MODEL BUILDER

ICD 08545

NOVEMBER 1982

$2.50

volume 12, number 130

0 74820 08545 1 1

Recognized for Quality
THE WORLD OVER


Staggerwing Beech
1/5 scale


P-51 Mustang
1/5 scale


Christen Eagle II
1/3 scale


A-36 Beech
1/6 scale


V-35 B Bonanza
1/6 scale

F-86 Sabre Jet
Avail. in D & H
models (ducted fan)
1/8 scale


A-4 Skyhawk (ducted fan)
1/7 scale


T-34B Mentor
1/6 scale

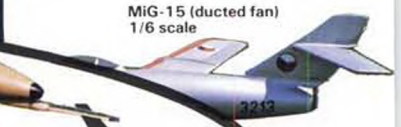
General information about these new product releases found in catalog.

NEW for '82


F-16 (ducted fan)
1/8 scale


Kfir
1/7 scale


MiG-15 (ducted fan)
1/6 scale


MiG-15 (ducted fan)
1/6 scale

BYRON ORIGINALS
T.M.

A product of Midwest Industries, Inc. Ida Grove, Iowa, 51445 Ph. 712-364-3165


F-33A Beechcraft
1/6 scale


Byro-Jet ducted fan
(for .60 engines)


Pitts Special
1/3 scale

Beech Baron 58
1/6 scale


T-34C Mentor
1/6 scale


Mirage (ducted fan)
1/7 scale

CAP 21
1/4 scale

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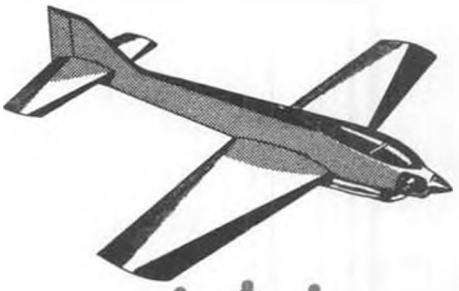

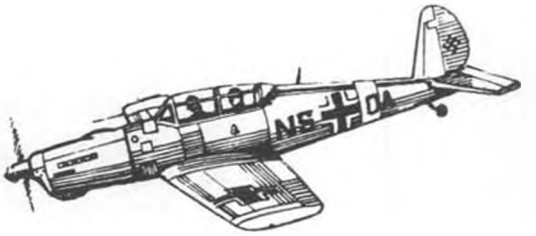

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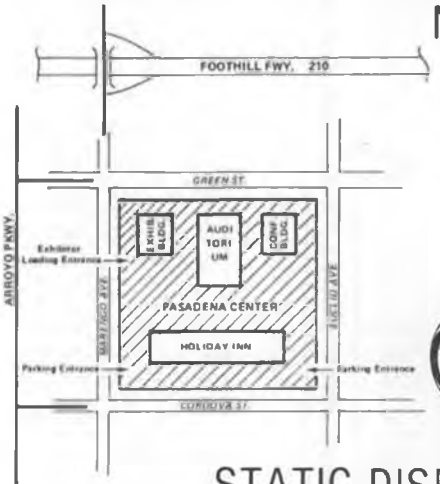

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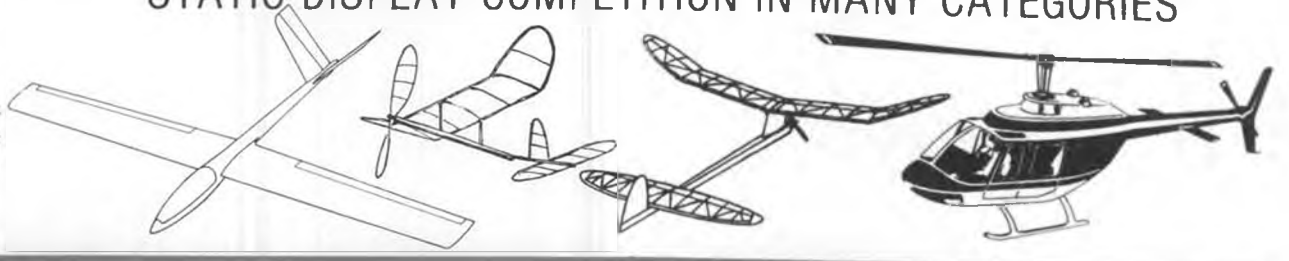

SEE INDOOR R/C SCALE AIRCRAFT AND BLIMP FLYING

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MODEL BUILDER

NOVEMBER

1982

volume 12, number 130

621 West Nineteenth St., Box 335, Costa Mesa, CA 92627-0132 Phone: (714) 645-8830

CONTENTS

FEATURES

CONSTRUCTION

Cover: Ever since we first published Tom Protheroe's R/C sailboat "PEA POD", over nine years ago, it has been one of our best-selling full-size plan offers. Though easy to build, with its four-piece Luan mahogany door-skin hull, it was not considered one of the hottest 360-600 class yachts in the pond . . just a nice beginner's boat. However, Ken Cashion's modified version (How about "Mod Pod" or "Pea Souped"?), is a racing machine that can hold its own with any boat in its class. Article begins on page 15.

MODEL BUILDER (ISSN 0194 7079) is published monthly by RCMB INC., 621 West Nineteenth Street, Costa Mesa, California 92627. Phone (714) 645-8830.

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Just as important, the 7FG has a great set of gimbals. 100% Futaba from drawing board to mold base dies, these precision open gimbals offer silky smooth action and sensitivity second to none.

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Consider this. At less than $400.00, complete with NiCads, maybe you can't afford not to.

Futaba

Dual personalities, mixed motions, servo reversology and everything else it takes to give you Total Control.

SIG HAS KITS FOR SPORT FLYING

HUMMER

There's more fun per ounce in this miniature tiger than in most any other model. Using just 2 channels of control you can fly up an aerobatic storm. Large wing area and light weight produces a low wing loading and that's the way to get superior performance from small models. Take off from any smooth surface, even close cropped grass.

DOUBLER II

Don't let the fact that the Doubler II fits 1/4 midget racing specifications lead you to a conclusion that this is a hot handful suitable only for expert pilots. All it takes to turn this sharp looking bird into a docile sport flier is the installation of a reasonably priced, non-racing, .15 sized engine. In this configuration it is aerobatic and responsive.

KIWI

We're all sport fliers at heart and this is a great model for Sunday sessions. Does well on wheels, floats, or skis. Big control surfaces for full aerobatic performance. You name it and the Kiwi can probably do it. And check that price against comparable models of other companies. A bargain without any shortcuts.

$20.95

Engine: .049 - .051
Wing Span: 34"
2 Channel Radio

KIT RC-50

Designed by - BILL FLEMING

HUMMER

Engine: .15
Wing Span: 36"
4 Channel Radio

Designed by - BRAD SHEPPARD

DOUBLER II

KIT RC-40

$38.50

KIT RC-42

$54.95

Engine: .35 - .45
Wing Span: 54"
4 Channel Radio

Designed by
HANK POHLMANN

KIWI

GET INTO THE AIR FAST WITH A MOLDED FOAM WING DESIGN

The models below come with Sig's own high-density foam wing, formed in one piece, ready to fly. The wing is fuelproof and needs no covering, but can be painted if desired. Tails are sheet balsa and fuselages are built up on printed balsa sides in a quick and easy assembly technique. The result is a rugged little sportster that can take the hard knocks of Sunday flying. All include the following: Die-cut plywood parts, formed aluminum landing gear, aluminum motor mounts, nylon control horns, RC links, threaded control rods, molded hinges, hardware pack of screws, blind nuts, etc. and an illustrated building and flying instruction book. In addition, the Colt and Klipper have a nose gear, nylon nose gear bearing and nylon steering arm. A formed plastic cowl is supplied with the Klipper and Super Sport. Many RC clubs have used this series for special fun-fly events because of the convenient size and economical price.

KIT RC-36

$30.95

Engine: .09 - .15
Wing Span: 45"
2 - 3 Channel Radio

KLIPPER

Designed by - CLAUDE McCULLOUGH

Every designer has favorite outline shapes and some of the familiar lines of the Kadet and Komander are mixed together in this model. Steerable nose wheel.

Engine: .09 - .15
Wing Span: 45"
2 - 3 Channel Radio

KIT RC-43

$30.95

Designed by - JEFF FOLEY

COLT

This scale-like (sorta-Cessna) little gem is an ideal subject to paint in full size color schemes. Inspiration can be found at any airport or in aviation magazines.

Engine: .09 - .15
Wing Span: 45"
2 - 3 Channel Radio

KIT RC-37

$29.95

Designed by - MIKE GRETZ

SUPER SPORT

Clean and simple lines characterize this functional design. That approach makes it a snap to built and the wing loading can be kept to the lowest possible minimum.

KIT RC-45

$29.95

Engine: .09 - .15
Wing Span: 45"
2 - 3 Channel Radio

Designed by - MIKE GRETZ

SCAMP

Remember the lightplanes of Aviation's Golden Age - the Cub, Champ, Taylorcraft, etc. The Scamp is reminiscent of several of those classic lightplanes of the 1930's and 40's.

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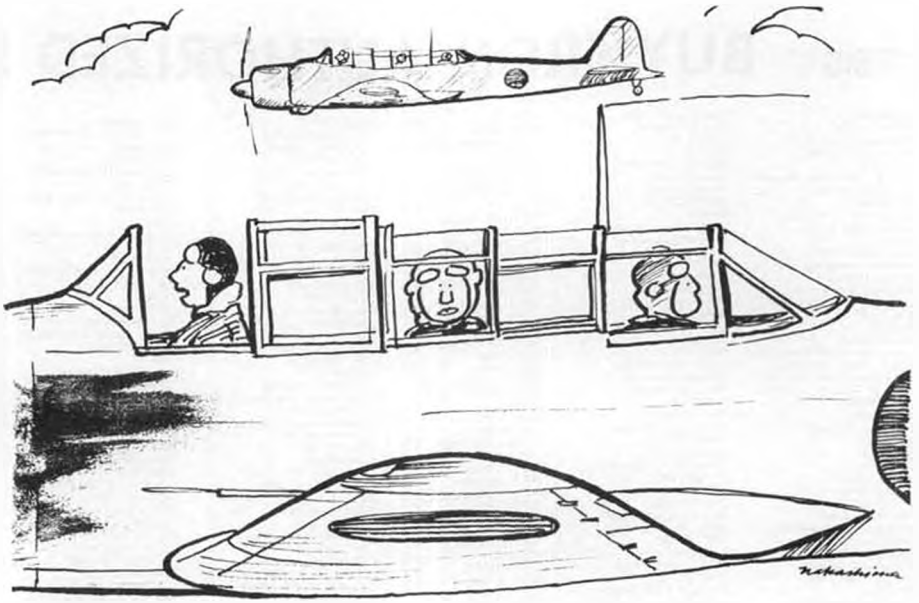


"When we get home Hiroshi, it's your turn to wash the windows."

from Bill Northrop's workbench

• • •

• Did you get your rules proposals for the 1984-85 period into AMA by September 1, 1982? This was the deadline for being serious about correcting those rules that you've been griping about.

I've had one pet gripe concerning the judging of Sport Scale models, and I guess this applies not only to R/C Sport Scale, but also to Giant Scale, Sport Scale R/C Sailplanes, and also Control Line Sport Scale. I've made the official proposal for R/C Sport Scale, but perhaps I should also write one for each of the others (there's still time as this is being written).

The point is this . . . all of the above model categories are judged statically from 15 feet away . . . Fine (well, maybe. Read on). But somehow, craftsmanship became one of the items to be judged . . . from a distance . . . also. Judging "Accuracy of Outline," or "Finish, Color & Markings" is logical and correct for Sport, alias "Stand-Off," alias "Look at it from far away" Scale, but judging craftsmanship from a distance is ludicrous! Craftsmanship must be judged "Close Up" to do it properly. Craftsmanship is not a function of authenticity, as is accuracy of outline, finish, color, and markings. Any of these could be totally wrong on a given model, yet the craftsmanship could be outstanding. To score craftsmanship properly, the judge must be able to examine the model closely, both to see it and feel it, if necessary. I proposed this officially.

In actual practice, if one judge is scoring all three items, he can do the "distance" judging first, turn in his scores to the C.D., and then move in close to judge craftsmanship. If two or more judges are available, one can do the close-up, and the other(s) can handle the distance work.

I was almost tempted to propose elimination of craftsmanship judging entirely, as the models are supposed to work at long range, where craftsmanship is (or should be) of no concern. But then, rewarding craftsmanship tends to preserve the neat, fine workmanship that is so much a part of the real hobby of building model aircraft.

A while back I said that 15 feet was "maybe" fine for distance judging. I have also proposed to eliminate the injustice of judging a three-foot span model and a 10-foot span model from the same center-to-outside distance. A simple graduated distance-to-wingspan table has been proposed, ie, the bigger the model, the further away the judges operate during the scoring of outline, finish, color, and markings. A whole bunch of concentric circles are not necessary at the judging site . . . just a string with "distance tags" attached, and staked down at the center point. Two or more strings can be made available, if the judges want to walk around, or if there is no one available to turn the model.

TOM HUTCHINSON

The relentless ravages of cancer finally overtook Tom, who passed away on Monday, August 16, 1982, just under a month from his 42nd birthday. Tom has been the Free Flight columnist for Model Builder since January 1979, taking over from very good friend, Bob Stalick. Ironically, it is Bob who has assisted us with Tom's recent columns, and who will, in fact, be filling in for Tom while we locate another columnist.

We offer our sincerest sympathies to Tom's wife, Rosemary, and their two sons, Mark, 7, and Michael, 5, and wish them the best in adjusting to their new life. And to Tom . . . thermals.

The family requests that remembrances be sent in Tom's name to the Tuality Community Hospital, Medical Foundation, Cancer Fund, Hillsboro, OR 97123.

JOE RASPANTE

Word comes from Al Holmes that Joe Raspante, designer of the classic "Snow White", passed away on July 25, at 74 years of age, due to heart failure. We are only happy to report, through Al, that Joe was very pleased with the Snow White article published in our August '82 issue, just barely in time for him to see it.

Al Novotnik, newly appointed Advertising Representative for MODEL BUILDER.

★ ★ ★

There seems to be a lot of mixed emotions about the "Monster" models. Some are entirely against them; the majority appears to be for them as long as size, weight, and power are treated in moderation; and some seem to be on an uncontrolled (emotionally and otherwise) ego kick to see who can build the biggest, heaviest, most attention-getting, etc. R/C aircraft.

I'm a member of the majority. Although still basically in favor of the Mammoth concept (large but lightweight, with .90's or reduction drives to turn big props), the two to two-and-a-half cubic inch ignition powered biggies

Continued on page 98

OVER THE COUNTER

All material published in "Over the Counter" is quoted or paraphrased from press releases furnished by the manufacturers and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by R/CMB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by R/CMB.

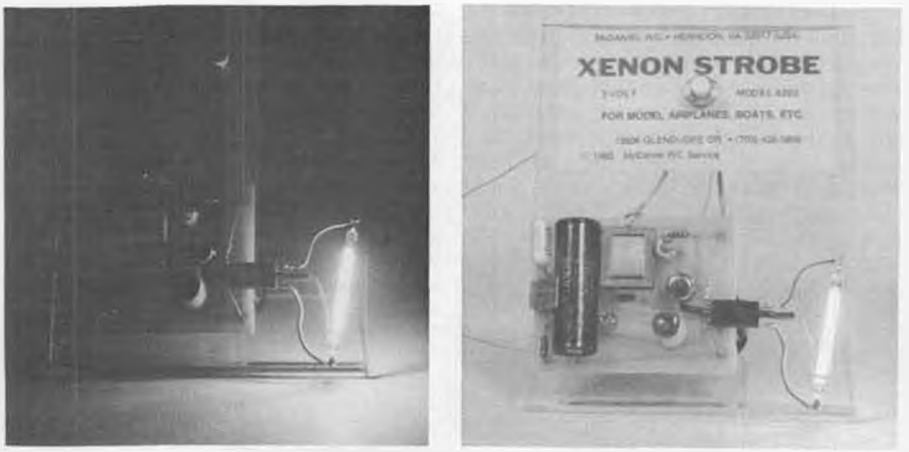
Four new (2,3,4, and 5-channel) low price radios from Charlie's R/C Goodies. Made in U.S.A.

• Kraft Systems continue to add new items to its line of 'Modeler-Designed' accessories. Along with an expanding hardware line of the most popular sized items, new modeling accessory items are being developed and added, too.

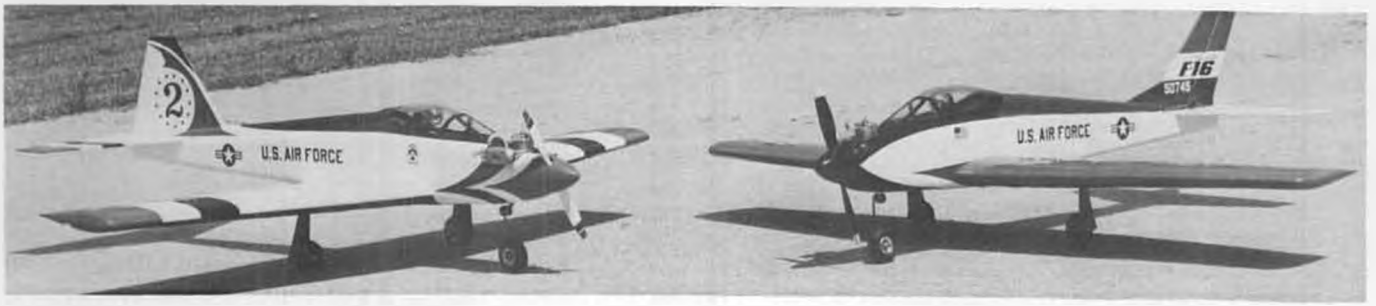
In the 'Hardware' department, Kraft Systems is now packaging engine mounting screws, with hex wrench, for 98¢ per package. Ten 6-32 x 3/4 long, hardened steel hex screws, in black oxide finish with wrench, are available under part No. 200-260. Handy to have for installing engines, mounts, landing gear, etc.

Packed in convenient 4-foot lengths, is a special formulated, high-grade black neoprene tubing for all glow, gas and oil, and diesel fuels. Retail price is $1.49 per package, part No. 200-249. Another handy item that should be on every modeler's workbench is several packages of Heat Shrink Tubing, ideal for sleeving plugs and connectors, or for an emergency splice or repair in the field. Shrinkable by using your soldering iron or cigartette lighter. The 1/16-diameter heat shrink tubing is 98¢ per package, part No. 200-250.

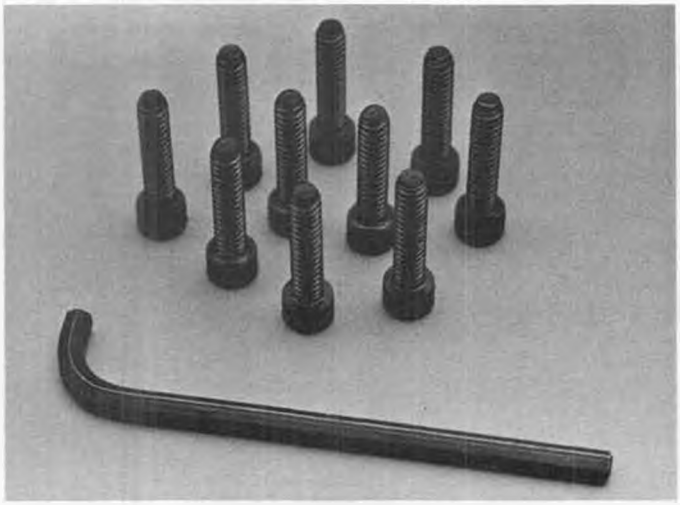
Keep several packages handy for last-minute finishing touches to that new model! What? Wing Saddle Foam Tape, of course! One-sided pressure sensitive adhesive on foam tape, 1/16 thick, approximately 1/4 inch wide and in 4-foot lengths, packaged under part No. 200-251 for only $1.59 per package. Perfect material for that fuselage saddle-to-wing fit. Use it to seal access hatches and cowlings, too. At your dealer's now,



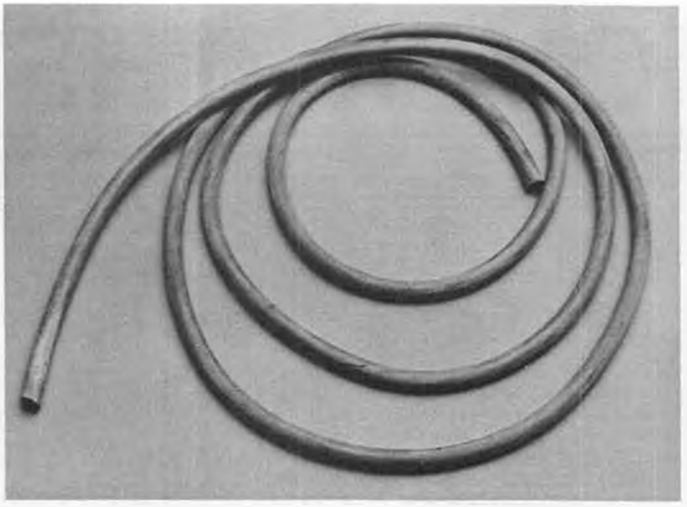
New strobe light system from McDaniel R/C. Photo at left taken with lens open for six flashes. Photo at right; two flashes, then normal exposure.



Sig KOBRA for .15 to .35 engines. Build either version. Both decal sets included.



Hardened steel 6-32 hex screws from Kraft Systems. Wrench included.



High-grade black neoprene tubing from Kraft. Handles any fuel.

and dealers, contact Dan Lutz or Lucy Skjegstad for more information on these fine products available from: Kraft Systems, Inc., P.O. Box 1268, Vista, CA 92083, or call Dan or Lucy at (714) 724-7146.

★ ★ ★

McDaniel R/C, the company that has developed the Ni-Starter and the Bo-Starter to assist in quick starting of your model airplane, boat, or car engine, has been busy developing and producing new items to add to the enjoyment of the hobby/sport. Now available is its #8023 Xenon Strobe unit designed for 3-volt operation (two alkaline cells or two NiCds), assembled and tested for only $34.95. It can operate up to 12 hours on two alkaline 'C' cells and two 'AA' NiCds will provide up to two hours of continuous operation before recharging. The high output Xenon flash tube is timed to flash two times per second with fresh batteries and then will drop to a rate of one time per second automatically as the batteries become weak. So, if you want to do your thing AFTER DARK and not in the Twilight zone, send a SASE to; McDaniel's R/C, 13506 Glendundee Dr., Herndon, VA 22071, or call (703) 435-5805.

★ ★ ★

The star attraction of both R/C model and full scale boat racing is the unlimited hydroplanes, the "Thunderboats." If you'd like to learn more about the R/C model versions, get *"R.C.U. In Detail,"* by Les Ruggles. This 47-page book contains over 30 illustrations and photos of Radio Controlled Unlimiteds, along with inside info on how to build, set-up, race, and win with these exciting juggernauts.

Not available in stores; send check or money order for $5.95 plus 50¢ postage to R.C.U. In Detail, 13417 S.E. 233rd St., Kent, WA 98031. Allow three to four weeks for delivery.

★ ★ ★

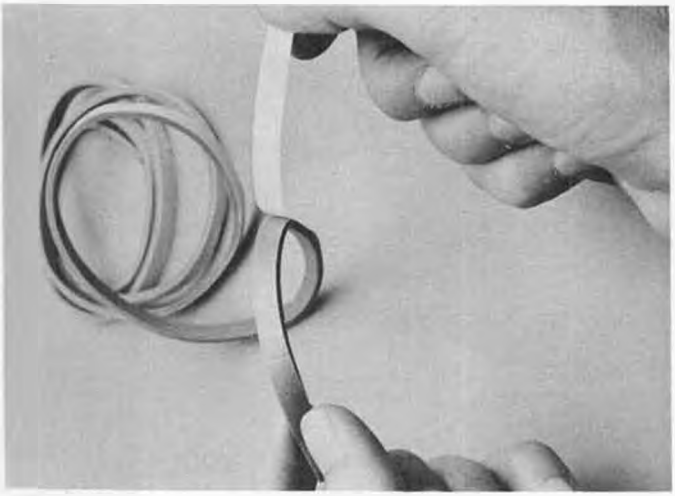
Here's something kinda new and different from Precision Sanding Tools, 2930 Skyview Ave., Pueblo, CO 81008, phone (303) 542-6200. They're called *SPEED STIX*. Great for smoothing out those hard-to-get-at spots, the wood sticks with sanding grit attached come in three color-coded sanding grades: 100, 120 and 180, and three diameters: 1/4, 3/8 and 1/2-inch. *Mini Speed Stix* are available in 1/4, 3/16 and 1/8-inch diameters, and in 120 and 180 sanding grades. They can all be used wet or dry. Regular Speed Stix are $4.85 postpaid, for a nine-tool set, and Mini Speed Stix

Heat Shrink Tubing from Kraft.

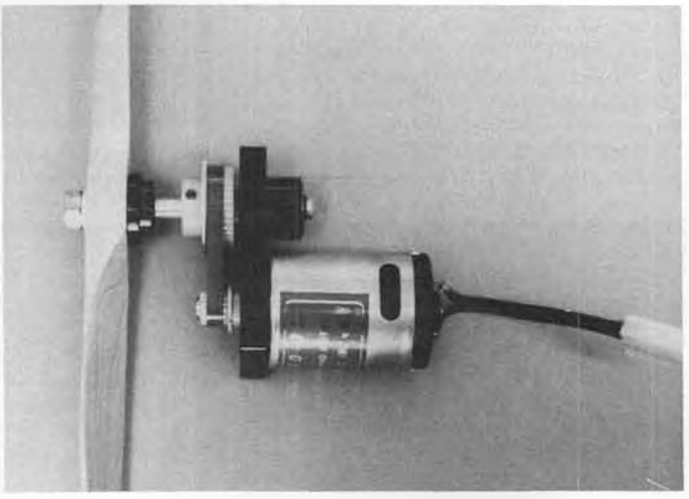
are $2.95 postpaid, for a six-tool set. They're especially effective on plastics, nylon, and other hard-to-sand surfaces.

★ ★ ★

New items from Charlie's R/C Goodies are 2, 3, 4, and 5-channel systems that are produced in the USA and priced below comparable imports. Typical system prices are $114.95 for the 2-channel system and $144.95 for the 4-channel system. The systems feature transmitter and receiver/servo NiCds with dual



Wing Saddle Foam Tape from Kraft Systems.



New belt-drive speed reducers for electric motors, from Astro Flight.

system charger, Hi-power transmitter with open gimbal sticks, 1.15 oz. receiver, and four servos with the 4 and 5-channel systems. Other servos are optional at extra cost. Send 75¢ for a brochure to: Charlie's R/C Goodies, P.O. Box 192, Van Nuys, CA 91408.

★ ★ ★

Attention Sunday fliers! Do you have the high-cost-of-fuel blues and would you like to have a slightly smaller, compact sport/pattern model to fit into your small car? Then take a look at Sig's new "3/4-scale Kougar," the "KOBRA." Designed by Claude McCullough, the KOBRA can be built and finished to create either an F-16 like version, or if you prefer, the Thunderbirds T-38 Talon appearance. The kit is produced in the usual Sig manner; complete hardware package, jet type canopy with framing molded in, printed fuselage sides to build on, die-cut ribs and formers, formed landing gear, molded plastic fuselage top, full size plans and photo instruction book, plus mylar decal sets for both versions. Spanning 45 inches with 390 square inches of wing area, the KOBRA is ideally suited for .15 to .35 engines. Priced at $44.95 and it should be available as you read this. See your dealer first or order direct from Sig, postpaid. Sig Manfuacturing Co. Inc., 401 S. Front, Montezuma, IA 50171.

★ ★ ★

Astro Flight has just announced a series of improvements to its line of speed reducers, including longer output shafts to ease installation in the cowls of scale models and the noses of old timers or electric sailplanes. The longer shaft has three adjustable positions to suit your installation needs. High-efficiency, super-quiet timing belts are used in place of noisy plastic gears and by using belts, no rewiring of the motor is required as it turns the same direction as the prop. The 05 reducer uses a 1/4-inch shaft, easing prop fitting problems. Also, the 05 unit fits Astro 05 and 075 motors, the 05 and 15 'Cobalts,' and any other size 05. Reducers are available to fit motors from the Astro 020 through the 25 and 40. Prices range from $14.95 for the 020 size to $24.95 for the 25/40 size. See your dealer or order direct.

The "Shrike", for .25 to .45 engines, by Wolff-Pak.

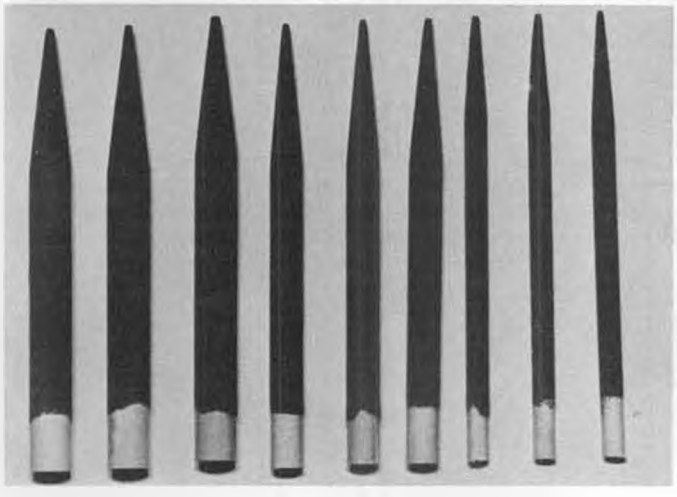
Build a model of this Puss Moth from plans by W. E. Technical Services.

Just released by Astro Flight is its new economy six-cell charger. The six-cell charger is designed to charge all six and seven-cell NiCd batteries; 1200 mah, as used in 1/12-scale cars, off-road, electric planes, and boats. This is the economy version of the Astro line, but still retains the important features you need (a fifteen-minute timer to automatically terminate fast charge and switch to the trickle charge mode, a quality ammeter, and a built-in equalizer circuit for automatically trickel charging your battery overnight). The best part is that the price is a fantastically low $24.95 available at your dealer, or direct. For more information on this and other Astro Flight products, send a SASE to Astro Flight, Inc., 13311 Beach Ave., Venice, CA 90291.

★ ★ ★

Contempo Hobby Products, manufacturers of the CAP 20L and Eagle, and Hobby outlet for the Magnum 11 engine for large scale model aircraft, has just announced that arrangements have been concluded wherein Acmex International of France, will now distribute

Continued on page 98



Speed Stix, variable sanding grit round sticks, from Precision Sanding Tools.

New economy six-cell NiCd charger from Astro Flight.

Air Force redesignated A-26 as B-26, scratching the "Widow Maker" from its rolls. This one by Parcell/Kelly team.

Steve Tilson's red and yellow "Airknocker" C-3 placed 7th in Sportsman at Scale Squadron Regionals.

R/C WORLD

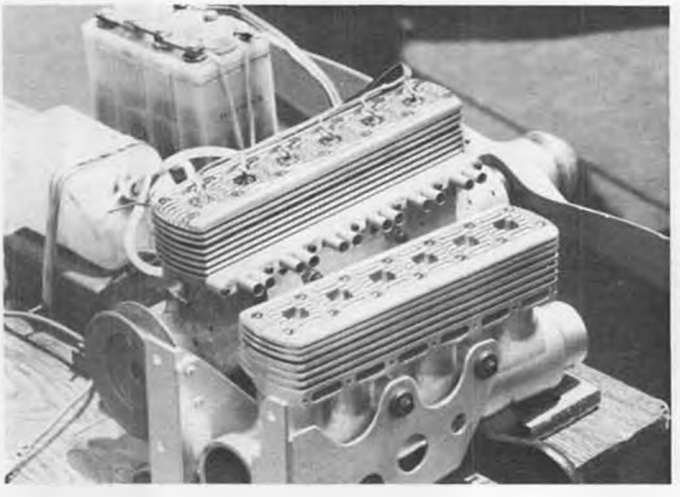
JOHN ELLIOT

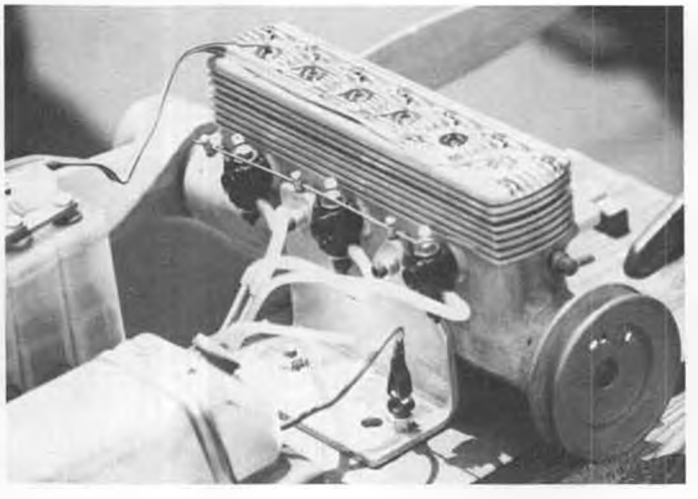
• Back in the early spring of this year, R/C World ran a contest about a wild aerobatic maneuver performed in a twin-jet fighter flown by the renowned WW-II pilot Jan Zurakowski while he was a test pilot with Gloster Aircraft, the maneuver being the 'Zurakowski Cartwheel.' Don Hambly, of Mount Hope, Ontario, Canada, had responded to the quiz and was kind enough to furnish some additional and fascinating history about Jan. As an example, Jan once crash-landed a Gloster Javelin and was out of the cockpit and off the wing before the aircraft had even stopped! According to Don, Jan had emigrated to Canada, became chief test pilot for Avro Canada, and was instrumental in testing the CF-100 and the CF-105 Arrow, later cancelled by the government. Don vividly recalls the time when Jan ejected from a CF-100 that crashed not too far from his home, leaving quite a hole in the ground. Unfortunately, the engineer didn't, or couldn't, make it out in time. Jan later retired and now runs a summer resort in Ontario, Canada. Interesting history . . . Thanks, Don.

Along these lines, the very special guest speaker at a recent bi-monthly meeting of Chapter 3, QSAA, was none other than Tony LeVier, famed Lockheed (skonk works!) test pilot and renowned pylon polisher. Tony started off his program with a sometimes humorously narrated slide presentation of his activities, past and present. His stories relating to his experiences (and antics) with the P-38 Lightning would fill a book with mind-boggling reading. Tony, now basically retired, has completely restored and now enjoys flying his magnificent Velie Monocoupe. Tony had flown it into John Wayne Airport recently for a Concours static display, and won the 'Grand Champion' award with it. A beautiful bird. Needless to say,

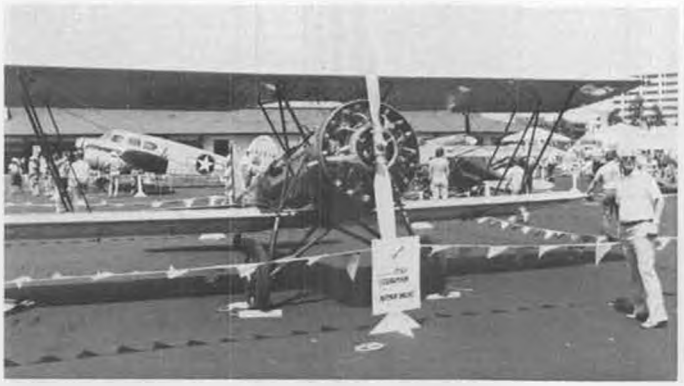
"Head for cover, men, Lockwood's here again! John's B-25 lays some eggs on Mile Square.

John Lockwood's newer and bigger B-25 settles smoothly on the deck after flight which included realistic bomb run shown above.





Terrific 6-cylinder in-line, built by Eldon Dwyer. Totals 3.6 cubes, uses K&B 61 top ends; turns 20 x 8 prop about 8500, weighs six pounds. Exhaust note is loud!



Static show at John Wayne Airport (Orange County, Calif.) attracted this rare 1930 Stearman, owned by Arthur Valdez.

Sun-glasses a necessity when looking at this polished, 1948 Cessna 195. That's right, Mable, no struts! Belongs to Roger Readhead.

local modelers had a field day with cameras gathering documentation for many a future scale project (MB has plans). Representative aircraft included such choice items as a 1930 Stearman, several 'regular' Stearmans in spotless civilian and military attire, a 1928 Travel-Air, a P-51A, (yes, an "A" model), a very nice J-3 Cub, and try a gleaming Cessna 195 so highly polished it hurt your eyes to look at it. The local scale contingent was asked to provide a display of R/C scale aircraft and that they did. And, it was very well received, too. Little Oshkosh? No, but a first time effort, quite well done, proceeds went to a worthy charitable organization and, 'bigger and better' planned for next year.

★ ★ ★

One thing about southern California and a few other high density areas around the country, one has to flip a coin to decide what type of activity to partake of on almost any given weekend. Shall we hit a scale contest or fun-contest, a Quickie 500 or Formula 1 race, or a pattern meet, perhaps something to do with R/C sailplanes . . . and we haven't even touched on R/C boats, or the hottest growing thing on the west coast, R/C off-road racing. *Something* is going on, or happening, every weekend, and in the case of R/C off-road racing, even at night at lighted tracks (and don't tell me, there's nothing to do, as the line in that old song goes)!

The same Saturday as the aforementioned full-size scale display, good friend Brian Curry, invited yours truly out for some slope soaring with his collection of variously configured flying wings. Watching Brian execute his overhead, backhand (?) launch and-away-it-goes technique with his 'wings' was quite educational. Brian is producing his 'quick-wings' out of foam, trying all kinds of airfoils, various amounts of sweepback, dihedral, wingtip and control surface configuration, along with juggling control throw and differential. The wheel (flying wing, in this case) isn't being re-invented, but a lot was being learned quickly, and filed away in the computer banks for later reference. Maybe Brian will treat us to a presentation of one of these 'quick-wings' soon. They fly very well, turn on a dime, some are most happy flying bottom side up, and are quite inexpensive (cheap is not an appropriate word) to produce.

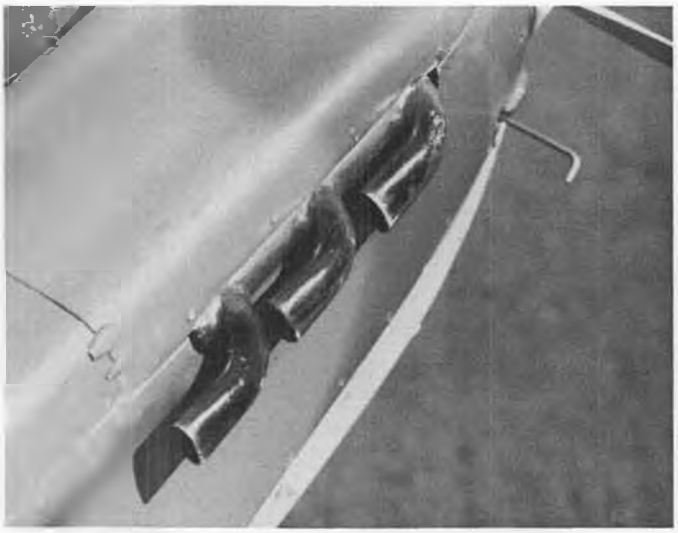
Ed Maloney's P-51A (yes, 'A') backs up scale model display personned by Diane Peterson and Bill Halpin. P-51A seen at Planes of Fame Museum.

★ ★ ★

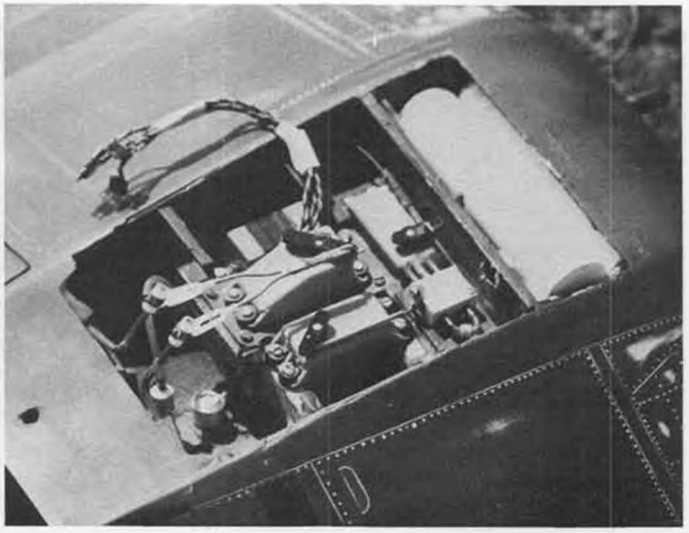
Signs that our R/C hobby/sport is really coming of age should perhaps, be reviewed lightly for the troops. Years ago, it was heard around the hobby that the manufacturers of R/C equipment, as an example, should not (be allowed to) participate in contests, as it was claimed an unfair advantage to others. In time, this subsided to a dull rumble, and like a stomach ache, it went away. Over the years, 'legal tender folding green' has been added to the trophy (kit, engine, radio) prize list and the word 'professionalism' has been heard. Current contests, including various soaring meets, have been fortunate enough to engage "suds" producers as sponsors. We all know how Circus Circus has really lifted up a segment of our Hobby/Sport to new heights, and now the R/C Scale Masters has been most fortunate to be recognized by Datsun as a worthwhile Public Relations endeavor, with a $10,000 new car sweetening the kitty!

This also leads up to interesting points, again regarding competition in modeling, not just RC, but the prime point in this dissertation. We know that many

A lovely Travel Air 4000, restored by Torrance Parker. Two wings, a round engine, and open seats . . . what else is needed!

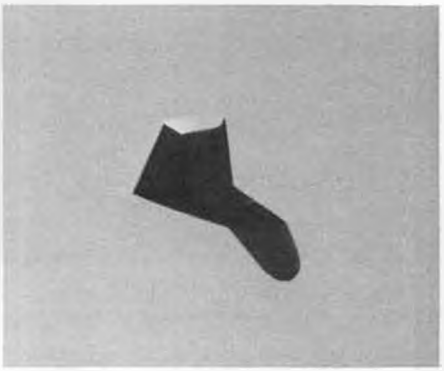


Bob Frey's modified Sterling Spitfire. Scale stacks are operational.



Inside of Mike Mann's Corsair wing centersection. Well organized and efficient.

Two of Brian Curry's R/C wings present odd shapes in the sky.



A bit reminiscent of the Northrop flying wing, with drooped outer panels.

Pretty logical way to launch a 'wing' when you think about it. Brian Curry.

countries have government subsidized athletes and *modelers*; controlline, freeflight, you name it. U.S. modelers compete in international events with assistance from the AMA and 'out of pocket.' During 'training,' degrees of assistance are pro-offered by various hobby manufacturers and publications, i.e.; kits, radios, building materials, accessory items and travel aid, but now, even this scene is changing by the involvement of non-hobby industry companies and individuals, or patrons.

In the 1st International Formation Flying Champs report in the October issue, we may note that the Peter Stuyvesant Cigarette Company sponsored the winning team. Simprop provided the necessary R/C systems, but there was a non-hobby sponsor involved. Interesting! How much non-industry sponsorship of our hobby/sport in Europe is being enjoyed? Would be neat to know! On the west coast, Jim Shinohara has been heavily involved with 'Team Samuri,' an elite group of Formula 1 types for several years. Quite a bit of help has been provided by Jim; planes, engines, etc., in an effort to help bolster Formula 1 racing. Jim has always liked things that go fast and turn left. Years ago, he sponsored several dirt track cars for well known Indy drivers such as A.J. Foyt and Johnny Rutherford.

Another area receiving the patrons touch is R/C soaring. A gentleman by the name of Roger Roth approached Larry Jolly with the concept that Larry select the talent, form and captain a highly competitive soaring team. With Roger providing certain guidance, ground support, and assistance, a formidable team is being welded together and should be well worth watching. We have come a long way, fella. . .

★ ★ ★

July 24th and 25th saw the Scale Squadron Regionals draw 51, yes Martha, fifty-one contestants together for a 'flight to the finish' contest in near perfect, warm weather. This was the first west coast contest wherein the giant scale models competed with sport scale on a same-rules basis. We will be seeing more of the giant scale models competing effectively from now on. Their 'presence' (thank you, Dave Platt) in the air, a given subject being able to be flown more realistically and handle windy or gusty conditions, all this adds up to picking up flying points.

In Sportsman, Steve Pfister, in his second contest (he was 2nd in the previously reported 4-stroke contest) won a well-deserved 1st place with his Aeronca C-3. John Bashore, Jr., flying the Don's Custom Models Super Chipmunk (giant scale) was second in his first contest! Better watch this young kid, guys . . . 3rd was Shane Cramer with his (giant scale) P-47. T'was the Jug's first outing. Fourth was Mike Peck with a

One thing a scale event has always done, as far back as we can remember . . . it brings out mobs of spectators. This is the Scale Squadron Regionals, Mile Square.

The Roth soaring team, equipment and personnel. Ball bearing winch motors, big Die-Hard, Honda generator. Team (l to r): Dennis Brandt, Mike Charles, Roger Roth, Larry Jolly, and Ken Nelson. OK, E.F., everybody's listening!

very nicely done Sig Liberty Sport and Dick Skuglund was 5th with his Ercoupe.

In expert, Kent "The Cowboy" Walters did it again. What can you say except that he has done his homework. He has stayed with the same aircraft (although a different model) for years (and someone once said that a winning model should be retired after so many first places . . . nuts, let the competition get *their* act together), and knows it intimately, flies it extremely well, and his scale documentation is excellent (I would have to give him a 10 on it. je). At this point, let me say that U.S. Navy aircraft were 1st, 2nd, 3rd, 4th, 8th, and 9th out of the first 10 places!

Garland Hamilton, now a California resident, had an outstanding performance with his Hellcat and netted 2nd spot, while being hotly pursued by the Hellcat of Don Lien for 3rd. Mike Mann's beautiful 'bent wing bird' was 4th (we hear rumbles of a bigger F4-U being developed by Mike). Jerry Ortego got his act together, stopped dropping his landing gear, and brought his FW-190 (semi-giant) into a well-deserved 5th spot. Chuck Fuller's big (giant scale) PT-17 was one of the crowds favorites with Chuck performing realistic turn-arounds (hammer-heads, etc.) during his flight performance. The real pleaser was when, during his low inverted pass, Chuck would blip the throttle on the big Kawasaki and the crowd thought that the engine would quit. Simulated temporary fuel starvation, the effect was very real. . .

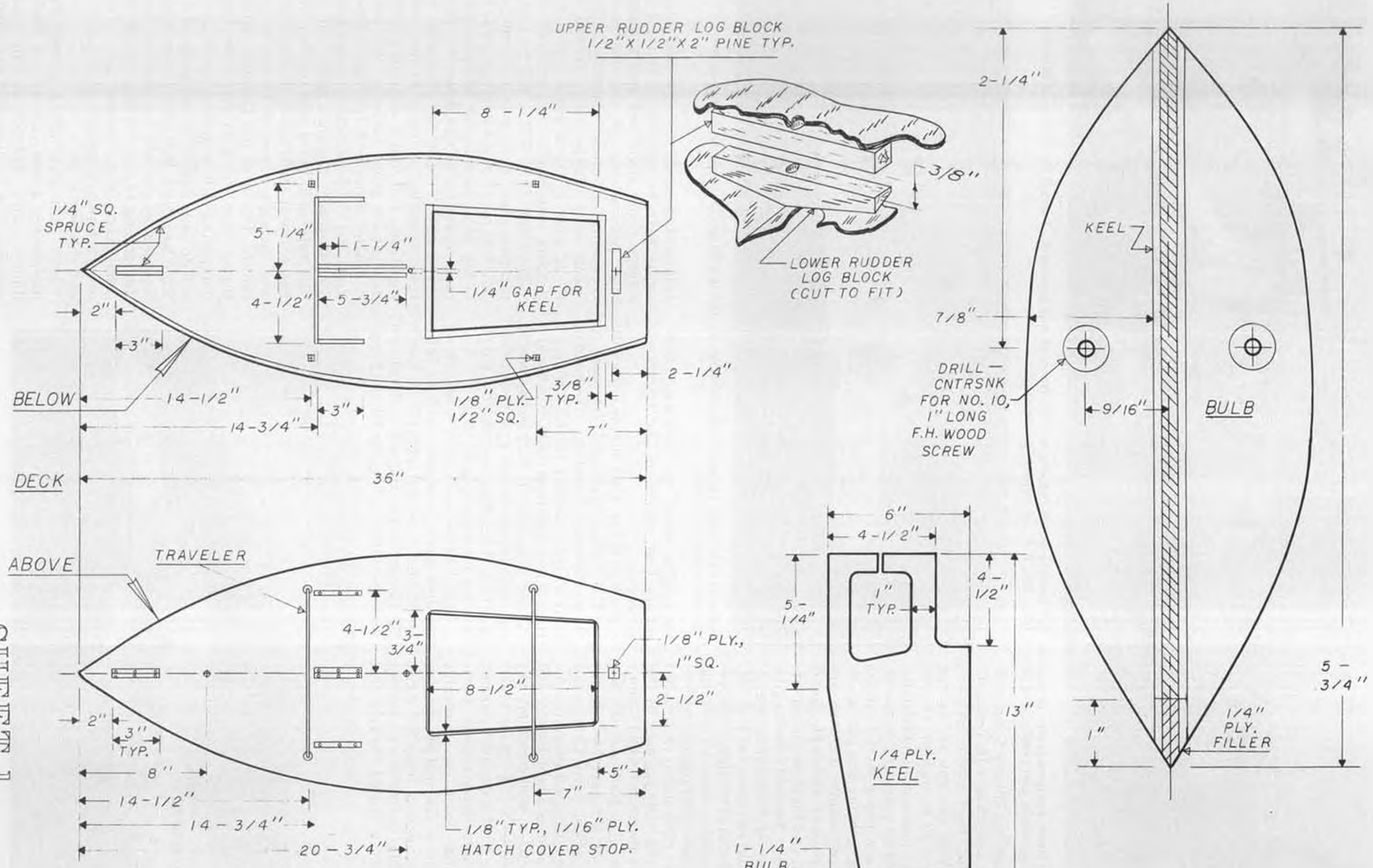
In sunny but windy Hawaii, island of Maui, Al Tuttle's Byron Originals A4 awaits calmer conditions for first flight.

Big Bert Baker, a last minute entry with his P-47 (giant scale and the mate to Shane Cramer's) eased into 7th ahead of Larry Wolff's Panther Jet. Rich Meyer's Hellcat was 9th (three Hellcats in the first 10 and only one (1) P-51 in the whole contest). Jerry Kitchen's perrenial P-47 was 10th. It has been said that the kid (?) needs a bigger airplane. Olaf?

Many other new and interesting models were entered, such as John Lockwood's new and bigger B-25. 'Catch 22' all over again. Harry Wood entered his first contest with his well flown Byron F-16 and astonished judges and spectators alike by rotating to about a 60 degree climb angle and going *upppp*, after passing through the 'maneuver complete' portion of his takeoff. Looked great! Buzz Watson finally retired his PT-22 after all these years, said it was getting too heavy, and entered his super-clean Zlinn Z 50L. Will be in the top five when Buzz gets it sorted out. Bob Frey purchased a Sterling Spitfire kit (a big seller back in the '60s) and did a total revamp of it. Cut down the 'free-flight' stab to scale size, rounded the fuse, installed retracts in the scale position, and had a scale operating exhaust for good measure. Will be a competitive machine. Tony Arand flew a Royal B-17 in Team Scale and was good for 5th place; Boeing's pride and joy flies very well, but a mite too fast. The Parcell/Kelly team left its B-25 at home and brought a new B-26 for its first outing. This is of the Douglas variety, bigger than the B-25 they have been competing with, and when sorted out, it will do well. Retired Commander of the Scale Squadron, Bob Olson (also caught sleeping on the job) managed to keep the landing gear in his new ME 109 for some good flights this time, too . . . Four rounds flown, a smooth, well run contest, the best kind.

Let's close out with a contest this month. For a one year sub to Model Builder, who invented and/or made popular, The Tennessee Waltz? And I don't mean 'Tessie' Brewer! •

Al Tuttle's Byron A4 will be the subject of a full product review, coming up shortly.



