R/C MODEL BUILDER

volume 10, number 102 $2.00 JULY 1980

ISSN 0194 7079

- TOLEDO 1980
- Lee Taylor on GIANT SCALE
- DAVIS D-1K Westburg Scale Views
- Bill Northrop's APPRENTICE R/C TRAINER

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R/C MODEL BUILDER

JULY

1980

volume 10, number 102

621 West Nineteenth St., Costa Mesa, California 92627 Phone: (714) 645-8830

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FEATURES

SCALE VIEWS

CONSTRUCTION

Cover: We highly recommend taking a trip by Hawaiian Air, as you might just possibly meet stewardess Miss June Uyeno, shown here in Honolulu with "Sting", a .40-powered pattern ship built by Leonard Onaga, from a Myers Airplane Products kit (686 Anson, Simi Valley, CA 93065). Plane is finished in acrylic enamel and controlled by a Kraft single-stick Signature Series radio. Fujichrome transparency by Jim Miura.

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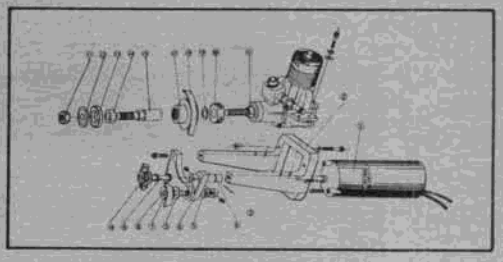

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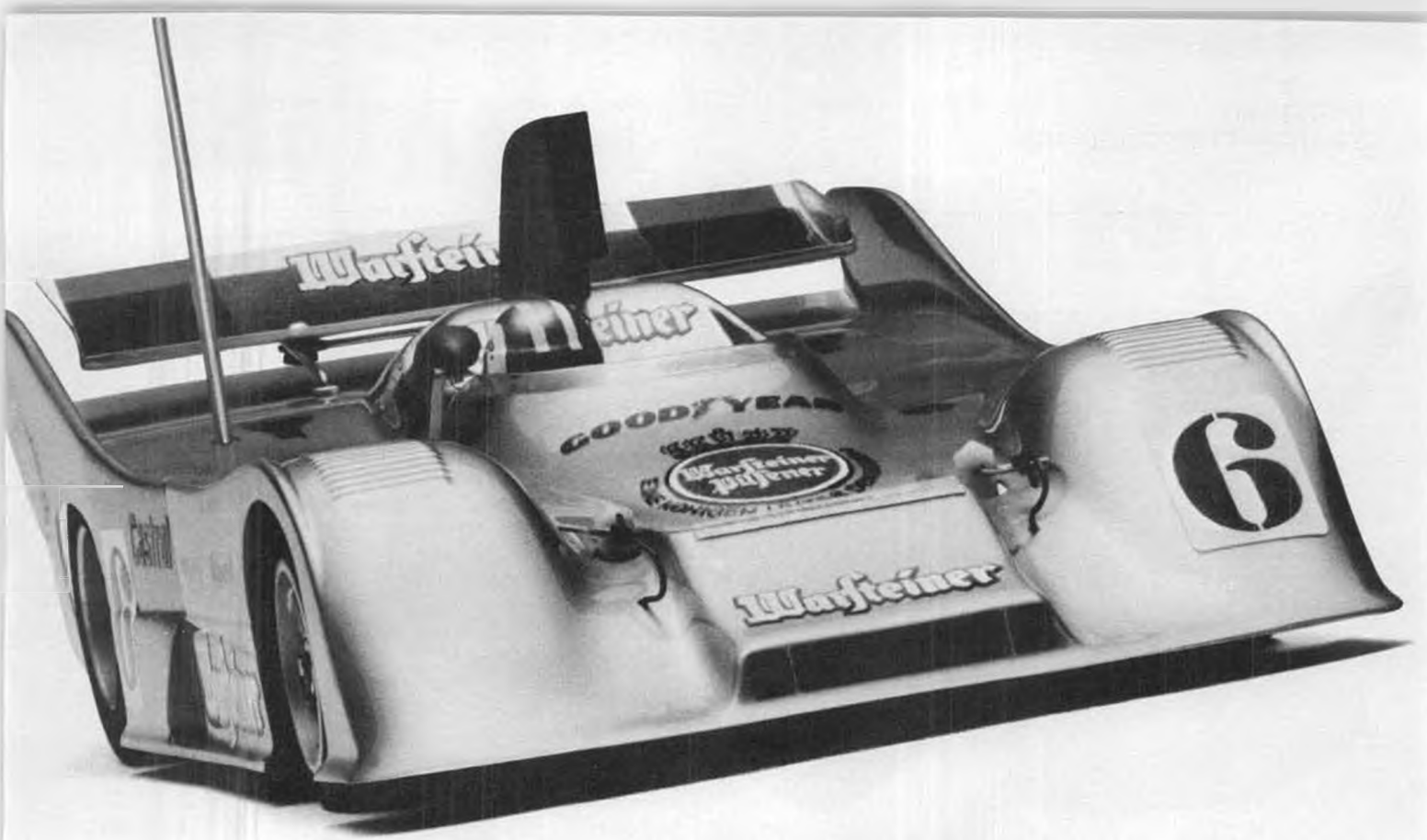

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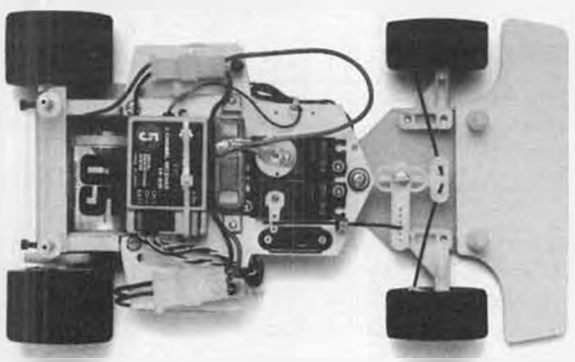

The Nats-winning RC12E features die-cut fiberglass chassis, lightweight racing wheels and tires, tough glass-filled nylon pillow blocks and complete, detailed instructions including racing tips from Gene Husting and Roger Curtis. Approved for ROAR competition.

THE RC12E'S TRACK RECORD AT THE NATS

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	6cell	No event	**RC12E**	**RC12E**
1979	4cell	No event	**RC12E**	No event
	6cell	**RC12E**	**RC12E**	**RC12E**

*4 cell cars run indoors, 6 cell cars outdoors. Chart shows all expert class main events under official ROAR sanction since the RC12E was introduced.

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KIT RC-46

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Designed by CLAUDE McCULLOUGH

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Wing Area: 430 Sq. In.

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Wing Span: 65 In.
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Working that trade show in Toledo sure gets rough at times! These are the Vall sisters (l to r); Marilyn, Terri, and Amy, who helped out in the RCMB booth, and were the hit of the show. They are 17, 18, and 21, and we'll let you figure out which age goes with whom!

from Bill Northrop's workbench . . .

A SUPER NO-NO!

The following letter was recently addressed to an R/C club by John Worth, AMA's Executive Director. The reasons that it was written will become clear as it is read, and it most certainly should be read, and absorbed, by every active R/Cer and/or R/C club officer.

Subject: Your March 18 letter to the FCC

No doubt your letter was sincere and well intended, but it surely does not help the cause. At best, it is discouraging to the efforts of other AMA'ers who have worked for the past two years to get more R/C frequencies. At worst, it will confuse the FCC and delay the process. Regardless, it's too late and we have to live with the consequences. Hopefully it will only be a diversion with no permanent damage.

In any case, perhaps this will help to correct some of the misconceptions in your letter.

1. The AMA is not asking for technical restrictions which would dictate that narrow band FM must be used. Our proposal only specifies the band width of requested channels, so that narrow band AM as well as FM could be used.

2. The AMA is not advocating the use of thirty channels simultaneously. The reason we are asking for so many is so that in any given area of the country we might be able to have some combination of ten or so that would be interference free. The FCC has said that it will not provide us with frequencies for exclusive R/C use because there are too many demands for use of all frequencies in the spectrum. So the FCC has suggested that if we had many to choose from we could be surer of having enough in any particular locality to operate safely. We note too that there is a need to separate aircraft from boats and cars, for safety.

At the present time in some parts of the country a number of the 72MHz frequencies are useless for R/C, due to commercial and industrial allocations by the FCC. That situation is going to get worse, according to the FCC. Therefore, they tell us, our best choice is to have more frequencies to choose from.

3. The problem of frequency synthesis that your letter poses is more a matter of human irresponsibility than accidental happening. Someone would have to deliberately sweep the frequencies and anyone who would do so is a different kind of problem . . . equally likely to shoot somebody down on one of the current frequencies. It should also be remembered that while transmitters may be frequency synthesized, the receivers will not be . . . the size, weight, and cost for receivers makes it impractical.

4. The complete text of the proposed rules will be published, with appropriate time for public comment. Until they are published, however, any uncoordinated correspondence with the FCC will only delay that process. The FCC asked us to make that fact known and we did so, direct to all AMA clubs and through all the modeling publications.

Meanwhile the proposal is not yet complete because we have been running tests of potential interference problems on the new frequencies and the FCC is waiting for those results before proceeding. At this writing the tests have just been completed and are being written up in final form for submission to the FCC.

5. For all the reasons above your letter was premature and ill advised. We hope, however, that no lasting damage has been done. In the meantime it would help to have a little more faith in those in the industry and on the AMA Frequency Committee who have devoted so much time and effort to date in working to solving our frequency problems.

6. Your letter offers no solutions to the current frequency problems, which are escalating daily. Meanwhile you are not being asked to discard your existing equipment . . . under the AMA proposals they will be usable for many years to come.

7. If you have constructive suggestions, complaints, criticisms, etc., please communicate them in the future to the AMA (except when the FCC calls for public response) so that a coordinated process of serving the best interests of all R/C'ers may best be served. To do otherwise is to confuse the picture and delay the solving of problems.

At the least, please give us the opportunity to answer your questions or concerns before deciding to take direct action. In this way the system can work to give you more complete (and correct) information upon which to base your decisions and actions. This is in no way intended to tell you how to think, but only to help insure that your own interests are protected, by knowing more about the subject we are all so vitally interested in.

The above design is a proposed international sign, similar to the all-language road signs being adopted all over the world. It would be used to identify model flying sites, club locations, etc., and is, like the others, intended to be understood regardless of the country in which it appears.

The design has been proposed by Peter Blommaart, of Belgium, a member of "International Test Service" and also President of the F.A.I. Subcommittee F3E (that's R/C sailplanes). We suppose each model aircraft special interest group would like to see something more indicative of its favorite type model, but the proposed design certainly gets the idea across without any confusion. What do you think?

PARDON? WHA'D YOU SAY?

The following was written by Ernie Olsen, and contributed to his club newsletter, the "Blue Angels Tablet" of the Bronx, New York, edited by Tom Waller.

BELLS OF ST. MARY'S

"Ask a prize fighter what the bells of St. Mary's are and he will tell you: 'It's da chimes ya hear in yer head when yuse are knocked punchy.' Move over,

prizefighters of America, and make room for the model airplane makers of America, who break in their new motors with the mufflers off, and their heads, including ears, only inches away. When done, they walk away with their ears ringing with 'discotheque high,' better known as the bells of St. Mary's.

"Let's start at the beginning. A very young child can hear sounds from 20 cycles (lowest) to 20,000 cycles (highest). By adulthood his hearing has narrowed to 120 cycles to 12,000 cycles. With age or hearing damage, the range narrows. Ear damage is what the doctors call 'cumulative.' That means it accumulates . . . in other words it continues to deteriorate and never gets better.

"In industry, shrieking saws, as in the aluminum window industry, reach 100 decibels in volume. If an employee can prove 93 decibels, he can claim disability for ear damage. Notice how your dentist steps away from you as he presses the button on the X-ray machine. He has learned that radiation is also cumulative.

"Modelers PROTECT YOUR EARS. Hearing loss is a one-way street. If you don't, in your old age you can sit quietly on a park bench or in bed, and enjoy hearing the bells of St. Mary's 24 hours a day.

"Here are suggestions for noise suppressors: Flents Anti-noise ear stopples, 6 prs. $1.79 at a drug store. Your friendly rifle center or sporting goods store has ear protectors, $9.95 to $27.00." —Ernie Olsen.

Did you note that adulthood hearing range? Ironically, people spend hundreds, even thousands of dollars on super hi-fi speakers that deliver a sound range from 25 cycles up to 25,000 cycles!

NEW SKIPPER

We didn't have room to mention it last month, but perhaps you noticed that "Strictly Sail" was back in the magazine, with a new name at the tiller. Actually, Don Prough (sounds like "row") was with us for a short period of time some years ago. Upon learning that Rod Carr had to come ashore because of business pressures, Don volunteered to take over the column once again. It was agreed that a column every month might get a little too frantic, so Don will be in every other month. Watch for him again in the August issue.

THE $8.55 SPREAD

Keen observers who may have been checking Byron Originals' ads in the June issue on the Byro-Drive reduction unit, were probably wondering how the price managed to increase from $89.95 on page 67 to $98.50 on page 111. Of course, the correct current price is $98.50. The ad on page 67, devoted entirely to a complete description of the reduction unit, was a repeat of an ad appearing back in the October '79 issue, when the price was indeed $89.95. The 10% increase is certainly in line with today's inflationary problems.

HOW ABOUT THAT!

Most TV watchers have seen the commercials dealing with the confusion over

Continued on page 110

"...THREE if by AIR"

(Letters to the Editor)

Dear Bill,

I always wondered how Bill Hannan managed to do so much with his time. He manages a business or two, builds up a storm, heads committees, etc., etc.

I just read his excellent book, "Peanut Power," and there on page 15 is the answer, in a photo. Hanging under his workbench is a roll of toilet paper. A picture is worth a thousand words. Can you imagine such devotion? And such efficiency!! Haaww . . .

Regards,
Ed Toner
Howell, New Jersey

We're glad Ed is so observant. He drives a 747 for Teeny Weeny Airlines!

Dear Walt:

My May issue of RCMB *was overdue this month. I assumed it was lost in transit, so I called your circulation department and had another sent. Now I know why some dirty old mailman must have intercepted my mag. When I came home from work today to see my May issue, my eyes nearly popped out. Boy, was my wife steamed. She claims I read* RCMB *for the cover. She also pointed out the ladies on pages 72 and 86. What my wife would like to know is, "What have these pictures got to do with model airplanes?" She also claims that she won't let me renew my subscription . . . fat chance!*

Keep up the good work.

Name withheld
No request needed!

Dear Mr. Northrop,

Being a fledgling in the area of radio control flying, I must say that after having read my first issue, that I was truly pleased with your magazine. I must also agree with a letter you published from John Birnie, of Gloucester, England, when he stated, "I very much appreciate the overall coverage that you provide in R/C Model Builder. *It's a thorough page-by-page read the minute the magazine arrives."*

As for your May cover, the model displayed was truly magnificent. Its beauty and lines would make its holder proud. Incidentally, the "Magnum 12" was also "eye-catching."

Keep up the excellent work.

Gary Novosel
Air Commerce, Flight Technology Major
Florida Institute of Technology,
Melbourne, Florida

Two strikes for Lori Fragola, our May cover girl. And you're correct, the Magnum ain't too bad either. Verrry nice proportions!

Dear Bill, Walt, etc.,

Much has been said concerning the various subcultures associated with model aircraft, i.e. "F/F is dead," "R/C Sucks," "C/L is for kids," etc., etc., ad nauseum.

Through it all, however, very little has been voiced (with the notable exception being my man, Dirty Dan) concerning the most ridiculous problem of all, in my opinion . . . having to belong to the AMA in order to compete in most contests. Now please bear with me; this is NOT *another "R/C Sucks" letter, but is rather intended to question* WHY *a person who flies rubber-powered scale should be required to donate $25 a year (or less . . . OK, OK) to an organization whose membership is ADMITTEDLY R/C-oriented. Why should the general membership help subsidize FAI get-togethers in Las Vegas? A "Nationals" that is, in reality, one long R/C Pattern and Scale meet? Why if one should choose to enter the U.S. Free Flight Champs, pay one's entry fee, and abide by the established rules, should one pump additional hard-earned cash into a National organization that* ACTIVELY *promotes and encourages everyone to "move up"/"graduate" to R/C?*

The AMA, as it now stands, has outlived its usefulness to the C/L and F/F flier, other than those who wish to participate in FAI competition. I am one of a growing number of competitors who will no longer pay for something I don't need. Anybody care to argue this?

Mike Keville
Lakewood, California

Hmmm . . . Maybe it's time to form the U.S. Model Builder Society. Dues are $20 per year and include a subscription to R/C Model Builder. The rest of the details will be worked out later.

The following letter to Earl Witt, AMA President, was copied to us, along with a request from its writer, Col. Hurst Bowers, USAF (Ret), to support the matters so discussed. As AMA has put the relationship of its organization and those of us in the profit making business of model magazine publishing on rather thin ice, it does not behoove us to take sides in any AMA related issue, at the risk of being accused of attacking motherhood, apple pie, and peanut butter sandwiches. We therefore reproduce the letter in total and refrain from any further public comment.

AN OPEN LETTER TO
THE PRESIDENT, AMA
Mr. Earl F. Witt
26 Warwick Drive
Chambersburg, PA 17201
Dear Mr. President:

Since you have assumed office I have been an ardent reader of your monthly dissertations in Model Aviation. *You are to be congratulated for your enthusiasm, and for your in-depth examinations of several areas which have become quite controversial. You have asked for input from members expressing our views and recommendations. I wish to take this opportunity to accept your invitation.*

To those of us who live in the Washington area and must cope daily with the traffic, weather, impossible parking and high costs, the thought of a move to a more desirable area is most alluring. I'm sure that the headquarters staff is no exception. We are being tempted by the "icing, and not the cake," however. I too have frequently been involved in the past with organizational relocation, and without exception, the budgeted or anticipated costs merely represented the "tip of the iceberg." Should such a relocation of our headquarters be implemented, there is no question but that our membership would pay very dearly before it is all over. As the Seat of Government, Washington has become the logical center of all association activities, regardless of the illegality of lobbying. Realistically speaking, any small savings in rent, etc., (and surely we don't intend to buy at a time of record high interest rates)

Continued on page 108

OVER THE COUNTER

WORKBENCH

• Ace R/C heads up the list of new products this month with several interesting goodies. First is the "Nilite" glow plug battery, consisting of a single 1.2-volt, 1.2 Ah rechargeable Ni-Cd cell which should have more than enough capacity for any normal flying session. The battery comes wired and the connectors for hookup to a glow plug clip (*not* supplied) are also furnished. Price is $9.95. And for those who need a charger, a companion charger is available separately for $5.95 and will charge a 1.2-volt cell at 120 ma . . . which just happens to be the overnight charge rate for the Nilite battery. No connectors are supplied with the charger when purchased separately.

But for those who *really* want to do it right, Ace is offering a Nilite/charger combo. Everything comes all wired up for you, and at $14.95 you even save a buck in the process. Still gotta supply your own glow plug clip, though.

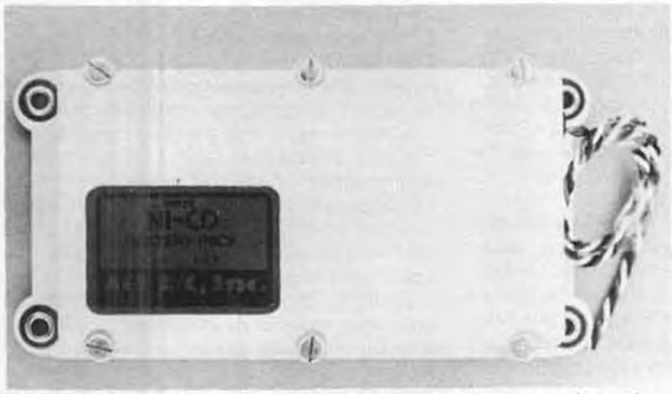
For giant scale and even large pattern models where weight is not too critical, Ace has a 1.2 Ah, 4.8-volt airborne R/C battery pack that will provide some extra flight time when high-drain or several regular servos are used. For vibration damping and protection, the batteries are surrounded by 1/4-inch latex foam *inside* the case. Also, mounting lugs are provided so the pack can be secured with screws to a bulkhead or other part of the model structure . . . no need for a lot of foam rubber in the nose of a big plane. Grommets, eyelets, and mounting screws are supplied, but you have to supply your own radio connectors.

The pack measures 1-3/8x2-3/8x3-7/8 inches, not including the mounting lugs, and weighs 10 ozs. Going price on this one is $23.95. A separate overnight charger is also being offered, identical in appearance to the Nilite charger but rated at 4.8 volts. No connectors. Cost is $5.95.

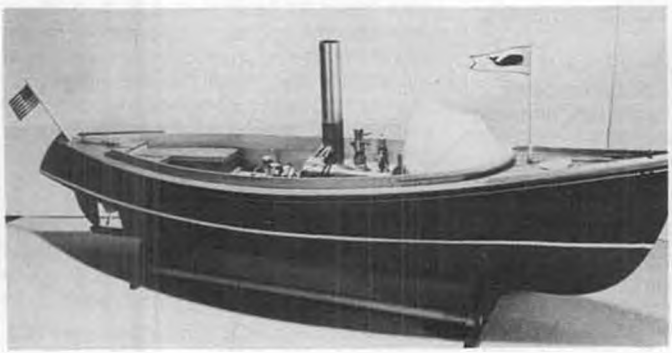
Not shown in the photos are Ace's new 1/2A racing wheels, machined from aluminum and sporting a rubber O-ring for the tire. Diameter is one inch, width is a scant 1/8 inch, and a pair of these things will add only .16 oz. to your model. Cost is $2.25 per pair.

Final item from Ace (it's about time!) is a "Goodie Box," a seven-compartment, 1x4x5-inch plastic box full of all sorts of

Taylorcraft's big scale pilot. Looks like Clark Gable or Burt Reynolds, take your pick.



Two new offerings from Ace; a 1.2 AH airborne R/C battery (above) and "Nilite" glow plug igniter and charger (right).



New kits from The Laughing Whale are the Steam Launch (left) and the Bass Boat, both for R/C.

Elaine Hostetler poses with a colorful Liberty Sport built from plans by her father, Wendell.

Plans for another large scale model, a P-40D, are being released by Nick Ziroli.

miscellaneous items that could come in handy at the field. Wheel collars, bolts, nuts, washers, servo pot lube (!), pins, grommets, heat shrink tubing, keepers, nylon bolts, etc. are some of the items furnished, and there is also some room left for you to put in other things you think you might need. Price is $6.95, and if just one time it saves you a trip home or lets you fly instead of watch, it will have paid for itself, right?

All from Ace R/C, P.O. Box 511, Higginsville, MO 64037.

* * *

Those two scale type boats in the photos are new additions to The Laughing Whale's growing line of hardwood boat kits. The first is the "Bass Boat," a 21-1/2 inch replica of a small sport fisherman patterned after small New England commercial fishing vessels. The model is designed for R/C and an Astro Flight 020 electric power system.

The other model is the "New England Steam Launch," a 35-inch semi-scale boat for R/C and steam power. This is the first of a series of large scale custom kits and is complete with all running hardware including brass propeller, stuffing box, shaft, and universal. Both models contain highly detailed drawings, quality mahogany and basswood, and complete fittings. Retail price of the Bass Boat is $66.95, and the Steam Launch will set you back $229.95.

Not shown in the photos is the new sail winch designed for The Laughing Whale's line of small sailing vessels and selling for $39.95. A high-torque electric motor is also available for $8.95, and a matched proportional speed control for $24.95. The sail winch and speed control both require a positive pulse R/C system (no Pro Lines).

If you're interested, The Laughing Whale has a catalog listing all of their products available for $1. Write to them at P.O. Box 191, Wiscasset, ME 04578.

Latest from J-5 Enterprises is this all-fiberglass, quarter-scale Canadian homebuilt, the Zenair Tri-Z CH300.

* * *

Nick Ziroli sent a short note saying that he now has drawings for another large size R/C warbird, in addition to his F4U-1 Corsair. The new model is a 2-1/2" = 1' version of the old favorite, the Curtiss P-40D Warhawk. Span is an impressive 94 inches and the recommended power is a Quadra or other two to three cubic inch engine. Plans also show an optional flap installation. A plastic canopy, fiberglass spinner and cowl are available separately.

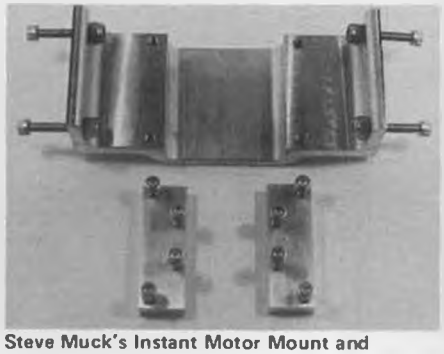
Cost of the P-40 drawings is $25, or, if you'd like a little more info before investing that much, a 15¢ stamp will bring full details on both the Corsair and Warhawk. Write to Nick Ziroli, 29 Edgar Dr., Smithtown, NY 11787.

* * *

If big scale warbirds aren't your thing but big scale homebuilts are, check out the plans for the colorful Liberty Sport biplane being sold by Wendell Hostetler. Designed specifically for engines in the two to four hp range, the Liberty spans 77 inches, has 1700 sq. inches, weighs 22-26 lbs. and follows more-or-less conventional construction techniques (balsa, basswood, and plywood). The scale outlines have been modified only slightly to make it a superior aerobatic ship.

The plans consist of two 42x82-inch

Continued on page 109



Steve Muck's Instant Motor Mount and replaceable engine mounting pads.

A real winner is the SST Outboard Tunnel being produced by Stewart Scale Models.

R/C WORLD AT TOLEDO '80

by BILL NORTHROP

PHOTOS BY AUTHOR

• If we were limited to a one-word description of the 26th annual Weak Signals R/C Club trade show in Toledo, Ohio, on the weekend of April 11-13, 1980, that word would have to be "JAMMED." Two more words would be "overcrowded" and "mobbed." This condition had its good points, and its bad points.

On the good side, and we hope the Toledo Chamber of Commerce will not be upset by our comment, one has to be a serious and dedicated modeler to show up in this industrial, inland seaport (to the Lakes) city at the tail end of winter, to get a view of the latest and near-future products to be offered by model manufacturers. From the businessman's point of view, they're a prequalified mass of potential buyers, with only a few disinterested spectators (mostly modelers' families) mixed in, a much higher quantity and percentage than appears at any similar show in the country . . . and maybe the world (most of the big European shows, such as Nurnberg, are restricted to dealers and distributors only, no off-the-street consumers).

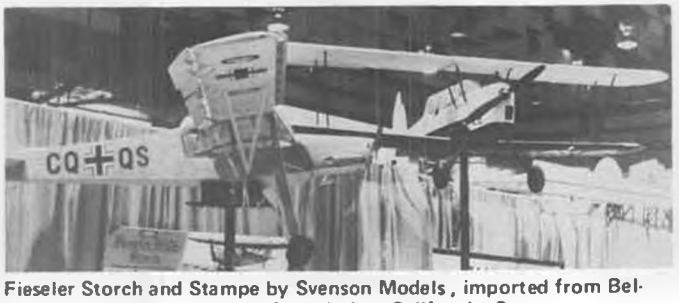
Also on the good side, from the point of view of the spectator, Toledo is the "Big One" to many manufacturers, who can barely afford to exhibit at one show a year, and this is where they'll go. If it's to be seen at all, this is where just about everything now or soon-to-be-available will appear.

On the bad side, the one-word adjectives used in the first paragraph sum up the problem, and believe us, we know the show management is just as sorely aware of this as the spectators. This is our 19th year out of the 26 continuous years the show has been on, and we've seen it grow from the time it was held in the clubhouse of a golf course, to the Champion Spark Plug hangar at Toledo Airport, to the Lucas County Recreation Center, and to the Toledo Sports Arena. And here's what the management now faces. . .

About 195 exhibitors occupied 295 booths in two huge buildings connected by an enclosed entryway. Huge, that is,

Giant Scale P-47 and P-51 in close formation over the Byron Originals booth. Both use Byro-Drive reduction prop drive unit.

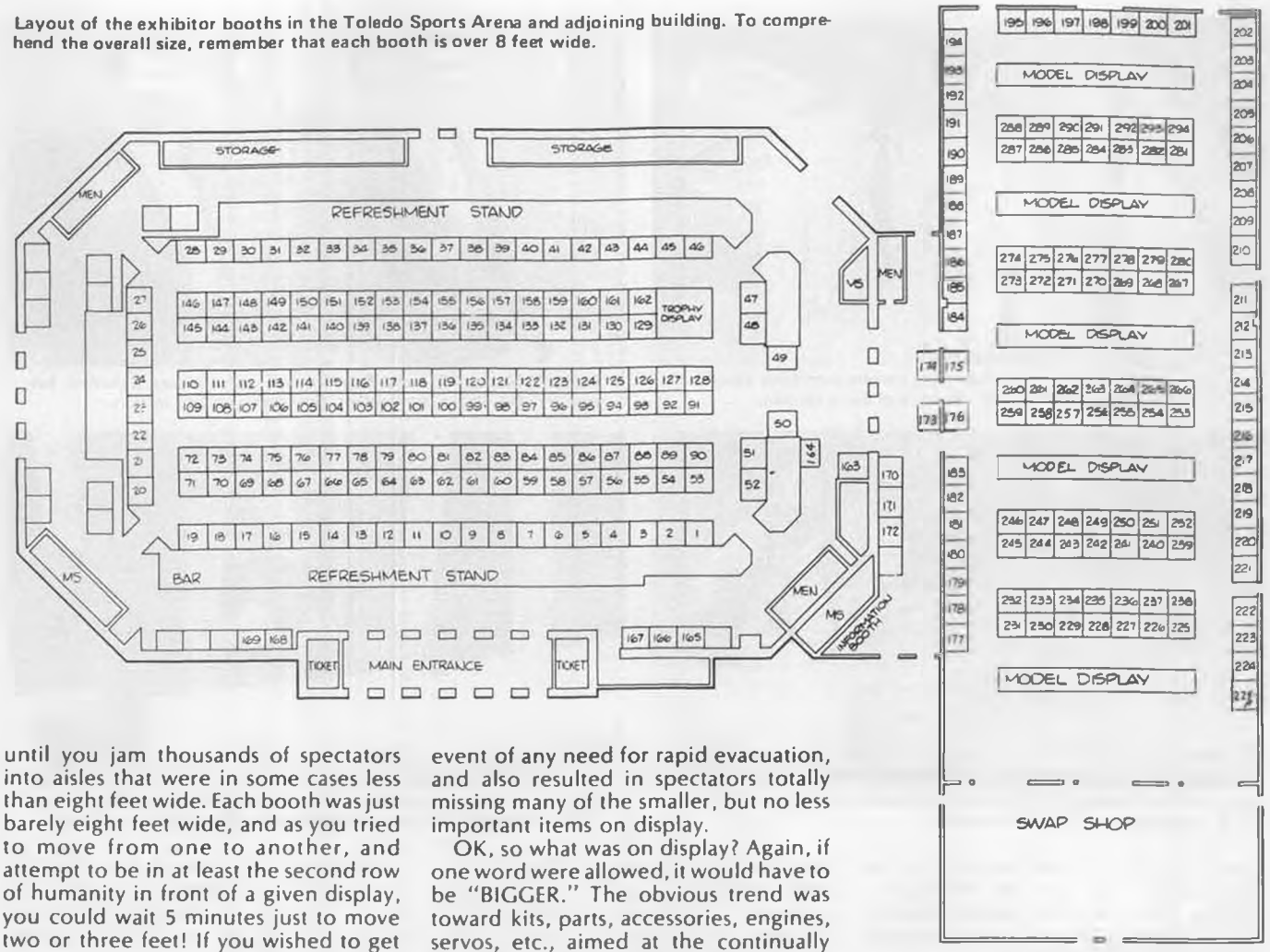
Mike Sriver, Clearwater, Florida, built this classy steam launch, Kaammaha. Superb detailing.



Fieseler Storch and Stampe by Svenson Models, imported from Belgium. Available in the states from Irvine, California. See text.

F-86 Sabre Jet, by House of Balsa, powered by K&B 3.5 tied into Midwest Axiflow RK-20B ducted fan unit.

Layout of the exhibitor booths in the Toledo Sports Arena and adjoining building. To comprehend the overall size, remember that each booth is over 8 feet wide.



until you jam thousands of spectators into aisles that were in some cases less than eight feet wide. Each booth was just barely eight feet wide, and as you tried to move from one to another, and attempt to be in at least the second row of humanity in front of a given display, you could wait 5 minutes just to move two or three feet! If you wished to get from one end of the arena building to the other, you did *not* use the spectator aisles, but, if you were aware of them, you used the passageways that circled the perimeter, under the raised grandstand seats (primary sports use of the arena is for ice hockey).

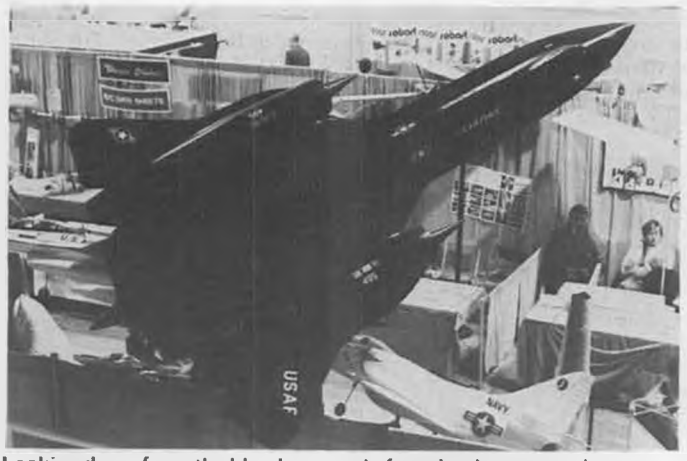
Show management is certainly considering the need of both a larger facility and additional show days. If you have any doubts about the use of weekdays, we have noted that Friday is just as crowded as Saturday, and in our estimation, this year it was more crowded than Saturday. The jammed aisles certainly bordered on extreme danger in the event of any need for rapid evacuation, and also resulted in spectators totally missing many of the smaller, but no less important items on display.

OK, so what was on display? Again, if one word were allowed, it would have to be "BIGGER." The obvious trend was toward kits, parts, accessories, engines, servos, etc., aimed at the continually growing interest in large model aircraft. We won't get into a discussion here as to whether it's a fad or long-lasting trend, but certainly quite a few manufacturers seem to be going at it with more than temporary efforts. Even the classic Ed Packard, of Cleveland Model Supply has found still another dimension in which to project his historic scale plans, which began life five decades ago as 3/4-inch scale!

In large-scale kits, the guy who has been there the longest is Bud Nosen. Bud's kits have always been designed with the idea of using either direct or reduction-drive .61 engines, although many have recently been powered by the 2 cu. in. and larger ignition engines.

Among the most popular are his 2-3/4 inch scale (102-inch span) P-51D, the 9-foot span Aeronca Champ, J-3 Cub, Citabria, and "Mr. Mulligan." The 101-inch span "Big Stik," featured in the October '79 issue of **RCMB** is also available.

A new company in the U.S., Svenson Models, offers kits made in Belgium for a 93-1/2 inch span Fieseler Storch, a 1/4-scale Jungmeister, 1/5 and 1/4-scale Stampe (German Tiger Moth look-alike), as well as some smaller scale and



Looking down from the bleacher seats before the show opened, we see the awesome SR-71 Lockheed "Spy Plane" by Byron Originals.

The nine-foot span Sopwith Pup by Balsa USA, has a wing chord of only 21"! Lots of redwood used in the construction.

The Circus Hobbies crew, in powder blue blazers with pink clown patch (l to r): Chuck Branch, Don Weitz, and Jerry Nelson.

Paolo Di Mario (left) and Peter Taylor, with the new Canadian Isotronic radio. Paolo is president. System described in text.

Rose Rehling is Rosie's R/C, which markets the well-known D&R line of products throughout the world.

J.T. Finley, representing Rev-Up props, and manufacturer of the ready-to-fly FB-100 (report coming soon) sport/pattern .60 ship.

non-scale kits. These appear to be super-quality kits, and we will be reviewing the 1/4-scale Stampe shortly. The company is located at 4941 Seaford Circle, Irvine, CA 92714.

Byron Originals, perpetrators of the popular plastic Pitts (well, it's really foam and fiberglass) and Byro-Drive reduction prop-drive unit, displayed its new F-16, in addition to the Mig-15 for its Byrojet ducted fan drive. Also on display were a fantastic Lockheed SR-71 "spy plane" with twin ducted fans, and a classic "Jug," P-47 from WW-II.

Sig Mfg. Co. will soon have a 1/4-scale version of Hazel Sig's pretty blue and white Clipped Wing Cub, which spans 86 inches. All 1/4-scale J-3 Cub builders will benefit from this, as the company is also making the scale engine detail kit included with the Cub as a separately available item.

J-5 Enterprises has added an all-fiberglass, 1/4-scale ARF kit for the Canadian E.A.A. homebuilt Zenair Tri-Z CH300, to its expanding line of biggies. The company, located at Box 82, Belmont, Ontario, Canada N0L 1B0, also produces a 1/4-scale built-up Stinson Voyager, a non-scale "Loadmaster" for Quadra-size engines, and an unlimited hydro measuring 7 feet long.

Orange County scale modeler Bert Baker, whose 1/4-scale Piper Cherokee 235 kit is already well-known, has added an 80-inch span AGM5 "ZERO" to his line. It is all balsa construction, like the Cherokee, with molded and epoxy glass accessories. Contact him at Box 7200, Costa Mesa, CA 92626. The Zero is for .90 power, the Cherokee for the heavier gas/ignition engines.

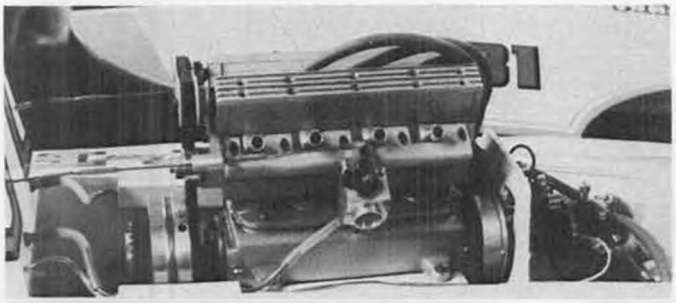
Former World Aerobatic champ Dr. Ralph Brooke, of Brooke Model Products, Box 3714, Midway Station, Kent, Washington 98031, is importing the super-quality Toni Clark "Practical Scale" kits and plans from West Germany. The 106-inch span Tiger Moth (larger than 1/4-scale) model on display, uncovered, was a masterpiece.

Selection now includes an 80-inch B.E.2e, the Tiger Moth in 72 and 106-inch spans, and a J-3 in 110-inch span. Plans and/or rib sets are also available for the big Tiger and J-3.

Leo Loudenslager's "Laser 200" is available in a quarter-scale kit form from Mallory Models, Box 207, Falls Church, VA 22046, produced by Bill Hinnant. A glass and foam kit, aluminum tube spars, aluminum landing gear struts, and many other special items are included in the $179.95 kit.

Balsa USA, Box 164, Marinette, WI 54143, has a monstrous Sopwith Pup with a 9-foot span (21" chord) which is in an all-balsa kit for $119.95. Kit includes a 13-inch diameter aluminum cowl, all rigging cable and turnbuckles, and uses redwood for spars, struts, longerons, etc.

Also seen were Bob Dively's kits for a 1/4-scale Skybolt and Stearman, a Cap 10 as used by Ivan Kristensen at Las Vegas kitted by W-K Hobbies, a 3/8-scale



Unusual four-cylinder OHV engine in Gary Conley's Pay 'N Pak. Unfortunately no info available on the engine.

Roger Miller, Bloomington, Ind., built this Miss Circus Circus. It weighs 14-1/2 pounds, is 43 inches long.

World Engines' S-16 servo for heavy duty. Lifts 12-1/2 lbs, ball bearings, waterproof.

Kraft's new weight lifter picking up 9-pound ballast. Don't kick sand at it!

Astro Flight's Bob Boucher (once and for all, it's Booshay), dusts off the charger display.

"Starduster" by R/C Kits, Cap 20L kits by Bridi and Higgins Aero Comp. Inc., and a Zlin-750L by Ohio Superstar Products.

Plans were displayed for the Skybolt, Liberty Sport, and Jungmeister by Wendell Hostetler, 1041 Heatherwood, Orrville, OH 44667. Barron's Scale Classics offers 1/4-scale plans for the Curtiss Gulfhawk, Curtiss "Goshawk," Stinson Reliant, and Curtiss Hawk P6E. And Bob Morse's Accounting/Clerical Services, 3351 Pruneridge Ave., Santa Clara, CA 95051 has plans for the Cessna 180, Berliner Joyce P-16, Focke-Wulf "Stieglitz," Boeing F4B-2/P-12B, Curtiss P-40 C&F, and Douglas O-25C, all for big gas/ignition engines except the O-25C, which is for .90 engines.

Many 1/4-scale accessories were shown by Jim Messers Quality Model Products, including pilots, cylinders, and cockpit details. Quarter Headquarters showed mounts for .90 to 1.5 engines and Quadras, as well as mufflers for all. K&H Glass Products, 16 Quincy Terrace, Mason City, IA 50401 has glass cowls for the Nosen Citabria, P-51, Mulligan (with blisters), and J-3 Cub. Also the Sig Champion Citabria and Cub, and Kraft Super-Fli cowls. T&D Fiberglass Specialties, 30925 Block, Garden City, MI 48135 also had an endless list of cowls for various regular and large kit lines.

Two more big engines that we noticed were the McCulloch and Kioritz. The McCulloch is 2.0 cu. in. and weighs 4-1/2 pounds. The Kioritz is 2.44 cu. in., and weighs 6-1/2 pounds. It claims 7,500 on a 20x8 Top Flite prop.

Engine accessories include exhaust headers and tuned muffler systems by Byron Originals, a Byro-Drive unit just for the Quadra, a tuned exhaust system for the Quadra by Cosmocon Ltd., Quadra flywheel balancing by Dario Brisighella, 1032 E. Manitowoc Ave., Oak Creek, MI 53134, Quadra mount and muffler by Edson Enterprises, and 6-bolt propeller adaptor by C.B. Associates.

Radio manufacturers have also joined the "think big" scene with heavy-duty servos. Both Kraft and World Engines demonstrated servos lifting weights in the 9 to 12-pound bracket. These may reassure modelers who know little about actual air loads on control surfaces, but they will also be literally helpful to big boat and car modelers, where steering loads can really build up. Actually, air loads on model aircraft, even up to the 40-pounders, is still in the ounces.

Speaking of radios, and to get off the biggie bandwagon for a while, several new manufacturers were in evidence, new at least in the U.S. For one, the JR Propo radio, which simply enough, means Japanese Radio, is said to be the biggest selling R/C radio in that country. To be brought into the U.S. by Circus Hobbies, the newly-formed company owned by Bill Bennett, of Circus Circus and Tournament of Champions fame, the JR line is quite extensive, from a smart 2-channel, 2-stick, up through an everything-but-the-kitchen-sink 8-channel radio with nine levers, four

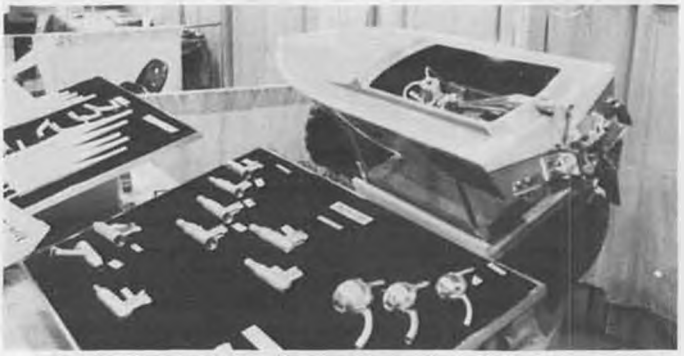
Keri Fritz has a great view of the Byron Originals booth courtesy of her father, Bill.

buttons, and two adjustment panels. The radio is already being made for foreign markets in many frequencies as well as FM.

Sanwa is not new, but its new line of radios, as marketed by Airtronics as the XL series, is all modern generation, using the latest IC technology of Signetics. Here we see new dust-proof open gimbal sticks, plug-in RF modules with plug-in crystals, servo reversing switches in *all* systems 2 through 6, linear and exponential control functions on all systems, sub-mini receivers, sub-mini connectors, new smaller servos, fast transit times, and lots more.

Isotronic is the lead name of a totally brand new radio out of Ontario, Canada, with three systems. The Proton series 7-channel is top of the line, followed by

Bob and Pam Smith, trying to cope with Toledo's coolish weather, showing his all fiberglass Sea Breeze R/C sailplane.



Display of Wally McAllister's Macs Products mufflers. Ball-types in foreground for helicopters.

Sid Axelrod, looking great in his recovery from serious illness, explaining how to cover a basketball with one piece of Monokote.

Nino Dironza, shows the fine Italian line of Avionix kits, which he imports into the USA.

Mr. and Mrs. Larry Jenno seem to be real pleased with that pretty laminated 22 x 18 Zinger prop.

Three happy faces; Charlotte and Terri Vall, with Bob Paul, in the RPM muffler booth. Very small, but efficient units. Report soon.

the Master 7-channel, and the Can-Am 5-channel. The Proton transmitter is in an anodized gold case, with servo reversing, dual rates, and many mixing and exponential choices from a control console set into the back. This board can be unplugged, removed and stored with the model to which it is tuned. Spare boards are available to set up for other aircraft. Now that's a great idea! No returning, switching servo directions, and readjusting throws, etc., when you switch your radio from the old Ugly Stik into the new Super Whammey B-11 Delta with eleflaperons!

The EMS line of servos offers a range from 20 oz-in. up to 56 oz-in. with ball bearings. A servo reverser is available for those "old fashioned" sets without switching. Battery packs include a 1200 mah flat pack; all are fast charging.

Litco Systems claims 18 pounds of thrust for its Magnum servo based on the Dunham mechanics. A ball bearing and waterproofing kit is available for an additional $5.00. This is one of a long line of servos and receivers available to fit various make transmitters.

Field box power panels come in various sizes and shapes, but pretty much accomplish the same things, with a few variations. Sonic-Tronics' Vari-Pulse Power provides variable power for different type plugs. A fuel pump switch is spring-loaded in the fill position, and starter power take-offs are on the front of the panel. LR Taylor's Super Power Panel provides plug-in starter outlets, plug-in outlets for the glow driver which automatically adjusts to the power requirements of the plug, fuel pump switch with spring return on the fill side, and a quick charger that will pump up most receiver and transmitter packs in 15 minutes. L.E.D.'s monitor the operation.

DaCa's Model Master Power & Test Panel carries all the above a step further by also providing controlled discharging for cycling batteries. We will be testing one of these units shortly for a product review.

In the world of helicopters, although John Gorham did not make it to Toledo, we saw the announcement about his little "Cricket" helicopter, and have actually seen it lately. For .19 to .25 power, this little gem will retail for less than $200., a direct opposite to the steadily increasing prices of the .60 powered machines which, in some cases, are exceeding $1200.

S.C. Modeler showed a reinforced tail and enlarged tail fins for the Heli-Boy, while Fibre-Craft Products, of Scarborough, Ontario, Canada introduced a

Ralph White shows his line of fiberglass and foam pattern and scale kits. Also sells masking liquid and air retract slower-downer.

Bill Hinnant is making this fine glass and foam Laser 200. For big glow or reduction drive .60's, aerobatics is its forte.

Newlyweds Howard and Jeanette Danforth. He and Chip Conklin are C&D Enterprises.

More newlyweds, Fran and Mark Schwing, of EMS, showing broad range of servos and packs.

Susumu Takahashi, President of Playtron USA and engine man Ray Kesteloot.

Roger Christy, of Carl Goldberg Models, resting between demonstrations of the new Super Jet, thick cyanoacrylate. Gee, look at the tree!

Jay Gornto and Lew Dumbauld holding down the fort for Pro Line Electronics. Jerry Bonzo recovering from disk problems.

Bill and Carol French wouldn't look up because we told them there wasn't any film in the camera! Aerotrend has growing accessory line.

If there's an engine mount or muffler that John Tatone doesn't have, it's 'cause the engine ain't been invented yet!

Gary Preusse (left) and Bill Pistello in the Mini Marine Racing Equipment booth.

The crazy couple from Omaha, Nebraska, Dave and Caren Litt (DAve and CAren, get it?) field boxes, model holders, and panels.

The terrific Vall sisters (l to r) Amy, Marilyn, and Terri, with "Pops" in RCMB's booth. Hmmm . . . wonder what he's thinkin'?

Eva Jane and Paul Clements, Kitty Hawk Models, showing his sleek Skynight 6 pattern ship.

Floyd Fogleman (standing) and Bill Wardlow, of Sonic Systems, makers of a fine line of compressed air retracts.

Bert Baker, Ellco Plastics, has added this Zero to his kit selection. His 1/4-scale Piper Cherokee 235 is already very popular.

Dick and Ellen Remington, Model Products Corp., makers of the 'sticky' Head Lock clip.

Barbara and Dick Penrod, the USA part of Giezendanner USA.

Bell 222 fuselage for the Heli-Boy mechanics, along with a replacement fuselage for the Gazelle.

Incidentally, Mark's Models has taken over the American R/C Helicopter line and hopes to bring it back to prominence. Orders for parts and/or kits should be directed to Mark's, at 1578 Osage St., San Marco, CA 92069.

Estes Industries, known as a leading model rocket manufacturer, has taken the giant step into model aircraft by way of electric power, a direction that certainly has a future in the noise and dirt conscious society we live in. Under the leadership of its R&D Manager. Bruce Paton, formerly with Cox, Estes is producing two planetary geared electric motors for model aircraft, and in addition, folding props to use with them. The company also has 3 kits coming; a 48-inch span R/C Skymaster electric trainer, a wild, twin-boom, 2-meter sailplane, and a competition free flight which can also use an .049/.051 TD for glow contests. The latter features geodetic wing and stab construction and is very contemporary. The Skymaster and 2-meter Skysailer feature a new variable-density foam construction, basically low-density foam within a thin vinyl plastic outer layer, said to be extremely strong and light.

The Estes electric motors are backed by a variety of battery packs and an adjustable quick-charger working off a 12-volt car battery. The Skyaligner is an interesting electronic device that plugs into any servo output of a receiver and visually displays the pulse width of that channel on a digital read-out. Allows perfect alignment of your transmitter without the use of an oscilloscope. It can measure stick slop, match servos, check centering, etc. and comes in easily assembled kit form.

Several new covering items appeared. Valair, Inc. showed Val-Kote, a low-heat plastic film in many colors. Sig offered Koverall (must have been named by Klaude McCullough). This material is applied like any open fabric such as silk or Silron. It is then heat-shrunk with an iron before being clear doped and then finished.

A device which works better than it appears to in drawings or photos, is the "Extra Hands Covering Tool," by Eldon J. Lind, Co., 2912 Walker Lee, Los Alamitos, CA 90720. This is a frame that holds a precut piece or covering material, which when lowered over a wing, tail, or fuselage side, stretches and holds the material while you apply the appropriate goo or heat.

If Robert Paul Mufflers (RPM) are as silent and efficient as they are small and light, they are much to be desired. Allowing more power over the full range of engine speed, unlike a pipe, yet under 85 db at 50 feet, these mufflers are great for scale models and/or in cowled installations. More info at 1462 Orchard Grove, Lakewood, Ohio 44107.

Twinn-K, Box 31228, Indianapolis, IN 46231, has picked up the fine line of Glo

"Hello, this is Dan." Always a welcome voice when you call Kraft Systems, it's Dan Lutz, super modeler and classic Ford restorer.

Pat Violett enjoys a quiet moment that doesn't come often in Toledo. Bob's ducted fan Skyhawk and Form I Polecat on the table.

NSRCA Sec. Sally Brown holds down the fort for husband Dave. This was their first trade show as individual manufacturers.

Yasuhide Yoshida, with the Nitto line of neat little R/C electrics. They're looking for distributors.

Bee plugs. Able to take 2 volts for starting, these plugs come in a variety of heats, lengths, and with R/C idle bars.

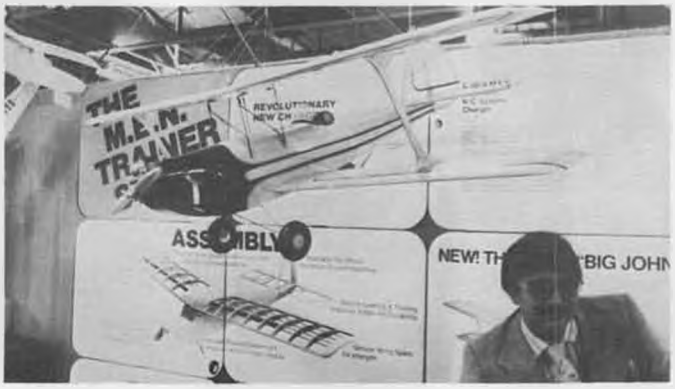
We've gotten a big charge out of the fact that M.E.N., well known for its extensive use of sharply die-cut light plywood in model kits, is now producing our Big John, 76-inch span biplane, first designed back in 1963, and to our smug satisfaction, closely copied several times since. In spite of ply sides (punched out) ply ribs (punched out), ply box wing spars, etc., the finished prototype indicates that kit builders will be able to easily stay under 10 pounds ready for takeoff, which means .60 power will be completely adequate. The prototype finished out at under 9 pounds with Webra Blackhead, radio, and transparent yellow Monokote with black trim . . . Lovely!

