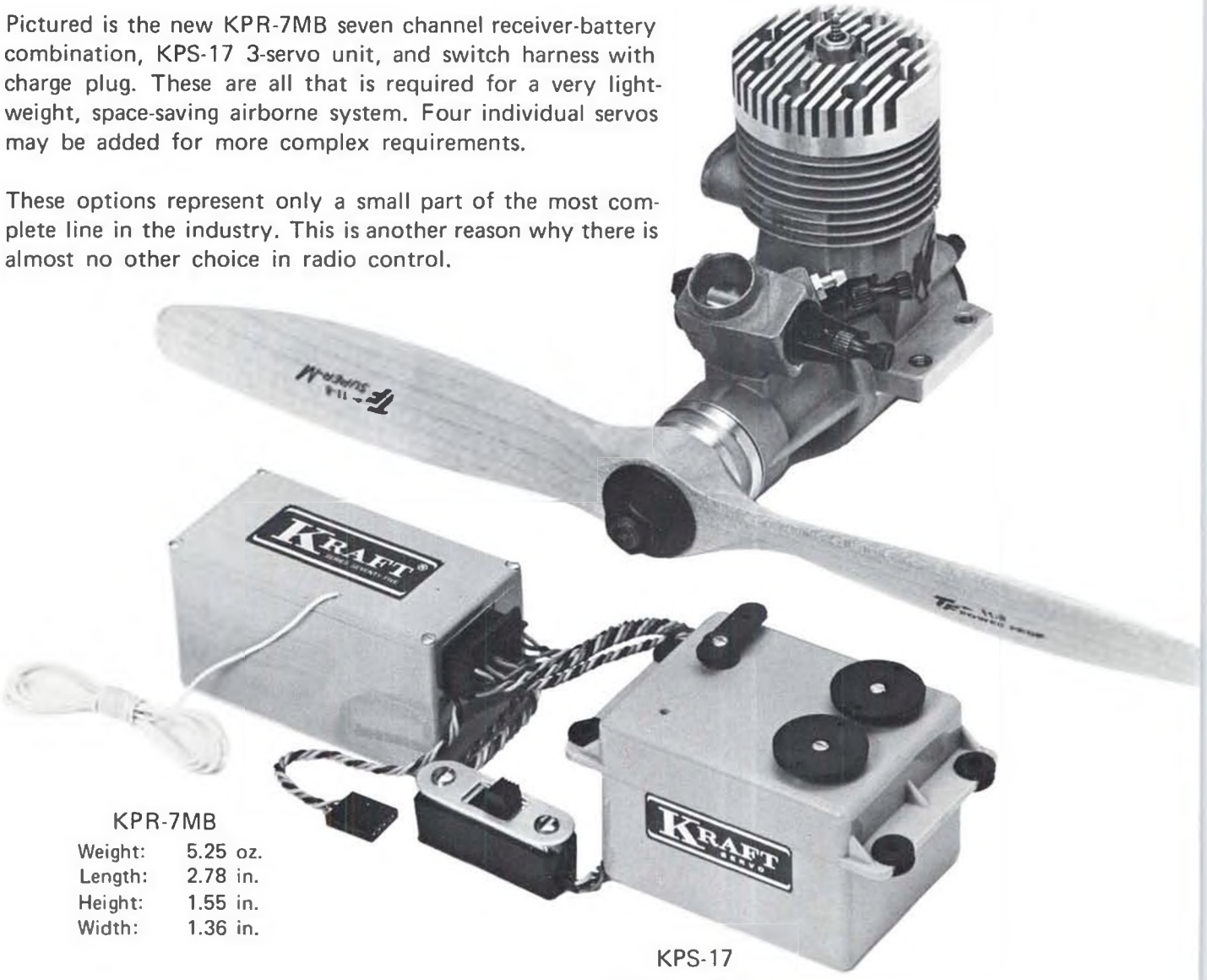
Pictured is the new KPR-7MB seven channel receiver-battery combination, KPS-17 3-servo unit, and switch harness with charge plug. These are all that is required for a very light-weight, space-saving airborne system. Four individual servos may be added for more complex requirements.

These options represent only a small part of the most complete line in the industry. This is another reason why there is almost no other choice in radio control.



KPR-7MB

Weight:	5.25 oz.
Length:	2.78 in.
Height:	1.55 in.
Width:	1.36 in.

KPS-17

Weight:	4.7 oz.
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Height:	1.71 in.
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Designed by
GEORGE PERRYMAN

This little gem from the drawing board of George Perryman, veteran free flight designer and competitor is another "model of a model" in the Sig Classic Series. A distilled version of his familiar Unlimited Rubber Craft, the Mini-Maxer has a flight performance of its bigger brothers. Two contest victories are already recorded, one with a 4-minute, 51-second out-of-sight flight. Needless to say, a pop-up tail de-thermalizer is standard equipment to keep the airplane from going cloud hopping.

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R/C Twin Trainer 75" span, for .40's.
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Chet Lanzo's famous rubber Puss Moth.
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Minnow U/C profile scale racer.
Fokker E-III R/C scale.
Al Vela's E-Z Boy 1/2A
E-Z Boy 1/2A, Al Vela.
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Fiberglassing over balsa, by Le Gray.
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Yankee Gull R/C glider 8' to 12' span.
Miss Cosmic Wind, QM R/C Pylon racer.
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Siebel 1/4A F/F scale.
Mr. Mulligan 3-views.
FAI power "Folder."

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Seahorse II, R/C sea-plane. For .19-.35.
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Mongster QM biplane R/C pylon racer.
Calif. Coaster R/C glider. Sheet wing.
Three profile Peanuts.
Deperdussin 3-views.
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1912 Avro G rubber.
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Travelair 2000 2" scale R/C, by Editor.
Chester Jeep 3-views.

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Bonzo standoff R/C sport pylon scale.
Counterfeit, tailless A/1 Nordic.
Shoestring R/C QM.
Peanut Taylorcraft on floats, also big one.
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Stephens Akro R/C sport scale.
Mini-FAI F/F for .010.
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Chester Special 3-views.
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Internats R/C pylon.

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

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Sproose Goose R/C bipe for .60 power.
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First "Plug Sparks" col.
Andreasson KZ VIII 3-views.

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Feb/March 1973

Profile F4U Corsair C/L stunt, .40 power.
Beecroft's Satan, Class A free flight.
Indoor Ornithopter.
Peanut Travelair 2000
PT-3 Scale Views.
Thermal hunting with R/C gliders.

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April 1973

Fabulous PEA POD, R/C sailboat.
Briegleb BG-12, scale R/C soarer.
R/C Spirit of St. Louis, semi-scale, .049-.09.
Peanut Volksplane
Finish painting of rubber scale models.

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May 1973

Bantee mini-pattern R/C 3channel, .19 power.
Woodwind A/2, all sheet covered wing.
Slope soaring technique.
Teakettle, twin-boom CO_2 pusher.
Peanut Monocoupe 110.
Aerbo, .020 Replica, OT

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MODEL BUILDER

FEBRUARY

1975

volume 5, number 38

1105 SPURGEON, BOX 4336, SANTA ANA, CALIFORNIA 92702 (714) 547-3963

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FEATURES

SCALE VIEWS

CONSTRUCTION

Cover: This photo of Hanno Prettner, age 22, from Klagenfurt, Austria, was taken in Las Vegas, Nevada, on December 8, 1974, shortly after he had won the first annual International Invitational Tournament of R/C Champions, co-sponsored by Bill Bennett, of the Las Vegas Circus Circus Hotel-Casino-Spa, and Walt Schroder, of M.A.N. In addition to winning the huge perpetual trophy, Hanno also was awarded a total of $6,000 in cash prizes! Complete story on page 18 of this issue. Ektachrome by Bill Northrop.

The sign says it all, on archivist Brewster Reynold's desk in the San Diego Aerospace Museum. Photo by expert scale modeler, John Oldenkamp, and "stolen" from "Hannan's Hangar."

from Bill Northrop's workbench . . .

GET YOUR FOOT OFF MY EMPIRE!

There has been a lot of talk lately about the "sport" of building and flying model aircraft. In fact, our "iddy biddy buddy" from Texas, AMA President, Johnny Clemens, has been pushing this image quite a bit, in recent months.

We go along with this idea, to a certain extent, but only as it applies to the small percentage of modelers who are "in it" for competition.

If a politician will admit the truth about *anything*, he'll tell you that a given set of statistics can be used to support either side of an argument . . . so we won't try to juggle figures. However, experience indicates that only about 10% of AMA's modelers fly competitively. A higher percentage of free flighters are competitive than control liners, and the percentage of competitive R/Cers is far outweighed by the sport or Sunday R/C flier.

To the non-competitor, building and flying model airplanes is a hobby . . . period. Except for comparing projects and trading building tips and techniques at club meetings, or at the flying field, or in the hobby shop, the hobbiest model builder is content to build and fly to his own specifications . . . and he can change those specs from week to week without an act of Congress . . . or he can stick to one specific interest indefinitely.

In contrast, the competition modeler enjoys the sporting aspect of modeling. If not all, nearly all of his models are built to competition category specifica-

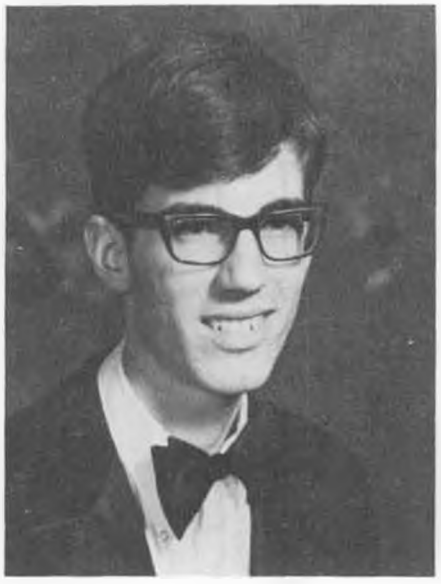
POP WAS RIGHT WHEN HE SAID MODEL PLANES WERE EDUCATIONAL!

1974 AMA SCHOLARSHIP WINNERS

Lell E. Barnes III ($500), North Caldwell, New Jersey, now attending Clemson University in South Carolina, majoring in architecture. He's a member of the Garden State Circle Burner M.A.C., and has won some 40 awards in competition.

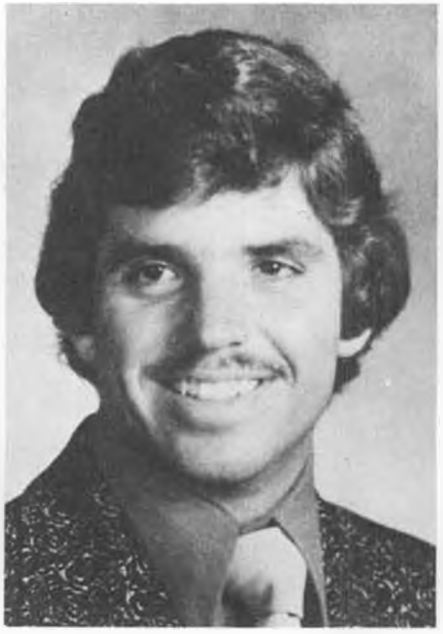
Donald L. Edberg ($1,000), Covina, California, now attending the University of California in San Diego, majoring in applied mechanics and engineering sciences. He is founder and past president of the Silent Wings Soaring Association, and a member of the Pacific Radio Control Soaring Association. Don also has a private pilot's license and has over 40 hours flying time.

Curtis M. Pfarr ($750), Tacoma, Washington, now attending the University of Washington, in Seattle, majoring in engineering. He's a member of the National Free Flight Society, National Indoor Model Airplane Society, and is Sec/Treas. of the Kent Strat-O-Bats Free Flight Club of Tacoma. He set a NFFS record at the Nor'westers Spring Annual, Hillsboro, Oregon in April, 1973.



Joseph E. Rotunda ($250), Vero Beach, Florida, now attending Embry Riddle Aeronautical University, Daytona Beach, Florida, majoring in aeronautical engineering. He specializes in control line modeling, is a member of the American Institute of Aeronautics and Astronautics (AIAA), and the Daytona Beach Control Line Club.

Allen E. Swanson ($1,000), Moraga, California, now attending Texas A&M University, College Station, Texas. He has flown in three Nats: placing 4th in Jr. C-Speed in '72, 4th in Sr. fast combat and 2nd in Sr. C-Speed in '73. Allen graduated from McGavock High School in Nashville, Tenn. and is also a member of the Nashville "B-Lines" Model Club.



Ramon L. Torres, Jr. ($500), Hialeah, Florida, now attending the University of Florida, at Gainesville, majoring in engineering. He's a member of the "Tropic Aeros" radio control club of Miami, Florida, and is active in pylon racing and scale.

tions and are a means to an end, rather than being "the end." In fact, the "means" may amount to nothing more than "purchasing power," particularly in R/C, the leading eliminator of the Builder of the Model Rule.

Rarely, and strangely enough this is typical of many consistent winners, the creative model builder and competition modeler are one and the same . . . Ron Chidgey and Tiger Tail, Sal Taibi and Starduster, Jim Whitley and Daddy Rab-

bit, Bill Hunter and Satellite . . .

Still, the competition modeler enters contests with his own "ball." Can you imagine building your own tennis racquet, golf clubs, bowling ball? How about Terry Bradshaw arriving at a game with his own, home-made football and insisting that it be used whenever he and the Pittsburgh offensive team came on the field? They'd figure he got sacked one too many times in the previous game and send him to the showers!

Anyhow, we will concede that for the competition minded, model building and flying is a sport . . . at least the flying is. But for the majority of modelers, it is something else.

The point we're trying to make is this, and it could be the key reason for the apparent apathy of modelers; to the activities of the local club; to state and regional organizations or specific interest groups such as NMPRA, PAMPA, etc.; even to Big Daddy AMA: This great hobby of ours provides a release from the pressures and tensions of everyday life. It's mental therapy for minds that are bogged down with monotony, pressures at work, tensions over our screwed up world, family financial worries, and so on.

When the model builder enters his workshop, or unloads his equipment at the flying field . . . like the model railroader with his layout, the audiophile and his tape or record collection or the photographer on a field trip . . . he has entered his own private little empire. There's no one here to report to. He is the boss, the president, the chairman of the board. He makes the decisions. If they're correct, he gets all the credit. If they're wrong, he won't get fired . . . or replaced . . . or reprimanded. If he wants to ask advice, it will be asked of another empire owner who on the "outside" may be an auto mechanic, or a medical doctor, a house painter, or priest . . . maybe a *real* empire owner . . . but in any case, just another model builder . . . with equal power to make the final decisions . . . "Let's see . . . I'll paint the fuselage white, trim it in red, and cover the surfaces with transparent red Monokote . . . No, make it orange trim and Monokote . . . there's enough left over from that 1/2A job to finish it and that'll save me a few bucks toward that . . ."

According to Webster a hobby is an occupation or interest to which one devotes spare time . . . Got news for ya, Dan.

NEW WORLD RULES

The FAI's Committee for International Aero Modeling (CIAM) . . . Europeans like to pronounce it "See-ahm" . . . met in Paris, France on December 5 and 6, 1974. Attending from the USA were John Clemens, John Worth, John Spalding, and Dan (What, not John?) Pruss. A total of 29 countries, the most ever, were represented, with over 50 attendees.

Though the following results are not complete in detail, they provide some food for thought . . . and possibly even stronger reaction.

CONTROL LINE

A. Speed and Team Race: Coupled lines, including intentional twisting of lines, are banned. All countries voted in favor of the ban except the USA, which abstained, as the C/L Contest Board decision was still in process at the time.

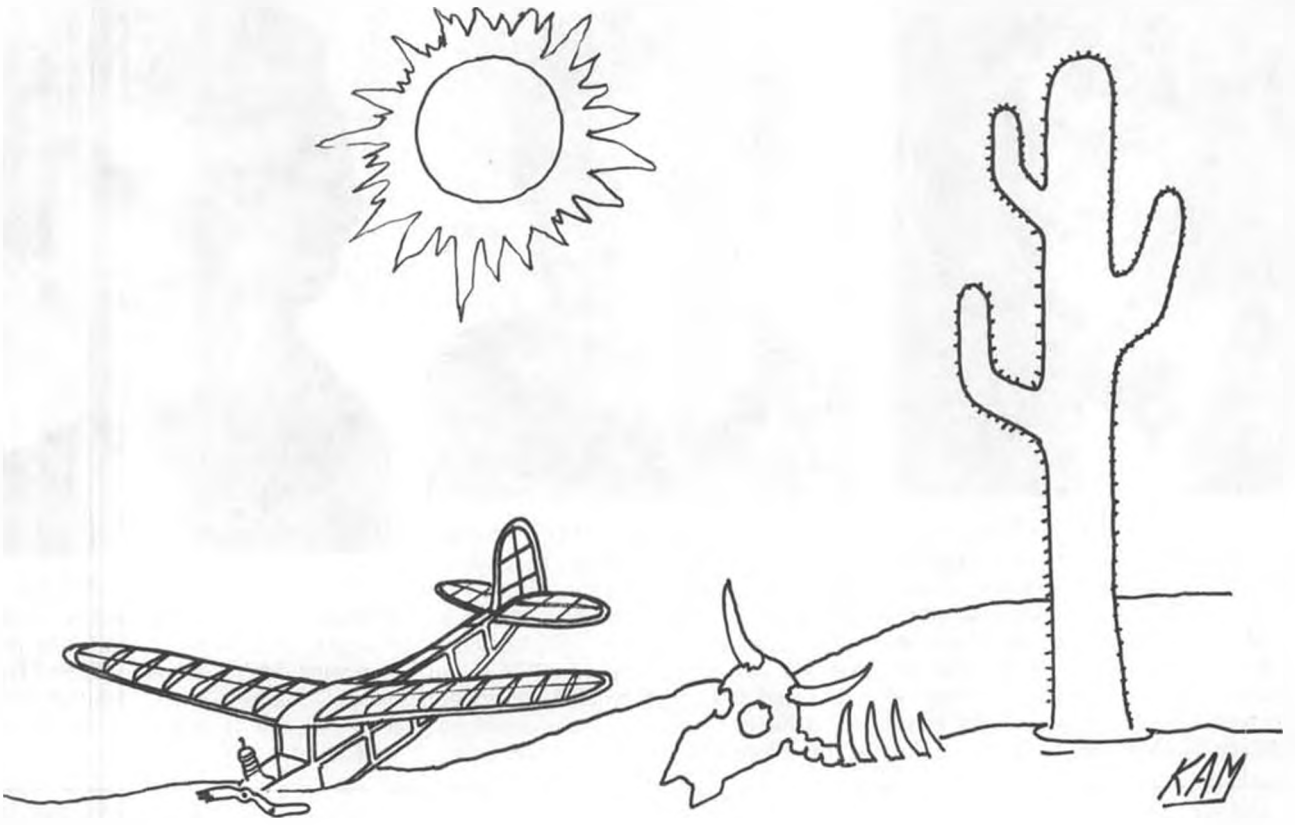
B. Speed Records: Longer lines, of such radius to provide whole laps to be counted for one-kilometer distance, are now permitted.

C. Speed Competition: Stop watches of 1/100 second accuracy are now required (Now all we gotta find are guys with 1/100 second-accurate thumbs!) The height rule for official flying has been clarified and now applies only during the timed portion of a flight.

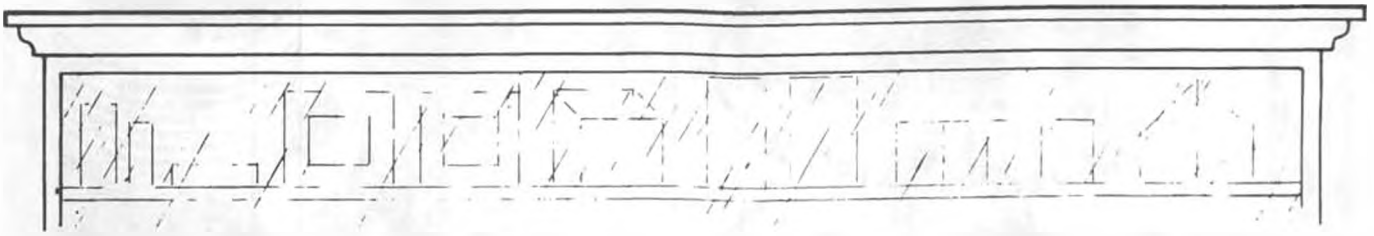
D. Stunt: Second attempts must be made immediately after the first attempt, or immediately after the next three competitors have flown. To indicate when timing starts, the use of hand signals before starting the engine is required rather than the previous flicking of the propeller. Total time remains at 7 minutes . . . the 7-1/2 minute proposal was defeated. Winner to be decided by total or best finals flight and best qualifying flight.

E. Team Race: Proposal for 4cc tanks defeated . . . 7cc tanks remain. Semi-

Continued on page 77



OVER THE COUNTER



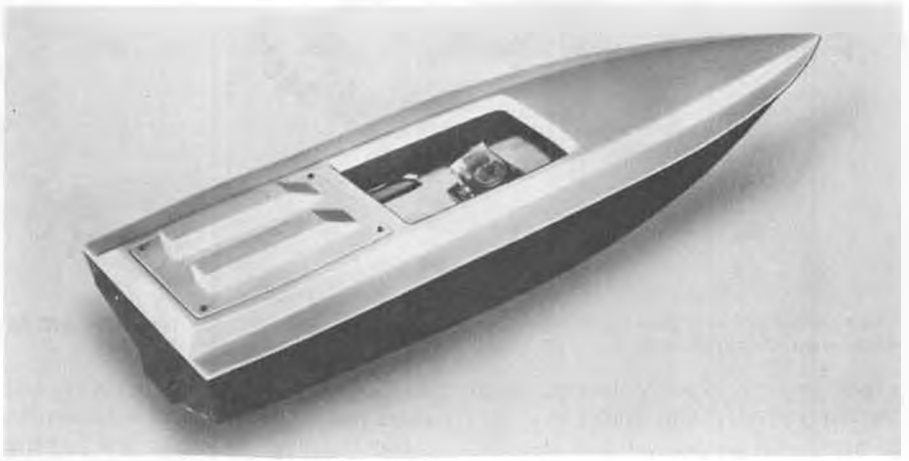
● As R/C flying fields continually give way to the ever-expanding sweep of housing construction, environmentalists and grumpy old ladies (some with very legitimate gripes about stubborn modelers who persist in flying alongside or over their homes with non-muffled, powered aircraft), there has been a growing interest in model boating, particularly powered racing.

Unlike R/C yachting, which, because of its inherent silence (except for PA assisted, recorded countdowns) and lack of contaminating exhaust residue, is acceptable in most any body of water. Power boating has some of the problems associated with model aircraft . . . noise and mess. It is therefore quite logical that racing with models of the Deep Vee ocean or off-shore type boat hulls is rapidly growing in popularity. The Deep Vee boats can be run in larger and rougher bodies of water that would otherwise prohibit the use of hydroplane or ski boats. Consequently they can be raced away from heavily inhabited areas where their minimal amount of noise and exhaust residue is far outdone by full size boats. In addition, the Deep Vee hull provides greater excitement for racing buffs because it can be run at continuously high speeds, in rough water, without a concern about flipping.

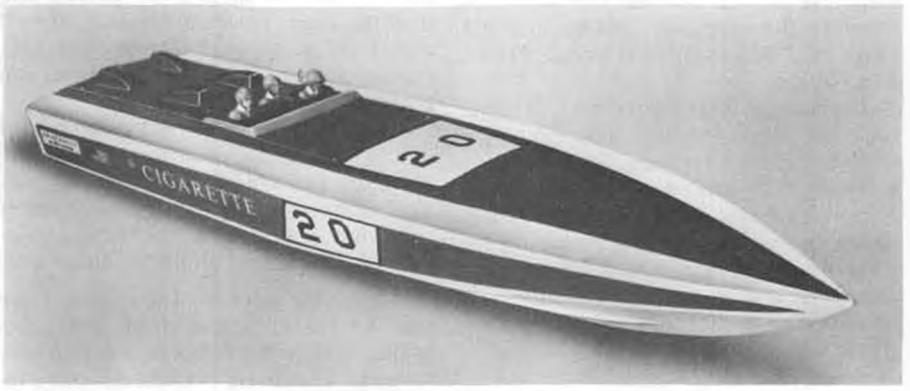
Dumas Products Inc. (see ad on inside front cover) which has been carrying a line of wood constructed Deep Vee boats for some time, has just added three new fiberglass built Deep Vee kits. Available for .20, .40, and .60 size engines, the boats are 32, 40 and 45 inches long respectively. Complete, adjustable, parallel drive running hardware is also available separately.

* * *

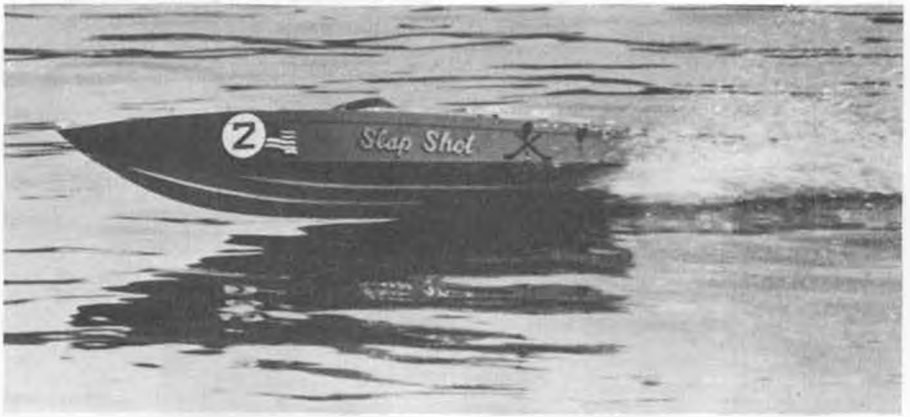
MRC's Mark VI and Mark VIII radios come to the consumer imbedded in a foam rubber-packed carrying case. To the best of our knowledge, MRC and EK are the only two R/C system companies that offer this protection to their product for shipping. Molded styrene shipping cases look nice, and they do afford some protection, particularly to the outside surface of the transmitter, receiver, servos, etc. But, any exterior shock applied to the styrene case is transmitted directly to the delicate components inside the units, such as transistors, diodes, I.C.s., and particularly, crystals.



Dumas Deep Vee 20-CF, for .20 engines, 32" long.

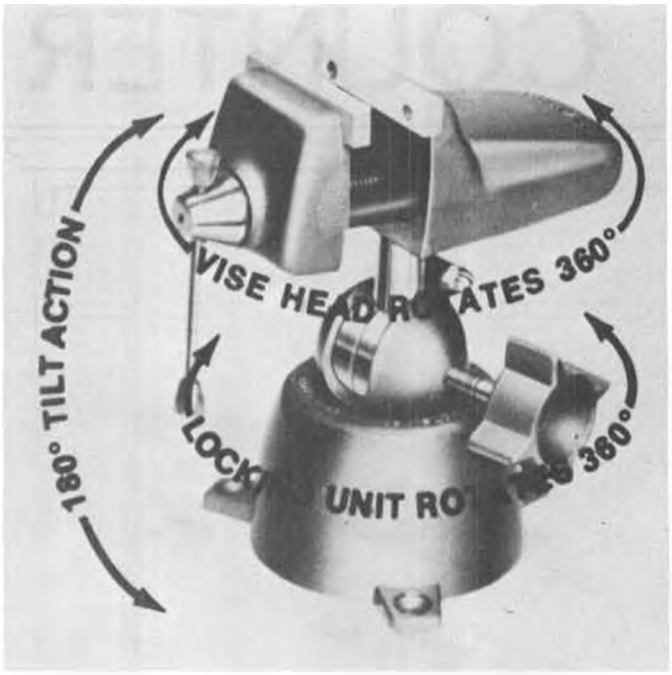


Dumas Deep Vee 40-CF, for .40 engine, 40" long.



Dumas Deep Vee 60-CF, for .60 engines, 45" long. All of above boats have fiberglass hulls.

Taking the good foam packing one step further, MRC has enclosed the whole thing in a handsome, leatherette surfaced, black plastic carrying case, complete mit handle and latch. Once the airborne gear has been mounted in your aircraft, the case can still be used to carry the transmitter to the field in the luxury it deserves, and the empty compartments can be used for such privileged items as glow plugs, small tools, prop wrench, that ever-popular



The Panavise will hold your work in just about any position you could want. One knob locks it.

New sport R/C 40 engine by Enya, available through MRC.

plastic box full of every size bolt except the one you need, and so forth.

MRC also announces that Enya has added a sport 40 R/C engine to its line. Weighing 10-1/2 ounces, the new mill develops .9 horsepower, and has an RPM range of 2,500 to 15,000 using 10x6 to 11x5 props.

Because of the higher cost of glow fuel, the .40 engine is gaining popularity with the sport flyer, who finds the fuel-gobbling .60 somewhat of a burden. National Champ, Rhett Miller, has also demonstrated that it is possible to fly pattern competition with a 40 powered model . . . and win. The MRC-Enya is equipped with the Enya G type variable throttle.

* * *

Panavise, a product of Colbert Industries, South Gate, Calif., is the best extra pair of hands we've ever seen for model building. Aside from the fact that these hands don't have to be fed, clothed, or sheltered (well, maybe you oughtta keep 'em in the house), they'll also hold your work firmly, yet delicately, and in most any position you could ask for.

The versatility of Panavise begins with the purchase of a unit. First of all, there are two choices of vise heads; vertical or horizontal . . . this almost seems superfluous because of the practically unlimited positioning ability of either one.

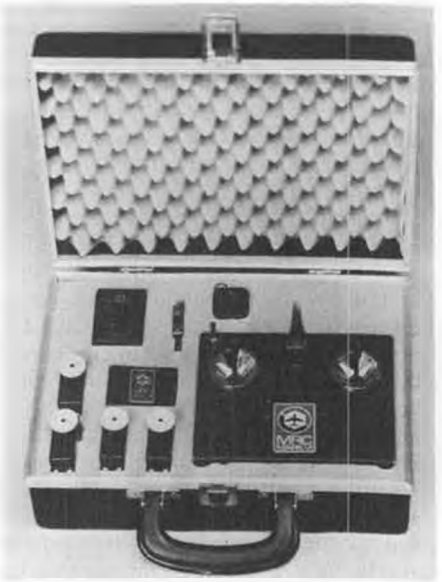
Next is the work positioner base. Here you have a choice of four units. Actually, this is the heart of the Panavise system. The base, whichever one, includes a ball-and-socket type mount into which the vise head stem is inserted. The one locking knob on the ball-socket, when loosened, permits 360° rotation of the ball-socket, 360° rotation of the vise head, and 180° tilting of the vise head. If you can't find the position you want your work to be in with this kind of flexibility, you're just plain hard to get along with!

The choice of bases include standard height and low profile units with three bolt-mounting lugs, a vacuum base for smooth, non-porous surfaces, and a converter base for mounting on a vertical-tube, up-down assembly. The latter is mostly for industrial applications.

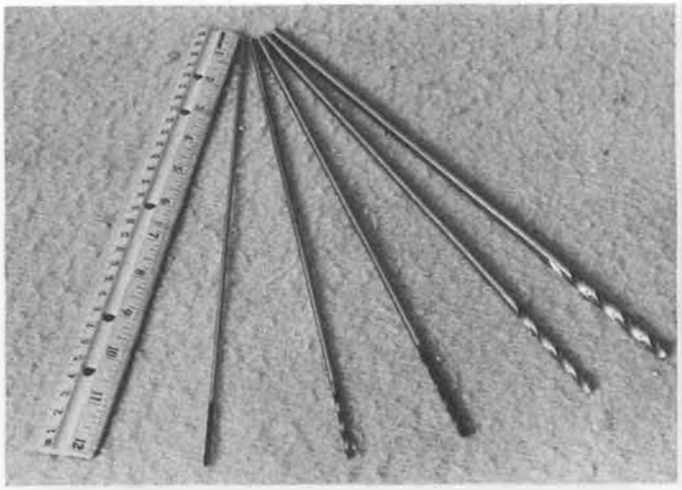
The many accessories available to complement the basic components include: nylon or steel jaw inserts, bench clamp with holes matched to base mounting lugs, circuit board holding assemblies, a sturdy precision-ground surface plate with base mounting holes in one corner, and many others.

Special circuit board holder by Panavise is also handy for holding items to be paited.

Panavise mounted on precision-ground surface plate.



Foam rubber-packed carrying case, comes with MRC Mark VI and VIII radio systems.



High speed drills, 12 inches long, marketed by Custom Hobbies.

New Standard Class "Windrifter" by Craft-Air, 915 sq. in wing area.

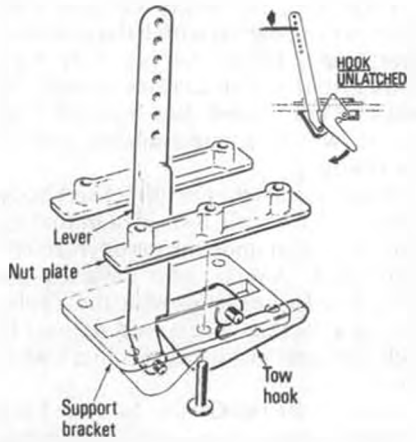
In our opinion, the Panavise is one of those special model building tools that, once you've used it a while, will make you wonder how you did without it before you got it.

* * *

Ya might know! EK's Bob Elliot has been doing a lot of R/C soaring in recent years, so what could be more natural than EK Products coming out with a dandy item for that sport?

Anyone who has done much thermal soaring from a hi-start or tow line launch has, at some time or another, had the sudden desire to unhook from the tow; either because of an unexpected problem, where "getting off" quickly could save the airplane, or towing into a boomer, where it's often difficult to get unhooked without losing altitude and/or the thermal. EK's new Tow Hook Release, for servo operation, is the answer. Made of tough acetal copolymer moldings, the THR features a radio operated trip-latch which can take the full tension load of the tow-line, yet will release with very little effort on the part of a servo.

The Tow Hook Release support bracket mounts on the sailplane with six screws going into self-threading backplates. Since there might be some difficulty adjusting its position, it would probably be best to determine the tow hook location with some sort of temporary device which could be replaced by the THR once the optimum position has been found.



Radio operated Tow Hook Release, by EK Products.

If your dealer doesn't have the THR, write to EK at 3322 Stovall St., Irving, Texas 75061 and tell 'em MB sent ya. The price will still be $3.95 . . . !

* * *

Custom Hobbies, 2408 East Platte Ave., Colorado Springs, Colorado 80909, is marketing a set of long-shank, aircraft quality, high-speed steel drills for modelers. Twelve inches long, the 3/32, 1/8, 3/16, 5/32, and 1/4 inch drills sell in a set for $23.95 or individually at $4.95.

Great for a multitude of special purposes, long shank drills are especially useful for drilling that forgotten hole in the firewall, or for running holes through wing ribs for retract linkages or tubing in glider wings.

Now then, if someone would just come up with a 1/16 to 1/4 inch drill chuck on a right-angle drive or flexible shaft . . .

* * *

J R Sales Co., 1316 N. Mill St., Bowie, Texas 76230, is marketing a book on R/C flying, written by Harold Cunningham. Entitled "The 'Crashless' Way to Advanced Radio Control Flying," the book is described as "The Sunday Flyer's Flight Manual." The book is said to contain details on avoiding all the known crash causes, plus radio, engine and airplane reliability details for the R/Cer's model safety. Price is $4.95.

Although there is no teacher like first-hand experience . . . and lots of it, a book such as this could certainly help an R/Cer to avoid many of the less obvious pitfalls that come up in every-day participation in the flying part of the hobby.

* * *

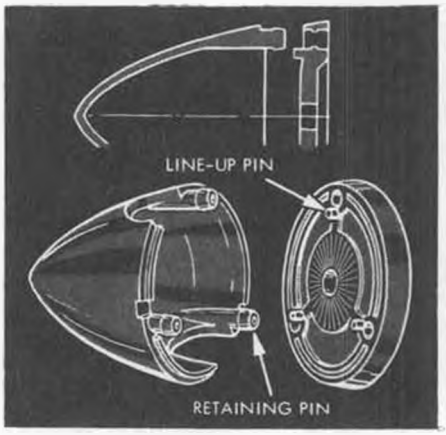
We've heard of breaking in an engine, but this is ridiculous! Break in a *SPINNER?*

After more than two years of development, Carl Goldberg is finally producing and marketing his Snap-on Spinners, in five colors and five sizes, ranging from 1-1/2 to 2-1/2 inch diameter, and from 90 cents to $1.75. And believe us, folks, don't take that "Snap-on" description lightly! You literally have to stand on the spinner to snap the two halves (cone and backplate) together . . . that is, until it's broken in.

The CG spinner is molded in two parts; the cone with three retaining pins, and the backplate with three sockets. Three screwdriver slots are also molded into the cone, one located right next to each retaining pin. To separate the cone and backplate, a small screwdriver (be *sure* you take it with you to the field!) is inserted straight into a slot (don't twist. All you'll do is damage the slot!) until the nearby pin pops loose. Now repeat in the other two slots.

When you try to assemble the unit, you'll understand what we mean about break-in. Unless you have unusually strong hands, you'll probably have to set the spinner on a flat, sturdy surface and apply all the force you can muster

Continued on page 76



New Carl Goldberg Snap-on spinner.

The Top Slider making a fast turn out over the ocean. Keep the nose down!

With nose slightly up, the Top Slider makes a relatively slow fly-by, Ken at the controls. The apparent droop of the wings results from the swept leading edge and minimum dihedral.

TOP SLIDER

By KEN WILLARD

Primarily for slope racing, the Top Slider also doubles as a fast, maneuverable sport slope soarer that requires only light winds to stay aloft. When the wind comes up, add ballast and hold on tight!

● The Top Slider is a special-purpose airplane. Its prime objective is to win slope soaring races. It's a slope soarer, and a fast one . . . up to 80-90 mph at times . . . not recommended for beginners. However, if you like slope soaring, you'll like the Top Slider. Actually, if you want to, you can add a rudder to make it more aerobatic, but it will do most of the maneuvers, except a spin, just with the ailerons. But I like to race, and the Top Slider is great for that purpose.

There are certain things that must be kept in mind when designing a slope racer. Naturally, it must be fast . . . but it also must have the ability to remain airborne in light winds. Normally, if the wind is light . . . less than six miles an hour or so . . . racing is not attempted. There are times, though, when the wind is light, and a reasonably good racer will stay up. Then the contest director can say, "Let's race!" So a race is started. If none of the racers complete the course, the race is cancelled and re-run later. But if any one racer finishes, the race is official. So, a good racer should be able to stay up in light winds . . . because you'll have them.

Then there is the opposite end of the spectrum, when the wind gets up to twenty-five or thirty. That's when you want to ballast your racer to the maximum for high speed penetration. And it better be rugged, to withstand the landings. You must also keep in mind the FAI limitations for models . . . eleven pounds maximum weight, and 24 oz/sq. ft. wing loading (this loading includes the horizontal projected area of the stab).

The Top Slider meets all the requirements. Empty, it weighs about five and one-half pounds, and will stay up in a six to seven mile wind, when the wind is blowing straight in. When the wind gets up to around twenty mph, the Top Slider can be ballasted right up to eleven pounds and still have slightly less than a 24 oz. wing loading.

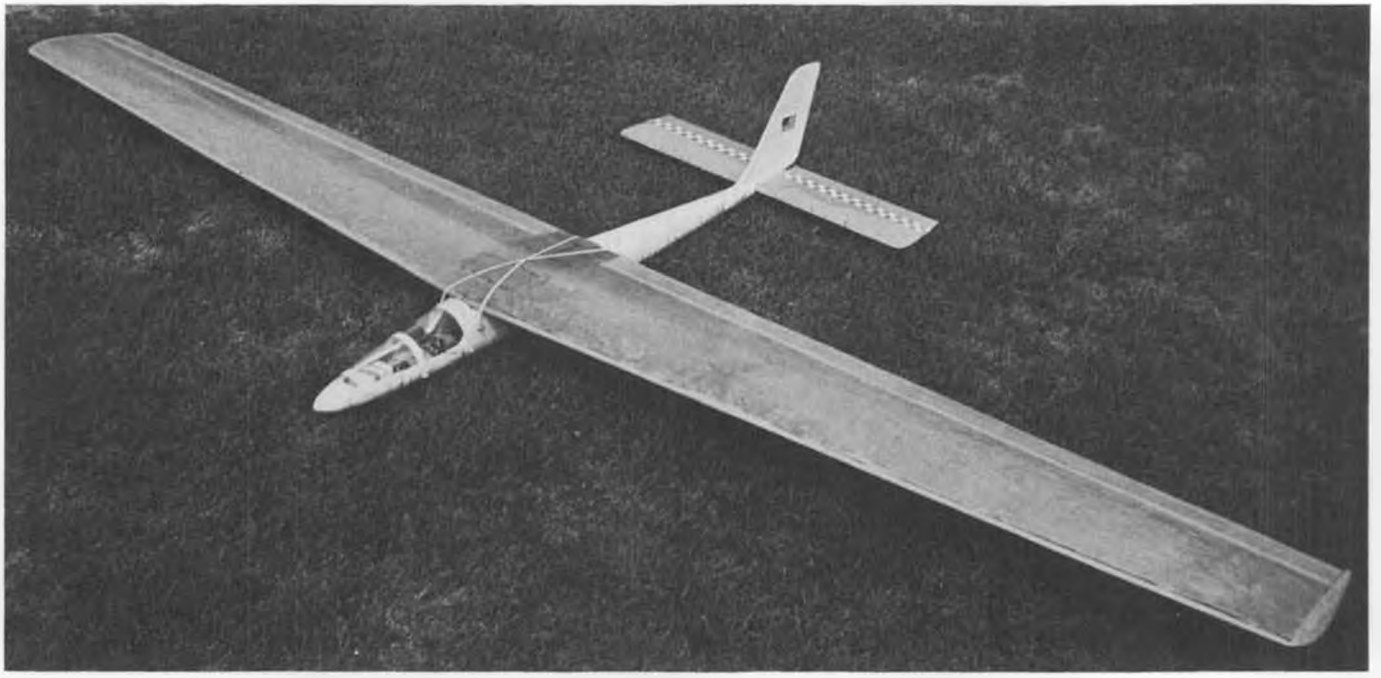
Now there's no particular secret about the design. It evolved over several years of racing, during which I had good racers, but not good enough. They had one thing in common, and that was the Francis Products Del Gavilan fiberglass fuselage, now put out by A & L Distributors, Inc. (Bud Anders and Larry Leonard). It's a well designed, streamlined and rugged body that takes a beating and comes back for more. *(If your hobby shop can't supply you, write to A & L, 16509 Saticoy, Van Nuys, CA. 91406. wcn).*

The shortcoming of previous designs was the wing. And that's what I decided to fix. I noticed that on all previous designs, when the wind was suitable for racing, I had to carry ballast, and that's wrong. If you need weight, it should be in the structure.

I had seen the ability of foam core wings, when covered with balsa and then fiberglassed, to survive not only hard landings but midair crashes as well. So that's what's needed. But then the 1/64 inch plywood became available, and it's even better.

What about the airfoil? Everybody seems to have their own idea in that regard, so I called upon my aerodynamicist friend Bob Andris, who designed the Peregrine. He recommended the Eppler 374 as a section that would do well in both light and fast winds. So that's what I used.

Because the Del Gavilan fuselage has a relatively short nose, considerable ballast is needed up front to compensate for a heavy empennage. To help reduce



The 990 sq. in. wing is a foam core covered with 1/64 plywood, followed by tapering layers of glass cloth and resin. Ken left it in the natural finish. Note full-depth ply dihedral joiners.

this factor, I decided to sweep the wing aft. I later discovered that this sweep yielded the best aerodynamic configuration, according to Bob, since it sweeps the quarter chord line aft at the optimum 5°.

Finally . . . and this may be purely psychological on my part . . . I went to the trouble of making a closed hinge line for the full span ailerons. At a seminar I attended in Seattle a couple of years ago, a modeler gave a talk on the benefits of eliminating the gap along the aileron hinge line, claiming it added about five mph to his slope soarer. Now that's significant, if it's true. Even if is isn't, and only a mile or two per hour is added, it's still worth it.

The Top Slider can be cleaned up even further, but when I built it, the big spring races were only a few weeks away. You will note that the wing is held on by the old reliable rubber bands; I didn't have time to fit an internally mounted bolting system. Tried one, but it didn't hold up on the landings. So, back to the rubber bands. And that's also why there are protecting rails on either side of the aileron servo, in case a rough landing makes the wing shift.

At first glance, you may think the CG is pretty far aft as shown on the plans. Remember, though, that the wing is swept, so the CG can be farther back. It still is at a relatively normal position with respect to the mean aerodynamic chord.

Then you will note that the stab is mounted low, and some of the Del Gavilan fiberglass is cut away, since it is not needed and only adds weight. The stab was lowered for racing to give a cleaner intersection between the stab and the fuselage. Again, a small thing, but every little bit helps when you're out for speed.

The experienced builder can put the Top Slider together from the plans, and frankly, I don't recommend it for inexperienced builders or fliers. Here's a couple of building hints as you put it together.

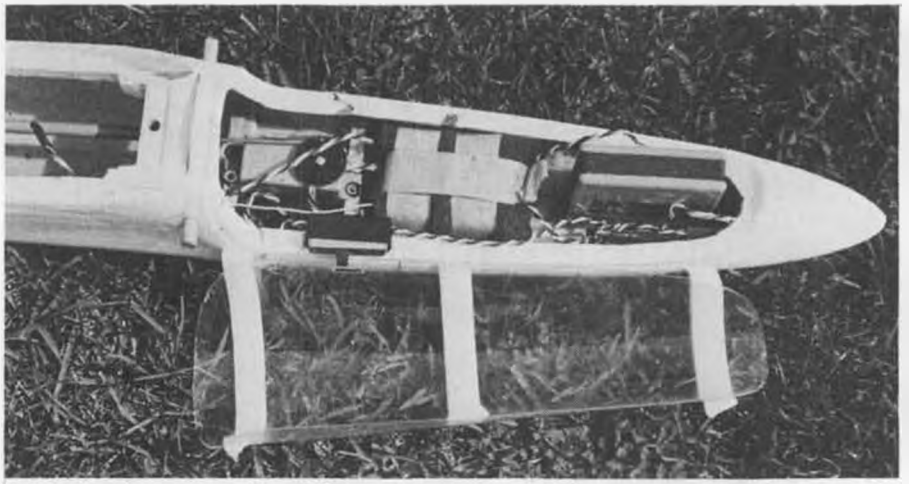
FIN AND STAB

Use hard balsa on the stab. It takes a beating on landings because it is mounted low. You could even fiberglass over the 1/4 inch balsa, but that much weight back at the tail means even more ballast in the nose. Just be careful as you can on landings.

The fin can be medium hard balsa, since it doesn't get banged around quite as much.