PEA POD MODIFICATIONS

BY KEN CASHION

DRAWING SCALE: NONE

SHEET 1

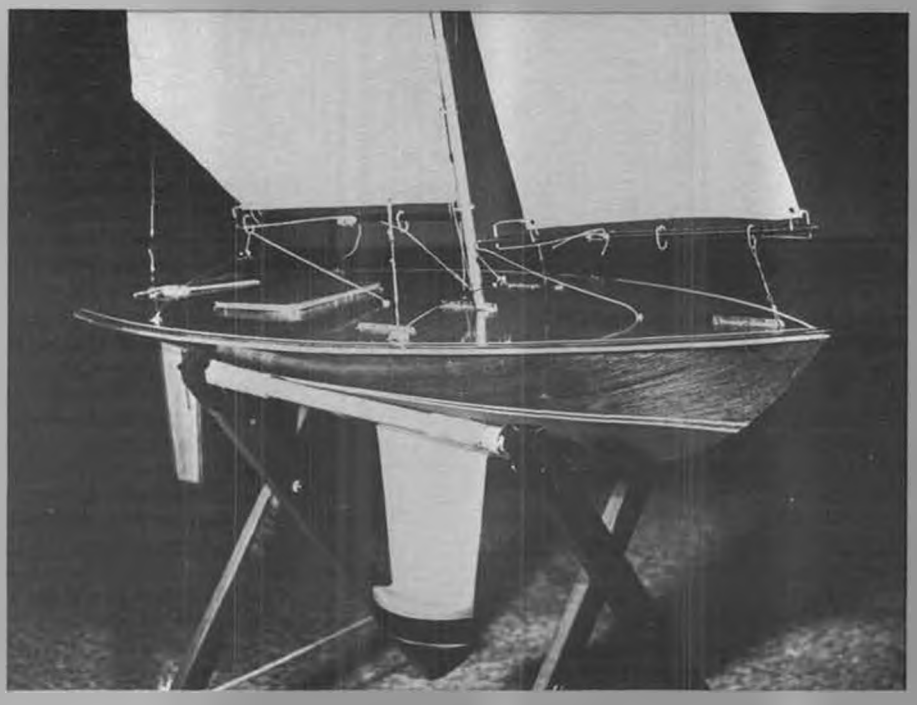
Pea Pod Mods

By KEN CASHION . . . Ever since first being published in the April 1973 issue of MODEL BUILDER, as originally designed by Tom Protheroe, the PEA POD has been one of our most popular building projects. Not meant to be the hottest boat on the pond, it is an inexpensive and easy-to-build project for getting into R/C sailboating. Starting with this in mind, Ken went through a series of trial modifications and ended up with an inexpensive wood sailing yacht that can blow the sails off most any boat in its 36-600 AMYA class.

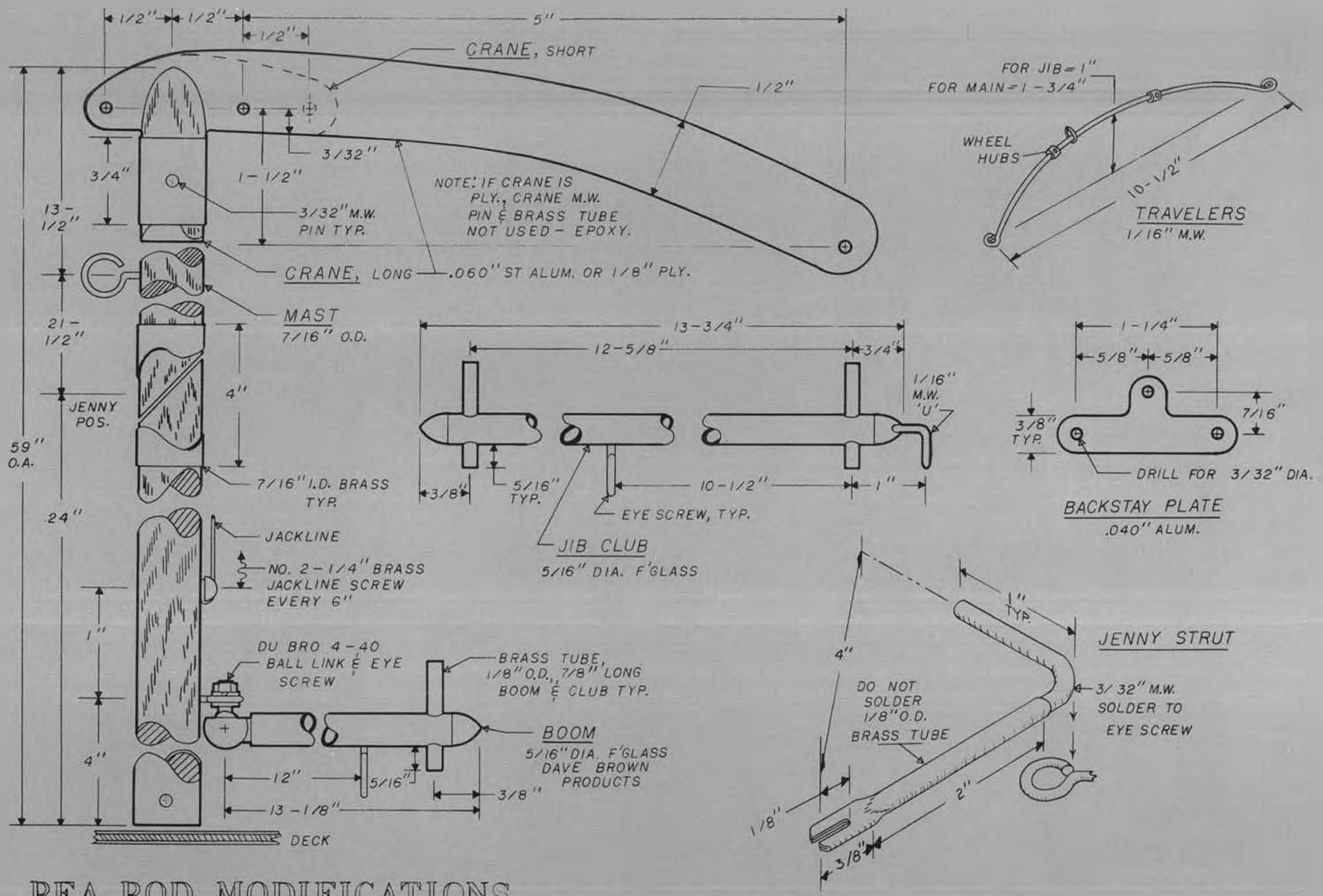
• It is not the purpose of this article to "up-date" the Pea Pod, nor is it meant to infer that I am "correcting" the design or construction techniques. This article discusses the modifications that I made on my Pea Pod, which greatly improved its performance. You can do the same for yours. This is one of those old "hop-up" or "soup-up" articles we used to read. The original Pea Pod concept and configuration are as valid today as when its was introduced by Tom Protheroe in the April 1973 issue of **Model Builder** (Plan #4733). For nine years the Pea Pod has been, I believe, the best beginner's R/C sailboat. I am talking about a sailboat for a model *builder* who wants to learn about sailboating. If you want to buy today/sail today, there are other choices.

I am new to model yachting. I once did a fair amount of full-size sailboating, so I already knew something about sailing. I also read books on designing full-size yachts. Recently, our local airplane modelers started "let's-get-into-model-yachting" talk. I was willing to build a boat, but not go out and refinance my Honda and plunk down money for a right-now, state-of-the-art racing sailboat. I decided if the activity built up, *then* I would get a more competitive boat. If I ended up with the only boat on the pond, I wanted it to be one that I really liked (wood). I had always admired the Pea Pod's construction techniques, and knew that I would eventually build one. Because I am a competitor at heart and we would be racing, I phoned the designer, Tom Protheroe, with this basic question: Since it was designed so long ago, what would he do now to the hull, keel, bulb, or rudder to make it faster? His answer, in essence, was "Nothing." It had gone through a thorough development process, and if you started changing the hull, a performance gain in one area would cost you in some way somewhere else. We talked about its weight: it is heavy compared to fiberglass hulls. We talked about all aspects of the hull, and I am convinced that the hull is an optimization of compromises. That means "generally as good as it is going to get."

My original intention was to build the boat as designed and learn how to sail, how to read the wind (as in sailplane flying), and learn the racing rules and tactics. But I immediately saw that the wide deck would permit the use of travelers to good advantage. Travelers on the narrow deck of a modern racing



Lead photo shows general deck features, travelers, sheets, shrouds, and stays. This photo is another view of deck, shows plywood doubler on bow to cover torn-out lacing holes.

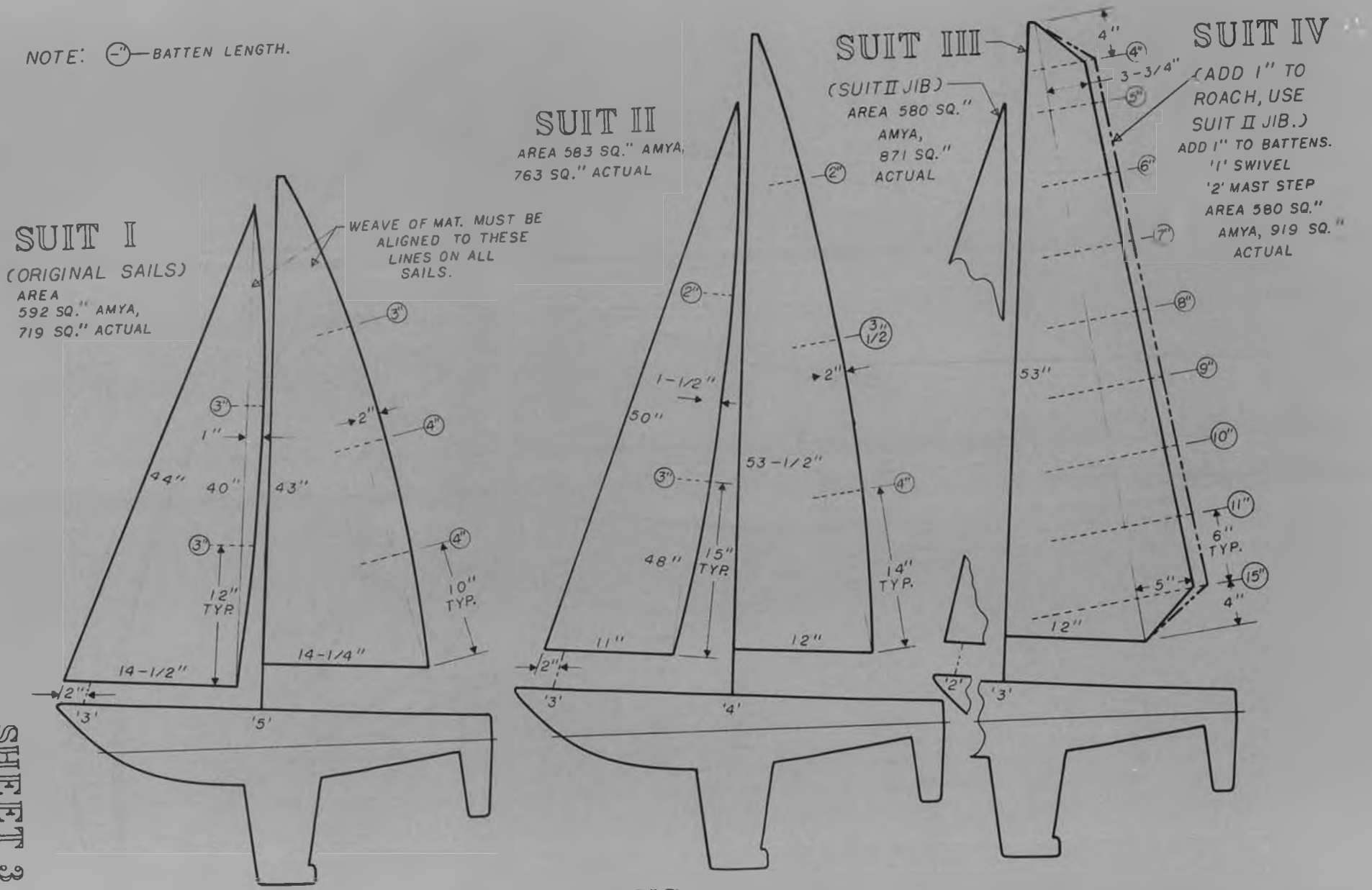


PEA POD MODIFICATIONS

BY KEN CASHION

SHEET 2

DRAWING SCALE: NONE

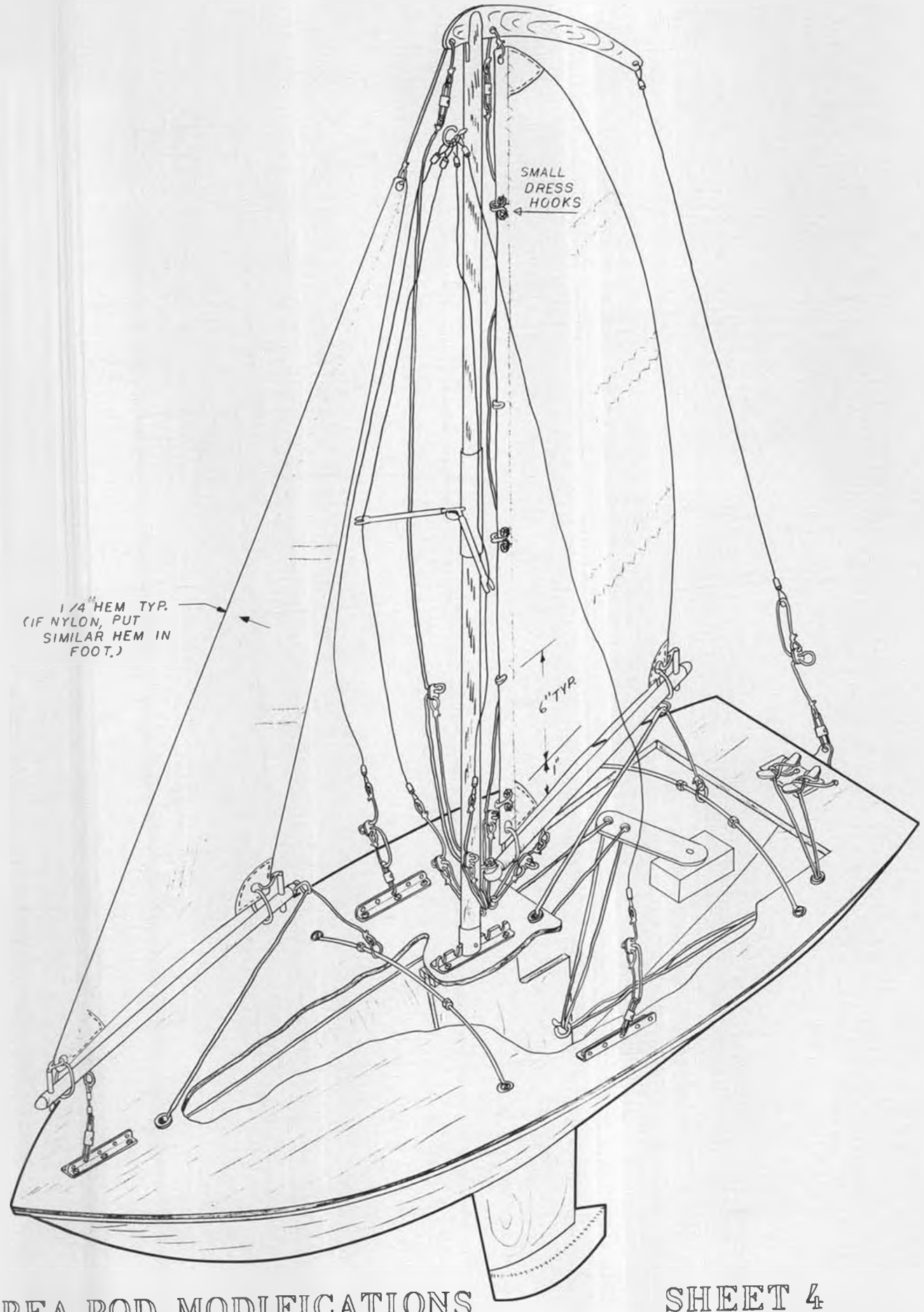


PEA POD MODIFICATIONS

BY KEN CASHION

DRAWING SCALE: NONE

SHEET 8



PEA POD MODIFICATIONS

BY KEN CASHION

SHEET 4

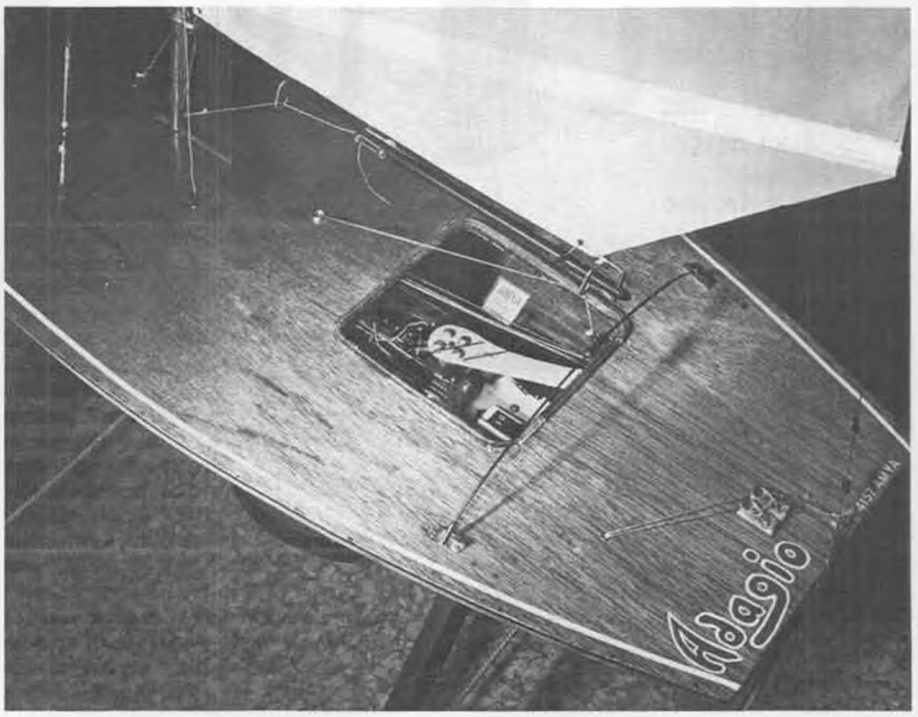
DRAWING SCALE: NONE

hull would not be as effective. This started a process of converting what appeared to be racing disadvantages to advantages, or at least minimizing their effects. In the process of using the Pea Pod as a test-bed for winches *(Let's stay serious. wcn)*, sail configurations, and trim changes, I finally got that hull going as fast as it will go. I will not list all the things I tried, just the improvements.

Unless stated otherwise, the construction approach and dimensions on this boat are the same as those presented on the original design. To avoid duplicating Protheroe's fine article, I have kept redundancy to a minimum. If you want to build a Pea Pod to some level of these modifications, you still have to purchase the original plan set. (See page 96)

When I was designing sailplanes in Picayune, Mississippi, I was fortunate to be sharing air space with as good a sailplane as you could find: a Legionair being flown by a very good pilot. Therefore, I had a good standard with which to compare my sailplane designs. The same thing has taken place with sailboats. On our pond, the "standard" is a state-of-the-art fiberglass hull, top-quality winch, fiberglass spars, and racing sails. This boat design is a proven national winner and the skipper is good. So when the Pea Pod is in a tacking war with that boat, I can tell if I am making the right changes.

Now for just a little bit of sailboat theory to introduce some words and concepts . . . it will not hurt much . . . you will understand the rationale for the modifications and be able to trim your boat better. First, we need to know what "center-of-lateral-plane" (CLP) means. Imagine having your sailboat hull floating at the proper waterline as you reach underwater and slowly start pushing on the side of the hull with your finger. At some point on the hull, the boat will not heel or turn, but move sideways through the water. You have located the CLP. In the case of the Pea Pod, it doesn't matter where it is because we are not going to change it. We just need to know that it has one, because the next thing we need to understand is the "center-of-effort" (CE) of the total sail area. Each sail has a center point which defines that place about which all wind pressure is equal. The location of the vectorial sum of the



With hatch cover off, note winch, arm, and winch control servo. Note American Model Yachting Association hull registration inside hull.

magnitudes of these points (in the case of two sails, jib and main) is the center-of-effort. Now this we can move, and where we put it is very critical to the speed of the boat in different winds. If we project vertical lines from the CE and CLP to the waterline, the distance between the CE waterline intersect and the CLP waterline intersect is called "lead." The CE leads the CLP by some small amount, usually expressed in percent of waterline length. We will come back to this "lead" anon.

The hull has a "waterline profile" which is the shape of the waterline (not deck) as seen from below. People will argue by the hour about which shape is best, but with the Pea Pod, it should stay as it was designed. The Pea Pod waterline profile is far better than you might think by judging the deck width (beam). We need to consider "wetted surface" or "wetted area." That is just what it sounds like, and we would like to keep it to a minimum. The wetted area on the Pea Pod is high for a 36-600 class yacht. (The 36-600 is an American Model Yachting Association racing class. The specifications state that the maximum length is 36 inches and the sail area is no more than 600 square inches by the AMYA formula. There are no roach or batten restrictions. More about this later.)

And now for the weight. The Pea Pod weight is high, but we do not want to make it lighter. The weight affects the waterline profile and the wetted surface area, etc., and if we change one parameter, we inadvertently change another, and eventually we end up with something that is *not* a Pea Pod, and *this* is a Pea Pod article.

The hull has a keel which, besides adding to the lateral plane area without hindering turning ability too much, ties the bulb (stabilizing weight) to the hull. The keel needs to develop lift to help the boat move windward. We know from control-line airplane days that wings which are flat plates do not develop

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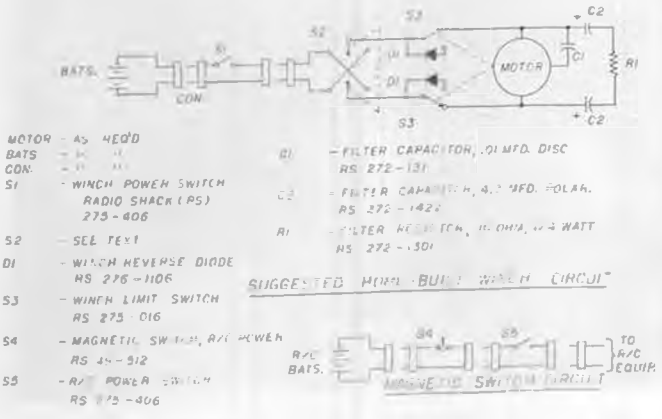
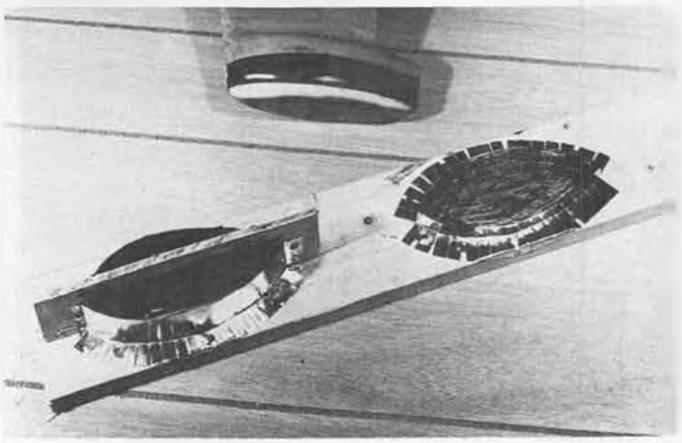




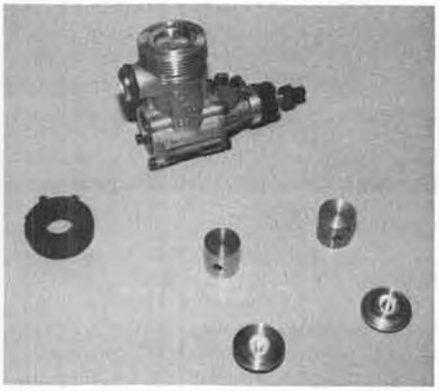
Easily made keel ballast molds, as described in text. Wheel grease eases separation, cuts down burning.

FUEL LINES

JOE KLAUSE
P.O. Box 2699
Laguna Hills, CA 92653

The Rossi .15 tuned pipe engine that has been so popular with FAI speed flyers around the world.

Ugo Rossi holds rear exhaust version of new .61. The .61's on table are side exhaust versions of this tuned pipe engine.



◄ Note that the new .61 piston on the left has a smaller bore than the old style on right. Considerably more power. Details in text.

• It's tempting to begin this column with, "Recently, when I was . . ." Sound trite? Of course, it is, but frankly, I'm somewhat at a loss as to how to begin this one without using some such hackneyed expression. Anyway, since just about all of us commonly use such phrasing, why be concerned?

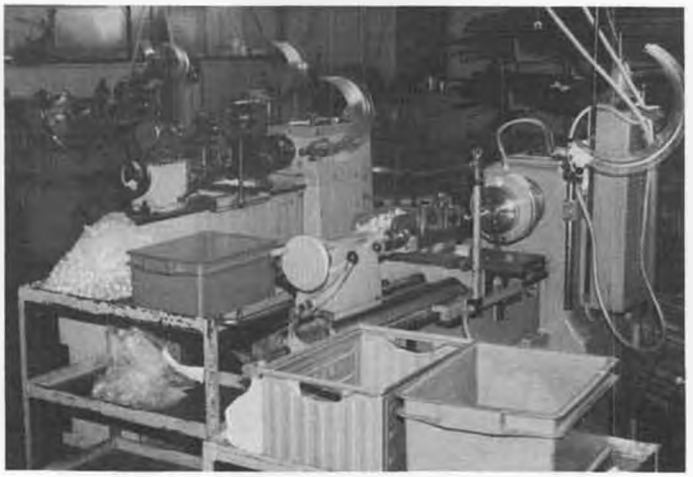
So . . . some weeks ago, I was in Europe. The itinerary included Italy, and while driving across the far northern sector, I had to *(HAD to? wcn)* pass through the city of Brescia. If that name sounds vaguely familiar, it probably means that you are or have been an owner of a Rossi engine. At the very least, you've seen the name imprinted on an engine box or instruction sheet. By now, you've surmized that I visited the Rossi factory in Brescia. Actually, it's in a nearby country suburb called Cellatica, but yes, I did have the pleasure of touring the factory and spending several hours with the Rossi brothers. All very enjoyable, and to say the least, Ugo and

Continued on page 71

The brothers Rossi; Ceasare, in plaid shirt, and Ugo, with a table full of the new Rossi .61 engines.

To meet increasing demand for the Rossi engines, an additional manufacturing building is under construction.

Several of the milling machines used to machine the ports in the sleeves of engines.



High precision lathes that are used in the manufacture of Rossi engines.

Pattern Flying

By DICK HANSON

• We recently went through an experience which threw some new light on trimming procedures for model flying machines.

Four of our local fliers had just completed new birds and were in the process of shaking the bugs out of them . . . I had also just completed a new 750 inch Tipo for myself, so that made five very similar designs (one 700 inch Tipo, two 750 inch Tipos, one 800 Hippo and one 825 Hippo Tipo.)

The 700 Tipo had an "up-pitch" problem in both knife-edge positions. Shifting the balance point aft resolved the problem by eliminating the up trim in the elevators.

The one 750 model needed nothing but some basic throw adjustments. My 750 was quite nose heavy but I tried it anyway. The rolls were lumpy and the "up-pitch" problem was evident. I shifted the radio (servos, receiver, and battery) to the extreme rear of the wing saddle area . . . this almost totally cleaned up all trimming problems.

Next, I changed the tuned exhaust pipe from a very long type (new S.T. 60 design) to a *short* C.M.B. 60 pipe. This setup stopped all pitching tendencies. The results here were very subtle, but positive. I am still scratching my head on this one. The angle and alignment were about the same on both pipes. The shape and length were the only real differences. However, it worked!

As a side note: A very interesting experiment was playing with the coupled flaps (J.R. radio) to see if trim change on my 750 was affected. The changes in aileron setting (using the flaperon trim lever) produced little, if any noticeable change. . .

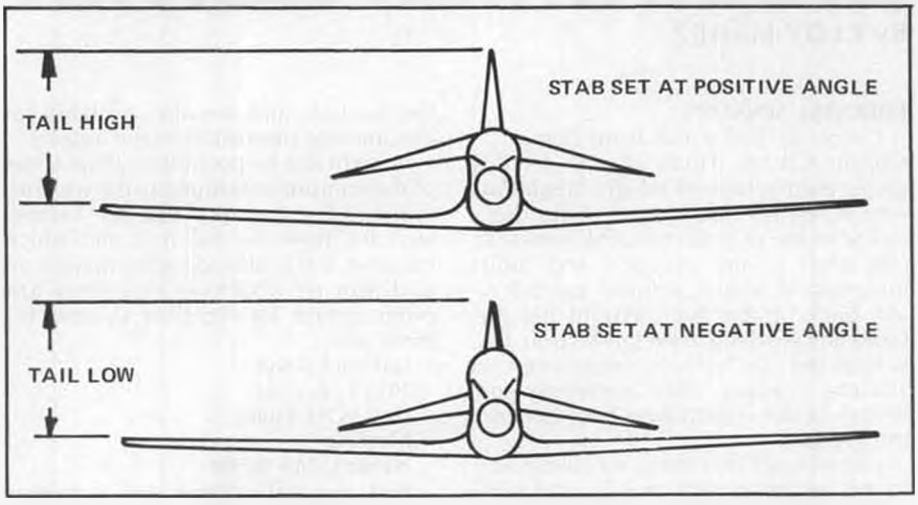
Next, the 800 Hippo rolled badly . . . kind of an uneven look, like a barrel roll. Changing the aileron linkage to produce considerable differential (more up than down), solved this problem.

The standard Hippo 825 also suffered from "up-pitch" in both knife-edge positions. The trimming procedure on this bird was not an easy one. To begin with, I had installed the stabilizer on this plane approximately 1/16 *positive*, i.e., the leading edge of the stab was high. Although we knew this to be the case, we reasoned that shimming the trailing edge of the wing down slightly would correct any problem . . . WRONG! Also, adding about 6 ounces of lead to the stab reduced the elevator trim to zero but the up-pitch persisted. It also made the elevator a little goosey. Ultimately, the stab was cut out and reinstalled in the normal (slightly negative) position. The problem was resolved, but our curiousity was not.

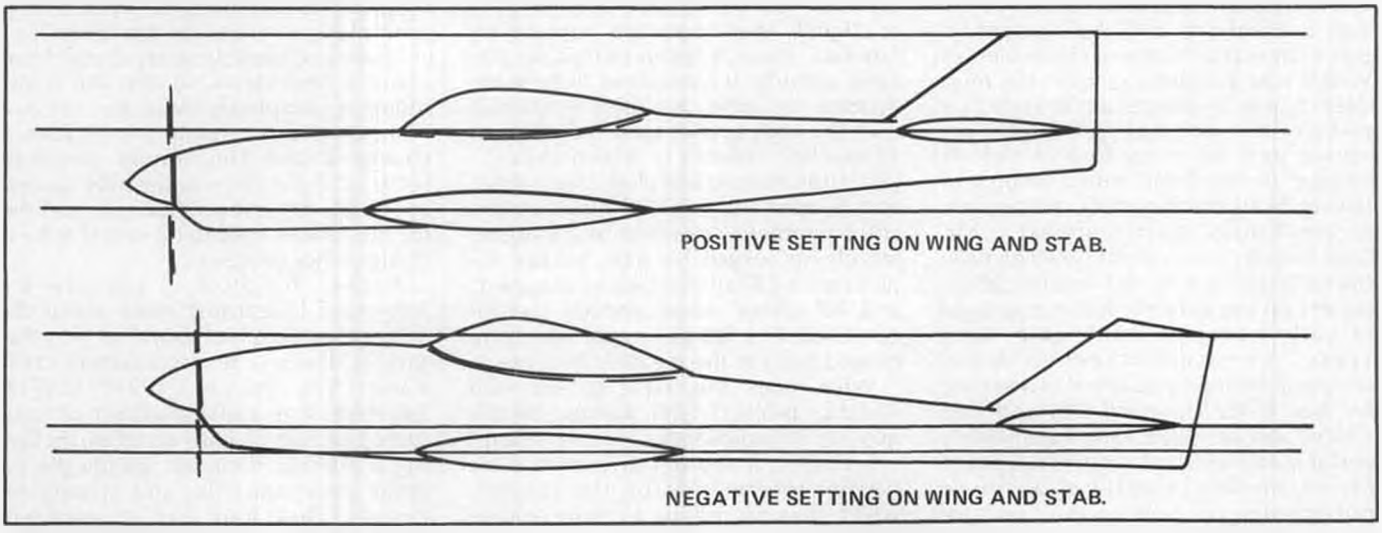
When we set up the original 700 Tipo, we reasoned that a little negative stab incidence would work best to eliminate any up-trim in the elevator. According to all the feedback we could get, the premise was right. However, a number of builders noted that the leading edge of the wing had to be shimmed slightly down to get the best results and eliminate down trim in the elevators.

The 825 and the 750 models have lighter wing loadings than the original 700 inch model, so we decided to reduce slightly the stab incidence. The old adage, "If a little is good . . . " finally got us. What we had unwittingly done was change the drag profile of the fuselage

Continued on page 72



Mounting the stabilizer at incorrect angle will cause model to fly with the tail higher or lower than desired, and can cause pitching problems. Also causes elevator trim settings which contribute to pitching problems.



Changing incidence of the wing and stab will alter angle of attack the fuselage assumes in flight. This can have same effect as completely redesigning the fuselage or the relocation of all major components!

With just a few mods, older 27 mHz transmitters can become reliable 6-meter units, though lacking many of the modern bells and whistles. See text.

Electronics Corner

By ELOY MAREZ

THERMAL SENSORS

I recently had a call from home . . . Corpus Christi, Texas, that is, from a glider guider named Wright Singleton, who asked for information about thermal sensors, or detectors, the kind that ride aloft in the sailplane and radio information about altitude gained or lost back to the flyer. Wright has the radio link working to his satisfaction, but is looking for help in detecting the altitude changes, then encoding and decoding the information back here on the ground.

I often wish that there was some way to get to the general public, and convince them, or at least let them see that we are far from a bunch of grown up kids playing with toy airplanes, to have them understand the degree of sophistication that is involved, and the amount of precision that is involved. This project of Wright's is another example. He must detect, and measure accurately, air pressure that only changes 0.00052 per square inch for every foot of altitude change. It has been done before, of course, both commercially and by a few of the hardier do-it-yourselfer's. Mr. Dick Jansson, a very well known name in the early days of R/C, did some excellent papers on the subject, which appeared in early issues of RCM, and "Grid Leaks," an excellent though skinny technical bulletin published at one time by Ace R/C. Maynard Hill and Ben Givens also did some early experiments and shared them with us in the pages of Flying Models. Copies of all these publications are now in the hands of young Mr. Singleton, assuming that the post office department kept it's share of the bargain, and are also available for anyone else interested in the subject.

It might also be possible to adapt some of the components found in the weather radiosondes, the type that are hoisted aloft by those big balloons and which transmit back altitude information in addition to whatever else they are programmed for. Possible sources for them are:

Fair Radio Sales
1016 E. Eureka
Lima, OH 45082
Meshna
Nahant, MA 01908

Just recently there was a rather interesting flying object over the skies of southern California that some of you might have missed hearing about. It first came to light when some airliner flying at 16,000 feet reported something familiar, though unidentified, at the same altitude. It turned out to be some aviation fan who, probably in protest over the high airline rates, had attached 39 weather balloons to a lawn chair . . . yep, an aluminum and plastic lawn chair, and headed for the wild blue yonder. His equipment consisted of a camera, which he forgot he had, taking no pictures; a CB radio, which he dropped; and his rather novel altitude control consisted of a BB gun, with which he pinged away at the weather balloons.

What does this have to do with Wright's project? Well, just maybe this guy has 39 radiosondes for sale, cheap!

Seriously, if any of our readers have further information on the subject, which they are willing to share, please pass it along.

Currently, there are not a whole lot of commercially available products of this type available. One that comes to mind is called a "Thermic Sniffler" available from Soaring Products, Box 117, Kensington, MD 20795. There is also a German made device called a "Thermikdetektor," from the well known Simprop Company. It is novel in that it does not transmit back information via a transmitter, but instead flashes a strobe light, claimed to be visible in sunlight and up to 500 meters, I'll let you do your own conversion as an exercise in metrics! I don't believe it is currently available in the U.S.; if interested, contact Simprop Electronics, Walter Claas GMBH & Co., Ostheide 5, 4834 Harsewinkel 1, West Germany.

FREQUENCY SYNTHESIS

Since the good news early this year that 1982 will be known as the year of the new R/C frequencies (if everything proceeds according to schedule), a new term is being heard: synthesizers. Don't let it scare you, it is not something else that is going to show up on the top of next year's transmitters so that rich kid in the club can out-point you at the next pattern contest. Frequency synthesis is an already established method of generating a large number of desired frequencies from one, or a relatively small number, of frequency generating devices.

Down here at the thumbs-on level, it means that we may someday be seeing R/C transmitters with output frequency controlled by a calibrated knob, marked in either frequency, or channel numbers, which we merely rotate to the desired spot. There are a number of advantages, such as the elimination of frequency conflicts at contests and the over-crowding of some certain frequencies as happens now. There are some obvious disadvantages, such as the worst case example of some kid playing with daddy's transmitter, turning it on, and spinning the frequency dial, thus cleaning out *everyone* who happens to be in the air at the time.

The subject is already being discussed by the manufacturers, including some built-in safety features to prevent catastrophic results due to unknowing, unthinking, or uncaring operation.

I have one possible safety to add: How about a time delay, so that the transmitter is completely dead for, say five minutes, after activating the frequency change knob? This should eliminate some of the problems possibly caused by fumble-itis, and provide enough time for the serious flyer to be sure that he is doing things properly.

Anyway, for those of you who are interested in learning more about the subject, an excellent source of information is Plessey Semiconductors, 1641 Kaiser Ave., Irvine, CA 92714; (714) 540-9979. It is a manufacturer of integrated circuits of many varieties, including a number designed specifically for radio communication and synthesizer circuits. They have had an excellent book on the subject, entitled "Frequency Synthesis IC Handbook"; 267

pages of information about frequency synthesis in general, and the application of Plessey IC's in particular. Complete circuitry is included, with even printed circuit board layouts for test and evaluation. Unfortunately, the book is no longer available . . . and I would agree with you that it is dumb to mention it, except that an updated 500 page version will be available in about six weeks, according to a company representative with whom I spoke on the phone. Taking into consideration deadlines, lead times, etc., involved in the production of MB, we are talking about mid-September in real time, so you'll probably be able to get availability and price information from Plessey about the time you are reading this.

And by the way, if the address is vaguely familiar, but you can't quite place it, it is because you were once a black box flyer; that is the address of the last home of Orbit Electronics. . .

CQ SIX

Those of you fortunate enough to have ham licenses, and who fly on six meters, are further fortunate enough to have a very inexpensive source of R/C equipment! Part of it, anyway, in the form of the many older 27 MHz transmitters still around, in good shape, with the possible exception of needing a new set of Ni-Cds.

As we all know, there were some excellent R/C systems being built long before the advent of today's multi-switch, air-conditioner and stereo equipped models. And for a number of years, most of the differences were all external, with a few exceptions here and there. Most of the manufacturers were using well proven successful circuitry, and in the case of their six meter equipment, were merely changing a few components here and there, and frequency wise, it is not too long a journey from 27 to 53 MHz. The transmitters of many of these old systems will be found to be easily available, for the asking, in many cases, though we can just about forget the airborne componenets. In most cases, the latter did not survive the years, due to the more unfavorable environment in which they lived and worked, and then too, the present-day equipment is far superior in design and operation. But it is compatible, and matching an oldie but goodie transmitter, converted to six meters, to one of today's receiver/servo combinations can be an inexpensive way to get that second bird in the air.

The surest way to success is to write the manufacturer of the equipment of your choice, if he is still around, and ask if there is conversion information to six meters. Some of them still may be able to supply you with coils, which will certainly make the project easier. If such information is not available, enclosed is a fairly simple but proven six meter transmitter schematic, which will not be too difficult to build on most PC boards which previously held a 27 MHz RF section. The crystal is a current fundamental frequency type, and though transistor types are given, most transistors now in place in one of these vintage 27 MHz sets will also work in similar circuits at 53 MHz.

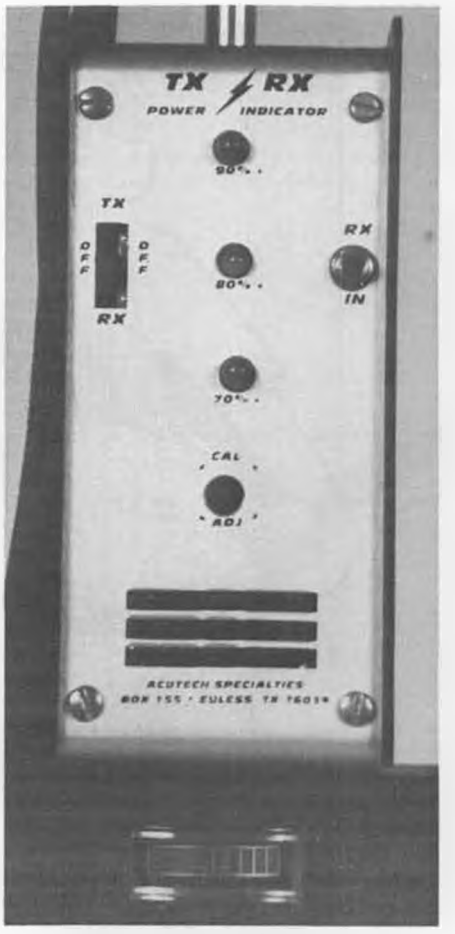
However, don't forget that the old center-tapping (if used) antenna will have to be replaced, or, if possible, disassemble the coil and solder a single straight piece of wire in it's place.

And please . . . any frequency other than 53.5 . . . that is the one I use!

MORE FROM DEEP IN THE HEART OF. . .

From Euless, Texas, to be exact, Suh, we present Acutech Specialties' new FS-25-R Power Indicator. It is a two-function device, which senses and measures both transmitter output power, and through a plug-in cable assembly, receiver battery voltage, providing both visual and aural indication of their status.

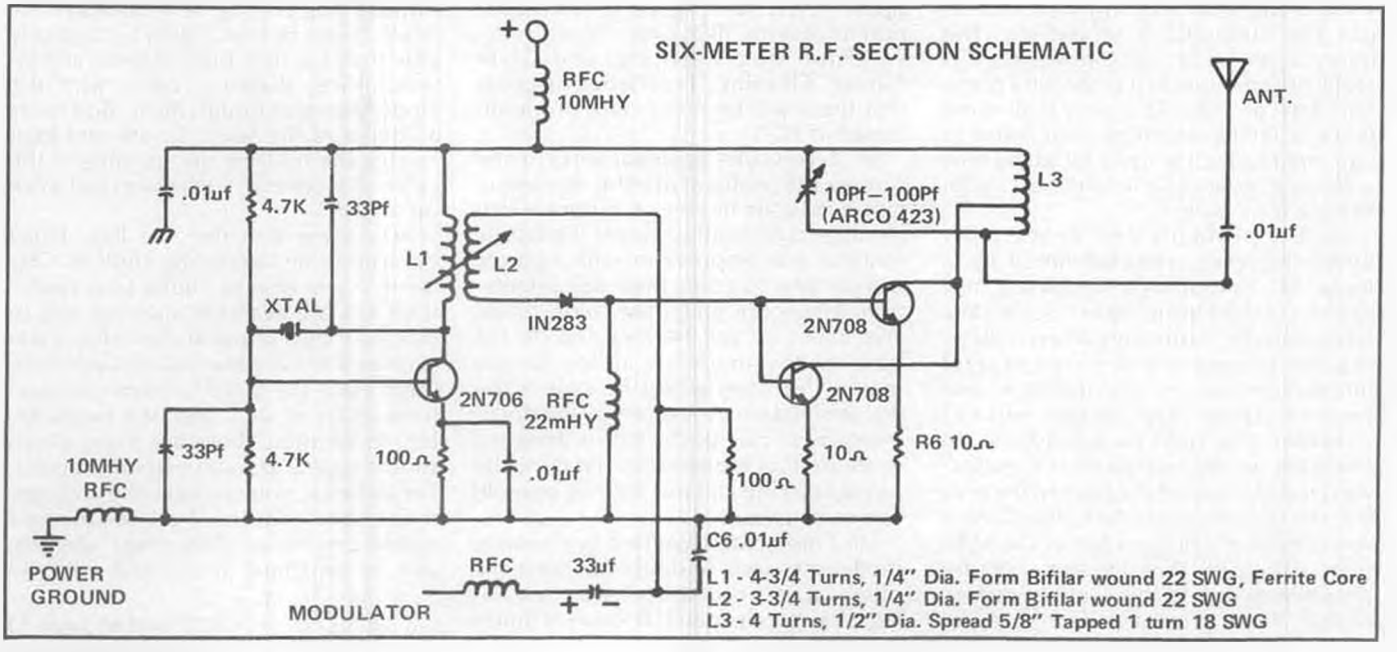
Though there are similar transmitter and receiver battery voltage monitoring devices on the market, some which light LED's and some which make a noise, or both, to my knowledge, this is the first such device to appear which gets its information directly from the transmitter's emitted signal.

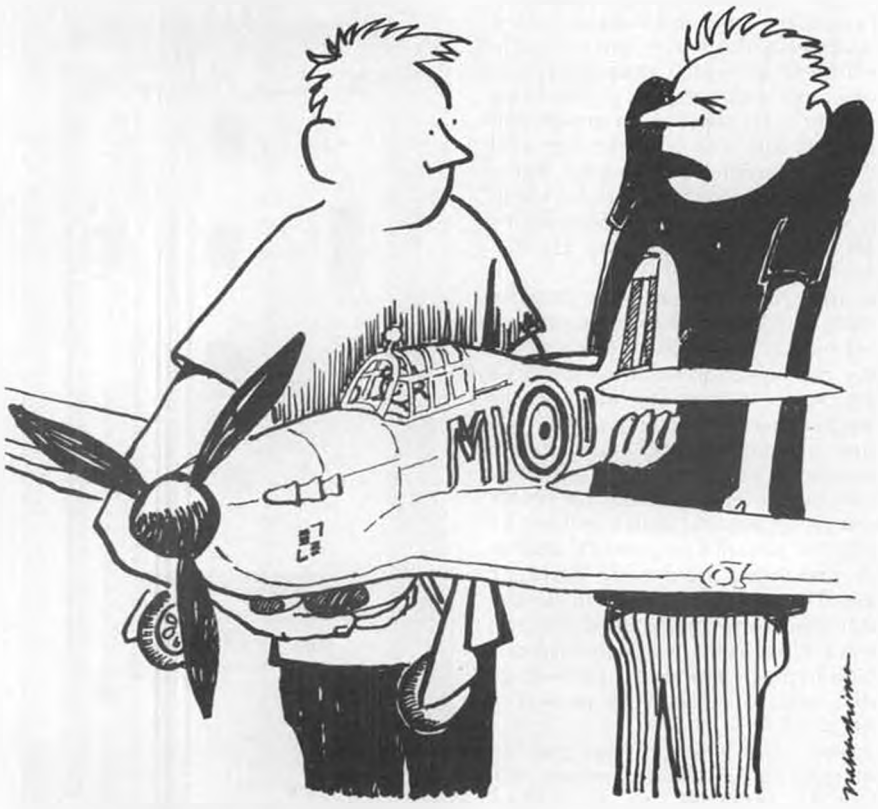


Acutech Specialties' FS-25-R Power Indicator. Fully described in column.

Both mentioned tests are made automatically, though some simple calibration is required upon installation to the transmitter, for which easy-to-follow instructions are provided. Basically, it gives you a green light when the trans-

Continued on page 72





"I don't know if I should try scale or not. I can't even slide on a decal without messing it up."

1 TO 1 SCALE

By BOB UNDERWOOD

• His trenchcoat was wrinkled and his gait the tired slouch of the spy. The information he brought, however, was really hot and he sold it at the right price. The bits of microfilm revealed some fantastic items which we can bring to you, the reader. He had a list of the new scale rules proposals for the next cycle. What a list they are.

SC-1 is probably one of the most interesting ever seen. Submitted by L. Jones, SC-1 proposes a completely new event called Home Sport Scale. We became quite suspicious when reviewing the proposal and noted several unusual provisions. For instance, one portion stated that "judges will not consider the roof or windows." In checking we discovered that "L. Jones" was *Linda* Jones and she figured the only way she could ever get the house painted was to make the house a part of the AMA rules structure. We see some sinister possibilities should this event become a reality. Aside from the fact that our house needs painting, we see an escalation of events like Grass Sport Scale, Precision Rug Cleaning, and Giant Garage Cleaning. Experience suggests that there will be many cross proposals aimed at SC-1.

SC-2. This rules proposal seeks to end *forever* the problem of color documentation for scale models. It proposes that all subjects be painted purple. Each scale modeler will be provided with a purple marker pen to color their documentation. The score given for color, finish, and markings will be awarded on the basis of the modelers ability to stay inside the lines when he colors the documentation. A "colorer of the documentation" part of the rule is designed to assure that the modeler has done the actual coloring and not their six year old son or daughter.

SC-3 has been submitted by the same modeler and will undoubtedly solve the other biggest problem of scale modeling; that is scale speed. The rule requires that all flight judges will be given special purple glasses which result in the model becoming completely invisible during the flight. All manuevers will be verbally described by an appointed "maneuver observer." A special set of words and phrases have been provided in the rules proposal that the observer may *not* use. These include such items as "Wow!", "Ugh!", "What was that?", and no laughing is allowed under any circumstances.

SC-4 seeks to add a new mechanical option. A modeler, Wilfred Wacker, has been very upset about the fact that certain types of aircraft just aren't allowed to drop things as a mechanical option. Noting that bombs, parachutes, tanks, etc. may be dropped from military aircraft, he was incensed that his Cessna was excluded from such scoring. Therefore, he has suggested the "Samsonite luggage drop test" as a possible mechanical option. This option *may not* be used by anything but non-military types. The judging guide suggests downgrading for such things as spilled contents or incorrect "luggage trajectory." Rumors have it that two other luggage companies are planning to use such drop tests in their ad campaigns, forcing the removal of the word "Samsonite" from the rules proposal.

These are a few of the new proposals which we have to look forward to in the next cycle. Be certain to provide your opinions on these as the rules proposals move through the cycle.

Holding an Ace

T'was 1969 that I first began flying with a particular brand of radio. I have been quite satisfied with it during that time, encountering very little problem over the years. Last year I got the itch for a new radio and began to cast about for something to buy. I was kinda looking for a little special work in that I had hoped to find some way of separating the throttles on a twin under certain circumstances. Several persons suggested that I check with Tom Runge at Ace. I received a very nice reply to my inquiry suggesting several ways my needs might be met. I *didn't* act quickly after that, but then Bud Atkinson and his wife, Alice, shared a cabin with the Underwoods at Rough River. Bud owns a couple of the Silver Sevens and kept leaving them sitting on the table in the cabin all weekend. Such things just work on a guy!

In looking into the Ace line, I discovered some interesting choices. Certainly if you wish to "build your own," their kits are available allowing you to plan your own layout and goodies. I was surprised to learn that you can also have them build the outfit to your specifications as far as stick and trim locations, etc. In addition, there are items which should appeal to scale flyers in particular. For instance, you can have the arrangement that couples the ailerons and rudder, provides differential ailerons, can be switched in and out with no

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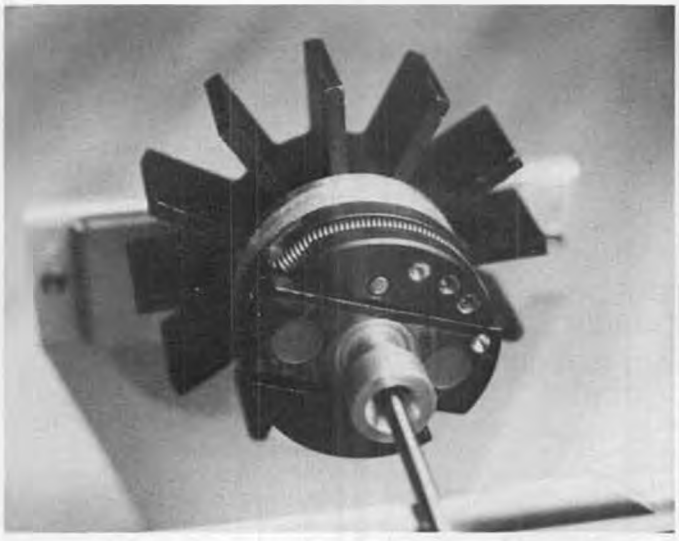
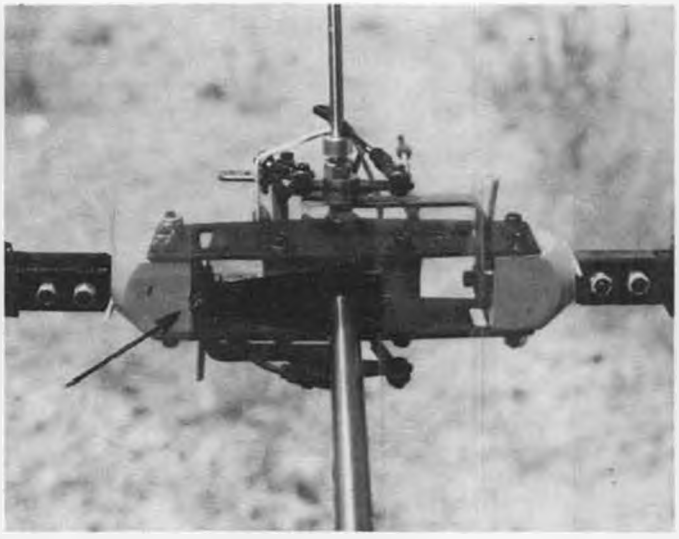


Fan and clutch on High Point Balancer. Note four holes drilled in clutch, needed to balance unit.



