MODEL BUILDER

JANUARY 1975

volume 5, number 37

$1.25

GET THE COMPETITIVE SPIRIT...WITH THIS NEW COMPETITION DEEP VEE SERIES FROM DUMAS

DV 60-CF
45" long; for .60 engine

A trio of offshore performers

DV 40-CF
40" long; for .40 engine (Scale Figures Not Included)

DV 20-CF
32" long; for .20 engine

Focusing on R/C Deep Vee Offshore Racing, the fastest growing model boating event in the country, Dumas has engineered a new competition series of Deep Vee kits fashioned after the famous 36' full scale Cigarette hulls. These new models are a strong addition to the standard Dumas Deep Vee kits which have captured the majority of wins during the past racing season.

Sleek and fast, these new designs will help you reach high speeds while providing greater control around the course. At home in the roughest water conditions, the new competition hulls give excellent flat water performance, too.

When competing in offshore type races, Dumas kits give you running ability with minimum flips, eliminate frustrating drownouts . . . and above all, give you maximum assurance that you'll finish the heat . . . topside up.

Now you don't need special engines or years of experience to be a competitive "pro".

All kits are easily built, and boast fiberglass construction with hull and deck finished and ready for joining. Complete adjustable parallel drive running hardware kits are available.

Ask your dealer to show you this new competition series, and remember to ask for the Dumas Deep Vee Running Hardware Set . . . and see if you don't feel the competitive spirit.

See your hobby dealer or
Send 50¢ for our complete catalog

dumas boats

Dumas Products, Inc., 790 South Park Avenue, Tucson, Arizona 85719

NEW!

KP-3/5

Five Channel Sports Series

The KP-3/5 is a companion radio to the famous KP-5 Sport, combining top quality and high performance with many new features. It offers the security of flying Kraft at modest cost.

Compact, lightweight transmitter has excellent balance for better control.

Expanded battery voltage meter eliminates guessing battery life.

"Click-stop" trim positioning minimizes accidental changes.

New stick design is a composite of the open and closed gimbal types, combining the best features of both.

Control potentiometers are conductive plastic and have virtually unlimited life with excellent resolution and accuracy.

Complete receiver-servo package mounts quickly and easily; has throttle reversing link.

Aileron or rudder selector permits either channel to be operated off of the right-hand control stick without transmitter modification.

External block plug provided for the addition of fourth and fifth servos.

Wired charge receptacle is built into the bottom of the transmitter to provide instant conversion from the dry battery to our new KB-8D rechargeable transmitter pack.

Heavy-duty KB-4E battery pack is standard. Charge receptacle is wired into the switch harness. Available now on 72 MHz and 27 MHz.

$279.95

WRITE FOR FREE CATALOG

KRAFT SYSTEMS, INC. ®

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P.O. BOX 1268 · VISTA, CALIFORNIA 92083

World's Largest Manufacturer of Proportional R/C Equipment

ANNOUNCING!

MODEL BUILDER magazine's

FIRST ANNUAL INTERNATIONAL (Premier)... Parcel Post Proxy Peanut RUBBER SCALE CONTEST!

EVERY PEANUT MODEL, FROM NEAR OR FAR, WILL BE PROXY FLOWN, INDOORS, BY SOME OF THE U.S.A.'S BEST RUBBER SCALE FLYERS INCLUDING WALT MOONEY, BILL HANNAN, CLARENCE MATHER, BOB PECK, FERNANDO RAMOS, BILL WARNER, AND MANY OTHERS.

LOCAL MODELERS WILL BE ALLOWED TO ENTER, BUT THEIR PLANES MUST ALSO BE PROXY FLOWN, AND NO VERBAL OR PHYSICAL HELP WILL BE ALLOWED FROM THE OWNER . . . ONLY WRITTEN INSTRUCTIONS TO THE PROXY FLIER, AS ALLOWED FOR ALL ENTRIES.

Open to modelers from all parts of the world... any nationality... any age... any sex... come one, come all!

AWARDS to include TROPHIES and MERCHANDISE . . . ALSO, a KRAFT RADIO SYSTEM to the

GRAND PEANUT of 1975!

(HIGHEST OVERALL COMBINED STATIC AND FLIGHT SCORE)

Other prizes include such items as; Peanut Scale kits and materials, Brown Jr. twin and single cylinder CO_2 engines, Uber Skiver knives and sets . . . over 50 trophy and merchandise awards all together!

Contest Director: CARL HATRAK

Chief Static Judge: RUSS BARRERA

Competition will be divided into five (5) classes: Pioneer, World War I, Golden Age, World War II, and Modern. There will also be individual awards such as; most distant entry, best shipping container, entry most damaged in shipping (Don't try hard for that one!), best entry built from Walt Mooney plans, best model by a female, best entry by any modeler under 15 years of age, oldest qualifying contestant, youngest qualifying contestant, best biplane (Big John Award!), best entry from a Peck-Polymers kit, plus a few surprises.

Scoring will be based on the total of each entry's static scale points (100 maximum) and flight points (100 maximum). Static judging will be according to AMA Indoor Rubber Scale rules. Flight points will be the average of the two best flights out of four official flights (10 seconds minimum, 100 seconds maximum). Ties will be broken by highest single score, or a fly-off. Unlimited attempts subject to size of total entry. Highest individual flight and static points will also be honored. A three-man jury will preside over all decisions.

SCHEDULE: Register by mail on or before February 1, 1975.
Models to be on hand on or before April 1, 1975.
Contest to be held approximately April 15 to May 1, 1975.

Send in now for your registration form, which includes an entry blank, a complete set of rules, and other particulars. Write to:

MODEL BUILDER PROXY PEANUT CONTEST
P. O. Box 4336
Santa Ana, California 92702
USA

MODEL BUILDER

JANUARY

1975

volume 5, number 37

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

Subscriptions $12.50 per year, $23.00 for two years. Single copies $1.00. Add $2.00 for postage per year outside of U.S. (Except APO). Add 75 cents for Canada and Mexico.

Published monthly by MODEL BUILDER Magazine, 1105 Spurgeon St., Santa Ana, California 92701. Phone (714) 547-3963

Second Class postage paid at Santa Ana, Ca.

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FEATURES

SCALE VIEWS

CONSTRUCTION

Cover: If we were asked to help in selecting the best example of rubber powered scale model construction seen to date, we would be hard put to find anything better than the model on this month's cover. It is the creation of Don Typond, Hackensack, New Jersey, and is a Polish PZL 104 Wilga C, scaled one inch to the foot from 1967 Aeromodeller 3-views. For more photos, and a description of how it was built, see page 28 of this issue. Don also took the beautiful color transparencies which were combined into a single picture for the cover.

Winners at the first MAN/Circus Circus Hotel, Las Vegas, International Pattern Contest (l to r): Ivan Kristensen, Canada (5th); Dean Koger, USA (4th); Dave Brown, USA (3rd), Wolfgang Matt, Liechtenstein (2nd); and Hanno Prettner, Austria (1st). Complete story coming next month.

from Bill Northrop's workbench . . .

● Many of us who have worked hard for, and also reported on the AMA nationals in past years, have had occasion to bite our editorial tongue, cross out a paragraph, write it another way, or leave it out. We do this because we realize we're in the unique position of being able to talk to many people, and good or bad, our words are more effective than those of the average individual . . . We must honor and respect this position.

There is nothing more convincing to an editor of a nationally distributed publication that this editorial material and responsibility must be devoted to his reading public than to see the work of another editor who has blown off the kind of steam he should have kept to himself. Public airing of personal opinion, and good taste, don't always go hand-in-hand.

Year after year, our AMA Nationals is put on, mostly by volunteer help . . . by modelers, for modelers. Things go wrong, they always will. A system that does the job one year may not work the next because of changing conditions . . . and conditions always change. Level heads try to anticipate these changes . . . sometimes they're right, sometimes they're wrong. After the rhubarb, it's easy to say, "It shoulda been done thus and such a way" . . . Monday morning quarterbacks are a dime a dozen, and inflation doesn't affect their price.

In 1975, we have a big constant to feed into the formula . . . a hot, humid, but most friendly constant . . . Lake Charles. And this time it will be done . . . *it will be done*, in one week.

Meanwhile we hope the following will counteract some of the careless comments that have been allowed to reach the many modelers who have no other way of knowing what it is like to attend an AMA Nationals. It is the major portion of a letter written to us by Bob Underwood, a hard worker for AMA and a perennial Nationals contestant, mostly R/C scale in recent years.

"I have been most interested in reading the various reports of the Nats and hearing from a few of the fellas at later contests. As far as the Underwoods are concerned, I must relate we enjoyed in every way, our trip to the South. We preceded our Lake Charles arrival with several days in the New Orleans area and capped off the end with a run over to Houston. My two girls and my wife worked both days with the Juniors, met many new friends, swam in the pool at the field, got a bang out of Ed Abram holding forth at the organ at Shakey's, enjoyed the banquet, and were generally "sold" at the first Nats they ever attended. Cathy, the youngest, cried upon leaving the dorms that last day. It had become home, and the very nice lady in charge at the dorm, another grandma.

"I guess there were those who were upset with the Nats, but fortunately, the Underwood clan didn't know enough to find anything wrong and had a great time.

"Along the same lines, I had a most interesting experience that pointed up to me what it's all about. While disassembling the Alcor, after taking it from the scale cage prior to the flying, a small group had gathered as they usually do in the hangar. I was in the process of fielding the questions associated with a model that is out of the ordinary, when a young man asked me, quite timidly, whether I would be willing to put the Alcor back together so he could snap a picture of it. I said certainly, and he smiled and said he'd get his camera quickly. When he returned to the area with a rather old Polaroid, he nervously asked if I would take it outside in the sun. As we headed out the door, from somewhere in the rear of our assemblage member of the Junior Committee may contact Ed. His address is Ouaquaga, came the comment, "Some nerve . . . asking him to put it back together and then take it outside."

"The statement irritated me, since I figured the young man was paying me a compliment in that he wanted a record of my efforts. Little did I realize then how true this was, since some time later when my photographer friend accompanied me to my car, he thanked me profusely, explaining that this was the first time he'd been able to get to the Nats and he was on a very severe budget. As a result he had just two rolls of film and related that while there were many shots he really wanted, he was exercising great restraint and carefully choosing each one.

"Had I grumbled and evidenced the attitude expressed by the unknown voice from the back of the pack, I would have, to some degree, destroyed what it's all about. The Nats offers a common meeting ground for the competitor, the general modeler, and the spectator. It's a time to share, reflect, plan, and compete. I sincerely pray that I never reach the level of aloofness that turns me from the thrill of relating to others the wonders of my hobby/sport."

* * *

Ed Abram, AMA's resident piano player, is also the Academy's Junior Committee Chairman. Beginning with the November Monthly Mailing, Ed is editing "Just Juniors," featuring news and views of, for, and about Juniors.

In his lead off edition, Ed asks for news, hints, stories, and anything of interest to Juniors, or adults working with Juniors. The idea is to pass information along, so that a better, stronger Junior program can be developed.

Anyone interested in becoming a

New York 13826.

Two well known members of the Junior Committee are Bob Underwood and Myron Cary. Bob, from St. Louis (writer of the letter you just read), has worked with the Delta Dart program at the Nats for several years. Myron has been directing Junior programs in the Binghamton-Johnson City-Edicott (New York) area for many years. Helped by members of the Aeroguidance Society of Endicott and the Modelers of Binghamton, he has promoted activities for Boy Scouts and Boy's Clubs, as well as any other group that shows interest.

Pay back some of the pleasure you've received from the hobby over the years, and help some youngsters to find their way into modeling. There are many more activities competing for their attention these days, but model building is still the best, and we've got to make them aware of it.

* * *

THINGS TO DO

The 1975 R/C trade and model shows are just around the corner. For the 10th year, the RAMS (Radio Aero Modelers of Seattle, Washington) are getting off to an early start, with their Annual Northwest R/C Model Show, scheduled to be held on February 8 and 9, 1975, at the Hyatt House Motel, located near the Seattle-Tacoma International Airport.

The RAMS R/C Show attracts modelers from Washington, Oregon, Idaho, Montana, Northern California, and British Columbia. Modelers display model aircraft, boats, and cars, and manufacturers display their latest products. Special awards and trophies are offered for best-of-show in various categories, and as an extra feature, the RAMS present a trophy for the best manufacturer's exhibit.

Call Bob Gruye (206-932-7583) Show Chairman, or write to the RAMS at 4118 32nd Ave. S.W., Seattle, WA 98126, for additional information.

* * *

MODEL BUILDER'S Parcel Post Proxy Peanut Contest is going wild! As of November 20, more than 200 modelers have written in, requesting registration and entry forms. As the registrations must be in by February 1st, 1975, there is still time to enter, if you haven't already done so.

With modelers registering from countries such as Australia, New Zealand, Scotland, England, Germany, and Czechoslovakia, the contest is truly international, as we had hoped. The interesting thing is that quite a few modelers are taking advantage of the rule that allows one entry in each of the five categories. By the time April 1 rolls around, when the models are due, our static judges and proxy fliers are going to find their hands full . . . to say nothing of our Peanut storage facility!

Merchandise and trophy awards from manufacturers are growing in quantity . . . Some being donated without solicitation. Ed Toner, Buzzer Model Co., is offering a trophy for the best multi-engine model (he's a TWA 747 pilot). Bob Whittier, Ace Publishers, has donated copies of his recently published "Phineas Pinkham Scrapbook," a compilation of choice adventures of the famous Boonetown pilot and World War I hero, from the pages of Flying Aces. These have been added to the list which includes a radio from Kraft (not AM/FM, dummy, an R/C system!), CO_2 engines from Bill Hannan, Walt Mooney, and the man himself, Bill Brown, kits from Bob Peck, goodies from Williams Brothers, and many more.

So . . . get out the sticks and tissue, set your proportional dividers for 13 inches, and join in the fun. Who knows . . . maybe *your* model will be crash . . . er, flown by that Pioneer Peanut Potentate, Walt Mooney!

TRY THIS ONE

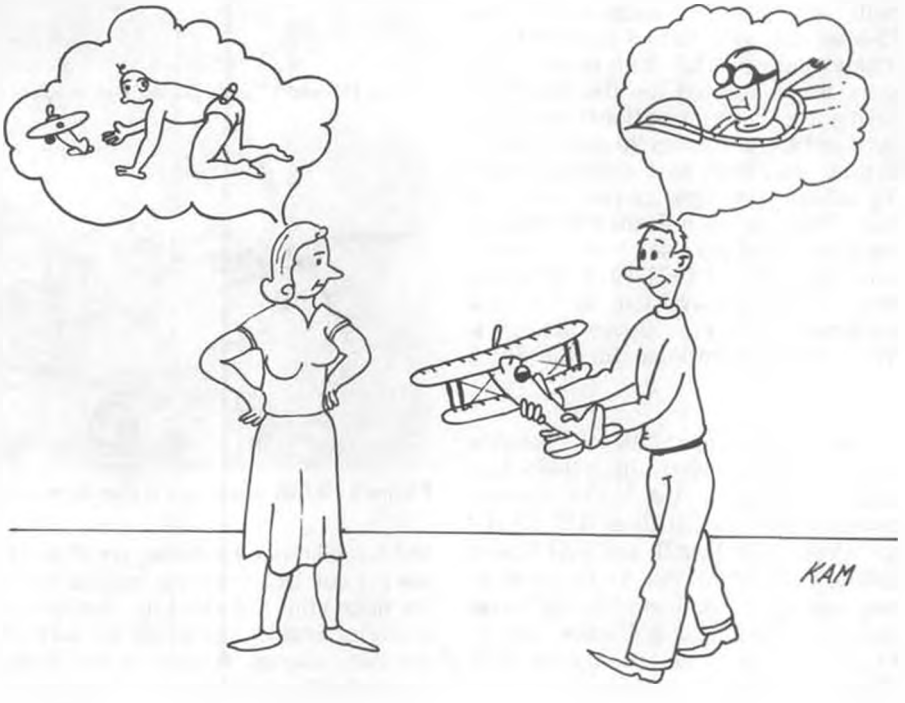
Have you ever wondered if you had management possibilities, or have you been a victim of the Peter Principle and aren't sure if you can hack it? The following test, which has a time limit of 4 minutes, was published in the Winnipeg R/C Club Bulletin, November 1974, edited by Dennis Saydak. Try it.

Are you ready?

GO!

Follow directions explicitly. Do not ask any questions. Do not look around the room or at your neighbors, or you will be disqualified.

1. Read everything before doing anything.
2. Put your name in the upper right hand corner of this paper.
3. Circle the word "name" in sentence two.
4. Draw five small squares in the upper left hand corner of this paper.
5. Put an X in each square.
6. Put a circle around each square.
7. Sign your name under the title of this paper.
8. After the title, write Yes, Yes, Yes.
9. Put a circle around sentence number seven.
10. Put an X in the lower left hand corner of this paper.
11. Draw a triangle around the X you just put down.
12. On the back side of this paper, multiply 603 by 66.
13. Draw a rectangle around the word PAPER in sentence number 4.
14. Loudly call out your first name when you get to this point of the test.
15. If you think you have followed directions carefully to this point call out I HAVE.
16. On the reverse side of this paper add 8930 and 9805.
17. Count out in your normal speaking voice, from ten to one backwards.
18. Underline all even numbers on this side of the paper.
19. Say out loud — I AM NEARLY FINISHED, I HAVE FOLLOWED DIRECTIONS.
20. Now that you have finished reading carefully, do only sentence one and two. ●



OVER THE COUNTER

● Flyline Models, 10643 Ashby Place, Fairfax, VA 22030, is adding three new classic scale aircraft to its line.

Star of the fleet, as far as we're concerned, is the Stearman C3B. This 1 inch scale, 35 inch span model will be ready in late winter or early spring, and is one of the sexiest looking biplanes ever designed. Price to be announced later.

The 1 inch scale, 41 inch span Curtiss Robin kit will be ready when this is published, and will retail for $11.95. As with the previous Monocoupe and Bellanca models (see ad in this issue), the Robin and Stearman kits will include all standard materials, decals, hardware, and super-detailed plans for models of museum accuracy. Both are for .049 power and can be flown free or with up to 3-channel lightweight radio systems.

Only plans, at $2.00, will be offered on the third model, the perennial Piper J-3 Cub, at 15/16 inch scale, which comes out to 34-1/2 inch span. For .020 power, it can be flown free, or with single channel pulse.

* * *

Orbit Electronics, 1641 Kaiser Ave., Santa Ana, CA 92705, announces the world's first sub-miniature servo with both rack and rotary outputs. This new PS-8 servo is very fast (.4 seconds transit time) and powerful. Both the pots and gears are guaranteed for life! The PS-9, having the same operational specifications and guarantee, has 90 degree rotary output only. Both have external centering adjustment, low current drain of only 8 ma, and both fit the PS-4 mounting trays. They are also compatible electronically with all 1971-1974 Orbit Systems. They are available as standard equipment with the Custom Series systems, and are optional for the Sport Series.

* * *

The mayor and sheriff of "Satellite City," Bill and Bob Hunter, 9486 Sandusky Ave., Arleta, CA 91331, have announced the new Satellite "450 GLH," for AMA Class A or B, and FAI Power. Selling for $20.00 plus $1.50 for postage, insurance, and handling (California residents must add 6% sales tax of $1.20), the kit is super-complete, with all wood, plans, and hardware.

Wing ribs, stab ribs, curved trailing edges and tips, fuselage pylon parts, fin, and Lord knows what else, are all bandsaw pre-cut. Detailed plans include building instructions, flight trim tips, and a listing of engines and props for each of the three classes. A separate FAI poop sheet details modifications for use in this class, including pattern for rear exhaust engine exhaust deflector. The ship has already posted several wins for its designers, and others, including official times only 96 seconds off the record. It is flown straightaway, with no thrust offsets or wing warps, and only a bit of rudder tab to control power . . . and no auto surfaces.

* * *

Stearman C3B, by Flyline Models. Scale is 1", 35 " span, for F/F or small radio.

Flyline Models' 1" scale Curtiss Robin, spans 41", also for F/F or small radio.

Flyline's J-3 Cub is available in plan form only, spans 34-1/2" at 15/16" scale.

Prather Products, 1660 Ravenna Ave., Wilmington, Calif. 90744, continues to add new products to its line of R/C accessories. Latest group concentrates on the ground navigation portion of pylon racers, including formed dural landing gear, turned aluminum wheels with rubber tires, axle retainers, and joined epoxy wheel pants. The items sell for $5.95, $5.95, $1.98, and $9.95 respectively, the latter three being a per pair price.

In addition, the company now has a complete kit for Terry Prather's world record Formula I "Little Toni." The kit is a deluxe version, featuring epoxy fiberglass fuselage and cheek cowls, the above mentioned landing gear parts, precision cut wood parts, foam wing cores, wing skins, all wire hardware, formed canopy, complete plans and instructions, and scale 3-views. Kit price is $99.95.

* * *

Peanuts are habit-forming . . . and if that line were used anywhere else but in MODEL BUILDER, it would have only one meaning. However, within these pages the reference can mean either "eating of" or "building of." At this point, we're referring to the less fattening activity.

Our Most Imperial Peanut Potentate, Walt Mooney, has just completed his second "Bag of Peanuts." Bag Two features 14 Peanut scale models and one 15 inch scale model, the Stahlwerk Mark R-IIIb. All of the models have been published in MODEL BUILDER. In addition to the plans, there are reprints of articles which go into specific areas of building small rubber models, such as; laminated surface outlines, sources of 3-views, hints on rubber winding, sources of materials, and covering techniques. In spite of rising costs, price is same as Bag No. 1, $5.00. See advertisement for address.

* * *

The Vintage and Veteran Aircraft Guide, by John Underwood, is a must book for all lovers of historic aircraft from World War I through World War II. Over 300 aircraft are pictured and more than 400 are described. Specification tables list engine, power rating, span, length, area, gross and empty weight, speed (maximum, cruise, stall), initial rate of climb, cruising range, and factory or contract price.

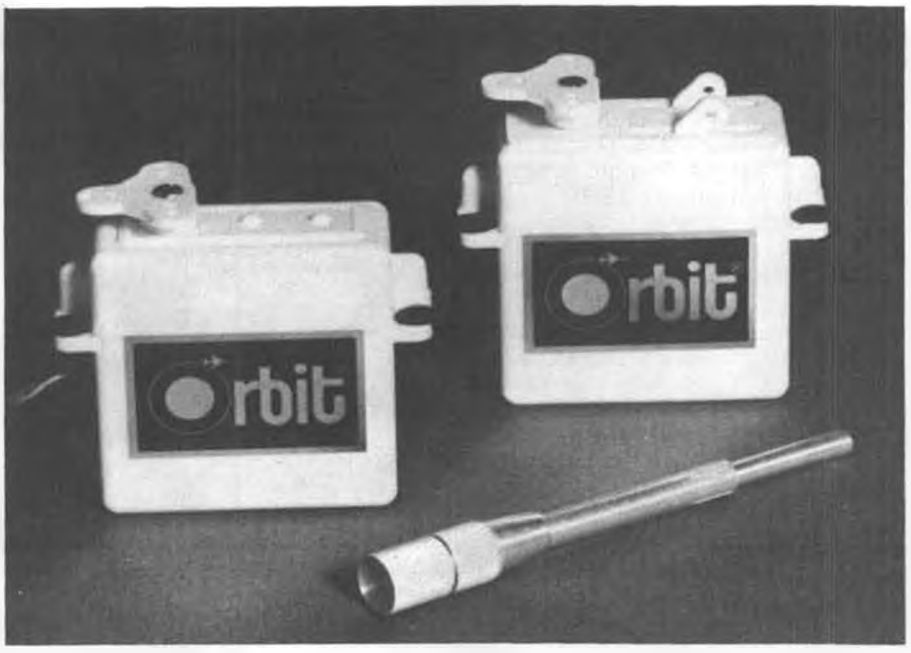
Most amazing is the fact that all of the more than 300 aircraft pictured are still existing (at least one or more copy) in the USA today! For instance; Howard Hughes' 1-B Special, that set a 352 mph speed record in 1935, and a transcontinental record of 7-1/2 hours in 1937, is currently licensed and airworthy! There's 1932 JU52/3M, low wing trimotor Junkers transport in Illinois. A Famous S-39A Sikorsky is being restored. There's a Northrop Delta 1D, over 40 years old, based in Denver, Colorado.

Although there are no 3-views, just thumbing through the book and looking at page after page of clear, sharp, contemporary photographs, all excellently captioned, will fire up a true modeler's imagination and send him off in search of further information on an airplane that he had all but forgotten and now must build for that next contest . . . or just plain 'cause he always wanted to . . .

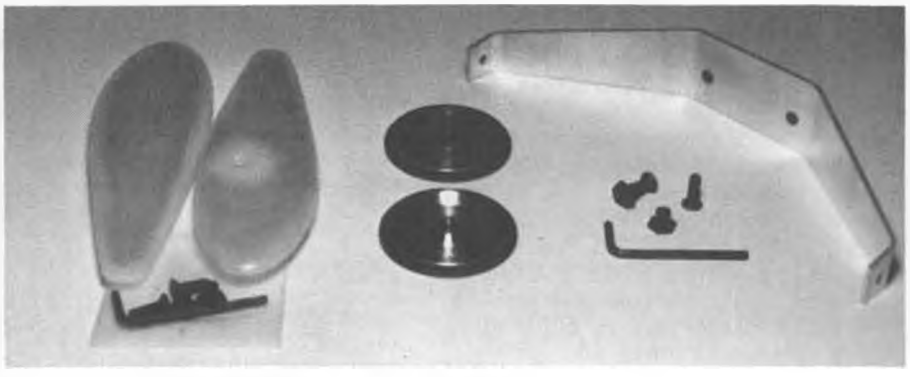
Once you've seen this book, which is available for $4.95 direct from Collinwood Press, Box 167, Glendale, California 91209, you'll want at least one or all of the other publications.

"Of Monocoupes and Men," 208 photos, four 3-views, $4.95.

"The Lightplane, 1909-1969," 360 photos, fifty 3-views, $4.95.



New PS-8 sub-mini servo (rt) by Orbit has both rack and rotary output. PS-9 has rotary only. Adjustable length stick in the foreground.



New Formula I landing gear parts by Prather Products.

The VariViggen homebuilt for which R/C model plans are now available.

"Atlantic Wings," describes 130 projected crossings during 1919-1939, 20 photos, 40 drawings, $11.95.

"Acrobats in the Sky," 250 photos, twelve 3-views, $4.95 (get this one!).

"The Stinsons," 231 photos, complete story of the Stinson family . . . both people and aircraft, $5.95.

* * *

The name Larry Conover should mean a lot to any free flighter worth his weight in D/T fuse. Larry and his wife, Dorothy, toured the competition circuit for many years, and that circuit included foreign countries, as Larry, with hsi famous "Lucky Lindy" power model, captured the World Championship in 1960.

Though the Conovers haven't been flying models in recent years, they haven't turned away from aviation . . . in fact, you might say that after all this time, they're finally getting the "hang" of it. You guessed it, Larry's been doing first hand research in hang gliding; not only flying, but also gathering facts and figures on some of the real pioneers in the sport . . . Lilienthal, Pilcher, Chanute, and the Wright Brothers.

Send 50 cents to Conover Products Co., Route 1, Toddville, Iowa 52341, for a catalog of hang glider 3-view plans and posters. The authentic plans contain basic dimensions, plus a scale to help enthusiasts build their own full scale flying machines. The designs (Percy Pilcher's "Hawk" [1896], Chanute's Biplane Glider [1896], and Wrights' 1902 Glider) are printed on antique-gold cover stock, 17½ by 23½, and have an old world quality look about them.

The catalog also contains 18 x 24 hang glider poster art created by artist (and free flighter) Al Vela, and several others by George Lippisch, son of Dr. Alexander Lippisch, famed aircraft designer. The latter are limited edition prints, each carrying the artist's seal and print number. They'll grow in value over the years.

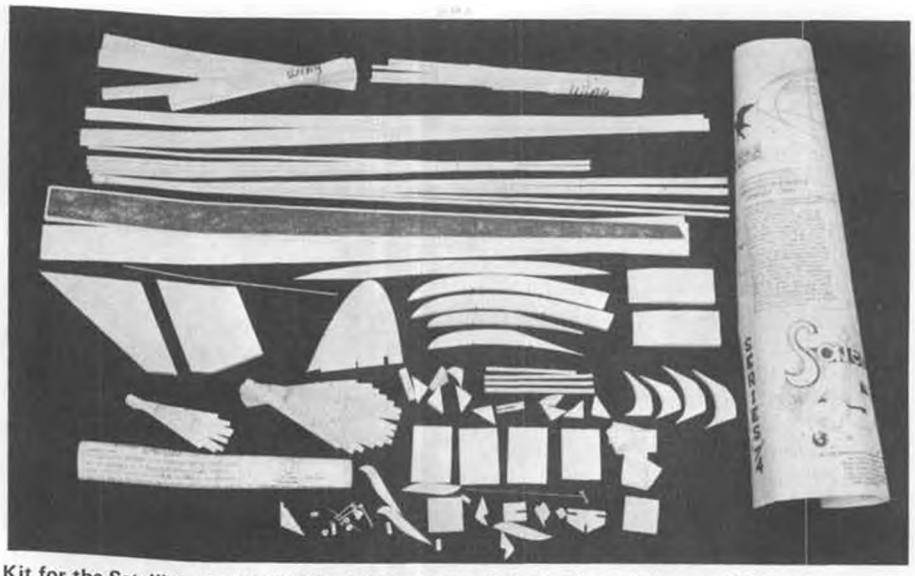
* * *

The Rutan Aircraft Factory, P.O. Box 656, Mojave, CA. 93501, (805) 824-2645, is the home of the VariViggen, an astonishing new homebuilt aircraft which, as the name implies, closely resembles the Swedish SAAB Viggen, a formidable canard jet fighter.

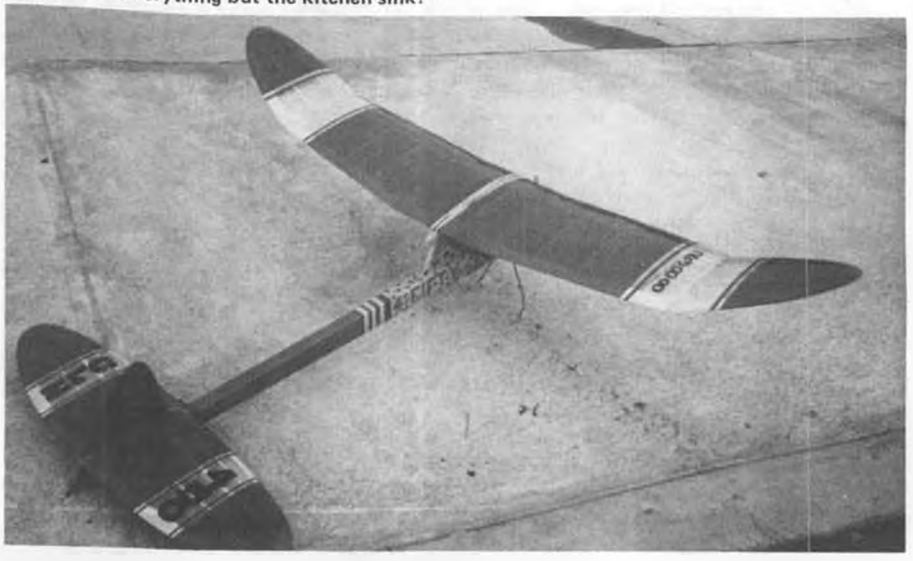
Designed and built by Burt Rutan, the VariViggen won the Stan Dzik trophy for design contribution at Oshkosh in 1972. It received the "Omni Aviation Safety Award" at Oshkosh in 1973, and the "Outstanding New Design" trophy at the EAA convention, Oshkosh, 1974.

Burt Rutan has been a modeler since age 12, designed and built many models and won numerous trophies in West Coast competition and also won trophies in the 1959 and 1960 Nationals. With that kind of a modeling background, it's academic to say that in 1971

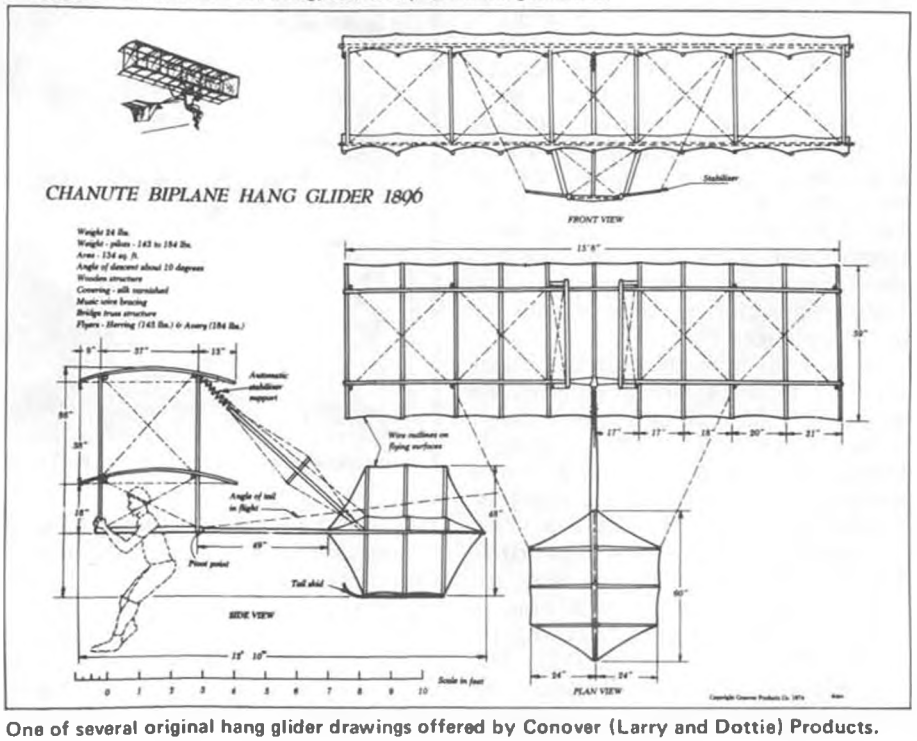
Continued on page 80



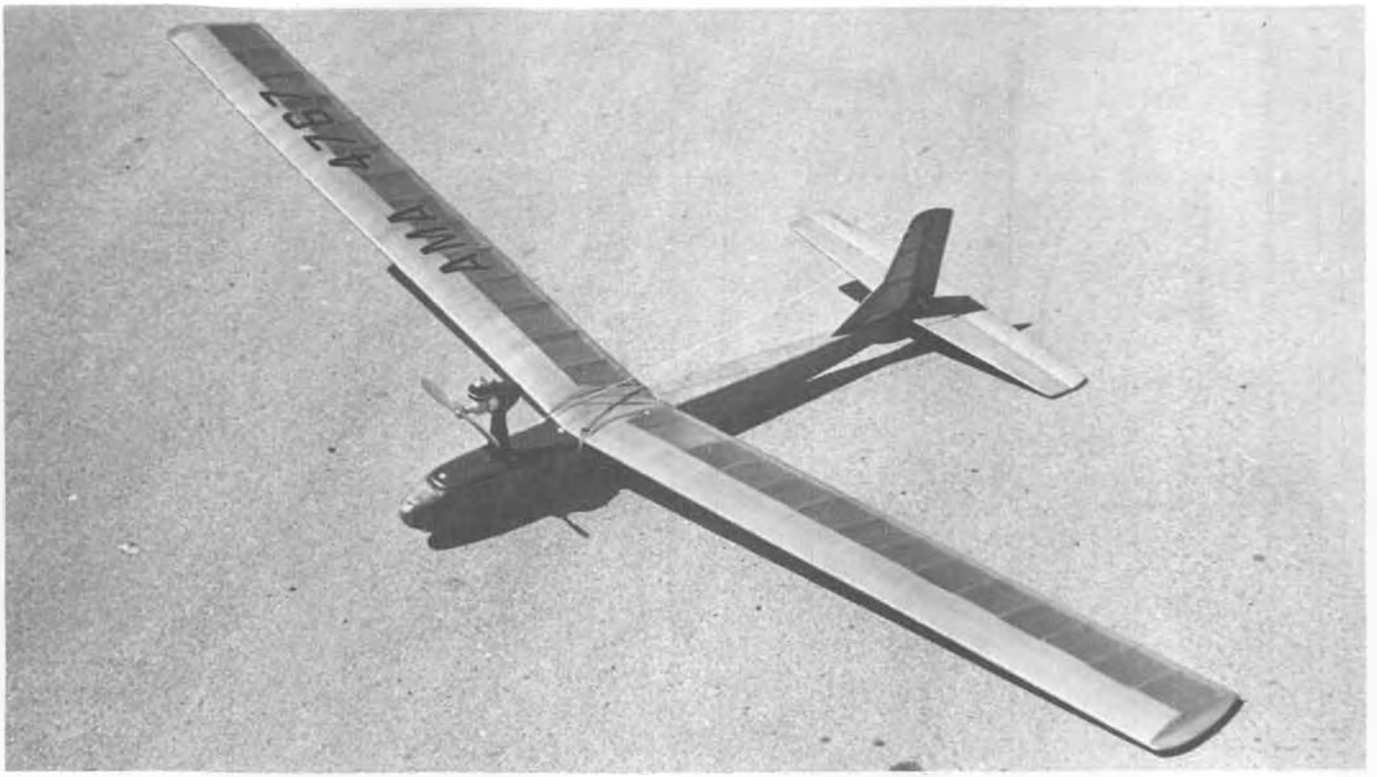
Kit for the Satellite 450 by Satellite City is so complete that it reminds one of the old expression, "everything but the kitchen sink!"