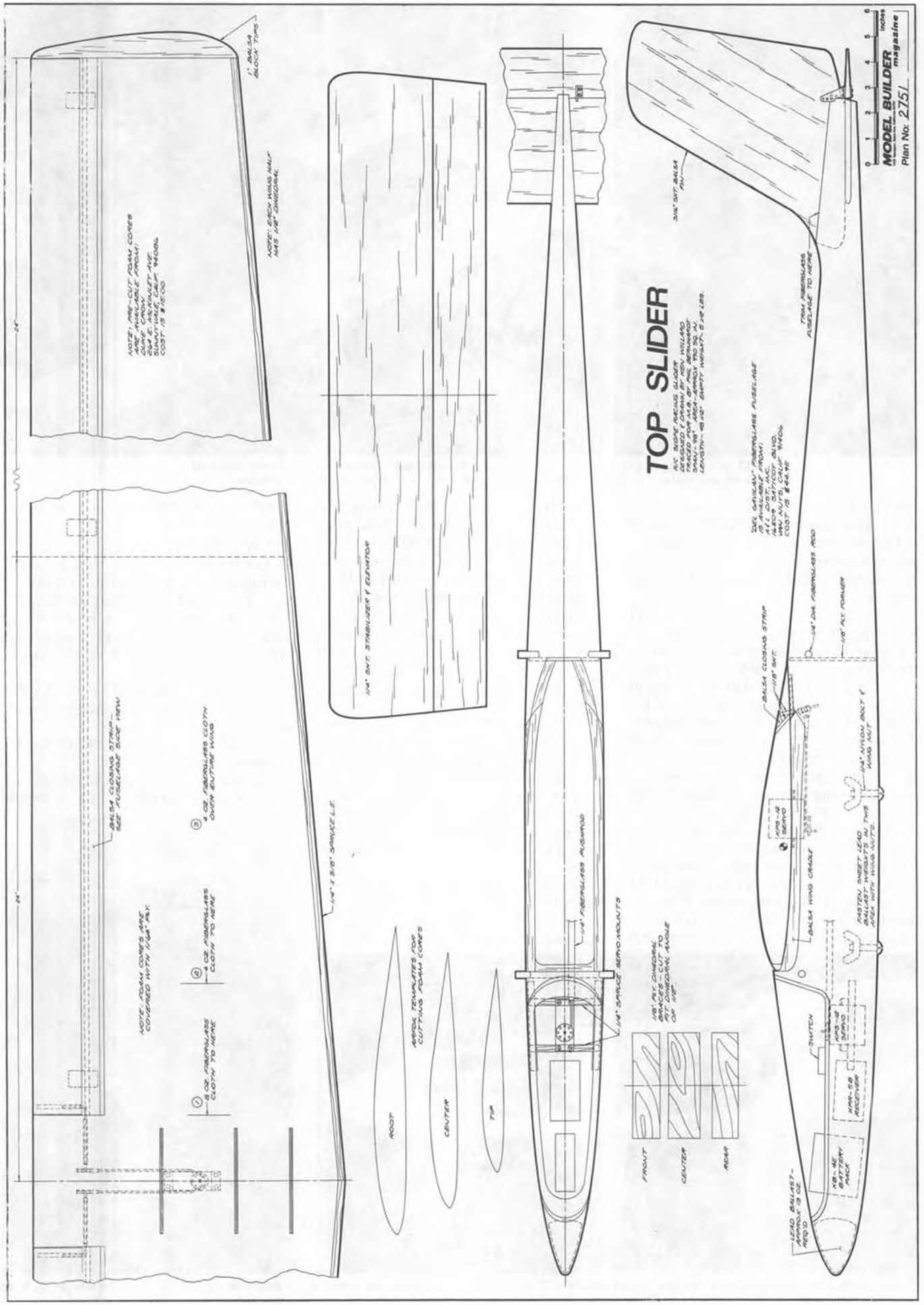
I used trim strip Monokote for the elevator hinge. Works fine.

To the extent possible, shape the surfaces to a thin airfoil section. It should



Although radio equipment is well forward, approximately 13 ounces of nose weight was required for proper balancing. Without ballast added for racing, the slider weighs over 6 pounds.

Ken about to give "Slider" the heave-ho. Keep nose slightly down and throw hard!



FULL SIZE PLANS AVAILABLE – SEE PAGE 80

help a little on speed.

FUSELAGE

The main effort here is cutting away the fiberglass at the rear of the wing cradle, leaving as much as possible for strength, and then shaping the new balsa wing cradle to fit the 12 inch Eppler 374 profile of the center section of the wing. Rough up the flat part of the fiberglass where the new balsa cradle will fit, and attach the balsa with Francis or K & B Fiberglass resin. Epoxy will work, but not nearly as well.

Make a cardboard template for the former which is shown at the trailing edge of the wing, cutting it to fit the contours of the inside of the fuselage. Then make the 1/8 inch plywood former. Be sure to cut a hole in it to let the elevator pushrod through. It's kind of tough to make the hole after the former is in place.

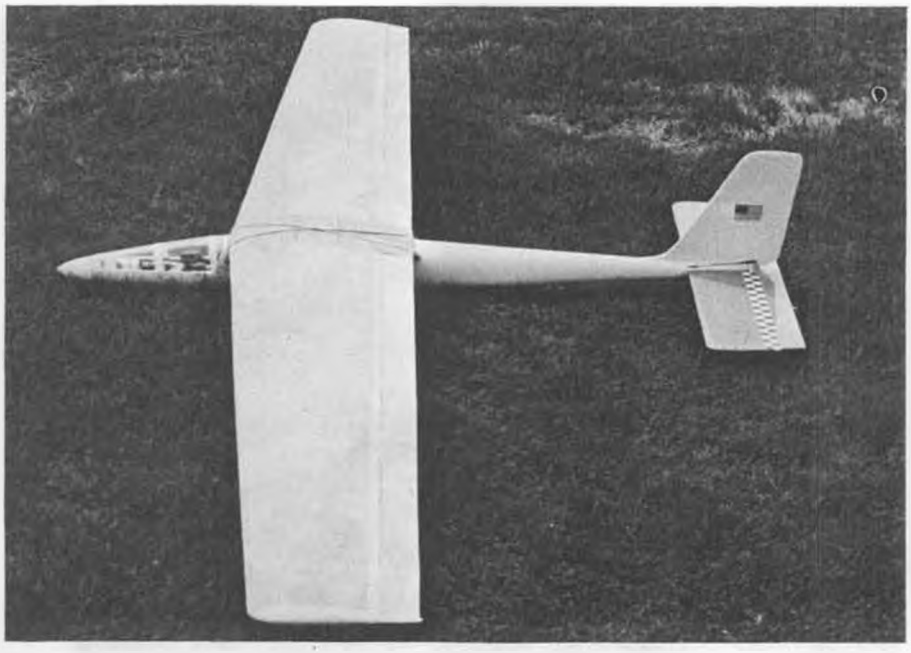
The plans show the mounting for KPS-12 servos. You can use larger ones . . . it's just that those are what I use on my smaller models, and they have ample power to move the surfaces, even those big barn-door ailerons.

Be careful in cutting the slot for the stab. Keep it right on the centerline so you have the right incidence setting for the wing in relation to the stab.

To mount the switch, I simply attached it to the fiberglass lip for the canopy, using servo mounting tape. Let the sliding knob protrude slightly through a hole cut in the canopy.

WING

Now here is where all the work takes place. It is the real secret of the speed of the Top Slider. If you have a wire cutter and want to cut out your own cores, the sections are shown for you to cut two center sections and two tips, which are each two feet long, the four of them adding up to the eight foot, two inch span (when you add the one inch shaped balsa tips).



The large, full-length ailerons feature a closed hinge line; extra work to accomplish, but worth the effort if you want to get the ultimate speed out of the design.

If you don't have a cutter, I've arranged for wing cores to be cut for the Top Slider by my friend Duke Crow. You can get a set by writing him at 264 E. McKinley Ave., Sunnyvale, Cal. 94086. The base price is $15.00 a set, plus a handling and shipping charge which will depend upon what part of the country you live in.

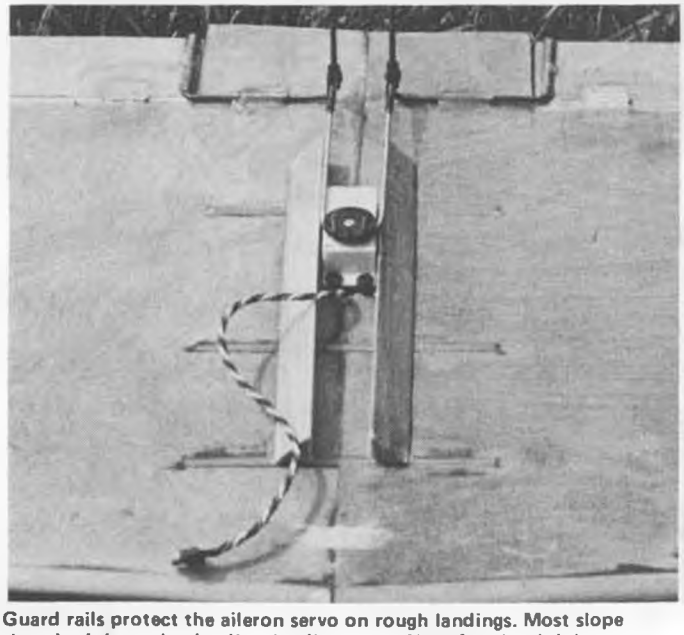
If you have a big flat table, you can put the two wing halves together on it, but I had to use the floor. It is important that the surface be flat; any deviation will be reflected in the wing.

Everyone seems to have their own personal preference for covering wing cores. In my case, I took the two cores for the left wing, epoxied them together, then laid the assembly in the foam blocks which Duke ships them in, skinning first the top surface with the 1/64 inch ply, using Best Test Paper cement for the contact adhesive. Repeat with the right wing.

Note that the trailing edge of the wing extends a 1/4 inch behind the aft line of the foam core; that's to give a real sharp trailing edge. To hold the 1/64 ply together back there, use epoxy. The contact cement doesn't hold the ply together well enough; scrape it away and, using a Hobby Poxy applicator knife, slide it in between the top and bottom skin and work the epoxy in place.

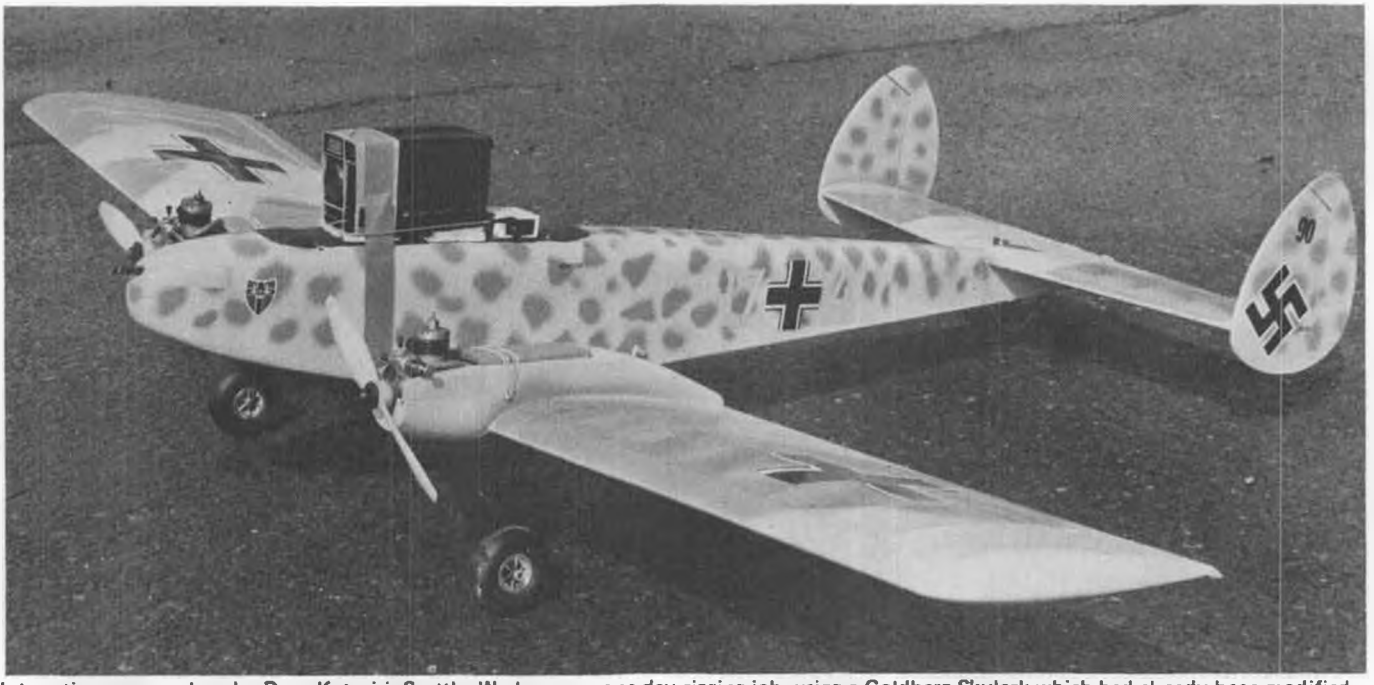
Cut the ailerons out before covering the wing with fiberglass. And this, if you choose to use the closed aileron hinge line as shown on the plans, is the

Continued on page 64



Guard rails protect the aileron servo on rough landings. Most slope sites don't have the dandiest landing areas. Note full-depth joiners.

Tailfeather set up is very simple. Rudder isn't necessary. Be sure you put that elevator horn on top!



Interesting camera plane by Dave Katagiri, Seattle, Wash., was a one-day rigging job, using a Goldberg Skylark which had already been modified with twin rudders and tail-dragger gear. The paint job was easy because no masking was necessary. Shows creative imagination.

'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

● The R/C Contest Board has almost finished its initial voting on rules for 1976-77. We say *almost*, because 5 of the 21 proposals required a re-vote that is due on December 31, a few days after this article must be in. If possible, we'll put in a last-minute result flash.

The 5 items pertain to soaring rules. The newly-formed National Soaring Society had been given extra time to submit recommendations on the 5 proposals. Unfortunately, the deadline put on these recommendations was two weeks *after* the Contest Board voting deadline!

The initially passed proposals, which are now up for comments and cross-proposals are as follows:

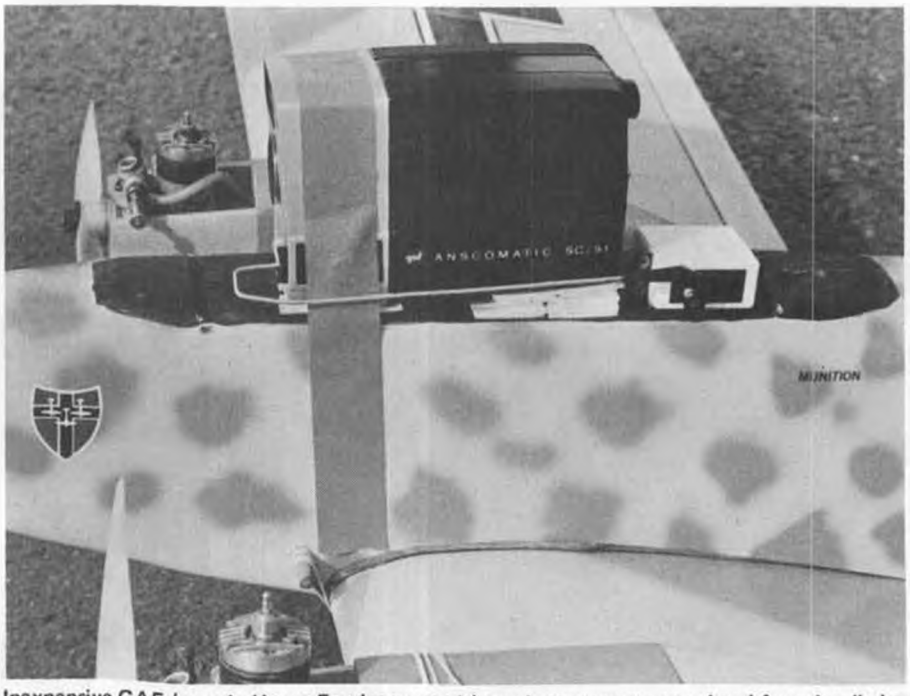
RC-76-1: This calls for a clearly defined "Flight Line," in front of which, all flying is done, and behind which, all judges, officials, contestants, and spectators are positioned. The flight line is infinitely long in either direction from its central location.

RC-76-2: Although this proposal calls for a zero if a maneuver is unannounced by the contestant (rules presently say "must," but do not specify penalty), there is still confusion, and the FAI's newest edict doesn't help matters (contestant needn't call start of maneuver).

Anyone who has gone through long sessions of judging at major contests knows how important it is that a contestant call out his next maneuver and also announce the moment of commencement . . . particularly the latter. The period of time from the completion of one maneuver to the start of the next, gives the judge time to write down his score, but it also gives him the opportunity to break away from the hypnotic effect of watching an aircraft continuously throughout a flight.

It may sound ridiculous to some, but we'll guarantee that there isn't a good judge in the business who hasn't, at one time or another "blanked out" for one or two maneuvers . . . eyes glued to the plane, but never really "seeing" it. The way to avoid this is to score a maneuver, then look away . . . anywhere . . . until the next maneuver is called. Between the time the maneuver is announced and the start of it is called, the judge re-acquires the aircraft and is ready to analyse the maneuver.

Speaking as an experienced judge (Nationals, Masters Tournament, two World Championships), we'd like to hear



Inexpensive GAF (as only Henry Fonda can say it) movie camera was taped and foam-levelled to top of fuselage. On-off switch drilled to receive 1/16 "pull" rod from auxilliary servo.

Believe it or not, a radio controlled autogyro that really flies, and flies extremely well. By Skip Ruff, Taft, California.

Skip's wife, Debbie, holding the semi-scale 1937 Foche-Achgelis. Yes, we will be publishing a construction article, probably in April issue.

two words from a contestant at each maneuver: "Ready," as he makes the turn-around and starts another maneuver pass and "Now," as he actually enters the maneuver itself. Maneuver identification should be optional, in place of "Ready" if so desired. After all, the contestant's helper has the list, and so does the judge.

RC-76-3: The need for this proposal would seem to have come about because of inadequate judging on a local level, however, it calls for maneuvers to be judged with no consideration to throttle setting of the engine at any time throughout the maneuver (?).

RC-76-5: The "Straight Flight Out" maneuver has been clarified to specify that the straight flight path be parallel to the "Flight Line."

RC-76-8: This proposal calls for cleaner definition of "Spot Landing," and specifies that the point of first contact with the ground of any part of the aircraft, is the landing spot.

It should be pointed out that many fliers, even some of the best, still try to hit the spot . . . with anything . . . just to get in. Simple mathematics will show you this isn't smart. A smooth landing with straight roll-out and positive stop can be worth 8 or 9 points. In a last-minute miscalculation, you may find yourself a little long, short, or wide of the 15k circle. If you make a sudden, jerky correction to get in the 15k circle, your 8 or 9 landing will become a 2 or 3 pointer, bouncing and wiggling all over the place. Multiply by 15 and you've got a score of 30 to 45. On the other hand, if you keep your cool, and get down in the 10k circle, your 8 or 9 point landing will get you a score of 80 or 90.

RC-76-10: The Quarter Midget Pylon course will be cut down in size to 1.7 miles, based on 400 foot legs instead of 478. Primarilly, this eliminates the need of four No. 1 pylon flagmen . . . to be replaced by one cut judge. Scoring is also changed to give 1 point for 1 cut, regardless of finish position. No-penalty finishers move up in position followed by penalty finishers.

RC-76-11: This is Jerry Nelson's proposal for changing the existing Class C pattern event to the new Sport Pattern event for biplanes. The exact rules will be similar to those previously published in various news media, with all refinements added.

RC-76-12: By rewording of paragraph 35.4.1, rotary piston engines will be officially permitted in Pattern competition.

RC-76-13: Not since the days of "Rudder-Only," "Intermediate," and "Multi" have we had legal descriptive names for the various pattern competition classes. Although the classes are now divided by skill rather than control systems, new legal names are being applied. Class A will also be called "Novice," Class B will be "Advanced," C/D

Prints of portions of movie film taken from Dave Katagiri's camera plane. Note cows, in photo 3rd from top. Last photo shows pilot making his slightly crabbed approach, due to a crosswind.

Successful "Woody Pusher," (August, 1974 MB) built by George Sousa, Cambridge, Mass. Popular airplane for sport scale, the "Woody" is easily built.

(Novice) will be called "Expert," and C/D (Expert) will be called "Master." As the proposal could not anticipate the outcome of Proposal RC-76-11 above, the "Expert" and "Master" classes will now only apply to Class D Novice and Expert (Hmmm . . . the Novice and Expert designations will be confusing for a while, until we get the hang of it). The new Class C will now have its own skill subdivisions: Sportsman, Advanced, and Unlimited . . . Oh Boy!

RC-76-14: Again we run into a slight problem with the approval of Proposal 11, but it can be overcome. Proposal 14 calls for revision of the maneuver lists so that a progressing flier is always dealing with FAI maneuvers, from easy, to more difficult, to most difficult.

Novice (Class A) Maneuvers:

1. Takeoff (upwind)
2. Straight flight out (U)
3. Procedure turn
4. Straight flight back (downwind)
5. Stall turn (U)
6. Single Immelmann (U)
7. 3 Inside loops (U)
8. Two pt. roll or Str. Inv. flt. (D)
9. Outside loop (U)
10. 3 axial rolls (D)
11. Rectangle approach (U)
12. Landing (U)

Advanced (Class B) Maneuvers:

1. Takeoff (U)
2. Non-rolling Figure M (U)
3. Cuban 8 (D)
4. Double Immelmann (U)
5. Two pt. roll or Str. Inv. flt. (D)
6. 3 Outside loops (U)
7. Slow roll (D)
8. 3 Inside loops (U)
9. 3 axial rolls (D)
10. Spin (U)
11. Rectangle approach (U)
12. Landing (U)

New Zealand R/C Pattern team. Paul Lagan (front ctr.) took first in Trans Tasman, Don Putt, 2nd, directly behind. Versatile Paul is also an expert Wakefield flier. Note NFFS sticker on ship.

Expert (Class D/Novice) Maneuvers:

1. Takeoff (U)
2. Non-rolling Figure M (U)
3. Cuban 8 (D)
4. Double Immelmann (U)
5. Slow roll (D)
6. 3 Outside loops (U)
7. Four pt. roll (D)
8. 3 Inside loops (U)
9. 3 axial rolls (D)
10. Old top hat (U)
11. Rolling 8 (D)
12. Spin (U)
13. Rectangle approach (U)
14. Landing (U)

The Master (Class D/Expert) maneuver list is the current FAI Pattern program.

As you can see, the Class D Novice and Expert maneuver schedules will not be alike . . . something more for Nats planners to overcome!

RC-76-20: The R/C Cargo event is born! We've made them go pretty and we've made them go fast. Now let's see how much they can safely carry. Industry has already been putting our models to work, hauling various payloads. Here's a chance for modelers to raise more eyebrows . . . and heavier loads.

RC-76-21: To increase safety in Quarter Midget racing, this proposal calls for safety and technical inspection of aircraft. Idle is to be checked on each plane before each heat, and approved hard hats are to be required for all personnel in the flight area.

Results on Proposals 9, 16, 17, 18, and 19 are the held-up soaring presentations.

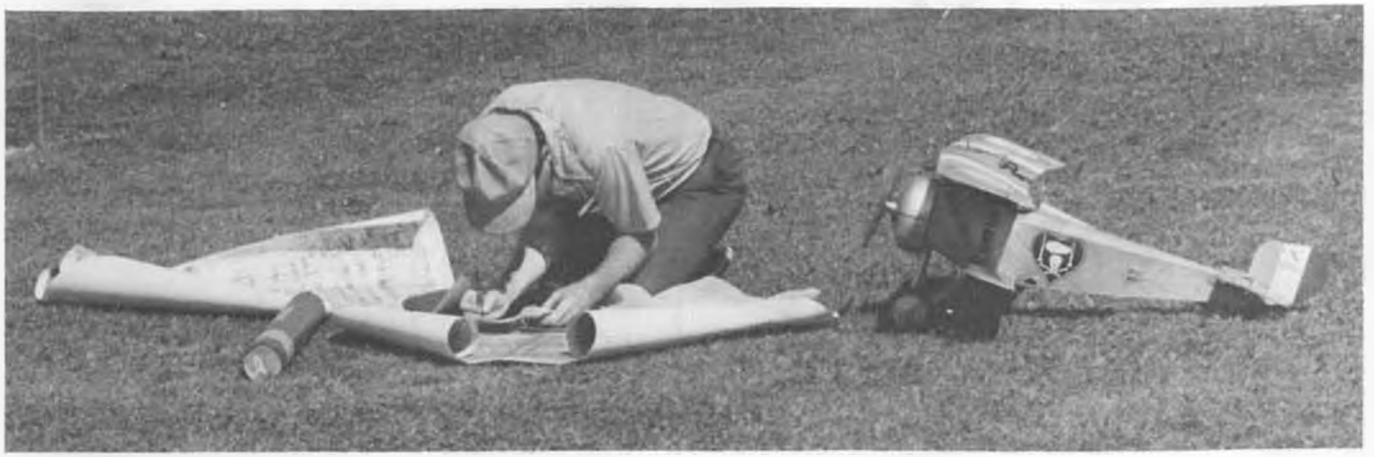
WHEREFORE ART THOU, CENTER?

Ever since the late Jim Kirkland

Enrique Blandino, long-time pen pal of MB editor, from Puerto Rico. Old Timer R/C Smog Hog (1957 MAN) is O.S. 35 R/C powered.

Enrique again, this time with "Blippy" from 1958 AM. Charlie Paz (Charlie Hobby Shop) holds single ch. pulse xmitter. Power is .049.

Taken at the 1974 Eastern States Championships by Chuck Eagle, photo is of Fran McElwee's retract gear saucer pulling appropriate sign.



"Honest, Mister, I really am a Nieuport!" Gene Sellers, scale judge at the Eastern States meet which is annually CDed by Leon Shulman, assumes a vulnerable position while doing his job. Sometimes those presentations get to be a bit much.

brought up the question at the 1972 Huntsville Masters Tournament, there has been almost as much debate about the center of the Four-Point Roll as there has about the Downwind Turn.

The problem about finding the center (for judging purposes, a pilot wants to *center* maneuvers for best possible points in regard to positioning) is that first you must know precisely where the maneuver ends! According to the FAI rule book, the maneuver is timed (for downgrading) from the moment the wings break from upright level flight until they become level again "at end of maneuver." If this is correct, then the center is half way through the hesitation during inverted flight.

However, many pilots argue that this means there are only 3 hesitations and/or points; first knife edge, inverted, and second knife edge. They feel that the fourth "point" or hesitation is during the level upright flight immediately after the 4th quarter roll, and that after an equal amount of flight at this attitude, the maneuver ends. If this is correct, then the center is at the moment that the roll to the second knife edge position begins.

All other rolling maneuvers are finished at the point where the plane regains level upright flight, which would point to the first description above as being correct. If that's the case, it is truly a roll with *four* points and *three* hesitations, and the center of the maneuver is in the middle of the second hesitation, while the plane is upside down.

By the same token, the Eight Point Roll has 7 hesitations, and the center of the maneuver is in the middle of the inverted hesitation.

Anyone for two Four Point Rolls . . . simultaneously?

HINTS

In the Bee Line, CARDS (Lansing, Mich.) Newsletter, Chuck Spencer tells us about the best item he has used for removing oil and grease from exposed balsa and hardwood motor mounts. It is available through the Burroughs Corp. (office machinery) and is called "Platen Restorer." Price is $22.75 per gallon, but it is also available in 4-ounce bottles for $1.75.

Chuck sloshes the liquid around exposed areas and wipes up the excess with a paper towel. No need to wipe dry, it evaporates quickly. He has dipped broken motor mounts in the stuff, let them dry, and then glued them back together. Also great for cleaning Monokote. Be careful around plastics. It will etch styrene.

* * *

Si Corson in the Valley Forge Signal Seekers (Pa.) newsletter, points out that new glossy "Contac" paper appears to

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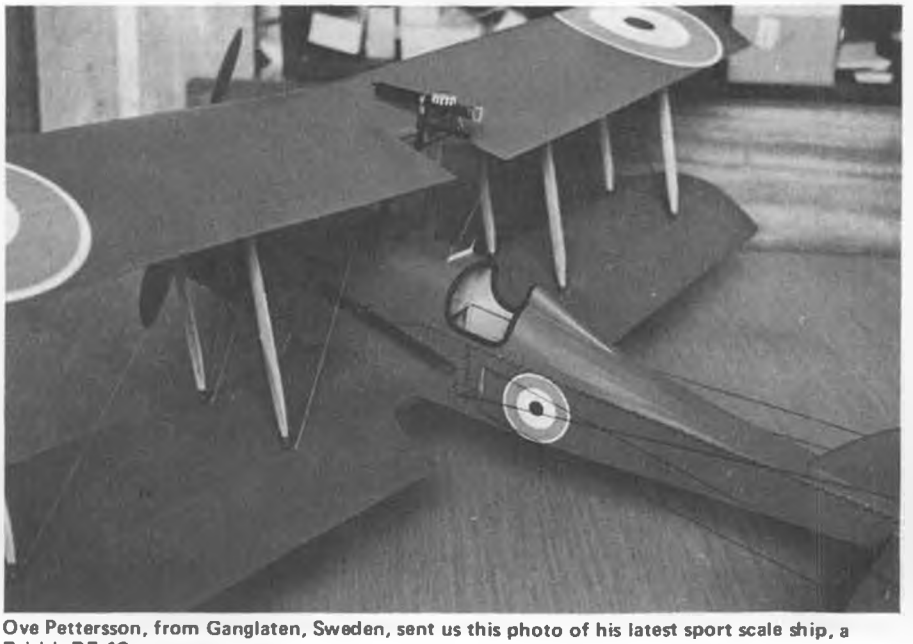


Ove Pettersson, from Ganglaten, Sweden, sent us this photo of his latest sport scale ship, a British BE 12c.

By BILL NORTHROP

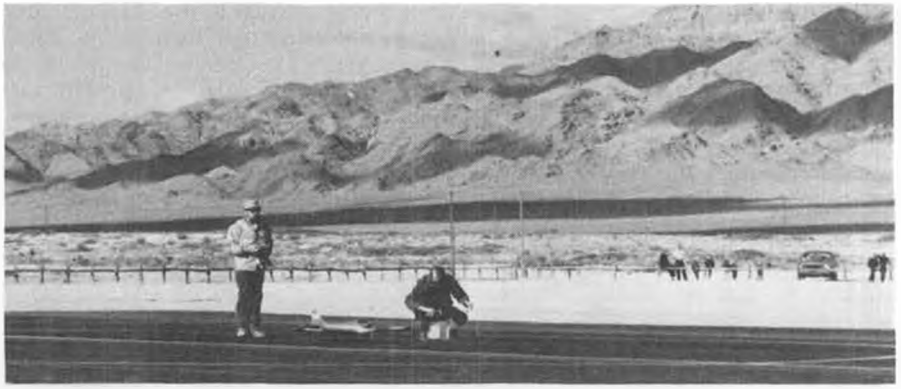
● It's a bit unusual for a magazine in our hobby to print much about one of its competitors . . . complimentary or otherwise. But, we must say that our former boss, Walt Schroder, of Model Airplane News, in co-sponsorship with Bill Bennett of the Circus Circus Hotel-Casino-Spa, Las Vegas, Nevada, put on the best privately sponsored R/C pattern contest we have ever witnessed and/or taken a part in.

Billed as the International Tournament of Champions, also the First Annual FAI Pattern International Invitational Sweepstakes, this contest, held in Las Vegas on December 6, 7 and 8, deserves whatever extended title it wishes. Truly international, there were 21 contestants from the USA (Alex Chisolm's report in the Competition Newsletter stated 18 from the U.S. and 3 from Vista, California!) and 11 contestants representing Japan, England, Sweden, Mexico, Liechtenstein, Austria, and Canada. Not bad for the first go-round!

Of course, the most interesting feature of the whole thing was the outstanding extravagance and "first-class" treatment of those involved. Contestants, officials, judges, and press were all invited as *guests* of the Circus Circus Hotel, and

The big winner, Hanno Prettner, from Austria, with Chris DeFrancesco and Bill Bennett.

Winner of second place . . . and $2,000 cash, Wolfgang Matt, of Liechtenstein.



Ralph "My first maneuver will be stumbling over the field box" Brooke prepares for the second maneuver, takeoff, against the scenic Las Vegas, Nevada background.

Dave Brown, top US winner at the tournament, accepts a $1,500 check for third place.

USAF Capt. Dean Koger placed fourth and received $1,000. Stationed at Offutt, Omaha.

Canadian Ivan Kristensen, originally from Denmark, won 5th place and $500.

Benny Kjellgren, Sweden, and his much autographed Mach I. Benny's helper, in cap, studies strange character who elbowed into picture.

Las Vegas UN get-together. Standing (l to r): AMA's Johnny Clemens, Dave Brown, Hanno Prettner, Wolfgang Matt, Mike Birch, Ralph Brooke (in front of an unknown), and Ivan Kristensen. Kneeling (l to r): Hans Matschnig (Austria), Anita Northrop, Hans Prettner (Hanno's father), Circus Circus PR gal Kim Michler, Masahiro Kato, and Tsugutaka Yoshioka doffs Hans Prettner's hat to improve the lighting.

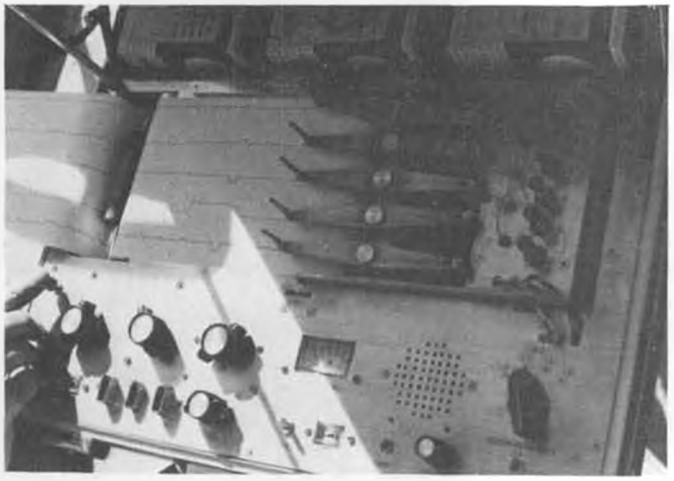
transportation to Las Vegas was also provided for officials and judges. And the capper was $10,000 in cash prizes divided among the top five winners and the highest single flight score!

The Contest Director, Gerry Nelson, and Chief Judge, Dr. Jim Edwards, were selected by co-sponsor Walt Schroder, while the judges were selected by the U.S. contestants in a vote taken several months prior to the event. Using a list made up primarily of experienced Nationals judges, the fliers chose Bill Northrop, Walt "Butch" Schroder, Bob Reuther, Al Sager, Sam Crawford, Dick Austin, Travis McGinnis, Bob Upton, Dave Lane, Whit Stockwell, Bill Johnson, Julie Woods, and Larry Sartor.

Following several days of practice by the contestants and a day of training for the judges, a pilot's meeting was held on Thursday night, prior to the first day of official flying. The only real problem of the meet arose at this time, causing considerable debate. Most of the foreign

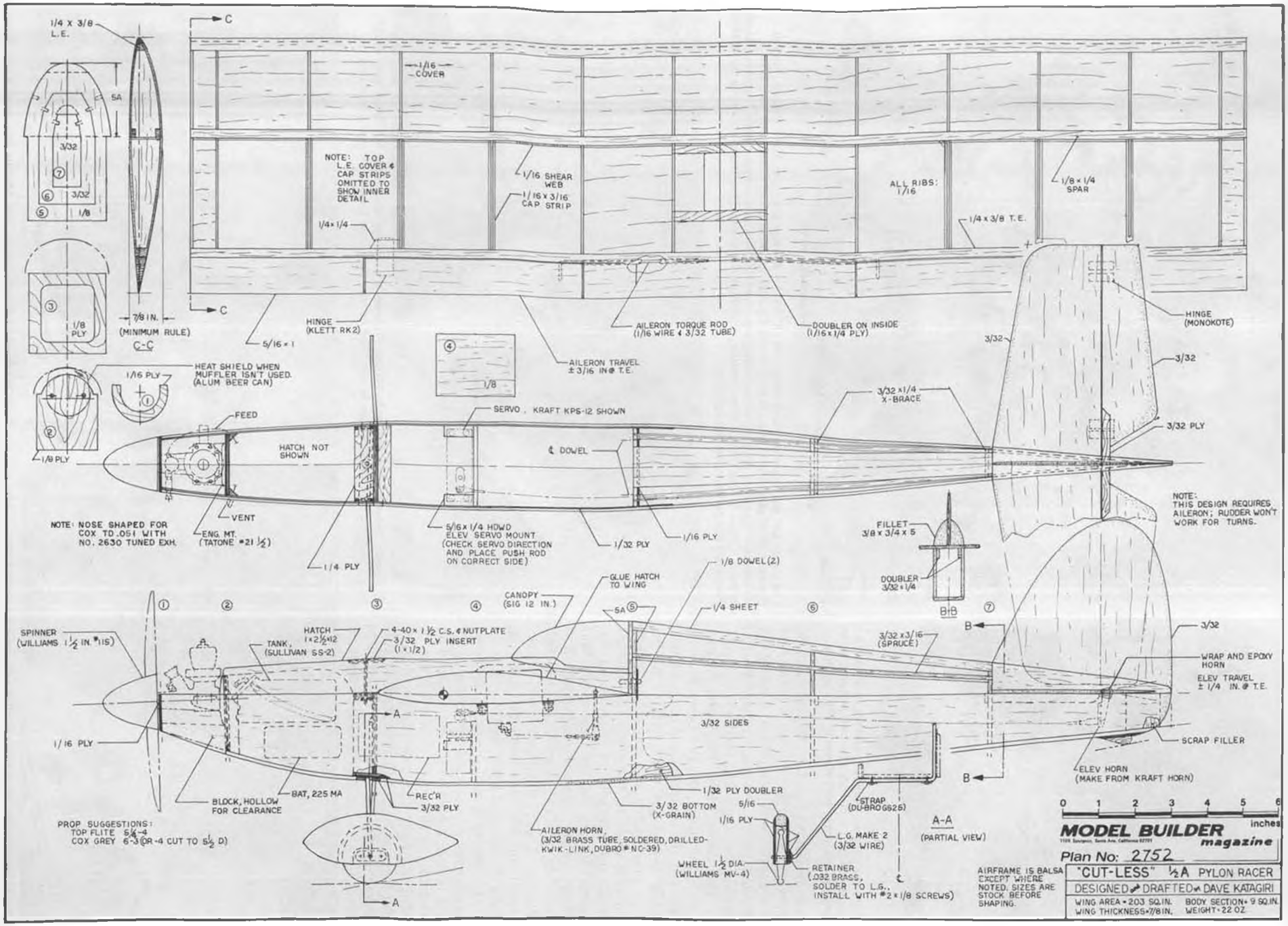
Continued on page 58

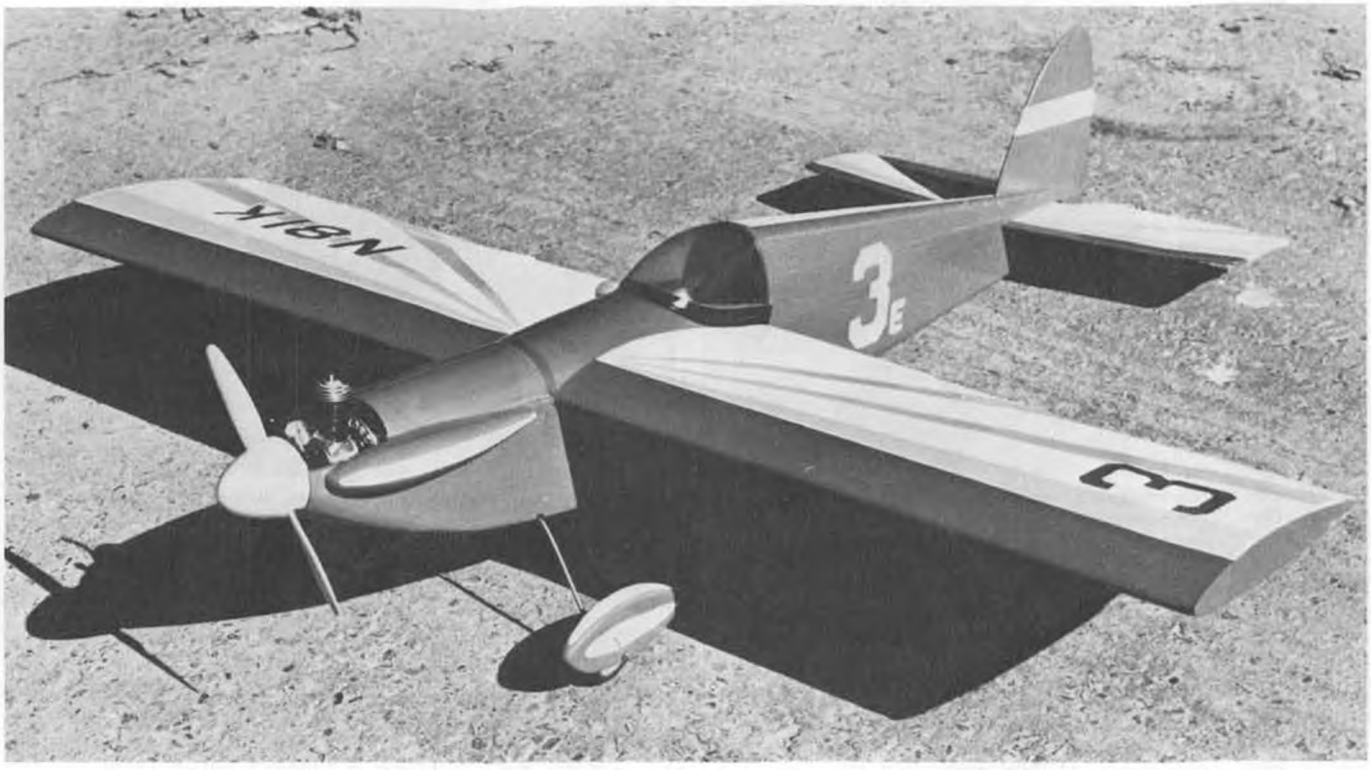
England's Mike Birch autographs Hanno Prettner's Las Vegas souvenier hat. Mike flew on 27, was a victim of CB interference in the third round, flew Don Lowe's Phoenix in round 4.



Clever instrument concocted by the Japanese for recording a flier's stick action as he performs maneuvers.

Yuji Oki stands behind (l to r): Isao Matsui, Masahiro Kato, T. Yamaguchi, and Yoshio Tadokoro, Chief Editor of Japan's RC Technique.


1/4 X 3/8 L.E.
5A
3/32
3/32
1/8
1/8 PLY
7/8 IN. (MINIMUM RULE)
C-C
C
1/16 COVER
NOTE: TOP L.E. COVER & CAP STRIPS OMITTED TO SHOW INNER DETAIL
1/16 SHEAR WEB
1/16 X 3/16 CAP STRIP
1/4 X 1/4
ALL RIBS: 1/16
1/8 X 1/4 SPAR
1/4 X 3/8 T.E.
HINGE (KLETT RK2)
5/16 X 1
AILERON TORQUE ROD (1/16 WIRE & 3/32 TUBE)
DOUBLER ON INSIDE (1/16 X 1/4 PLY)
AILERON TRAVEL ±3/16 IN @ T.E.
HINGE (MONOKOTE)
3/32
3/32
3/32 PLY
1/16 PLY
HEAT SHIELD WHEN MUFFLER ISN'T USED. (ALUM BEER CAN)
1/8 PLY
FEED
SERVO . KRAFT KPS-12 SHOWN
3/32 X 1/4 X-BRACE
HATCH NOT SHOWN
℄ DOWEL
NOTE: NOSE SHAPED FOR COX TD .051 WITH NO. 2630 TUNED EXH.
VENT
ENG. MT. (TATONE #21 1/2)
1/4 PLY
5/16 X 1/4 HDWD ELEV SERVO MOUNT (CHECK SERVO DIRECTION AND PLACE PUSH ROD ON CORRECT SIDE)
1/32 PLY
1/16 PLY
NOTE: THIS DESIGN REQUIRES AILERON; RUDDER WON'T WORK FOR TURNS.
FILLET 3/8 X 3/4 X 5
DOUBLER 3/32 X 1/4
B-B
1/8 DOWEL (2)
GLUE HATCH TO WING
CANOPY (SIG 12 IN.)
5A
1/4 SHEET
3/32 X 3/16 (SPRUCE)
3/32
WRAP AND EPOXY HORN
ELEV TRAVEL ± 1/4 IN. @ T.E.
SPINNER (WILLIAMS 1 1/2 IN. #115)
TANK, (SULLIVAN SS-2)
HATCH 1 X 2 1/2 X 12
4-40 X 1 1/2 C.S. & NUTPLATE
3/32 PLY INSERT (1 X 1/2)
3/32 SIDES
SCRAP FILLER
1/16 PLY
ELEV HORN (MAKE FROM KRAFT HORN)
BLOCK, HOLLOW FOR CLEARANCE
BAT, 225 MA
REC'R
3/32 PLY
1/32 PLY DOUBLER
3/32 BOTTOM (X-GRAIN)
STRAP (DU-BRO #626)
5/16
1/16 PLY
L.G. MAKE 2 (3/32 WIRE)
A-A
(PARTIAL VIEW)
AILERON HORN, (3/32 BRASS TUBE, SOLDERED, DRILLED- KWIK-LINK, DUBRO #NC-39)
WHEEL 1 1/2 DIA. (WILLIAMS MV-4)
RETAINER (.032 BRASS, SOLDER TO L.G., INSTALL WITH #2 X 1/8 SCREWS)
PROP SUGGESTIONS: TOP FLITE 8 1/4-4 COX GREY 6-3 OR-4 CUT TO 8 1/2 D)
AIRFRAME IS BALSA EXCEPT WHERE NOTED. SIZES ARE STOCK BEFORE SHAPING.
0 1 2 3 4 5 6 inches
MODEL BUILDER magazine
Plan No: 2752
"CUT-LESS" 1/2A PYLON RACER
DESIGNED & DRAFTED by DAVE KATAGIRI
WING AREA - 203 SQ.IN. BODY SECTION - 9 SQ.IN.
WING THICKNESS - 7/8 IN. WEIGHT - 2.2 OZ.



"CUT-LESS"

1/2A R/C PYLON RACER

BY DAVE KATAGIRI

PHOTOS BY AUTHOR

Get into the fun, grass-roots end of pylon racing with this fast-building little racer. Meets the rules being used by most clubs around the country that have found this to be a most popular "Sunday Flyer" event.

● As I approached the local R/C field to practice with my 60 powered ship I noticed the sky filled with little gnat-like planes doing an oval dance. The time was winter and the air was cold, with snow on the ground.