Anti-rotation link (arrow) for swash plate is slipped on main shaft just below head, for balancing.

CHOPPER CHATTER

By RAY HOSTETLER

PHOTOS BY THE AUTHOR

• Before I get to the main topic, two things impressed me this last month. 1) There is always so much more to learn, and 2) Humans are prone to error. In case you're wondering what brings all of this on, let me explain.

This spring I started flying full size Jet Rangers with Grand Canyon Helicopters. Most of you probably know that the Grand Canyon is in Arizona, but you may not be aware that the south rim is 7,000 feet above sea level. This brings interesting circumstances to model helicopter flying.

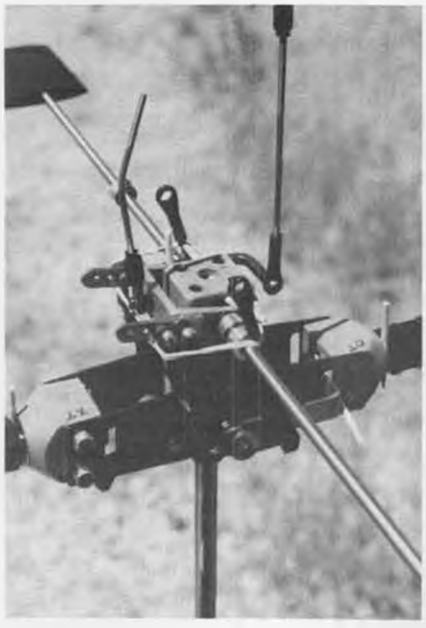
I had never flown a model helicopter above 1,130 feet, and I had heard stories about high level operations. I had American R/C's Super Mantis running very nicely back in Long Beach; I disassembled the blades and tail boom for the trip to Arizona, then rebalanced everything upon arrival at the Canyon.

Once setlled I took the Super Mantis out one afternoon to see how it'd do at 7,000 feet. I re-tuned the engine while a friend held the ship overhead. All was good so we put the helicopter down and I advanced the throttle. Immediately at lift off I had a vibration. I tracked one blade high, then the other high, no luck. I fooled with the mixture some, to be sure the engine wasn't too lean, as a lean run can cause vibration. Again, nothing.

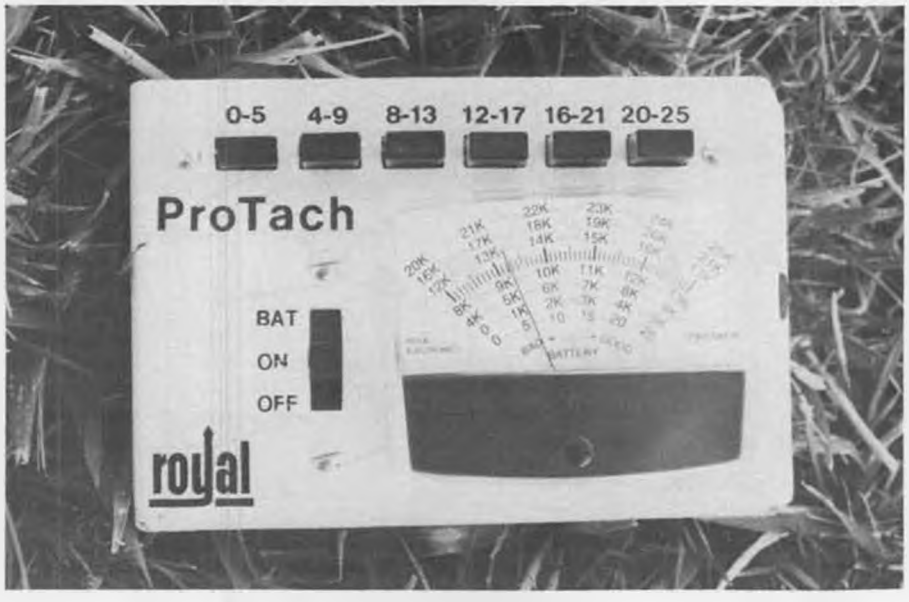
Back home I double-checked rotor head balance, all was fine. I did a *total* balance job, see photos. Everything above the swashplate was kept on the head, even the anti-rotation bracket, and I substituted the collective rod (which stays in the mainshaft) with a short piece to simulate the collective pushrod's weight.

Back out again, same thing.

Well, if it wasn't the main rotor, it must be the tail rotor. I put the whole tail assembly on the High Point balancer (as per July '82 MB) and clunk! One blade was way out . . . must have forgotten to



Complete head ready for balance check. Hiller rod and simulated collective rod left on head. Note high angle on collective yoke . . . 9-1/4° pitch needed for hover at 7,000 ft.! Low pitch set at 2-1/2°.



Pro Tach in use at the field. Main rotor being tached as quasi-governor is advanced from idle . . . 1,240 rpm indicated.

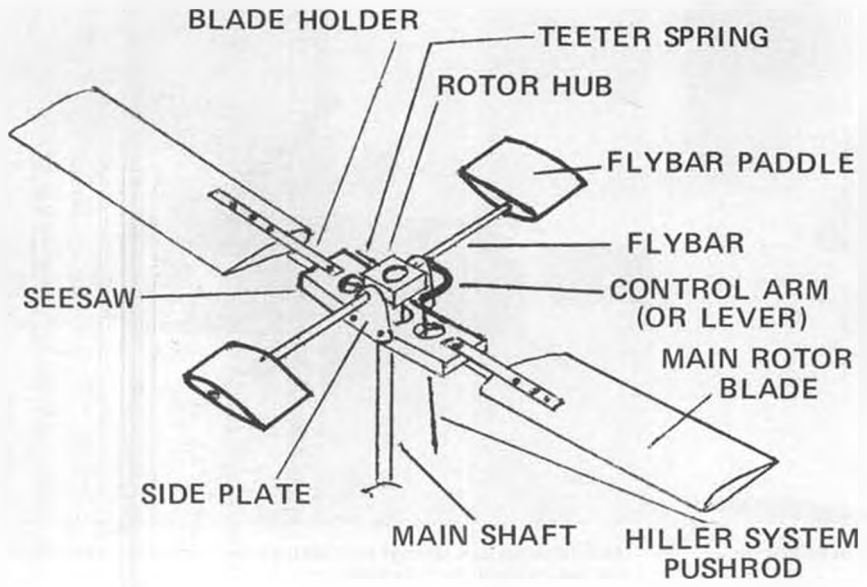


FIG. 1 TYPICAL FIXED PITCH ROTOR HEAD

SCHLUTER HELI-BABY, AMERICAN REVOLUTION .40,(BOTH WITHOUT TEETERSPRING):GMP CRICKET, (WITH TEETERSPRING).

balance it before . . . I straightened everything out and balance it again. Out to the field, same vibration was still there, as pesky as ever. I tracked and retracked the blades in and out, no change. Back home.

O.K. Time to sit back and analyze things. Main rotor tracked and balanced. Tail rotor tracked and balanced. Maybe the cooling fan is out of balance . . . That evening I pulled the engine, fan and clutch unit. Put the fan on the High Point balancer, it was out just a touch. Not enough to cause the moderately heavy vibration I was experiencing. So I started to re-assemble the clutch to the fan. Just for the fun of it I stuck the fan-clutch unit on the balancer. One side immediately dropped down and stayed there. Five minutes later I had four 3/32 dia. holes in the clutch to make it balance. Two 1/8 inch deep and two 1/16 inch deep (see photo). I thought that this was out a *lot* for a clutch spinning at 10,000 r.p.m., and I thought I had finally found the culprit.

Next morning I was back out at the field. Essentially the same vibration was still there. Not quite as bad, but I still classified it as a moderate shake. Now I started to get frustrated. I figured that the only thing left to do would be to check the gears, pulleys, or belt drive system.

That evening the whole ship was apart as I carefully inspected and balanced anything I could get my hands on! Everything checked out with only minor balance adjustments. I reset the tail rotor belt tension as I had it before, and back to the field the next morning.

That shake was still there! What else was there? I balanced the M/R head again, still fine, and decided to pull the tail rotor assembly and recheck it. Clunk . . . out again. This proves point number two. I removed the weight I had applied earlier and things were back in balance again. Evidently, before I had not had the blade-holders screwed down evenly, or something like that which would throw out spanwise balance.

Back out to try it again. Finally I was getting somewhere. Vibration was down quite a bit, but the boom still had a visible buzz. I took it back to the car and loosened the tail boom belt tension. I had it set halfway back in the slots, so I let it slide full forward to the loosest tension possible. Back out to the pad and *finally*, dead smooth flight!

As I look back at the whole episode, I believe it was the out-of-balance clutch that started the whole thing, accented by the belt tension being a shade too tight. Then my human errors complicated things a bit more, enough to raise my frustration level. After all, I'm supposed to know what I'm doing . . .

The other interesting thing is that the vibration problem was not even apparent back at Long Beach! I am learning that high altitude makes everything work very hard. (My wife likes this excuse . . . The altitude must be getting to you.) At sea level the engine and drive system can loaf along. At 7,000 feet everything is to the limits. Actual available engine power is down but power to the drive system is up. Blade pitch in the main and tail rotors is considerably higher, putting a greater load on the head bearings, gears, etc.

Another thing I noticed was the difference in full scale ships vs. altitude. For instance: At sea level the pedals work smoothly with minimal effort. At 7,000 feet the control force is considerably higher. More power and more pitch required at altitude. (You can't feel this difference in the cyclic as the system is hydraulic boosted. With a non-boosted system the cyclic forces are higher too.) All of this has to apply directly to the model helicopter as well.

As far as performance of the Super Mantis goes, yes, it will fly up here. At 7,000 feet and 70 degrees (which by the way happens to be *9,200 feet density altitude)* it will hover up to three or four feet, just at the limits of ground effect hover. For forward flight you have to push it forward very slowly and take advantage of effective translational lift, otherwise you'll find the skids digging into the ground.

Approaches must be made with caution. Adding throttle too late at termination could be costly, but since I'm

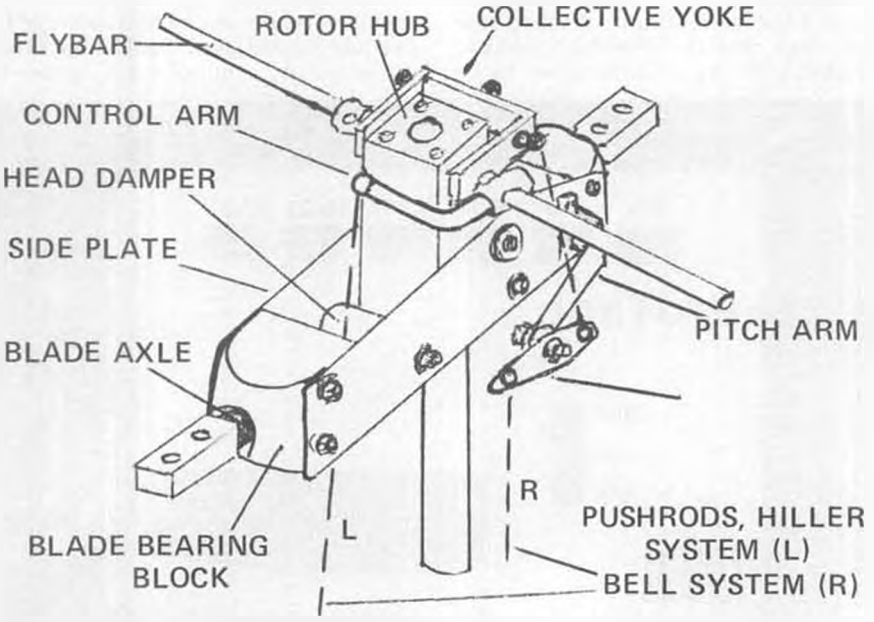


FIG. 2 TYPICAL COLLECTIVE PITCH ROTOR HEAD.

AMERICAN'S SUPERMANTIS, (SHOWN) SCHLUTER HELI-BOY (SIMILAR)

flying my Quasi-Governor (Sept. '82 MB) on the Super Mantis it really makes the approaches easier. Blade speed does not fall off at all on descents, so cyclic and collective control remains extremely steady at all times. Now all I have to do is find a way to fit a Webra Speed .61 into the Super Mantis. Then I'd have a *real* high altitude combination. For those of you at sea level or nearly so, you had better appreciate your conditions. I know I will when I can get back down to where the air is thick enough to breathe.

To finish up this experience, I'd advise all of you with a Mantis or Super Mantis to balance your fan and clutch unit, and set the belt tension as loose as possible. If you have a new ship, let the boom slide to the most forward position. If it slips a little, *then* tighten it up slightly. As a case in point, it also proves again that the balancing method described in the June and July '82 issues of *Model Builder* works extremely well. If the rotors are balanced and a vibration persists, *look elsewhere in the machine.*

BACK TO BASICS

Last month I started a series of articles for the beginner. I briefly compared the fixed pitch helicopter with the collective pitch ship. This month a look at the rotor heads of each.

In Figure One you have a simple fixed pitch head with all parts labeled. Figures Two and Three show two types of typical collective pitch heads with everything identified. I would like to go into more detail on the operation of the heads this month, but space will not permit it. I already have eight drawings to simply explain rotor head operation, so I'm just going to stop here and save it all for next month when I can devote the space to it that it deserves.

ORGANIZE!

A new helicopter club has formed in the Southern California area. Aptly named the "R/C Helicopter Club of Southern California", it is based in the North Hollywood area. President is Pete Adler, and Newsletter editor of "The Rotor Head" is Lynzie Flynn. Anyone interested in joining up or receiving the newsletter should contact Mike Flynn, of M-K Model Products, at 11526 Burbank Blvd. #12. P.O. Box 284, N. Hollywood, CA 91603. Mike will be able to supply you with the information you need.

To close out this month you can start to work on your helicopter vocabulary; courtesy of the "LARKS Flypaper" from Eustis, Florida.

Crash: Result of mixing pilot and helicopter.

Hover: To remain motionless while suspended over a fixed point. Often seen at hangings, but seldom at helicopter flyings.

Collective Pitch: Request from United Way, Red Cross, etc.

Cyclic Pitch: Monthly plea to wife for money for new blades, gears, etc.

Tail Rotor: Censored.

Tail Boom: Noise made when tail hits first.

Training Gear: Diapers, rubber pants, etc. A requirement for new helicopter pilots.

Shin: Area on lower leg for testing hardness of rotor blades.

Ground Effect: Standard answer to the question "Why did it break into so many pieces?"

Auto Rotation: Backing your car over your chopper. Sometimes on purpose.

Starting Belt: First drink before flying a helicopter. (Soft drink that is . . . rh).

Expert: Someone who has crashed more helicopters than anyone else.

Come to think of it, it is about time for my own cyclic pitch. See you next month! •

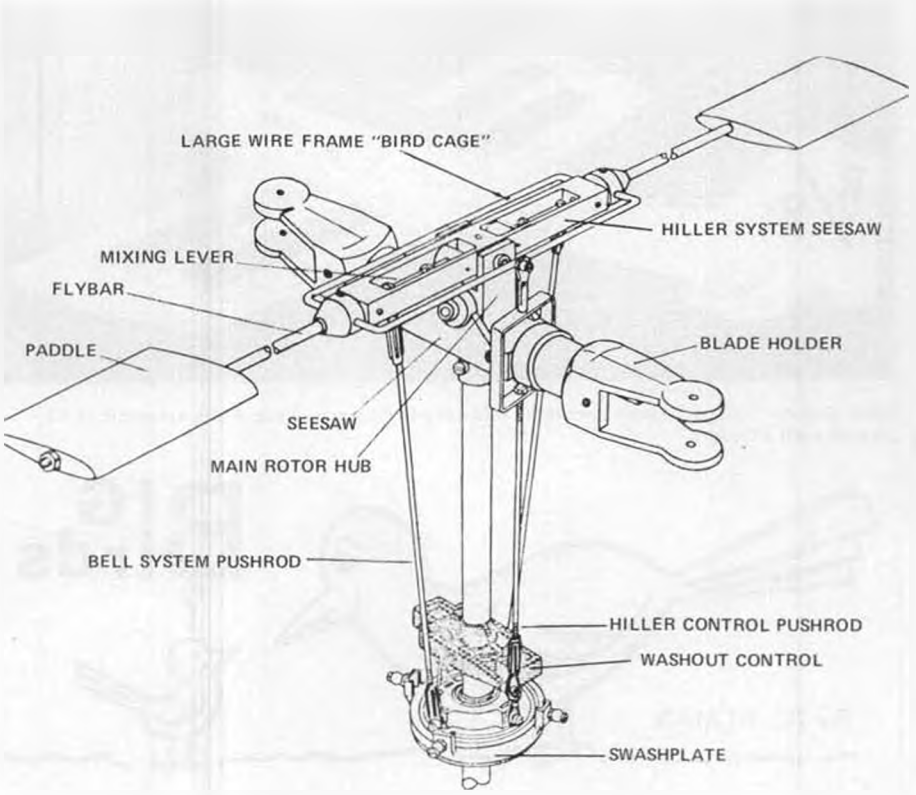
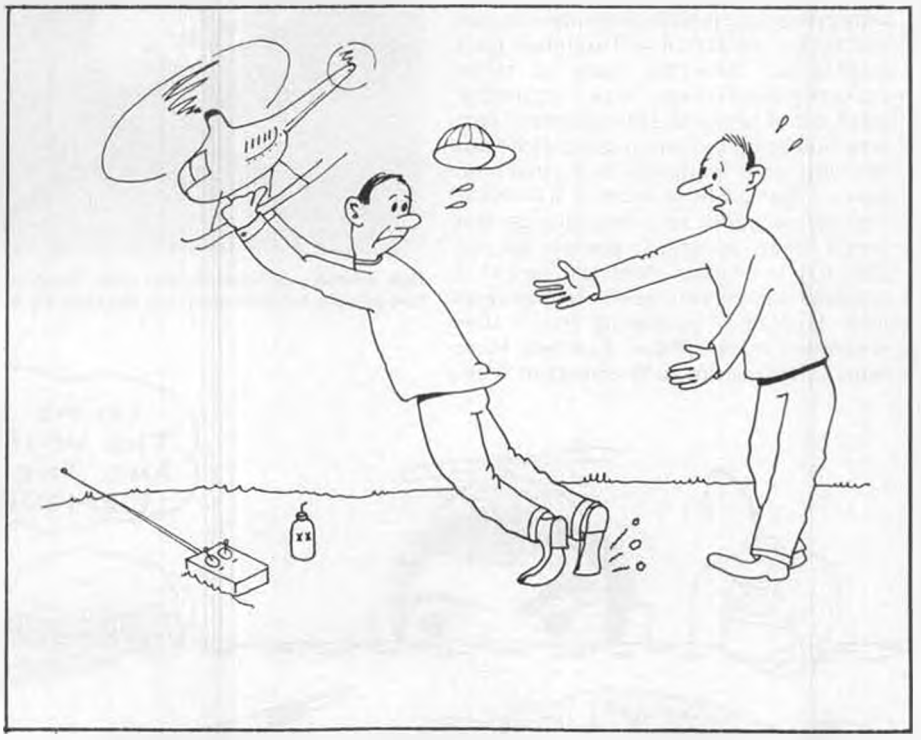


FIG. 3 TYPICAL COLLECTIVE ROTOR HEAD

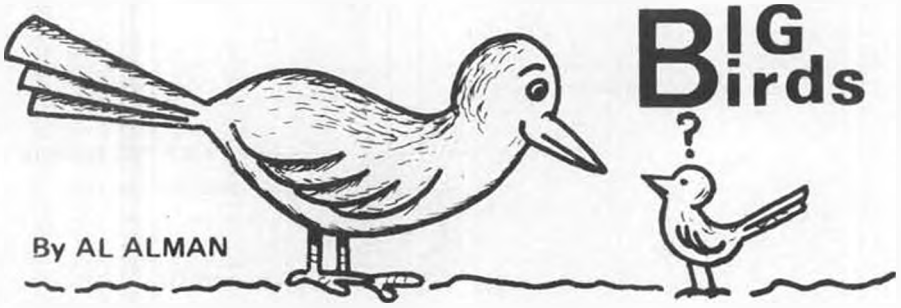
KAVAN'S JET RANGER, (SHOWN) HIROBO SCALE HELICOPTERS (SIMILAR).



"You better go back and read Ray's article on setting the pitch for hovering at sea level!"

R&R Models' "Stinger" looks something like a big tail-draggin' Kaos. Fully aerobatic at 17 pounds with a Quadra.

A "Bevy of BIG Birds" at Hill Country, Morgan Hill, Ca. Majority of modelers are staying with sensible size biggies.



JUNE BUGS: THE TRUE STORY

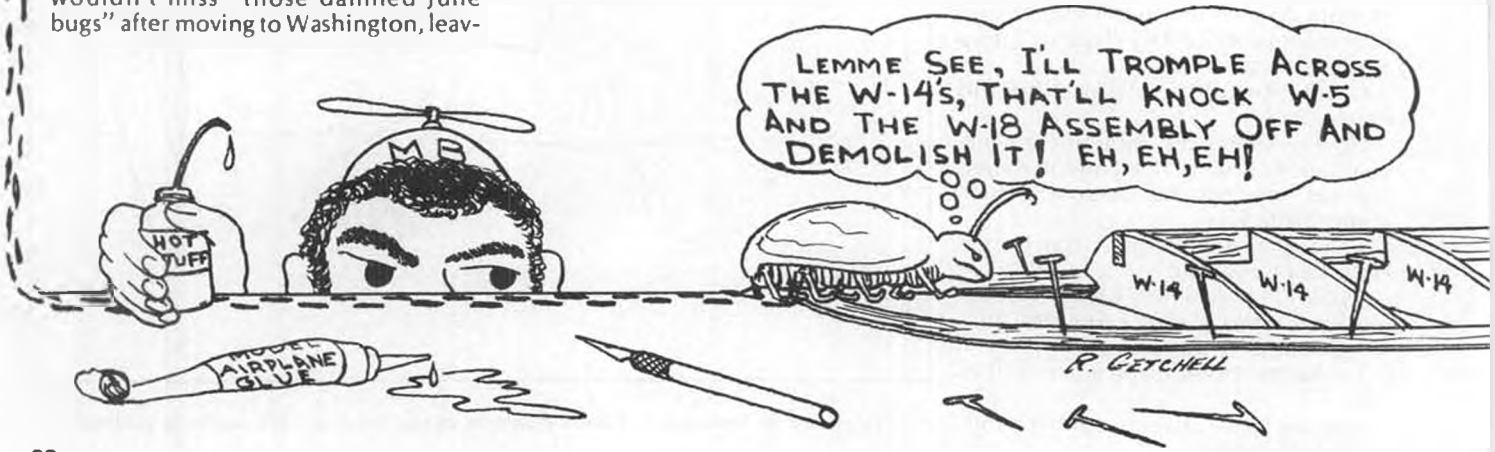
June bugs taste just like buttered popcorn . . . according to Texas racoons and armadillos who've scarfed down both kinds of treats. But R/C'ers, however well they like buttered popcorn, usually try to ignore these pesky bugs; although within the past few years our modeler's inherent creativity has added an entertainment category to this June bug (also known as May or June beetles) thing.

You see, guys found they could get their jollies by Hot-Stuffing these nasty little critters . . . which sometimes turned out to be an act of self-defense (you oughta see how big some of these suckers grow in Texas). Now it's true that this kind of perverse entertainment cuts into building time and uses up Hot Stuff like you were feeding it into a machine gun . . . but oh how sweet it is to occasionally succumb to a bestial urge and watch that accursed enemy go up (down?) in smoke. And last month I jumped on the anti-beetle bandwagon with both feet by stating that I sure wouldn't miss "those damned June bugs" after moving to Washington, leaving you with the unmistakable impression that the beetles are a blight.

Well, once again I've had to change my thinking, 'cause the scope of June bug operations has been expanded; these wee beasties can now be used to help keep eye-hand coordination and reflexes honed to a fine edge . . . and here's how. . .

By connecting the smallest diameter hose to your shop-vac, and using a crevice tool at the business end, you (try to) suck the bugs out of the air while they're whizzing around making the usual kamakaze attacks. The small diameter hose is easier to handle than the larger, less flexible one, and the narrow, tapered crevice tool makes it quite sporting since the opening is mighty small (like using very light tackle for trout). The end result: your timing

Bob Johnson, of R&R Models calls "Snapper Twoo" a much needed, non-scale bipe. Being a two-winged Snapper weighing less than 20 pounds, it should fill the bill.



and coordination are fine-tuned because the bugs are so difficult to suck up while on the wing.

"Aha," you say, "that's all well and good, but who needs those stupid bugs in the summertime. It's during the winter that my reflexes go to hell. And besides, what if I happen to live in Limestone, Maine, where I never even heard of these May or June beetles . . . and wouldn't recognize one if it fell on me?"

Take heart, oh liver in Limestone, 'cause you and everyone else who resides in the hinterlands will be able to reach the same exhalted state of readiness as any good old Texas boy. There'll no longer be any reason for you to covet a Texan's bugs because you, too, can be knee-deep in these whirling dervishes any time of the year and benefit from their presence.

JuBe's, Unlimited, is planning to flash-freeze these beetles; they'll be bagged in quantities of 1000, 5000 and 10,000. After receiving your bag of bugs, just scoop out the amount you prefer and let them thaw out at workshop temperature (you'll need at least 55 degrees in order to have busy beetles), turn on your shop vac . . . and you'll be on your way toward becoming a better and much safer pilot.

Price-wise, we expect to market the "JuBe's" at a penny a bug for the 1000 and 5000 count bags, and 3/4 of a cent apiece for the 10,000 size bag. This largest amount was really designed for clubs and large groups, as just 1000 beetles would last one BIG Bird Lover for about a year (JuBe's, Unlimited, recommends you thaw out and use 50 June bugs every few weeks in order to keep in top shape without overdoing the training).

And don't worry about infesting an area that hadn't previously had June bugs . . . because we only flash-freeze male beetles. You see, only the males are attracted to, and flit around, lights; the females shun these lighted areas and therefore are never bagged with the males . . . so you'll never sweat the dubious honor of having a "June Bug Blight" named after you.

Watch for our ads giving firm prices and JuBe's, Unlimited ordering info. . .

MORE KICK FOR THE MUSTANG

A whole bunch of guys are interested in the Byron P-51, and John Morris, of Louisville, Kentucky, is one of many who already has one. He's been winning awards and/or hardware just about every time he's entered a contest or fly-in; but even though he's a fine pilot, the road to success has been a rocky one for John . . . because the stock P-51 needs modifying to enhance its longevity and flying characteristics.

So, for the countless guys who love the Mustang, and are interested in, or already have, this most familiar of warbirds, here are some valuable tips from John on how to keep her truckin'. . .

LANDING GEAR

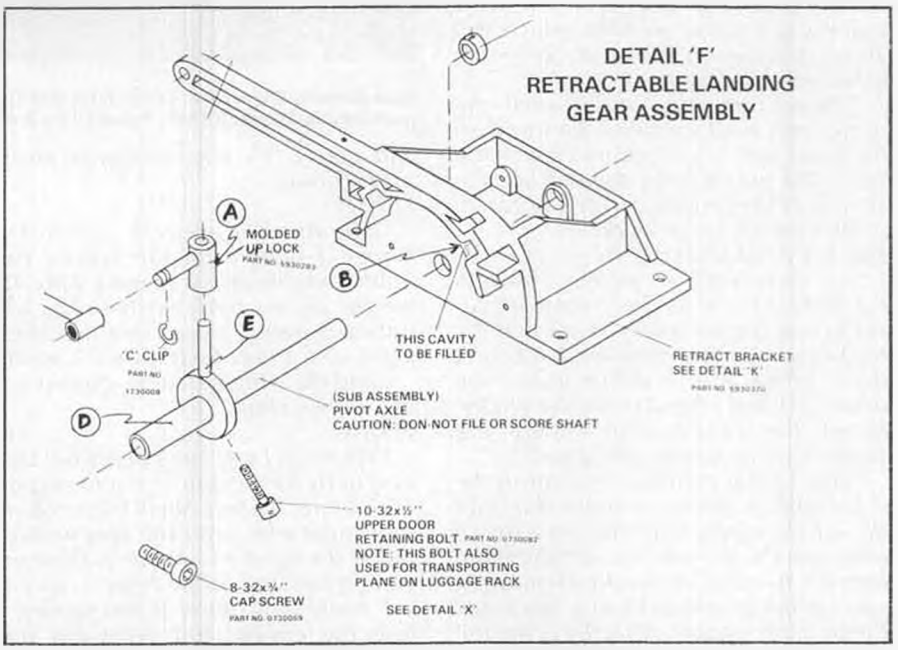
"With the molded-uplock (A) in the Up-Lock Cavity (B), the gear will lock up as it's designed to do. However, due to friction created by the locking pin being snug in the cavity, the gear will very often not unlock and free-fall as they are supposed to.

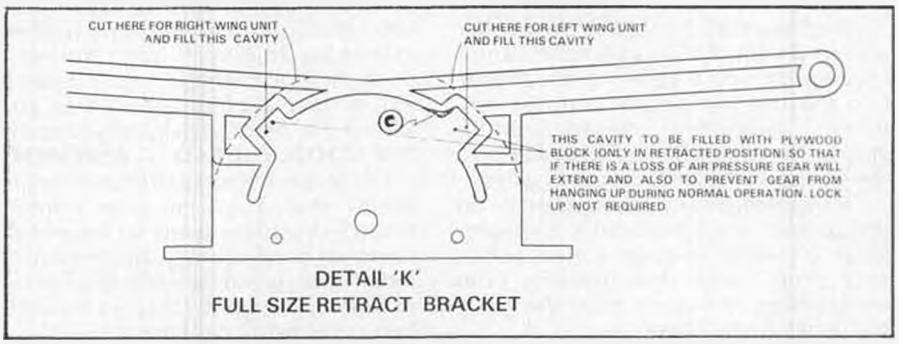
"By simply rounding off the edge of the Up-Lock Cavity (C), thereby eliminating this friction, a loss of air pressure will allow the gear to free-fall to the down position every time.

"As for the gear folding under landing loads, red Loctite on the pivot axle (D) will make the difference. However, you must get the gear up and down travel adjusted before the Loctite sets because the gear will not give on the pivot axle with Loctite on it. I've had a pivot pin guide break (E) due to heavy side loads on landing. PUT THIS BIG BIRD DOWN STRAIGHT!

"Proper main wheel alignment is necessary to avoid ground loops at taxi and rollout speeds . . . and ground loops are the things that cause side loads . . .

John Morris' Byron Mustang begins takeoff. Bird has over 50 flights. John has some mods to offer other builders. See text and drawings.





Modification to retract mechanism on Byron P-51 by John Morris seems to indicate he chose to ignore instruction regarding the filling in of "gear up" cavity, resulting in occasional failure to come down. Skip Ruff (Byron P-51 review, Jan '82 MB) filled in cavity per instructions, and uses higher air pressure to keep gear up tight during flight. John's method is recommended if you're not using enough air pressure.

and side loads cause things to break.

"I was never able to perfect operation of the landing gear and gear doors from single servo operation. So, I took the easy way out and used another channel and servo to open and close the main gear doors. (And using vasoline as a lubricant on the moving parts of the landing gear works very well.)

"Most fellows can't bring themselves to put from 90 to 115psi in the dinky plastic bottle that's used for an air tank, however, it takes this amount of pressure to insure proper operation of the gears. I just stay between the second and third line on the pressure gage and haven't had any problems. CAUTION: *you must tie the air hoses in the fittings with wire or else they're going to blow off at these high pressures.*

"The plastic wheel hubs will wear quickly and cause wobble, which will allow rubbing on the strut; keep the axles well lubricated.

"About the strut . . . I loaded the upper part with vasoline, then pushed the lower part in and secured it with the knee. The grease helps dampen bounce as well as keeping the struts lubricated. A little messy, but it works!

ENGINE AND DRIVE UNIT

"Let's start with vibration . . . learn to live with it! There has been some speculation that the prop hub has caused the biggest part of this vibration. But I don't think so because I disconnected the drive unit and after starting the engine found that the vibration was still the same (it's only bad at idle speed).

"Due to the extreme tension on the drive belts, I elected to move the front driveshaft support further forward to minimize the driveshaft overhang at the forward bearing, hopefully eliminating some of the driveshaft flexing forward of the bearing support. Also, the drive unit I have has the idler pulley removed.

"And be careful installing the rubber universal joint. If you tighten the clamps improperly, you'll squeeze the rubber into the bearing support, causing friction . . . and worse, putting pressure against the crankshaft end, which puts the thrust washer into an early grave.

"It's a good idea to use blue Loctite on the spinner screw because if it vibrates loose it's going to make a mess out of your prop blades (I'm speaking from experience), not to mention the really bad vibes it can cause.

TAIL WHEEL RETRACTION

"I use the Goldberg Nose Wheel Unit for the Mustang's tail wheel. However, you could use a B&D unit and save the extra servo and linkage.

RUDDER

"I elected to use two flexible cables to the rudder. I believe it cuts down on flutter over the pushrod type system. (Single pushrod control systems belong in the smaller .40 and .60 size ships; not in a BIG Bird! ama)

WING

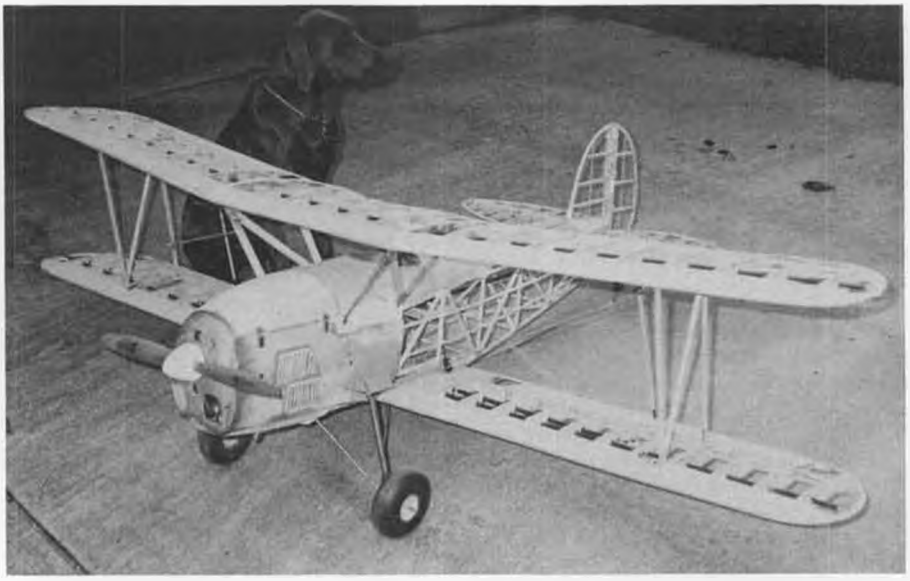
"Knock on wood, I haven't had any of the flutter I've heard about, even after 50 flights. I did wrap the center section of the wing with 6 inch wide, 6 oz. cloth and epoxy (it's not mentioned in the instructions).

FINISH

"The finish is entirely automotive laquer. I believe it's the lightest type finish and the easiest to work with. The weight of my bird, ready-to-fly, with onboard starter, retractable tail wheel, eight servos (less fuel) is 23-1/2 pounds . . . and the wing is double-glassed with two-ounce cloth.

FLYING

"What can I say? She's beautiful! She's easy to fly for anyone with some experience under his belt. She'll loop, roll and four-point with ease. The only problem is that she tends to run out of elevator if you get too slow on landings . . . and she will really slow down. If you happen to lose the engine, just point her nose down and save the speed for flare; it's all you can do. And don't forget to check everything frequently (also known as preflight and postflight. ama); if you do you'll have a chance to enjoy your Mustang as much as I've enjoyed mine."



Dale Bassant, Grapevine, Texas, built this Great Lakes 2T-1E from Frank Comyns plans as published in March '82 MB. Powered by 2.4 Kioritz. Has been flown by now.

THE GOOD, THE BAD . . . AND WORSE

Got some strange queries about plans. Seems that a lot of your potential scratch-builders want to know who turns out good plans . . . but most of the letters give no indication as to what kind of birds are favored. Okay, you want my two-cents worth, so here it is. . .

First, you must understand that I've got this "thing" about plans; they've got to be legible and complete. I hate the faded blue-line drawings that all too often are skimpy on bulkhead views and cross-sectional data. Plans should be so complete that anyone with some experience shouldn't even need instructions in order to build that design with little or no problems. Turning out a well-built, good-looking BIG Bird is enough of a challenge without having plans so lousy they turn every step into a frustrating guessing game. And it always seems that the guy who turns out poor plans also turns out equally poor instructions and near worthless pix.

On a grading scale of one to ten, I rate Dario "US Quadra" Brisighella's plans at the top and compare all others to his. Now I know there are other good draftsmen and craftsmen out there cranking out plans, but none I've seen so far are better than Dario's . . . and in most cases they're not quite as good. So "Mr. Quadra's" handiwork is the yardstick I measure all others against . . . and, unfortunately, too many nowhere measure up in this comparison.

If you've been lucky enough to get a look at Dario's "Starduster Too" plans, you know what I mean about quality. His plans are so complete, so cram-packed with info, drawings and sketches, that most guys want to jump right in and start cutting wood. In fact, even if you never plan to build the "Starduster Too," the plans are worth the thirty bucks just because of all the great usable how-to's and building hints . . . such as fabricating your own steerable tailwheel, making and rigging flying wires, support struts, shock-absorbing landing gear, etc.

I especially appreciate all the well-detailed cross-sectional data and bulkhead views his plans contain. And there's no guessing as to what any part of his planes are supposed to look like, nor do you have to waste time searching for the important info that's usually missing from other plans.

At this point you may be thinking that I'm on the payroll at US Quadra . . . so let me state here and now that although I think his plans are great, I do not agree 100% with Dario's philosophy about BIG Birds. A prime example being the difference in our thinking about servos. I most certainly favor the use of proven, robust HD servos, while according to Dario "the KPS 14 or 15 servos (or their equivalent) will suffice." (At least we do agree on the need for a 1200mah battery pack.)

And while on the subject of Dario's plans, I've got to tell you about his latest

Continued on page 94

Steve Kaneshiro launches Bob Angel-Sanchez's "Focus" at SULA-hosted semi-finals, in Carson, CA.

Steve Kaneshiro and his Eismann "Focus", which he modified by installing a wing joiner box around the joiner tube. E-387 airfoil.

R/C SOARING

By BILL FORREY Photos by the author.

• I would like to begin my column this month by thanking all of the many people from the various clubs who hosted FAI contests this year. You guys can really feel proud that you helped select the team that represents us in England next year. I know from first-hand experience that sometimes all your hard work goes unthanked, and even unnoticed, but believe me, *it is* appreciated, and *it is* noticed. Thanks again.

This month I would like to write a little about what the fliers in the Southern California area are flying, and how they are putting together their F3B systems. If you are familiar with F3B flying, then you know that it demands a whole lot more than just a good airplane and matching flying skills. While these two things will provide you with the basics, they won't get you very far in competition.

F3B has come a long way in two years. Back in 1980 at the last team selection finals, the hot setup was a strong Sagitta and a Hi-Flight winch. Not this time. I would say, at least in the Southern California semifinals, that the level of competition has doubled in every way.

The pilots who are competing are, in general, more skilled in the rigors of the speed, distance, and duration events. They are flying more highly refined sailplanes, and launching them off ever stronger winches. There is more pressure to win now than in the past when the semifinals were just the last practice event before the finals. You could pick the pilots who were sure to win ... before the contest began. Not anymore.

This year, I competed in the F3B program. I made it to the semifinals hosted by the Soaring Union of Los Angeles (SULA) before breaking my Gemini MTS and having to drop out. It would have been a whole lot more fun for me if that hadn't happened, but what-the-hay, I got a chance to see some really fine F3B flying, and that was worth it.

There were at least 20 serious competitors out of the 45 (approx.) entrants, and I would like to tell you about some of the more interesting things I saw.

Roger Roth, Larry Jolly, Mike Charles, and a few other like-minded Pacific Soaring Association fliers showed up with one of the most sophisticated equipment systems that I've seen in F3B competition. They really spent some time and money putting together what you see in the pictures on the opening page of this article.

What they decided to do was couple the best F3B glider kits with the strongest winches capable of launching them. They chose to use Eismann Focuses (Focii?) as their primary flying machines. The Focus is a balsa wood and fiberglass skinned, foam core wing glider. It uses a rather thin Eppler 387 airfoil which has a good performance envelope, and a molded fiberglass fuselage with all the room you would want for receiver and servos. This German kit is marketed in the U.S. by Wilshire Model Center, an MB advertiser.

What I like best about their choice of gliders is the very little building required after your initial purchase. That purchase will set you back 275 to 300 bucks, which sounds rather steep, but if you were to develop a similar glider, you would have spent even more money, so it's not as bad as it sounds. That's not even considering the *time* you would have spent in the development of the thing,

Dick Odle launches Mike Bame's "Illusion" (2-meter) from his Gorilla "Sport Winch." Mike normally hits over 900 feet on launch. Shutter speed of 1/1000 not fast enough to stop action.

Trent McGee launches his Eismann "Camaro" during early round of semi's. Wortmann Fx 60/100 airfoil. Molded F/G skins . . hollow.

Roger Roth, Pacific Soaring Ass'n FAI Team Manager, with teams equipment: Focus, two winches, generator, extra line spool.

and I don't know about you, but I don't have a whole lot of time and money to be spending on a design that could be a real turkey.

The PSAers were launching off of 12-volt starter motor winches. But not just the standard 12-volt motor that you could buy at your local auto parts store. Although it looked like your run-of-the-mill 12-volt, long-shaft motor, it certainly was not. Internally, there were many changes made . . . nothing really exotic . . . that gave their motors "40% more torque and 50% more power." First, they removed the brass bushings at each end of the armature and replaced them with needle bearings. Second, they removed the field coils and replaced them with four permanent magnets. Third, they rewound the armature in such a way that they could double the number of wires that current flows through. This meant that they needed to double the number of brushes at the commutator, which they did, and at the same time, they replaced the usual brass brushes with more conductive carbon brushes, which are several times more expensive (but don't last as long).

Now for the external changes. Right off the bat, the most obvious deviation from the normal way of making winches is the frame which allows the end of the output shaft to be supported by ball bearings, and with the increased power, this was probably a very good idea. The second thing I noticed was the housing built around the outer bearing. In that housing is a small pin which, when pushed in, contacted the teeth of the standard bicycle freewheel sprocket which served as a ratchet (No bicycle chain to mess with).

The other things which were present to complete the system: a small Honda generator hooked up to a battery charger which kept the 12-volt deep cycle marine battery at 15 volts between rounds, hand held push button switches in place of the usual foot pedal, and the twin battery cable leads which powered the primary and backup winches from the same battery.

Finally, the towline that the Roth team used was 100-pound test, tournament grade, Andes or Maxima brand, monofilament fishing line. Roth claims that the line they used in the semis was used in practice before the contest, was used during the contest, and in fact, *finished* the contest for a total of an estimated 213 launches before it was replaced. Incredible!

Since monofilament necessitates care in preventing chafing or kinking of any kind to maintain its strength, a superior turnaround needed to be developed. So Roth did some searching and came up with a very good one.

What he rigged up was an aircraft cable pulley block with a Micarta cable pulley recessed inside. It looked like the pulley was made of phenolic material . . . similar to a fiberglass composite. Its dimensions were roughly 1/8 inch wide and 2 inches in diameter.

It was necessary to go to this type of pulley to prevent the monofilament line from actually burning on the more commonly used bicycle hubs, which are typically 1/2 inch diameter and can't revolve at high enough speed to keep the line speed from exceeding the hub speed and causing friction and burning.

The pulley was then hung from a short length of steel cable on the end of a long stake which was driven into the hard soil

Handy hint for aching backs! Roger Roth tightens down a servo wheel, while Focus sits patiently in simple bracket.

Mike Bame launches Gary Ittner's TAI-PAN, first place F3B winner at semi-finals. Plane is two years old.

of the flying field. Obviously, the purpose of hanging the pulley 8 inches off the ground was to minimize ground friction and allow the pulley to pivot with the aircraft on launch. Really a good system.

In actual service, the PSAers were not using their winch system to full capacity. They always pulsed their Focuses up the line until they were ready to dive for the zoomie at which point they pushed the nose over, poured on the power briefly, and pulled out for the extra altitude.

If the Focus had a good spar system, it could take a full-power launch and survive. As it was, they found out the hard way just how much power was too much power, and broke a few of them in practice prior to the semis.

Roger Roth, the PSA FAI team manager, expressed his disappointment in the Focus design to me recently in a phone call. He feels that "in the air" the Focus is a superior F3B machine to most ships used in competition. But, he feels that the wing's structure is a bit of a handicap due to the built-in stress riser at the end of the wing joiner tube. The Focuses that he has seen broken always break at this point.

What has been done to alleviate this problem was to skin the fully sheeted balsa wing with lightweight fiberglass cloth. As the Focus already has a fiberglass layer under the balsa, a layer over the balsa creates a sandwich which is quite a bit stronger.

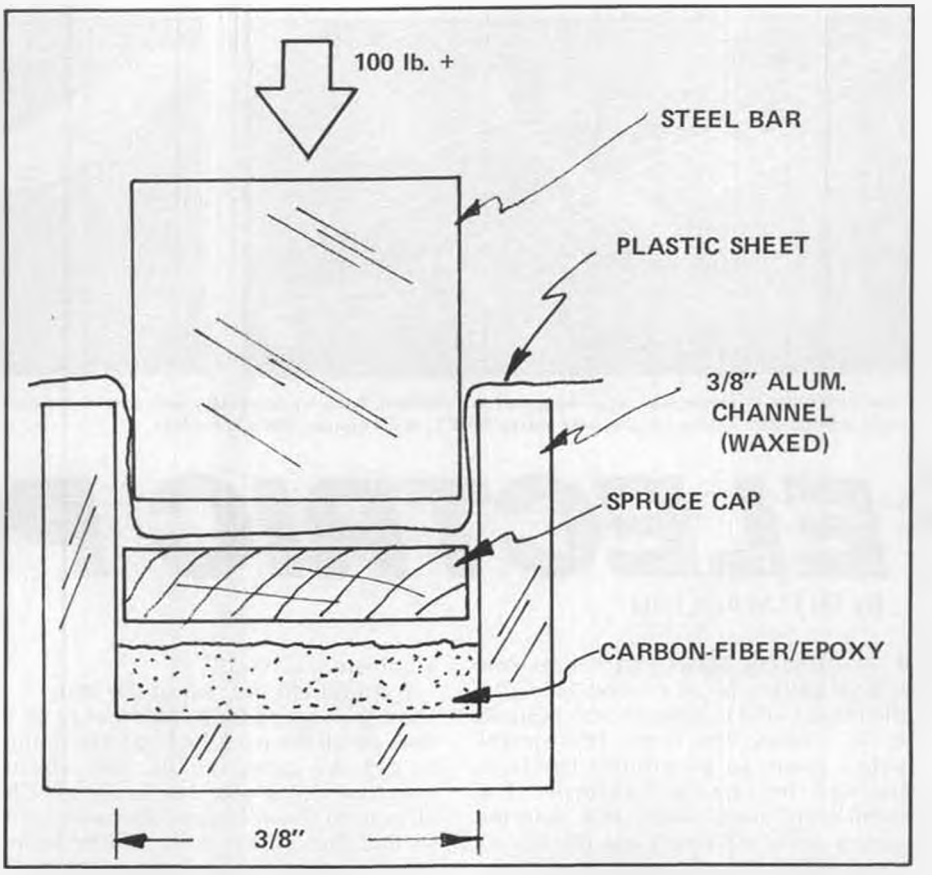
Steve Kaneshiro, of the Soaring Union of Los Angeles (SULA), carried this a step further. He added a plywood box around the joiner tube, and extended it out a little farther than the end of the tube to act as a type of shear web near the root. What I think he accomplished was a stronger joiner area, but he is still left with a stress riser at the end of the box webbing. This is a definite improvement, but not the ultimate solution. It needs a spar to taper off the loads created by the joiner.

Is anyone listening at Eismann? I hope so, 'cause I'd buy a Focus with those structural improvements.

Last month I told you about Gorilla winches and Glider Missiles. Well, they were present at the semis, and they were awesome! Pictured with this article is Mike Bame's "Illusion" launching off the Gorilla winch. The photo was taken at 1000th of a second shutter speed, and I still couldn't competely stop the action. Mike, unfortunately, didn't finish the competition due to pilot error during the speed run, but as one contestant put it, "it was worth coming here just to see Mike launch off that winch!"

Last month I indicated that not only were 800 foot launches possible, they were a reality. Well, they are, but so are 1000 foot launches. That is the number Mike Bame was hitting on his best launches, give or take 50 feet.

Every time Mike would go to launch, a scene similar to that which was enacted at Sacramento during the World Champs last year would occur. Eyes were suddenly shifted over to the area that the



Gorilla occupied and fixed on that little two-meter. Then, as it took off, there was silence mixed with a few laughs and "Oh-my-gods" and finally, as he came off the line, screams of approval from the onlookers. I thought it was very reminiscent of the reactions that the Canadians got last year.

Dick Odle, master mind of the new "sport winch technology," also launched in glorious fashion, but with not quite the same results. He was only getting 800 to 850 feet. (Only?!!!) Yes, he claims a reluctance to really push his RO15 very hard on tow. Such modesty. A lesser ship would have folded within split seconds, pun intended.

Do you remember two years ago a guy named Gary Ittner making first alternate to the U.S. soaring team? He flew a rather normal-looking *polyhedral* ship called the TAI-PAN. He also set a national record or two with this same ship. Well, start paying attention to this guy, 'cause he's pretty good. He took first place at the semifinals that I attended. And he flew against some pretty tough competition, too.

Gary is a consistent, patient flier (Where have you heard those virtues extolled before?). He maxed all his distance rounds, got 3 of 5 maxes in duration, and was as consistent as anybody in speed. His best speed time was 26.5 seconds (he hit two in the 28 second bracket, and two in the low thirties). How many people can do that with a two-year-old glider?

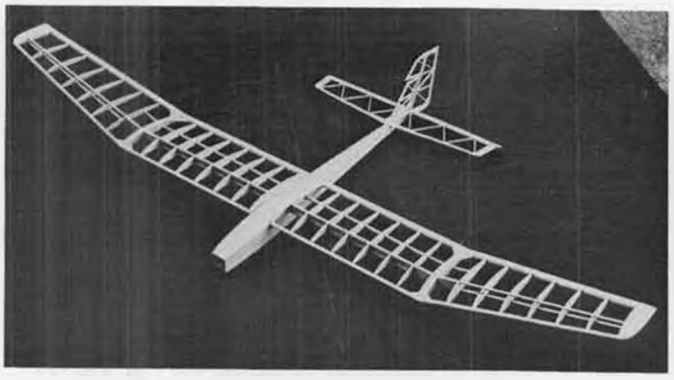
Another one to watch is Alex "The Kid" Bower. He usually flies borrowed planes, but don't let that give you the wrong impression about him. You see, he really *was* trying to finish his F3B glider in time to become familiar with it in practice so he could go to Chicago this summer. But, you know how it goes when you're a senior in high school.

Some of you will recall Alex as the kid who showed up in Joliet last summer for the LSF tournament flying Ed Slobod's prototype Gemini MTS. Well, that particular glider has really been through the mill in the last year. . .

Jerry Kraincock borrowed it this spring to set some cross country records in the desert. He lost a stab a third of the way

Continued on page 93

Dennis Brandt with his Eissmann HAI. Flaperons, rudder and elevator. Eppler 178.



The Airtronics Olympic 650, as reviewed in this column. Parts fit extremely well and framework is strong. This one covered in transparent yellow Solarfilm. All up weight, with Astro 05 XL, is 46 ounces. Span is six feet.

ELECTRIC POWER

By MITCH POLING

• The Boeing Hawks had their first official electric pylon race on June 27 at the Hawks field in Kent, Washington. As far as I know, this is the first electric pylon event to be held in the U.S., besides the ones in California. The inspiration, hard work, and determination of Dave Katagiri was the driving force behind it all, and I would personally like to thank him for all the effort. He even designed a plane for it, the Ohm-My-Gosh, which is a delight to fly and definitely faster than any of the other electrics that were entered. At the end of the races, Dave asked if we all wanted another race, and the vote was a uninamous "Yes!!".