Completed Satellite 450 is strong, but easily built. No geodetics.



One of several original hang glider drawings offered by Conover (Larry and Dottie) Products.



With Cox "Q-Z" engine and 72" span, the Tyro Trainer should put you within walking distance of an acceptable flying site.

R/C TYRO TRAINER

By HANK COHAN

A glider is *almost* a perfect R/C trainer, but there's nothing to keep it in the air while you're practicing. Add just enough power to make it climb gradually, by itself . . . *now* you *do* have a trainer!

● The Tyro Trainer is a powered R/C training glider designed to meet three objectives:

1. Smooth, slow, stable, and forgiving flight characteristics so that a beginning RCer with some free-flight experience can handle it from the start, including launchings and landings.
2. Quick and easy conventional (balsa and covering) construction.
3. Low cost airframe and engine.

These objectives have all been met.

Wingspan is 74 inches, overall length 40. Power is a Cox Babee .049. The prototype weighs 30 ounces with Heath GD-19 radio equipment. The wing loading is 9 oz/sq. ft., resulting in a low stalling speed, and corresponding low approach and landing speed. Nevertheless, the airplane is rugged, and easily repaired when damaged.

Coming in after another powered, but silent, flight. For powerless thermal or slope soaring, the power pod/hatch is replaced by a plain, flat panel. Extra ballast will then be needed.

Rudder and elevator control are used. The generous dihedral provides lateral stability so that the airplane will fly hands off, even when trimmed to glide in large circles. The .049 engine provides adequate power to take it up several hundred feet on a tank of fuel.

The engine is mounted on a removable forward hatch, eliminating the need for ballast. For powerless soaring, a plain hatch and some weight in the nose is substituted.

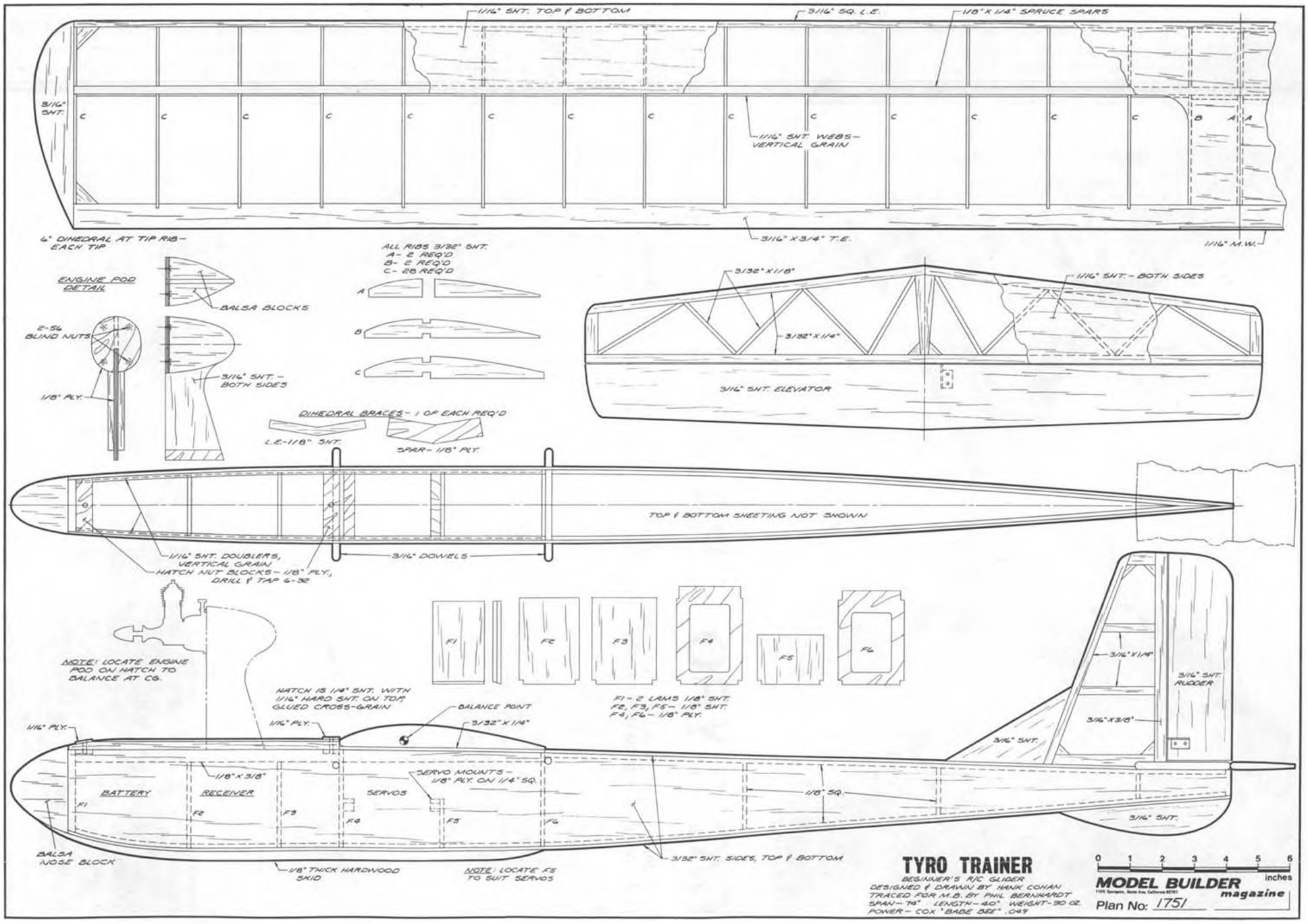
Standard size materials are used throughout construction. Scraps left from cutting out the fuselage sides are used for the stabilizer frame . . . a single sheet of 3/16 x 2 x 36 balsa makes the elevators and rudder, with the leftovers being used to make the fin and sub-rudder.

CONSTRUCTION

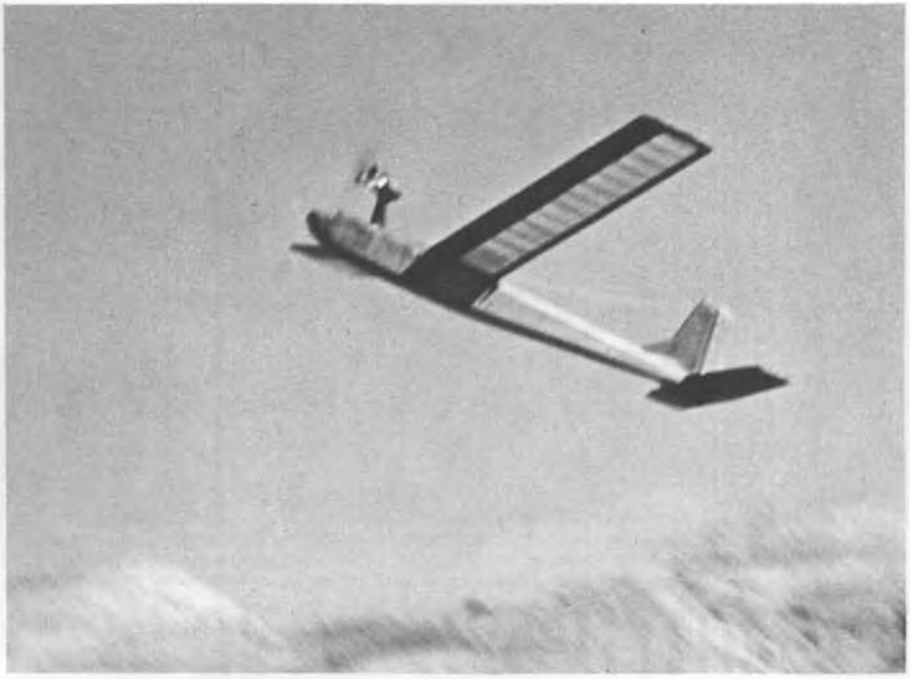
All wood is balsa unless specified otherwise. All glue used in the prototype was Franklin Titebond except when epoxy is called out, when Hobbypoxy #1 or #4 is used as specified.

WING

The wing should be built first so it can cure completely while the rest of


1/16" SHT. TOP & BOTTOM
3/16" SQ. L.E.
1/8" X 1/4" SPRUCE SPARS
3/16" SHT.
1/16" SHT. WEBS – VERTICAL GRAIN
6° DIHEDRAL AT TIP RIB – EACH TIP
3/16" X 3/4" T.E.
1/16" M.W.
ENGINE POD DETAIL
BALSA BLOCKS
2-56 BLIND NUTS
1/8" PLY.
3/16" SHT. – BOTH SIDES
ALL RIBS 3/32" SHT.
A – 2 REQ'D
B – 2 REQ'D
C – 28 REQ'D
3/32" X 1/8"
1/16" SHT. – BOTH SIDES
3/32" X 1/4"
3/16" SHT. ELEVATOR
DIHEDRAL BRACES – 1 OF EACH REQ'D
L.E.–1/8" SHT.
SPAR – 1/8" PLY.
TOP & BOTTOM SHEETING NOT SHOWN
1/16" SHT. DOUBLERS, VERTICAL GRAIN
HATCH NUT BLOCKS – 1/8" PLY, DRILL & TAP 6-32
3/16" DOWELS
NOTE: LOCATE ENGINE POD ON HATCH TO BALANCE AT C.G.
F1
F2
F3
F4
F5
F6
F1 – 2 LAMS 1/8" SHT.
F2, F3, F5 – 1/8" SHT.
F4, F6 – 1/8" PLY.
3/16" X 1/4"
3/16" SHT. RUDDER
3/16" X 3/8"
3/16" SHT.
HATCH IS 1/4" SHT. WITH 1/16" HARD SHT. ON TOP GLUED CROSS-GRAIN
BALANCE POINT
1/16" PLY.
3/32" X 1/4"
1/16" PLY.
1/8" X 3/8"
SERVO MOUNTS – 1/8" PLY. ON 1/4" SQ.
BATTERY
RECEIVER
SERVOS
F1
F2
F3
F4
F5
F6
1/8" SQ.
3/16" SHT.
BALSA NOSE BLOCK
1/8" THICK HARDWOOD SKID
NOTE: LOCATE F5 TO SUIT SERVOS
3/32" SHT. SIDES, TOP & BOTTOM
TYRO TRAINER
BEGINNER'S R/C GLIDER
DESIGNED & DRAWN BY HANK CONAN
TRACED FOR M.B. BY PHIL BERNHARDT
SPAN – 76" LENGTH – 40" WEIGHT – 30 OZ.
POWER – COX "BABE BEE" .049
0 1 2 3 4 5 6
inches
MODEL BUILDER magazine
Plan No: 1751

Midge Cohan has been checked out with the Tyro Trainer. Great intro to flying R/C.



When you don't have a tow, this is the best way to go! Depending on the engine used, you can get several hundred feet of altitude to work with on each flight.

the glider is under construction, and any warps that develop can be worked out. A secondary reason is that this writer finds wing construction the least enjoyable and most tedious phase of model building, and tries to get through it before his enthusiasm wanes.

The original wing was built with 1/16 sheet ribs and the leading edge sheeting on the top surface only. It was unsatisfactory due to recurrent warping, and was replaced (after more than 80 flights) with the one shown on the drawing, using 3/32 sheet ribs and 1/16 leading edge sheeting top and bottom. This wing has proven to be much more warp resistant. A third variant suggested for consideration would retain the top and bottom leading edge sheeting, but utilize 1/16 sheet ribs with 1/16 x 3/16 cap strips top and bottom. This would be even stiffer than the second design, and would result in smoother covering. If this configuration is chosen make all the "C" ribs like "B", to allow for the cap strips.

Cut and notch wing ribs by your favorite method. For this model a 1/16 plywood rib template was made; and ribs traced with a fine ball point pen. For "A" and "B" ribs, trim "C" ribs to accommodate the 1/16 center section sheeting. Note that "A" ribs are each made in two pieces to accommodate the spar dihedral joint.

Start the wing by notching the trailing edges 1/8 deep for the ribs. Note that no notches are used at ribs "A" and "B", and at the tip ribs. An easy trick for notching is to use the edge of a fine flat warding file. A few trials on balsa scrap will show which file is right.

Pin the trailing edge over the plan (suitably protected with Saran Wrap or similar). Trim the lower leading edge sheet roughly to width (leave a little at the leading edge to sand later) and pin in place with its after edge lined up with the back edge of the spar location. Glue and pin the lower spar on top of the sheet. To reduce later frustration, wipe up any glue fillets at rib locations before they dry, using a scrap stick or steel scale.

Glue and pin the leading edge onto the sheet, using a straight edge to keep it straight, and again wipe away excess glue. Now fit all the ribs except "A", glueing to leading edge, sheeting, spar, and trailing edge. Shim up back half of "B" 1/16 inch. Check top spar in notches for fit and straightness, remove, then glue in place. Do not add top leading edge sheeting at this time. Add tip gussets.

Fit and glue the 1/16 shear webs between ribs, using the wood left from the leading edge sheeting. Fill the vertical space between the spars from the wing centerline to rib "B" with scrap 1/4 sheet, well fitted and glued. This will be the seat for the dihedral brace when the panels are joined. Allow wing panel to dry overnight, then remove from board.

Turn plan over and oil or wax so that left wing can be built by the same process. When both panels are complete to this stage, trim the spars, leading and trailing edges to make a good fitting dihedral brace and the 1/8 sheet leading edge brace. Now mate the wing panels, with one pinned flat to the board and the other tip raised 12". Use Hobbypoxy #1 epoxy for the spar joint and brace. Be sure that the raised wing is not in a warped position, and allow at least 12 hours to cure.

When thoroughly dry, bevel leading edge top and apply top sheeting while the panel is pinned on your board. Allow to dry, remove pins, and pin the other panel flat, then repeat above operation. This process will help prevent built-in warps. Last, cut tips from 3/16 sheet or two crossed laminations of 3/32 and glue in place. When all is thoroughly dry, sand carefully to prepare for covering. Note that it is not necessary to sand the trailing edge to a knife edge. Leave it 1/16 or so thick. It doesn't significantly affect the performance, and it's much more damage resistant.

The prototype wings were covered with silk, applied wet. Precede this with two coats of dope and light sanding of the wing structure where the silk is to be fastened. Silk adds much strength and is light. If you want to use Monokote or a similar material, you're on your own. Heavy weight Silkspan can be used, but is more liable to puncture on rough terrain.

FUSELAGE

Laminate two sheets of 1/16 balsa crossgrain, large enough to make bulkheads F2, 3, and 5, and two pieces of 1/8 for F-1, using Titebond, and allow them to dry under pressure overnight. F4 and F6 are made from 1/8 plywood. *(When laminating sheets with Titebond, the water base causes joined sheets to curl away from each other . . . almost uncontrollably. To overcome this problem, wet the outside sheet surfaces at the same time that glue is applied. The sheets will then remain flat. wcn)*

The fuselage sides are cut from 3/32-3x36 medium sheet. Try to get two sheets well matched in density and grain,

Continued on page 62

Roy Stephens, of the East Tennessee Tri-Cities Modelers, always includes a top quality photograph of a club member's model in every issue of their newsletter, edited by Carl Cumbow. An example is this excellent shot of Lyle Sam's J & J Eyeball, originally designed by Art Schroeder. It's powered by a blackhead Webra, and is equipped with tail-dragger Rom-Air retracts. Yellow with black trim. Thanks, Roy.

'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

● The Swiss Aero Club has thrown a bomb into the works of the R/C Aerobatic World Championships. With the 1975 competition scheduled to take place in Switzerland this coming September, the host club has announced that contestants will be required to silence their engines to 83dbA at 10 meters! This is considerably quieter than anything that has been accomplished to date, with either stock or experimental mufflers.

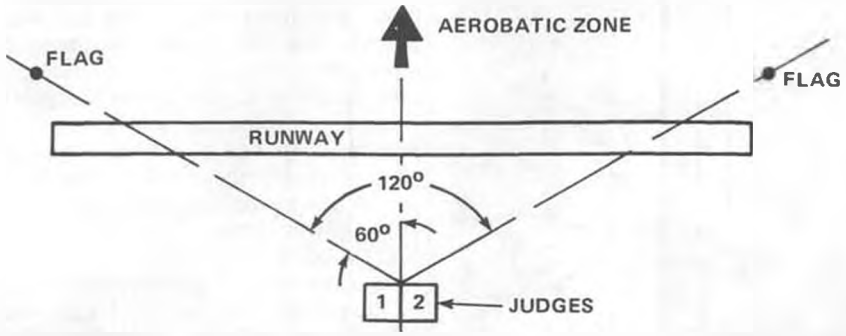
In all probability, someone among the Swiss modelers, in answer to the government's demands on noise pollution, has come up with a silencer which performs to this specification . . . And more power ('scuse the pun) to 'em. No one should question the need for quieter model engines. However, to initiate such a demand on a world competition level and on such short notice, is quite unreasonable. Certainly, along with establishing such a requirement, it is logical that several of the "power" maneuvers should be removed from the program.

Hopefully, by the time this is published, the December FAI meetings in Paris will have resolved this situation. There's no doubt that a strong silencer requirement will be incorporated into the world modeling rules, but it should come about in normal, rules-making fashion.

Though we disagree with the method, an attempt is now being made to stiffen muffler requirements in FAI. A proposal is in the works to disqualify venturi-type mufflers. To our way of thinking, it doesn't matter how the silencing is accomplished, as long as it happens. If a contestant wishes to run his engine exhaust through a Turkish water pipe,

Our "Big John" design came in several sizes. This was "Galloping John", as published in MAN. Built and flown by Bob Neulin, Hellertown, Pa., this one simply wore out, is being replaced.

This fascinating "VariViggen" homebuilt was designed and built by Burt Rutan. He is offering plans for the R/C version that was built to test stall characteristics. See "Over the Counter."



The NSPA is going to this larger "frame" of reference for aerobatics, finding the 45 degree angle a little too small. Would seem to indicate the 45 is way too small for pattern bombs.

let him do it . . . if it works.

Meanwhile, we are continually amazed at the sluggish progress being made on the use of mufflers in this country. Five or six years ago, we put the blame primarily on the engine manufacturers, for not making decent mufflers available for their engines. T'ain't so any more. Most engine manufacturers have come to realize that their future depends on the theme, "Fly quietly, or don't fly at all."

On the other hand, modelers, while searching for new fields to fly on and be thrown off of because of noise, steadfastly refuse to face the truth. In a conversation with Clarence Lee about the Swiss edict, it came out that he continually receives requests from modelers to modify the factory mufflers so they make *more* noise . . . not requests for more power . . . more noise!

Like the kids who bolt on racing headers and straight-through megaphone pipes, jack up the tail end of their car 'till it looks like a blood hound going down the street, stick big fat racing slicks on mag wheels, and then do all their racing from one ice cream drive-in parlor to the next, it could be that the noisey model engine nuts are suffering from a lack-of-virility complex . . . they need the ear-damaging roar of an unmuffled engine to boost their ego!

Got news for you fellas. Chicks go for the strong, SILENT type!

There is no question that in all-out competition, where speed is the primary factor, such as R/C Pylon, C/L racing events, and free flight duration, talk of silencing comes for different reasons than those facetiously referred to above. In this case, the serious competitor is out to win, and noise is a by-product of this goal. If silent engines were an important factor in winning, we bet all the models would have to be equipped with horns and whistles so you could hear them coming!

However, the fact remains, if competition is to continue, places to fly must be available . . . and to maintain this availability, competition is going to have to become quieter. Competition is the leader.

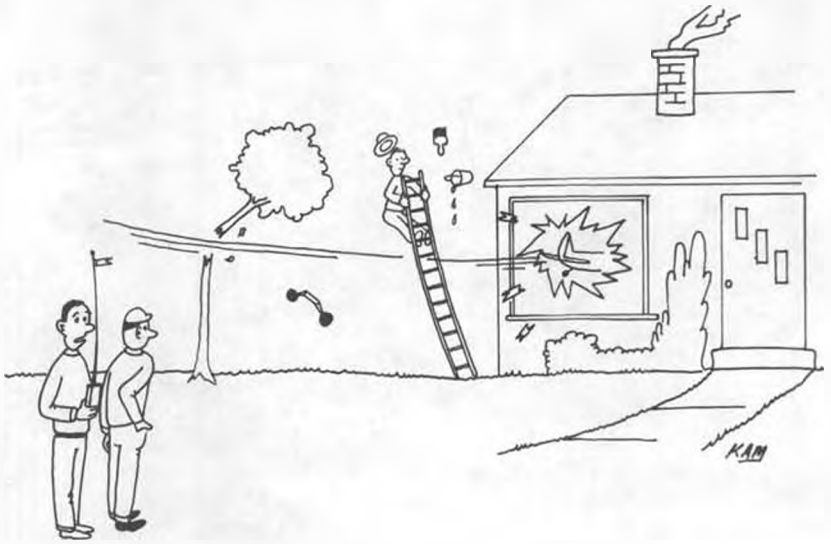
When competition quiets down, the sport fliers, who make up 90% of the activity, will follow . . . Which brings us to the crux of the situation. It is already past the time for AMA to put a muffler rule into effect . . . across the board . . . on *all* competition. For a start, it need specify a sound level requirement. The idea is to get a foot in the door. Just getting any muffler, manufactured or homebuilt, on all engines in competition, is 95% of the battle. The requirement should allow sanctioned contests located a mile or better from populated areas to bypass the rule. Eventually, when the noise gets down to acceptable levels, the contests could, other conditions being tolerable, "move back to town."

This discussion has perhaps wandered away from 100% R/C, but as this is the primary model airplane activity based on amount of participation, it seems to belong. We invite your comments.

HOW BIG IS A FRAME?

The question is similar to "How high is up," but in pattern competition, it is becoming an increasingly important factor. In an attempt to confine R/C aerobatics to a smaller space, and also to make it more similar to full scale aerobatics, there is much talk about confining maneuvers within a frame of reference. At present, the "frame" is an area within a 90 degree field of vision centered on a line perpendicular to the wind from the judge's point of view.

Present day pattern aircraft, and the fliers thereof, are finding it difficult to stay within this frame unless some maneuvers are performed so far away that they must be downgraded because the



WHAT KIND OF INSURANCE DID YOU SAY THE CLUB HAS ?

Duane Thomas' high altitude Bi-Prentice. OS Gold Head 60 power and MRC 3-channel radio. Wing span increased to make up for the thinner air in Colorado Springs. Photo by J. A. de Vries.

Another bipe built by Bob Neulin, the "Barnstormer," designed by the late Jack Luck. One of earliest biplane R/C designs, it was MB Editor's 2nd R/C model. Pulse rudder.

Scale judges doing some pondering at the recent Las Vegas R/C Club's Annual. Kent Walters, Scottsdale, Arizona, wipes down his FG-1 Corsair, which placed 4th. Jerry Flatt photo.

judges can't see them too well. That this is an important consideration is evident from the fact that the NSPA, which flies typically slow and more maneuverable biplanes, is already looking into expanding the frame to 120 degrees (60 degrees each side of perpendicular).

If you fly pattern, for fun or profit, it might be good idea for you to place flags at 45 and 60 degree angles from your standing position, try putting maeuvers in the frame. Let us know what you think about it.

WHERE TO LAND

Several top pattern fliers we've talked to are increasingly in favor of getting away from the spot landing concept. Started back in the early days of R/C, when landing in the same county was considered a miracle, spot landings were very much the exception and considered a primary accomplishment.

With the state of the art becoming more and more like flying full scale aircraft, the spot landing is becoming more and more unrealistic. Perhaps the idea should be to land on the designated runway, as smoothly and precisely as possible, between two lines across the runway that designate the "threshold" at the downwind end and the "fence" at the upwind end.

R/C CARGO

Our mention, in the November issue, of the proposal for an R/C Cargo event brought the following comment from Joe Sullivan, hobby supplier in Richardson, Texas.

"Years back, we did something similar in U/C. To allow club members to use existing planes and engines, we devised the formula: W/D = P, where "W" = gross weight in ounces, "D" = total engine displacement in cubic inches, and "P", of course, equals performance.

"For a new R/C event you could use gross aircraft weight but require removable cargo of at least 1/3 (1/2?) the total gross. With this formula, an .050 powered plane grossing 50 ounces has P = 1000. To match this, a .60 powered plane would have to weigh 600 oz, or 18-3/4 lbs.! As this is getting rather heavy, I would think that a limit of .40 (that's still 12-1/2 lbs.) would be more realistic. Throttle control would also be necessary, I think, as a safety requirement, if nothing else."

Maybe Joe's suggestion could be applied to the proposed R/C event, if it passes the preliminary vote. However, a lot depends on how the event would be run. It could be that officials would need a computer bank in order to recalculate "P" values after each flight. With one size engine (or at least with two or more displacements separated into different classes) no calculations would be needed . . . just a scale. Still, an overall winner could be determined by using the formula.

HALF-A RACE RULES

To take the place of Quarter Midgets,

which went "National" and thus left the ranks of fun events for club activity, the little 1/2A racers are gaining in popularity for grass-roots racing. This may not sound like it should be coming from AMA's R/C Contest Board Chairman, but we hope that 1/2A racing will *not* become national, but rather, that it stays on as a fun event for the many modelers who don't go for heavy competition.

However, it would be nice if modelers from all parts of the country were flying 1/2A racers on a more-or-less similar basis. Actually, what rules we have seen aren't that much varied, but to help keep things in line, if you feel it's worth while, send us your club's 1/2A racing rules and we'll publish them. Perhaps a universal set of rules might develop which everyone could use.

Speaking of pylon racing, a note from Quarter Midget pioneer, Bob Penko, relates another story of youth over age and experience. The MARCS Club of Mentor, Ohio, held their 1974 Championship QM race on September 29 in the teeth of a gale. Winds were averaging 40 to 50 knots, and the Cleveland Airport verified gusts to 60 knots! Bob was C.D.

In the midst of this blast that made the ill-fated Masters Tournament seem like a balmy breeze, young Billy Johansen . . . age 15 . . . wiped out the likes of Bob Mellen, Bob Jones, John Fotiu, Ed Nobora, Bob Cademer, Fred Johansen, Bob Penko, and Berne Oldenberg. These gentlemen finished in that order . . . behind Billy!

Congratulations Champ!

WHAT IS AN EXPERT?

To the average spectator at an R/C pattern contest, a loop is a loop, and that's that. They all look alike, whether flawlessly performed by a top competition flier or completely screwed up by a a beginner. Surprisingly enough, there are quite a few R/C fliers who have flown for several years and have all the best of equipment, who also think the same way.

We have watched, and judged, the world's best R/C aerobatic fliers in competition. To see maneuvers performed to perfection, or very close to it, is a thrilling experience, and no amount of judging of this caliber flying can dull the edge.

Continued on page 56

Continued from next page.

ing about its birth, and the 1974 scratched Master's Tournament for giving it the slap on the behind that brought about its first breath of life.

It is now up to all interested R/Cers to help the growth of NSRCA. Join today by clipping out, Xeroxing, or simply copying the membership form printed herein, include a check or M.O. for $4.00, and mail it to Sally Brown, Secretary/Treasurer. ●

Winner of scale at the Las Vegas Annual was Bill Hemple, Sr. with this scratch-built Chipmunk. He's from Tuscon, Arizona. Photo by Jerry Flatt.

Brett Wade gets some assistance from his dad and Joe Bridi as the skies started unloading at Las Vegas. Jerry Flatt photo.

LET ME KNOW WHEN THE RUDDER STOPS WORKING, WALLY!

"THE SCORESHEET" NSRCA NEWS

(NATIONAL SOCIETY OF RADIO CONTROL AEROBATICS)

● Beginning with this issue and continuing on a monthly or as needed basis, MODEL BUILDER will devote a full page to the National Society of Radio Control Aerobatics. This page will be used as the Society sees fit, and for the most part, will be edited by Rhett Miller, Jr., our current pattern champion's father.

The Society's first election of officers has been completed, with the following results: President – Joe Bridi, 23625 Pineforest Lane, Harbor City, California 90502 . . . Vice-President – Don Lowe, 2710 N. Kings Arms Cir., Centerville, Ohio 45440 . . . and Secretary/Treasurer – Sally Brown, 8534 Huddleston Dr., Cincinnati, Ohio 45236.

The following is a message from the first president of NSRCA, Joe Bridi:

"As contest pattern flyers, which include A, B, C, and D, we have wanted to be represented in some way or form to AMA and FAI. By forming the NSRCA we can help ourselves by assisting AMA in selecting better conditions and facilities for our National and International competition.

"AMA has done an overwhelming job, but we, as competition pilots, can hopefully be more effective as a group with ideas and suggestions in assisting AMA. As individuals, we can only voice our opinions, but we are somewhat overlooked. As an Association, we can ask and get more desirable locations and conditions that can only enhance the sport of R/C Aerobatic Flying.

"I, along with other elected officers, and all members, have a tremendous and tedious job ahead of us this coming year. If we all coordinate together, we will have an Association that will be effective and beneficial to AMA, and to all of us now and in the future.

"Anyone can take part in this organization who wants to see the sport advance. Sign up and participate for a better organized sport."

Sincerely yours,
Joseph Bridi
President, NSRCA"

We're sure we can speak for all members of NSRCA in offering a huge vote of thanks to Rhett Miller for literally carrying the unborn NSRCA, from its inception, for well over a year . . . without his efforts, it probably wouldn't have happened. Also, quite facetiously, we can thank the 1974 Nationals for bring-

Continued on previous page.

NSRCA's first president, Joe Bridi, Harbor City, California. Packard photo.

NSRCA's vice-president, Don Lowe, Sec/Treas Sally Brown, and MB Editor at Oshkosh, 1973

NATIONAL SOCIETY OF RADIO CONTROL AEROBATICS

NEW MEMBERSHIP AND RENEWAL FORM Please PRINT

Name _____ AMA No. _____

Address _____

City _____ State _____ Zip _____

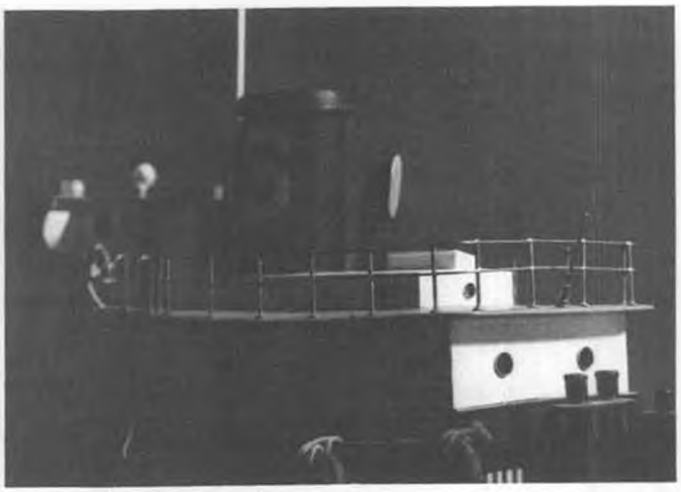
Competition Classification: A ☐ B ☐ C/DN ☐ C/DE ☐

NEW ☐ RENEWAL ☐ NSRCA No. _____

Dues are $4.00 for one year.
Send check or Money Order to:

NSRCA, c/o Sally Brown, 8534 Huddleston Drive, Cincinnati, Ohio 45236

Close-up photo of cabin details.



Cabin detail photo looking forward.

85 FT. HARBOR TUG (PART TWO)

By FRANCIS SMITH

The author continues with construction of the cabin of this all-wood tug. In response to a surprising number of requests, there will be a Part Three, showing radio, power, bow thruster, and tow-line installations. Stay tuned!

● To continue with construction of the 85' Harbor Tug, my next step was to assemble the Cabin Roof to the Main Cabin by inserting into the slots and pushing the roof forward and locking the two sections together.