There were many more interesting new items at Toledo than we have space to describe. We'll try to bring these to you in detail in future columns . . . such as Foremost's fuselage building jig and gapless hinges and glider towhook, Robart flat hinge pockets, Sonic Tronic's Crazy Tape, Giezendanner USA's electronic digital tach, stab mechanisms, and new retracts, K&S Flex-I-Grit, K&S V-Block and clamp, Dave Brown's engine mounts, the Thermic Sniffler now on license-free 49 mhz for use with gliders on 72 MHz, Higley's Smoker Valve, RAM's pilots, International Marine's huge catalog, Nitto of Japan with beautiful little 2&3-channel electric powered scale models, Sonic Systems' big retracts . . . it goes on and on.

Hopefully we've got a good supply of photos to fill in the whole picture of the biggest model show on Earth in 1980 . . . But what will they do next year??? •

R/C MODEL BUILDER

Mike Mas held a meeting of helicopter enthusiasts to form national organization. No, you don't have to fly upside down to join!



Jerry Jarvis ducks under the wing of the prototype M.E.N. kit for our Big John design, due to come out when you see this. Very light!

1 TO 1 SCALE

By BOB UNDERWOOD PHOTOS BY AUTHOR

• After two years of writing this column, I have come to some profound conclusions. First, the most difficult task each month is to find a beginning for it. Lacking the literary genius of some, I find it difficult to come up with something like a Shakespeare might. Indeed, the whole thing hangs about my neck like the Mariner's Albatross.

Even after I find a suitable beginning, I am still faced with the task of developing new and invigorating ideas to pass on to you. Those, of course, should include innovative practices and news of great import. But that's hard to do month in and month out, especially for a fumble fingers whose workshop looks like the majority of WW-III was fought there.

The struggle continues, however, and once again this month we'll try to pass on another gem or two. For those of you who already utilize those "discoveries" of mine, please *don't* let me know. It only tends to depress me.

On one of my latest models, I tried a few new (for me) ideas and they seemed to work quite well. If you wander through your local business service store, you'll find some most interesting products under the heading of Zipatone. There is a variety of tapes that have a low tack but will hold quite well even when curved in a rather sharp radius. They come in many widths and are quite inexpensive.

A second product is Parapaque. This is an extremely thin plastic material which has a low, almost imperceptible tack. It has a heavy plastic backing which forms a fine working base on which to cut designs. To form a mask for intricate designs, two approaches can be used. Using a marking pen, you can draw directly on the material or you can cut a guide from light cardboard and tape it to the material. Either way, you can then use a new sharp No. 11 blade and cut the design. A bonus appears in that the scribed backing becomes a "record," should you need to repaint later. The mask can then be placed properly and rubbed gently onto the surface. The low tack combined with the extreme thinness of the material causes it to follow every contour and bump. There is also a static charge effect to hold it. Should a wrinkle appear, a small slit with the knife followed by gentle rubbing will solve the problem neatly. Once the painting is done, you'll find it very simple to remove with a flip on the corner with a knife blade. I can't imagine that there would be any danger of pulling off paint, due to the low tack. Parapaque comes in various size sheets and is red in color.

Those of you who use Ralph White's Fliteglas "Liquid Mask" when making designs know the ease with which it works and the fantastic edge that results. (If someone new out there hasn't run across it, let me explain that the material is a water-base latex substance which, when sprayed, brushed, or swabbed on the surface, dries to a cacoon-like covering. It must be put on heavily so it can be peeled off later.)

First place at recent Spirits of St. Louis Build-A-Plane contest went to Don Allen with his gorgeous Me-163 Komet. Yes, Don knows he needs a dummy pilot for 1980. Engine exhaust vents through pipe in tail.

With a model that has pin stripes, a very efficient method of cutting them is to lay the whole design out in masking tape *over* the Liquid Mask, then use the edge of the masking tape as a guide along which you can run the knife blade. Very little pressure is required to cut through the Liquid Mask, so guiding the blade is not too difficult.

A couple of points are important to consider, however. Unless your eyesight is vastly better than mine, use some sort of magnifying piece to view this cutting operation, on very narrow striping especially. Secondly, do not use the very thin plastic tapes as a masking guide, since they are very easily cut into and not thick enough to provide the edge required to guide the knife. Some of that Zipatone tape mentioned earlier works well, as does regular masking tape and the thicker plastic material.

One caution should be noted, and that concerns using the Liquid Mask over a fabric covering. The mask itself works fine; however, use a super delicate touch to cut any designs. Usually, the weight of the knife alone while held almost but not quite vertically will be sufficient to cut through the mask but will not go through the covering. I must admit that the only fabric I've used it on is Super Coverite, where the method suggested worked quite well.

Do be careful when you are pulling the material to be removed away from the rest of the "cacoon." If you have not cut entirely through the material, it will start to tug and stretch. Relax your tug, cut carefully, and pull it away. The material will assume its former position and you will not lose the seal.

One last thought is that the Liquid Mask is super for covering plastic canopy material. It will not attack the plastic in any way and may be left on for long periods of time without problems.

A WINTER OF CONCERN

We've tried not to be too editorial in this column over the two years of its

German aircraft captured first four places at the Spirits' Build-A-Plane contest. Second to fourth place winners were (l to r): Dan Holting with Me-109E; Don Babbett with Focke Wulf 190; and Mike Holting with another Me-109E. All very nice building jobs.

New warbird kit being produced by Scale Propeller Crafts is this .60 size Me-109E. Features mucho fiberglass parts. Cockpit detail at left. More info in text.

existence, however, several developments in our hobby/sport over the past winter have merged into some generalizations in my mind. Some of these events are local in nature, while others are national as well as international. They are not necessarily "scale" concerns.

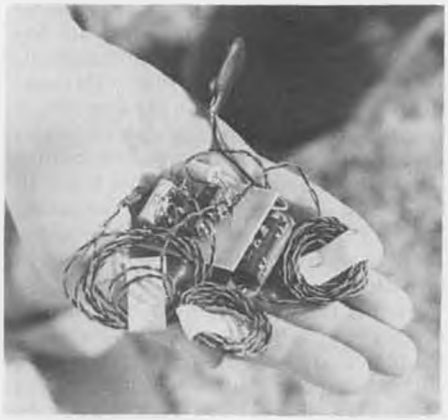
The general public is becoming more and more aware of our activities through the various channels we've generated within the hobby/sport. This can be generally very helpful to our cause. While it not only brings new members into the fold, others are weaned away from the old "toy" image. We have provided appeal to most all ages and ability levels along with ways in which these people may become a part without spending many years developing skills before they can produce a result that they will be proud to show to others. This is a commendable goal, then, to provide enjoyment and challenge for a vast number of persons by bringing modeling to them either as a participant or as a spectator. When it is recognized that modeling is a responsible, productive outlet and recreational activity which can be enjoyed by *all* ages, we have a great selling point.

With this in mind, may I pass on some observations from the past several months which have created some nagging concerns to creep into this old head:

I have run a class for R/C beginners for the past five years. We jokingly call this our "8-week crash course" since we meet once a week for several hours and cover as much as possible from such things as kit selection to field etiquette. If nothing else happens, we try to make these persons aware of the fact that flying R/C is not something which can be learned like Harold Hill suggested in the "Music Man," that playing an instrument can be learned by the "think method."

More and more advertising, however, tends toward that concept. I realize that it is important commercially to suggest that your product is easy to use, etc., but realism and the rights of other persons are equally as important.

Consider, if you will, the number of ads you've seen recently that suggest that you zip out to the discount store or hobby shop, buy the product, and become an ace that afternoon, probably at the local schoolyard. This approach, while commercially profitable, is patently unfair to the bulk of modelers who fly at established model fields in a respectable, safety-conscious manner. A model airplane draws attention wherever it is operated, and to operate one with no concern for safety (or knowledge that it's necessary) can result in problems for all modelers.



Full navigation light system sold by Classic Flying Machines of St. Louis.

The problem goes beyond this, however, because even established fields, especially public sites, experience increased difficulty. At the public site here in St. Louis county, we have noticed difficulties with persons "not wanting to bother the better fliers" and going off into some remote portion of the field or into the control line area to fly or to test their engines, not knowing that their activity will jeopardize others. When told about it, they simply indicate they really didn't realize that they could cause a problem or that help is really an important ingredient to successful R/Cing.

A recent conversation with a fellow in a hobby shop points out this problem. He had purchased a ready-built from a friend and wanted to know about flying it. He suggested that the ads said it wasn't hard and "I have this large area

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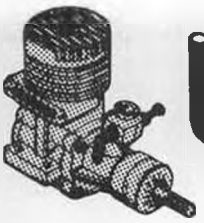
CFM's transmitter warning device mounts inside the case, light indicates that transmitter is on and also indicates low voltage.

Dual flashing strobe unit from CFM comes in alternate or simultaneous flashing modes. Neat workmanship!

FUEL LINES



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Send in your questions, relative to glow or ignition engines, and these experts will give you the correct answers.

KLAUSE

• Maybe it's just a coincidence, but a series of recent calls has me beginning to think we're off on another compression kick. Without pointing a finger, there was one common theme: "Well, I took the head shims out to get more power for the vertical maneuvers." So, this time around, I'll begin by telling you a true story. As you read on, don't become apprehensive about it being another nostalgia trip that semi-senile writers all too often take in their columns. It's merely intended to emphasize how poorly we seem to have learned one lesson about increasing engine power. Here goes . . .

During my high school years, I earned my spending money working part time in a small machine shop. One day, the owner milled down the head of the engine in his new car. He explained to me that he was "Gonna get a lot more power." I believed him . . . especially when he subsequently demonstrated how successful his efforts were. A whole six months went by before an engine overhaul was needed . . . new valves, pistons, rings, rods . . . the whole works. That fact was lost on me. All that I remembered for some time was that increasing compression produced more power. Only after I'd paid the price of ruining some model engines did I realize that there was another correlation.

Today, some thirty-five years later, it's still very common for performance buffs to be myopic about jacking up the compression ratio. How's that expression go? "Will we ever learn?" If we do, we don't seem to pass the lessons along to those younger than we are. Towards that end, here are some hard facts about high compression:

1) Within limits, it really will increase power. The major limitation is technically referred to as the thermal limit of an engine, and it varies from engine to engine. More commonly, we hear of detonation and pre-ignition, although they are only two manifestations. For more on the subject of compression ratio and power, refer to this column in the February 1980 issue of **R/C Model Builder.** You might also check the section of a good physics book dealing with brake horsepower.

2) It will shorten the life of your engine! For a dramatic example, watch the drag races on television. The odds are almost overwhelming that you'll see one or more engines blow. Their engines are hopped-up to the hilt, and they are rather short lived. Naturally, high compression is a part of their game. Stock car racers are another example. In fact, in any racing or speed event, the engines are not famous for longevity . . . not even rubber power!

3) In throttled engines, it will cause rough idling. Further, if the full power needle valve setting is ideal, the chances are that the mid-range mixture will not be.

4) Engine overheating can be a serious problem.

5) Plug life will be shortened.

6) It will be more difficult to "needle" the engine.

7) Finally, there's the catch-all: the engine will just seem cantankerous as all get-out.

Does all this mean that I'm against high compression? Certainly not! My purpose is only to make it unquestionably clear to all readers that high pressures can be very hard on our engines. If you play that game, be prepared to pay the price, and don't curse the manufacturer. Conversely, if you want to maximize engine reliability, lowering your compression and/or the nitro content of your fuel is a step in the right direction.

At this point, some guys may say, "I run my engine the way the manufacturer made it, and I only use ten percent nitro without a pipe. Surely I'm OK." Very probably you are, but I want to add one caution about what I'll call "unintentional compression." It's due to an accumulation of manufacturing tolerances. Since every part is made within certain tolerances, it is possible for them to be additive. For example, if the distance between the two connecting rod bearings is on the long side, and if the depth of the portion of the head that fits into the cylinder is also on the long side, then we have an accumulation of tolerances. This particular engine would have a higher compression ratio than another one with a rod and head machined exactly correct. Of course, it's possible that the machining of the case and sleeve could compound the problem further. Even the distance of the crankpin from the centerline of the shaft could be slightly off. Thus, if they are all additive, the head spacing of any two engines could vary as much as .010 of an inch. This may be an extreme, but I do know from measuring engines that it has happened.

How can you be sure that yours is right? Well, you could write to the manufacturer and ask for the ideal head clearance for engine, prop, and fuel, and then use a depth micrometer to check it. If you don't care to go that route, then first borrow your buddy's very accurate tachometer that easily reads in 100 rpm increments and then . . . but wait a minute, this procedure is exactly what I used to close out last month's column on glow plugs. Remember? Too much compression is hard on plugs. Since you wouldn't want me to be repetitious, I'll simply refer you to that article and issue. If you don't have a copy, Bill Northrop will gladly sell you one . . . or even a subscription for a full year. Bill, is that enough of a plug?

Take care, guys. •

NELSON

• I'd like to preface this month's column by thanking Dirty Dan for his kind comments in the April C/L column. Unfortunately, he was not as accurate as kind. My presence on the West Coast last spring was not to acquire a new Porsche. Said Porsche was new once but can now only be charitably termed a restoration candidate. You were only wrong by a factor of ten or so, Dan. Not bad for an electric car racer.

Now, getting to the subject at hand: toy engines. I'd like to begin by stating two seemingly contradictory statements.

1) Model engines are a terrific bargain.

2) Model engines are junk.

The first applies to the Sunday flier who treats his engines as he does his car. He wants it to start and perform in a nominal fashion without his knowing much more than how to turn the ignition key. If a particular engine doesn't produce sufficient power, a suitable replacement can be found.

The majority of engines for the general market satisfy his requirements, and they are a bargain. Using normal trade discounts, a $100 list engine is sold by the manufacturer for about $44. Materials may be in the $5-$10 range, which leaves about $38 for all expenses from the time the raw materials come in the door until the finished product is shipped out in its carton. Using a shop rate of $20-$30 per hour means that there can be only a bit over one hour charged for all operations on that engine.

Can you build an engine in one hour? Can you build one in even less time? That $100 is certainly not a minimum list price for a thoroughly serviceable engine, either. As I said, model engines are a bargain.

But there is the other side of the coin, and it's the competitor who is aware of it. In competition, the choice of engines is usually limited to one or two in any particular event. After a contest season the most promising one or two engines

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The only remaining photograph we have of the original Apprentice, taken in 1968. Weighing only 3-1/4 lbs., it flew very well with a Webra .20, was especially fun to do low-altitude "contour flying", a few feet off the ground and following the dips and rises of our grass field in Delaware.

THE "APPRENTICE"

By BILL NORTHROP . . . First introduced in the May 1968 issue of Model Airplane News, the big and light Apprentice continues as a first rate trainer and fun ship for model builders.

• *The Apprentice was designed about 13 years ago, when the author was Radio Control editor for* Model Airplane News. *In that period of time, many changes have taken place in the R/C hobby, but one thing has not changed . . . the need by beginners to have a genuinely easy and forgiving aircraft with which they can successfully get through their first few hours of flying time.*

In our opinion, the only design to possibly exceed the merits of the Apprentice in meeting the requirements of the beginning R/C flier, is Tex Newman's "Dragonfly," which we published in the February '76 issue of **MB.** *The Dragonfly is about the same size aircraft, but is even slower and more rock stable than the Apprentice. Hundreds of Dragonflys have been built and flown, by R/Cers of all accomplishment levels, who can attest to its "anyone can fly it" capabilities.*

However, we still believe that the Apprentice is "one up" in several ways. First, its appearance is more scale-like . . . something the beginner usually prefers. Second, the airfoil allows the beginner to progress further into his flying capabilities before feeling the need to "move on to something hotter."

It has the ease of construction and inherent stability of a flat-bottomed airfoil, but then the bottom surface curves up to the leading edge from the main spar (a man called Phillips got this named after him!), giving it an almost semi-symmetrical effect which allows good penetration in the wind, and sustained inverted flight . . . when you're ready to do it.

Although it was published in the May 1968 issue of M.A.N., *we still get occasional request for plans to the Apprentice, long since sold out by* M.A.N., *and therefore felt we should republish them. Incidentally, the* M.A.N. *plans were prepared by a guy named Walt Schroder!*

Herewith the original article with a few updates in italics:

The Apprentice was designed specifically for the model builder who has decided to move into radio control. It was particularly designed for the beginning R/Cer who is located in a low R/C activity area and who will not have the help of an experienced pilot during the first flights.

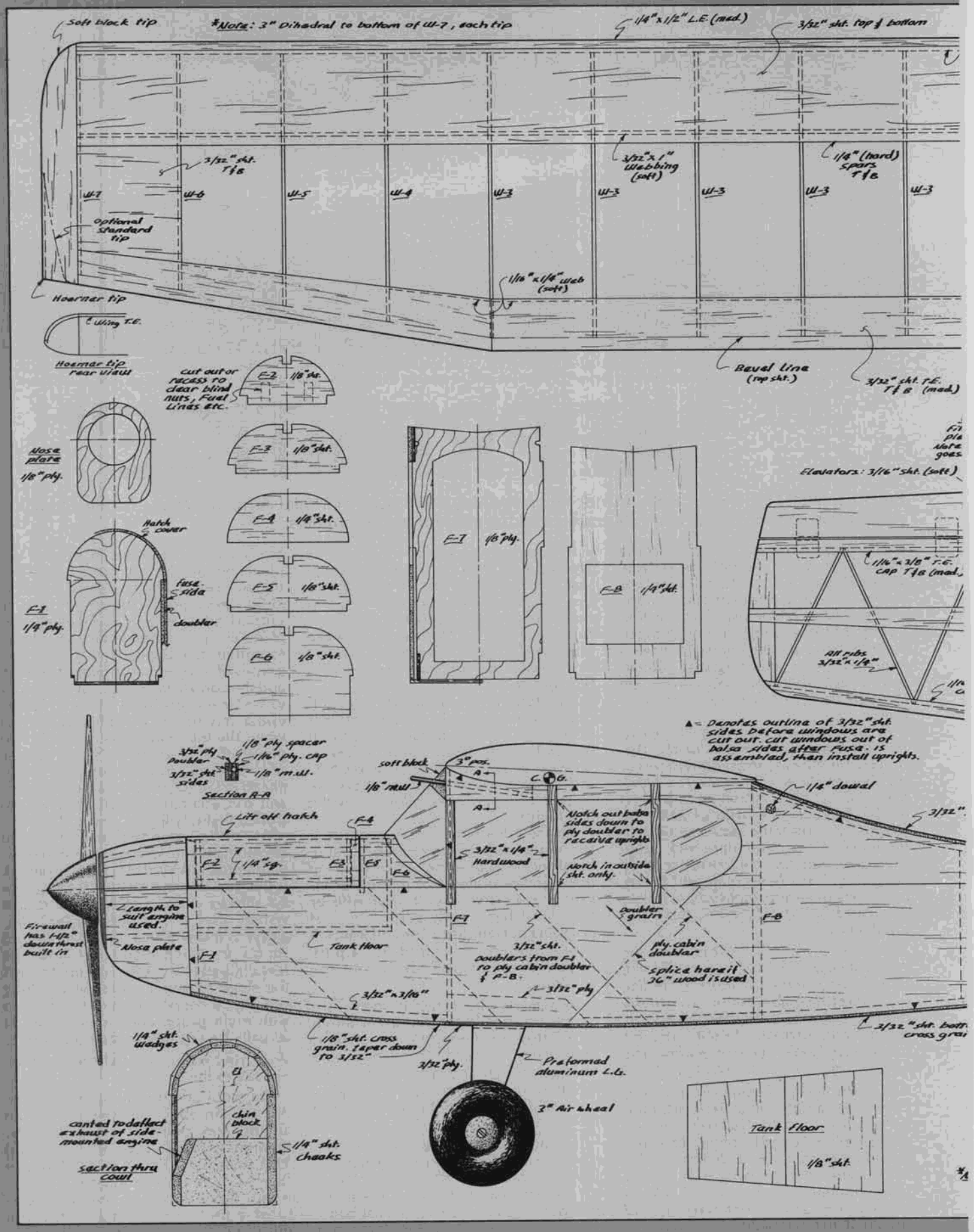
On the other hand, the Apprentice is the perfect ship for the veteran R/Cer to build for his young son who is showing that significant gleam of interest in his eye. And by the way, if your wife or girlfriend has finally given signs of resigning herself to her fate and wants to "try it sometime," build her a pink Apprentice and put curtains in the windows.

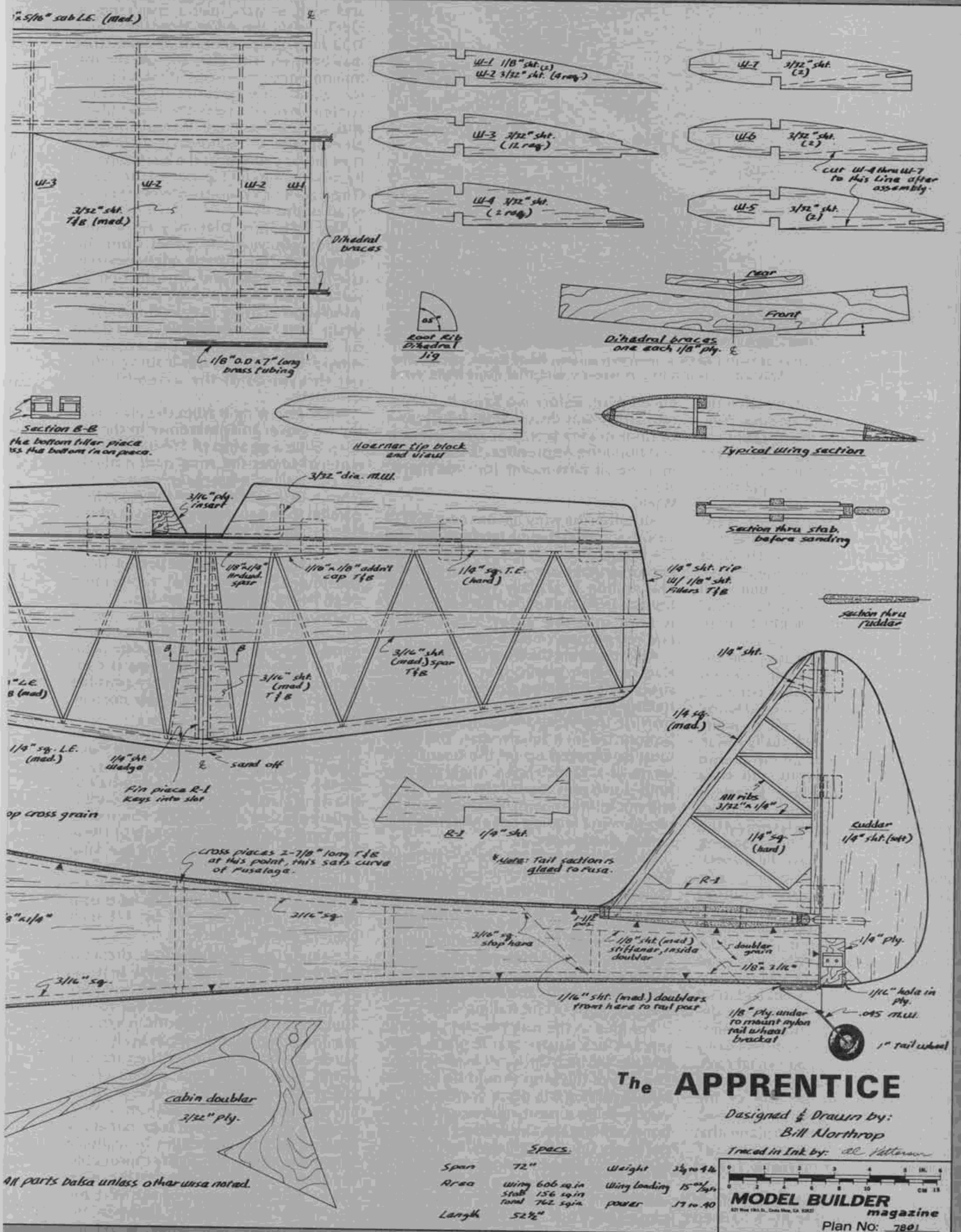
To suit the above requirements, we felt the ship needed an important design factor that has been left out of most present day "trainers." The plane should be large enough, and light enough, to fly steadily and slowly, giving the new pilot time to think about his next control movement.

This design consideration also provides another important factor missing in most so-called "beginner's" airplanes. It is no particular problem for an experienced flier to handle a somewhat badly trimmed airplane on its first flight, but the beginner has three strikes against him right at the start: an untried airplane, an untried radio (the bench and the air seem to be unrelated as far as radio operation is concerned), and an untried pilot. A large, lightweight airplane will permit test gliding, an almost forgotten art as applied to R/C. Through a series of test glides, the plane, the pilot, and the control system all have a chance to become acquainted with each other under less strained conditions, so that when the big moment occurs, that first powered flight, there is a better chance of survival all around. Most any experienced R/C pilot, if he's willing to admit it and can accurately recall his first controlled flight, will go along with this.

Another point in favor of a large, light airplane like the Apprentice is that it will take almost any kind of radio equipment. If the new R/Cer is fortunate enough to be able to afford a multi proportional system, there is no need to feel obligated to install it in a typical multi bird for his first flying lesson, nor should he feel obliged to work his way up through the single channel route. In the long run, if you are pretty sure of ending up with multi propo equipment, it would actually be cheaper to start out with it. Work your way up through the airplanes, not the radios.

We were asked if ailerons could be put on the ship, and this brings out another key point of the design, the inherent stability. Even Webster's old 1941 Collegiate Dictionary has that one figured. Webster says inherent stability is the "firmly infixed (inherent) property of a body which causes it, when disturbed from a condition of equilibrium or steady motion (stability), to


Soft block tip
*Note: 3° Dihedral to bottom of W-7, each tip
1/4" x 1/2" L.E. (med.)
3/32" sht. top & bottom
3/32" sht. T & B
W-1
W-6
W-5
W-4
W-3
W-3
W-3
W-3
W-3
3/32" x 1" Webbing (soft)
1/8" (hard) spars T & B
Optional standard tip
1/16" x 1/4" web (soft)
Hoerner tip
Uling T.E.
Hoerner tip rear view
Bevel line (top sht.)
3/32" sht. T.E. T & B (med.)
cut out or recess to clear blind nuts, Fuel Lines etc.
F-2 1/8" sht.
F-3 1/8" sht.
F-4 1/8" sht.
F-5 1/8" sht.
F-6 1/8" sht.
Nose plate 1/8" ply.
Hatch cover
Fuse. side
doubler
F-1 1/4" ply.
F-7 1/8" ply.
F-8 1/4" sht.
Elevators: 3/16" sht. (soft)
1/4" x 3/8" T.E. CAP T & B (med.)
Alt ribs 3/32" x 1/8"
▲ = Denotes outline of 3/32" sht. sides. Before windows are cut out, cut windows out of balsa sides after fuse. is assembled, then install uprights.
3/32" ply doubler
1/8" ply spacer
1/16" ply. CAP
3/32" sht. sides
1/8" m.w.
Section R-A
soft block
3" pos.
C.G.
1/8" m.w.
1/4" dowel
Lift off hatch
F-4
Notch out balsa sides down to ply doubler to receive uprights
3/32" x 1/8" Hardwood
Notch in outside sht. only.
F-2
1/4" sq.
F-3
F-5
F-6
F-7
F-8
Length to suit engine used.
Firewall has 1-1/2" down thrust built in
Nose plate
F-1
Tank floor
doubler grain
3/32" sht. doublers from F-1 to ply cabin doubler & F-8.
ply cabin doubler
splice here if 36" wood is used
3/32" ply
3/32" x 3/16"
3/32" sht. bott. cross grain
1/4" sht. wedges
1/16" sht. cross grain, taper down to 3/32"
3/32" ply.
Preformed aluminum L.G.
2" Air wheel
canted to deflect exhaust of side-mounted engine
chin block
1/4" sht. cheeks
section thru cowl
Tank floor
1/8" sht.



W-1 1/8" sht. (2)
W-2 3/32" sht. (4 req.)
W-7 3/32" sht. (2)
W-3 3/32" sht. (12 req.)
W-6 3/32" sht. (2)
cut W-4 thru W-7 to this line after assembly.
W-4 3/32" sht. (2 req.)
W-5 3/32" sht. (2)
3/32" sht. T&B (med.)
Dihedral braces
Rear
Front
Root Rib Dihedral Jig
Dihedral braces one each 1/8" ply.
1/8" O.D. x 7" long brass tubing
Section B-B
Hoerner tip block end view
Typical wing section
3/32" dia. M.W.
3/16" ply. insert
Section thru stab. before sanding
1/4" sq. T.E. (hard)
1/4" sht. rip w/ 1/16" sht. fillers T&B
section thru rudder
3/16" sht. (med.) spar T&B
1/8" sht.
1/4" sq. L.E. (med.)
sand off
Fin piece R-1 Keys into slot
R-1 1/4" sht.
1/4 sq. (med.)
All ribs 3/32" x 1/4"
1/4" sq. (hard)
Rudder 1/4" sht. (soft)
Note: Tail section is glued to fuse.
R-1
3/16" sq.
3/16" sq. stop here
1/4" ply.
1/16" sht. (med.) doublers from here to tail post
1/16" hole in ply.
1/8" ply. under to mount nylon tail wheel bracket
.045 M.W.
1" tail wheel
cabin doubler 3/32" ply.
All parts balsa unless otherwise noted.
The APPRENTICE
Designed & Drawn by: Bill Northrop
Traced in Ink by:
Specs.
Span 72"
Area Wing 606 sq.in. Stab 156 sq.in. Total 762 sq.in.
Length 52½"
Weight
Wing Loading
power
MODEL BUILDER magazine
Plan No: 7801

FULL SIZE PLANS AVAILABLE — SEE PAGE 108

Charlie Bauer, Chicago, Ill., father of recent AMA Scholarship winner, Paula Bauer, sent us this and the photo on page 29 of his Apprentice, which he just recently sold after many flight years.

develop forces or moments which tend to restore the body to its original condition." In other words, the Apprentice, like any properly trimmed free flight model, will take care of itself in the air. If you disturb its otherwise tranquil flight by applying rudder and/or elevator, it will respond by going left or right and/or up or down, *but,* as soon as you neutralize controls, and with most systems this means releasing the stick(s), the Apprentice's inherent stability will take over and return the ship to normal flight . . . a comforting thought if you're a tyro and get yourself in a jam.

Now, about those ailerons. The inherently stable airplane will respond nicely to elevator and rudder controls, but it has rather fixed ideas about being induced to roll with ailerons. In many I.S. designs, the plane will actually yaw in the *opposite* direction from the aileron control given! The cure for this is to make the airplane *unstable* about its longitudinal axis, or fuselage centerline. The simplest way to do this is to drop the dihedral. In fact, without even resorting to ailerons, you can increase the maneuverability of an airplane (also increase its instability) by lowering the dihedral somewhat. However, now the airplane will require constant control corrections to keep it in level flight. It cannot take care of itself and will crash if the pilot does not make up for its lack of stability.

This type of instability is not bad. It's a necessary ingredient of airplanes designed for maximum stunt capability, but the beginning flier needs this like a hole in the head. Until you can take off, fly around for ten minutes, land, and be perfectly relaxed and on top of the whole situation from beginning to end, you're not ready for an airplane that demands constant "second nature" attention throughout its flight. End of sermon.

We had originally planned to include flying instructions in this article, aimed at the individual who does not have access to the assistance of an experienced pilot. Before we knew it, a separate article was developing. It just can't be done in a few words. So, get busy now and build the Apprentice. We'll get you into the air next month *(or soon thereafter).*

WING

Although the wing has our own SSS714 airfoil (somewhat semi-symmetrical, the 714 is our area code), it can and should be constructed on a flat, true surface. The section is actually straight on the bottom from the spar on back. Washout is built into the outer, twelve inch tapered portion of each panel.

After covering the wing plan with Cut-Rite or Saran plastic film, begin construction by pinning down the bottom trailing edge of the inner straight portion of the wing in addition to the bottom 1/4 inch square spar. The latter must be blocked up off the board with scraps of 3/32 inch balsa. Angle the spar hold-down pins toward the rear so they will not interfere with installation of the top spar and leading edge sheeting that comes a little later.

Glue and pin in place ribs W-1 through W-3, tilting W-1 with the root rib dihedral jig. Don't glue the outer W-3 rib to the trailing edge just yet. Now glue and pin down ribs W-4 through W-7. Next, prefit and then slide in place the tapered tip portion of the bottom trailing edge. Apply glue only after it is in place. Also, the outer W-3 rib can now be glued over the butt joint of the trailing edges.

Put glue in the notches and press the top 1/4 inch square spar in place. Next, add the 1/8 inch thick sub-leading edge. The top of this strip should be beveled before putting it in place. Incidentally, if you're using a runny glue such as Titebond, adding the sub-leading edge can get messy since the glue will be dripping off some of the ribs before you get them all coated. Try this: lay the strip back-side-up on top of the ribs, and where it crosses each one, apply glue to the strip. Now pick it up, slap it on the front of the ribs, and pin it in place.

While this is drying, prefit the top trailing edge pieces. Using a ball point pen, mark the bevel line on each piece, and with a razor plane and sanding block, bevel the edges down to about 1/32 inch thick. Remove any pins that may interfere and glue and pin the top trailing edges in place. Titebond is not too good here because its moisture content tends to relax the wood fibers and causes the edge to curl, making pinning difficult. Either go to a cellulose cement, or counteract the Titebond curl by moistening the top side of the sheet. *(The new, thick cyanoacrylates take care of all of this.)*

The last item that may be added before removing the panel from the board is the top leading edge sheeting. Use plenty of pins and wipe the outside surface with a damp cloth just prior to installation in order to ease the bending strain. Butt the sheet tightly against the rib notches and allow the excess to extend beyond the sub-leading edge. Let this much of the assembly dry overnight.

After removing it from the plan, turn the wing over and pin it down by the top spar. Slide a jig strip of 1/4-inch square material under the wing until it blocks up the trailing edge, keeping the wing from rocking. Make sure the jig strip is parallel to the spar, then pin everything down tight to keep the wing straight. Now install the webbing in front of the wing spars, followed by the bottom front sheeting. Of course, that sub-leading edge has to be beveled off first.

Once the webbing and bottom sheeting are in place and the glue has hardened, the wing is beyond the point of no return so far as its straightness is concerned. Eyeball it from every possible angle to make sure there are no permanent "warps."

Repeat all of the above for the other wing panel, and for heaven's sake make sure it's opposite hand! An easy way to do this when you have only one-half of the wing plan is to rub oil into the critical locating points on that half. This makes the paper transparent enough at these spots to turn the plans over and build the second panel on the back side. The final steps before joining the two panels are trimming off the building tabs on the tip ribs, and gluing the 1/4 by 1/2 inch leading edges in place.

Using a large sanding block, dress the root end of each wing panel so that you will obtain a smooth, uniform butt joint at the center. Pin one panel to the building board with the bottom spar and trailing edge held down securely (stick some of that Saran under the root rib). Apply glue to the root section of the other panel, press it into place, prop the tip up 6 inches (to the bottom of W-7) and pin the center joint together at the leading and trailing edges to maintain alignment. Allow this to dry thoroughly.

Make room for the dihedral braces by slicing out that portion of ribs W-1 and the inner W-2 which is between the spars and the trailing edge. Epoxy the braces in their respective locations and

then trim and reinstall the ribs. Scrap sticks may be sprung between the trailing edge and the main brace to hold it in position until the epoxy hardens. Finish the wing structure by adding all of the tip and center section sheeting and the tip blocks. The Hoerner design is optional and has not been proven for better or worse on this model.

TAIL

Carefully select all tail section wood for lightness. An extra ounce in the tail will require adding three ounces in the nose to balance the airplane, and that's a useless 1/4 of a pound that nobody needs.

The basic 1/4-inch thick stabilizer frame is first built right over the plan. While it is pinned down, you can add the top 3/16 inch main spar, the 1/8 inch tip fillers, and the 3/16 inch center section fillers. Leave a 1/4-inch slot for the fin.

Once this much is dry, remove all pins holding the 1/4-inch square spar and leading edge and add the 1/16 by 3/8-inch spar caps. Purpose of the caps is to provide a smooth, uninterrupted surface from outside edges to center spar and to avoid the annoying little covering kinks that usually form as ribs try to push into spars under tension of the covering. When stab is dry, remove from plan and add bottom spar, filler pieces, and caps. Plane and sand everything to shape for covering.

The fin is built from 1/4 inch materials and needs no further explanation. The rudder and elevators are simple solid sheet material and only require the addition of ply inserts for control horns. Note that the elevators are only rounded at the trailing edge, not tapered to an airfoil shape as is the rudder.

FUSELAGE

The fuselage is of typical sheet wood box construction. Hobbypoxy II was used on all doublers, Sig Epoxy glue on all heavy-duty points, and Titebond for anything else. Doublers, upright stiffeners, and longerons are all added before joining the two sides. The top longerons of 3/16 square may need a series of partial saw cuts to help them follow the curve.

Proper and square alignment in early construction stages is important, so with this in mind, do not, repeat, do *not* cut out the window area (if you do it at all) until the fuselage is just about completed. Join the two sides by epoxying F-7 and F-8 in place. We temporarily pinned a six-inch wide sheet of wood across the bottom of the fuselage between F-7 and F-8 to keep things true until the epoxy cured.

Next, cut two 3/16 square by 2-7/8 inch long cross pieces and glue and pin them in place at the vertical stiffener location which is 12 inches aft of F-8. Pull the tail posts together and bevel the inside surfaces until the total width of the two sides at the post is a little over a 1/4 inch. When this is glued together, the rear fuselage assumes a natural curve from F-8 to the tail post. With 3/32 balsa applied crossgrain, plank the top from elevator cut out to F-8 and the bottom from tail post to the 3/32 ply landing gear base. Also epoxy this in place. Use a 4-inch wide piece of planking just aft of F-8 on the top and score the underside down the middle so it will press into the "V" at the top of F-8 and gradually blend out to a flat section.

Charlie Bauer's Apprentice is powered by an Enya .35, about the most you'd want to use. Although not necessary, a side-mounted engine, with cowling, greatly improves the appearance.

Epoxy F-1 into place using 1/4 by 1/2 inch spruce sticks with rubber bands stretched across them to hold the sides tightly against the bulkhead. Force pins through the sides and into F-1 to prevent sliding. Next, epoxy in place the tank floor F-9 and F-10 "instrument panel" bulkhead F-6. Another set of sticks and rubber bands just ahead of bulkhead F-6 should cozy everything up nice and tight.

While this is curing, you can glue in and carve the upper windshield block, drill out for the 1/8 inch dia. music wire wing dowels, and prepare the various ply pieces that are then epoxied in place along with the wire dowels. If you want the little extra touch of realism afforded by real honest see-thru windows, cut the balsa siding out now, guided by the ply doublers. Notch out the outer sheet sides as shown to accommodate the hardwood 3/32 by 1/4 vertical dividers. Since we used Super Monokote, the job of applying "glass" was easy. The sides were covered, including the window area, with one chunk of the instant skin. The S.M. was ironed down around each window frame, and then, using cotton sticks and Kleenex, the color/adhesive was removed from the clear plastic backing film from inside the cabin *using butyrate thinner.* Presto! Daylight!

Meanwhile, back at the schnozz . . . Glue in F-5, the hatch stop F-4, the short 1/4-inch square stringer from F-5 to F-6 and then plank the windshield cowl. We did this with two pieces which were first well soaked in hot water and taped into place over the bulkheads. When dry, it was an easy matter to trim them to shape and glue in place with only a few pins necessary.

Now construct the removable hatch framework right on the fuselage, using three 1/4-inch square stringers and bulkheads F-2 and F-3. You may want to insert pieces of Saran before gluing, so the hatch won't become a permanent part of the structure. After trimming the side stringers, the hatch frame was sheeted in the same manner as the windshield cowl. Don't forget the 1/4 inch overhang on each end.

The exact engine cowl construction will vary, depending on the engine used and whether it is mounted upright or tilted to the right. We mounted the Webra .20 turned 90 degrees to the right. Whatever you decide, remember that the center of the fuel tank should be at the same level as the engine's needle valve. If mounted upright, you will probably have to drop the thrust line slightly, and as a result, may need a little more downthrust. We have long been in favor of radial mounting, and suggest either a Tatone mount, Midwest "T" bars, or an aluminum plate bolted directly to the back plate of the engine.

We left the bottom nose planking until last, in case your engine mounting required blind nuts below the tank floor. Now this can be cross grain sheeted with hard 1/8 inch balsa. Obviously, it must be feathered down to 3/32 where it meets the ply landing gear base, but the idea is to prevent the battery pack from exiting the hard way (through the bottom) if you should plop down ungently.

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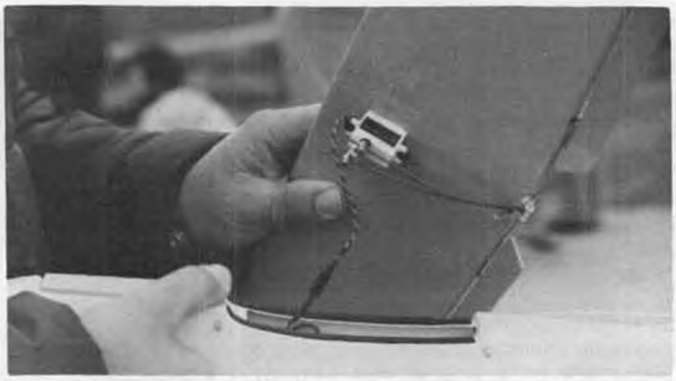

Doug Klassen is currently into small, aerobatic slope gliders, terrorizes So. Cal. sites with this Sparrow. It uses itty-bitty Cannon rig, but most anything will fit in the big fuselage.

R/C SOARING

by Dr. LARRY FOGEL.

PHOTOS BY AUTHOR

• We are in the middle of a revolution. The micro-processor is here, and we are only beginning to feel its impact. Pocket computers are only the tip of the iceberg.

How will all these new computing devices affect R/C Soaring? Well, let's see. In the near future, your transmitter might have sufficient internal memory and logic to allow it to learn your pet maneuvers. Suppose you fly your aerobatic ship through a roll while the computer in the transmitter records your stick movements. Oh? You didn't like that last maneuver? Erase it and try again. Aha! That one's good enough to keep. Release the record button, and you're now ready to repeat that maneuver anytime you like. You dive for speed, level off and then press the button marked "roll" . . . that's all there is to it. It performs the roll while you leave your stick in neutral.

I'm not the greatest pilot. I'll wait until Ken Banks or some other top performer shows up and have him put my bird through its paces while recording his stick movement. On the next windy day, I'll reproduce that same outside loop, Cuban-8, or whatever, simply by pressing a button. It's almost like having a player piano.

Oh oh! I can hear someone say, "That's cheating." Well, maybe so. I hear tell that in England, some of the better pilots are getting a handle on the rolling circle maneuver . . . you roll the plane

Frank Hunter's winch turnaround is unique, in that it pivots from side to side and also up and down. Text has full details.

and at the same time go around a flat circle, ending where you began, and in the same attitude. That's tough to do. I wonder if you could perform that maneuver with the simple control stick movement of the flat circle, while the internal logic puts the plane through a straight line roll. Sure, the recorded maneuver puts you a step further away from direct control, but now you can attempt far more complex maneuvers. How about an 8-point loop? And who knows what else?

With more memory and logic you might go through a sequence of maneuvers, using the control stick to take out the effect of wind drift and turbulence. That's right. You're still in control; you're just sliding from tactics into strategy. It's like some of the new electronic organs; you play a simple melody, indicate the harmony and rhythm, and it does all the rest. The "real" musician may object to all this, arguing that you are losing a lot of the options, and he's right. But you've allowed the beginner to create and enjoy a lot of music.

Say, could this record and playback feature be useful for training the novice pilot? Would it help if the control stick were made to move in accordance with the recorded instructions? That way you can feel the commands given to the control surfaces as they are read out of memory. What about a telemetry link with the bird in order to close the loop? The possibilities are endless.

How far along have we come on this path? Well, pattern fliers can now have a "snap roll button." Adding the required memory and logic for more complex maneuvers is within the state of the art. Military remotely piloted vehicles are often commanded in terms of heading and altitude; a computer figures out the most efficient maneuvers to achieve these ends.

Let's go one step further. You've seen the many TV games simulating tennis, ping pong, artillery, depth charges, and whatever. How about simulating an

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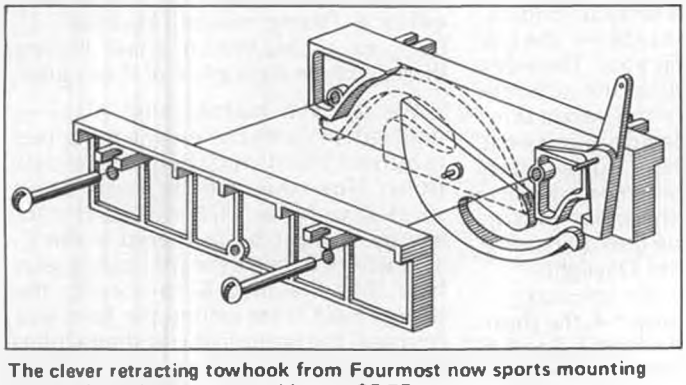
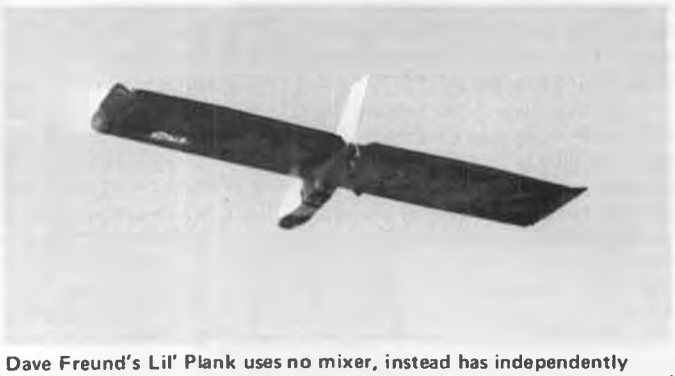


The clever retracting towhook from Fourmost now sports mounting lugs. Light and strong, a good buy at $5.75.



Dave Freund's Lil' Plank uses no mixer, instead has independently controlled elevons! Requires intense concentration at all times, we bet!

the Perfect Thermal!

By DAVE THORNBURG . . . And now, for something completely different; an authentic, on-the-spot interview with a turkey vulture! Highly informative and entertaining, we doubt if you have read anything like it before.

• So I'm headed west out of Phoenix one bright and shiny morning, rolling along through the desert at a solid 38 mph in my Studebaker convertible, top down, big left arm dangling over the side, fingernails striking sparks off the pavement . . . just another typical American headed for the Promised Land. Only I'm not in any big rush to get there, see? Nobody with lungs oughta rush to California.

Other side of Wickenburg there's this black dot on the horizon, and when I get closer I can see it's a big old red-headed turkey vulture . . . I call 'em buzzards, but not to their faces . . . and he's thumbing a ride. So I roll up alongside and sing out:

"Goin' all the way to Big L.A.!"

He don't even move. Just ruffles his feathers and glares at me with one ugly yellow eye. "L.A.," he says, kinda slow. "Many people dying out there?"

"All of 'em," I assure him.

Right away he hops in, slamming the door. Hitchhikers always slam your doors, you ever notice that? And all at once there's this awful smell in the car; reminds me of my second wife's cooking. I race through the gears and coax her back up to 38, and turn a wing-vent so it blows right in my face.

"Smells like you been eatin' garlic," I say, just to make conversation.

"Horse," he says, kinda sharp. I get the idea he don't want to talk diet. So I try another opening.

"Gonna be a nice day for soaring, looks like."

His head jerks around and that yellow eye is on me again. "What do you know about soaring?" he says.

"Oh, about all there is to know, I reckon," I tell him modestly. I toss a thumb over my shoulder to indicate the big glider trophy in the back seat, propped up like the Statue of Liberty. Those guys in Phoenix always give big trophies.

He looks it over carefully, then snorts. "Fifth place," he says. Them buzzards sure got sharp eyes, I'll say that for them.

"Yeah, well, I maxed every round. I just blew off a couple of landings, is all. I *woulda* got first . . ." Explain, explain, explain. I get sick of it. Maybe that's why guys like Miller and Gunsalles and Holley WIN all the time . . . it's easier than explaining why they didn't.

"Fifth place," old buzzard says again, shaking his head. "Know what you get when you come in fifth on a horse carcass?"

"Look," I tell him, "it was a tough contest. We had to launch downwind. The air was violent, as full of holes as Swiss cheese. You may not know much about these desert thermals. . ."

"I know plenty!" he growls, holding up a sprained wing. "You think I'm thumbing for the fun of it?"

I don't want to listen to this guy's sob story. Hitchhikers and people on Greyhound buses all sing the same tune: I usually fly, this is the first time . . . etc. So I bait him with a question, to change the subject.

"What makes desert air so violent?"

He looks at me with disgust, but I can see he's secretly pleased. Everybody likes to play guru.

"Well, son," he says, sitting up straighter in the seat, "it takes three things to make a perfect thermal; hot sun, low wind, and dry air. The desert has too much of all three. That's why it breeds some really nasty patches of lift. Why, that thermal that sprained my wing was. . ."

"Hot sun isn't always necessary," I interrupt. "I've had some good soaring on overcast days."

"Sure you have. Thermals form in all kinds of weather, summer and winter. You don't see us vultures walking, just because it's a cloudy day. But I'm talking about the *perfect* thermal . . . the big, lazy riser that you pick up just above the treetops, and it's soft and smooth as rabbit fur, and you can ride it with your eyes *shut*, it's so gentle, and it carries you off across the pasture in big slow circles and dumps you right on top of a nice fat bloated cow carcass. . ."

"Ugh," I say, "suppose you just ride it on up into the cool, shady, blue-gray air at the base of a cumulus cloud, instead."

"Now why would anybirdy want to do that?" the buzzard asks.

"Never mind. Look, I still don't see how thermals can form without sunshine. With no sun to heat up the air. . ."

"The sun doesn't heat the air, stupid. At least not directly. The sun heats the earth, and the *earth* heats the air. Air molecules have to pick up most of their heat from direct contact with a warm surface, like dark ground, a blacktop highway, or the roof of a building. Any surface that's warmer than other surfaces around it will generate lift. That's why I always look for a dry, brown field surrounded by moist green fields. Remember, thermals don't form because of high temperature, they form because of a *difference* in temperature. There might be snow all over the ground, but if you can find a warm rooftop or roadway, you'll soar."

"Well," I say, "I don't see why they form on the desert at all. *Everything's* hot out here."

"But some things are still hotter than others. The sides of hills that are exactly perpendicular to the sun's rays, for example. Or little depressions in the ground that are protected from the wind."

"You said 'low wind' was one of the ingredients for making perfect thermals. What difference does wind make?"

"Wind? Why, it makes all the difference in the world! Look, suppose you have this big old thermal rising up like a ghost out of some farmer's dry cornfield. If there's no wind, it's just going to sit there and grow fatter and fatter, right? But if the wind is blowing, then as soon as the thermal gets high enough into the wind gradient, the top will blow off of it."

"Wind gradient?" I say.

"You don't know about the wind gradient?" the buzzard asks. "Haven't you ever watched a column of smoke rising in the wind? Close to the ground it goes almost straight up, but the higher it gets the more it leans, right? That's because windspeed drops off as you

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The late John L. "Kingfish" Sadler in 1936, with his original 10-foot low-wing with Brown Jr. Sadler's "Pacemaker" low-winger plans available from RCMB. Photo courtesy of H.A. Thomas.

PLUG SPARKS

PHOTOS BY AUTHOR

By JOHN POND

• Awright! All you Easterners get ready to see your name in print, as that hard working Contest Director, Jim Clark, has sent in the results of almost the complete schedule of the 1979 Eastern O.T. R/C flying. Jim has sent quite a bit of stuff on happenings on the eastern seaboard, so let's get on with it.

The first meet of any consequence was the Jersey Antique Modelers Meet of July 12, with Mike Granieri as Contest Director. Held at the North Branch Park in Bridgewater, New Jersey, the meet featured hot and sunny weather with great thermals. However, the attendance was low, no doubt due to the threat of rain. With the possibility of a postponed meet, the shortage of gas, and the cost of same, some of the less competition-minded modelers failed to show.

In listing the results, the reader must remember that O.T. R/C events (limited engine run events particularly) are run on ten minute maximum flights rather than the seven as specified in the SAM rulebook. Another interesting feature is that they allow the best three out of four flights for all classes except Texaco, which is the usual one best flight out of two.

CLASS A

1) Tom Acciavatti	Playboy Sr. (scaled)
2) Mike Lachowski	M-G (Cl. AB)
3) George Haley	M-G (Cl. AB)

CLASS B

1) Stu Murray	Interceptor B
2) Tom Acciavatti	Playboy Sr. (scaled)
3) Tom Wroblesky	Playboy Sr. (scaled)

CLASS C-D

1) Tom Acciavatti	Playboy
2) Esio Grassi	M-G
3) Tom Wroblesky	Playboy

ANTIQUE

1) Esio Grassi	M-G
2) Stu Murray	Gas Bird
3) Don Hartman	Standby

CLASS ABCD IGNITION

1) Hank Baer	Playboy
2) Woody Woodman	Playboy
3) Steve Boucher	Sailplane

FUEL ALLOTMENT

1) Jack Van Dusen	Dallaire
2) George Murphy	Dallaire
3) Woody Woodman	Playboy

The Fuel Allotment event above generally replaces the Texaco event, as it allows all models, Antique and Old Timer, to compete. (Texaco models must conform to a deadline of December 31, 1938.)