I should tell the rest of the story . . . Dave then asked for a volunteer to take over on all the work he had been doing to get the races set up. Talk about everyone doing one step backwards! It all goes to show that a good man is hard to find, but I'll bet there will be some more electric events here in the near future. Dave won the event, and Ben Almojuela was second. Both raced with the Ohm-My-Gosh and the Leisure 05. The last heat was very exciting, with Dave and Ben close on each other; only the fact that Ben cut a pylon kept it from being either a tie or the reverse result. The speeds were in the 50 to 55 mph range, which is about right for hackers like me. I entered the Challenger 05 but didn't get to show how it could do, the receiver failed and I barely made a semi-controlled crash landing. The damage wasn't too severe, but ended the flying.

I can state that the fuse setup (by John Szary) that I showed in the September column works well, the fuse blew and saved my expensive cobalt motor. The 50¢ fuse is well worth the investment! I strongly recommend this; use the spade lug fuses by General Motors (sold also by Radio Shack) with spade lug connectors. These are easily installed; just cut a lead, clamp or solder in the spade connectors (Radio Shack), and plug in the fuse. These fuses come in just the right values, 10, 15, 20, and 25 amperes. The 20 ampere fuse did a good job of protecting the Challenger motor. I am using 10 and 15 ampere fuses to protect my Astro 035 and 05 (old system) motors, and they have more than paid for themselves. I have had quite a run of crashes lately (would you believe, five?), and these fuses have saved four motors from an untimely death. That's a lot of money

Radio installation in Oly 650 (l to r): elevator and rudder servos, motor push-push switch, airborne pack, receiver. Power batteries and motor in nose.

"Amazin', ain't it Henry? You can make an airyplane out of all them little sticks and pieces!" Precision cut parts fit well.

Peter Ballentine, Mitch's nephew, with Oly 650. "Ashington" shirt refers to volcanic ash covering Washington. Rain washed it away.

Dave Katagiri, spearhead of electric pylon activity in Seattle area. His "Ohm My Gosh" design, 300 sq. in., weighs 33 to 35 ounces with Leisure 05.

"Look, Ma, pylon racing without noise!" Dave Katagiri leads Ben Almojuella down the back straight. Stayed like this to finish.

saved. I originally started to use fuses to comply with the race rules, which require them, partly to protect spectators (electric motors can be tough on people!), but now I'm using them on all my planes. Thanks, John Szary, for an excellent fusing system. In addition to its convenience, it is quite flat, and easy to tuck away in the fuselage. The fuses also come in pretty colors! It looks right, installs right, and works right, showing that the best ideas can be simple ones.

The rules of the pylon race are simple; any 05 motor, limit six cells, sub-C, on-off control, fuse required, fuselage cross-section minimum to be 3-1/2 x 2-1/4 inches, minimum 290 sq. in. wing area, minimum wing thickness 7/8 inch, unreworked props, no landing gear required, hand launch. The ten-lap course is triangular, with two 300 foot legs and one 60 foot leg. These rules have worked very well indeed, no one had any complaints at all, and competition was quite even, with the skill of the pilot the deciding factor. Try a race, you'll like it, and with the electrics, you don't have to be a motor or plane expert to compete.

Occasionally a product comes along that is really outstanding, and when it does, it's a pleasure to report on it. I just finished and have been flying an Olympic 650, kitted by Airtronics, and powered by an Astro 05XL. This is a combination that I would not hesitate to recommend to a beginner in electric power, or, for that matter, for a beginner in R/C. The price of the kit is very reasonable, under $30, and when you open the box, it's a modeler's dream. The kit is *beautiful*! It is as close to a work of art as any kit I've ever seen. The balsa and plywood parts are machined, not cut, and the wood is immaculate, not a flaw in it. The kit shows obvious tender loving care from the Airtronics people. I have gotten very picky about what I build, because I usually design and scratch build my own, and I didn't build a couple of kits lately (they will stay nameless) because I was so turned off by the bad wood and die-smashed parts. The Olympic 650 was a pleasure to build, and I usually don't like to build kits! The fitting of the parts was flawless, there was *nothing* that didn't fit! The directions were excellent, complete with photos to show you the steps. I managed to thwart their purpose by losing them shortly after I looked at them, so I proceeded to build using just the directions on the plans. The plans are so complete that I had no difficulty in doing this, everything you needed to know was on the plans, which are exceptionally clear and well drawn. The structural design is again, exceptional, with simplicity and strength the watchwords. The fuselage is Sig Lite Ply, and all wing spars are spruce. The wing tips and tail assembly can be made removable, which I did, so I can take it on trips with me. The motor mount is simplicity itself; the front plywood former has a hole machined in it that is exactly the right size for the front bearing of the 05, and all you do is drill two holes to mount the motor to the former with two bolts. Access to the motor is simple, via the hatch that serves as a canopy. The entire building took me about three weeks of sporadic building . . . about forty hours . . . the same as it takes me to build my own designs. This is fairly fast for me, a total beginner might take four weeks if he had about two hours a night to work. In all, this is the easiest building powered glider I have owned.

I did find that the motor battery should be installed directly behind the motor, that is, in the nose, for correct balance. There is just enough room for this for the Astro 05XL pack; other packs might take some fitting and cutting. The radio gear went in the cabin, which looks quite empty without the motor battery in it! I decided to put the servos in the rear of the cabin; if I were to do it again, I would put them in the front. Things get quite cramped in the back of the cabin, both vertically and side-to-side, and the Bantam Midget servos were a tight fit. On-off switching was

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The Ohm My Gosh is a clean, simple design. Plans will be in MB soon. Join the fun!

Dave and his plane at Boeing Hawks field, pylon racing site. Note "fuel" container in background.

1. Contest Manager, SAM Champs, George Armstead, takes a moment to run Super Cyke in his Goldberg Valkyrie.

2. Tom Acciavati, SAM Champs R/C Contest Director, makes himself heard with the bullhorn.

PLUG SPARKS

By JOHN POND

• Having just returned from that long haul to Westover AFB, Chicopee, Mass., the most asked question has been, "How were the SAM Champs?" For an answer, the 16th Annual O/T Champs were GREAT! Let me spell it out for you.

"G" stands for Good weather, Good flying, Good competition, Great camaraderie, and just all around Great fun! What else can you ask for in an old timer meet?

"R" stands for the *Record* number of events held. By and large, the SAM 7 sponsored Champs was the largest ever featuring 23 free flight events and nine radio assist events. Contest Manager, George Armstead, certainly set himself a mark to shoot at!

"E" stands for Entries. At last reports the actual number of contestants was 152. Although this was the second biggest Champs for entries, this columnist was a little disappointed the meet didn't draw over 200 contestants. Of course, the number of entries was over 800. No question about it, times are tough and quite a few fellows who normally make all the SAM Champs were missing. The fact the contest did not turn out to be the biggest in SAM history is no reflection on the SAM 7 boys. They did a super job. If you weren't there, too bad, you missed a great time.

"A" stands for Accommodations which were outstanding, with the Rodeway Hotel serving as the central headquarters. The so-called "bean feed" turned out to be a beautiful setup of tables, smorgasbord, and open bar, all by the cool poolside. The main convention room was more than adequate for the Annual SAM Business Meeting, the "El Grando" MECA National Collectogether, and the SAM Victory Banquet.

"T" stands for Trophies and were there ever a flock of them! Thirty-one events with trophies to fifth in each means 155 trophies to be given out, not to mention all the special awards. Armstead did a fantastic job on merchandise awards. Nobody went home empty-handed!

3. Typical lineup of modelers for the Texaco event. A great time to get acquainted with fellow contestants, Westover AFB SAM Champs.

4. Chet Lanzo, Ohio, is all smiles after winning Texaco event. C.D. Acciavati checks weight.

5. Latest electric powered model by John Pond is Dick Shumacher "Gulliver". Familiar Pond color scheme.

7. Bert Pond with his unusual low aspect ratio compressed air design. Note "brand" of air tank being used!

8. Neat, legal launch, takeoff demonstrated by Sal Taibi and his Ohlsson 60 powered cabin Playboy.

10. The perennial Henry Struck, with his (any doubts?) 1937 Wakefield design, just recently approved by SAM.

T is also Teamwork. This, to the author, is the most important ingredient of any contest. First you need a Contest Manager who is willing to devote weeks of his time setting up the contest site, accommodations, printing of all brochures, handling of all entries . . . Oh, I could go on forever with this thankless job! His very capable assistants; Ed Novak on F/F, and Tom Acciavati for R/C, were more than qualified to run an excellent meet. Best part of all was that Ed had organized event directors to help run the myriad free flight events scheduled for each day.

Okay, let's get on with the pictures. This time we are not going to let any other publication scoop us for photos. Many thanks are due to Harold Johnson, 1415 Trollhagen Dr., Minneapolis, Minnesota 55421. Incidentally, if you would like to get a copy of the photo presented, send Harold a buck or so. I am sure he'll be happy to accommodate you.

So, first things first! Let's start with the people who made this contest such an outstanding success: Photo No. 1 shows our indomitable Contest Manager (with his back to us, natch!) tuning up the Super Cyclone in his Valkyrie. Armstead must have had at least 15 models ready to fly, but was unfortunately unable to get them in the air because of the press of running a contest.

Photo No. 2 depicts Tom Acciavati, erstwhile SAM R/C Rules Coordinator, in his capacity as Contest Director for the R/C portion of the Champs. Tom was lucky to have the girls, Evie Woodman, Dorothy Granieri, and Miriam Clark to help out. Jim Clark sat in the last couple of days to also help out. Things ran very smoothly!

Over on the free flight side of things, we don't have a solitary picture of Ed Novak and his crew. With a huge tent and numerous subsidiary canvas flys, the free flight area was exceptionally well organized.

9. Steve Bocher, New Jersey with his hot flying scaled down Playboy Sr.

As reported before, practically every event had its own director. In addition to this, Armstead had organized a retrieving team that did yeoman work in getting many a model out of the trees.

This gang employs the old bow and arrow method. Retrieving is done as follows: An arrow is shot over the limb holding the model. A very light string is attached to the arrow. Once the arrow is looped over the limb, then successive heavier cords or ropes are pulled over the limb.

6. Bill Hamner and wife Phyllis, with his Orwick 64 powered Flying Quaker. Nice models, Bill!

11. "Krazy Karl" Spielmaker, with his unusual compressed air version of Army WW-II target drone.

13. And another Pacific Ace! This one by Jack Guetens, Cheshire, Conn.

12. Did we say "another Pacific Ace"? This time it's Joe Fitzgibbon, of G.A.R., Braintree, Mass., and Bob Schlosberg.

Once a strong enough rope is over the limb, two fellows then work the rope back and forth, literally walking the model off the branch. Very few models were damaged this way! Of course, you had to be light on your toes to catch the model as it fell out of the tree!

Needless to say, we'd get some shots of Novak and his busy little beavers. We couldn't let this go unrecognized!

Wandering around the Texaco Event is always this writer's favorite occupation having pioneered it at the 1974 Lakehurst Champs. Photo No. 3 shows a typical lineup of the boys waiting to be weighed and gassed up. In lines like this, many fellows have found it is a great way to get acquainted with your fellow competitor. More friendships have sprung up this way!

Of course, if we are talking about Texaco, we simply have to run a shot (Photo No. 4) of the winner, Chet Lanzo, who found the only real good thermal of the day. Others tried piggy backing, but it was too late.

Actually, Lanzo's win was most appropriate, as he donated the E.R. Roberts R/C Trophy (won in 1937!) to SAM to be used as they saw fit. Naturally, it fit right into the Texaco idea, so, with all the previous winners engraved on a new base (and the trophy heavily polished by Jack Alten, 1981 winner), this is the trophy to win!

Before getting over to the free flight side of things, this columnist wants to run Photo No. 5 of his latest creation, an 05 Leisure powered model known as "Gulliver". This was a 1941 design recently approved by the SAM Board of Directors as an old timer. With the slight pot belly design up forward, this lent itself admirably to the compartment for the six-cell battery unit. Although the motor was brand new (electric motors need breaking in too!) and an untried model, the writer was pleased to place fifth. (It's better than a poke in the eye.)

Photo No. 6 reflects the family interest in the SAM Champs, as many *many* modelers brought their families along to "enjoy" the fun. The photo shows Bill Hamner, from Colorado, with an excellent flying Flying Quaker. Although the lines of this particular design do not scream beauty, the large tails, which were such a detriment in free flight, are just the ticket for R/C soaring in the clouds. Just think, a model that truly represents the old turkeys we used to build and best of all, it is competitive!

16. Rodgers Barton, Texas, shows how to fly five events with two models. More on this in text.

Of course, we have to have a little nepotism in the column. Photo No. 7 shows Bert Pond with an unusual low aspect wing design for his compressed air engine with aluminum beer cans for the tank. Look carefully and you'll find the name of the beer on the first can! Bertram P. Pond (actually no relation) of 128 Warren Terrace, Longmeadow,

15. Sid Sutherland, London, England, with his Mills 1.3 Diesel powered "Colibri", a Louis Garami design.

14. Ted Dock, Warsaw, Indiana, with rare 1941 Goodrich Trophy winner, from 1943 M.A.N.

18. George Murphy, Schenectady, N.Y. with his Atwood Super Champ 60 powered Ehling "4-1/2 Hour Flyer". Whatta name!

20. C. E. Bowden's "Blue Dragon". Gee, John calls it ugly! Built by Danny Sheelds. Yes, caption writers, Sheelds.

24. The "Red Ripper", from Flying Aces, by Gerald Donohue, Central Falls, R.I. Power is a Wahl Brown Jr. Special.

Mass., 01106, used to run a hobby shop in 1930 under the name of Peru Model Shop in Peru, Indiana. Bert made the best compressed air engines, as all the C.A. records will attest.

After all these years, Bert is again making compressed air engines with improved tanks (found out that he didn't need to wrap them with piano wire as metallurgy has improved). Bert makes them in all sizes, shapes, and arrangements. The most popular model is his three-cylinder version that wins most of the meets. If any of the readers out there are interested in acquiring a compressed air engine complete with tank, write Bert for particulars and price. Kind of a neat way to fly!

We never get tired of publishing photos of Sal Taibi's models taking off. This is such a truly unassisted legal launch, it is a real pleasure to watch. Photo No. 8 shows the Playboy Cabin we talked about three or four months ago. Sal was really primed for this meet and won no less than six trophies! As Sal ruefully remarked, he left at least three models in the trees surrounding Westover AFB.

Incidentally, by now, you the reader, must have gained some insight as to the size of the base. Actually John Worth, Executive Director of AMA and Ed Izzo, District I Vice-President, showed up with the idea of possibly getting the use of the base for the Nationals. As it stands now, Lakehurst NAS is tied up for at least one or two years with the Army and its contractors occupying the base with their projects.

Photo No. 9 shows Steve Boucher with his hot flying scaled Playboy Senior and at the same time gives some idea of the proximity of the trees. Actually, the viewer is looking directly across the field at the free flight headquarters. The runway is laid out for the prevailing wind, but like Murphy's law, if something can go wrong, it will!

Actually, complaints about the weather were quite moderate, considering the contest was run in New England, with no rain and only one windy afternoon on the second day. That was a black day for free flights, as the crashes could be heard quite clearly all over the field. Other than that, this writer has to commend George Armstead and his cohorts for their selection of weather!

Right after Sal Taibi, we have to run a photo of his buddy, Henry Struck, as can be seen in Photo No. 10. Henry may be getting a little grey around the temples, but he can still build and fly models with the best. The only drawback to old age is that you can't seem to move as fast anymore when retrieving your model!

The rubber model shown is a faithful copy of the 1937 model he sent to England to be proxy flown in the Wakefield meet. That was the year Fillon of France won. This design has just recently been approved by the SAM Board of Directors, so it won't be long before the plans are available.

Continuing on with our parade of Champ pictures, Photo No. 11 shows "Krazy Karl" Spielmaker with a most unusual compressed air design. He has taken the outlines of a standard U.S. Army drone (as used for target practice) and lightened it sufficiently for a C.A. motor to fly it. At last reports he didn't do too bad!

Carl has been a long time enthusiast of compressed air flying, always offering some inducement for fellows to build and fly in this rare event. One year, he put up a couple of hundred dollars to get the boys out!

For the benefit of those who patronize Golden Age Reproductions and don't know who or what Joe Fitzgibbon looks

17. John McSwiney, with his real nice looking Simmons Eastern States Gas Champ. Super Cyclone 60 engine.

19. Forster 99 powered Super Buccaneer by Nick Notte, Hartford, Conn. Very realistic flier!

22. Smart looking Wally Simmers designed Midwest Jabberwock, by Walt Hartung, Detroit, Mich. Simmers went for hot climb.

21. Bucky Walter, SAM 39, makes his Lanzo R/C Stick really perform in the Antique Event.

like, Photo No. 12 is offered, showing Joe with a Modelcraft Pacific Ace 30. . . a great flying model! Joe has been quite successful in his line of flying scale plans, and of late, his kits to go with the plans. Business must be pretty good to have his panel truck properly identified. He has been very good to SAM 7 and has sponsored many an event for that SAM Chapter.

While on Pacific Ace Models, Photo No. 13 shows Jack Guetens, of Cheshire, Conn., with his version. This very popular class of models has really caught on back east. With good rubber again available, rubber powered models are really making a comeback.

Photo No. 14 only proves the point all the more. Ted Dock, of Indiana, built and flew this little-known design 1941 winner of the Goodrich Trophy (you know the other guys . . . not Goodyear). Main reason for not building this model is that it did not appear in print until 1943 thus leading many modelers to believe it was an ineligible design.

Getting back to gas jobs, Photo No. 15 shows Sid Sutherland all the way from Merrie Olde England with a Louis Garami design called the "Colibri". Although Sid didn't win, he had a real ball at the SAM Victory Banquet giving out awards to worthy people who ran the contest. Appropriately, the prizes were all English Tea boxes, as a reminder of the Boston Tea Party. More darn fun!

SAM ANNUAL BUSINESS MEETING

We mentioned the Annual welcoming SAM Bean Feed held in rather luxurious quarters by the swimming pool, but we didn't mention the Annual SAM Business Meeting. Highlights of the meeting included reports from the Treasurer, the Engine Test Committee (Sal Taibi reported the M & P Forster 29 & 35 motors were approved for old timers as was the Herb Wahl reproduction of the Ohlsson Gold Seal), and the announcement by Don Garafalow, Elections Tabulator of the following SAM officers for 1983-84.

President:	Mike Granieri
Secretary-Treasurer:	John Pond
Eastern V-P:	Woody Woodman
Midwest V-P:	Robert Larsh
Rocky Mtn. V-P:	James Thomas
Western V-P:	Sal Taibi

Paste those names in your hatband men, so you won't forget it!

New business under the incoming President, Mike Granieri, consisted of donating $500 to the AMA building fund. Woody Woodman made a proposal to restore the office of Historian with John Pond in the office. This was passed, but the actual duties and responsibilities were not outlined. A writeup should appear shortly in SAM Speaks.

The MECA "El Grando" Collectogether was also held in conjunction with the SAM Champs. Quite a few collectors displayed their wares for swap and sale, but the average modeler simply wanting to find a "runner" engine was shut out by the $4 door fee. This, in this writer's mind, was okay for the collectors, as they would require tables and chairs, but it did stop a considerable number of modelers from attending the "El Grando". Gus Munich might look into this inequity if he is interested in attracting more people to a National Collectogether.

Getting back to the flying, the Texas boys made a real killing in the R/C events, winning 12 of 25 trophies. Whew! To show how they came prepared, Photo No. 16 shows Rodgers Barton with only two models, but with four setups to fly five events. Traveling long distances always poses a packing problem, so the more events you can incorporate in one model, the more room there is in the car. Barton was able to fly in Class A, Class B, Class C (all glow events) and Class AB and Class C ignition events. One thing for sure, he did keep busy!

Couldn't resist showing a shot of this writer's favorite ignition model, the

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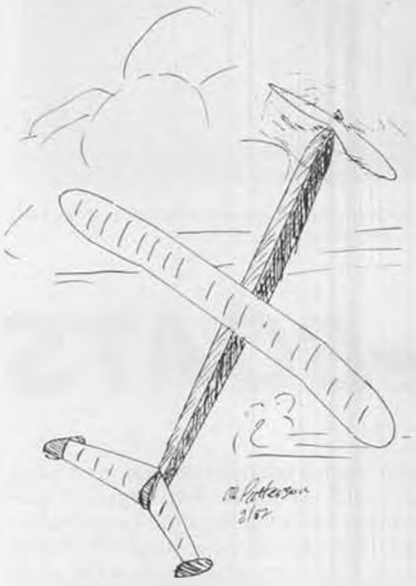
23. David Hicks, Washingtonville, N.Y. built this neat Louie Garami "Molecule" with sheet monocoque fuselage. P.A.W. diesel.

25. Vought V-143 built from Comet 50¢ kit plans by Bob Schlossberg.

CHAMPIONSHIP STICK MODEL



OLD TIMER Model of the Month

Designed by: Al Casano
Drawn by: Al Patterson
Text by: Bill Northrop

• Writing the text for this feature each month is very time consuming. The article itself is usually quite short. The time consumed, however, seems to be unavoidably longer than necessary. Writing it only takes a few minutes, but when I open up the old magazine to refresh my memory on the featured old timer, my eyes and mind begin to wander. Take this month, for instance. . .

Al Casano's Championship Class C Stick Model was published in the May 1940 issue of Air Trails. On the cover was a three-quarter front view of a TWA DC-3, highly silhouetted against a sunrise or sunset, with a single round-roofed hangar in the background, complete with drooping windsock. The inside front cover contains a full-page ad by Megow, announcing a huge contest. First two places were all-expense paid trips to the 1940 Nationals in Chicago. On the contents page (4) was an ad for the Class A .199 Bantam engine, Ben Shereshaw's pride and joy. The next 20 pages were all devoted to full-scale aviation; ads for aviation schools, photos of the latest in military aviation, a story on early flying in the stratosphere, articles about lightplanes and soaring, and even a short fictional adventure about two air cadets competing for

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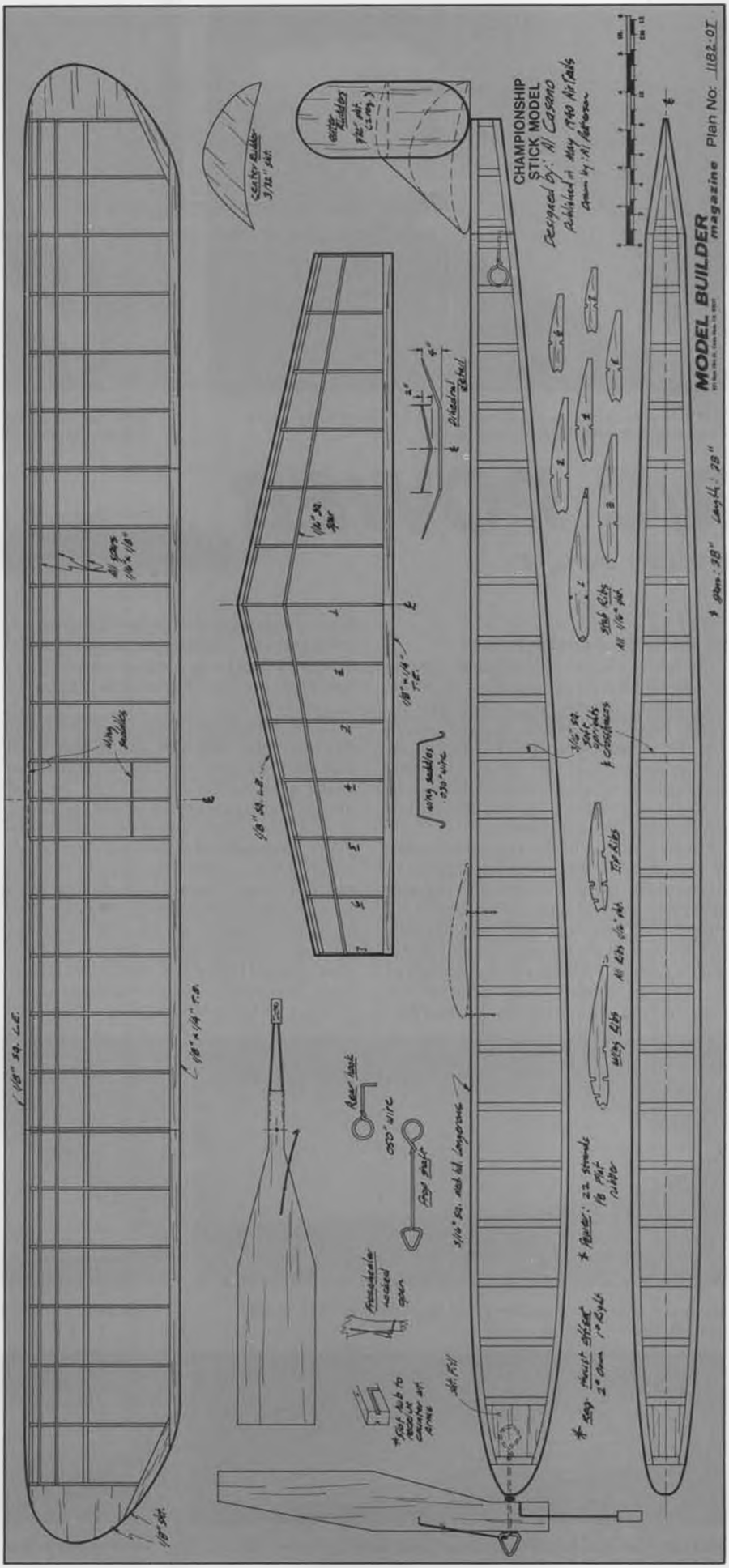

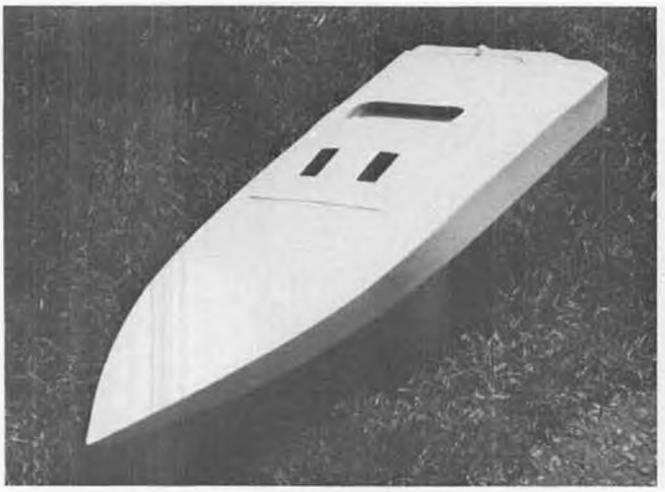

A Ward Marine Offshore 33 primed with K&B Super Poxy white primer and ready for final coats of paint.

Ward Marine Offshore 33 with three-color paint scheme; yellow, red, and orange. Very visible on the water.

R/C POWER BOATS

By JERRY DUNLAP

SPORT 40 - THE CANARD CONTROVERSY

The Sport 40 Class of the North American Model Boat Association has received some degree of coverage in this column. It has been my belief that this class provides a good entry level for those wishing to compete in a class of semi-scale type unlimited model boats. In some areas, the class has obtained quite a following of participants.

Although most of the rules governing the class tend to be somewhat general in scope, there are some specifics regarding length, engine type, and hull design. The rule concerning hull design became a focal issue of a protest of a boat at the 1982 N.A.M.B.A. Nationals conducted in Los Angeles in early July. One of the rules dealing with hull design specifies that no outrigger designs will be allowed. When I think of outrigger designs, boats like the Wing Ding, Crapshooter, Water Spider, Gator, and Hughey Rigger come to mind.

One of the boats entered in the Sport 40 Class at the 1982 N.A.M.B.A. Nationals was the canard design hydroplane belonging to Ed Fisher. The canard design features rear positioned sponsons as compared to a conventional hydroplane having front sponsons. The boat's appearance is more like something out of "Star Wars" than a boat that races as an unlimited hydroplane. However, the boat is a model of the 1981 "Circus Circus" unlimited hydroplane that participated in the 1981 American Power Boat Association Unlimited Hydroplane circuit. The 1981 "Circus Circus" unlimited hydroplane was not very successful. At some of the races it was unable to even qualify and I'm not sure it ever completed one heat of racing during the entire season. As a full scale unlimited, the canard design was not what one might consider a blazing success.

It should be noted that the full scale 1981 "Circus Circus" canard unlimited was designed by Ed Fisher and his dad, Charles. Mr. Bill Bennett, one of the owners of the Circus Circus Hotel and Casinos as well as the unlimited hydroplanes, first saw one of Ed's canard hydroplane models run in 1978. He was sufficiently impressed to attempt to build and race a full scale version of Ed Fisher's model boat. During the 1978, 1979, and 1980 unlimited racing seasons,

Plain paper is used to cover bottom of this Offshore 33 to protect it from overspray.

Top deck is masked off using Flex-Mask and regular masking tape.

Flex-Mask is used to define color separations on this Offshore 33. Base coat is yellow, with color panels of orange and red.

Masking tape is used to cover the areas that have already been painted.

the "Circus Circus" hydroplane was a conventional cabover design. In 1979, the team had its most successful season. I believe the boat finished third overall in season points and driver Steve Reynolds was named Rookie Driver of the Year.

(It should be pointed out that the full-size 1981 Circus Circus hydroplane was never actually completed according to the Fishers' design, having been modified before completion by other "experts." It would have been interesting to see the results, had the Fisher design been left alone. wcn)

The basis for the protest against Ed's canard Sport 40 was the contention that the boat was actually a "reverse outrigger." The canard's sponsons are affixed to the back of the hull by means of a stubby wing rather than booms or extensions used on front sponson outrigger designs. Apparently there were some who felt that the design provided an advantage over conventional Sport 40 boats. There's no denying the boat is fast. Ed Fisher holds the Sport 40 record with the boat at 1:18.57 for the five lap, .9 mile oval. That record time is only about five seconds more than the record Ed holds in the 40 Open Hydroplane Class. The best time I can recall for a conventional Sport 40 hydro is 1:31. As you can see, the time difference is considerable. Of course, one can't protest a boat because it's too fast. Therefore, the protest was based on the hull's design.

As one of the three members of N.A.M.B.A.'s technical committee, I was called upon to render a decision about the classification of the hull. Actually, the question was more, "Is the boat an outrigger?" Well, I have an image of what constitutes an outrigger model hydroplane and I listed that earlier in this discussion. Okay, if it isn't an outrigger, what is it? I stated I felt it was a hydroplane employing reverse suspension when compared to a typical hydroplane with sponsons attached to the forward section of the hull. As I understand the final outcome, the protest was disallowed and the boat declared legal for N.A.M.B.A. Sport 40 Class. At the time I'm writing this article, I don't even know how the boat did in the class.

Since my opinion was given over the telephone, I don't know the type of reception the decision received. It would seem that some folks would be rather unhappy with the outcome as their protest was not allowed. This incident brings up a challenging issue in what is supposed to be a restricted class of model boat racing. What happens when someone comes up with "a better idea?" If the individual can comply with the rules of the class and still come up with "a better mouse trap" should he be penalized for being innovative? Certainly there are no easy answers to these questions. I can appreciate the concern of the competitor who brings out his conventional hydroplane design and has his boat devoured by something he doesn't even recognize as a model hydroplane.

It appears to me that there are two possible solutions to problems regarding hull designs in the Sport 40 Class. The first solution would be to continue to allow any hull design that complies with the existing rules. If the hull configuration ran as a full scale unlimited and it's not an outrigger, it can run in Sport 40 Class. The canard fits these rules.

The second solution would involve a rewriting of the existing rules to restrict the boats to hull designs that comply with what might be termed "conventional designs." So, what's conventional? I would say boats that have a design configuration like the round nose Slo-Mo-Shun type boats or the cabover, picklefork designs like the Miss Budweiser or Atlas Van Lines. N.A.M.B.A.'s

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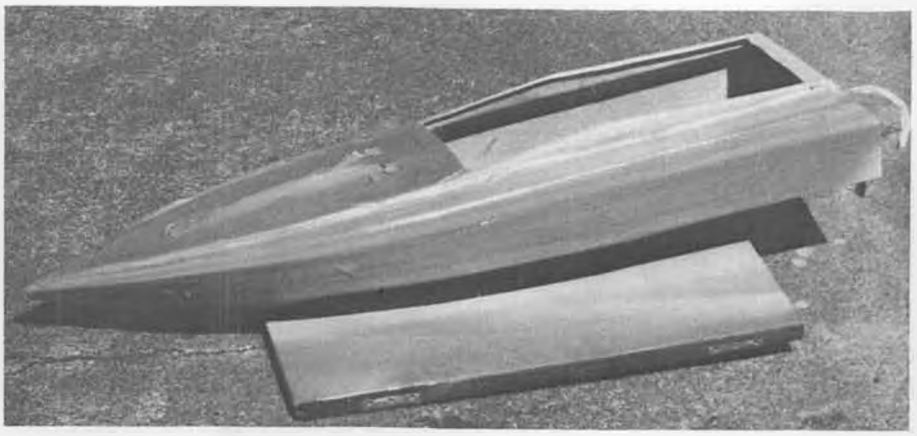
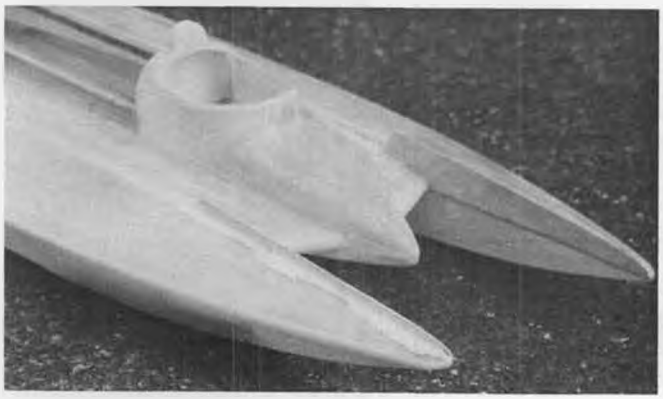


Masking tape and paper protect areas already painted, as last color is applied.

Another view of the Ward Marine Offshore 33 in its three-color yellow, orange, and red paint scheme. Can't say you didn't see it!



Automobile body putty used to fillet wooden air dams added to Prather 3.5 Tunnel.

Automobile spot and glazing putty applied to Prather 3.5 Tunnel after the boat was primered.

R/C AUTO NEWS

By DAN RUTHERFORD

PHOTOS BY AUTHOR

MRP's latest lightweight, molded Lexan body shell for the Tamiya off-road cars. This is the Ford 150 xlt.

• Not much shaking this month; the Associated RC500 is only half built as I write this, so no test of it this column. Associated's other new car, the RC12i, still has to get a thrashing before I can commit thoughts to paper. So we will take a trip down Sillyness Lane where I tell you of some of the funny things I have seen happen in RC car racing.

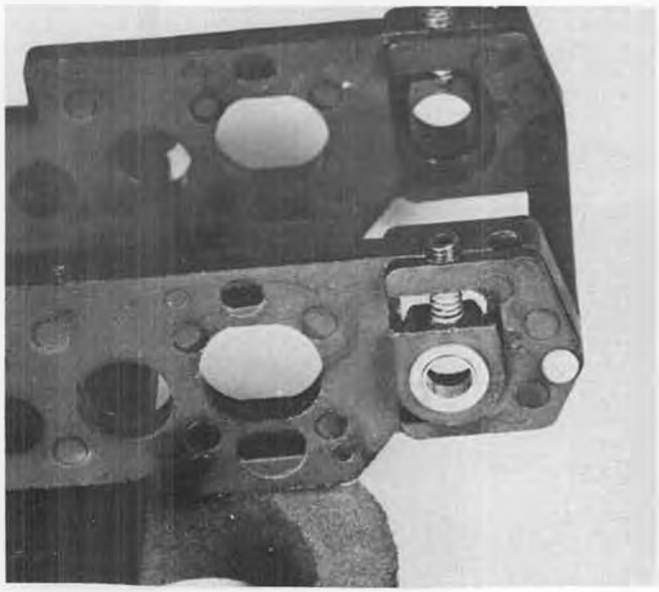
First thing is actually a recent happening, the deal where Floyd Manley, writing in the M.A.N. RC car column, referred to the water-dip method of electric motor break-in as being dumb and it could quickly ruin a good motor. There is also some confusion about exactly what I said in the article that detailed the water-dip break-in method; I happen to know where the confusion is coming from but prefer to say only that nobody other than Team JoMac was reported as having actually used this method of break-in. If you are confused please go back and reread the original article in the April '82 issue of MB.

Racers, the water-dip method does in fact work as so many of you have found out. It worked quite well at the recent ROAR Nationals where Team JoMac, with Ralphie Burch driving, won Production class, as well as being Top Qualifier, with a water-dipped motor. Burch's motor was fast enough that his qualifying time in Production would have also placed him as Top Qualifier in Modified class! In the Production class it is known that at least 8 out of the top 10 were using water-dipped motors. When Stock class came up, quite a number of the few remaining doubters of this method's effectiveness had seen the light with one electric motor wizard in particular putting it to good use . . . And I have a picture to prove it! You won't find the picture with this column, I'm saving it for a special time, as well as waiting to see how Mr. Manley handles the situation from his end (of course I wrote to him!).

(There was also a sketch illustrating motor water-dipping in the latest issue of the Japanese magazine R/C Technique. *However, I don't know what they were saying about it! wcn)*

FUNNY STUFF. . .

We were back at the ROAR Nationals at Rattey's a few years ago and I was kinda traveling with the JoMac/MRP Racing Team, as I knew them better than everybody else. The team of Pete and RePete Fusco was then sponsored by MRP in 1/8 racing, and as the race was almost in their backyard, they were out in force. Now before we get too far in this story I have to tell you that I really like Pete and RePete and there is just no denying their effectiveness on the track when there is racing to be done and races to be won. But at this time in their careers they both had 1/8 cars that looked like rolling disasters. Way down deep they were MRP cars, sure, but they had been modified so much as to be barely recognizable, the caked-on layers of dirt kept even Bob Welch (designer of the car) from easily identifying them and there were certain, uh, "unique" features, such as the receiver mounted in the center of the car, directly on the pan. That in itself is not real unusual, or wasn't at the time, but in



Springer rear conversion kit for MRP's 1/12 racer, number 529 gets it, price is $14.00.

NiCd conversion pack for Kraft K-Line radio system. Receiver pack is five-cell unit . . . what the serious racers want.

Funco Buggy from Parma. Latest 1/10 off-road .050 thick body will out-crash competition.

this case the tank normally was placed where the Petes had the receivers. No problem, Pete simply strapped the fuel tanks on top of the receivers with rubber bands! Like I said, the cars were disasters, it was difficult to believe they would actually run and yet come time for the main events one or the other, or both, would be there and going for a National Championship.

With these two cars sitting on a table right next to the gate to the pits, a couple of RC guys, airplane types, stuck their heads in to see what was going on. Don McKay and I happened to be sitting close to the gate and one of the visitors asked to see an Associated 1/8 car, he had been reading RCM and heard they were the hot tip in race cars. The two guys looked at the cars, looked back at each other, looked at Don and me, and back to the cars again and obviously couldn't believe what they were seeing. They left the track after coming to see the state-of-the-art in RC cars thinking that the race cars were whittled out of aluminum with an axe . . . a very dull axe.

A couple of days later it was time for another qualifying run or two and the Fuscos had run out of glued and trued rear tires. So Pete spent part of the previous evening gluing up some new sets. And he didn't have much spare time (evidently) as there was dried glue not only on the tires and wheels, but on various parts of cars. I had wondered how he was going to true the tires as there wasn't a tire machine around, and about the time I forgot about it, there was heard the sound of a snarling K&B 21 being run at full throttle. Not an unusual sound at a race track, but this time the screaming (this was a year or so before we had decent mufflers, remember) was coming from the pit area. When, after a minute or so, the moaning of the engine hadn't quit, a few of us walked over to see who was doing the rod test and why. Here was Pete, sitting flat on the ground holding one of the cars by the rear bumper, the engine was singing at high throttle and he was casually using the asphalt in the pit area as a sanding board! I just couldn't believe it, but then he takes the still-running car, which now has trued rear tires, over to a table, hangs the rear end off the edge, advances the throttle once again and with a hand-held X-acto knife trims the excess rubber from the inside and outside of the wheel. When finished, and with the motor finally silent (but the cloud of exhaust smoke still very heavy in the air), Pete seems almost as surprised at the crowd he has drawn as we are at what he is doing . . . Not many things surprise Pete, I guess he figured everybody trued their tires that way!

Parma off-road knobbies. Will fit over Tamiya two-piece wheels.

Our club always has a Play Day or two prior to the start of the racing season, just to give everybody a chance to get the race cars sorted out without the pressure of actually racing. As I carry the reputation locally of being a Motor Wiz, during these Play Days, a number of racers will be by to get something sorted out. This day Dick Reed, a good friend and equally good racer, came over complaining that no matter what he tried the motor just wouldn't fire. I checked all the usual stuff, as Dick already had, the motor was getting fuel to the carb, needles were open and not blocked, the ammeter said the plug was OK . . . It just had to make noise. I fiddled with it for 10 minutes or so. Nothing. Then, when blocking off the stinger on the pipe to force fuel from the tank to the carb, noticed that there wasn't any air at all coming through the pipe when the engine was being cranked by the starter. I mentioned this to Dick. There was a long pause. . .

"Hey, Dan, you've got four cars of your own to get sorted out, I'll just go work on it some more myself."

"I thought you said you didn't have the engine apart during the winter."

"I didn't. Here, I'll take the car back to my pits, you've spent enough time on it already."

"Wait a minute, Reed, I think we're onto something here, I've already got enough time invested that I should be allowed to figure it out."

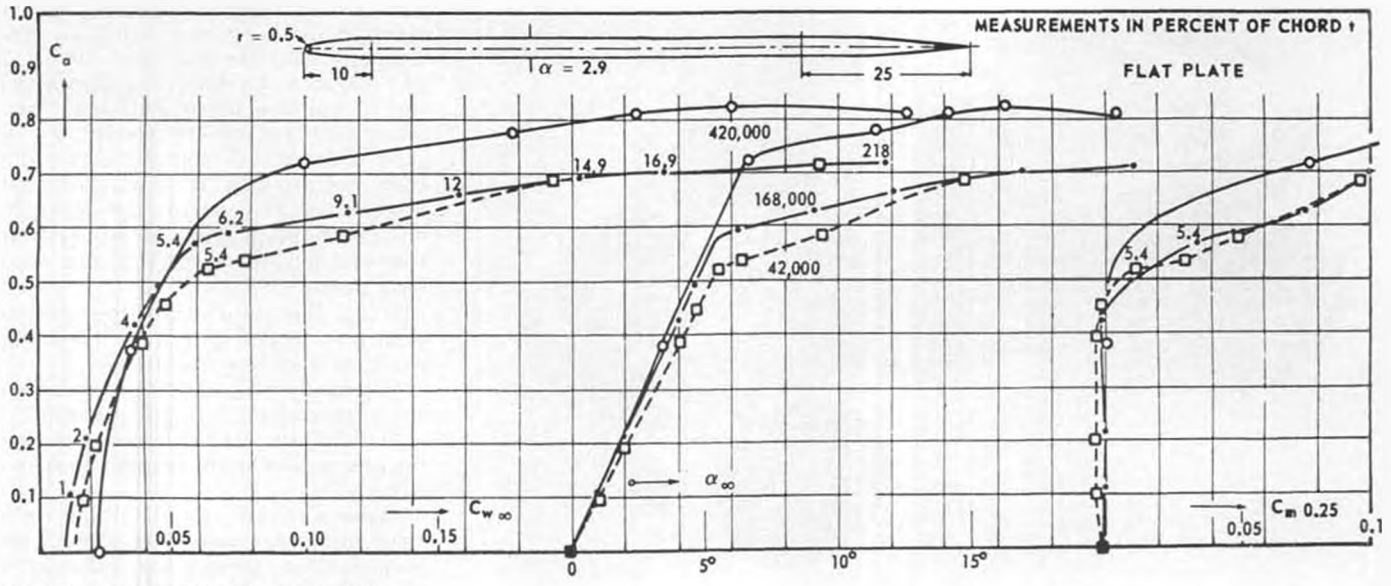
"No, no, I'll just go back and work on it some more, it has to be just a simple problem."

So I let him take the car, planning on sneaking up on him just as soon as he had time to undo whatever he had done during the off-season. And you might have guessed the problem already. Dick had very carefully made a new gasket to go between the exhaust flange on the K&B 21 and the header pipe for the muffler. All neatly trimmed on the exterior. . . But no hole in the center! Living up to my nickname of Dirty Dan, I made sure to tell everybody at the track that day what he had done, wrote about it in our club newsletter, and now I've told you. He really should have let me completely diagnose the problem instead of sneaking off like that. . .

After a race in Portland, Oregon, a bunch of us were at a pizza place, standing in line waiting to order. Dick Reed (the same) and I are talking when

Continued on page 87

Heavy Duty 1/10 scale shocks from Parma, fit Tamiya buggies, smoothes out bumps.



POLAR CHART OF THE FLAT PLATE

SUPERSTABILITY

CONCLUSION CONCLUSION

By CHARLES McCUTCHEN

WHAT CAUSES SUPERSTABILITY?

The ballasted plane is a symmetric airfoil. According to airfoil theory, a symmetric airfoil has its c.p. at the 25% chord point at any angle of attack below stall. It is therefore neutrally stable. The c.p. of a negatively cambered wing is forward of 25%. It moves with angle of attack, travelling back as the angle of attack is increased, which makes the wing stable. Ordinary flying plank models and full-sized flying planks are stabilized this way. They have either negative camber or a turned-up trailing edge. In the models, the balance is at 20% or farther forward. The c.p. of a positively cambered wing is aft of 25%. It moves forward with increasing angle of attack, which makes the wing unstable.

The ballasted plane will fly with its balance, and therefore its c.p., anywhere between 22% and 37% of the chord. Its c.p. moves aft from 22% to 37% as the angle of attack rises. The wing acts as if it had variable camber that changed smoothly from negative to positive as the c.p. is moved back through 25%.

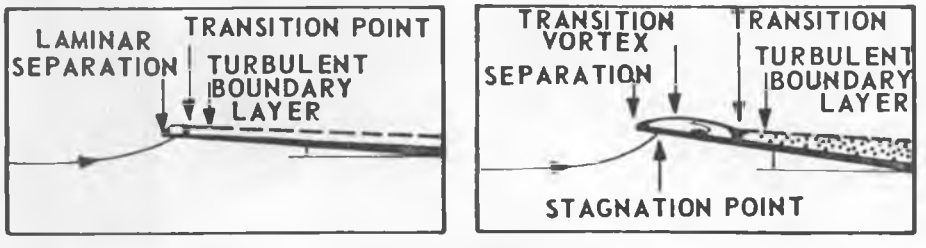
Airfoil theory says this cannot happen. But the theory assumes that the airflow stays attached to the wing surface. Superstability occurs only if the leading edge of the wing is fairly sharp. Airflow coming up from under a sharp leading edge fails to follow the surface. Instead, it curls round a separation "bubble", a miniature roller of air, becomes turbulent, and comes down to the upper surface (Schmitz, 1942; McCulloch and Gault, 1951).

At low angles of attack the bubble is small. In effect, it seems to add a ridge to the top of the leading edge, giving the wing negative camber, and moving the c.p. forward of 25%. As the angle of attack rises, the bubble gets longer and thicker, and apparently gives the upper surface of the wing as a whole an effective positive camber. The presence of the separation bubble can be demonstrated by spanwise threads on the upper surface. They reveal a region of forward-moving flow next to the surface extending aft from the leading edge. It extends farther and farther aft as the angle of attack rises.

At some point, as the bubble gets longer, it gets unstable, as evidenced by the pitching undulations of the model. Presumably the bubble forms, is at least partly swept away, and then reforms. One cannot be certain that this does not occur with the balance farther forward than 30%, the value behind which visible undulations occur. Creation and sweeping away of bubbles may occur in too rapid succession to make the model undulate. The four-part Fig. 6 is Schmitz's interpretation of the flow patterns at different angles of attack.

Schmitz tested various airfoils in a low speed wind tunnel. Fig. 7 gives his results for a flat plate. At a Reynolds number of 42,000 the plate has a stable center of pressure travel starting at 22% of the chord at a lift coefficient of .1. This behavior is not wildly different from that of my ballasted plane shown in Fig. 3, whose superstability starts at a lift coefficient of .264 with the c.p. at 21.4% of the chord at a Reynolds number of 29,000. Schmitz's text contradicts his data on this point, saying, on page 107 in the translation, that the center of pressure is "fixed from -6° to +6° angle of attack" (corresponding to lift coefficients of -.4 and +.4). Schmitz was aware that ballasted planes would fly stably, but on page 84 gives 25% as the forward balance limit. For a detailed account, he directs the reader to Vol. 2, No. 3 of *Luftfahrt und Schule* ("Aviation and Education"), which I have not seen.

At a Reynolds number of 168,000



Flow around leading edge of a flat plate at low angle of attack; origin of the turbulent boundary layer on the upper surface by stationary transition eddy.

Schmitz found that the center of pressure did not start to move aft until the lift coefficient reached .43.

ARE FULL SIZED WINGS EVER SUPERSTABLE?

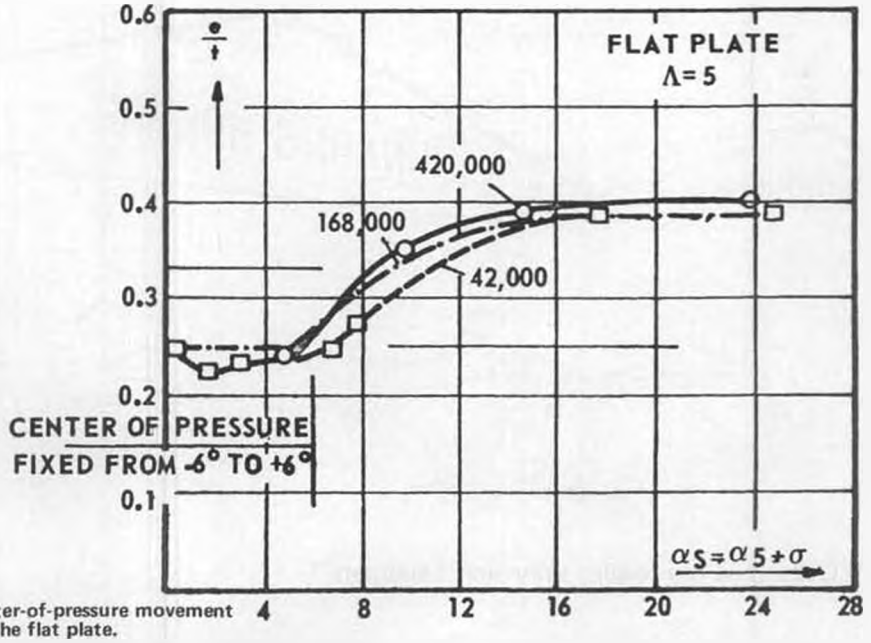
Superstability occurs at the much higher Reynolds numbers that full scale airplanes fly at, but only at such high lift coefficients that it is regarded as the first sign of an approaching "thin airfoil stall." In NACA tests by McCulloch and Gault at a Reynolds number of 5,800,000, the c.p. of a diamond-shaped airfoil whose greatest thickness was 4.23% of its chord moved forward as the angle of attack was increased until it reached 22.9% at a lift coefficient of .59. Then it moved rearward. The airfoil starts to stall at a lift coefficient of .8, and its maximum lift coefficient is .85, with the c.p. at 38%, so the superstable flight envelope is obviously much diminished. With the more streamlined 6% thick NACA 64A006 airfoil, superstability starts at a lift coefficient of .63 with the c.p. at 24.3%. There is a marked kink in the graph of lift coefficient vs. angle of attack at this point, but the wing does not start to stall in earnest until the lift coefficient reaches .84. The maximum lift coefficient is .88, with the c.p. at 36.5%. Similar behavior is shown by the fine-nosed NACA 0010-35 section and the thin NACA 64006 section, both symmetric. Each has a strongly stable center of pressure travel starting at an angle of attack just below stall (Abbot and von Doenhoff, 1959).

Comparing Schmitz's data with the NACA data suggests that about half the rise in the threshold lift coefficient for superstability occurs between Reynolds number of 42,000 and 168,000. That the normal stability regime gets more precarious as a catapulted ballasted plane slows down also indicates that much of the rise in threshold occurs at low Reynolds numbers. Halving the gliding Reynolds number, from 29,000 to about 15,000, by reducing the weight of the ballasted plane from 7 to 1.5 gm, shifted the forward balance limit for superstability to 20.8%.