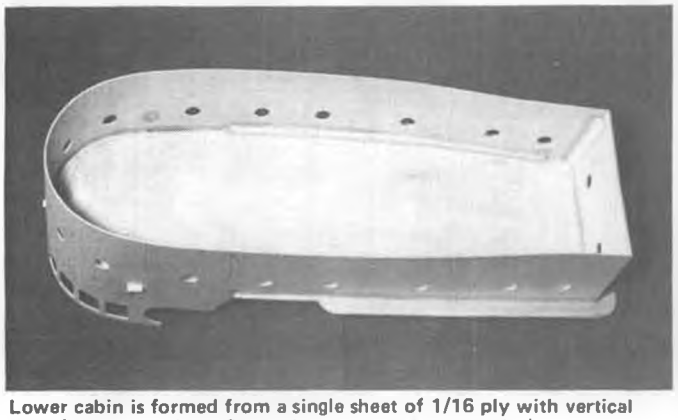
Using the Hull as a support, the Cabin was glued and weighted down. The Cabin Rear Panel was attached and the Pilot House Rear Panel was put on.

Making the Pilot House, Stack, Cupola and Ventilator was routine, and all epoxied to the Cabin with the exception of the Pilot House, which was made a removable piece.

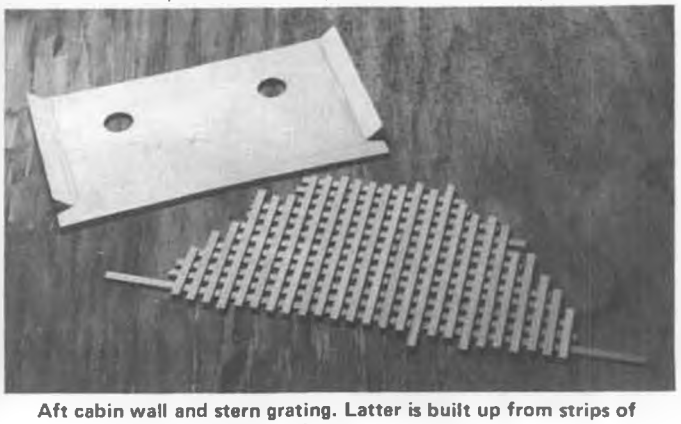
The Cabin Doors were made next and the Pilot House Doors were attached, as well as window trim and the trim strip above the bell.

The detail pieces I made mostly of scrap wood according to the detail drawing, with the exception of the Bell, Horn and Searchlight which were purchased.

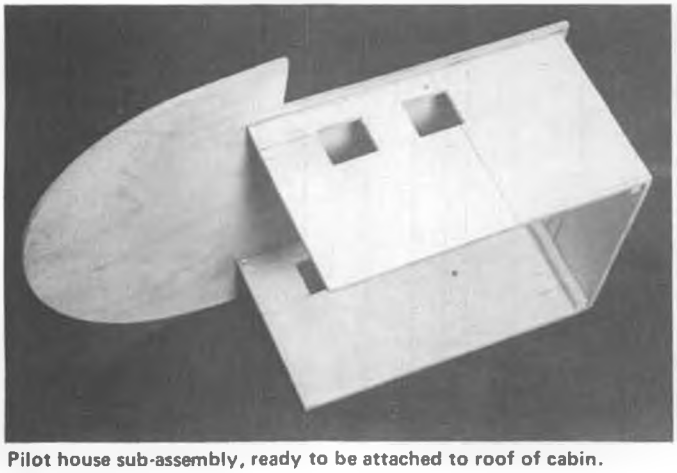
I made the Portholes from brass tubing, and the Handrails and Railing were made from 1/16 inch O.D. tubing and brass rods. My method of making the Railing was to drill a clearance hole for a 1/32 inch brass wire in the uprights and then slip 1/16 inch tube separators over



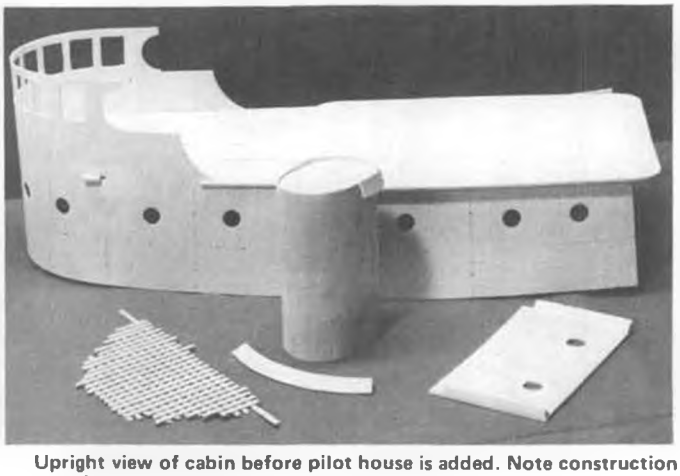
Lower cabin is formed from a single sheet of 1/16 ply with vertical grain (obtainable from Sig at about same cost as regular).



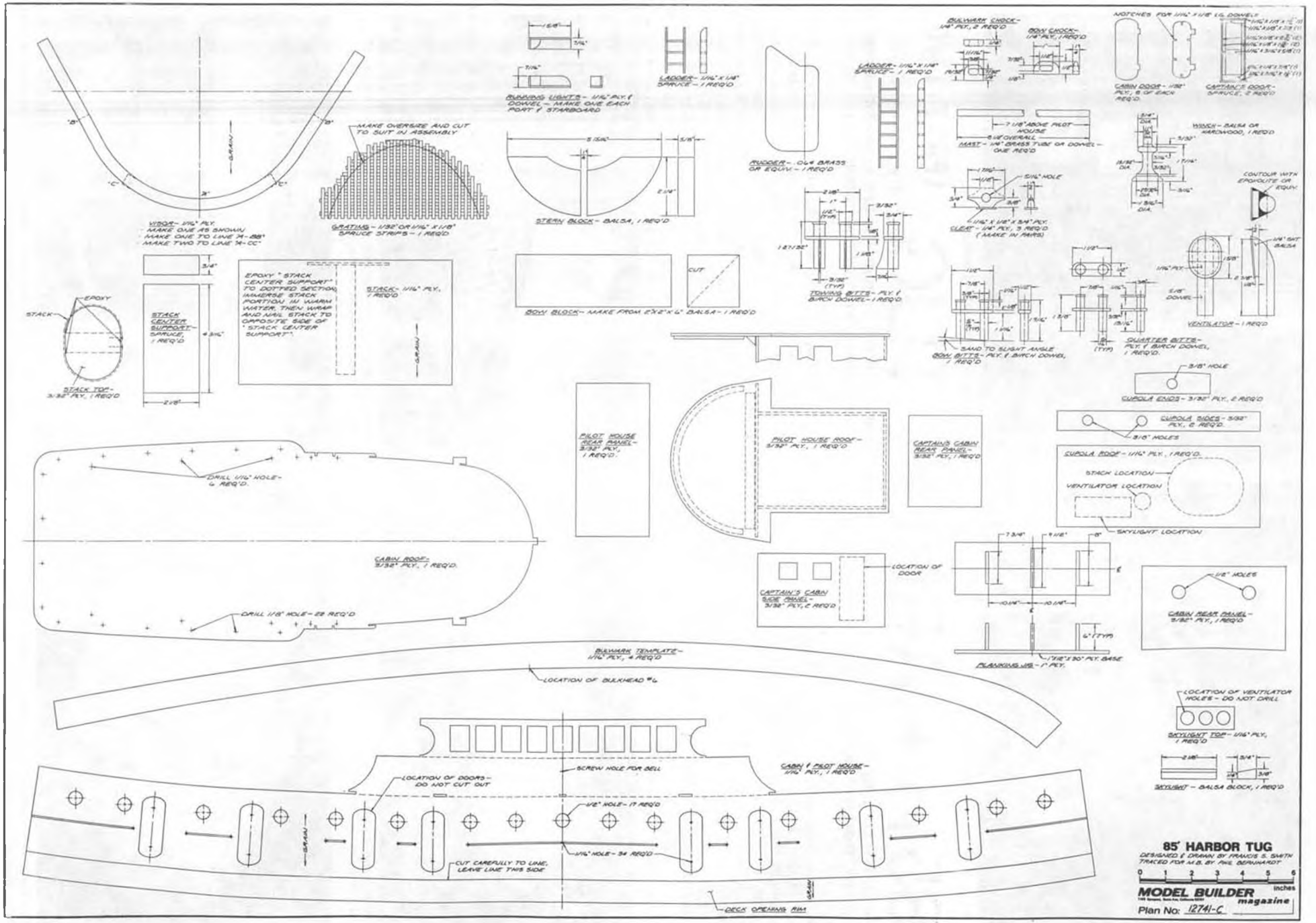
Aft cabin wall and stern grating. Latter is built up from strips of wood and then trimmed to shape.

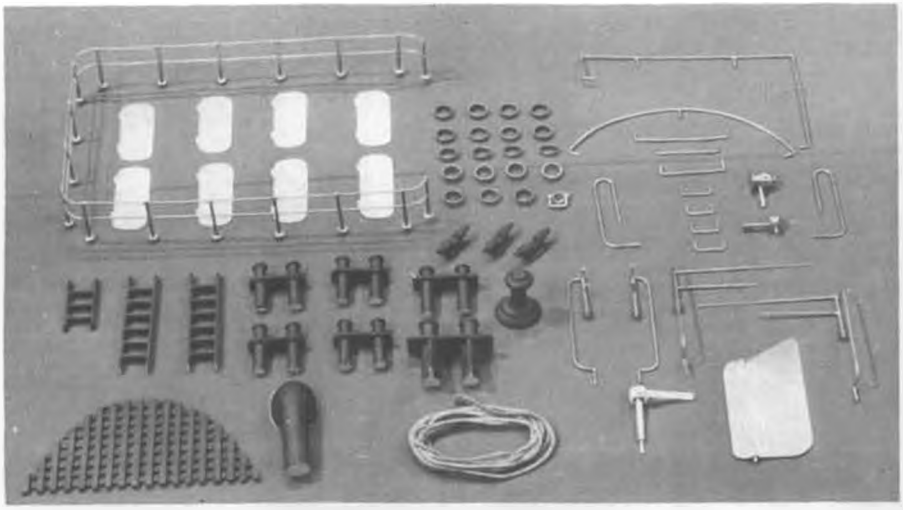


Pilot house sub-assembly, ready to be attached to roof of cabin. Note reinforced corners.



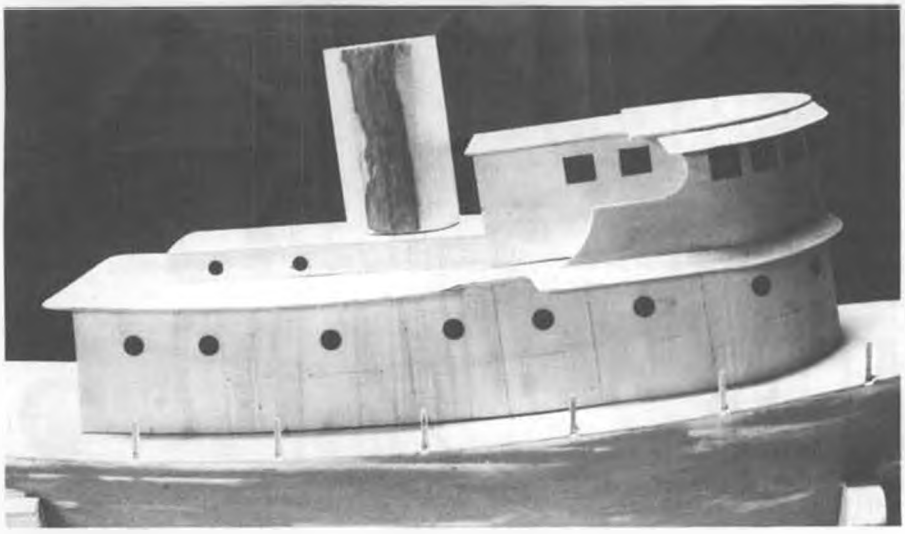
Upright view of cabin before pilot house is added. Note construction key. Stack is plywood, soaked and bent to shape.


VISOR– 1/16" PLY.
MAKE ONE AS SHOWN
MAKE ONE TO LINE "A–BB"
MAKE TWO TO LINE "A–CC"
GRAIN
MAKE OVERSIZE AND CUT TO SUIT IN ASSEMBLY
GRATING– 1/32" OR 1/16" X 1/8" SPRUCE STRIPS – 1 REQ'D.
RUNNING LIGHTS– 1/16" PLY. & DOWEL– MAKE ONE EACH PORT & STARBOARD
LADDER– 1/16" X 1/4" SPRUCE – 1 REQ'D.
STERN BLOCK– BALSA, 1 REQ'D.
RUDDER– .014 BRASS OR EQUIV. – 1 REQ'D.
LADDER– 1/16" X 1/4" SPRUCE – 1 REQ'D.
BULWARK CHOCK– 1/4" PLY., 2 REQ'D.
BOW CHOCK– 1/4" PLY., 1 REQ'D.
NOTCHES FOR 1/16" X 1/8" LG. DOWELS
CABIN DOOR– 1/32" PLY.; 6 OF EACH REQ'D.
CAPTAIN'S DOOR– SPRUCE, 2 REQ'D.
7 1/8" ABOVE PILOT HOUSE
8 1/4" OVERALL
MAST– 1/4" BRASS TUBE OR DOWEL– ONE REQ'D.
WINCH– BALSA OR HARDWOOD, 1 REQ'D.
5/16" HOLE
1 1/16" X 1/8" X 3/4" PLY.
CLEAT– 1/4" PLY., 3 REQ'D. (MAKE IN PAIRS)
CONTOUR WITH EPOXOLITE OR EQUIV.
1/4" SHT. BALSA
1/16" PLY.
5/8" DOWEL
VENTILATOR – 1 REQ'D.
3/4"
STACK
EPOXY
STACK TOP– 3/32" PLY., 1 REQ'D.
STACK CENTER SUPPORT– SPRUCE, 1 REQ'D.
4 3/4"
2 1/8"
EPOXY "STACK CENTER SUPPORT" TO DOTTED SECTION. IMMERSE STACK PORTION IN WARM WATER, THEN WRAP AND NAIL STACK TO OPPOSITE SIDE OF "STACK CENTER SUPPORT".
STACK– 1/16" PLY., 1 REQ'D.
GRAIN
BOW BLOCK– MAKE FROM 5" X 2" X 6" BALSA – 1 REQ'D.
CUT
TOWING BITTS– PLY. & BIRCH DOWEL– 1 REQ'D.
BOW BITTS– PLY. & BIRCH DOWEL, 1 REQ'D.
QUARTER BITTS– PLY. & BIRCH DOWEL, 1 REQ'D.
3/8" HOLE
CUPOLA ENDS– 3/32" PLY., 2 REQ'D.
CUPOLA SIDES– 3/32" PLY., 2 REQ'D.
3/16" HOLES
CUPOLA ROOF– 1/16" PLY., 1 REQ'D.
STACK LOCATION
VENTILATOR LOCATION
"SKYLIGHT" LOCATION
PILOT HOUSE REAR PANEL– 3/32" PLY., 1 REQ'D.
PILOT HOUSE ROOF– 3/32" PLY., 1 REQ'D.
CAPTAIN'S CABIN REAR PANEL– 3/32" PLY., 1 REQ'D.
DRILL 1/16" HOLE– 4 REQ'D.
CABIN ROOF– 3/32" PLY., 1 REQ'D.
DRILL 1/8" HOLE– 28 REQ'D.
CAPTAIN'S CABIN SIDE PANEL– 3/32" PLY., 2 REQ'D.
LOCATION OF DOOR
7 3/4"
9 1/16"
8"
10 1/16"
6" (TYP.)
1/16" X 3" X 30" PLY. BASE
PLANKING JIG– 1 REQ'D.
1/2" HOLES
CABIN REAR PANEL– 3/32" PLY., 1 REQ'D.
BULWARK TEMPLATE– 1/16" PLY., 4 REQ'D.
LOCATION OF BULKHEAD "4"
LOCATION OF DOORS– DO NOT CUT OUT
SCREW HOLE FOR BELL
CABIN & PILOT HOUSE– 1/16" PLY., 1 REQ'D.
1/2" HOLE– 17 REQ'D.
1/16" HOLE– 34 REQ'D.
CUT CAREFULLY TO LINE, LEAVE LINE THIS SIDE
GRAIN
DECK OPENING RIM
LOCATION OF VENTILATOR HOLES– DO NOT DRILL
SKYLIGHT TOP– 1/16" PLY., 1 REQ'D.
2 1/8"
3/4"
SKYLIGHT – BALSA BLOCK, 1 REQ'D.
85' HARBOR TUG
DESIGNED & DRAWN BY FRANCIS S. SMITH
TRACED FOR M.B. BY AXEL BERNHARDT
0 1 2 3 4 5 6
inches
MODEL BUILDER magazine
Plan No: 1274-C



Fittings, railings, doors, portholes, etc., are finished and painted before being added to the boat. Makes a neater job than painting them after installation.

Reversible electric windshield washer pump operates bow thrusters.



Completed cabin structure, resting on deck. It fits over deck opening rim, and serves as a quick-opening lid to the radio and running gear in the hull.

the wire and solder the joints. It was similar to stringing beads.

I managed to salvage some 1/25 scale truck tires from the kids in the neighborhood, which worked out very nicely for bumpers. The Bow bumper and rope were soaked in stain, which gave a more realistic look and texture.

I did not go overboard with sanding because I wanted to get a weathered look. The tug was painted, believe it or not, with Rustoleum; dark green below the waterline, flat black from the waterline to the top of the Bulwark. The Cabin was dark green below the Handrail and cream above. The deck and roofs were painted gray.

My Drive consisted of one Pittman Boatmaster motor powered by two motor-cycle batteries, using a 1-1/2 to 1 gear ratio and a Pittman speed control.

A Ford windshield washer service kit was used for the Bow Thrusters.

When the tug is finished and ready to run, it weighs approximately 26 pounds.

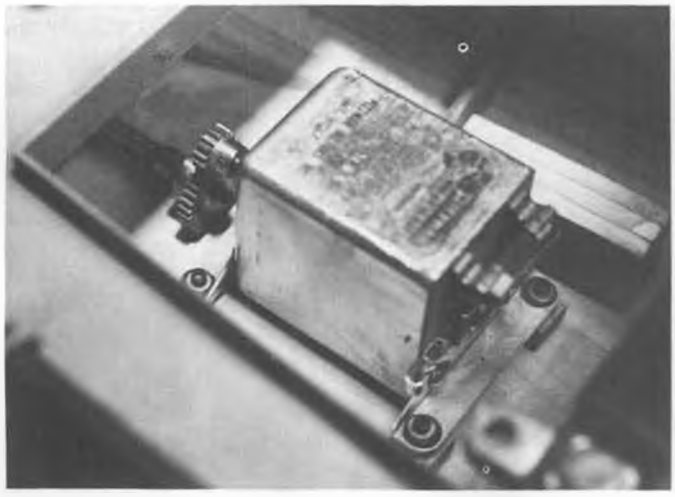
21. From a 1/16 x 12 x 48 length of plywood (grain running in the 12 inch direction) cut the Cabin and Pilot House.

22. The Cabin Roof is made from 3/32 plywood. Assemble to Cabin and Pilot House section by inserting into slots and pushing forward to lock in place. (Putting 1/4 inch long x 1/16 dowels in roof section will aid in holding sides in place while glueing.) Place assembly on Hull, epoxy well, and put weights on roof to assure good fit. Reinforce with balsa gussets after removing from Hull.

23. The Cabin Rear Panel can be made from 3/32 or 1/8 plywood and epoxied to Cabin.

24. All the pieces for the Pilot House can be cut from 3/32 plywood. When

Continued on page 73



Single Pittman motor drive system with 1-1/2 to 1 reduction gears. Note overload circuit breaker.

Another drive system consisting of two Dumas motors with a Dumas 3-1/2 to 1 gear reduction. Note universal couplings.

The "New Look" on John Tucker's latest Hegi Bell Huey Cobra was obtained by turning the stock canopy around! Not a bad looking arrangement. Modification required a triangular gusset to fill in a gap at the aft end.

CHOPPER CHATTER

By JOHN TUCKER

● Boy, am I confused with the time schedules . . . ever since we went back to Pacific Standard Time, I haven't been able to get "in gear" as far as my modeling goes. It used to be I'd get off work and have a couple of hours in which I could get my chopper into the air for a few passes before dinner, but now its dark before I leave the office and all I can do is put in workshop time and save the week-ends for flying.

Speaking of workshop time, it seems I've been repairing more and flying less these past few months. You would think that after a dozen choppers and two or three years experience I could come up with at least one "old faithful" that was in tip-top shape and foolproof . . . not so! Seems you can pretty well approach the foolproof stage but not the "damn" fool proof! The more I work at it, the more I realize there is a long way to go in simplification of equipment, better quality control, and flying technique improvement. It does get quite discouraging at times, and of course, the investment in both dollars and time is considerable. At least three prominent West Coast chopper pilots have all but given up their interest in model helicopters for reasons such as; lack of companionship and sharing of interests, lack of contest activities and organization, unpredictable performance of the machine itself, not seeing much improvement in personal flying capability, etc. On the

Here's John's Huey Cobra with the Schluter "Expert" collective pitch head. Described in text.

Ernie Huber's Kavan Jet Ranger with a Mike Bosch elevator rig for looping. It ties into "reverse" cyclic.

other side of the coin, there is the intense desire to master the chopper and the knowledge that some of the guys turn in regular performances every time they fly!! One of these days, I'd like to interview an expert like Ernie Huber and get the "real" low-down . . . Was his professionalism achieved at the expense of many failures, or was he blessed with exceptional good fortune from the beginning? Ernie, how 'bout a detailed report for a future issue . . . I'm sure the readers would like to share your thoughts!

If the above meanderings appear to be negative in nature, perhaps it's because I've been plagued with numerous helicopter problems myself in the past month! For over a year now, I've had a Hegi Cobra kit just sitting on the shelf waiting for someone to put it together. I finally got my new Schluter Collective Pitch rotor head assembled and decided to build the "Cobra" as a test-bed, and at the same time, do a little customizing in the process.

So . . . I cut off the lower gun turret and filled in the hole with a sheet of fiberglass laid up on a flat board. This resulted in a clean looking nose, however, I still wasn't satisfied with the bump-cockpit enclosure. A few sketches later convinced me that I would have to mold a new canopy. My biggest surprise came when I simply turned the existing canopy end-for-end and glued it in place! Now *that* is a streamlined nose! Of course I had to fill in the rear corners with wood, but there are existing braces in that location which re-worked into the scheme of things nicely.

I have also thought of reducing the height of the upper pylon by one inch, but will hold this idea for the future. Anyway, the completed model turned out just like I wanted, and I was very pleased.

Dieter Schluter advised that either flat or symmetrical blades would be O.K., so I added a slab of balsa to the bottom side of the flat blades and sanded them to a symmetrical shape. So far, so good. (I also built a set of standard blades and installed them on the "S" rotor head as a back-up.)

The transmission case conversion was no particular problem (just follow the drawings), except that the side clearances in the Cobra are not great enough unless you keep the bell-cranks in real close to the transmission . . . slight modifications required here.

Well, the day finally came last weekend . . . The new German Veco was well broken in, and everything was adjusted to specs. I could hardly believe that the first lift-off ocurred at one-third throttle, no trimming or adjusting required, and the model was super-stable! Gosh, how nice that machine is for easy control . . . I still say it's the best bet for beginners!

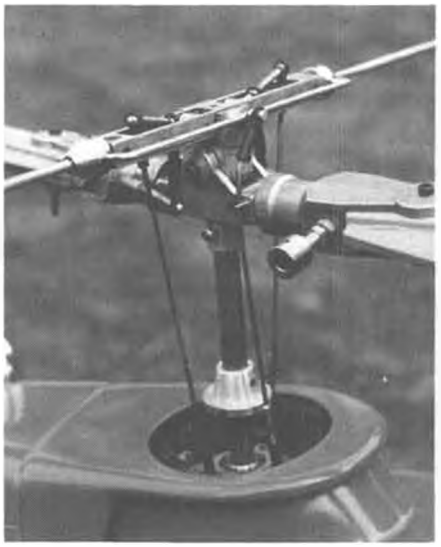
The collective pitch head worked fine for several hovering sessions, and then suddenly the rotor blades went "ape"! They would drift out of track by three or four inches, then come back in track. All the while, the blades themselves were twisting and assuming a curve much like a sine-wave. Naturally, as this was happening, the lift component was rapidly changing, and it became quite a chore to get the model back on the ground in one piece (but I did it, ha!)

A thorough examination showed nothing broken, nothing loose, alignment still perfect, etc., but the problem persisted on subsequent flights. Now this is something I had run into before on a collective pitch head that Charlie Gilbert had built for me. It too had exhibited the same identical whip-lash problems and we had scrapped the idea, at the time, as unsuitable. I still haven't

Continued on page 61

CORRECTION: Last month's column featured a picture of Ernie with this Bell 212 Twin Jet. It is NOT a Graupner, but rather, Yugi Oki's Kalt fuselage, with Kavan Jet Ranger running gear!

"Well, the way I feel about it girls, if she doesn't get her collective pitch straightened out . . ." Kalt Cobra, Kavan Jet Ranger, and Hegi Cobra, belonging to "Chatter" editor . . . having a chat.



"Third arm" conversion for Kavan Jet Ranger, as explained in text.

R/C SOARING

By LE GRAY

. . . a lesson in functional aerodynamics from the teachers of the world . . .

● The year 1927 was significant in aviation history. The primary event was the Lindbergh flight. To the east of this landing at Le Bourget Field in France, however, another pioneer's contribution to the future was in progress. Alexander Schleicher was bending first wood and clamping prototype glue joints in his new glider manufacturing shop at Poppenhausen, Germany.

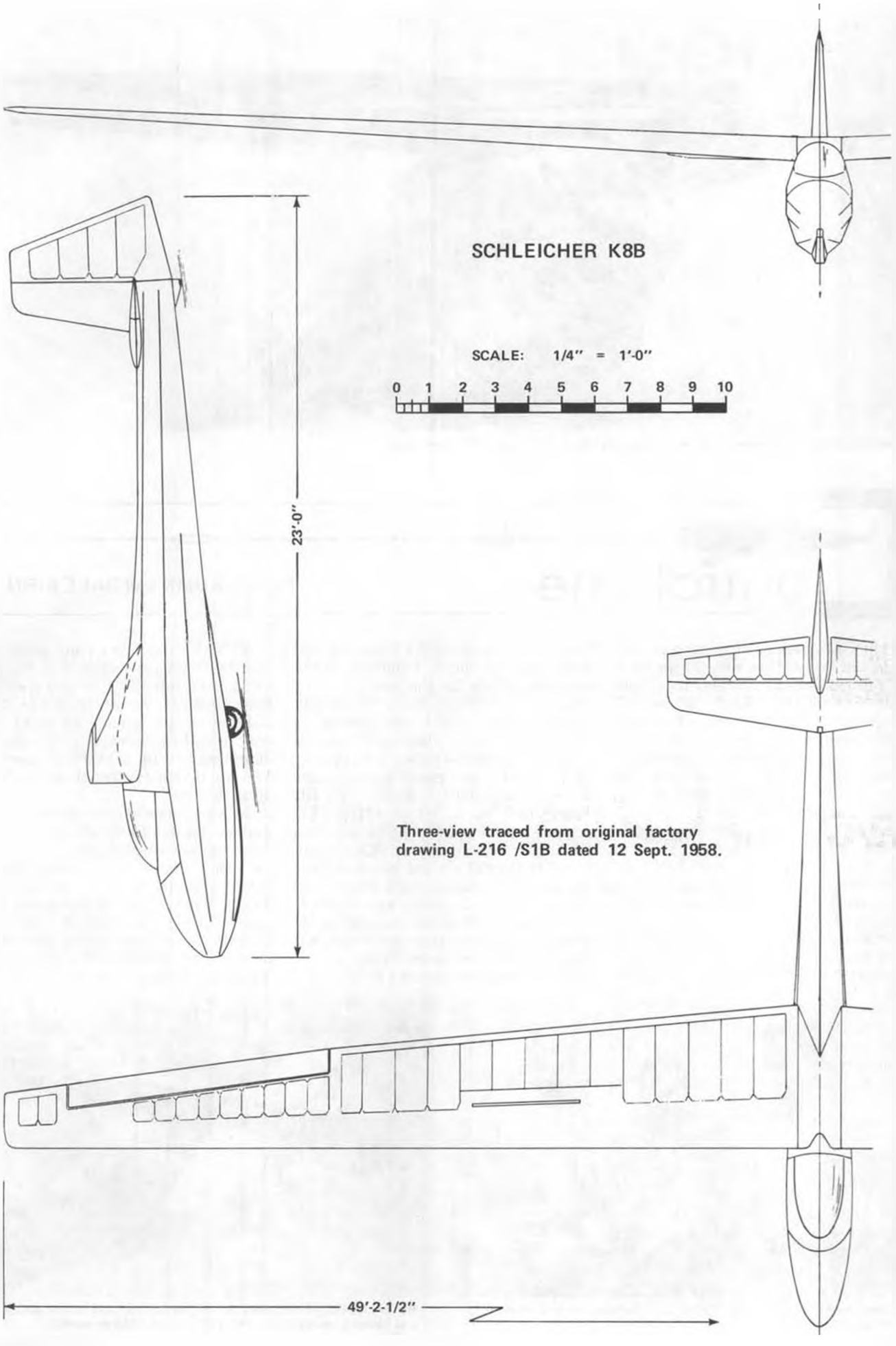
Schleicher had won the 1927 contest for training gliders held at the popular Wasserkuppe soaring center. His instant fame captured the imagination of sportsmen looking to upgrade their equipment. The small company founded to satisfy the demand for Schleicher's new and better aerial mousetrap was to become one of the oldest manufacturers of gliders and sailplanes in existence today.

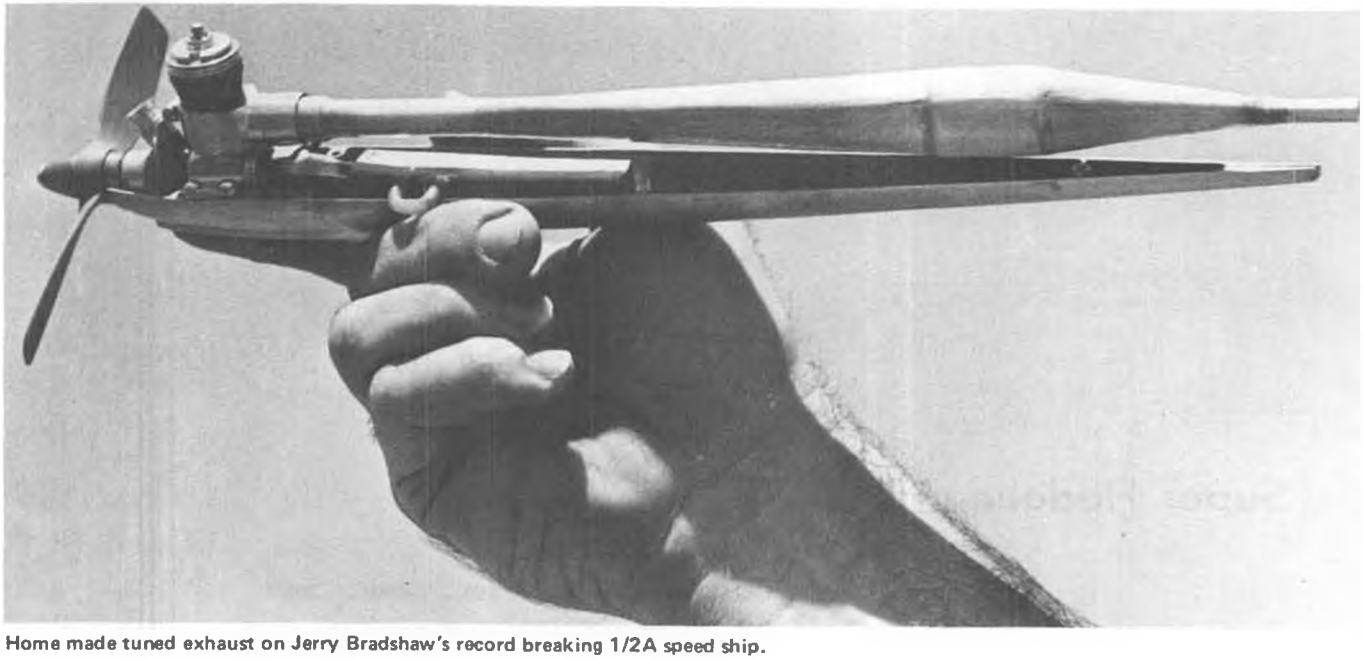
In the years preceding World War II, when gliding activities in Germany were preparing young men for the yet-to-be identified Luftwaffe, Schleicher's major products were the renowned "Rhonbussard" and "Rhonadler," by designer Hans Jacobs. These craft flew in direct competition with Hirth's gull-winged classic, "Minimoa."

During the second World War, sport soaring disappeared, and the talents available at the Schleicher works were directed to the repair and maintenance of Granau Baby II sailplanes used for wartime pre-primary training. For a period immediately following V-E Day, the woodworking artisans at the Poppenhausen glider factory devoted their skills to the production of furniture. In 1951, Alexander Schleicher Segelflugzeugbau again began producing sailplanes.

One of the first post-war configurations of the revitalized aircraft plant was the "Rhonlerche II," a small, strut-braced, 2-seat trainer very similar to the American Schweizer 2-22. This design, by Rudolf Kaiser, was produced in quantity and several hundred served private owners and clubs throughout the world. A more exciting Schleicher-built, Kaiser design was the Ka 6. It was a Standard Class, competition sailplane, first flown in 1955, and introduced to the international soaring fraternity at the 1958 World Championships. At this outing, the Ka 6 placed third and won the OSTIV Prize for the best Standard Class design entered. Various examples of the Ka 6 series were piloted to the top of many competitive scrambles, including Standard Class World Championships in 1960 and 1963. In 1965, a German pilot, in a Ka 6E, flying as a guest in the U.S. Nationals, was the highest scoring contestant. Several goal distance flights in

Continued on page 74


SCHLEICHER K8B
SCALE: 1/4" = 1'-0"
0 1 2 3 4 5 6 7 8 9 10
23'-0"
Three-view traced from original factory drawing L-216 /S1B dated 12 Sept. 1958.
49'-2-1/2"



Home made tuned exhaust on Jerry Bradshaw's record breaking 1/2A speed ship.

Control line

By JED KUSIK and DALE KIRN

● Jed Kusik wasn't able to get a column to us this month, but some of the seeds he planted in past columns have born fruit. For instance, Sandy Blaize, 417 Ridgewood Drive, Metarie, Louisiana 70001, responded to Jed's comments on diesel engines. His letter, which follows, should be of interest to anyone who uses, or has thought about using diesels, whether for R/C, F/F, or C/L.

"Well, well, well! Someone finally is doing it! I have threatened to, and in fact, have a rough text about 75% complete. What I am talking about is that series on diesels you have been doing in MB. Good work so far.