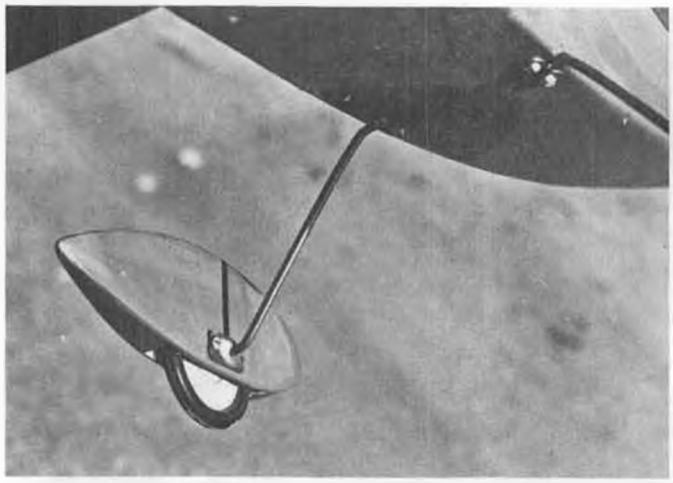
What I was witnessing was one of the monthly Frost-Bite series ½/A Pylon Races sponsored by the Seattle "PROPS" (Pylon Racers of Puget Sound). An R/C buddy of mine once told me that a model airplane flown by a grown man must be a BIG model. Here were a bunch of old Sunday fliers being exposed to pylon racing using dinky little ½/A ships, and they were having a ball! The PROPS races were scheduled during the winter months . . . first Sunday of each month, regardless of weather.

After that outing I parked my BIG ship with its companion gallon cans of fuel and cleared the ways to join the fun. The design I flew the rest of that season (and two more) was the "Cut-less," which was named after the advice my pit man kept giving me. It was good advice, because we placed a respectable 2nd for a 6-race season.

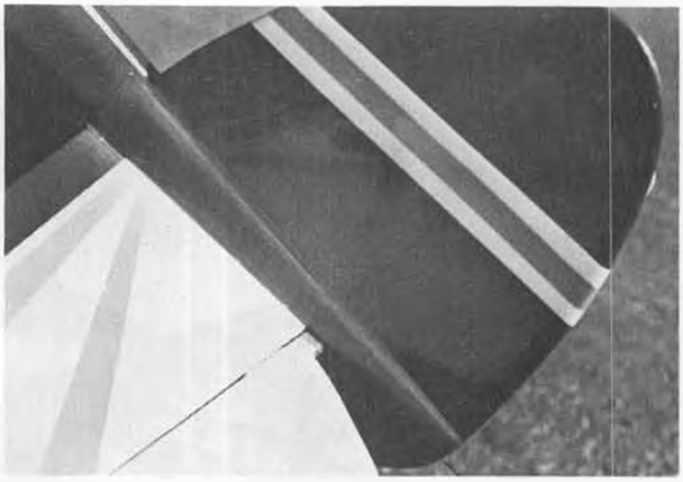
Half-A Pylon Racing has proven to be the most popular racing event in the Seattle area. The best thing about this class is that it is a one-engine class. Better yet, it is difficult to make big gains above the stock engine. Consistent flying can be a quick equalizer. If hop-up is decided, the steps are simple and inex-

Dave's fellow modeler, Ed Burman installed a Cox muffler on his Cut-Less. Also did not include the cheeks.

Cheeks and wheel pants dress 'em up a little without too much trouble, and are immaterial to performance.



Underside of Ed Burman's ship, showing wheel pant installation over Williams Bros. WW I type wheel.



Elevator horn is inside fuselage. Rudder is deemed unnecessary, one less servo to lug around. Two channel system will do it.

pensive. The other advantages are the simple procedures and low man-power requirements. Also, a runway is optional.

Our races have been started by hand-launch and by a flying start. The latter is a greater challenge because it is one more potential cut.

The model was patterned after a full size mini-pylon Formula-V (VW powered) racer "Soneri" by John Monnett ("Private Pilot," June 1972 pg. 38-43). His little V-dub does 175 mph max on 60 H.P.

The model weighs 22 oz. with iron-on covering (20 oz. is minimum). Minor extra weight won't damp straightaway speed, but induced drag due to lift will increase on turns. Next to a good engine, minimum weight seems to be the next important criteria for a winning racer. Weight control was achieved by using a 225 ma battery pack and light wood. The photographs show wheel pants and cheek cowls for show, but for go . . . take them off. The purpose of these races is to have fun, so the appearance rules have been informal.

CONSTRUCTION

The structural arrangement is simple and conventional, so only comments concerning assembly sequence will be discussed.

WING

The airfoil section is semi-symmetrical, and a shim will be required during construction in order to ensure a true wing. I used a 3/16 inch square strip, parallel to, and 1/8 inch forward of the trailing edge, to shim the ribs to position. The upper surface is sheeted on the board. Remember to glue the servo mounting strips at the center section before sheeting that area. At this point, the wing should be stiff enough to remove from the board to cover the under side. Wing thickness is at the minimum (7/8 inch), so don't sand other than to true the cap strips.

FUSELAGE

Select matched (adjacent slices) sheets for the body sides, and cut the 1/32 ply doublers in a way that initial warping will tend to be compensated when the nose and tail end are bent to form the plan view shape. Omit the 3/32 x 3/16 spruce stringers until after the 1/8 inch dowel holes are made in the top block. This is done by drilling through body frame holes in 5 and 5A.

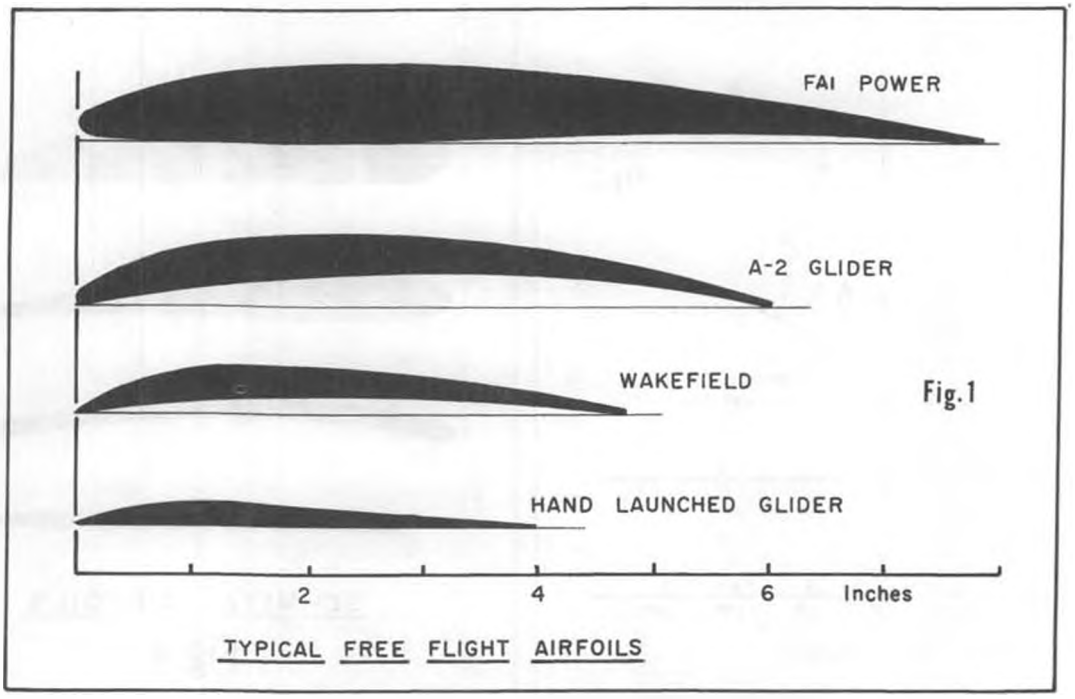
The 4-40 nut plate for the hatch/wing mounting should be deformed out-of-round slightly to increase friction on the bolt if the fit seems too loose. Otherwise, engine vibration may tend to cause the bolt to back out. The breakaway feature is the 1/4 inch plywood plate that pulls out. A 6/32 nylon bolt can be substituted, if the head is counter-bored into the hatch. The hatch can be fastened with either epoxy or silicone glue. Both have been used successfully.

TAIL ASSEMBLY

The elevator horn is enclosed. A suggested sequence for assembly is as follows: Cut and shape the fin fairing blocks while tack glued in place with Ambroid, and with small shims to simulate the thickness of the fin and stab. Separate and glue these fairing blocks to the fin. Cover the stab, elevator and the fin parts separately. Fit and adjust the

Continued on page 66

Dave Katagiri makes some practice runs. Half-A racing can give you all the excitement of pylon racing without the expense . . . which means it can be a lot more fun, too.



TYPICAL FREE FLIGHT AIRFOILS

Fig. 1

SOARING and Aerodynamics

with LE GRAY

Guest Editor TED OFF takes a logical and every-day-language look at the myths and truths about old man Reynold's Numbers. Read this and then surprise your friends with your knowledge of aerodynamics.

● I happen to like small R/C gliders . . . say 2-300 square inch wing area. Because of the scale effect, these designs will have a steeper glide slope and aren't as stable in gusty winds (their momentum is lower) as their king-size counterparts. But I get tired of reading the warnings by aeronautical engineers about the dramatic changes in airfoil performance that take place below certain Reynolds number values. I really get upset when someone says that I shouldn't build a wing with a chord less than so many inches.

Sure, dramatic changes can take place with certain airfoils. The free flight model builders have known about this for years, but through the evolution of thousands of designs they have learned to cope with the problem. How? By *not* copying airfoils designed for full size gliders. Instead, they have developed airfoils specifically for the size of their models and the various types of com-

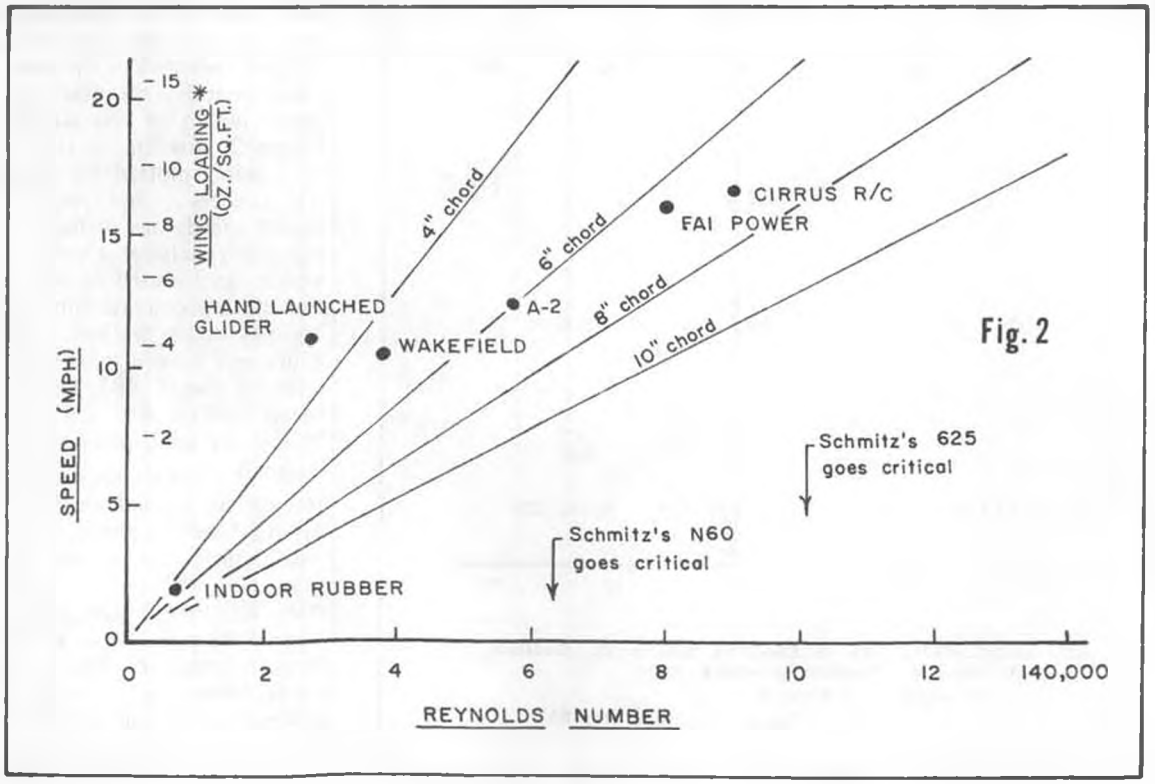


Fig. 2

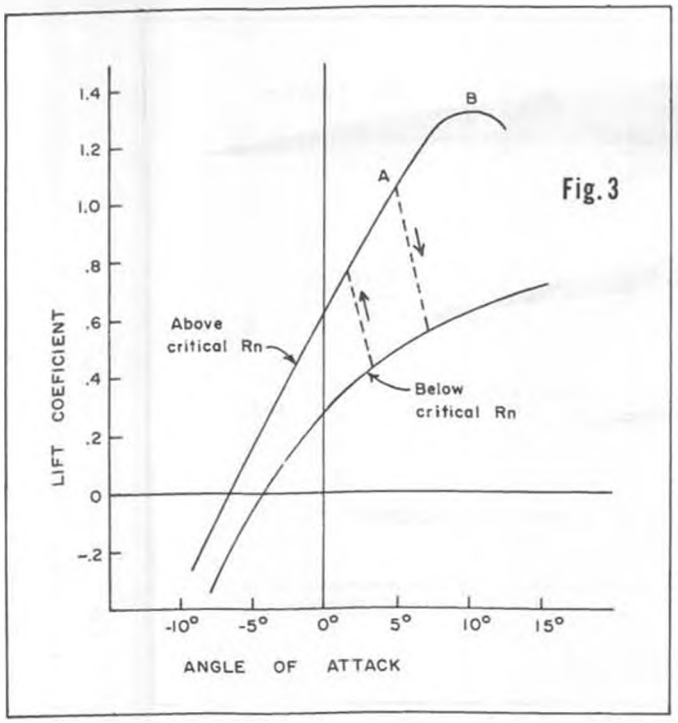
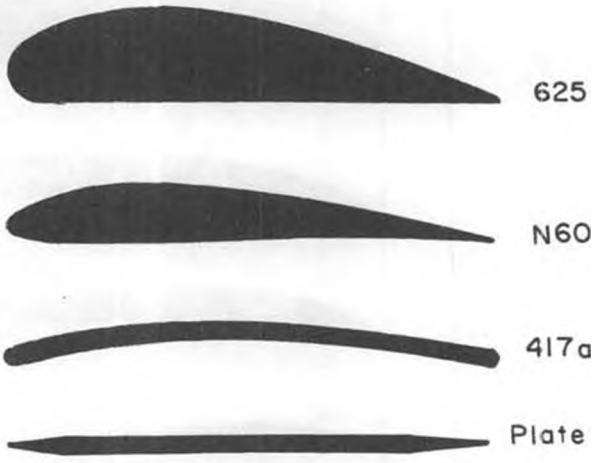


Fig. 3



SCHMITZ AIRFOILS

Fig. 4

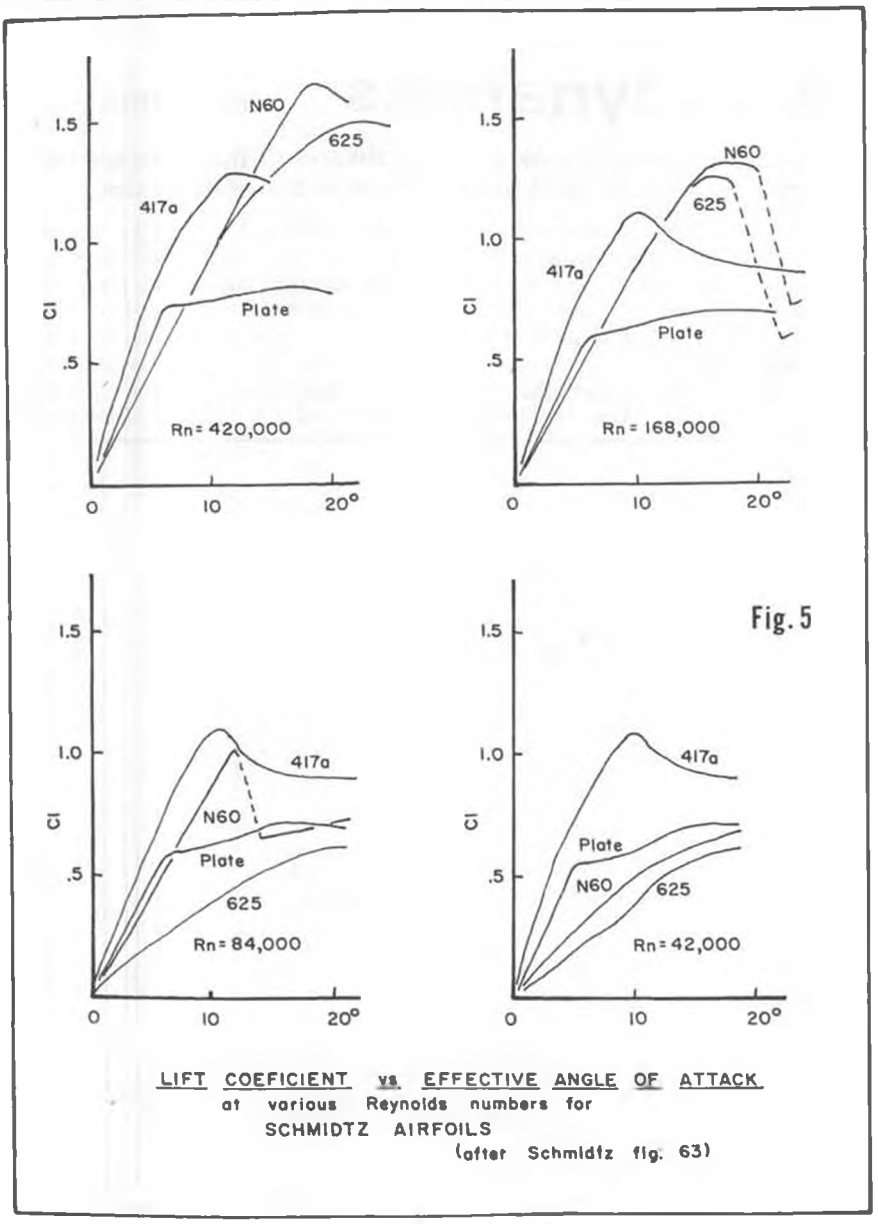


Fig. 5

LIFT COEFICIENT vs. EFFECTIVE ANGLE OF ATTACK
at various Reynolds numbers for
SCHMIDTZ AIRFOILS
(after Schmidtz fig. 63)

petition. (Figure 1). We can do the same for our R/C glider designs.

The Reynolds number is a dimensionless ratio which portrays the relative magnitude of dynamic and viscous forces in the flow of a fluid. For our purposes, it is used to measure the effects of the air's viscosity and density on our models as we change their size or speed. The complete formula for an airfoil involves this air density and viscosity, the speed of the plane and the length of the wing chord. A tapered wing operates with a lower Reynolds number at the tip chord than at the root chord . . . at any given speed. Using our units of measurement and assuming we fly at or near sea level, Reynolds number (R_n) = 780 VC; where V is the velocity of the plane in miles per hour and C is the chord length of the airfoil in inches. Figure 2 puts this in visual form. The data points plotted for specific models are a guess . . . but reasonable. Since model speeds are difficult to measure, the graph includes a wing loading scale which can be used in lieu of speed to find the approximate minimum R_n. This assumes that a modern, relatively clean glider will have a maximum lift coefficient of about .085 and its minimum speed thus equal to $7.95\sqrt{W/A}$, where W/A is the wing loading in ounces/sq.ft.

Wind tunnel tests have shown that somewhere around an R_n of 80,000, a normal Clark Y airfoil has its lift drop and its drag increase, suddenly and dramatically. This is just about the Reynolds number where we fly our R/C gliders. Why does this airfoil show this strange behavior? The lift on a wing comes from two sources: 1) The air hitting the bottom of the wing at an angle tends to push the wing up, and 2), the air, as it flows over the wing's curved

upper surface, increases its velocity and thus reduces its pressure (Bernoulli's law), causing a lifting force on this upper surface. If we assume a positive angle of attack, lift from the bottom of the wing will always be present, but the upper surface lift will only occur as long as the air flows smoothly over this surface (remains attached). Most of us have seen wind tunnel pictures illustrating a stalled wing, where the air has become detached and turbulent above the upper surface.

The problem with our models is that, because of viscous effects (measured by the Reynolds number), this detachment can occur at all angles of attack if an airfoil is flown at or below its critical R_n. Refer to Figure 3. This was derived from some work by F. W. Schmitz. As can be seen, if a glider is flying above the critical Reynolds number, its lift coeficient is almost a straight line function of its angle of attack speed until it smoothly stalls at point B. However, if the glider is flying significantly below the critical R_n, air will be detached from the upper surface of the wing and this upper surface then will contribute essentially no lift. Although a glider can be made to fly this way, it's a very inefficient flying machine (This is the way a DT'd free flight model "flies").

The most important point to note on the graph is what happens to a glider when its wing is flying at about the critical Reynolds number. Instead of stalling smoothly as a point B of Figure 3, it will suddenly stall at say, point A, pick up speed along the lower curve, and then suddenly again balloon up as its lift coeficient jumps back to the upper curve. This porpoise effect has been observed in model gliders with the wrong airfoil and is very similar to a glider with the center of gravity too far back.

This Reynolds number problem was first studied in detail by the German engineer, F. W. Schmitz, prior to World War II. His often quoted work was published under the title, "Aerodynamics of the Model Airplane," and is available from Department A, National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22141. Cost is about $4. Request document # N70-39001.

Dr. Schmitz tested five airfoils in the Reynolds number range 20,000 to 160,000. Four of the test sections are shown in Fig. 4. The fifth one was an N60 with a reflex (turned-up) trailing edge. He chose this strange assortment in order to demonstrate the extremes of airfoil behavior, and because these particular sections had already been well tested at high R_n's in other German wind tunnels.

Figure 5 summarizes a portion of Dr. Schmitz's data, but equally good data is available in the book for the other parameters of airfoil behavior. These graphs show the solution to the Reynolds number problem. At a Reynolds number of 420,000, the thick (20%) 625 airfoil is just coming into its own. Below an R_n of 84,000 (its actual critical number is 105,000) it's a less efficient lifting device than a flat plate. The N60, which is very similar to the sections often used on R/C gliders (12% thickness), is clearly superior at the higher Reynolds numbers but less efficient than a flat plate at 42,000 (Critical R_n = 63,000). According to Schmitz, the curved plate (417a) showed no critical number in his wind tunnel: its lift and drag were essentially independent of R_n; So, assuming we could solve the structural problems, we can use a curved sheet of balsa for our wings and forget about the Reynolds number problem. The late Scotty Murray of the famous Brooklyn Sky Scrapers used this very same section on his small, elliptical dihedral gas powered models in the late 1930's and early 1940's. This is also why the Jedelsky wing is so well known and used.

Schmitz also did some experimenting with turbulent flow and found that even the 625 section could be kept from going critical down to R_n 20,000 by making the air turbulent in his wind tunnel. Thus, turbulators can be used to reduce the critical R_n. (See RC Soaring, MODEL BUILDER December 1971).

To summarize Schmitz's conclusions:

1. Round-nosed, thick wings are sen-

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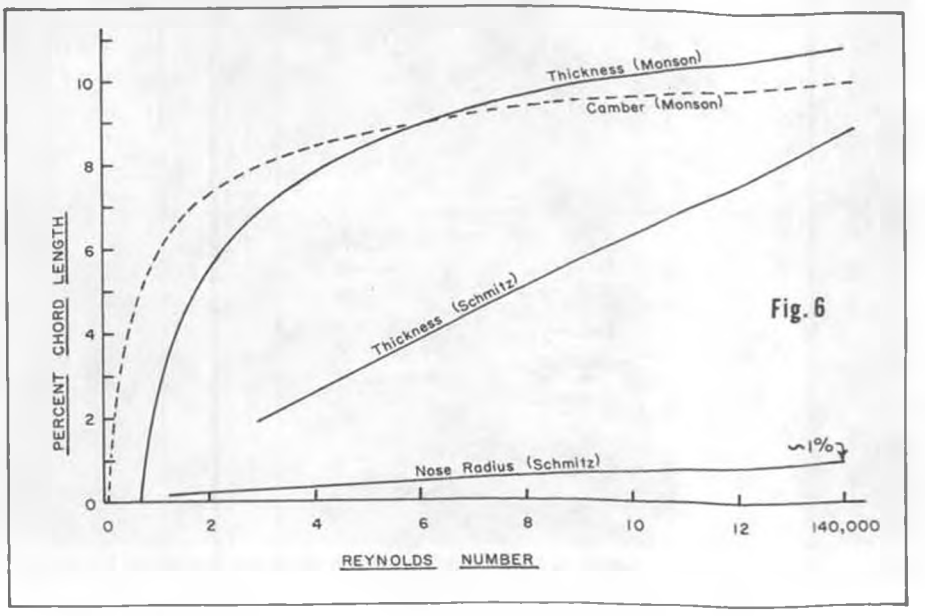


Fig. 6

JEDELSKY WING

TYPICAL HALF-A FREEFLIGHT AIRFOIL

DR. SCHMITZ'S FAVORITE HAWK PROFILE

Line up of helicopters at at contest in Stockholm, Sweden, as photographed by Jan Levenstam. Only ten flew because of strong winds.

CHOPPER CHATTER

By JOHN TUCKER

● Every month, I review the previous "Chopper Chatter" column to see if I need to pick up a point that I missed . . . To my chagrin I realized that I hadn't listed the names and data that the modelers send in, for the past several issues. So, without further words, here is a longer list than usual to make up for my neglect. Everyone listed has either expressed a desire for help in their R/C helicopter building–adjusting–flying, or has offered their expertise in helping others:

Don Lodge, 3304 Greenville Drive, Simi Valley, Calif. 93063. (805) 527-2126. (Modified Kavan Jet Ranger) helio flight test pilot and engineer . . . Helio theory.

Terry D. Edmonds, No. 1 Lakeview Knoll, Route 6, Iowa City, Iowa 52240. (319) 351-1517. (Kavan Jet Ranger) Accomplished pattern pilot . . . Needs local flying help.

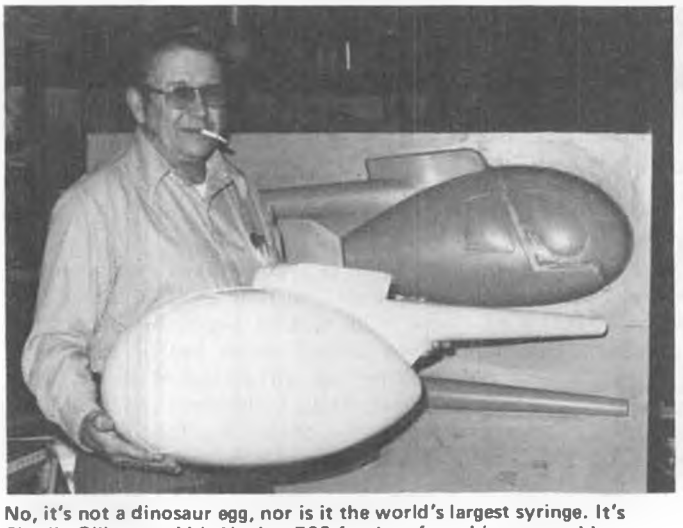
Dave Smith, P.O. Box 784 Bedford, Nova Scotia, Canada. (902) 443-3059. (DuBro Shark) needs help in flying . . . nearest qualified flyers 1½ days hard driving away.

Thomas F. Diamond, Sr., 1129 Allengrove St., Philadelphia, Penn., 19124. (215) PI-4-1827. (Kavan Jet Ranger) Has knowledge of hi-temp lubricants for gears/bearings, etc.

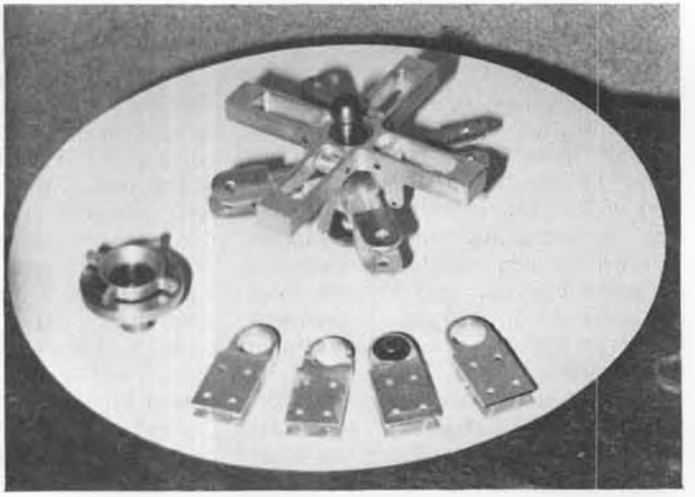
Steve Tillman, 2119 W. Lincoln, Peoria, Illinois, 61605. (309) 674-6662. (DuBro 505, Hegi Cobra, Kalt Cobra, Kavan Jet Ranger). General building and finishing skills to share.

Barry W. Blaisdell, 880 Silver La., Stratford, Conn. 06497. (203) 378-6577 (Hegi Cobra, Hughes 300, Gazelle) Looking for photos of Gazelle . . . Full scale chopper pilot.

Bobby G. Sutton, 2727 Old Galveston Road No. 124, Houston, Texas 77017.



No, it's not a dinosaur egg, nor is it the world's largest syringe. It's Charlie Gilbert and his Hughes 500 fuselage from his own mold.



Rotor head parts for the Hughes 500 chopper being scratch-built by Charlie Gilbert. We'll keep you posted on progress.

The Ernie Huber of Europe, Michael Bosch, was "disqualified" in Sweden because he flew far better than any of the competition!

(713) 643-4739. (Kavan Jet Ranger) Needs help in trim and control set-up.

Skip Ruff, 535 "B" St., Taft, CA. 93268. (805) 763-1457. (DuBro Whirly-Bird, Hughes 300). Has problems with electrical noise in radio, needs help. Claims no special skills, however, we know him to be quite conversant in R/C autogyro construction and flying.

Tony Frackowiak, 2720 Pebble Dr., Erie, Pa. 16508. (814) 864-5737. (DuBro Whirly-Bird, Shark) Needs help on trimming and flying. Machinist.

Timothy Smith, 34 E. State, Salem, Ohio 44460. (216) 332-9916. Very interested in R/C choppers . . . Has raced R/C cars and boats . . . Needs a "push" into helicopters.

Danny Floyd, 2585 Beeler Dr. S.W. Apt 21, Atlanta, Georgia, 30315. (404) 761-6990. (Kavan Jet Ranger) Needs help in setting up radio gear, share general construction skills.

Thomas Herr, Box 137 R.D.I., Paxinos, Pa. 17860. (717) 672-2306. (Hegi Cobra, DuBro 300, Kavan Jet Ranger, Whirly-Bird, Oringal PB-1). Can help in all areas of R/C helio.

* * *

I'm sorry about last month's column, fellas, if you noticed the "bad day at black-rock attitude"! I guess it's a periodic thing that modelers (especially R/C chopper builders) go through once in a while. In addition to some friends "dropping out" of the hobby, I had my own problems to whip! I told you that I had finished my "Super-Cobra" with the "Expert" collective pitch head and had wild blade-whipping, etc . . . then I changed to the Schluter S-head with uncontrollable pitch-up as soon as it went into forward flight! Well . . . this past month, I have worked out the solution to both problems, but haven't the foggiest idea what one of the problems really was!

To begin with, I didn't want to risk tearing up my beautiful new machine with the (then unsatisfactory) expert head, so I tried the S-head. This head has given me superior performance on many other choppers, however, it just wouldn't translate into forward flight without violent pitch-ups. The solution to this problem was to install the more rigid Cardon head, which proved to be the ideal combination for the chopper and my skills. After a tankful of fuel in hovering and control trimming, I went into the traffic pattern; slowly increasing speed with each circuit of the field until it was fairly "screaming by" on the downwind leg! At no time did it exhibit any abnormal characteristics and was a real joy to fly . . . it is an unusually light Cobra, weighing in just slightly under 10 lbs., and lifts off with less than 1/3 throttle.

Now that I had proven the machinery, I decided to go back to the Expert-head and see why it had such wild blade excursions during the first flying attempts. Originally, I had carved out my own symmetrical main rotor blades and thought perhaps they were not quite suited for the newer concept of pitch control. I finally purchased a set of Schluter blades (designed for the system) and installed them according to the instructions. Alignment and sweep-forward was double-checked and the engine fired-up. Would you believe, the same thing happened again!

Just at lift-off rpm, the blades started to thrash wildly and acted like they were going to tear the chopper into a million little pieces. After 5 or 6 tries to find out why, I realized I could "jump" the chopper into the air quickly and hover several seconds before it went into its act again. This got me to thinking that the jump take-off was being accomplished at a rather high blade attack angle and at a comparatively low rpm (the engine is coupled to the pitch mechanism, but lags slightly behind during the initial acceleration).

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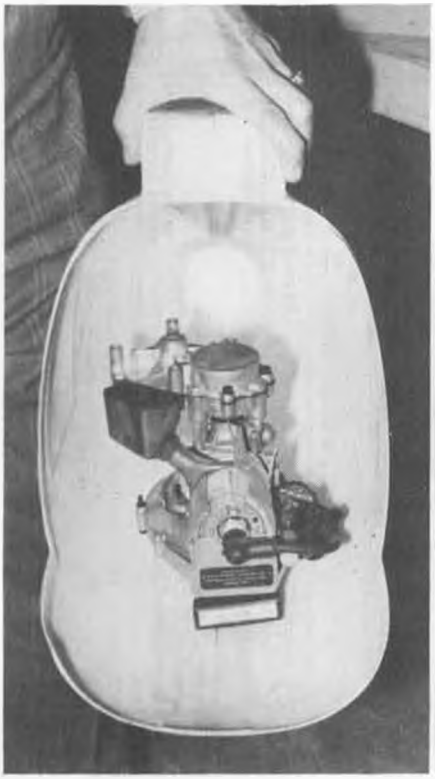
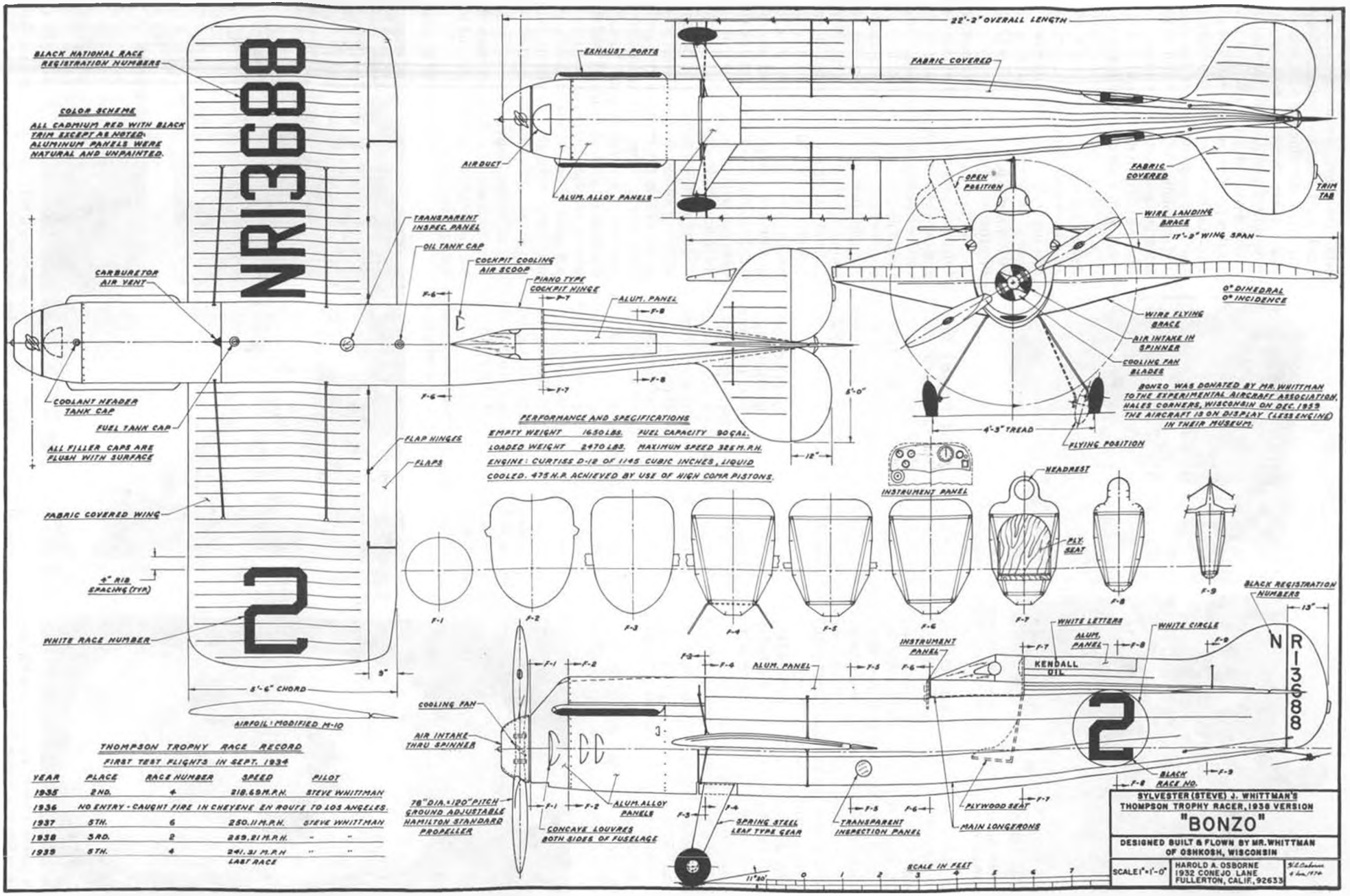


O & R Compact inside the cavernous fuselage of Charlie Gilbert's Hughes 500.

"Fellow Knights of the Round Table . . ." Inaccessibility is NOT going to be a characteristic of the Hughes 500, if Charlie has anything to say about it!

FULL SIZE PRINTS OF THIS DRAWING ARE AVAILABLE DIRECT FROM HAROLD A. OSBORNE, BOX 2033, FULLERTON, CALIF. 92633. PRICE IS $1.50, INCLUDING FIRST CLASS POSTAGE.



Steve Wittman's "BONZO"

By HAL OSBORNE

PHOTOS SUPPLIED BY BOB HIRSCH

● Steve Wittman's "Bonzo" was not the most esthetically attractive aircraft that appeared on the air race circuits in the 1930's. "Bonzo" was strictly the smallest possible aircraft that could be built around a Curtiss D-12 Conqueror engine.

As was usual with most racing aircraft of the period, "Bonzo" went through a series of modifications each year to improve performance. The aircraft was built in 1934 and was first raced in 1935, to a second place in the Thompson Trophy. For the race year of 1936, the awkward tripod landing gear was replaced by a cantilever spring steel leaf type gear which is now installed on all Cessna aircraft. A fire, which occurred during transit to Los Angeles, prevented "Bonzo" from competing in 1936.

For the 1937 season, race number 6 was used. The wingspan was shortened from 20 to 17 feet, and flaps were added. A new propeller spinner was installed which had an internally mounted ducted fan that pulled air through a large opening in the spinner to the coolant radiator. Wittman was in the lead in the 1937 Thompson race until magneto problems caused him to drop back, and he finished fifth.

For the year of 1938, the only change made was to the race number, which became 2. Wittman placed third in the Thompson race despite a leaking radiator that sprayed Prestone over the windshield. First place was taken by Roscoe Turner in the "Pesco Special," which had more than twice the horsepower of "Bonzo."

In 1939, "Bonzo" was painted all red and carried race number 4. The propeller spinner was removed and a ram air system to the carburetor was devised. This system caused uneven carburetion which burned valves. This problem and the cutting of a pylon resulted

Continued on page 77

Half-A Combat is king with the self-supporting Junior flyer; the most action for the money. Jed assists at school flying session.

Another youngster joins the speed profession. Californian, Mark Lyon with his Torky 1/2A proto profile, a Dale Kirn kit.

Control line

By JED KUSIK and DALE KIRN

● Oh Wow. Here we go into a New Year, and it's going to be good. There is a definite reason why I can say that. I have a lovely new wife! We were married the day after Thanksgiving and now will live happily ever after in Orange, California.

So, to any of you who have been trying to contact me at any of my three previous addresses where I have lived the past year and a half, I'm not there! That's why your mail has been returned and your bills haven't been paid . . . Ha! *(Direct Jed's mail to MB. Occasionally he comes down off his cloud to communicate with the outside world! wcn).*

Her name is Merry, she is 5 feet tall and right 'purdy' to look at. She races motorcycles with me (her KX125 Motocrosser is faster than my 250 Elsinore). She builds and flys model airplanes, and she's a good cook . . . so what else can I ask for?

* * *

New Year's Resolution for modelers: Let's all cooperate this year and quit hassling over Nats sites, rules, splinter factions, and other phases of the hobby. The '75 Nats will be super-fantastic the second time at Lake Charles, with a one week schedule (like old times). Rules will be tested by modelers and not psuedo politicians.

Splinter organizations are doing good things for their members. (PAMPA: Get some intelligent, informed coverage from MODEL BUILDER by sending us your newsletter!) Everything that flys, and the people who build them are superneat by me. I don't care how they control their model, or choose not to control it. We shouldn't degrade anyone's personal choice of events.

A Junior problem? Never . . . if you treat them right. There are many self-supporting Junior flyers all around, just hoping for a chance to get into it and compete. But, because Dad doesn't build or fly, the big engine, big bucks (over $10.00) contest machine is out of the question. I know, because I have sponsored Junior clubs in school for eight years.

A steady diet of ½/A events will draw the local Junior privateer. Unrestricted ½/A combat is the most popular for Juniors. Try having Junior-only combat at every contest, no matter what else happens. Also, give a few contest notices to the schools close to your flying field. After one or two contests, when the Juniors *know they can depend on you*, they will start building and

New 1/2A Proto records set on Mono-Line. Jim Wade (left), 101.38 mph, and Rick Westbrook at 93.96. Both used single-blade props.

Another new record in Class A Speed, by Jim Clary (left) and John Newton. Using ST .15 and coupled .012 lines; 172.84 mph.

Lance Kaplan, 14, recent winner in Profile Carrier contest. Modified "Mongoose", McCoy 35 powered. Nose lengthened 2" and stab/elevator increased to 30% of wing area. Kirn photo.

practicing for *their* event.

F.A.I. TEAM RACE

I still want to hear from people interested in trying or learning more about F.A.I. Team Race. I am making a list and checking it twice, and you will be the first to hear about Jed's Custom Team Race Diesels and Goodies!

SLOW RAT . . . WHY NOT?

The coming event and "in" debate this year will be Slow Rat. There are several rule proposals to AMA now for this event. The rules that seem most workable and realistic, that I give my blessings to, are as put forth by Charlie Johnson and Ben Sasnett in the SCCA newsletter. Following are their ideas, plus a lot of good information on running and fuels. By the way, subscription to the SCCA newsletter is $25.00 a year . . . no joke! The paper is not available to just anyone (so how'd I get a copy?).

Gary Sauder and his Sig "Akrobat" stunter. Fox .35, weight 48 oz., "uniflow" tank venting. Semi-scales look better! Kirn photo.

"Our number one project for the coming year should be to get AMA to adopt the SCCA Slow Rat event. There are already two Sport Racing events proposed and we can cross-propose ours at the appropriate time. We feel that ours is a better way to go about running this type of event. The event is fairly easy to get into; cheap, safe, and can be flown off grass or asphalt. We can also fly three-man heats again.

Basic Rules: 300" wing, profile body, one wheel landing gear, up to a .40 engine, .014 solid or .105 braided lines (60 ft.) and ONE ounce tank. Fuel shutoffs, hot glove, and fast fills are optional.

"Why? The minimum wing keeps the models fairly large and draggy, same with a landing gear. The .40 limit allows use of the best engineered engines on the market. In over three years of using these basic rules, we haven't had trouble with broken lines or the need to regulate profile body specs (how long, wide, etc.). The one ounce limit on fuel tank size is the real equalizer; the latest X-40 isn't quite as competitive when good laps and restarts enter the picture. Cubic money doesn't buy you a sure win in this event.

"So what can you do with the plane once you've built it and broken in the engine? There's venturi size, engine modifications, fuels, plugs, props, and the old give-and-take of laps vs. speed. The magic numbers for a 140 lap race (10 miles) are; 47 laps for a two stopper, 35 for a three stopper, and 28 for a four pit race. Remember, 140 laps at 120mph takes 5 minutes. At 100mph it takes 6 minutes, or if you're going 100mph and make 3 pits, about the best you can hope for is 7 flat or high high sixes.

"We've found it best to have a standard fuel we can go back to if everything else goes wrong (for both Fast and Slow Rat) and it gives you a basis for comparison too. The Slow Rats seem to be terrifically sensitive to weather changes; a plane that has been going 105 mph for 37 laps will suddenly struggle to hit 100 and suffer a drop in laps. At a recent contest, we were happy to finish up with a 7:43, when in previous meets the plane has always run in the 6 minute bracket. So what to use for fuel? Our standard fuel:

K&B 40 – 8% Nitro, 20% Steen C, 72% Alky,

Tigre 35 – 5% Nitro, 20% Steen C, 75% Alky,

"Nasty Medicine:"

K/B 40 – 20% Nitro, 20% Isopropyl Alcohol, 20% Steen, 20% Isopropyl Benzene, 20% Methanol.

"Isopropyl alochol, benzene (benzol) cumene (isopropyl benzene) and even

Continued on page 73

Oil	Time	Cost Qt.	Stain	Mix with Nitro	Running & Restarts
K&B X2C	18.4	3.75		Good	Average
Ucon 1145	18.4	2.25		Good	Average
Ucon 650	18.5	1.50	x	Good	Rattles but starts
NPG	18.0	2.75		Good	Very Good
TC	18.0	1.95	x	Good	Good
Castor AA	18.0	2.50		to 45%	Good
Klotz Reg.	18.6	2.25		Good	Real Strange
Steen C	17.9	1.60	x	Good	Very Good
Castrol Synthetic	18.8	2.85		Poor	Nees lean setting

Joyce Margarido wipes down hubby Fred's B speed plane. How's that for service, libbers?! Joyce flies speed too! Kirn photo.

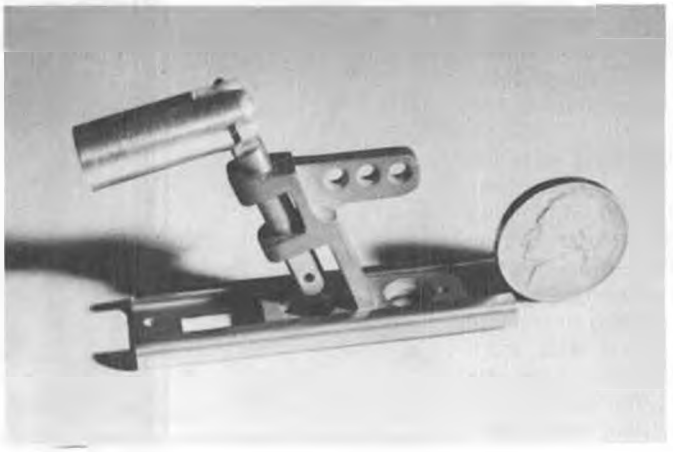
This "Sprite" was the second development in the evolution which culminated in the "Yankee."