DESIGN CONSEQUENCES OF SUPERSTABILITY

Were it not for superstability, a stable glide would require longitudinal dihedral. This would make the model loop at high speed. Superstability allows the stabilizer to be trimmed so that at high speed the model flies straight, or noses slowly up, or even down, yet still has a stable center of pressure shift at low speed, where the angle of attack is high.

At low speed, longitudinal dihedral is needed only if the designer wants the model not to be longitudinally stable in inverted flight, for example, so it will finish a loop rather than glide inverted off its top. The chuck glider designer, of course, *likes* the model to be longitudinally stable upside down, because it helps convert its half loop into an Immelmann by holding the model inverted long enough for dihedral to roll it right side up. Otherwise its nose will drop, and it will complete the loop.



Center-of-pressure movement on the flat plate.

At high speed, the stabilizer provides pitch damping. It also balances the nose-down pitching moment caused by a cambered wing, if camber is used to get low sinking speed. At low speed its prime function is to provide pitch damping. Its angle of incidence has a minor effect, but its own superstability may have more, if the stabilizer is large.

The typical chuck glider has enough longitudinal dihedral to pull slowly out of a dive in the normal regime. As it slows down and approaches the superstable regime, its effective longitudinal dihedral increases. Being still above gliding speed it zooms up, and may stall, dive, and stall again in repeating succession. The pitch damping conferred by a larger stabilizer makes the zoom milder.

Almost all chuck gliders have sharp-edged stabilizers. Their wings vary in sharpness, but probablt few are blunt enough to avoid superstability. Larger models usually have thicker wings, but in some of these, the leading edge is made sharp precisely in order to trigger the transition to turbulence that occuirs as the air swings round the separation bubble. Whether this bubble yields a stable, or less unstable, center of pressure travel, I do not know.

If it still happens at the higher Reynolds numbers of power models, superstability should permit a non-looping climb to be combined with a precariously stable glide.

Very blunt leading edges are commonest on control-line stunt models, combat models, and radio control pattern models. These have no need of Jeckyll and Hyde trim characteristics, but require a viceless response to control that might be lost if the flow separated or not at the leading edge depending on the angle of attack. And they benefit from the high lift available either upward or downward from blunt-nosed airfoils at their operating Reynolds number of 200,000 or more. See Althaus (1980) for a compilation of model airfoil data.

Thin-wedged, full-sized airplanes should have a superstable regime, but it will be confined to such high lift coefficients as to be lumped with stalling characteristics, and appreciated because it helps recovery.

The presence of two stability regimes affects the spiral behavior. A banked turn is a continuous pull up as well as yawing motion (and a rolling motion if the turn is an ascending or descending spiral). In a zero-zero model, superstability can give sufficient pull up to keep the model's nose up in the tight glide circle commanded by substantial fin or aileron deflection. In the normal regime, the much reduced pull-up may be inadequate, so the same model that circles happily following a good launch may spiral dive after a bad launch or an upset.

Either fin and aileron deflection provides torque proportional to (speed)^2. Their effects are nearly the same. Sight parallel to a deflected fin and you will see that, because of their

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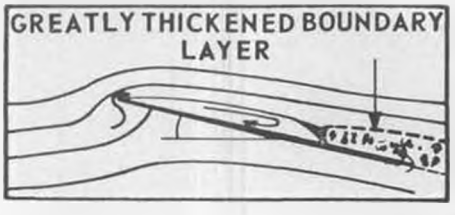
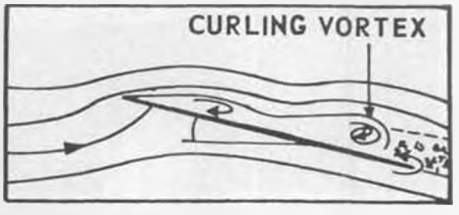
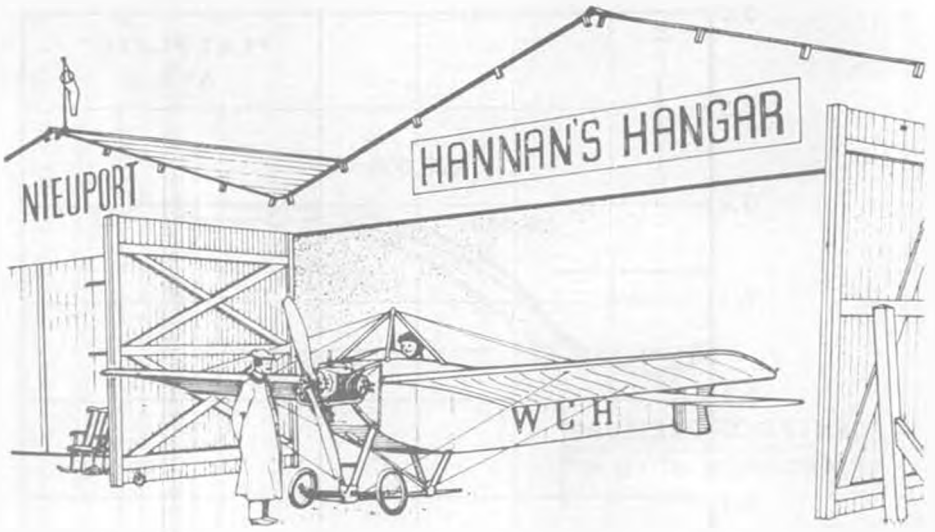


Extension of the transition eddy with increasing angle of attack.



Transition from stationary transition eddy to periodically separating curling vortex.



"Occasions are made; they don't happen."

Junior Chris Scott, one of three to "go the distance" during the West Baden 24-hour Peanut Scale Gran Prix.

• Our lead-in line this month is by Doug Lamont, Editor of *SOARING* magazine, and is perhaps an appropriate introduction to some contest reports and news, which we think may be enlightening even to non-competitors.

PEANUT LE MANS

This year's West Baden, Indiana, 24-hour Peanut marathon was another success, attracting some 73 entries, representing five countries including Canada, England, West Germany, Switzerland and the U.S.A. Thanks to Contest Director Dr. John Martin and participants Charlie Sotich and Frank Scott, we are pleased to present the results and some of the event's flavor. Complete listings are given rather than the more usual abbreviated results, to emphasize the scope and variety of this "occasion." Note that some seemingly unlikely subject choices were proven remarkably effective.

New this year from the sponsoring M.I.A.M.A. club, of Florida, was a rule offering a 10-second bonus for R.O.G. starts. Actually, in the case of the West Baden atrium indoor site R.O.T. might be more suitable, since the "ground" is in fact, the world's largest terrazo tile floor! This option was well-received, and proved quite rewarding to some of the lesser-duration type models.

In keeping with the relaxed atmosphere associated with Peanut meets, were such features as the rendering of classical music via tape recordings; the serving of ice cream floats, courtesy of Heather and Suzan Arak, and even a celebration of proxy chairman Mike Arak's birthday.

Classes flown were: *Pioneer* (for pre-WWI aeroplanes); *Warplanes* (WWI and WWII combined, this year); *Golden Age*; *Modern*; *Weirdo*, and a special *Fike/Lacey* category intended to purge the Modern class of these persistent winners. Note that canards, once considered Weirdos, had proven so efficient that they are no longer given any special consideration, but must compete in their regular vintage categories. *Results at end of column.*

Special Awards:

Best Proxy Fliers: Frank Scott and Dave Lindley.

Best Achievement: Jack McGillivray for his Yugoslavian twin, which turned in the remarkable duration of 1 minute and 57 seconds!

Best Duration: Millard Well's Wee Bee, 2 minutes, 33 seconds.

Grand Peanut: Warren Shipp's Avro/Cierva C.17 Autogiro.

A personal thanks to my proxy crew, consisting of Chief Pilot Charlie Sotich and able assistants Don Lindley, Frank Scott, Chris Scott, and Vito Garafalo. If any readers may be considering next year's Gran Prix, the time to get started is *NOW*! And if you haven't tried participation by proxy, you're missing a lot of *truly* remote-control fun!

Continued on page 74

Ebbe Jensen, Johanneshov, Sweden, displays two of his flying scale CO_2 models. On left is a Halton "Mayfly", on the right, a Crawford monoplane.

CO_2 powered Farman Jabiru, by Bob Clemens, on its way up the dome of the 100 year old West Baden atrium. Frank Scott photo.

PEANUT SCALE

Grumman's Turbo AG CAT

By HOBY CLAY . . . Grumman was very kind to modelers when it added a long, turbo power nose to to the Ag Cat. Three-bladed prop clears the ground for takeoffs.

• Grumman's latest version of this airplane, using the P&W turbine engine, required a nose extension of 4-1/2 feet. This made it much more suitable for a rubber-powered model, which Warren Shipp was quick to point out. His drawings and the photos in the January, 1982, issue of "Model Aviation" inspired this Peanut. If you haven't seen his presentation, and you like the looks of the airplane, get a copy. It really is an excellent biplane design at any scale.

I chose to model the all-yellow prototype N6868Q, and built-in the increased wing gap modification. Sheet balsa is used for the cowl and top deck, with stringers and tissue for the remainder of the fuselage to simulate the corrugated metal sheet. Construction works out pretty conventionally, except for a few fussy details, most of which are shown on the plans.

Use light sheet balsa for the cowl. The sheeting on the bottom back to Station 2 and the top to Station 3 is lapped over the respective longerons. When cement has partially set, trim against a small straightedge to expose about half the width of the longerons to hold the side sheets. Make a second top Former 3 and mount it in back of the first one after the top cowl sheeting has been trimmed off flush. This provides a mounting base for the aft sheeting. Cut paper patterns for the remaining cowl sheet pieces. Fit and trim the sheets carefully. The top of the fuselage between 3 and 6 uses three pieces mated at the top stringers, which can be 1/20 square. When the sheeting is all in place, sand to blend the joints to hide, since most of them don't fall at cowl separation lines. Build the nose thrust block as shown, using two-ply 1/64 sheet with the grain crossed for the disc, and shape the disc to match the front of the fuselage.

Slide the wire landing gear into place and epoxy to the inside of the fuselage and to a 1/20 x 3/32 cross-member laid under it and wedged against the fuselage sides. I couldn't figure a way to show that detail completely on the drawing. The important thing is to tie it down securely so it won't lay back under landing stress. Put in the curved pieces which form the top of the lower wing slots after the side formers and stringers are on and cock them outward to match the finished side surfaces.

The four wing panels are identical. Cut a paper pattern of the sheet wing tips and make them with the grain spanwise. Lay short strips of 1/64 x 1/32 on top of the spars outboard of the tip ribs and butt the tip sheets against the ribs. They should conform to the top rib curve when laid down across the spars. When the lower wing is complete and sanded, slide it into place, trimming the top slot pieces to a good fit.

Use the best quality and lightest weight tissue you can find. If the yellow shade is deep enough, most of the grain in the sheeting will be obscured. The fuselage sides have a slight compound curve. Cover this area first, using the damp-tissue method. Covering the rest of the parts is duck soup. Tighten with a light mist of rubbing alcohol and brush on one thin coat of 50-50 nitrate dope with a plasticizer. Pin down all panels and allow to cure well after doping. The chemical hopper is light brown. You probably don't have any tissue this color. Stretch a piece of white on a small frame and color with a dye spray to get the shade that looks right. I used Dr. Martin's 13A Saddle Brown Radiant water color cut with alcohol, and my airbrush. Rectangles and trapezoids of black tissue will simulate all the openings and the wingwalk. Cut several feet of 1/32 inch wide black strips and mark the control surfaces outlines and all the fuselage seams. A small brush dipped in acetone will stick the black down. Tedious, but it really dresses up the solid color.

I used 24-point rub-on letters and numbers applied to a strip of sticky-back clear mylar for the tail numbers. If you can find 1/4-inch blue decals, they will be more authentic. To set the markings and give the plane a little gloss, try a light spray of Krylon Crystal Clear acrylic coating, available at artist supply stores. Doesn't add much weight and seals and finishes beautifully. It acts like dope, so pin the panels back down and let cure overnight if you use it.

Build the two sets of struts, making the center-section ones exact and leaving a

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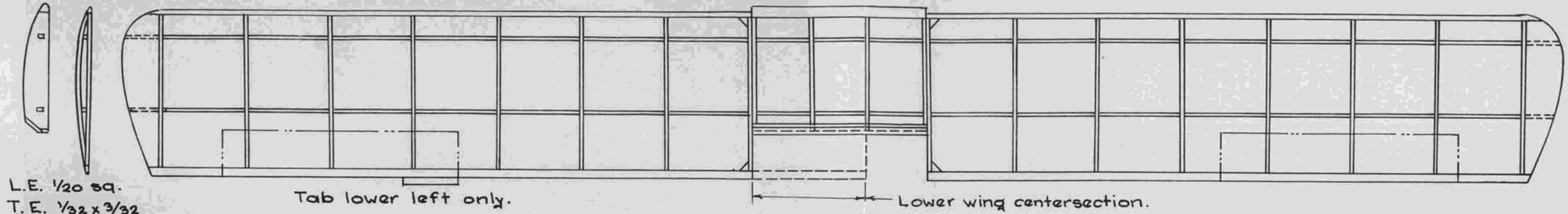
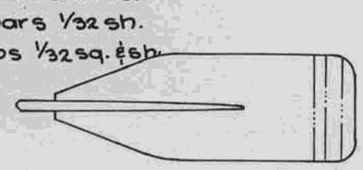
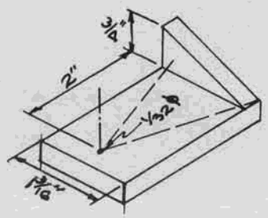
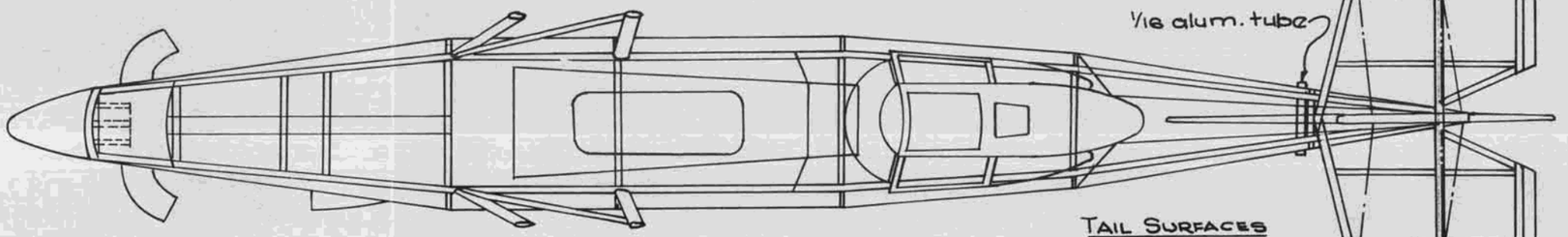




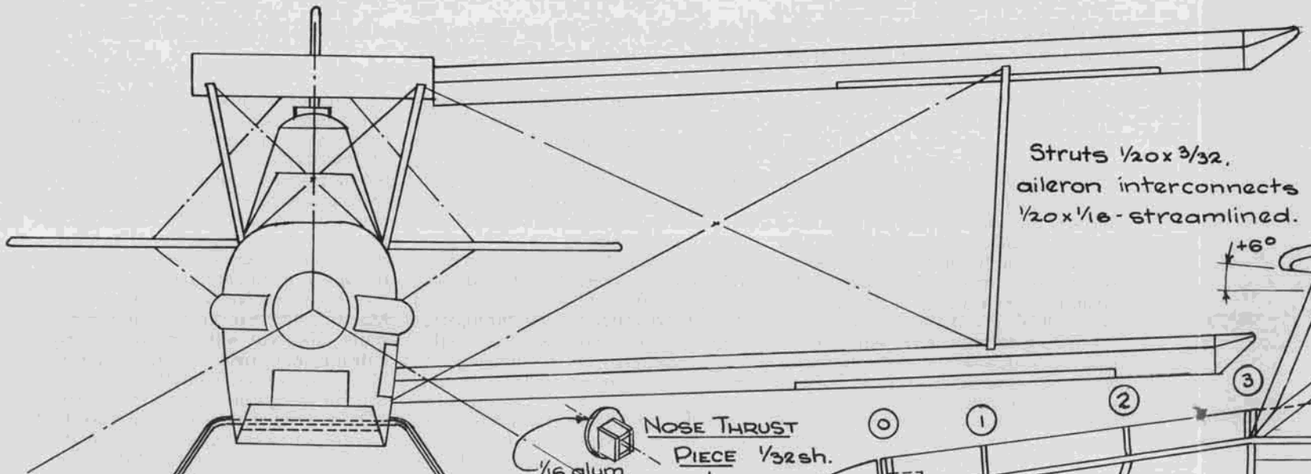
THREE-BLADE PROP
4.5D-8P
1/64 ply blades - shown true shape, toothpick hubs.



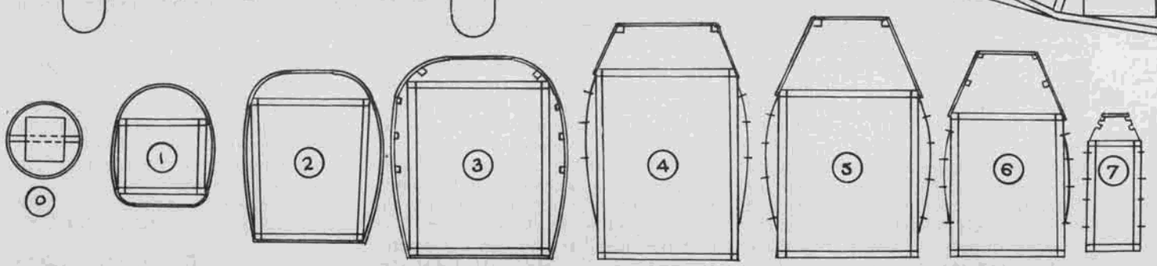
PROP PITCH JIG
8" Pitch - any dia.
all 1/4 balsa.

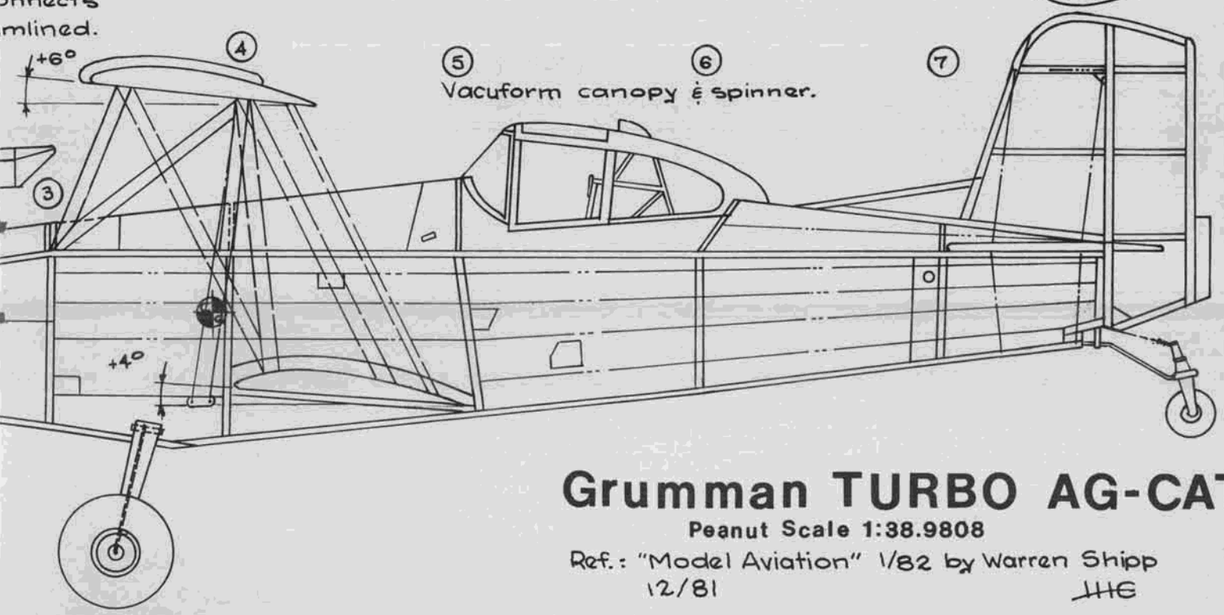


TAIL SURFACES
Outlines & spars 1/20 sq.
Ribs 1/32 x 1/20.
Tabs 1/32 sh.
Laminate tips.



FUSELAGE STRUCTURE
Longerons & cross-members 1/20 sq.
Formers 1/32 sh. Stringers 1/32 sq.
Cowl & turtledeck 1/64 sh.





Grumman TURBO AG-CAT

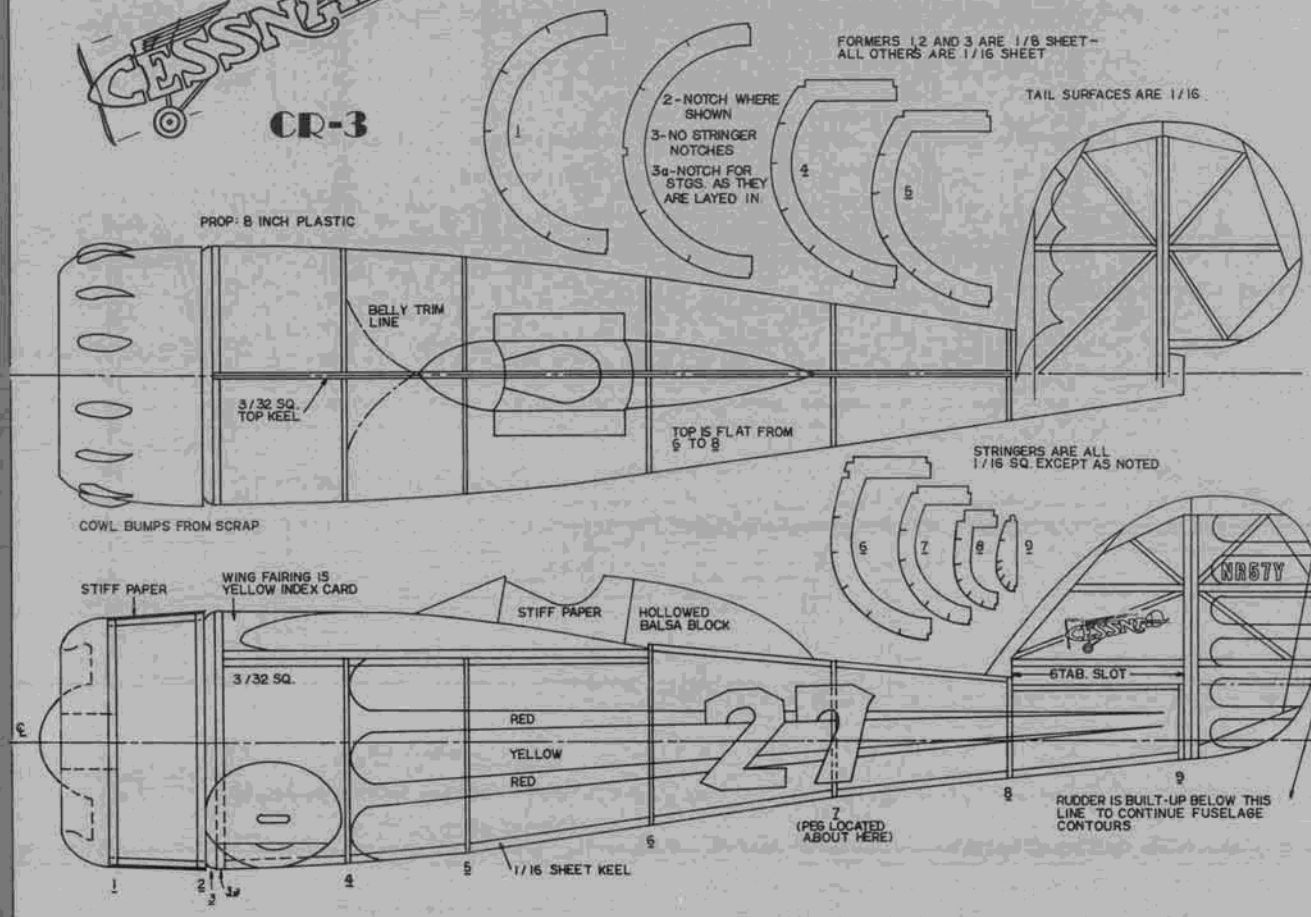
Peanut Scale 1:38.9808

Ref.: "Model Aviation" 1/82 by Warren Shipp
12/81 HHE

1933

CESSNA

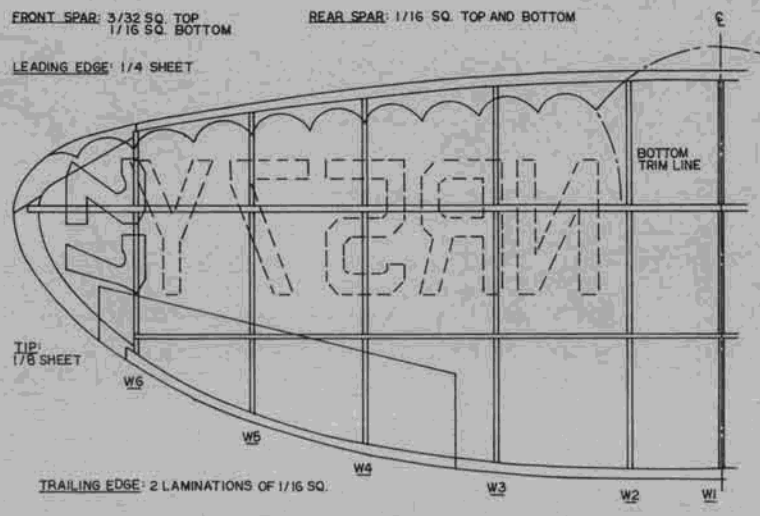
CR-3



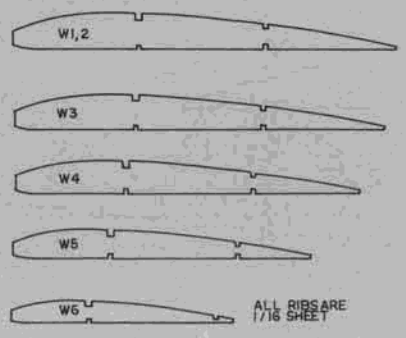
FRONT SPAR: 3/32 SQ. TOP
1/16 SQ. BOTTOM

REAR SPAR: 1/16 SQ. TOP AND BOTTOM

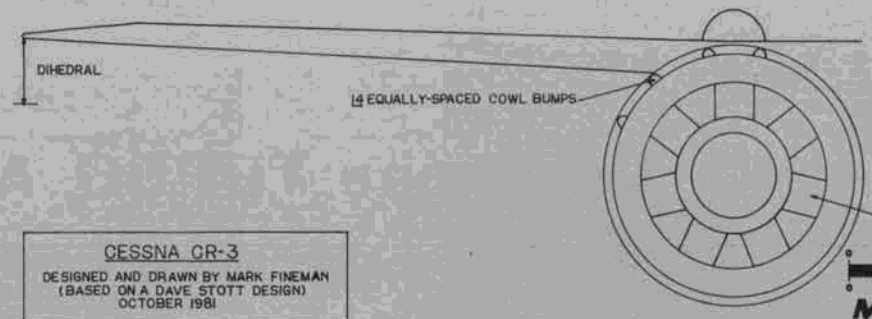
LEADING EDGE: 1/4 SHEET



TRAILING EDGE: 2 LAMINATIONS OF 1/16 SQ.



ALL RIBS ARE 1/16 SHEET



COLOR SCHEME

YELLOW - BASIC COLOR
ALUMINUM - FRONT OF PROP
BLACK - 27, CESSNA TRADEMARK ON FIN, TIRES, ENGINE CYLINDERS
RED - TRIM, WING REGISTRATION, ENGINE CRANKCASE
WHITE - TAIL REGISTRATION

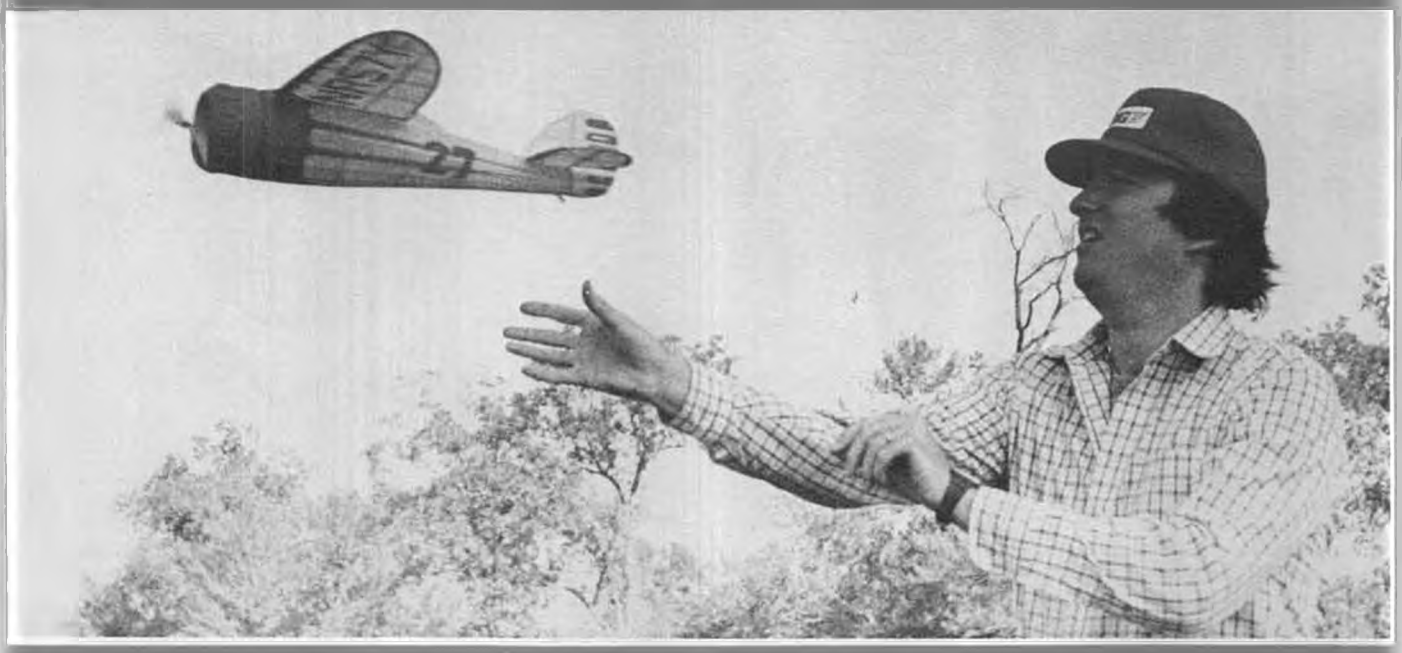
NOTE: RACE NO. "27" APPEARS ON BOTH FUSELAGE SIDES, TOP OF LEFT WING TIP AND BOTTOM OF RIGHT WING TIP

CESSNA CR-3

DESIGNED AND DRAWN BY MARK FINEMAN
(BASED ON A DAVE STOTT DESIGN)
OCTOBER 1981

MODEL BUILDER magazine

Plan No: 11821



Author/designer Mark Fineman releases the stubby little CR-3 for another stable flight.

CESSNA CR-3

By MARK FINEMAN . . . Winner of several F.A.C. Thompson Trophy competitions, and flying well enough to go O.O.S. at the 1982 F.A.C. Nats, this stubby racer is a real performer . . . once trimmed.

• There are certain airplanes that I think of as "brutes," usually radial-engined jobs that look like airborne powerplants with airframes tacked on as an afterthought. Of course the Gee Bee racers fit this description, but so too do some lesser known Golden Age racers, such as the subject of this article, Cessna's strictly business little powerhouse, the CR-3.

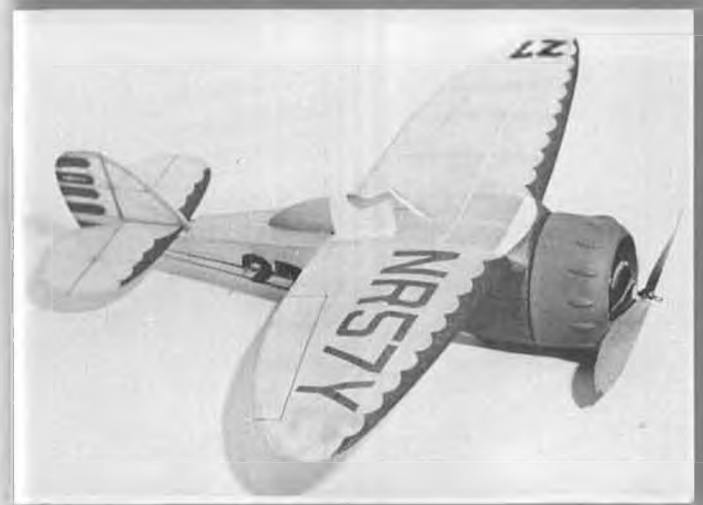
When the Flying Aces Club's mass launch air race events came to be dominated by inline ships, particularly the Chambermaid, the FAC high command modified the rules so as to limit the Thompson Trophy to radial-engined aircraft and the Greve Trophy to inlines. Radial-engined planes, with their generous frontal cross sections and short nose moments, present similar problems to both the designers of real aircraft and to model builders. Since these competitions are limited to scale models of planes that actually raced, when the rule change was announced, modelers had a tough job of picking an appropriate subject.

The CR-3

Although we usually think of Cessna as primarily a manufacturer of lightplanes, for a short period in the mid-'30s they were deeply involved in the national mania called air racing. The CR-3 was the last of their custom built racing ships, and was created especially for Johnny Livingston of Monocoupe fame. The little red-and-yellow speedster was powered by a 145 hp Warner radial encased in a tightly fitted cowl with raised rocker arm blisters. In its brief career, the CR-3 won every race in which it was entered and established a new world's speed record for aircraft of 500 cubic inch displacement, 237.35 mph. Its career, alas, lasted little more than two months, when Livingston was forced to bandon the fiesty little ship after its landing gear failed to come down on a flight to Columbus, Ohio. The pilot went safely over the side, but the CR-3 augered in at several hundred miles per hour.

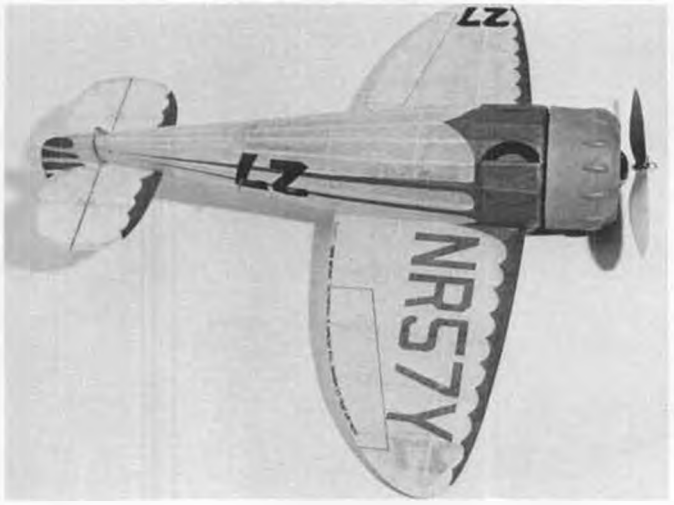
The Model

The history of the CR-3 model is almost as intriguing as that of the real racer. Several years ago, Dave Stott designed a Peanut CR-3; a good looking



Strictly business scale model. After two years, the cockpit was still not detailed.

This model is somewhere around Johnsville Naval Air Station, Pennsylvania, where it flew O.O.S. during 1982 F.A.C. Nats.



Note return address and phone on trailing edge of left wing. Bright yellow and red colors should make it easy to spot.

No, it's not a case of the blahs! Mark is showing why it's important to use the nose plug retainer rubber band.

little bird that never quite lived up to its promise. When the air race rules were modified, FAC competitors scrambled for appropriate subjects, only to find that existing plans suffered numerous shortcomings. FAC pilot John Stott scaled up the Peanut plans of Uncle Dave, making appropriate modifications along the way. His CR-3 was no small success, capturing the Thompson Trophy at the first modified-rules competition and at the 1980 FAC Nationals. John, like many scratch builders, had not made meticulously detailed plans, and those of us who wished to duplicate his successes were left to our own devices.

John's model spanned 24 inches and was a devilish handful. Its fuselage was so large in diameter that his "mechanic" needed two hands just to hold on to the peg while John cranked in the turns . . . and when that wad of Pirelli occasionally disintegrated, the spectators were treated to a sight reminiscent of Johnny Livingston's racer excavating a hole at 400 miles per hour!

Although my version of the plane was also based on an enlargement of Dave's Peanut version, it was slightly smaller than John's (22 inch span), sported a different airfoil, enlarged tail surfaces, and more robust construction. As the air races are not strictly scale events, I tried to make my model sharp looking but without slavish attention to detail. After more than two years, I still haven't gotten around to detailing the cockpit!

Although the model was completed in

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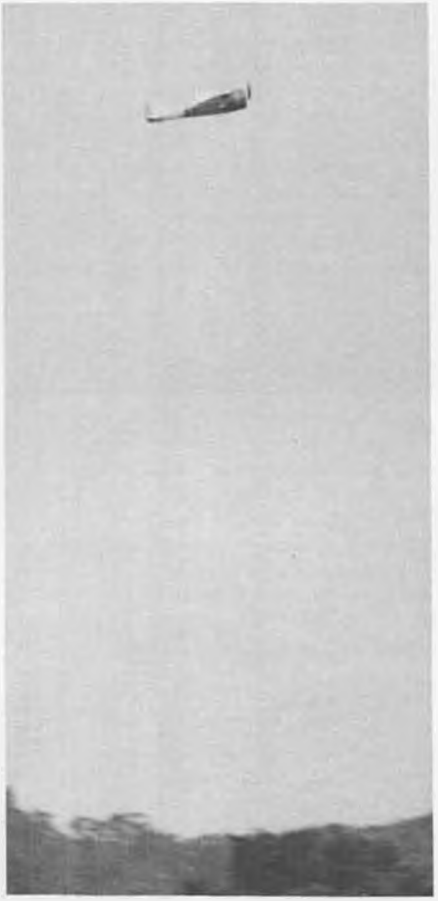
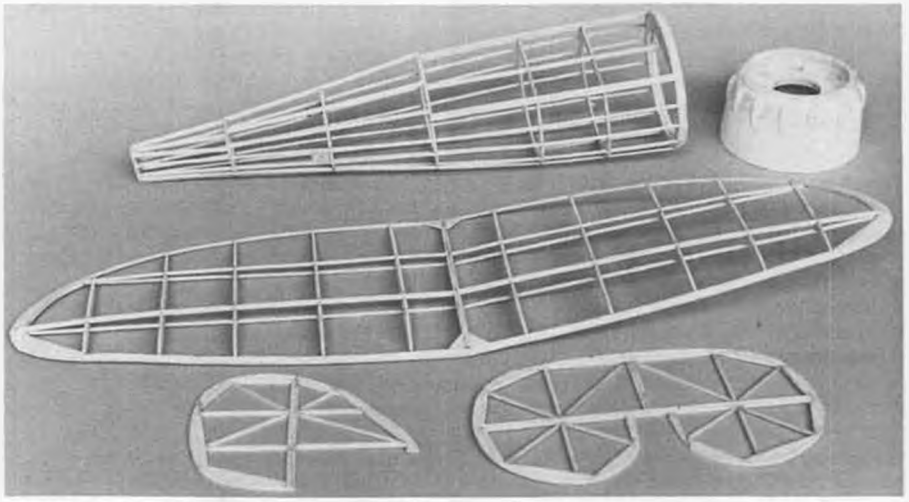
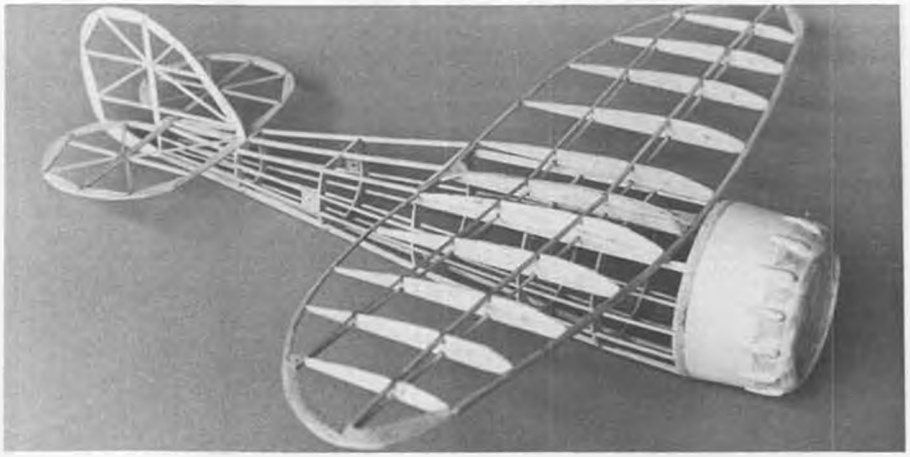
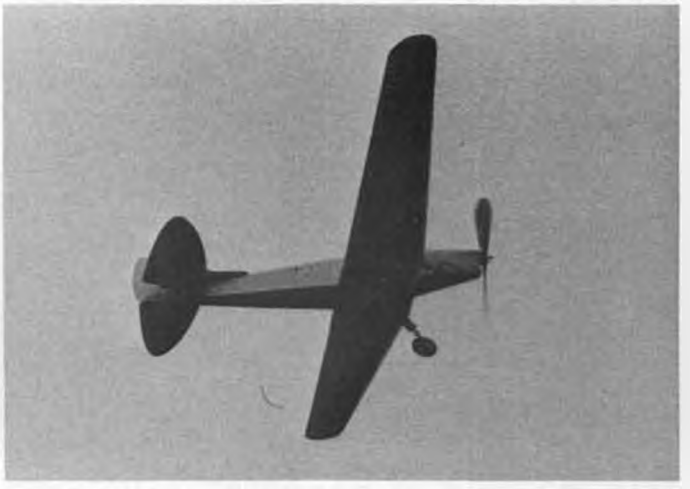


The CR-3 doing its up, up, and away thing. A smooth and steady flier.





After losing the CR-3 at the F.A.C. Nats, Mark immediately got to work on a new one, and so we are privileged to have these skeleton photos.



Leon Bennett launches his magnificent (90" span) DH Moth Minor. With 24 strands of 1/4-inch rubber, it weighs around 24 ounces. What a sight in the air!

FREE FLIGHT SCALE

By FERNANDO RAMOS

• Bill Noonan and I just got back from the 3rd Fying Aces Nationals, held at Johnsville Naval Air Station, in Pennsylvania. This was also the site of the first F.A.C. Nats. The day of our departure, I got my most understanding wife to arise at 4:30 a.m. to drive us to the Disneyland Hotel in order to get a bus to LAX airport. While Bill was purchasing our tickets, I was being hassled by a fairly young bus driver who refused to take on my model box. His excuse was that it was too large to carry on board. This is the same model box I carried to Dayton a couple of years ago. This, of course, didn't make any difference to him or any others standing around working for the bus company. What was really aggravating, at that early hour there weren't too many passengers, so there was enough space to carry several coffins let alone a modeling box! What I didn't know until my return, is that the maximum size of any luggage or parcel is a scant 13 x 17 x 32 inches. Most suitcases exceed those numbers! Needless to say, I'm writing that company what I think of their system, and plan to use a limousine service the next time around. My wife ended up driving us to the airport.

When a trip starts out like that, you wonder what is in store for you later on. The flight there was with TWA, and they saw to it that we were constantly fed during the whole trip. When we got to Philadelphia, it was raining pretty hard. We rented a car and drove to Warminster, which was home base for most all of the contestants. We were expecting Bill Stroman and Bob Haight to arrive somewhere around 1 a.m. in the morning. As it turned out, it wasn't until about 2 a.m. that we heard the door open, and two tired modelers arrived. You might be wondering why we didn't go together. They decided to leave from Las Vegas, as Bob lives there.

As we arrived early, we had a chance to acclimate ourselves to the heat and humidity typical of that part of our country. We also had a chance to get a little extra test flying to see what the excess moisture did to our models. It may be psychological, but that air does have a negative effect on the way the models perform. Our models are more used to the air with particulate matter floating around in it! We were led to an

Mass launches are always spectacular, these being WW-I types. Bob Haight in foreground flying a Pfalz D-III.

Ralph Kuenz and his Lockheed Altair. First "Wooden Wonder" with retracts.

Walt Eggert flew this .020 powered Fokker DR-I triplane.

Mark "Cessna CR-3" Fineman with his drop off gear version of the Winnie Mae.

Allan Shanzel's CO2 powered DR-I is an excellent flier.

Another photo of Leon Bennett and his "Super Jumbo" Moth Minor. A new class?

excellent flying site by Bill Kalp, who was one of the men responsible for arranging for this grand event. It is interesting to note that the people back there are so helpful and congenial. Everyone takes the time to help no matter what the issue may be.

By late Friday afternoon, the arrival of the contestants started at a regular pace. By dinner time, most everyone had arrived. One large suite was reserved so that we could all get acquainted. Fellas, let me say, that there is nothing more gratifying than seeing many friends who you don't get to see more than once every two or three years . . . and meeting new ones! Such is the case with the F.A.C. Nats . . . with flying scale being the focal point. It's worth every penny spent to have this experience!!

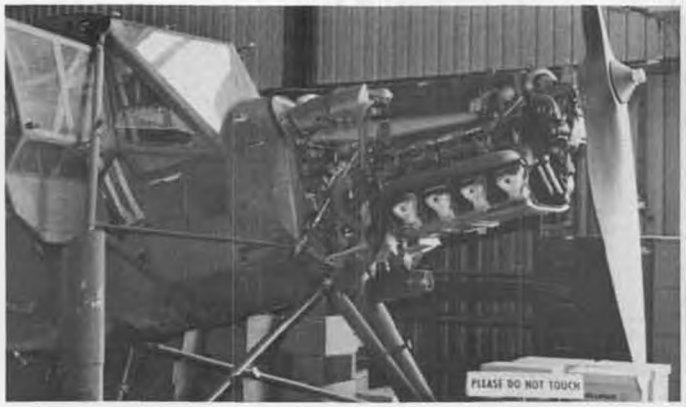
I hope the pictures I've submitted will tell the story. In the two days of flying, it is almost impossible to cover all of the exciting moments that are taking place simultaneously. The quality and caliber of models is outstanding! They seem to get better each time I attend one of these gatherings. Most of the models are rubber power, and range in span from Peanut to Jumbo. One exception is Leon Bennett. If you remember, Leon had a D.H. Moth Minor of 50 inch span that flew like a bird at Dayton. This year he had another Moth Minor, but this one was a scant 90 inches in span with a 22 or 25 ounce weight (I can't remember

Chuck Moses preps his "Schlepp", Swedish target tug aircraft.

Unusual camouflage markings on this enlarged Stahl P-51 by Chuck Moses.

Don Srull did well with his various sizes of Santos Dumonts.

Wee Willie Stroman isn't really leaning on Srull's jumbo Santos wing to test the strength, he's helping stuff wound rubber.



Seen at the Silver Hill facility of the Simthsonian; Fieseler Storch.

Arado 71. Note seahorse insignia.

Nice looking Hurricane.

Unusual and rare 1922 Bellanca CF. Wing/strut is a trademark.

which!) He's honestly trying for quarter-scale rubber, and he is sensibly doing it in increments. Needless to say that it takes some pretty fancy equipment to wind 24 strands of 1/4 inch rubber! It's quite a sight to see in the air. One remark is that the larger the rubber is, the more fragile it becomes. Unlike an R/C model, where "beefing" is a common practice, a rubber model can't handle the additional weight.

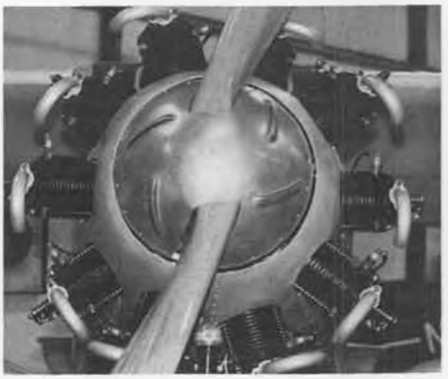
The most respected name in scale modeling is that of Earl Stahl. He has been to each of the F.A.C. Nats, and his modeling influence can be seen in dozens of models flown. I wish I could remember how many scale models he has designed and were published in the model magazines . . . it's a lot more than you can imagine!

By late afternoon, you could see the heat and humidity takes its toll as modelers headed for the motel and the swimming pool. That evening there was a banquet honoring the winners of that days events. They also handed out a few copies of the ultimate award, the Blue Max. It requires 16 wins to receive this most prestigious of awards. These are accumulated wins in F.A.C. type of contests.

Sunday's flying was no different than Saturday's, in respect to the skies again being dotted with scores of beautiful models. Like so many things is life, every good thing has to come to an end, and such was the case for another exceptional F.A.C. Nats. Many goodbye's were exchanged as modelers headed for home. At this time, no one yet knows where the '84 F.A.C. Nats will be, but I know that I want to be in attendance. I would recommend that you start saving now and plan for one of the greatest experiences in modeling!

Bill and I did not head for home immediately, but were given a ride to Silver Springs, Maryland by Tom Schmitt. This was to be our home base while we toured the D.C. area and visited with friends. Ray Rakow came by our motel and escorted us to the Metro, and showed us how to get around by this convenience. We spent most of this day at the Aerospace museum and library. You can't believe all of the resource material that is available to modelers. It is a most frustrating experience to have so much information at your finger tips, but not have the time to see a fraction of it! That evening, Ray drove us to Don Srull's home, where we visited with Bill Winter and John Worth, among many other friends. Don really has a fantastic workshop and collection of prize-winning models. Don is truly an exceptional builder and flyer, as well as designer, and he has the trophies to prove it.

Tuesday's schedule was an eventful ride out to Silver Hill with Bill Stroman and Bob Haight. Eventful, because we got lost several times and got a flat tire on one of the expressways. When we finally arrived, we were met by Allan Schanzel, who made the necessary arrangement for a tour of the Paul Garber facility. There are no words to describe the goings on at this facility. All I know is that I saw a lot of airplanes, and parts of airplanes, each with its own particular history . . . simply unbelievable!!



Twin row Anzani 10-cylinder engine. Note air scoops and offset prop blades.

From Silver Hill we headed for Fairfax, Virginia, to visit with Hurst Bowers, at the hospital where he was recovering from open heart surgery. I'm happy to report that Hurst is doing very well, looked good, and was headed for home in a day or two. He tried putting off the surgery until after the F.A.C. Nats, but his heart didn't see it that way. From here, Don came by to pick us up and

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Gee, Chuck, I bet I could snag my lines on your handle.

Gosh, Jerry, I see you've snagged your lines on my handle . . . why don't you just let go and I'll see what I can do.

Control line

By "DIRTY DAN" RUTHERFORD

PHOTOS BY CHARLIE JOHNSON

• On the off-chance that a few of you will take to heart some suggestions concerning winter storage of your models and engines and related support equipment, that is the direction this column will take.

For most of us, the motors are the most important of all of our modeling equipment, as you gotta have good ones to be competitive and they are fairly expensive pieces to buy, seemingly costing even more if they need to be replaced, especially if a little preventative maintenance would have saved the replacement costs. The motor should first be removed from the model and cleaned well. Many ways to do this; I just plug the exhaust and venturi and spray on a household degreaser, finding that Fantastic Spray Cleaner works. Squirt it on, let it sit for a few minutes and hose it off with water. If it doesn't come clean, a second application, as well as some brushing with a scrub brush, should make it look like new. Recently I had an engine that was being cleaned and while all the normal junk came off OK, there were a lot of cooked-on stains on the head, presumed to be from the oil in the fuel. This can be very difficult to remove, although it did finally come off after soaking the head in Sears Gum and Pitch Remover, a product normally used to remove gum and pitch (surprise, surprise) from high-speed wood working tools, such as router bits and saw blades. Some scrubbing was necessary, although not much, and the remover didn't seem to have any bad effects on the aluminum, which can be a problem with other exotic cleaners.