"One comment though. Your 'running instructions' seem to be oriented towards Team Race engines. First, you state that a cut-down 8 x 4 is to be used with a 2.5 cc diesel. I shudder at the thought of this for the first 10 to 15 minutes of running! Even though my Super-Tigre G15RVD was limber at about 20 minutes running . . . enough to put on a 7-1/2 x 4 or 8 x 4, I wouldn't have done it right away. By no means would I have done it with, say, a DC Rapier or PAW 2.5DS or 19DS. PAW engines are too darn tight in the main bearing and will overheat VERY easily . . . at least until you get about an hour on them. The Rapier needs lots of running to obtain a good piston/cylinder fit. Neither of these are contending engines for team racing, by any means, but they are good for sport flying, as well as for learning how to run a diesel.

YES! You are sure right about the 'tuning' techniques! Mess with the piston and cylinder fit with any jeweler's rouge, pumice, or anything like that, and you've got a piece of junk! The only thing I can think of in the way of improving the fit is LOTS of running! You are definitely right about a LONG break-in time.

Now . . . some diesels *are* low speed engines and don't have modern porting. Also, the bore-stroke ratio is all wrong, for high speed 8 x 4 running, that is, but this seems to be an oddity with diesels. What I mean is, compared with glow engines, the stroke is almost invariably longer than a glow for a given displacement. This doesn't apply to most 'Modern' designs, such as the Super-

Big helpers for a small plane (l to r): Jon DeFries, Jerry Bradshaw, and Luke Roy.

Record holder all buttoned up and ready to go. Note left-hand prop and Mono-Line lead-out, also, last-minute AMA numbers!

Bill Fitzgerald, San Mateo, Cal., now holds the WAM 1/2A stunt record . . expert class. Used "Li'l" Pronto design by Dick Mathis.

Rare picture of Jim Wade smiling! Why not? His record-holding proto 1/2A ship just set another record at 108.27 mph!

Tigres, Bugls, MVVS and the like.

"You might also encourage the use of 1.5 cc engines in a '½A T/R' event. This would be great for younger flyers and would surely expand Team Race in the U.S.

"By the way, I am interested in Team Race (pit man/mechanic) and wanted to build a 'Turtle' racer. Even wrote to Henry Helmich for all the prices, etc. Can you put me in contact with anyone in this area who is interested in flying?

"By the way, did you get one of those "Doonside" Mills 75's? What an engine! A real antique! The darn thing starts with one flip and will turn a GreaaT BIGG PROP!

"Also, I was introduced to MVVS with a 1.5 cc about a year ago. That little thing looks like a crude piece of junk, but does it *run!* Low RPM is not for it. It literally likes to *scream* . . . Turns a 6 x 6 prop to all kinds of revs. Don't remember what my Thumb Tach read, but it was a bunch.

"As to diesels throttling: I have been flying R/C with ME "Snipe" engines now for quite a while, with very good results.

"I am at present flying a JR. FLITE STREAK with a PAW 1.49 D-S and a 10 year old vanilla FLITE STREAK with a PAW 19 D-S. Neither one burns the circle up with speed, but both stunt nicely and fly at a leisurely pace. Have a homebrew 'Pfalse-SE,' done up in semi-scale Pfalz D XII regalia with a SOKOL 2.5 cc turning a 9-4 prop. With streamers on the interplane struts, it creeps around the circle and stunts to boot! You gotta keep the maneuvers big to keep from stalling her out, but she pulls mighty hard. Very realistic, slow flight. That model appeared in Aeromodeller some time ago.

"I am in the engine business in a small way too. I import PAW, ME, DC and ED engines. Have been working on trying to bring in the USSR engines (SOKOL, MK16, MK17 etc.,) but no contacts so far. The Russians are very touchy about everything!

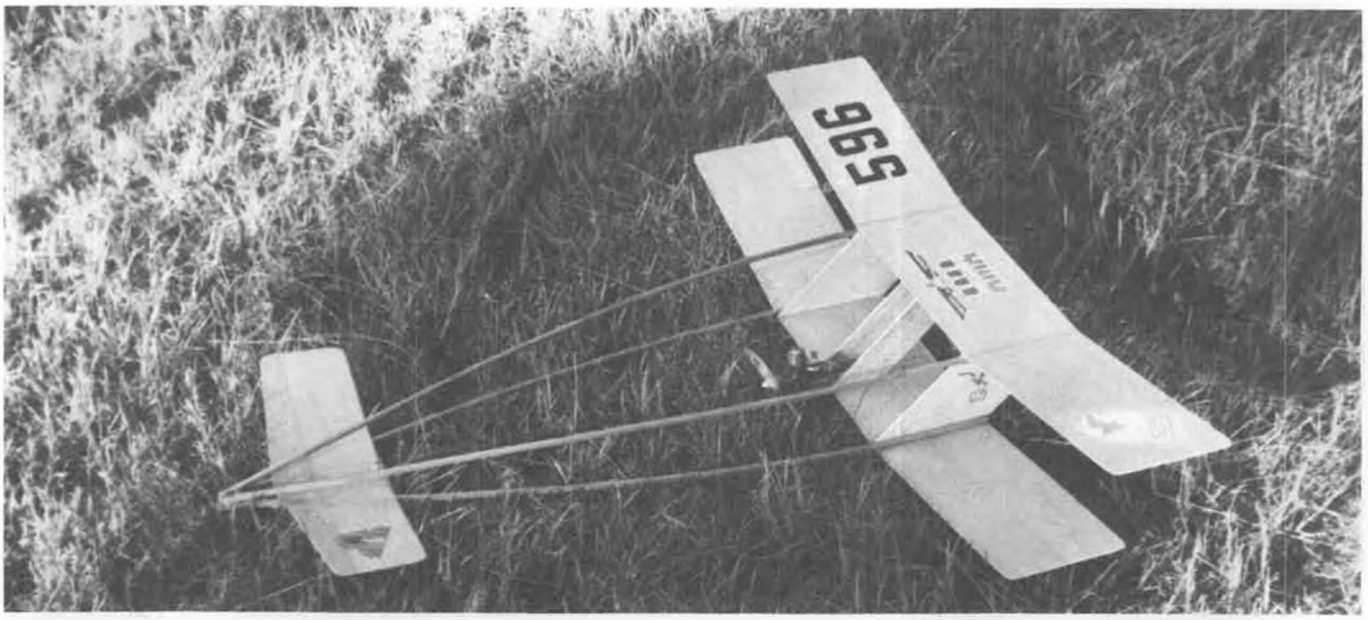
"By the way . . . On fuels. Have had very unsatisfactory results with anything but castor oil. Some engines will run on regular motor oil, some on synthetics, but some balk on everything except castor oil. Tell your readers *not* to run a PAW on a fuel containing less than 25% oil, with at least 15% castor oil. Main

Continued on page 58

CHART 1 (Data based on existing records and two-line wire sizes)					
CLASS	PRESENT LINE DIA.	PRESENT RECORD	PULL IN FLIGHT	LINE STRENGTH FACTOR AT 80%	SAFETY FACTOR
1/2A	.008	117 MPH	17 LBS.	32.1 LBS.	1.89
A	.012	168 MPH	37 LBS.	68.2 LBS.	1.84
B	.014	193 MPH	62 LBS.	90.9 LBS.	1.47
C/JET	.018	201 MPH	89 LBS.	144.9 LBS.	1.63

CHART 2 (Possible records using coupled lines)					
CLASS	PRESENT LINE DIA.	"POSSIBLE" RECORD	PULL IN FLIGHT	LINE STRENGTH FACTOR AT 80%	SAFETY FACTOR
1/2A	.008	129 MPH	20 LBS.	32.1 LBS.	1.61
A	.012	185 MPH	45 LBS.	68.2 LBS.	1.52
B	.014	212 MPH	75 LBS.	90.9 LBS.	1.21
C/JET	.018	221 MPH	107 LBS.	144.9 LBS.	1.35

And, a new WAM jet record of 192.03, set by John Newton (pilot, in photo) and Jim Clary.



The Beach's Flyer is a real quickie, in addition to being quite "far out", as John Denver would say. Wings are flat, all-sheet construction. Booms are 1/4 square spruce. Any .049 or small diesel will provide the needed power. Ti ekil ll'uoy, ti yrt!

BEACH'S FLYER

By MIKE BEACH
and JIM KLOTH

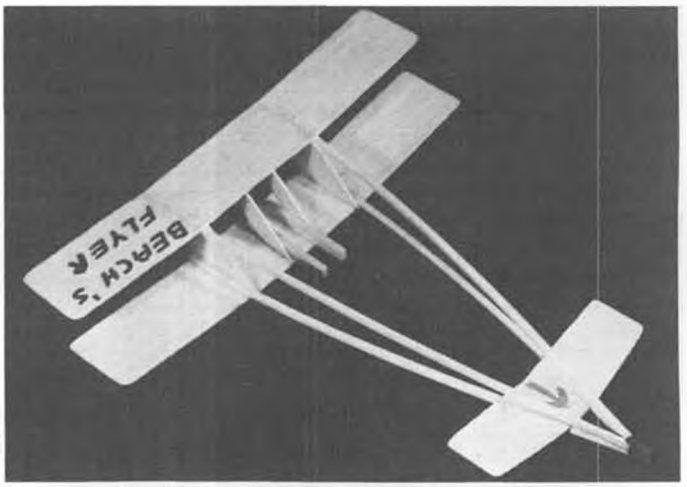
We bet a lot of modelers will build this thing just to see for themselves if the authors mean it when they say, "It's a Stable Mabel that'll fly right off the table!" Join the "It Went Thattaway Club" and try one yourself.

● There is an old saying in automotive circles, "Give an Englishman a piece of sheet metal and he's bound to do something stupid with it!" Maybe this applies to balsa too. Actually, M. L. "Mike" Beach of Twickenham, England, is a rather exciting person. He is a full scale pilot of no small ability. He shares in the ownership of several full size airplanes and vintage (pre-WW II) sailplanes which are flown at air shows and rallys in England. He is a member of the British Tiger Club, their Aerobatic group, and is currently building a full size replica of an SE-5. He was featured in a BBC-TV ten minute sequence doing a comedy aerobatic routine. He has also designed and built several successful ignition model engines. He hasn't forsaken models, but limits his participation to their Vintage (Old Timer) events.

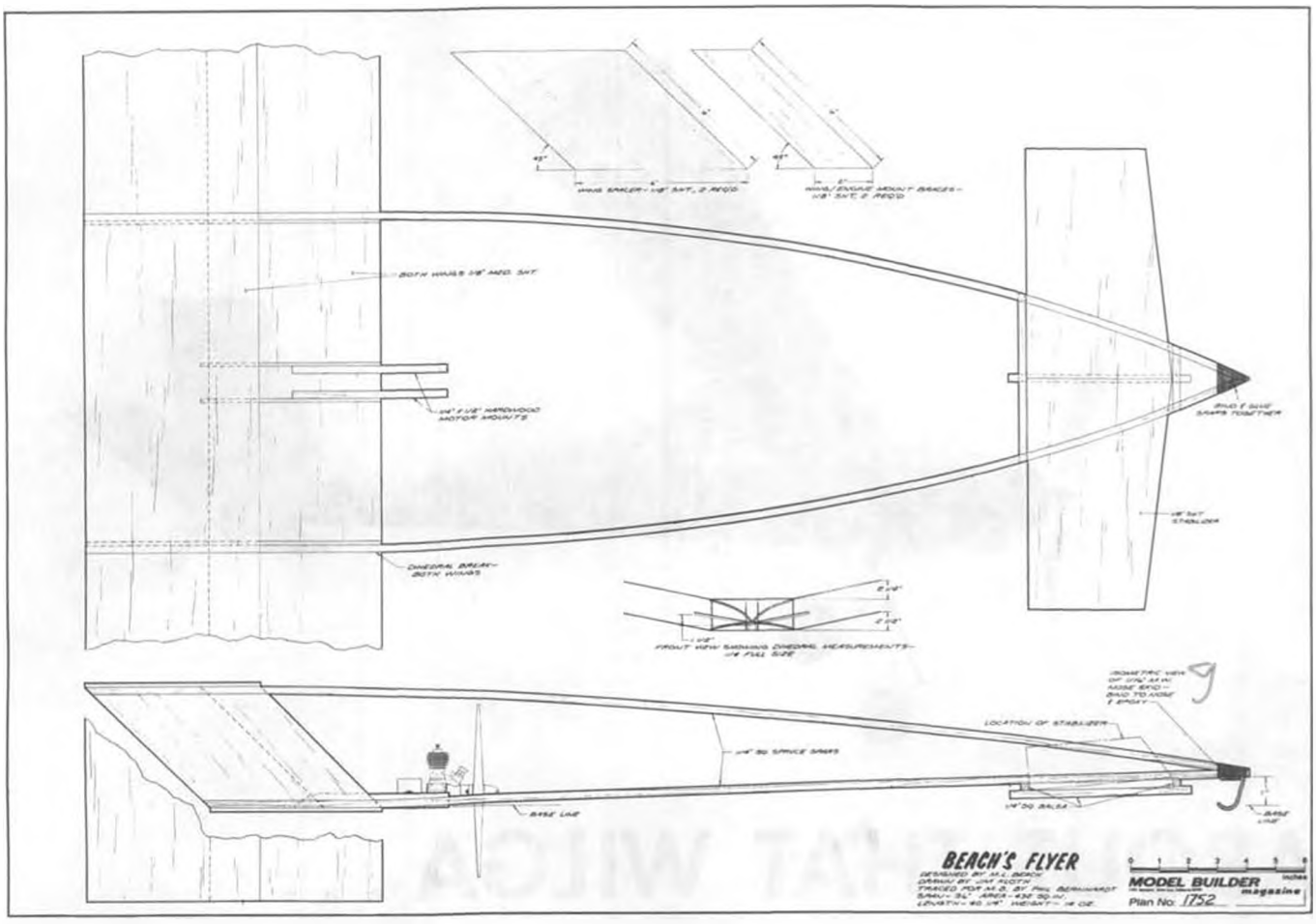
I became acquainted with Mike through our mutual interest in engine collecting. Sent along a picture of me launching my 1928 Don Burnham Twin Pusher in response to some pictures which he had sent. He sensed my interest in backward flying models and described his Beach's Flyer. I couldn't resist something this strange so asked for the plans. He responded with the drawings and construction details, but I filed them away for awhile. The mood to build something different struck again finally and my version started taking shape.

It is simple and easy to build by following his instructions. I used Hobbypoxy I throughout, and finished up with 3 coats of clear dope to seal the wood. Only change which I made was to use 1/4 x 1/4 spruce crosspieces fore and aft of the forward stab, with a longer piece centered on them and extending beyond to act as rubber band hooks to hold the stab in place. I also added a wire skid to the nose and a pair of skids beneath the bottom wing to protect it from the concrete runways and taxi strips on the fields where we usually fly. I chose a Mills P.75 diesel for power with the standard Mills tank. First flight attempts proved Mike to be right . . . the damned thing did fly despite the caustic comments of my flying com-

Jim's daughter, Carolyn, shows how to hold the . . . er beast while starting the engine. It may take a little practice.



Test model built to try out the configuration . . . you can hardly blame anyone for that! Forget it, Mooney, t'ain't scale!



FULL SIZE PLANS AVAILABLE – SEE PAGE 80

panions that day. Tweaking (it is a British design so must be handled in their manner) the right lower wing tab up about 1/8 inch produced a gentle left turn and this was all the adjustment that it needed.

The Mills tank didn't allow much of an engine run, so I added angle brackets to a Perfect ½A tank and mounted it, with the pick-up tube at the bottom, between the mounts. This gives a longer engine run and more interesting flights. No matter what Mike says, the glide is nothing to write home about. It would need a "Taft Trash Mover" to do any kind of soaring. But then, it is only a fun flyer, to amaze and amuse your friends.

Jim Kloth, St. Petersburg, Florida, with his Beach Flyer. Motorcycle is handy!

Starting is best accomplished by grasping the mounts in one hand from above and reaching up from below to flip the prop with the other hand. I chopped up a few fingers before I worked out a launch method. What seemed to work best was to hold it in one hand by the inboard struts, aim it up about 20 degrees . . . and shove. Allow plenty of room around the launch site as it does climb slowly.

Mike and I used small diesels for power, but I suspect that any of the Cox Reed Valve .049's would do the job too. Maybe it is a good place for a fugitive from a plastic ready-to-fly. A suitable ply firewall type adapter could be epoxied between the engine bearers.

I've had a ball with my Beach's Flyer. Wish that I had a flying field nearby so that I could crank it up more often. It sure is an attention getter . . . people aren't really sure which direction it flies until you crank 'er up and chuck it into the air. It created quite a stir at the Lake Charles Nats, just sitting in the Old Timer's booth. Northrop saw it there, and you know how he is about Bipes . . .

Now I'll bow out and let Mike tell his side of the story,

"Some while ago, when browsing through some books at Beaumont Aviation Literature, I was tempted into buying a pre-Great War book on aeromodelling. I've always had a suspicion that some of the early designs could be made into simple unusual models and thought I'd try out something on this line. After scribbling on the backs of envelopes for a while, this layout showed up, which looked promising. It is loosely based on the type of design flying before 1914.

"I made a small balsa glider on these lines and it flew beautifully, so I decided

Continued on page 74

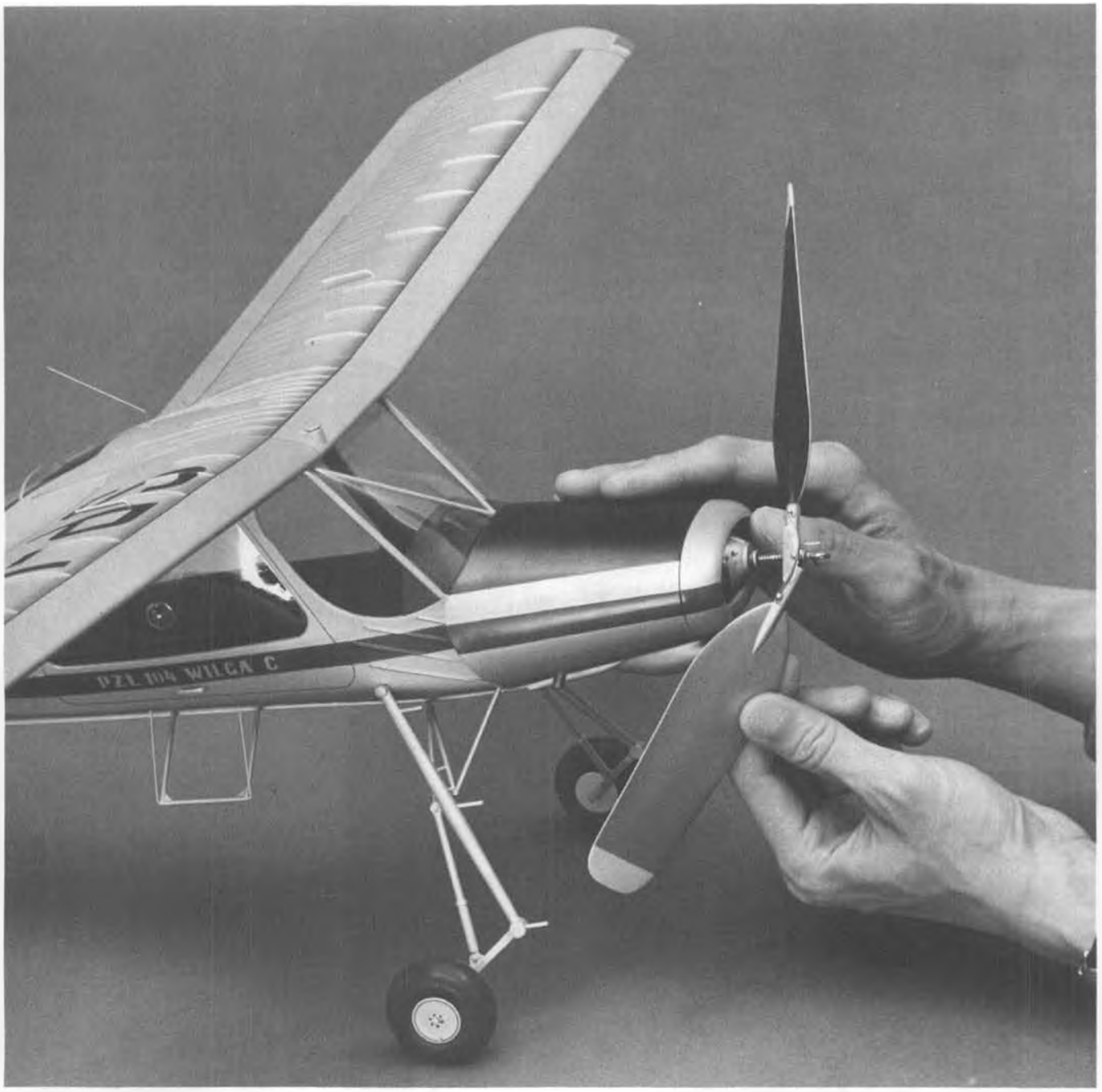
With Carolyn on the watch, Jim proves that it really does go "thataway."

ABOUT THAT WILGA . . .

After publishing a picture of this model a few months ago, we were bombarded with letters asking for plans. During a phone conversation with the builder, we learned why the requests would have to go unanswered . . . you simply can't draw plans around the building techniques described in the article. By DON TYPOND

● The model was based on a three-view appearing in AEROMODELLER sometime in late 1967 (and again in the Flightmaster newsletter of August 1974). The scale of the model is 1 inch to 1 foot for a span of 36 inches. I drew "plans" but they don't exist any more. As you know, scratchbuilders sort of shoot from the hip and don't always draw plans complete enough for anyone else to build from.

Anyway, I chose to build this thing for two reasons: One, it's a weird looking aircraft, and I didn't think anybody else would show up with one. Two, I



wanted to build a model of an all-metal aircraft that looked like an all-metal aircraft . . . in other words, all sheet balsa rather than stick-and-tissue. (This was nothing new. Other people had done it . . . it's just that / hadn't done it.) I chose to rubber power it because I dislike "gas motors."

Construction: The fuselage was built on a horizontal crutch. The crutch was formed by laminating 1/32 x 3/16 strips to form a 1/16 x 3/16 crutch in the "tadpole" shape of the top view. Upper formers were glued in place, followed by 1/32 planking of the cabin area and tailboom. The cabin area was a real problem because it's mostly glass, and the wing mount structure is essentially cantilevered off the main portion of the fuselage aft of the side windows. This required some 1/16 sheet for strength.

Once the top was planked, the fuselage was turned over and the lower half received its formers and planking.

The landing gear was made up as two separate legs. Each leg consists of a piece of 1/16 music wire, bent to form the axle, knee-joint, leg, and mount. The mounting is "torsion-bar" with each gear leg held in a transverse brass tube on the bulkhead. Bits and pieces of basswood, plywood, cardboard and balsa were glued on and around the wire to form the gear fairing, knuckle joint, etc. The oleos are telescoped aluminum tubing, held on with model railroad screws. All external stiffening ribs on the fuselage were made from balsa strips, sanded to proper cross section and applied just prior to final painting. The nose area was carved and hollowed from blocks.

Wing construction is all-sheet, with 1/32 ribs, 1/32 skins, 1/2 x 1/2 leading edge, and no trailing edge . . . the sheet just comes together to form the trailing edge. False spars were installed to hang the hinged ailerons. Stabilizer is similar except it's 1/64 sheet. Same for fin and rudder. Wings plug in to fuselage with 1/16 music wire.

Propeller is free-wheeling, but with spring-loaded hinged blades to absorb minor impacts. Hub is brass and aluminum, blades are laminated balsa sheet.

The entire model was covered with tissue, then clear doped. The aforementioned strips were glued on, plus the upper surface fences on the wings. Chart tape was used to simulate corrugations on the ailerons, elevator, fin and rudder. Then the whole thing was shot with a very fine coat of Aerogloss silver cut with 10% grey. All lettering was done

with a pen and india ink.

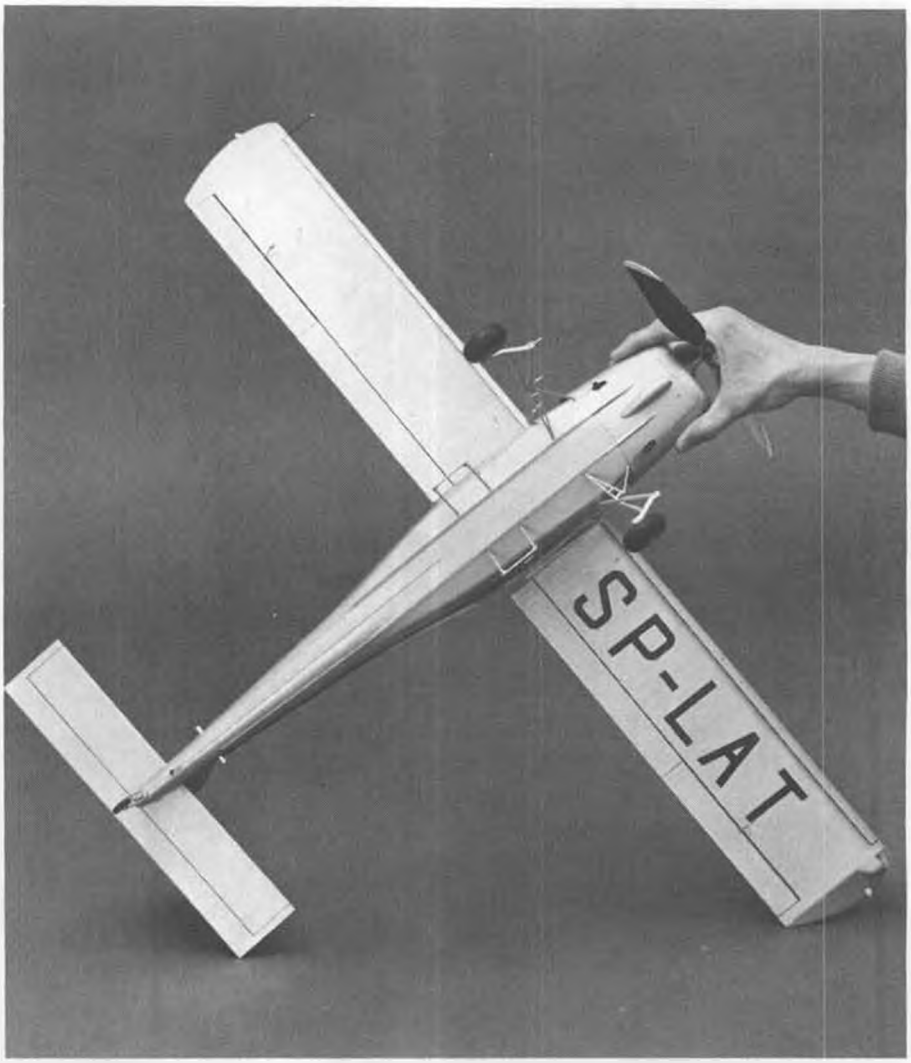
Leading edge slats on the wing were simulated by masking and "feathering" with an airbrush and dark grey paint. This gives the appearance of slats if you don't look too closely and you're pretty far away.

Every piece of glass on this airplane is compound curved, so every window had to have a form carved, over which was drape-formed the butyrate sheet material. Cabin air vents, as well as the landing light cover, were vac-formed over suitable forms. The cabin air vents were then cemented to the side windows with liquid plastic cement. Each window is mounted in a molding made from thin cardboard, which was built into the fuselage structure. This eliminates the "pasted-on-the-outside" appearance, but took many many hours of tedious work.

All the little details are made of aluminum, brass, wood, card, wire, tubing, paper, dowel, and anything else that worked.

Does it fly? Yes, sort of. It's smooth and stable under power, but when the rubber is unwound it glides like a clump of grass. For one thing, a free-wheeling prop has about the same amount of drag as a flat disc of the same diameter. For another thing, this model is HEAVY. It's about six ounces, which is about four ounces too much. Maybe it's a good thing the prop has so much drag . . . it keeps the airplane from hitting too hard!

As a footnote, the model took about 650 hours to build. ●



Tom Stark's Tailwind rubber powered model won first in outdoor scale at the 1974 Nationals. Only deviations from true scale are slightly increased dihedral and stabilizer area. The flight times averaged over a minute for four flights.

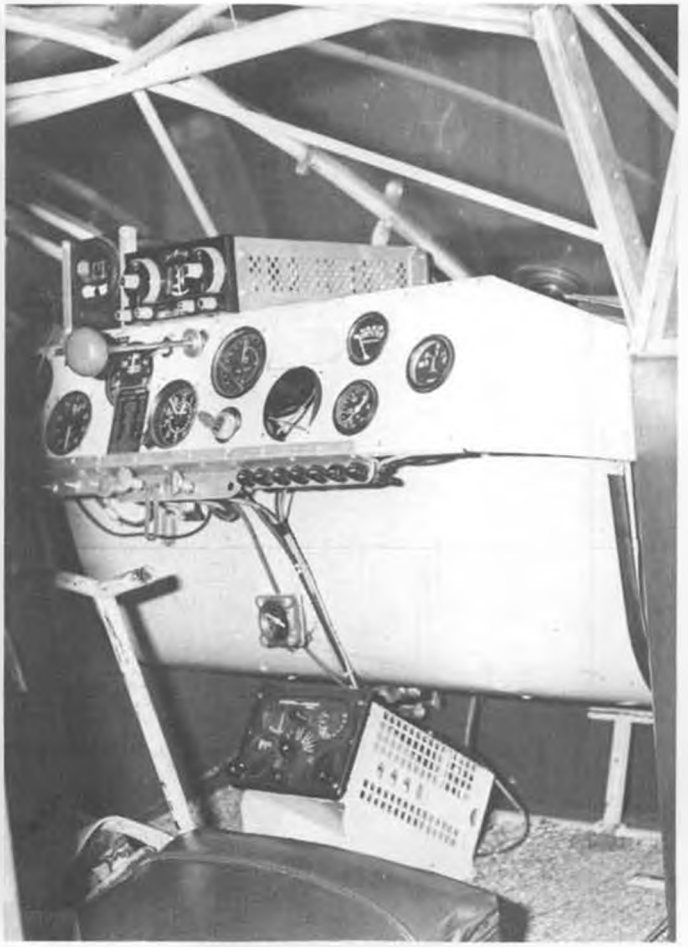
WITTMAN TAILWIND

By TOM STARK

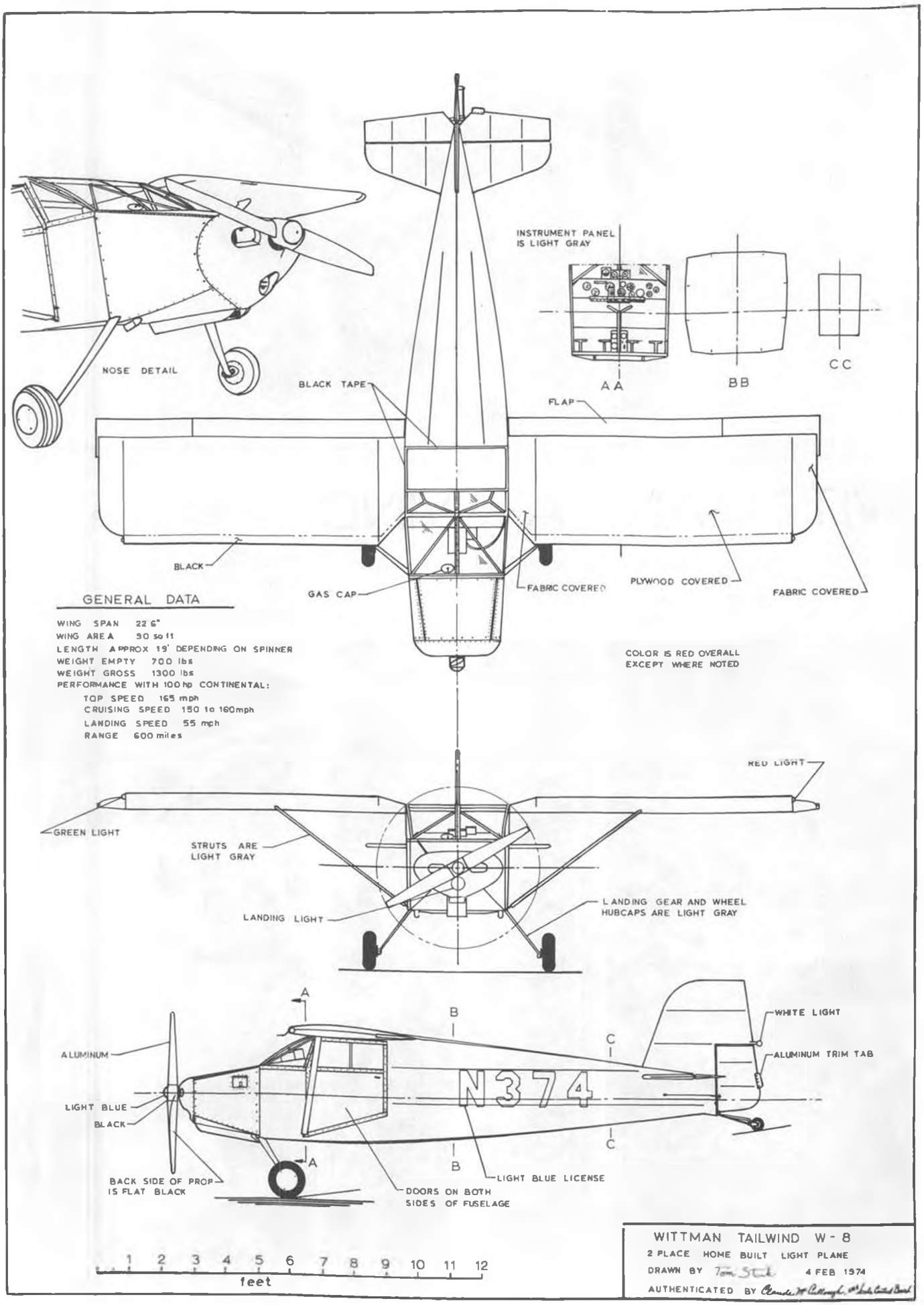
● Steve Wittman has been building, flying and racing airplanes since the 1920's. His designs have not been characterized by elegant compound curves or elliptical shapes, but they have all been outstanding performing planes.