STRICTLY SAIL

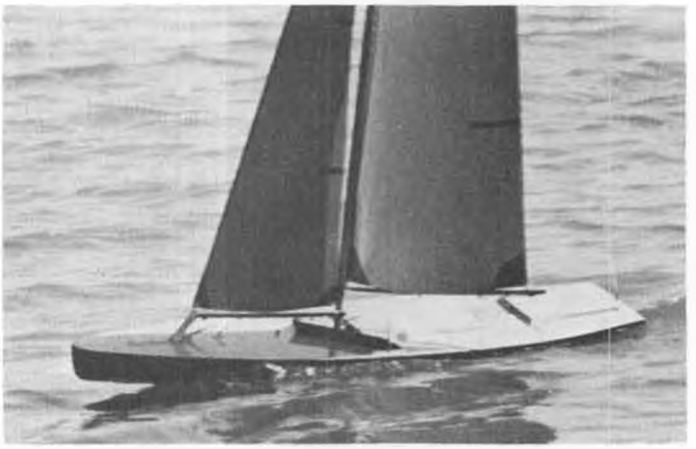
By ROD CARR

● With the intervening ride across the bumpy North Atlantic I find that I have slipped behind on the 50/800 YANKEE project. Hulls and keels are now available from Leisure Products, 6920 Braddock Road, Annandale, Virginia 22003. The cost is $50.00. I have the hull/keel combination on my work bench and will have the first chapter ready for you next month. We will be installing Futaba R/C gear (the two channel rig), a Harris Engineering Little Hercules winch, and the necessary deck structure, rudder mount and keel mount. I would suggest that you start work on the mast and spars you will need. The mast needs to be about 63 inches tall, either the two piece kind for a bolt-rope main luff, or a single piece for jack-line and dress hook attachment. Main boom should be 17 inches, and a jib club of 16 inches is needed. Make the spars as light as possible, consistent with good strength. Since we are in an off-season period, now would be a good time ot order the sails you will need from your sailmaker. The main has a 58 inch luff and a 16 inch foot. The jib has a 45.25 inch luff, 15.5 inch foot and a 42.5 inch leach.

Our aim through the whole YANKEE project is to build a 13-14 pound M-class vessel which will be a light air dream, yet has a hull form which will allow it to take 20 knot gusts without lying down on the job. Having sailed the prototype at the 50/800 ACCR to a tie for 6th place, I can attest to its ability to do both. The fiberglass hull/keel weighs in at about 3 pounds; add 7 pounds of lead ballast and you are left with 3-4 pounds for deck, sail rig, R/C gear and



J. G. Products new radial jib fitting. Other items are planned.



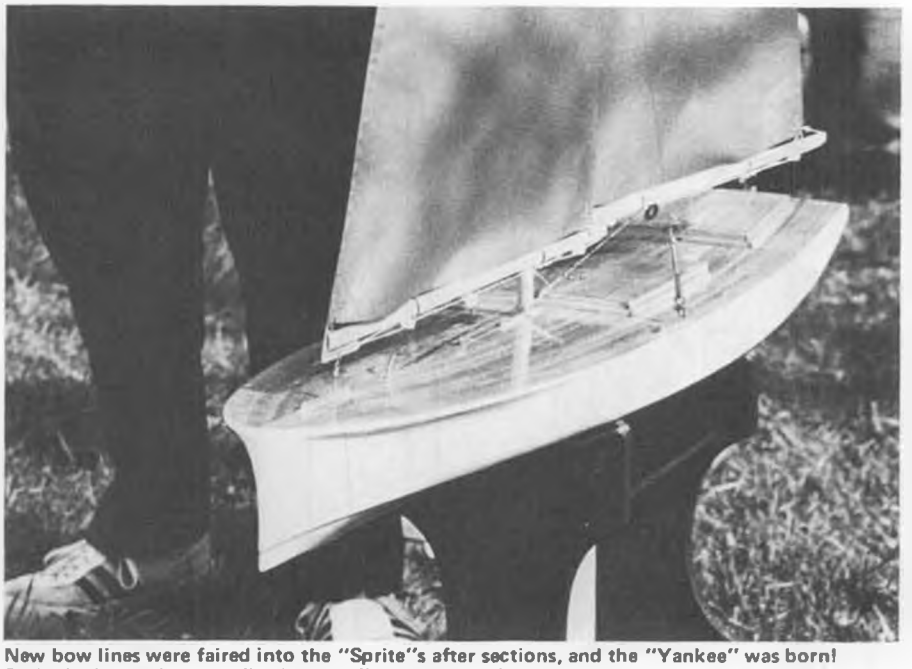
The "Sprite"s light weight produced a boat which had unbelievable acceleration.

winch plus batteries. It can and will be done; and using unmodified, stock, easily available components,

The YANKEE is the third generation of a design series by Chet Purdy of Germantown, Maryland. The second generation SPRITE showed astonishing bursts of speed during the 1973 season. As you can see in the photos, she had a bow of U-shaped sections, much like the BOOMERANG. This bow had a tendency to bury on down wind runs and was modified in the YANKEE to the plumb bowed, flared deckline configuration. The extension of the foot of the bow forward has made the bow quite a benefit when beating to windward while heeled well over. It seems to push the boat up to weather and make her pointing ability a joy to behold. Each generation of the YANKEE series has done well. The progenitor sailed in the 1971 Mid-Atlantic Sailing Regatta held in Bristol, Pa. She won the event handily. The SPRITE version won the first 50/-800 series our club sponsored in 1973. And as mentioned, the YANKEE did well in the 50/800 ACCR this year, except for the handicap of the skipper who was sailing it, yours truly. With the 1975 50/800 ACCR set for Washington, D.C., in August of that year, I imagine we'll see plenty of excitement on the pond.

I'm happy to report that AMYA has been lucky enough to grant Sanctioned Club Status to the MARBLEHEAD MODEL YACHT CLUB. This club was formed in 1925 and was the club which gave birth to the 50/800, or Marblehead Class, which has become so popular. The club has 1974 National Champion Standley Goodwin (designer of the WARRIOR) as head man. He can be reached at 33 Norman Street, Marblehead, Mass. 01945. The club has already scheduled an October 5, 1975 regatta for the Campbell Cup. That is one I don't intend to miss.

Almost simultaneously, sanction was granted to the CENTRAL PARK MODEL YACHT CLUB with Larry Goodrich of 295 Henry Street, Brooklyn, N.Y. 11201, as Commodore. All you skippers who have been wanting to go to the Big Apple can take your boat along now, and have a little sailing too. Both CENTRAL PARK and MARBLEHEAD clubs are also members of MYRAA, which is the organization which sails boats by vane gear. Apparently AMYA proved its ability in the organization and promotion of R/C sailing to these long established clubs. I'm sure that we will all gain by making the acquaintance of these skippers.



New bow lines were faired into the "Sprite"s after sections, and the "Yankee" was born! Sprite had a tendency to "stub its toe" on downwind runs.

A distinct possibility exists of a club forming in the Seattle area. We recently had a visit with Ralph Gibbons of 19849 Marine View Drive, S.W., Seattle, Wa. 98166 who was staying with relatives in our area. He said that a number of AMYA members and other skippers were beginning to assemble. With such sites as Green Lake in that city, it seems natural that miniature sails will soon be seen racing round the buoys.

MODEL BUILDER's intrepid editor has offered to provide a 15 percent dis-

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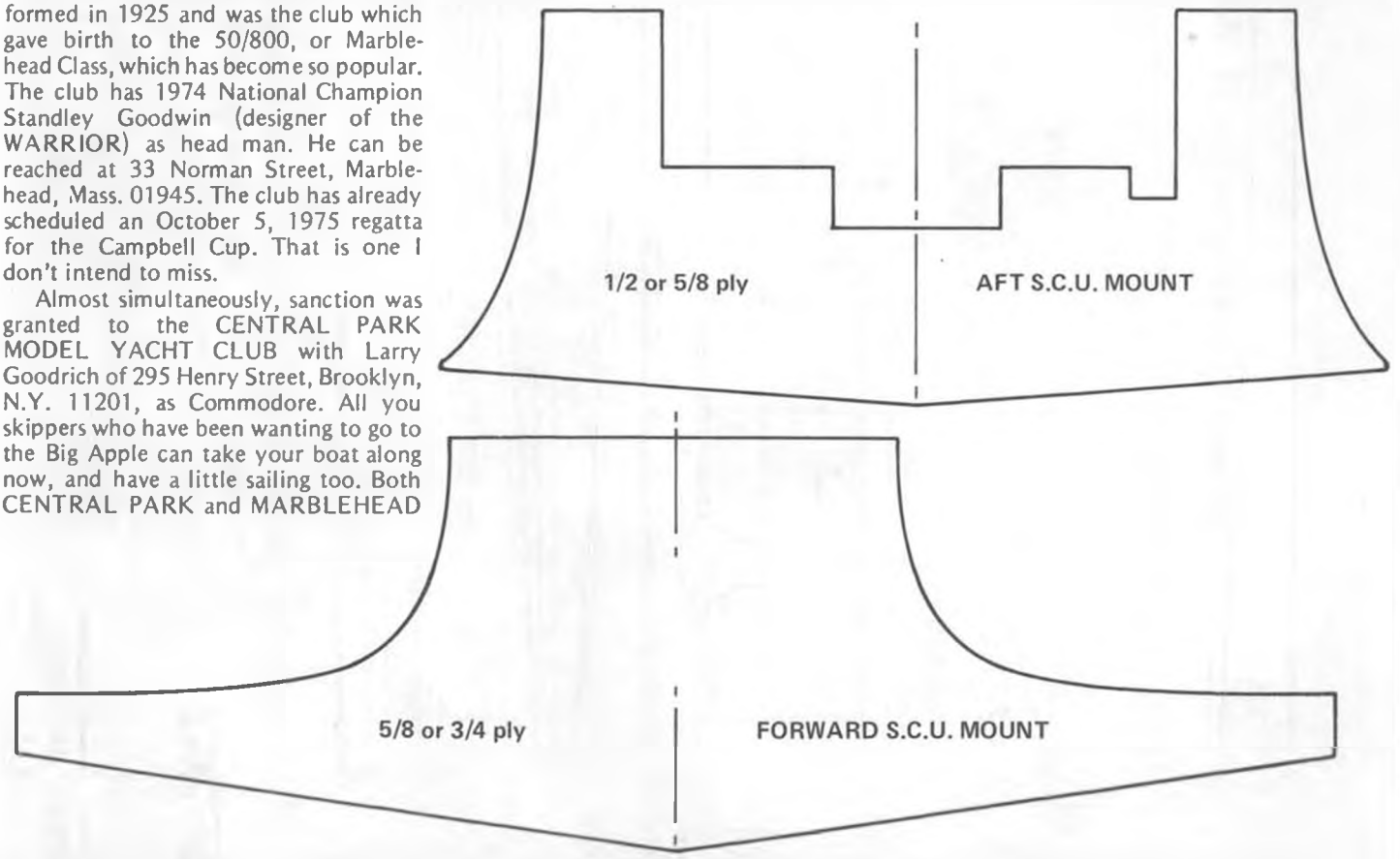
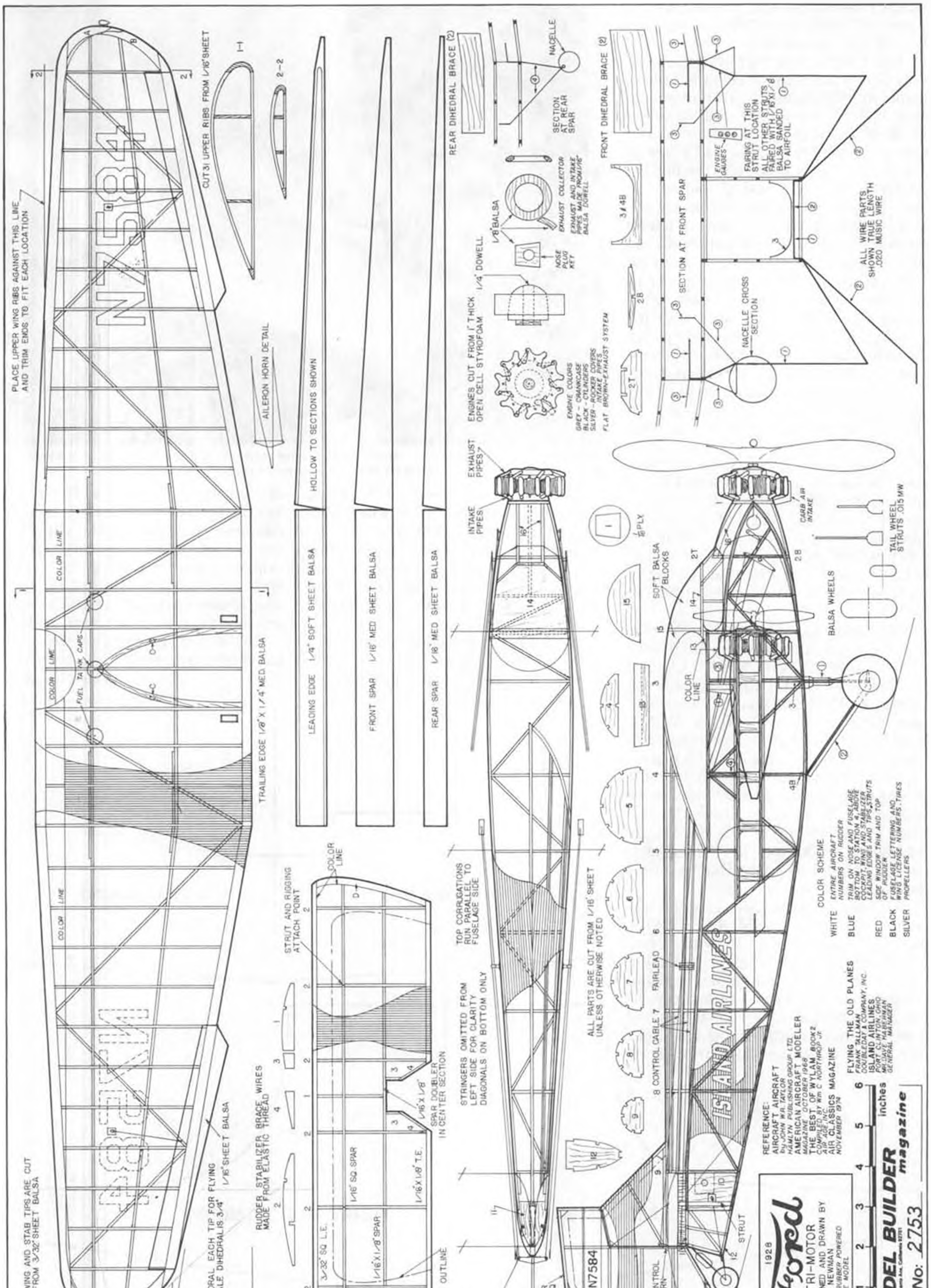


These patterns go with next month's article on building the "Yankee", however, there are so many illustrations with the next article that we are putting these in while we have the space. If you're gonna build one, you can trace these off, cut out the parts, and be that much ahead!


1928
Ford
TRI-MOTOR
DESIGNED AND DRAWN BY
TEX NEWMAN
32 1/2" RUBBER POWERED
SCALE MODEL
MODEL BUILDER
magazine
Plan No: 2753
inches
REFERENCE:
AIRCRAFT AIRCRAFT
AMERICAN AIRCRAFT MODELER
THE BEST OF WYLAM BOOK 2
AIR CLASSICS MAGAZINE
FLYING THE OLD PLANES
ISLAND AIRLINES
COLOR SCHEME
WHITE
BLUE
RED
BLACK
SILVER
N7584
ISLAND AIRLINES
PLACE UPPER WING RIBS AGAINST THIS LINE AND TRIM ENDS TO FIT EACH LOCATION
CUT 3 UPPER RIBS FROM 1/16" SHEET
WING AND STAB TIPS ARE CUT FROM 3/32" SHEET BALSA
2" DIHEDRAL EACH TIP FOR FLYING SCALE DIHEDRAL IS 3/4"
1/16" SHEET BALSA
AILERON HORN DETAIL
HOLLOW TO SECTIONS SHOWN
LEADING EDGE 1/4" SOFT SHEET BALSA
FRONT SPAR 1/16" MED SHEET BALSA
REAR SPAR 1/16" MED SHEET BALSA
TRAILING EDGE 1/8" X 1/4" MED BALSA
FUEL TANK CAPS
COLOR LINE
REAR DIHEDRAL BRACE (2)
FRONT DIHEDRAL BRACE (2)
SECTION AT REAR SPAR
NACELLE
SECTION AT FRONT SPAR
NACELLE CROSS SECTION
ENGINE GAGES
FAIRING AT THIS STRUT LOCATION
ALL OTHER STRUTS FAIRED WITH 1/16" X 1/4" BALSA SANDED TO AIRFOIL
ALL WIRE PARTS SHOWN TRUE LENGTH .020 MUSIC WIRE
ENGINES CUT FROM 1" THICK OPEN CELL STYROFOAM
1/4" DOWELL
1/8" BALSA
NOSE PLUG KEY
EXHAUST PIPES
INTAKE PIPES
1/16" PLY
SOFT BALSA BLOCKS
BALSA WHEELS
TAIL WHEEL STRUTS .015 MW
CARB AIR INTAKE
TOP CORRUGATIONS RUN PARALLEL TO FUSELAGE SIDE
STRINGERS OMITTED FROM LEFT SIDE FOR CLARITY DIAGONALS ON BOTTOM ONLY
ALL PARTS ARE CUT FROM 1/16" SHEET UNLESS OTHERWISE NOTED
FAIRLEAD
8 CONTROL CABLE 7
RUDDER STABILIZER BRACE WIRES MADE FROM ELASTIC THREAD
STRUT AND RIGGING ATTACH POINT
3/32" SQ L.E.
1/16" SQ SPAR
1/16" X 1/8" SPAR
1/16" X 1/8" T.E.
SPAR DOUBLER IN CENTER SECTION
SCALE OUTLINE
RUDDER 1/16" SQ
CONTROL HORN
STRUT

"Mam, either get your dog outta the co-pilot's seat, or fasten his safety belt, we've got to get the show on the road!"

The model "Tin Goose" has made outdoor flights of a minute in calm air. Outboard plastic props free-wheel like mad!

PHOTOS BY AUTHOR

FORD TRI-MOTOR

By TEX NEWMAN

A super-lightweight rubber powered model of the famous "Tin Goose." Outdoor calm air performance is in the one minute bracket. Not a one-weekend project, but well worth the effort needed.

● "The Shortest Airline In the World," says the schedule of Island Airlines. First flight of the day at 9:00 A.M. to Put-In Bay on South Bass Island, Middle Bass Island, North Bass Island, and a stop at Put-In Bay on the return flight to Port Clinton. Sounds exciting, doesn't it? Especially in a 1928 Ford Tri-Motor. The round trip covers little more than twenty air miles and takes about an hour depending on the cargo to be loaded. Flights are also scheduled at 11:45 A.M., 2:15 and 4:00 P.M. Mid-day flights include a side trip of an added ten miles to Kelly's Island. Port Clinton, Ohio is located on the south shore of Lake Erie, midway between Toledo and Cleveland. Island Airways is the only commercial airline in the United States flying the Ford in scheduled service today.

The Ford Tri-Motor has served around the world. Admiral Byrd flew a Ford over the South Pole in 1929. Today, Island Airline's Ford Tri-Motor N7584 is still earning an honest living, flying the skies less than seventy five miles from its birthplace in Dearborn, Michigan. Our subject N7584 was built in 1928, and carries the serial number 4-AT-B-38.

To the few people living on the Bass Islands, the Ford is a welcome sight indeed, as it serves them year 'round! During the six winter months, it is the sole means of transportation to the mainland. Food, mail, and other necessities of life are brought in by Ford. The school kids rate a round trip flight five days a week. Who would want to play hookey and go fishing instead? Doctor's appointments, shopping trips, or to a movie . . . take the Ford.

Last year, five families moved on or off the islands. With the seats removed, the Ford took over where Bekins couldn't go, carrying suitcases, bicycles, the washer, drier, stove, refrigerator, and every thing else that could be put through the door.

Well, if you are at all like me, it will be a long time before you have an opportunity to fly in the Island Airlines Ford Tri-Motor but, since we are Model Builders . . . "There is a Ford In Your Future." Quick . . . send off for a set of full size plans, round up some balsa, and let's get started.

WING

Cut the spars and carve and hollow the leading edge according to the plan. Begin assembly by pinning the leading and trailing edges in place. Add the tip pieces. The diagonal braces are laid down on the plan first, followed by the bottom strip rib pieces. Both spars are now placed on top of these 1/16 sq. strips. The upper strip ribs, cut from 1/16 sheet, are laid in position with the front ends touching the reference line shown on the right wing plan and then cut to fit at each rib location. Block the tips up to the proper dihedral angle and glue to the center section. Do not in-

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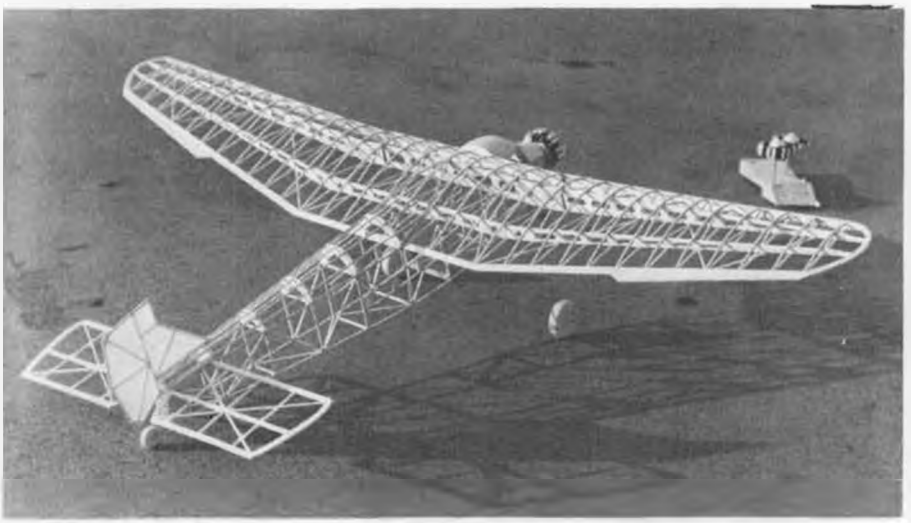
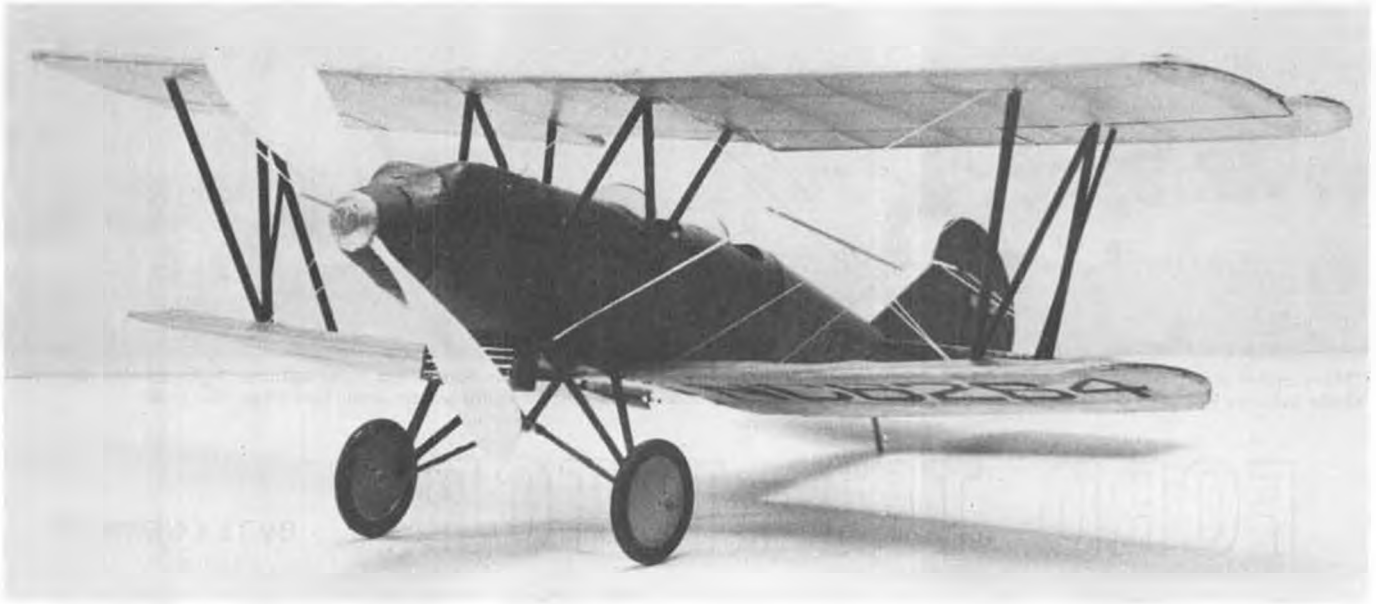


Not exactly a weekend project, but a good way to get your mind off of our present economic situation without spending much money. Not difficult, just "tejious!"

Tex advises that if you have a tendency to sneeze while building, try something else!

PHOTOS BY TED BALL



Rolfe Gregory, Potomac, Maryland, built this peanut Travelair 2000 (March '73 MB) and flew it at the 1974 Nationals. Photo was taken by Hurst "Flyline Models" Bowers.

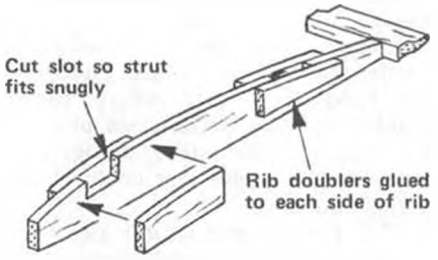
FREE FLIGHT SCALE

By FERNANDO RAMOS

● One area of construction that I thought may prove interesting for scale modelers concerns the various ways wing struts and interplane struts can be attached. Some of the advantages and disadvantages particular to each method will be discussed, as well.

Since Peanut models are the smallest and the easiest for strut installation, they will be discussed first. One primary consideration before covering a Peanut is to add small triangular gussets to both the fuselage and the wings wherever the struts will attach. When the model is actually ready to have the wing struts installed, cut away a little of the tissue covering the gussets so that the glue attachment is to the wood and not the tissue. (It is amazing how many times I have seen wing struts attached directly onto the tissue, with the modeler expecting the struts to hold!) After cutting away the tissue, take a pin, poke a few holes into the gusset at the exact location where the struts will be attached, and also into ends of the individual struts, so that the glue can be forced into the holes, creating a "dowel-effect." This gives added strength to the joint. And with Peanuts, every little bit helps.

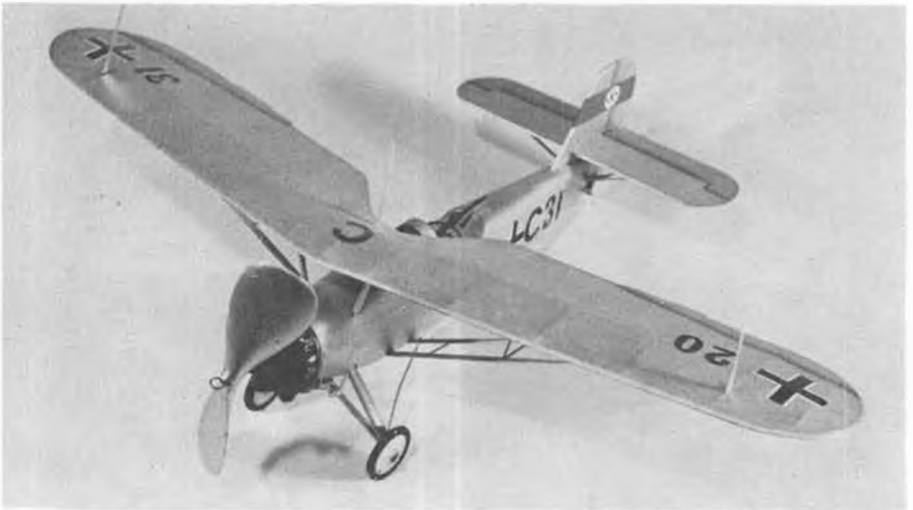
Installing interplane struts on biplane Peanuts can be highly simplified by making small rectangular notches, the fore and aft width of the interplanes, in both lower and upper wing ribs where the struts attach. Then glue small pieces of card stock or balsawood to either side of the notch. When the model is covered, you can cut away the tissue over the notch. You will have a perfect slot for the interplane to slip into. If you are careful to make each notch the same depth, you will have no difficulty in installing the interplanes accurately. A good source of material for making interplanes for Peanuts is model railroad basswood, or Walt Mooney's favorite, 1/64 plywood. The latter works particularly well on N-type struts. They are strong, yet flexible. This system can be used on larger size, one-piece rubber models and light gas models as well, except larger stocks would have to be used for the struts.



On rubber models larger than Peanut, but smaller than Jumbo, I prefer to use contact cement for attaching wing struts. I personally feel that the contact cement gives more flexibility in the event of a hard landing. One good contact cement that I have used, that is not stringy, is Pliobond.

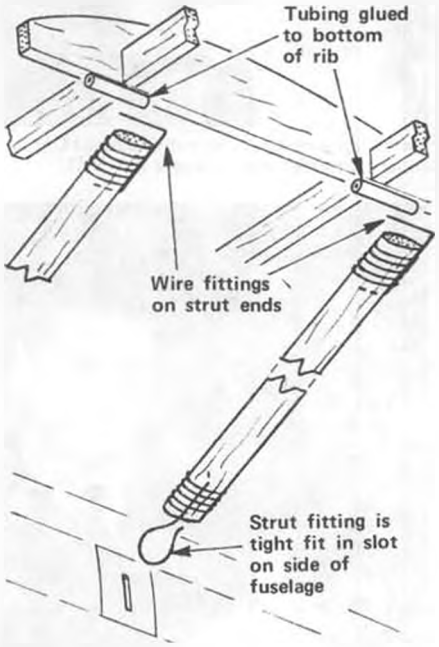
For large rubber biplanes, the notch in the wing rib is still a pretty sound way to go, but provisions for flying wire attach points should be made. Wrapping thread around the cabanes and interplanes is all right for a Peanut, but on larger models, it just doesn't look good. (Practically a whole article can be devoted to making flying wire attach fittings, and this will be done in another issue.)

Another approach for wing struts on high-wing monoplanes is a system used by the French. That is, the wing struts



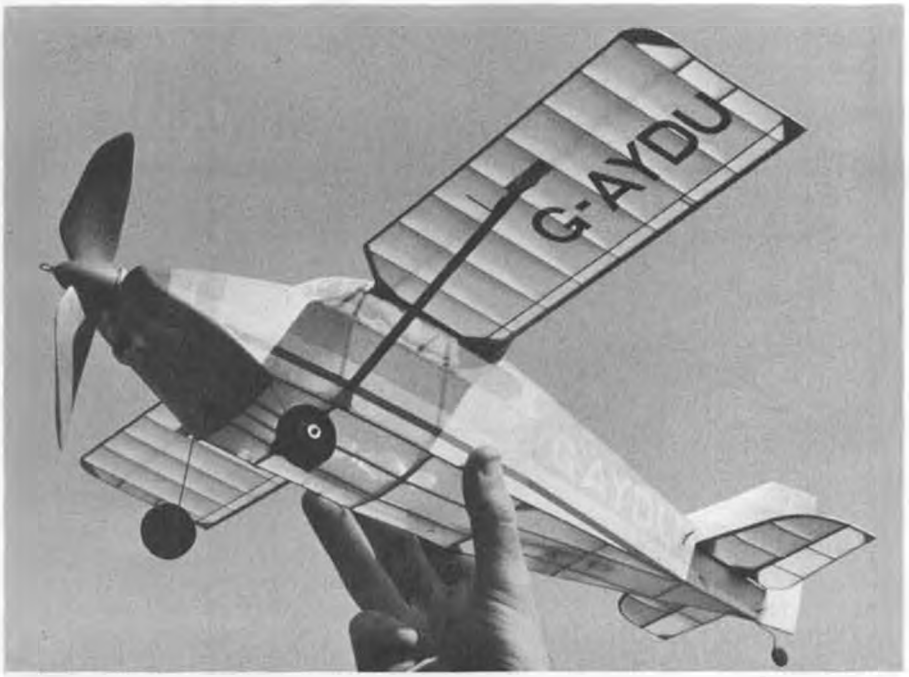
C. W. "Butch" Hadland, manager of the 1974 British indoor team, built this beautiful 16-1/2" span (1/2" scale) Heinkel 46, from Doug McHard plans in Aeromodeller.

are held onto the wings by the rather conventional way of using small tubes attached to the proper wing rib. On the end of the upper portion of the struts there is an "L" shaped wire that fits into the tubes. At the fuselage attach point, there is a substantial gusset with a small vertical groove. The wire at the lower end of the wing strut has a hook shape, just like the kind you use for a rubber motor. The hook slips into the groove and is held by friction. On impact the hook merely slides out of the groove, saving the struts and possibly the wing, from damage. This method could also be used on light gas powered models.

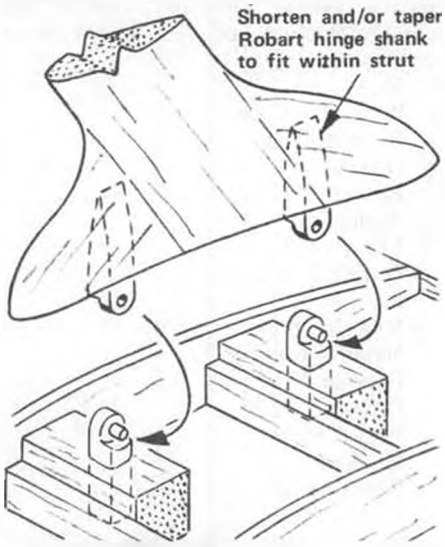


Now, the best system, in my opinion, for Jumbo rubber and gas powered models is using the Robart R/C hinge. This hinge can be used for both wing struts and interplane struts. Wherever there is a strut point, add a small block of wood with the appropriate size hole to accept half of the hinge. Carefully pull the hinge apart and glue (Titebond works great!) one half of it into the hole. The hinge has a ball-like fixture on one half, with a matching socket on the other half. I prefer to insert the socket end into the fuselage and wing, with the ball end on the struts. This method makes a neat and simple installation. It also provides a "knock-off" strut.

Another reason I like using this system is that, typically, on real aircraft, neither wing struts nor interplane struts attach to a rib. Often, on a three-view, it appears this way, but it isn't so. The strut attach point is usually inboard of a wing rib, mounted securely on the spar. With a model, it is a simple task to place a small block of wood between two ribs so that the strut can be located accurately. Keep the block just below the surface of the covering so that it doesn't show. The block can also provide an anchor point for any flying wire attach fittings.



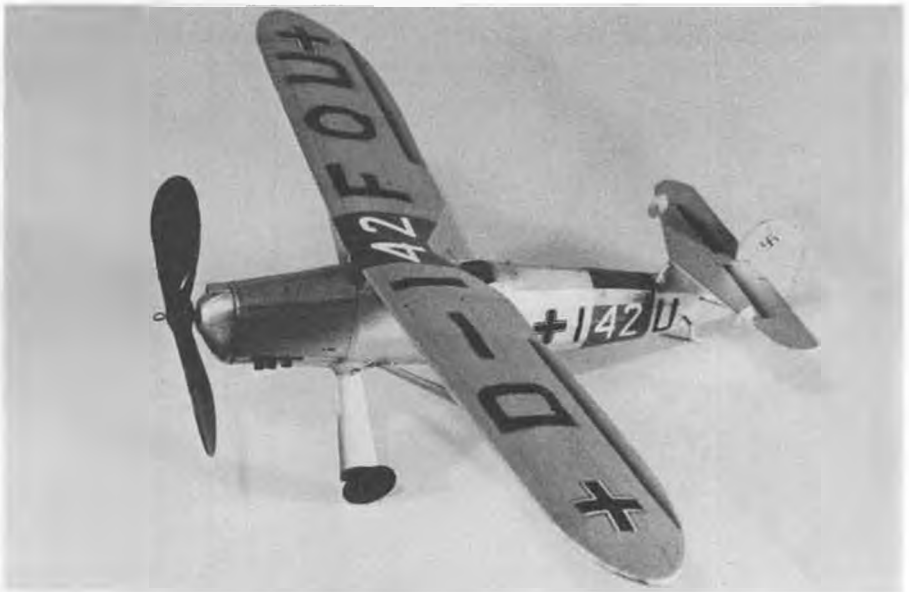
Wakefield flier Charlie Learoyd built this Wittman Tailwind from Aeromodeller 3-views. Lump of clay is not to scale! Excellent photo by Chris Clemens, age 15.



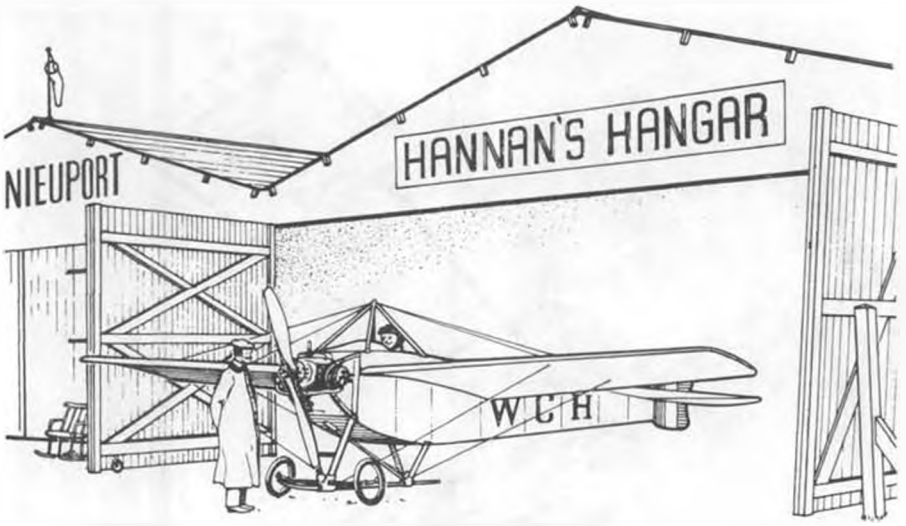
One of the easiest methods for attaching interplanes is to secure a 1/16 O.D. aluminum tube into the wing so that it rises a hair above the surface of the wing. The struts have a small length of wire at each end that plugs into the holes. Tension between the two wings is usually enough to keep them smug, or if wire bracing is used, it should provide the necessary tension to keep the interplanes in place. The one big draw-back is that they are not knock-off, and when jarred loose, they really do a job of poking holes in your prize covering and paint job.

The British have another approach which is used quite a bit on biplanes. Wherever there is a strut location a small

Continued on page 76



Another beauty by Butch Hadland, 1/2" scale Foche-Wulf FW 56 Stosser, 17-1/4" span. Wing covered with 1/64 to simulate stressed ply skin. Flies 40-45 secs. from takeoff.



. . . this month's slice of aeronatical pie . . .

PREMIER CONCOURS DE MAQUETTES CATEGORIE CACAHUETTES GRANDISSIME

Or, to put it another way, the first Peanut Scale contest ever held in France was an outstanding success! Although a strike by the postal people prevented participation by a number of intended entrants, including several California Flightmasters, more than thirty models did appear. This is truly remarkable, when it is recalled that most of the early U.S. Peanut events drew only a handful of entrants. Even more amazing is the fact that the French interest in the Peanut phenomenon largely resulted from the pioneering efforts of one man, Jacques Pouliquen.

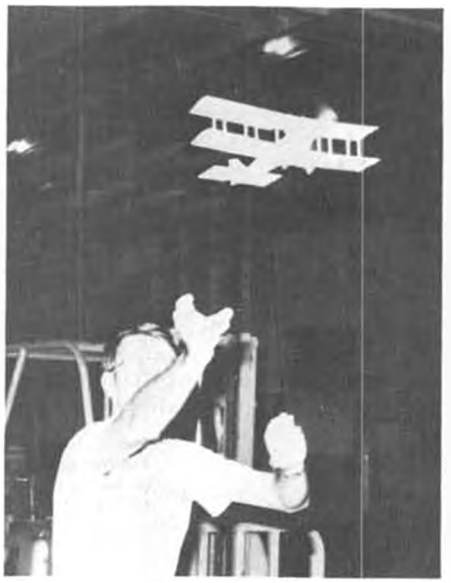
MODEL BUILDER's own Walt Mooney sent a Peanut to be proxy-flown in the Gallic contest, and we are pleased to learn that his Renard R 17 was judged the best entry in static judging. Overall placement of the model was 5th. Congratulations, Walt! Congratulations are also in order for Walt's "French Connection" J. Laruelies, who handled the proxy-flying.

Winner of the affair was Desire Giauffret, while second place went to Jacques Pouliquen, and third spot was secured by Jean Louis Rouquier. Judges were distinguished enthusiasts E. Fillon, J.M. Blaizot, and C. Convert. A list of the models entered offers some idea of the terrific variety on hand; one of the chief attractions of the Peanut Scale concept:

SE.5A
Waterman Racer
Pietenpol (3)
D.H. 6
Renard R 17 (2)
Andreason (4)
Evans VP 2
Druine Turbulent (2)
Piper J3 (3)
Miles M 18 (4)
Nesmith Cougar (3)
Farman 231
Bede 4
Pilatus Porter
Kunkadlo
Pitts Special
Kellner Bech.

(note the high percentage of Model Builder and Peck-Polymer designs)

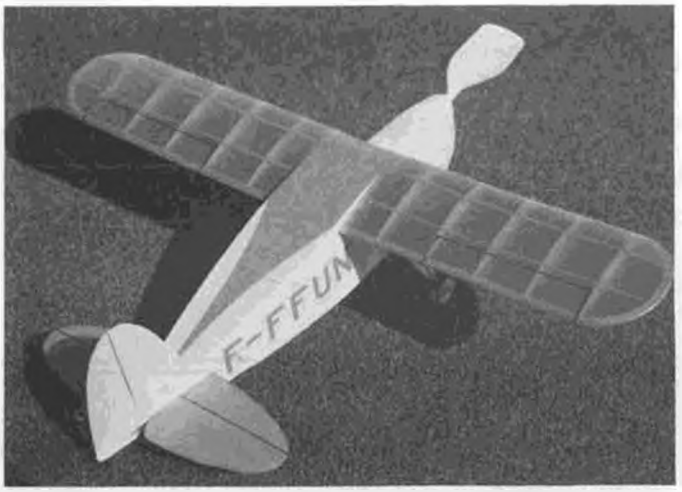
Continued on page 66



Lieut. (jg) Jan Jacobs launches peanut DH-6 aboard aircraft carrier Ranger (CVA-61).

Milan Kacha, Czechoslovakia, winds peanut Luton Minor. Many Czech modelers interested in peanuts and are entering MB contest.

Milan built this Sommer Monoplane from Hannan plans. Weighs 15 grams and features FH spoked wheels.



Super-simple lines and construction of "La Cigale" are evident in this overhead photo. Fictitious license is very appropriate.

Imagine that fat fuselage in Jumbo scale! Prop is cut-down Testors plastic. They still won't make them available separately!

PHOTOS BY FUDO TAKAGI

La Cigale... a French Peanut!!

La Société des Avions Paul Aubert présente "La Cigale." . . . What? . . . You don't parlez Francais? Well, how about Paul Aubert's "Grasshopper?" . . . . Just shut up and build!! By WALT MOONEY.

● This is a simple little peanut scale model. The original airplane had a very square fuselage and a large horizontal tail. It seemed like a good design for a model that could be expected to fly with scale tail surfaces. It was built with a sheet balsa fuselage and sheet balsa tail surfaces to simplify construction. Only the wings are of built up stick-and-tissue. The only intentional deviation from exact scale was an increase in dihedral angle . . . the real plane had no observable dihedral.

Alas, the model did not fly right off the drawing board. In fact, as originally built, it would hardly fly indoors at all! This is pretty bad for the old Peanut Vendor's reputation. It simply would not turn to the left, and spiraled in if it was turned to the right tight enough to miss the walls of the local basketball court. When I say it would not turn left, I mean it would not turn left with half of the original scale tail turned 30 degrees. Who ever heard of *that* stubborn a model?

So it was taken home and the problem mulled over a bit. The result . . . a larger vertical tail as shown on the plans. It is now quite happy turning left. I suspect that a decrease in dihedral angle might have also corrected its resistance to a left turn, but increasing the size of the vertical was lots easier than trying to get the wings off and put them back on with less dihedral, and besides, the spiral diving in right turns was a little worrisome. *(Modelers could tack wings on at less dihedral and try scale rudder before going to the larger rudder. wcn.)*

Construction of the model is simple enough, so not much need be written about it. The nose end is added to the basic fuselage structure after the sides have been assembled on the formers, and the bottom skins attached. Right at the front of the sides, 1/16 by 1/8 balsa reinforcing sticks are cemented inside and crosspieces are added to make a squarish frame just behind the nose block. Cement the side cowls to the sides and the bottom cowl block to the bottom skin. Rough carve the top cowl block and hollow it out, then cement it in place. Temporarily cement the nose block in place, then carve and sand the nose to final contours.

Don't forget the side doublers on the inside where the aft motor peg penetrates the fuselage. The grain on these pieces must go up and down, that is, cross grain to the fuselage. Add a skin of cement to the inside of them as a further reinforcement to help take motor loads. Note also the round hole that should be left open on the bottom in the area of the aft peg. It is dark inside of sheet balsa fuselages, and the hole makes installing rubber motors much easier.

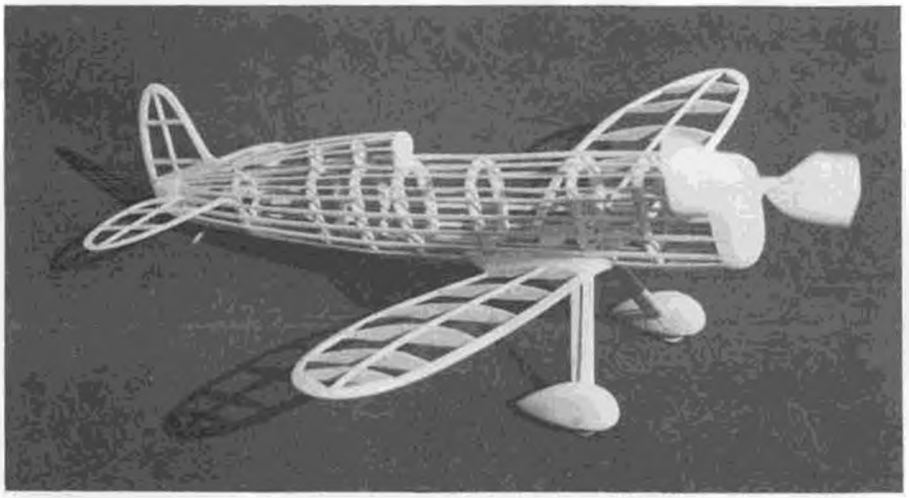
The landing gear wire is inserted through a slit in the bottom skin just forward of Former "B," and cemented in place. Use a sliver of balsa to fill the slit.