With the exterior of the engine cleaned, you now have to decide whether or not to take it apart. Personally, I used to disassemble engines at the drop of a hat just to fiddle with the internals. No more; if the sucker is still putting out the power and starting reliably, it is left alone. Still, even with an engine that is doing the job, it is suggested that the back door be removed for a look at the rod, more specifically the lower end bearing of the rod. It seems that in all high-performance engines, one of the most highly stressed pieces is that rod, and as access to it is so easy, why not check it once in awhile? With the back door off, squirt some alcohol or other mild solvent in, just to remove any traces of oil. A light film of oil between the crankpin and the lower rod bearing could fool you into thinking the clearances are OK. With the oil gone, grab the rod with your fingers (if you can); most of us have to use a tool. I slip fuel tubing over the jaws of a hemostat and use this to jerk up and down on the rod, using a combination of "feel" and actually watching the rod's movement to see if the clearance is within tolerance. Admittedly, this is not a super accurate way to do it but it is still possible to determine whether or not the rod is OK, questionable, or ready to pop. Any rod that is questionable should also be regarded as having gone bad, so there are only two choices here. And it should be obvious that you do not want to scratch and otherwise tear up the rod when checking lower end clearance, hence the soft-jawed hemostat.

What's wrong with this picture? Just a minute, Chuck, I'll just loosen that wing nut and grab my handle again.

The rear bearing can be looked at, even though just looking will rarely tell you anything about it. If the crank turns freely, no notchiness is what you are trying to detect; all you can do is look closely to be sure that the bent-over tabs on the retainer are all still there, as they tend to fly off first and then the retainer lets go in a big way with large chunks of it

getting wedged in between places they don't belong.

If the forward face of the back plate is unmarked, just install a new gasket and close 'er up. Scratches from the crankpin or rod hitting the plate indicate the need for an extra gasket; just be sure both of them are new. When installing the back plate (or any other parts), it is a good idea to use new fasteners, especially if your motor doesn't already have allen-head cap screws.

The head can be pulled off for a look-see, even though you won't see much and are taking the chance of moving the cylinder a slight amount, plus the always-a-hazard (at least with some motors) chance of finally stripping the threads of a hole in the crankcase. Better to just check to be sure all the head bolts are tight, but if you can't resist a look inside, check for scratches on the interior wall of the liner, detonation damage to the top of the piston and the combustion chamber, and anything else that looks out of the ordinary. When replacing the head, it is best to use new head shims (gaskets), but not absolutely necessary. Do be sure the new ones are the same thickness as the old.

What to use as an oil for storage is an old debate; everybody has their favorite brand. The really important item, however, is to use an oil of some kind, and to not have any fuel left in the motor. The nitro evidently causes some damage that shows up as corrosion. The alcohol serves very well to draw in water and that causes rusting. And don't use a castor oil, it just gets all gummy over the winter. Doesn't seem to actually hurt anything, but it usually means totally disassembling the motor to get the stuff cleaned out. I use Marvel Mystery Oil as an after-run oil, and also use it as a storage oil. Just slop the stuff in through the plug hole and the venturi, turn the motor over a bunch of times to spread the oil everyplace, wrap the engine in a bag of some kind, and then store it where there aren't large temperature changes or high humidity. This means avoiding the temptation to just chuck it out in the unheated garage or up in the attic.

Models seem to be easier to prepare for storage, especially if you take the time to clean them after each flying session. All that is really necessary is a better-than-usual cleaning job. For instance, with the motor out, the motor mount area can be cleaned. If using wooden motor bearers, they can be sprayed with K2R Spot Remover, which just sucks all the old oil right out of them, although a couple of applications may be needed to get it all. Tanks should be cleaned, preferably removed from the model so vent and feed lines can be checked thoroughly. Hard (metal) tanks need a complete cleaning; flushing with alcohol works fine. When clean, be sure to get the interior of the tank well-oiled so it won't rust over the months. All replaceable fuel lines should be maintained, for those who are on a very tight budget this means just looking closely, for all others it means simply replacing all the tubing with new stuff . . . it is just too cheap to consider taking chances . . . I prefer Prather's line of silicone tubing for almost all applications.

Ain't Rat Racing fun? Larry "Conan" Hill thinks it is just great but Forrest Adkins thinks otherwise. About 20 laps of this had everyone running for cover at Nats. After Larry taught Forrest a lesson (for trying to pass) he let him fall back to his rightful position (second place).

To avoid alternate shrinking and expansion of the covering, again storage is not the best way to go. Not as big a problem as it may seem; with plastic films it just means that come flying season you will have to reshrink the covering (something you may have to do in any case) and there is the argument that by storing the model in the garage where it is mostly cold but can also be warm once in awhile, the structure and covering will tend to stabilize over the months. Could be, just be sure to check for warps come spring. If your model to be stored is one of those 19-point Stunt jobs, no worry about where to store, you've probably already got a dandy spot in the living room for it. . .

Tools just need to be cleaned well, very few of them are used only for flying sessions, so will be seeing a lot of use in the building season. Fuel won't be used much; do your best to get each type into as small a container as possible to avoid having a lot of dead-air space in the container. While doing this, filter all of the fuel through a coffee filter or something equally appropriate. I can recall Charlie Johnson using a gas of some kind, normally used to keep

Continued on page 89

Rich Lopez, Steve Hills, and Spider Man Myles Lawrence (l to r), after Rich won Fast Combat. If Rich does well, Steve lets him roll up lines (and Myles gets to hold a wing tip).

MB's *Free Flight* columnist, Tom Hutchinson, with his Maverick 1/2A design.

Tom's assistant columnist and ex-MB columnist, Bob Stalick, holding Tom's Dragmaster A/2 design.

FREE FLIGHT

By BOB STALICK

• What is this? A new writer for *Model Builder Free Flight?* Well, if you've been reading this column for a long time, you may remember the name of Bob Stalick . . . that's me. I used to write the regular free flight column back in the "old days." Here I am again, this time pinch-hitting for your regular columnist, Tom Hutchinson. Tom has asked me to fill in for him while he overcomes his current bout with the big "C". Hopefully, for him and for you, this will take just a short time. In the meantime, I'll try to carry on with the quality of the column as you would expect from Tom. Wish me luck!

Mystery Model

For you old time readers of the *NFFS Free Flight Digest*, you should recognize this one from a 1966 issue. It's a Wakefield, and it's not by Bob White . . . even though it has twin fins. The V-dihedral is not seen much anymore, but at the time it was a feature on several successful designs. The designer was an up-and-coming free flighter who competed in the FAI Team Selection program until he met with an untimely fate. If you know the design, drop Bill Northrop a line with the correct answer, and he will reward you with a good goodie . . . provided you are the first in line.

Model of the Month: B-Quell AMA Gas.

One of the nice benefits of being a columnist is that you can promote your own model designs. This design is the B version of the highly successful C-Quell design that I have been flying for the past 8 years. The C-Quell is a Model Builder plan and is still available. Some notes on the ship are in order:

1. The ship owes its heritage to Al Vela's Mexi-Boy for the proportions and planform shape.

2. The ship owes Bill and Bob Hunter for its wing and stab construction . . . direct from Satellite City.

3. The fin location is owed to any number of British designers. All other features of the model are original. The design is the most competitive Big Gas model in the Northwest and has been for several years. For two consecutive years, it was in the flyoffs at the Annual Hawks Power Bash, winning first one year and second the next. In each case, the flyoffs went to the 5-second engine run (Cat. II).

Although the stabilizer is huge by current standards, the model grooves exceptionally well in a right-right pattern. The transition is smooth and the glide has to be seen to be believed. Power is the new K&B .21, but an OS Max 25 would also be a good choice.

It may look difficult to build because of the elliptical type surfaces, but don't be fooled . . . a long sanding block does wonders in shaping ribs. . .

Darned Good Airfoils: NACA 4309.

This month's DGA comes from the NACA labs and is promoted as a good power model airfoil. It uses the same camber line as the more popular 4409 foil, but moves the high point to the 30% area. The result of this is that the section should be less sensitive to balance point shift or size of stab. The bad news is that it is a somewhat slower airfoil. As it is not undercambered, but has a "dropped" leading edge, it should be a decent choice for large AMA gas models. It is probably too thick for modern FAI power models and 1/2A gas models. Give it a try on your next big gas design . . . you might like it.

A Flight of Airfoils

Since I began writing this column in 1974, I presented a new airfoil each month until Tom took over the writing job. He continued the practice. Some of the sections have been used successfully by modelers around the world . . . many of the sections presented on these pages have come from world famous (and successful) modelers. I have since copied each of the DGAs printed in Model Builder since 1974 and would make this set available to anyone who is interested,

Ron McBurnett preps his 1/2A Megabucks at Harts Lake Prairie, Washington. Model is prototype for his FAI Power model.

Also at Harts Lake Prairie, Gene Jensen waits with Pirelli ready to snap in Wakefield ship. Is that a piggybacker also waiting?

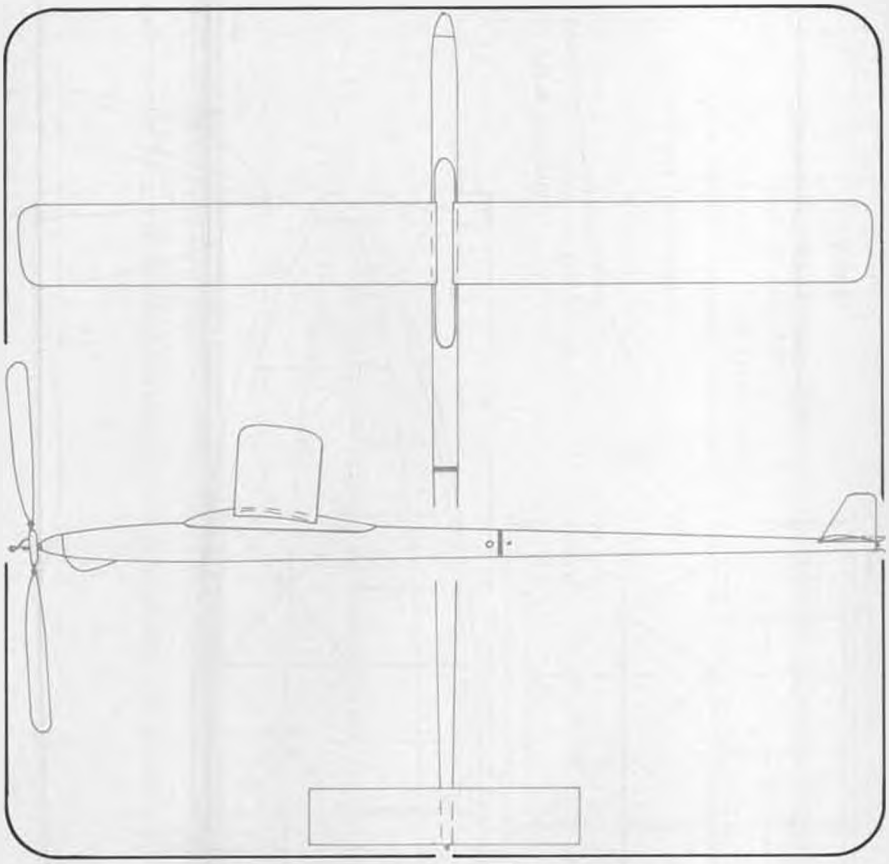
for the cost of duplication and postage . . . provided there is enough interest. As we are talking about 100 plus airfoils, the booklet is 15 pages long. Two dollars a booklet would cover all costs. If you have some interest, drop me a line, and if I get enough inquiries, I'll produce a run of them. Contact Bob Stalick, 5066 N.W. Picadilly Circle, Albany, OR 97321.

The Latest Flap from the FAI Free Flight Program

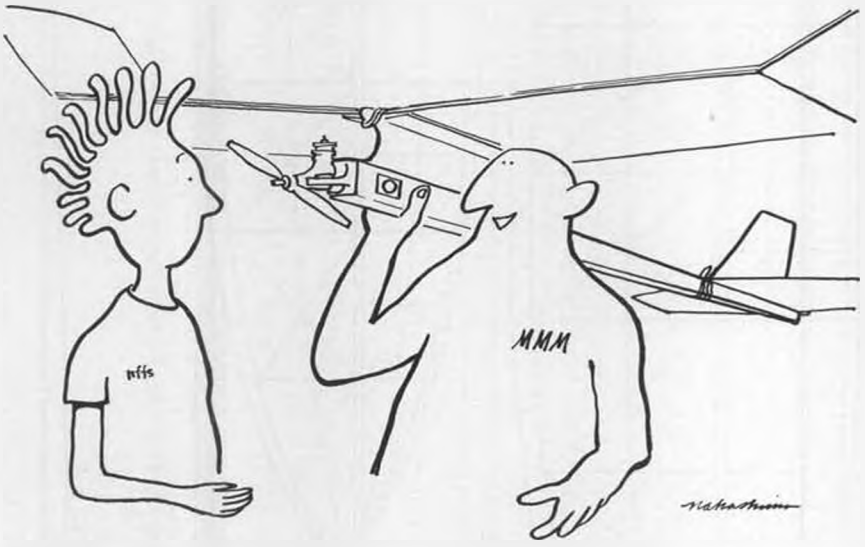
Once upon a time, the National Free Flight Society and the Academy of Model Aeronautics noticed that the FAI F/F program was in need of some overhaul. These groups appointed FAI types . . . one per AMA district to the FAI F/F Committee. This committee met in Detroit to iron out the format for the program. Ideas flew back and forth . . . and finally, a new program was adopted . . . presented to the membership of the FAI fraternity and passed into immortality. Over the years, the program has been modified and refined, but the basic concept has remained intact and valid. As an integral part of that program was the concept that the finals site would be rotated every two years from East to Central to West . . . provided a suitable site could be located. In fact, the committee even stipulated what was East, Central, and West. From the Atlantic Ocean to the Mississippi was East, from the Mississippi to the Rockies was Central, and the Rockies to the Pacific was the West. A site selection committee was appointed to look into the suitability of the proposed sites. One result was Hastings, Minnesota. From nearly every contestant's point of view, this site was a debacle. In fact, the contest was not completed due to the poor weather and site conditions. A second contest had to be held later to finish up the team.

Consequently, a set of guidelines were drawn up entitled "Site Selection Criteria for FAI F.F. Finals." These criteria have been used ever since to determine the suitability of preferred locations. Sites are rated on everything from weather history to site size and terrain, from availability of support staff to contest and event directors, and from field amenities and proximity to motels and highways. It is probably the most complete document available to guarantee a good location for an important even such as team selection.

Now, here's the rub. A small group of AMA vice presidents wants to require



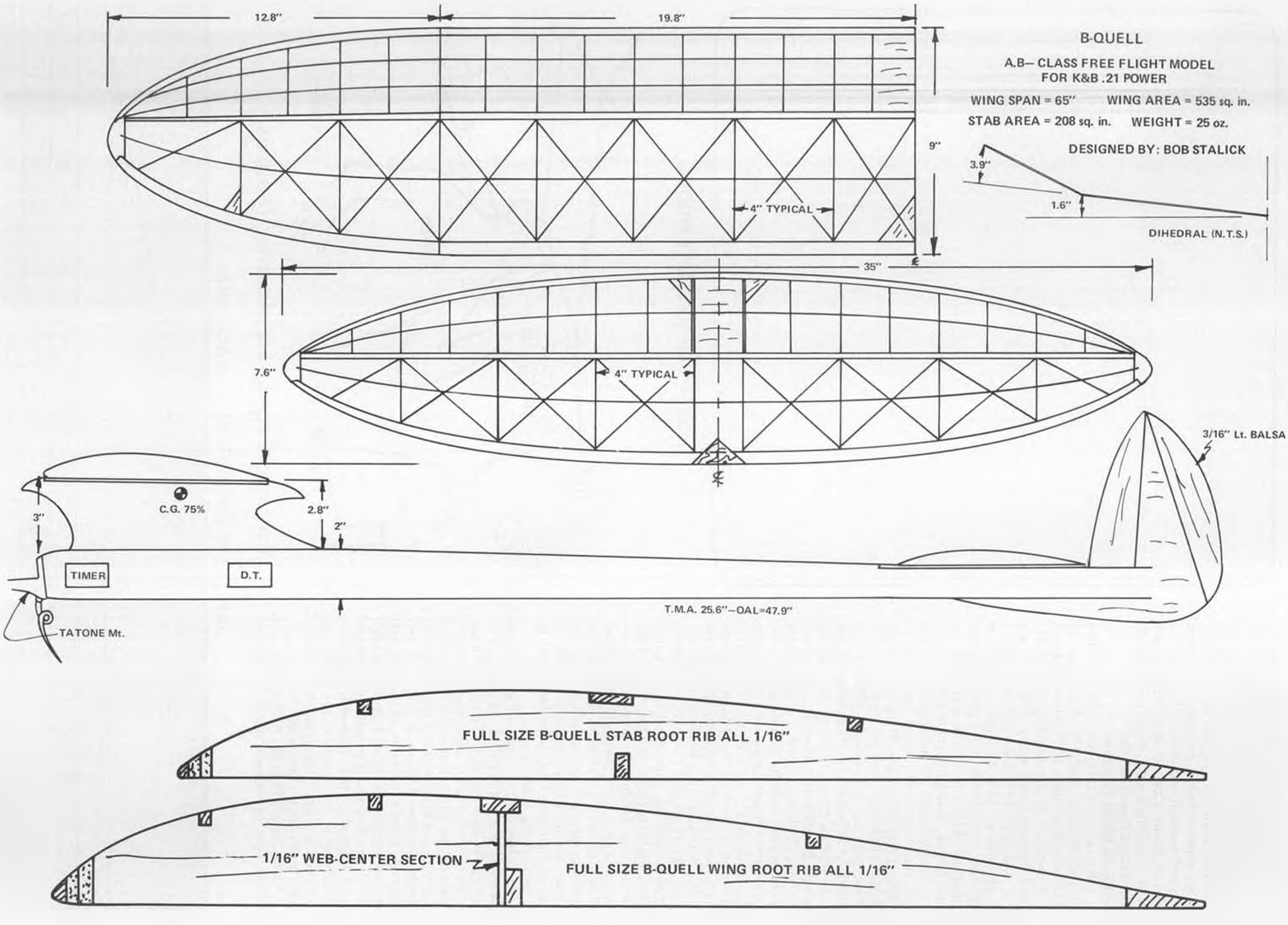
NOVEMBER MYSTERY MODEL



"Big airplane equals big positive feelings."

DARNED GOOD AIRFOIL — NACA-4309

STATION	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0	2	2.8	4.1	5	5.9	7.1	7.9	8.5	8.3	7.6	6.7	5.5	3.9	2.2	1.2	0
LOWER	0	-0.9	-1.2	-1.4	-1.4	-1.3	-1	-0.8	-0.5	-0.4	-0.3	-0.1	0	0	0	0	0



B-QUELL

A.B— CLASS FREE FLIGHT MODEL
FOR K&B .21 POWER

WING SPAN = 65" WING AREA = 535 sq. in.
STAB AREA = 208 sq. in. WEIGHT = 25 oz.

DESIGNED BY: BOB STALICK

DIHEDRAL (N.T.S.)

that the program rotate its final sites. The purpose is noble . . . to insure equality of opportunity and interest in the AMA FAI F/F program regardless of geography. But, if the sites aren't there or aren't proposed, no amount of *requiring* will automatically cause it to happen.

The following suggestion (or proposal) to this issue is offered as a solution. Give priority to a site (other than West) if it meets the criteria, if it is located in the East or Central part of the U.S. If we use the original format, the 1982 finals should have been held in the East. That means that the 1984 finals should be held in the Central region. I would suggest that we promote fliers in the Central region to hunt for and secure sites for 1984. If one of two are located, then these folks should propose their sites to the committee and the fliers. The vote should be between or among those Central sites that are proposed. If none are suitable or proposed, then an alternate site, e.g.: Taft, should be made available.

The result of this proposal or suggestion is that we have prioritized the region as the choice for the finals. Only if no suitable offers are forthcoming, should the finals be held in another region. In order to determine suitability, the committee should review the site selection criteria for each proposed location.

We don't need the greatest site for a finals . . . but we do need an excellent site. Selecting the best team is the primary goal, but maintaining the program's participation has to rank right behind it.

Hand Launch Glider Turbulator Flaps

A sketch in this issue of Model Builder Free Flight shows a new hand launch glider development by Phil Hainer, Sr., of Seattle. According to Tom Cashman, of the Bat Sheet, the glider was launched straight up, as near to vertical as possible. As the airspeed dropped off, the glider would show a bunt type transition with just a bit of a stall at times. Best of all, reports Tom, it seemed non-critical as to launch angle, bank, etc. Several people took turns throwing the ship, and although several bad transitions occurred, most of the time, it would roll out into the glide without a significant altitude loss. Phil theorized that the flaps are held flush during the high speed launch, but spring out to provide a lot of turbulation and kill the stall that would normally occur. This seems to be an idea that's worth more experimentation. Phil tried to get the angle of the mylar strip to be nominally tangent to the arc of the airfoil section and 10% behind the leading edge. Hmmm, I wonder if the idea would work on indoor gliders?

Some Points to Ponder

Every once in awhile, I begin to wax nostalgic about the past. When I do, I always amaze myself. Here are some of the latest: I wonder whatever happened to the greatest free flight contests ever held at Bong Field . . . The Gatherings of Eagles.

I wonder whatever happened to the AMA's greatest Free Flight Contest Director . . . Pete Sotich.

I wonder whatever happened to the best design innovation on power models . . . Very High Thrust Lines (VHTL).

I wonder whatever happened to Jetex.

I wonder whatever happened to Pneumatic timers.

Did you know that the National Free Flight Society began 17 years ago?

Did you know that Frank Zaic published his last yearbook 17 years ago?

Did you know that old timer events began 21 years ago . . . and at the time, the decision was made to limit old timers to designs that were at least 20 years old!?

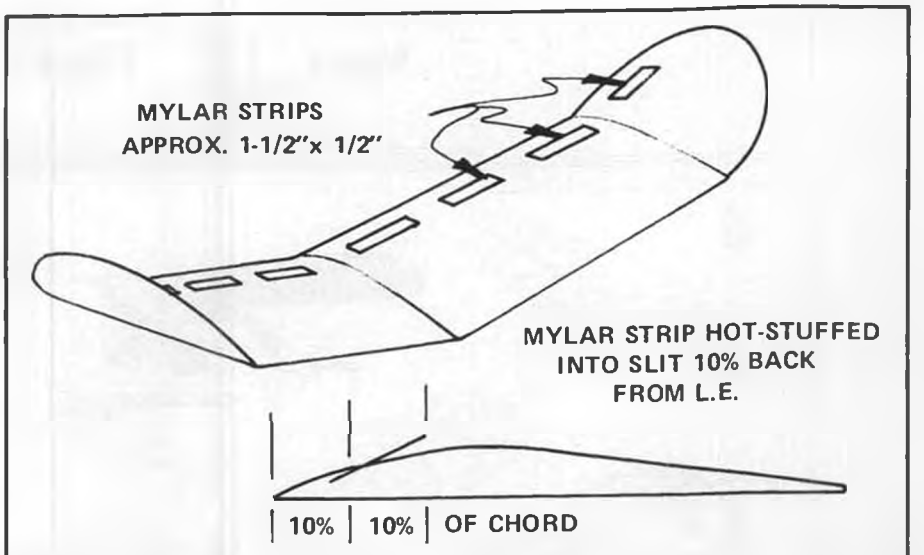
Did you know that Marilyn Monroe would be 55 years old this year?

Did you know that the first NFFS Symposium occurred 14 years ago?

Do you remember when a small car was a Chevrolet or Ford?

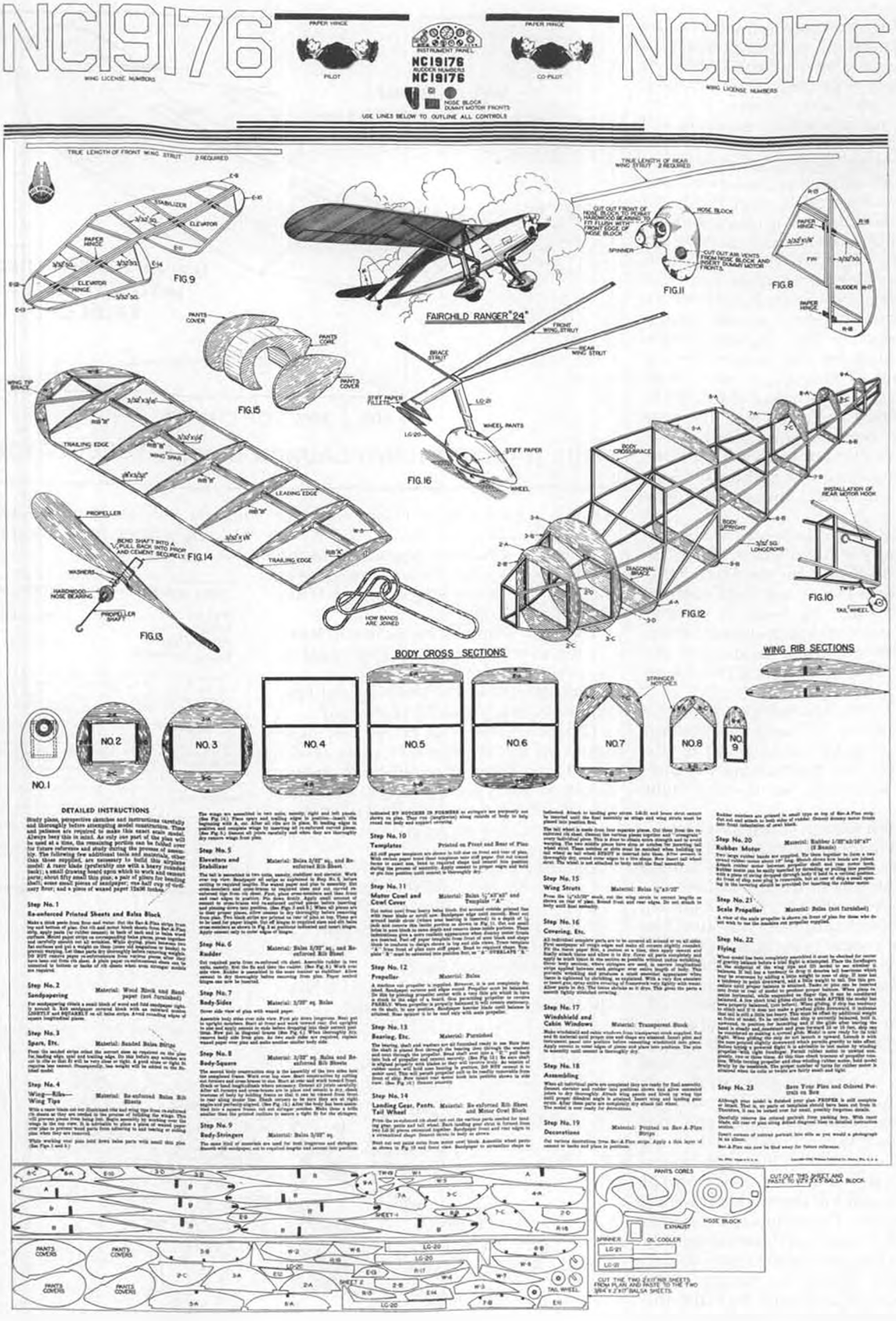
Do you remember when the U.S. Navy sponsored the AMA Nationals?

Either Tom or I will be back next month with more of the latest on the free flight front. In the meantime, find a thermal and fly. ●



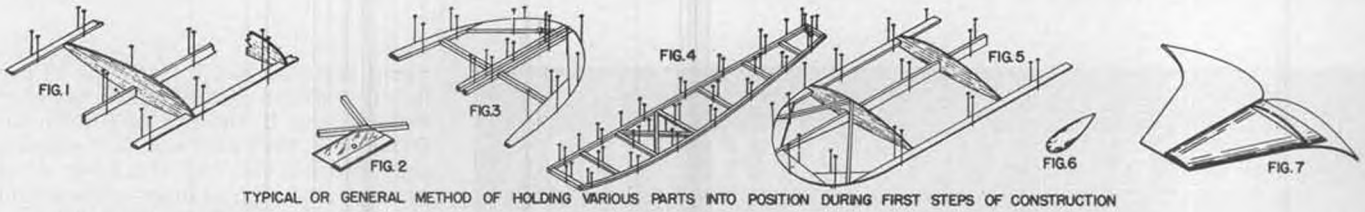
PHIL HAINER'S HAND LAUNCH GLIDER TURBULATOR FLAP.


"I used to practice on a ten acre piece, then a five acre piece, then a two and a half acre piece, then....."



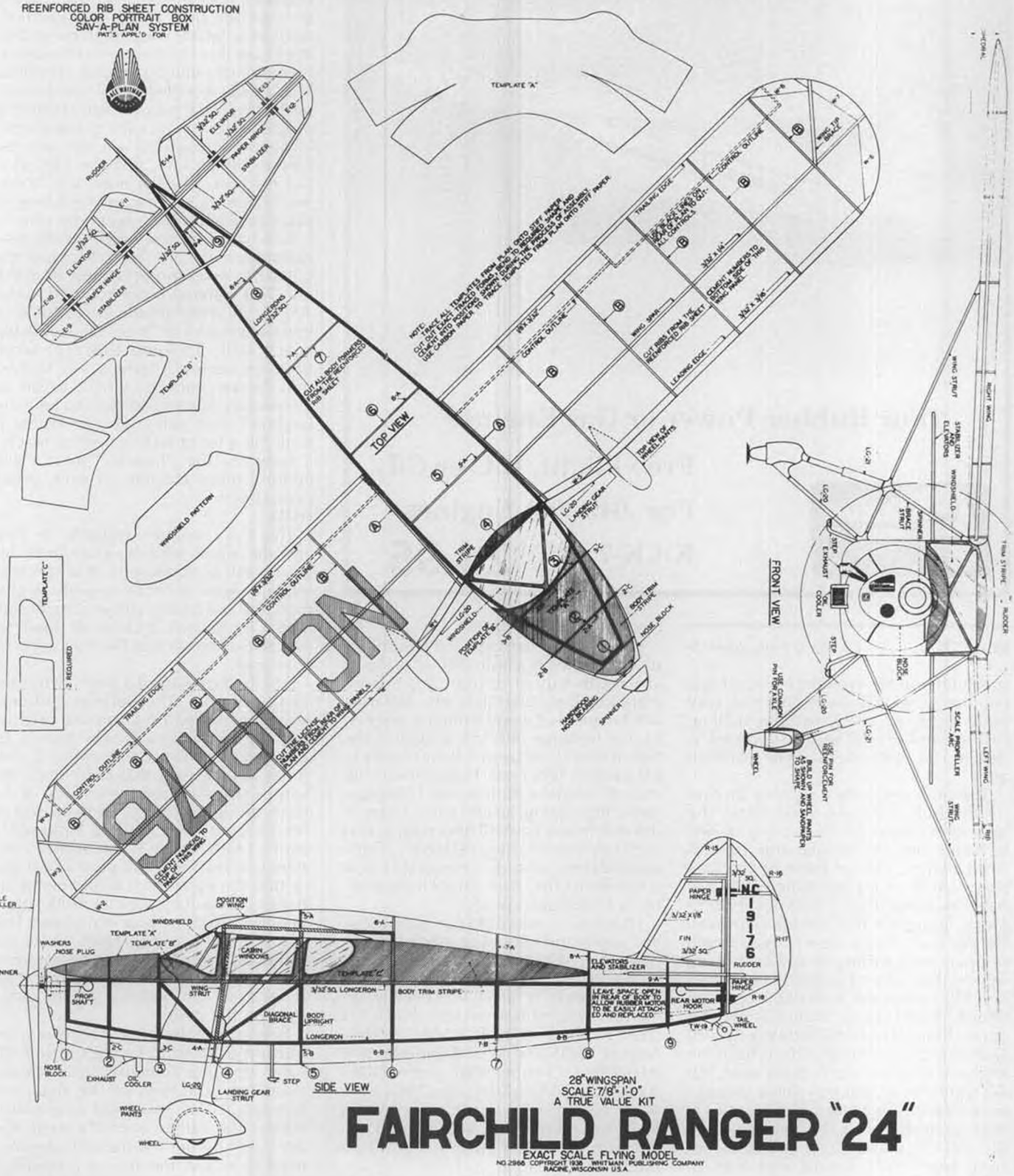
This plan, printed on the front and back of a single sheet, was included with an Ace Whitman kit, produced by the Whitman Publishing Company, Racine, Wisconsin, beginning in 1938. Span is 28", based on 7/8" = 1 foot scale.

Harold Johnson, Minniapolis, MN, supplied the "like new" plan from his own Ace Whitman kit. Original plan was printed in blueprint style . . . white lines on blue background, while the reverse side with instructions and sketches was in black on white. Incidentally, there was no printwood. The parts layouts were to be cut out and "pasted" to blank balsa sheets supplied with the kit.



TYPICAL OR GENERAL METHOD OF HOLDING VARIOUS PARTS INTO POSITION DURING FIRST STEPS OF CONSTRUCTION

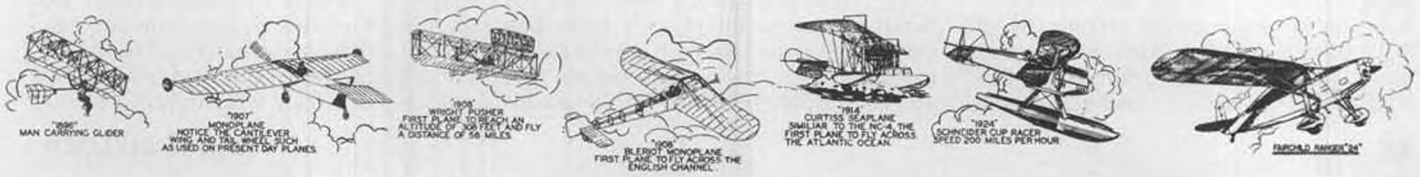
REENFORCED RIB SHEET CONSTRUCTION
COLOR PORTRAIT BOX
SAV-A-PLAN SYSTEM
PAT'S APPL'D FOR



28" WINGSPAN
SCALE: 7/8" = 1'-0"
A TRUE VALUE KIT

FAIRCHILD RANGER "24"

EXACT SCALE FLYING MODEL



PEA POD . . . . . *Contued from page 19*

much lift, but fat, symmetrical stunt and combat wings will develop lift at very high angles of attack without stalling. Just remember: the keel is supposed to develop lift, and water acts like real thick air.

The bulb performs a righting motion on the hull when the wind forces the sails over. Most of the racing 36-600 bulbs are long, low-frontal-area, streamlined bullets, so that must be the best shape. BUT, in my ignorance, I do not have to accept that. I took a very simplistic approach that I think improved the Pea Pod. (Please, don't all you racing skippers start writing in and destroying our myths.) Since I wanted lateral area and lift, I made the bulb like a constant chord, short-section wing. I know that some boats (Tower Tradewinds and Dumas Huson, among others) have the keel and weight in a one-piece wing, but we want the weight way down there so we do not need so much of it. So now my bulb contributes to the below-surface lift and the lateral area, and does not have much more frontal area than an equivalent-weight bullet. I can add a wafer of lead to the bulb to change the weight when I change sail configurations (as the wind speeds dictate). See, I have turned another disadvantage into a tuneable parameter to optimize the Pea Pod for the prevailing conditions. (Isn't ignorance wonderful?)

The best spars are light and reasonably stiff (the price is a little stiff, also). Spars are made out of aluminum, boron, graphite fibers, fiberglass, etc. This mast will be made of wood from the simplest source because with the weight of the hull, it would not be worth the money to get a super-light mast. The boom and jib club are airplane push rods of fiberglass. As for the rigging, just do it like I have in this article and you will have rigging that is easily adjustable, reliable, field-serviceable, strong, reasonably low wind-resistant, non-stretching and, really important, cheap.

Winches . . . we could purchase a top-line winch and it could be used on a boat twice the size of the Pea Pod . . . which is kind of an over-kill. Sanwa makes a servo winch which is used successfully on many Tower Tradewinds; Futaba FP-S25 (ref: FLYING MODELS MAGAZINE, August 1981) and World Engines S-16 (ref: FMM, October 1981, and MODEL AVIATION MAGAZINE, May 1982) have often been used. I made mine from a $1.25 toy motor, and it cost $3.70, including the three switches and two diodes.

Now for the sails; there are two kinds, flats and panelled. Flats are (ready for this?) flat when you lay them on a flat surface, and panelled sails have bag down the center. Flats are easy to make, panels are not. Should you decide that you want a panelled sail, I would recommend that you buy it from one of the listed vendors. You should consider making Suits II, III, and IV (shown on Drawing 3). Start with Suit II. The idea is that when a flat sail is under wind pressure, the highest point of the airfoil chamber is at the 50% chord distance. Remember that a sail is a vertical, flexible sailplane wing stuck on a stick. We know that the position of the airfoil high point should be around 25 or 30%. That's what a panelled sail can accomplish; the extra material will create the proper airfoil high point at the proper location. This article will not address how to design sails, find the CE's, etc., but for now, like the man says, "Trust me." Drawing 3 will show you where to place the sails for the optimum trim.

Sails have roaches, which is the material outside of a line from the top of the sail to the lowest point farthest aft of the sail. This material is not counted in the AMYA sail area formula for 36-600's, so you can get a lot of "free" sail area in big roach sails. To keep this area from flopping around, battens are slipped into batten pockets. I hate to be so elementary, but this article is to help the beginner *start* sailing at a level that it took me a lot of testing time to reach.

Now for the "how-to" part; I will address these changes in each major component.

HULL

There are options available to you, and the whole idea is to optimize for your weather conditions. It is said that wind comes in three speeds: light, medium, and heavy; and you can design a boat for any two, but not all three. So pick the ideas that look like they apply to your area.

The hull consists of a deck, two sides, and a transom. The outlines and construction should be as on the original, but the reinforcing blocks should be epoxied as shown on Drawing 1. Drill holes for the nails that hold down the spruce strips around the outside of the deck during assembly, and you will be less likely to split the strips. I assembled my hull with Hobby-Poxy Formula 2 (45-minute work time) and used a heat gun to thin the epoxy so it would penetrate better. You will notice a scroll-like piece of plywood on the bow of my boat. That is to cover the lacing holes I tore out while I was pressing the sides down to the deck during assembly. Perhaps this reflects on my building ability rather than on the design.

Symmetry is the thing to achieve when building the hull. Leave cutting the hatch opening until after the deck and sides are attached, so the deck will remain as flat and rigid as possible during the earlier assembly steps. Cut the hatch before the transom goes in. I tried to utilize the top of a sandwich container for a hatch, but it was not watertight and could not be sealed with tape, so I made a ply hatch cover that could be sealed. By the time you read this, I will have my hatch cut to the size and shape shown on the drawings. Few hatches are truly watertight, so plan to

use tape for sealing. A larger hatch would have permitted me to do much neater work below deck. For a hatch cover, use transparent plastic or built-up plywood. This boat is going to be sailing in rough weather. Do not worry about a lot of taping, because a magnetic switch is used to turn the radio off/on and all pond-side sail adjustments are made from above deck. Once you set it up, there may be weeks when you will not untape the hatch cover until the end of the sailing day. After the hull is off the building board or work bench, fill the nail holes with pieces of toothpicks.

Install the rudder log blocks (Drawing 1) before adding the varnish to the inside of the hull. When drilling for the rudder shaft log, turn hull deck-down. This hole should be as close to 90° to the deck (when viewed from rear and side) as possible. Drill through the hull bottom, rudder log blocks, and deck in one operation. Cut three pieces of 5/32-inch ID brass tubing 1/2, 3/8, and 1-7/16 inches long. Rough up the outside of the tubing so the epoxy will grip better. Slip a 5-1/8 inch piece of 5/32-inch OD brass tubing inside the three pieces with the 3/8-inch length in the middle (this center piece is to help assure alignment and spacing of the shaft log). Push this "assembly" through the hole, epoxying the outer tubes to the rudder log blocks. The outside end of the 1/2-inch piece should be about 1/8-inch below the upper deck surface. Confirm that the inside piece rotates smoothly. After the epoxy cures, remove the inside tube and the 3/8-inch piece. Do not bevel the tube bottom to match the hull shape.

KEEL

Here there is a choice. The original is fine and is what I have, but if I were building another Pea Pod, I would use the one shown in Drawing 1.

RUDDER

Build as an original except push a piece of 1/8-inch diameter bronze welding rod five inches long into the rudder post tube. This is strongly recommended. If you solder this rod in, put solder in each end of the tube before epoxying the shaft to the rudder. (If you use "Hotstuff" or equivalent, de-oil the inside of the tube and the outside of the rod.) De-oil the outside of the brass and rough it up before epoxying it in the rudder. Shape the rudder into an airfoil. Set up the steering for about two inches total movement when measured from the rudder trailing edge.

SPARS

Mast: Use the same materials as on the original. Really shop for the straightest 7/16-inch hardwood dowels available. I must have handled at least a hundred dowels at six stores before I got the two I wanted. Build the mast as shown in Drawing 2. What mathematics did I use to determine mast length? I measured the maximum distance from the inside rear-view mirror to the back, inside lip of my Honda Civic hatchback. It does seem to be the optimum length . . . really. I transport my boat fully rigged. Hardware choice is up to you, but you will have no difficulty doing what I did.

Boom and jib club: I used fiberglass push rods. Make sure they are light, stiff, and can be easily drilled. The method I used to secure the sails to the boom and club is a good idea (Drawing 2) but, in reality, the method shown in the original drawings may be as good and is much easier. The original boom vang is also quite adequate. Make sure that it is possible to switch sails at the pond and move the jib fore and aft on the club, because it is desirable to control the ratio of the jib area fore and aft of the club swivel.

BULB

This is a major change to the original "hull package." Build the bulb as per Drawing 1 and the photos. The bulb can be made in two or three pieces. The bulb without the streamlined bottom cap weighs 3 lbs. 1 oz. With the cap, it weighs 4 lbs. 13 ozs., and with the wafer and cap, 5 lbs. 8 ozs. These are not absolutes, as long as the bulb weight can be adjusted from about 3 to 5-1/2 pounds. These weights are used in combination with different sail patterns. Just remember that as the wind tries to blow the sails over, the bulb will resist. But also remember that as you add weight the waterline gets a little longer and the wetted area increases.

I put the bulb work off as long as I could because it is always such a drag to convert HER kitchen into a foundry. (Go

outside to pour the lead.) Get plumber's lead in 5-pound ingots from a plumbing supply shop. It will seem that the big chunk will never start melting but it will, eventually. Do not try to melt it in an aluminum can. Get as much lead-to-can-bottom contact as you can (file the oxidation from the bottom of the ingot before you start heating it and you will save many kilowatts), turn on the stove vent fan, and disconnect the smoke detectors. Make the molds out of tin can stock like the photos show. Use the dimension of the template in Drawing 1. Make the three molds 9/16, 7/32, and 1-1/4 inches high and fill them to the top, so they will be the correct weights when shaped. Use plenty of that old black wheel-bearing grease inside the mold. An old rough file will clean up the pieces quickly.

Make the bulb, wafer, and cap fit as flush as possible. Drill and countersink for two flat-head wood screws, then screw cap and wafer to bulb bottom; now shape as one piece. Sand, separate, clean with acetone, and immediately smear the outside surface (as viewed when assembled) with quick-set epoxy. Use a heat gun to help the epoxy flow. When cured, trim the edges as necessary and fit bulb to keel; securing with one #10, 1-1/4 inch long flat-head wood screw.

Epoxy bulb to keel, fill cracks with Plastic Wood, Bondo, or other filler material that is not water soluble. Cover with one more thin coat of epoxy, final sand, and decide if it is smooth enough. You could put glass cloth over it, but it is not necessary structurally. Put a strip of tape or Trimkote over the bulb/wafer/cap seams, and fill the bottom countersunk areas with oil-base modeling clay. You can put two disks of Trimkote over the countersunk holes if you like; I have done both. Permanently fill the bulb-to-keel screw recess with putty. Install keel in hull, 90° to deck, with rudder and keel in line as viewed from the stern.

DECK FIXTURES AND RIGGING

The brass work is installed as shown on Drawing 1. This puts all brass forward of the original position, because the large sail patterns have a more rearward CE than the original sail. However, the original sails can still be used with these new positions.

There is a way to check proper sail position. When sailing toward the wind (about 45° off) and a gust starts to heel the boat, you can readily see if the "lead" is correct. When the boat is blown over, does it quickly try to come about and head up into the wind? If it does, the CE should be moved forward by relocating the mast and/or deck/swivel connector forward. When you move the mast, move the shrouds accordingly.

If the rudder cannot turn the boat into the wind, the CE is too far forward. Remember, however, that when the boat is heeled way over, the rudder is part rudder and part elevator, so some steerage loss is to be expected. You may have to let out on the sheets and dump some air, which will allow the boat to come back toward vertical, where your rudder will be more effective.

A backstay has been added and requires a mounting plate (Drawing 2). The travelers shown on the same drawing are simpler than those I made, but will work every bit as well. The purpose of the traveler is to exert downward pressure on the boom, decreasing the amount of twist in the sail. The travelers are adjustable. Start with the traveler block (ring) stops (hubs) in the center as if they were tied off at the deck. As wind increases, start opening the area for the block to slide. It is an easy addition to the boat and another opportunity to learn sail trimming.

The shrouds and stays are made from 20-pound-test plastic-covered fishing leader with a small amount of 85-pound-test braided nylon line and a bowsie for adjustment. The loops on the leader are secured by crimped sleeves. The sheets and down-hauls are also 85-pound nylon with medium size airplane control line clips. Do not use fishing clips or swivels, as they foul and pull open. No one likes to see his mast go down out in the middle of the pond.

The jenny strut (Drawing 2) is for stiffening and trimming the mast. There are times when you want the mast bowed forward or backward, but never to the side. Smooth inside the jenny strut arm notches and just barely grip the stay so it will not pop out by itself, but the line can be removed to adjust the tension. If you must often unrig your boat, you might decide to use quick-disconnect turnbuckles and solid stainless steel fishing leader for shrouds and stays.

I stained my mast mahogany to match the hull and put polyurethane on it before I put the jackline on. Leaving 1/32 inch between the mast and the bottom of the screw heads. The screws are available at most good hardware stores, but they are not sold in the little plastic boxes . . . you have to ask for them. The solid .020 diameter stainless steel jackline is available at sporting goods stores specializing in fishing

equipment. Obviously, the screw head slots are to be aligned with the mast, then given a drop of "silvery" solder flux (no one could afford *real* silver solder these days . . . I used Stay Brite). Solder the wire in the slots with the wire under a little tension to keep it tight and straight. A 30-watt iron works fine. Be sure to wash the flux off everything.

The long crane is necessary for the backstay to clear the large roach sails. If you know that you will not use the large roach sail configuration, make the short crane. You will see in the photos that my crane is really an extension. I have not removed it since I put it on the first time. You will also see where I have extended the original mast to the height recommended in this article.

Over the rudder post hole, I epoxied a block and mounted cleats to secure the ends of the sheets. The deck eyelets for the antenna and fixed sheets are small servo eyelets, but the "feed throughs" for the running sheets need to be larger and quite smooth. The freer the sheets from the inside eyescrew to the traveler, the sooner that elusive little zephyr will waft the sails into position, get the drive system rigid, and the hull moving. I like to think that I would have eventually evolved the sheeting system I have, but the truth of the matter is that it is identical to that shown in the July 1978 issue of **Model Builder**; another one of the excellent Rod Carr articles.

RADIO CONTROL

Any two-channel radio gear will work. In R/C yachting, the effects of interference from other transmitters, vibration, and crash damage is the least of any modeling form (excluding non-powered indoor lighter-than-air R/C).

There are two potential problems, however: corrosion from the high humidity, and electrical interference from the winch motor and gears. The best way to take care of the moisture is to put your R/C equipment on a removable board which will be in the boat only when sailing; or you could put the receiver in a plastic bag with desiccant material, but do not seal the batteries, as they have to vent when recharging. You MUST get a sponge about 1x1x4 inches, cut lots of slots in it to increase the surface area, and poke it into the lowest part of the hull. Then when you get water in the hull (and you will) it will not slosh around and get all over everything. During a regatta, if it is VERY windy, I wring out my sponge between heats. I do not mind the repeated taping of the hatch cover because "this is racing' an' racin' is sirus biznis." When sport sailing, before I leave the pond, I wring out the sponge and let it dry. I always leave the hatch cover off while the boat is stored.

If you use a commercial winch (or servo), the electrical noise will not be a problem. If you build your own, as I did, it may be. Moving the R/C wiring harness away from the winch and winch wiring will help take care of the problem. The circuit shows arc suppression for the motor brushes.

My winch is sufficiently powerful, and very fast while running on 2.4 volt 1100 MAH NiCds. The winch battery lasts for about four hours of sailing. The motor, gears, and batteries were all bought from electronic surplus mail-order houses. I said SURPLUS . . . know the risks when you buy surplus batteries, etc.

Using wire on the sail control unit to contact the micro-limit switches is a good idea because by bending the wires you can adjust the extreme ends of travel of the arm. The diodes across the switches permit reverse current around the open limit switch. The switch that controls the winch direction can be made in several ways. I suggest you take a small toggle switch (DPDT) and open it to remove the spring or whatever causes it to snap from one position to another. Make sure that you still have good contact pressure when you reassemble it. You can attach the winch control servo push rod to the switch toggle any number of ways. I modified a slide switch to accomplish the same thing. The general difference is the toggle will have a "wide" center OFF and the slide switch will have a "narrow" center OFF.

For the rigging shown, the arm is 5 inches from the arm pivot to the main sheet eyelet and 5-3/8 inches to the jib sheet eyelet. An arm moving through a 140° arc will do fine. Swing rates from 4 to 10 seconds will be OK. Mine is 2 seconds!

The magnetic switch is not my idea,

and it is a good one. The switch is a Radio Shack 49-512 NC. I removed the glass tube with the reed switch from the plastic housing, put connectors on both ends (this redundancy is to your advantage) and lightly epoxied the glass tube to the underside of the deck in a place that I could easily locate from above deck. To the magnet that comes with the switch, I added a bright streamer so I would not be likely to launch with the radio off — a sort of "remove before float" tag. You can hear the switch click even with the hatch cover taped on.

SAILS

At last! All the other work does not matter unless we understand from whence comes our power. If you have made the original sails, you can cut off the sleeve luff, then hem and attach the hooks. The original boom is too long to use with the backstay, but you can remove the backstay and replace the boom when you want to use those sails. The original sail pattern I am showing as Suit I. I have sailed in "scale" gales with Suit II with the bulb wafer in place, and I do not think that I needed the Suit I's lower aspect ratio. I do not think that the boat would have been any faster with Suit I and no bulb wafer. If you are going to build just one suit, unless you live in dead air, build Suit II, or buy a panelled sail to Suit II's dimensions.

I have made sails from 1-1/2 oz. ripstop nylon, 3.0, 2.8, and 2.5 oz. dacron, and have tested a 2.2 oz. panelled Suit II sail made for me by Chuck Black. The 2.2 oz (or the 1.8 oz.) dacron is generally the preferred material. I do not recommend the new mylar material for this boat. Nylon is harder to work with than dacron and is not as airtight as I would prefer, but it is cheaper. I test all my patterns in ripstop before I cut up my good dacron for what might turn out to be a dog of a sail . . . like my big roached panelled main (not shown!).

I lay out the sail pattern full-size on paper, showing the outline and batten pockets, lay sail material over it (you can see through the material) and with a pencil draw on the material. If it is nylon, I run a bead of Hotstuff-type glue over the outline, with the glue spreading 1/8-inch on either side of the pencil line. You need do this on only one side of the fabric, as it will soak through. NOTE: Do not do this with the sail lying on something; I thumbtack mine to an open doorway. I tried using dope to seal the edges, but it shrinks the material too much. After the glue cures, I cut on the pencil line with sharp scissors. The dacron I cut with a hot knife which I made by putting a little blade of sharpened brass shim stock on my 45-watt soldering pencil. It has to heat 10 minutes before I use it and then I have to be very careful while cutting, but it is FAST and gives a good edge.

Make VERY SURE that you have drawn the finished luff edge (front of sail) with a straight edge. You must crease the material on that line. Fortunately, the material holds this crease well. Unfortunately, it will also hold a crease where you do not want one. When sewing, use a #11 ball point needle; straight stitches of 8 to the inch; and polyester thread on a light tension. When using zig-zag stitches, use a stitch about 1/4-inch wide. Sew on batten pockets so they really are pockets, with the opening toward the luff. Put a drop of Hotstuff on end of stitching line so the wind won't whip the thread loose. Use a soldering pencil to burn the holes for the corner grommets. The battens for Suits I and II are plastic shirt collar stays. For Suits III and IV, I used 3/8-inch strips from the plastic "FOR RENT" type signs found in hardware stores. This material is .015 inches thick. Use a single-edge razor blade to scrape the paint off the signs . . . I mean battens. More than one strip will be needed for the very long battens for added stiffness.