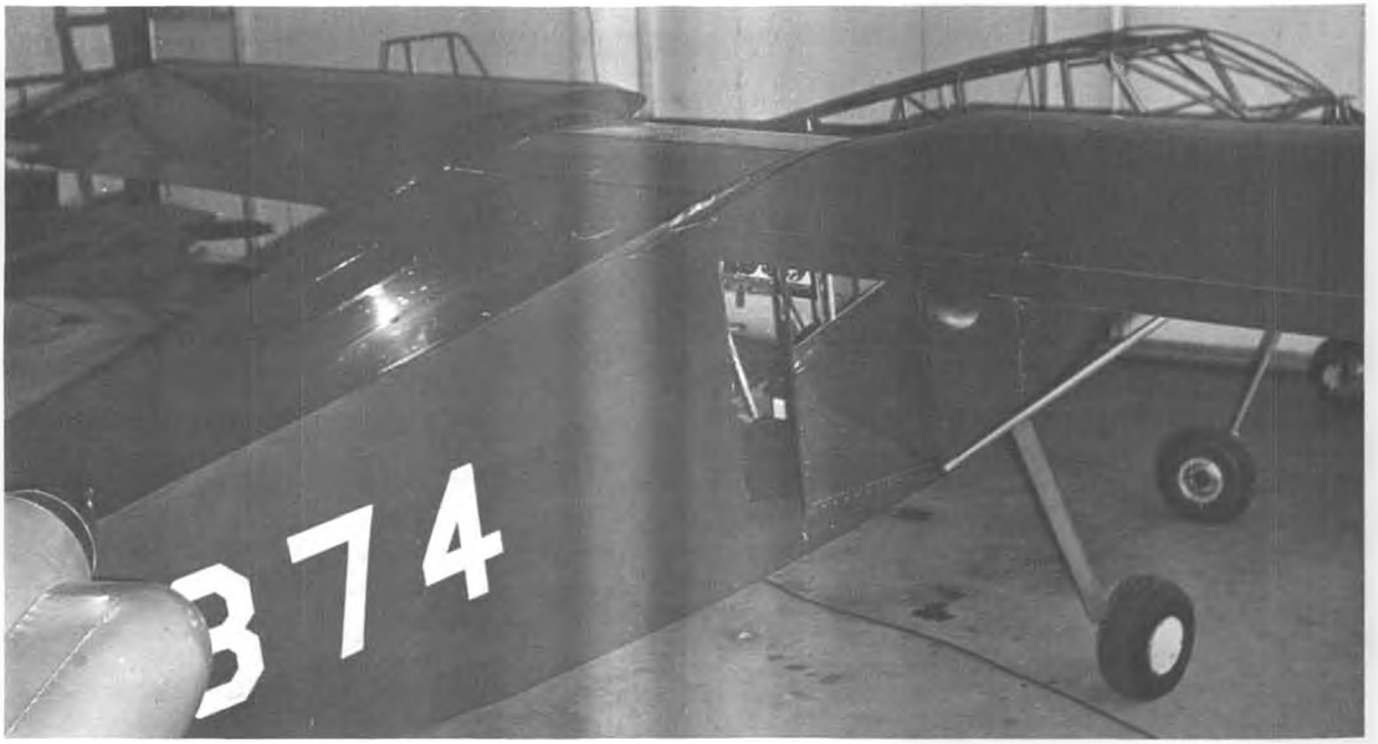
The Tailwind is a good example of his approach to design of high performance airplanes. It doesn't look particularly streamlined at first glance, but on careful examination, one sees a simplicity and careful attention to drag reduc-

Landing light is in the center of the cowl. Workmanship on the Tailwind is of the highest quality.

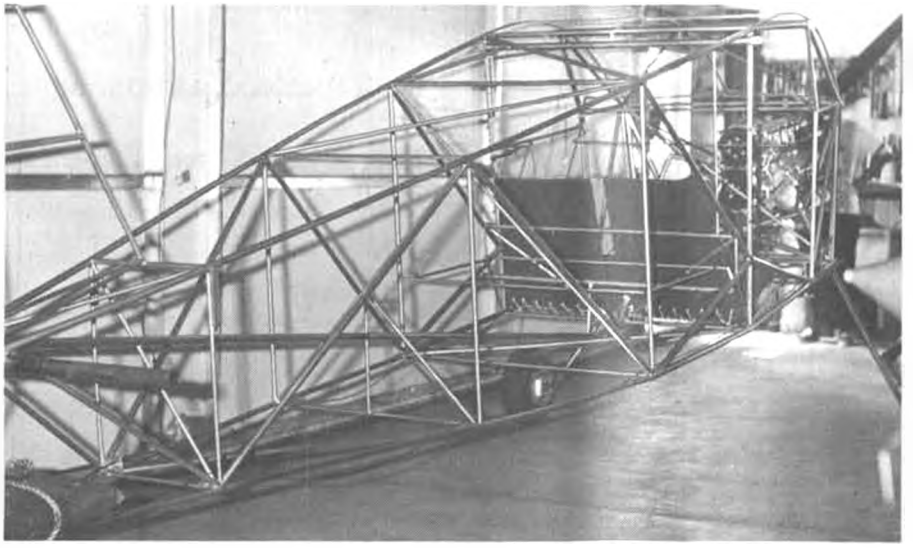


Instrument panel is light gray. The stick is centrally located and can be used from either seat.


NOSE DETAIL
INSTRUMENT PANEL IS LIGHT GRAY
AA
BB
CC
BLACK TAPE
FLAP
BLACK
GAS CAP
FABRIC COVERED
PLYWOOD COVERED
FABRIC COVERED
GENERAL DATA
WING SPAN 22 6"
WING AREA 90 sq ft
LENGTH APPROX 19' DEPENDING ON SPINNER
WEIGHT EMPTY 700 lbs
WEIGHT GROSS 1300 lbs
PERFORMANCE WITH 100 hp CONTINENTAL:
TOP SPEED 165 mph
CRUISING SPEED 150 to 160 mph
LANDING SPEED 55 mph
RANGE 600 miles
COLOR IS RED OVERALL EXCEPT WHERE NOTED
RED LIGHT
GREEN LIGHT
STRUTS ARE LIGHT GRAY
LANDING LIGHT
LANDING GEAR AND WHEEL HUBCAPS ARE LIGHT GRAY
A
B
C
WHITE LIGHT
ALUMINUM
ALUMINUM TRIM TAB
N374
LIGHT BLUE
BLACK
BACK SIDE OF PROP IS FLAT BLACK
DOORS ON BOTH SIDES OF FUSELAGE
LIGHT BLUE LICENSE
1 2 3 4 5 6 7 8 9 10 11 12
feet
WITTMAN TAILWIND W-8
2 PLACE HOME BUILT LIGHT PLANE
DRAWN BY Tom Stark 4 FEB 1974
AUTHENTICATED BY



Overall, the Tailwind is simple, but highly sophisticated. The color is red, with light blue numbers.



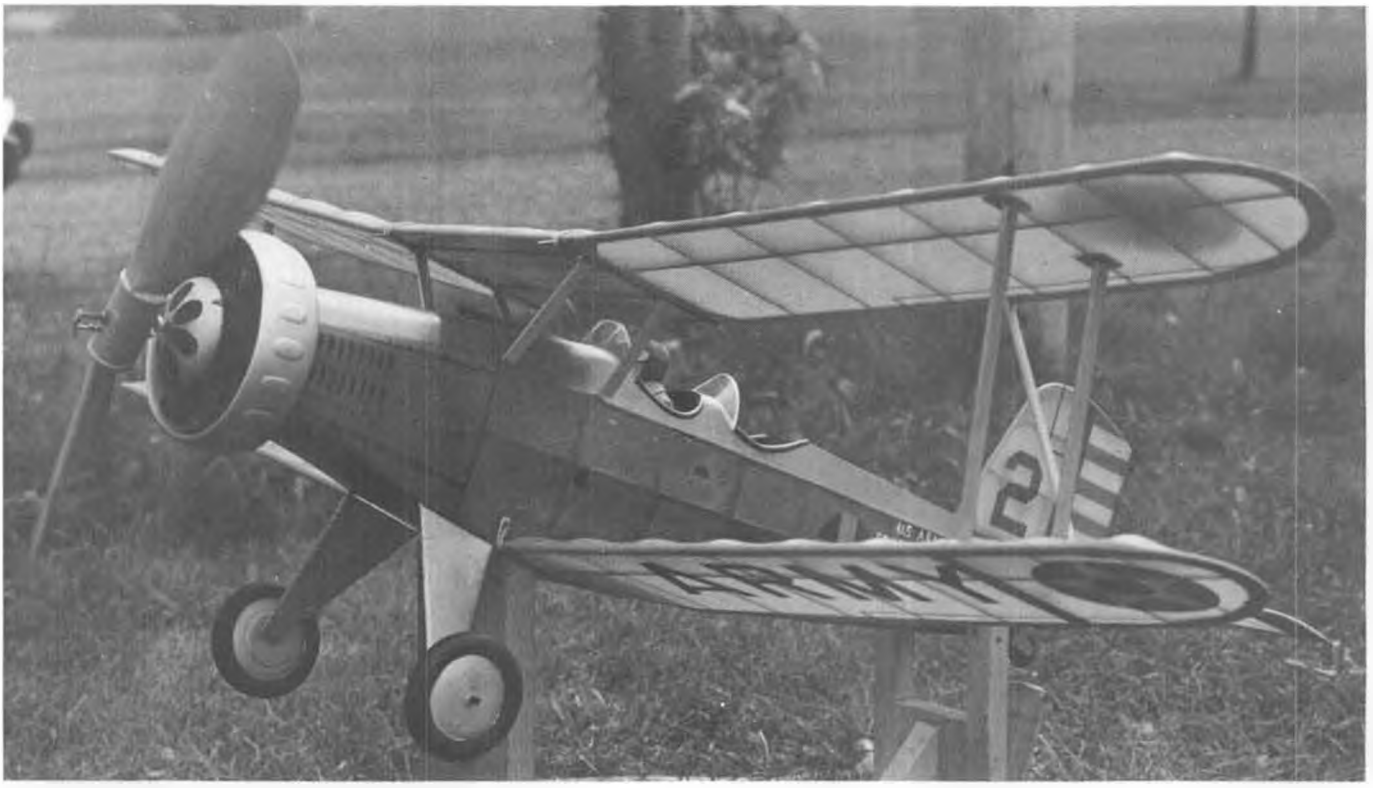
A new Tailwind under construction by Steve Wittman. Essentially the same construction as the other Tailwinds, but this one is powered by a Buick V-8 automobile engine.

tion that results in performance well in excess of commercially available planes of the same horsepower. It also has excellent handling qualities and ruggedness. It is little wonder that the Tailwind is a a favorite with home builders. Nearly 200 Tailwinds have been built, and another 100 or more are being built. The average cost to construct a Tailwind is about $3,000.

The Tailwind is an exceptionally good subject for flying scale. The simple lines and nearly square fuselage cross section make it an easy subject to build, while the inherent stability makes it suitable for free flight with only moderate increases in dihedral and stabilizer area. A model of the Tailwind, built by the author, won free flight rubber power scale at the 1974 Nationals, and soon will be a SIG kit. ●

The cowl and nose are simple and clean, resulting in low drag.

Excellent visibility through the large windshield. Interior is light gray except for flat black above instrument panel. Radio is aluminum.



Mike Midkiff, Erie, Pa., built this Jumbo Scale Douglas O-38 from Aeromodeller plans. The 40" span ship uses 24 strands of 3mm Pirelli, and averages 45 to 50 seconds. Seen here at the Canton, Ohio Flying Aces Club contest where it placed 1st. Photo by Russ Brown.

FREE FLIGHT SCALE

By FERNANDO RAMOS

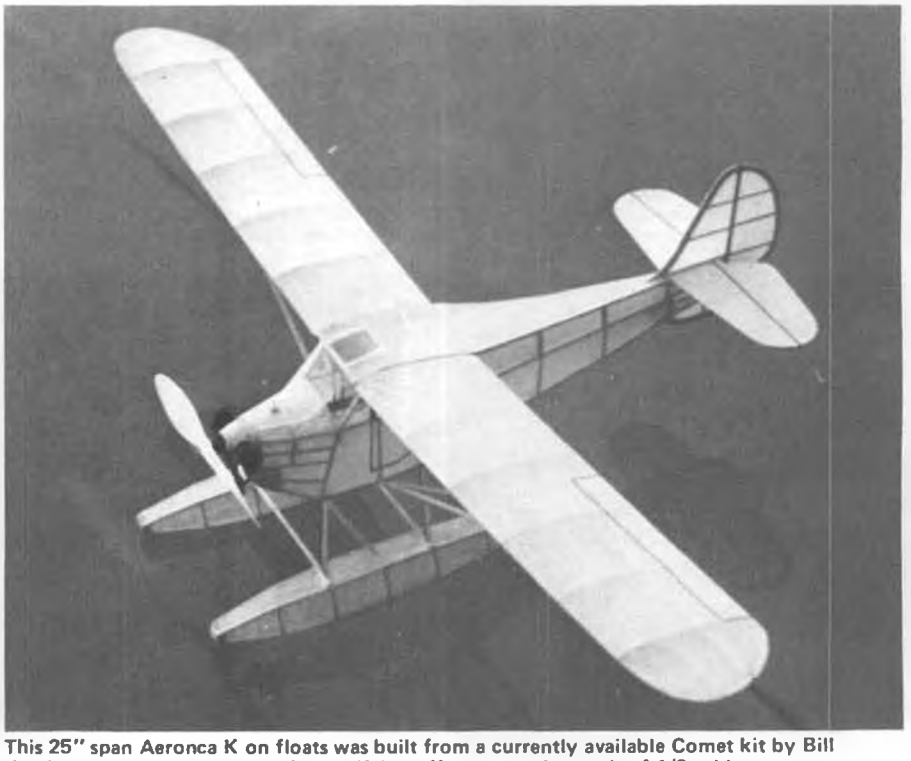
● This month I would like to finish the series on covering. Areas that I want to discuss include covering with silkspan, silk, and even a bit regarding iron-on type coverings.

First I would like to mention a twist involving the wet-tissue method. In my usual style, trying to beat the contest-date-dead-line, I had a model which needed covering. The turtle deck is stringered and has a compound curve. Knowing full well that the only way to satisfactorily cover it is to either cover it section at a time or wet cover it. The former way is too slow. To do the latter would require to coat the framework several times and this is time consuming. So after some deliberation I tried using wet tissue applied with white glue. Lo and behold it worked and worked well!

All I had to do is to coat the outer edges of the turtle-deck with the thinned white glue. I sprayed the dull side of the tissue with a fine spray of water and arranged it in place, pulling it taut in all directions. When the tissue dried it was smooth and wrinkle free. I have since used this technique on other models including Peanuts with equal success. Wings can easily be done in the same manner. This really speeds up the covering process with exceptional results. The book, "Flying Scale Models of World War II" has an excellent article on wet tissue covering, including step-by-step photos. (See advertisment in this issue).

Gene Wallock uses a product made by the Fuller Paint Company called Fuller's Lacquer Cement, No. 3919. Gene applies a coat of this material around the edges of a structure in the usual fashion. He then lays the tissue over it and adheres it to the framework by the use of acetone. He points out that it must be acetone to activate the Fuller's cement, which is a nitro-cellulose. This method eliminates the many coats normally required.

Silkspan is one of the easiest materials to cover a model with, especially while



This 25" span Aeronca K on floats was built from a currently available Comet kit by Bill Kincheloe, Monte Sereno, California. Takes off water on 4 strands of 1/8 rubber.

Beautiful Hawker Hurricane was built by Ralph Kuenz.

Bill Warner's Gipsy Moth in full, stable flight. Close-up static photo was published in last month's issue.

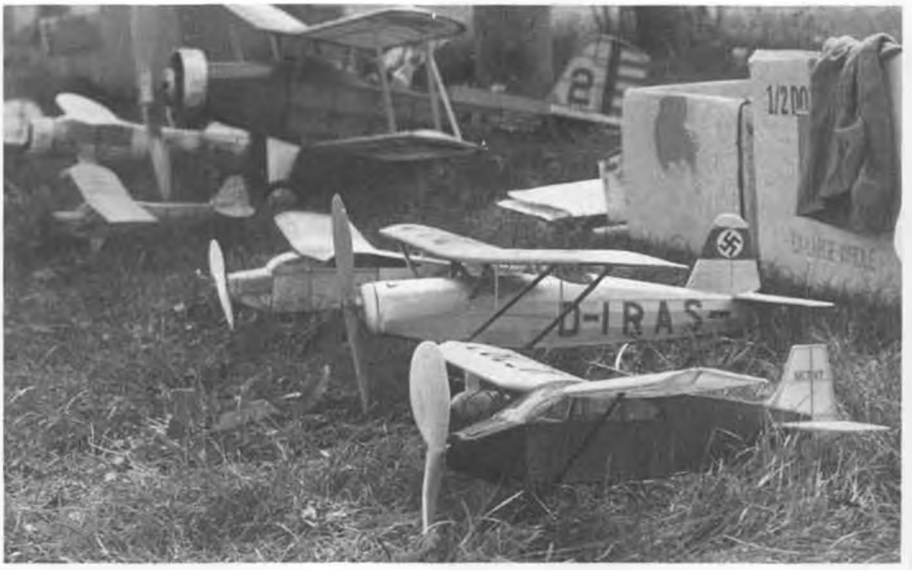
wet. However, it is quite porous and requires numerous coats of dope to get a smooth finish. Even the so-called light silkspan is heavy. It is mainly used for gas powered models. Another drawback is that it is difficult to find in any color other than white. But . . . like so many things, silkspan has its good points. One such point is suggested by Robert Gable.

For old timer, antique and World War I models, a semi-transparent colored covering is often desired. A technique that does give beauty and utility involves the following rather simple steps:

First, cover with desired weight silkspan, water shrink and apply two coats of thinned dope. For wood planked or sheet areas, apply dope to wood after required sanding, then dope silkspan directly to the wood.

Secondly, apply desired color tissue the same as you would on a bare model. Water shrink and apply thinned dope as desired. Treat wood areas the same as the silkspan. The time consumed by doing two coverings is more than offset by the saving in mixing, masking, and fooling with colored dopes which tend to give irregular, at best, results when you want non-opaque finishes.

Another method incorporating silkspan is used by Keith Ward. A couple of years ago at the Nationals, Keith entered a F/F scale model of the Gere Sport.



Erie, Pa., squadron line up at Canton, Ohio: Lin Reichel's Peanut Tailwind, Arado D-76, and Lacy M-10 . . . Mike Midkiff's O-38, Clip-Wing Piper Cub, and Sig kit Mr. Mulligan.

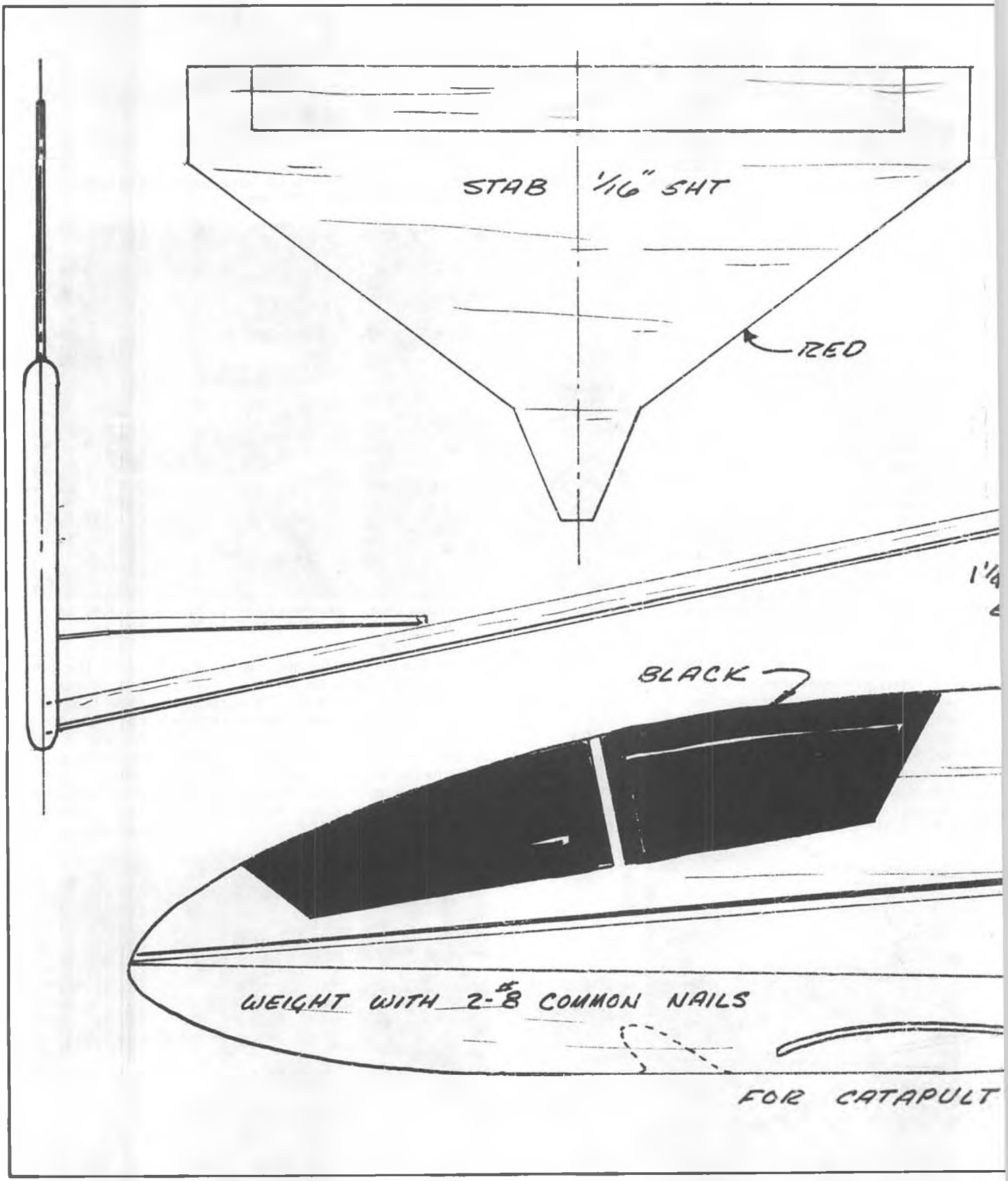
This is one of the finest scale models I have ever seen. Keith's method of finish is most unusual, and uses silkspan as a base. Once the model is completely covered, it is given a couple of coats of butyrate dope. Before going onto the next step, the dope has to be thoroughly dry . . . you don't want any trapped fumes. The next step is to give the covering a couple of coats of Francis resin, sanding lightly between coats. The model is then sprayed with polyurethane paint of the appropriate color. Patching, according to Keith, is not a problem.

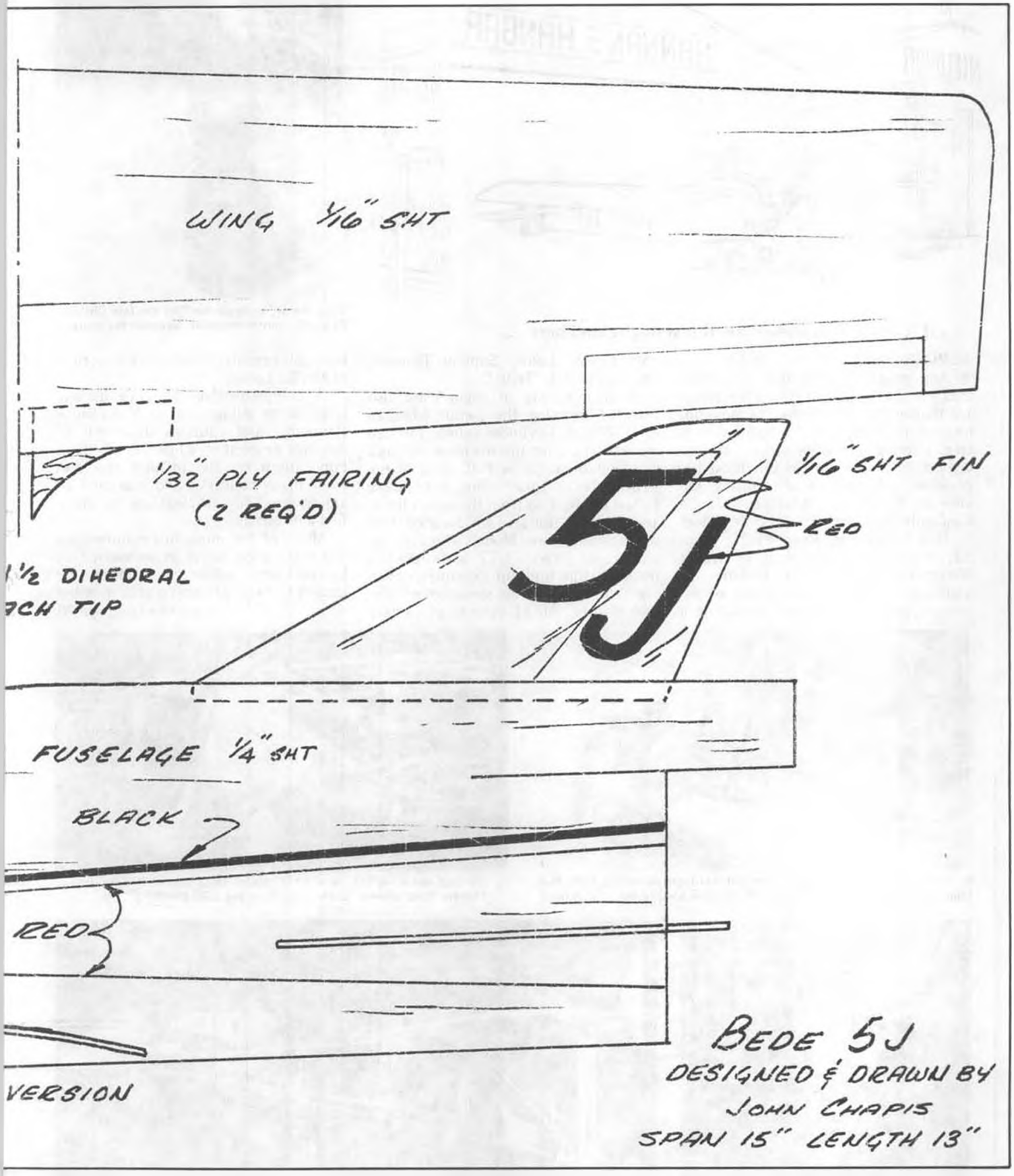
I tried this method on one of my models, but goofed. I used nitrate dope instead of butyrate (I simply do not like butyrate dopes). Polyester resins are very particular about what materials

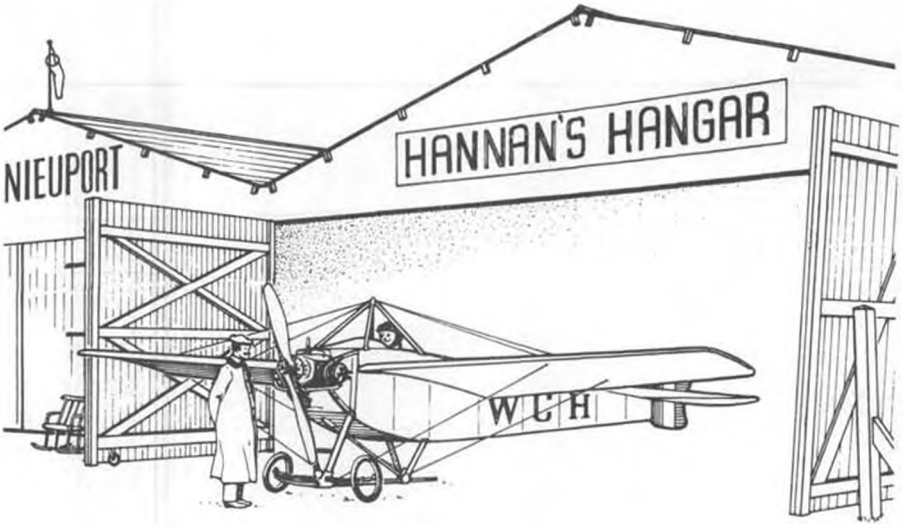
Continued on page 71

Lin Reichel launches his 19-1/2" span Arado, built from plans by Fallston Plans Service. All Conton, Ohio photos by Russ Brown.

Jim Hyka flew this beautiful Wedell Williams Racer at the Canton, Ohio Flying Aces contest.


STAB 1/16" SHT
RED
1'/4
BLACK
WEIGHT WITH 2-#8 COMMON NAILS
FOR CATAPULT


WING 1/16" SHT
1/32" PLY FAIRING
(2 REQ'D)
1/16" SHT FIN
RED
5J
1½ DIHEDRAL
ACH TIP
FUSELAGE 1/4" SHT
BLACK
RED
VERSION
BEDE 5J
DESIGNED & DRAWN BY
JOHN CHAPIS
SPAN 15" LENGTH 13"



Tiny metal "twin pusher" by the late Christy Magrath, master modeler. See text for more.

. . . if it doesn't fit elsewhere, it just might land here . . .

AEROSPACE MUSEUM A MUST

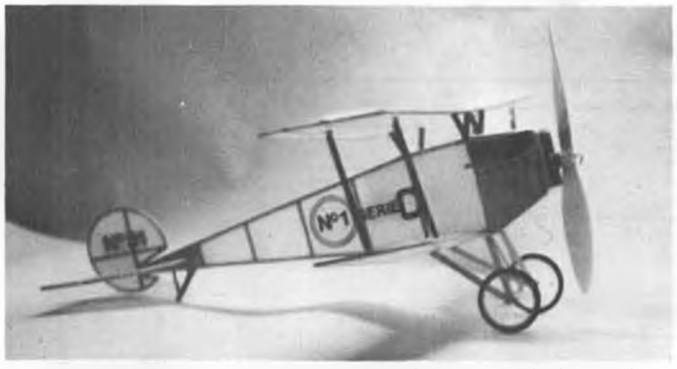
● Any reader visiting the San Diego area is urged to allow at least a few hours for touring the fine Aerospace Museum, located in Balboa Park. Admission is free, although small donations are accepted, to help maintain this most impressive collection of aeronautica. On view are many rare aircraft, including a Luscombe Phantom, Bowlus glider, Fleet 7, Hall Flying Car, Ryan PT-22, Ryan ST, Wee Bee, and several of Waldo Waterman's experimental machines. In addition, several reproductions of famous types are exhibited, including a "Spirit of St. Louis," Sopwith Triplane, and Curtiss A-1 "Triad."

A great variety of engines are also featured, running the gamut from an early Wright 4-cylinder inline, through modern jets. Then too the museum has a mock-up of a Curtis P-40 used in the "Tora! Tora! Tora!" film, a Japanese fighter dredged up from the ocean floor, and many aviation artifacts donated from private collections. Models also abound, and range from 1/72 scale plastics through large built-up examples, covering virtually the entire spectrum of aviation history. All of these displays have been ably organized under the direction of Mr. Ed Leiser.

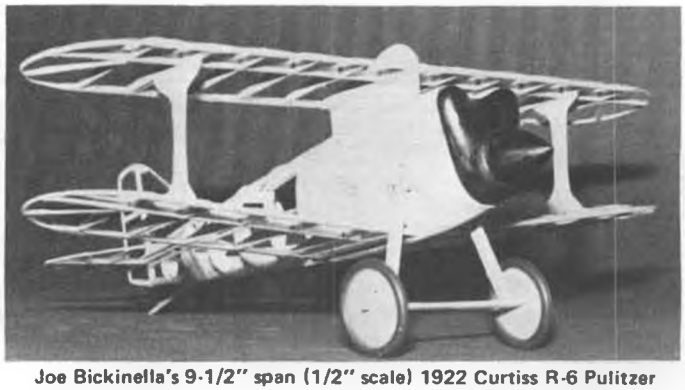
A comprehensive reference library, is under the guidance of archivist Bruce Reynolds, and contains thousands of volumes devoted to all phases of flight. Publications on file include examples from many countries and eras, and all are arranged for efficient use by qualified enthusiasts.

Much of the museum's maintenance and restoration activities are carried on by part-time volunteers. Among the leaders in these projects is staff member

Continued on page 70

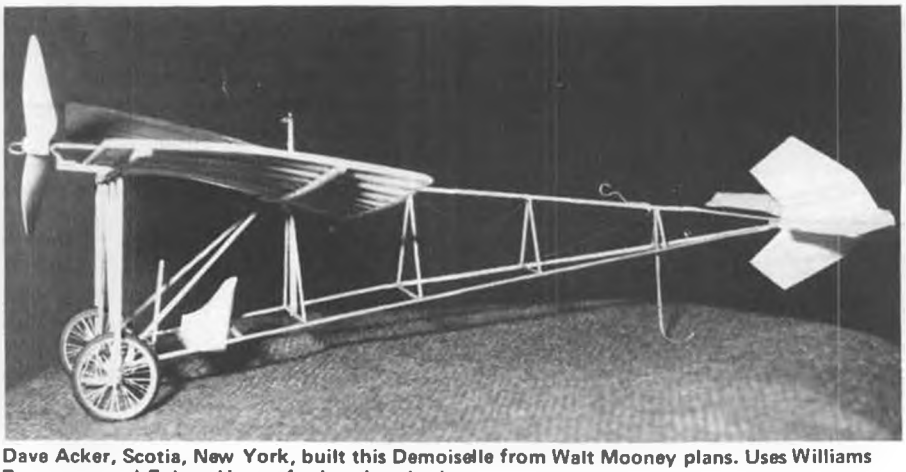


B. H. Kennewell, MB Proxy Peanut entrant from Australia, built this Microplano-Veloz from Mooney MB plans as a warm-up. Watch him!



Joe Bickinella's 9-1/2" span (1/2" scale) 1922 Curtiss R-6 Pulitzer Trophy Race winner. Surface outlines are 1/20 bamboo.

Djau Carter, Vienna, Va., solo-winds peanuts with electric power! See text.



Dave Acker, Scotia, New York, built this Demoiselle from Walt Mooney plans. Uses Williams Bros. prop and Fulton Hungerford spoke wheels.

A real classy looking biplane, the AVRO is all silver with black lettering. Extremely short nose moment calls for light tail construction and a bit of ballasting.

Lighting gives impression that lettering is raised, but it isn't. Rigging adds realism!

Peanut Scale AVRO 534C

By WALT MOONEY . . . A great Peanut for the two-winger set, the AVRO is a good subject for CO_2 power as the weight (?) of the motor will help to overcome the short nose moment.

● This is a peanut scale model of a little racing airplane built by AVRO in 1921. It was ill fated, in that it never raced, but was lost due to power failure, crashing in the water. This particular version of the AVRO Baby was selected for a peanut scale model because it had shorter wings than any other version and therefore scales into a larger peanut. Its proportions are just about ideal for a model with one exception . . . the nose is rather short. Because of this, it is important to keep the tail end of the model as light as possible. A heavy nose end for extra strength and weight is not amiss, either.

The model is complicated enough to require more than the usual amount of time in construction. The main rib spacing is scale, however, the leading edge riblets, between each rib, were omitted. On the model in the photos, all of the surface outlines, vertical tail, horizontal tail, and the wing tips and trailing edges, were laminated from three layers of 1/16th by .020 model railroad basswood strip. The technique for doing this has been covered before, in MODEL BUILDER, so there is no need, I hope, to go over it again. The wing tips and trailing edges have been drawn to be made out of sheet balsa for those who may prefer it. Obviously, the tail outlines could also be made out of sheet balsa.