Red tissue was used to cover the wings, and was also used to color the top of the fuselage and the top and bottom of the horizontal tail. It was also used to make the license letters. French registration letters always start with F, and I didn't know what the real registrations should be. However, modeling is lots of FUN, so . . .

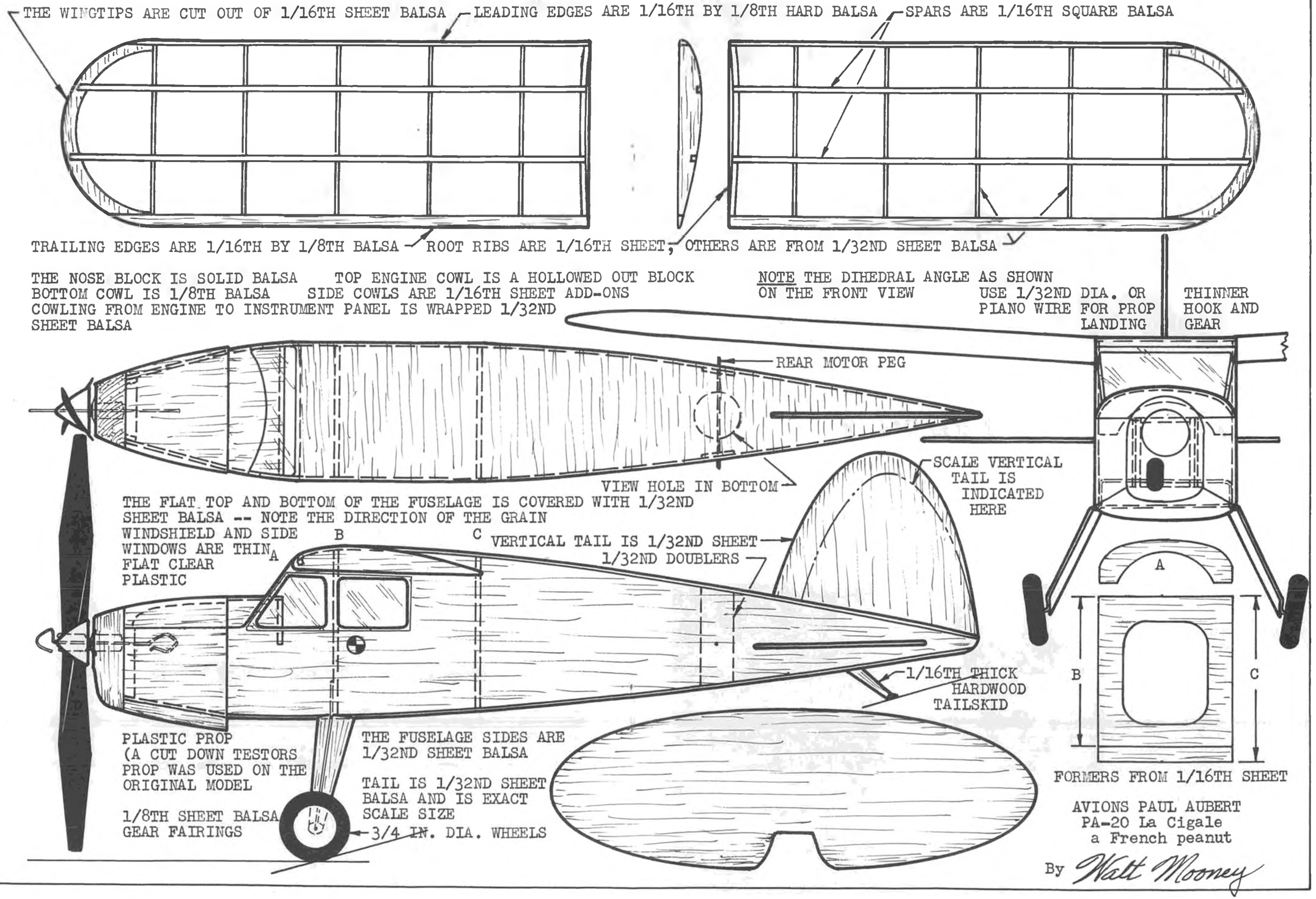
The wheels are 3/4 inch diameter hardwood, made by Marlow Engineering, 6850 Vineland, North Hollywood, Ca. 91605, which also makes kits and other interesting accessories. The catalog is 20¢.

The thrust bearing is a nylon one,

Continued on page 75

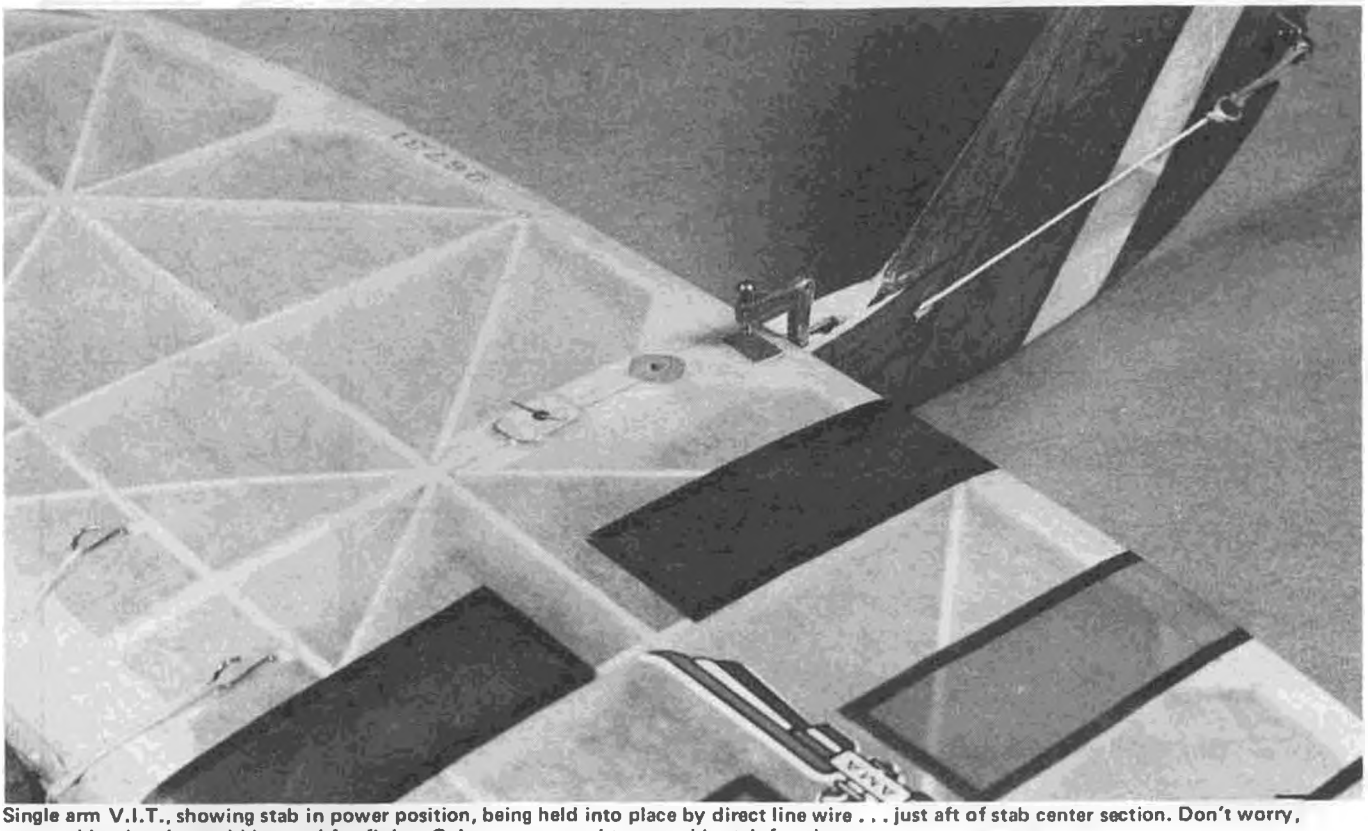


Next month's project, the relatively unknown Gorden Israel "Redhead" racer. The model was built by Walt Mooney, but wait 'til you see where the plans and text came from!



AVIONS PAUL AUBERT
PA-20 La Cigale
a French peanut

By Walt Mooney



Single arm V.I.T., showing stab in power position, being held into place by direct line wire . . . just aft of stab center section. Don't worry, more rubber bands would be used for flying. Only one was used to assemble stab for photo.

FREE FLIGHT

By BOB STALICK

● Got quite a bit of material to convey this month . . . what with the Indoor season underway and the outdoor season now trying to awaken itself from the winter doldrums, so let's get going.

MYSTERY MODEL February

Here's a goody for all of you who keep writing to tell me that the Mystery Model is just too easy. In keeping with the indoor theme, here's an ornithopter that was originally published in a national magazine in the 50's. Name the model and you win a one year subscription to MODEL BUILDER . . . and these subscriptions are worth even more in '75. First one with the correct answer wins.

DARNED GOOD AIRFOILS:

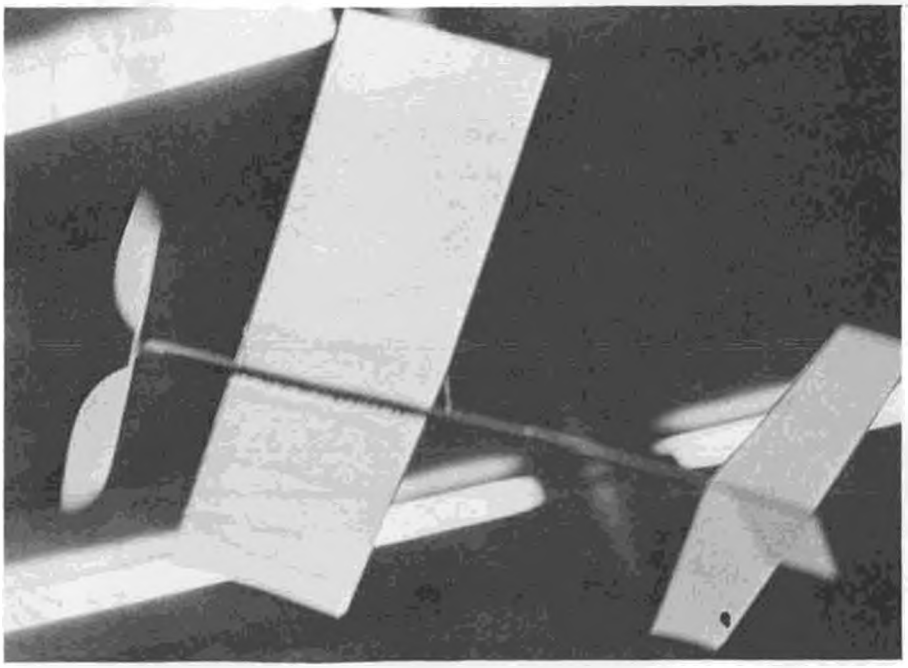
Lucky Lindy

The Lucky Lindy was designed by Larry Conover, for his FAI power model of the same name. This section has been used by numerous other designers . . . notably Ralph Prey, who chose it for his successful Dragstar series. Several Italian FAI flyers, who followed Larry's lead, also chose it for their designs. The Lindy foil is one of the first of the fast flatbottom sections which began the current trend in FAI power. Larry's original was turbulated at about 4%, 8%, 15% and 24%. The stab section used was an identical section thinned slightly. For contemporary use, this section could be slimmed down to about 8.5% thick in order to increase its climb speed. Although the section design is now around 15 years old or so, it's one which shouldn't be overlooked in AMA Gas events . . . just as designed, or thinned down for FAI Power.

PLAN OF THE MONTH:

Philadelphia Penny

Penny plane is an event which was conceived to allow beginners to get into Indoor Modeling. Even though the state of the Penny-Plane art has advanced some (and perhaps advanced is not the correct word), there is still a large amount of experimentation taking place in the event. This month's plan, by Dick Hardcastle, via "Indoor News and Views," is an excellent example of this experimentation. This is a model worth



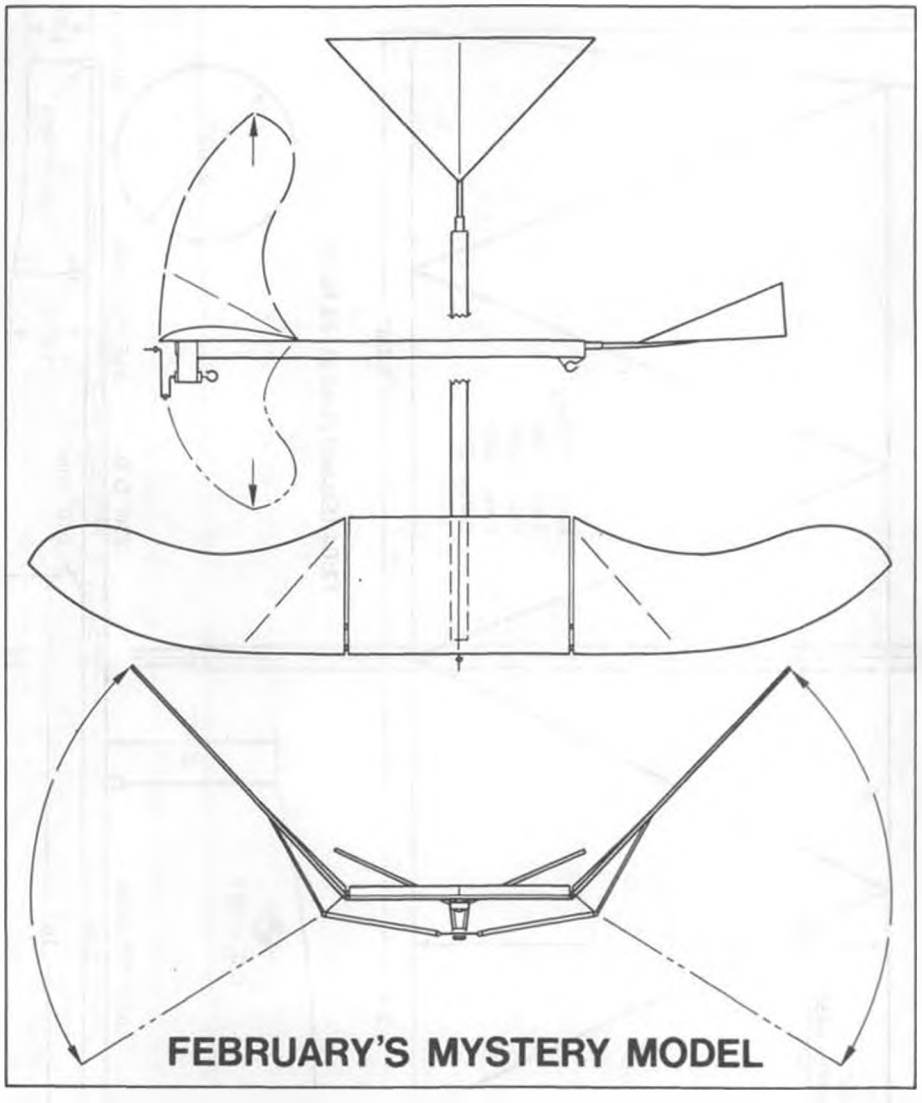
Penny Plane climbing toward the lights. Model built by Bud Schulz.

building and flying . . . even for newcomers. It is a possible stepping stone into the more advanced forms of indoor duration. And by the way, don't worry about it weighing less than a penny (one of the rules), I have yet to build one which has come out this light. Here's what Dick has to say about his ships:

"My Philadelphia Penny Plane now has wings with chords of 5-1/2, 6, 7 and 8 inches. I've also built stabs with chords from 3 to 5-1/2 inches. The model can fly with any combination of the above . . . at pennyweight.

"I would like to say the combination flown at the Nats was chosen after exhaustive tests proved it best for the site. The truth is that a collision on the first test flight broke the 4-1/2 inch stab. While the repairs were drying, I sent up a test flight with a 6-1/2 inch wing and 3 inch tail. The first flight did 10:45, so I didn't change (Once again science and technology win out over luck and superstition . . . b.s.). Official flights followed: 11:14, 11:17, 11:36, 12.04.8. I did not change wings, stabs, CG, or rubber . . . all of which were available.

After the 12 minute flight, a test flight of 12:27 was made on different rubber. The last official was 'all out' and hung up at 2:35. The Philadelphia Penny is truly a flying lab. With additional paper sockets along the stick and boom, wings and stabs can be changed to fly the model. Incidence can be changed on front and rear surfaces, and the rudder can be turned. A sliding ballast can be moved to adjust CG. Unfortunately, the only time I fly the model is at the Nats, when time is short."



FEBRUARY'S MYSTERY MODEL

NOTE: MYSTERY MODEL winners for Nov. & Dec. '74, and Jan. '75 will be listed next month.

To follow up on the whole scene of Indoor Modeling, I strongly urge that you join the National Indoor Model Airplane Society . . . drop a letter to NIMAS at Box 545, Richardson, TX. 75080. Send along a check for $4.00 and make both you and NIMAS happy. You'll also get a one-year subscription to "Indoor News and Views."

While you are at it, there are several other suppliers of information . . . and more specifically, supplies for indoor modelers . . . try these out while you are at it: Micro-X Products, P.O. Box 1063, Lorain, OH. 44055. Everything the indoor modeler could want is carried there . . . including complete kits of excellent designs, from beginner on up. For limited supplies for indoor duration models, but an excellent source of rubber power strip and other goodies, try Peck-Polymers, P.O. Box 2498, La Mesa, CA. 92041.

HINTS AND TIPS AND OTHER STUFF

1. You Vill Schrink . . . But not too mutsch! How about water shrinking light structures, such as indoor models . . . I've gone the gamut . . . from the usual soak-'em down approach, which produces an unusually shaped and colored potato-chip, to not water shrinking at all. Now, Jim Scarborough suggests using rubbing alcohol to shrink tissue *(Fernando also suggested this in a previous "Free Flight Scale" column, wcn).* It's also ready for doping 10 minutes later . . . should you want to warp your model by doping it! If you get a warp, try taking it out by using the heat from a toaster. You can also get the bathroom good and steamy, then hang in there until the tissue gets slightly damp and loose. Hold in an opposite warp until everything cools off. It works.

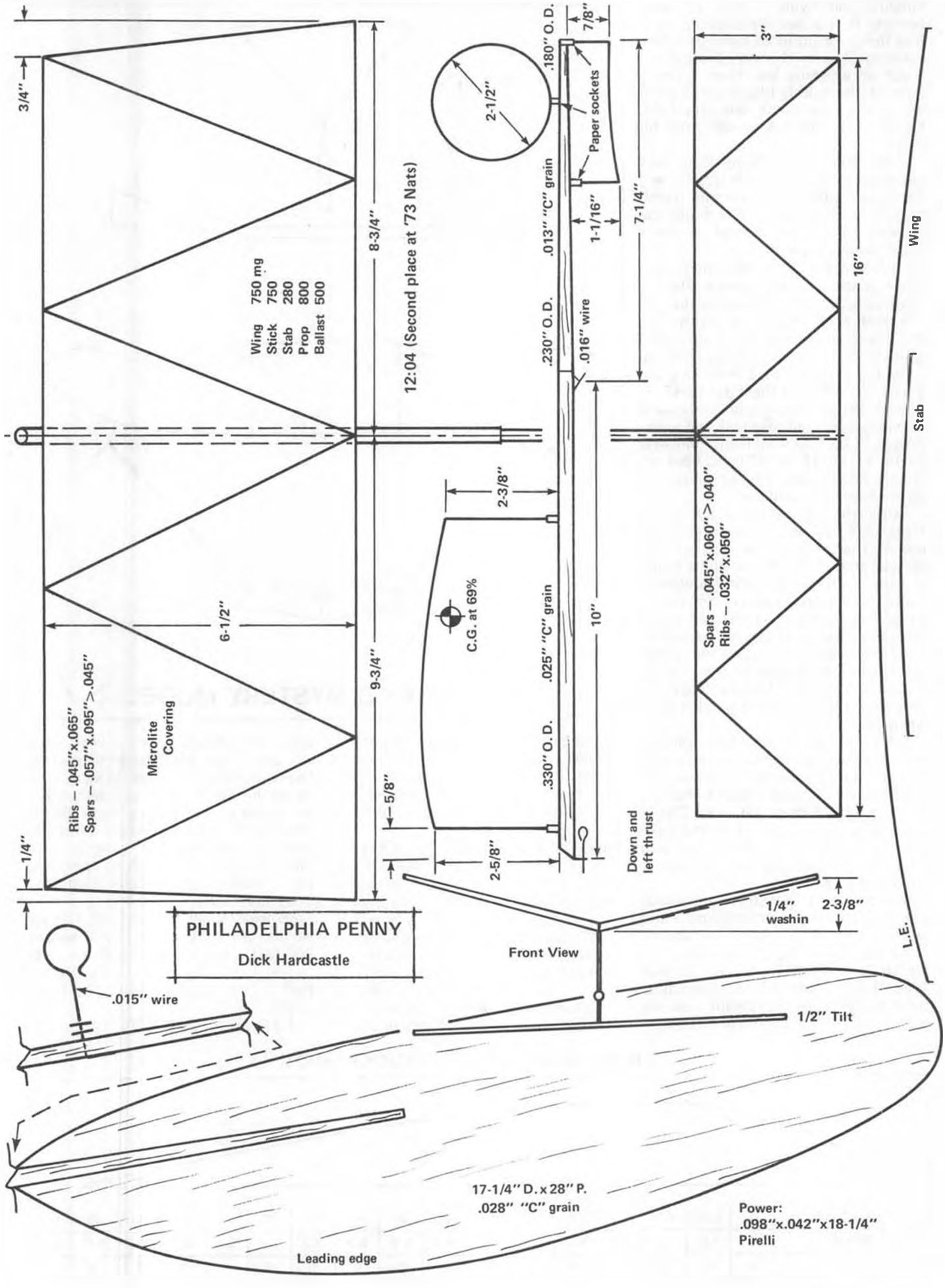
2. What kind of Fuel am I? Ever wonder what the nitro content was of that fuel you were using, here they are:

Fox Fuels: Superfuel – 5%, Duke's Fuel – 10%, Missile Mist – 25%, 40/40 – 40%.

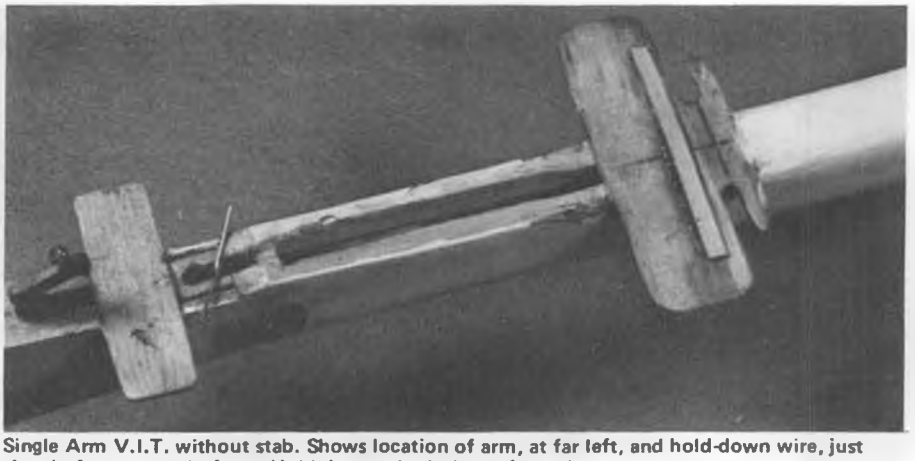
K&B Fuels: FAI – 0%, 100 – 7%,

DARNED GOOD AIRFOIL – LUCKY LINDY

STATION	0	1.25	2.5	5.0	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0	1.6	2.8	5.0	6.0	7.2	8.4	9.4	9.8	9.2	8.2	7.2	5.4	4.2	2.6	1.8	0.8
LOWER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0


3/4"
8-3/4"
12:04 (Second place at '73 Nats)
Wing 750 mg
Stick 750
Stab 280
Prop 800
Ballast 500
2-1/2"
.180" O.D.
7/8"
Paper sockets
.013" "C" grain
1-1/16"
7-1/4"
.230" O.D.
.016" wire
3"
16"
Wing
Stab
2-3/8"
C.G. at 69%
10"
6-1/2"
9-3/4"
Ribs – .045"x.065"
Spars – .057"x.095">.045"
Microlite
Covering
.025" "C" grain
.330" O.D.
5/8"
1/4"
2-5/8"
Down and
left thrust
Spars – .045"x.060">.040"
Ribs – .032"x.050"
1/4"
washin
2-3/8"
L.E.
PHILADELPHIA PENNY
Dick Hardcastle
Front View
.015" wire
1/2" Tilt
17-1/4" D. x 28" P.
.028" "C" grain
Power:
.098"x.042"x18-1/4"
Pirelli
Leading edge

Stalik Platform, aluminum arm location. Adjustment screw inside bottom at rear.



Single Arm V.I.T. without stab. Shows location of arm, at far left, and hold-down wire, just ahead of rear stab platform. Hold-down wire is direct from timer.

500 – 12%, 1000 – 25%, K&B Speed Fuel – 65%.

Sig Fuels: They're all marked, so read the can. Don't be fueled.

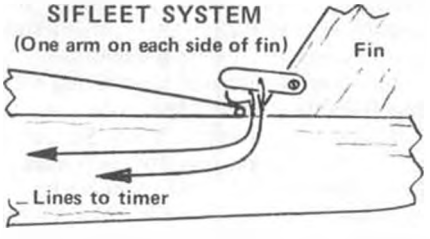
V.I.T. SYSTEMS

Since I am trying to put some emphasis on the FAI programs during the current set of columns, it seemed appropriate to spend some space in this issue going over the various kinds of V.I.T. (variable incidence tail) systems presently in use. The purpose of these systems is to allow a different setting of the wing and stabilizer of a model during the climb and glide phases of flight. A model which has a high degree of angular difference during the climb phase of the flight tends to climb slowly (in comparison) and to glide well (again in comparison). The new multi-function timers, such as the Seelig and the Monks Timer, allow for exact adjustment and timing of the stabilizer setting, which provides the modeler with the opportunity to adjust each phase of his model's flight independently of the other. The problem that remains for the designer of the system, then, is what kind of a system to use. In this issue, I have presented sketches of 6 possibilities. All of these are in use . . . to a greater or lesser degree. All have strengths, all have weaknesses. I plan to describe in some detail how each one functions, and mention what I see to be their strengths and their weaknesses.

The main purpose of the V.I.T. is, as mentioned earlier, to allow a change in the angle of attack of the stabilizer. This means that during the climb, the trailing edge of the stab is lower than during the glide. The usual amount of movement for the trailing edge of the stab is on the order of 1/8 to 1/4 inch. The usual method of raising the stab this amount is through the rubber bands which also function to move the stab into a d.t. attitude on a non-V.I.T. equipped model. What is needed, then, is a device to hold the stab t.e. in place during the climb phase, and a second device to allow the stab to pop into the glide setting at the right instant . . . with some provision for the stab to raise to the correct angle for d.t. at the end of the flight. Each of these systems does that, albeit in different ways:

TYPE I

The Sifleet System: This was popularized by Bob Sifleet on his Centaur design. Essentially, it consists of two metal or wire strips pivoted at one end, which are fastened to the leading edge of the fin (on aft-finned ships). These metal strips are approximately 1/4 inch high by anywhere from 1-1/2 to 2 inches long, made from 1/16 inch aluminum sheet. A length of cotton fishing line is fastened through a hole in each strip in front of the pivot. This line is threaded through the fuselage to the timer . . . where it is spring or rubber band loaded. The strips are adjusted by blocks of wood which are glued to the fuselage under each strip to allow the strip to return to a constant position against the stab t.e. or by a screw adjuster which accomplishes the same end. The t.e. of the stab should have an aluminum tube epoxied to the rear so the strip may contact it.



The operation is as follows: 1. One strip is held snugly against the stab t.e., during the climb phase. 2. At transition, the timer releases the tension on strip No. 1. allowing the stab t.e. to raise to contact strip No. 2, which is set at 1/8 to 1/4 above the setting for No. 1. 3. The stab, all during the glide, rests against strip No. 2, until d.t., when the timer releases the pressure on No. 2, allowing the stab to pop into the d.t. setting . . . which is determined by a measured length of string that is independent of either No. 1 or 2;

The advantages of this system are:

1. Ease of installation and construction.

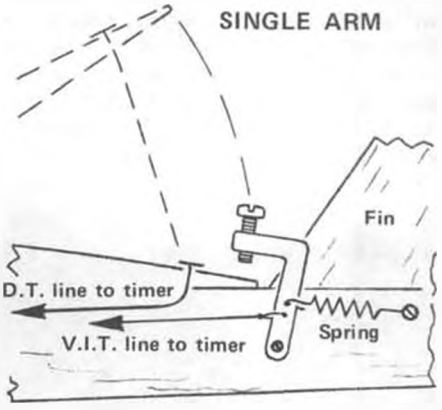
2. Ease of operation, i.e.; dependability.

3. Ability to make fine adjustments quickly.

Disadvantages: 1. The model must be rear fin equipped, unless a superstructure is constructed to hold the pivot tubes. 2. A separate d.t. limit string is needed.

TYPE II

Single arm: This system uses a wire or sheet metal arm shaped like a figure "7." The arm is spring loaded so that pressure is exerted to move it away from the stab t.e. A pivot tube is installed through the vertical leg of the "7" near the the bottom. This pivot is anchored in the fuselage but the arm must rotate freely upon it. A hole is drilled through the leg about midway and a cotton fish line or stranded steel cable is attached through this hole. This line goes to the timer, and it is spring or rubber band loaded. Additionally, a 2-56 screw is tapped through the front end of the horizontal leg of the "7" so that it extends downward. Some means of restraining the forward and backward movement of the arm must also be employed.



The stab is held in place for the power phase by the tension of the line which is fastened directly to the stab and runs to the timer. When the power phase is over, the direct line is released by the timer and the stab t.e. pops up to meet the 2-56 screw which is set at the glide setting. After the glide phase is complete, the line keeping the arm in place is released by the timer and the

Continued on page 67

Bill Cooksey, who moved to Gisborne, New Zealand five years ago, built this beautiful Super Buccaneer (there's no balsa wood left in NZ!). It's powered with a Super Cyclone. Plans came from John Pond, natch.

PLUG SPARKS

By JOHN POND

● "Ignition? What the heck is that? You mean like the system in my auto? You won't catch me using those darn, hard-starting setups!"

Well, if I had a dollar for every time I have heard those statements, this writer wouldn't be working, even in retirement. Actually, fellows, this is old timer flying at its best. One of the biggest challenges to most fellows is the mechanics of starting and running engines. That is what made gas models so popular. Nowadays, the emphasis is on FLY, with glow plug motors.

With the Texaco Event gathering more popularity every day, the logical way to go is to power your big bird with an ignition engine. With today's metallurgy and advanced designs, the modern engine makes an excellent subject for conversion to spark ignition.

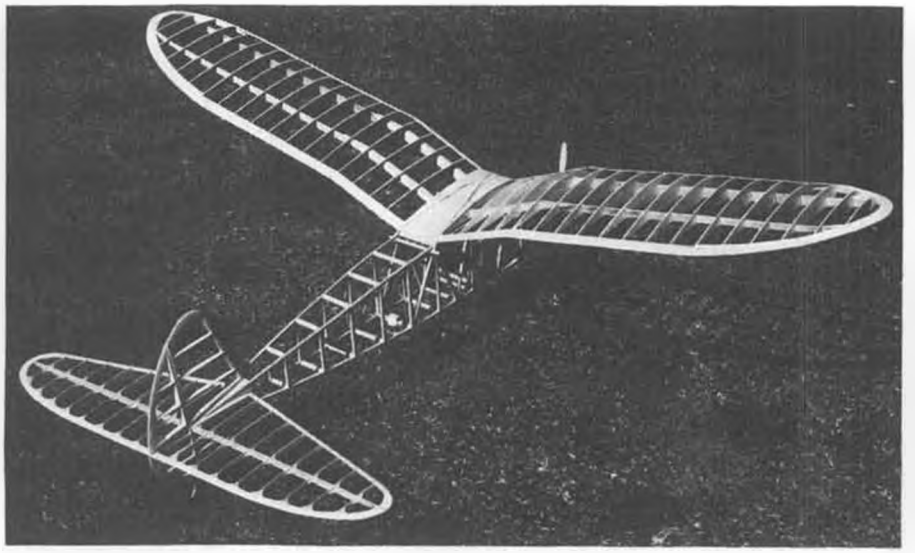
In experiments conducted along with Red Barrows, the writer was amazed to find that a converted Veco 50 could run 12 minutes on less than two ounces of gasoline and oil! Just to prove it was no fluke, Red then ran his Enya 45 for an even longer length of time on the same amount of fuel. Talk about a cheap way to fly, even with gasoline (white or unleaded) running 60¢ a gallon.

So popular has this modern engine conversion become, there are a considerable number of fellows in the game. The foremost promoter, of course, is Bruce Chandler, of Chandler Engineering, with his excellent Black Knight series developed from OS engines. SCIF member, Otto Bernhardt (draftsman Phil's dad), has been doing some excellent work with O.S. conversions. Have you ever seen a Schneurle 40 on ignition?

Hugo Mercoli with his ST 60 Blue Head powered Powerhouse at field in Clayton N. J. flying site. Orbit radio. Photo by Bob Dahl.

Bob Miller uses a K & B 35 to power his Senior Playboy. Kraft radio. Proposed rules will keep engines to this sensible size.

No, it's a boy! Billy Cooksey built this E.D. Comp. diesel powered Scientific "Coronet."

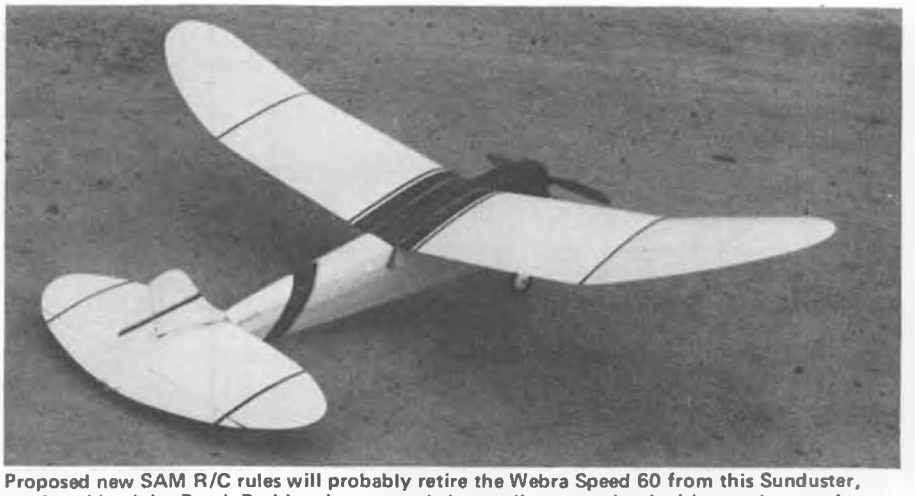


Capt. Clyde Byrns, of the Gardena, Ca. police, built this beautiful Spook 72, only to have it lost on the first flight. That could be why his next one has R/C in it!

Wild! Also getting into the game is Mark Fechner of Salt Lake City. Further dope can be had by writing to this columnist in care of the MODEL BUILDER.

The writer has noticed with considerable interest the articles on ignition engine operation appearing in club newsletter, "The WMC Platter," edited by Bob Stalick. This has inspired the columnist to carry the torch for the cause of ignition motor flying. After all, in case you didn't know it, Duke Fox had an excellent ignition version of his Eagle that never quite got into production. Who knows, if fuel gets real tight, he may yet revive the project.

Anyway, to discuss ignition systems, the writer has decided to talk about spark plugs first. We will run this ignition stuff serially, as most modelers don't like to get large doses of technical talk of do's and don'ts.



Proposed new SAM R/C rules will probably retire the Webra Speed 60 from this Sunduster, produced by John Pond. Problem is, proposal also applies to weaker ignition engines too!

Model airplane spark plugs are just like their big auto counterparts. In removing the mystery of starting ignition engines, one must remember that model engines run on decidedly different fuel mixture than automobiles. While the standard four-cycle engine is oiled through pumps and/or splash systems, the small two-cycle engine derives its lubrication directly from the fuel mix of gasoline and oil.

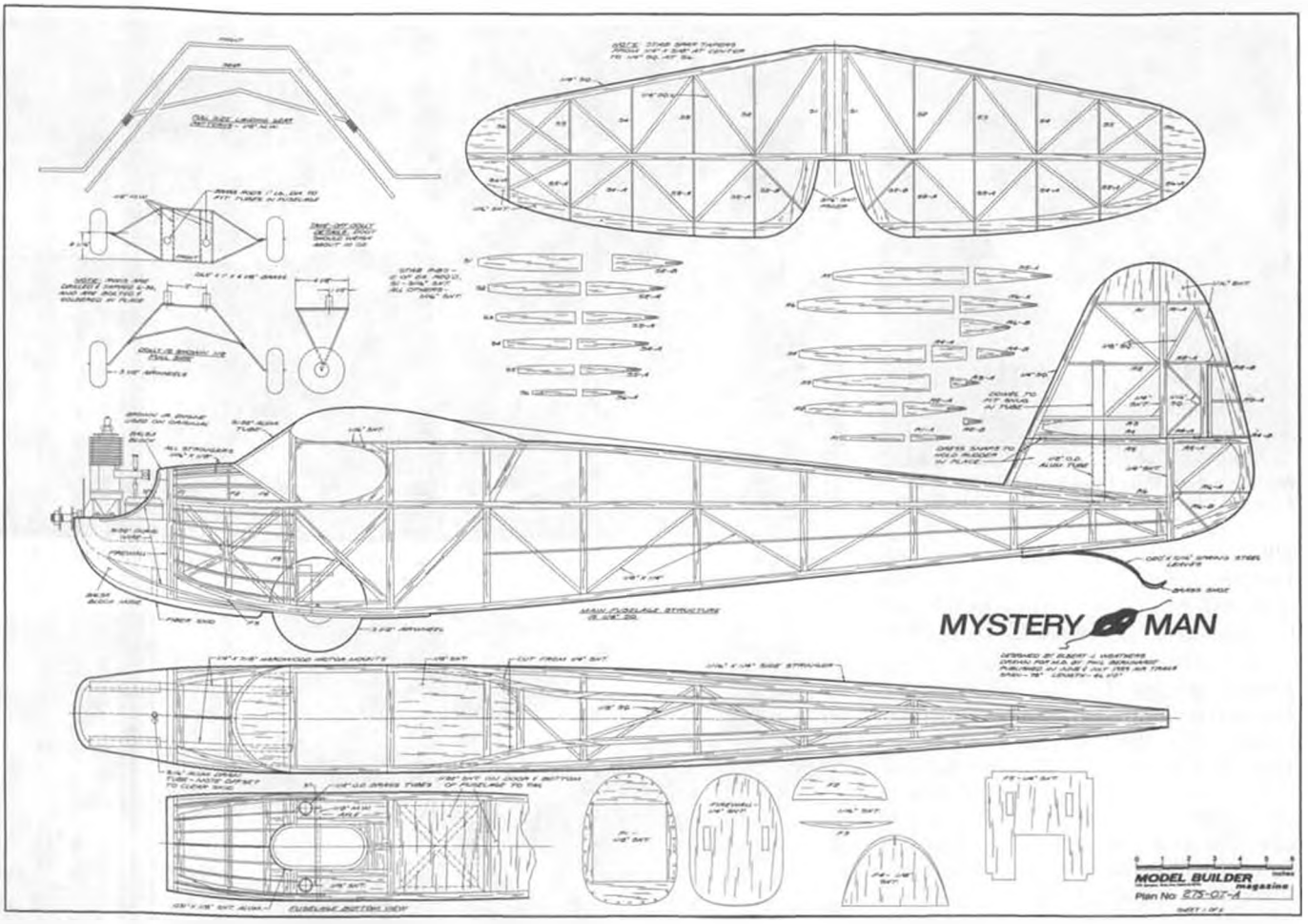
On this basis, any prolonged running will result in covering the plug electrodes with carbon. Unless kept clean, this carbon, being electrically conductive itself, will reduce electrode gap, causing a dead short. Of course, the real culprit is the carbon deposits around the base; when wet from too rich a start, it will short out to beat the band.

Experiments with various fuels show that unleaded gasoline, white gas, naptha based gas, and Coleman lantern fuel, in that descending order, keep down the build-up of carbon. However, it pays to keep plugs clean. Don't scrape them, as

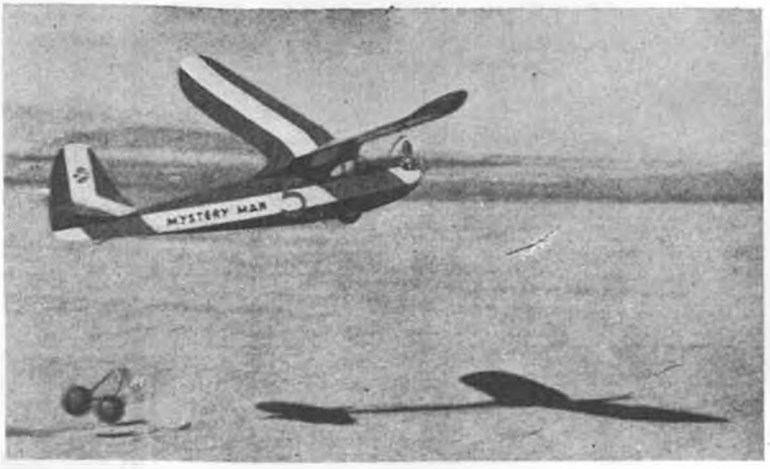
Continued on page 48

Jim Adams receives his reward, an Atwood 60, from John "Daddy Warbucks" Pond, for correctly naming 1936 Nats winners.

John Haggart, England, drew plans and built this C.E. Bowden "Kanga Cub." Col. Bowden personally approved plans.



FULL SIZE PLANS AVAILABLE — SEE PAGE 80



"MYSTERY MAN"

OLD TIMER Model of the Month
Designed by: Elbert J. Weathers
Redrawn by: Phil Bernhardt
Text by: Bill Northrop

● "If you can't beat 'em, throw the book at 'em!"

Of Californian Elbert J. Weathers' many famous gas models, the "Mystery Man" will undoubtedly go down in history as the most remembered. A beautiful and well thought-out design, it had two outstanding features that immediately identified it.

First, there was the graceful gull wing with curved up tips. The gull center section was built as part of the fuselage, and the outer panels plugged in with tubes and dowels, much like our modern R/C sailplanes.

The most outstanding feature was the takeoff dolly. To eliminate drag, and yet permit unassisted takeoffs, Weathers designed a dolly from which the plane lifted as it gained flying speed. At first, it was considered quite a novel and interesting feature . . . but it soon became a problem . . . Elbert was placing in too many contests! Before long, the "If you can't beat 'em" motto was applied, and the ship was declared illegal . . . unless the heavy takeoff dolly was locked in place. The contention was that the "Mystery Man" was "Dropping parts in flight", which of course, has always been illegal in competition flying.

In our estimation, the "Mystery Man" takeoff dolly is no less legal than the dolly now used by control line speed ships, and it should be declared "Not Guilty" and given a full pardon! However, in case you should run up against some narrow-minded CD who thinks lifting off of a dolly is the same as dropping parts, you better keep a set of locking pins in your field box . . . or hand launch! ●

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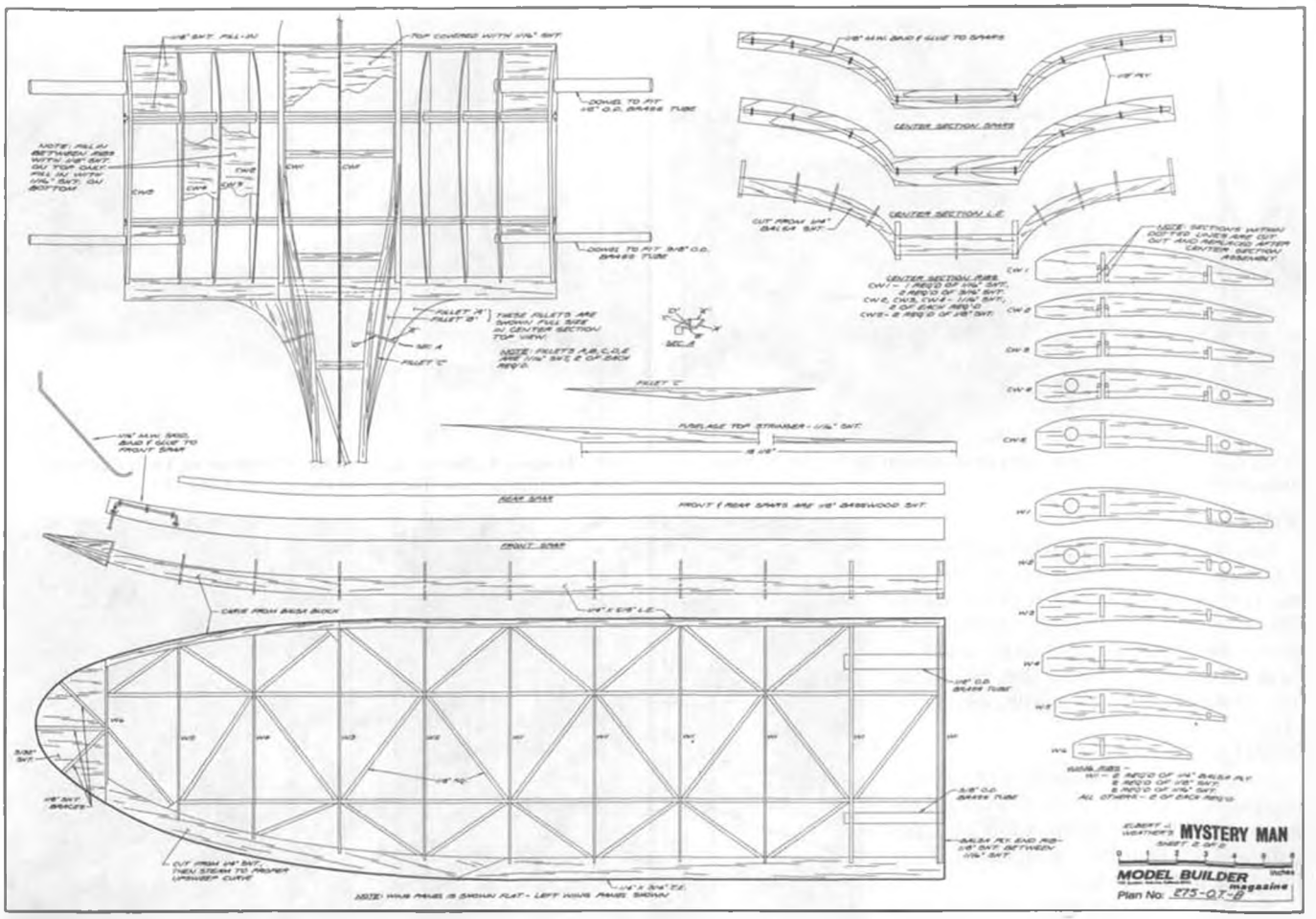
once you cut through the porcelain glaze, they will only foul up faster. Carbon tet used to be a real great cleaner, but the do-gooders have pretty well outlawed the use of this volatile cleaner. Regular household ammonia is the best for cleaning plugs. Just soak them thoroughly, scrub, and bake dry.