The next meet occurring in New Jersey was the S.P.O.T. (Society for the Preservation of Old Timers) Annual at the CJR/CC (Central Jersey) Field located at Piscataway, New Jersey. Actually, the meet had to be postponed because of bad weather and was actually held on August 26.

C.D. Jim Clark reports the day was hot, humid (ugh!), and partly cloudy with winds between 0 and 10 mph. At this contest, the so-called Texaco event was actually a Fuel Allotment event, as models past the date of December 31, 1938 were allowed to compete in order to swell the attendance. Interestingly enough, regardless of the apparent superior flying qualities of the Old Timer models (dated between 1939 and 1942) the old Texaco type models win the majority of times. It is tough to beat those big birds once you get them up high enough!

S.P.O.T. Results:

CLASS A

1) Mike Lachowski	M-G (Cl. AB)
2) George Haley	M-G (Cl. AB)

CLASS B

1) Tom Wroblesky	Playboy
2) Don Hartman	Gas Champ
3) Jim Clark	M-G (Cl. B)

CLASS C

1) Tom Wroblesky	Playboy
2) Frank Lashek	Bombshell
3) Richard Reuter	Bombshell

CLASS ABCD IGNITION

1) Woody Woodman	Playboy
2) Fred Quedenfield	PB-2
3) Hank Baer	Playboy (crunch!)

ANTIQUE

1) Robert Skupien	Dallaire
2) Mike Lachowski	M-G
3) Ralph Clemens	Quaker

Wotta dedicated flier! Woody Woodman with Scientific Eaglet in New Jersey's cold January weather. Note the ice cubes!

Ted Kleuser, a Sadler admirer who gave his life as a B-17 pilot in WW-II, with a flock of Little Rock low-wings. Pacemakers apparently were built in all sizes. H.A. Thomas photo.

Tom Kulp did a super building job on this 6-foot "Ole Reliable", his first R/C gas job. Flew at SAM 49 Texaco last December.

Jim Clark, the East Coast's busiest man. Between CD'ing meets, Jim also flies, and sometimes even wins too!

TEXACO (FUEL ALLOTMENT)

1) Fred Quendenfield	M-G
2) Don Hartman	Gas Champ
3) Ralph Clemens	Quaker

Interesting to note that Eastern trends are similar to the West. If you don't have a Playboy in the Limited Engine Run events, then you are definitely at a handicap. About the only model that seems to enjoy the same popularity is Mike Granieri's M-G, which has been scaled to four sizes.

Biggest and best meet of the 1979 season on the East Coast appears to be the Somerset Signal Senders Annual, held September 7 at the North Branch Park in Bridgewater, New Jersey.

Contest Director Pete Vano wisely postponed the meet to their rain date and was amply rewarded with beautiful weather. Incidentally, Pete Vano did bring his big Powerhouse (scaled up 1-1/2 times) and flew it just to show the boys he wasn't kidding about the performance. He also garnered the Hank Baer Trophy for the best finished model on the field.

Jim Clark (flying for a change) was justifiably proud of his brand new M-G, scaled to Class A size, when the model flew perfect on its maiden flight. Maxed out, too!

Let's take a look at the results to see what this big meet drew in the way of contestants and models.

CLASS A

1) George Haley	M-G (Cl. AB)
2) Tom Acciavatti	Playboy A
3) Stu Murray	Interceptor

CLASS B

1) Tom Acciavatti	Playboy B
2) Tom Wroblesky	M-G (Cl. B)
3) Jim Clark	M-G (Cl. B)

CLASS C

1) Ted Patriola	Sailplane
2) Tom Acciavatti	Playboy Sr.
3) Tom Wroblesky	Playboy Sr.

ANTIQUE

1) George Haley	M-G
2) Mike Lachowski	M-G
3) Bob Bara	M-G

CLASS ABCD IGNITION

1) Fred Quedenfield	PB-2
2) Hank Baer	Playboy (ignition)

FUEL ALLOTMENT

1) Jack Van Dusen	Dallaire
2) Dan Schneider	Flamingo
3) George Haley	M-G

Noted on the field were several models not normally seen, notably Joe Beshar's Fox, Vano's 1-1/2 size Powerhouse (two fourth places), and a Flying Quaker. Before we wrap up this report on East Coast flying, we simply have to put out a schedule of contests for 1980:

June 8: S.P.O.T. Annual, Middlesex Model Airport, Piscataway, NJ; C.D. Jim Clark.

July 20: Jersey Air Modelers Meet, North Branch Park, Bridgewater, NJ; C.D. Mike Granieri.

August 24: Somerset Signal Senders Annual, North Branch Park, Bridgewater, NJ; C.D. Pete Vano.

In all of the foregoing contests, all O.T. R/C events will be held. See the results of the foregoing 1979 contests to get an idea of what is being staged. Don't miss the fun!

MOTOR OF THE MONTH

Most all of the engines featured in this column have been American designs, produced by U.S. manufacturers. This time we are featuring the Hurricane, an engine produced in Canada.

Hurricane engines (of which there were quite a few variations) were the brainchild of Ray Hunter, a quiet and unassuming man. Ray's background consisted of being trained as a journeyman machinist. His interest in models soon led him to tinker with gas engines in the late thirties.

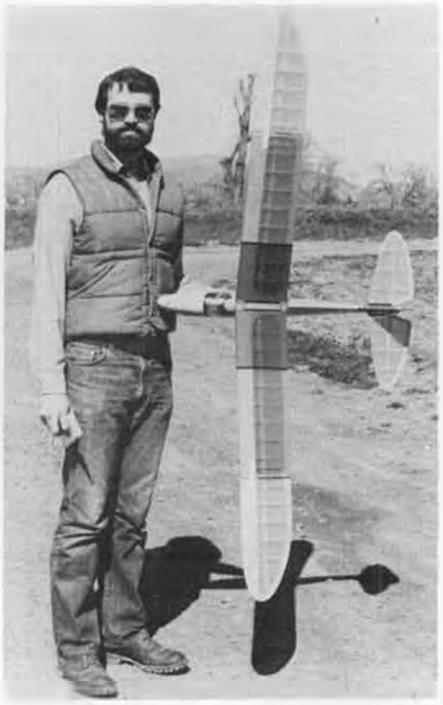
Ray built a few home-brew type engines but it was not until he took a page from the Forster .99 engine brochure and actually produced one of these large engines from scratch, including all castings and machining, that he had a really successful engine.

Convinced that he now had the know-how for producing engines, Hunter was actually able to obtain an Education Priority to purchase critical wartime materials for the manufacture of model

No question about the popularity of the MG design on the East Coast. Designer Mike Guarnieri has plans in all sizes.

Ignition in R/C models is gradually catching on back east. Hank Baer shows his Anderson powered Playboy. Clark photo.

Photo taken by Pond at recent SAM 21 Sailplane/Old Timer contest shows some of the models used. A total of nine teams, three fliers on each one, competed at this meet.



SAM 21's newsletter editor, Steve Roselle, flew this Berkeley 'Sinbad the Sailor". How's that for an authentic O.T. glider?

airplane engines.

Of course, on the first several models, considerable expense was involved during the learning process. The first Hurricane motors were produced by the lost-wax method (known as investment casting). It wasn't long before Hunter went to die castings to reduce costs.

The engine we are featuring this month is the fourth version, the Mk. II type, where the molded plastic tank on a bracket was replaced by a steamlined tank, forming a completely sealed unit.

Hurricane engines came out during a time (World War II) when new motors were extremely hard to find. This writer, of course, had to be the first on his block to have one. Running the engine presented no great problems, as the engine was very similar in shape and size to the very popular Ohlsson .23. Starting and running characteristics were remarkably alike! It was a great substitute until the close of the war when the U.S. manufacturers, notably Ohlsson & Rice, got going full blast again on engine production. This firm, in producing extremely reliable engines, ran many of the smaller engine manufacturers (including Hunter) off the market. When the O&R firm dropped its price by half when competition starting getting a little stiff, it really did in those manufacturers that were barely hanging on.

For the technically minded, the Hurricane 24 had a bore of 11/16 in. and a stroke of 21/32 in., giving an actual displacement of .287 cu. in. Weight of the base engine assembly was five ounces. Hurricane motors for the most part were made of cast magnesium parts (head, cylinder, and crankcase). Crankshaft was of one-piece unhardened steel with a small size counterweight. Main bearing was made of bronze alloy and press fitted to the crankcase.

The piston was machined from mehanite iron, and the first models featured a bronze alloy wristpin. This was found inadequate and the later models such as the Model 4 featured hollow drill steel for wristpins. Liner was machined from steel with a milled slot for the bypass cast integral in the cylinder.

Rotary valve engines were quite popular in this immediate post-war era and the Hurricane engine reflected this trend. Enclosed timer points as popularized by Ohlsson were employed. A V-3 type plug was recommended for best performance.

Strobatac tests, as run by *Air Trails* back in 1946, revealed that the Hurricane ran best with a 10x4 propeller at 7,500 rpm. When using a 10x6 prop, rpm dropped to 6,300 rpm. The *Air Trails* engine test group reported the Hurricane motor was one of the steadiest running engines tested to date.

KSB TIMERS

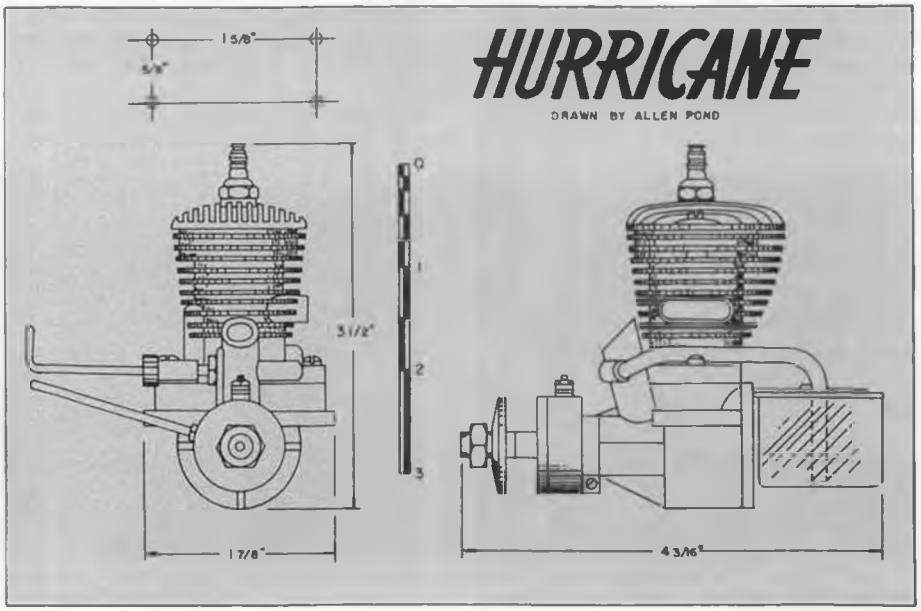
Tatone timers are in very short supply these days; hence, this info may be helpful. Lou Delateur, who runs Galaxy Hobbies, Cherry Chase Center, El Camino and Bernardo, Sunnyvale, CA 94087, has recently acquired a flock of KSB timers for fuel shutoff. The timers look and run like Tatone timers, but the price is simply great! Get all you want at $6.95 each. Better yet, call Lou at (408) 732-5750.

FORTY YEARS AGO, I WAS. . .

W.G. Moore of Wilmington, North Carolina, writes to say the following: "Forty years ago, as a kid, I fell in love with model airplanes. My 'hero' in those days was a fellow by the name of Clarence Wampler. He turned out what I considered magnificent models in Greeneville, Tennessee. I remember being with him one day when he was testing a straight-wing Stinson of 60-inch wingspan, a rubber job built from a Megow kit.

"I asked his age and he replied 19. Gads! How ancient, I thought at that time when I was only 9 or 10. Now, here I am in my early fifties and wondering, like a million other guys, what happened to all those years.

"My first model was a 12-inch span Corben Ace that cost me a dime! You know the story of course; the kit came complete with all printwood, balsa strips, wheels, Japanese tissue, strand of rubber, and even a tube of cement!



Ol' Bud McNorgan cleaned up in Scale at Vamps Annual with this Corben Ace, got a 22:55 flight! Model spans 7 feet. Pond has plans.

And here's 'Daddy Warbucks' himself, cranking on the stubborn Baby Cyke in his Miss Model Craftsman. Marc Tackett offers advice.

"It doesn't seem so long ago that I was badgering my father to sit down and write a check for the then astronomical sum of $1 to obtain the Taylor Cub as manufactured by Megow's at Howard and Oxford Sts. in Philadelphia. My persistence was rewarded and the kit was my first 'big' model. I still have the original box, kit No. D3.

"Unfortunately, the plans to it and many other models I built as a kid have been lost with the passing of time. I managed to save between six to ten kits of Cleveland, Scientific, Berkeley, and Comet. These I still treasure.

"Now that I am well past the mid-point of life, I am very desirous of getting back into modeling. I would like very much to be able to obtain these old Megow plans. (Columnist's note: he came to the right department!)

"Please forgive me for bending your ear but model aircraft has always been a soft spot in my heart. I would like to once again build some of those old time rubber powered models. The latest pattern aces and their look-alikes don't do a thing for me."

How about that? Another modeler who got the message! Welcome to the club!

AUSTINCRAFT OBIT

Just received a letter from Gordon Codding of Kingman, Arizona, informing me that his neighborhood buddy, Clyde Austin, had just passed away on March 11 at the Mohave County Hospital.

Clyde finally succumbed to cancer and a slight stroke. His delicate wife, Vera, survives him. The Austin plant, which produced all those miscellaneous items such as needle valves, battery boxes, fuel pumps, wrenches, etc. will no doubt be up for sale. Codding reports all of the tools and manufacturing equipment are still in place and ready to continue the marketing of the items. Wanna be a hobby parts manufacturer?

CALIFORNIA CAPERS

The contest season is in full swing in California, much to the chagrin of the rest of the modelers who love to fly outdoor models. Just so the local boys won't throw brickbats at this columnist, here is what has been happening:

Very nicely done So-Long by VAMPS member Bill Holt garnered 4th place at VAMPS Annual. Powered by O.S. .15 with Bernhardt (77 Products) conversion. This and above pic by Stroman.

BROWNS VALLEY "INTERNATIONAL"

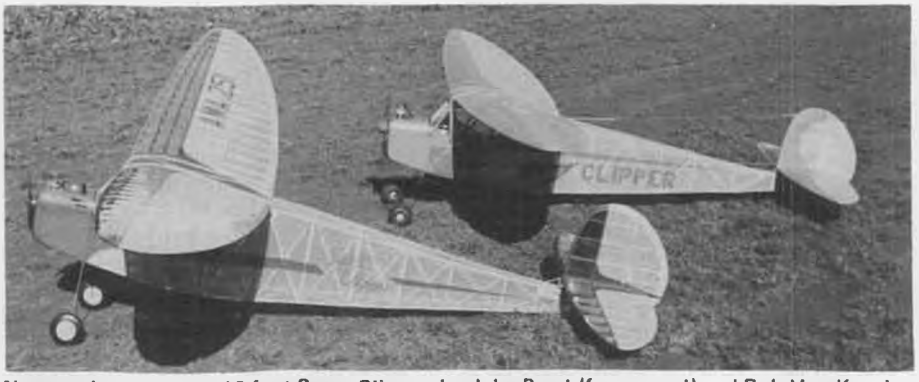
For the second time around, this Annual as sponsored by SAM 30 has all the earmarks of being the best meet to start the year with. Harold Cullens, Manager, and Loren Schmidt, Contest Director, spared no effort to make this meet as pleasant as possible.

Staged at Speed Hughes' ranch, the weather was simply fabulous between rain spells several days before and after the meet. With winds never exceeding five mph, Charles Werle was actually flying rubber power rubber demonstrations in that small field enclosed by many trees.

The new 1/2A Texaco event was given a thorough tryout this time, with Don Bekins again proving that the guy who climbs the highest wins. Actually, Jack Alten could have won the meet, but his half-hour flight was unofficial. (As usual, they always fly better when there is no watch on them!) The columnist had the unusual flight where the model had too much downthrust. Got a seven-minute motor run and an 8:16 flight! Ridiculous!

Held over two days, the meet allowed everyone to thoroughly enjoy themselves at the bean feeds. Neva Nicholau and Miriam Schmidt outdid themselves again! How do you get help like that? They not only run the registration and timing, but feed you in the bargain!

Results looked something like this:



Not one, but two huge 10-foot Super Clippers by John Pond (foreground) and Bob Von Konsky. Wing outline at this size is identical to a Valkyrie. Both are real floaters!

Speaking of Valkyries, here's one by SAM 7's George Armstead. Fuselage is 1/32 sheet wrapped over 1/16 longitudinal sheet, makes a light and strong framework. Brown Jr. power.

CLASS AB

1) Rick Kultti (Bombshell)	14:35
2) Don Bekins (Playboy Cabin)	10:02
3) Hal Cullens (Albatross)	9:48

ANTIQUE

1) Bob Hughes (Dallaire)	29:56
2) Jim Kyncy (Gas Bird)	29:10
3) George Hindman (Lanzo)	25:38

1/2A TEXACO

1) Don Bekins	19:41
2) Jack Alten	12:19
3) Bob Anderson	8:24

CLASS C

1) Don Bekins (Playboy)	21:00
2) Jim Kyncy (Playboy)	16:08
3) Hal Cullens (Albatross)	15:29

TEXACO

1) Eut Tilson (Westerner)	30:56
2) Jim Kyncy (Gas Bird)	28:44
3) Don Bekins (Gas Bird)	23:30

SCIFS ANNUAL "KICKOFF"

Free flight got off to an excellent start in 1980 when the SCIFS held their "Kickoff" on March 8 and 9 with excellent weather prevailing. It was probably one of the best all-around flying weekends in Taft that Old Timers could remember.

To show how conducive good weather is to a good contest, there were 77 entries in the various events. Very few crackups were noted, but those that did occur were dandies, to wit: Bruce Chandler rekitting (again!) his Super Skyrocket while Al Heinrich, not to be outdone, stuck his Foo-2-U-2 in very convincingly.

A new face in the rubber winners, Ed Lidgard (yes, they eventually all come to California!) placed third with a Comet Sparky! Just wait until he builds one of his super Wakefield designs! That'll make the boys step! Talking about rubber, another newcomer to the silent side of modeling, Wade Wiley, produced a 1932 Gordon Light Wakefield Winner that shows excellent promise. When he gets some turn in it, he won't have to settle for second place! Wanna see what the boys on the West Coast are using? Well, look over the results:

COMMERCIAL RUBBER

1) Andy Faykun (Orr Chieftain)	9:00
2) Wade Wiley (Gordon Light)	8:20
3) Ed Lidgard (Sparky)	9:19

O.T. RUBBER

1) Art Corvella (Hi-Climber)	12:51
2) Leon DeWitt (unknown)	12:30
3) Wade Wiley (Gordon Light)	11:47

30 SECOND ANTIQUE

1) Larry Clark (Miss Delaware)	11:33
2) C. Large (Long Cabin)	8:30
3) J. Ogg (Powerhouse)	8:16

CLASS A PYLON

1) Cliff Silva (Ranger)	9:35
2) W. Weathers (Playboy)	9:34
3) Al Hellman (Ranger)	9:07

CLASS B PYLON

1) Jim Persson (Zipper)	13:54
2) Bruce Chandler (Zipper)	12:31
3) Bob Oslan (Ranger)	11:38

CLASS C PYLON

1) Bruce Chandler (Demon)	12:20
2) Jim Persson (Playboy)	10:35
3) Al Rasmussen (Sailplane)	9:54

CLASS A CABIN

1) Bob Oslan (Flybaby)	9:46
2) Bill Cohen (Cabruler)	8:56
3) Bruce Chandler (Coronet)	7:37

CLASS B CABIN

1) Al Hellman (Clipper)	9:34
2) T. Heiser (Dodger)	9:25
3) Ross Thomas (So-Long)	7:35

CLASS C CABIN

1) Jim Ogg (Bombshell)	11:34
2) Bruce Chandler (Clipper)	9:57
3) Bill Cohen (Buccaneer)	7:41

.020 REPLICA

1) Bob Oslan (Strato Streak)	17:52
2) Al Rasmussen (Playboy)	16:51
3) Jack Jella (Strato Streak)	8:48

Continued on page 104

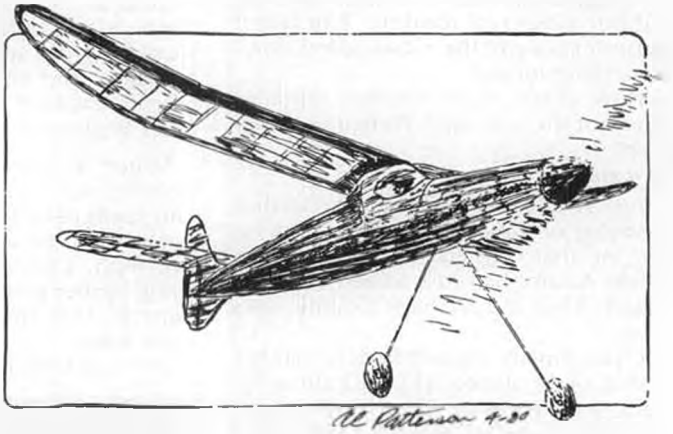
STRATOSPHERE

OLD TIMER Model of the Month

Designed by: Henry Cole

Drawn by: Al Patterson

Text by: Phil Bernhardt

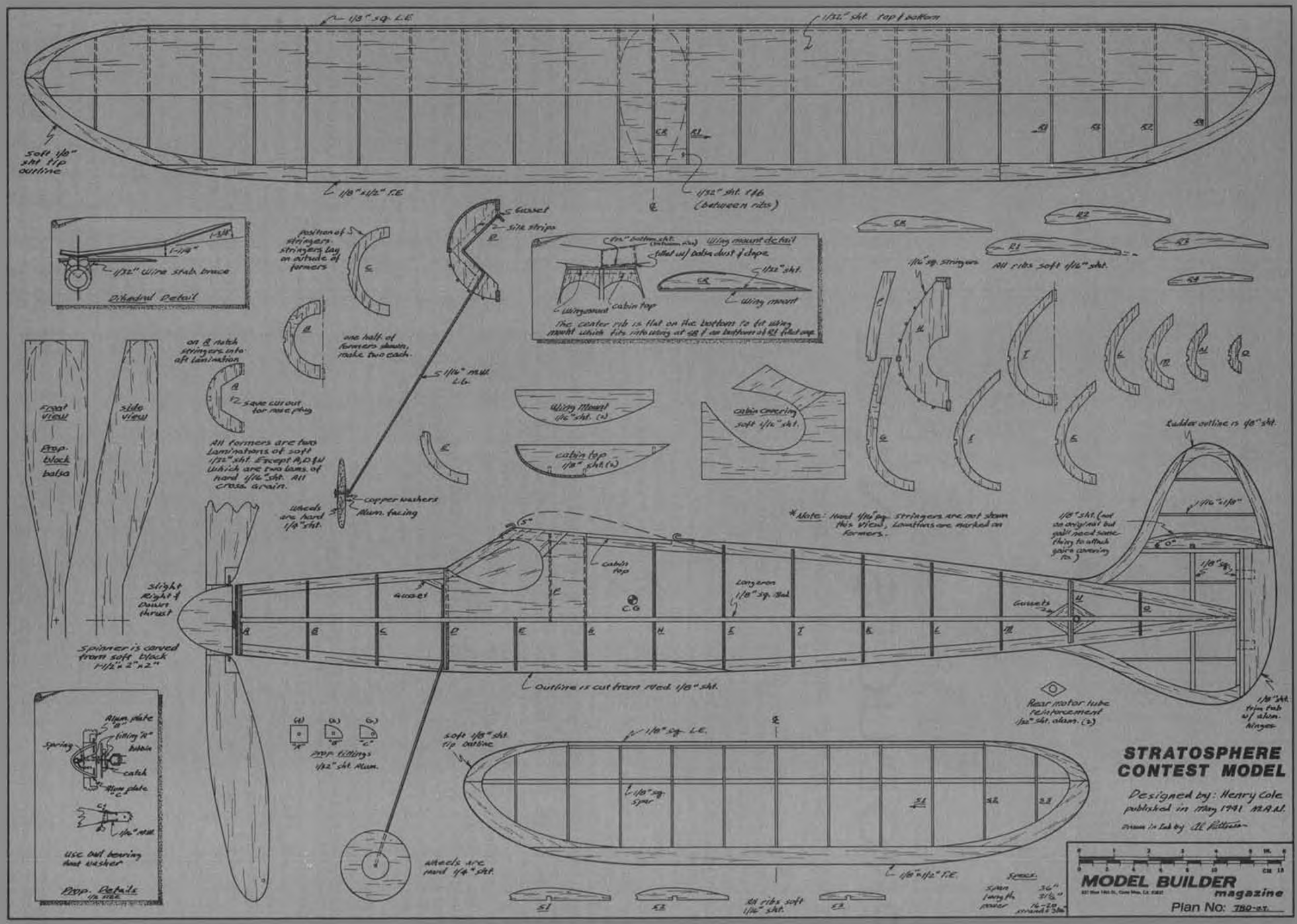


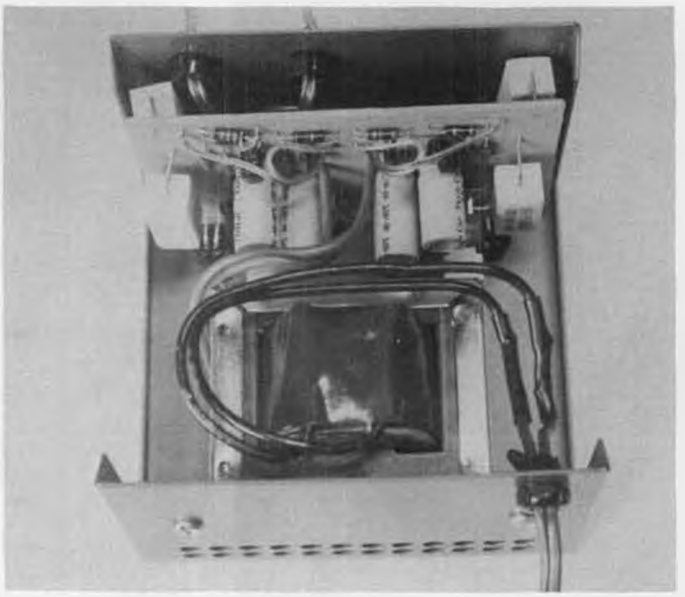
• Henry Cole's "Stratosphere," from the May '41 *M.A.N.*, is one very distinctive looking model, with its unusual cabin and multi-stringered fuselage and semi-T tail. The airplane was so successful that the designer's later and slightly larger high-performance ship, the "Smoothie," is basically similar in layout except for the landing gear and tail surfaces. Both are all-out contest models and will more than hold their own in O.T. rubber competition today.

Rubber models had to meet a minimum weight rule in those days. Cole's strategy with the Stratosphere was to build an extremely light streamlined airframe, then bring it up to the weight rule with a heavy motor to give as high a power-to-weight ratio as possible for maximum climb. Recommended power is 20 strands of 3/16 rubber . . . pretty potent for this size ship.

In spite of what looks like a complex structure, the Stratosphere is fairly simple to build. The wing has no spars, relying solely on the top 1/32 sheeting for strength and also to reduce covering sag between the ribs. The fuselage is built on the half-shell, where all the half-formers on one side are glued to the top and bottom keels before turning the assembly over and adding the opposite former halves. Stringers are laid on top of the bulkheads, making it easy to get them straight and also bypassing the tedious job of cutting a million notches in the bulkheads.

The high-mounted stab and wire stab brace makes a pop-up stab DT kinda tricky. One possibility is to make the stab in two halves with a short center section mounted in the fin. The two halves could pivot on a short 3/16 or 1/4-inch aluminum tube axle located just forward of the 1/8 sq. spar. The wire brace could probably be left off without too much grumbling from the purists. •


1/8" sq. L.E.
1/32" sht. top & bottom
soft 1/8" sht. tip outline
1/8" x 1/2" T.E.
1/32" sht. s/b (between ribs)
Dihedral Detail
1/32" wire stab. brace
Gusset
Side strips
Position of stringers. stringers lay on altitude of formers
one half of formers shown, make two each.
1/16" sq. stringers
All ribs soft 1/16" sht.
Wing mount etc. tail fillet w/ balsa dust & shape.
1/32" sht.
Wing mount
Wingstand
Cabin top
The center rib is flat on the bottom to fit wing mount which fits into wing at SR & on bottom at R1 fillet one.
1/16" sq. mount L.G.
on B notch stringers into aft lamination
save cut out for nose plug
All formers are two laminations of soft 1/32" sht. Except A, D & W which are two lams. of hard 1/16" sht. All cross grain.
Front view
Side view
Prop. block balsa
Wing Mount 1/16" sht. (2)
Cabin top 1/8" sht. (2)
Cabin covering soft 1/16" sht.
Rudder outline is 1/8" sht.
copper washers
Alum. facing
wheels are hard 1/8" sht.
*Note: Hard 1/16" sq. stringers are not shown this view, Locations are marked on formers.
1/8" sht. (not as original but will need some thing to attach gore covering to.)
1/16" x 1/8"
slight Right & Down thrust
Gusset
Cabin top
C.G.
Longeron 1/8" sq. Bal.
Gussets
Spinner is carved from soft block 1-1/2" x 2" x 2"
Outline is cut from hard 1/8" sht.
Rear motor tube reinforcement 1/32" sht. alum. (2)
1/8" sht. trim tab w/ alum. hinges
Alum. plate "A"
Spring
tilting "A" bobbin
catch
Alum. plate "C"
1/16" rod
Use ball bearing thrust washer
Prop. Details 1/2 size
Prop. fittings 1/32" sht. Alum.
soft 1/8" sht. tip outline
1/16" sq. L.E.
1/16" sq. spar
wheels are hard 1/4" sht.
1/16" x 1/2" T.E.
R1 ribs soft 1/16" sht.
STRATOSPHERE CONTEST MODEL
Designed by: Henry Cole
published in May 1941 M.A.N.
Drawn in Ink by Al Pittman
Scale:
Span 36"
Length 31½"
power 1/2 A or 2 mini 3 Sts
MODEL BUILDER magazine
Plan No: TBO-87



PHOTOS BY AUTHOR

PRODUCT$ IN U$E

M.E.N.'s R/C SYSTEM CHARGER, by CHIP CONKLIN

• It's Sunday afternoon and time to put away the lawn mower and go have some fun. One last check of the new servo you put in this morning and . . . oops, you've done it again. You got sidetracked and left your system on all morning. There isn't enough time for your quick charger, and you don't have a fast charger. You have thought of getting one, but you knew it would just be a matter of time before you got sidetracked while fast charging and destroyed your battery pack. What you really wish is that someone would come out with a charger that could fast charge your batteries when you need it without the danger of destroying your batteries. On the other hand, you would still prefer to do most of your charging overnight with a slow charger that will ensure that your batteries are at their peak capacity when you go to the field.

M.E.N. has recently introduced its "RC System Charger" which can not only perform both of these functions, but in addition, can provide you with some valuable information about your batteries. With this charger you can get a fast charge sufficient for several flights, or you can leave it plugged in and forget it and it will continue to slow charge your batteries at a safe rate until you are ready to use them. The unit is designed to charge both the receiver and transmitter packs at the same time, or either may be charged separately. It is available in three versions. All of them will charge a 4.8-volt receiver pack and, depending on the model, will charge a 6-volt, 9-volt, or 12-volt transmitter pack (be sure of what you have before purchasing the unit).

CHARGER OPERATION

Operation of the charger is very simple; there are no buttons to push or knobs to twist. After connecting your own charge plugs and performing a couple of simple tests to check that the unit is functioning properly and that you haven't shorted anything out, a normal charge sequence goes like this: Plug the unit in and observe that the power indicator light is on. Plug in the battery or batteries to be charged and note the light associated with the battery being charged comes on. This indicates that you are in the fast charge mode. After a time, depending on the battery capacity and charge condition, the light will dim, flicker and finally go out. This indicates that the charger has automatically switched from the fast charge to the slow charge rate. It will stay in this mode until the battery in unplugged.

In addition to charging, you may obtain information about the condition of your batteries by observing the lights during the charge cycle. If a light doesn't come on, you either have a bad connection somewhere or an open cell. If it is an open cell, you can find it by connecting the charger across each individual cell. If, after a known discharge, the unit switches to slow charge too soon, you know that you have either a high impedence or low capacity cell. If the unit remains in the fast charge mode too long you have a shorted cell. Also, if you charge for a couple of days, take the battery off for an hour and then reconnect it. It should immediately switch to slow charge. If it does not, then you know you have a leaky cell which is discharging itself.

The initial high charge current of the unit is enough to clear shorts from some cells. The manufacturer claims that cells which were successfully cleared of shorts never reshorted as long as they were charged on the RC System Charger, but when they were charged with a conventional charger the shorts came back.

FUNCTIONAL OPERATION

Upon opening the unit I was impressed with the conservative design, which includes a high quality, husky power transformer, an epoxy circuit board, and a clean, uncluttered

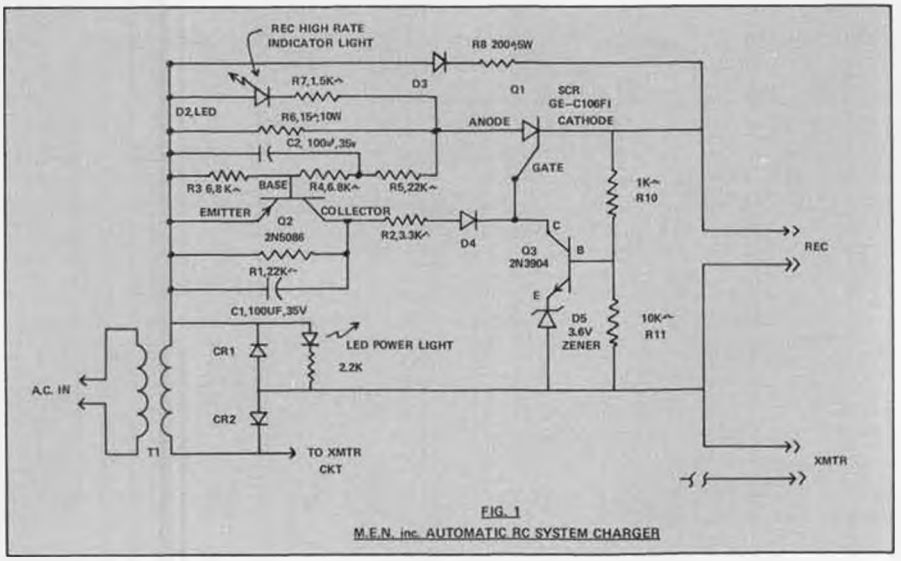


FIG. 1
M.E.N. inc. AUTOMATIC RC SYSTEM CHARGER

mechanical layout. With a metal-cased device I would prefer to see a three-wire grounded power cord, but with the quality of the power transformer and since none of the circuitry is connected to the case, the chance of a safety problem should be minimal.

The circuit of the receiver half of the charger is shown in figure 1. The transmitter section is identical except for component values. The heart of the circuit is the SCR (silicon controlled rectifier). This device operates just like a switch, except that when it is on, current can only pass in one direction. The "switch" is turned on by passing current through the gate and, once turned on, it can only be turned off by removing the voltage from the gate and anode.

CIRCUIT OPERATION

The circuit operation is as follows: T1, CR1, and CR2 provide half wave voltage pulses (figure 2A) to the receiver and transmitter sections. The transmitter and receiver pulses occur at different times, so the two sections do not affect each other.

FAST CHARGE

When a battery is connected a current begins to flow through C1, R2, and D4, and into the gate of the SCR at the beginning of the voltage pulse. Depending on the battery voltage, a point will be reached during the pulse where enough current flows in the gate to begin to turn on the SCR. When this happens, current will flow through R3, R4, R5, and R6 and into the anode. This causes a current to flow through the base and emitter of Q2. This current turns on Q2 and provides enough current to the SCR gate to latch it on (figure 2B). It will now remain on, providing a high rate current, determined by R6, to the battery and turning on the charge indicator LED, D2, until the end of that particular voltage pulse from the transformer. At the end of the pulse everything turns off and waits for the next pulse, and everything starts again. When the battery voltage is low enough current will be generated in the gate to turn the SCR on at the beginning of the pulse, but as the battery voltage rises, this requires a higher and higher voltage, thus moving the vertical line of figure 2B to the right. Since the proportion of time that the SCR is on becomes less as the charge cycle continues, we get the effect of a tapering charge rate. This is indicated by the dimming of the LED's.

TRANSITION TO SLOW CHARGE

When the battery voltage reaches the point at which the SCR is not turning on until the center of the pulse, a point is reached where, for some pulses, not enough gate current is generated to turn on the SCR. At this point the LED's will begin to flicker and the average charge rate is reduced further.

While all this is going on, the voltage on the battery is also being divided down and applied to Q3. At a certain voltage, determined by D5, Q3 and values of R10 and R11 selected at the factory, enough voltage is present to turn on Q3 and keep it turned on through the next voltage pulse. When this happens, Q3 robs the current from the SCR gate and keeps it from turning on. The battery is now charged through D3 and R8, which determine the slow charge rate and keep the battery voltage high enough to prevent the SCR from being turned on during the rest of the charging period. Note that it is the battery voltage in the absence of a pulse that determines the cut-off point. Technically this is called "trough voltage detection" and is the preferred method, since transients which might occur during the high current pulses cannot cause a premature cut-off.

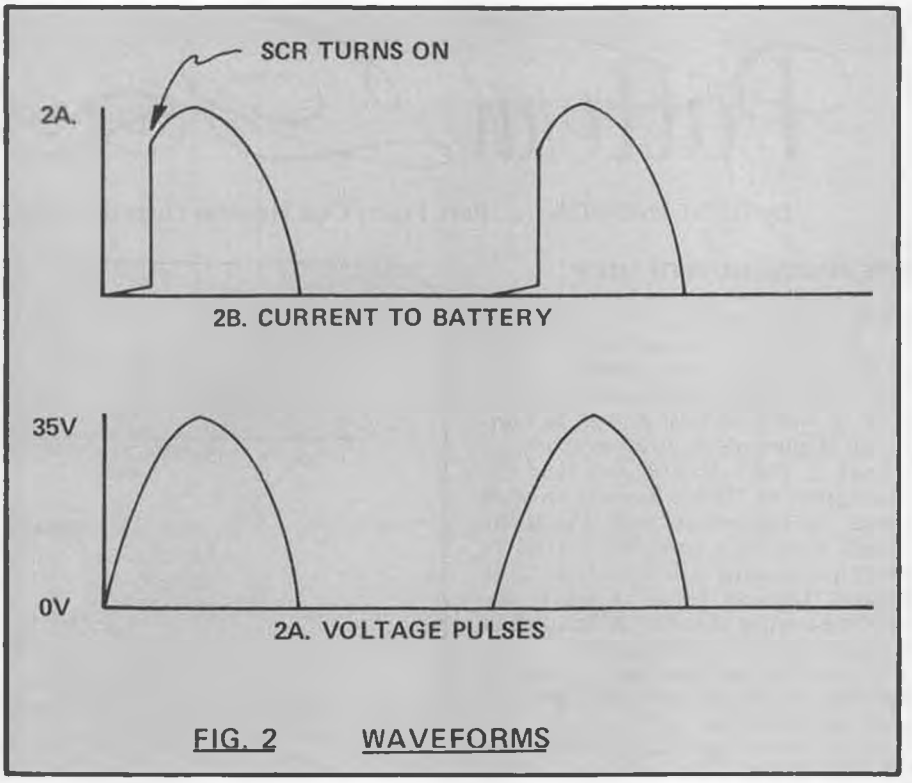


FIG. 2 WAVEFORMS

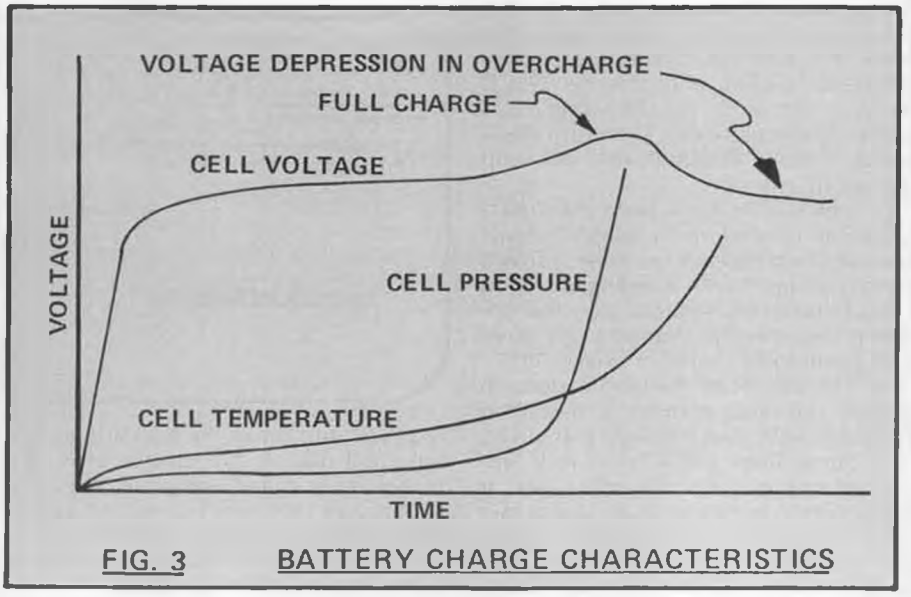


FIG. 3 BATTERY CHARGE CHARACTERISTICS

PERFORMANCE TESTS

After performing the initial function tests and attaching my charge connectors, I took my 500 mah receiver and transmitter packs (which, after a 24-hour slow charge, lasted two hours each on my Super Cycle) and charged them on the RC System Charger for 24 hours. The charger acted as described earlier, with the lights flickering after 70 minutes for the receiver and 75 minutes for the transmitter and going out completely after 80 and 85 minutes respectively. I then discharged the batteries for an hour on my expanded scale voltmeter to get a discharge level equivalent to about five flights. This time I charged them just until the lights went out, which took 40 minutes for the transmitter and 30 minutes for the receiver. The discharge took 107 and 115 minutes, which means the charger had charged the receiver to 89% and the transmitter to 96% of its capacity. Next, I discharged both batteries until they were completely dead.

Continued on page 89

Pattern Flying

By DICK HANSON . . . Part Four: One Reverse Outside Loop and Three Horizontal Rolls.

ONE REVERSE OUTSIDE LOOP

"One Reverse Outside Loop" seems a simple enough description of a maneuver, but don't be misled; this is the first of the maneuvers that combines rolls with loops. That's significant, as we now have to watch vertical as well as horizontal alignments in order to score.

Look in the rulebook and read the description of "Three Reverse Outside Loops" in the FAI section. This is the closest thing to a complete maneuver description you will find for "One Reverse Outside Loop." Look at the accompanying sketch "A" and then read on and note these points.

1) Start the maneuver early enough so that the one second inverted flight puts you exactly in front of the judges.

2) Get the wings exactly level in the inverted position before you start the loop, even if it causes you to miss the presentation slightly. If you don't, the loop will automatically put you on a different heading and altitude. This is because lift is 90° to the wings on a perfectly set-up model. Therefore, it will simply follow through with the loop canted to one side.

3) Unless you have been through a trimming procedure to establish equal up and down elevator *response*, you will have problems with keeping the loop round and even. You can alter the up-down response by changing the servo arm position as shown in sketch "B."

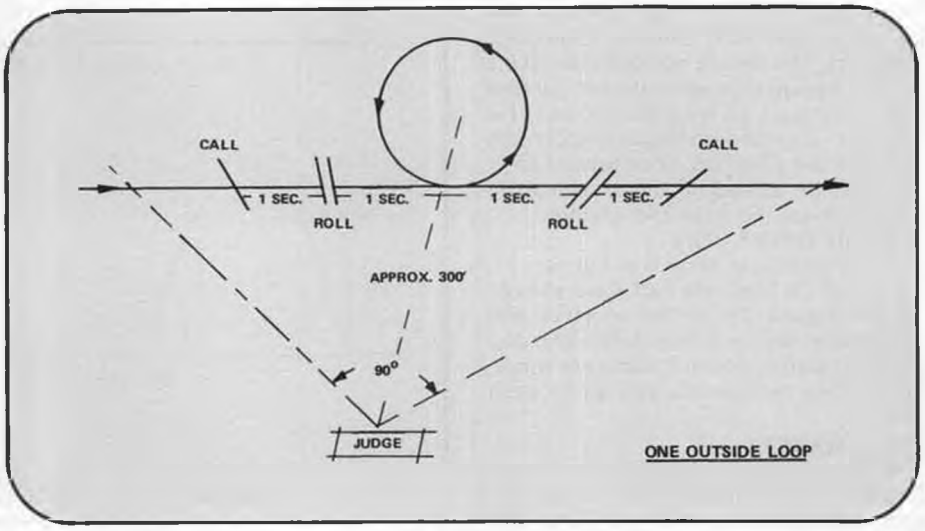
4) The exit from the loop is done in exactly the same manner as described for the straight inverted flight maneuver.

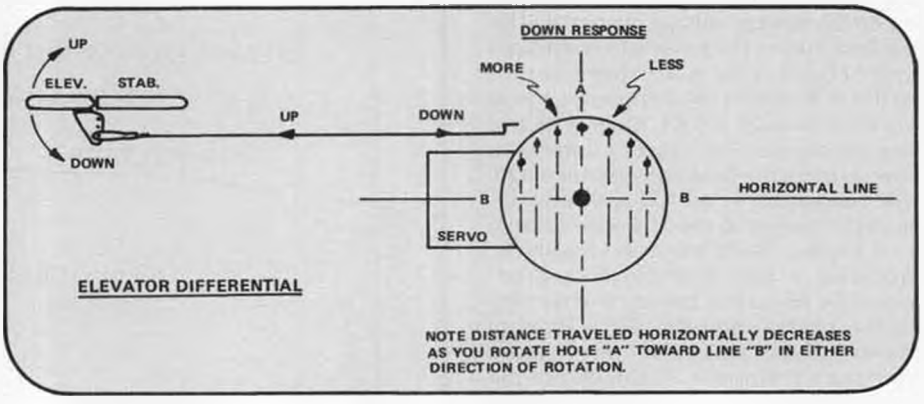
5) Some fliers use a "slow roll" entrance and exit on this maneuver. It looks pretty, but it can cause you to lose points if you make the frame (45° each way from the judges) oversize. (Note to judges: We consistently see high scores given for the slow roll technique on this maneuver, even when the sequence goes out of frame.)

6) Remember how large and at what altitude you do your three inside loops. Try to duplicate this presentation when you do the outside loop.

7) If you tend to get a corkscrewing effect on the outside loop, *but not on the inside loop*, check your aileron linkage for slop, the elevators for misalignment, and the hinge lines for gaps. Don't feel bad if it takes a while to get the insides and outsides to track equally. Those fliers who really understand the procedure will readily admit that it can be a frustrating experience. You may not believe it, but improper aileron differential can aggravate the problem by causing a slight yaw as you correct with aileron trim.

8) You may try reducing power slightly as you start down the backside of the loop and reapply full throttle after the maneuver is called complete. This is a technique that works well on some planes and not so well on others. Also, it doesn't work well in windy conditions where you need penetration.



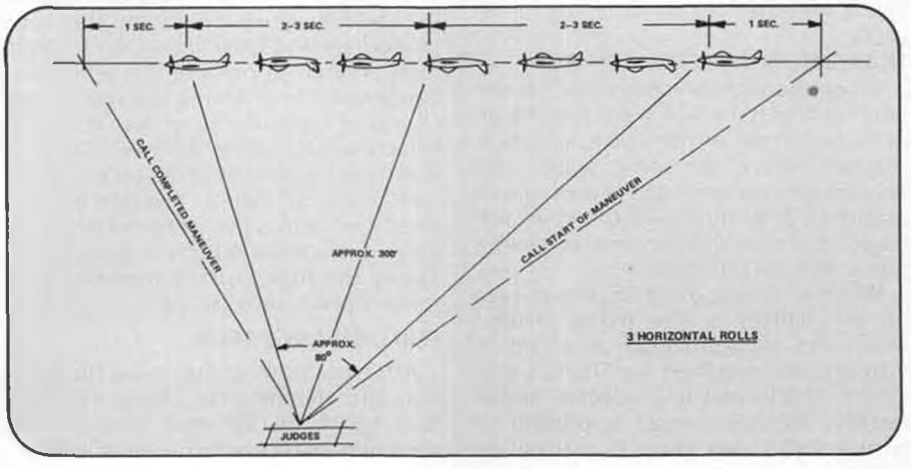


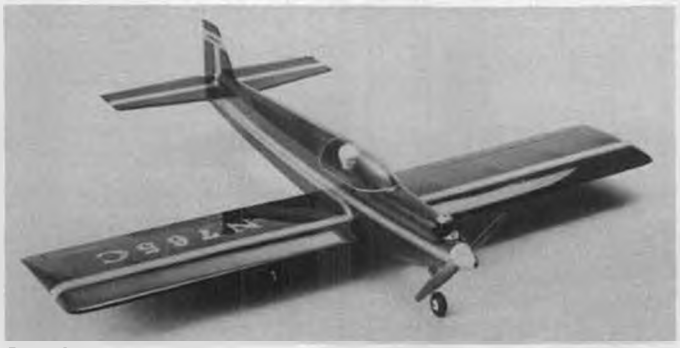
9) Rudder is required for heading corrections in the outside loop (providing you started with the wings level).

It's tough to learn, but it's absolutely necessary to have this coordination at this stage of pattern flying. It will make the complex maneuvers much simpler.

10) Make certain that you start the roll to upright with just a touch of down elevator pressure and release the down pressure immediately after starting the roll. *Don't* lead the rollout with opposite

Continued on page 94





One of the better 1/2A aerobatic ships is the Cox-Airtronics Warlock .05. Features a built-up wing and super kit quality.

For the "I prefer to fly" set, MRC now has several all-foam scale models available for .09 engines and 3 to 4 channels.

The 1/2-A SCENE

By LARRY RENGER

PHOTOS BY AUTHOR

• Building good-looking models from kits seems to be a knack which escapes a lot of modelers. When you go to shows or even to contests, the models are, often as not, built from kits (in R/C and 1/2A Free Flight, anyway). The poorly built models look ghastly, the well built ones nearly flawless. Why?

Most of my modeling for the past few years has been from kits, in order to stay current with what's available for this column. I'll try to pass on some of the hints I use to end up with an attractive model.

First fact of life is that there are good kits and bad kits. The best kits fit together better than you can make them yourself, unless you have a belt sander and lots of time. Bad kits are something else. We won't mention any names, but the term "Die Smashed" wasn't coined in honor of the scratch builder. Let's say you have a kit where some of the parts look like the die cutting was done with a set of worn dentures. Before removing the parts, try running a wet Q-tip over the smashed areas, then run a hot iron over them to steam-swell the wood. Also, never force a die-cut part out of its matrix. Free it carefully with a very sharp razor blade or No. 11 knife blade.

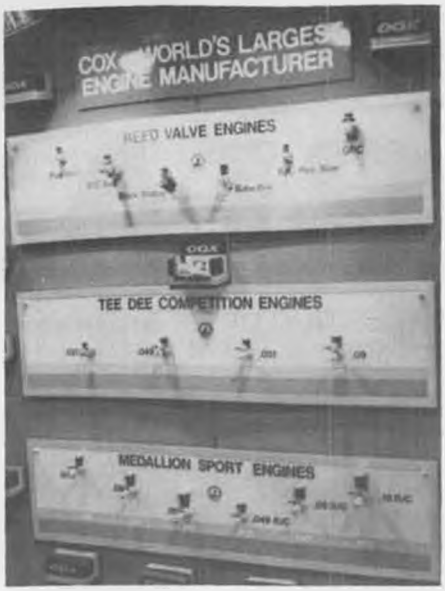
If critical wood parts are warped, soak them in clear ammonia solution and pin them to a straight, heavy board to dry. If possible, bake them dry. Remember, it is worth replacing a spar or two rather than to risk having a warped model. You can usually use the warped wood in a non-critical spot some other time.

On rare occasions you find a piece of wood that is unacceptably heavy or light for the purpose intended. If too heavy, you may be able to save it by cutting a few holes or sanding the part thinner. The light, mushy pieces can be coated with dope or epoxy to improve their stiffness a bit. When all else fails, make a substitution with an appropriate piece of wood.

The most common problem I experience is poor fit of parts. Considering that the kit tooling is not all that difficult or expensive to do, this should not happen, but it does anyway. When parts don't fit, don't hesitate to trim here and there and fill in as required. Small gaps can be filled in with a mixture of Dap and microballoons to give a relatively smooth, light filler which sands easily. Add braces and gussets where needed to help reinforce any weak spots.

Select the heavier, strong wing parts for the root areas and lighter parts for the tips, if possible. This improves both the strength and performance.

Be sure to use jigs or a building board for all construction. You can make a pretty fair bet that the parts aren't matched for flexibility. Fuselages tend to wander to one side or twist unless they are carefully constrained until all sheeting is in place.



The full line of Cox engines. You should have bought more .010's, then maybe Cox would have kept on making them.

Wings should be built pinned down. Use blocks to hold the leading and trailing edge up if the airfoil has a curved undersurface. When the glue has set, spray the entire structure with ammonia water (outdoors!) and let it set for at least a day in a warm, dry place before unpinning from the board.