The fuselage is a very conventional structure. Where the real airplane had metal panels at the nose, we have shown 1/16th sheet sides and bottom to simulate the metal. The upper cowl is made up of two layers of 1/32nd sheet, to make the wrapping easier and still maintain the nose strength and weight desired. From the instrument panel back, the top of the fuselage is covered with 1/32nd sheet. Make sure that this is very light balsa. Sanding it a little thinner before applying, will help also.

The nose block is made from a solid balsa block and has a square (approximately a square) of 1/8th balsa cemented to its back side to locate it in the front of the main fuselage structure.

The landing gear wire is bent to the shape shown in the front view (Only about half is shown, so be sure your wire is long enough to include the other

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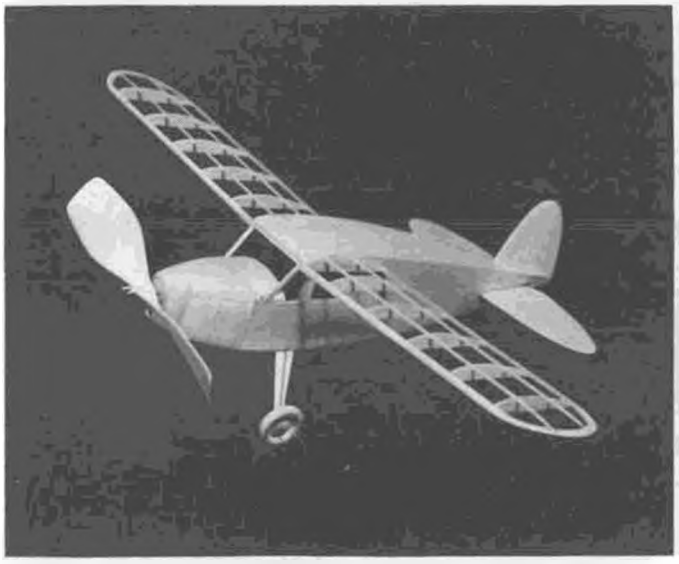
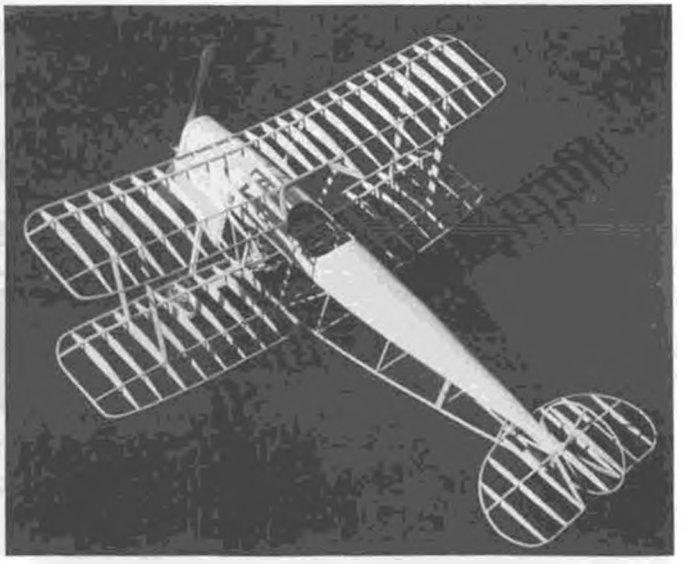
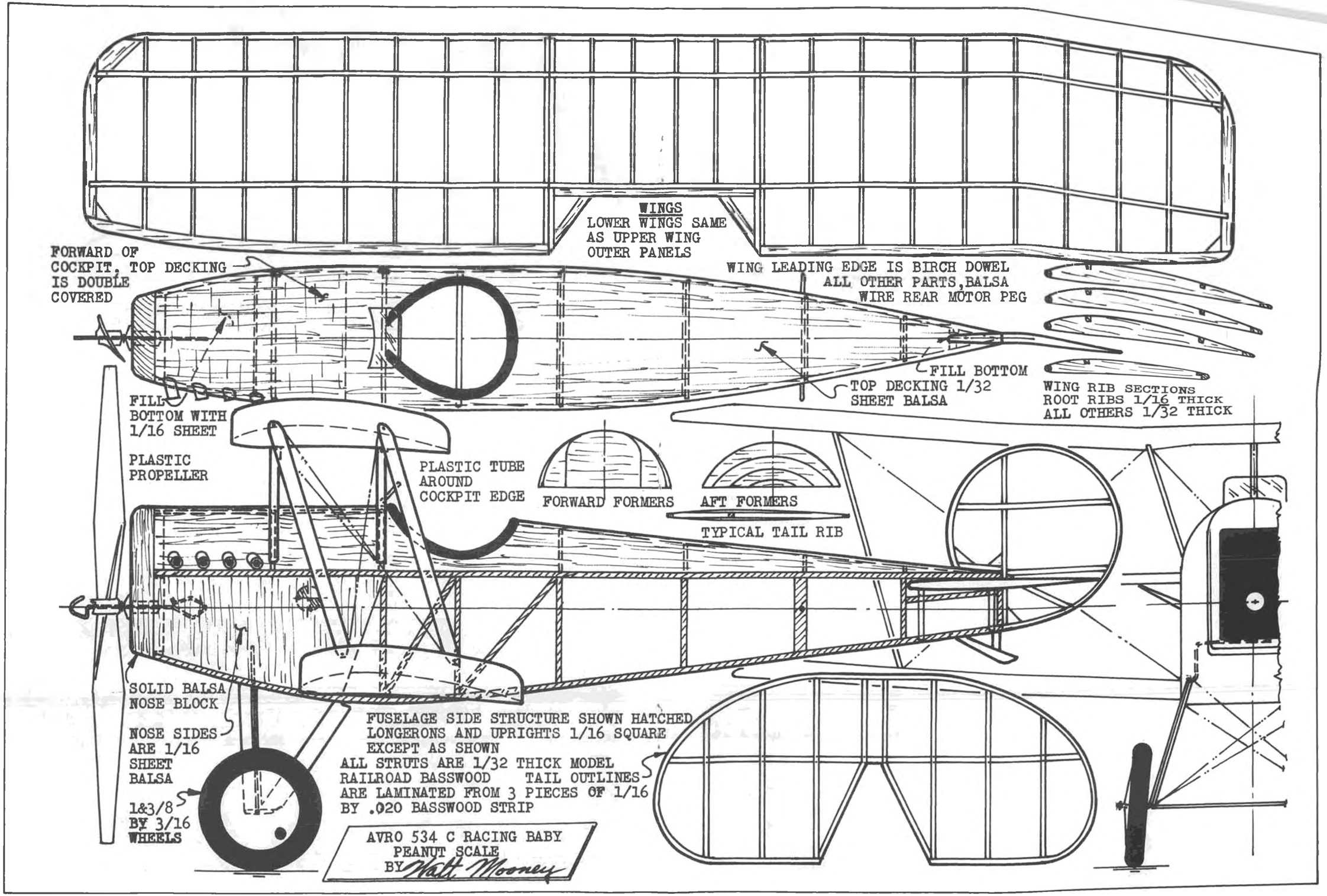
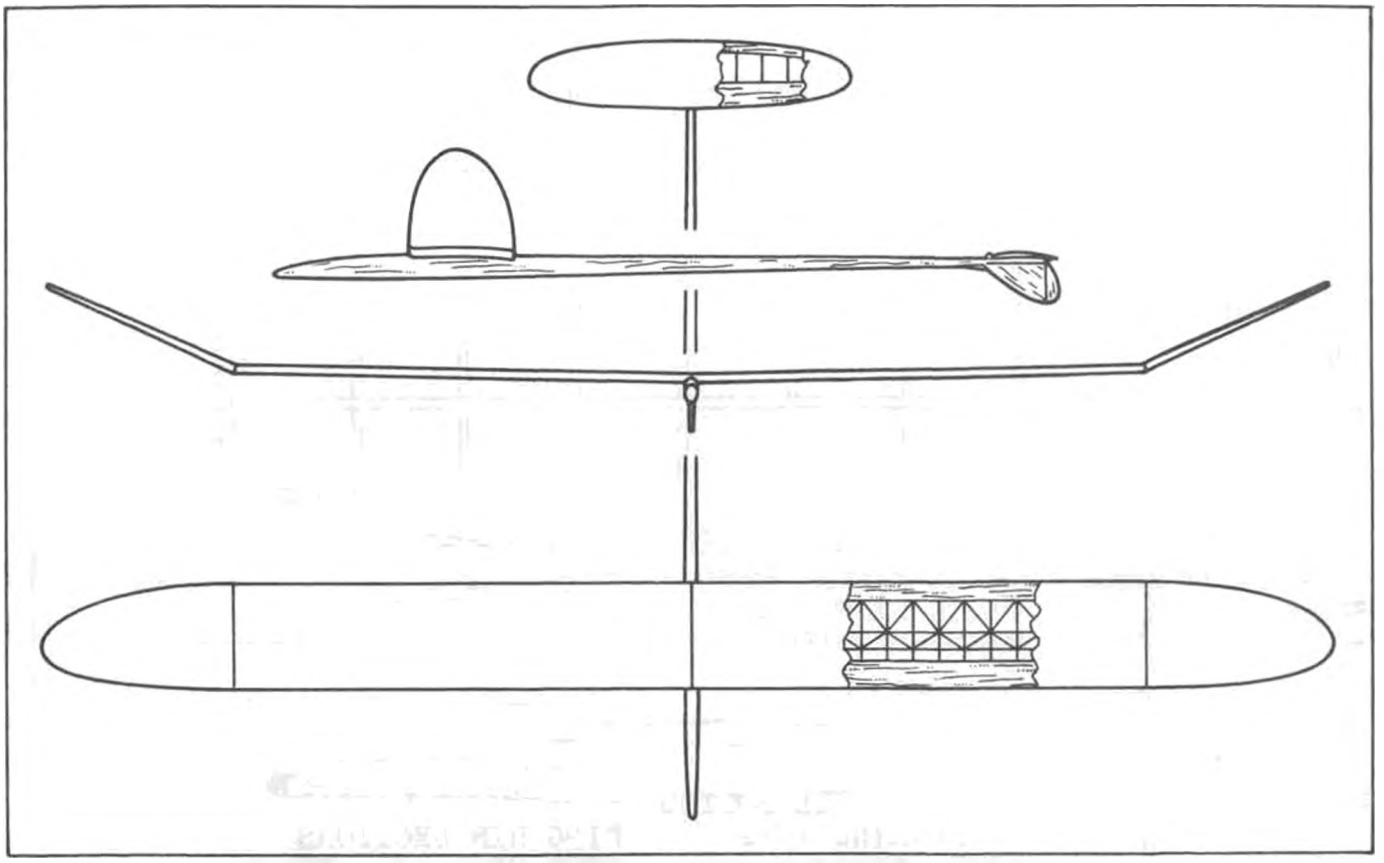


Next month's peanut is the Avions Paul Aubert "La Cigale," which means "Grasshopper." . . . Not a drink.



Something more than a "Megowlike" peanut in construction, the AVRO nevertheless is devoid of tricky building details.


WINGS
LOWER WINGS SAME AS UPPER WING OUTER PANELS
FORWARD OF COCKPIT. TOP DECKING IS DOUBLE COVERED
WING LEADING EDGE IS BIRCH DOWEL
ALL OTHER PARTS, BALSA
WIRE REAR MOTOR PEG
FILL BOTTOM TOP DECKING 1/32 SHEET BALSA
WING RIB SECTIONS
ROOT RIBS 1/16 THICK
ALL OTHERS 1/32 THICK
FILL BOTTOM WITH 1/16 SHEET
PLASTIC PROPELLER
PLASTIC TUBE AROUND COCKPIT EDGE
FORWARD FORMERS
AFT FORMERS
TYPICAL TAIL RIB
SOLID BALSA NOSE BLOCK
NOSE SIDES ARE 1/16 SHEET BALSA
1&3/8 BY 3/16 WHEELS
FUSELAGE SIDE STRUCTURE SHOWN HATCHED
LONGERONS AND UPRIGHTS 1/16 SQUARE
EXCEPT AS SHOWN
ALL STRUTS ARE 1/32 THICK MODEL RAILROAD BASSWOOD TAIL OUTLINES ARE LAMINATED FROM 3 PIECES OF 1/16 BY .020 BASSWOOD STRIP
AVRO 534 C RACING BABY
PEANUT SCALE
BY Walt Mooney



JANUARY'S MYSTERY MODEL

FREE FLIGHT

By BOB STALICK

● A year ago today, at the time this is written, Bill Northrop called me and suggested that he would like to have a Free Flight columnist who would stay with him at least a year. I am taking this opportunity to let everyone know that he got what he bargained for . . . one year of a Free Flight columnist . . . not necessarily an expert (which, by now, all of you are aware) but a columnist. And judging from the mail which comes in . . . and the number of letters which I have sent out, it's O.K. with a majority of MB readers. I believe that, of all the national model magazines, MB has the most well-rounded coverage of them all *(Keep that up, Bob, and you may get a raise! wcn)* and deserves to be supported by all Free Flighters. Your support of this column by sending in pictures, article ideas, and other hints, is welcomed. Please continue, and I promise to continue to do my best for another year . . . if Bill can stand it. *(Sigh . . . I suppose so. wcn)*, and if all of you can stand it.

TEN MODELS OF THE YEAR

As you should already know, Hewitt Phillips is the editor of the 1975 NFFS Symposium. He has asked me to head up the "Ten Models of the Year" feature for the report, and I have accepted. At present, I am organizing the committees who will research and make suggestions as to the models which should be given the NFFS badge of distinction. In the past, awards have been given in such categories as: International Classes, AMA Gas, Hand Launch Glider, Outdoor Rubber, Indoor Rubber, and Special Classes. If you have any suggestions for favorite models, which, because of their excellence or innovative features, could qualify . . . and have never been given the award previously . . . please forward your suggestions to me and I will see to it that the proper committee gets that suggestion so they may consider it.

MYSTERY MODEL FOR JANUARY

This is an oldie (but not too old) A/2 Nordic which was the first . . . or at least one of the first, to set the trend for modern A/2 design, i.e., slim fuselage, high aspect ratio wings, thin duration airfoils, etc. Although it did not have a "given" name, it is clearly identifiable. A one year's subscription to MB, free of charge, to the first person to correctly identify the model and the designer-flier.

DARNED GOOD AIRFOILS

The R. St. Genese 29 (RSG 29) foil is a usual suggestion for the stab on power models and for wing sections for smaller, faster ½A models. I have also used it for Wakefield and Nordic stabs, when I use a larger percentage area stab. With the constant thinning down of FAI Power wing sections, it may also be usable in this fashion, although the high point is a bit too far forward (30%) for my thinking. With V.I.T., it should prove ideal for the stab section to use for FAI Power, particularly if the stab area does not go too much under 20%.

MODEL OF THE MONTH . . . RINGO FAI

This month's 3-view is from the drawing board of short-time MB F/F editor, Tom Hutchinson. It is being presented

Dick Gildersleeve, recently from So. Cal. and Seattle, preps Wakefield. M. Vercammen pic.

Mike Ransom, Dallas, with his Texas-style Nordic. Monokoted wing, sheet T.E., British style fin, glasrod boom. Linstrum photo, '74 Nats.

Jack Nix, Brooklyn Skyscrapers, bids adieu to his Texas-bound, Mathis Class B ship. Nats photo by Dave Whatsistrum.

because it represents an easy way to get into FAI Power for the up-coming Qualifying Trials. The model is very uncomplicated, with no tricky building gimmicks to deal with.

Tom says about the Ringo, "This model is fairly conventional in proportions, with a slightly high pylon, but a natural, groovy power pattern was easy to achieve. Wing construction is almost as rigid as geodetic, but lighter and not nearly as much work. Another one is under construction, very similar, but with a slightly higher aspect ratio wing . . . with false ribs between each of the main ribs. The model probably has a bit too much incidence now for top performance, making one full turn in 10 seconds, but the pattern is so consistent that the performance loss is acceptable to me as a good compromise."

SCATTER RETURNS

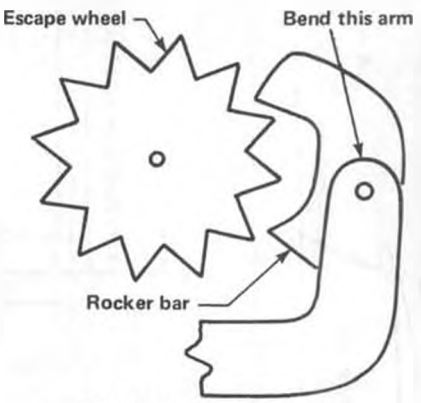
Of the many newsletters which have been published in the U.S. over the years, few have been as eagerly anticipated in the mailbox as Scatter (the Journal of the Southern California Aero Team . . . S.C.A.T.). This publication ceased several years ago, and FAI fliers were the primary losers. It was with great pleasure that I recently received a copy of the new Scatter, complete with pictures, sketches (by Craig Cusick), and good text. I highly recommend it to you. For $3.00, you will get 6 issues (one year's worth) of excellent quality information. Send your bucks to Craig Cusick, manager, 20134 Gresham St., Canoga Park, CA 91306. Scatter is edited by Bill Hartill.

To give you some idea as to contents, I have excerpted the following from the July-August issue, entitled, "Care and Feeding of Timers," by Andy Faykun:

"Seelig: Clean and rinse the timer in tri-chlor-ethylene, if available, or benzine solvent. After drying, apply very light oil (clock oil) on the pivots only of all wheels, upper and lower. Use a heavier oil on the coils of the mainspring and its bearings, as well as the wheel next to it. Use a piece of brass wire, flattened and shaped like a spade, to apply oil.

"Some fellows use a spray of WD 40, or equivalent. But this is not recommended as the teeth and pinions also get coated and are more likely to pick up dust and dirt, and jam more readily. Gear teeth and pinions should be run dry.

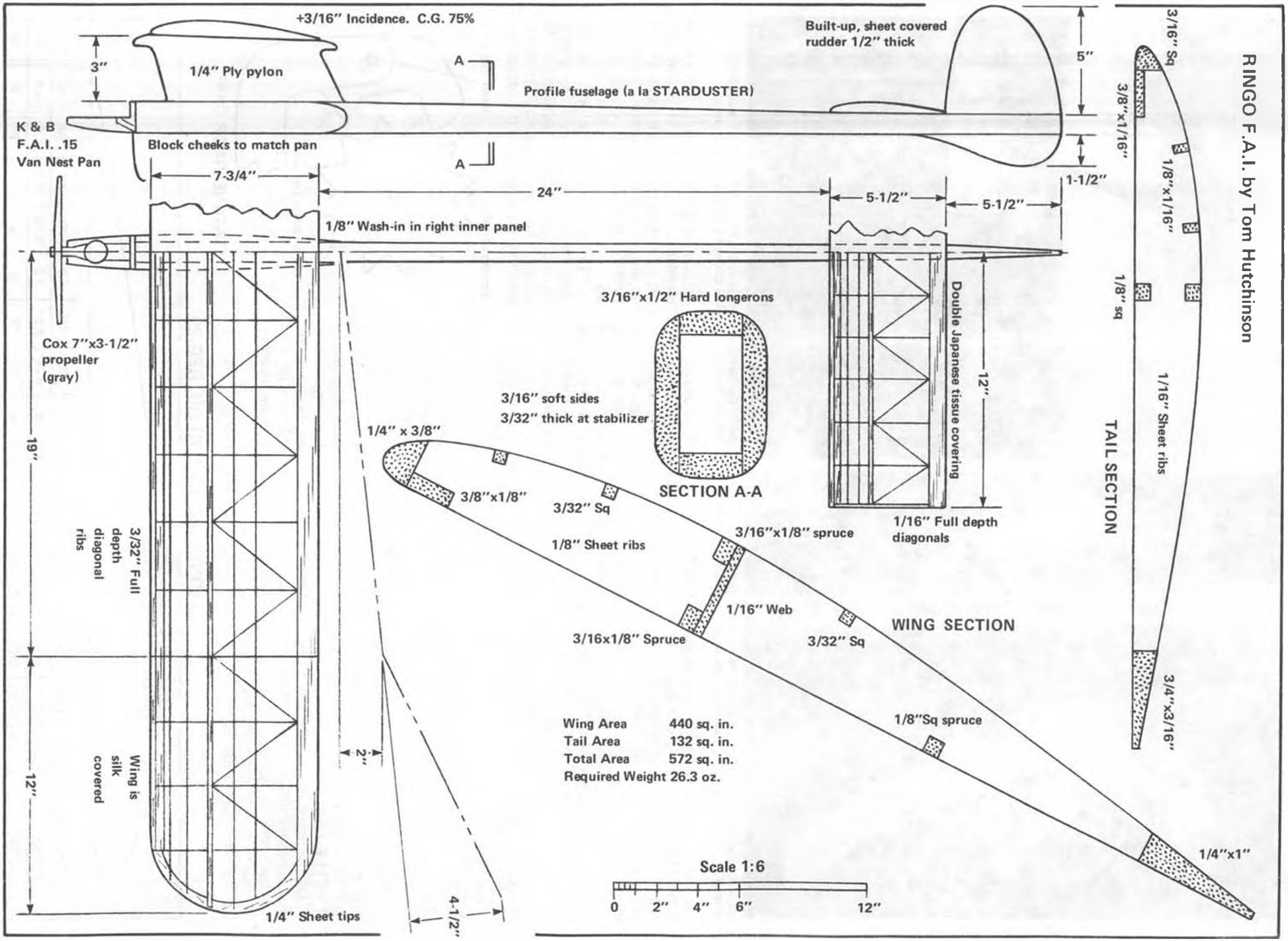
"Tatone or similar types: Use the same cleaning and oiling techniques as for the Seelig. But in addition, oil the escape wheel that contacts the rocker bar, and the bearing of the rocker bar.



TATONE TIMER CARE

DARNED GOOD AIRFOIL RSG-29

STATION	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	100
UPPER	2.13	3.76	4.53	5.53	6.4	7.15	8.1	8.53	8.66	8.27	7.6	6.53	5.2	3.6	1.8	0
LOWER	2.13	0.98	0.53	0.27	0.14	0	0	0	0	0	0	0	0	0	0	0


RINGO F.A.I. by Tom Hutchinson
+3/16" Incidence. C.G. 75%
3"
1/4" Ply pylon
A
Profile fuselage (a la STARDUSTER)
Built-up, sheet covered rudder 1/2" thick
5"
1-1/2"
K & B
F.A.I. .15
Van Nest Pan
Block cheeks to match pan
7-3/4"
24"
5-1/2"
5-1/2"
1/8" Wash-in in right inner panel
Cox 7"x3-1/2" propeller (gray)
19"
12"
3/32" Full depth diagonal ribs
Wing is silk covered
2"
4-1/2"
1/4" Sheet tips
3/16"x1/2" Hard longerons
3/16" soft sides
3/32" thick at stabilizer
SECTION A-A
1/4" x 3/8"
3/8"x1/8"
3/32" Sq
1/8" Sheet ribs
3/16"x1/8" spruce
1/16" Web
3/16x1/8" Spruce
3/32" Sq
WING SECTION
1/8"Sq spruce
1/4"x1"
Double Japanese tissue covering
12"
1/16" Full depth diagonals
3/16" Sq
3/8"x1/16"
1/8"x1/16"
1/8" sq
1/16" Sheet ribs
3/4"x3/16"
TAIL SECTION
Wing Area 440 sq. in.
Tail Area 132 sq. in.
Total Area 572 sq. in.
Required Weight 26.3 oz.
Scale 1:6
0 2" 4" 6" 12"

Bob DeShields, "Hawkeye 600," K & B .15 Schneurle. All photos on this page at San Diego Orbiteers Annual, Oct. 26-27, by Mike Keville.

Scotty Harte (rt) and his "Condor 800." Orbiteer contest was held at famous Lake Elsinore site.

Top Wakefield flier, Bob White, discloses secret method of thermal detection in this exclusive photo. It seems to work!

Jim Scarborough heaves his "Texan" into the air. This latest version of famous design will be a future MB construction project.

Sal Taibi launches John Brodbeck's Starduster 900 on its last flight. Trimmed out properly, hotter fuel was too much. SPLAT!

Adjust the rocker bar by bending its holder away from the escape wheel and slowly moving it back until it just meshes without skipping. This should be done very accurately and carefully as it is a close adjustment. Check this adjustment by manually moving the rocker bar back and forth and listening for a smooth run. If you remove the printed faceplate and winding key, always wind the spring fully before replacing the faceplate."

WHERE TO GET SEELIG TIMERS

Although Tatone timers should be available through your local hobby emporium, the Seelig timer is not usually marketed through such retail outlets. In order to get this precision timer, drop a line to Doug Galbreath (The Printer), 707 Second St., Dept. MB, Davis, CA. 95616. He has all three of the Seelig styles; the FAI Combo for $20.00, the Nordic and Wakefield Timers for $12.50, and the ½A-A Minicombo for $17.50. Enclose money and he will respond with the timer.

V.I.T. SYSTEMS

In line with the emphasis which I am employing to promote participation in the up-coming FAI program, I plan to feature V.I.T. (Variable Incidence Tail) systems for power models in the next issue of MB. If you are building a new power model and are thinking about V.I.T. for the first time, pay attention next month, because there should be some ideas which you find useful right on these pages.

WAKEFIELDS

The following is excerpted from an article in (SIN) South Island News, by Paul Lagan: "There will never be any class of model that will replace the classic rubber model, and to win the Wakefield trophy would, in my opinion, be the ultimate modeling achievement. Now, I can imagine all those who have never been bitten by the Wakefield bug turning off right here . . . A lot of sentimental poppycock, Lagan's getting soft and sloppy in his old age, etc.

"Wakefield is a hard class to fly well . . . it always has been. Some people contend that a Wake is simple to build . . . Perhaps the basic airframe is, but the propeller assembly and blades must have "put off" many would-be rubber fliers. It is one of those things that seems almost impossible to start, but once one has been made, then it is difficult to see, in retrospect, the reason for all the trepidation! Modelers, people in general, are becoming lazyer as the 20 century rolls past. We all look to quick and simple ways of getting models into the air these days and nobody (yet) has come up with a suitable ready-made or even an acceptable kitted Wakefield propeller . . . There have been propeller hub assemblies produced from time to time, but those blades remain the biggest single deterrent to most.

"No, I'm not going to turn this into a treatise on how to make a propeller, but I would like to emphasize that the Wakefield propeller is a lot easier to make than it appears at first glance. The only advice I can offer is to chew the ear of the local 'expert' (and there is one in every district) and pester him until he relents and shows you his method of

Continued on page 72

The 1936 Nationals contest winners. Top row (l to r): Bruno Marchi, Central Airlines Trophy; Jessie Bieberman, American Airlines Trophy; Robert Copeland (England), Whitfield Trophy; Hewitt Phillips, Model Craftsman Tlush Ace. Center row (l to r): Wilbur Tyler, Comet Trophy; Al Courtial, Detroit Times Trophy; Sheldon Bell, Balfour Trophy; Joe Buehrle, Small Texaco Trophy; Dick Korda, Detroit Times Trophy; Melvin Yates, Whitfield Trophy; Roy Wriston, Detroit Times Trophy; Bronik Soroka, Detroit Times Trophy,; Chester Lanzo, Megow Trophy. Bottom row (l to r): Bruce Luckett, Mulvihill Trophy; Alvie Dague, Bloomingdale Trophy; Ervin Lesher, Stout Outdoor Trophy; Bert Pond (Proxy flew for winner Vernon Grey, New Zealand), Moffet Trophy, Francis Tlush, Texaco Trophy; A. A. Judge (England), Wakefield Trophy; Louis Casale, M. A. N. Trophy; John Haw, Guillow Cup and Stout Indoor; Joe Matulis, Jimmy Allen Trophy; Carl Goldberg, Springfield Trophy, and Mike Kostich, Model Craftsman Trophy and Baby Cyclone. Whew! First correct identification of all by Jim Adams, Santa Ana, California.

PLUG SPARKS

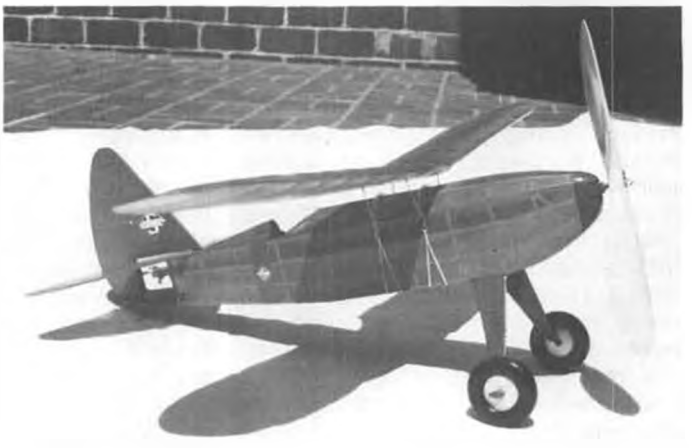
By JOHN POND

● Don't say it! It's about time we got around to announcing the winner of the 1936 Nationals Winners Photo Identification Contest, from the May 1974 issue of MB. The only reason for the delay was the hope we could dig up some info on how these old modelers are doing and where they are now. Didn't get too much!

Before getting into this too far, better mention that Jim Adams, Santa Ana, California, was the winner. The writer awarded Jim his motor at the North-South Old Timers meet at Taft, California. While talking about winners, the writer had to smile during a telephone conversation with Bert Pond (in the picture), when he mentioned he could only identify a few. For the benefit of those who don't know, Bert Pond stood the boys on their ears by proxy flying Vernon Grey's New Zealand rubber job to first place in the Stout International Event. When *he* couldn't name the boys in the picture, you know it was a real chore to get them all right . . . Jim did!!

To comment on a few of the modelers in the photo, it goes without saying the writer is constantly amazed at the activity of Bert Pond. A mechanical engineer with the Navy for years before retirement, Bert is still very active in consulting work. Of course, Bert has lately been making a habit of showing up at the Nationals to give the boys a few lessons on how to fly old time rubber designs. Bert presently resides in Longmeadow, Mass., at 128 Warren Ter-

Bob Osenga, Ventura , Cal., with little-known Scout, produced by Modelcraft (Barney Snyder). Photo by Bob Oslan.



Jimmy Allen Thunderbolt, by Bill Waite, Greenwood, Missouri. Kits were sold by Skelly Oil Co. gas stations back in the '30's.

THEN: Barney Onofri, 1937, in the photo seen by any reader of the old Flying Aces magazine, when his "Miss Trenton", renamed "Trenton Terror," was published as a construction article.

TODAY: Barney and his .020 Replica Terror. Probably cost as much to build as original!

And just to prove it still flies well, here is Jerry Otis' Trenton Terror grabbing altitude at Elsinore. Photo by Art Hemler.

Bruce "Von" Chandler lights fuse on his American Ace 54. Powered by his Black Knight OS ignition conversion engine. Photo by Oslan.

race. He still makes compressed air motors just like 40 years ago, when he ran Peru Model Co. in Indiana. Still just as good!

Of course, Carl Goldberg is so well known, any comments are redundant. Carl has run the gamut, from indoor microfilm to the latest in radio control. He successfully established a kit manufacturing business that constantly comes up with "best sellers" every time. It couldn't happen to a nicer guy!

Louis Casale is still around, presently working at North American. Most all modelers will remember the formed aluminum airplane kits he produced directly after WW II, under the name of "Casalaire." Although the business never went over big, Lou is still building aluminum formed models. Just attend one of the MAC shows in Santa Ana . . . he invariably has one on display.

Chet Lanzo, long known for his successful rubber models in the forties, has also succumbed to radio control. Like for the rest of us, it is a pleasant and easy way to fly without overly exerting yourself. I know I'll hear from the free flighters on that! Chet still produces a design for the model magazines once in a while (just to keep his hand in).

Dick Korda is still around, but has been interested in full scale aircraft for the longest time. Reports reaching this scribe indicate Dick is dabbling with radio control and some of his old gas designs. Be great to see him on the field again.

The Southwest boys (Tulsa, et al); Wriston, Dague, Luckett, haven't been heard from since Dague went to England for the Wakefield finals in 1938. Same thing for Joe Matulis. Last time the writer saw him was at the 1950 Plymouth Internationals, when we both had young boys entered in the Freshman finals. Joe just about came apart watching my boy's paper R.O.G. bounce off the rafters for seven minutes. It was an amazingly lucky flight, considering the obstacles it could have hung up on.

Francis Tlush has probably retired from American Standard by now. His nephew recently prevailed on Frank to produce 100 of the old Tlush Super Ace motors. Even at $125 each, these were eagerly gobbled up by the engine collectors. Unless there is a real demand for more of these motors, it is highly unlikely Frank will produce any more.

Bill Tyler is still around. He attended the testimonial dinner for C.H. Grant several months ago. Just like the rest of us, he is getting old rather gracefully. Must be that youthful outlook that goes with model airplanes!

Might comment that Melvin Yates was the only modeler at the Nationals who placed high with the famous KG design by Joe Kovel and Charley Grant. Despite the fact that Kovel set the World's Duration Record in 1935, he never won the Texaco Event. Yates, with his second place, was the closest with a KG.

Hewitt Phillips is still active, having never given up his love of experimenting with wind tunnels and airfoils. Every so often, one can find a technical article by Phillips appearing in one of the modeling mags. He has been appointed to

Sign says, "Reserved for John Pond's airplanes, compliments of Joe Beshar." Seen at the SAM Champs, Lakehurst, N. J.

Uugh! Bob Oslan heaves his Spitfire powered Powerhouse into the air. Gene Wallock times and Mark Tackett watches with .020 Clipper.

Ah so! Admiral Yamamoto . . . whoops, no, it's Jim Adams "assists" his Super Cyke powered Powerhouse as Gene Wallock times.

handle the 1975 Symposium Journal for the NFFS.

The Grim Reaper has been responsible for some inroads on the cast of characters; namely Bruno Marchi and Joe Buehrle.