Faithful reproduction of Fillon's 1937 Wakefield winner by Ed Wallenhurst. Fillon of France still has his original model! Maybe the old cross-section rule would keep 'em close to home.

England's Alwyn Greenhagh flew this oiled silk covered twin pusher.

Spark plugs, while regarded as a major source of ignition trouble, are not to blame in the majority of cases. Too many times, the point settings of the timer are poor, the insulation of the wire is leaking, and worse of all, there may be loose connections. So don't be yanking off the plug every time the engine fails to start. There are many simpler ways to check for spark. We'll talk about this and the other segments of ignition next issue. So start looking around for a good engine to convert.

LAST FLIGHT

Just received a nice letter from Ron Moulton, editor of Aeromodeller, who reports the sad news of the passing of C. A. Rippon, well known for his RIPMAX radio sets. C. A. died 28 November after 17 years of tremendously active modeling. Included among the credits and kudos due C. A. were his founding of the British organization, K&MAA in 1909, the SMAE in the twenties (the present British modeling ruling body) and several notable clubs, including the famous Northern Heights MAC. His London Hobby Shop was unsurpassed, and for years, was the favorite hangout of modelers. His interest in youngsters and their subsequent development is a real tribute to the activities of this most fatherly of modelers. As Ron sez, "We're gonna miss that boy."

"King Otto" Bernhardt persuades an Anderson Spifire for Spirow Nicholaw's Sailplane.

Bill Woodward, Detroit, coaxes his .020 powered Twin Cyclone. Kit is available from Micro Models (see ad, page 76).

GOOD NEWS

Just received the latest brochure from O.K. Motors, announcing the availability and sale of all types of OK motor parts. This is a real bonanza for those who have been looking for Bantam and OK Twin parts. Gettum while they're hot, at OK Motors, Box 40, Mohawk, N.Y. 13407.

CONTEST NEWS

Almost lost in the shuffle of reports was the R/C Old Timer Contest held by the San Diego No-Name Club at Lake Elsinore, 27 October, with Gene Bach doing the honors as C.D.

Wouldn't you know it; the guy you have to "con" into entering the meet is the fellow who wins. Norm Burnham was no exception as he registered the longest flight of the day (32:14) with his Comet Clipper. John Pond was claimed as a victim of the Red Baron, being shot down from 1000 ft. at 25 minutes.

All entrants had a good time, but the best news of all was announced by Red Barrows. In all future Texaco R/C contests, a perpetual trophy will be awarded. It'll take winning three times to retire the trophy. This should prove an added incentive to all old timer F/F R/C flyers.

The next meet will be held as a parallel meet with the SCIFS Kickoff meet on March 16 at Taft. Events will be Texaco, Class A-B Combined, and Class C, the latter two events being 20 second motor run rules. So gettum out fellows. We hope to stage at least three parallel R/C meets in '75.

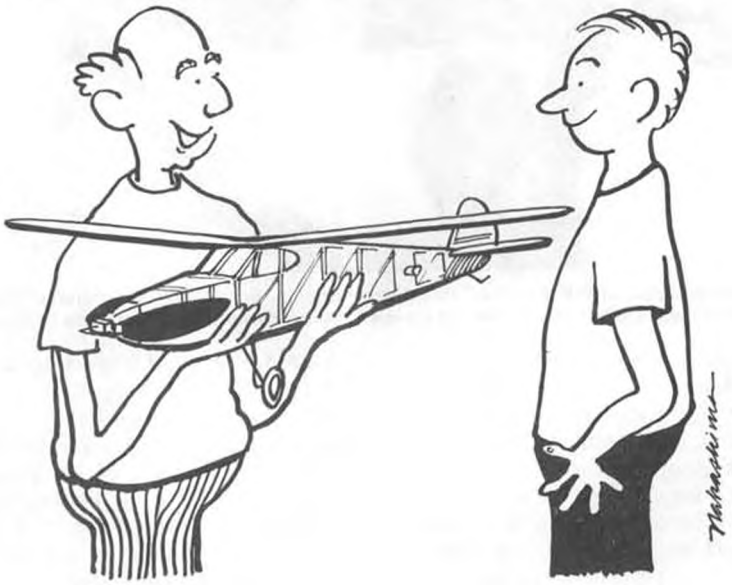
SCIF TEXACO

Probably the best attended Texaco Event this year was the popular SCIF contest on Dec. 1 at Taft. This contest had the added flavor of pitting free flights against the R/C versions of these old birds.

This year, the R/C boys got roundly shellacked as many of the hot shots, such as Barrows, Curiel, and Northrop, failed to put in an appearance. Cliff Silva finally won a Texaco Event. He

Continued on page 61

Breathes there a modeler who flies them free, who has never yet had to climb a tree? John Hammond, Baltimore, Maryland, rescues his Scientific Mercury.



"In this age of foam, fiberglass, plastic, and epoxy, I feel like an anchronism with my tissue and balsa . . . . nevertheless, most of the time I feel very good."

Francis Smith's tug, "Prospect Park," under a full head of watts, heads out to pick up a stranded vessel. The swinging pick-up boom is ready to engage the target. The boom will then swing back, release the hook, and 6 feet of tow line will pay out over the stern.

PHOTOS BY AUTHOR

85' HARBOR TUG - Part III

(Conclusion) By FRANCIS SMITH

● Last month we mentioned that because of the immediate popularity of the 85' Harbor Tug Model, we would add a Part 3. Based on numerous requests which accompanied orders for the plans, we asked designer Francis Smith to pass on some hints about equipment installation.

Of course, most modelers who would tackle a construction project of this nature have their own ideas on power and control systems. However, the number of requests indicated a need to go a little further into the how-to of equipping the tug with electric power and radio control. Our request for this information brought a bonus . . . the trick towing rig with a swinging boom for snagging stranded or becalmed boats, or stalled seaplanes, and bringing them back to shore!

Because all of the ideas in this concluding part on the Harbor Tug are in the form of suggested procedures only, we are offering them in the form of photos with extended captions. A couple of sketches are also included.

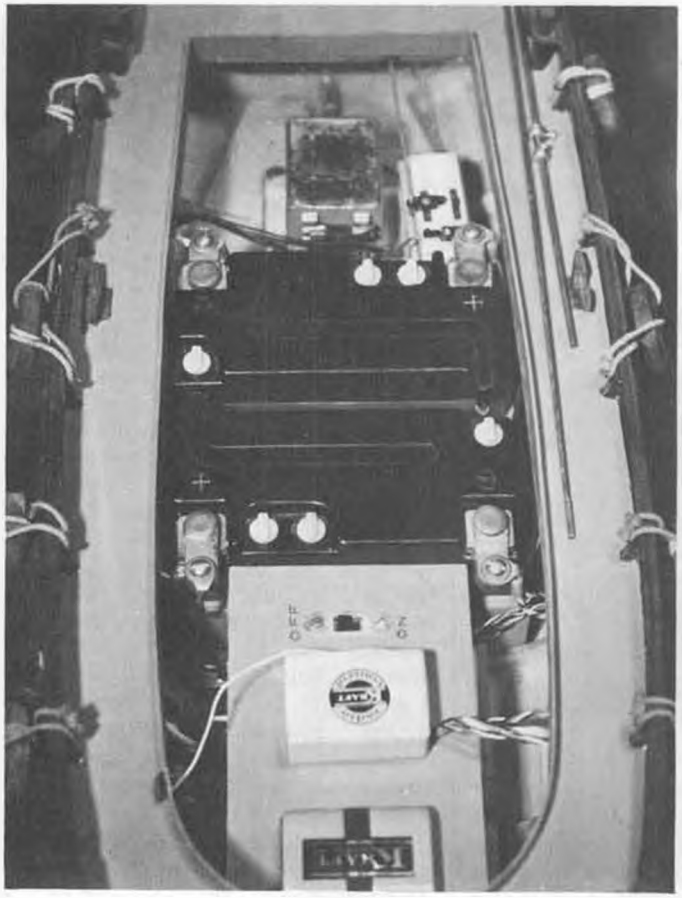


Photo No. 1

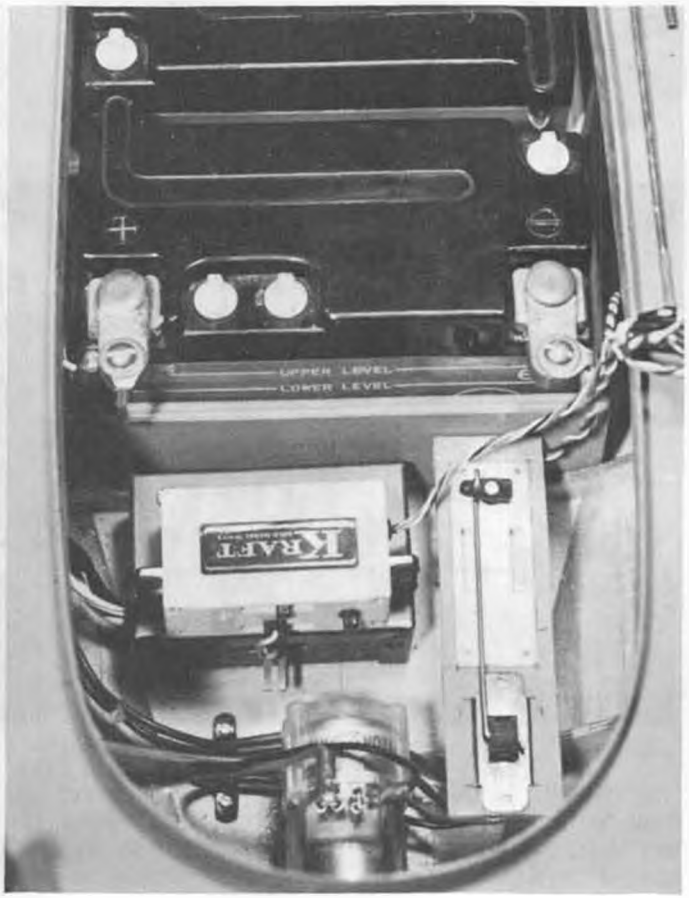


Photo No. 2

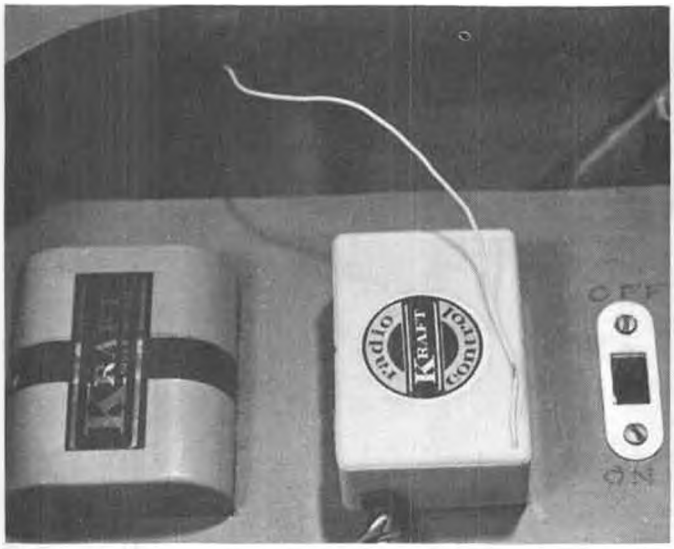


Photo No. 3

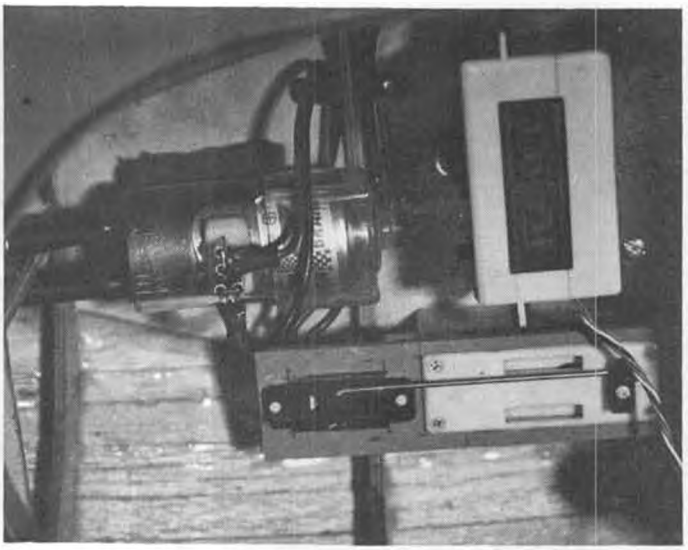


Photo No. 4

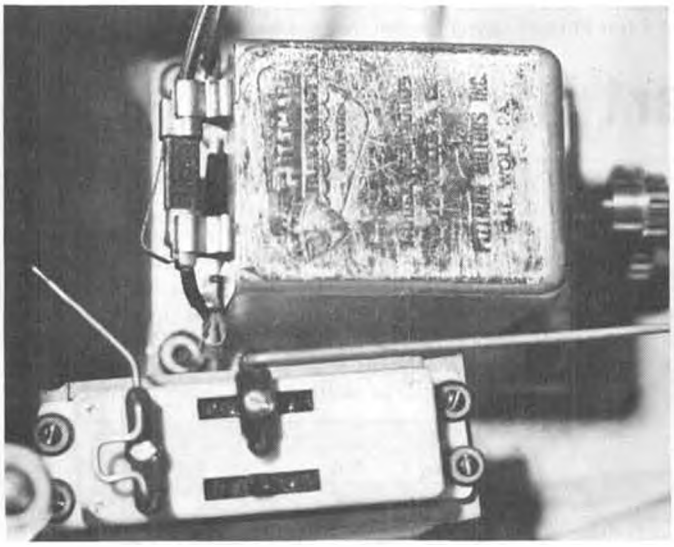
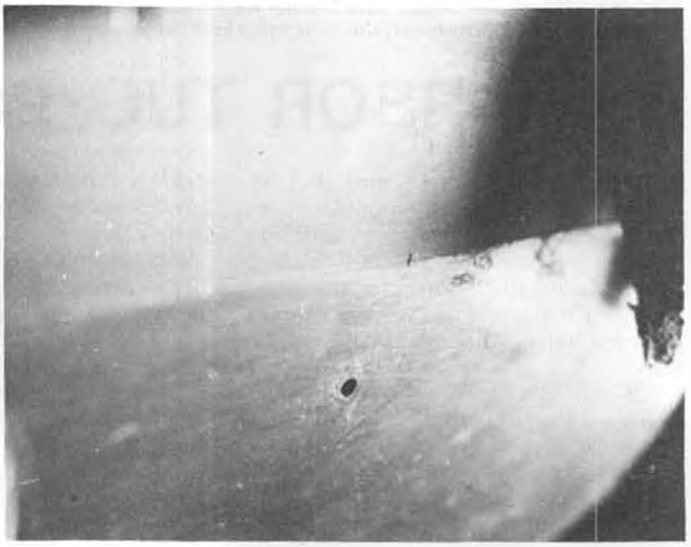


Photo No. 5



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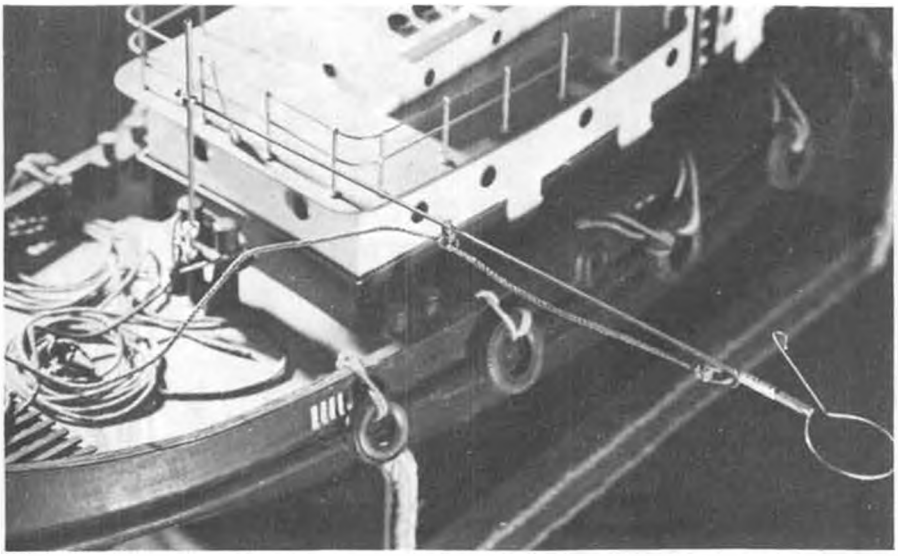


Photo No. 7

Photo No. 1: General view of Tug ready to launch. Receiver, receiver battery, and switch harness are mounted on a removable platform (Notice towing rig on deck).

Photo No. 2: General view of Tug with receiver, receiver battery, and switch harness platform removed. This photo shows a servo mounted on top of a Dumas Speed Control unit, which gives forward variable speed, stop, and reverse variable speed. A second servo is mounted to a single-pole, double-throw, center-off, slide switch that operates a water pump (Sullivan electric fuel pump in this case). The 12 volts to operate this pump is tapped from the two six volt power batteries.

Photo No. 3: Close-up of receiver platform, showing antenna attached to a brass clip on the deck opening rim. A mating brass shim is glued to the inside of the cabin, which is secured to the antenna wire.

Photo No. 4: Close-up view of the water pump for the Bow Thruster. Brass tubing is cemented to the sides of the keel and to bulkhead No. 2 and then coupled to the pump nipples with flexible fuel line. The Bow Thruster is used when the Tug is stopped and the rudder is ineffective. By using the Bow Thruster, the tug can be nudged at the bow for docking or nestling closer to stranded boats for retrieving. (Also, see sketch.)

Photo No. 6: Close-up view of tubing approximately 3/4 of an inch below water line at bulkhead No. 2.

Photo No. 5: This photo is of the

Continued on page 57

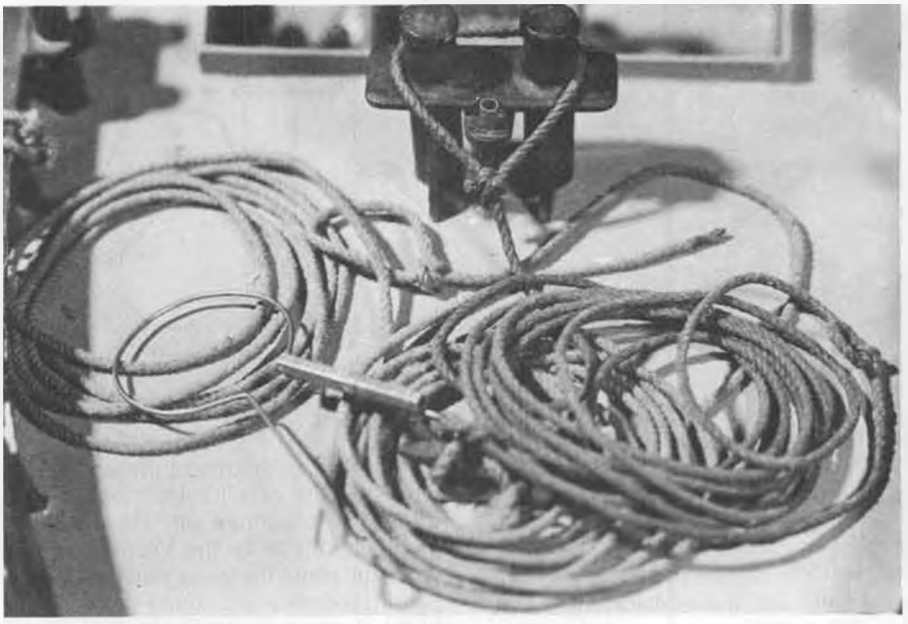
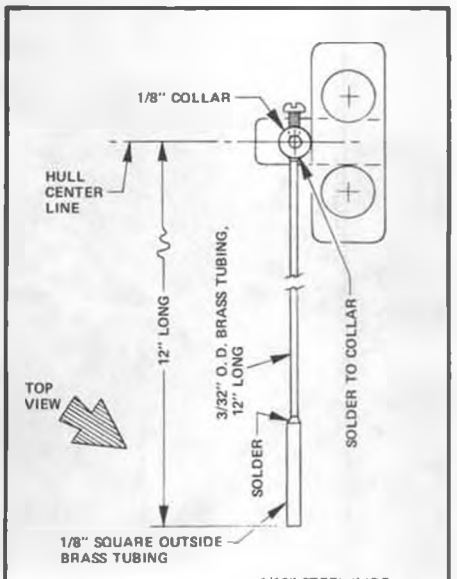
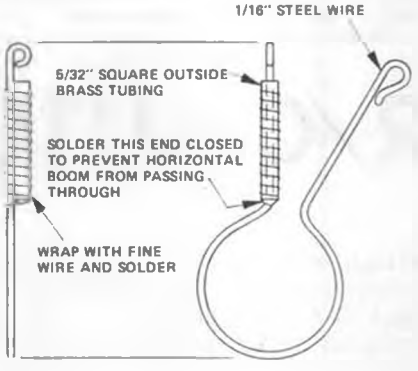
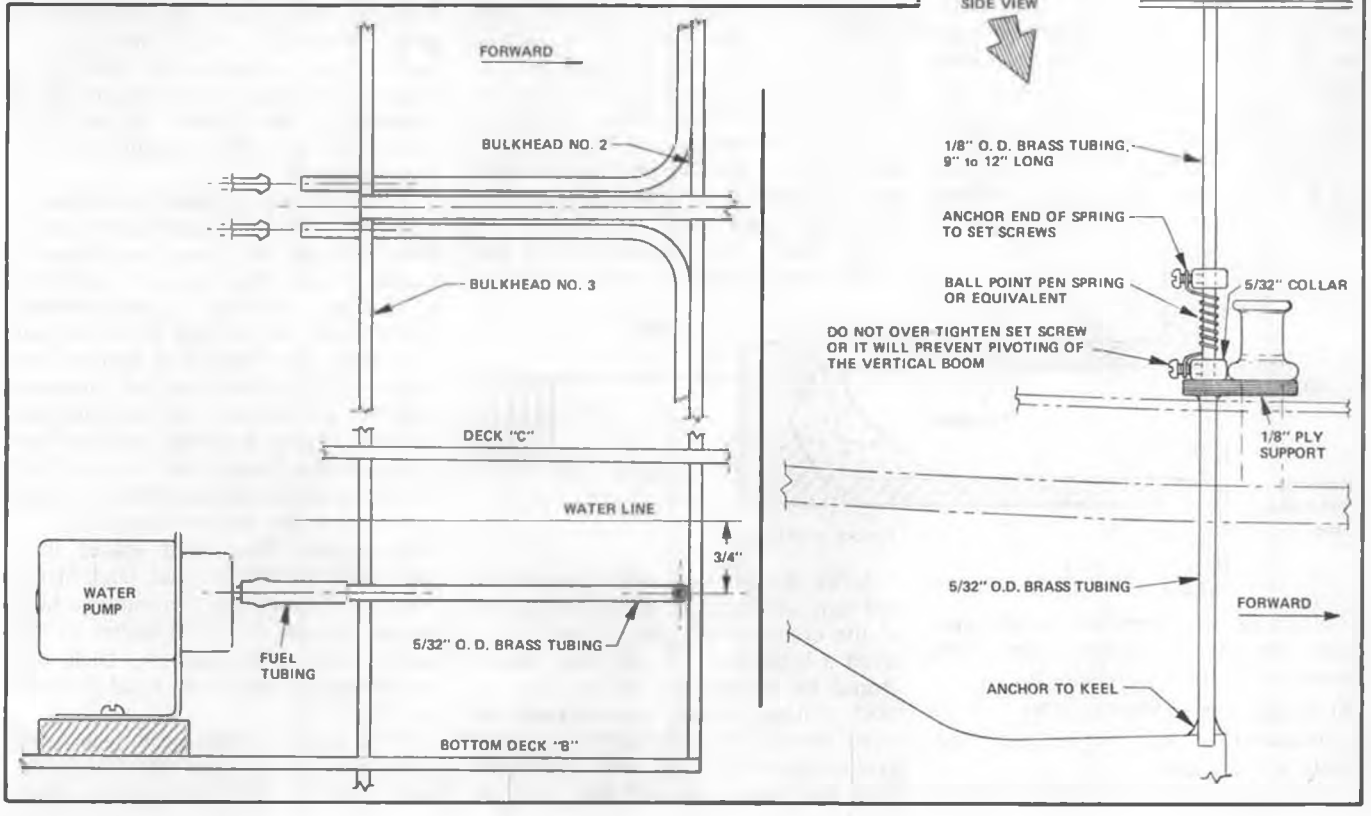


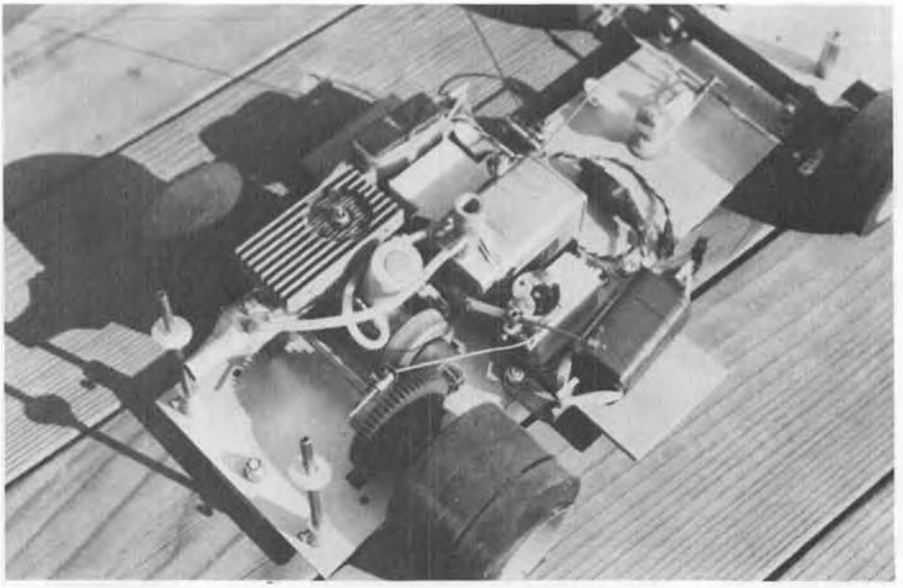
Photo No. 8

Next project from the "Francis Smith Ship Yards" will be this Coast Guard cutter, shown here on a shakedown cruise prior to fitting out with final details. To be published later this year.









Lots of cars are going to muffler pressure fuel systems. Better acceleration characteristics and consistent needle settings are some of the benefits . . . also quieter!

R/C AUTO NEWS

By CHUCK HALLUM

● Last month we went through the modifications, which can be made to the Veco 19 engine, using the stock parts. The super stock engine still wasn't quite extracting the limit of power from the stock parts . . . but reliability was still maintained. One of the biggest limitations of the factory Veco engine is the steel piston. With a high piston weight, if rpm's are increased too far, the inertia load on the connecting rod becomes great enough to cause reliability problems. The Dick McCoy conversion kit has an aluminum, ringed piston which reduces piston inertia . . . hence higher rpm's can be attained reliably. Also included in the McCoy kit is a stronger con-rod, longer (than stock) wrist pin, and a chromed cylinder liner. Engines using the McCoy conversion kit can be modified further, from last month's recommendations, to obtain even more power and speed with reliability.

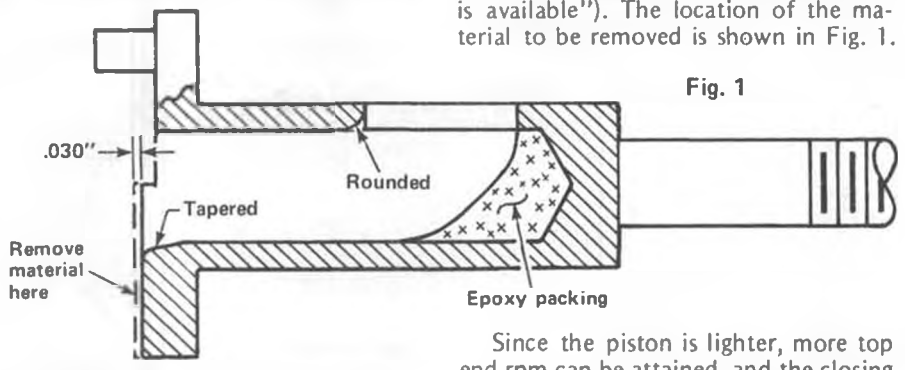
VECO–McCOY CONVERSION

Disassemble the engine per last month's instructions.

I am assuming that you have already put a 40 carb on the engine, cleaned up the case, squared and rounded the crank intake port, packed the crank bore and tapered the carb outlet, per Part I of this series, in last month's issue of MODEL BUILDER.

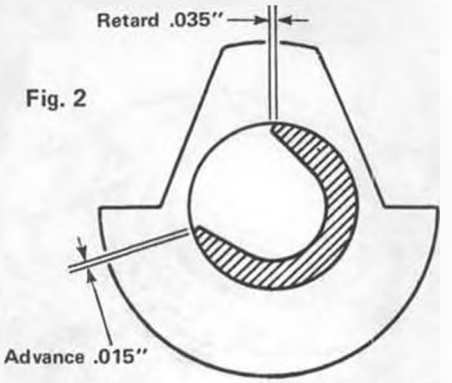
Only one major modification has to be made to the Veco engine to accept the McCoy parts. The rear face of the crankshaft counterweight must be faced off .030 inches. Increased clearance is required for the new rod, and also, since the piston is lighter, not as much counterweight is required. You will have to find somebody with a grinder to do this for you . . . there are several people in every area who will do this. (Dick McCoy says, "I use a sanding belt for removing the .030 from the crank face. If careful, you can do a good job in case no grinder is available"). The location of the material to be removed is shown in Fig. 1.

Fig. 1



Since the piston is lighter, more top end rpm can be attained, and the closing of the crank intake port should be delayed a little more. Total delay timing should be about .035 inches from the stock timing. If you have already delayed the timing .020 inches you only have to take off an additional .015 inches from the closing side of the crank intake port. The cross section in Fig. 2 illustrates the correct timing.

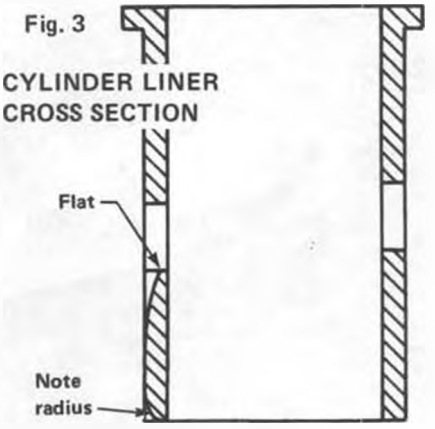
Fig. 2



The flow path around the side of the sleeve by the case intake transfer port should be smoothed up. Do the same modifications as to the Veco sleeve . . . taper and blend the lower portions of the line intake ports and round the bottom of the sleeve as shown in Fig. 3.

Fig. 3

CYLINDER LINER CROSS SECTION



Use the 1/8 D carbide cutter and polishing wheel as before. Again be sure not to go all the way to the cylinder bore with the blends . . . leave about a quarter of the original intake port lower land width intact. Mark the area to be rounded at the bottom of the sleeve from the inside of the engine, with the sleeve in place.

That's all we are going to do now, so clean the parts and assemble the engine. When you get the piston and sleeve installed, crank the engine over, and check to see that the top of the piston is aligned with the bottom of the exhaust port when the crank is at bottom dead center (BDC). Every one that I have put together was correct, but you may have to put a shim between the case and liner shoulder (under the liner shoulder). A Veco high compression head is good, but I think the McCoy head may be a little better. Two head spacer shims come with the McCoy head. Dick McCoy used to recommend a minimum head-piston clearance of .015 inches to .020 inches, but with mufflers, Dick now recommends a minimum head clearance of .025 inches.

With ringed pistons, it seems that more nitro can be used without sacrificing reliability. A 30% nitro mix should

Dick McCoy (right) gives advice to Don Amedo at the '74 ROAR Nats.

be no problem, and even 40% is acceptable. But this engine will really perform even with 10% nitro. It even seems that fuel using Klotz 2 cycle engine oil or X2C can be used. The proper gear ratio for this engine is in the 4.9:1 to 5.1:1 range.

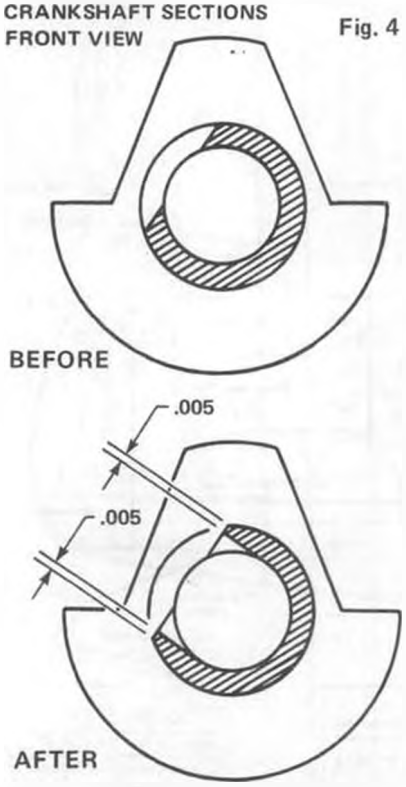
SUPER VECO-McCOY

Even more power can be extracted from the Veco-McCoy engine with further modifications. The engine is really turning up, so what we are going to do, hopefully, is improve the breathing a little further. I don't use some of the things that are mentioned here, but they undoubtedly improve breathing.

Tear down your engine again and grab the crank. Most of the recommended modifications are to this part. The intake port timing can be advanced from the stock opening position. Primarily this is to help the bottom end, but it seems to help horsepower just about all the way through the full rpm range. Fig. 4 shows the modification to be made.

CRANKSHAFT SECTIONS
FRONT VIEW

Fig. 4



Be sure not to have any burrs on the crank O.D. Finish off the job by using a small cutting stone or crocus cloth on the port edges.

The only other thing I do to my crank is to taper the crank bore at the crankcase end, as shown in Fig. 1. To do this, use a larger cone abrasive tip on your Dremel or motor tool. This helps to slow the gas down before entering the crankcase and allows gas to get by the rod during cylinder charging.

Two other things many fellows do is to elongate the crank intake port, to the rear, and bore the crank I.D. to a bigger diameter. Elongating the port probably helps the most. The crank intake port is only full open at one instant and is partially open the rest of the intake opening period. Hence the bore is usually much larger than the actual crank port opening (the bore is not the restriction, but the port is). If you do elongate the port, only go about .05 inches to .10 inches to the rear. Larger openings will reduce the gas momentum and possibly decrease flow. Be sure to radius the inner rear part of the crank intake port again. If you elongate the crank intake port you now have to increase the port length in the case to match. With the carburetor out (no easy task if its epoxied in) you can use the 1/8 dia. carbide cutter and reach in through the carburetor venturi opening in the case. Bevel back at about a 60° angle until the case and crank ports are aligned.

Just to give you an idea of the gas velocity through the crank bore I'll relate something that happened a while ago. Once, when starting an engine, it swallowed part of the sponge air filter element. I corrected the problem but ran the engine for several weeks. When I took the engine apart later, some of the sponge rubber was still in the crank bore between the intake port and crankcase outlet end. The only thing holding the pieces of sponge in place was a little bit of oil. It's hard to believe, but I saw it. Anyway, the gas velocity through the crank bore must be very low.

A bit more top end can be squeezed from the engine by raising the intake and exhaust ports a little. Dick McCoy recommends using a high speed grinder or filing to accomplish cylinder timing changes. Chamfer the upper (inside) port edges at a 45° angle as shown in Fig. 5. I use a file or small cutting stone and draw outward. Chamfer the side edges of the exhaust port in the same manner, to improve the exhaust flow path.

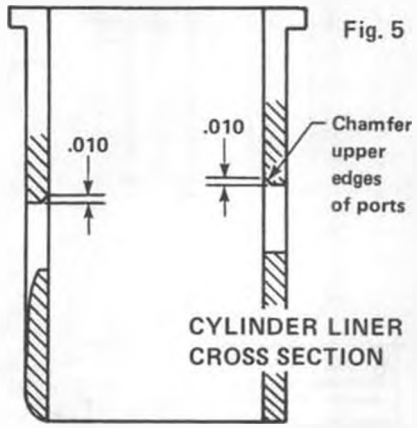


Fig. 5

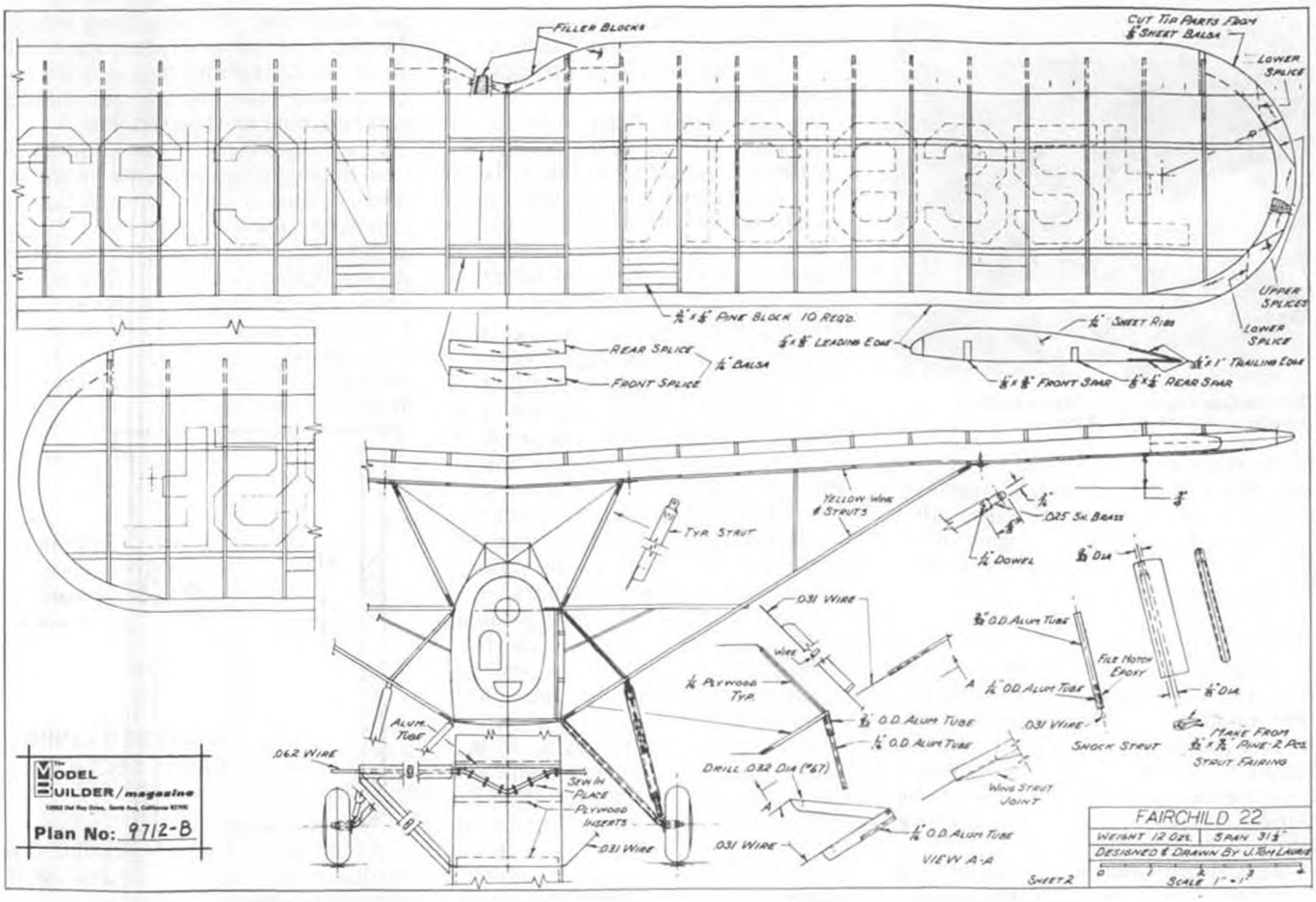
At this point, the only possible flow restriction may be in the crankcase intake bypass port. Standard practice in racing engines seems to be to use two transfer holes between the piston and case bypass port. The holes in the liner and piston are aligned with the piston at BDC. The holes should be about 3/16 inches in diameter and placed as shown in Fig. 6.

Bevel the upper outside edge of the holes in the liner upward to improve flow, and bevel the lower inside edge in the piston to help direct the flow properly. I haven't done this to my .19

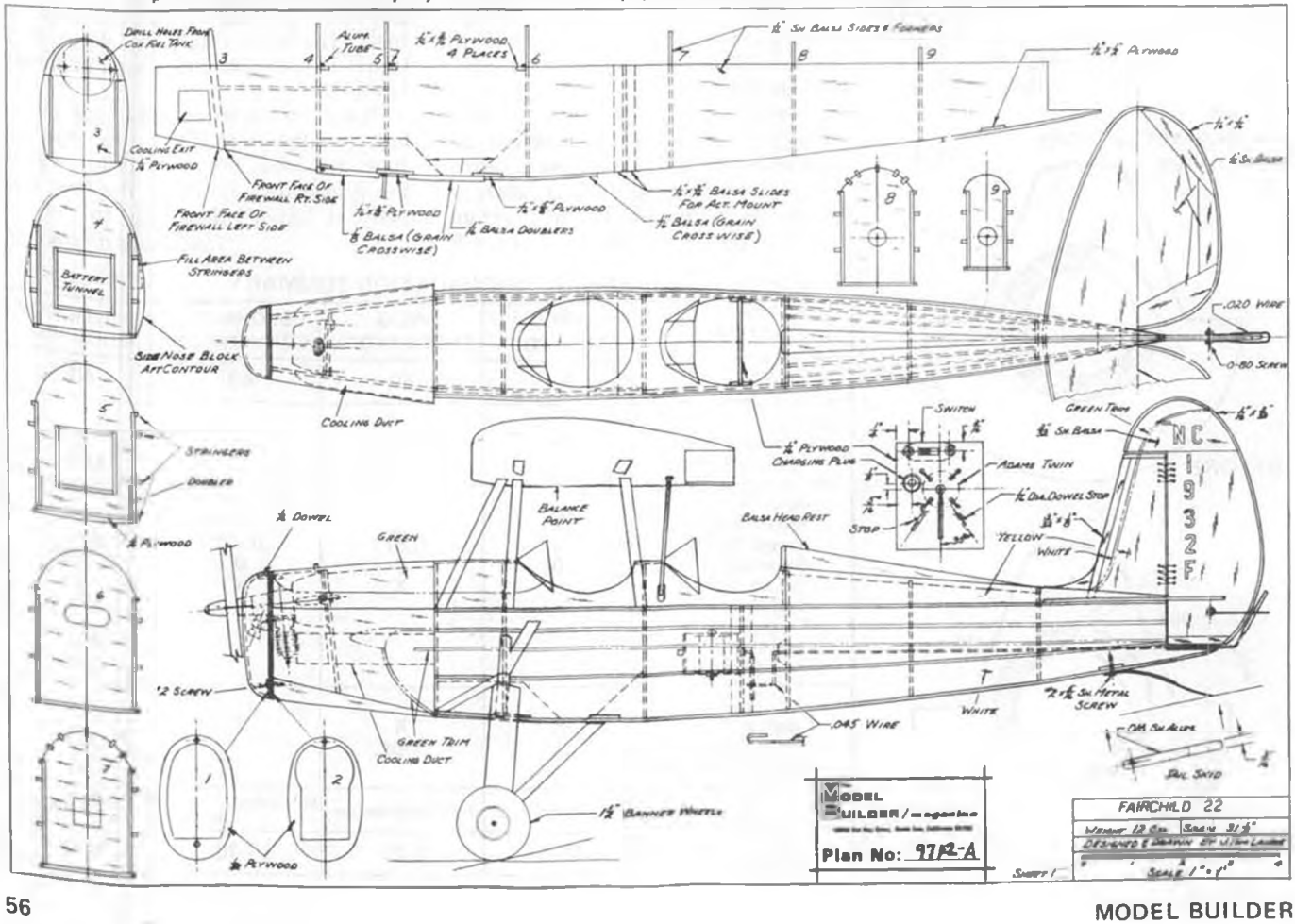
Continued on page 76

ENGINE MODIFICATION SUMMARY

ITEM	VECO SEMI-STOCK	VECO SUPER-STOCK	VECO/McCOY CONVERSION	VECO/McCOY MODIFIED
Carburetor	19	40	40	40
Case				
Cleanup	X	X	X	X
Intake Elongation				Opt.
Crank				
Square & Round	X	X	X	X
Retard Timing	0	.020"	.035"	.035"
Advanced Timing	0	0	0	.015"
Packed		X	X	X
C'wt Ground			X	X
Tapered				X
Bored				Opt.
Intake Elongation				Opt.
Liner				
Cleanup	X	X	X	X
Raised Ports		Opt.		Opt.
Extra Ports (Piston)				Opt.
Head	Sport	Hi Compression	Hi Comp./McCoy	Hi Comp./McCoy
Nitro	5-20	5-20	10-40	10-40



TAKE ANOTHER LOOK . . . From time to time, as space permits, we will give you another look at some of the construction plans published in early issues of MODEL BUILDER. One advantage of Diazo prints over offset is the fact that plans will always be available. You can get a complete list of MODEL BUILDER plans for the cost of a stamped, self-addressed envelope, sent to our office, along with your request.



Tugboat . . . . . . *Continued from page 52*

Dumas drive motor, using a 1-1/2 to 1 spur gear drive. It also shows the rudder servo and tiller push rod. A nice feature of this installation is the circuit breaker. When an overload occurs, the circuit breaker opens and the Tug comes to a stop. The rudder servo is ineffective to steer the boat, so now it can be used to reset the circuit breaker. Once it has been reset the servo goes back to operating the rudder. Not all motors are equipped with circuit breakers but it is worth the effort to install one.