It is well and truly said that "A good finish hides all mistakes." Lay on heavily with sanding blocks, fillers, and primer. Then add lots of elbow grease to get the

Continued on page 88

An engine like the Cox R/C Bee has been long overdue in 1/2A R/C flying. Throttled, muffled, and equipped with a clunk tank.

If you're in a rut, get out of it with this air car from Sterling. With lots of plastic parts, you can get it on the road fast.

PHOTOS BY AUTHOR

A nice pair of birds highly adapted and especially designed for the stresses of Giant Scale flight. Jim Folline's PT-19 design is one of the most popular set of construction plans available. Ted Hyde's FW-190A is an original project also, but sadly, no plans are available for it.

GIANT SCALE

FLIGHT LINE

By LEE TAYLOR . . . Beginning what should become a regular, alternate month column on the biggies, by a leading proponent of the breed. Learn what's new, how-to-do-it, and see what others are building.

WHY ARE YOU IN THIS HOBBY?

Are you in it for the glory? The public acclaim? How about for the money? I don't know about you, but after 25 years of messing around with planes of all shapes and sizes, I think I have finally decided why I stay with models. They're FUN!! I enjoy the daylights out of them.

It has taken me almost that entire 25 years of modeling to make that decision, because all that time, someone else besides me has been trying to tell me what I should do in the hobby, what kind of plane I should fly, and how I should fly it. Right down to *dictating* exactly how a downwind pass should be made.

Three years ago, though, something happened that was just plain glorious. Giant models burst on the scene, and with this sudden acclaim modelers who had long ago decided why they modeled came out into the limelight. Many of these guys had built giant models long before they were even remotely practical. They built giants when there were no engines capable of flying their planes, or radios capable of controlling them. They built giants because that is what they wanted to build, and they didn't care what anyone else thought. They were real loners back in those days, many times completely isolated from standard modeling, and rarely seen at the ulcer-factory flying sites.

These rugged individualists did what they durned well pleased back then, and when their models suddenly became extremely popular and practical, they insisted on their right to keep on doing so. More than anything, they were anti-competition. They had seen competition develop in the normal modeling categories until it was no longer fun, and wanted no part of it with their birds. The enthusiasm that attitude generated was literally mind-boggling!

What has happened since the advent of giant model popularity is well-known. To my mind, there are only two real reasons for this popularity. First, Giants fly like *planes*, rather than angry hornets. They truly are Miniature Aircraft. Second is the prevailing attitude that these giants are built and flown for the pure personal satisfaction and pleasure of the individual, not so that they will please some prejudiced judge who needs new glasses. For once, an area of the hobby has appeared that pleases the individual, the way he wants to be pleased. To my mind, this attitude represents a new level of maturity in modeling. To say you are doing something simply because

Bill Wendt's original scratch-built Fokker D-VIII is done up in Polish Air Force markings, finished in olive drab Permagloss Coverite. Span is just over nine feet, weight is about 27 lbs., and it's Quadra powered. Scale is 1 ft. = 1 meter . . . an unusual figure, but one that works very well, since the full-size ship was designed in meters; comes out to approximately 1/3 scale.

Bill expresses mild satisfaction after highly successful first test flight of his D-VIII.

Ted Hyde show off his FW-190A, powered by a 3.6 cu. in. Poulan engine. Originally equipped with a Quadra, it was radically underpowered, can now loop from level flight!

you enjoy it is pretty darned honest.

I guess I ought to tell you who is yakking at you. I'm Lee Taylor, I'm 35, and I have been modeling steadily since I was seven. I made my living in full-scale aviation from age 13 until recently, when I decided models were more fun. Got a job then working for the railroad so that I could afford my hobbies. In 1977, I attended the first Las Vegas Fly-In, and came away from that event as the Editor of the QSAA newsletter, the *Monster News*. I, and others, promoted the daylights out of QSAA until November of '79, when radical and disagreeable changes were forced upon that organization.

The concepts that most of us promoted in QSAA were changed rather dramatically with the new structure, and those changes led us to split from that group. We formed a new organization that would formally carry on with the philosophy that we wanted. Consequently, I now call the Miniature Aircraft Society home, and edit its newsletter, *High Flight*.

In all the time I've been involved with the giants, one fact stands out strongly. This is virtually an entirely new area of modeling. VERY few people have any real concept of what is happening to a model when they get away from the more normally accepted sizes. Procedures, techniques, and equipment right now are at the extremely primitive stage of development; indeed, it is just recently that sufficient equipment has come on the market so that the average modeler can realistically expect to succeed with these birds. Before now, it was the domain of the true expert, the man with vast experience, knowledge, and creative ability so that he could overcome the unknowns of these models without help. Even now, the person just getting into Giants is faced with a bewildering expanse of unexplored problems. Since Giant modelers are still pretty scarce, and those who do exist aren't highly visible on the local level, finding answers to these problems is a major stumbling block for many.

That's where I come in. I'll tell you guys right now that dear old Lee is a long way from being the world's greatest builder. I really don't *like* to build! If I have any talent, it is as a pilot, but even more so, I think I'm a pretty good listener. That means that all those super-expert builders out there are just chock-full of valuable ideas, and I consider it my ultimate duty to find out about those ideas and get them spread around. That is what these articles will be all about. I'm going to do the best I can to see that as many of those ideas as possible get on these pages.

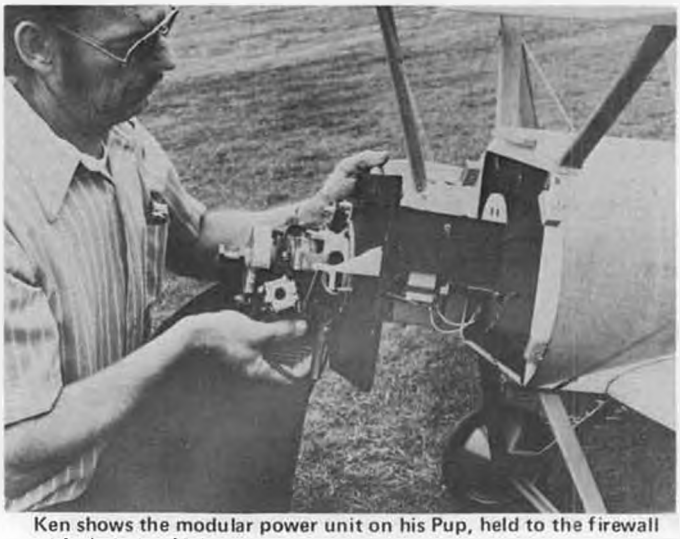
Since this article is the beginning, I'll start at the beginning.

Probably the most common question a newcomer to Giants asks is what plane should he build as his first. First I have to ask, "How good a pilot are you?" If you can handle the standard four-channel plane such as a Senior Falcon or RCM Trainer well enough so that you don't panic every time the ground gets close, I say go directly into a simple scale bird, with emphasis on the SIMPLE. Please don't grab a complicated biplane or one of the fighter types. These birds are a whole lot more involved and complex than you could possibly imagine. If you try to start with one of these, you will almost certainly get discouraged and quit before you can taste success. Get some ideas of what you're getting into before tackling one of these elaborate projects.

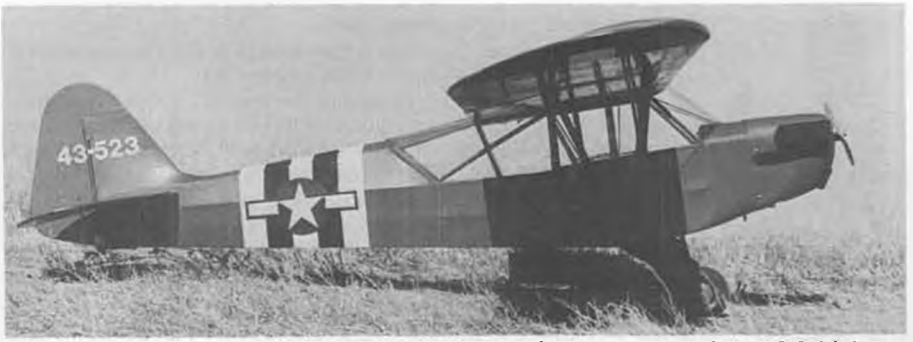
If you are not a good pilot yet, you have only one Giant trainer available at this time, as far as I am concerned. That is the EWH Specialities "Puma." This is not a cheap kit, costing well over a hundred dollars, but it is extremely strong, bears very little resemblance to a standard model in its construction, and will introduce you to the type of strength ideas that you need to be thinking about with these size birds. It is also one of the extremely few birds that *might* withstand the "ground-bumping" a beginning pilot is likely to give it. At least, it stands a much better chance of doing so than any other I know of. This bird makes an excellent first trainer for the beginning pilot who wants to fly a Giant.

For the completely new modeler who wants into the Giants, the Puma is the one I recommend. Many would tell you to learn on the smaller, more standard trainers first. I don't. Reasons? Giant models are an entirely different animal from standard models. If you start off with the small models, you will learn small model techniques. When you do eventually get to the Giants, you will then have to *unlearn* a lot of those techniques, and that is sometimes quite

Ken Runnestrand is almost ready to cover his Balsa USA Sopwith Pup. We hope that is HARD hardwood in that aft fuselage section!



Ken shows the modular power unit on his Pup, held to the firewall with six bolts. Makes any engine servicing very easy.



Another of Ken Runnestrand's big ones is this Piper L-4 (military version of the J-3 Cub), heavily modified from the Balsa USA J-3 kit. Much substitution of hardwoods for the kit-supplied balsa was necessary to strengthen the bird for its Quadra powerplant.

The L-4 "Grasshopper" makes a scale climbout. A scale pilot has since been added, makes photos of the model and the real bird indistinguishible when taken at the same angle.

painful. Many of the things used commonly on the small birds just won't adapt to being used on the big birds, the most common example of that being the use of piano wire for landing gears. It works quite well on the small birds; it is often downright dangerous on the big ones.

If you are a brand-new pilot, get a Puma kit, build it with help from an experienced modeler and get a good pilot to test-fly it for you and to stand by while you learn to fly. But don't let anyone talk you out of starting with a big bird if that is what you want to do. They fly altogether better!

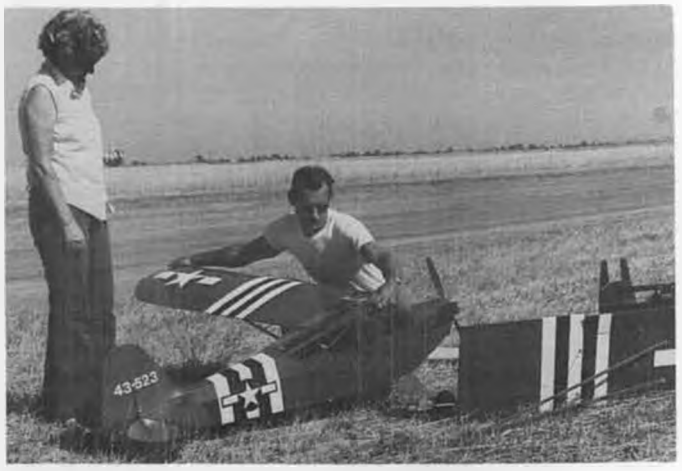
If you have some stick time under your belt, and your takeoffs and landings are no longer frightening occurrences, then you can start off with one of the simpler Giant Scale birds. I would recommend starting with one of the models, from a kit or plans, that are specifically designed for the larger engines. There aren't too many of these around, and I honestly haven't seen too many of the ones that are. However, from what many people have said, Jim Messer's Ercoupe, Don's Custom Models' Piper Tomahawk, and Ellco Plastics' Piper Cherokee, are kits that I can recommend.

If you want to build from plans, your choices for a first bird are similarly limited. I know of only two that I will recommend for a first Giant: Ken Runnestrand's Piper L-4, and Bill Wendt's Fokker D-VIII, both specifically designed for the Quadra, both extremely strong structurally, and extremely docile, beautiful flying planes. Both span nine feet, though Bill's D-VIII towers over Ken's L-4 (which, by the way, is the military version of the Piper Cub J-3). Write me for info on these plans.

Almost everyone who asks me about getting started in the monsters asks about one group of planes. "What about the Nosen models?" They are all *excellent* flying planes. The Nosen 310, with two .60's, is one of the most docile complex planes I personally have ever flown. But the Nosen models are quite weak by present-day standards. In order to come up to today's strength requirements, they require considerable modification. These are now quite old designs, and they originated back considerably before any of the newer engines came on the scene. They *had* to be designed light then, or the older engines wouldn't have lifted them off the ground. They were excellent then, and with a beef-up program, they are excellent now. The Mr. Mulligan and Piper J-3 Cub are joys to fly, while the Gere Sport sheds its ugliness entirely in the air. And the Citabria, with a Quadra, puts its full-scale counterpart to shame. As I said, though, BEEF-UP is the name of the game with these kits. *(For those who want to go big without getting into the 2 cu. in. gas engines, the Nosen J-3 and Champ can be built as-is, using .60-.80 glow engines. wcn)*

To bring the Nosen kits up to present-day standards, start with the fuselage. Replace all balsa fuselage longerons with 3/8 hardwood dowel or 3/8 square hardwood strips, whichever is easier for you to get. Install hardwood trailing edges in place of the balsa ones on the vertical and horizontal stabilizers, and the leading edges of the rudder and elevators. Add a second 1/4-inch plywood firewall to the one supplied, to bring the firewall thickness up to 1/2 inch of plywood. This is quite important; the bigger engines you are going to put on these birds need a good solid mount.

Continued on page 101



Ken's L-4 features plug-on wing panels and separate aileron servos, making this an easy model to assemble and transport.

All set for the first test flight, Paul sims holding. That's Paul's Quadra powered Nosen Champ in the foreground.

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

DAVIS D-1K

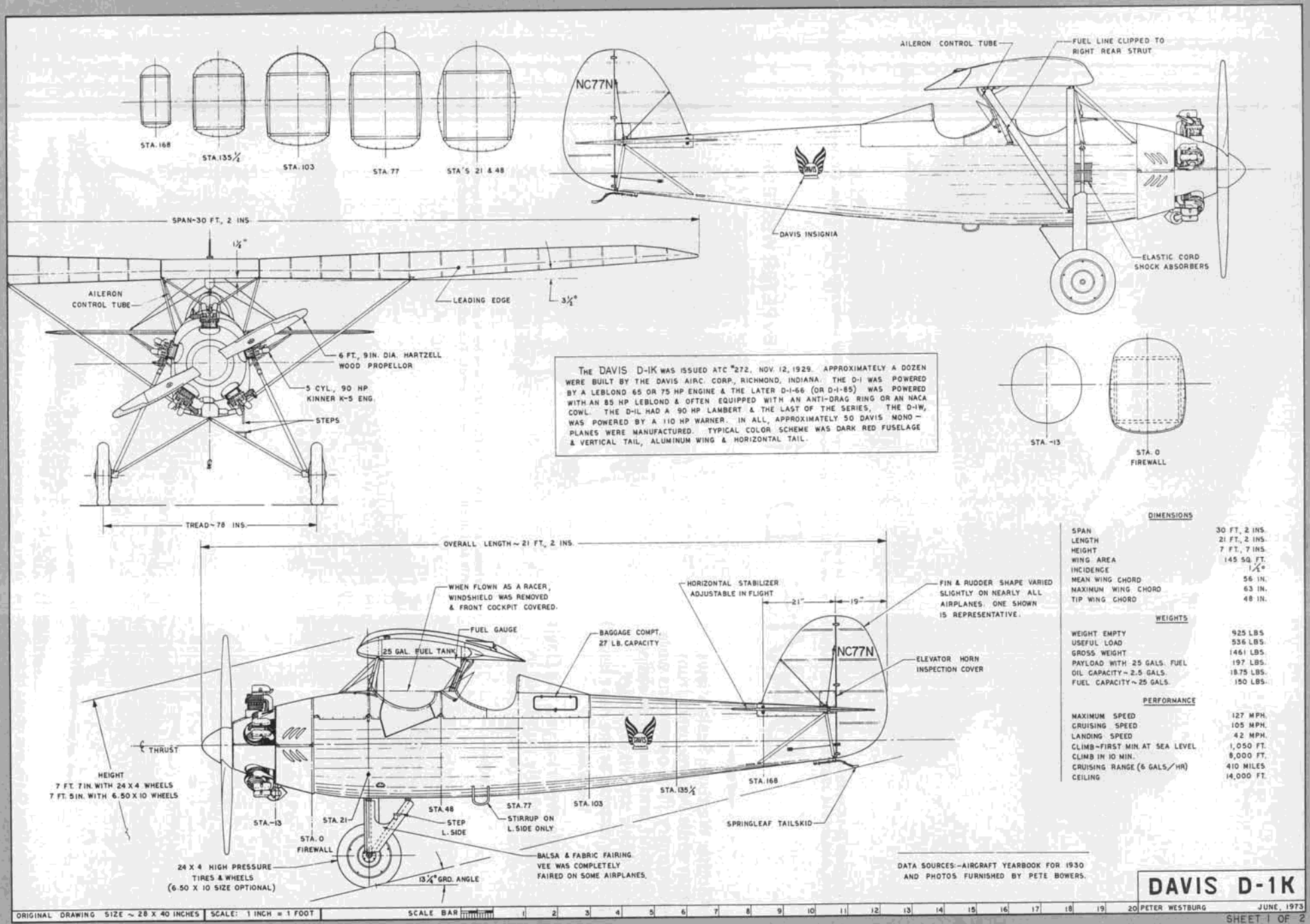
By PETER WESTBURG

Another Westburg Scale Views rerun while Pete recovers from eye surgery (The operations were successful, and we will be seeing more of his superb drawings, possibly as soon as the next issue!)

Meanwhile, we bring you the Davis D-1K, as originally published in the February 1974 issue of MB.

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

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



THE DAVIS D-1K WAS ISSUED ATC #272, NOV. 12, 1929. APPROXIMATELY A DOZEN WERE BUILT BY THE DAVIS AIRC. CORP., RICHMOND, INDIANA. THE D-1 WAS POWERED BY A LEBLOND 65 OR 75 HP ENGINE & THE LATER D-1-66 (OR D-1-85) WAS POWERED WITH AN 85 HP LEBLOND & OFTEN EQUIPPED WITH AN ANTI-DRAG RING OR AN NACA COWL. THE D-1L HAD A 90 HP LAMBERT & THE LAST OF THE SERIES, THE D-1W, WAS POWERED BY A 110 HP WARNER. IN ALL, APPROXIMATELY 50 DAVIS MONO-PLANES WERE MANUFACTURED. TYPICAL COLOR SCHEME WAS DARK RED FUSELAGE & VERTICAL TAIL, ALUMINUM WING & HORIZONTAL TAIL.

DIMENSIONS	
SPAN	30 FT. 2 INS.
LENGTH	21 FT., 2 INS.
HEIGHT	7 FT., 7 INS.
WING AREA	145 SQ. FT.
INCIDENCE	1½°
MEAN WING CHORD	56 IN.
MAXIMUM WING CHORD	63 IN.
TIP WING CHORD	48 IN.

WEIGHTS	
WEIGHT EMPTY	925 LBS.
USEFUL LOAD	536 LBS.
GROSS WEIGHT	1461 LBS.
PAYLOAD WITH 25 GALS. FUEL	197 LBS.
OIL CAPACITY-2.5 GALS.	18.75 LBS.
FUEL CAPACITY-25 GALS.	150 LBS.

PERFORMANCE	
MAXIMUM SPEED	127 MPH.
CRUISING SPEED	105 MPH.
LANDING SPEED	42 MPH.
CLIMB-FIRST MIN. AT SEA LEVEL	1,050 FT.
CLIMB IN 10 MIN.	8,000 FT.
CRUISING RANGE (6 GALS./HR)	410 MILES
CEILING	14,000 FT.

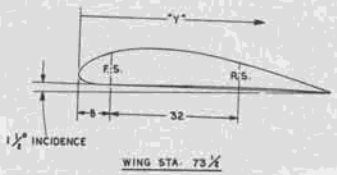
DATA SOURCES:-AIRCRAFT YEARBOOK FOR 1930 AND PHOTOS FURNISHED BY PETE BOWERS.

DAVIS D-1K

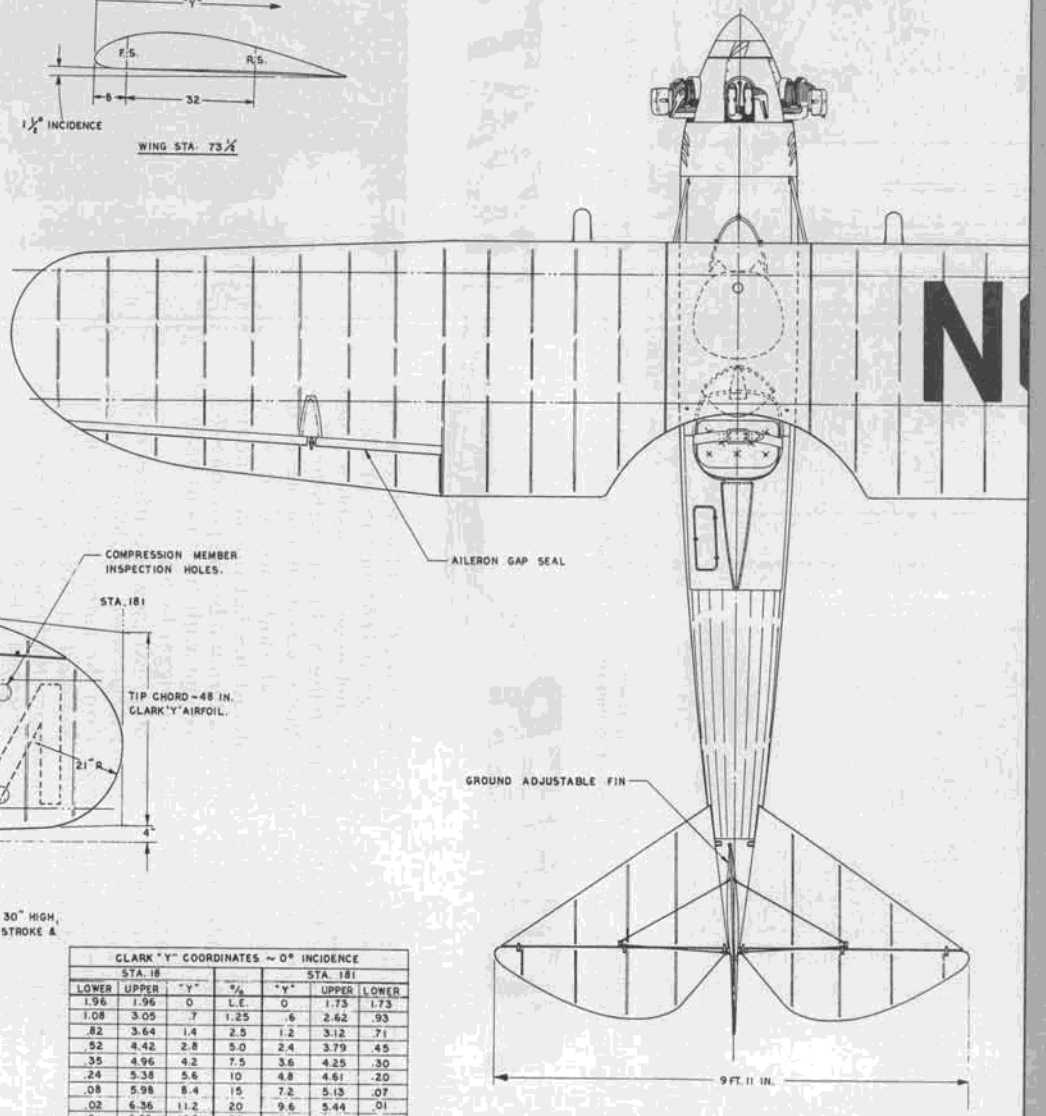
ORIGINAL DRAWING SIZE ~ 28 X 40 INCHES | SCALE: 1 INCH = 1 FOOT | SCALE BAR 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 | PETER WESTBURG | JUNE, 1973

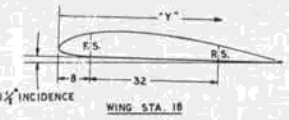
SHEET 1 OF 2

GÖTTINGEN 387 ~ 0° INCIDENCE			
STA. 73½			
%	"Y"	UPPER	LOWER
L.E.	0	2.02	2.02
1.25	.788	3.94	.95
2.5	1.575	5.02	.66
5.0	3.15	5.99	.35
7.5	4.925	6.84	.16
10	6.3	7.53	.063
15	94.5	8.44	0
20	12.6	9.07	0
30	18.9	9.48	.13
40	25.2	9.20	.25
50	31.5	8.41	.28
60	37.8	7.15	.32
70	46.1	5.61	.28
80	50.4	3.87	.19
90	56.7	2.05	.095
100	63.0	.095	0



WING STA. 73½





WING STA. 18

CLARK "Y" COORDINATES ~ 0° INCIDENCE						
STA. 18				STA. 181		
LOWER	UPPER	"Y"	%	"Y"	UPPER	LOWER
1.96	1.96	0	L.E.	0	1.73	1.73
1.08	3.05	.7	1.25	.6	2.62	.93
.82	3.64	1.4	2.5	1.2	3.12	.71
.52	4.42	2.8	5.0	2.4	3.79	.45
.35	4.96	4.2	7.5	3.6	4.25	.30
.24	5.38	5.6	10	4.8	4.61	.20
.08	5.98	8.4	15	7.2	5.13	.07
.02	6.36	11.2	20	9.6	5.44	.01
0	6.55	16.8	30	13.4	5.62	0
0	6.38	22.4	40	19.2	5.47	0
0	5.89	28.0	50	24.0	5.05	0
0	5.12	33.6	60	28.8	4.39	0
0	4.12	39.2	70	33.6	3.52	0
0	3.00	44.8	80	38.4	2.51	0
0	1.57	50.4	90	43.2	1.34	0
0	.067	56.0	100	48.0	.058	0

DAVIS D-1K

ORIGINAL DRAWING SIZE ~ 28 X 40 INCHES | SCALE: 1 INCH = 1 FOOT | SCALE BAR 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

PETER WESTBURG JUNE, 1973

SHEET 2 OF 2

Nancy Ward helped person the timer's table at N.W. Record Trials. Gloved hands belong to Dist. 8 Sec. Nancy Austin, who also helped.

Attending the record trials from Canada were Dave Haydon (left) and Malcolm Frasir. Class C hydros ran in mid-50's with O.S. .65's.

PHOTOS BY AUTHOR

R/C POWER BOATS

By JERRY DUNLAP

NORTHWEST RECORD TRIALS

A certain harbinger that a new model boating season is underway out in the Northwest area is the record trials sponsored in mid-March by the Seattle Model Yacht Club. This event has become somewhat of a tradition out this way, as it marks the first officially sanctioned event of the racing year. The only problem with hosting an outdoor event in the state of Washington during March is attempting to get the cooperation from the weatherman. One thing about the weather that blessed the March 15 and 16 event this year was the variety in what occurred. A real smorgasbord of conditions were served up during the two days of 1/16 mile straightaway runs. At one time or another, the following climatic conditions were present: snow, hail, rain, fog, wind, and yes, even sunshine. In spite of these less-than-ideal conditions for an outdoor event, five new North American Model Boat Association records were established.

The record that attracted the most interest was the new Class A (.21 c.i.) Stock OPC Tunnel. At least ten different individuals made passes to establish the record in this class. The winds that plagued both days of running really took a high toll in this class. Most of the tunnels spent more time upside down than running up and down the lake. It was on Sunday that Ed Fisher once again showed why he is among the world's most creative model boat designers, as he piloted his original tunnel to a two-way average of 39.64 mph in the Class A OPC Tunnel event to establish a new record. In the A Outboard Hydro Class, Mike Wight, Vice-Commodore of the Puget Sound Model Boat Club, waited until almost the last possible moment Sunday afternoon before posting a 46.73 mph average with his Crapshooter El Diablo outrigger hydro.

The other two new records set in the outboard class were established by none other than the author of this column. Mike Shelhard of West Coast Model Marine provided one of the new Frank Ward designed 33-1/2 inch deep-vee hulls for testing and evaluation as an outboard configuration. Frank Ward certainly has to be among the top designers of model deep-vees in this country, and his designs have the records to prove that statement. It appears that Frank has designed another winner, if records are any indication of success. Using a stock K&B .21 powerhead and a modified lower end (the exhaust system was modified), the new Ward hull upped the A Outboard Deep-Vee record to 35.21 mph and the A Outboard Monoplane record to 34.30 mph. Seems like I took advantage of the NAMBA rule allowing deep-vees to set records in the monoplane class. I'm not really in favor of this situation, but until the organization decides to clarify the rules I'll take what I can get in both classes.

The only other record set during the event was a new R/C Unlimited Hydroplane mark of 75.50 mph by Ron Erickson. Ron held the previous mark at one mph less than his new record. If anyone at that meet truly deserved to set a new record, it was Ron. He really had to work to get those record passes. The cold weather and winds made it extremely difficult to get a good engine setting and then keep the boat on the water. During the course of the two days of running, Ron's "Miss Circus Circus" made some

Ron Erickson has good reason to smile; his Miss Circus Circus upped the R/C Unlimited straightaway record to 75.50 mph!

Two shots of Erickson's Miss Circus Circus running at something over 70 mph. OPS .65 provided the urge.

Dave Austin's OPS 3.5 powered deep-vee rides the waves. Hull is one of Frank Ward's new 33-1/2 inch designs. Dave is Commodore of the Longview R/C Boaters.

Things look mighty rough out there as Frank Ward's X-Class deep-vee gets clear out of the water. Uses Rossi .69, had a one-way pass of better than 63 mph.

Streaker belonging to Ed Fisher made a one-way pass at 47 mph, but rough water prevented Ed from breaking his existing record of 47.28 mph set last year. Boat uses K&B 3.5.

Frank Ward (left) and RCMB's boating columnist with the Ward-designed boat Jerry used to set two new NAMBA outboard records.

Original design tunnel hull by Ed Fisher was fast enough to set new NAMBA records in 1/16 mile straightaway and .9 mile oval.

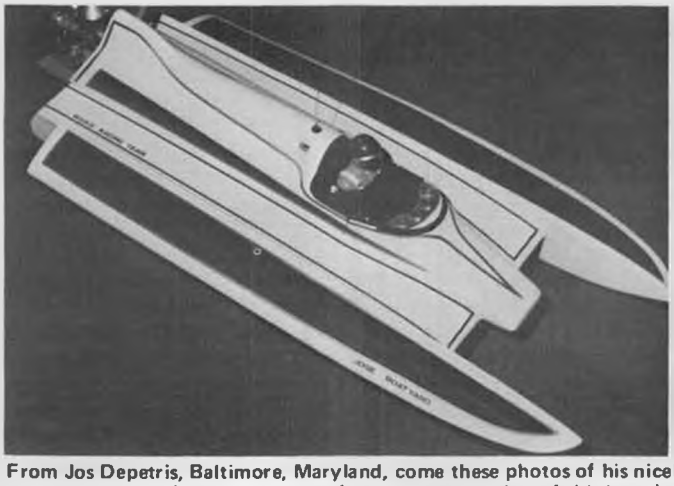
unbelievable flips. Those crashes were beginning to take their toll, both equipment-wise and in patience. Ron had all but given up trying to set a new record because of the weather conditions when a break in the weather came on Sunday afternoon. Ron patched his broken cowlings together with wire and decided to give it one more try. His diligence and efforts were rewarded with the new record. An R/C Unlimited doing 75.50 mph is really a sight to behold. Ron's model of the Circus Circus is the one that ran in September of 1978 at San Diego. It is not the newer design that ran last year and is scheduled to run in 1980.

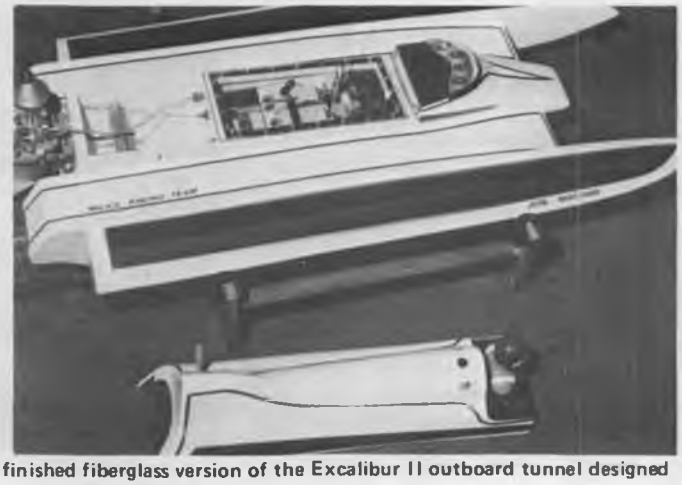
Frank Ward was the Contest Director for the record trials and was most ably assisted by his wife, Nancy, and Nancy Austin, District 8 Secretary. Cold fingers and toes were the rewards for those who assisted at the timer's table. Although he wasn't able to set any new records, Frank did make a one-way pass of 63+ mph with his X Class Deep-Vee powered by a Rossi .69. This was the fastest I'd ever seen a deep-vee run and it was most impressive.

MARCH OF DIMES MODEL BOAT RACE

A new event was added to the Puget Sound Model Boat Club's annual Mini Daffodil Regatta held on March 30 at Lake Waughop, Ft. Steilacoom Park. The P.S.M.B.C. sponsored a Race-A-Thon with proceeds going to the March of Dimes. The event was based on the Walk-A-Thon concept that March of Dimes uses to gain funds for its research in the area of birth defects. Each contestant obtained sponsors who pledged a certain amount of money for each lap the boater would complete in a 10-minute enduro. A survey indicated that

Continued on page 99





From Jos Depetris, Baltimore, Maryland, come these photos of his nicely finished fiberglass version of the Excalibur II outboard tunnel designed by Jerry Dunlap. (RCMB has plans for a wooden version of this boat.) A very neat job, Jos!

They're off! Start of the "A" Main Final. Surface was a brand new parking lot at Sea World in Florida. Traction was unbelievable. Heavy barriers took their toll in equipment.

Overall winner of the 1980 Winter Nationals, Bill "The Greek" Jianas.

R/C AUTO NEWS

By CHUCK HALLUM

PHOTOS BY MIKE PINO

• I keep telling myself that I'm going to make it down to Florida for the Winter Nationals. And one of these years I will. It sounds like I really missed a good one this time. In fact, several racers I know would rather go to Florida for this race than to the Nationals. Anyway, I received a comprehensive race report from Mike Pino on the Winter Nationals, along with some good pics. Let's see what he has to say.

"The 1980 Winter Nationals will be remembered as a very closely contested race with the best of the factory teams competing for top honors. All the major manufacturers were represented, with some utilizing (in the words of John Thorp) the 'Shot Gun' approach to try to win this race. Associated had the most team drivers with Jianas, Davis, Smeltzer, Kimrey, Curtis, Husting (Gene and Curtis), and Rowland, among others. Team Delta had 'Local Boy' Arturo Carbonell, Ken and Bill Campbell, Sanders, Petty, and a host of fast independents. By far there were more Delta cars than any other. (They did well, as will be explained later.) Kyes, Belizzi, and Firestone represented MRP. Also represented were P.B., S.G., and yours truly for H.R.E. In addition, the Venezuelan team with their familiar yellow and green cars were also present. These were the only foreign drivers to come this year. These fellows always show great preparation and always do well. I asked one of them how they can come so far to race, but he pointed out to me they were only two and one-half hours away by plane, a lot closer than California.

"On the technical side, almost everyone was using a tuned exhaust of some sort, and a few cars had dual disc brakes on the rear axle. A variety of new equipment layouts were in evidence. Slide valve carbs were also in abundance, the most popular being the OPS slide valve. Delta showed off its new slide valve carb. It looks remarkably like the OPS, but Delta has incorporated some new features. Only a select few had this carb. Some drivers had the new prototype P.B. slide valve carb which proved promising. The new Picco 3.5 engine was also introduced. This engine is very new and is potentially a very quick engine. It utilizes a unique head design, beefy liner, and good manufacturing quality. The price: $185!! That includes a big bore carb (similar to Perry) an exhaust manifold (no muffler), and heat sink head. Only 50 will come into the country this year, and parts availability is unknown.

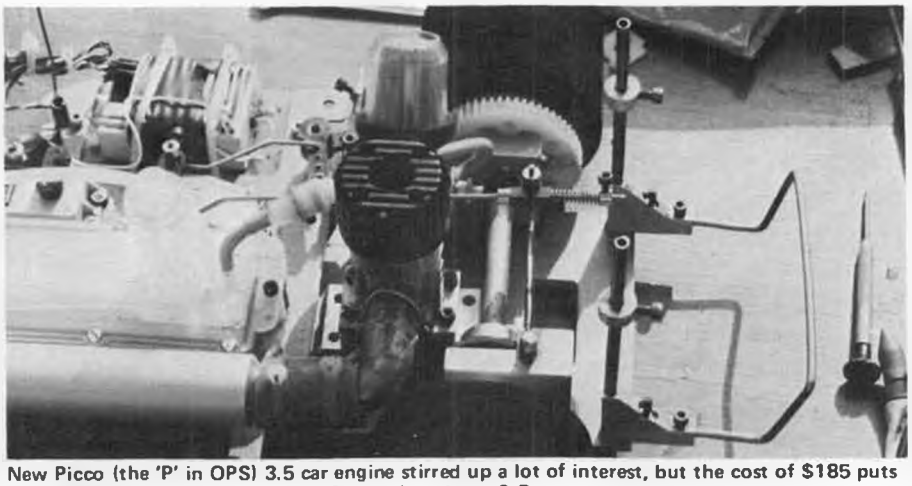
"One interesting note was that the lone H.R.E. entry was utilizing ground effects totally with no wing and no spoiler. This concept has been tried before, but not as effectively as on this car. Despite problems experienced with the concept, which forced its removal before the final qualifying heats, there is promise that ground effect does work, but further experimentation is necessary.

"The race site was located at the Sea World parking lot in Orlando, Florida. Track layout was simplistic and barriers were used to outline the course. These barriers took their toll on equipment in the form of numerous destroyed bodies, bumpers, front ends, etc. The track was very fast with one high speed sweeper leading onto a moderately long straight-

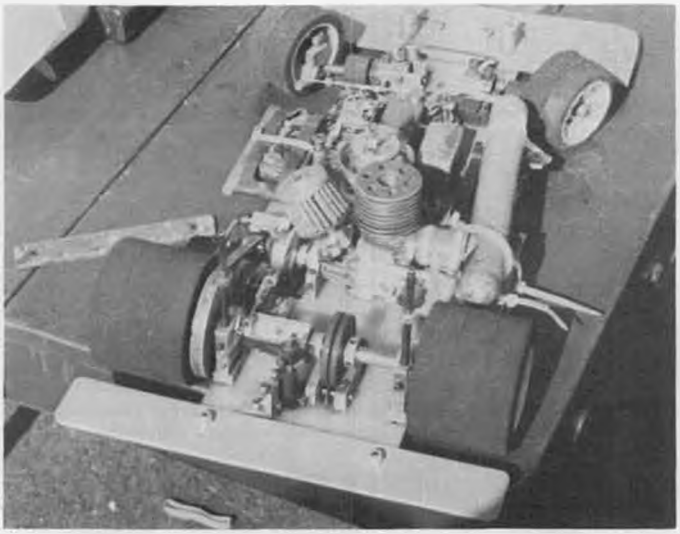
Bill's winning Associated car used a racing number not normally seen on his cars.

away, ending in a tight hairpin. Phenomenal speeds were attained in this section and good brakes were at a premium for the hairpin. Delta cars fared well with the inevitable brushes with the barriers, but other car makes were not as fortunate. My car was one of them. I destroyed both of my graphite fiber chassis plates in wall banging incidents early in the week.

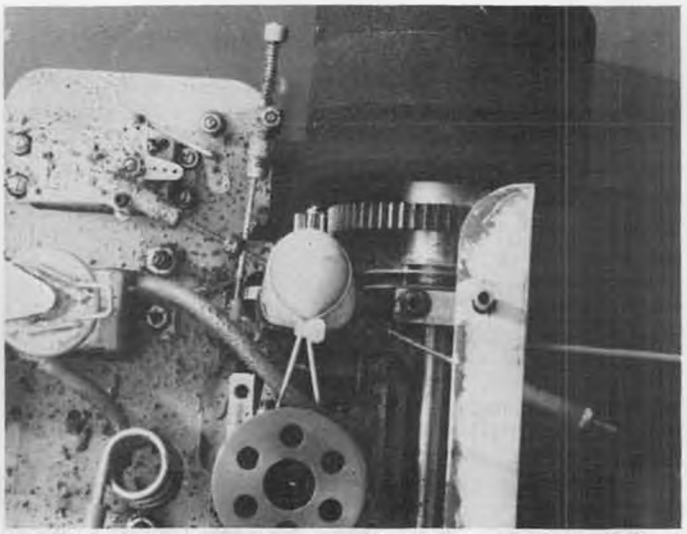
"Another contributing factor to the high speeds was the fantastic traction. The surface was incredibly smooth and retained oil and rubber well. By Tuesday, almost everyone had removed their differentials or tightened them up to the point of locking. This made nonsense of the class system the organizers used. They formed two classes, unlimited and limited. The difference was that the limited class was allowed no differentials. As it turned out, diffs were totally



New Picco (the 'P' in OPS) 3.5 car engine stirred up a lot of interest, but the cost of $185 puts it out of the reach of most racers. Shown here in an S.G. car.



John Thorp's car was equipped with dual disc brakes and timing belt drive to rear wheels. Also note new muffler, said to work well.



Rick Davis also had dual brakes on his car. Lots of brake needed on high-traction surfaces.

unnecessary.

"Qualifying began on Friday after a round of practice heats. Qualifying heats were ten minutes long. Mike Kimrey put in a good 36 laps and this became the target to shoot for, but when the smoke had cleared, Arturo had shown them how to do it with 36.5 laps. This eventually turned out to be the fastest time of the weekend. Only two other drivers broke the 36-lap barrier. Kyes did it on his last qualifier on Saturday, and Dana Smeltzer did it on his second attempt.

"The highlight of Saturday was the spectacular qualifier of Arturo Carbonell and Bill Jianas. These two drivers showed their fantastic skills by finishing only one turn apart after ten minutes. This was Jianas' fastest time. Other notable times were put in by Rick Davis (last year's champ) who would certainly have broken the 36-lap barrier had it not been for slight mistakes. He looked very strong, as did Kyes. It was shaping up to be a battle between Kyes, Davis, Jianas, Smeltzer, and Carbonell.

'80 WINTER NATIONALS
QUALIFYING — A MAIN

1)	Art Carbonell	36.5 Delta
2)	Gary Kyes	36.4 MRP
3)	Dana Smeltzer	36.2 Assoc.
4)	Mike Kimrey	36.0 Assoc.
5)	Bill Jianas	35.7 Assoc.
6)	Ken Campbell	35.6 Delta
7)	Rick Davis	35.5 Assoc.
8)	Jack Jacobs	35.2 Assoc.
9)	Hank Smith	35.0 Delta
10)	Roger Curtis	34.9 Assoc.

"A slight shower on Saturday night left the track surface wet for Sunday morning. Some people in the lower mains were contemplating putting their differentials back in. By the time the unlimited mains were run the traction was the same as it had been all week.

"The B Main was won by Steve Sanders for team Delta. I have raced against Steve in the southwest series. He is a very underrated driver. He has virtually dominated the southwest series for the past few seasons, but this was his first big win. It will not be his last. He told me after the race that he was getting hit right in front of the drivers' stand. It is a credit to his car and driving skill that he finished, let alone win.

"Now it was time for the big boys. Because of lack of time caused by the weather, the unlimited mains were cut to 20-minute lengths. At the drop of the flag, Bill Jianas shot out into the lead followed by Kyes, Davis, Carbonell and Smeltzer. Jianas, who had not been running super fast all week, was pulling out a big lead. Kyes, Davis, and Carbonell were inches apart and pulling away from Smeltzer. Carbonell then made his move and just blew by Davis and Kyes and set out after Jianas. Davis also got by Kyes. So, with a few laps gone the order was Jianas, Carbonell, Davis, and Kyes. Suddenly Carbonell dashed into the pits for an unscheduled pit stop. The cause, I found out later, was that the filler had hung up on the body and all his fuel was dumped out of the car in those first few minutes. Also, this caused his engine to run lean, which caused a burned-out plug and subsequent flame-out. Also, the carb needed adjusting. So Art was out of the running early. At the end of the heat, he really flew and eventually got fourth place. Kyes also had his problems with a servo saver which caused him to slow significantly.

"It was now a two-car race between Jianas and Davis. Right around the time of the first pit stop Jianas was just in front of Davis. (Davis had led briefly before this.) They both pitted at the same time and rejoined the race inches apart. Jianas had the advantage in the turns and Davis had more horsepower . . . the classic duel. For the remaining fifteen minutes these two were never more than a half lap apart. The race was finally decided with two minutes to go, when

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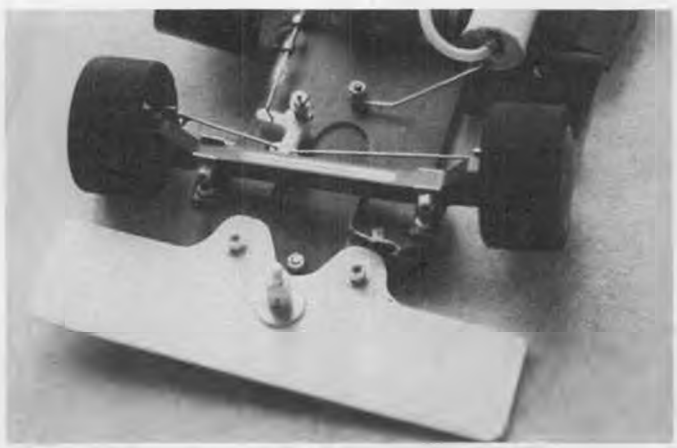
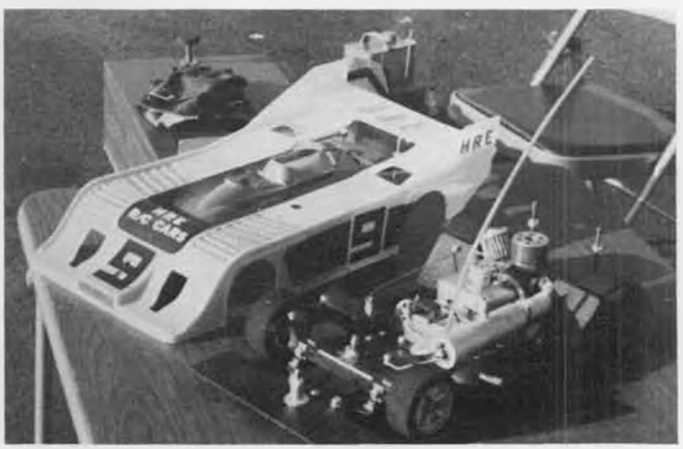


Ouch! Barriers were hard on cars. Bodies and front end parts fared the worst. Still, it was better than bumping spectators.



Mike Pino's H.R.E. car had an aerodynamic wing/tray, didn't use a rear wing or spoiler. Shows promise.

Craig Christensen must be one dedicated flier to pilot his Bird of Time with Astro 15 in all that snow. Note tiny wheels. What you really need is a set of skis, Craig!

The fast little 020 twin that has everyone talking, Steve Neu's Cessna Conquest.

ELECTRIC POWER

By MITCH POLING

PHOTOS BY AUTHOR

• Last summer I went on a vacation to Europe, and of course, I checked out what was happening on the electric scene there. The combination of vacationing and reporting turned out to be a very good one, with many pleasurable memories. One of the highlights was my visit with Heinz Keller, who makes the samarium cobalt motors I mentioned a few months ago. Europe offers delightful contrasts because of its long history, and the lovely countryside and the medieval village where Heinz lives and makes his space-age motors is just such a contrast. Everyone knew where Heinz lived, and with their directions, I soon found his workshop. Heinz turned out to be a hospitable host, and we were soon talking electrics and motors. Heinz has a degree in physics and does research for an electronics firm, so his motors come directly out of his research experience.

When he started to fly electrics, Heinz was frustrated by the power limits of the motors that were available. Since he had already done work with samarium cobalt motors in his research, he knew how superior they were, and promptly made some for himself in his machine shop at home. Their performance was so electrifying (pun intended!) that word soon got around, and before Heinz really knew it, he was in the motor business. The mark of prestige now at European contests is the red box that the Keller motors come in, and Heinz was six months behind in his orders when I visited him.

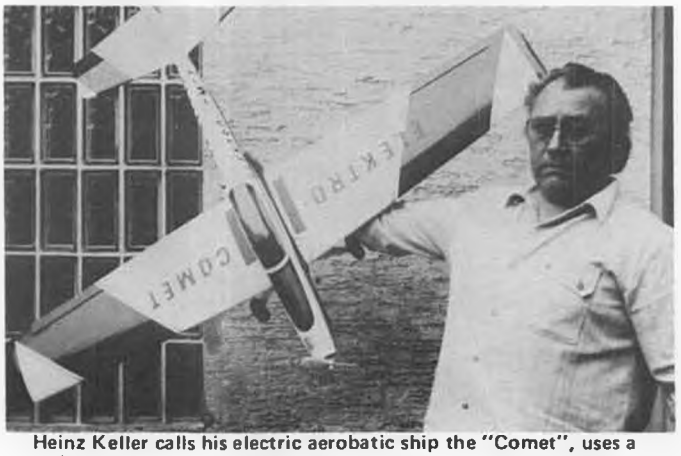
The wait is obviously worth it. I met several fliers later who had no complaints about the wait, the motor performance was that spectacular. The sound in the air is more like a turbine than a motor, with extremely smooth, fast, and powerful flight, including good vertical maneuvers. The photo shows one of the planes in Heinz's workshop. He calls it the Comet, a sport pattern ship with a 10 or 11% semisymmetrical airfoil, 57-in. span, flying weight of 5-1/2 lbs., and 50/14 motor turning a 10x6 or 11x6 Top Flight at 9,500 rpm, using sixteen 1.2 Ah cells. The current draw on the ground is 24 amperes, and in the air 14 amperes, giving a flight of five or six minutes.

Heinz also has a glider designed for the European electric glider competition, which emphasizes speed and climb. It uses a 50/24 motor with a 14x6 prop, ten to fourteen 1.2 Ah cells, weight six lbs., span 117 in., rpm on ten cells is 4,200, on 14 cells it is 5,600. It uses spoilers, rudder, and elevator, and will climb 500 feet in one minute easily. Heinz offers a glider much like it, the Greyhound, as a kit with a fiberglass fuselage and foam core, planked wings for $190. Another kit, the Blizzard, is for pylon racing and the 30/12 motor. It also has a fiberglass fuselage and foam, planked wings and sells for $145. It does 100 mph with a 50/30 motor turning 17,000 on a 7x6 prop with 32 cells. Flying weight is five lbs.

Some of these voltages and currents I have mentioned are very high indeed. In fact, most motors in this size could not handle these voltages and currents. The samarium cobalt magnets are not only much more powerful than ordinary magnets, but they resist the loss of their magnetism much better than ordinary magnets. This means that very high currents can be handled without degrading the motor performance. Heinz took full advantage of this by building very large brushes and commutators into his motors, capable of handling up to 30 amperes. This also means that the motors can handle a tremendous range of voltages, and their versatility is so good that they can be used with a broad range of props, planes, and battery packs. This can be used for gaining either maximum power or maximum flight time.

Continued on page 90

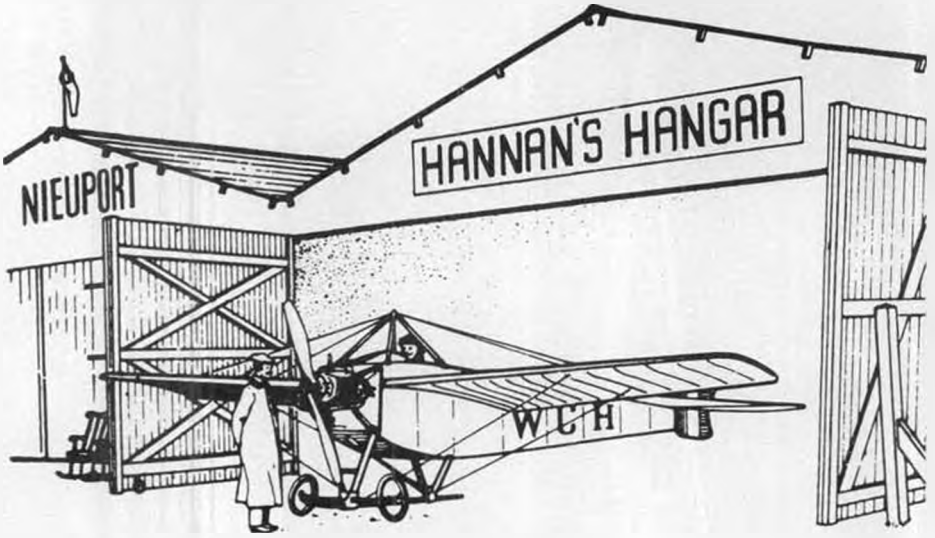
Some of the excellent samarium cobalt magnet motors produced by Heinz Keller of Germany. Not inexpensive!



Heinz Keller calls his electric aerobatic ship the "Comet", uses a 50/14 motor, weighs 5-1/2 lbs. A fast and smooth performer.

FREE FLIGHT AND CONTROL LINE

Another classic in rubber scale construction by Bill Noonan, San Diego, California. This one is a 3/4" scale Dornier "TNT". Stab reinforced to hold rubber motors.



Patience: With time the grass will become milk, and balsa wood finished models.