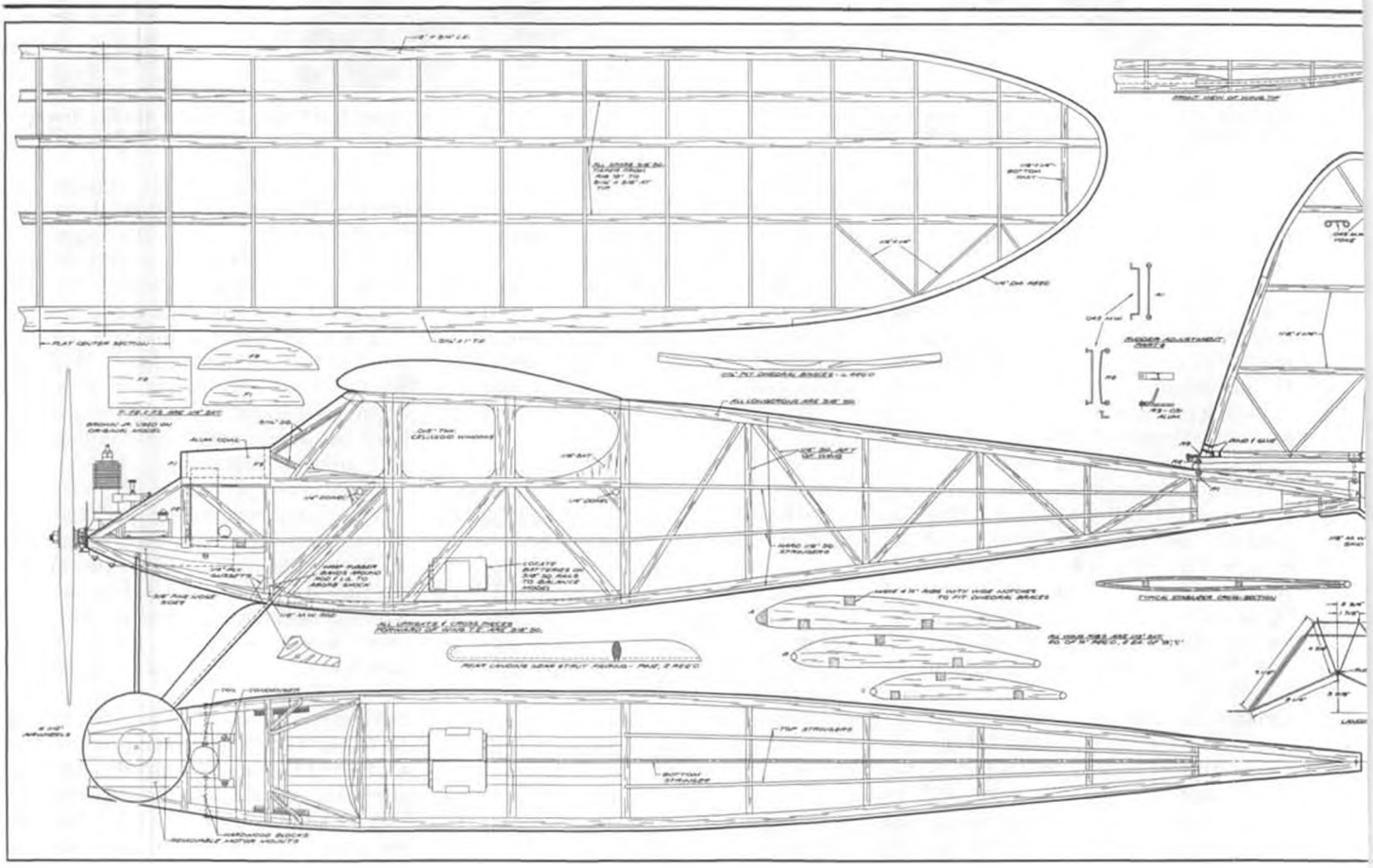
We'd still like to complete a rundown on the present status of the modelers in the photo. If anyone can fill in the gaps, please drop us a note.

Editor's note: MODEL BUILDER has received two letters which provide info on some more of the 1936 winners; one from Ron Moulton, Managing Editor of Aero Modeller and Radio Control Models and Electronics (RCME&E), and the other from Al Courtial, one of the winners.

From Ron Moulton:

"In July MB you asked the whereabouts of personalities from the photo of the 1936 Nats Trophy winners which you ran in May issue. If you have not already been advised, they include two Britishers, Bob Copland and Bert Judge, the latter with the Wakefield Trophy which he won in that year. Bob Copland's present address is 7 Rothwell Street, Regents Park, London, NW1.

"After a lifetime carrer with Hawker Aircraft as a protege of Sir Sidney Camm, he is now with Hawker Siddeley (Kingston), and has the title of Assistant Head of design Office/Harrier. (It also happens that the Head of Design on the same project is also a very keen aeromodeller and has contributed to Aeromodeller magazine). You can see Bob Copland's style in the fin shape of



"Contestant", a rare design by Frank Zaic, published in Popular Science a "few years ago." Seen at Lakehurst. Builder, please?

Al Hellman, a member of SCIFS, test gliding his Mk I Comet Clipper. On Clippers, cowls are for squares! Photo by Bob Oslan.

Hawker aircraft starting with the Fury, then Sea Fury, Hunter, Harrier, and soon to appear, the Hawk. The swan curve of the leading edge is his trademark.

A. A. (Bert) Judge (present address is "Kristeron," Larksfield, Hartley, Dartford, Kent., has been involved with modelling ever since his return from the USA in 1936. His winning design was kitted by FROG and this gave him contact with the great Joe Mansour, who created the FROG trademark and the name Flying Rise Of Ground. Joe, of course, was responsible for all the FROG products ultimately absorbed in the Lines Brothers empire, then created separately the JETEX plant. Bert Judge was intimately concerned with all of the FROG products and then with JETEX. In fact, it can be said that no one in the world knows more about JETEX than Bert, and possibly no one regrets its absence through inability to manufacture the propellant, as does Bert. He is currently engaged in high quality pattern prototype model making.

"It is of interest that also at Detroit in the British Wakefield Team were three other famous personalities.

"Alwyn Greenhalgh retired after a Navy career as Lt. Cdr., and one of the most knowledgeable Royal Navy engineers on helicopter maintenance. More particularly, to the model world, he is the official Historian to SMAE, and has a collection of famous models and engines, which I am personally sure is unrivalled throughout the world in the longevity of its material. It dates back to the original model engines of 1909, and flying models of before that date, and includes originals of many famous designs. His address is 61 Headington Road, Maidenhead, Berks.

"J. B. Allman continued as a competition modeller for many years and then went to South Africa where he is still active, and became a full size boat and motor cruiser constructor. He re-

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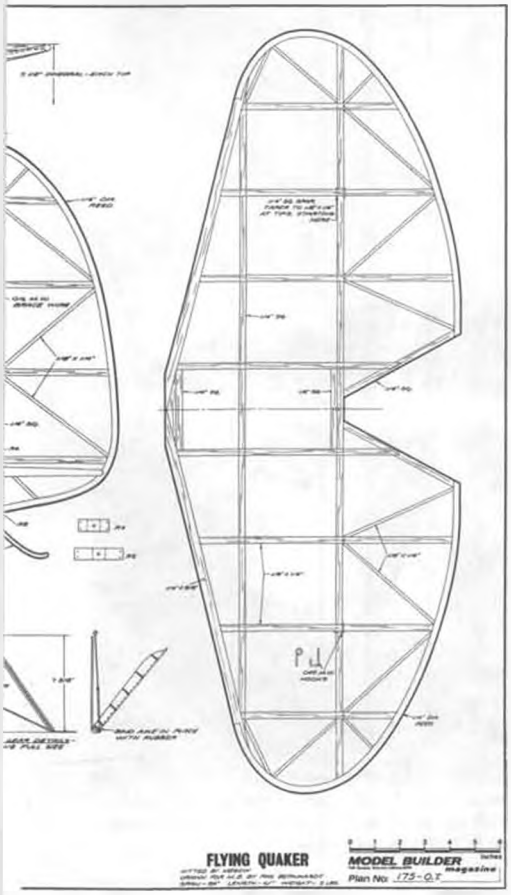


FLYING QUAKER

OLD TIMER Model of the Month

Designed by: Paul Karnow
Redrawn by: Phil Bernhardt
Text by: Bill Northrop

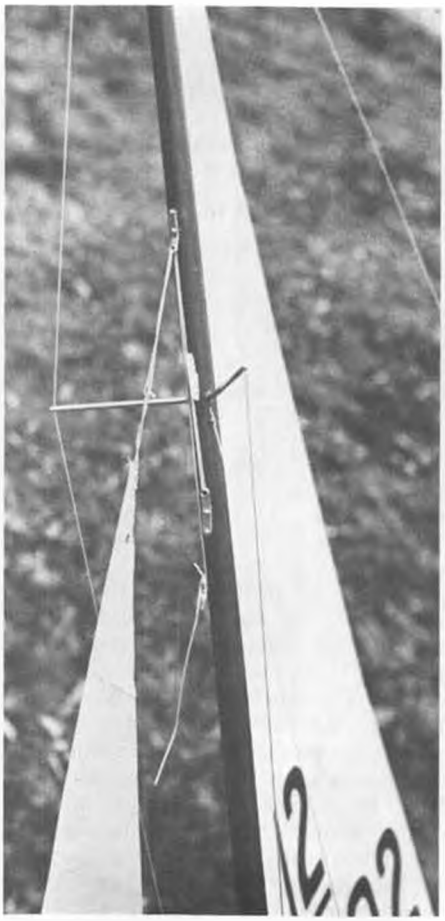
● Among the most famous of the antique old timers is the Megow Flying Quaker, designed by Paul Karnow. Introduced in the February 1937 issues of model magazines, it was quickly followed by the smaller, faster climbing Quaker Flash, which had a wingspan of 67", as compared to the Flying Quaker's 7 ft.

Both ships had pleasing lines for the day, with smoothly rounded tail surfaces and semi-elliptical wing tips. Also featured were "fail-proof" shock absorbing landing gears and motor-saving mounts for crashes. If either of the latter were put to test, it is likely that the aircraft itself took the worst beating.

Nevertheless, the Quakers were pioneer gas models in the early days of gas powered model flying.

Continued on page 77

Mast rigging on an EC/12. Clean and efficient. (Pardon the telephone wires).



Jenny strut detail on an EC/12. Cleat is for jib stay. Flat bowser/tang is for jib halyard, and controls luff tension.

Put straight edge on 102's jib luff, see how much sag is allowed by having separate forestay carry part of mast load.

STRICTLY SAIL

By ROD CARR

● Next month we are planning to start a 2 or 3 installment series on construction of a fiberglass-hulled 50/800. This is in response to an increasing number of requests for really basic constructional information on R/C sailing yachts. Before launching such an ambitious undertaking, we'll try to clear up a number of odds and ends which have been begging for attention.

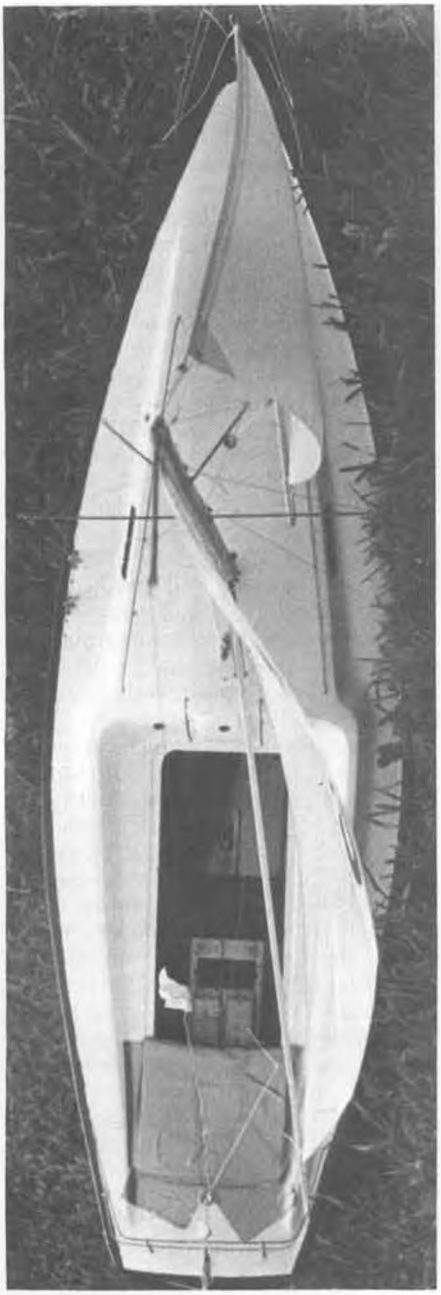
Most important is the new Secretary for AMYA. He is Bud Salika, 3917 Sunnyside Avenue, Brookfield, Ill. 60513. *(Is he an "odd" or an "end"? Sorry, Bud, couldn't resist that! wcn).* He will handle your $5.00 annual dues as well as your vessel registrations. I had the good fortune to finally shake hands with Bud after many years of trading correspondence, and am very pleased that AMYA is again armed with a strong Secretary who really keeps the paperwork flying. Remember to renew your AMYA membership in order that you won't miss a newsletter issue in the shuffle.

* * *

San Franciscans will be happy to know that the Bay Racing Association has become AMYA Sanctioned Club No. 38. This group is headed by Harold Sleight, 330 First Street, San Francisco, Ca. 94105, who may be contacted for further information regarding sites and sailing times.

Sanctioned Club No. 39 is Ontario Radio Control (Yacht) Club, being headed by Rich Whan, 804 Nicholson Ave., Ottawa, Ontario, Canada K1V 6N5. This club is experimenting with two different approaches to Racing Rule usage. First, they are not allowing a yacht in a race to touch a buoy, and secondly, if a foul is committed, a judge assesses a 360° turn against the offending boat. Rich says they are lucky to have one good judge who can make these decisions while the races are underway. (What happens if he stays home with a sore throat? And aren't there times when

Chuck Black's monster 12 meter, 75" LOA, 2000 sq. in. of sail, reaches in a fresh breeze, San Diego's Mission Bay.



Overhead view of Huson 36. See text for discussion of rigging and sails.

a protest hearing ought to be held?)

We recently discussed the Heat List problem in these pages. A little midnight oil and some broken pencils have produced two heat lists which we are using in local contests with excellent results. They are: the MARK 16 . . . 12 heats for 16 boats (two boats per frequency); the MARK 30 . . . 12 heats for 30 boats (3 boats per frequency). I would be happy to send copies of these to anyone who will send me a stamped (20¢), self-addressed envelope. (See address at end of column). A discussion of the 50/800 ACCR Heat List will be found in the Club News Column of the Fall 1974 AMYA Quarterly Newsletter. It is quite revealing.

Also, we can provide an information sheet containing all the names and addresses for getting started in R/C yachting. FCC, AMYA, manufacturers and publications, are all listed in one place to allow the novice to gather the materials he needs to choose a class of vessel.

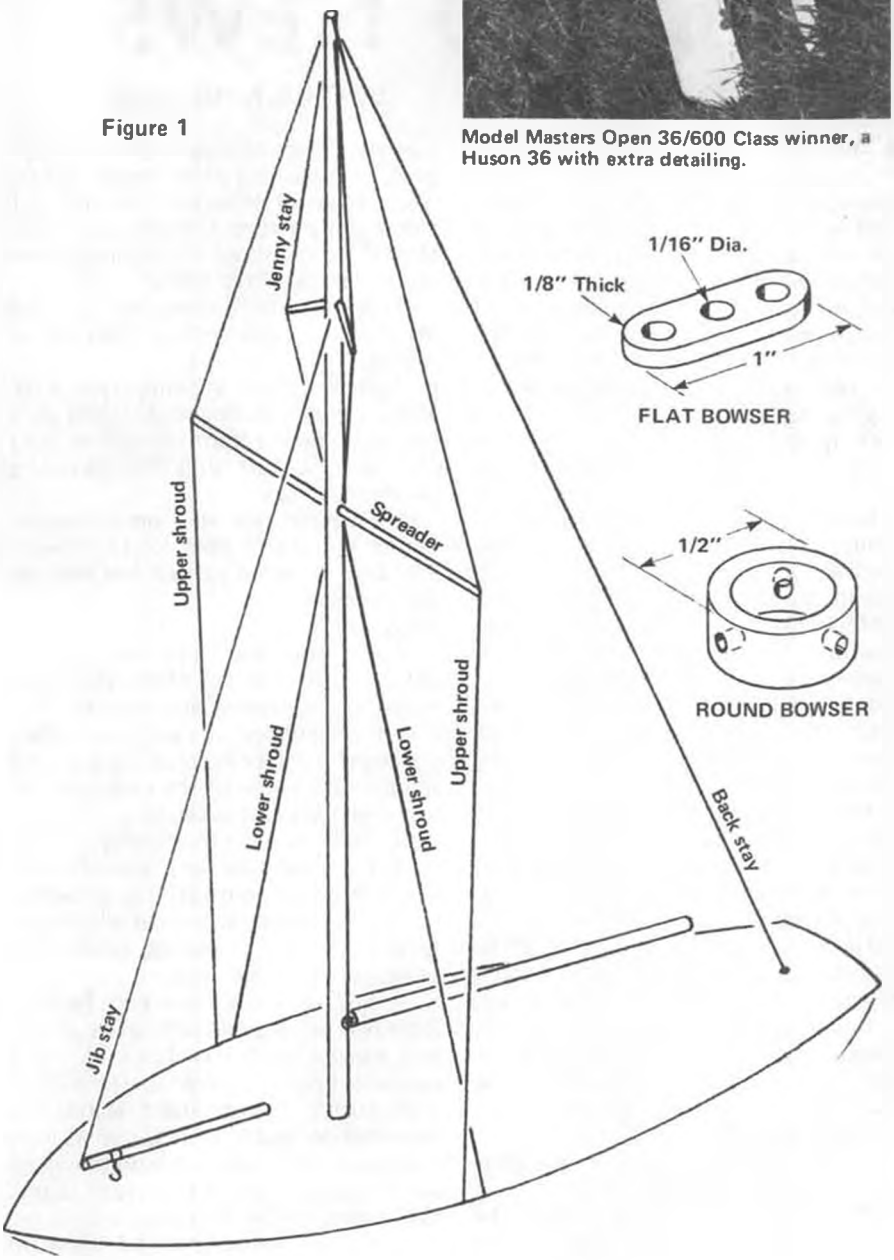
* * *

Figure 1 is an idealized sketch of the typical rig which is used on our boats. It is very much like the full sized Lightning Class rig. I have on hand a copy of a booklet titled "A Collection of Reprints and Excerpts on Tuning, Rigging and Sailing" obtained from the Lightning Class Association, 808 High Street, Worthington, Ohio 43085. It cost $3.00 to the best of my recollection. Some of the data, such as that on crew positioning, is not pertinent to our uses, but the major part of the discussion on setting up the boat is a great help, as all the information on sail shape, mast shape, etc., is directly applicable. Worth tracking down in case you are really serious about improving your boat.

Continued on page 65

Model Masters Open 36/600 Class winner, a Huson 36 with extra detailing.

Figure 1



This month, Chuck gets into the nitty-gritty (to be washed out before assembly!) of engine hopping for auto racing purposes. It's all kitchen table type modification.

R/C AUTO NEWS

By CHUCK HALLUM

● A lot of racers think that the hot dogs of racing don't tell all there is about their engines because they want to keep their secrets to themselves. I'm going to tell you everything that I think is important in making the Veco and Veco-McCoy go fast. Maybe when you get through with the article you'll say "He sure doesn't know much." But what I'll tell you can give your car more than it can handle. Then it's up to you to train your throttle finger.

Most of the information here is for the Veco-Veco/McCoy type engine, not a Schneurle port engine. Some of the comments are applicable to any engine, however. It's appropriate to go through a sequence of engines; from semi-stock super stock, McCoy-modified, to super-modified, so that beginners as well as experts can get something that is appropriate for their abilities. Part 1 will cover the semi-stock and super stock Veco engine and Part 2 will cover the McCoy modifications.

I don't think anybody takes an engine out of the box and puts it right in a car. Usually they take it apart and see what it looks like. That's the best thing anyway, 'cause you'll find all kinds of chips and burrs in most new engines. While it's apart you might as well do a few things to it to make it run a little faster.

Before we get started on the modifications, I think it will be beneficial to put down the proper disassembly and assembly procedures for the engine.

DISASSEMBLY

1. Remove the head and back plate (and carburetor if applicable).

2. Remove the sleeve. This should be a slip fit. If it won't pull out from the top with finger pressure on the inside bore, try pushing from below with a wood dowel or other soft item. If it still won't come out, put engine in an oven at 200°F for about 15 minutes, then push sleeve out from below.

3. Remove piston and rod. Lift rod off crank pin and remove from top of engine.

4. Remove crank from crank case. Screw a nut on the crank shaft and use a plastic or rubber-tipped mallet to drive out the crank shaft, with the case resting on wood surface.

5. Remove bearings from crankcase. Put case in 200°F oven for 15 minutes. Tap case on wood surface and bearings will drop out.

ASSEMBLY

1. Be sure liner slips into case. It should slip in and out of the case quite easily. If not, remove any burrs or scratches from outside of liner, using #600 grit paper and crocus cloth. Do the same thing to the inside of the case cylinder, using only the crocus cloth.

2. Clean all parts thoroughly.

3. Put front bearing in case. Be sure shield is on the outside. Tap in with a mallet, using a cylindrical bar which contacts outer face of bearing (place back of case on wood surface).

4. Put in crank and rear bearing. With rear bearing on crank, place in case and, using a wood dowel or stick which contacts back of crank shaft, drive in with mallet. Be sure front bearing has remained in place. If not, use washers and spacer which contact both inner and outer races and use nut on crank to pull the bearing back into place.

5. Put in piston and rod. Drop in from top, put rod over crank pin. Be sure baffle is to intake side.

6. Slip in liner sleeve. Align sleeve with intake ports and piston baffle.

7. Put on head. Also put oil (3-in-1 or equivalent) in all openings and flip engine over a few times.

8. Put on rear cover.

SEMI-STOCK ENGINE

The first thing you need to do after disassembling the engine is to put on a new carburetor. The Perry 19 is a good choice. Here's how I put them on.

First, remove the rubber ring seal from under the carb body, then push the carb into the venturi hole in the case. If the body sits up off the case, trim the required amount off the bottom of carburetor outlet tube so that the body is flush with the case. With the carburetor aligned properly, center punch carburetor tube in the center of the hold down screw holes in case. Drill through the carburetor tube from each side with a 10-32 tap drill (#25). Put the carburetor back on the case and run a 10-32 tap completely through the hold down screw holes (they do line up).

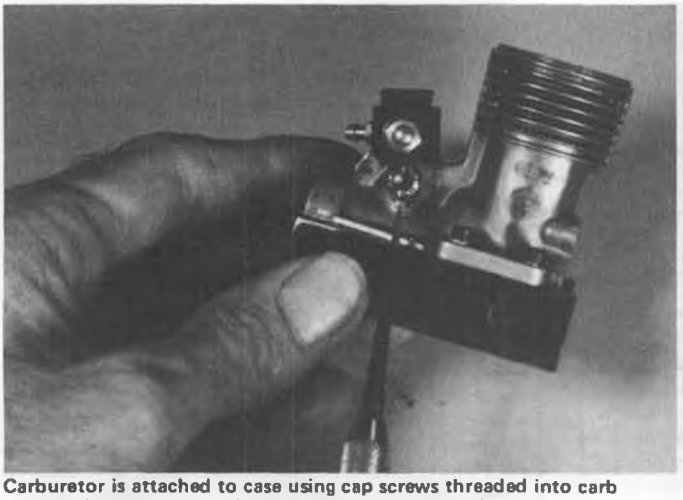
Next get some short pan head or fillister head 10-32 screws and put them in the hold down screw holes. With the barrel out of the carb, look down the throat. Note how much the screws stick into the passage. Shorten the screws so that they are flush with the throat wall.

Usually at this point, I take a taper reamer and ream the bottom of the carb outlet tube until the taper run-out is just above the mounting screw holes. This diffuses the gas flow to a lower gas velocity and gives a higher pressure at the crank inlet and lower turning losses. With the carb in place, look down the carb throat again . . . the mounting screws may have to be shortened a little more.

Now you're ready to seal the carb in place. Clean the carb outlet tube and case venturi bore with alcohol and dry. Wipe a little silicone seal on the outside surface of the carb outlet tube and on the inside of the case venturi bore. Press the parts together. Put a little silicone seal on the 10-32 screw threads and screw them in. Smooth over the excess that squeezed out between the joints. Look down the carb throat and crank bore and clean out the excess silicone with a small screw driver. Using this method, the carb should stay in place for at least a season . . . you might be ready for a bigger carb before then.

While the silicone is drying, let's work on the crank and sleeve. On both of these, only smoothing of the fuel charge flow path will be done . . . no timing changes.

For the crank job, a hand grinder with small abrasive tips will be needed; small cones and cylinder shapes. A 1/8 dia. carbide cutter with rounded tip and a small polishing wheel will be needed for the sleeve modifications. The same

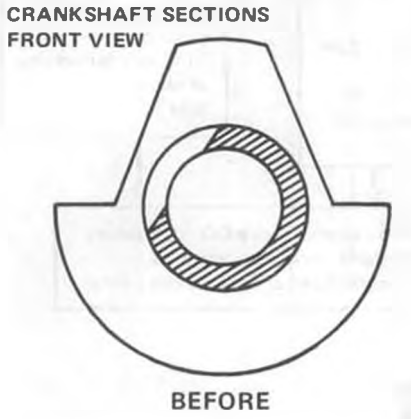


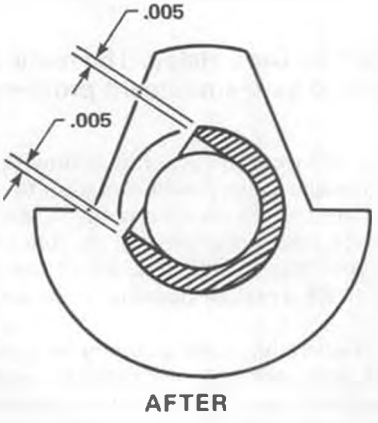
Carburetor is attached to case using cap screws threaded into carb outlet tube . . . along with some silicone rubber sealant.

For larger carburetor installations, epoxy should be used to strenghten the joining areas.

carbide cutter will be used later to take a casting flash off the case.

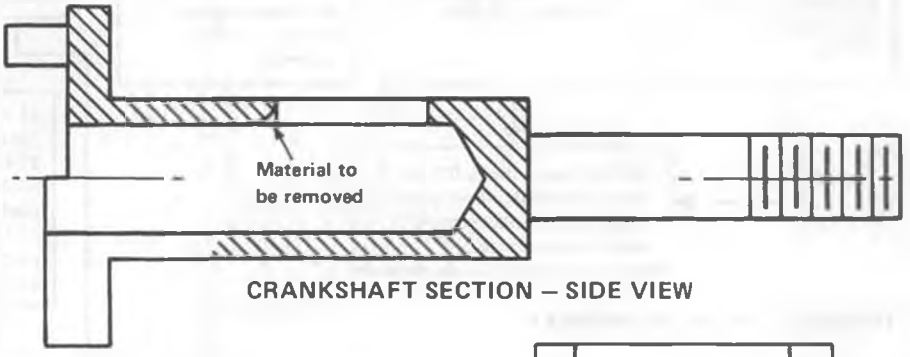
If a section were taken across the crankshaft at the intake port it would look like the figures illustrated below:





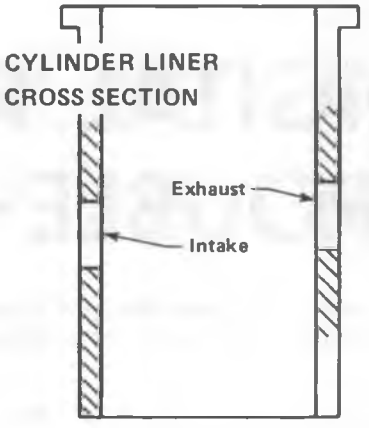
Both the before and after views from the front of the crank are shown. For this job use a small cone abrasive tip. A small tip is needed to get into the corners. Two of these tips may be needed to complete the job. Be sure to leave a small flat of the original cut where it intersects the crank O.D., for a definite reference later and to assure no timing changes. A .005 in. flat is great, if you're careful.

Now let's look at a section down the centerline of the crank:



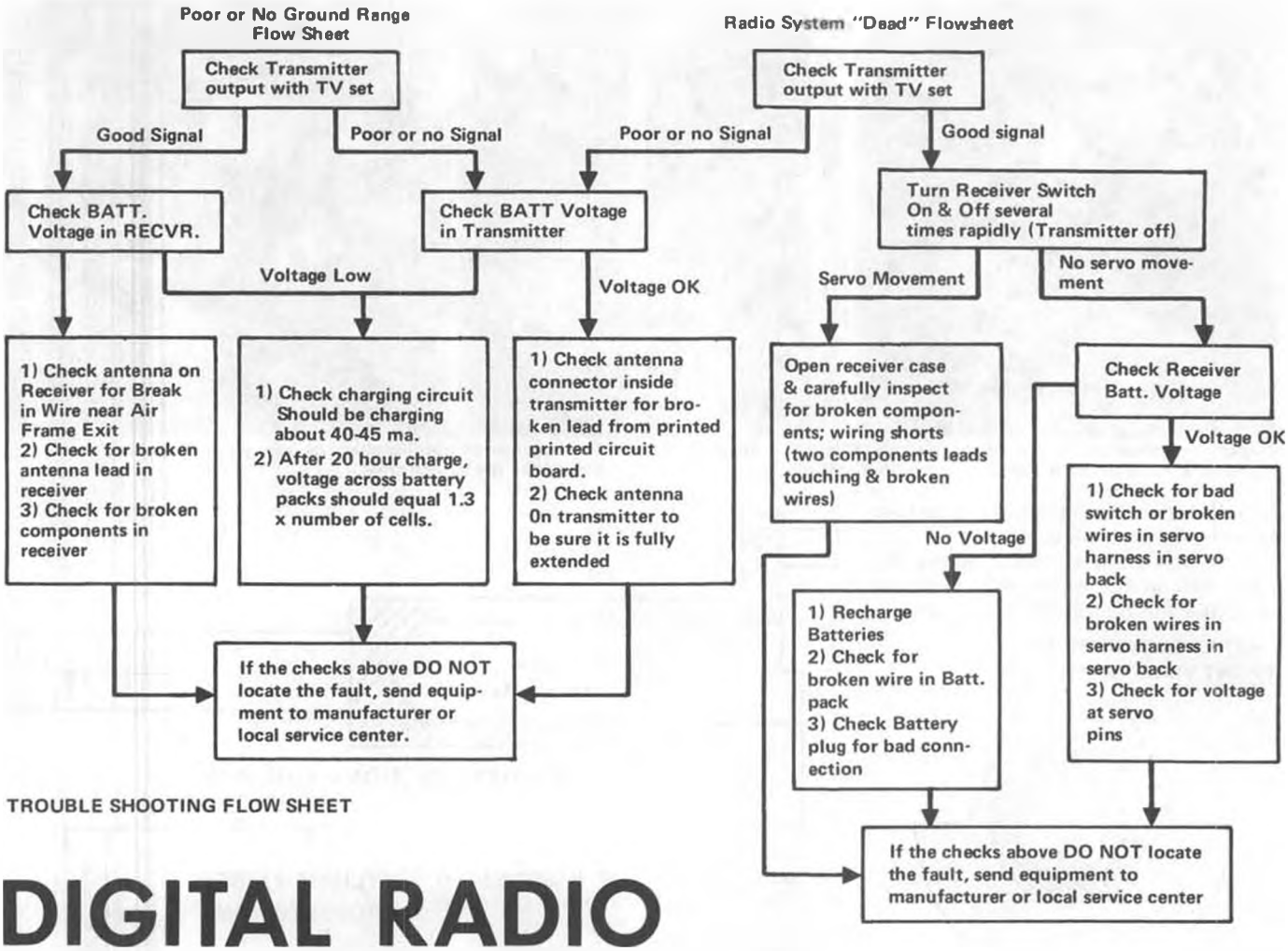
As you can see, what we are going to do is try to allow the intake fuel charge to turn more easily. A slightly larger cylindrical abrasive tip can be used here. First bevel the rear surface back at an angle parallel to the carburetor venturi centerline, and then put the full radius contour in. You will have to switch back to the small conical tip to get the rear corners properly. O.K., that takes care of the crank shaft for this step.

With the sleeve, all we're going to do again is make modifications to allow the gas to flow more easily. Before and after sections of the liner sleeve are shown below:



Continued on page 67

Use a tapered reamer to reduce losses and increase pressure at the crankshaft inlet port.



TROUBLE SHOOTING FLOW SHEET

DIGITAL RADIO TROUBLE-SHOOTING

By VICTOR BANEY

The author prepared this article for the Houston R/C Club newsletter, as edited by Dave Haley. The material is so simple and direct that we felt it could be helpful to many of our readers who have equipment problems.

● From the Houston R/C Club comes this very interesting and helpful item. The Newsletter is Feedback and is edited by David Haley.

"The question, 'What can I do if my radio quits or doesn't work, has been put to me several times. Well, the answer is 'a lot if you want to.' In the trouble shooting chart, an attempt has been made to help the average R/C flyer trouble shoot and diagnose some common problems, save some money on repairs, and spend more time in the air.

First of all, if you don't already have a volt meter, I recommend the purchase of a low cost volt, ohm, and milliamp meter, usually referred to as a VOM. While there are many on the market, the one I recommend to the average non-electronic R/C'er is the Micronta Model 22-4027 handled by Radio Shack. It sells for about $5.95 and the small size (3-1/2x2-1/4x1) makes it ideal for the flight box. There are several other comparable models which will suffice to make the simple checks required to determine whether you can repair the radio, or whether it will have to be sent to the repair shop.

"The next test instrument is your TV set. It can act as a large screen oscilloscope to view the RF pattern of a properly functioning transmitter. In fact, as shown on the flowsheet (insert) this is a good test for a transmitter. It does not matter which frequency you are on. Just extend the transmitter antenna fully, place the transmitter near the TV, and flip through the channels until you find one that is obviously "blitzed" by your signal. Harmonics of your transmitter occur all through the VHF (channels 2-13) and UHF (14-83) bands. Adjust the Vertical Hold knob on your set until the lines across the screen stop moving. You will then notice that if you move one of the sticks on your transmitter the spacing between the lines changes: in fact, this is how your transmitter generates information to the receiver and servos. The point is, if you cannot find a station that is "blitzed" by your transmitter, it just isn't putting out an RF signal, or possibly a very weak one.

"Generally, radio equipment is reliable and is not normally prone to failure if proper care and preventive maintenance is given. This is a pretty broad statement, and I am sure some of you will disagree. Well, each to his own opinion. Nevertheless, it has been my experience in repair of R/C equipment, that a lot of the faults could have been located by the owner if he would have taken the time and had known what to look for. Take a look at the trouble flowsheet and I will discuss some points of major interest.

"Switches, connectors, wiring, and batteries are the most prone to failure; therefore, these are the things that we

concern ourselves with primarily. Nickel-cadmium batteries have a cell voltage of 1.3 volts per cell when fully charged. With this bit of knowledge, we know that a four cell receiver pack should measure 5.2 volts immediately after charging. If you should measure less than this voltage, you can assume that there are one or more defective cells. Again, a simple test with your VOM will locate the bad cell or cells. You may replace them, or you can find a friend who is handy with a soldering iron. (Replace with same type of cell, such as G.E. with G.E. etc.)