So now . . . which material? What weight? What kind of sail? We need to understand that sails develop no thrust on the hull unless the jib and main sheets are tight. Keeping them tight is the trick. Therefore, anytime this tension is not there is "drift" time. The panelled sails, with more material (or bag) have more drag when the tension is removed. When this drag is coupled to a very light hull, the skipper must be very careful or he will lose steerage. It takes time (sometimes a lot of time) to get the drive system rigid again. Then why use panelled sails? Because they are faster. They do have more drag and less acceleration than flat sails, but when they are rigid, they develop more thrust. They are noticeably faster at "terminal velocity." Our group races on a course that is 150 feet to a side. The shorter the course, the better flats would be. The more flexible the material, the more luffing during a tack change, and the more drag; but the lighter material would permit better control over the shape of the sail. There are no easy answers, but that is what makes it so much fun. Try to learn how to optimize your equipment for the wind and the course.

CONCLUSION

This is not a super-light, efficient hull using mylar sails, but there are many times when you will enjoy the weight of

this boat. When sailing, the inertia will permit steerage when lighter boats will have lost theirs. Rounding a buoy and tacking is much easier when you are carrying a lot of inertia. The inertia is also an aid in choppy water. High inertia usually hurts in two conditions: trying to stop in a hurry (not applicable in sailboat racing) and trying to start in a hurry (definitely applicable in sailboat racing). Since the Pea Pod is heavy (mine weighs 9 pounds), there is logic for the flat sail: higher acceleration. With the listed modifications, the Pea Pod is very nearly a boat for all seasons, because you can learn so much from it and it is a good boat on which to try new ideas.

My Pea Pod was named before I sailed it . . . ADAGIO . . . a dance or music "with much posturing but not much movement." I may need to rename it . . . maybe ANIMATO . . . "with spirit."

I have a lot of things I want to try in the future on model yachts, and I am not out of ideas; I am, however, out of ideas to try on the Pea Pod, and this was a Pea Pod article. Should you have any questions, please feel free to write to me at 236 Tennyson Cover, Picayune, MS 39466.

Please join the American Model Yachting Association; they have a fine journal. And . . . definitely . . . start racing. Model yachting is the only form of model racing in which tactics play such a predominant part. I recommend the following **Model Builder** issues for additional information.

THEORY	August 1979
	September 1979
TRIMMING	August 1974
	March 1979
SAIL CONTROL	May 1978
SPARS	April 1977
	May 1977

INFORMATION
American Model Yachting Association
2716 Briarwood Drive West
Arlington Heights, IL 60005

SOURCES
Sails
Amen Design Group
38 Burlington Drive
Petaluma, CA 94952
Black Sails
4761 Niagara Avenue
San Diego, CA 92107
Winches
Sail Engineering
P.O. Box 8439
Richmond, VA 23226
Dumas Products, Inc.
790 South Park Avenue
Tucson, AZ 85719
Hardware
A.J. Fisher, Inc.
1002 Etowah Avenue
Royal Oak, MI 48067
Winches and Hardware
Vortex Model Engineering
210 East Ortega Street
Santa Barbara, CA 93101
PROBAR
P.O. Box 639
503 Smoketree Glen
Escondido, CA 92025
Motors, Gears, Batteries
Jerryco, Inc.
5700 Northwest Highway
Chicago, IL 60646
Poly Paks, Inc.
P.O. Box 942
South Lynnfield, MA 01940 •

Fuel Lines . . . . *Continued from page 20*

Ceasare Rossi were both most gracious hosts. Again, thank you gentlemen.

Now, I think you'd probably rather peruse the accompanying photographs and captions, than read through wordy descriptive paragraphs about the factory. When you're finished, come back to the text and I'll close with some information on the latest developments in Rossi engine technology.

OK, so much for the photographs. They tell a story all by themselves. Here are a few technical aspects of the latest .61 Rossi tuned pipe engine. To begin, it is a smaller bore and longer stroke engine than previous .61's. However, the important point is that it is more powerful and less noisy! Specifically, it generates 2.6 brake horsepower on an 11½ x 9 prop at 14,000 RPM. The noise level is less than 80 decibels. Very impressive indeed. It will be available in either a side or rear exhaust version. When? By the time you read this you should be able to purchase this engine from either Rossi Sales of North America (Bill's Miniature Engines) or Condor

Hobbies. Their addresses and phone numbers are:

Rossi Sales of North America
1325 Carol Drive
Memphis, TN 38116
(901) 396-7485

Condor Hobbies
17835 Skypark Circle, Suite F
Irvine, CA 92714
(714) 556-1888

What else can we look forward to from the Rossi brothers? How would you like to have an .81 piped Turbo Fan that turns 22,000 RPM? Well, there's one under development. In the meantime, you also might watch for advertisements about Rossi R/C equipment. That's it, guys. •

Pattern . . . . . *Continued from page 21*

by making it fly in a more tail-high altitude.

The realtionship is critical, not just on this design, but on any of the pattern birds I know of. The attached sketches show this a little more clearly. If you are the type who likes to experiment with designing or if your interest is strictly in getting the existing designs to fly properly, you should check *this* relationship carefully.

Last month we mentioned that we would provide photos this month of a 1000 sq. in. pattern bird designed for gear box engines . . . well . . . next month!

We have, however, received some of the new production model OSVF 61 gear box engines. They are much nicer than we previously believed. The rest of the engine designers better take a long hard look at this one. Not being equipped with any engine testing goodies except for two tachs; one optomistic and the other pessimistic, I will leave any reviewing to the engine experts.

In the meantime, if you have had any peculiar trimming problems with your pattern bird, please drop us a line and share it with us. •

Electronics . . . *Continued from page 23*

mitter is operating at 90% or better of it's normal power; or the receiver battery voltage is 4.7 volts or higher.

When the transmitter power drops to between 90 and 80%, or the receiver battery voltage drops below 4.7 volts, a yellow LED is lighted, and a 90 db alarm beeps at two times per second.

The most dangerous condition, that of a transmitter power drop below 80%, or a receiver battery voltage lower than 4.35 volts, is indicated by a red LED, and an increased beeper frequency to five times per second.

As seen in the accompanying photo, the Acutech Power Indicator installs directly onto the antenna, with two metal snap-on clips, sitting directly on top of the transmitter case. It is powered by an internal 9-volt alkaline battery, reported to have a useful life of 30 hours. Off, as well as Tx, or Rx testing is selected by a small slide switch on the front of the unit.

Now, we have all heard about the undesirability of attaching anything metallic to the antenna of our transmitters, and this was one of the first tests I made of this unit. Using my MB Field Strength meter (September, 1981), I established some standard readings for a number of transmitters without the Power Indicator in place, and then, with no other changes in locations or distances, with it attached per the instructions. In no case was there a discernable drop in power!

Actually, we are not attaching a metal box to the antenna, the clips are insulated from it, and merely provide a support, I assume the actual electrical connection is made by a low value capacitor or some high impedence device which does not cause any antenna detuning. The transmitters I had available to check were a Kraft 7C, MRC 775, Ace Silver Seven, and a couple of Orbits. In case of doubt about the reaction to some other brand, you may care to duplicate my tests, the procedures are explained in the FSM article referenced.

The Acutech Power Indicator is priced at $39.95, from Acutech Specialties, P.O. Box 155, Euless, TX 76039; (817) 267-5312. It appears to be an item which definitely bears consideration for anyone interested in the longevity of his models, but more by those who own those few transmitters around which have no built-in battery or power meter, and those who tend to stretch the flying time available from a single charge.

AND FINALLY

My steady readers, both of you, know by now, that now and then we tend to stray from subjects which are strictly electronic, and I would like to do so again for three words: I like it!

What? Pat Potega's recently released book entitled "Basics of R/C Scale"; $10.45 postpaid, the Model Press Agency, Dept. MB, 7021 Vicky Ave.,

Canoga Park, CA 91307. It covers the title subject extremely well, and should definitely be on the shopping list for those involved in, or contemplating entering this exciting phase of the hobby.

I understand a more advanced publication on the subject is now in the works by the same author! I wonder if it will include plans for a 1/4-scale flying lawn chair? After all, it flew, was witnessed and documented, and is now a part of aviation history!

Talking about aviation history, do you suppose there is any truth to the report that Icarus is supposed to have said "Hey fellows, watch my victory rollllll. . . ●

Scale . . . . . *Continued from page 24*

surface movement, and retains independent trim capabilities. So many older type aircraft fly poorly without coordinated rudder-aileron movements that this would be a most welcome addition. I enjoy the servo reversing switches, throw adjustments, and the trim throw adjustments. It's handy to have a maximum amount of trim throw for those first flights, but then have the capability to back off on this as you've worked the bugs out in subsequent flights. The cross trim I felt at first might be somewhat strange, but it's so much easier to use the left hand to trim the elevator and ailerons (Mode II) without having to reach across the box.

I think the most important factor is that Ace is trying to fill the personal needs of the modeler. This can be most significant to the scale modeler, as he very often has special needs and whims for specific projects. I realize that other systems have various options available, but the problem often develops that the modeler doesn't have the accessibility to the manufacturer to bring about special arrangements. Since you are dealing with *modelers*, you will find a sensitivity to your needs which is not always present. If you wish to investigate further, contact Ace R/C, Inc., Box 511, 116 W. 19th St., Higginsville, MO 64037. Phone (816) 584-7121.

'Tis a Puzzlement

The song from Rogers and Hammerstein's *"King and I"* seems appropriate in this little discussion. Last year I had the opportunity to handle the R/C scale event at the Nats for the first time. For some time, including last year, I heard many persons voice opinions as to why the scale event had become less popular at the Nats while, in general, scale activity was showing a definite increase about the country. The reasons most often given were that first, you were required to turn in your models on Wednesday, while not flying until Saturday and Sunday; secondly, the amount of time available was insufficient.

A sincere effort was made this year to alleviate these as much as possible. Static judging time was moved to Thursday for Precision and Friday for Sport Scale and Giant, cutting the required time to be there significantly. In addition, the Sunday air show was dropped, making it possible to utilize as much time as might be needed to complete at least four rounds. (That number was flown last year in Seguin). The scale flying on Sunday is to be advertised as the attraction or "air show," if you will.

Additional reasons for lack of attendance in scale at past Nats have included things like location, site conditions, cost of entry, etc. It is now just two weeks before the 1982 Lincoln Nats, and I have received the "final" tubulation of entries. (Some possible late entries could occur). The results are: Sportsman Sport Scale, 4; Sport Scale Experts, 20; Giant Scale, 4; and Precision, 2. Even an expensive calculator will only come up with a total of 30 entries. What did I do wrong?

I would *sincerely* appreciate some feedback from those of you who can afford a twenty cent stamp as to reasons for the lack of Nats scale activity. This could include personal reasons such as economy (job problems), timing, etc., and changes you feel that might be helpful. Direct your comments to me at 4109 Concord Oaks Dr., St. Louis, MO 63128. Be assured that I will pass them on to the remainder of the Nats Council.

Products, Comments, Help, and Stuff

At Reno, we found the wandering soul, Dale Willoughby, with his trusty packs of aircraft photos he gathers from trips around hither, thither, and

yon. I'm not certain whether he had just come from hither or thither, but he has produced new sets of photos. A new page containing 52 new subjects, added to the hundreds already available, can be found in the new catalog. Each entry gives a brief paragraph of information about the aircraft, registration numbers, number of photos, etc.

Contact: Scale Model Research, P.O. Box 685, Orange, CA 92666.

A recent communication from Pettit Paint Company, makers of Hobbypoxy, offered the following information concerning color mixing and matching. I suspect after the beginning items in this column, someone may think this is a put-on as well. It is not. The material is taken directly from the communication and would appear to be a most helpful source for scale builders. Pettit has mentioned that future colors will be added to this list. In addition, they would like to know about other colors that might be needed. (What hundred do you need?)

HOBBYPOXY PRODUCTS is proud to announce a special project directed specifically toward the scale model builder. We know that one of the most difficult aspects of producing an authentic finish is matching the exact color of the prototype aircraft. Even when a color chip is available, it isn't always easy for the average modeler to know how to mix that color from existing paints.

To make life easier for the scale model builder, we've put our laboratory color experts to work creating formulas for mixing the most-asked-for World War II camouflage colors, using standard Hobbypoxy paints.

The first one we worked up is the ever-popular and very elusive OLIVE DRAB 41, also known as pre-1964 Federal Standard 34087. As you know, the color of OD was changed in 1964, but the Feds, in their perversity, gave the new color the same FS number as the old discontinued color . . . much to the chagrin of model builders everywhere. Fortunately, we were able to obtain the proper FS chip and our lab has come up with a perfect match. Here's the formula:

Two parts H66 Dark Red, two parts H81 Black, one part H10 White and one part H49 Cub Yellow. Mix them together, add an equal amount of Part B Flat Hardener and you've got WW-II Olive Drab.

To go along with the OD, we next matched NEUTRAL GRAY 43, FS 36173, so you can paint the undersurfaces of those USAAF aircraft. The formula for this color is:

Four parts H10 White, two parts H81 Black and one part H25 Light Blue. Again, use Part B Flat Hardener for the proper matte finish.

A word of caution. *These formulas were developed using HOBBYPOXY epoxy enamel standard colors. You won't be able to use any other brand of paint to achieve the same result, as their pigment concentrations and colors are not the same as ours.*

And while on the subject of color accuracy, it should be noted that the apparent hue and value of any color will shift depending on the type of light it's viewed in, and that matte colors will appear darker as the surface gets glossier and lighter if you spray them a bit "dry." The formulas given produced an exact match to the Federal Standard chips we worked from, when mixed 1:1 with Flat Hardener. To assure accuracy, please mix each component color thoroughly before blending with other colors. And be sure the Flat Hardener is thoroughly mixed as well to achieve the proper degree of flatness.

We know these color formulas will be of great interest to scale model builders and hope you'll find room in your magazine column to publish them. Our lab is now working on Sea Blue 35042, Intermediate Blue 35164 and White 37875 for all those Corsairs, Hellcats, and other WW-II Navy aircraft. After that we'll do RAF and Luftwaffe colors. We'll send you the formulas as we develop them.

In closing, we'd like to thank Claude McCullough for all the help he provided on this color-matching project.

Darn! Where in the heck are Russian colors? •

Hannan . . . . . *Continued from page 48*

PROXY PEANUTS IN EUROPE

Belgium is again hosting an indoor contest at Flemalle, near the industrial city of Liege. Sponsored by the "Club de Petite Aviation," classes will include Sainte Formule (similar to U.S. Manhattan), F.1.D., E.Z.B., Penny-Plane, and Peanut Scale, for which proxy entries are invited. Previous Flemalle meets have attracted in-person participants from Belgium, Holland, England, France and Germany. Flying is conducted in the Andre Cools Omnisports hall, which measures some 144 feet by 108 feet. Although an exact ceiling height was not supplied, the site is rated Category 2.

Although it is too late to enter the August, 1982 event, details of the 1983 championships may be obtained via

PHOTO PIOTR ZAWADA

BOB HUNT, *flying models* **Managing Editor says:**

"ADHESIVES? HOT STUFF™ & SUPER 'T' ARE THE ANSWERS!"

Dear Bill and Bob,

After thirty years in controline, the R/C bug has finally bitten me, and I love it!

My experience in the C/L Stunt event has underscored the importance of light, straight and strong airframes. Your products, **Hot Stuff** and **Super 'T'**, have helped me to reduce airframe weight, while adding measurably to strength. Once perfect alignment has been achieved, **Hot Stuff** adhesives allow a quick bond between surfaces resulting in more accurate, easier to trim planes.

The speed of assembly allowed with **Hot Stuff** and **Super 'T'** has become my favorite feature. I can now build as fast as parts can be assembled!

Now that I'm building R/C planes, more uses for this fantastic duo of adhesives are being realized. I've found **Super 'T'** great for kit building where parts don't always fit perfectly. **Hot Stuff** is great for positioning glass cloth when joining foam core wings. I simply tack the cloth at the edges as I work the wrinkles out, then fill the weave completely with **Hot Stuff.**

Whether C/L or R/C, **Hot Stuff** and **Super 'T'** are the answers when the question is which adhesive!

PHOTO JACK RUSSELL

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Bob

Bob Hunt,
Managing Editor, *FLYING MODELS*
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THE OTHER SIDE OF THE SCALE SPECTRUM

Although the Reno R/C Scale Internats are being well covered by Bob Underwood, we felt that a report by scale model builder Bill Kee, of Twin Falls, Idaho well worth sharing, from an enthusiast/spectator's point-of-view. We have slightly edited his story, which he entitled: OPINIONS, COMMENTS, NIT-PICKING.

The Opening ceremonies of the Championships started on time with the raising of each team's national flag, and the playing of a stanza or so of that team's national anthem over a GOOD public address system. Very impressive, and it made one's (mine, anyway) spine feel "funny" . . . flags were raised in alphabetical order, which made the U.S. last. At the start, the FAI flag was raised in the center of the 17 poles, then the AMA, Nevada state flag, followed by the Australian, Belgian, etc. After the flag-raising, the Sacramento R/C club's show team put on a fast and enjoyable performance, and the remainder of the afternoon was devoted to judging and practice flights.

I immediately felt "at home" at the Stead field, a former air base, out in the wide open spaces where you could stretch eyeballs and elbows in a quiet, easy-going small-airport atmosphere. Nearly all flight activity was in full view of the audience. All-in-all, everything was pretty well organized.

Since we had purchased the "supporters" package, we were given badges to permit entrance into the hangar that housed all the models for display and judging. There were a lot of models . . . both Stand-off and Precision types. All were very fine . . . sort of made you want to go home and learn how to build again!

What caused me to "flip" the most? Rib-stitching and rib tapes. Now there is something I must attempt . . . a study in patience. Some "pinked" tape was, of course, way over-scale. However one West German model had nearly scale pinked edging, small enough to catch your eye. He had to have made a die of some sort to accomplish this.

The WWII and more modern models do not appear (to me anyhow) as detailed as the biplanes, but the detail was all there upon close observation. Sometimes the color detracted from quick notice of detail. (There is an important message here to all builders of scale models. w.c.h.)

Workmanship, both in Stand-off and Precision, was of the order one would expect; very good. Nothing "half-done." Comment: Once a plane taxied out for take-off, there was no difference between a Stand-off and a Precision model, in spite of all the extra work that goes into a Precision job. Is it really worth it except for the modeler's personal gratification? (Right on! wcn)

Flying: Boy, oh boy. Here were top flyers, but alas, all were faced with 5000 foot elevation, with the temperature giving a density altitude one day of 7800 feet. Plus light and variable breezes to occasional gusts much of the time. But also, calm early mornings when one flies at the equivalent of lower altitudes. And suddenly things are much different. There is astonishment on the part of each flyer, wondering why his model is not performing as it should; and with only three flights, one doesn't get it all mastered.

Turns must be milder . . . a lot of planes literally fell out of tight turns and dropped like rocks. Take-offs were hazardous, with not enough power. Some wound up ground-looping, or staggering into the air, faltering and falling from low altitude, while others finally "made it." All rather exciting (on one's heart, that is!) Comment: Nearly all the models were tail-draggers. Nearly all landings were wheel-landings, which made sense, but once rudder control was lost, anything could happen; ground-loops, nose-overs, or a combination of both. Some flyers lucked-out and had beautiful roll-outs. Never a dull moment.

Outstanding performers to my eyes were: The Belgian De H Mosquito, which sounded like a finely-tuned sewing machine and flew great! The PBY Catalina in Danish markings. It was also a sweet-sounding job, that performed very well, but at about three times scale speed. Two Tiger Moths, one from Canada and one from New Zealand, both flew realistically and smoothly. A 1/5th size Tiger Moth from Sweden also flew well, as did a 1/4 size Sopwith Pup from South Africa. Other models flew great until they "lost their footings" in the thin air and crashed. Made one sick.

A West German fellow, confined to a wheelchair except when flying at which time he used a stool-like affair, flew, in my opinion, the most perfect flights from the take-offs (straight and true) through landing roll-outs, on all three flights. Smooth and precise.

A Canadian Sea Fury looked fine until it too fell out of a turn. Such a thing happened so fast that even when looking right at the model, one's mind hadn't caught up before the sound of the crunch. . .

The Reno R/C club members did an outstanding job of preparation, policing the area, and clean-up. All wore jumpsuits with their club logo on the backs, so they were easy to spot.

Bonus extras: In addition to the model flying, we witnessed tests of the Lear Fan and OMAC-1 canard. Then there were the antiques and home-builts from California. Of special note was the FW bipe in Swedish markings, flown by Monty Grove's son, the prototype for one of the R/C entries. And a real, live Tiger Moth in Swedish markings, cor-

RESULTS

Pioneer:

Placing/Pilot	*Country*	*Subject*
1. Dr. John Martin	U.S.	Santos-Dumont canard
2. Ranier Lotz	W. Germany	Santos-Dumont canard
3. Mike Arak	U.S.	Chiribiri
4. Ken Groves	Canada	Tabloid
5. Tom Sutton	U.S.	Annular wing
6. Jim Miller	U.S.	Ponnier
7. Bob Clemens	U.S.	Nieuport IV mono

Warplanes:

1. Dave Kiefer	U.S.	Sopwith Tripe
2. Jack McGillivray	Canada	S.E. 5
3. Mike Arak	U.S.	Nieuport 17
4. Dr. John Martin	U.S.	?
5. Tony Sutter	U.S.	Heinkel 100
6. Alfred Genther	Switzerland	Douglas A-26
7. Walt Everson	U.S.	P-51 Mustang
8. Bill Hunter	U.S.	Fokker triplane
9. Stephen Oxley	U.S.	Hellcat
10. Jack Little	U.S.	Morane-Saulnier N
11. C.E. Roth	U.S.	P-51 Mustang
12. Millard Wells	U.S.	Lockheed P-38

Juniors:

1. Mike Escalante	U.S.	Bristol Scout
2. Chris Scott	U.S.	Martinsyde

Golden Age:

1. Alfred Genther	Switzerland	Bucker Bu 131
2. Bob Clemens	U.S.	Farman Moustique
3. Dr. John Martin	U.S.	Dornier Merkur
4. Millard Wells	U.S.	Winnie Mae
5. Bill Hannan	U.S.	Chauviere Gyroptere
6. Warren Shipp	U.S.	Avro/Cierva Autogiro
7. Millard Wells	U.S.	Curtiss triplane
8. Jim Miller	U.S.	Piper Cub
9. Phil Cox	U.S.	Buttercup
10. Walt Everson	U.S.	Bucker Jungmann
11. Millard Wells	U.S.	Micro-Velz
12. Millard Wells	U.S.	Wee Bee
13. Jack Little	U.S.	Fairchild 24
14. Phil Cox	U.S.	Druine Turbulant
15. Millard Wells	U.S.	Huntington H-12
16. Walt Everson	U.S.	Waco E
17. Bill Criss	U.S.	Bellanca
18. Jerry Skrjanc	U.S.	Farman Moustique

Modern:

1. Jack McGillivray	Canada	Yugoslavian 45T (twin!)
2. Jim Miller	U.S.	Piper Vagabond
3. Lou Liefer	Canada	Volksplane
4. Siegfried Glockner	W. Germany	F.R.E.D.
5. Jim Miller	U.S.	Itoh
6. Dave Kiefer	U.S.	Pitts
7. Mike Arak	U.S.	Piper Vagabond
8. Bob Clemens	U.S.	BD-4
9. Bill Criss	U.S.	Cougar
10. Millard Wells	U.S.	Piper Vagabond
11. Bill Hunter	U.S.	Piper Vagabond

Junior:

1. Bryan Varney	U.S.	Cougar

Weirdos

1. Warren Shipp	U.S.	Avro/Cierva Autogiro
2. Bill Hannan	U.S.	Chauviere Gyroptere
3. Dave Kiefer	U.S.	Sopwith triplane
4. Jack McGillivray	Canada	Yugoslavian 45T
5. Millard Wells	U.S.	Curtiss triplane
6. Alfred Genther	Switzerland	A-26
7. Bill Hunter	U.S.	Fokker triplane
8. Tony Sutter	U.S.	Annular wing

Fike/Lacey class:

1. Ken Groves	Canada	Fike
2. Jim Miller	U.S.	Lacey
3. Butch Hadland	England	Lacey
4. Don Lockwood	U.S.	Fike
5. Don Lockwood	U.S.	Fike

responding to a 1/5th scale entry from that country. A model shipped halfway 'round the world, and what happens, but a full-size one in identical colors flies in. Who wouldn't be excited?

The awards presentations were held facing the flags, with the antiques and homebuilts parked close around as a background; a Ford trimotor occupying the central position. National anthems were again played, following trophy presentations. All-in-all, the entire week was well worth it, and I'm glad I attended.

FAREWELL NICK

Another fine model builder, Dominic J. Bressi, has passed away. A retired civil engineer and long-time member of the Flightmasters club, Nick specialized in small flying scale models, and was a familiar competitor at Mile Square free flight contests, as well as at indoor events near his Sacramento, California home. We join his many modeling friends in extending sympathy to Nick's wife, Deborah, and family.

PECKS ON TELEVISION

Bob Peck, Sandy Peck and their associates appeared recently on a San Diego TV program. Although of brief duration, the presentation was comprehensive and included coverage of Peanut kits, an interview with Bob, and demonstration of a remotely-controlled camera mounted in one of the Peck-Polymers electric-powered blimps.

SIGN-OFF

"There's a child in all of us . . . fortunately, to help overcome our 'adultness'." ANON •

Electric ..... *Continued from page 35*

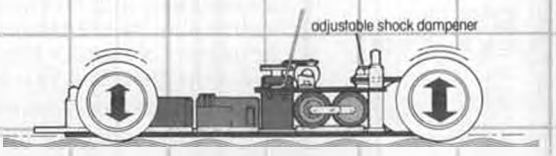
done by the Radio Shack push-push switch actuated by full down elevator. The plane was covered in Solarfilm, and weighed 46 ounces with two channels, Cannon receiver, and a 250 mah receiver pack. The span is 72 inches, the wing area is 650 sq. in.

The flights were excellent, right off the board (true!), no adjustments necessary at all. The climb is a good steady pull up to 400 feet in about two minutes, with plenty of altitude to clear obstructions in the first circuit around the field. The controls are positive but not jumpy. As with all electric gliders, you need between a quarter to half throw on down trim on the power climbout, otherwise the nose will pitch up and it could cause a stall. The glide, motor off, is not fast, not slow, something in between, with good penetration into the wind. I would not hesitate to fly the Oly 650 in winds up to 15 mph, though it would be hard to do for a beginner. The glide, like all electric gliders, requires from half to full up trim on the elevator. Stalls are straight ahead, no tendency to fall into a spin, and the plane will recover by itself if you leave it alone. Turns are super simple; gentle ones require only rudder, steep ones require some elevator. You could fly the entire flight rudder only if you wished.

The plane senses even small thermals with a definite "bump"; it pitches up if it runs straight into one, or banks away if it brushes one. I have not had any good thermal days yet, so my times are between ten to fifteen minutes with just power. This usually consists of three power runs up to about 400 to 600 feet, then glides. I can even do loops from level flight, impressive for a plane this size with an 05. As the battery is easily accessible, two packs would have you flying continuously until you are worn out! Landings are a delight, verrrry smooooth, just float in, to a zero speed flare a couple of inches above the grass. This plane never fails to pull the spectators, as the Solarfilm is transparent yellow; they can see the structure, and all of them have wanted to build one after they see how strong it is, and how perfectly the parts fit. So, I'll admit, this is a rave review, but the Olympic 650 is worth it, it is rare to get so much value for your money as you do for this one. Try it, you'll like it! Congratulations, Airtronics, on a job done right.

Among the many items that Bill Gilchrist sent me in his letters was a comment on using voltage regulators to run the receiver from the motor battery pack. His experience was not so good; he was using an Ace R/C flight pack with Bantam Midget servos, and a Kraft transmitter. His plane had glitches on takeoff and in the air; the latter seemed to be relative to the distance and direction from the transmitter antenna. It almost took over the flying, and in a later flight, resulted in a crash on takeoff. He has used a regular flight pack for the receiver since then, and has had no problems, so he is pretty sure it was the regulator. He would like to know what experiences others have had with regulators; his address is Route #1, Oskaloosa, Iowa, 52577.

I really don't know much about the regulators myself, as I always fly with the 250 mah receiver batteries sold by Astro Flight. I would imagine that not all regulators are "within specs," and it would be a very good idea to check with a voltmeter how much voltage the



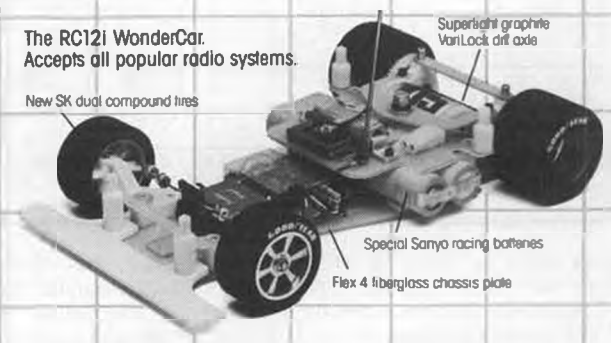
While the tires of the amazing RC12i follow the contours of the track, the central chassis, radio equipment and batteries remain stable for phenomenal cornering power.

Nobody knows more about building winners than the Team. In just four years our RC12E won an astounding 10 National Championships, winning in every class of competition indoors and out.

Now there's a brand new winner from Associated, the RC12i. We call the RC12i the WonderCar, because it has handling and road hugging characteristics second to none.

The RC12i grips the track with our unique Flex 4 chassis, a totally new design featuring shock-dampened front and rear roll rates and a trailing link controlled beam axle. That gives the RC12i a suspension without springs, to isolate the radio and batteries from excessive vibration for maximum traction on every track surface.

The RC12i WonderCar.
Accepts all popular radio systems.



FLASH! NEW ASSOCIATED RC12i FLAT OUT-CORNERS THE COMPETITION

And the RC12i isn't all that's new from the Team. Special "SK" dual compound front tires, graphite VariLock diff axles, Reedy Indoor rewinds, plus McRae Can-Am, Brabham F1 and Lola T600 bodies are just a few of our latest speed secrets.

Keep up with all the action with your free subscription to Racing with the Team. Call or write today.

The IMSA Champion Lola T600 GTP, our newest 1:12 scale body shell. New McRae and Conquest Can-Am bodies also available.

Associated Electrics 1928 East Edinger/Santa Ana, CA 92705/(714) 547-4986

1981 ROAR Nationals! Boston – Mike Lavacot/Team Associated wins Indoor Modified.
Reedy motors win All modified classes for 4th year in a row.

receiver is getting when the battery pack for the motor is getting low. I do know that if there are glitches, turn the motor off if at all possible, then the voltage of the motor pack will go up and the regulator will do better. I have used dropping diodes to run the receiver off a six cell pack in boats, but never in planes. I find that the Cannon receiver I use likes three dropping diodes. Each diode subtracts about a half volt from the pack voltage. This is also common practice in the 1/12th scale cars. If anyone is bold enough to try it in planes, let me know the results, I am interested. Try three diodes first, and try a range test with the motor pack low first. Don't try it with your favorite plane!

Heinz Koerner sends some good items quite often too; he explained the difference between red and yellow Sanyos beautifully. I've mentioned that the red Sanyos are popular in Europe and are more tolerant of overcharging than the yellow Sanyos. The red Sanyos are available from Wilshire Hobbies in this country. Anyway, the red Sanyos have a thicker and heavier insulation between the layers in the battery. This makes it more tolerant of overcharge (heat), but does reduce the capacity somewhat, to 1.1Ah., compared to 1.2Ah for the yellow Sanyos. Thanks, Heinz, that does clear up the mystery for me, at least. I have found that the yellow Sanyos are quite tolerant of charging at 4 amperes, *if you are using a digitial charger*, and stop the charge as soon as the voltage stops rising (don't wait for a drop!). My Sanyo packs have given excellent service under these conditions.

Well, now, let's race electrics! •

Plug Sparks . . *Continued from page 40*

Eastern States Gas Champ, as originally designed, built and flown by Russell Simmons. As Sal used to say, Russell and his brother would come to the contests dressed in their Sunday best. The jokes and kidding would stop at the end of the meet as invariably Russell would cop a first place. Photo No. 17 is an excellent reproduction by Jack McSwiney, using the power as originally designed for it . . . a Super Cyclone. Jack's model was a good flyer, but was plagued with gremlins. Gettum next year!

MORE PHOTOS

George Murphy came in for his share of attention with his Frank Ehling Model called the "4-1/2 Hour Flyer". George took this columnist's drawings scaled up from the 1935 Zaic Year Book and made additions and corrections to put the plan in first class shape for anyone wanting to reproduce this particular model, as can be seen in Photo No. 18.

In the early days, most of Frank Ehling's models went unnamed. Frank freely admits he never bothered to put a title on any of his designs, preferring to let the model editors cook up a title. Some like the G.E. Cabinette were incorrectly named, as Frank had originally said "Gee! Cabinette!" You can save that bit of trivia for your next club meeting.

Now how about Photo No. 19, showing a good old Super Buccaneer as built by Nick Notte of Hartford, Connecticut? Without a doubt, this was the best selling kit in the early days. The model was rugged, flew very smoothly and checked out easily. It was a natural for early R/C gear, and many a modeler built a Super Buccaneer for a possible R/C conversion.

Of interest to the modern modeler is the fact that Bill Effinger, original producer of the Buccaneer under the name of Berkeley Models is again producing plans for this model. Plans are also being made to again kit this famous old model.

Ta-Dah! We are proud to present what we regard as the ugliest gas model of all time, the "Blue Dragon", the 1934 English Record Holder as designed by Col. C.E. Bowden. Photo No. 20 shows the handwork of Danny Sheelds, of Baltimore, Maryland. A very faithful reproduction except for the Brown Jr. in the nose. The original had a Comet 30 cc for power.

Actually in describing the model as ugly, one must remember in those early days no one knew how to design a gas model. Most of us put tails on them in

the same proportions as rubber models. With such large tails and about triple the flying speed, gas models were very touchy to trim.

In those days, to set a record (if you happened to have a gas model that flew!) you simply gassed it up and turned it loose. Needless to say, many gas models were lost under this system. Even the Colonel's record of 12 minutes plus was set with the motor still running and disappearing into the clouds. This record, incidentally, was never broken in England, as the rule changes in 1937-38 prevented it.

For those who are interested, the Colonel still lives in retirement in a large manor. Daney Sheelds reports in a visit to see the old boy, he was astonished to see six rooms just jammed tight with models. Bowden was a prolific builder, but finished them about all the same way. Muslin cloth with white paint . . . not the most beautiful finish in the world. Sheelds further reports that Bowden is still active, experimenting with boats, rockets, etc. You never seem to get old when you spend your time modeling.

Another model that isn't so pretty is the Lanzo R/C model that won the first R/C trophy, the Roberts Cup. Bucky Walter, member of SAM 39, the same club that Lanzo belongs to, built this model as seen in Photo No. 21. Bucky has been having a lot of good luck with this model as can be attested to by the number of wins. Bucky thinks this Lanzo design is a good one for the Texaco Event. Just goes to prove, beauty is in the eye of the beholder!

Getting along, Photo No. 22 of Walter Hartung, Detroit, Michigan, is offered to show that Midwest Jabberwocks are quite competitive in old timer rubber cabin events. Up to about five or ten years ago, this kit could still be found on the dealer's shelves. If one were to prowl around some of the older stores in the sticks this writer is willing to bet at least one of the old Wally Simmers designs could be found, i.e., Jabberwock, Gollywock, Dyna-Moe, etc. All good flyers.

Some interesting statistics were received from George Armstead, Contest Manager. He reports the average contestant age was 50.3 years. We're getting older men! Youngest entry was 14 and oldest was 81 (no! not me!). Here's a tricky one: only 15 out of 143 were under 40. Does that tell you what this columnist has been preaching? *(And what this editor has been preaching! Youngsters cannot find stick-and-tissue model airplane kits in any type of store, as they could four to five decades ago. That's where we all came from! We are an endangered species. Maybe that qualifies us for federal assistance! wcn)*

Some other facts gleaned from Armstead's report was that there were 275 entries in free flight for 23 events and 220 entries in R/C for only 9 events. A slight bit of overbalance here.

Playboy designs continue to dominate the competition. In R/C, 18 out of 45 trophies were taken by Playboy designs! Maybe we ought to adopt a handicap system based on the number of wins so that other designs would be built. This system worked in WAM Flying Scale Controline. Why not in old timers?

Armstead also points out the free flight events were dominated by the popular designs. As some examples, how about *Strato Streak* in 020 Replica, *So Long* in C1. A Cabin, *Alert* in C1. B Pylon, *Brooklyn Dodger* in C1. B Cabin and *Playboy* in Class C. It would appear these designs have proven their point. How about something different?

Now you take Photo No. 23. Here is a shot of Louis Garami's well known "Molecule", but very few built to date. It is models like this that need encouragement. Certainly is a pleasure to see different designs.

Or how about Photo No. 24, showing Gerald Donohoe of Central Falls, Rhode Island, with a Red Ripper. This design is a real goer, but darn few fellows build it as it seems to be an off-beat design. Gerry says there is nothing wrong in the way this model performs.

Finally, the last photo we present (No. 25) is of Bob Schlessberg holding a rubber powered flying scale of a Vought V-143. This was originally a 50-cent kit back in the late thirties. Many people have asked whatever happened to the 10 and 25 cent kits, but Bob Peck of Peck Polymers can answer that with the statement that the boxes alone cost more! In any respect, rubber powered flying scales are very popular with the SAM 7 modelers. Bob's model is an excellent representation of a well built and neatly finished model. Flies too!

Before we get to the results, perhaps some of the readers will be a little disappointed we didn't describe the Champs a little more in detail. But what the heck, once you have seen a green tailed dragon with polka dots you have seen all green tailed dragons with polka dots. This writer honestly believes people like to see their name and face in print. After all, we all like some form of recognition, even if it is a brickbat!

We probably could have written how Bruce Norman spread-eagled the field in capturing the Sweepstakes R/C Trophy, or we could have pointed out the excellent flying by Sal Taibi and Bruno Markiewicz in free flight, but heck, we know that! This columnist does hope the foregoing presentation of photos pretty well sums up the 16th Annual SAM Champs. Okay, let's see those results so that in ten years you can settle a bet.

FREE FLIGHT

Class C Cabin
1. Sal Taibi 360
2. Al Bailey 346
3. Larry Fair 340
4. Jim Walston 338
5. Bruno Markiewicz 332

Class A Cabin
1. Jim Walston 360
2. Bob Edelstein 335
3. Bruno Markiewicz 332
4. Woody Bartelt 305
5. Jim Robinson 293

Class C. Cabin Glow/Ign
1. Sal Taibi 320
2. Bruno Markiewicz 315
3. Tom Lucas 276
4. Nick Wyeth 274
5. Ed Konefes 261

Cabin-Rubber
1. Jim Fiorello 360
2. Carmen Botticello 348
3. Stan Colson 338
4. Bob Bissett 304
5. Alex Dashko 291

Class A Pylon
1. Sal Taibi 360
2. Jim Walston 323
3. Bill Hale 320
4. Mitch Post 312
5. Gene Martha 310

30 Sec Antique
1. Bruno Markiewicz 450
2. Mitch Post 360
3. Herb Wahl 357
4. Bob Edelstein 335
5. Bob Bissett 318

020 Replica-Pylon
1. Mike Poorman 360
2. Bob Bissett 295
3. Kevin Barrett 293
4. Fred Schlegel 285
5. Merl Shammo 280

020 Replica Cabin
1. Bill Hale 304
2. Bob Edelstein 286
3. Rich McLellan 277
4. Jim Walston 269
5. Henry Hill 227

HL Glider
1. Jim Fiorello 320
2. Peter Mann 313
3. Dick Sherman 303
4. Denny Dock 250
5. Ed Konefes 171

Pylon Glo/Ign CLC
1. Tom Lucas 306
2. Bob Edelstein 305
3. Sal Taibi 248
4. Harry Fager 235
5. Allan Martenson 111

Twin Pusher
1. Dave Dodge ..... O.O.S.
2. Bill Bell
3. Mike Poorman
4. Karl Spielmaker
5. Tim Banaszak

Class C Pylon
1. Woody Bartelt 697
2. Tom Lucas 577
3. Bill Hale 480
4. Mitch Post 349
5. Bruno Markiewicz 348

Scale-Gas
1. Bill Bell 132
2. Sid Sutherland 79

Pylon Glo/Ign Cl. AB
1. Bruno Markiewicz 302
2. Jim Robinson 291
3. Louis Black 249
4. Harold Fager 244
5. Jerome Persh 211

Baby R.O.G.
1. John Stott
2. Bob Champine
3. Gene Hartmangruber

Compressed Air
1. John Stott 227
2. Danny Sheelds 165
3. Loren Schmidt 149
4. Karl Spielmaker 145
5. Chet Bukowski 133

Rubber Stick
1. Ray Factor 360
2. Sal Taibi 356
3. Gene Martha 353
4. Alex Dashko 348
5. John Stott 336

Small Cabin (Glo/Ign)
1. Bruno Markiewicz 480
2. Jim Walston 360
3. Bob Edelstein 318
4. Jim Robinson 302
5. Sal Taibi 302

Scale Rubber
1. John Stott 295
2. Bob Moulton 286
3. Bob Bissett 280
4. Chet Bukowski 269
5. Ray Factor 243

Class B Cabin
1. Sal Taibi 653
2. Bill Hale 355
3. Bob Edelstein 337
4. John Lessig 273
5. Bruno Markiewicz 271

Towline Glider
1. Jack Gutens 310
2. Stan Colson 291
3. Paul Nelson 270
4. Chet Bukowski 264
5. Eric Martenson 232

.020 Electric
1. Bob Edelstein 275
2. Larry Fair 271
3. Arnoldo Hernandez 271
4. Fred Movel 203
5. Joe Beshar 120

Class B Pylon
1. Bruno Markiewicz 347
2. Herb Wahl 344
3. John Lessig 341
4. Mitch Post 341
5. Jim Robinson 305

RADIO CONTROL

Texaco
1. Chet Lanzo 2748
2. Jim Buice 1684
3. Loren Schmidt 1641
4. Arnoldo Hernandez 1400
5. Steve Boucher 1223

Class B
1. Bruce Norman 1561
2. Art Peterse 1528
3. Hugo Mercoli 1182
4. Jack Swain 1129
5. Rodgers Barton 1080

1/2 A Texaco
1. Joe Beshar 1427
2. Stew Murray 1358
3. Rodgers Barton 1229
4. Don Schnieder 1217
5. Art White 1110

Flying Near Airports? Be Careful!

Free Flight or Radio Control flying near airports, or in any situation which might involve the possibility of models being in the vicinity of full-scale aircraft operations, must be avoided—or conducted so as to eliminate any dangerous situations. Models should not be flown in the proximity of full-scale aircraft operations unless the flyer has someone else with him for the sole purpose of watching for full-scale aircraft and supervising the flying so as to prevent accident possibilities.

PROTECT YOUR RIGHT TO FLY!

Safe Flying Is No Accident!

Class A
1. Rodgers Barton 1260
2. Joe Percy 1212
3. Bruce Norman 1194
4. Dick Huang 1137
5. Hugo Mercoli 1111

Electric
1. Loren Schmidt 620
2. Dick Huang 480
3. Bruce Norman 426
4. Steve Boucher 326
5. John Pond 274

Class C Ignition
1. Bob Walter 1260
2. Buck Zehr 1249
3. Jim Buice 1113
4. Dick Huang 1064
5. Chet Lanzo 1025

Antique
1. Bruce Norman 1800
2. Hugo Mercoli 1777
3. Joe Percy 1733
4. Dick Huang 1632
5. Esio Grassi 1378

Class C
1. Ralph Turner 1026
2. Bruce Norman 999
3. Steve Mozuwkewich 966
4. Jim Buice 920
5. Joe Percy 870

Well, that wraps up another beautiful SAM Champs. Seems like they get better every time. In the next issue we will run an account of the Old Timer Events at the Nationals. These were the very start of national recognition of old timers, the first being held at Willow Grove, PA in 1965. Getting to be old hat now! •

O.T. Stick . . . *Continued from page 41*

assignment to a highly rated fighter squadron.

The model section started on page 25, with an inside cover photo and headlines for key articles.

First there was the "Thermaleer" by Dan Veronica, a beautiful, streamlined Class C gas model with a span of 76 inches. Full-size ribs for the Chester "Jeep"-style tapered wing, and full-size bulkheads, help in enlarging the plans for construction. In fact, it's so pretty, we'll have to do it some day soon for Model Builder.

Next was "Model Matters," featuring *The Dope Can* (it really didn't mean anything else in those days) by Gordon Light. Then came an article on prop fittings by Dick Korda, top rubber modeler of the day.

Our OT Model of the Month appeared next. If you remember Al Casano's designs, you'd probably agree they were functional, but not always pretty. The sometimes angular outlines cut into what would ordinarily constitute the esthetic beauty of many other designs of the time. In my opinion, however, this stick model was simple, clean, functional, and had a "just right" look about it. Being chicken about heavy rubber motors, I really liked the 3/16 square fuselage construction!

On the next page, Herb Weiss presented an article on model helicopters, "Ceiling Walker" style, but more exotic.

Following three-views of a Douglas DB-7 for France came Part II of Henry Struck's "New Ruler" article (now you know how I found Casano's Stick model . . . wandering through the mag when writing about the "New Ruler!")

After another three-view and a brief article on building a Stinson 105 solid model (you know what a solid model is, don't you? Even plastic models aren't solid!!) We come to the model ads that make old timer addicts drool; kits for a few bucks, all kinds of juicy ignition engines . . . how about an OK Twin 1.2 cu. in. displacement for $35.00 . . . the Atom for $12.95, Miniature Aircraft Corp. scale kits, Midwest's "Jabberwock" for $1.00 postpaid, and so on.

See?! An hour-and-a-half shot already on only 66 pages, and I've been through the magazine hundreds of times since I picked it up 42 years ago. •

R/C Boats . . . *Continued from page 43*

reestablishment of the Deep Vee Class was brought about by those who didn't wish to race in an unrestricted design event like Offshore Class.

Possibly the real question that needs to be answered is, can you legislate equalized competition? Basically, I think the second proposal would be an attempt to do that through restriction in state-of-the-art hull design. However, I don't think it's possible to equalize model boating by simply restricting the type of hull that can be allowed. Your Ed Fisher types would still hold a considerable competitive edge over most others in the class. Guys like Ed are super at boat setup and driving ability. That's a difficult combination to beat under any circumstances.

I personally do not favor banning a model just because it happens to be fast. However, if sufficient numbers of N.A.M.B.A. members feel the Sport 40 Class needs more stringent guidelines concerning hull types, it would certainly be possible to exclude canard designs from the class. The canard design would still be a legal hydroplane design for open hydroplane classes. It will be

interesting to see if any rule changes are forthcoming in the Sport 40 Class.

PAINTING A MODEL BOAT

There are a couple of schools of thought about painting model boats, especially model racing boats. The first group would contend that the main purpose paint serves is to seal and protect the model from the elements and stuff you spill on it. This purpose can be accomplished rather easily by just slopping on some type of paint and heading down to the pond. The second group would contend that the purpose of painting the model is to enhance the beauty of the model or attempt to duplicate a realistic paint scheme. Depending on the model and what I'm attempting to accomplish, I subscribe to both positions.

In many cases, I'll simply brush on a coating of clear epoxy on a wooden boat to seal it so I can try the boat out. This approach is used extensively when I'm developing a new design. Why bother spending a bunch of time and effort on an untried model until it's completely "debugged?" Once the boat is running properly, it can be painted. Most folks however, don't bother with developing new designs. Instead they purchase a kit. In such cases, the builder will probably want to paint the boat prior to running. Unless, of course, he just can't wait any longer to get the boat on the water. And that happens to me rather frequently.

PREPARING THE BOAT FOR PAINTING

The two main materials used for model boat construction are wood and fiberglass. Models built from wooden kits will take more time to prepare for painting than pre-built fiberglass models. We'll take a look at preparing wooden boats first.

After the wooden boat has been completely assembled, it will be necessary to fill in all the pin holes, gaps, or seams with some type of filler material. I have had success using automotive body putty as a filler material. Hobbypoxy also makes an excellent fiberglass filler. These types of fillers can set up quickly, so you'll want to use a bit of speed when applying them. The automobile body putty can cure within ten to fifteen minutes. I prefer the quick curing material as it allows more time to work on the model without waiting around for the filler to set. Care should be taken when applying the filler material to not apply more than is needed or to get it on areas that don't need filling. This material really hardens, and extra sanding can be avoided by judicial application. These materials can be sanded very smooth and make very nice fillers.

When doing the initial sanding of a wooden model, I use fairly course sandpaper; 60 or 80 grit works well to sand the filler material. Use of a sanding block is definitely recommended when sanding a model boat. Be especially careful when sanding edges that are wetted running surfaces. Such edges should not be rounded, but left sharp to sheer the water. Rounded edges on running surfaces allow the water to cling to the hull and increase contact surface, resulting in slower speed.

Most fiberglass hulls require little preparation prior to painting. One area tha sometimes needs attention is the seam where the hull deck and bottom are joined. Automobile body putty or a polyester filler should be used to fill any gaps on a fiberglass hull. Care must be taken when removing excess filler from a fiberglass hull using coarse sandpaper. If the fiberglass hull has a gelcoat finish, the gelcoat can be scratched by the coarse sandpaper. It is recommended that fiberglass hulls be sanded with a 200 grit or lighter sandpaper before painting. This sanding will help assure better adhesion of the paint to the fiberglass surface. If the fiberglass surface is too smooth,the paint will be unable to achieve a good bonding.

APPLICATION TECHNIQUES AND MATERIALS

Painting is generally accomplished by either brushing on the material or spraying. Although some have accused me of dipping my boats in a bucket, I've never employed that technique. The only type of paint I apply with a brush is clear epoxy used to seal a wooden boat. In most instances, spraying will result in a smoother finish than brushing. It's also one heck of a lot faster to spray paint a model.

Not everyone has access to spraying equipment. There are some spray cans available that provide a fine paint for model usage. Pactra's Formula U spray cans offer a variety of colors. I've seen some very nicely finished models using this product. Models powered by glow engines will need a paint that is fuel-proof. If spray cans are to be used, make certain the material is capable of resisting the high nitro fuels used to power many racing boats.

I use a small airbrush to paint my models. Depending on how much you want to spend, such devices can range from around $25 to over $100. Unless one plans to really do some "trick" paint schemes, the less expensive models will suffice for most model painting purposes. Some of the spray units can be operated by use of propellant cans. I personally think these cans are rather expensive if one plans to do much painting. Small air compressors can be purchased to provide the needed air pressure to operate the airbrush. I wouldn't recommend that the individual just getting started in this hobby purchase this equipment. If it appears that this is an activity you're going to enjoy, then consider this type of equipment investment.

There are a number of brand names available to use in painting a model boat. Among those most popular are Hobbypoxy, K & B Super Poxy, and Formula U. My personal preference is K & B Super Poxy epoxy paints. The fast setting characteristic of this paint is especially appreciated. I'm sure there are those who find other brands to be more to their liking. It might be like selecting a

favorite type of beer. If it's something you like, you don't need to spend lots of time justifying your preference. I would encourage the new model boater to try the different brands available for finishing a model boat. They all work well. It becomes a matter of finding the one that you can make work the best for your own particular needs.

THE PRIMING PROCESS

This particular step may be the most important phase of preparing the hull for final paint application. I cannot imagine attempting to do a final painting without first priming the boat. I say this because many pinholes and small cracks go undetected until some type of colored paint is applied. As mentioned earlier, I suggest painting wooden boats with clear epoxy paint to seal the boat. It isn't necessary to do so with a fiberglass hull.

I have used a couple of different types of primer and the one I prefer is K & B Super Poxy white primer. This primer dries quickly and can be sanded easily. I spray the primer on good and heavy and don't worry about any runs that might appear. The primer sands so easily that runs can be taken care of with ease. It's amazing how many blemishes appear after the boat has been painted with primer. This is especially true for wooden boats and boats made of clear fiberglass or epoxyglass.

Automotive spot and glazing putty works super for filling in the small holes and cracks revealed by the primer. This material comes in tubes and is available at most stores carrying automotive paint supplies. Spot and glazing putty is fine for filling small surface blemishes. It is not intended to be used to fill gaps and cracks. Use body putty for those situations.

Use 200 or finer sandpaper when sanding the primer coat. I usually sand just about all of the first primer coat off the boat. Use a tack rag to clean the boat after sanding the first primer coat and apply a second coat of primer. As this is usually the final primer coat, I try not to load it on the boat too heavily. Fine grade sandpaper is used to smooth this primer coat. If more holes, cracks, or gaps are still visible, repeat the priming process until the imperfections are corrected. This is really the most crucial part of the finishing process. The finishing colors will not cover up hull blemishes. If you don't have the preparation process done properly, the final painting is only going to accentuate this lack of effort. Primer is also an excellent material to use when learning how to operate a spray gun or airbrush. If you do get runs with primer, they can be easily removed.