AVIATORS UNITE

Unlike the majority of the world's politicians, aviation people seem easily able to get along with each other. As an example, Lorraine Bennett, Los Angeles Times reporter, described the German Luftwaffe pilots presently training in the United States. In an interview with the airbase information officer, Major Childress, she asked what had impressed him most. It was not the differences between the pilots from the two countries, but their similarities: "A flier is a flier. They'd all rather fly than eat."

We like to think the same is true of model builders, regardless of their geographical location.

NO NEST FOR THE BIG BIRD

As of this writing, the Hughes "Spruce Goose" flying boat has still not found a permanent home. Most likely contenders were the city of Long Beach, California; and Aero World recreation park, scheduled to be situated not far from San Diego. Among the problems to be considered is transportation. While it might be possible to tow (or even taxi) the machine on water, at least for a short distance, overland movement presents formidable obstacles. Recalling the difficulties encountered when the monster was originally moved to Long Beach from its Culver City point of fabrication, we did a bit of checking. According to *Aviation News* for June 24, 1946, 40 policemen from 10 cities and towns were required to sort out traffic problems, and workers from 23 utility companies had to move power and telephone lines. At the time the craft was still in sections, and Southern California had far fewer people in the way. None the less, the cost of the move was $58,000 pre-inflation dollars!

RECOGNITION AT LAST?

According to Jean Frugoli, of France, a Flamalle, Belgium, FAI indoor model *and Peanut Scale* contest has been "inscribed to the international calendar." Apparently this represents the first acknowledgement by the FAI that there are such things!

NOT SO FREE

Don Typond sent in an interesting discussion of the free-wheeling propeller, as employed in sailing vessels. According to designer John Simpson, writing in *Cruising World*, a boat free-wheeling propeller generates lift, but in the wrong direction . . . astern. He conducted experiments with a 40-foot racer/cruiser fitted with a 16-inch diameter propeller. With the prop locked, the vessel could achieve 6 knots, but with it free-wheeling, the speed dropped to 5-3/4 knots. The results were consistent during several tests.

Now then, if the drag of a free-wheeling 16-inch prop can retard a 40-foot vessel by 1/4 knot, what must the drag of a free-wheeling prop be doing to a model aeroplane? Don opines: "Pilots are taught to slow their airplanes until the prop stops when confronted with an engine failure. This is because a windmilling prop has more drag than a stationary one. Feathering, of course, is the best bet.

"I admit that the windmilling prop on our rubber scale jobs looks nice in the air, but maybe we ought to just stop the prop and trim for the slight rolling moment the pitch of the blades might impart to the airframe. Or, horror of horrors, make the blades . . . *fold!*"

Charming Mrs. Dietlinde Glockner, of West Germany, with her husband's Peanut Lacey M 10. Photo from Benno Sabel.

NEW OWNER FOR AERO ERA

William Pine of Oregon has purchased the Aero Era line of model aircraft plans formerly marketed by Tom Houle of Wisconsin. Mr. Pine expects to expand the range of offerings, and seeks to acquire other plan designs as well. Potential customers or designers may contact Aero Era at 5955 S.W. Glenbrook Road, Beaverton, OR 97007. When writing, tell 'em **RCMB** sent you!

SUSPICIONS CONFIRMED

Tony LeVier, while graphically de-

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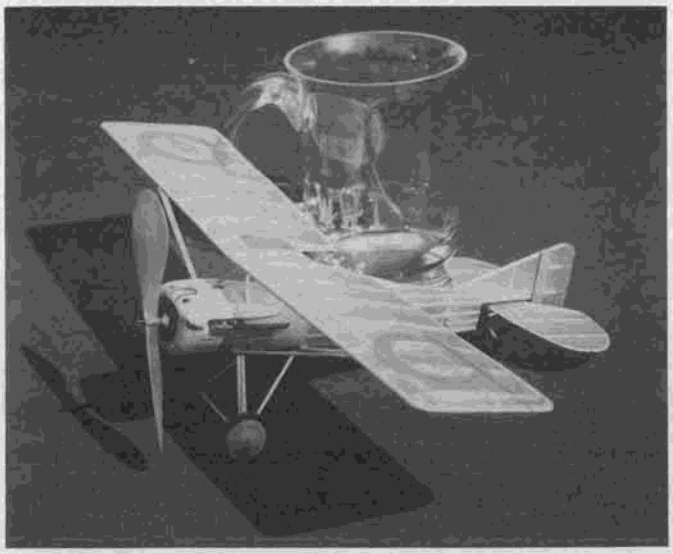
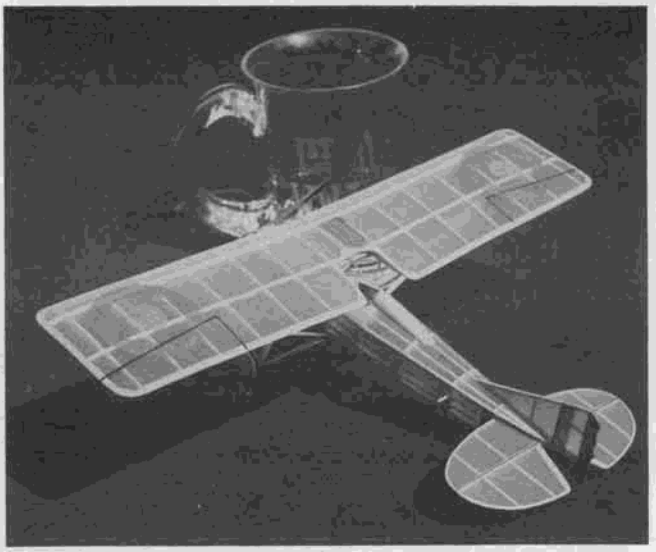
Left, the "Czech Team" of So. Cal., consisting of (l to r): Andy Faykun, Carl Hatrak, Bill Krecek, and Ken Sykora. Fifth member, Jed Kusik, was not present for photo. Most or all are members of the SCIFS O.T. F/F club. Above, Texas artist Bill Caldwell's rubber powered Italian Ambrosini has exceptionally clean lines.





PHOTOS BY FUDO TAKAGI

Who else but Walt Mooney could find 3-views for an obscure airplane, draw up plans, build the thing, cover it, detail it, and trim it out in just one week, then win 1st place with it at a contest the following weekend? Condenser paper covering realistically duplicates clear-doped linen.

PEANUT SCALE

GOURDOU-LESEURRE C1

By WALT MOONEY . . . Resembling a Spad with only one wing, the Gourdou-Leseurre C1 is still another forgotten war machine that just happens to be an excellent modeling subject. Already a contest winner!

• The inspiration for a new Peanut scale model can occur in many guises; for instance, a set of scale wheels, an interesting color scheme, a popular airplane in a new movie, or in the guise of total desperation for a good flying model to enter in a specialized contest scheduled for a week away. Such was the case for this model. I was desperate for a model to enter in the Flightmasters West WW-I contest. Looking in *Warplanes of The First World War, Fighters*, Volume Four, on page 121 I found a three-view of the C1. It looked quite a bit like the more modern Baby Ace or Heath Parasol, so it was obvious that it would have excellent flight potential. In addition, it is a relatively simple design, so there was a good chance that it could be built in time for the contest.

The Flightmasters West club lets each member in turn, on a voluntary basis, run the club's monthly contests and decide what the competition will be. The contest director has the responsibility to provide the prizes. First place at the WW-I event was a very nice, engraved, crystal flagon.

The model is constructed in a very conventional fashion in almost all respects, so we won't belabor the technique except to mention several of the details which are not totally commonplace.

First, the fuselage structure is narrower at the bottom, which should be noted when the two fuselage sides are being assembled into the main fuselage box.

Second, the cabane struts take the form of a "trestle" (sawhorse to us Americans), and the thin struts that angle out from the top cowling near the cockpit were aileron actuation pushrods.

Third, although the wing has a constant chord (i.e., the wing is untapered in plan view), it is tapered in thickness near the tips which requires more than one wing rib shape, therefore the ribs "B" and "C" in addition to "A."

Fourth, the two center ribs are cut to the "A" pattern from 1/16 sheet and everything aft of the second spar is removed.

The model in the photos was covered with condenser paper because it is light and because it is about the right color for the C1, which shows the covering of the wings and tail to be translucent in the photographs that accompany the three-view in the book mentioned earlier. The insignia was cut from red and blue tissue. Roundels are doped in place on the top and bottom surface of the wings near the tips, and the rudder has vertical stripes. Interestingly, there is a darker colored panel on the fuselage sides at the horizontal tail installation. We assumed this to be an indication of a plywood panel and made it brown, using a felt pen, but the color is only an assumption. And to quote the illustrious Murphy: "Assumption is the mother . . . and father . . . of all foul-ups."

The model balanced as indicated by the black arrow at about 0.9 inch aft of the leading edge of the wing, with a twelve-inch loop of 3/32 rubber. When the condenser paper was water shrunk and then doped the outer half of each wing warped to give about 1/8 inch of washout at each tip. Since this is a good flight adjustment, it was left in. The horizontal tail had a slight warp which was not necessarily desirable, and we removed it by holding it over a source of heat while twisting the surface counter to the warp before we even tried to fly the model.

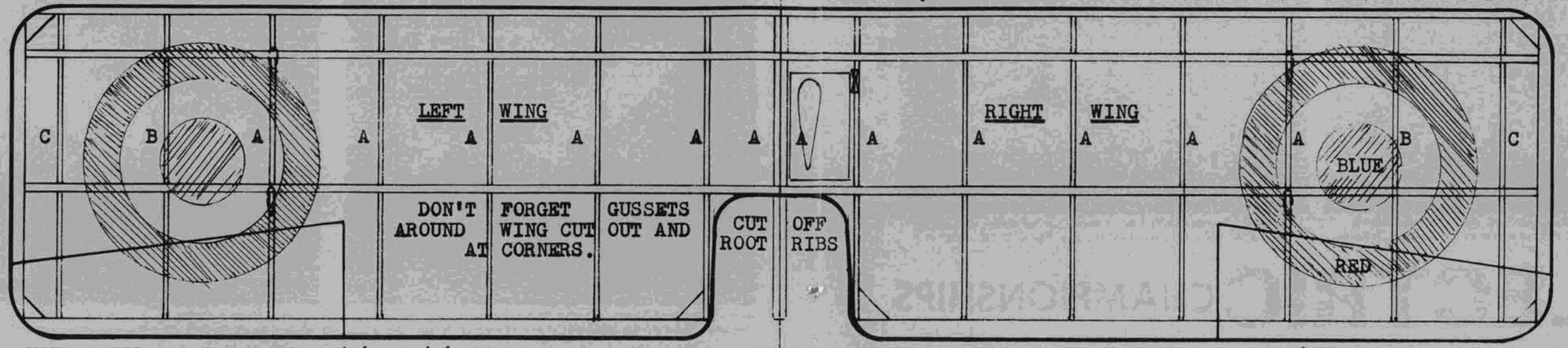
The torque of the propeller, in conjunction with the twisting slipstream, just happened to give the model a power pattern that would circle nicely in a gymnasium. On maximum winds the torque rolls the model up on the left wheel and the model takes off with its left wingtip about two inches from the floor. The high torque portion of the rubber motor run is thus spent on a relatively fast, fairly highly banked circle which then gradually flattens out. The circle diameter stays about the same size. This is a nice flight adjustment for a low ceiling site, but this model probably could be flown to the right to higher altitudes and longer durations if you have a suitable high ceiling site or if you are flying outdoors.

The only intentional deviation from exact scale dimensions is in the horizontal tail area, where the scale tail size is indicated, and of course in the larger-than-scale propeller. The real prototype airplane had the dihedral shown. Considering that the model in the photos accompanying this article has shown itself to be a smooth, stable flier, I believe it may be possible to fly it with a scale size tail.

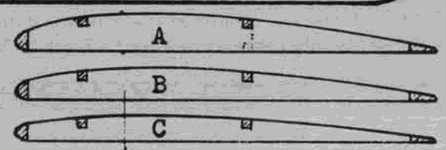
Details such as cylinder head fairings and exhaust stacks were made from balsa. The wing gas tank, venturi, engine cowl louvers, surface outlines, valve stem access holes, mounting step, and machine gun openings were added with black ink.

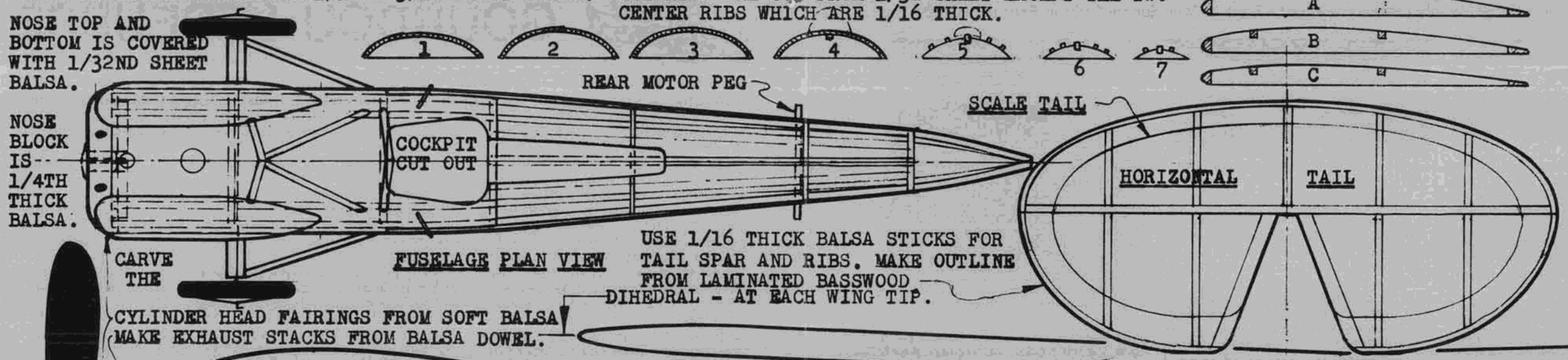
Have a good time pretending you are a WW-I test pilot flying the Gourdou-Leseurre C1. •

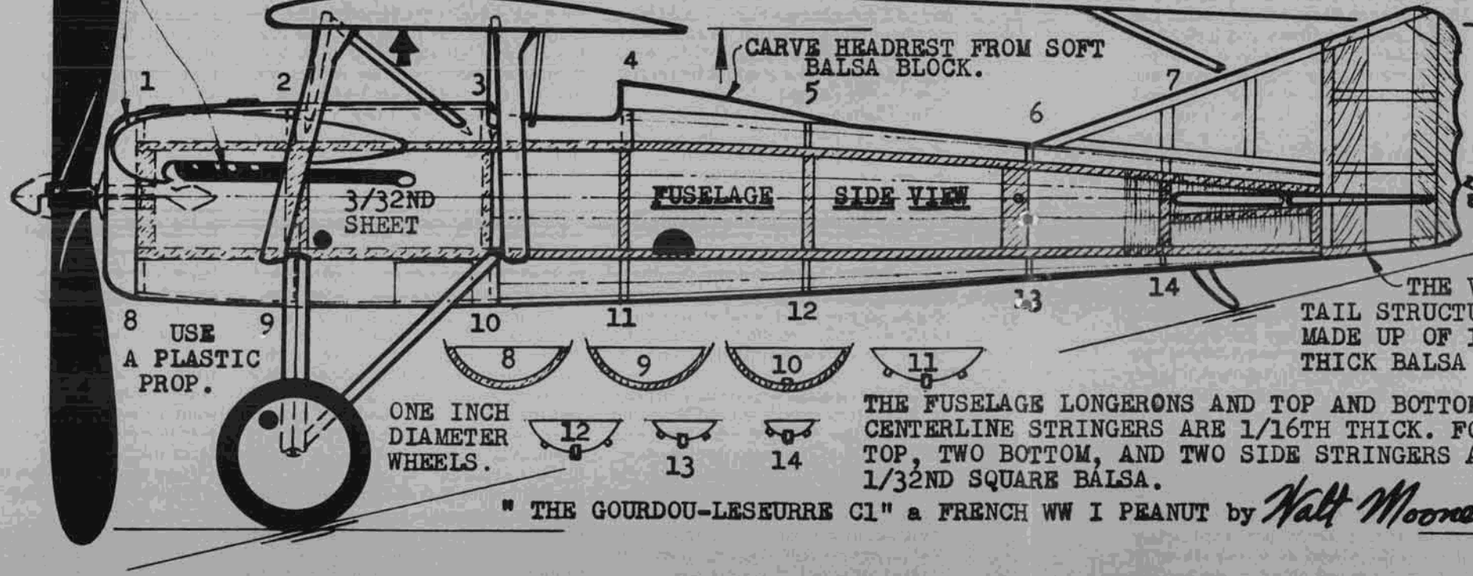
MAKE LEADING EDGES FROM 1/16 X 1/8 FIRM BALSA. SPARS ARE 1/16TH SQUARE MEDIUM BALSA. TIPS ARE 1/16 X 1/8 FIRM BALSA.

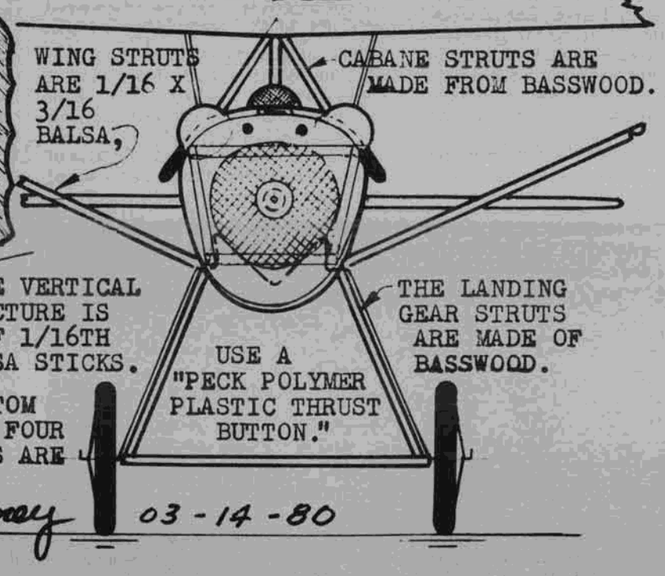


MAKE TRAILING EDGES FROM 1/16 X 3/16 LIGHT BALSA. ALL RIBS ARE CUT FROM 1/32 SHEET EXCEPT THE TWO CENTER RIBS WHICH ARE 1/16 THICK.









" THE GOURDOU-LESEURRE C1" a FRENCH WW I PEANUT by Walt Mooney 03-14-80

Among the entries in 020 Replica were 2nd placer Jim McDermoth (left) with a Strato Streak and Art Herbon with a Buzzard Bombshell.

Gangway! Ferrell Papic's Bleriot No. 7 is a real mover, chalked up the highest scale flight points of the day. Placed 3rd in scale.

PHOTOS BY AUTHOR

✶ ASTRO FLIGHT ✶ ELECTRIC CHAMPIONSHIPS

By BILL STROMAN . . . At last! The F/F events at the January Astro Flight Electric Championships, postponed because of poor weather, finally came off without a hitch at Mile Square Park, in Fountain Valley, Ca.

• As many of you may know, the F/F portion of the Astro Flight Electric Championships, originally scheduled for Jan. 20, was postponed because of strong winds. How windy was it? Well, we found whitecaps in the Naccarato's motorhome toilet! The radio control part of the contest was run on that day and many did well, but the free flighters decided that it would be unsafe to fly and rescheduled the F/F events for March 16. It was well worth the wait, as we were rewarded with a very calm and sunny day. Combine this with a good turnout of fellow fliers, many new models, and a crowd to watch us, and you can't ask for a better time.

As the contest was to start at 8 a.m., I made sure to be there at 7:30 to get things in shape. First thing I saw was the Flightmaster president, Mike Mulligan, test flying an old time rubber model. Mike volunteered to be the scale flight judge for our scale event. Well, he didn't volunteer right away, but he also didn't want one of his fine models stepped on (I'll do anything to get a judge). As it was, I got him just in time, as many modelers were showing up to test their models and enter the contest. We had a good many enter, 19 in all. Not bad for a postponed contest!

Caught just lifting off is Art Herbon's Luton Minor, presumably from a Flyline kit.

If you went to the IMS Show last January, you will remember the electric powered control line aircraft that flew each day. Addie and Tony Naccarato wanted to include this event in the Electric Championships, so they talked to Contest Manager Bob Boucher about it. To make a long story short, it was included. There were six entries, but this should be greater next year when word gets out to the control line people.

Here's some background on the event. The models are made from WW-II Guillow rubber scale kits. They are all powered by an Astro 02 free flight unit. The models are first judged on static scale points; that is, one should have at least a three-view of the model (some of the presentations were of Nats quality).

Dick Ploeger brought this Caudron Monoplane, a 1939 design by Henry Struck. Fine flier.

As I was the scale judge, I got a good look at each model, was impressed with the workmanship of each one. The planes are then flown and judged on scale takeoff, flight, maneuvers (in this case some touch-and-go landings), and landing. One would think that these models would require some leading of the lines to keep them in the air; not so, the Astro 02 seemed to have more than enough power to fly these planes. I think that Tony and Addie have found a new facet to modeling that will have a great appeal for the juniors.

These models can be flown in schoolyards or parks without the noise and mess that gas models have, and therefore may get the blessing of the public. Also, the fact that they are made from kits with instructions in them would help get many new modelers started. If any of you readers are interested in this, please write me or Tony Naccarato in care of this magazine.

The 02 Old Timer Replica event is fun to fly and the models always seem to amaze the gas fliers with their good performance. Art Wahlstedt had a Strato Streak with a silver Monokoted fuselage that really showed up in the sky when the sun reflected off of it. Jim McDer-

Electric control line is gradually catching on; six were entered in the meet. Models are built from Guillow rubber kits. Some of the entrants (l to r): Tony Naccarato, Ron Duly, Bill Malo.

Robert Mehmen and Bill Malo ready Robert's Eaglet prior to ill-fated O.O.S. flight. Hope he got it back. At least he won 1st in Junior!

Second place in Unlimited went to Jim McDermoth and his Hummer, an original design of Jim's.

moth also had a Strato Streak that lived up to its name. This model would really climb during its 25 second motor run, then glide very flat and slow for some long flights. In fact, Jim won the event with flights that included two three-minute maxes. Not to be outdone, I charged up my Valkyrie (not the scale canard, but a small version of Carl Goldberg's famous late-1930's design), raised the stab up for a little flatter glide, and launched. Seems I hooked some really good air, as the model climbed steeply and stayed up there in the glide. Carl Hatrak came over and asked me if I had lit my D.T. fuse. Good grief, I had forgot! Well, I kept it in sight for a little over nine minutes, then it disappeared. By the way, I wasn't alone in this; one of our juniors, Robert Mehmen, lost his Eaglet the same way, as did Tony Naccarato his Starduster in the Unlimited event. I was lucky, though, because at about 4 p.m. I got a phone call from a young man named George Robertson, who lives about six miles from Mile Square. He had found my model in the street, saw my name and phone number on the pylon, and called me up. When asked if he wanted money or a model kit for his reward, George chose the model, so off I went to get my model. This proved two things to me: first, it pays to put your name and phone number on your model, and second, most people will return a model if they find it. Got a bonus of starting a new person into our hobby; someday we may find George entering one of our contests.

Tom Comparet Jr. was the only Junior to enter scale this year, flew this Flyline Aristocrat.

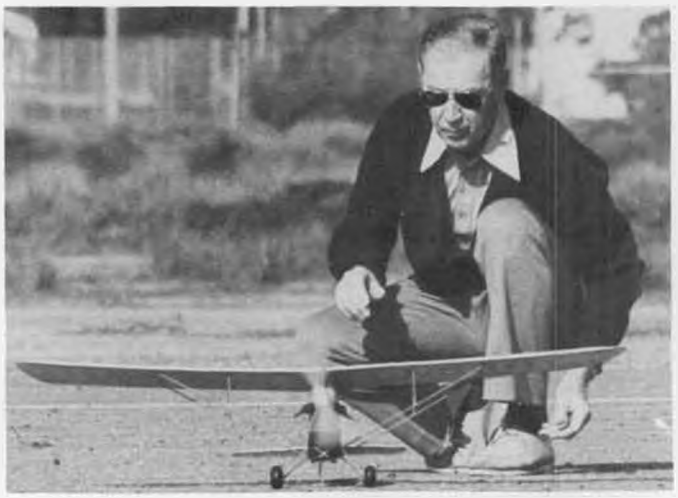
I mentioned that Jim McDermoth flew in the Old Timer event, and won it. He had also entered and placed 2nd in the Unlimited event with his own design, the Hummer. Someone should get with Jim to make this a kit, as it sure flies well. Tony Naccarato won the event with his Starduster. As most of you know, there's no shame in placing behind the famous Naccarato family; after all, Tony holds the world's record for radio controlled indoor electric models. As Jim placed highest in the two endurance events, he received the grand sweepstakes trophy also.

Now for scale. This event had the most entries, which is not too surprising, as electric power is very compatible with free flight scale. As usual in this event, there were no two planes alike. To me, this is the fun of scale modeling . . . the subjects are almost limitless. Bill Warner had his FK-43 monoplane that made some long takeoffs and great flights.

Ferrell Papic had a Bleriot No. 7 Monoplane that really stole the show. To give you an idea of how well it flew, it was awarded the highest flying points of the day. Carlo Godel had converted his Ansaldo A-1 biplane from Jumbo rubber to an Astro 02 unit. Seemed to be a little overpropped, but should do better at the next contest. Sure is a great looking plane. Dick Ploeger's Struck designed Caudron Monoplane was a little tough to R.O.G. at first, due to the narrow tread, but soon Dick was making some fine flights. The only junior to enter the scale event was Tom Camparet Jr. He had a General Aristocrat with an Astro 02 in it. I have always enjoyed watching a

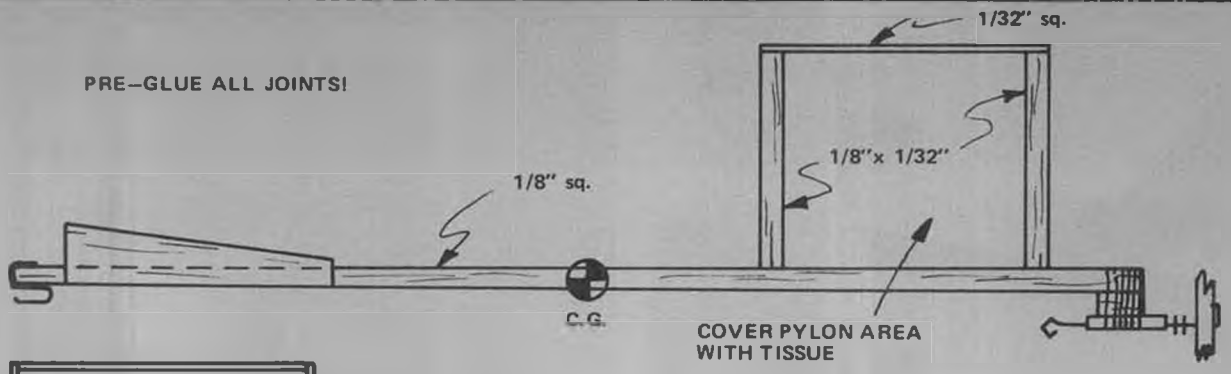
Continued on page 99

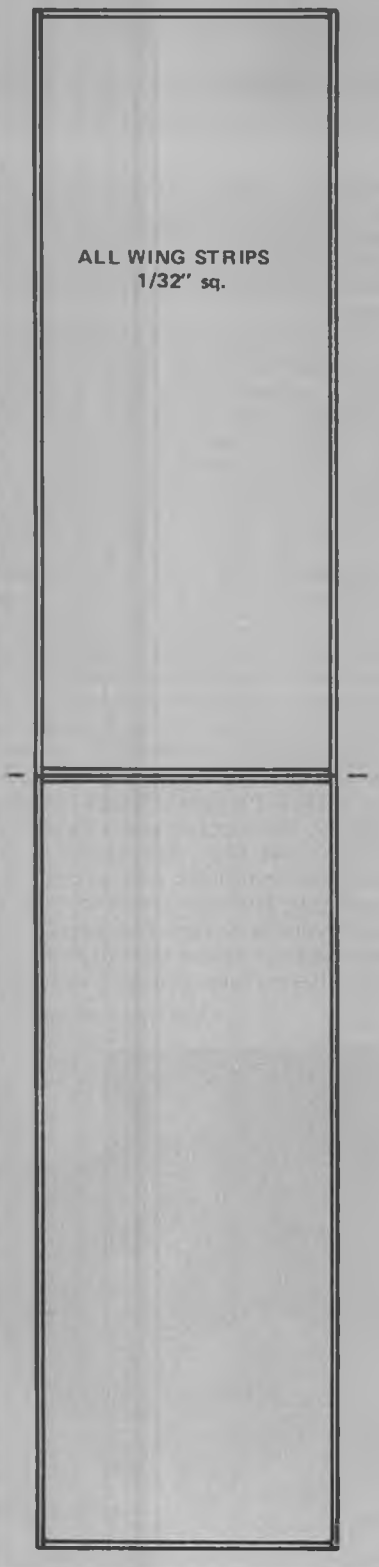
One of Bill Warner's more conventional models is this FK-43. Bill took 2nd in scale with his Annular Wing, resembles flying toilet seat.

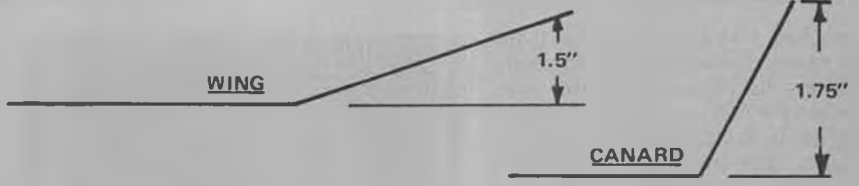


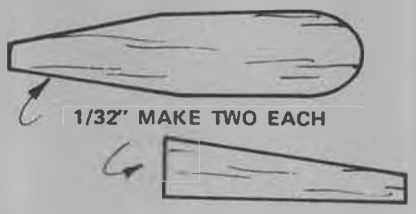
Tom Laurie gets off another fine flight on his American Eagle 'Eaglet'. MB published plans for this more than four years ago (No. 2763).

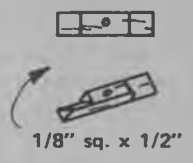
PRE–GLUE ALL JOINTS!

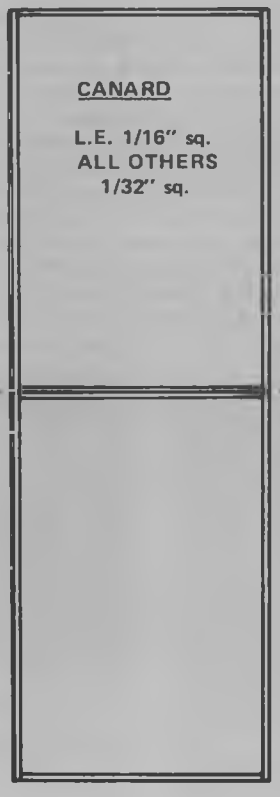












MATERIALS

1/32" x 8" x 3"
1/8" sq. x8"
.015 MUSIC WIRE
1/2" OF PLASTIC OR METAL TUBING
w/ I.D. SLIGHTLY LARGER THAN
PROP WIRE
3–4 SMALL PROP BEARING WASHERS
COVER W/ LIGHTEST TISSUE AVAILABLE
(DO NOT SHRINK!!!)
12"x 1/32" sq. RUBBER

WHIRLAWAY

A LIVING ROOM RUBBER MODEL

BY: NICK SANTOVITO

"Hey, how do you like my plane?" Two-year-old Rocky Santovito thinks his Whirlaway is really neat. Primarily intended for indoor flying, it can also be flown outdoors on dead-calm days.

Whirlaway

By NICK SANTOVITO . . . When you have the hots to fly but the weather is miserable, whip up a "Living Room Rubber" job. Here's an intriguing canard that builds quickly and flies in small spaces. Try it!

• The Whirlaway was born on a cold, rainy afternoon when I had the flying fever, but no intention of wading through our muddy field. I was frustrated! In my house, frustration leads to one of two things: yelling at everybody or chopping balsa. I chose the latter and came up with a pusher canard configuration that I had seen in an old magazine article, only much smaller.

Being somewhat lazy, I always build the model, then if it flies, I draw up the plans. This assures future builders that if the model is built according to the plans, it will fly.

Please note that all measurements are approximate, and as long as you start and stay with the materials listed on the plans, just about anything you cut will work.

ASSEMBLY

First, cut out four 1/32 strips and one 1/8 strip from 1/32 sheet for the wings, canard, and wing pylon, respectively. (A double edged razor works best for cutting wood on this model.) Then assemble the wings and canard over the plans in one piece; the dihedral cuts will be made after they are covered.

While these are drying, cut the fuselage to length from the 1/8 stock and sand it to a very slight taper. Glue a 1/2-inch length of the same stock to the rear end of the fuselage and let everything dry.

If you don't use Hot Stuff or the like, you can use this time to cut out the canard mounts and prop blades from 1/32 sheet. Hot Stuffers can do like I do and wait till the last minute.

Cover the wings, but *don't water shrink*. When dry, glue in the dihedral angles of 1-1/2 inches in the wing and 1-3/4 inches in the canard. Try not to cut through the tissue when making the dihedral cuts.

Assemble the wing pylon over the plans, then glue to the fuselage as shown and cover. Glue the canard mounts to each side of the fuselage, making sure that the bottoms of the mounts are even with the bottom of the fuselage. Glue on the wing and canard, blocking or pinning in perfect alignment.

While the ship is drying, build the prop by cutting a 1/2-inch length of the 1/8 stock and mark it as shown on the plans. Then, with the markings up, draw a diagonal line from the lower left corner to the upper right on both ends of the block. This line will be the surface that the prop blades are glued to. Make a cut on the top lines down to and even with the lines on the end, then make a cut from the ends back to the first cut. Push a straight pin through the center of the block, or if you're picky, use a .015 drill bit. Sand the prop blades lightly and glue to the completed hub, lining everything up until dry.

While the prop is drying, cut a short length of tubing that fits the prop wire closely but freely and glue it to the rear fuselage block, wrap with thread, then coat with glue.

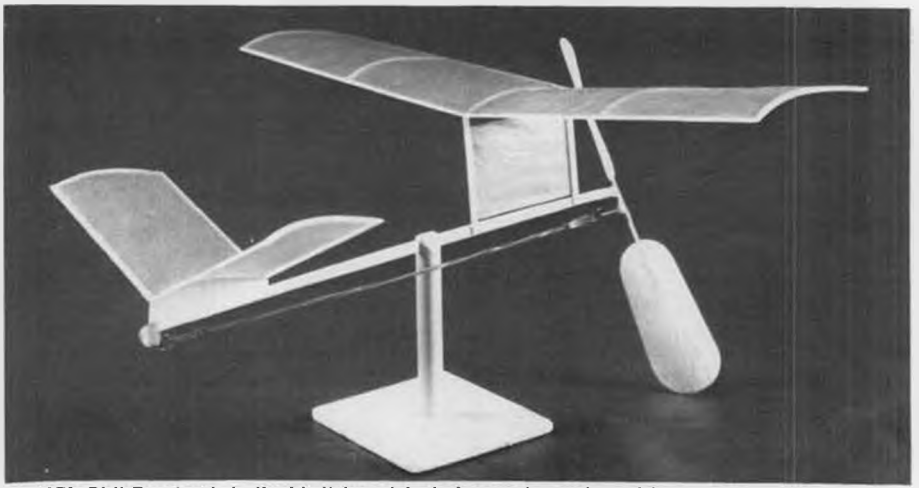
When dry, shove the prop wire through the tube with the hook to the front, slip two or three small washers on, then the prop. Then take two pairs of needle nose pliers and make a 90-degree bend in the wire where it exits the prop, then glue it to the face of the hub, making sure that the prop tracks somewhat close to straight. Install a loop of 1/32 square rubber (if nothing else, you can cut open a golf ball and get some passable rubber), then balance upside down as shown.

FLYING

Whatever the size of your house, don't worry, I have managed to get around 20 seconds in my 9x12 living room. The model makes a tight six-foot circle with 1/4 inch of washout in the right wing panel; yours should also. My model took 1-1/2 hours to build using Ambroid glue, and the rest of the afternoon was spent chasing thermals that form around our heater vents at this time of the year.

Although the Whirlaway is a very delicate model, it will bounce off of any obstructions without damage and last a long time (unless you have kids). Contests can be a real blast if the right prizes are offered. Use any rules or no rules, anything goes. It can really liven up a dead day.

Turn right and stay up a long time! •



RCMB's Phil Bernhardt built this lightweight indoor-only version with condenser paper covering and cambered ribs; prop from 1/100 sheet. Managed a creditable 2:21 in local gym . FUN!

NOSTALGIA

By TOM HUTCHINSON . . . Ralph Prey's Nostalgia event is spreading like wildfire and may be the biggest thing to come along since the rebirth of Old Timers. The author explains what it's all about. Join the fun!

• Just about a year ago, the San Valeers' Ralph Prey hoisted a trial balloon for a new gas free flight event. He called it the Nostalgia event, to recreate the vintage free flight era of the 50's by creating a special contest event for pre-1957 designs. Ralph's idea was enthusiastically received by all who heard it, starting with the club meeting where it was first brought up. Soon there were articles in other clubs' newsletters, the NFFS Digest and the national magazines (you read it first in **RCMB**!). Contests were scheduled for the new event in all parts of the country, and last winter's "hot-stove league and discussion society" was stimulated by thoughts, reminiscences and anticipations of the coming events.

Most of the Southern California clubs included Nostalgia events at their two-day Annuals, in addition to the U.S. Free Flight Championships. Up here in Oregon, both the Willamette Modelers Club and the Portland Norwests staged Nostalgia events. Biggest response to the new event came at the Central Indiana Aeromodelers Annual, where 19 contestants showed up to fly Nostalgia! Harry Murphy's comments were typical of those who observed Nostalgia: "It has been a long, cold day since any newly-staged event drew this much enthusiasm the first time out, so you can bet the CIA will do it again next time." Bob Stalick voiced similar views: ". . .the Nostalgia event is the biggest shot in the arm for free flight since the return of the Old Timers. It should be in every contest."

Ralph Prey summed up the first year's growth of his infant event this way: "Word from the building boards indicates that the Nostalgia event will pick up interest this year. Seems like many fliers got started too late last year to get something together for the contest circuit to have large entries in Nostalgia. But from the newsletters that cross my desk, it is gaining momentum." The same newsletters cross my desk also, and I get the impression that Nostalgia may turn out to be the fastest growing event since P-30.

So, if you were left out of last year's action and would like to try Nostalgia this year, here's what you need to know. The rules basically limit eligible designs to those published or kitted from the close of WW-II through December 1956. (Burden of proof of eligibility is on the contestant to supply kit, plan, or 3-view, if doubtful.) All engines of that era are eligible, along with later makes of plain-bearing, non-Schnuerle engines. Pressure fuel systems are allowed, along with two models.

One of the strongest pieces of evidence that Nostalgia is here to stay is that the initial contests brought about several questions about the rules already! The San Valeers envisioned the event being flown under wide open spaces, so they specified six-minute maxes with 20 and 15 second engine runs. Those of us with smaller fields improvised to fit shorter maxes. The WMC used three-minute maxes with 15 and 12 second engine runs. The CIA group flew to two-minute maxes (Cat. III) and had more improvisation by permitting pre-war O.T. designs as well, using engine run handicaps for

PHOTOS BY AUTHOR

Ralph Prey, originator of the Nostalgia concept, VTO'ing from old Gardner Field site.

Dick Williamson maxed out at WMC Nostalgia event with this Ramrod, still kitted by Sig.

Ted Stalick won Class BC at Harts Lake with AB Spacer. Really climbs with O.S. .25!

Now that's a VERTICAL takeoff! Johnny Werts with 1/2A Spacer (a Sal Taibi design) at the unbeatable Gardner Field site near Taft.

1/2A POWER EVOLUTION

(Originally compiled by Larry Conover)

Year	Engine	RPM*	Wing area
1949	Torp .035	8,000	100 sq. in.
1949	Baby Spitfire	10,000	150
1950	Torp .049	12,000	175
1950	Wasp	12,000	175
1951	OK Cub	11,000	165
1952	McCoy .049 Diesel	13,500	185
1952	Space Bug	14,000	200
1953	Atwood	14,500	220
1954	Thermal Hopper	15,500	250
1955-7	Thermal Hopper	16,500-17,500	270
1959	Space Hopper	18,000	320
1959	Holland Hornet	18,500	320

*6x3 Toronado before 1956, 6x3 Top Flite nylon after

A popular Nostalgia design is the Kiwi, this one by Bill McDow and powered by a TD .09.

ignition and glow conversions. Original ignition engines were allowed 16 seconds, glow conversions 12 seconds, and glow or diesels, nine seconds. All flights are VTO or ROG.

It took all maxes to win each of these contests, but only the WMC contest required a flyoff. The San Valeers specified flyoffs to a constant six-minute max, but we decided, on the field, to reduce the engine run to nine seconds hand-launched, which worked OK.

The San Valeers rules permitted scaling designs up or down, but the CIA group objected to this. They felt that this might permit .020 Replica ships to be flown in two events, and, more to the point, thought that scaling down to "hot-rock" sizes would encourage deviation from the intent of the event. They did realize, however, that scaling designs up or down for various classes of competition was a common occurrence during the Nostalgia era, so agreed to allow scaling up or down where the designer included proportional multipliers (or scale-up tables like those published with the Ramrod, which even included suggested wood sizes) in his published article.

Since Nostalgia is not an official AMA event, such tinkering with rules to suit local conditions will probably continue for a while. If you have any doubts, your best bet would be to contact the sponsoring club to check out any questions beforehand. (It wouldn't be a bad idea to obtain a copy of Ralph Prey's original detailed rules for Nostalgia. Send an SASE to him at 4859 W. 97th St., Inglewood, CA 90301 and ask for them.)

So what design are you going to build? If you've read this far, you probably have a favorite design in mind already. It's probably a sentimental favorite, something you won your first trophy with, or that was the first to survive the test-crashing process, or that one of the local heroes beat you with. If you're typical, you've probably got the plans to it somewhere in your cardboard boxes in the corner of the garage, so start rummaging. If you don't find your favorite, chances are that you'll find something else from the past that you'd like to build again.

However, if you've got a particular design in mind, and prolonged searching doesn't bring forth a wrinkled, glue-spotted set of plans, don't despair! John Pond (P.O. Box 3215, San Jose, CA 95156) has Nostalgia designs in his Old Timer Plans Service, in addition to the pre-war stuff. I culled out most of the readily-identifiable designs and have included them with this article. (Prices range from $2 for a 1/2A to about $4.50 for a large Class C version. Include 20% extra for postage.)

There are Nostalgia designs for all types of free flighters. If you're the craftsman type who enjoys building, you might try any of the Civy Boys, Gaster's Gastove FAI winner (for this one, you even have to scale up your own plans), Enticknap's Gool, or Carl Goldberg's Cumulus, with its planked fuselage and cowled engine. For the person interested in winning contests, take a look at the winningest designs of that era. The best of them had simple construction, straight lines, and were easy to fly, like the Spacer and Ramrod. Fubars, Zeeks, Hogans, and Kraft's Upstart would be good choices also.

NOSTALGIA EVENT MODELS AVAILABLE FROM JOHN POND PLANS:

Cat.#	Design	Designer/Mfr.
40D1	Amazon	Hill/Berkeley
9D4	Badger	Kenhi
9E1	Champion 36*	Brofman/Enterprise
6G7	*Civy Boy 24, 31, 36	Gilliam
6G7	Civy Boy 61, 74	
33C1	Civy Hearse	
40D3	Crowbar 46	Matthews
5C5	Cumulus	Goldberg/Top Flite
34B3	Dream Weaver	Posner
34C3	Frisco Kid	Tatone
34B7	Frisco Kiddie*	Tatone
34C4	FuBar 36*	Matthews/Midwest
34C5	Ghoul	McGovern
9A4	Gool	Enticnap
40F5	Hairy C	Gould
34F2	Mini Hogan 34, 35	Davis/Berkeley
34F2	Sandy Hogan	Davis/Berkeley
33A2	International	Blanchard/Berkeley
34D5	Lucky Lindy	Conover
34E3	Near Miss	Collinson
9D2	Phoenix Baby, Flash Imp*, Junior*, Skipper	Ehling/Jasco
9D2	Super Phoenix	Ehling/Jasco
6A7	Playboy Senior	Elgin/Cleveland
9A5	Powerhouse 33*	Korda/Berkeley
7A4	Powerhouse 41	
6A3	Powerhouse 56	
6A2	Powerhouse 62	
6A1	Powerhouse 64	
33G5	Slicker	Dean/Keil Kraft
33A1	Spacer	Taibi/California Models
9G4	T-Bird	Hansen/Midwest
34G7	Upstart	Kraft
33A3	Zeek	Air-O
33A3	1/2A Zeek	Premium

*denotes 1/2A designs

If you are interested in international events, take a look at some of the FAI Power designs of the Nostalgia era. For example, the top three places at the 1956 World Champs were a trio of outstanding designs. Ron Draper's winning Crescendo design wouldn't have looked out of place at any U.S. contest . . . it even had VTO pegs! Dave Posner's 2nd place Dream Weaver had appealing curved lines and an appealing look of "rightness" about it. And the bronze medalist in 1956 was a model that was given an NFFS Top 10 award in 1977, Larry Conover's Lucky Lindy. This was a larger, lighter version of the Lindy used

Continued on page 78

Gene Bartels won WMC Nostalgia with all maxes. AB Spacer with O.S. .25 is potent combo; also placed at '79 U.S. F/F Champs.

Walt Prey has always liked intricate construction and tissue trim. Here he VTO's a Satellite from Gardner Field in the early '60's, now has a Civy Boy under construction. Old Satellites are not eligible for the event, but still have the Nostalgia spirit.

FREE FLIGHT

by TOM HUTCHINSON

PHOTOS BY AUTHOR

Would you buy a used MG from this man? Bill Hartill does a little test flying at L.A.'s Sepulveda Basin in 1963, when F/F was still allowed there. Model is Bill's "Godzilla".

ALTITUDE MEASUREMENTS AT WORLD CHAMPIONSHIPS

One of the more interesting sidelights of the recently concluded World Championships at Taft was the effort expended by the NFFS Technical Reporting Task Force. There were four teams of people collecting data during the World Champs, one for each event, and one that collected altitude measurements during the contest. The latter group, under the direction of Fred Pearce, has recently released a preliminary set of figures, here reprinted from the San Valeers "Satellite" newsletter.

The team used two base stations 535 feet apart, with a theodolite at each station, to record data used to produce a calculated height. Data was measured at a time of day least likely to be affected by thermal activity, usually the first round. (Several readings were taken on the practice days, to check out the system.) Thus, not all contestants had altitude readings, and then only for the first round.

These measurements make interesting reading, beyond a direct comparison of competitors' altitudes. It was a bit surprising that Peter Harris of Great Britain had the greatest measured altitude in the first F1C round; most observers touted another favorite (Galbreath, Sugden, Schlacta, or Koster, were those mentioned most depending on the observer's nationality or preconceived notions). It makes you wonder what the result might have been if Harris hadn't had the misfortune to overrun twice in the first flyoff round! Six of the nine Power flyoff participants had their altitude checked; all were near the top of the list, except for Quinfei, Schlacta, and Truppe. (Schlacta had a practice flight the day before with an altitude of 543 feet, which would have placed him near the top also; perhaps the first round flight had a poor transition?) Even though Truppe wasn't the highest climber, he flew consistently and avoided downdrafts, as did Quinfei, who made it through to the last round even though his climb ended up almost 250 feet below the highest.

The measurements include several fliers who did not max in the first round of Power. This permits a good estimate of the sinking speed of World-class FAI Power models to be made. (By subtracting ten seconds from the flight time, to allow for engine run and recovery into glide, you can find out the time required to glide down from the measured height.) It quickly becomes evident that these models have a very fast glide! Koster's model, for example, came down from 526 feet (lower than his best because of a poor transition) in only 165 seconds, yielding a sinking speed of 3.2 ft./sec. The rest of the non-maxers came down almost as fast, all of them with an identical sink rate of 2.9 ft./sec. Only Enstrom did better: 2.6 ft./sec. Previous analyses of FAI sink rates (by Andy Bauer and Joel Chesler) indicated that the value was closer to 2 ft./sec. for non-flapper models. The question is, do *all* FAI models glide that badly, or did the non-maxers not have the glide adjusted? (Some observers noticed that Koster had too tight a glide circle.) Perhaps the recent emphasis on thin, flat-bottomed airfoils has increased the altitude reached at the expense of sinking speed, or maybe FAI Power fliers don't spend much time trimming for glide! Maybe Rocca's victory will swing the pendulum back towards slower-gliding models? (Incidentally, the altitudes measured correlate well with the previously mentioned theoretical studies, although a bit lower than theory would predict. This is probably due to fliers cutting back on the timer setting to allow for the speed of sound and human reaction time. According to Chesler, Harris' model would need a timer setting of no more than 6.2 seconds on the ground to avoid an overrun caused by these two factors.)

The late Marc Nagasawa with one of his finely crafted Nordics. Photo by Steve Helmick.

Wakefields were a bit harder to figure, since their prop runs vary more than Power models, and only one of the non-maxers had a first round Wakefield flight long enough to be sure that the model didn't stall all the way down. Assuming a 30-second prop run, Roberts of Canada had a sinking speed of 1.4 ft./sec. I watched Walt Ghio's first round flight, so I know the motor run and time all the way to the ground. This gave Walt a sinking speed of about 1.2 ft./sec., which is about the same as most Nordics. Jim Wilson's first round Nordic flight was measured at 190 feet at the top (about a 20-foot zoom, allowing for height of towline above ground), and he landed in less than 181 seconds, for a 1.05 ft./sec. sinking speed.

As a sidelight, Fred Pearce also did some similar altitude measurements at the 1954 World Championships on Long Island. Dave Kneeland's greenhead Torp model, which R.O.G.'d for a 15-second run, reached an altitude of 724 feet. Sort of makes you wonder what the FAI has accomplished with all its changes to the FAI Power rules, doesn't it?

DARNED GOOD AIRFOIL: TAHK-EDEK

This airfoil was sent to me by Lee Hines, who used it on his latest Nordic, the Mean Bird (not flown at World Champs). He didn't tell me much about it, but the name suggests a combination of the Tahkapa airfoil and the Benedeks. Playing around with the ordinates of both doesn't indicate any mathematical relationship between the two sets of numbers, so my guess is that Lee sketched something out that LOOKED like a combination of the two airfoils, then figured out the ordinates. Note that the maximum thickness is 7%, a bit thicker than Russian A/2 airfoils. This seems to be a trend among Nordic fliers, trading off pure glide performance in dead air to obtain more structural

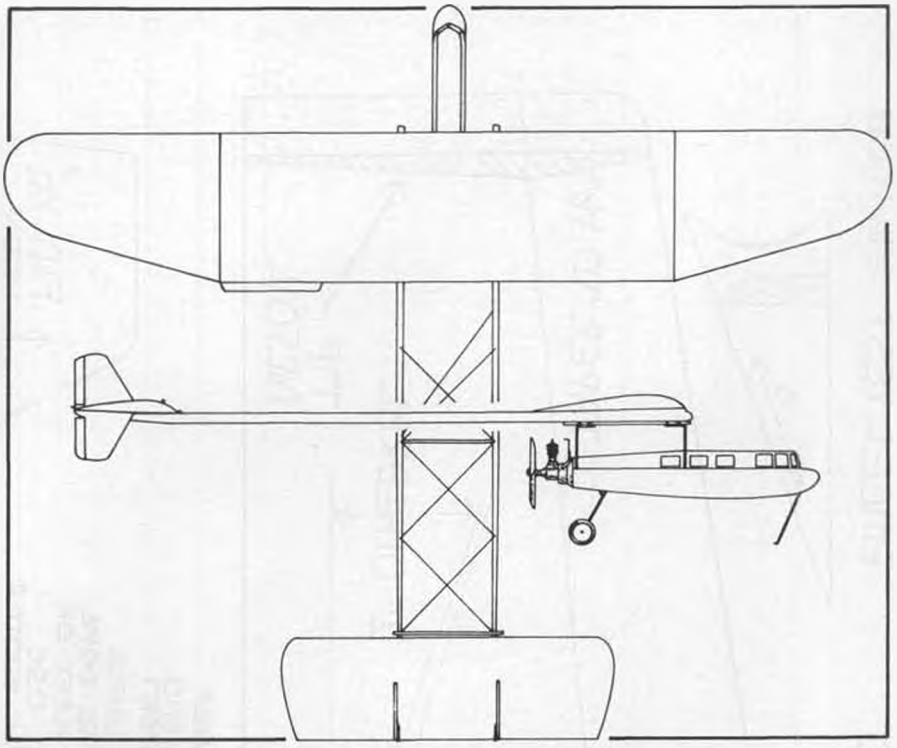
FIRST ROUND WORLD CHAMPIONSHIPS ALTITUDE MEASUREMENTS (BY NFFS TASK FORCE)

NORDIC	ft.
Wilson	190
Hines	180
WAKEFIELD	**ft.**
Ghio	331
Zetterdahl	301
Waser	290
Shibachi	263
Cheng Ming	262
Kabori	258
Kai	223
Kilpelainen	220
Roberts	196
Gonzales	192
Ruyter	192
Silz	179
Vasquez	158
POWER	**ft.**
Harris	610
Bogart	577
Galbreath	567
Iribarne	566
Sugden	554
Monks	554
Simpson	534
Koster	526
Screen	514
Schlacta	505
Sarkonnen	489
Akesson	487
Zito	482
Bauman	460
Vela	459
Barbarella	454
Oxager	443
Nutini	429
Seelig	422
Truppe	412
Enstrom	411
Quinfei	369
Hinds	369
Imamura	329
Schenken	320
Bonetto	278

strength and consistency for harder launches.