Photos No. 7 and 8: Pictures showing the Towing Rig. This contraption is popular with stranded boaters. The hook is mounted to a length of square brass tubing and a towing line is attached to it and the other end is tied or looped to the Towing Bitt. The hook and line assembly is slipped onto the horizontal boom, which also has a short length of a square brass tubing on the end. This square engagement keeps the hook level.

The horizontal boom is set-screwed to the required height (depending on the boat to be retrieved) on the vertical boom, which is spring loaded (Ball point pen spring). The vertical boom is inserted into the towing bit tube and set-screwed (see photo No. 8). When the tug hooks a disabled boat, the forward motion of the tug swings the horizontal boom to the stern, the hook slides off, and six feet of towing cable is drawn out, with which to tow the disabled boat back to port. ●

Remotely . . . . *Continued from page 17*

be thinner than the earlier 3 mil stuff. Cover bottom of wing first, and stretch as you go from center to wing tip, then to leading edge and trailing edge. Trim with razor and then cover tip of wing with about 1/4 inch overlap. With the heat from a light bulb on the plastic, wing tips can be done perfectly.

Fuselages are a little tougher, and edges around the engine area should be sealed with epoxy. Si covered one ship with brick patterned Contac, but said it seemed to make the plane fly like it looked!

PRESS TIME

Based on votes from 8 district R/C Board members, the R/C sailplane proposals which were approved are as follows:

RC-76-9: This proposal is for two classes of sailplane: Standard, with projected wingspan of 100 inches or under and controls limited to rudder and elevator, including V-tails. Open class would be any R/C sailplane. The National Soaring Society approves the proposal, but prefers the span limit only, and would allow any control system desired.

What surprises us is that the division is by span instead of area. Area rules have been used in modeling practically since the beginning of competition, and tied to wing loading, is really the most logical way to separate classes. As an example, Craft-Air's new Windrifter, with 99-3/4 inch span, has 915 sq. in. wing area, only 5 sq. in. less than Soarcraft's 12 foot span Glasflugel 604!

RC-76-17: This proposal removes the existing official Task IIA Precision Duration and replaces it with the currently Provisional Task IIA, which requires precision in all three flights, not just the last one.

RC-76-18: Changing the title of Task I to remove the FAI tie-in, is the basis of this proposal. The N.S.S. prefers that this straight duration task remain under control of AMA. Of course, since all FAI events and rules are automatically a part of AMA rules, to be used as seen fit, the FAI tasks are still available for AMA sanctioned contests, if desired.

DONE SO SOON?

Our "Remotely Speaking" is a little shorter than usual this month as we had the extra assignment of describing the first annual R/C Tournament of Champions in Las Vegas.

By the way, we've already heard comments to the effect that the so-called prima-donna pattern fliers backed off at Hutchinson, yet were perfectly willing to fly in the wind at Las Vegas . . . money talks.

To us, that's a lot of hogwash. If

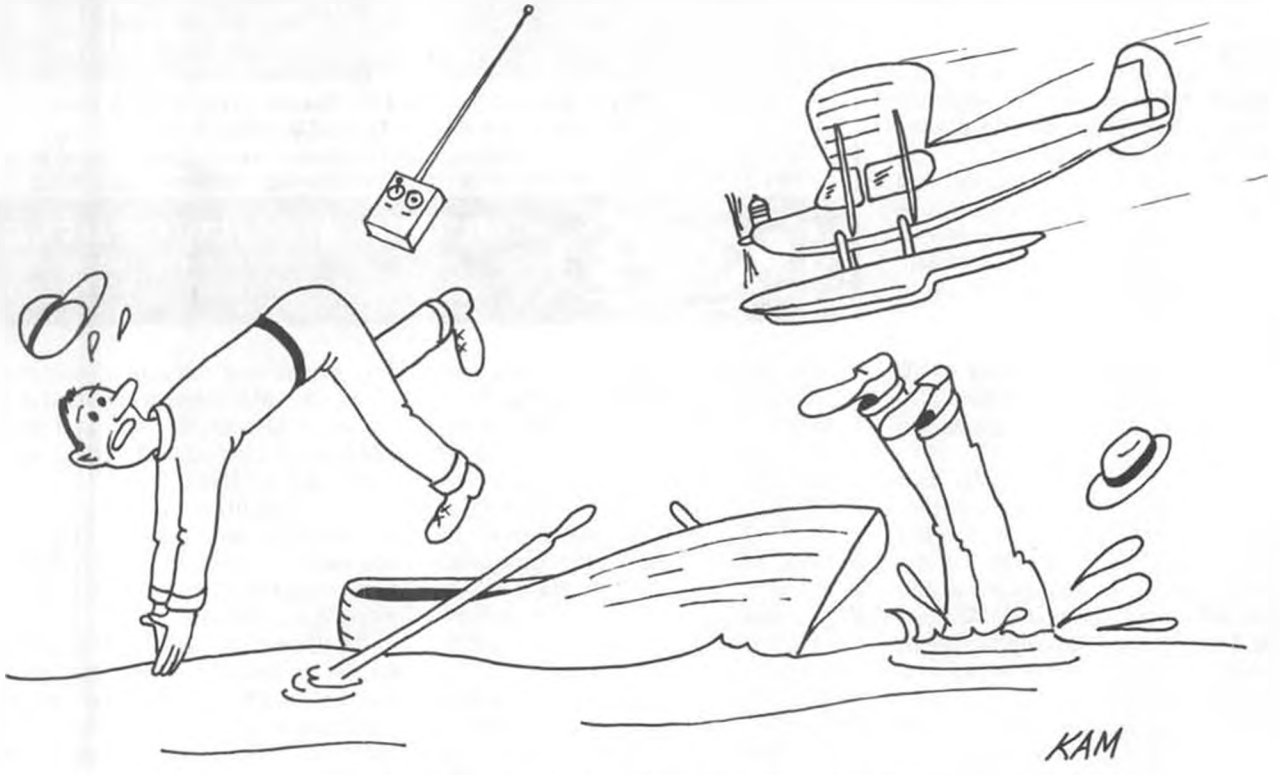
anything, it points up that the privilege of representing the United States as a member of its R/C aerobatic team is more important to these top flyers than taking a what's-to-lose gamble at substantial cash prizes. Hutchinson was a very serious affair, and though we are by no means putting the International Tournament down, it does go to prove that money isn't everything . . . WHAT AM I SAYING?!! ●

Las Vegas . . . . . *Continued from page 19*

fliers were not used to, and therefore apprehensive of having two flight lines operating from the same site, as is quite common in the U.S. Considering the facts; there were 21 U.S. fliers (oops, 18 from the U.S. and 3 from Vista!) in favor of two flight lines; however, they all represented one country in favor, and there were 7 other countries represented which opposed; and it is intended that this tournament be the first of a long series of annual international tournaments . . . so the decision was made to operate a single line.

The above decision brought about considerable revision of the original flight plan; to have four qualifying rounds plus two or three fly-off rounds by the top five. This was to be interspersed with lunch breaks, and demonstrations of R/C helicopters, Dan McCan's "Shrike" Commander, and barnstorming by some of the contestants. Instead, it took continuous flying . . . and judging . . . from dawn 'till dusk on Friday and Saturday, and from dawn until early afternoon on Sunday to complete just four rounds. Winners were selected on the total of their two best flights.

Speaking of the winners, Hanno Prettner, of Austria, and Wolfgang Matt, of Liechtenstein proved that they are still two of the world's best fliers (they take turns beating each other at all major



"And you were worried about the servos getting wet!!"

European contests), taking first and second respectively. Hanno therefore collected the perpetual trophy and $5,000 for first place. He also won $1,000 for the highest single score, contributed by Tower Hobbies. Matt won $2,000 for second place.

Incidentally, we've been asked how Rhett Miller III, our current National Champion of two years running, would stack up against Prettner and Matt. Having judged all three, we'd say that any one of them could come out on top in a contest, just depending on which one happens to be the most "up" on any given occasion. If Rhett should qualify to represent the USA this year in Berne, Switzerland, and it's hard to believe that he wouldn't, we could be in for an outstanding battle for the title of World Champion!

Third place, and $1500, was taken by Dave Brown, highest scoring flyer of the American contingent. Dave, who has been hovering near first place in major U.S. contests over the past several years, put in the fourth and fifth highest individual flight scores of the contest, and totaled only 40 points less than Matt's 19,625 (Prettner's top scores were 10,200 and 9,970, totaling 20,170).

Also from the U.S., Air Force captain Dean Koger, placed 4th and collected $1,000. His 9,610 flight in Round 3 was 7th highest. Dean is a very quiet, unassuming and extremely pleasant guy. In fact he's *so* quiet and unassuming, that whenever his name appears on a list of top fliers, many people say, "Who's this Kooger, or Kroger, or whatever-his-name-is?" Well, maybe now you know. He's a damn good pattern flier whose duties don't always permit him to get out and play with the other fellows!

In fifth place, and picking up $500, was Ivan Kristensen of Canada, originally from Denmark. Ivan didn't have one outstanding flight, but his consistency got him in the money, just 50 points under Koger's 18,805.

Just out of the money, in 6th place, and only 70 points under Kristensen, was Mark Radcliffe, a young employee of World Engines. Mark was followed, in 7th and 8th places, by U.S. fliers Don Lowe and Jim Whitely. And from Vista, that newest little country, just east of Oceanside, California, Steve Helms and Phil Kraft placed 9th and 10th.

The remaining "out-of-towners" placed as follows: Benny Kjellgren, Stockholm, Sweden, 12th; Mike Birch, England 21st; T. Yoshioka, current World Champ, Japan, 27th; Ben Castaneda, Mexico, 28th; T. Yamaguchi, Japan, 29th; Luis Casteneda, Mexico, 30; and M. Kato, Japan, 31st.

Both Mike Birch, England's top pattern flier, and World Champion, Tsugutaka Yoshioka of Japan, were shot down by Citizen's band interference on 27-mHz. Mike, in his usual form, quickly spread the word that the city of Las Vegas was going to bill him for filling the cavity made by his "Capricorn" when it buried itself in the Nevada desert. Demonstrating the true camaraderie that dominated the whole tournament in spite of the high stakes, Don Lowe loaned his Phoenix to Mike, and Ralph Brooke loaned his ship to Yoshioka, so that both could finish out the four rounds of flying.

Incidentally, filling out the remaining placement of contestants: Bill Salkowski (11th), Al Dupler (13th), Ed Keck (15), Steve Buck (17), Ron Chidgey (18), Norm Page (19), Ralph Brooke (20), Wayne Abernathy (22), Don Coleman (23), Merle Hoem (24), Jim Oddino (25), Tony Bonetti (26), and Bob Smith (32).

Judging, in general, was considered accurate and consistent. To assure even exposure, one team of six judges scored a complete round of contestants, and then the second team scored the next complete round. Only bad thing about this was the fact that a complete round took five hours! This was tough on the kidneys, the behind, and also concentration. From Nationals experience, we know that 2-1/2 to 3 hours is about the maximum duty time for efficient and consistent judging. Breaking the rounds

in half would have cured this, assured better (and more comfortable) judging, and would still allow equal exposure. We'd strongly recommend this change for next year.

One redeeming feature though; when you're judging some of the world's best fliers, your interest and concentration overcomes the aches and pains.

Away from the flight line, the International Tournament had many other attractions. Entertaining, or being entertained by modelers from other countries is always a heck of an experience. Language barriers create interesting problems that both sides have fun solving. Of course, we of the U.S. have an advantage in that most "foreign" countries teach English in their schools and colleges.

Benny Kjellgren, from Stockholm, Sweden, along with his helper, whose name *no one* figured out during the whole affair, had the least English training, yet made out quite well. On their first day in Las Vegas they were in one of the Circus Circus shops, attempting to make a purchase and having no luck . . . But then it changed . . . A pretty young gal, one of the aerialists with the circus troup that entertains continuously on the mezzanine of the huge Circus Circus Casino, happened into the shop. You guessed it, she was from Sweden, and from that moment on, whenever she wasn't cruising around the Casino on a trapeze, twenty or thirty feet above the slot machines, or the roulette, crap, and Black Jack tables, Lillemon Moller escorted Benny and friend, as chief interpreter . . . and eyefull!

The Saturday night banquet was a tremendous affair. The head table included astronaut Gordon Cooper and Indianapolis 500 race drive Roger Ward, in addition to the co-sponsors and top officials. Each of the contestants was called up and presented a commemorative plaque.

The original plans called for the $1000 highest single score award to be based on qualifying flights. However, as this had been revised, Hanno was awarded the prize on the basis of his excellent first flight score of 10,200. Fortunately for all, no one exceeded this score on the final day of flying, though Dave Brown came within 335 points as a result of his outstanding last round effort.

In concluding his speech at the banquet, co-sponsor Bill Bennett announced that the tremendous success of this first International Tournament assured its continuance on an annual basis, and that commitments had already been made that would up next year's cash awards to $20,000!

Las Vegas is truly living up to its reputation! ●

Sailing . . . . . *Continued from page 33*

count to AMYA members who provide him with their AMYA number when sending in subscriptions. Now is the time for that two-year subscription which will keep this fine magazine coming to your door. Bill Northrop is the only editor who has supported R/C yachting, and actively solicited the materials necessary to give that part of the modeling hobby its fair exposure. My hat is off to him, and I urge you to support his publication to the fullest extent in recognition of this generous contribution to our welfare.

* * *

I am continually asked where to buy the fittings that are used on the boats. The major source is A.J. Fisher, 1002 Etowah, Royal Oak, Michigan 48067. Write to Bob Irwin and ask for his catalog. A new source I have just learned about, is west coast skipper Jim Gale. Jim has long been known for his line of speedboat propellors, but is now adding sailboat fittings to his offering. First out of the chute is his radial jib fitting, which is 2.5 inches long, and offers a 7/8 inch fore and aft adjustment in its mounting channel. It is investment cast of silicone-bronze, brass and aluminum.

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I have not actually held one of these little gems, but am hoping to in the near future. Write to Jim at: J.G. Products, 8030 Fordham Road, Los Angeles, Ca. 90045. By the way, the little fitting shown in the photo will go for $6.75 plus $.50 postage.

* * *

I recently got word on the availability of the "IT'S FUN TO SAIL, BUT IT'S MORE FUN TO WIN" Book. You may obtain a copy for $4.00 from the author, Ray Davidson, 320 Rumsey Road, Toronto M4G 1R5, Ontario, Canada. This one is worth its weight in gold. Don't pass it up.

* * *

Having passed my duties as an AMYA Director on to Buddy Black of Tampa, Florida, I was given the chance to take a poke at a sore spot in organized sailing's side. This was the STAR 45 Class. The STAR 45 Class has met the minimum 20 boat registration for two years, and polling of the membership had failed to locate a skipper who would serve as class secretary. Since most people join AMYA for racing, it was felt that either the STARS should be goaded into racing, or else AMYA should publish a disclaimer so that skippers would not join thinking they were only a hop-skip-and-a-jump away from a STAR 45 Regatta.

I sent out a form letter to the members of the class, and to this date have heard from over 25 percent of them. As of this writing, the Savannah MYC has scheduled the EASTERN REGIONAL CHAMPIONSHIP for STAR 45 Class to be held in March 1975. I'm only a couple of boats away from delcaring an ACCR to be held in Washington, D.C., in late August. The class is small, yet more of those boats have crossed hobby shop counters *(A Dumas kit, selling for about $70.00. wcn)* than any other boat out today, unless I miss my guess.

This is probably due to a general lack of push from a class secretary, and may be due to people who have sailed the boat against others and found it to be slower. Yet, as a one-design boat, the STAR can be as much fun, when raced against its brothers, as the hottest 50/800.

The main problem to organization has been the lack of a set of class rules. Since a goodly number of boats have been built using templates, rather than the kits themselves, there is a natural latitude in measurement from one boat to another. After 5 years of competitive sailing, I have the distinct feeling that a quarter of an inch of some hull measurement is not 1/100th as important to winning as is good sail trim, or a light hand on the rudder. So my approach to a provisional set of class rules was to keep everything on the big side in order that all boats would fit in. After sailing in 1975, the class members can provide input and we'll fill any loopholes which have been left. Here is the proposal. If you have a STAR 45 gathering dust, take it down. You just might find out your next door neighbor has one too!!!

Maximum LOA – 45.50 inches
Maximum Beam – 11.5± 0.5 inches
Centerline of deck to Bottom of Keel – 17.25 inches Maximum

Jib – (All sail dimensions to be cloth to cloth, with sails attached to spars.) Luff – 41.25 inches, Foot – 14.75 inches, Leech – 36 inches. Foot round – 1 inch max. Leech Roach – 1 inch max. No battens, tablings to be of same material as sail.

Main – Luff – 61.75 inches (Incl. headboard). Foot – 24.25 inches, foot round 1 inch max. Leech – 64.50 inches, (Incl. Headboard). Max. roach – 2.5 inches.

Main Headboard – Maximum 1 inch fore and aft, Maximum 1.25 inches vertical extent.

Main battens – Maximum of 4, maximum length 8.5 inches.

What we are really saying is . . . "If it looks like a Star 45, it probably is a Star 45."

I'm the class secretary, so if you have have one of these, let me know. I can use all the help I can get. The class secretary is supposed to do what the skippers in the class want, so here's your chance, give me the word. ●

Plug Sparks . . . *Continued from page 50*

has been running second for so long, the C.D. has been marking him that way out of sheer habit. Jim Adams narrowly failed to win. Would have made it three in a row! Marc Tachett put up the most spectacular flight when he took out the radio and flew the model nearly out of sight directly overhead.

Biggest fun model of all was Phil McCary's Piper Cub Cruiser, converted to free flight, that flew well enough to win the O/T Scale event. Looked like the real thing in flight characteristics! Nick Sanford was a close second with his old reliable Modelcraft Corben Ace.

BEST NEWS YET!!

As previously announced, the dates of the SAM Championships were not yet firm . . . only tentative. Now hear this!! The dates (by popular demand) of the SAM Championships will be July 29, 30, and 31. If you want to take in the Nationals the following week at Lake Charles, here is your chance.

The SAM Champs will be hosted by the Model Museum Club at Denver. Monday, July 28 will feature the bean feed, to be held in conjunction with the MECA Grand National Collectogether. the collectogether will run all day and evening.

On Tuesday, flying starts in earnest, and will feature the following events: Class A Pylon, Class C Cabin, Old Time Rubber and O/T Scale. This will be followed by a tour of Coors Brewing. Burp!

Wednesday events will be Class A Cabin, Class B Pylon, 020 Replica, Towline Glider and 30 sec. Antique. The Annual SAM Business Meeting will be held that evening.

The final day, Thursday, will be an "easy" day, with only three F/F events; Class C Pylon, Class B Cabin and Unlimited Antique. As of this writing the R/C events have not been formalized. We'll carry these in the next issue, if possible. Anyway, the wrap-up is the O/T Awards Banquet, Thursday night. That'll be fun!

FINAL WORDS:

Just had luncheon with Howard Carmen and his delightful wife, on tour from New Jersey. Howard has been responsible for starting a new SAM chapter called SPOTS (The Society for the Preservation of Old Timers). How about that? The newsletter, "Spot Shots," is a goodie that will go far towards building a solid club. With the gals as the cheering section, this club shows they are no slouches at winning either, taking five trophies out of a possible 12 at the Pittsfield Meet. The SAM Champs at Denver better watch out for these high flying birds! ●

Tri-Motor . . . . *Continued from page 35*

stall the dihedral braces at this time . . . or parts C.

LANDING GEAR

All wire parts are bent and assembled over the plan. Where wire parts Nos. 1 and 3 meet, or cross, they should be bound with fine copper wire and lightly soldered. Parts 1 and 3 are now positioned on the front side of the front wing spar and sandwiched in place with the front dihedral brace. Wire parts No. 4 are mounted on the front side of the rear spar in the same manner. It will be necessary to slightly crack the rear brace in order to fit against the spar. These joints should be held in place with clothespins while drying.

FUSELAGE

Lay out two basic sides as indicated by the shaded outline on the side view. Begin assembly of the sides over the top view by installing Formers 3 and 4B along with cross braces on top. Bring the rear sides together at Former 9 and a bottom cross brace. Add parts 11 and 12, joining them with a 1/16 x 1/8 balsa tailpost and diagonal brace inside. Add 1/16 balsa filler under the stab mount, cut with the grain running vertically. The nose is brought together at Former

1, then add Former 2T, 2B and short bottom stringer. Pieces 16 are glued in and the nose back to Former 2 is covered with 1/32 balsa.

The cockpit area is built starting with parts 13 and 14. Fill the area below the side cockpit windows with scrap balsa and add the 1/16 sq. window posts. Upper rear Formers 5 through 8 are installed, along with bottom cross braces and diagonals. Bend up tail wheel struts and mount. Ends of wires are pushed into parts 11 and 12 and glued well.

TAIL SURFACES

The stabilizer is quite conventional in construction. The rudder is built from 1/16 sq. strips with gussets cut from 1/16 sheet.

COVERING

Begin covering now and complete it during assembly of the components. To duplicate the corrugation lines on white Japanese tissue, lay tissue on a smooth hard surface, lay a sheet of carbon paper, carbon side down, over the tissue and then drag a comb over the carbon paper with a firm smooth pressure. Surprise . . . corrugated-looking tissue! Carefully check all areas to be covered for direction of tissue grain and direction of corrugations. All trim on covered surfaces is cut from colored tissue and clear-doped in position. Begin covering by

doing the fuselage sides and the bottom of the wing.

ASSEMBLY

The wing is slipped into place over the nose of the fuselage, landing gear wire 1 is sprung slightly to clear and then bound with thread and glued to rear side of Former 3.

The wing is glued in place.

Wire piece 2 is bound and glued to Former 4B and joined with fine wire to wire 1 and lightly soldered, providing axles. Wing parts C are fitted into place, flush with the upper surface of the wing. Add Former 4, bend a 1/16 sq. strip and glue to the top of parts C. This provides an anchor line for both wing and fuselage covering. Add fuselage stringers and Former 15. Carve the large block above the cockpit, hollow it and glue it in place.

The top of the wing may be covered now, along with the remainder of the fuselage and tail surfaces. After mounting the tail surfaces, carve a block to fit between Former 15 and the wing. It is covered partially with corrugated tissue. Check color line for blue area. Windows are made from light acetate sheet or cellophane. Apply colored trim and ink lines for control surfaces. Dope with thinned clear to suit your preference.

NACELLES

Nacelles are carved from soft balsa and hollowed for lightness. Drill a hole for Number 4 strut wire and cut two slots to receive wires 1 and 3. All strut fairings are added, clear doped two coats, and sanded then painted with Pactra or Testors Enamel. Nacelles and landing gear struts are blue. Struts, between wing and nacelles, as well as stabilizer struts, are white.

ENGINES

Open-cell styrofoam may be found at a Hobby or Craft Shop. It is very light, and when shaped and painted, looks very realistic. Cut circles and drill center hole for 1/4 inch dowel. Drill hole for prop shaft through dowel in center engine only. Sand or file foam to shape shown in side view, then cut individual cylinders as per front view.

Shaping may be done with small files, or sandpaper glued to small sticks or dowels. Balsa parts are shaped, sanded, and glued into place with Titebond glue. Spark plugs may be made from round toothpick ends, two per cylinder, one front and one rear. Paint with enamels. Outer engines are glued to nacelles with cut-down North Pacific Skeeter prop mounted on straight pins. Center engine is removable with the prop for winding.

REMAINING DETAILS

Wheels are carved from balsa and painted with enamel. Control horns are made from card stock. Control cables and spark plug wires are made from black thread. The original was flown with an 8 inch Guillow wooden prop.

I hope that you have as much fun as I did building your Ford Tri-Motor, and I am sure there are many pleasant flights in store for you. Oh, by the way, if you install an .020 engine and an Ace Pulse Radio, be sure to fuel proof the nose engine assembly with a coat of clear Super Poxy. Enjoy your flights into yesteryear. I'd like to hear about your Ford . . . Write to me in care of the MODEL BUILDER. ●

Tex

Top Slider . . . . *Continued from page 13*

most tedious and demanding job of the whole airplane. Carefully mark the top lines and the bottom lines on the plywood covering where you have to cut through to attach the 1/8 inch hard balsa strips . . . both to the wing and to the aileron. Using a modeling knife, slit through the ply at the top, then the bottom. Using those lines as a guide, slice the foam core at the angle shown, first for the aft edge of the wing, then the leading edge of the aileron.

Sand the foam smooth along the lines, then epoxy the balsa edges in place. Leave a little excess both top and bottom so you can cut and sand the balsa to fit the wing contours smoothly.

The triangular closing strip of balsa is then epoxied (or you can use Titebond here) to the trailing edge of the wing. And here is where the tedious work comes in. You have to shape the top of the aileron, and the bottom of the closing strip of balsa, so that when the aileron is hinged to the wing at the bottom, it will move freely up until the leading edge butts against the slanted trailing edge of the wing. The curved upper surface of the front of the aileron has to fit the lower curve of the closing strip, with just enough clearance for easy movement. When the hinges are inlaid and epoxied in place, you'll have a smooth wing surface for the entire chord, with virtually no break at the aileron hinge line, even when up or down aileron is commanded. It's a lot of work, but you'll be glad you did it. Even if it doesn't add a lot of speed, it looks fast!

Now you have two wings, with ailerons, ready for joining and fiberglassing. To join them, I used three full-depth 1/8 inch plywood joiners, with just enough dihedral to keep the wing from having a drooping appearance in the air.

When the center section has been epoxied together, and all surfaces lightly sanded smooth (the plywood doesn't need much) it's time to fiberglass. Start at the center section with the five inch strip of 8 oz. cloth, then lay the 15 inch strip of 4 oz. over that, and then cover the entire wing with a layer of 4 oz. over that, and then cover the entire wing with a layer of 4 oz. cloth.

And now the elbow grease comes into play! Sand the fiberglass resin in the

first layer smooth, add another coat, sand, another, sand, and another, and sand. And if it isn't glass smooth by then, add a couple of more coats and sand some more. Using very fine grit, wet-sand for the last coats, and then, when you think it looks just right, use some Simoniz paste wax to bring out the best in it.

The aileron servo fits into a cutout in the wing, with small screws holding it in place. The guard rails are epoxied in place, and then the aileron horns mounted. Epoxy the brass tubing to the wing, and then put a small strip of fiberglass over the tubing and extending about one inch fore and aft for added strength.

Note that the aileron horns slant aft, and the attachment to the servo of the pushrods is at the 45° hole locations. This is to yield differential aileron movement . . . more up than down, to prevent adverse yaw in turns.

FLYING

For your first flight, I'd suggest you pick a day when the wind is neither light nor strong . . . say around 10-12 mph. Check the CG. If anything, it's better for it to be too far forward than too far aft. Aileron travel should be about 20° up and 10° down, and the elevators about 15° for both. Give it a good heave. It won't start to fly if you don't. And heave it straight ahead, or down the hill. Not up.

After you've flown it a bit, you can begin experimenting with ballast for the wind conditions on your own particular hill. It's better to fly with too little ballast than to have too much. In the latter case you'll have to mush to stay up, and that slows you down. You can always put the nose down if you are a bit light. Ballast is added at the CG. I use lead strips, held in place by the nylon bolts through the bottom of the fuselage.

In very light air, the Top Slider seems to fly better with the CG just slightly forward of the position shown. In moderate or strong winds it handles best with the CG as drawn. To be sure, check this out with your own model.

And here's an interesting feature of the Eppler wing section. You can slow the model down and fly at a fairly high angle of attack in light air, and then you can put the nose down, pick up speed, and it will come right back up and maintain altitude at a much faster speed. Learn to use this feature; it really helps when racing in light winds.

The big ailerons don't have to move very far to make the model bank. Thus, they don't create a lot of additional drag during turns. Keep the nose down, turn smoothly, and you'll come out of the turn almost as fast as you entered it. Don't pull too much up elevator . . . you'll mush and slow down.

So build yourself a Top Slider, practice, and come on out for some slope races. They're great sport! ●

Soar-dynamics . *Continued from page 25*

sitive to Reynolds number and turbulence, thin sharp-nosed airfoils are insensitive to Reynolds number and turbulence.

2. The lower the Reynolds number, that is the smaller the model airplane or its speed, the thinner must be the wing section profile to achieve the supercritical flight state.

3. To achieve the supercritical flight state, it is sufficient if the upper surface flow is turbulent.

4. The critical Reynolds number of an airfoil sensitive to Reynolds number and turbulence can be reduced by artificial creation of turbulence in the upper boundary layer, through

a. Pointing of the wing nose (knife edge).
b. By a rough surfaced wing nose.
c. Most effectively, by stretching a turbulent wire or thread parallel to the wing's leading edge.

Knowing that the critical phenomena only exists for certain airfoils operating below certain Reynolds numbers, gets us a long way towards solutions to the problem. But, what kind of airfoil should be used for your latest design? The answer depends on glider size and use. As in A/2 glider competition, a "still air ultimate design" may be a dog when the wind comes up. Then, because contest rules specify neither wing loading nor area, factors other than airfoil shape prohibit simple comparisons between models with different airfoils.

Some hints can be derived from looking at what the free flight boys have been doing. Have they followed Dr. Schmitz's advice? You better believe it. Look again at Figure 1. Note how the thickness, camber and leading edge radius of these airfoils change as the size is reduced. Then there's another type of free flight airfoil which also uses Dr. Schmitz's principles that is not illustrated in Figure 1. It's often used on free flight power (except FAI). It's a fairly thick, flat-bottomed airfoil with a sharp leading edge and a couple of spars running along the top of the wing, close to the front.

This airfoil evolved in a competition class which has no minimum weight requirement. To obtain a low wing loading with adequate strength, this thick, multi-spar section has real advantages. Then, too, flat bottomed airfoils are less sensitive dynamically and so can handle the power flight and transition with few problems. Finally, the sharp nose and spars act as turbulators to keep the airfoil from going critical.

The problem in R/C, of course, is that gliders are required to do other things besides coming down as slow as possible, which is the object in free flight

competition. However, some free flight data can be of real help. Don Monson, a free flight expert, has developed some thoughts based on Schmitz's work, but supplemented by more recent wind tunnel data and practical observations (Figure 6).

My own inclination is to follow Don's suggestions for thickness and Schmitz's leading edge radius recommendations for any glider where Reynolds number phenomena might be a problem. (For the big 1000 sq. in. beasts, you're on your own. A fancy laminar section might work. These ships fly above critical R_n for almost all airfoils). Undercambered airfoils, however, seem to be bad news in R/C design and we should probably stick to flat bottomed sections. These are much less sensitive to speed changes, and we do fly our gliders at different speeds (unlike free flight gliders).

If you've already got a ship built that seems to be Reynolds number sensitive, try thread turbulators on the wing. This is essentially an unexplored field. (How about removable turbulators and a variable camber wing to adjust for different contest conditions?)

Do you want to keep it simple? Frank Bethwaite, of New Zealand, set several R/C glider duration records in the mid 1950's with an escapement controlled model of about 6 foot span (time 7 hours, 37 minutes!). After numerous experiments with airfoil shape, he settled on a thin (9%), flat bottomed "french curve" section similar to a thinned Clark Y. In the 20 years since then, I've seen no evidence of a better section for the average size glider in spite of all the pseudo titles affixed to other flat bottomed sections. Who can top the Keith Brewster (LSF/002) "Laminar-Y"?

If the above doesn't appeal to you, and you really want to be innovative, try Dr. Schmitz's favorite hawk profile. Although it might be sensitive to gusts, he thought it should be insensitive to Reynolds number phenomena and have adequate spar depth besides. ●

Cut-Less . . . . . *Continued from page 22*

elevator push rod and trim the recess in the rudder to clear the elevator push rod and trim the recess in the rudder to clear the elevator horn. Pin the assembly in place and check the elevator servo location and direction. After the body is covered, the entire tail assembly is glued together. Don't forget to attach the push rod before gluing.

ENGINE AND INSTALLATION

The only competitive ½/A engine available today is the Cox TD .049 or, .051 (favoring the .051). The engine compartment is sized to receive the Cox muffler. The new pipe version is a very effective unit and causes only about 400 RPM loss. This is minor for sport flying and can be tolerated in a race, considering the engines run 19-20 thousand RPM on speed fuel. Besides, the sound is smooooth. The prop is important as always in competition. Try those suggested on the plan to start.

FLYING

With the control deflections noted, the plane will be sensitive, so be alert on the test flights. The roll rate will be about one roll per second. Make further adjustments so overcontrolling in the excitement of a race will be minimized.

Good luck, and remember . . . Cutless to win! ●

Hannan . . . . . *Continued from page 38*

NEW PLANS LIST

We recently received a drawing list from Gordon Codding, 4572 West 147th Street, Lawndale, California, 90260. Included were 13 pages of offerings, ranging from pre-war solid and flying model plans, clear through drawings for FULL-SIZE (Yes, we said full-size) World War I aircraft, such as the Sopwith "Pup" and "Camel," Curtiss JN-4, S.E.5A, Nieuport 27, and the S.P.A.D. 7. The model plans run the gamut from tiny Peanut Scale types, through large "old timer" gassies. Gordon will send you a copy of his list for 50¢ to cover postage and handling.

AERONAUTICA IS WHERE YOU FIND IT

Djau Carter checked in with some interesting clippings relating to the memorabilia in one HARRY'S BAR, located in Cueravaca, Mexico. Among the collection of posters, photos, and cartoons adorning the interior of this "sunny place for shady people," are a pair of nondescript model aircraft and several full-size propellers. The point here, of course, is that aviation holds a fascination for a surprisingly large number of people in all walks of life. Thus, we find restaurants springing up in several parts of the U.S. utilizing aviation as their motif. According to recent newspaper clippings, quite a business has grown in providing suitable artifacts for these establishments. Particularly in demand have been high-quality models, and in at least a few cases, full-size reproductions of famous aircraft. In fact, it would seem that aeroplanes are fast displacing the traditional ship models which have long served as conversational pieces. *(The "Nieuport 17" in Santa Ana, is owned and operated by two ex-Navy pilots. An excellent dinner and night spot, full of aeronautica. wcn).*

LIFE'S LITTLE TRAGEDIES DEPARTMENT

Every once in a while we hear of incidents which make us cringe, such as the following: (From the Turbulator, Newsletter of the McDonnell-Douglas MAC). Editor R. W. Klipp tells of visiting a local hobby shop to purchase some tissue, as the store had just received a dozen boxes of Esaki superfine in all colors. He obtained a few sheets, and

about a week later, learned of the shortage of such material. Returning to the shop to load up, he found the entire supply gone. Seems that local high-school kids had bought it all for use in artificial flowers for a homecoming float!

Almost as depressing was a clipping from the Los Angeles Times newspaper, in which someone suggested the use of balsa wood as moisture indicating gauges for potted cacti plants. The person mentioned that he was using the wood in over 200 examples! Just what we need, more uses for scarce commodities.

Which brings to mind reports from several modelers who visited the Zaic model kit company during its early years in New York. At the time, balsa was so cheap and plentiful, that it was being used to fuel the shop stove!

THE HEAVY AIR KITE?

Sort of makes one wonder if punctuation is needed in the title of a new product for kiting enthusiasts, being offered by the FRUIT CAKE KITE COMPANY. By now you are sure this is all a put-on, but we assure you it is not! The Heavy Air Kite is, in fact, an off-shoot of an historical design by S. F. Cody, dating from the late 1890s. Cody was a wild-west type, often confused with, but not related to "Buffalo Bill" Cody, of early show-biz fame. S. F. was an American who emigrated to England and proceeded to make a name for himself in a bold series of aeronautical adventures which ultimately resulted in some of the most bizarre, yet successful flying machines ever seen. His earlier interests, however, centered around kite-making, including the man-carrying variety. Cody based his "Bat" kite upon Lawrence Hargrave's box-kite, but added wings.

Now, David T. Van Zandt, of Fruit Cake, has taken the concept even further, and made some important changes, resulting in a truly superior "tethered flying machine," featuring 11 square feet of lifting surface. The kite is said to fly easily in winds of from 7 to 20 mph. The kit, which requires only a few hours, to assemble, plus some strapping tape to complete, is available for $5.95 plus $1.25 postage from: FRUIT CAKE KITE CO., P.O. Box 77, South Bellingham, Wa. 98225. *(Tell 'em where you read about it!)*

MORE READY-MADE COWLINGS

In a recent column we mentioned a few reader-submitted suggestions for adapting common throw-away items for use as radial-engine style cowlings for models. Examples given included spray-can tops and doll kitchen pots. To this list may be added the bottoms from plastic bottles and plastic ends used for protecting the threads on different sizes of electrical conduit, according to Bill Harney and Sears McCorrison. Recycling of the best kind!

ANOTHER CLINKER

From the NEW ENGLAND SPORT AVIATION NEWS: "Then there was the airline captain who could not start the engines of his new Boeing 747, because some clown among the 300 passengers hadn't fastened his safety belt!"

AIRCRAFT CARRIER FLYING

Everyone knows aircraft fly ON to carriers, but how about IN them? Reader Lt. Jg. Jan Jacobs has, as shown in one of our photos this month. Jan, who is an F4 "back-seater" for the U.S. Navy, is also an avid model builder, and constructed the DH-6 he is shown launching, from an MB centerfold plan. Times of 20-30 seconds duration have been achieved with this model over the hangar deck of the carrier RANGER (CVA-61). Additionally, Jan's EZB craft has stayed aloft in the same location for two and a half minutes.

All of this was of particular interest to your author, who also served aboard aircraft carriers in the Navy. We used to fly control-line models from the flight deck when conditions permitted, and ½A powered ukies on the hangar deck at other times, until a rather militant chaplain threatened to put us on report for disturbing his meditation!

(Your MB Editor also flew "IN" a carrier, CVE-117 U.S.S. Saidor. Along with two Marine buddies, Woody Woodward and John Silver, we flew scratch-built rubber stick models among the hangar decked F-6's, TBM's, SB3C's and Corsairs of the Marine Air Group we hosted in 1945. wcn).

THAT TIME AGAIN

This is being written during the holidays, and quite a number of nice cards and letters have been received here at the hangar from readers, for which we are most appreciative. Perhaps the best way we can thank you is to borrow some of the New Year's wishes from Bill and Bob Hunter of Satellite City fame:

"A wife who loves model airplanes."
"All the building time you need."
"A pole longer than the tree is high."
"Somebody else to mow the lawn."
"An alarm clock that gets you up in time to get to the flying field before the wind does."
"A soft place to land."
"And most of all, MAX Thermals." ●

F/F . . . . . *Continued from page 45*

arm pivots rearward, allowing the stab to move to the d.t. setting, to be retained at that setting by the direct line to the stab.

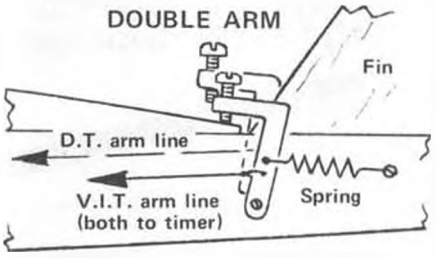
Advantages: 1: Ease of adjustment, 2. Only two lines needed. 3. Simple to operate.

Disadvantages. 1. A metal plate must

be fastened at the t.e. of the stab in order to meet the 2-56 bolt at the same angle each time. 2. Semi-difficult to construct and install. 3. Must have springs or rubber bands of differing tensions so that one counteracts the other on the arm.

TYPE III

Double arm: The double arm system is similar to the Sifleet system, except instead of strips, it uses arms as described in No. 2, above. One arm is used to maintain pressure to keep the stab in the climb setting (instead of using the d.t. line to do so as in No. 2), the other is used as a glide setting arm, as in No. 2. A third line is needed to determine the correct amount of d.t. angle.

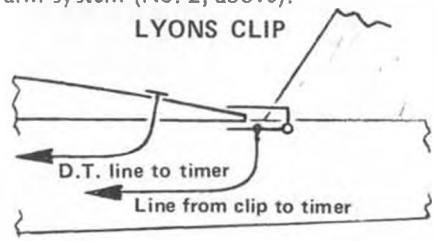


Advantages: 1. Reliable. 2. Ability to make fine adjustments.

Disadvantages: Same as for No. 2, plus the need for a third line d.t. angle retainer.

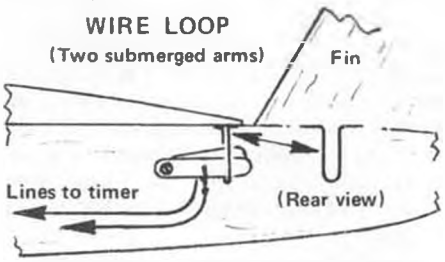
TYPE IV

Lyons Clip: This system is one devised and used by Dick Lyons, who qualified in Power for the 1975 U.S.A. FAI Team. It uses a 1/32" aluminum sheet metal U-shaped clip (with the U turned on its side) hinged at the aft lower corner. A line from the timer directly to the stab is used to hold the stab in the climb setting. Another line from the timer is fastened to the bottom leg of the sideways U. The stab t.e. sets in the slot between the two legs of the U. When the climb phase is over, the direct line is released allowing the stab t.e. to pop up to the upper leg of the U, which is set by bending at the glide setting. The stab stays at this setting until d.t., when the line from the timer to the U clip is released, allowing the stab to move to the d.t. angle, which is determined by the direct line . . . as in the single arm system (No. 2, above).



TYPE V

Wire Loop: The wire loop is a modification of the Sifleet system, where the workings of the system are installed inside the fuselage, with the strips of metal pivoted at the front and a 1/16 wire loop (actually a U shape) attached to the bottom of the stab t.e. and inserted into the fuselage when the stab is attached. The strips are then pulled into place by the lines to the timer and ride against the inside of the loop. During climb, the first strip is held in place by the tension on the line from the timer, with this strip riding against the inside of the loop. At release, the stab pops up and the wire contacts the second strip, where it remains until the line releases, allowing the stab to d.t. Again, a third string is required to determine the d.t. angle of the stab. Micro-screws or blocks of wood, set inside the fuselage, are used to set the correct amount of angle for each strip.



Advantages: 1. All functions are inside the fuselage, aiding streamlining. 2. Ease of construction. 3. Moderate ease of installation. 4. Can be used with non-rear-finned models.

Disadvantages: 1. Visual checking of the system is hampered. 2. The suspended wire loop is prone to being knocked off during hard landings or cartwheeling. 3. Adjustment is awkward.

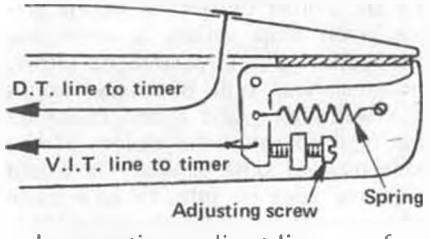
TYPE VI

Stalick Platform: Modestly named. This system came about in an attempt to circumvent some of the problems inherent in other systems. It is designed to be used with any model where the fin, or fins, are mounted on or ahead of the stab. It provides a simple and foolproof way to key the stab, without retaining the stab so much that it cannot give during a cartwheel or hard landing. It is constructed using a piece of 1/8 inch aluminum stock which is cut into an "L" shape (laid on its side). A pivot . . . made from brass tubing, is fastened into the fuselage and runs through the "L" at the juncture of the horizontal and

vertical legs. A hole is drilled 2/3 of the way down the short leg and the long leg is tapped on the outside to take two 4/40 bolts. Dimensionally, the long leg is 2 inches long and the short leg 1-1/4. To the outside of the long leg is fastened (by 4-40 bolts) a piece of 1/16 aluminum sheet, backed with a piece of 1/16 plywood. This aluminum/plywood section is 1-3/4 inches long and 1-1/2 inches wide. It forms the rear stab mount of the fuselage. This whole assembly is mounted on the pivot tube so that it cannot slide from side to side, but so it can still pivot freely. A small piece of 3/32 aluminum (as wide as the inside of the rear fuselage and 3/8 inches high) is installed one inch behind the short leg. This piece is tapped to take a 4-40 bolt . . . which serves as an adjusting screw. A stiff typewriter spring, which serves to pull the arm back into a glide position, is attached to the short leg of the "L." A stranded steel cable is also attached to the short leg of the "L" and runs to the timer.

STALICK PLATFORM

(For use with fins mounted on or ahead of stabilizer)



In operation, a direct line runs from the timer to the stab, holding it in place for the power phase of the flight. A second line also holds in place the arm for the rear stab platform during the power phase. When the power phase is completed. the rear platform line is released and the platform pivots, overpowering the direct line and moving the stab t.e. up the predetermined amount. When the glide phase is completed, the direct line releases and the stab pops up to the predetermined angle for d.t.

Advantages: 1. The stab may be keyed onto the platform employing the usual split dowel keying system. 2. The operations are all internal, but can still be visually checked. 3. System operation is simple and dependable. 4. System can be finely adjusted. 5. It can be used on any model configuration.

Disadvantages: 1. The system is relatively difficult to construct and install. 2. It has to depend on a series of differing pressures to operate effectively . . . necessitating the use of springs instead of rubber bands. 3. The system is the heaviest of all of those cited.

All of the above systems work and work well. Some are easier to set up and use, but all can be made with the most elemental tools. Hopefully, this brief run-down will help clear up some of the mysteries of V.I.T. for you so that you will consider them for your next model . . . whether FAI or AMA. V.I.T. makes any model easier to trim, since the two flight functions . . . power and glide . . . can be trimmed separately.

To trim your model for V.I.T., aim for a center of gravity of around 65% (give or take 5%). Test glide the model with the V.I.T. in glide position. Adjust until the glide is just at the hint of a stall, then apply 1/32 stab tilt to induce some turn. Pull the stab into the power position and test the model under full power . . . with very short engine runs. A shallow, almost horizontal launch will allow the model to build up speed for the near vertical climb which will follow. Some slight right turn (for pylon models) is desirable.

After you have worked up to a full 9.8 second engine run, work on the transition. This is accomplished usually by setting the auto-rudder to kick in at about the same time as the engine floods off. It can be slightly before floodoff, but seldom should it be after. Auto-rudder throw should be as minimal as possible. The purpose of autorudder is simply to groove the model into the turn pattern. Auto-rudder is not used to determine glide circle, this is done by stab tilt. The V.I.T. should kick in just as the model is beginning to slow down after floodoff . . . usually about 1/2 to 1 second after auto-rudder. Final trimming can be made by adjusting the grub screws on the V.I.T.

One final word . . . With the speed at which V.I.T. models climb, the need for wash-in on the right wing panel (for pylon designs) is limited. If you are a wash-in addict . . . as I tend to be, use

small amounts . . . 1/16 to 3/32 should be adequate . . . and forget any downthrust . . . it just slows the plane down.

WAKEFIELD COMMENTS by Paul Lagan. Continued from January.

Last month, I presented comments from Paul Lagan about the design and construction of his Wakefield models. This month, I am concluding the series with the following:

"So far you'll note that I have avoided mentioning the part that rubber itself plays in this class. It doesn't really matter to model design/layout just what rubber you have or how you handle it, provided that the model will stand the "burst" from the most powerful motor that you are ever likely to put into it. The first criteria in rubber handling is to select a motor that will run off the prop you intend to use in about 30 to 35 seconds. Even with the best of rubber, any motor run in excess of about 40 seconds tends to lack punch . . . In theory, maximum duration will result from a Wakefield if you have a motor run of 50 seconds or even longer. This, however, assumes that the model climbs and glides in dead still air. With any breeze, or, more importantly, with any degree of thermal activity, it is most desireable to get that model up to its maximum altitude and to do it reasonably quickly . . . especially near the ground where turbulence below 50 feet can upset a model considerably, unless it is powering through it.