APPLYING THE FINAL COLORS

Before launching into a discussion of applying the final colors, let's consider the actual color or colors to be used. I sometimes think model boaters forget that their boats need to be seen by others. This is especially true of model racing boats that occasionally stop or flip during the course of a competitive event. A model racing boat that stops during a race becomes a hazzard. There are some colors, like black, dark blue, and dark green, that are extremely difficult to see on the water. Just painting the boat a bright color will not guarantee it's safety upon the water, however, it doesn't hurt to have a boat that has a high degree of visibility when it becomes an object to be avoided.

I've been asked how I learned to paint model boats. The answer is fairly simple. You tend to achieve some degree of proficiency with those things you do frequently. I've painted my share of model boats. Reading about how to paint a model boat is not going to make you proficient in this task. It should be mentioned that I've also screwed up my share of paint jobs.

I know the reason behind most of the paint jobs I've messed up. It's called impatience. When I load my airbrush I want to get the job done as quickly as possible. It's getting in too big a hurry that causes most of my problems when painting.

The biggest problem for me and probably for many others is trying to put on too much paint at one time. The end result of this is usually a big sag or run in the paint. It's impatience that causes this to occur. The sage advice here is, "Slow down and do it right the first time."

I'm not going to discuss painting with a brush since I don't use that method. I will share a couple of thoughts about using a spray gun or airbrush as I do have some experience with this method.

Using an airbrush is not all that difficult to master. It's quite a simple tool actually. Before attempting to squirt paint on your model boat, get a feel for the equipment. Read the instructions on the paint to see how much the paint should be thinned for proper spraying application. Practice spraying some smooth surfaces. I use the metal and plastic trash cans I have in my workshop to adjust my airbrush. An important thing to remember when using an airbrush is to move the gun across the surface you are painting. Do not stop the spraying motion as this causes the paint to build up in one area and runs can result. With a little practice you will be able to develop a smooth motion that will result in good coverage. Start the spraying at the ends of the model, not in the middle. Have the spray coming out of the airbrush as the airbrush approaches the model. Don't stop spraying until you have swept past the model. When you are done, clean your equipment thoroughly.

APPLY THE BASE COLOR FIRST

If the boat is only to be painted one color then that's the base color. However, if the boat is to be painted more than one color, it is a good idea to paint the entire boat the lightest shade you plan to use. As an example, most of my boats are painted red, white, and blue. Patriotic, huh? I think they're pretty colors. White is the lightest color, and I paint my boats white as the base color. The white base also makes the red and blue brighter in hue. I have always had better luck painting dark colors over light colors than the other way around. Once the base color is applied, we get to the fun part.

TAPING AND MASKING

I occasionally paint boats for others for a fee. I charge according to how much I have to do. As soon as I have to start masking and taping for color separations, the price goes up dramatically. It takes time to mask and tape a model, but the results can be well worth the time and effort.

When it comes to taping the lines for the color separations, a product that I've found to be excellent is Flex-Mask. It comes in 1/4 inch wide rolls and bends easily around tight corners. Regular masking tape can then be applied over the Flex-Tape, leaving a slight amount of Flex-Tape exposed. If quite a large area needs to be covered, butcher paper can be used to protect this area. Tape the paper to the masking tape. Newspaper shouldn't be used for covering such areas because the newsprint can rub off on the base color and leave a mess. This is especially true if the base color is white or yellow. Two inch wide masking tape can be used to cover areas from overspray.

If you see a boat whose paint job is especially pleasing to you, don't be afraid to ask the owner how it was accomplished. A beautifully finished model shows pride of ownership and very few modelers are hesitant to tell you how they achieved that beautiful finish. With practice and time, you too can learn how to finish a model that brings praise and compliments. •

R/C Auto . . . . *Continued from page 45*

he notices that my boy, Joshua, is working his way down the line of people, asking for quarters. Dick wandered off to ask him what he was doing, turned out that Josh had lost his comb and was trying to round up enough money to buy a new one before I found out about it. The kid was only 7 at the time so begging from strangers was forgiven. And we spent what he had collected on beer, so it had all worked out.

Only a very few of you reading this ever raced the 1/12 scale Gas cars, powered by Cox reed-valve and rotary-valve (TDs) 049 motors, and should probably be thanking your lucky stars for that, although we used to have some great times here locally racing the things. Anyway, the engines ran hot. I mean, *real hot*. To give you an idea of just how hot they ran, one time Don McKay was corner marshalling and a car got stuck on the boards right in front of him. Of course the thing died on idle, but Don picks the car up, flips the flywheel with his thumb and the sucker started right up . . . No glow clip or battery, remember. The racer whose car it was had already gotten down from the driver's stand and was in his pit area, finally Don got his attention and the guy finished the race. Hey, I saw it happen and still find it very difficult to believe.

One story that may not be a real yukker is still one that I like to tell . . . Just to get even, I suppose. When several of us started racing 1/12 Gas cars, which were quite popular around here for a number of years, a very few people, Don McKay included, would always be giving us hints on how to make the cars more reliable and to handle better. A larger group of established racers, with at least one National Champ in their midst, actually got mad because we were being told the "racing secrets"! Word of this got back to us, of course, which made us work all the harder to get competitive. And ever since, just because it is my nature and to show them up for the fools they were, have gone out of my way to tell every racer every trick in the book. The racing got better and today we enjoy really good, clean races still, partly as a result of these ducks quacking about the "new guys" being told all of the secrets.

A FACTORY DRIVER IS HEARD FROM. . .

Here is something that I really am hesitant to use as it is one of those letters where I got a copy and not the original. That usually means copies were sent to

all of the magazines and several of us will be duplicating each other's efforts. I will make an exception to my usual policy this one time, as the letter deserves wide distribution. . .

"I'd like to take this opportunity to congratulate Sierra RC Club on their first annual Peppermill Classic and to thank all the sponsors who made this event possible. Jim McAdory and his staff deserve a big pat on the back for handling 100 plus entries with the speed and efficiency of a well experienced crew.

"However, there are a couple of incidents I would like to comment on They deal with the ever-present 'factory driver' situation. Let me say now that I am presently a factory driver, and feel that much of the 'help or hinder' debate is based on situations synonymous to the two I'm about to relate.

"The first deals with a factory driver getting caught practicing on the track after it was closed by the race director until the next day. The track closure was obviously so no one would have an advantage. Getting caught was naturally grounds for disqualification. The race director then chose to have the drivers vote as to whether or not the driver in question would be disqualified. This action was in my eyes, questionable at best. Without disclosing the driver's name, a vote was taken. The majority voted to let him race. As it turned out he won the main event.

"The second incident was when the officials had decided to put nine cars in the feature race. The 10th qualifier was also a factory driver. Upon finding out he hadn't made the main, he had a discussion with the race director and was then placed in the race as 10th and final qualifier.

"Now take a minute and imagine how this must have looked to the majority of non-factory or independent racers! As factory drivers it is our responsibility to set a good example. After all, we represent the factories and if we don't, who will?

"There definitely is a place for factory drivers in RC racing. But it's not playing politics. It's helping other drivers who drive the same brand of car, helping with advice and knowledge that the factories have passed on to us, and fighting for the lead in that "A" main regional or national. It's helping the manufacturers prove that a win on Sunday means a sale on Monday, but not at any cost." *Eddie Janis.*

One of the reasons for using Ed's letter is that it is straightforward and makes sense. Another is that this is not one of those sour-grapes-after-a-loss-letters. Ed's team would not have won the race had the winning driver actually been disqualified and, from what racers who were there tell me, it was one of Ed's teammates who wiggled his way into the "A" main after coming in 10th for a 9-car field. It seems to me that we need more factory drivers to have Ed's attitude, as displayed in his letter, and to weed out the few (who are easily in the minority, by the way) who always seem to be causing the problems. More accurately, the factories need to look at their drivers and see who is doing them some good in the long run, and then to rid themselves of the ones who only give them a bad name in exchange for a win or two.

At the risk of appearing to place myself on high as a shining example (which I am not), my attitude in racing is, all that matters is a good race. The fight can be for fourth place in the "C" main, but so what as long as it is a good race? Toward that end, and for reasons already mentioned earlier, I have never had a secret trick up my sleeve, in fact will go out of my way to make new techniques known to all in our club. When 1/12 electric started to get hot around here, I was the first with an Associated RC12E, was winning most of the races and not because I am a fast racer, which I'm not, but because I had the best car. There were racers in our club who mumbled about my car having a trick motor in it; we ran Stock class and use of Stock motors was assumed but not enforced with a tear-down procedure. Man, I had the same motor in the car that came with it. It hadn't even been opened up and these guys evidently weren't able to see that I was beating them in the corners, not on the straights. Finally, two of these same racers had to use a real cheater motor to beat me, an act for which they still owe me an apology. But what is the point in winning, or even in racing, if you have to use "tricks?" Is it enjoyable to win a race by a large margin? OK, maybe once it is a good feeling to suck everybody's doors off, just stomp them right in the ground. But the races that are terrific fun and that you really remember are those where the racing and the finish are super-close. Just this last weekend we had such a race in 1/8 scale. In the "A" main, three of us had the lead at one time or another, were always within 30 feet of each other, often closer. Zale Thompson won with a two-corner advantage, and I won a literal drag race to the line by just two inches for second! It was fantastic and from watching all of us congratulate the other you couldn't have told who won and nobody really cared, the high quality of the racing was the important thing, even though later, after all the yelling had died down, Dave Clark was probably wondering about fuel economy, as his car either died just before or right at the finish line in our run-to-the-wire. Hey, guys, you can't put a price on racing like that, it is worth whatever investment it takes and quite often it takes helping others out in whatever specialty you do best, whether it is motors, batteries, driving smoothly or just general car setup.

In my case, at the end of each year's racing season, there were easily several races that I could look back on and see where, had I just kept my mouth shut and not helped somebody with their

car, I could have moved up a couple of positions, possibly even won the race in question. But such thinking is stupid, as every year I look back and see all of the really close, exciting races I have had, even if most of the fights to the finish weren't for first and second.

Think about it, racers, as we aren't talking about just sponsored racers here. Every driver putting his car on the track knows something that can help somebody else. If we all spread the knowledge around there will be more winners and much better racing. •

C/L . . . . . *Continued from page 59*

photo-processing chemicals fresh, in his fuel cans to avoid storing fuel in small containers. This gas (a "gas" like air, not the liquid kind) just sorta floats on top of whatever it sees as the bottom of the can, whether it is the upper level of the fuel or the actual bottom of the can, forming a barrier between the fuel and air. Interesting trick, one that I have never tried.

Flying handles get the once-over around here; they are generally very reliable although wires can fray and plastic parts wear. The flying lines are what need a very close look, the only way to do it properly is to string them out. I place sawhorses out in the street and string the lines between them, clamped at both ends to keep them off the ground. One at a time they are checked full length for nicks and kinks; any bad spots at all relegate them to the status of "borrowers lines," to pass out to those who never seem to come to contests prepared. The lines in perfect condition are wiped down with a rag soaked in WD-40. This product is mostly solvent, which is why it penetrates so well, the solvent cleans the lines, yet there is also a light oiling action to prevent corrosion. Lines are too important to use any that are at all bad and too cheap to justify cutting corners. Remember that when sorting your flying lines from the borrower's lines. And come flying season, it is necessary to again clean the lines, as the wipe with WD-40 is only for storage; I prefer to actually fly with lines that are clean and dry, no oil at all on them as the oil tends to attract dust. At the most, I will wipe a set of lines down with a very light oil at the start of a day's flying, frequently wiping them down with a dry rag just to be sure they are clean. In no case are lines directly out of winter storage used for flying without another cleaning.

Any rechargeable batteries need a general cleaning as well as once-a-month charging during the winter. With NiCd batteries there isn't much to do except to charge them. Wet-cell batteries should be checked for fuel level and topped if necessary. Store any

batteries in a warm, dry place and *do not* forget to charge them once in awhile, a statement I repeat, as it is easy to forget, and it really is important to keep them charged up. Dry cell batteries can also be stored, but by the time you go flying again, will no doubt be pretty weak. Figure out a good use for them, one that does not involve the heating of glow plugs, as the normal 1-1/2 volt dry cell isn't too good at doing that job, even when in the best of condition.

WHAT'S THE HEAD CLEARANCE?

A simple question that not everybody can answer properly, can you? Used to be that just setting the head clearance was a bit of bother, more than most wanted to go to, but if interested in max performance from your engine, you really should be able to set it or at least determine what is stock and then be able to proceed from there if the engine doesn't hum the way it should, or seems to be hard on plugs. The neatest way I have ever come across to do this is now making the rounds of the RC car racers, and the trick is to simply stick a short length of 1/32 diameter resin core solder in the plug hole, rotate the prop shaft a couple of times (by hand, of course!), pull the solder out and using a micrometer, measure the squeezed down end to read the head clearance.

It is real late at night as I write this; possibly that wasn't too clear first time through. So we'll try again. A short length of the solder is bent so as to have an "L" shaped leg on one end, this "L" should be just long enough to reach from the glow plug hole to the side of the cylinder. The length of solder is inserted in the plug hole, positioning it so that the "L" end is between the top of the piston and the squish band on the head. By carefully holding the solder in position and then turning the engine over, the piston will mash the solder flat against the squish band area of the head. With this done, it is an easy thing to pull the solder back out of the motor and then to mike it. The thickness of the mashed end of the solder is your head clearance, although I suspect that there is a tolerance here of a thou or so. No matter, what you want are consistent results; always use the same solder to measure clearance, write down the clearance and refer to these notes when performance comparisons are made. It's a neat trick, easy to do, repeatable, the tools don't cost much, and you don't have to tear the engine down just to check the clearance. •

F/F Scale . . . . *Continued from page 57*

drive us to a Chinese restaurant for a sensational meal. Then over to Ned Kragnes for more talk about airplanes big and small. Ned was the first man to fly a jet (the Bell P-59, I believe) in this country. Needless to say, he had lots of great stories to recount, and many beautiful scale models for us to view.

The next morning we stumbled out of bed and headed for Dulles Airport, and the trip home. If it sounds as though we were busy every minute of our trip, you're right! We packed a lifetime in a week, and enjoyed every minute of it. I'm already looking forward to 1984! •

Stability . . . . . *Continued from page 47*

dihedral angle, the two wings meet the air at different angles of attack. Fin deflection can be regarded as aileron deflection plus sideslipping by the fuselage, and the latter has relatively small effect. Thus, whereas aileron deflection causes a rolling torque directly, fin deflection makes the model crab through the air, and the crabbing makes the model's dihedral apply a rolling torque. At high speed, especially when the model flies steeply upward or downward, the force of gravity may be much smaller than the aerodynamic forces on the model, and the rolling torque will produce continuous rolling. In the glide, thanks to gravity, the bank produced by rolling causes sideslip, and the sideslip acts via the model's dihedral to generate a contrary rolling toque that arrests the rolling at an equilibrium angle of bank. The sideslip causes a side force on the fin, which makes the model circle.

The common cure for spiral diving in the normal regime is to have the rolling torque proportional to g load rather than $(\text{speed})^2$, so that when the pull-up is sluggish in the normal regime, the rolling torque is correspondingly reduced. Ways of doing this are wingtip weight, wings of unequal length, and stabilizer tilt. The first two generate rolling torque by displacing the c.g.

laterally from the center of lift. The last makes the airplane crab toward the low end of the stablizer, and the model's dihedral generates rolling torque.

IMPLICATIONS OF SUPERSTABILITY FOR MODELLING

"Modelling" here means using a model to predict the behavior of a larger airplane. Making a model smaller is known to reduce its lift/drag ratio. It will probably also increase its stability, so it will fly with its balance both farther forward, and farther aft than will its larger counterpart. This could lead to sinister forms of overoptimism.

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Peanut . . . . . *Continued from page 49*

little extra on the interplanes for trim. Notch out the fuselage sheeting to allow them to mate to the longerons with the tip of a sharp No. 11 blade. When these cement joints are about set, glue on the top wing, adjusting everything into alignment. Slide in the lower wing and recheck alignment.

The canopy will only look right if vacu-formed. Mask off and color with yellow enamel to match your tissue. Side windows are outlined with narrow strips of plastic tape painted yellow and black. The cabin fresh-air scoop is made separately. Don't forget to put in a 5/16 scale pilot and build up the overturn structure from slivers of bamboo painted gray before mounting the canopy.

The exhaust stacks must be lightweight and they are huge. Try this. Carve and sand a crescent-shaped piece of foam long enough for both stacks and slightly under-diameter. Spiral-wrap with five or six layers of 1/8 inch wide tissue strips held down with white glue. When set, sand the "papier mache," coat with more white glue and cut off to the proper lengths. Drop a little acetone on the foam core to dissolve, swab out the goo, and presto . . . light, realistic stacks

Paint flat black inside and out.

The three-bladed prop lets the diameter be small enough for take-offs. Plywood makes tougher blades than balsa for about the same weight. Form a little twist in them by soaking and strapping to a two-inch can or bottle at 15-degree forward skew. Use small amounts of epoxy to hold the parts together and blend the hubs to the blades by sanding with an emery board to achieve static balance. Pitches in the range of 1.7 to 2 times prop diameter seem to work best for my light, underpowered models. Bend the .020 wire shaft over and epoxy to one of the toothpick hubs before cementing on the spinner. Install a 12-inch loop of 3/32-inch rubber and check the balance.

The rigging, for a biplane, is relatively simple. I use two-pound nylon monofilament on a small needle, pushed through at the proper points. Fasten with a small dab of thinned Ambroid on a pointed stick after all slack is pulled. Not necessary structurally, but it looks good.

The scale trim tabs are right for flight adjustments. Bring your small brush and a little acetone to your test-flying session. Soften the cement on the proper side of them to set needed adjustments. Mine flew naturally in wide right circles, which is best for biplanes.

If you really want to build this Peanut and just can't figure a way to make the canopy, I'm willing to sacrifice one of my apparently irreplaceable Mattel plastic sheets. Send me a buck to 5604 Cedarwood Street, Farmington, NM 87401, and I'll make you one. •

Cessna . . . . . *Continued from page 54*

time for the '80 FAC Nats, it took another two months of fooling around to trim her out, including the construction of two enlarged tails. But by the Fall of 1980, it was flying well enough to capture the Thompson Trophy at our Fall meet, a feat that was repeated in 1981. This model is not for the inexperienced or the faint-hearted. It required a great deal of patient trimming, and, for reasons bordering on the supernatural, has shown a fondness for landing in trees . . . very high trees at that . . . but with those two trophies now on the shelf, I have forgiven her these eccentricities. Perhaps my accumulated experience will make things easier for you.

Building the Model

Fuselage: This is constructed using the familiar half-shell technique. Although most of the stringers are 1/16 square, the upper "backbone" and top-and-side stringers are 3/32 square stock. All of the stringers, as well as the 1/16 sheet bottom keel, should be stripped or cut from firm balsa. Only the general locations of the stringers are indicated on the former patterns, because a neater job will be achieved by notching the formers as you go along. Note that Former 3 is doubled and cross-laminated. A 3/32 square wing rail is added to the completed fuselage between Formers 3 and 6. The wing rail may be tapered if you wish to build in some wing incidence.

The cowling is of composite construction. It is best made as a separate unit and then glued to the fuselage after both have been finished. Begin by making a drum-like structure with 3/32 square stringers, top and sides, and 1/16 square stringers between, from Former 1 to 2. The front of the cowling is made up of several circles of 1/8 balsa, cross-laminated, the last few of which make up the dummy cylinders and crankcase; the nosebutton is an integral part of the latter structure (see photos for the details.) I found it necessary to incorporate a rubber band noseblock holddown in order to insure that the prop assembly would not slip out at an inopportune moment during a race.

The "drum" is covered with stiff paper, after which the front of the cowling is sanded to the correct contour. The rocker arm blisters are tedious to make from scrap, but are authentic and a nice touch besides. The completed cowling was given several coats of sanding sealer and sanded with 400 grit paper between coats before being painted. The cowling has never been damaged, even when the model has

dived straight in.

Tail surfaces: These are quite straightforward. In order to keep the tail surfaces reasonably light, I used 1/16 inch stock for both the sheet outlines and the supporting members. Consult the plan to distinguish between 3/32 x 1/16 components and those that are simply 1/16 square. When the fin-and-rudder structure has been assembled, use scrap to build up the lower portion so that it conforms to the fuselage contours. The tail surfaces are made in such a way that a generous stab slot remains for adjustment purposes. After trimming, the slot can be tissued over.

Wing: The trailing edge is made from two lengths of 1/16 square stock laminated together with thinned white glue. A similar procedure may be followed for the leading edge, using two 1/16 x 1/4 pieces, even though I had used a cut piece of 1/4 inch sheet on the original. The remaining construction is coventional.

Finishing: Except for the cowling, which is painted red, the entire model is covered with yellow tissue. As durability was a more important consideration than weight, the model was covered with domestic tissue, not Japanese tissue. The red trim (side stripes, wing and tail scalloping, and wing registration numbers) was accomplished by doping red tissue directly to the yellow base. The same was true of the black "27" race numbers on the wings and fuselage sides. You may want to make peg anchors at fuselage Formers 7 and 8 in order to experiment with their effects on the flying characteristics of the finished ship. The wheels, of course, are in the retracted position, which was simulated with black tissue semi-circles and inked pants outlines. Control surfaces were likewise inked with a .5 mm technical pen.

Flying

My CR-3 uses an 8-inch plastic prop and is flown on four strands (two loops) of fresh 3/16 SIG rubber, 30 inches long. Trimming, as suggested earlier, was something of a nightmare. My model required about two degrees of negative stab incidence and a small amount of noseweight (don't forget that the cowl was deliberately made to be heavy). In addition, several degrees of down and right-thrust were shimmed into the noseblock in order to get the craft to fly right under power. Just remember that the real CR-3 exhibited dangerous instability and vibration on its early flights. The problems were corrected in the racer and they can be in your ship, too. •

Soaring . . . . . *Continued from page 33*

into his record flight, and it was never recovered. No great loss, there was another set around Ed's garage that wasn't being used from an earlier Gemini prototype.

Then came what looked like the end for MTS number 1. A week before the semifinals, Ed was launching off Gary Ittner's hot FAI winch, which he pushed to the limit, and good 'ol Numero Uno finally broke its center section a hundred feet up. Well, it crashed kinda hard and finished off the center section some more.

The only problem was, Alex was planning to borrow #1 for the semis the following week.

The morning of the contest (6 a.m.) he finished covering the new center section. This time he made it stronger than before, with a bigger spar which he extended all the way out to the Monokote for extra depth. Too bad he didn't have time to put on the cap strips!! Can you imagine what that 15% thick airfoil looked like sans cap strips!??

Alex nick-named his conglomeration of Gemini parts, "Rent-A-Wreck." And nobody would have taken a serious look at the darned thing if Alex hadn't flown this untrimmed, unproven MTS to the best top speed of the meet!!! It's true, he was the fastest. Try 26.1 seconds. I think he's headed for a new nickname.

The final outcome was: Ittner, first (TAI-PAN); Odle, second (RO-15); Bower, third (Gemini MTS); Jolly, fourth (Focus); Mike Reagan, fifth (Lyre Bird 9); Mike Charles, sixth (Focus).

We can apply F3B technology to our own designs and improve them. Here's one idea that we can use to strengthen our wings. If you've ever broken a wing while launching a glider or had it blow up in a high-G maneuver, this might interest you.

Most of you have probably heard of carbon fiber spars. They're the ones with lots of strength, right? You'd better believe it! The following method of making carbon fiber spars was developed by Mike Bame (as far as I know), and is a very effective way of beefing up your next set of wings.

As I have illustrated, this method is a composite spruce/carbon spar, not truly a pure carbon spar. However, this method could be used for a solid spar just as easily.

What you need to do is decide how wide a spar you need to make. Three-eighths of an ince is a pretty common size, but for a really beefy spar, 1/2 inch is better. Once that is decided, you need to buy either a 3/8 or 1/2 inch extruded aluminum channel and a steel bar (square) of the same measurement. Check to see that the bar slides freely in the channel or it will be useless to you. The channel will generally run a few thousandths wider than the bar, and this won't be a problem, but check anyway.

Next, you need carbon tow, epoxy, and the proper size spruce spar cap.

If you don't have an outlet for carbon or epoxy near you, try California Custom Yachts, 531 N. Francisca Ave., Redondo Beach, CA 90277; phone: (213) 821-6762, UPS freight service anywhere in the U.S. They have both the 1 inch carbon tow (6 inch also) on 100 foot rolls, and the epoxy (West Systems, by Gougeon Bros.). You might try Aircraft Spruce and Specialty, 201 W. Truslow Ave. (P.O. Box 424), Fullerton, CA 92632 for Safety-Poxy, which is reportedly a good epoxy with low toxicity and good wet-out qualities.

Basically, the procedure is simple. First you take a good mold wax (or floor wax with a lot of carnuba in it) and wax down the channel with it. Repeat the waxing once. Wipe out any excess wax. Then

take your 1 inch carbon tow and cut it to strips the size of the channel. Mix up some epoxy and pour it into the channel (a small bead down the length will do nicely). Spread this bead out. Now carefully place the carbon tow on top of the epoxy and with a squared off popsicle stick carefully dab the epoxy through the tow. You will probably need to put a little more epoxy over the tow and work it through to fully wet out the fibers.

Continue to add layers of tow, being very careful not to trap air between layers and to wet out the fibers . . . very important! In the end, the less epoxy left in the fibers, the stronger the spar will be, so don't just glop on a lot of epoxy. Next, place the spruce cap in the channel, making sure that you don't trap air here either. Now, place a thin plastic sheet over the channel (trash bag plastic would be okay). The square metal bar goes over the plastic next.

If you have an encyclopedia set, or anything heavy (100 pounds or more would be about right), stack it on top of the assembly. This will compress the fibers together and hopefully squeeze out excess epoxy. Let it cure overnight or longer.

If you did it right, the bar should pop right out. With a little force, the spar cap should also pop right out. Trim off the excess epoxy that oozed out overnight using a file and sandpaper. That's it! If it sounds simple, that's because it *is* simple. This process adds very little thickness to the spruce cap so that it can be easily incorporated into a stock kit by sanding the spar notches in the ribs a little bit. If you so this, beef up the shear webs too or all will be for naught. You shouldn't need to fear a good 12-volt winch again!

This type of molded spruce and carbon spar was used by Mike Bame on his "Illusion" two-meter which was launched off the Gorilla winch at the semifinals at Carson, California. There probably isn't a winch made (that would be practical) that could break those wings.

Another FAI/F3B spinoff that I could see being useful to the more advanced builder is fiberglass wing skins over foam cores. This is by no means a really new idea, but one that is now becoming more popular among those fliers seeking that little extra gimmick to make their sailplane more flashy or efficient.

In principle, the idea is again, simple, but this time the execution of the idea will require special tools. The idea is to lay up a fiberglass skin on a thick sheet of mylar then transfer this skin to the foam core and press it tight against the core by means of a vacuum bag and pump.

The mylar keeps the outer glass skin as smooth as . . . well . . . glass, and the atmospheric pressure (up to 14 pounds per square inch is available) bonds the epoxy and glass cloth to the core with completely even pressure.

The special tools would, of course, be the vacuum pump and the foam core cutter. The cores can be cut by someone other than you. Hi Johnson's catalog is full of cores that you can order. Write to Super Wings, 11015 Glenoaks Blvd., Pacoima, CA 91331, or phone (213) 899-4312. I believe custom cores can be purchased also . . . you provide the templates to their specs.

Mike Bame will also cut foam cores to your specs, but I suggest you write to him first and tell him what you would like to have cut. He could advise you on many things related to foam core wings. His address is 830 26th St., Santa Monica, CA 90403.

As far as the vacuum bag equipment goes, well, next month I'll show you how I did it with some readily available stuff for very little money.

That's it for now, remember, if you want this column to reflect your interests, I've got to know what they are. If you have something that you feel other glider guiders should know, write me at 487 Mesa Rd., Santa Monica, CA 90402. Good lift. •

Big Birds . . . . . *Continued from page 30*

. . . the Waco ARE. I just received my set yesterday and spent a most pleasurable two hours just "browsing" through them. Now it's true that Brisighella's getting old, but no matter how adversely any of his other functions have been affected by age, his mind and his hands can still work together in harmony and turn out great plans . . . the kind that make you behave like one of Pavlov's dogs as soon as you roll them open. Tell you what, if you don't get the instant hots to build this tail-draggin' cabin bipe, then you ain't got no soul and should stick to kits that have those "training wheels" found on the "smaller stuff."

Before I received these Waco plans, I figured that I'd live to the ripe old age of 150 . . . 'cause that's how much time I was gonna need to complete all the BIG Bird projects that are lined up. Now,

INDEX TO ADVERTISERS

CLASSIFIED ADS

Non-commercial (personal items) rate is 25 cents per word, with a minimum of $3.00. Commercial rate is 40 cents per word, with a minimum of $5.00. No advertising agency discounts allowed.
All ads are payable with order, and may be for any consecutive insertion period specified. Name and address free, phone number counts as two words. Send ad and payment to: MODEL BUILDER, Classified Ads, Box 335, 621 West 19th St., Costa Mesa, CA 92627.

WANTED: In excellent shape, mfgr's desk models with stands: WR or RB-57 (long wing version), U-2, X-15, all other X-1 through X-5, D-558-I and II Skyrockets. L.J.B., P.O. Box 997, Ocala, FL 32678.

CLEVELAND'S 1400 AUTHENTIC, prototype practice scale flying model plans, 1/32-1/4 size. Pictorial catalog including prices $1.50. Price list alone 60¢ or SASE and 25¢. Cleveland Models, 10307M1 Detroit, Cleveland, OH 44102.

WANTED — OLD MODEL ignition engines, cars, etc. Paying top dollar. Bill Simpson, 7413 Via Lorado, Rancho Palos Verdes, CA 90274. (213) 377-3532.

VIDEOTAPE — Two hour tape of 1982 1/8th Air Force scale fly-in. Unedited. $40.00 P.P., specify VHS or Beta format. Wright Enterprises, 13315 Chico Rd. N.E., Albuquerque, NM 87123.

KITS CUT from full size plans. Send $2.50 for catalog. Repli-Kit, P.O. Box 2066, Inverness, FL 32650.

FOR SALE: Two Helicopters; Shark 60 and Revolution. Both for $350. Mike Turner, 3200 E. Genesee, Saginaw, MI 48601.

AVIATION MAGAZINES from 1947: M.A.N., Air Trails, R.C. Modeler, etc. Send large S.A.S.E. and 50¢ for list. Pappy Colvin, P.O. Box 251, Wilcox, AZ 85643.

WANTED: Built, for Static Collection; Sterling Kits; #P-2 Monocoupe, #P-5 Stearman PT-17, #E-4-P-40, and #E-15-P-61. Super clean! Will pay for photo. L.J. Blum, P.O. Box 997, Ocala, FL 32678.

ENGINE COLLECTION SALE: The collection consists of 450 powerplants, many in excellent condition, included are spark ignition, glow, diesel, and CO2 units. All have appropriate plugs and accessories and have been carefully inspected and described in an eight-page list, offering 115 groups of four engines each. Send one dollar and legal size S.A.S.E. with 2 stamps to: Granger Williams, 181 Pawnee, San Marcos, CA 92069.

thanks to Dario and his new "ARE" plans, my lifespan has just taken another jump.

There is one thing terribly wrong with Dario's plans; only two (the "Starduster Too" and the "Waco ARE"— are available (so far).

HIRSH SAW TABLE ADDENDUM

In my infinite widsom I gave you everything you needed to know about the saw table (BIG Birds, July '82) . . . except the Hirsh Company's address. You see, it never dawned on me that the table might not be available in all parts of the country, and as a result, a lot of frustrated guys wrote demanding to know the Hirsh Company's address so they could find out where the nearest dealer is.

I apologize for leaving so many hanging, but here, at last, is their address: The Hirsh Company, 8501 Central Park Avenue, Skokie, Illinois 60076.

And while you're looking at the saw table, take the time to check out their router and sabre saw table, and their $29.95 work bench; all good items. . .

NON-SCALERS! ARISE AND BE COUNTED. . .

It's been slim pickin's for the sport flyers who don't want, or need, scale type birds. These guys want fast building, good aircraft that look better (more realistic) than a Big Stick, but that don't have to be a miniature of anything full-size.

And Bob Johnson, (R&R Models, 1611 Red Bud Dr., Northwood, Ohio 43619; 419/691-6525) seems to have answered the call for help with his "Snapper." Although I haven't (yet) built one, I have had the pleasure of flying two of them; both Snappers weighed 17 pounds and were "snappy" (pun intended) performers with out-of-the-box, stock Quadras. The two owners kept raving about the quick building; I would have been more than happy even if the bird took twice the time, considering how much of a superb flying machine it is.

I've since talked to a few other "Snapper" owners and found out that 16-17 pounds is a very realistic gross weight, unlike so many other kits that should have their "flying weight" changed to read . . . "Wishful Thinking Weight." According to every one of these guys, building and flying the "Snapper" was pure delight; a couple of them admitted that they pretty much hated to build, but found this kit to be less objectionable than anything they had tried.

The finished product has eye-appeal. "It looks like it might have been a home-built," is the remark I kept hearing, over and over again. Even spectators like its simple, clean lines (the two I flew had cowls, which really dressed them up), and were anxious to see the birds perform. Both airplanes had pilots in residence, which added a bunch to the "home-built" image.

My coordination and sense of timing have gone downhill enough to make me feel uncomfortable with most fully aerobatic BIG Birds (that's why I love my C-3 and other puddle jumpers). But not so with the "Snapper." In spite of being a pretty clean, fast machine, she's honest and predictable; like handling a good road car. Gotta admit that both "Snap-

pers" made me look as though I was in complete control and knew what I was doing all the time. What more can you ask of an airplane?

The "Snapper" has been joined by another kit called the "Stinger," which looks a bit like a super-size Kaos (a la tail dragger). It uses the same 86 inch wing and, not too strangely, also grosses out at 17 pounds. And almost ready for kitting is Bob's new "Snapper Twoo" (dontcha love that spelling) that he touts as being "a much needed, non-scale, non-descriptive aerobatic bipe." Since Mr. Johnson didn't lie about the "Snapper," I've got to believe what he says about his new bipe, especially the "non-descriptive" (?) part.

If you don't give a hoot about scale, but appreciate an easy building, nice looking, excellent flying machine . . . then do give R&R Models a toot.

PHOTOS AND COLOR NEGATIVES

Like any other columnist, I'm always on the prowl for good pix . . . but I've had to return quite a few 'cause they weren't usable. So to help us both out, here's the skinny on photos. . .

B&W glossy prints (at least 4x5) are preferred; please no Polaroid prints because: 1) the quality is usually poor, which makes for l-o-u-s-y magazine pics, 2) they're much too small and always lack the necessary detail we all look for. And please remember, guys, that I can't return the B&W prints that are used! *(Correction: If you want 'em back, put a sticker with name and address and "please return" along the bottom edge of photo. wcn)*

Now, most of you don't have a darkroom, very few use B&W, and shoot only color. No sweat, 'cause I can make good B&W prints from color negs (no slides) and promise to take care of each and every frame as if they were my own negatives. Please include a SASE so I'll know you really want the stuff back. And keep in mind that the pix don't have to be limited to flight line and flying shots; interesting workshop activity and con-

R/C MODEL BUILDER's 40 BEST SELLERS!

SEE PAGE 100 FOR ORDERING INSTRUCTIONS. COMPLETE PLANS LIST SENT WITH EACH ORDER.

No. 6781 LOCKHEED P-38L $12.00
R/C Sport Scale, balsa and ply const., a trophy winner, big, 8' span. Art Johnson.

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Continually popular genuine R/C trainer for .19-.35 eng., 72" span. Bill Northrop.

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First gas model kit by Megow, 1937. Span 7 ft. Redrawn by Phil Bernhardt.

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Natural finish mahogany planked 40" OA "African Queen" type Kilburn Adams.

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R/C funship, looks like giant rubber stick model Superb trainer By Tex Newman.

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Easy to build & fly semi-scale R/C home-built, like C.W. Jr, .09-.15. Chris Moes.

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Sport scale biplane for 3-4 channels and .19 engines, 40" span. By Bill Northrop.

No. 4801 BRUSHFIRE $6.00
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Semi-scale twin rotor R/C autogyro for .35 engines. Very stable. By Skip Ruff

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Rubber stick winner, '40 Nats. Span 4½'. Still good in Unlim. By Phil Bernhardt.

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Classic high wing 1936 'C' cabin gas job. Span 64". Redrawn by Phil Bernhardt.

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Chet Lanzo's famous "Record Breaker." Two large plan sheets By Phil Bernhardt.

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R/C tunnel-hull outboard constructed of plywood, for K&B .21. By Jerry Dunlap.

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Complete plans (3 sheets) for R/C tug. All wood, 37" LOA. By Francis Smith.

No. 7724 TRAVELAIR '2000' $5.00
Two inch full scale Classic R/C biplane Proven flier, 60 power By Bill Northrop

No. 7721 FAIRCHILD 51 $3.50
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Rubber powered, 24-inch scale seaplane An excellent flyer. By Walt Mooney

No. 579-O.T. TAYLORCRAFT $12.00
Quarter-scale in 1941! Famous 9-foot design kitted by Miniature Aircraft Corp.

No. 10753 SUPER PUP $3.00
Profile C/L stunt ship for .29 to .36 power, 42" span. Easy-built. Mike Parenteau

No. 8781 R/C VELIE MONOCOUPE $9.50
Light-weight 1/4-scale for belt reduction electric power, 90" span. Bob Boucher.

No. 4733 PEA POD $4.50
A 36" long R/C sailboat easily made of 1/8" Luan mahogany Clever sail control Full size patterns. By Tom Protheroe.

No. 5761 ALBATROS $5.50
R/C sport scale post-war German lightplane. Span 74", .36 eng. By Jeff Breece.

No. 176 O.T. KORDA WAKEFIELD $2.50
The classic of all rubber powered competition free flights By Phil Bernhardt.

struction photos are also most welcome 'cause these help to get a lot of guys off their collective duffs once they see what others are building. And it's okay to have you or your dog in these pix . . . so try to get that canine to smile.

If you can, photo coverage of BIG Bird Fly-In's, and especially IMAA Fly-In's, would be absolutely great and very much appreciated. Oops . . . almost forgot to mention that the only negatives I can work with are 35mm; I'm not set up to handle any other size.

So there it is guys. All you need to know in order to get your pix into "BIG Birds." And don't forget to include all the information that goes with each picture . . . but *DON'T* write it on the back of the photos; list all the data on a separate piece of paper (do the same if you're sending negs), please.

TIP OF THE MONTH

"After things have gone from bad to worse, the cycle will repeat itself."

Al Alman, 2609 Burningtree Ct., Arlington, TX 76014. •

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

the Contempo hobby line. Claude Mischler, owner of Acmex, expects an excellent response to the Homelite built, Magnum 11 engine.

Modelers and customers should write to Contempo Hobby Products for the name of their closest dealer. Contempo Hobby Products, 11611 Cantara St., North Hollywood, CA 91605, or call (213) 768-2800 for more information.

★ ★ ★

The latest offering from W.E. Technical Services is its one-sixth scale, R/C model of the famous British "Puss Moth." This is one of the first large R/C versions to be made available. Spanning 73-1/2 inches and using a .20 engine, full scale lightplane flight performance is assured. A .40 may be used by those desiring more spirited performance. Scale rib spacing is provided, along with rearward folding wings, as on the real aircraft, for easier handling and flight preparation. Markings and details for several historical Moths are provided on the plans. Plan and pattern set, No. RC6S-3 includes three full-size blueprint sheets, instructions, and a complete bill of materials. Price is $14.95; please add $2.00 if you wish it sent in a mailing tube. W.E. Technical Services, Inc., P.O. Box 76884, Atlanta, GA 30328.

★ ★ ★

If you would like the satisfaction of building your own ply and balsawood aircraft model, but at the same time desire close tolerance parts that don't need refitting during assembly . . . a kit with which you can open the box, add glue, shake well, and it's done . . . consider the "Shrike," by Wolff-Pak. This shoulder-wing, 60-inch span, tail-dragger, for .25 to .45 engines and 3 to 4-channel radio, builds from an all wood kit of machine cut balsa parts, and precut, shaped, bevelled and drilled ply and hardwood parts.

The Shrike's complete hardware package includes an ounce of CA glue, spinner, fuel tank, silicone fuel tubing, hinges, horns, pushrods, tail wheel, glass cloth, wing bolts, screws, aileron horns, etc. Landing gear is preformed and slips into bulkhead. Fuselage sides are notched, as are the wing leading and trailing edges. Average assembly, less covering, takes four to six hours. A 20-page manual leads the way through construction.

Introductory price is $68.00 and available at your local shop, or contact Wolff-Pak, 4517 Morning Wind Pl., Ft. Wayne, IN 46804, phone (219) 432-4324. •

Workbench. . . . *Continued from page 6*

in the 20 to 30 pound range don't bother me. In fact, the latter models don't have to wait for almost dead-calm conditions in order to fly, as would some of the Mammoths.

While the Super-Monsters (the 50 to 150 pound beasts with huge single/multiple engines) are interesting to look at, and the power and weight of them is mind-boggling, they really aren't

"model airplanes" in the normal sense of the words. We must also keep in mind that we, our models, the people around us, and in most cases, the sites on which we fly, are covered by AMA's insurance, and though no personal injury Super-Monster accidents have occurred at this writing, the higher potential exists wherever they are flown.

Understand this: I am not against the building and flying of these Super-Monsters . . . . I'll beat everyone out the door to go see them. But I am against their being included within AMA's coverage of model airplane activities. Therefore, I have proposed that: "Model aircraft weighing in excess of the current maximum amount specified in any AMA competition category shall not be permitted to fly in AMA sanctioned compe-etitions, in AMA insured activities, or at AMA insured flying sites." There is no need for AMA's responsibility to go beyond the maximum limits imposed by the model specifications in its current rule book. In the 1982-83 book, that weight limit is 40 pounds.

As a side note: perhaps the company that now insures the AMA membership can provide individual insurance to modelers who wish to build and fly aircraft in the Super-Monster category; over 40 pounds and powered by engines larger than the specified limits in the AMA Rule Book.

THAT OCTOBER COVER

Just today we were repackaging the painting which was reproduced on our October '82 cover, and lo and behold, there was an unopened letter (relax Post Office, it came by UPS!) at the bottom of the shipping container. After reading the letter, it became obvious that there was a lot more we could have told you about artist Bob Benjamin in our October *Workbench* column.

"As I have mentioned in our various phone conversations, I am an active modeler in the areas of control line, gas and rubber sport free flight, old timer free flight (through SAM 8), R/C . . . with the emphasis on scale, and am succumbing rapidly to the temptations of antique engine collecting. I also fly the 12"-to-the-foot type airplanes; specifically, my 1946 Cessna 140, and am active in EAA locally.

"My artwork energies are devoted to aviation subjects, and I actively solicit custom work to individual client specifications. In 1980, I completed two large aircraft paintings on commission for the Commander of the Royal Flight of the Sultanate of Oman, for presentation to His Majesty the Sultan on Omani National Day in November of that year.

"I'm affiliated with the Aviation Art International gallery in Scottsdale, Arizona, and am one of the original 13 members of the International Society of Aviation Artists, a new honorary group dedicated to the promotion of professional quality fine art devoted to aviation subjects. ISAA's credo reads in part, 'to promote and preserve the beauty and wonder of the pheonomenon of flight

by paying homage to its environment, the machines, and the men and women whose efforts have thrust us toward the final frontier.' "

It's quite an honor to have an artist of this caliber grace our cover with his work. Bob his agreed to do others for us, hopefully coordinating subjects with construction articles, as occurred in the October issue. At some time in the future, limited edition full-size (22 x 28 inches) litho prints, suitable for mounting and framing, will be made available. These high quality reproductions will be individually numbered and personally signed by Bob Benjamin. Estimated price is expected to be about $50. If this offer interests you, please drop us a note, or call, so we can determine the quantity required.

NOVOTNIK JOINS MB

The model industry rumor mill is faster than the speed of light, so the following is already history to members of that fraternity. However, for those of you who are "out of touch" . . . Al Novotnik, a long-time member of the *Model Airplane News* staff, has joined Model Builder Magazine as Advertising Representative. Al will operate from his home at 4 Beverly Place, Norwalk, CT 06850, and his Model Builder business phone is (203) 847-7478.

While the world is his territory with respect to the solicitation and acceptance of new advertising, Al will also render service to existing advertisers located east of the Mississippi. The home office in Costa Mesa will continue service (all right, you farmers, stop giggling!) current advertisers west of the Mississippi and overseas.

CHANGE OF ADDRESS, AND. . .

By the time this reaches you, Bill Forrey, our new *R/C Soaring* columnist, will have a new address. It is 1843 Pomona Ave., Unit C, Costa Mesa, CA 92627. We don't know as yet what his new phone number will be at home, but during normal 8 to 5 working hours, it will be (714) 645-8830. If that number sounds familiar, it's because you may have called Model Builder recently. Yes . . . Bill is becoming a regular member of MB's staff as of September 1, 1982 . . . not just to write the soaring column, of course. He'll be working into the position of Art Director, taking over some of the duties now belonging to this writer, who will give them up without a fight!

NO CHANGE OF ADDRESS

For Al Alman, that is. Perhaps they found out what he's *really* like, or maybe they don't allow you to move up to Puyallup, Washington until you know how to pronounce it. But in any event, Al's address, until further notice, remains at 2609 Burningtree Ct., in Arlington, Texas 76014. Hmmmm . . . maybe those June bugs took exception to his derogatory comments and ate up the tires on his VS bus!

CHANGE OF PLANS

Our Plan No. 3824, the Blackburn Monoplane, is being removed from the next printing of our Full Size Plans list, and the plan itself is no longer available through Model Builder. You may still obtain the plan, however, from Model & Allied Publications, Ltd., Box 35, Bridge Street, Hemel Hempstead, Herts, HP1 1EE, England. Ask for Plan No. FSP/567 (as originally published in the November 1954 issue of *Aeromodeller*). The last known price, according to our MAP Plans Book, was 2.40 pounds British, plus 45 p for postage. Check your bank for current exchange rates.

PETTIT PAINT POINTERS

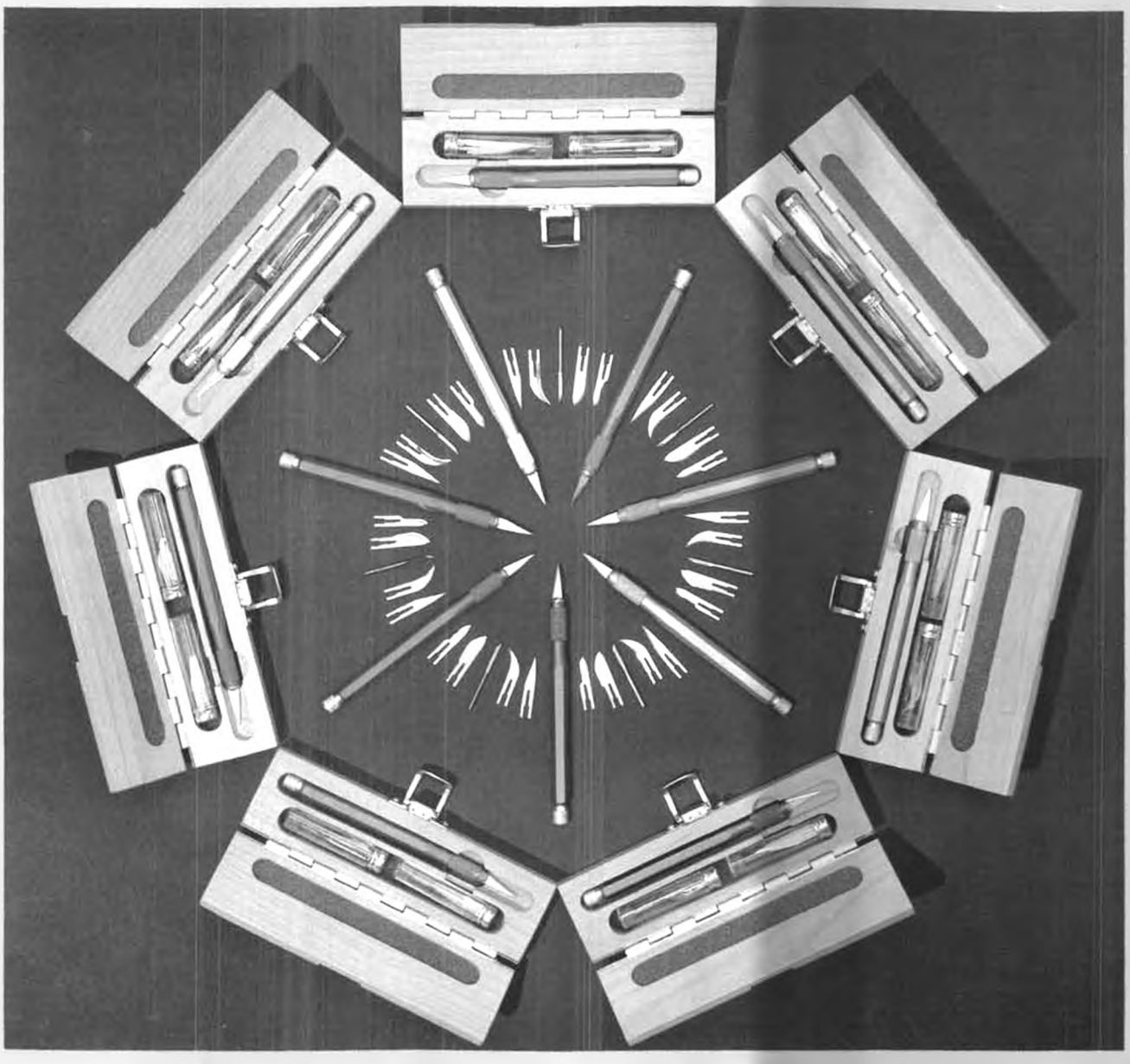
If you haven't done so already, check Bob Underwood's *"1 to 1" R/C Scale* this month for information about mixing Pettit Paint Company's Hobbypoxy paints to match specific military aircraft colors. Arriving too late to add to his column, here are two more military color formulas.

To get U.S. Navy Sea Blue, FS35402, as used in WW-II on Corsairs, Hellcats, etc., mix three (3) parts H81 Black, two (2) parts H33 Stinson Green, and one (1) part H24 Dark Blue.

For Intermediate Blue, FS35164, which was used in combination with Sea Blue in early WW-II three-color U.S. Navy camouflage schemes, mix four (4) parts H70 Gray, three (3) parts H66 Dark Red, and one (1) part H24 Dark Blue.

Of course, with both formulas, add an equal quantity of Part B Flat Hardener for the proper matte finish. •

IN THE BEST CIRCLES, IT'S **über skiver**



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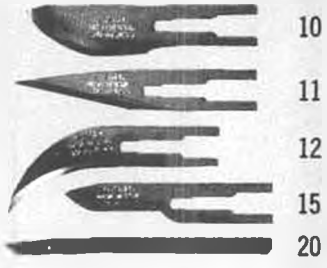

Available in seven satin anodized handle colors: silver, blue, red, green, gold, copper, violet. Complete set in fitted hardwood case; includes uber Skiver, together with two vials containing four No. 11, and one each of Nos. 10, 12, 15, and 20 . . . . . $14.95
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(No. 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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621 West Nineteenth St., Costa Mesa, California 92627

If you're a flier who thinks R/C trucks are "for the birds," it's time you looked at our Toyota Hilux Pickup Truck kit. It features the kind of high performance, component engineering that has R/C pilots flocking to their hobby shops.

R/C Engineering that soars to new heights . . .
Now you can speed up, change gears, steer and switch from 2 to 4 wheel drive while the truck is in motion . . . all from your radio transmitter. **Features include:** an all new electronic speed control for smooth, powerful acceleration. We've coupled this to our factory assembled 3-speed transmission for power and control in all speed ranges. This is technology that'll impress the most die-hard R/C fliers.

Built tough to take the roughest landings . . .
We've given it a rugged metal ladder frame, and semi-pneumatic tires with plastic inserts for sidewall strength. It soaks up the kind of punishment that would easily ground other rigs. And like the prototype, it has locking wheel hubs . . . to go from 2 to 4 wheel drive. And to keep you on the run, it's complete with our new 6V-4000 MAH nickel-cadmium battery pack for up to 30 minutes of uninterrupted fun. This is no ordinary R/C vehicle, this is MRC-Tamiya 4-wheel drive, that has everyone flying high . . . over the dunes, up the mountains, through mud, water and obstacles no other off-road could handle. If you think planes are the only way to fly, see MRC-Tamiya's new Toyota Hilux Pickup, and put yourself on the road.

MRC-TAMIYA'S 4x4 PICKUP HAS R/C FLIERS SHIFTING GEARS.

This sophisticated engineering breakthrough is putting fliers on the road for the first time.

Specifications:

Length: 16¾"
Width: 8¾"
Height: 7"
Min. Ground Clearance: 1¼" (underneath differential case)
Power: (1) Mabuchi RS-540 electric motor

MRC TAMIYA
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