MODEL OF THE MONTH:
Bruce Kimball's "Cornchucker" HLG

I got a 3-view of Bruce's latest HLG at this year's Northwest FAI Symposium (to be reported next month). I was looking for a glider design that would use three-inch-wide wood and be easy to build, for use with junior high kids, and the Cornchucker looks like it was designed to my specifications. It should be economical to make, since the lengths of wood needed for flying surfaces and fuselage are multiples of six inches. The flat center section makes for a strong, accurately-aligned wing/fuselage joint (very important for juniors!). I haven't flown mine yet, but construction was VERY quick and weight came out as Bruce specified without any need for raiding your choicest stock. This should be a good glider for those nice days when the morning fog has just lifted, where your "full-grunt" gliders would glide through the light stuff, and there's not much danger of losing a non-DT HLG. Or maybe something to throw around to keep your arm in shape, just before the sun goes down.



JULY MYSTERY MODEL

MYSTERY MODEL

After all the easy ones, this design should be a challenge to devout MM spotters. Designed by a famous American free flighter and former FAI Power World Champ, this was intended as a contest model for an event still in the rulebook. The pusher configuration with the stab mounted on twin booms, along with the tip dihedral in the wings, should be all the identifying features you need to correctly identify this free flight from the past. Send your entry to the **R/C Model Builder** office (NOT to me, that just slows things down) to see if you win the free subscription for being first with the correct identification.

MARC NAGASAWA: A EULOGY
by Steve Helmick

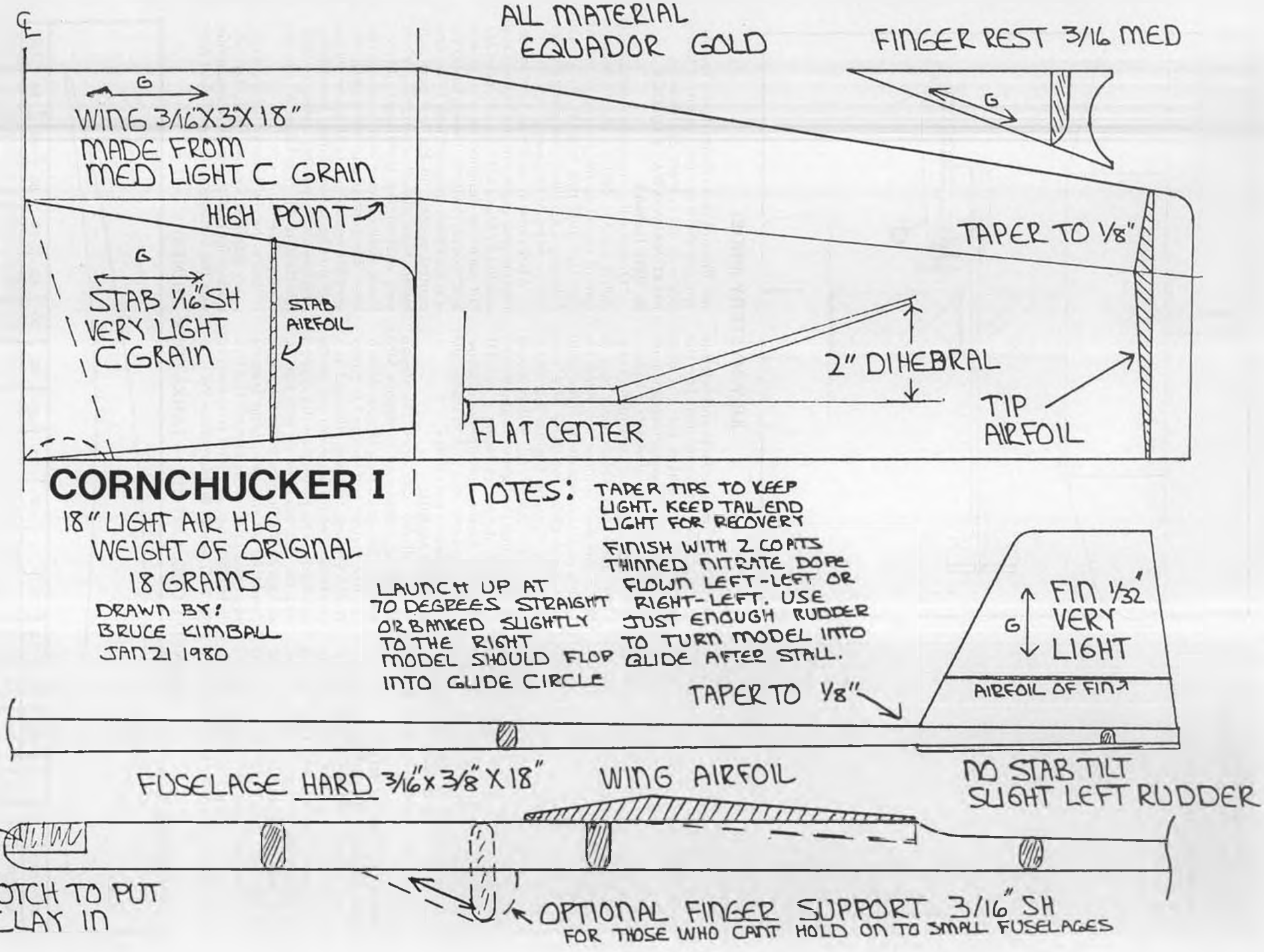
"Occasionally, newsletter editors are called upon to perform the unpleasant task of reporting the passing of one of our free flighting friends. This past February 5, a brilliant young Nordic flier left us, Marc A. Nagasawa, age 21.

"Marc came to our hobby from model rockets, and guided by Jim Walters and assisted by Bruce Kimball, advanced at a fast pace. He designed his own gliders and his own towhook. His workmanship was excellent, matched only by his fine contest record. In his first and only Finals, Marc placed an inspiring 5th in very challenging conditions. (Marc's flying abilities were widely recognized after this contest and were only prevented from being noted sooner by the fact that he suffered from hemophilia, which made his parents understandably reluctant to let him travel to faraway contests like the Finals. TH)

"Since the 1979 Semis, where Marc again qualified for the Finals, he contracted leukemia, and had apparently won the battle only to be stricken with

DARNED GOOD AIRFOIL – TAHK–EDEK (HINES)

STATION	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	1	2.9	3.9	5.3	6.2	7.1	8.2	8.95	9.4	9.6	9.5	9.1	8.1	6.8	5.3	3.15	2	0.6
LOWER	1	0.25	0.1	0.1	0.4	0.75	1.3	1.9	2.3	2.8	3.35	3.75	3.85	3.5	2.8	1.6	0.85	0


℄
ALL MATERIAL
EQUADOR GOLD
FINGER REST 3/16 MED
G
WING 3/16"X3"X18"
MADE FROM
MED LIGHT C GRAIN
HIGH POINT
TAPER TO 1/8"
STAB 1/16"SH
VERY LIGHT
C GRAIN
STAB
AIRFOIL
2" DIHEDRAL
FLAT CENTER
TIP
AIRFOIL
CORNCHUCKER I
18" LIGHT AIR HLG
WEIGHT OF ORIGINAL
18 GRAMS
DRAWN BY:
BRUCE KIMBALL
JAN 21 1980
NOTES:
TAPER TIPS TO KEEP
LIGHT. KEEP TAIL END
LIGHT FOR RECOVERY
FINISH WITH 2 COATS
THINNED NITRATE DOPE
FLOWN LEFT-LEFT OR
RIGHT-LEFT. USE
JUST ENOUGH RUDDER
TO TURN MODEL INTO
GLIDE AFTER STALL.
LAUNCH UP AT
70 DEGREES STRAIGHT
OR BANKED SLIGHTLY
TO THE RIGHT
MODEL SHOULD FLOP
INTO GLIDE CIRCLE
FIN 1/32"
VERY
LIGHT
AIRFOIL OF FIN
TAPER TO 1/8"
FUSELAGE HARD 3/16"x3/8"X18"
WING AIRFOIL
NO STAB TILT
SLIGHT LEFT RUDDER
NOTCH TO PUT
CLAY IN
OPTIONAL FINGER SUPPORT 3/16" SH
FOR THOSE WHO CANT HOLD ON TO SMALL FUSELAGES

Our Junior Free Flighter of the Month, Eric Connelly, Philadelphia, with his Ultimate Dragmaster and trophy won at Skyscrapers Intl.

Steve Beebe lends a helping hand to Bob White, loading a rubber motor at the '79 World Champs.

Sole Chinese entry in Power, Gao Quinfei, made it to the final flyoff round and finished 6th with a model that was nowhere near the highest-climbing. See chart on page 65.

pneumonia. Marc died of the pneumonia only a few hours after I told him of my proxy-flying his models in the Misery Meet.

"Bruce Kimball is having a memorial trophy made to be presented perpetually at the Western FAI Challenge, which will be renamed in Marc's memory. Our most sincere condolences go to the Nagasawa family, Bruce Kimball, and Gwen Ditsworth, probably Marc's closest friends. A single word comes to mind that expresses our opinion of Marc, his family and his models. That word was the name of his first F1A design, 'Sa-Ha-Lee,' which means 'High Above' in the Chinook Indian language."

THE NOVICE GAS EVENT: LATEST DEVELOPMENTS

Down in Fort Worth, Dave Benepe has been beating the drums the past few years for a Novice Gas event to encourage new free flighters. He did an article on the event for the 1979 NFFS Symposium, complete with computer simulations, and came up with a set of rules that was turned down by the Contest Board. We corresponded on the subject when he was trying to get interest stirred up, and his latest letter indicates that he's not given up the concept completely:

"Now that winter is upon us, I have some time to devote to rethinking my approach to establishing the 'Novice Free Flight Power' event. We have obtained some flight experience with models made to conform to the revised rules I presented in the 1979 NFFS Sympo Report, and my calculations are vindicated by the results. But, as you predicted, I have had almost no response to the many letters I sent to free flight clubs around the country.

"We have had some success locally because two or three older members of our club (the Ft. Worth Planesmen) have helped a half dozen boys in their neighborhood to get started. (Actually, two of the boys started with some simple rubber stick indoor models last winter, then progressed to Peck's Prairie Bird, a Sig Mini-Maxer, and a One-Night 28. Those boys got four others interested in free flight, so between them they fly H.L. glider, Unlimited Rubber, A/1 towline, and reed valve .049 powered 1/2A Gas.)

"The boys are fortunate enough to have a reasonably good-sized field less than a mile away . . . about twice the size of a football field, but in an area of expanding population. So they get some visibility when they fly, which is quite often.

"After Christmas, another boy showed up carrying a TD .051 and a kit for a Carl Goldberg Viking, which his parents had bought him at a local dime store with a hobby section. That combination is likely to be a disaster (for the complete novice). One of the older members is going to try to convince that boy to start with a simpler design and a reed valve engine, like one of the other boys has been flying very successfully all fall.

"Back to the Novice event. In order to get something going I plan to undertake another letter campaign, but this time, the rules will be very simple:

1) Reed valve engines of .049 or less displacement.

2) No restrictions on models, fuel, or equipment.

3) Engine runs of 10, 15, or 20 seconds with maxes or two, three, or four minutes respectively (depending on site size and weather).

Clever combined rear wing peg and snuffer tube on Bruce Kimball's Coupe. DT line runs through guide to stabilizer.

4) Scoring to be one of two methods, at CD's discretion:

a) Same as AMA gas; total flight time for three official flights.

b) Flight duration divided by engine run for each of three officials.

"Add scores of three flights to get total score and placing. The second method of scoring would allow the CD some leeway in putting on the event if eyedropper tanks or other simple fuel shutoff is used by some of the contestants.

"Perhaps I'll get a better response with these simpler rules, but I'm afraid that the major difficulty is the fact that most of the active fliers couldn't care less whether anyone new is attracted to free flight power or not."

Dave's new rules describe an event that should fit a beginner's needs very well. These rules also have enough flexibility to allow a wide range of designs (including currently available kits) and approaches, which is essential

Continued on page 97

Outlawed for 1980-81 is this inboard tank set-up on Greg Hill's model. Tank is vented to run without a carb, but the same combination with swing carb should be capable of 120 mph or so.

Here's Edsleve and Dave Wood at it again, just before the line tangle shown last month. Note Dave's sunglasses, probably to keep the rain out of his eyes . . . sure wasn't any sun to speak of.

Control line

By "DIRTY DAN" RUTHERFORD

PHOTOS BY CHARLIE JOHNSON

MORE ON STARTING THAT ENGINE

Last month I went into a bit of detail on how to fire off an engine that is fed fuel from a bladder, usually a pen bladder, pacifier, or more commonly a bladder made from surgical tubing. That part of the story was intended to help you to just get an engine started and was for the people who are new to the game. Now that we have that covered, it seems to make sense to carry things a step or two further, going into the basics needed for those magical, one-flip starts. (For long-time readers of this column, yes, this has been done before in this column, so all three of you can flip over to the next section.)

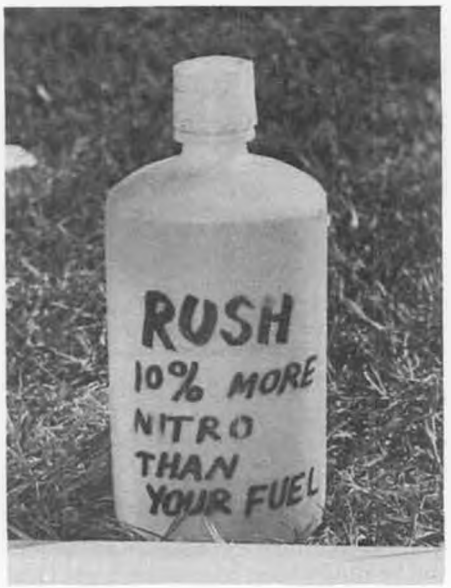
This section on one-flip starts must be concerned primarily with Combat models, as they are what I am most familiar with. The event itself places emphasis on quick starts, and although racing events also demand fast starts and restarts, the situation there is not so cut-and-dried. In racing, there are so many different motors and fuel systems in use that one method doesn't always work. I have had motors that refused to start cold, others that needed patience and extreme care to coax into a hot start, some that showed absolutely no consistency at all, and others that just seemed to start every time.

However, for Combat models there is a method of starting that seems to be almost foolproof, working on all engines I have used in Combat, including Fox .36 Combat Specials, Fox .15 BB's, Rossi .15's, S.T. .35 Combat and G-21 models, S.T. .15's and so on.

Before flipping the prop, there are several things to take care of. The flight box you are using *must* have a good battery. I use a two-volt lead-acid battery that is a military surplus thing about five inches high, three inches wide and deep. The size isn't too important, but note that it is not a small battery, but one with lots of capacity. Dropping diodes are used to get plug voltages of 1.2 and 1.6, as well as the straight two volts. The full two volts will not burn out the plug, as you may have been told, although that setting is only used if it is suspected that the engine is flooded.

Hooked up in the line you need to have an ammeter, preferably one that will read from zero to five amps. It is a lot easier to find meters that go to ten, but the scale is too wide for our use, making the meter difficult to read when checking for a flooded engine. You might check at a model railroad hobby shop for an ammeter made by NJ International, Inc. I have used one of these numbers for several years and it is durable, as well as consistent. Or, you can just buy a complete power panel. Most hobby shops carry the DAE line of panels and they seem to be quite popular. What you will do with the fuel pump, electric starter, and charging receptacles is up to you. . .

Another alternative is the Fire Plug, previously made by Fusite and now being produced by Twinn-K. I have a couple of these and really like them, but do not bother using them in Combat, as



Howard Rush has everyone covered. No matter how much nitro your fuel has, his has 10% more! Does some fancy flying, too.

A sad sight is this telephoto shot of the end of an FAI match at San Diego's Mission Bay. Models belong to Jim Jack and Pat Millay.

the meter is small and hard to see when the Fire Plug is laying on the ground and you are standing up, getting ready for a start. If your budget can only allow for one decent starting system, get a Fire Plug, even though it is of more value in racing events or sport flying than in Combat.

To back up a paragraph or so, you will note that a 12-volt power source is required for the DAE Power Panels. Don't let this put you off, as it is not necessary to lug around the battery from your car. Several types of sealed lead-acid 12-volt batteries are available, and thanks to more than just a few of the high-zoot, multi-cylinder motorcycles eventually turning into basket cases, used batteries of 12 volts and packing pretty decent amps are available in sizes that are not out of reason. Regardless of the starting battery used, just be sure the system works all the time and puts out plenty of power. If you are still using the 1-1/2 volt dry cells that are now really high in price, the best of luck to you, my friend. . .

There are a few other incidentals to be aware of. For instance, you need to be in a comfortable position for starting. I like to be able to stand straight up, which means that long battery leads are used, another reason for the heavy-duty battery. As the leads are long, it is also important that the wire gauge be on the large side; I use heavy-duty lamp wire. The important thing is to look for anything in your system that compromises ease of operation, consistency, or results. Eliminate these items, the first usually being short plug leads that require a stooping or kneeling position while starting.

Next thing to do is get the super needle setting on the motor. On contest days this is most usually done by test flying, although with practice it is quite possible to get the setting by just running the motor in the pits. In fact, I loathe test flying on the day of the contest and only very rarely can be caught doing so. This means that I set the needle on the ground, which actually isn't that difficult; it just takes experience and a lot of faith in your judgment, as a mistake can result in a loss in the first round. This needle setting ritual is done as late as possible before flying, yet early enough to allow the engine to cool completely before the match. Don't get tricked into setting the needle early in the day, only to have the temperature go up and the humidity down (or up).

A new or very nearly new plug is used when setting the needle, as plugs can have an effect on settings. With the engine set, a brand new plug is put in the motor; the used one can be saved for practice flying or as a loaner.

Everything is double checked, including the plug, as even new plugs can sometimes be bad. Be sure the prop is positioned so that it lays flat when up against compression. When your match is called to the circle, you have to be ready, including having the bladder filled, lines checked and so on.

With the model in the circle and a couple of minutes left until the start of the match, the motor can be primed. Remember from last month that this is always done with the model flipped over on its back, the exhaust stack sticking up. A rather healthy prime is used, again laying the fuel on the piston, the piston positioned so as to cover the exhaust port in the cylinder. The exact amount of prime used is fairly critical and can only be determined by trial and error (mostly error). The only motors I use for Combat are Fox Combat Specials, and it usually takes a prime that will fill 1/4 to 1/3 of the volume in the exhaust stack. Sometimes even more is required, usually on cold days. With the model still upside down, the prop is rotated enough to let the prime into the engine and then rotated further to just close the port, trapping the prime in the cylinder. The model is then flipped over and positioned for starting.

Now you have a choice. You can hook up the leads to the plug and while holding the prop firmly, pull it through a couple of times, feeling for a bump as part of the prime fires. This is an excellent clue, telling you that the proper mixture of air and fuel exist in the cylinder. At least that's the way the story goes. My version is that the bump only tells you that immediately before pulling the prop through, the magic mix was there . . . whether it will still be there when it comes time to actually start the

motor is not guaranteed. Actually, it is not that critical. Many, but not all, Combat teams check for a bump before the start. The important thing here again is consistency. The guys who do check for a bump do it every single time. I never check, being confident that the correct prime for my starting system is there already and that pulling through on the prop might upset things a little. Whatever method you use, do it the same way every time.

With time getting close, I take the hemostat off the fuel line, get the leather thong on my hand, make sure the prop is laying flat and test for a good plug one last time. At about five seconds before the match starts the plug lead is hooked up and the holder and I get set. When the start signal is given, the prop is hit (not flipped) very hard with a motion that starts high above the prop and passes vertically through the arc of the prop and then is followed on through. It takes more time to do it this way, as you can't go flippity-flip-flip, but then one hard hit is worth a lot more of the less-than-enthusiastic kind, one good smack generally being enough to make noise.

An important point to make here is that the prop is hit on the inboard blade, so the engine is initially spun backwards, the prop going up against compression the "wrong way." Firing takes place (evidently quite aways before the piston reaches top dead center), and just like magic the motor is running the right way, even though it was started backwards. Trust me, it works like a charm. Give it a try and never again will you go through the old ritual of warming the engine before a start . . . I did say that we always start our engines cold, didn't I? Hmmm, guess not, at least not specifically.

(Don't let the preceding mislead you into thinking that a motor cannot be started by flipping it in the direction of normal rotation, as it obviously can be. In fact, if the motor is hot, we often resort to normal techniques, as back-flipping the prop doesn't usually work too well on a motor that is pretty warm.)

AFTER YOUR FINGERS ARE CUT AND BLEEDING. . .

If all of the directions to getting those one-flip starts are followed, you will soon have the most interesting cuts and slashes on your fingers, all from hitting the prop so hard. To prevent needless bloodshed I use a leather thingie that slips over two fingers and is stout enough to ward off even super-sharp glass props.

Now you can buy a very similar item called the "Neater Beater" from John Thompson, 1411 Bryant Ave., Cottage Grove, OR 97424. The Neater Beater is a two-fingered thong that is tough, yet pliable, including in its construction a palm flap for good grip and which makes easy the job of taking it off and on quickly. It is also laced for adjustability, as well as being offered in either left or right-hand configurations. The Neater Beater really is a good piece and you can get one from John for only $5. Just about the cheapest protection I can think of, as well as being much handier than gloves, chicken sticks, garden hose, or any of the many starting aids usually seen at C/L circles. ●

Apprentice . . . . *Continued from page 29*

To help prevent nose overs during landings and taxiing and to improve general appearance, your aluminum landing gear may have to be altered to reduce ground clearance. Clamp the center section in a sturdy vise, keeping the bend to be altered as close as possible to the jaws. Using muscle power, carefully open the bend to reduce the angle. Check for accuracy and evenness by measuring the height of each axle hole with the gear laid upside down on a flat surface. Height above surface should be two inches if you use three inch wheels. Finally, bend the outer tabs to provide vertical wheel position.

The gear location shown is a little touchy on rough ground, especially for a beginner, so you may wish to move it ahead about 1-1/2 inches. Relocate the ply base accordingly if you do this. On smooth ground or a paved runway, there should be no problem for anyone with the gear located as shown.

Getting back to the cowl, the construction shown is fairly simple and can be adapted to any engine. Let your engine determine the location of the 1/8-inch ply nose plate. Cut a chin block and left cheek to suit, install all three and then fill in the curved top portion with wedges of 1/4-inch sheet. Note the caved-in right cheek designed to deflect exhaust from the side mounted engine.

At this point, mix up a large batch of Hobbypoxy II or Sig Epoxy, thin it to a pastey brushing consistency with dope thinner, and pour a big blob of it into the aft end of the tank compartment. Slowly rotate the fuselage until you're sure the unreachable area is well covered, then brush out the rest until the tank compartment is completely coated. Do the same with the engine cowl and the hatch.

RADIO INSTALLATION

As with flying instructions to a beginner who will not have the help of an experienced pilot at hand, a long book could be written on proper radio installation. There are so many different systems that can be used with the Apprentice, that there just isn't room on the plans or in this text to describe how to install all of them. The original airplane was equipped with a Gold Medal Kraft KP-4, which fortunately was the only radio at our field on 53.4, what with a six-ounce Sullivan tank and a .20 cubic inch engine. Talk about long trips! The KPS-9 servos were mounted three abreast just aft of F-7 on 3/8 inch square mahogany cross bearers, and the motion is transmitted by Ny-Rods. Balance is right on the mark, without extra ballast needed. The 500 mah pack is about two inches in back of F-1, followed immediately by the receiver.

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Designed by Bill Carter

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STRAIGHT TALK FOR THE BEGINNER

Up until the time of the introduction of the BUTTERFLY II, the most popular kit trainers on the market have required flying skills far beyond those expected of one just entering the sport. In fact, the vast majority of these "trainers" were never successfully flown. Typically, their take-off and landing speeds are 35 to 40 mph. Of course some of the "trainers" were never completed, yet many, which were beautifully built, were reduced to rubble on their first day out.

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Wing Loading	6 oz./ft.²
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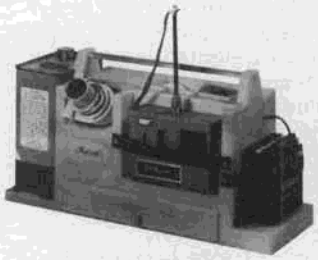

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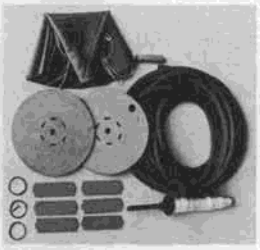
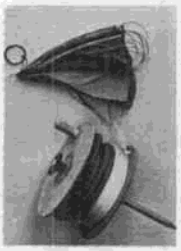


From this

to this

in about 15 minutes!!



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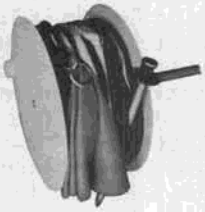
- Easy to Stow
- Easy to Store



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Total weight, ready to fly, with empty tank, is three pounds, eleven ounces. The experimental *(it had just been introduced)*, semi-transparent, blue and yellow Super Monokote undoubtedly contributed to the low weight, and plug number 2, the whole ship was covered in about three hours. Having diddled with this stuff for about three years now, we've learned there's a place for everything. Don't try to fight it into cowls or around complex nose shapes, or into concave vortex tips. An occasional "fix" of dope fumes is good for every modeler.

FLYING

The Apprentice has now had three lengthy test flights. Actually, it only took about one minute of the first flight to find out everything was better than planned. The rest of the time was spent putting the poor bird in all sorts of impossible attitudes, letting go of the controls, and watching it recover to straight and level flight within seconds.

From a 45 degree stall, the ship mushes down to a level attitude, losing only about ten feet of altitude, and simply resumes flying. No oscillating whatsoever. From a completely vertical stalled position, the ship falls back slowly, somewhat sliding, but mostly doing a mild whip stall. In fact, you could call it a marshmallow whip (sorry). The nose drops to about 20 degrees below the horizon, flying speed builds up, the nose raises to about 10 degrees above zero, the plane mushes back to level attitude and again, normal flight is resumed. About 25 feet of altitude is lost. Remember, this is hands off, no controls, from the stall point through to straight and level flight.

Hands-off recovery from a steep turn takes about 360 degrees, and with mild turns, there is no loss of altitude. On the second flight, I handed the box to an innocent, unsuspecting spectator, who shakily maneuvered the Apprentice through several left and right turns before turning completely to jelly. Starting the third flight, I advanced throttle, held the tail down with up elevator until the plane picked up speed and then got off the controls. The takeoff was (ahem) better than the previous two!

Incidentally, a smidgen of right thrust is needed for the Webra .20. For larger engines, be prepared to add a little more. And speaking of engines, don't blow the whole thing by hanging on anything bigger than a tired .35. Even at that, cut the power back and/or add a muffler. The Apprentice was designed and does fly as a trainer. If you want a bomb or something with ailerons, you're barking up the wrong airplane. •

Hannan . . . . . *Continued from page 54*

scribing his Golden Age air racing experiences, cautioned his audience to remember that "Baloney was about the same then as now . . ."

NEW SCALE RULES PROPOSAL

Dick Carsen, Scale Manager for the 1979 Nats, feels that one of the basic problems in model flight judging is being hampered by lack of precise proof of how the full-size prototype performed. He suggests, therefore, that each modeler's documentation presentation should feature an actual pilot's report, written by a person who flew the big machine. According to Dick, if such information were to be supplied to the judges, they could do a much fairer evaluation job, and "make judging and building more meaningful."

Any comments or suggestions may be directed to Dick at: P.O. Box 19122, Spokane, WA 99219.

HANDY HINTS DEPARTMENT

Captain Fred Komlosy, of Florida, has been modifying plastic commercially-made pilots for greater realism: "Give Testors Plastic Putty a try. It seems to stick well and can be worked a bit with a toothpick. I stipple it on, build up fur collars, edging for helmets, wrinkles in clothing and use it around the pilot's eyes to close them to a squint."

And Captain Ed Toner, of New Jersey has been experimenting with systems to reduce the frosting-up tendencies of CO_2 engines under certain climatic conditions. Ed's approach involves a plastic bag containing a small amount of water, rubberbanded around the fuel tank. Evidently, the water is needed in only a small amount, so the weight penalty is minimal.

R/C HELICOPTERS ON TV

"The Kids Who Knew Too Much" was the title of a recently aired Disney feature on television, which incorporated a few R/C model cars and helicopters. Although a bit hokey (evidently the model choppers were equipped with self-starters, for example), if one simply disengaged his logic mode, the show did offer a rather unusual showcase for "electric toys." Interestingly, the listing in our local TV guide described the kids as *model builders*.

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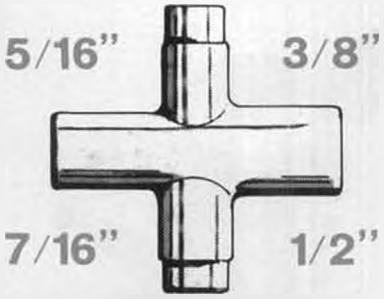

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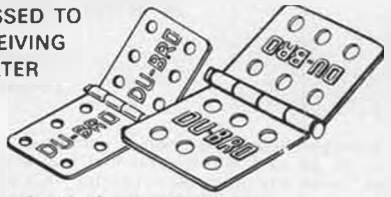

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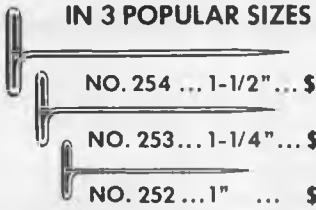

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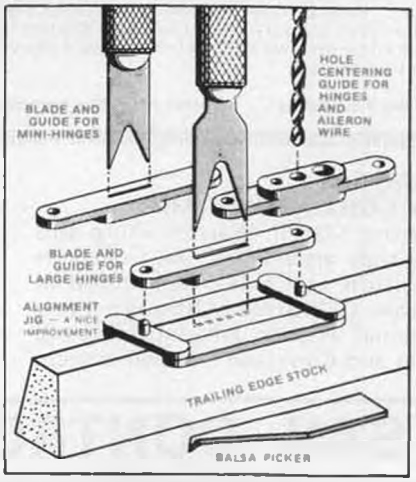

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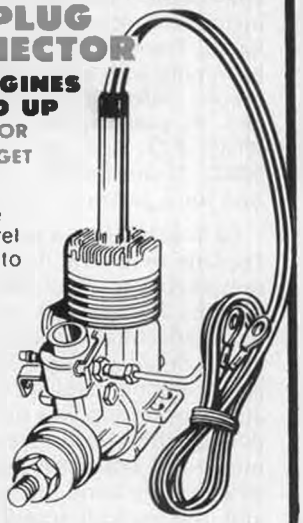

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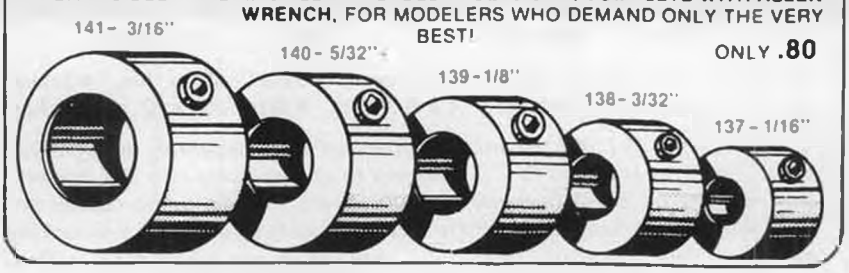

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PLASTIC KITS
NOW COLLECTOR'S ITEMS

During March, Warren Shipp and yours truly attended a "Kit Collectors Exposition and Sale" conducted in Stanton, California. Although a few traditional wooden kits, including old Comet and Cleveland types were seen, the vast majority of items in evidence were plastic static scale models. Many of them were long out of production and thus in diminishing supply. Result? Astonishingly high prices and a big demand among collectors. Also offered were limited production vacuum-formed kits and plastic models from foreign countries. A casual examination disclosed specimens from England, France, Poland, Czechoslovakia, Russia, and of course Japan.

Ed Bole, of the International Plastic Modelers Society, was helping to man that organization's booth, which displayed many issues of their various publications. These items are quite reasonably priced and might be of interest to flying scale model builders, since they contain a great amount of carefully researched reference material.

For instance, the Winter 1979 *Quarterly* includes a feature about Amelia Earhart's Transoceanic Lockheed Vegas, brimming with scale details and photographs. Information about the society and its publications is available from IPMS, P.O. Box 255, Long Beach, CA 90801. Please include a stamped envelope for a personal reply.

Ed Bole had his award-winning Fokker Triplane model on display, and it was a remarkable work of the modeler's art. Tiny by flying scale model builder's standards (smaller than a Peanut), it was highly detailed, inside and out. The tiny rotary engine revolved when the laminated wood prop was turned; the Spandau machine guns were etched from metal and crispy finished; the spoked wheels were hand made by the builder, and the cockpit interior details were convincingly executed.

But to return to the collector's aspect of the show, it was interesting to note

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TENSIOMETER - Included with each Byro-Drive, the tensiometer will determine the recommended belt tension for peak performance and belt longevity.

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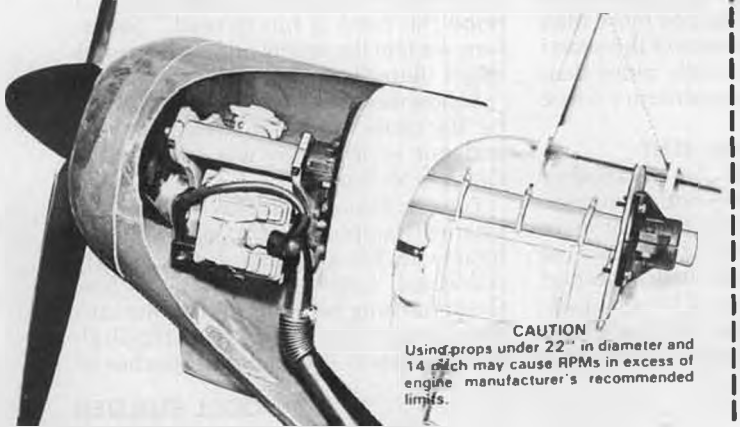
As illustrated below, the Byro-Drive II mounting system provides plenty of strength and rigidity. It consists of a long, center support tube that is secured to both the firewall and a bulkhead within the fuselage. This strong yet lightweight mounting not only helps to suppress vibrations, but also proves very versatile on today's larger aircraft.

The Byro-Drive II is designed to accept any Quadras built after 1968 that utilize the 4 bolt rear mounting flange. Units are available either with or without the engine. These particular engines available from Byron Originals are equipped with a CD ignition system which greatly reduces the possibility of accidental starts. When used in conjunction with the Byro-Drive II with its nearly two to one reduction ratio, a quick flip of the prop privides sufficient spark for quick and easy starts. This CD ignition engine is not recommended for direct drive application.



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the division between those who were primarily model builders and those who had no intention whatever of turning the kits into finished models. It is those in this latter group who have made such remarkable progress in kit cataloging, and in some cases are actually producing pricing guidelines, almost like the used car "Blue Book." Although automobile, ship, and other types of kits were on display, aircraft constituted the overwhelming majority and seemed to be commanding the highest prices. How high is high? How about an Ideal plastic Curtiss Condor, which originally sold for less than a buck, going for fifty dollars! And that was not the top price paid for a kit, either, we were told. So it would appear that plastic model kits are taking their place among the world's valuable commodities. Better put a lock on that closet door!

ENGINES GALORE!

According to a recent Cox advertisement, that firm has produced more than *50 million* model engines over the years! That is almost undoubtedly more than all the world's manufacturers since aviation began.

BOOK REVIEW DEPARTMENT

Aircraft book collecting is another fast-growing facet of the model builders' scene. Scale modelers in particular seem to accumulate reference books almost as a second hobby, while history-minded modelers avidly seek out long out-of-print aero books for their archives. Since many such publications were printed in only limited quantities, they are in short supply and often command high prices. Yet, bargains can be found, and we find searching through used book stores to be a fascinating pastime. Additionally, we try to keep abreast of the current publications devoted to both model and full-size aviation. Two widely differing books were brought to our attention recently, and each seemed to deserve special mention.

September Champions is a difficult item to classify. Devoted to air racing, it is based in large measure upon interviews with actual participants. Inevitably time has dimmed the memories (and occasionally the accuracy), but none of the exciting flavor of the action has been lost. Certainly the people involved in aircraft racing constitute a colorful and often courageous group, which author Robert Hull has managed to confirm in convincing style.

The book's photographs should interest model builders, including those from the Ed Packard collection (Cleveland models). We particularly like the picture of the eager-eyed youngster with his R.O.G., symbolizing the "spirit of the sky" so beautifully. Also included in the book is the reproduction of a Cleveland model racer plan, a delightful touch.

An especially impressive chapter for us was devoted to the late Don Young, Roscoe Turner's mechanic and right-hand man. Don was one of racing's unsung heros, who not only built and maintained the machinery, worked incredibly long hours under difficult conditions, but seldom had the chance to share the limelight with his employer. However, he was thoroughly respected, as *September Champions* makes clear.

Another delightful chapter concerns the experiences of Mary Haizlip, the only woman to compete with a Wedell-Williams racer. Her recounting of her husband Jim's efforts to instill the confidence to do so is intriguing reading indeed.

Aviation enthusiast/model builder Rudy Profant is also singled out for recognition, in a chapter entitled "My Love Affair with the Ortman Racer" . . . a truly off-beat but long overdue tribute to those private citizens who contribute so much to the preservation of aviation history.

On the negative side, portions of the book presenting grisly descriptions of crashes seem strangely out of keeping with the rest of the contents, particularly when the author's preface says, "I hope this book is fun to read." Somehow we feel the seamy side of the stories might better have been left out.

September Champions is published by Stackpole Books, of Harrisburg, PA, and our review copy was supplied by Granger Williams.

Former *Model Airplane News* editor Charles Hampson Grant, still hale and hearty in his eighties, has recently published *Gateway to Aero-Science*. Grant has long been devoted to the idea that actual demonstration through experiments is the soundest teacher of

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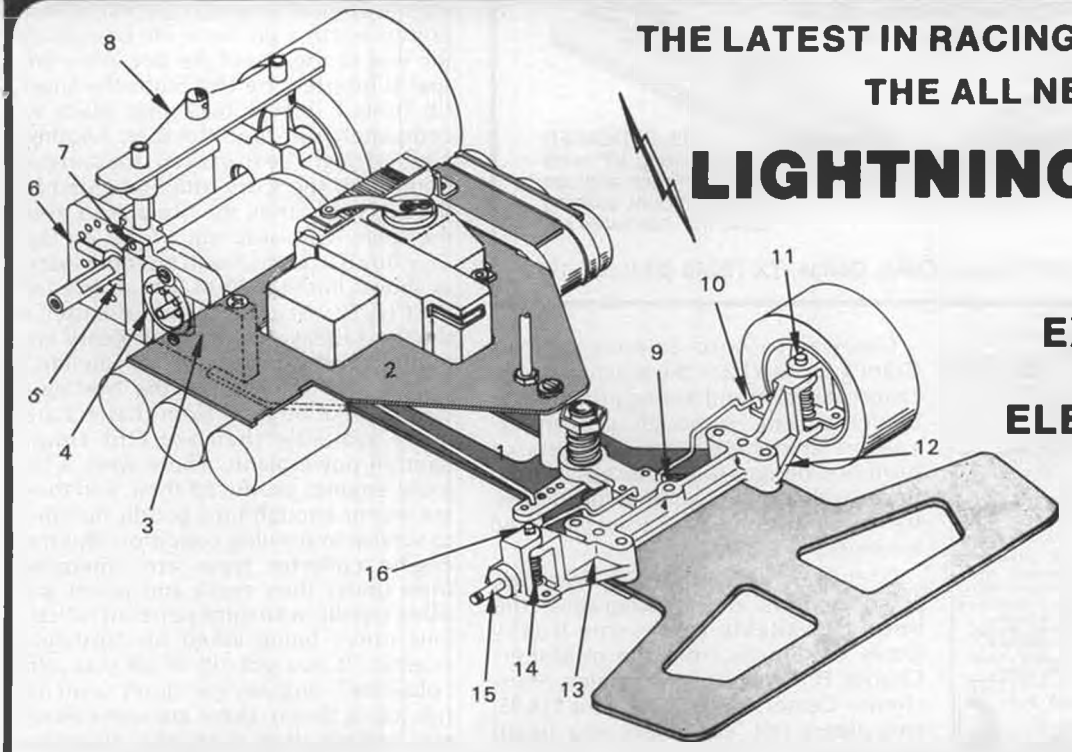

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aerodynamics. His own background includes experience in just about everything that flies, such as paper gliders, rubber and gas driven models, hang gliders (as early as 1910), the design of flaps and retractable landing gears for full-size aircraft, teaching, and lecturing.

His Vermont boys' camp, which included model building instruction, provided the inspiration to many youngsters who went on to achieve success in industry.

Among the camp's more famous "alumni" was Howard McEntee, certainly a highly influential member of the modeling community.

Gateway to Aero-Science reviews Grant's approach for the practical application of design and testing principles to model aircraft. Although proven examples are given, readers are also furnished designs to be constructed and flown with a high assurance of success, backed up by some 62 years of tabulated evidence.

Extensively illustrated with drawings, plans, 3-views and photographs, the book is available from some hobby stores or directly from the publisher: Charles H. Grant and Associates, Manchester Center, VT 05255. Price is $14.95, and please tell 'em where you heard about it!

SIGN-OFF TIME

Hold my father, Ted Hannan, responsible for this one: "Why do you suppose more than two million quarter-inch drills were sold last year?" asked the teacher. "Obviously people wanted quarter-inch drills," replied a pupil.

"Nope, not true," answered the teacher. "What they really wanted was quarter-inch holes!" •

Nostalgia . . . . . *Continued from page 63*

under the heavyweight FAI rules which began in 1957. One nice feature is the angular takeoff peg for contests which require ROG. Other notable designs to take a look at are Wheeley's Senator, Tatone's Frisco Kid (both simple, square-tipped designs), and Kneeland's Vapor Trails (which sported a Cumulus wing and stab on a simple diamond fuselage).

There's even room in the Nostalgia class for the gadgeteers and experimenters. Hank Cole had a flapper design in the 1956 Aeromodeller Annual, along with a model with VIT in the 1955-56 Zaic Yearbook. John Lenderman had a 1/2A with symmetrical airfoils in the 1953 Yearbook. As a matter of fact, a search through these Zaic yearbooks might make you the first kid on your block to fly a Hungarian Nostalgia model!

One thing you want to remember when building your Nostalgia design is to stick closely to the original construction. You're not trying to redesign or develop the original design, just fly it in the manner in which it was originally intended! This can be a hassle in some designs, since many of the most popular designs featured internal spars going through the center of the ribs. It can be a real pain cutting out slots from the middle of the ribs, but there are a few shortcuts you can take without bypassing the original construction. Ralph Prey prefers to cut a slot from the bottom all the way to the top of the slot. After the spar is inserted, he Hot Stuffs the small rib bottom pieces back into place to completely surround the spar. Another method might be to use cap strips on the bottom, so the spars could be glued to the cap strips, then the ribs placed over the spars. One way out of this on the Civy Boy is to build it with multiple spars, as shown in the 1953 M.A.N. article for the Civy Boy 61. (This version also used a simpler fuselage than on the Kenhi kit, more like that on the original Satellite.)

One nice thing about the Nostalgia event is that engines from that era are more available than are Old Timer ignition powerplants. There were a lot more engines produced then, and they are recent enough for a goodly number to survive in running condition. But the engine collector types are emerging from under their rocks and prices are rising rapidly, with some perfectly ridiculous prices being asked for Nostalgia engines. If you got rid of all your old "obsolete" engines (or don't want to risk losing them), there are some modern engines that meet the Nostalgia restrictions (plain bearing, non-Schnuerle types) and would be well-suited, as I'll point out later.

Original 1/2A Nostalgia engines are probably the hardest to come by. Progress in this engine size was rapid enough that older models were discarded and replaced as the new higher-powered models were introduced. Even if you have an old 1/2A model engine, the odds are that you haven't got any of the special glow heads required. However, all of the current Cox line of .049's are eligible for Nostalgia purposes, so there's no need to risk your precious Atwood in a Taft Trashmover.

Be warned, however, that there is a tremendous power difference between a modern TD .049 and the engines used on early 1/2A models. Check the engine shown on the plans against the 1/2A rpm chart, to find out how much power the original model used. A Nostalgia 1/2A design is a good place for those "cull" .049's that Cox should never have let leave the factory. A Cox 290 engine (on a Goldberg mount) or Babe Bee would be a perfect match for most of the smaller (under 200 sq. in.) Nostalgia designs. (If you're not sure about the amount of power a design can take, you can detune the engine by using low nitro fuel, an extra head gasket, or a less efficient prop.)

In the larger engine sizes, you shouldn't have as much trouble finding an authentic engine if you wish. If you can't, there are lots of modern substitutes that should do well. For FAI size models, you can use a TD .09, or any of the non-Schnuerle sport .15's such as the O.S.,

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This sealing iron makes finishing your model fast & easy. Works great with any covering. Features teflon-coated shoe, adjustable temperature, tapered edges, rounded sides, & pointed tip.

RETAIL $22.95 **NOW ONLY $15.98** **MBM313**

DREMEL No. 381 MOTO-TOOL KIT — 41% OFF

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RETAIL $79.95 **NOW ONLY $46.98** **MBM153**

MILLER No. 2017 SPRAY SET — 40% OFF

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RETAIL $89.95 **NOW ONLY $53.98** **MBM228**

QUADRA 2 CU. IN. ENGINE — 32% OFF

Develops 2 horsepower! An engine suitable for large models with its scale-like sound and realistic performance. Comes with muffler and mount. Runs on gasoline.

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DEVCON 5 MINUTE EPOXY IN ECONOMY 9 OZ. SIZE — 37% OFF

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RETAIL $7.95 **NOW ONLY $4.98** **MBM151**

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RETAIL $109.95 **NOW ONLY $68.98** **MBM154**

GOLDBERG FALCON 56 MK II — 39% OFF

A reliable, rugged, & easy-to-fly balsa trainer. Redesigned, it features a longer, wider nose & a strengthened wing with aileron hardware. 56" span. Requires a .19-.40 size engine & a 3 - 4 ch. radio.

RETAIL $54.95 **NOW ONLY $33.48** **MBM392**

HB .61 RC PDP BALL BEARING No.6300 — 31% OFF

This powerful, high quality ball bearing engine comes with a Perry carb and features Perry Directional Porting for increased power.

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LATRAX CORVETTE W/RADIO — 37% OFF

Won a 1st & a 2nd in the ROAR NATS!

Add 8 AA pen cell batteries to the radio, charge the car for 15 minutes, & you're ready to race!

THIS IS A FANTASTIC VALUE! Comes with a powerful 2 ch. radio (w/wheel stick) already installed, 6 cell nicad battery pack, & a quick charger. 16" length. Runs up to 30 mph! Electronic speed control.

RETAIL $199.95 **NOW ONLY $124.98** **MBM212**

GOLDBERG SKYLARK 56 MK II — 38% OFF

Extensively improved construction, strength, and flight performance! 56" span. Requires a .30 -.40 size engine and a 4 ch. radio. This fun-to-fly balsa sport plane has pattern capabilities. It makes a great low-wing trainer.

RETAIL $56.95 **NOW ONLY $35.48** **MBM181**

GOLDBERG GENTLE LADY — 28% OFF

A great way to break into the world of sailplanes! This simple-to-build kit flies slowly enough for a novice, yet is clean and efficient enough for competition. Requires a 2-3 ch. radio. Has a 2 meter wing span.

RETAIL $24.95 **NOW ONLY $17.98** **MBM481**

MIDWEST TAYLORCRAFT — 35% OFF

An easy-to-handle, realistic, aerobatic, RC trainer. This balsa kit features aluminum motor mount & landing gear, ABS cowl, & instruction manual. 55½" span. Requires a .29 -.45 size engine & 4 ch. radio.

RETAIL $64.95 **NOW ONLY $41.98** **MBM482**

CRAFT-AIR FIELD BOX — 33% OFF

Made of hi-density polyethelene, ready to use, lightweight, easy to clean, & practically indestructible. 22" long. Not a kit. Features a removable accessory well on the top & drawer in the side.

RETAIL $29.95 **NOW ONLY $19.98** **MBM148**

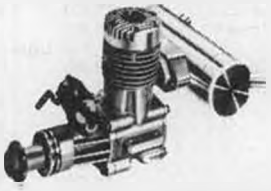
COX TRADEWINDS SAILBOAT READY-TO-FLOAT — 53% OFF

LOWEST PRICE EVER!

This new ready - built RC sailboat has a 60" height, and a 35.9" length. Requires a 2 channel radio. Easily sailed using one servo for rudder control.

RETAIL $169.95 **NOW ONLY $79.98** **MBM427**

K&B .21 RC SCHNEURLE W/MUFFLER (No. 8380) — 37% OFF



Features ABC cylinder and piston, ball bearings, and Perry Carb. Rugged, powerful, and dependable. No break-in period required.

RETAIL $80.00 **NOW ONLY $49.98** **MBM406**

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This rugged & stable airboat runs on water, dry grass, or snow. Requires a .40 -.60 size engine & a 2 ch. radio. 31" length. Mahogany & birch plywood construction.