"It is almost universal practice nowadays to use a 16 strand 1/4 x 24 rubber motor in Wakefields, and to turn something on the order of a 22 x 28 propeller. There are a few variations, but most top flyers prefer the 35 second motor run such a combination will produce. It is easy to make up 16 strand motors, and such a motor is probably the maximum cross section that normal human beings can wind efficiently.

"The big problem with rubber recently has been its variable quality. Pirelli has been tops in the rubber field since the early '60's, and there have been good and not-so-good batches produced from 1960 to 1972. But generally, it has been reasonably consistent in that period. Recently, however, the Pirelli Lastex division was renamed the Filati Company, and with the change of name has come a drastic change in quality. The supposed variations in Pirelli quality in the previous two decades were nothing compared to the ups and downs in the Filati quality. Nowadays, Pirelli of 1970 to 72 vintage is worth its weight in Wakefields . . . if you have some, then keep it well and use it wisely, for it seems doubtful that we shall see rubber of similar quality again for many years. Filati is apparently attempting to regain lost quality, but the former trust their predecessors had is now gone, and it is difficult to see it being regained until Mr. Filati really produces the goods.

"Assuming you have managed to get hold of a skein or two of Pirelli, then it is a good idea to make it all up into a batch of motors and keep each batch from each skein separate from all others, for the stuff does vary from batch to batch quite a bit. It pays to give each motor some form of break-in prior to use . . . It is no good breaking in a new motor then putting it aside for 3 months . . . it regains practically all its original set in the period it is not used. It is far better to stretch your motors a week before the intended contest. I make my motors into 8 strands and then stretch each 6 to 7 times original length for about 3 minutes . . . The reason for breaking in motors is purely a physical consideration. If you were going to use motors of, say, 12 strands, then there would be no reason to break them in, because during actual winding, you would impart sufficient stretch and twist to the motor to efficiently wind all of it to an even and near maximum capacity. Because we use 16 strands, however, it becomes almost physically impossible to give the motor sufficient stretch while winding to ensure that all strands reach a point very close to their limit. This human limitation is most noticed when trying to wind a brand new unbroken-in 16 strand motor . . . the result is a very torquey wind that runs off much faster than the nominal 35 second motor run, and that deliveres much less power than a motor that has been broken in. As a matter of fact, I receive my best flight performance from the second wind-up on a given day of a motor that has had the 7 times stretch-in technique applied a week previously.

"Lubricants applied to Wakefield motors are almost universally of the glycerin/green soap variety . . . some use castor oil. I don't recommend either. The green soap type isn't very viscous on a warm day, and it and castor oil thus tend to spray the insides of the model on unwinding. Similarly, on a cold day, they gum up into an icky paste and make winding difficult. Since 1968, I've used Dow-Corning silicon lubricant type DC-4 or DC-3. It is ideal for rubber and is of constant viscosity. It doesn't dry up and it doesn't deteriorate, and experiments have proven it to be a better lubricant than either of the others.

"How many turns? This is a problem that besets the Wakefield flyer more than any other . . . take a tip from the Indoor boys and use a torque meter during winding.

"Performance . . . still-air times, etc. There isn't much importance placed on the ability of the Wakefield to do a high still-air time these days . . . for that matter, there isn't much opportunity to

measure such an evasive quality of performance. It is an attribute that is rarely put to the test . . . even in Sweden, during the early morning and late evening calm rounds, there were patches of air where Wakefields would do over 4 minutes with ease, and the first rounds of the actual contest, starting at 4:30 a.m., had helpful air sufficient for well over half of the entry to max. It isn't very often that one actually requires still-air performance.

"I have several times exceeded 3 minutes in very calm early morning air at the Nationals, but and here is the point. All the still-air ability in the world is no substitute for the model that has good stability. Watch some gliders flying together next time you have the opportunity. Notice that it is not the machine that sinks slowest that stays up longest . . . it is that non-descript crate that just gives a little wobble and carries on through that little bit of turbulence while minimum sink ships lurch and drop 2 or 3 feet. The same is true with Wakefield.

"The ability of a model to work a bit of light air without lurching or stalling and losing height is very important, and is very hard to achieve. In fact, the only way to achieve this is to do a lot of trimming and know your model in all conditions. It is also very desireable that moments of inertia be kept low . . . very light tips and tail, and short noses on Wakefields are definite aids.

"Assuming your Wakefield does possess the glide required, then, if you can combine this with climb performance in normal trim, you have a very competitive machine. A good Wakefield will climb to about 220 feet in the calm and will sink at about 1.2 feet per second. This altitude is definitely for a near perfect set of conditions, and with less than maximum winds, or trim a little off, or a launch a little awry, it is easy to drop below the 200 ft. mark.

"Despite all the theorizing and even with the best rubber in the world, it is still very necessary to possess good thermal flying and picking ability to fly successfully. The best conditions for Wakefield are at a contest where glider events are being flown . . . in such conditions, it is relatively easy to scab off thermalling gliders, as the Wakefield can easily reach the same altitude as the glider. When there are no gliders to scab off, it becomes difficult. If it is really calm, it is possible to scab off other Wakefields, but with any breeze at all, this isn't on, and so one must resort to feel or some artificial thermal indicating device. Of these, the bubble machine is supreme, but it does take a team effort to manage one.

"Intuition is the worst thermal indication there is. One needs a gadget of some kind when there are no real indications, such as other models or seagulls around. Failing the bubble machine, the mylar streamer can be useful. I haven't used one much but what I've seen of them they are quite handy . . . if only for distracting the opposition.

"Assuming one does attain infallibility in picking thermals, and that one has the perfect Wakefield, then contest success is still not assured. Support equipment is a very necessary part of the successful Wakefielders kit. In summer months it is a good idea to keep

models, and more particularly rubber, in the shade. And for this reason, I take a little white lean-to shelter to all summer events and take the trouble to erect it when the temperature rises. True, other bods also use the shelter, but as long as they leave me a few square feet, I'm happy.

"Wakefields often fly a great distance in thermally summer conditions, and so in order to see them at distance, it is desireable to fit chrome tape flashing

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strips to wing leading edges and around the fuselages. The Wakefield can disappear quite quickly in seemingly flyable conditions, and I have been clocked short of max on several occasions in a breeze. In order to see the model in long grass, red or orange fluorescent strips near wing tips and on the fin are desireable, and recently, I invested in a very small pair of 3 power binoculars, which fit easily into the pocket, for tracking wayward machines.

"Another essential part of one's equipment is a willing and capable helper/timekeeper . . . a hard person to find. You require someone who won't fall over as you wind, who will dispatch curious bystanders when they start in on awkward questions as you approach full turns, and who, above all, is willing to wait with you as you decide the moment to fly. If you have to rush into flying because you don't like to keep your timekeeper waiting, then you are doomed to failure. There are many times when you can't keep the bod waiting. But I'm stating the ideal.

"Since starting Wakefield flying, I have always had two models in good flying trim at any one time. If I wanted to play around, changing one model, then I would bring another into commission in the interim period until the original was sorted out again.

"That just about exhausts my ramblings on Wakefield and one man's approach to the class."

And that just about exhausts your columnist for February . . . I'll be back with more (actually less) next month. And to that one fan in South Nosebleed, N.J., who keeps telling me how much he likes the humor section, you'll just have to wait until next month. See y'all then. ●

Choppers . . . . . *Continued from page 27*

After a coke and ham sandwich, I re-adjusted the blades to a much higher pitch so as to start lifting earlier and before the engine reached a high rpm. My reasoning was that perhaps I was running too high an rpm with a resultant natural resonant frequency of the blades at high rpm, thus causing the shakes (Like a huge hang-over!).

Wow! it worked! with the increased blade angle, the engine barely left idle and it was airborne like a homesick angel. The stability was fine and control response was great, but I knew I had gone too far in the other direction because my cone angle was about 20 degrees above the horizontal. No, I needed more rpm at lift-off, so that centrifugal force would flatten out the cone angle. A few more adjustments and I had it just right.

I now have about 50 flights and am very pleased with the results of this new head. After all was said and done, I built a large and very accurate jig to align those blades just right, both for sweep and angle of attack. To the best of my ability, I measured at least 3 degrees pitch greater than the instructions called for, and found a discrepancy in the instructions concerning the relationship between engine rpm and pitch setting. Oh well, that's the way we learn!

Flight-wise, the Schluter Expert collective pitch head is a fine modification to your Hegi Cobra . . . the altitude control is exactly "right-on" your command and can be easily held within 6 inches of your desired altitude. I have noticed a strong ballooning tendency on the approaches, and quick stops are almost ruled out because of this, however, it may be due to the light overall weight. Next week, I'm going to load on extra pounds and see what effect it has . . . will report the results next issue. In the meantime, if someone knows why the S-head causes such violent pitch-ups on this bird, please let me know! (Yes, I've gone back and tried it again, and it is still as bad as ever!).

* * *

Jan Levenstam of Stockholm, Sweden, sent some fine photos of a helicopter competition that was held September 22. There were 24 models at the contest but only 10 dared to fly in the strong winds. Michael Bosch, from Ger-

MODEL R/C HELICOPTER DATA CARD

Complete and return to: MODEL BUILDER – CHOPPER CHATTER
Box 4336, 1105 Spurgeon St.
Santa Ana, California 92702

Name: _____ **Phone:** _____

Address: _____ **Age:** ____

R/C Helicopters: Interest only ☐ **Building** ☐ **Completed** ☐

Type model or kit: _____

Areas where help is needed: _____

List special skills you might share: _____

Remarks: _____

many, came up to demonstrate the Jet Ranger, and entered the contest only to be disqualified because he flew much too good!

A fine crowd of 1000 spectators showed up to view the 10 Jet Rangers, 4 Gazelles, 3 Hegi Cobras, 2 DuBro 300's, a Graupner 212, a Schluter DS-22, and 3 scratch-built originals. Jan also reports this was their first public contest and that helicopters are really on the increase in that country. Thanks much for your letter and photos Jan, hope we hear much more from you in the future.

* * *

The scratch-built Hughes 500 of Charlie Gilbert's is coming along real fine. I visited him this week and he showed me the first fuselage from the mold, and it was flawless! Although it really looks big for the first time, it isn't as large as a Hegi Cobra. Rest assured, however, that you can install the "big" O&R chain-saw engine and still get both hands inside for the installation! He is now getting ready to vacuum-form the windows in clear butyrate sheets . . . separate molds have been taken from the master plug for this exercise. As soon as the prototype is finished and flying, I suspect Charlie will be willing to contract with someone to turn out the finished product for a reasonable fee.

* * *

I also talked with Al Strickland, of Kavan, and he informed me that the Kavan Bell Jet Ranger has just recently finished being run through extensive wind tunnel tests in Germany, and the results should be released in the near future. Judging by the photographs, this was quite a project; something in the order of a full blown analysis and research, much like the initial testing of full scale aircraft. The results, when released, should be very interesting to the R/C chopper pilot who aspires to more knowledge and theory!

Al also chided me for not mentioning in my last month's column that those beautiful Bell 212 helicopters flown by Ernie Huber for the movie, were actually built around the Kavan mechanics! And they are too . . . I remember looking one over very carefully. I guess the Kavan mechanism is so universally accepted that it didn't "ring-a-bell" when I wrote about it. It proves something else too . . . The Kavan engineers are sure doing their homework in keeping up with the modelers' activities.

To make sure that the Kavan organization gets its just rewards, I wish to reemphasize that without doubt, the Kavan Jet Ranger is the most perfectly responsive R/C model helicopter in the world today. We are getting more and more reports of loops, rolls (yes, I said rolls . . . not true axial rolls, but barrel rolls) and other aerobatic maneuvers that can't be touched by other machines yet!

Would you believe that two weeks ago, Sunny California had a ferocious winter storm come through over the weekend I was scheduled to give helio demonstrations in San Diego? With strong Northeast winds of 35 to 45 mph, I tried to get my big Cobra off the ground but control was next to impossible. Undaunted, I fired up my trusty Jet Ranger and made a half-dozen flights without the slightest concern for stability and ease of control . . . now that has to prove sumthin'! I can't loop or roll it yet, but one of these days . . .

* * *

Another charmer that has always appealed to me is the Graupner Bell 212 Twin Jet . . . through the courtesy of Johannes Graupner, who sent a complete kit to MODEL BUILDER . . . with all of the latest modifications, I have just started to build their 212 and intend to present a construction review and flight characteristics report in future issues. The review will cover the latest rotor shaft modifications, as well as performance on training gear, and with their new float kit which they also sent. Watch MODEL BUILDER Magazine for the latest data. Gotta go now . . . BCNU next month! ●

C/L . . . . . *Continued from page 31*

white gas are all lap boosters, but are full of surprises and grief. We generally go back to the stock brew after experimenting with the other stuff, because of the consistency.

"If you're interested in building one of these planes, the place to be is in the pits at the next contest. Plans are available, and it's a lot easier to show a person how to build a plane, or uniflow tank, than it is to draw pictures. Several of the clubs plan to have a Novice Slow Rat event for guys just getting started, so you might strap on a one ounce tank on the Mongoose and get into the action!

"A final word of warning for those of you who are already to go testing. Be sure to run the engine plenty rich the first few runs, because they sure have a habit of going over-lean. Lots of whipping can usually overcome an over-lean run. Have your pilot try whipping his plane 10 laps with the engine off! We did some fuel tests using 10 and 50% batches, the speeds are for 8 laps and on 10%.

"It seems that the easiest way to adjust to different atmospheric conditions is by changing oils and not nitro. The Steen and NPG seemed to be almost identical in all respects, same with K&B and Ucon 1145. We thought the Steen and NPG made the motor sound the smoothest when running, plus giving best restarts and speed. Right now, we've switched over to the NPG because it doesn't have the nasty stain in it as does Steen C."

HELPFUL HINTS FOR SERIOUS STUNT FLYERS –

As told to Dale Kirn by Bart Klapinski

Now that cold weather has set in for most of you, 'tis the time to do your building thing. Since time is not critical now, try spending a few extra moments on your building techniques. Here are a few areas that should be given your utmost consideration:

Selection of glues: Make *all* joints fit as tightly as possible. This means less glue will be required, which means *less weight* and less chance of a warp setting in . . . *very* important in wing construction. So, be very careful in your selection of glues. The type of finish you plan on should be your guideline. For example, do not use Ambroid glue to attach the wing to the fuselage, if you plan on painting the plane with Aero Gloss. If you do, a very large (and ugly) "fillet" will appear. It is advisable to use 5-minute epoxy to hold the engine mounts in place and the mounting area for the control system. Also, use it to secure the wing and stab to the fuselage.

Alignment of parts: Ever wonder why your plane doesn't fly like your buddy's . . . and you both made the same kit . . . and even the weight came out the same? The problem can usually be traced to mis-alignment of the wing, stab and/or engine. Only one out of the three will cause problems, but if two are out of alignment, you have *real* problems. All of these parts *must* be set at O° into the fuselage. The ole "eyeball – close enuff" technique can only end up with serious problems. This alignment thing is more critical to performance than a perfectly detailed cockpit or flawless finish. So, take the time to DO IT RIGHT! Once the wing is in place, you have to work with the engine thrust line and flaps to remove your "built in problems."

Covering the wing: When covering the wing with either silk or silkspan, do only one panel at a time. Most modelers will cover a lower wing panel first, then immediately cover the top of the same panel. This is done to prevent warps. The same techniques should be used when doping the wing. In case you have some patching to do with silkspan or Japanese tissue, try "tearing" the patch to approximate size, rather than cutting it. Much easier to feather in the edges when doping/sanding.

Vibration causes: *Always* balance the prop. Make sure it has several coats of dope on it, as fuel/oil has a tendency to

creep in . . . which will throw balance off. Also, check spinner for alignment, and make adjustments if necessary.

Miscellaneous items: Do not "Over wax" your model. You can easily add from 1/2 to 1 oz. to the total weight. And most of that weight will go towards the tail . . . which means it ain't gonna fly the same as it did before it was waxed. But do keep your plane as clean as possible. After the day's flying session, hang the plane "nose down" so any fuel/oil will drain out the front. Otherwise, it could creep back into the fuselage and start adding weight . . . plus weakening the fuselage.

Do not be afraid to try different props. Not all 10-6 or 9-6 props will give the same results. They vary between brands as well as within the same brand (if they are wood). Wooden props *must* have the same blade flex characteristics or they will vibrate.

All flight adjustments (engine thrust changes, flap degree changes, etc.) should be made in very small increments. And please check your model for warps BEFORE each flying session. Just because it was perfect when you first made it is no guarantee it's gonna stay that way!

If you are interested in learning some of Bart's techniques for trimming out a new stunt plane out, drop us a line. Believe me, there is a lot to it.

SPEED RECORDS

The 100 mph barrier has finally been broken in ½A Proto! Jim Wade is the first to hold this distinctive honor at 101.38 mph. The back-up flight was a solid 100.54 mph. He credits the new left-hand single blade prop he carved a few days before the meet. He was running a 5.4 inch diameter and that Proto took off like it was shot from a catapult! Incidently, this is the same plane Wade used to set the previous ½A Proto (Senior) record at 98.64 mph and the Senior ½A speed record . . .108.57 mph.

Rick Westbrook boosted the Junior ½A Proto record to 93.96 mph. He was also running a new left hand single blade of 5.4 inches diameter, only his was a reworked Kirn-Kraft plastic prop. The blade area was reduced about 25% and the leading edge "raised" .020. Then, a full symmetrical blade cross-section was used for the entire length of the blade. Pitch at the tip was 4.9 inches. Who sez ya gotta run a flat bottom airfoil on a speed prop?!

The speed team of Jim Clary and John Newton established a new Class A (Open) record at 172.84 mph! And would you believe, with a Tired Super Tiger .15! Major reason for this record was the fact they were flying on two .012 lines . . . tied together. Plane was a bit unconventional too. Assymmetrical in design, with an upright engine (see photo).

Chuck Schuette was close on their heels at 165 plus . . . and with his engine running extremely rich. He was running tied lines also. It appears, in Class A, that two tied lines cause less drag than Mono-Line . . . which is an .020 line.

The AMA Control Line Contest Board will vote in early February to see which classes will be permitted to use tied lines. As we have mentioned before, be sure and let your District Control Line Representative know how you feel on this issue.

* * *

Speed activity has picked up a bit during 1974. Maybe it would get even stronger if the AMA age classifications were dropped. The AMA R/C flyers already have a proficiency system in operation, and WAM has this "proficiency rating" in ALL of their events.

Why not establish such a system for speed flyers? It would certainly be much fairer for the newcomer. Building experience, and flying techniques determine who will succeed. Classification by age alone just isn't the answer. The beginner, advanced, and expert classifications would really let you know at which level you are flying.

How about it, speed flyers. Let us know if you are "for," or "against" such a system. If enough flyers are in favor of this, it can be made into a reality during the next rules proposal cycle. ●

Peanut . . . . . *Continued from page 39*

designed by Peck Polymers for small rubber models, they can be obtained from Peck or from Bill Hannan, Graphics, Box A, Escondido, Calif. 92025. Catalog 25¢.

The prop used on the model is a cut-down Testors prop from one of their ready-to-fly models. I don't know any other way to get one of these specific propellers, but I wish Testors would put them on the market all by themselves. However, both Hannan and Peck can supply suitable plastic props and Marlow makes balsa ones that are easy to finish into lightweight propellers.

Wire, sheet balsa, and tissue, are obtainable at your local model shop. Tell 'em the Peanut Vendor sent you. ●

Counter . . . . . *Continued from page 9*

. . . on one pin at a time. After pushing together and prying apart about 10 times, the operation begins to ease up to the point that you'll believe it possible to assemble it on the plane without breaking something in the process. It goes without saying that the spinner won't come loose under the influence of an electric starter . . . no way!

* * *

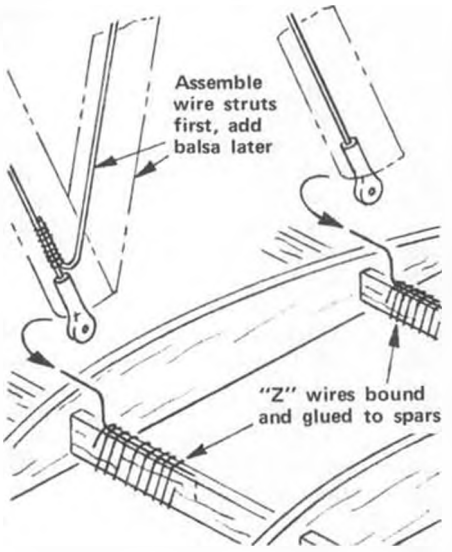
Windrifter is the name of the latest R/C Glider being produced by Craft-Air, 5651 Kelvin Ave., Woodland Hills, Calif. 91364. A Standard Class Sailplane, it spans 99.8 inches, yet with its larger-than-average chord for that span, the wing area totals 915 sq. in., providing wing loadings around 6 oz./sq. ft.

The Windrifter has already accumulated an impressive list of accomplishments in contests, including a 1st, 2nd, and 3rd in the 1974 LSF Tournament, with a 6th place overall, as flown by Rick Pearson.

The ship is of conventional and easy construction, and although it is highly competitive, it is also well suited for the beginner because of its stability and wide speed range. Kit sells for $37.95 and is at your hobby shop, or may be ordered direct, prepaid, shipped by air, postpaid.

F/F Scale . . . . . *Continued from page 37*

diameter wire (.032) is bent and mounted. The shape of the wire is "Z"-like, with one arm of the Z wrapped with thread and glued to the spar. The other arm (about 3/16 long) is pointed toward the wing tip, and is about 1/16 above the surface of the wing.



The upper and lower wings are held in place, preferably with jigs, while the interplanes are actually made in place. First, two short pieces of brass tubing (usually 1/16 brass O.D.) are flattened on one end, filed round and drilled with a .032 hole. They are placed on each end of a length of .032 wire and telescoped between their attach points, then soldered. When both wire interplanes struts have been made, "X" bracing can be added. When completed, the interplane wires are covered with wood and sanded to an airfoil shape. This, too, makes another neat installation.

Since I am a real biplane freak, I experiment with different approaches to the problem of interplane struts with practically every new model built. Yet, I still, at this time, like the Robart ball and socket hinge for the quickest and neatest installation, especially for F/F gas.

If anyone has a particular method that has been found to work well, let me know, and I'll pass it on to the rest of our readers. ●

R/C Auto . . . . . *Continued from page 55*

engines, so be careful. Also be sure to remove any burrs and lightly break the edges on the liner bore and piston O.D. (Dick McCoy says, "I am not using two bypass ports in sleeve and piston any more as it doesn't seem to give any advantage . . . I do feel it lubricates the top end of the rod better.").

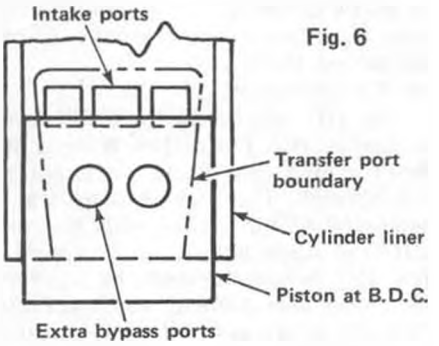


Fig. 6

PISTON-LINER SIDE VIEW

Another "trick" that is used on some engines is to put radial swirl grooves on the crank counter weight. An abrasive cut-off wheel is used on the hand grinder. The grooves usually are about .050 inches wide and about the same depth. The idea is to agitate and throw the fuel out and up the transfer port. Personally, I don't go for this ("I don't feel it helps." Dick McCoy). When the intake port is open the gas flow is across the grooves or even in the opposite direction. If you put the additional bypass ports in the piston and liner, the swirl grooves might help. I really think there is already enough agitation caused by the rod and crank counterweight, and flow paths should be smoothed as much as possible.

SUMMARY AND COMMENTS

All of the engine modifications discussed in this engine series are tabulated in the summary table. In this table you can see at a glance the modifications that can be made to engines and which ones are recommended for various stages of

tune. I would recommend the semi stock engine for beginners and novices, the super stock and McCoy conversion for amateurs and sportsman, and finally after you have been an expert for a while, go to the modified Veco-McCoy.

On all engines, it seems that when they begin going super-good, they are about to the end of the line. Next you have to start using more nitro to make them go, and then they're gone. This can happen in a few tanks of fuel. Also, usually, the more nitro you use the sooner the engine is going to go. Engines will last a lot longer if they are run a little on the fuel rich side. You'll also get more bottom end power if a little on the rich side rather than a little on the lean side.

Heating can be a serious problem on all modified engines. Dirt and grease can really cut down on engine cooling, so keep your engine clean, especially the head heat sink. Lay-down engines, in particular, have poor cooling and should be kept spotless. When an engine has poor cooling, the needle valve setting is very critical. The fuel seems to do all the cooling. When the engine is leaned out, it starts to heat more and then goes super-lean. So the engine seems to be either rich or too lean with just a small needle adjustment. Also remember that when an engine is running hot, there is a higher probability of "blowing" the engine.

Nothing can hinder your driving improvement more than an engine with too much power. It is very difficult to feel or notice the effects of chassis and aerodynamic adjustments on car handling, because they can't be noticed as well with too much horsepower. As a consequence, the beginner-novice-amateur may never progress to the next class because the car will never drive properly. But if you want to remain a perpetual member of a lower class, go ahead and do your thing. Only in the upper classes do engines really become the determining factor of maximum performance.

Thanks again to Dick McCoy for going over this series of articles. Dick has helped advance model engine technology for many years. The McCoy conversion for model cars jumped performance a very noticeable amount. I hope that the rest of the car technology can keep up with him.

This concludes the series on engine modifications. I'll come back to this later when I think there is something better or important to say. Many of the modifications mentioned here can be used on other engines to obtain better performance, mostly the flow smoothing changes. If you missed Part I of this series or other back articles, write to MODEL BUILDER or to Chuck Hallum, c/o HRE Inc., P.O. Box 4658, Irvine, Ca. 92664. Here's hoping that you'll move up to the next drive class so you'll be ready to hop up your engine, so that you'll cut back your power so *you* can improve! ●

Bonzo . . . . . *Continued from page 29*

in a fifth place in the 1939 Thompson race.

After the 1939 race season, Wittman corrected the ram air system, which solved the problem of burning valves. The aircraft was then capable of 325 mph without problems. But it was too late, for air racing was cancelled for the duration of World War II.

The aircraft is now on display (less engine) at the Experimental Aircraft Association Museum in Hales Corners, Wisconsin.

(Photos provided by Bob Hirsch) ●

Workbench . . . . *Continued from page 6*

finals will now have two rounds. Draw for flying order at World Champs will be by competitor name rather than by country.

F. Combat: A subcommittee redraft of the official rules was approved, including U.S. proposals regarding marking of streamers and use of the pyramid system.

FREE FLIGHT

Outdoor: The 80 gram weight rule (70 for airframe, 10 for rubber) for Coupe D'Hiver has been reinstated! No changes to take place in Power, Wake, or Nordic for 1975, however, in 1976, changes were approved to reduce power engine run to 8 seconds and return to the old fly-off system of increasing max times by 1 minute increments. Beginning in 1975, including the World Champs, the contest *may* begin before sunrise and may be interrupted (suspended) during the day if high winds *and* high thermal activity cause retrieving problems. A proposal for 2 minute maxes during such conditions was turned down.

Indoor: AMA's sponsorship of the Kopecky Trophy, on behalf of East Coast Indoor Modelers, was approved. A Hungarian proposal for a smaller class of models was adopted as an additional event, with provisional rules status, to encourage new interest. For World Champs class, another attempt may be made for any flight of less than 30 seconds. Also, a model may "touch-and-go" off the floor without terminating the flight.

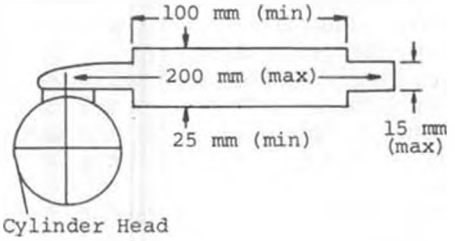
RADIO CONTROL

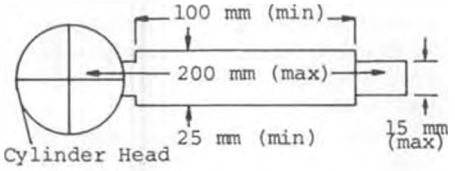
Aerobatics. A slightly amended '74 maneuver pattern has been approved for 1975, including a Top Hat with only half-rolls, the interchanging in flight sequence of the Running 8 and the Rolling 8, better definitions involving the Cuban 8, Spin, Rectangular Approach, and Landing, concerning when each maneuver is to begin; definitions are to make the rules agree with how the pattern was flown in '74 regarding sequence and wind direction. Also, the pilot, rather than his helper, is now required to call maneuvers, but he does not have to say when the maneuver starts. *(Good Grief! wcn).*

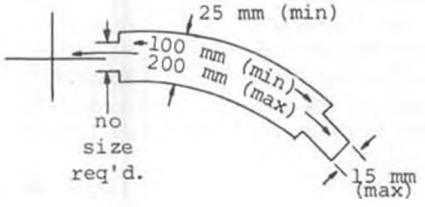
No changes were made to model and engine size rules. Four flights are now required (previously optional), with the best three to count. Jettisoning of parts, even if accidental, is not allowed (current rule stays as is). Framing angles for judging are designated as 90 degrees (45 each side of center) for horizontal viewing; from ground to 60 degrees for vertical.

Venturi (open front end) type silen-

cers are banned. The RC Subcommittee will use the '75 World Championships experience with sound measurements to devise more specific silencer requirements for 1976. A new provisional pattern, using three groups of maneuvers, was approved for testing and evaluation during 1975, for possible adoption in 1976.







Helicopters. Rules proposed by Germany were referred to the RC Subcommittee for study and possible '76 adoption.

Pylon. A fuselage cross-section area rule (100 cm^2 min.) was added, also a 300mm minimum track (lateral) for landing gears, plus a minimum of 18mm thickness of wheels for at least 1/3 of their diameter. A cockpit must be provided of minimum size, with clear vision forward and to the side. More specific silencer size requirements were added, (see sketch).

Soaring. The provisional rules were changed to official status, including the following in this report.

Signalling or talking to the pilot by helpers during the flight is no longer prohibited; applies to both Slope and Thermal Soaring. Proposed German rules for a simpler Soaring event were referred to the RC Subcommittee for study in '75 and possible adoption on a provisional basis in '76.

Thermal Soaring. U.S. proposals were adopted . . . an attempt can be repeated in case of launching system malfunction; launch location is defined; the maximum stretched length of lines is defined as 200 meters; the requirement for flight annulment after 60 seconds on the launch line is deleted; a 150-meter limit is placed on hand towing movement during launch; all references to 'working time' are deleted. Proposals from other countries were also approved . . . high-start and catapult-type lines must have one end attached to the ground; flight commencement is defined to be when the towline releases or the motor (for motorglider) has stopped.

Slope Soaring. Only 6 minutes allowed for scoring; partial scores using Thermal Soaring formula added; 7 minutes from launch is defined as the period in which additional points may be received.

SCALE

The principle of Stand-Off Scale was approved for an additional event, without World Championship status, with specific rules to be studied by the Scale Subcommittee for possible adoption on a provisional bais in '76.

A dummy pilot is now required for open cockpit models, but judging of the dummy pilot is not required unless contestant requests such judging. Two separate scale rulers are now permitted. Cockpit/Cabin scoring has been slightly downgraded in favor of increased points for Finish, Color, and Markings. RC model weight limit has been increased to 5kg, *without fuel.* Smaller landing circles for scoring, as per RC Aerobatic rules, were approved. Longer lines for multi-engined CL models were approved. The size of circular RC maneuvers were defined more precisely.

CORRECTION TIME

In the December issue, on page 71, John Pond mentioned receiving a letter from Jim Kloth (Beach's Flyer, Jan. '75 MB) in which Jim asked why we couldn't use the British D.C. Dart .035 diesel in O.T. Replica event, which currently specifies .020 only. John then mentioned that the Dart could be obtained from Stanton's in Chicago.

Scale modeler and Nats Judge Dave Shipton, proprietor of Hobby Hideaway, Delavan, Ill. 61734, *and also one of our advertisers* (Oh, Boy!), dropped us a note to *remind* us that he is the source of D.C. engines in the US, and in fact, he's not sure that Stanton's any longer stocks the Dart.

* * *

Our guest editor under Le Gray's "R/C Soaring" column this month. Ted Off, was also the author of the excellent article on scale effect in the December '74 R/C Soaring column. Though under Soaring, both of Ted's articles (this month, and Dec. '74) should be of interest to modelers of all categories.

The point here is that Ted somehow managed to reverse figures of a formula in the December article, and wishes to correct it at this time.

"I made a mistake in my article on the effects of scale. Le Grey and I further compounded the error in trying to correct it on the phone.

"The error cropped up in my original article as submitted. I got the definition

of S_1 and S_2 reversed. This obviously made S_f the reciprocal of what we call scale. Le caught this, but then we defined S_1 and S_2 correctly, which made all of his comments about reciprocals confusing (none of the discussion of scale is in error in the article, just the math).

"So, to correct the mess: I here define S_f as the scale of a model. Then $S_1/S_2 = S_f$, where S_1 is the span of the model and S_2 is the span of the prototype. Then, $A_1/A_2 = S_f^2$ and the first example on page 23 should read:

$$9.83/49.2 = 1/5$$
$$5.8/145 = 1/25 \text{ or } (1/5)^2$$

"In the example involving the weight of a concrete block on the bottom of page 23:

$$800/100{,}000 = 1/125 = (1/5)^3$$

"And in the example on page 62:

$$\frac{5.3/5.8}{660/145} = \frac{0.9}{4.5} = \frac{1}{5}$$

"All the other numbers make sense as they were printed."

THINGS TO DO

For the 3rd year running, the big Orange Coast Radio Control Club, Inc., is holding its Model Expo, in conjunction with the American Cancer Society. The Expo's main function is to raise funds for the Cancer Society, but it also serves as a means of exposing all facets of our great hobby to the public. It is entirely an outdoor affair, and will take place at Mile Square, Brookhurst and Edinger Streets, just northeast of the San Diego Freeway, Fountain Valley, California, about 40 miles south of Los Angeles. The dates are Saturday and Sunday, April 12 and 13, 1975.

The model Expo will feature:

1. A two hour repetitive flying demonstration of radio controlled models representing the many eras of aviation, from the Wright Bros. to the Jet Age.

2. Continuous day long performance of U-control aircraft. All children will have a chance to fly these planes.

3. Radio Controlled auto racing . . . including the dragsters. Probably the world's longest R/C drag strip!

4. Continuous demonstrations of Free Flight throughout the day.

5. Local rocketry groups will demonstrate their latest launch and recovery techniques at regular intervals.

6. Large display of plastic scale models manned by representatives of the International Plastic Modeler's Society.

7. A display of sail and power boats.

8. Staffed displays by some of the manufacturers of model supplies.

By the way . . . admission is free! Donations will be solicited by representatives of the American Cancer Society. Don't be chintzy, bring a donation with you!

AMA SCHOLARSHIPS

The Academy of Model Aeronautics established a scholarship program in 1968. When making its choices, the Scholarship Committee considers school grade averages, class ranking, national test results, school and community leadership activities, and of course, performances in AMA aeromodeling competition activities. The Scholarship funds are awarded for the furthering of the

recipient's education at the college of their choice.

Photos, and information about the recipients (shown on page 5) were furnished by Larry Bolich, AMA's new Public Relations Director.

MACA IS CALLING

The following notice was sent to us by MACA member Richard Lopez, Daly City, California:

"NOTICE TO ALL COMBAT FLYERS

"This is an official invitation to any combat flyer who is interested in being well informed on the latest combat happenings in the United States. The Miniature Aircraft Combat Association is an organization of devoted combat flyers interested in the betterment of the combat event. M.A.C.A. is dedicated to uniting combat flyers throughout the United States and establishing combat at the World Championships. A world combat championship is something that American and British combat flyers have been wanting for some time. The only way we combat flyers can achieve this is to be united.

"M.A.C.A. published 9 newsletters in 1974 that were full of information directed at combat flyers. There were articles on engine reworking and theory, National's combat coverage, critiques of contests, helpful hints and much more. These articles were contributed by M.A.C.A. members throughout the country. M.A.C.A. is open to the views, ideas, questions and opinions of its members. If you are interested in a M.A.C.A. membership for 1975, send $4.00 (very reasonable) to M.A.C.A.'s treasurer, Tom Southern, at 2207 Paul, Longview, Texas 75601. You will not regret it!"

IN CLOSING

SCIF (Southern California Ignition Flyers) newsletter editor Brick Brickner quoted the following foot-in-mouth comment in a 1935 publication:

"Douglas Aircraft will build a long range airliner to replace the DC-2. Prices on the DC-3 will range from $58,000 to $86,000 each, and it is expected that the Douglas Company will sell in the neighborhood of 200 of them before competition forces them to put out something better. A profit on the total number will be about one million dollars."

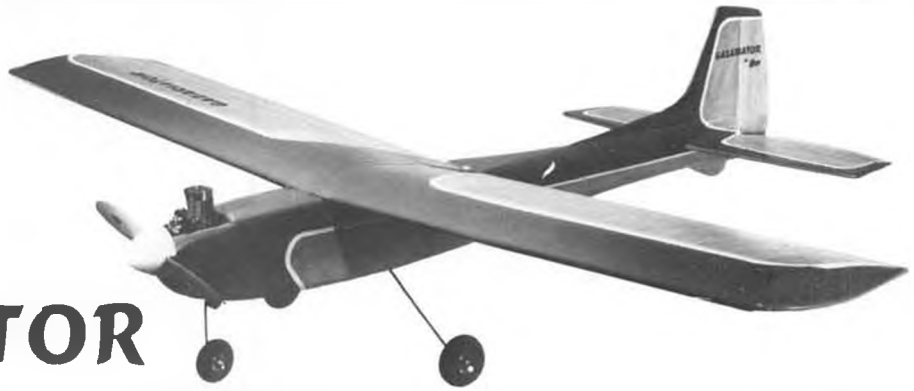
Brick went on to say, "Well, there were 10,926 DC-3's and military variations built, and thousands of the C-47's were reconverted after the war for civilian use. The Russian and Japanese copies raised the total to over 13,000. Called the most successful airplane ever built, there are still about six hundred currently active in the U.S., and no one knows the world total, but it will be many years before the Old Gooney disappears forever."

. . . and they laughed when we started MODEL BUILDER! ●

HAVE YOU LOOKED THESE OVER YET?

KIT FS-32
SPAN 68 in
LENGTH 52½ in.
AREA 800 sq in
FOR ENGINES .50 to .61

$51.95



GAZARIATOR

(Super Fledgling)

For The Sport Flier...
...And Especially the Newcomer to .60 Radio Control Flying

If you are a Sport Flier or a newcomer to R/C then this is your ship. It's a good looking plane that builds easy — goes together fast — plenty roomy for any equipment — rugged for hard use — flies comfortably and is just the right size, for a 60.

AND ABOUT THE KIT ITSELF. Fuselage sides are one piece with ply doublers back past the wing. Only a few bulkheads and a shaped top make for almost "instant fuselage." Torsion main gear & sprung nose gear (or fly it as a tail dragger). Aluminum engine mounts, etc.

The complete wing is built on the work bench without having to remove it which eliminates warps — All parts are die cut, carved, etc. Balsa sheet cover keeps warps out and makes for a tough wing. Tapered Strip Ailerons are simple to install. Wing is installed just like the low wing jobs, using dowel pins and nylon-screw in maple nut block, like it ought to be. No rubber bands to deteriorate or slip or tear up.

Elevator and Rudder are sheet. Stab & Fin is built up and sheet covered to keep it flat . . . so that's it, a fine kit of a fine ship.

Included is all the linkage hardware, pushrods, aileron and elevator horns, bellcranks, clevis, connectors, etc.

SAILFISH

One of the prettiest Sailboats you ever saw either Free Sailing, or R/C. Construction is simplicity itself. Die Cut Frame, features Plywood for strength and long life. Printed-planked Deck is Die Cut and ready to slip into rub rail, molded into Sleek Plastic Hull. Kit is unusually complete with Die Cut Mahogany Cabin, Brass Chain, Many Cast Metal Fittings, CLOTH SAILS, Rigging cordage, Mast & Boom Material stamped Rudder and Keel with INTEGRAL LEAD BALLAST, Step by Step Plans show simple assembly. Base shown not included.

Kit B23
$14.95

HEIGHT 32½"
LENGTH 24"
BEAM 5"

G1 Spanish Galleon
G2 USS Constitution
G3 Schooner Blue Nose
G4 HMS Bounty
G5 Golden Hind
G6 Pirate Brig

All Just $6.95 ea.

Authentic Replica Series

Every kit contains a machine carved hull, genuine metal castings of Cannon, Life Boats, Anchors, Steering Wheel, Stern Castles, Figurehead and many other castings as needed. Also Chain, Black and Tan Rigging Line, Printed Cloth Sails, Decals, Display Pedestals, and all the rest that go to make an easy to build full rigged sailing ship that will gain in intrinsic value as years go by. Models truly worthy of a place in your home or any museum.

BeGINNeRs FUN SeRies

13 of 'em—2 at $4.95 the rest $4.50

If you really want to have some fun, then go out and get one or more of these nifty control line models. They're the easiest ones in the world to assemble—all wood, no tissue covering—only 6 to 9 parts, depending on the model (except the Fokker which has a few more, because of the struts). Genuine Nylon motor mount ready to bolt in place—Complete control system (less handle and lines) decals, landing gear, wheels etc.; which makes building a cinch and assembly literally in minutes.

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Airborne Superiority

Mark V—Five Channels

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Twenty six years ago, MRC started to manufacture electronic control equipment. The company's uncompromising quality standards have made it today's largest diversified manufacturer of electronic products for the hobby industry. MRC grew because it made a better product and MRC's Mark V and Mark VI radio systems typically stand head and shoulders above the systems they compete with.

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Proven dependability is a goal all RC systems seek but few achieve. MRC's designs using state of the art American made integrated circuits rate high in performance and dependability. Combine this with precision assembly and thorough testing, and it results in reliability the MRC user can depend on. Every Mark V and Mark VI is bench tested twice after final assembly and then actually ground range tested twice. The MRC system you get has passed a test procedure so far advanced and so confident are we of its reliability, that we provide a written full year guarantee for each MRC set.

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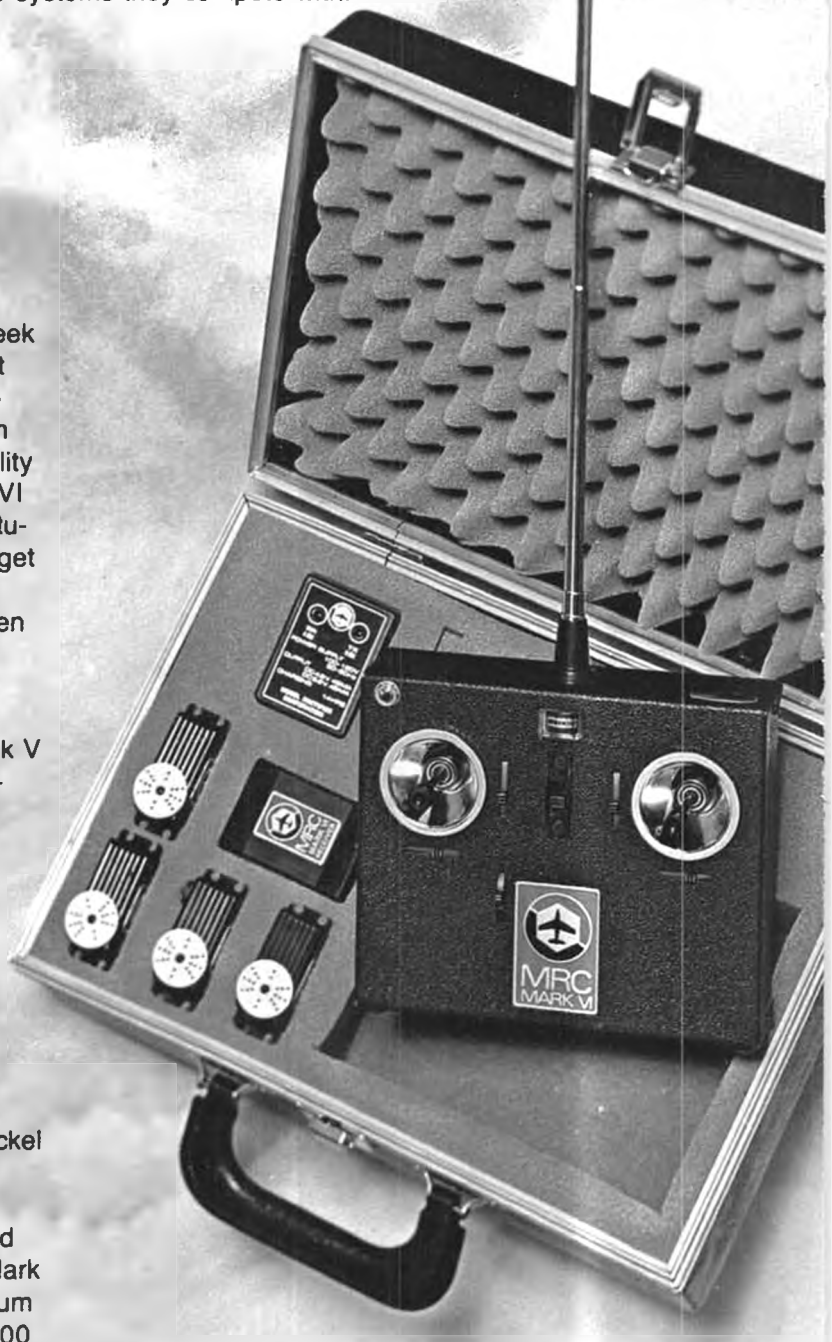
It has been more than a year now since the Mark V first came to market, and the frequency of service required is less than 20 percent of our previous models.

The range of the Mark V and Mark VI is more than twice as great as our former set, and the servo resolution four times better. The new MRC systems offer range, reliability and precision control that exceeds many other so called sport systems and even challenge the higher priced "professional" sets. Ask your dealer. Ask the man who owns one. Fly a Mark V or Mark VI and enjoy MRC product superiority.

Mark V—5 channels, complete with 4 servos, nickel cadmium batteries in receiver and transmitter and charger. Recommended retail under $300. . . . Mark VI—6 channels, features as above, and including field carrying case. Recommended retail under $325. . . . Mark V Special "2"—5 channels with 2 servos, nickel cadmium battery in receiver only. The set to grow with. Under $200 recommended retail.



Mark VI—Six Channels
Complete with case.

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