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MBM417	Air Capital RTF FB-100	149.95	139.98
MBM105	Airtronics Aquila	79.95	55.98
MBM106	Airtronics Olympic II	54.95	38.48
MBM107	A-Justo-Jig Wing & Fuse Jig	59.95	43.98
MBM411	Associated RC 300 Car Kit	190.00	119.98
MBM113	Associated 6 Cell Car Kit No. 3012	102.00	69.98
MBM412	Associated 6 Cell - Asmb. No. 3024	119.50	79.98
MBM114	Badger 200-1 Air Brush Kit	35.00	24.48
MBM115	Badger 200-3 Deluxe Kit	45.00	29.98
MBM460	Bolink 1092 6 Cell Performance Car	130.00	84.48
MBM459	Bolink 1352 Econo Perform. Car Kit	99.95	69.98
MBM485	Bolink Performance Car w/2F	260.00	189.98
MBM123	Bridi RCM Trainer 40	58.95	39.98
MBM125	Bridi Dirty Birdy 40 - wood	64.75	45.28
MBM126	Bridi RCM Trainer 60	67.95	47.58
MBM127	Bridi Super Kaos 60	74.95	52.48
MBM454	Super Coverite 47"x15' - white	38.84	27.98
MBM132	Coverite Balsarite - 8 oz	3.50	2.58
MBM137	Cox RTF Cub w/Engine & Radio	121.95	74.98
MBM138	Cox RTF Cessna Centurion	79.95	48.98
MBM418	Cox RTF Piper Arrow	78.95	54.98
MBM139	Cox RTF Sportavia Trainer	99.95	69.98
MBM461	Cox Electric Sportavia	149.95	104.98
MBM518	Cox Medallion .049 RC Engine	21.95	12.98
MBM462	Cox RC Bee .049 w/Muffler	21.95	14.98
MBM134	Cox Tee Dee .049 Engine	27.95	14.98
MBM387	Cox Tee Dee .051 Engine	27.95	16.98
MBM486	Craft-Air Golden Eagle Sailplane-NEW!	109.95	69.98
MBM143	Craft-Air SD100 Sailplane	59.95	35.98
MBM146	Craft-Air Butterfly II	49.95	32.48
MBM142	Craft-Air Drifter II	19.95	13.98
MBM423	Craft-Air Piece O'Cake	24.95	17.48
MBM409	Craft-Air Upstart (3/16 inch)	17.95	12.58
MBM141	Craft-Air H.D. Hi-Start	49.95	32.98
MBM148	Craft-Air Field Box	29.95	19.98
MBM149	DAE Series IV Power Panel	38.95	24.98
MBM151	Devcon 5 Min. Epoxy - 9 oz	7.95	4.98
MBM487	Devcon 30 Minute Epoxy - 9 oz.	7.95	5.48
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MBM154	Dremel 572 Deluxe Moto Shop	109.95	68.98
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MBM416	Dremel No. 730 Disc-Belt Sander	99.95	59.98
MBM158	Dubro Kwik Fill Fuel Pump	10.98	6.98
MBM163	Dumas Atlas Van Lines U-1	60.00	38.98
MBM162	Dumas Big Swamp Buggy	42.00	25.98
MBM166	Dumas Hot Shot 21" - glass	80.00	51.98
MBM165	Dumas Hot Shot 24" Tunnel Hull	37.00	23.98
MBM448	Dumas American Enterprise	85.00	54.98
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	Enya Engines	Call For Low Prices	
MBM488	Flitecraft RTF Cardinal Sport	129.95	89.98
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MBM168	Fox .15 RC Schneurle	39.95	23.98
MBM169	Fox .19 RC Engine	41.95	24.98
MBM170	Fox .25 RC Engine	41.95	24.98
MBM388	Fox .35 U/C	31.95	19.98
MBM171	Fox .36 RC	44.95	26.98
MBM489	Fox .40 RC Schneurle w/MK-X Carb.	64.95	38.98
MBM478	Fox .40 BB RC Schnl. w/MK-X Carb.	79.95	47.98
MBM490	Fox .45 RC Schneurle w/MK-X Carb.	64.95	38.98
MBM457	Fox .60 RC Eagle w/MK-X Carb	79.95	49.98
MBM177	Fox 1.2 Cubic Inch Twin	250.00	174.98

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MBM501	Fuji .40 RC BB Schneurle w/Muffler	79.95	52.98
MBM481	Goldberg Gentle Lady Sailplane	24.95	17.98
MBM392	Goldberg Falcon 56 MK II	54.95	33.48
MBM181	Goldberg Skylark 56 MK II	56.95	35.48
MBM182	Goldberg Skylane 62	74.95	47.98
MBM183	Goldberg Senior Falcon	74.95	46.88
MBM403	Goldberg P6E Curtiss Hawk Bipe	52.95	33.58
MBM184	Goldberg Handi-Tote	19.95	13.98
MBM476	Goldberg Super Jet - ½ oz	4.50	2.98
MBM186	HB .15 RC BB w/Muffler	45.50	29.98
MBM187	HB .25 RC BB w/Muffler	59.00	39.98
MBM190	HB .40 RC BB PDP	89.00	59.98
MBM189	HB .50 RC BB	80.50	54.98
MBM191	HB .61 RC BB PDP	125.50	86.98
MBM430	Hi-Flight Mirage	69.95	44.98
MBM465	Higley's Smoke System	19.95	14.98
MBM192	Hobbypoxy Formula 2 Epoxy - 8 oz	4.75	3.28
MBM193	Hot Stuff Adhesive - ½ oz	3.95	2.78
MBM502	Hot Stuff Adhesive - 2 oz	12.00	7.38
MBM503	House of Balsa .40 Pitts S-2	109.95	76.98
MBM477	Jemco Fun Scale Mustang	44.95	33.68
MBM198	Jensen Das Ugly Stick	69.50	53.58
MBM405	Jet Hangar .40 Ducted Fan	69.95	56.98
MBM424	K&B .19 RC	60.00	35.98
MBM206	K&B .21 Inboard Marine w/Muffler	81.00	49.98
MBM205	K&B .21 Outboard	110.00	65.98
MBM406	K&B .21 RC Schneurle w/Muffler	80.00	49.98
MBM201	K&B .40 RC Pressurized	105.00	59.98
MBM438	K&B .40 RC RE Schneurle w/Muff.	110.00	69.98
MBM207	K&B .40 RC Sport Marine	82.50	49.98
MBM199	K&B .45 Schneurle Marine 9080	125.00	74.98
MBM202	K&B .45 RC Schnl. w/Pump 9100	160.00	95.98
MBM203	K&B .61 RC w/Muffler	96.50	59.98
MBM204	K&B .61 RC w/Muffler & Pump	125.00	76.98
MBM419	Kraft RTF Electric Cardinal	99.95	59.98
MBM420	Kraft Electric Motorcycle	79.95	59.98
MBM209	Lanier Transit	49.95	31.98
MBM210	Lanier Caprice	75.95	46.98
MBM407	Lanier Comet II	65.95	41.98
MBM453	Lanier Jester	75.95	46.98
MBM212	Latrax Corvette w/Radio	199.95	124.98
MBM213	Leisure 1/8 Dune Buggy	199.95	159.98
MBM432	Mark's Bird of Time Glider	59.95	38.98
MBM214	Mark's Models Wanderer 72"	23.95	15.98
MBM217	MEN Trainer .15 -.25	36.95	27.68
MBM482	Midwest Taylorcraft - NEW!	64.95	41.98
MBM221	Midwest Little Stik	35.95	23.38
MBM222	Midwest Cardinal ARF	38.95	24.98
MBM223	Midwest Super Chipmunk	39.95	25.98
MBM224	Midwest Sweet Stik	46.95	28.98
MBM226	Midwest Attacker	47.95	29.98
MBM504	Midwest RK-208 Ducted Fan	54.95	39.98
MBM228	Miller No. 2017 Spray Set	89.95	53.98
MBM505	Miller No. 2134 Spray Set	103.95	61.98
MBM506	Model Products Headlock	2.95	2.38
MBM410	Monogram RC Electric Leopard Tank	49.95	24.98
	Monokote Reg. and Trans. Colors	9.90	5.98
	Monokote Metallic Colors	11.70	6.98
MBM507	MRC RC Rough Rider - NEW!	117.95	84.98
MBM230	MRC RTF Cessna w/Enya .35 RC	449.95	277.48
MBM231	MRC RTF Cherokee w/Enya .40 RC	499.95	314.98
MBM229	MRC RTF Hawk Trainer w/Enya .15	99.95	74.98

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MBM442	MRC Lamborghini Countach LP500S	77.98	45.98
MBM443	MRC Martini Porsche 936 Turbo	68.98	39.98
MBM508	Bud Nosen Trainer - 8.5'	79.95	57.58
MBM509	Bud Nosen Aeronca Champ - 9'	99.95	71.98
MBM421	Bud Nosen P-51 - 8.5'	169.95	119.98
MBM444	Bud Nosen Big Stick - 8.5'	129.95	93.58
MBM238	Ohio Superstar Softglas - Qt	10.95	8.78
MBM240	OPS .65 RC Marine w/Tuned Pipe	246.00	179.98
MBM510	Orline Victory Stick - NEW!	49.50	35.98
MBM455	O.S. Max .20 RC w/Muffler	46.95	31.98
MBM446	O.S. Max .40 RC w/Muffler	84.95	59.48
MBM469	O.S. Max .45 FSR RC w/Muffler	119.95	83.98
MBM519	O.S. Max .25 RC w/Muffler	49.95	34.98
MBM470	Peerless 1/12 Electric Porsche	110.00	49.98
MBM511	Pica Gluit Aliphatic Glue - 12 oz	3.19	2.58
MBM255	Pica Waco	99.95	63.98
MBM251	Pica Cessna 182	109.95	66.98
MBM253	Pica T-28B	99.95	59.98
MBM256	Pica Duelist 2/40	89.95	59.98
MBM260	Quadra 2 Cu. In. Aircraft Engine	139.95	94.98
MBM262	Robart Incidence Meter	19.95	13.98
MBM471	Robart Super Pumper MK IV	24.95	17.98
MBM265	Rhom 2 Gear - mains	87.00	56.58
MBM266	Rhom 3 Gear - firewall	125.00	79.98
MBM267	Rhom 3 Gear - flat mount	125.00	79.98
MBM268	Royal Photocell Tachometer	39.95	33.98
MBM513	Royal B-17 Flying Fortress	169.95	135.98
MBM272	S&O Battery Tester	29.95	19.98
MBM514	Semco 202FS Muffler (.20 -.40)	13.95	9.98
MBM515	Sig Cessna Skyhawk 172 - NEW!	89.95	66.98
MBM415	Sig Beechcraft Bonanza	77.50	54.98
MBM275	Sig Piper J-3 Cub	49.95	35.98
MBM516	Sig Kadet Junior	34.95	25.98
MBM276	Sig Kadet Trainer	43.95	31.68
MBM279	Sig Kavalier	49.95	35.98
MBM277	Sig Kougar MK II	52.50	37.78
MBM278	Sig Smith Miniplane	59.95	42.98
MBM285	Slimline Std. Muffler for K&B .35-.40	9.95	4.98
MBM517	Sonic GR-3A Retract System	59.95	41.98
MBM304	Sonictronics No.1250 12v. Fuel Pump	16.95	12.68
MBM431	Spickler Quickie 500	43.95	32.98
MBM295	Sterling Fledgling	48.95	29.98
MBM296	Sterling ½A Corsair	35.95	22.98
MBM305	Sullivan Electric Starter	38.95	24.98
MBM306	Sullivan Deluxe Starter	41.95	27.28
MBM472	Sullivan 24 v. Electric Starter	49.95	33.48
MBM452	Supertigre X-11 RC Schnl. w/Muffler	45.95	31.98
MBM 307	Sureflite Skylane 182	44.95	28.98
MBM 308	Sureflite All Foam J-3 Cub	44.95	28.98
MBM 310	Sureflite Spitfire - foam	44.95	28.98
MBM 259	L.R.Taylor Power Pacer 9.6 v	59.95	46.98
MBM 390	L.R.Taylor Multi-Charger	24.95	19.98
MBM 408	L.R.Taylor Super Power Panel	89.95	69.98
MBM 425	Top Flite Contender 40	54.95	35.98
MBM 316	Top Flite Contender 60	62.95	39.98
MBM 320	Top Flite F4U-1A Corsair	99.95	59.98
MBM 473	Top Flite F8F Bearcat	99.95	59.98
MBM 315	Top Flite Freshman Trainer	52.95	34.38
MBM 314	Top Flite Heat Gun	32.95	21.98
MBM 313	Top Flite Sealing Iron	22.95	15.98
MBM 413	Top Flite Trim Seal Tool	15.95	11.98
MBM 311	Top Flite 10x6 (6) Super Maple	9.00	6.28
MBM 321	Tower RC Long Plugs - 6 plugs	8.94	5.48
MBM 322	Tower 12 v. Starter Battery - wet	25.95	12.98
MBM 323	Tower 12 v. Battery Charger	13.95	6.98
MBM 439	Webra .61 RC Schneurle (speed)	229.80	124.98
MBM 440	Webra .91 RC Schneurle	268.35	149.98
MBM 333	X-Acto No. 5083 Dlx. Knife Chest	9.29	6.98
MBM 334	X-Acto No. 5087 Knife & Tool Chest	34.95	22.98
MBM 337	Zinger Props 10x6 - 6 each	8.40	5.88
MBM 338	Zinger Props 11x7 - 6 each	9.60	6.68

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Radio Sale!

MODEL	NOW ONLY	STOCK NUMBER
TOWER HOBBIES	TOWER HOBBIES	TOWER HOBBIES
6 Channel w/2 KPS-14II Servos	$169.95	MBM397
6 Channel w/3 KPS-14II Servos	194.95	MBM398
6 Channel w/4 KPS-14II Servos	219.95	MBM339
6 Channel w/4 KPS-15II Servos	229.95	MBM340
Tower KPS-14II Servo	25.00	MBM399
Tower KPS-15II Servo	25.00	MBM480

THIS SALE IS NOT RETROACTIVE

KRAFT	KRAFT	KRAFT	KRAFT	KRAFT	KRAFT
KP-2AW (Wheel) w/14IIA's		$149.95	$101.98		MBM344
KP-2AW (Wheel) w/15IIA's		155.95	105.98		MBM345
KP-2A (2 Stick) w/14IIA's		149.95	101.98		MBM346
KP-2A (2 Stick) w/15IIA's		155.95	105.98		MBM347
KP-2AS (1 Stick) w/14IIA's		149.95	101.98		MBM348
KP-3AS w/KPS-14IIA's		164.95	109.98		MBM433
KP-4A w/KPS-14IIA's		329.95	209.98		MBM350
KP-4A w/KPS-15IIA's		341.95	218.98		MBM351
KP-6A w/KPS-14IIA's		359.95	229.98		MBM352
KP-6A w/KPS-15IIA's		371.95	237.98		MBM353
KP-5C w/14II's or 15II's		414.95	299.98		MBM354
KP-5CS w/14II's or 15II's		424.95	305.98		MBM355
KP-7C w/14II's or 15II's		549.95	389.98		MBM356
KP-7CS w/14II's or 15II's		559.95	399.98		MBM357
KPS-14II Servo		44.95	32.98		MBM358
KPS-15II Servo		44.95	32.98		MBM359
KPS-18 Servo (Super Mini)		59.95	47.98		MBM360
KPS-14IIA Servo		39.95	27.98		MBM361
KPS-15IIA Servo		42.95	29.98		MBM362

FUTABA	FUTABA	FUTABA	FUTABA	FUTABA
FP-2GS	109.95	74.98		MBM363
FP-2F w/S-7's	149.95	98.98		MBM364
FP-2F w/S-22's or 23's	134.95	89.98		MBM365
FP-2E w/S-7's	149.95	98.98		MBM366
FP-3S w/S-23's	144.95	94.98		MBM368
FP-3S w/S-20's	169.95	109.98		MBM369
FP-3FN w/S-22's or 23's	219.95	139.98		MBM383
FP-4FN w/S-23's	289.95	179.98		MBM370
FP-4FN w/S-16's	319.95	199.98		MBM371
FP-5FN w/S-23's	319.95	199.98		MBM372
FP-5FN w/S-16's	359.95	219.98		MBM373
FP-6FN w/S-23's	339.95	209.98		MBM374
FP-6FN w/S-16's	369.95	229.98		MBM375
S-7 Servo	39.95	29.98		MBM379
S-16 Servo	39.95	29.98		MBM378
S-23 Servo	29.95	22.48		MBM483

MRC	MRC	MRC	MRC	MRC	MRC	MRC	MRC
No. 2000 2 Ch. w/MR-12's				99.98	72.98		MBM474
No. 4000 4 Ch. w/MR-12's				249.95	169.98		MBM475

SANWA	SANWA	SANWA	SANWA	SANWA
No. 8020 2 Channel	99.95	69.98		MBM380

Enya, or Fox models. The best power-to-weight ratio, if your design can handle the power, would come from a TD .15, which can also swing a big prop. It would perk up the performance of any of the old .19-.23 designs, but these engines are a bit hard to find since production ceased. Other replacements for the old greenhead Torp .19 would be the O.S. (non-Schnuerle) .25 and the Fox .19 and .25. (The O.S. .25 on an AB Spacer is a particularly potent combination to reckon with!)

The standard engine for Class B and C in the Nostalgia era was the Torp .29 and .35. Since these were good all-around engines for control line and R/C, many examples have survived. The Johnsons appeared shortly after the 1956 cutoff date, but offer good reliable power. (Those that have survived are likely to be in good condition, since I can't remember having one that wore out!) Enya, O.S. Max, and Veco also made some very usable machinery back then.

The K&B tradition of good plain-bearing .35 engines has been kept up. The old greenheads were revived shortly as the Stallion .35, and even now, the factory offers the "Series 75" No. 7860 PB engine, which your dealer can order for you if not in stock. The Testors Series 21 engines are some to seriously consider, if you're going to buy a new engine. These run well, and don't require too much break-in, since they're ringed. Bill Netzeband claims the .35 responds readily to a little polishing. He polishes (to a mirror shine!) the cylinder bore in the crankcase, the wrist pin, crank pin, crank barrel, and main bearing. He also laps the lower face of the ring to a high shine and dead flat, taking care not to push any slivers or dirt into the ring groove on reassembly. Then pull the venturi and use pressure for maximum rpm. One thing to note is that these engines were set up to extract maximum power from up to 10% nitro; they don't respond favorably to hotter mixes, so don't try. The only disadvantage might be the slightly higher weight, but some short-nose designs like the Civy Boy need a heavy engine anyway.

The easiest way to get started in Nostalgia is with a good 1/2A, like the Spacer. If you've built a Starduster, then Sal's Spacer should be familiar, since the flying surfaces use the same construction (I think the ribs are the same, too!). Get out some 8 to 12 lb. balsa (same as used in the kit) and start getting Nostalgic again! •

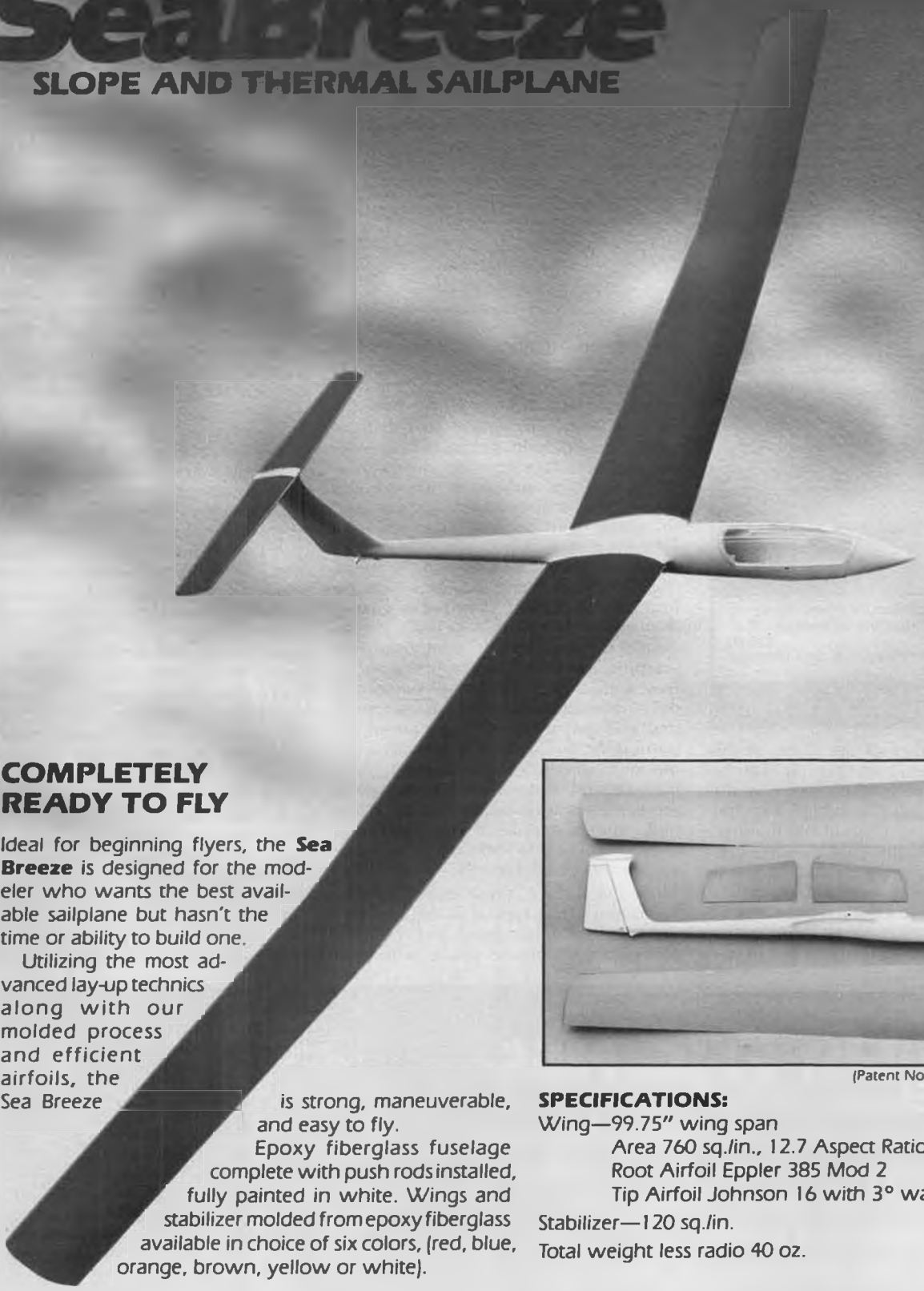
1 to 1 . . . . . *Continued from page 23*

out behind my place of business," where he could fly it. The "place of business" was not far from a nearby established site. Hopefully, the shop owner and I convinced him that the use of the public site and the help of an experienced pilot were most important.

We have two large clubs in St. Louis which have lost fields during the past

SeaBreeze

SLOPE AND THERMAL SAILPLANE

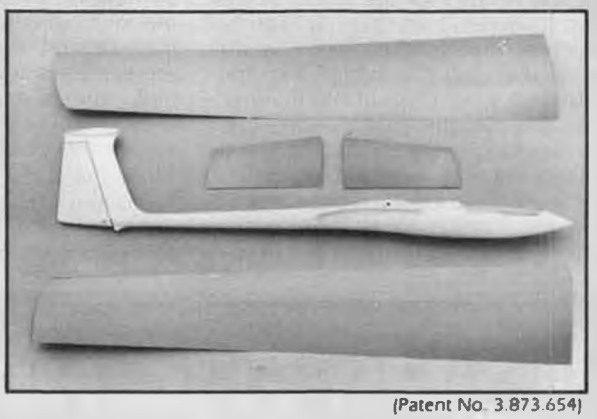


COMPLETELY READY TO FLY

Ideal for beginning flyers, the **Sea Breeze** is designed for the modeler who wants the best available sailplane but hasn't the time or ability to build one.

Utilizing the most advanced lay-up technics along with our molded process and efficient airfoils, the Sea Breeze is strong, maneuverable, and easy to fly.

Epoxy fiberglass fuselage complete with push rods installed, fully painted in white. Wings and stabilizer molded from epoxy fiberglass available in choice of six colors, (red, blue, orange, brown, yellow or white).



(Patent No. 3,873,654)

SPECIFICATIONS:

Wing—99.75" wing span
Area 760 sq./in., 12.7 Aspect Ratio
Root Airfoil Eppler 385 Mod 2
Tip Airfoil Johnson 16 with 3° washout

Stabilizer—120 sq./in.

Total weight less radio 40 oz.

Just install your radio and go fly!

UNPAINTED..... $169.95
PAINTED..... $229.95

DEALERS: Contact one of these fine distributors who handle our kits:
• A/L DISTRIBUTORS • GREAT PLANES DISTRIBUTORS • MIDWEST MODEL SUPPLY
• TECHI-MODELS • B. PAUL DIST. • PAN AMERICAN • WORLD ENGINES
ADDITIONAL DISTRIBUTORS WANTED

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R/C AIRCRAFT

485 EASY ST., SIMI VALLEY, CA 93065 (805) 527-4004

two years. Neither of the clubs, at this writing, have replaced them. It must be made clear that neither loss was the result of the club's activities, for they operate in a most responsible manner. But the fact remains that they are presently seeking new areas. The task becomes very difficult in a large, metropolitan area when a distance needs to be kept from already established sites. Therefore, the complications that develop from encouraging the unwary newcomer to fly anywhere is harmful to modeling.

I realize that most or all ready-builts include the information to the purchaser to seek help, get an FCC license, etc., but let's face it; often this material goes unread or unheeded, while it was the colorful, snappy ad that first grabbed the person and becomes the "sell."

In much the same vein, I was interested in a recent ad called to my attention by a modeling friend which he found in an airplane oriented magazine (but *not* a modeling magazine). It suggested that you could "pilot your own warbird," leaving the impression, at least with a large number of persons at the club meeting where it was discussed, that this was a snap and required no training or skill. (This was a ready-built model, complete.) This brought guffaws from several of the club members who are excellent scale builders but are just now, after a couple of years of flying, really beginning to feel capable of flying a scale model adequately.

On the surface, these examples may be passed off as typical of the way any product is merchandised, and the general public should be aware of it. I am not certain that this constitutes a legitimate excuse, however. The general public is *not* aware of the capabilities or limitations of our models. As an example, consider the recent "Hawaii Five-O" program. Several modelers called me, incensed at the implications and actual visual impressions the program left. They were upset because modeling was associated with a criminal act. *I* was upset primarily because of what the actor-modeler caused the model to do. Indeed, the day following the program, I had numerous inquiries both from faculty and students at my school as to the realism of the events portrayed. I simply related that I don't think I would be able to pilot a model airplane as far away from me as the movie pilot did, land it on a sidewalk, taxi up to a smoke-filled hole in a wall, take off in 30 feet as they mentioned in the dialogue, and fly it back to a rooftop while my buddy used *binoculars* to view the action. Most people I know, including myself, have trouble hitting the 24-foot wide runway when we're standing beside the darn thing! So much for realistic R/C operation. Come to think of it,.I never did catch how they managed to swap models in the later chase scene either.

A last thought, dear to the hearts of many, is size. I know that I am speaking now of a very sacred and increasing-in-popularity cow, but I feel duty-bound to suggest moderation. Almost two years ago, I suggested in this column that I could agree very realistically with the large model movement's arguments concerning safety, etc. I agree they do fly better, generally. I agree they may not pose any more impact potential, generally. I agree they are visually easier to fly and react slower, generally. But I still steadfastly maintain (and maybe more so now) that our biggest concern comes in the field of the general public's conception of our hobby/sport. Size is important to their understanding of our activities. They are *not* tuned to the sizes and weights we are creating. Certainly, they enjoy seeing them just as they enjoy

speed. But a full understanding of it is something else. A 1/3 or half-size model may not have any great impact on their thinking until they see it, especially in an indoor model show where it is displayed. Then when they visit the field and especially when they see *any* model crash and think about what might happen if the "big one comes down," some serious concerns are implanted. *I* know that the 8 lb. pattern plane going 100 mph or the 11 lb. scale model going 75 mph might be just as dangerous, but I don't think the *public* perceives it that way. Witness, if you will, the inaccurate statements concerning size, weight, and construction materials made in a newspaper which followed a fatal modeling accident some time ago.

The question we need to ask ourselves is whether there is a limit. New products include single engines or engines in tandem which generate 5-1/2 hp. Are we going to see 30-50 lb. models going 70 mph? How many of those four-engine bombers weighing 120 lbs. are there going to be in the world? Was it *only* a rumor about someone in this country working at R/Cing a full-scale J-3 Cub?

I do not wish to be a purveyor of doom, nor do I wish to trample the toes of the industry or fellow modelers who are pursuing their own interests. I *do* think, however, that it is incumbent upon all of us to do more to police our own ranks. Responsible modelers recognize the problems inherent in all fields of endeavor. They recognize the new techniques and skills, for instance, which are necessary to build large. But they must also be cognizant of the fact that others with less expertise will emulate them, and the result becomes a very unsafe model arriving at the field. Most smaller models are quite overbuilt and will stand much greater stresses than encountered, but do we have the knowledge to know this about large models? How about the newcomer who heads in that direction? Remember, he is not regulated in any way!

And a last point: Will regulation come? If so, from what source? Will it be the modelers, or. . .?

MISCELLANEOUS THINGS AND STUFF

Vern Zundel, an old friend from St. Louis, has passed on some products of his company called Classic Flying Machines. Vern is a very innovative modeler who is remembered for scale models of 1910 vintage which appeared in various magazines some years ago. Elsewhere in this column, you will find pictures of some of CFM's products resting gently in my daughter's hand.

These products are not to be taken "lightly," since they can provide not only some very nice realism to your model but safety as well. They range from very small systems to mount in the transmitter to indicate that it is on and to indicate low voltage, to various lighting sources for increased scale realism. The lighting systems include two and four-light navigation systems as well as strobes which are very realistic in operation. Aside from a single flashing strobe, you'll find dual strobe systems in both simultaneous and alternating modes.

The systems are quite small and operate from a 9-volt battery. The prices range up to about $15. Each system comes with a generous amount of wire for installation, battery clip, and are ready to install. Contact Classic Flying Machines Co., 4956 Tiemann Ave., St. Louis, MO 63123 for a complete listing and current prices.

Photos in this issue show some very nice models viewed at the recent Spirits of St. Louis Club Build-a-Plane contest and dinner. A generous number of scale aircraft were judged as per AMA rules by a panel of three judges, including F/F-R/Cer Tom Stark, shop owner Clarence Idoux, and yours truly. Phew! What a job! The models were extremely well done and most had very good documentation. In addition, the task was further complicated when you realized that no flying would take place, so the winners were chosen only as a result of static scores. In addition, there were several of the same type of aircraft. In fact, Germany darn near could have won the war that evening. There were three ME-109s, a Focke-Wulf, and a Komet, to be challenged by a P-47 and a Corsair.

The winners were Don Allen with a very impressive Komet; second, Don Holting with an ME-109; third, Don Babbett with a Focke-Wulf; and fourth,

Mike Holting with another ME-109. I'm looking forward to seeing all the models show up at our local contests since they seem to be very competitive models.

Another German plane appears in pictures this month in the form of a soon-to-be or just-released kit offering. The ME-109E is produced by Scale Propeller Crafts, P.O. Box 6623, Orange, CA 92667. The kit has many fiberglass parts including fuselage, fin, cowl, spinner, and accessories such as blisters, etc. Complete details are included for the scale cockpit shown, and an Aero Publication booklet is provided. With a 62-in. span, it's probably for a .60. Price is $129.95.

'Nuff for now. I'll try to remember no sermons next month. •

Halt-A ..... *Continued from page 41*

weight back off. Sand out all the mistakes and saw gouges you can and fill the rest in. Airfoil shape is only super-critical on the ultimate competition models; for sport flying, the prime requisite is that the airfoil be smooth, especially the upper forward third of the wing.

For finishing, I usually use clear epoxy paint outside the fuselage to the middle of the wing saddle and on the inside of the tank and radio compartments. After covering, I repaint the engine compartment and about 1/2 inch inside the wing saddle area to really seal against raw fuel and hot oil lifting the seams and edges of Monokote or other films.

Think out your equipment installation ahead of time so you can cut any necessary openings while they are still accessible. I have found that fuselage front ends can often be narrowed slightly with the equipment that I use. Most kits are designed to accept just about any radio, but small equipment can give you a chance to reduce weight and drag.

Try a complete test balance of your bare structure with all equipment taped or rubber banded in place. You may find that lightening holes should be cut into the tail surfaces or aft fuselage. There is at least a three times weight penalty in the nose weight required to balance each bit of excess tailweight.

In conclusion, one prime ingredient to kit model success is the knowledge that just about any kit can be made into a beautiful and flyable model if you make an effort to analyze and correct the problems as you go along.

On to some models! First up is the "Space Squirt" from Sterling. They have come up with a futuristic speedster for the ground hugging set. This is actually a wheeled car loosely styled after one of those jet speed machines they run on the dry lakes here in California. Much of the construction is vacuum formed plastic, so the assembly

time is minimal. Single channel, tethered, and free running are possible modes for this vehicle, but throttle/brake would be nice to have too!

MRC is now selling a line of foam scale models for your .10 size engines. One is the Me-109 with (what else?) an Enya .09 engine. The Enya has finally been redesigned to put the exhaust on the right side like the rest of the sport engines in the world. There is plenty of room in this model for your four channel system. The show model was urethane painted, and looked good. The airfoil is semi-symmetrical, so you get real performance out of this easy building model.

The engine in the photo is Cox's R/C Bee .049. I quoted from the catalog some time ago that this would be a rotary valve engine. It isn't. I talked to some old friends to get the real story, and it seems that some early prototypes were made based on the old RR-1 design concept of rear rotary drum intake porting, but the cost of the engine would have been completely out of line with the target market. The Tee Dee .049 would have been cheaper and still had higher performance, so the idea was dropped. The engine now uses the time-honored reed valve induction system. It does, however, have the promised clunk tank feature built in, so you can have a one-piece, throttled, muffled, inverted-flight capability sport engine.

The next photo shows the entire Cox engine line as displayed at their booth at the HIAA convention in Anaheim. Close examination will show that the Tee Dee .010 and Conquest .15 are indeed no longer with us. Too bad, they were the best of their kind!

As long as we are on a Cox kick, here is a photo I received of the Warlock .05. Pretty, clean, light, and that super kit quality you expect from Airtronics. What else could you ask for?

By the way, for a list of very interesting plan sets from the *Aeromodeller* collection, Jim Newman can fix you up. Jim, designer of many models for Midwest, has struck out on his own and is the American agent for the Plan Service. He'll send you a catalog for 60¢ or answer questions if you include an SASE. The plans include all phases of models, and a large number of them are small aircraft due to the more limited flying space in England. •

Charger . . . . . *Continued from page 39*

This time it took 97 and 93 minutes for the lights to go out. The discharge times were 92 and 112 minutes, or 77% for the receiver and 93% for the transmitter.

At this point you might be asking, why not design the charger so that it would always charge the battery to 100% of its capacity before cutting off? The reason for this is the same reason that you always risk cooking your batteries when using a conventional fast charger. The battery voltage vs. charge time for a nickel cadmium battery is shown in figure 3. You will note that the voltage initially rises very fast, levels off for awhile and then rises fast again as the battery approaches full charge. When the battery goes into overcharge, the voltage decreases again and this is where the problem begins. This voltage depression in overcharge is accompanied by rapid increases in both cell temperature and pressure. This causes further voltage depression, which causes the battery to draw more current which further increases the pressure and temperature, etc. This chain reaction creates enough pressure to open the cell's safety vent, allowing electrolyte to escape, and eventually the cell is destroyed.

It might seem that it would simply be necessary to set the charger's cut-off point at or near the peak, but this is not reliable because the height and voltage level of the peak varies with temperature and from cell to cell. Cells designed for high rate charging are available (G.E. "Power-Up 15" cells). These cells can tolerate some overcharge at a high charge rate, but they require special charging systems which closely monitor both cell voltage and temperature. This is too costly and impractical for our R/C systems. The only alternatives are to either slow charge (or quick charge with some systems which are supplied with batteries designed for it) or to provide enough safety margin in our fast charge

systems to ensure that the charger never charges the batteries over the peak of the curve in figure 3. The M.E.N. RC System Charger does this and provides added protection by providing some internal temperature compensation, which lowers the cut-off point when the room temperature where the charger is being used is higher.

Next, for a comparison to the way I've been charging, I fast charged (not with the M.E.N. unit) my receiver and transmitter batteries for 35 and 45 minutes respectively from a 50% discharge. The discharge times were 112 minutes for the receiver and 117 minutes for the transmitter, or 93% and 98% of capacity. You will note that these are slightly better times than I received with the RC System Charger, but please bear in mind that charging in this manner required my complete and constant attention.

The RC System Charger is best described as a split-rate fast charger. With a high quality 500 mah battery pack, its initial charge rate is about 500 ma. This tapers off to about 300 ma and then switches to a slow charge rate of about 40 ma.

The manufacturer states that batteries from 250 mah to 4 Ah may be charged. It should be noted, however, that the charger's fast charge rate is closer to a slow charge rate for a 4 Ah pack, so you won't gain much time advantage for this size pack. Also, it should be observed that the slow charge rate is twice the recommended slow charge rate for a 250 mah pack. Unless you are sure that your 250 mah pack is a quick charge battery, you should not leave it on long after the lights go out.

This type of charger is probably the best all-around means of charging your batteries and maintaining them in peak condition. The fast charge mode can salvage at least a few flights from what might have been a lost afternoon of flying, if you forgot to charge or left your system on. Otherwise, with the system charging your packs to as much as 95% of capacity in about 30 minutes from a partial discharge, an additional two or three hours of slow charging will get you a fully charged pack.

In addition to the advantages of fast charging, the desirability of slow charging should not be overlooked. Consistently charging your batteries with only a fast charger allows imbalances to develop in the cells, and an occasional extended slow charge should be used to equalize the cells.

Batteries which are not cycled occasionally tend to build up byproducts which limit the charge acceptance of the cells. Only cycling the cells a few times with a full discharge and extended slow charge will allow you to get the most from your batteries. When I first started using the charger I was only getting to 60 or 70 percent of capacity when the lights went out. After four or five complete cycles I noted a considerable improvement in the cells.

Priced at $36.95, the Automatic RC System Charger looks like a good, all-around way to go in order to keep your batteries at their peak. •

Electric . . . . . *Continued from page 52*

An example of maximum flight time is the 30/12 motor, which will turn an 8x4 prop at 12,000 rpm on 12 cells, drawing 12 amperes. The flight pack weight would be about 28 ounces with 1.2 Ah cells, and the flight time about eight minutes. If, on the other hand, you wanted more power, 16 cells on the Keller motor would deliver 14,500 rpm on the 8x4 prop, with a four to five minute flight time.

There are three motor types in the Keller line: the 100 series, the 50 series, and the 30 series. These are roughly equal to .60, .30, and .20 size glow motors. The number after the series type refers to the nominal voltage of the windings, with 50/24 meaning a 50 series motor wound for 24 volts. In fact, as previously mentioned, the voltages can be varied quite a bit because of the big commutator and the magnets. The most popular motors in the series are the 50/24 and the 30/12. The table gives you some idea of the motor performance:

KE 100/35

PROP	RPM	NO. CELLS	CURRENT
14x6	7,310	22	19.6

12x6	8,830	25	16.8
11x6	10,500	30	17.7
KE 50/24			
14x6	5,400	12	19.5
12x6	6,110	12	13.4
	7,920	16	24.0
11x6	7,250	14	13.5
	9,570	20	26.0
10x6	9,190	16	15.7
	10,340	20	24.0
9x6	11,110	20	17.4
KE 30/12			
9x6	8,950	10	20.0
8x6	9,710	12	18.7
	11,030	12	18.7
7x6	10,300	10	10.0
	11,710	12	12.6
	13,300	14	17.0

There are sixteen different motor types in Heinz Keller's catalog, with tables like the one above, so if you want more information, write to Keller Motoren, 6451 Neuberg 1, Vogelsbergstrasse 3a, West Germany.

I didn't get all the photos back from the Astro Flight Electric Championships until recently, so here at last is a photo of Steve Neu's twin Astro 020 Cessna Conquest, which won first in scale and first in pattern. At 30 ounces and 200 square inches, the motto "Wie ein floh, aber OHO!" applies, that is, "Like a flea, but oh boy!" This was the motto on the ME-163 rocket plane! It is a very impressive performer; maybe some day Steve will publish some plans so the rest of us will have a chance.

Last but not least, a few months ago I published John Szary's rules for Sportsman class Astro 05 racing. Somehow, a line got left out, line 3.2.5.: "Battery. Standard Astro 05 battery shall be used." This rule is important, because it sets the limits at eight cells (ten volts). Otherwise bigger packs could be used, and the fun aspect would start to disappear.

The final line this month is the photo of Craig Christensen getting ready to fly his Bird of Time in the cold Minnesota winter. There is a man with courage . . . at least, he reports, until his hot coffee runs out. The Bird of Time uses an Astro 15 to get to high start altitude in one minute, and like all BOT's, glides beautifully. The stabilator is enlarged, and this helps on the control. Flying weight is about four lbs. Till next time, fly high!•

Soaring . . . . . *Continued from page 30*

R/C sailplane and the immediate terrain. Your task is to land on the marked strip or spot. You first see the plane at 300 feet away and 100 feet high. It responds to your control and moves through descending circles as a floater or a highly loaded FAI ship, your choice. You might want to add some wind. Now you'd better use S-turns instead of circles. You can add some crosswind and turbulence. Add terrain features, obstacles, or even a slope. You can have any level of difficulty you desire. What a great training device!

The trouble is, it might be too enjoyable and replace the real thing. Who wants to go out flying in marginal weather? Why not stay home and soar? I can see it all now. The contest is scheduled for Sunday afternoon at home. The C.D. decides on the events: a two-minute precision landing in dead air, then a seven-minute precision duration, with thermals programmed in at random times and places. All you have to do is find them. Then, there is an aerobatic event with the same ship . . . or you can instantly switch the dynamics to that of an aileron/elevator/rudder craft more nearly in tune with this event. You could have a "one design" contest, where each pilot flies the very same dynamics. Or you might allow each pilot to try some interesting new design features (variable camber, sweep, etc.) . . . even dynamics that could not be realized in the real world. Your ship could be lighter than air whenever reaching an altitude of less than, say, five feet, for example. You could hold the contest "on the moon" with the gravity cut by a major factor and an "atmosphere" of whatever density you desire. Think of the possibilities!

I can hear Dave Freund shudder at the thought of automated control. You see, Dave is a fundamentalist. He believes in direct command of the control surfaces. His flying wing does *not* have a mixer. Each hand directly controls an elevon. Pulling both sticks outward causes pitch up. Pushing the sticks toward each other yields pitch down. I'll let *you* figure out

what it's like to perform a roll with this beast! Dave is remarkably agile in commanding his critter off the slope at Torrey Pines. He can turn using differential drag or bank. Several times he's asked me to take over the controls, but so far, I've avoided this option (and what would surely be the consequence). Here's wishing Dave many more happy hours of flying his wings at the gut level.

Another challenge comes in the form of the "Sparrow," a 36-inch span, ABS plastic fuselage and foam wing bird available from Specialty Models, P.O. Box 1819, Canyon County, CA 91351.

Doug Klassen and Chris Benjamin of the 54th Aero Squadron Hobby Shop (18930 Soledad Canyon Rd., Canyon Country, CA 91351) have been flying this fun slope soarer around the California countryside. Its all-up weight is 12 ounces, using a 225 mah battery pack and micro receiver and servos from Cannon. It might weigh a little more with larger servos, but in any case, it is bound to be fast and highly maneuverable, to say the least. The roll rate is quicker than you can call it out. Doug tells of a recent flight in which his Sparrow was attacked by a real red-tailed hawk, and there are claw marks on his wing to prove that the bird meant business. The kit costs $19.95, takes three evenings or so to build, and is extremely durable.

By the way, Doug Klassen and Keith Smith have formed a new company, Pacific Sailplanes (same address as above), and will be taking over the inventory of Windspiel Models. They intend to satisfy the growing interest in scale sailplanes and in addition offer the "Red Tail 100" designed by Dr. Terry Hovey, which features a 100-inch built-up wing of balsa/spruce construction. The fuselage is of hand layed-up epoxy fiberglass. Here's wishing them well.

Frank Hunter accepted responsibility for providing the Torrey Pines Gulls with new and improved winch turnarounds. The trick is to reduce chafe on the line and the resulting drag on launch to an absolute minimum. The result is a turnaround that pivots both ways. It swivels around the vertical axis in a crosswind launch and tilts upward to compensate for any surge in the tension on the line . . . a safety bonus. The main roller is two inches in diameter and 1-1/2 inches wide. The roller surface is V-shaped (an included angle of 123°) to guide the line.

The smaller roller is of the same width but half the diameter. It has a smaller groove (.375 inches wide) to help center the line. Ball bearings support each of the rollers. Two 1/4-inch by two-inch TV antenna U-bolts bracket the main roller to help guide the line and prevent entanglement. I've watched these turnarounds sing as they perform during launch. Congratulations, Frank, a job well done. By the way, for further information on this fine low-cost device, write to Frank Hunter, City College of San Diego, 1313 12th Avenue, San Diego, CA 92001. You can call him at (714) 238-1181, extension 372.

Ralph Cooney of Fourmost Racing Products, 4040 24th Avenue, Forest Grove, OR 97116, (503) 357-2732, has added mounting lugs to the flange of

his new retractable towhook. You may remember this cleverly designed device. After the line is released, the hook itself retracts into the body of the unit, leaving a smooth undersurface on the fuselage. It weighs only 1/2 ounce. It's best to screw-mount this unit into a hardwood box. The price is $5.75; a good investment for your "classy chassis."

Robert Barrett of Grantham, Pennsylvania, has been experimenting with his own version of a hand-launched R/C glider. He would also like to share the following:

"Is it by your wisdom that the hawk soars,
And spreads his wings toward the south?
Is it at your command that the eagle mounts up
And makes his nest on high?" •

Job 39:26, 27

Thermal . . . . . *Continued from page 31*

approach ground level. If it's blowing ten mph ten feet off the ground, then at five feet it's going to be a little slower, say eight mph. At knee level it may drop to three or four mph, and down around your ankles it's going to be almost zero. Surely you've noticed that? That's why so many people miss their landings . . . they forget to allow for the wind gradient, and overshoot."

I just shake my head sadly. "I always *undershoot*," I confess.

"God you're dumb," the buzzard says.

"Getting back to the thermal in the cornfield," I say, "what happens when the top blows off? Does the rest of it just keel over and die?"

"Not if the heat source is strong enough. It just grows a new head, sticks that head up into the wind, and gets it blown off. Over and over again."

"Wow! What you're describing is a *pulsing thermal*, isn't it? A pulsing thermal just keeps sending up little balloons of lift, one after another. Sometimes you can time the pulses, and be there just as one breaks loose, and ride her up for a max while everybody else is falling out of the sky!"

"Right," says old buzzard. "And other times you get there between pulses, and sink like a stone! No . . . give me a good calm day, when the thermals have time to grow big and fat before they break loose and begin to rise."

"Yeah, I suppose calm weather is the best, especially if you're looking for the perfect thermal. Let's see: hot sun, low wind, and . . . what was the third ingredient you mentioned?"

"Dry air," buzzard says. "Generally speaking, the lower the humidity on any given day, the stronger the lift will be."

"How come?"

"Dry air insulates. Wet air saps the energy out of a thermal, so it usually doesn't get very big, or at least very strong. I just spent a month with some relatives down in Picayune, Mississippi. Believe me, it's tough to soar down there when that seabreeze comes in off the Gulf! Some days you're better off to stay home and pick your teeth and your guitar."

"Izzat so?" I say, disbelieving. "Two years ago I went to Pensacola for an FAI Team Finals and the lift was good for six days straight!"

"What was the wind like?" buzzard wants to know.

"Light and variable, mostly from the northwest."

"You were lucky," he says.

So we drive along in silence for awhile, old buzzard and me, with the warm desert wind streaming over us and the naked Arizona sun on our backs. Down in the hot, still hollow between my shoulder blades a small pulsing thermal begins to send up little puffs of rising air every twelve seconds, regular as clockwork. I glance at the buzzard and he's starting to look hungry. He's got that cold yellow eye on me again, and he's beginning to drool a bit.

"Don't let the beard fool you," I tell him. "I dye it gray to get into movies on a Senior Citizen pass. I'm actually 37, and in excellent health."

Old buzzard don't even blink.

"Look," I say nervously, "I been meaning to ask you: what do thermals actually look like? I mean, if you could see them, what shape would they have? Some people say they're like big bubbles, and others say they're like minia-

ture tornados. You're an expert on these things. . ."

It works. Old buzzard forgets his stomach, and draws himself up tall on the seat, and says:

"Well, now! Let's just think about this for a moment. Suppose a thermal were just a big bubble of hot air, breaking loose and rising like a free balloon. All you'd have to do to soar it would be to get inside the balloon and circle tight and let it carry you up, right?"

"Right," I say.

"Wrong!" old buzzard says triumphantly. "What would hold you up, inside the balloon? You'd make three or four spirals and fly right out the bottom, same as if you were circling inside an empty room!"

"I never thought of that."

Buzzard just snorts. "What a thermal actually looks like . . . and I'm talking about the perfect thermal . . . is a big rising doughnut, or smoke-ring. The air inside is in constant motion, rising up through the hole in the middle and spilling over the top and down the sides and then rising back up through the middle again. And all the time it's sucking new air in, through a long stem that extends down to ground level.

"So it really looks more like a giant mushroom than a doughnut," I tell him.

"I suppose so," he admits, "but I never think of it that way. I hate vegetables."

Just then a big dust devil wanders across the road in front of the car, giving us a good hard shake and peppering us both with flying sand.

"So how do you explain THAT?" I say. "It sure looked like a miniature tornado to me!"

"That's the stem from a big fat thermal somewhere up above us," buzzard assures me. "Sometimes they spin tight and fast, sometimes they spin big and soft and lazy. But they're all just long stems, feeding a big doughnut up in the sky."

"That one was a real killer," I say. "I'll bet it would haul my fiberglass FAI ship up like a missile!"

"Killer?" says the buzzard, getting this strange look in his eye again. "Did you say *missile?* Look, suppose you were to take that FAI ship of yours and clobber a nice fat cow, right between the eyes . . ."

"Oh!" I say, "that'd be *awful!*"

"Offal?!" he says, smacking his lips. "Don't I wish!"

"Especially if I were carryin' ballast!"

"If you were WHAT?"

"Carryin' ballast."

"Don't mention carrion!" buzzard screams. "I'm starved!"

Just about then we hit the California line, and suddenly both sides of the road are lined with wall-to-wall Denny's Restaurants. I whip into the first one and slide to a stop at the door.

"We're in luck!" I tell the buzzard. "A Denny's!"

Old buzzard takes one look at all that plastic and bolts for the open desert. "Migawd!" he shouts, disappearing over the hill, "you trying to turn my stomach?" •

Pattern . . . . . *Continued from page 40*

rudder unless you plan on changing headings. We use a dual rate switch on the elevator so that it takes quite a bit of stick movement to get a noticeable response. As we've said before, a dual rate system properly used is a tremendous aid . . . use it.

THREE HORIZONTAL ROLLS

This is my favorite maneuver. It can be mastered one day and the next day it just turns out awful. It's a ballet performance for one flier and a pratfall for the next.

The two major secrets of good rolls are:

1) Proper fore-aft balance of the model. Nose-heavy models are difficult to roll correctly.

2) A developed sense of timing by the flier. Practice, practice, practice.

Some models are just plain old good rolling designs. Others won't do good rolls unless they are going 1000 mph. The reason is that the model is constantly fighting gravity with rapidly alternating lifting surfaces during the roll.

The better the lifting ability of the fuselage *as it assumes lift*, the less the nose of the model will drop during the roll. Hence, less correction is necessary. Also, a design which requires little horizontal stabilizer pressure to fly level upright or inverted will require less

correction. There are too many different designs on the market to allow discussion of the individual rolling characteristics of each one. Let's just say that bad designs usually require very high speeds and rapid roll rates.

The timing we mentioned is different for each model. Basically it consists of applying aileron, then alternately adding down elevator, pausing, adding up elevator, pausing, etc., etc.

Ten years ago the pumping action required for the proper amount of down-up-down-up was fairly deliberate, and smooth, because the servos were not very quick compared to today's little wonders. Now you have to wait longer between downs and ups or the roll gets a snaky look to it. This is because the new servos will move at the slightest touch, ever under the load of the air pressure on the elevators. I personally don't think there is such a thing as a servo which is too fast, although there are some very fast, erratic servos on the market. Check your linkage, servo, and transmitter stick to see how well the elevator responds to slow, even actuation. If everything is OK, get out there and practice.

Here are some suggestions on what to practice.

1) Find a roll rate that gives three rolls in approx. five to six seconds and set your low rate switch (you *do* have dual rates, don't you?).

2) Trim your plane for hands-off level flight.

3) Start the first roll so that the second roll is half complete (inverted) exactly in front of the judges' location. Use yourself as reference for the judges' stand.

4) Start the entrance to the maneuver in an almost indistinguishable climb. Do not blip in up elevator as you start the first roll. It's a lousy habit and any judge who is not certifiably blind will spot it.

5) Try changing your timing from slow to rapid application of elevator. Watch which way the plane turns; this timing change will cause the model to move away from you or toward you. It can result in a rolling circle.

6) Roll the same direction (stick left or stick right) regardless of whether you are flying left to right or right to left. It's easier to learn.

7) If your plane does everything OK but requires more stick movement down than up, change the elevator differential as noted for outside loops.

8) Practice the maneuver crosswind, upwind, and downwind, and try to keep the sequence centered in each condition.

9) Don't, don't, don't practice the rolls without practicing keeping centered. It's easier to start the first roll in front of you, but it's a hard habit to break!

NOW GET OUT THERE AND ROLL 'EM! •

Fuel Lines . . . . *Continued from page 24*

have usually been determined and the majority of competitors limit themselves to these types.

It usually becomes apparent that all

samples of one engine type are not equal. The reason is the random distribution of production tolerances. These variations which were of little concern with the "sport" engine can determine the winners in a horsepower oriented competition event. Why does it happen?

1) Even an "expensive" racing engine is still cheap. In many examples much of the extra cost is taken up by design complexities (such as rear disk intake) rather than increased precision.

2) The racing engines utilize the same production equipment as the sport engines, so there is no reason to expect increased precision.

3) The expense involved in additional precision is not consistent with the retail price which the users will pay.

4) Whatever the performance benefit, the total of dollars involved is insignificant to the manufacturer because the racing engine market is small compared to the sport engine market.

One result is that the winners use engines which "specialists" have modified or which they have modified themselves. A second result is that a limited production engine(s) dominate the event.

An example of the first result is Formula 1 pylon where, despite K&B's efforts, the Supertigre X40 dominates. Within that brand, a Prather Tigre or some other modified X40 is the winning engine. Out-of-the-box doesn't win.

An example of the second result is FAI Team Racing where, from the introduction of the Bugl .15 in 1972, the event has been a contest between limited production engines. The Rossi .15 Diesel failed to match the Bugl, and today there are three competitive engines in production. My Nelson 15D is one, the Bugl-Geschwendtner and Cipolla are the others.

A third type of event requires a so-called "stock engine." This kind of event (1/4 midget pylon is an example) is reinvented from time to time by misguided souls who believe that it is possible to create equality by banning the work of the dreaded "engine expert." There is a long list of holes in their argument. A few follow:

1) First, the engine manufacturers don't publish a set of drawings showing all legal dimensions for a particular engine.

2) Because of (1), there is plenty of room for the expert to utilize his abilities.

3) If absolute "box stock" could be enforced, the advantage would lie with the person who could buy the most boxes.

Getting back to the category 1 situation, one of the problems with engine modifications is that it's quite expensive, whether you have it done for you or do it yourself. First of all, by building the parts in batches of one to ten thousand pieces, the manufacturer has used the benefits of large scale production. Further modifications require someone's time, and time is expensive. Furthermore, it's best to forget any ideas of using only a can of rubbing compound and a file. Some machine tools will be needed, and whether they're yours or someone else's, they aren't going to be cheap.

What we're up against is that the manufacturer has really done an excellent job of building his engines. If we were to send a drawing of all the engine's components, properly dimensioned with the tolerances the manufacturer achieves, to a general machining job shop, we'd receive a quote in the $1000 range for our $100 engine. The "normal" precision found in model engines costs a pile of money if purchased from a general machine shop.

Unfortunately for the competitor, the high level of precision found in an engine is still not sufficient to provide peak performance. Except for the piston/cylinder, the pieces of a model engine are not selectively fitted together. Part A is pulled from a bin and attached to part B which plugs into part C, etc. Dimensions are chosen such that all the pieces fit together. It is inconvient if 20% of a run of heads won't fit into the last 20% of the cylinders.

For a lapped piston racing engine, the single most important feature is the piston/cylinder fit. The second is the head-to-cylinder fit. With few exceptions, the shapes of both the cylinder and piston are incorrect. Even if the

shape of the head's combustion chamber is correct, it's probably too loose in the cylinder. Heads should be fitted as carefully as the piston, but the manufacturer can't afford to do it.

In the future, I'll supply more details of engine rework. Throughout, however, I'll carry the theme that proper rework requires a large investment in money for the proper equipment and time to learn how to use it. If you have somebody else to do the work, expect to double the original price of the engine.

To give a few examples, in AMA C/L Combat the most popular engine today is the Fox Combat Special, which has a retail price of $50 . . . an absolute bargain. Remember that Fox receives on the order of $22 for the complete engine. When this engine was introduced a few years ago it had a problem with breaking crankshafts. Richard Brasher had two batches of 100 crankshafts made up which, if not unbreakable, were at least a great improvement. How much did they cost? Around $20 each. That was itself a good price, but it was more than Fox received at the time for the *entire engine.*

Let's look at the engine today. The out-of-the-box engine can be greatly improved by properly tapering the sleeve and fitting the piston. The life of the engine will be improved by chroming the sleeve. How much will that cost?

At this time I know of only two people active in the chroming and fitting business: Gene Hempel, who also writes for *Model Aviation,* and myself. Gene's price for the Fox is $20 and mine is $25.

By now I hope you're getting the message. Looking at an engine as a piece of machined metal, it's a bargain. If you look at the work required to optimize its performance, it's a piece of junk. •

F/F . . . . . *Continued from page 67*

to the success of the event. I think the secret to any new event is that it must produce a model that is attractive enough for both beginners and experts to try. And when it's tried, the event must have enough of a "fun factor" to keep up the interest. (The event must be kept alive by the "experts," since it will not attract beginners until it becomes popular . . . and then will come the simple kits that beginners can build.) That's the way it's been with such events as Coupe, P-30, and Embryo Endurance. The fun factor is what gave the Old Timer movement (and the current Nostalgia event) the impetus to spread rapidly across the country. Without the fun factor, you end up with specialized events like Payload, Cargo, and Control Line Endurance, which clutter up the rulebook without really exciting anybody. The revised Novice Gas rules look like they may produce a "fun" model which is suited to the needs of the beginner. But it really needs a catchier name; who wants to be branded a novice? Any ideas out there?

The only quibble I might have about Dave's rules is that by limiting the engine to reed valve types, several good, cheap front rotary engines like the Wen Mac and Testors series would not be allowed. And it *would* allow such contest types as the Thermal Hopper, Space Bug, and Space Hopper. Maybe the only engine rule should be to define the engines to be excluded, like these latter three and the Tee Dee and Holland Hornet.

THE JUNIOR PROBLEM: IS THE PROBLEM REALLY THE JUNIORS?

Dave's letter also points out a major problem with attracting younger modelers to free flight, one that won't necessarily be cured by a new event. Quite

simply, Junior fliers have a transportation problem, especially when it comes to going to a free flight field. The youngsters Dave mentioned were lucky to have a flying site within easy access from their homes. It was small and unsuited for contest use, but it was close by, and the models they built are evidence that they are making a logical progression to the hot contest types without too many bad experiences. Most other kids in this age bracket aren't so lucky. In most areas, the largest area they have to fly in is the local football field. If they ever get a glimpse of model flying, the odds are that it's a model that can be flown in this confined area, usually control line or R/C. He may be able to fly small rubber models, or hand launch gliders, but any projects more ambitious than that will have performance far beyond the confines of his only flying site. (What free flight REALLY needs is a gas model capable of taking off from a football field, running out a full tank of gas, and landing on the field, in normal 10 mph winds, without the use of radio. Such a model would be of more benefit to the future of free flight than a squadron of FAI Power models capable of ten minutes in a calm-air World Champs flyoff.) So he never gets a chance to build and fly more advanced models unless he has access to a flying site. Think back on your own experiences when you started flying free flight; when you really got hooked and started improving, the chances are that you went down to the flying field a lot.

But where is the Junior going to find a decent-sized flying field? In rural areas, he's likely to find farmers who don't take kindly to outsiders on their property. In urban areas, the situation is even worse. When I moved to the Los Angeles area, Sepulveda Basin was an exception to the rule . . . a green, spacious oasis near the center of the city, accessible via freeways from anywhere in the metropolitan area. When I left, free flight had been kicked out of the basin by a combination of highway engineers, the U.S. Army, and the L.A. Parks and Recreation Department (who didn't understand anything that wasn't played with a ball). This left Lake Elsinore, 75 miles away, as the closest free flight site. Now I hear that Elsinore is under six feet of water and will be unusable for the next three or four years, leaving the hardy types to drive the 125 miles to Taft, even for *test* flying.

Not all areas are as bad off. But most free flight sites are outside the city limits, too far for the 12-year-old whose bicycle is the main mode of transportation. Most Juniors lack a means of reaching a flying site, unless transported by his parents. And, unless Dad is a free flighter too, the Junior will not make it to the site, especially at today's gasoline prices. Small wonder, then, that most of the surnames in the Junior contest results are familiar. The Junior who is not related to an Open contestant is a very rare bird indeed.

What sparked all the above pontificating was an article in the "Fresno Gas Model News," which indicates that somebody down there *is* thinking about younger fliers and their problems. Joe Lobbia has donated $100 to the club for the express purpose of getting kids with non-modeling parents out to the flying field and to the club meetings, by helping with the gas costs for those who give them a ride. GREAT IDEA, JOE! And, in addition, Russ James, in the same club, has promised to teach any kids who want to learn how to build models, in his shop.

What have YOU done for free flight lately? Are you part of the solution, or the problem? Is Dave Benepe's analysis of the situation correct?

JUNIOR OF THE MONTH DEPARTMENT

As my immediate contribution, I'd like to help publicize the efforts and accomplishments of those Junior free flighters who are persevering in spite of the above-mentioned difficulties. I'd especially like to include those Juniors and Seniors who don't have modelers for parents. If you'd like to appear in print, send me a black-and-white photo of you and your favorite model, and tell how you got started, problems you have, successes in competition, future plans, etc. I'll keep publishing the stories and photos as long as you keep sending them in.

To start off, I'd like to introduce you to Eric Connelly, from Philadelphia. He's called me a few times to order Ultimate Dragmaster kits, and I've been able to follow his progress each time he calls. He's a protege of Tom Kerr, noted FAI Power flier, who predicts great things for Eric. Here's some excerpts from Eric's latest letter: "I sent you pictures of my planes; the red one is the newest. It got me 3rd at the International Challenge Meet held by the Brooklyn Skyscrapers (Eric placed a minute ahead of Bob Hatschek in 4th place. TH). The other picture is of my first Dragmaster, which I lost at the Semis. I lost it in the 7th round, but I got it back, only to lose it again at an AMA meet in New Jersey. It sat in the pine barrens for two months until it was found by Capt. Lou (he gives the fishing reports on Channel 3 news)." •

F/F Electric . . *Continued from page 59*

young modeler progress, as each model is made a little better than the last one. Well, Tom has really outdone himself with this one; it looked good and flew like the real thing. By the way, Tom also entered his General Aristocrat in the endurance event and placed second! Shades of Walt Mooney!!

Later in the day, Bill Warner got around to flying his Lee-Richards Annular Monoplane (sorry about the pun, but the model looks like a donut with a fuselage laid on it). In spite of the model's unusual looks, it flies very well, in calm or windy weather. One of the finest builders I know, Tom Laurie, showed the crowd how an American Eaglet should be built and flown. Not once, but twice, his model made a takeoff that went between two cars just as it was lifting from the ground, and made it both times. What a sight!! As it was, he did what I couldn't do. On my second flight with my Stinson SM-2 Jr., I flew it into the front of a car, then did a bank shot into a bike wheel for a finish. Tore off both wings and ripped some tissue. It taxis faster now, but may need the wings to fly better . . . oh, well.

Well gang, that's about it, except to thank Bob Boucher for donating the trophies and ad space in **R/C Model Builder.** Thanks to Mike Mulligan for flight judging, Mik Mikkelson for static judging, and Carl Hatrak for timing and helping out in his usual fine manner. And last but not least, thanks to all the modelers for entering.

RESULTS

SCALE

1) W.R. Stroman	Stinson SM-2 Jr.
2) Bill Warner	Lee-Richards Annular Wing
3) Ferrell Papic	Bleriot No. 7 Monoplane

UNLIMITED

1) Tony Naccarato	Starduster
2) Jim McDermoth	Hummer 1

020 OLD TIMER REPLICA

1) Jim McDermoth	Strato Streak
2) Bill Stroman	Valkyrie
3) Art Wahlstedt	Strato Streak

JUNIOR

1) Robert Mehmen	Eaglet
2) Tom Comparet	General Aristocrat

CONTROL LINE SCALE

1) Ron Duly	Zero
2) Bill Malo	Me-109
3) Tony Naccarato	F4U
4) Addie Naccarato	P-47

Power Boats . . *Continued from page 49*

between $350 to $400 would be sent into the March of Dimes once all the contestants had collected their pledges. The results of the 10-minute enduro were as follows:

1) Dennis Caines, 21 laps, Excalibur Tunnel
2) Jerry Dunlap, 20 laps, Hustler .21 Hydro
3) Bill Brazzle, 18 laps, Hughey Tunnel
   Stan Hoagland, 18 laps, Excaliber Tunnel

This event proved to be very popular and is very easy to stage. The money goes to an excellent cause and a good deal of positive publicity is generated. Other model boat clubs may wish to consider sponsoring a similar type of event for a worthy charity. Such a project can be very beneficial in increasing public understanding and acceptance of this hobby. Besides the 10-minute enduro for the March of Dimes, four other classes were raced. The results of these classes are as follows:

A OPC TUNNEL
1) Bill Brazzle, Hughey Tunnel
2) Ron Fisk, Klampon-Kai
3) Stan Hoagland, Excaliber Tunnel

A HYDRO
1) Ed Fisher, Original Hydro
2) Jerry Dunlap, Hustler .21 Hydro

A DEEP-VEE

1) Ed Fisher, Streaker .21
2) Ron Erickson, Schoef Vee
3) Jerry Dunlap, Ward 33.5

SPORT 40
1) Mike Groul, R/C Glass Hydro
2) John Metzger, R/C Glass Hydro
3) Bud White, Dumas Hydro

Two new oval records were established: Ed Fisher turned in a 1:51.12 with his A OPC Tunnel, and this writer ran his A Deep-Vee to a 2:15.08 for .9 mile.

MORE STRAIGHTAWAY RECORDS

Just as I was preparing to write this column, Ed Fisher gave me a call to report on the record trials held at Whonnock Lake, near Haney, British Columbia, on April 5 and 6. Ed reported that the fellows up there have a really fine site for this sort of thing and did an excellent job of hosting the event. I'm sure that the fact that Ed was able to establish two records helped in making his trip enjoyable. He used his original canard outboard hydro to up the A Outboard Hydro record to 51.74 mph. Piloting a Steve Muck Streaker Vee, Ed upped the B Deep-Vee record to 59.60 mph using a K&B 7.5 engine. Frank Ward also attended this meet and made a one-way pass of 85 mph with his original hydroplane using twin Rossi .65's. Frank was experiencing some radio problems and wasn't able to back up any of his runs. Frank is another one of those model boaters who is aiming at being the first person to exceed 100 mph with a model boat.

NEW ITEMS FOR K&B'S .21 OUTBOARD

The people down in Downey, California, who supply us with the outboard all of us are using, have two new items that should be of interest to many of you owning the K&B .21 Outboard. The long-awaited barrel carburetor should be available by the time this article is published. This carb is similar in appearance to the non-existent 4049 Series. The price for the carburetor kit, carb, exhaust pressure fitting, and conversion directions, is around $17. The carb will be available as a separate item for about $14. I am told that it is possible to bore out this new carb to the same opening as the old 4049. Ed Fisher used one of these new carbs on the K&B Outboard when he set the new A Outboard Hydro record that was reported earlier. He is very impressed with this new carb and feels it is definitely going to help make the K&B Outboard more reliable, as well as providing a better method for stopping the engine.

The other product that K&B is releasing for use with the outboard is a transom plate for mounting the engine. This new item allows for easy adjustment of the height of the engine on the transom. Sorry, I don't know the price. Check with your hobby dealer or contact K&B Manufacturing directly.

KEEP THOSE CARDS AND LETTERS COMING IN

Tim J., of Las Vegas, recently wrote, "Thanks for the interesting reading material you have been providing in **R/C Model Builder.** If not for people like yourself, many questions regarding model boating would go unanswered.

"My first question is, are there any plans available on the scale hydros, and if so, where can I obtain them? I am interested in building a hydro similar to Bill Hornell's Thriftway Too with twin 7.5's. Would also appreciate any info on Bill's engine set-up.

"Another question I have is, do you know of any particular advantage to either an exhaust throttle or a K&B 4049

carb for the 7.5? It seems that the boaters in Indy swear by the 4049 and the people out West swear by the very costly exhaust throttles. Any info you can provide me will be greatly appreciated."

Thanks for the positive comments about the boating column in **RCMB,** Tim. I'd like to think it's of value, but it's nice to hear from you readers. There are two sources of plans for R/C Unlimiteds. Roger Newton and Les Ruggles both sell plans for these boats. Their addresses are: Roger Newton, 14518 167th Pl. S.E., Renton, WA 98055; and Les Ruggles, 13417 S.E. 233rd St., Kent, WA 98031.

I believe Bill Hornell drew up the plans for the Thriftway Too. His address is 2533 N.E. 24th, Renton, WA 98055. Bill used twin props and twin drive lines on his boat. The drive lines were .187 cable. This boat was banned from competing in District 8 R/C Unlimited events in 1979 because the real boat only used one prop. However, it was legal for Nationals competition and won the R/C Unlimited event and placed second in the X Hydro Class at the 1979 NAMBA Nationals held at Seaside, California. Bill has sold the boat and is now in the process of building a single prop version.

You might be interested in knowing that the NAMBA rules for R/C Unlimiteds now limit engine size to Class C (.47-.67 c.i.). Twin 7.5's would have to race in X Class. Use of the twin 7.5's would eliminate a boat from competing in the R/C Unlimited Class.

The exhaust throttle versus carburetor for controlling speed appears to be one of personal choice. However, since K&B is no longer making a 4049 carb, the exhaust throttle often becomes the choice. A number of the go-fast crowd on the West Coast build their own intake carbs and exhaust throttles. They install needle valve assemblies from Rossi, Super Tigre, or OPS because they believe these needle valve assemblies do a better job of metering fuel than the stock units.

I have a new Prather Products exhaust throttle on the K&B 7.5 in my Sport 40 and it works just fine. I'm using the intake carb that comes with the engine. On the K&B 6.5 in my deep-vee, I'm using a 4049 carb because I'm one of the people who was able to find one. It also works well. As was mentioned earlier in this article, the new carb that K&B is releasing for use in the .21 Outboard can be drilled out to the same size opening as a 4049. I'm sure many people will take advantage of this possibility. If it's of any interest, the "hot dogs" in this area (Fisher, Erickson, and Ward) use the R/C barrel carb on all their boats.

119 CRESTWOOD DR. S.W.,
TACOMA, WA 98498

That's the address for sending information, photos, or questions. With the model boating season now in full swing, take the time to get that kind of stuff in to me. Believe me, I need all the help I can get. •

Giant . . . . . *Continued from page 44*

On the cabin planes, the window structure is completely responsible for holding the wing onto the fuselage. It is also almost universally weak. Replace all balsa in the window structure with hardwood and piano wire. Carry the window post braces up into the wing root structure and down into the cabin structure. Try to avoid having any of these braces just butt-join to the structure. Inset them heavily into the structure, then glue on a scab-patch of 1/32 plywood over the joints. Most of these cabin planes have a false tubing structure in the forward windshield, supposed to be duplicated with wood dowel. Replace all the wood dowel pieces with piano wire, joined as necessary with brass tubing, and imbedded heavily into the wing root leading edge section of the cabin, and the cabin sides. I would personally glass the entire nose, inside and out.

The J-3 has a windshield brace that extends from the center-front of the windshield, up into the corners of the wing root area. Make this brace out of a V-shaped piece of piano wire. Bolt it to a false plywood bulkhead you will make and install beneath the instrument panel

decking, and carry the ends up into the wing root area. Secure the wire into the wing roots with liberal amounts of epoxy, after you have heavily nicked the wire with a file, so that the epoxy will have something to grab to.

The wing struts on these birds are V-I-T-A-L!!! If they fail, the airplane will almost certainly crash, minus its wing. Modify the strut ends by imbedding a 1/16x1/2x2-inch metal tab in each end. These tabs will then *bolt* to heavy blind-nut fittings in the wing and fuselage. Make these points STRONG. Remember, the life of your plane depends on them holding. *(Since last October, all Nosen aircraft using wing struts have been modified for the most part in this manner. wcn)*

The cowlings on the Nosen planes are quite difficult to make. I would recommend you get one of the replacement fiberglass cowls that are available. T&D Fiberglass, 30925 Block, Garden City, MI 48135, makes a complete line of replacement cowls. Parker R/C Planes, P.O. Box 8195, Van Nuys, CA 91409, makes a magnificent cowl for the Citabria.

That should hold the newcomers for awhile, let me know how you do.

HANDY TIPS

For you experts who have been building these things since before WW-I, how would you like a *true* xenon strobe light for your model? One that is completely built, and is readily available? If so, trot on down to your local Radio Shack store and pick up one of their Emergency Strobe Lights, Cat. No. 61-2644. It'll cost you about $11. This is a flashlight-like goodie, with a white frosted lens. It has a beautifully made, very strong plastic/nylon case, which you are going to completely cut off and throw away. First, take your Dremel grinder and install one of the grinding cutoff wheels. Use this to cut around the lens, completely through so that the lens can be discarded. Then cut away the rest of the case as needed to free all the electronics, including the switch. What you have now is a small bar-type xenon strobe bulb with its reflector, mounted to a very light P.C. board. This can now be mounted in your plane as needed, and caution everyone around to not look directly at it when it is flashing. It is bright!

I put mine inside the Halloween pumpkin I had on my porch bannister this season, with a remote switch going inside the house so I could turn it on whenever kids came to the door. Pretty dramatic results.

Whenever you are working on any plane, invariably the smallest part you have will fall into the most inaccesssible spot in the plane. Buy yourself a pair of the Perfect, K&S, or K&B Mechanical Fingers. This is a fabulous little tool that I would have never even considered if Johnny Brodbeck hadn't given me a pair one time. I cried for a week when they were stolen, because immediately afterward I dropped a screw, and no way could I get it without them!

There are any of a million little tools that are useful to the modeler, and most of them are darned hard to find. I'd recommend everyone get a copy of the Brookstone Tool Catalog, Vose Farm Road, Peterborough, NH 03458. These people specialize in small and specialized tools. This is the modelers' goodie-book.

M.A.S.

OK, guys, enough work for now, time to talk about a very enjoyable subject, the Miniature Aircraft Society. A new group, it was formed to carry on the work and programs that had been started in "that other group."

An idea is a precious thing, especially when it is so vital as the Giant Model movement. In this case, it is far too precious an idea to allow any subversion of it. The idea is being able to build and fly the type of giant model *you* want, and being able to get together with others who feel the same way, without any competition pressure or demands on your activity except that which you yourself impose. The idea is not having *anyone* tell you what, or how, or when you will fly, only having common-sense rules governing the safety of that flight, rules that help protect your plane as well as anything and anybody it might hit. The idea is belonging to an international group whose stated purpose is the advancement of the *individual* and *local group* enjoyment of the hobby, by mutual help, representation, and participation in the overall group. If these ideas turn you on, combined with a quarterly newsletter, the first issue of

which has *forty-six* crammed pages, then drop a $10 check ($12 outside U.S.), made out to Miniature Aircraft Society, to Don Godfrey, 254-258 Washington Blvd., Binghamton, NY 13901, for your first years' dues.

Last minute news. The M.A.S. is off and running! A meeting was held at the Toledo R/C Exposition which formalized the society, and while there will be a name change in the immediate future, the society's programs, officers, and non-competitive philosophy, have been formalized. President is Don Godfrey (address above) and there are eleven members on the Board of Representatives, nationwide, including one in France. Yours truly is the Newsletter Editor.

FINAL NOTE

Ideas, pictures (color slides, color negatives, B&W prints and negatives), info needed. Write Lee Taylor, 216 Willow Ave., Roseville, CA 95678. This column is to share ideas, so SHARE!!!●

R/C Auto . . . . *Continued from page 51*

Davis made an insurance pit stop. That was it! Jianas cruised home the victor. His comment after the race was that he solved his problem at 6 p.m. the previous evening after his qualifying heat, when he found the proper front tire compound to use.

"All in all, it was a good race and I made some new friends. Although my performance was dismal, I learned a great deal and will be better prepared next time. However, I must register some complaints. I think for a race of this importance, a better way should be conceived for marking the course, especially if the course is fast, like this one was. The problem was that the barriers came loose and many a car was destroyed by hitting a barrier that was jutting out onto the track. The surface is excellent, but the track could be outlined better.

"My other complaint is lack of crowd control. I saw many a spectator with small children right up next to the barrier in the big sweeper. You do not have to imagine too much what would happen if one of those cars went out of control and hit someone at the speeds they were going. We do not need this type of incident.

"However, the CFR car personnel did a good job and the banquet was great! I really enjoyed the Hula Dancers, especially Pete Fusco!"

1980 WINTER NATIONALS — A MAIN FINAL

1)	Bill Jianas	71.5
2)	Rick Davis	70.6
3)	Dana Smeltzer	68.9
4)	Art Carbonell	66.5
5)	Jack Jacobs	66.5
6)	Gary Kyes	66.3
7)	Ken Campbell	65.6
8)	Michael Kimrey	64.6
9)	Roger Curtis	59.4
10)	Hank Smith	23.0

Thanks Mike!

After the first couple of practice days I knew this Winter Nationals race course was a little on the destructive side. Midge Husting (Gene's wife) of Associated was sending front end parts and new bodies for the team drivers. It sounds like one of the worst things was that there were no track outlines marked on the course to give drivers a good reference. Some of the expert racers seem to get along well without the outlines, but they sure help me. I understand the Central Florida club just got the site and plans on putting down the track border outlines, but just hadn't gotten to it yet.

The traction must have been fantastic. I heard you could tip your car over in any corner you wanted. Dana Smeltzer said he ran a solid rear axle from the second day of practice. And Dana *never* runs anything but a differential.

Next month I'm going to have a rather belated report on the 1/12-scale Western Regionals held in Pomona, California. Don't miss it, because I've analyzed the results and have a few very interesting comments to make. Then I'm

going to get into a tech article about aerodynamics of full-scale and 1/8-scale cars . . . and if you're interested, tell you about the hows and whys of today's F-1 and Indy wing cars. Then it's on to differentials and more.

Hope you'll be looking for me, because I'll be here. I guess my "off" season is over. •

Plug Sparks . . . *Continued from page 39*

We probably won't have such an extensive coverage of the results again, but we just wanted to show that the trends for 1980 are not much different from the preceding years. The hot ones still win! Before wrapping it up, acknowledgements for excellent trophies and an even better run contest should go to Ed Kelley and his wife, Rose. That's what makes competition worthwhile!

SAM 21 OLD TIMER/SAILPLANE TEAM CONTEST

Here's an idea generated from the Texas boys (SAM 29), where a two-man team, one flying an Old Timer and the other a high performance modern R/C glider, form a team and attempt to make max flights under rules governing their particular type of flying.

The idea spread like wildfire, and so many glider boys showed up that C.D. Jack Alten had to end with three-man teams; one O.T. and two glider contestants. Regardless, this made it all the more fun as one more variable had been added. There could possibly have been more than nine teams, but the contest had to get going, so many of the latecomers had to be content with just being spectators. All had fun just the same!

The best fun of all was had by the winning team, headed up by Dave Bruner, SAM 21 prexy, flying a 110% Lanzo Record Breaker. He was simply delighted with the event, as this was his first win! Another who has been waiting outside the winner's circle was Pete Samuelson, who flew his hard luck Foote Westerner to second place team honors. The hot shots, Bekins and Pond, had to be content with third and fourth places.

This type of meet, where head-to-head type of competition is avoided, is simply great! The team spirit really generates when it looks like it is still possible to win! This has brought on such a reaction that at least one or two meets will have to be squeezed into the busy California schedule!

MISERY MEET

While we were talking about beautiful weather in California, the Annual Misery Meet was again staged on February 3. (Man! It's cold in Washington then!) As Don Dodd said, "The weather was compatible with the name of the meet." Terra-firma conditions of Hart's Lake flying area were wet, slippery, sloppy, and muddy. Atmospheric conditions were a perfect match with wind, rain, hail, sun, and periodic gusts to 25 mph. These "ideal" conditions were all in conjunction with temperatures in the 30 to 40 degree range. Only the hardy flew that day, although quite a few SAM 8 boys put in an appearance.

In the results, the only flight time in .020 Replica worth a darn was Larry Delaney's 333 second total. O.T. Pylon fared a little better with Don Dodd at 403 (New Ruler), Bob Findley with 386 (Playboy), and third place Don Nordlund with 347 (Playboy). O.T. Cabin was dominated by Don Nordlund's Bombshell at 319, with Ed Lamb (Spook 72) and Bob Findley (Miss America) in second and third respectively.

Actually, the rubber event looked real good for entries, with John Kamla winning with a Korda followed by Ernie Linn and Doug Hanney. Regardless of the weather, you missed the fun!

MORE COMPETITION SCHEDULE

Looks like we overlooked the Great Northwest (Oregon, Washington, Idaho, and British Columbia) when we listed contests. Between SAM 8 and the Willamette Model Club, here's what the activity for 1980 looks like:

April 20	Hart's Like (SAM 8)
May 4	Yakina (this is an O.T. control line meet!)
June 7 & 8	Hart's Prairie (SAM 8 Annual)
August 24	WMC O.T. & Nostalgia at Parker Field
August 30 & 31	SAM 8 Labor Day Bash
September 27	WMC O.T. Annual (Parker Field)
October 4 & 5	SAM 8 Fall O.T. Annual

That should keep the boys busy up there! For info on SAM 8 meets, write to Tom Cope, 23262 S.E. 57th St., Issaquah, WA 98027. For Willamette MC meets, write to Bob Stalick, 5066 N.W. Picadilly Circle, Albany, OR 97321. With so many meets, you can afford to be choosy! Haw!!

ROCKY MOUNTAIN DOINGS

Almost forgot to include the schedule for the Model Museum Flying Club, SAM 2. According to Jim Thomas, since they have obtained a new flying site, things are really looking up. Here's what they are starting off with this year:

May 4	O.T. Rubber
June 8	O.T. Fun-Fly
Sept. 20-21	O.T. Annual

SAM 7 "YANKEE FLYER"

Leave it to the New England boys to get themselves organized early in the game. We missed publishing their schedule last month, so we better rectify that in a hurry. Here is the schedule for Old Timer flying all at that excellent site, Westover AFB:

May 25	Spring Rally
July 6	Summer Outing
Aug. 30-31	East Coast SAM Champs
Oct. 19	Fall Rally

All contests except for the East Coast Champs will have the following events:

Cabin Gas (ROG)
Pylon Gas (ROG)
.020 Gas Replica
O.T. Towline
O.T. HL Glider
Rubber Endurance
Rubber/Peanut Scale
1/2A (AMA)
HLG (AMA)

To say the least, there is a little for everyone. SAM 7 officials are eagerly looking forward to the 1980 calendar of events. They hope to see you with your new (or patched-up old) models on the field to join in the fun.

M.A.M. MEANDERINGS

Received the first newsletter for this year from the Michigan Antique Modelers (M.A.M.). Between Karl Spielmaker and Bob Pattison, they are energetically promoting three O.T. contests this year. The schedule:

May 18	Three Rivers, Michigan
July 13	Hastings, Michigan
October 5	Hastings, Michigan

For those who have complained about a dearth of Old Timer activity in the Midwest, between COFFC, CIA, Chicago Aeronuts, the Pelicans, and now the M.A.M., the modelers should regard 1980 as a banner year. Add to that the Annual SAM Champs at Wright-Patterson AFB this year and you have enough activity to satisfy the most avid contest goer.

GENTLEMEN'S O.T. HAND LAUNCHED GLIDER?

According to Joe Kresnak (who puts out the M.A.M. newsletter), a proposal has been put forth to have a hand launched glider event for modelers having a birthdate prior to 1943, "gentlemen" meaning, in this case, the older modeler who doesn't have the arm to heave those gliders to any great height!

JOHN L. SADLER

Received the following note from

pioneer model designer, H.A. Thomas:

"John L. 'Kingfish' Sadler died recently at age 87. He was a pioneer leader in model aviation in the 1935-1955 era. he was a retired sales executive with Armco Steel Corp. I met him in about 1933 when he was in his early 40's and I was 19; he had just discovered model building. We became lifelong friends. His 'Pacemaker' low-wing free flight gas model design was published in *Air Trails* and was built and flown in many parts of the world. His 'Little Rocket' control line speed models, built in all engine classes, were frequent winners in regional and some national meets.

"John loved the low-wing configuration and had built fine flying low-wing rubber models. He helped me build the first gas model to fly in Arkansas in 1935, an original design having features he developed or improved such as phone jack plug-in boosters, I-section white pine wing spars, cap strips, a cabane structure having adjustable incidence, and turned wooden wheels. The following year, his 10-foot span low-wing, with Brown Jr. engine, became a familiar sight in Arkansas with its stable, majestic flight. Later, his 'Pacemaker' design was an outstanding performer with several hour-long flights to its credit.

"Scores of young modelers obtained help and encouragement from John Sadler, who always found time to help with every problem. We loved him for his generosity and admired his skill and originality. Mrs. Sadler usually supplied fudge and soft drinks for the frequent night sessions in Sadler's shop, where there was often standing room only. Many of his young following are today successful space and aeronautical engineers and professional people. Happy landings, Kingfish."

THE WRAP-UP

Well, we saved the best news for the last. (Just our sneaky way of making sure you read the entire column.) For those fellows who fly Old Timers and are not a SAM member, this information is directed to them.

As published in the official SAM Newsletter, "SAM Speaks," the Annual SAM Championships will be held at Wright-Patterson AFB, Dayton, Ohio, this year beginning on Friday, August 8 and concluding Sunday afternoon, August 10. The welcoming "Bean-Feed" will be held Thursday, August 7 at the Wright College, beginning at 6 p.m. This very casual affair is intended to acquaint all the modelers and contestants with each other. The get-together also serves as a forum to make last-minute announcements of any changes to the program.

Last year, SAM gave away over 125 trophies, not counting the perpetual trophies, special awards, and merchandise prizes. This year will be no different, as trophies will be given to fifth place again. Here's what the schedule of events will look like:

FRIDAY
F/F:
- Class C Cabin
- Class A Pylon
- 30 Sec. Antique
- Rubber Cabin

R/C:
- Class C Glow
- Class A Glow
- Class C Ignition

SATURDAY
F/F:
- Class A Cabin
- Class B Pylon
- .020 Replica
- Rubber Stick

R/C:
- Antique
- Class B Glow
- Class A-B Ignition

SUNDAY
F/F:
- Class B Cabin
- Class C Pylon
- Scale Rubber
- Scale Gas
- Nostalgia ABC
- H.L. Glider

R/C:
- Texaco
- 1/2A Texaco
- Electric

Special events that also will be held during the three-day meet are .020 Electric (run by Joe Beshar), Compressed Air (Tim Banaszak in charge), Twin Pusher (Danny Sheelds handling this), and the Two-Minute event (sponsored by Gene Lapansie).

The above may not be an exact arrangement of the events, but you will find it close enough. For entry forms and pertinent information on housing, write to the Contest Manager, Bob Larsh, 45 S. Whitcomb, Indianapolis, IN 46201. Might also mention the free flight Contest Director will be Meredith Chamberlain, while the R/C end of things will be run by Woody Woodman with Assistant C.D. Mike Granieri. You couldn't ask for a better bunch of officials!

Don't forget the dates of Wright-Patterson AFB, August 8, 9, and 10. We are going to have so much activity, be sure you are prepared to have a good time. See you all there! •

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OLD TIMER HAND LAUNCH GLIDER PLANS. Many prewar record setters $1 and stamp for list and sample plan. Bob Larsh, 45 S. Whitcomb, Indianapolis, IN 46241

WANTED: Old model airplane engines, gas model race cars, kits, magazines, parts, related items, 1935-55 Arthur Suhr, W218 N5866 Maclynn Court, Menomonee Falls, WI 53051

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Free flight rubber scale model of popular homebuilt bips, 18" span. Steve Gardner.

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Complete sets of pressure sensitive patterns provide "printed wood"... on your stock .. for selected MODEL BUILDER plans. Press all patterns for ribs, bulkheads, tips, etc., on proper thickness sheet balsa or plywood, and cut 'em out! No tracing, no transferring, no plans tearing, no inaccuracies. Just like making up your own kit with printed wood. "Stick 'em Pattern" numbers correspond to plan numbers. Order with plans and they'll be mailed together .. 3rd Class. Add 65¢ per set to mail patterns 1st Class.

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Price includes 3rd Class postage and reprint of building instructions (if any). Add 65¢ PER PLAN for 1st Class postage. Add $1.00 PER PLAN for overseas orders (except APO and FPO). Complete plans list 35¢.

CALIFORNIA RESIDENTS ADD 6% TAX.

MODEL BUILDER PLANS SERVICE
621 WEST NINETEENTH ST.
COSTA MESA, CALIFORNIA 92627

Letters . . . . . *Continued from page 7*

which might be realized by a move to the hinterland would in all probability be more than offset by additional travel expenses alone; most likely for travel back to, and from Washington. The hundreds of associations located here have found it advantageous to be in the Washington area. Are we in the AMA crass enough to believe that we are different? In summary, I believe such a move would only serve the interests of a few, for personal gain, and that the issue should be dropped.

Another matter which is becoming quite apparent, and one which can do untold damage to the entire modeling hobby in this country is that of "cliquism," and political infighting within AMA. Specifically, one gains the distinct impression that some elected officials may be using their positions to maneuver for employment within the organization as salaried staff members. Much has been said regarding the practice of "double dipping" by federal employees. It is much more repugnant within an organization such as ours. To remove all grounds for doubt in this area I believe that every elected official should be required to sign a pledge not to accept any AMA salaried employment or position within a period of not less than three years after leaving his elected office. This should also apply to members of each elected official's family. There should be no "grandfather clause" to this, and it should be done at once. As an experienced executive I know that you recognize the hazards of the absence of such a provision in the by-laws and published policy in any organization such as the AMA. Therefore, I'm sure that you will use your good office to immediately implement such a policy, and provide exemplar leadership by being the first to sign this pledge.

Warm personal regards,
Hurst G. Bowers
AMA 29299

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MODEL BUILDER, 621 West Nineteenth St., Costa Mesa, Ca. 92627

Counter . . . . . *Continued from page 13*

sheets, plus an 18-page instruction manual filled with sketches and photos and a wealth of general construction info that can be applied to any giant scale model. A cowl, wheel pants, cabane, landing gear, and other parts are in the planning stages and should be available in the near future.

Cost of the plans is $21.50, from Wendell Hostetler's Super Scale Plans, 1041 Heatherwood Lane, Orrville, OR 44667.

• • •

We have a lot of stuff for giant-scalers this month. In addition to the two plans mentioned above and Ace R/C's big battery pack, J-5 Enterprises is making a kit for an *all-fiberglass* 1/4-size Zenair Tri-Z CH300 Canadian homebuilt . . . sort of looks like a homebuilt Piper Cherokee. The only wood parts listed in the press release were the 1/2-inch ply firewall and 1/8 mahogany ply ribs; *everything* else, we assume, is glass.

The CH300 spans 79-1/2 inches, weighs 18 to 22 lbs., and is designed for the Quadra engine, which ought to make it very aerobatic indeed. The airplane is set up for five channels (the standard four plus flaps).

The Zenair CH300 is now available at a suggested list price of $139.50, at retail outlets or direct from J-5 Enterprises, P.O. Box 82, Belmont, Ontario, Canada N0L 1B0.

• • •

W-K Hobbies in Ohio is offering a new line of glow fuels called "Boss" fuel. These mixes are available in pints, quarts, and gallons, with nitro content from zero all the way up to an eat-one-plug-every-flight 70%. Standard Boss fuels use Klotz racing oil but are also available with Bakers AA castor oil, or blended to the customer's specs. W-K will ship its fuel anywhere in the U.S.

Send for a price list, and while you're at it, ask about the special quantity discount. W-K Hobbies, 19 N. Main St., Centerville, OH 45459.

• • •

Stewart Scale Models is releasing a kit for an Outboard Tunnel racing boat called the SST. Even casual readers of Jerry Dunlap's "R/C Power Boats" column will recognize that name as being one of the most competitive boats on the racing circuit today. The Stewart SST is an all-fiberglass hull that comes with the deck already joined, plus the materials to build the radio box. As shown in the photo, you also have a choice of cowl styles. Overall length is 21 inches, beam is 13 inches. The SST is priced at $99.95.

More information can be obtained from Stewart Scale Models, Rt. 2, Box 220-5, Thonotosassa, FL 33592.

• • •

Our newest contributing editor and well-known advocate of giant scale models, Lee Taylor, is making his debut in this issue and also sent along some info on his company's latest in a line of accessories catering to the big scale buff: a *full-figure* large scale model pilot. By "full-figure," I don't mean the 36-24-36 kind, but rather that the fellow is "all there" . . . it's not just a bust, like most other dummy pilots you see in hobby shops.

This realistic-looking aviator is molded from flexible flesh-colored plastic. One arm is movable (the left one, looks like) while the opposite hand is positionable. The pilot is wearing a flight suit with zippers, a full parachute harness with molded buckles, and is sitting on a seat-pack parachute which can be easily cut away if desired. Total height is 14-1/2 inches.

Going price is $29.95, direct from Taylorcraft Ltd., 216 Willow Ave., Roseville, CA 95678.

* * *

Steve Muck has three new sizes of removable engine mounting pads to fit his company's four and five-inch Instant Motor Mounts. The new pads fit the Rossi .61, .65 and new O.S. .65 rear exhaust engines; other pads in the series are set up for the K&B 3.5, OPS 3.5, K&B 7.5, OPS .40, OPS .60 and .65, O.S. .40 FSR, Webra .40 and .61, and S.T. .65. The pads come pre-drilled and tapped to fit both the Instant Motor Mount and your engine, and all the necessary mounting bolts are also included.

You can get a catalog and full pricing information from Steve Muck's R/C Boats, 6003 Daven Oaks Dr., Dallas, TX 75248.

* * *

We received a note from Twinn-K, a company well-known for its model car racing products (tires in particular), informing us that they have bought all production rights, patents, tooling, inventory, etc. from Fusite, a division of Emerson Electric and makers of the popular Glo-Bee glow plugs, Fire Plug, and Stinger electric starter. Effective immediately, you can buy these products from Twinn-K, Inc., P.O. Box 31228, Indianapolis, IN 46231. Products literature and price lists are available at no charge. •

Workbench . . *Continued from page 10*

a "Goodrich Blimp." Funny thing is, there really was a Goodrich blimp, in fact, the B.F. Goodrich company made nine such airships during World War I for the U.S. Navy! This fact was revealed in an article by Steve Kidd in the April 1980 issue of *Private Pilot*. But another fact was also revealed which was even more interesting. Goodrich built five limp airships which were designated Class B, and later built four C series ships. Get it? Those first five were Class B limp airships, and thereby comes the origin of the name "blimp"! Glad they coined the name before the Class C ships came along. "Climp" just doesn't have a nice ring to it.

Incidentally, one of the Goodrich-built C-blimps, C-2, became the first airship to fly coast-to-coast across the U.S., in 1921.

WHAT'S AN LSF?

For the benefit of those who are new to R/C glider-guiding, a few words about the LSF, the League of Silent Flight. To quote:

"You're in good company if you're curious about the LSF. Many are these days. The LSF is attracting the attention and interest of R/C sailplane enthusiasts throughout the world.

"The League of Silent Flight is an association of and for the individual sportsman. It is not a club . . . it is a program . . . and participation neither conflicts with nor requires club membership. However, many clubs find that group participation in the LSF can excite new interest and bring new growth.

"Membership can only be earned. Membership cannot be bought . . . there are no membership dues or fees. To become a member, an R/C sportsman must fulfill the requirements of Level I of the LSF Soaring Accomplishments Program: a 5 minute thermal flight; a 15 minute slope flight or a second 5 minute thermal flight; and five spot landings within 3 meters (9.84 feet) of a target point.

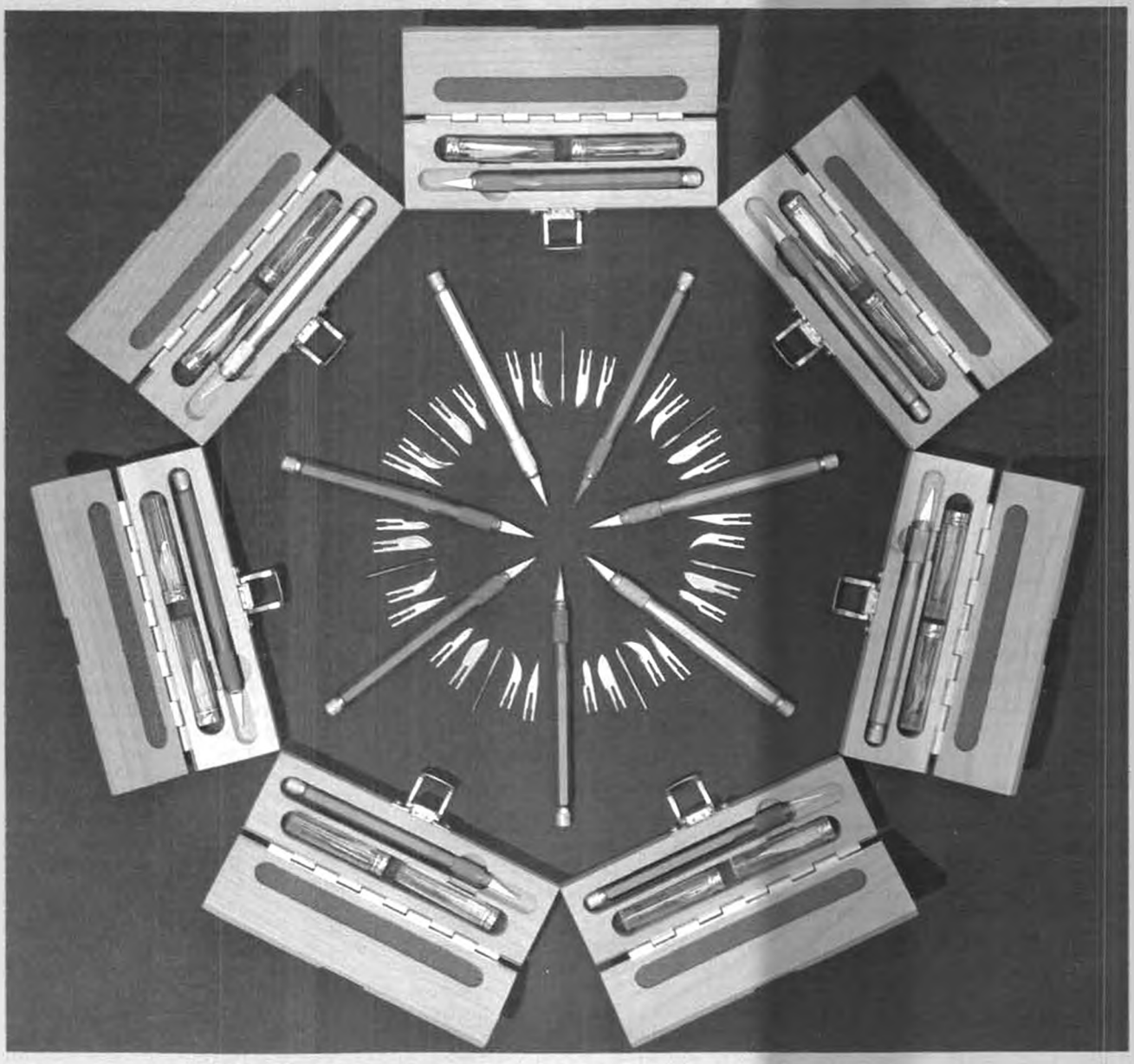
"Advanced levels in the program are progressively more challenging. Level V, for example, requires a 2 hour thermal flight, an 8 hour slope flight, a 10 km (6.21 miles) goal and return flight, as well as considerable success in soaring competition.

"Members . . . sportsmen who have achieved Level I or higher . . . are privileged to display the distinctive LSF insignia. The LSF emblem on a jacket or sailplane is a symbol of proven performance . . . it is displayed with pride . . . and recognized . . . anywhere in the world."

If you wish to declare your intent to become a member, write to the LSF Executive Board, P.O. Box 39068, Chicago, IL 60639, give your AMA or FAI affiliate license number, your FCC (or other) radio license number, and enclose 30 cents in stamps for return postage (remember, there are no dues).

The 1980-81 LSF officers are: Gordon

IN THE BEST CIRCLES, IT'S **über skiver**



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- *Safe, Rear Draw-Bar Clutch*
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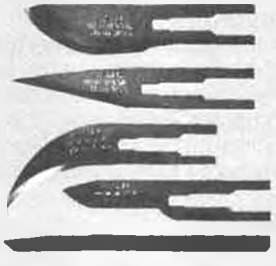

Available in seven satin anodized handle colors: silver, blue, red, green, gold, copper, violet. Complete set in fitted hardwood case; includes uber Skiver, together with two vials containing four No. 11, and one each of Nos. 10, 12, 15, and 20 . . . . . $14.95
Individual handles (specify color) $5.95
Vial of 6 blades (No. 10, 11, or 15) $2.10
(No. 12 or 20) $3.30

See your dealer, or order direct.
Dealer inquiries are invited.
All direct orders sent postpaid in U.S.
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Pearson, LSF #410, President; Warren Plohr, #334, Vice President; Warren Tiahrt, #241, Secretary; and Keith Finkenbiner, #601, Treasurer. The membership, counting Level I holders or higher topped 3,800 in March, 1980, with 13 having reached Level V.

Though our frequent R/C soaring activity ceased pretty much with the beginning of **Model Builder,** we're proud of our LSF 096 number earned in 1970 flying a Graupner Cirrus, one of the first to be built in the U.S.

INTERNATIONAL NOTES

Though not exactly international, as Puerto Rico is a U.S. possession, we'd like to mention that P.R. will hold its second Nationals in Fajardo, on August 30 and 31, and September 1, 1980, and it's open to modelers from all over the world. For further information, contact Joseph Micalizzi, Box 1532, Fajardo, PR 00648.

* * *

Also on August 30 and 31, in Flemalle, Belgium, there will be an indoor contest for F1D, beginner's E.Z.B., plus Peanuts and "Saintes Formules" (that one has us!). For complete information on the contest, plus a list of accommodations, etc., write to F.L. Van Hauwaert, Grand Place, 1/52, B-4110 Flemalle-Haute, Belgium, phone 041-33 30 78. And would someone explain "Saintes Formules"!

* * *

From Giogio Gazza, Via Losanna 6, 20154 Milano, Italy, comes word of the second "Coppa Schneider," on September 6 and 7, 1980. This, of course, is patterned after the famed Schneider Cup races dating back to 1913-1931.

Several foreign magazines had reports on the first contest, also held in Italy, last year. Not too many successful flights were accomplished, but that is typical for any new venture. It takes a while for modelers to fully develop the idea into a workable concept.

The rules are basically comparable to most flying scale contests, with both static and flight judging. Power is limited to .61's. Complete information can be obtained by writing directly to Giorgio, who also offers the rules translated into English.

THINK ABOUT IT

The following was written by George Murphy (no, he didn't create Murphy's Laws) and published in the Schenectady, New York "Thundervolts" newsletter, which he edits. It's entitled, "My Two Cents," and it's well written.

MY TWO CENTS

"I talked to a friend of mine the other day and during the course of the conversation, I mentioned that I had just paid my AMA dues and was waiting for spring to try out two new ships. Charlie was surprised to find that I was still in modeling. He had been a modeler for about 6 years, quit, and was into photography.

"I got to thinking about why my good flying buddy had quit and concluded that Charlie had never really gotten into modeling. I remember his first plane, a year old KADET that he bought from a club member and flew for a year or so before he got the itch for a better ship. Plane number two was a TIGER TAIL with a hot 60, and from then on, every 3 or 4 months ole Charlie would come out to the field with the latest radio, 3, 5, then 7-channel on the latest hot ship (glass and foam). For a while he got into pylon and then it was quarter-scale. No wonder he quit: the only thing he ever did was buy and fly. I don't think he ever joined two pieces of balsa, covered a wing, doped a fuselage he had built, or carved a nose block from a chunk of balsa.

"The history of model aviation is not beyond the lifetime of some of the older modelers. I am sure they built their first planes from a set of plans from a magazine, then at a later time when kits were available, became kit builders (I remember my first CLEVELAND kit). The next development was die-cut parts, a change welcomed by all, and with the exception of the detailed instruction booklet, probably the last change worth a damn.

"Engines have also had their history from the original hand-made to the production BROWN on through to the OHLSSONS and then the changeover to glow engines and then the development of the carb and the addition of good mufflers: all to the good.

"Most of us remember the radio story also: big unreliable single-"channel" escapement units, then the multi-channel reed units, then the discovery of transistors. Next came pulse proportional with the servo, NiCd, and increased reliability and range.

"At some place and time the people selling this stuff no longer were modelers but were businessmen with the big buck their only concern. Kits became fiberglass and foam, engines became ducted fans, radios added roll buttons, and Charlie quit modeling because he never was a modeler.

"I don't advocate going back to 1937, but I don't think we are going in the right direction now. I am a firm believer in the concept that part of the fun in flying is knowing that you built it yourself. The more you put into this hobby the more enjoyment you get out of it. I think it's about time we gave up this ARF (almost ready to fly) and RTF (ready to fly) aspect and get back to basic modeling. Modeling today is similar to becoming a parent by artificial insemination, people are missing the fun!" •

CX-350 gas race car.

CX-12 electric race car.

RACERS

LEE CARS

The CX-350 1/8 scale gas race car (background) has done very well in Germany - winning the West German Nationals. The car is of basic, sturdy construction and is designed for full blown competition. The easy to assemble kit includes fuel tank, tires, heat sink, and clutch.

The CX-350 uses a fiberglass flex plate in the chassis. Wheels are supported in ball bearings front and rear. Disc brakes. Wheel hub diameters are compatible with tires generally available in the United States for this type car. The CX-350 comes less body. World Engines stocks the line of Parma bodies for use on the Lee car. In other countries Lee buys the body from Parma and includes it in the kit. See price schedule at the right for Parma bodies.

The CX-12 1/12 scale electric (foreground) is a competition electric racing car. We feel that this machine will raise quite a few eyebrows. All reports indicate that the CX-12 offers superior handling characteristics and is very sturdy. The CX-12 comes complete with motor, 6-cell nicad pack, and charger.

This car was originally listed at $112.50 complete with the Lola Can Am body. We are now offering the car less body as World Engines stocks the line of Parma bodies that are used by this manufacturer; hence, the price reduction. The CX-12 has a unique and adjustable servo saver usually found only on 1/8 scale cars. The CX-12 uses standard size tires.

SG RACING CAR

World Engines is now acting as the SG agent in the U.S.A. and maintains an SG inventory of race cars, parts, and ARF planes - Devil, Pioneer, Atlas. World Engines will service dealers directly and also arrange for sales to other distributors. Copies of SG catalog (Italian) available. 1980 - $2.00; 1979 - $3.00. The 1979 is the larger main catalog.

PRICE LIST

Lee CX-350	159.95
Lee CX-12 (less body)	99.95
Lee Parts	See catalog
SG Cars	Write for prices
Parma Group 12 RTR Painted body	130.00
Parma Group 12 Kit Clear body	115.00
Parma Group 12 RTR Painted body w/Futaba Radio	260.00
Parma 1/12 Clear bodies	9.95
Parma 1/12 Painted bodies	15.00
Parma 1/8 Clear Sport	19.95
Parma 1/8 Painted Sport	28.00
Parma 1/8 Clear Indy	11.95
Parma 1/8 Painted Indy	18.00
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O.S. 3.5cc Car Engine	99.95
K & B 3.5cc Car Engine	77.00

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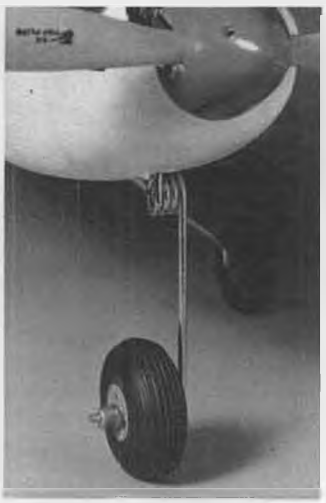
- Factory installed bulkhead, fuel tubing, fuel tank, engine, hinges, control horns. The control rods for elevator, rudder and throttle are prebent.
- An hours work ... and you'll be flying high
- Uses either two or three channel radio

Powerful throttle control .15 TV engine factory installed along with big fuel tank.



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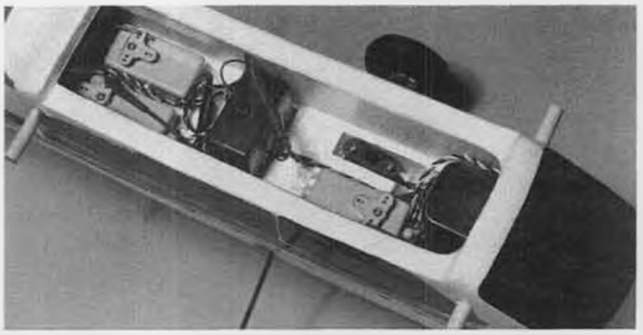

Premolded compartments to hold and cushion servos, receiver, battery. (radio not included) Control rods prebent.

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- Sleek, low density, pure white foam with lustrous red, black and white decal striping. Enough striping to customize.
- Add up the components and you'll find you can't even buy the parts for this price ... let alone the workmanship and assembly time. Time you can now spend flying instead of building.

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