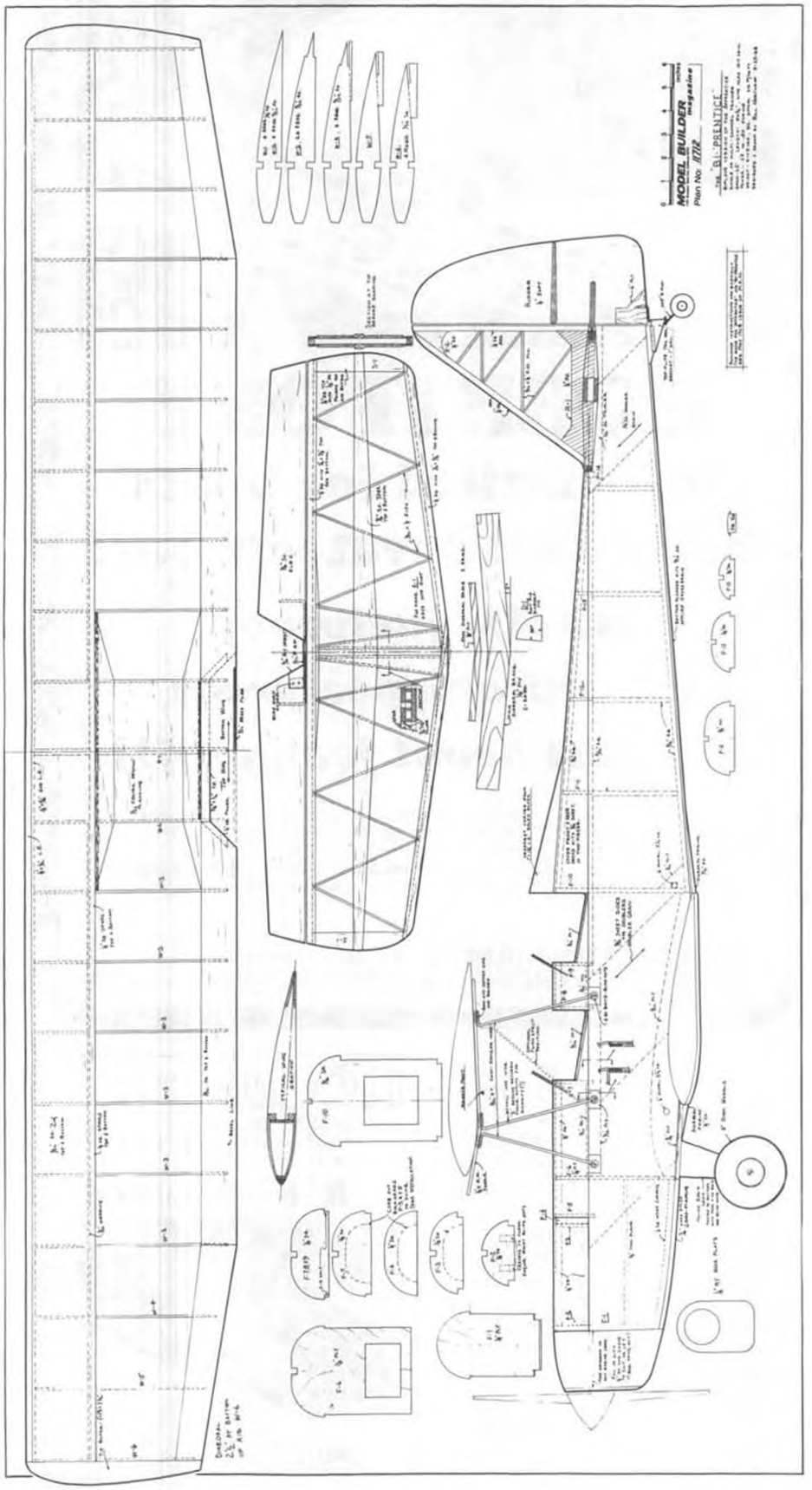
"Wires are always subject to pulling, turning, twisting, and vibrating. The end result will be a broken wire. Careful inspection of the wiring in a receiver/servo arrangement will generally produce a few connections which are "hanging" by one or two strands of wire. This is an accident looking for a place to happen! This situation commonly produces a non-operative or intermittently operative radios, and can cost you an airplane (and maybe more) if not caught early!

"Switches and connectors are exposed to dirt, oil and general pulling and tugging. Again, this can result in intermittent to complete system failure, with time. Careful inspection is the key here also. Frequent spraying of denatured alcohol on these parts is recommended. The alcohol does not harm the plastic used in servos, switches, and connectors, and does cut the dirt and oil from these troublemakers.

"One item not covered on the flowsheet is the "problem" servo. Often your radio will seem to work well, but one servo will be noisy and slow, or jittery. The culprit behind the slow noisy servo is a worn out motor. Although our servos use very fine and expensive motors, each of them will wear out if you use them long enough. Although these small motors can be serviced, the safest route is to replace them. If you take the trouble to keep a spare motor on hand, a ten minute switch of motors (three solder lugs) can save two weeks of waiting and someone's $10/hour labor. A jittery servo is usually the result of a little dirt in the servo feedback pot. Often a blast with silicone spray cleaner as sold in TV repair supply shops will clear up the problem entirely.

"Finally, when the weather is too bad to fly and you are looking for something to do *(Does not apply to Californians. wcn)*, try removing the gear from your plane and pulling a Preventive Maintenance inspection check. This will consist of visual inspection of all switches, connectors, wiring, and antenna leads for oil, dirt, and abrasions. Then open the receiver case and inspect for near shorts of component leads, cracked components, and antenna connections. Next open up your transmitter and check for wire fatigue around the stock potentiometers. While you are there, check battery voltage and inspect the antenna connector for a loose connection from the P.C. board. Check the transmitter antenna to make sure that each section pulls out and has a firm connection with the connecting sections. If not, replace it; remember, the antenna is what gets the signal out to the receiver. Check receiver pack batteries for proper voltage, and inspect battery inter-connecting straps to make sure the cells are connected securely. Finally reassemble everything and clean all the cases with denatured alcohol. Reinstall in the plane and enjoy yourself on the next good flying day. Remember that the radio is reliable and you have just checked it over yourself to be sure!!" ●

The BI-PRENTICE a two-wing trainer



Remotely . . . *Continued from page 15*

Quite often, we've tried to find the words to define this special ability that belongs to just a few of the many who enjoy the hobby. Rich Willenbrink, editor of Signal News for the Signal Chaser R/C Club of St. Louis, Missouri, said it pretty well.

"Most of the R/C pilots I know are eager seekers for perfection, lets face it: 90 percent of flying R/C is no more difficult than driving an automobile off the Jefferson Barracks Bridge, but mastery of that final ten percent is what sets the superb R/C pilot apart from the merely adequate. For this is the indefinable area in which experience, judgment, technique and a true 'feel' for flying combine in a rather sophisticated formula; if all the right ingredients are there in the right amounts, then you have one of those rarities, a pilot's pilot.

"Someday I hope we all can achieve the touch I have so admired in some of the outstanding pilots; a touch that is both positive and smooth, perfectly timed so there's no wasted effort, no lost energy, no double corrections. Lovingly handled, the aircraft always does precisely what the pilot has in mind; rapport between man and model."

HIGH-ALTITUDE "BI-PRENTICE"

Not long ago we spotted a photo of a familiar looking biplane in a copy of the Pikes Peak (Colorado Springs) R/C Club Newsletter. We wrote to the editor, Col. John de Vries, USAF, (Ret'd.), to learn more about the plane, which we recognized as a slightly modified Bi-Prentice, one of our designs which had been published in the second issue of MB, November 1971.

Shortly thereafter, we received the following report, written by John, describing the Bi-Prentice which had been built and flown by Duane Thomas. John is also credited for the photo which we have published with this report.

"High Altitude Bi-Prentice"

"When you fly with the Pikes Peak R/C Club (of Colorado Springs, Colorado), you've got a problem! The Club's paved strip is 7200 feet above sea level. The air is thin and the winds, blustery. Thus, you've got to be very careful about which model you build and fly. Lots of wing area and a bigger-than-recommended engine is the way to go at our high-altitude airfield.

When Bill Northrop's Bi-Prentice appeared in Volume 1, No. 2 of the MODEL BUILDER, Duane Thomas was quick to realize its Colorado potential. A super-competent builder and flier (he's one of the Club's Instructor Pilots), he ordered the plans and began acquiring the necessary balsa, wire and accessories for a scratch-built effort.

"When Uncle delivered the plans, Duane decided to make one important modification . . . increase the wing area.

Continued on page 58

HAVE YOU LOOKED THESE OVER YET?

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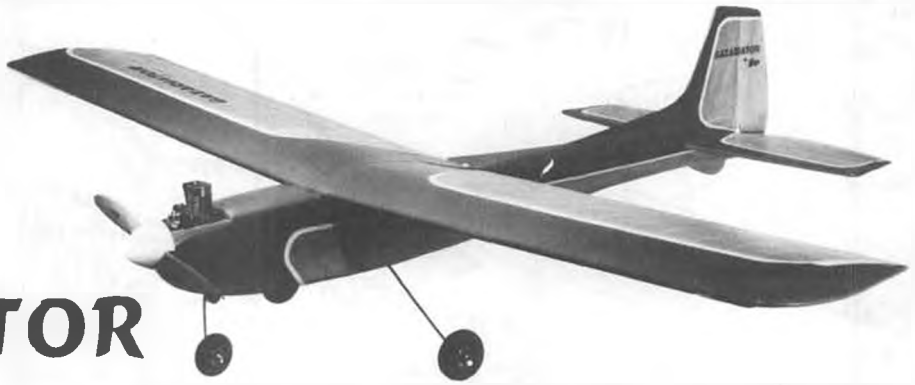
SPAN 68 in.
LENGTH 52½ in.
AREA 800 sq. in.
FOR ENGINES .50 to .61

$51.95



GAZARIATOR

(Super Fledgling)

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

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

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

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

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

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

SAILFISH

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

Kit B-23
$14.95

HEIGHT 32½"
LENGTH 24"
BEAM 5"

G1 Spanish Galleon
G2 USS Constitution
G3 Schooner Blue Nose
G4 HMS Bounty
G5 Golden Hind
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All Just $6.95 ea.

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

BeGINNeRs FUN SeRies

13 of 'em—2 at $4.95 the rest $4.50

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

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- ☐ "Secrets of Control Line and Carrier Flying." Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions. 25¢ enclosed. No checks. Only U.S. money orders or currency accepted.

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Continued from page 56

The original MB article, a one-column 'quickie,' seemed to invite such a change in the design. So, the span of the lower wing was increased by the width of the fuselage, with two more rib bays. The upper wing was lengthened by five inches . . . making the upper span 66 inches. It turned out to be a BIG biplane!

"Powered by an OS 60 Gold Head, and with a three-channel MRC radio installed, Duane hocked the family jewels and covered the bipe with Solarfilm. He chose an Air Corps color scheme, with blue fuselage and yellow wings, complete with stars and rudder bars.

"With the uncowled 60 screaming, the first test flight was, like they say in the articles, without incident. It flew right off the building board. Stable as a brick, the High-Altitude Bi-Prentice

Continued on page 79

C/L . . . . . *Continued from page 25*

bearing wear will be very unpredictable and sometimes very rapid. My fuel is now 38% kerosene, 30% ether, 30% castor oil and 2% Hexyl Nitrate. I have found that the Hexyl Nitrate makes the engine run *lots* smoother, and the compression setting is a little less critical.

"I tell everyone who wants to know diesel basics, that the key to diesel operation, provided all else is well, is one thing: HEAT! Too much heat, and you are in trouble. This is caused by too lean a mixture, or over-compression, or an engine not run-in long enough. Too little heat, and you are still in trouble. Caused by undercompression, occasionally too rich a mixture, or no nitro in the fuel, on some engines. Anyway, heat is the key. Get that right for a given RPM and you are in business. You don't have near as much control over how hot the engine gets in a "glow" situation. At least this is the way it seems to me."

All of this diesel talk sort of gets you to thinking . . . maybe some of us 100% glow nuts have been overlooking something!

* * *

The discussion on coupled lines, if nothing else, very appropriately continues to go round and round. Dale Kirn has more info in his section which follows this.

Jed described the "funny lines" in his November column, but unfortunately, we didn't have room for some further interesting information. Chuck Schuette, from Long Beach, California, well known speed man, and FAI Speed Team member, did some research and slide rule work, with the results shown in the two charts.

Chart 1 contains data based on existing speed records and normal two-line wire sizes.

However, information available shows that the best coupled-line speeds are 13% faster than uncoupled lines. Tests with a model which was converted from a two-line to Mono-Line plane showed Mono-Line to be approximately 3% faster. Therefore, a two-line plane with coupled lines should be about 10% faster than Mono-Line, assuming present wire diameters for both systems remain as is.

Chart 2 then, shows the possible figures based on 110% of the existing

Continued on page 60

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1973 AND 1974

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PERFORMING LOOPS

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UNWANTED TURNS BY AUTOMATICALLY
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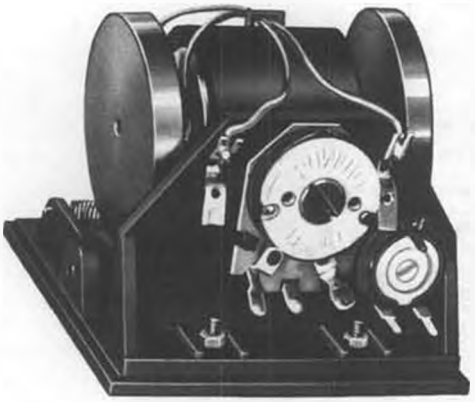

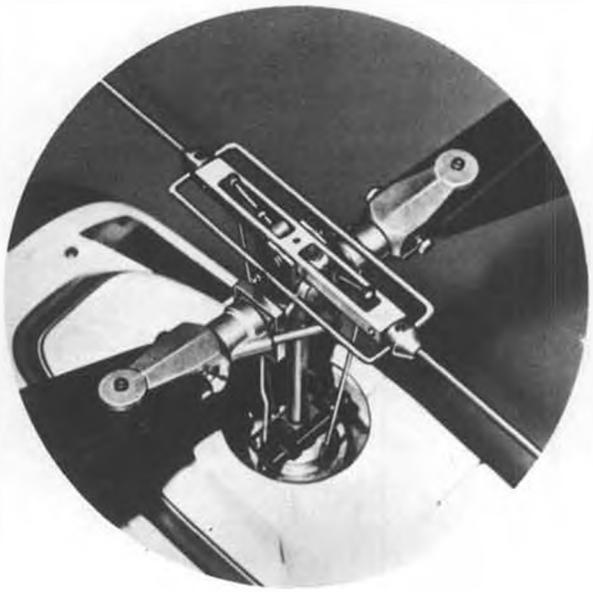

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Continued from page 58

records listed in Chart 1. From this, it can be seen that B and C/Jet lines would be too small. By increasing "B" lines to .016 and the C/Jet lines to .020, the safety margin would increase to an allowable 1.55 and 1.64, respectively.

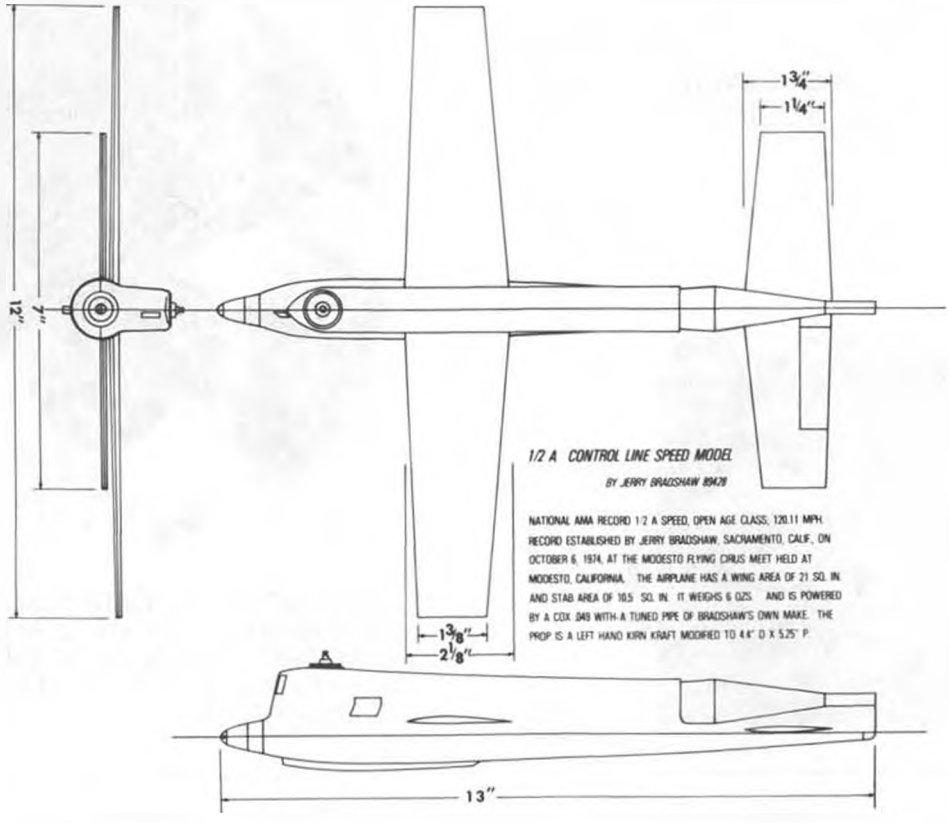
Actually, with the larger lines, the projected record speeds would be slower . . . which would also increase the calculated safety margins.

* * *

. . . And now, Dale Kirn reports on . . . SPEED

A couple of 1/2A speed records were set early October at two separate California contests, Jerry Bradshaw (Sacramento) left no doubt in anyone's mind that his "home made" piped .049 is gonna go . . . and go it did! How about 120.11 MPH, for a now AMA and WAM record!? And, he backed it up with a solid 116.23 MPH! If you recall, about a year ago we showed a picture of Jerry's plane after he had set a WAM 1/2A speed record, on the 4th of July, in San Jose . . . at 104 MPH. He is still using the same plane, but now has most of the bugs worked out. Jerry has really been working hard on this project, and it has paid off. Of interest to speed flyers is the fuel he was using; a very "mild" mix with methanol the main ingredient . . . no propylene oxide! And of all things . . . a Kirn-Kraft left hand prop in the two-bladed configuration. Prop diameter was cut to 4.4 inches and pitch was increased to 5-1/4. Not only is this the fastest 1/2A speed record . . . but also a record speed for left-handed props as well.

On the same week-end, in San Diego, a new Senior AMA 1/2A speed Record was set by Jim Wade. A non-piped Tee Dee with left hand single bladed prop (hand carved), turned in the very res-



pectable speed of 108.57 MPH. The plane was something else . . . his regular 1/2A Proto plane!! The back-up flight was a strong 107 MPH. He almost upped his present 1/2A Proto record (98.64 MPH) too, but only turned 98.32 MPH. Both of these speeds were faster than any 1/2A speed or Proto speed turned by Seniors at the 1974 Nats. Congratulations to both Jim and Jerry on their fine efforts . . . and results!

Another Californian, Bob Spahr, set an FAI speed record that was really something. A super-fast 170.41 MPH flight with his Rossi .15 and a single bladed prop. He was using the "coupled" lines (see Kusik's notes in recent MB) and had a back-up flight of 169.98. Sure is a consistent machine . . .

The newly formed speed team of Jim Clary and John Newton set a WAM jet record of 192.03 MPH with a Thomas, all metal "Ironsides" plane. They were also using the modified Thomas Dynajet engine (extended venturi and combustion chamber). Understand these fellows are getting this plane rigged so that they can fly it on "coupled" lines. According to their calculations, it should go well over 220 MPH!

Speaking of "coupled" lines, you should see the volumes of letters and paperwork that the AMA has been going through on this situation. An Emergency Proposal was submitted in early September to have this method of line ties banned immediately . . . on the basis that it was unsafe. Without going into the pros and cons, the decision was reached by AMA President John Clemens and Control Line Contest Board chairman Jean Pallet, that the Emergency Proposal will not be put into effect. In a six page letter sent out on Nov. 1st, they recommended the following: "Lacking any information on actual speeds on coupled lines in other than events normally flown on two lines, and with no safety problems yet arising therein, we see no current safety basis for a ban on coupled lines and will not, therefore, effect such a ban. We further recommend that the CLCB act accordingly in its vote on the matter." If any speed flyers out there have comments they feel should be heard, we suggest they get this info to their District AMA Control Line Representative.

It appears that until further notice, coupled lines will be permitted in the various speed events, but the outcome of some of the other control line events, such as carrier, combat, rat racing, and stunt, is not clear at this time. ●

Choppers . . . . *Continued from page 21*

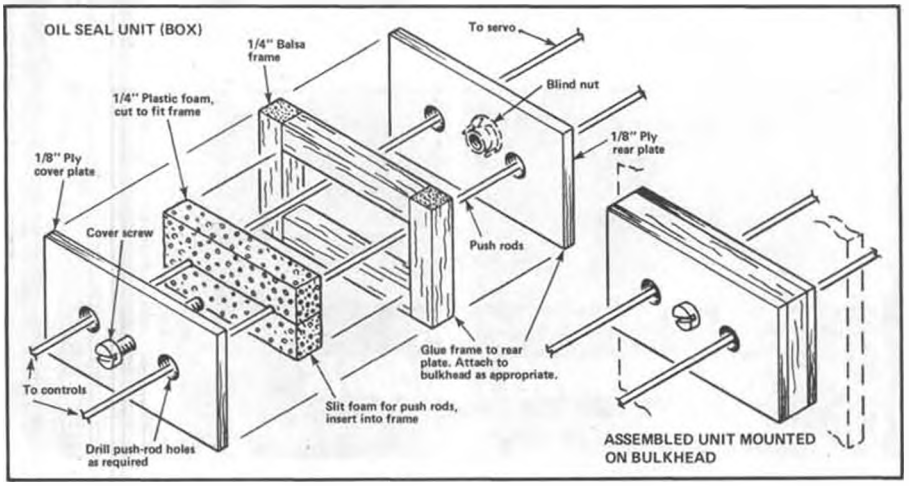
cured the problem, but will keep trying (if you have the answer, please send me a note).

The next step was to install the "S" head (I had designed the system for quick conversion for student training) and give it another go. Again the stability was amazing, and it was so firm and positive I decided I'd really found the right combo! Up, up and away, out into the traffic pattern and . . . nothing but trouble!!

As soon as the Super-Cobra attained a forward speed of about 15 mph, it pitched up violently. A reduction of power almost stood it on its nose. Application of full power brought it under pitching control, but climbing like a homesick angel. I spent the next 5 minutes desperately fighting to lose altitude while trying to maintain some semblance of control. Again I lucked out and got it down without a scratch, but I never want to do that exercise again!

Some months ago, my son, Kim, had problems with his Kalt Cobra, and we installed the "S" rotor with excellent results. However, recently, he had an identical experience where the nose pitched up violently in forward flight. I must admit that I thought he was having radio problems . . . or pilot technique problems, and chided him for it . . . that is until it happened to me! Since then I have been studying my basic helicopter theory, such as assymetrical lift and transverse flow effect, all to no avail.

After all this, I wonder why the engineers say a helicopter tends to pitch down in forward flight, and in fact,



they recommend positioning the horizontal stabilizer in such a manner as to deliberately cause a pitch-up. When I find the reason, I'll pass it on . . . in the meantime, watch out for it!

Getting back to another subject, I have some inputs on the Kavan Jet Ranger which might be of some value: one of the pictures in this column shows a neat conversion for the "third-arm" to the rotor head on the Jet Ranger which eliminates problems with the "yoke" that straddles the blades. It also makes it easier to put your finger down on top of the head (for slow-down) without getting it tangled in the yoke. I don't know who devised the idea, but it's very simple and works great. See the picture for self-explanatory details.

There have been major problems with the tail rotor shaft of the Jet Ranger breaking on ground contact. Several modelers have inserted oversize bearings in the tail-mounted gear box, which allows for a larger shaft (constant diameter) to be machined and installed. This minimizes shaft breakage on ground contact, but can also tear up the tail boom! I guess the compromise is up to you as to shaft breakage or tail boom and rudder damage, whichever is most important! Incidentally, if you do have to replace parts or pieces on the tail rotor, be sure to check out (prior to flight) the directional control for proper direction of movement, since it is *very easy* to get the blade-holder ball sockets reversed! (left rudder now becomes right turn). All it takes is a 180 degree rotation by accidently installing the blades backwards in the holders!

While we're on the subject of reversing, I've almost convinced myself to reverse the vertical fin on my Jet Ranger so that the longer half is pointed downward and the short half up. This doesn't change the fin area, but does offer excellent rotor blade protection. I'm sure the scale purists will completely reject the idea, but I don't think it looks too bad, and it sure will save blades!

In spite of "off-set rudders and the latest modifications to the control systems, I still have three recent reports of Jet Rangers going into the tight right diving spiral at high speeds, with the pilot being unable to control the situation. I observed one of these, and am convinced there was nothing the pilot could do that he wasn't already doing . . . It certainly bears looking out for, and approaching that regime of flight with caution.

FINAL APPROACH

One last item to close this months issue; a fairly simple way to seal off the radio and servo compartment so that exhause oil cannot get through the push-rod holes. I built a small box with two cover plates and drilled holes in the plates for the push-rod wires to go through. By filling the box with plastic foam, the rods can slide sideways as well as fore and aft without permitting the oil to seep in. The cover plate can be removed easily and the plastic foam replaced when soaked, without disconnecting push rods! See drawing for details.

BCNU next month. ●

Tyro . . . . . . *Continued from page 11*

so they will bend equally in assembly. Pin and clamp the two sides together and sand the edges to bring them to identical shape. (Save the scrap pieces for use in the stabilizer). Separate, pin to the work board, and add the longerons, uprights, and 1/16 sheet doublers from the nose to the front of station 6. Note that the grain of the doublers is vertical, to provide more stiffness and split resistance to the fuselage. Titebond was used here. Clamp or weight the doublers well to get a good joint, and allow the sides to dry.

Be sure to make one left and one right side.

When the sides are dry, bevel the tail ends slightly as shown on the top view, and join at the tail and bulkhead 6. Five minute epoxy such as Hobbypoxy No. 4 will speed things up here. Be sure the fuselage is lined up at this time; it will be too late when the epoxy cures.

Give the epoxy 30 minutes to set, and install the remainder of the bulkheads. Bulkhead 5 is positioned to accommodate the servos to be used, leaving room for the servo mounts. The top and bottom 3/32 sheeting is now applied, grain crosswise. If the model is to be flown on rough fields, the bottom may be covered with 3/32 plywood instead of balsa from F6 to the noseblock to help withstand wear.

Make and install the nut blocks for the hatch retaining screws, using epoxy, and complete other details as shown on the plans. Now sand the entire fuselage, rounding all corners as depicted in the typical section view, but do not round the top from F-6 to the nose. The wing and the hatch will rest on this area.

The hatch is made by laminating hard 1/16 sheet crossgrain to the top of a piece of 1/4 sheet. When dry, cut to rough shape and drill 5/32 clearance holes for the nylon 6-32 hold down screws. Tack-glue the hatch in place, using the screws to hold it until dry. Glue the nose block to the fuselage nose but not to the hatch. Now shape both hatch and nose to a pleasing shape. Remove the hatch, add the 1/16 plywood pads at the screw holes and drill.

Continued on page 64

MODEL R/C HELICOPTER DATA CARD

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

Name: _____ Phone: _____

Address: _____ Age: ____

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

Type model or kit: _____

Areas where help is needed: _____

List special skills you might share: _____

Remarks: _____

TYRO . . . . . *Continued from page 63*

Build the engine pod as shown. A Cox Babee .049 was used in the original and provides adequate power. Locate the mounting holes in the firewall to suit the engine, being sure to mount the blind nuts on the back of the firewall before adding the upper fairing blocks. The blocks must be recessed to clear the blind nuts. The 3/16 balsa fairings on the pod strut are used to stiffen the strut; deletion may result in excessive engine vibration. Sand the fairing to shape, and put the pod assembly aside until later; its mounting location is determined when the glider is otherwise complete.

The fuselage is prepared for covering at this time. The original was covered with colored tissue, an easy and lightweight treatment. If color is not desired, or if it is to be painted, use Silkspan; it helps keep balsa from splitting. The fuselage should receive two coats of fuel-proof dope before covering, including the interior from the nose to F-6. Four coats of fuel-proof dope thinned 50-50 were applied after covering.

TAIL

The tail assembly is very simple. The stabilizer is built up using the 3/32 scrap sheet left from the fuselage sides. It is covered on both sides with 1/16 medium sheet, sanded, doped, and covered as was the fuselage. Do not cover the areas where the fin will be mounted, and where the stab contacts the fuselage. A little time could be saved making it from solid 3/16 sheet, but the solid stab will be somewhat heavier and not as stiff as the built-up, therefore the latter was selected for the prototype. The elevator is a single piece of 3/16x2 sheet sanded to a taper towards the trailing edge and rounded on the leading edge.

The fin is build up from 3/16 scrap and is tissue covered; the rudder is 3/16 sheet, treated like the elevator. Mount the fin to the stab, and when dry enough to handle, install the control surface hinges and the control surfaces. Be sure to use pins or pieces of round toothpicks to secure the hinges in all surfaces. Mount the entire empennage on the fuselage by glueing.

CONTROL SYSTEM

The push rod system on the prototype is Nyrod, but 1/4 square balsa push rods with wire ends will work as well. The rudder push rod emerges from the top of the fuselage about five inches forward of the fin spar. The elevator push rod exits the fuselage right side at a point about four inches forward of the stabilizer spar. The push rod system must be adjusted so that it works smoothly and with no binding.

FINAL ASSEMBLY AND BALANCING

Install the radio equipment with the battery and receiver well padded with foam rubber. Place the battery as far forward as possible. The switch will be best protected from engine exhaust if located on the left side of the fuselage . . . the bay between F-3 and F-4 is convenient.

Assemble the entire model, including the unfinished hatch. Now place the engine and pod unit (on its side) on the hatch; a rubber band will help keep it from falling off. Balance the model at the point shown on the plan by moving the engine unit as required. DO NOT ALLOW THE MODEL TO BE TAIL–HEAVY. Tail-heavy models are unstable, and there is no point in creating extra problems.

When balance is correct, mark the hatch for the pod strut location. Remove the hatch, cut a 1/8 wide slot clear through to accept the strut end, and epoxy the pod to the hatch. The assembly may now be fuel-proofed and painted as desired. That completes the airplane construction.

FINAL CHECKS AND TESTING

Check the wing carefully for warps, and eliminate them before flying. The prototype wing has deliberate washout (trailing edge up) of 1/8 inch at both

tips. This is achieved one panel at a time. Brush a coat of thinned (50-50) dope on both sides of one panel. As soon as the dope is dry to the touch, weight the panel down on a flat board with a 3/16 wedge under the trailing edge at the tip. Piles of magazines make good weights. Allow it to cure at least 24 hours; 48 is better. Inspect, and if correct, repeat on the other panel.

For test flying it is advisable to have an experienced RC flyer help test and trim. If none is available, use the following procedure:

Range test the radio system per manufacturer's instructions. With receiver and transmitter on, set control surfaces to neutral by adjusting the push rod clevises. Now find some benign terrain . . . soft sod and/or high grass, . . . Choose a time of zero or light wind, and hand glide the airplane. This requires a run and a straight, slightly nose down javelin launch.

When your knees have stopped shaking, analyze the test and make corrections to get a straight, nose-down glide. Make the adjustments at the clevises, one-half turn at a time. Do not allow any trace of a stalling tendency or turn as it will be exaggerated under power. When the glide is good, fire up the engine, test the control system, and if all is well, have your helper give the plane the same kind of launch. If it doesn't start to climb, give it just a touch of up . . . be careful, it's more sensitive under power.

Allow it to climb at about a 15 degree angle to about 75 feet, then put it into a shallow turn. Be sure to keep her upwind of your transmitter until you get familiar with her characteristics. When at a safe high altitude, set the transmitter trim levers so she will glide hands off. She's all yours. Have fun! ●

Sail . . . . . . *Continued from page 51*

But back to Figure 1. As previously mentioned in regard to jibs, the forestay needs to be maintained as taut as possible. This is to allow the jib to sit on the stay and "set" properly. In order to avoid bending the mast in a backwards arc as you tighten the backstay, the jenny stays are tightened, using turnbuckles which terminate at or near the spreaders. (See photo). Using a separate bow mounted forestay will give you jib shape as seen in the photo of JR 102. Hold a ruler up to the jib luff!!! And look at the wrinkles which have developed along the luff. This boat needed some firm treatment to whip it into shape, including an entire change of sails, removal of the forestay, addition of spreaders, and addition of lower shrouds and a backstay! Granted, all this rigging adds wind resistance, but if you haven't the ability to control the shape of your sails for maximum efficiency, you can kiss the silverware goodbye.

The upper and lower shrouds terminate at the deck in turnbuckles, while the backstay usually has a bowser adjustment for greater movement and allowing a fore and aft movement of the rig for balancing the hull/rig combination. The jibstay terminates in a rack as shown last month, or at a tang or eye on the mast near the jenny struts. (See photo). Provision is made for adjustment of both forestay and jib halyard to change mast rake. I prefer to cleat both to the mast, as I do not trust bowsers (especially the round ones) to carry forestay loads without slipping.

I will again say that the best way to learn about your rig is to set it up on the boat and experiment with it by sighting down the mast, or by looking up the mast with a mirror. If the mast cannot be stayed absolutely die straight, chuck it and make a new one. It should be straight before any rigging is put on it anyhow.

I use 3/32 OD brass tube for spreaders and jenny struts. The latter are pushed through the hole drilled in the mast and bent to the proper angle. The former are installed the same way, and installed the same way, and retained by soldering some drilled out tangs to prevent athwartships movement, as well as to provide points of attachment for jenny stay turnbuckles and lower shroud terminations. (See photos.) Make the holes a tight friction fit on the tubing, and after installation, flatten the tubing ends and drill holes for the rigging wire to fit through. (We use 30 pound test Steelon plastic covered leader wire for rigging. It is available in sporting goods shops in 25 foot rolls. Remember to also pick up the proper size swaging sleeves while you are there.) Every hole you put in a mast weakens it and makes it more prone to take up a shape other than a straight or smooth curve. Contrive to make your mast attachments as few and as far apart as possible. There

is nothing more disconcerting that to be out in front of the fleet, heading for the finish, and see your entire rig fall into the drink!!! It has happened to me!!

* * *

Our "Shape of Speed Gallery" shows a Monster 12 belonging to the fertile board of Chuck Black. This beast was 75 inches overall, and did such a number on the West Coast 12's and Santa Barbaras, that my spies tell me the M-12 was retired from active racing after several threats on the skipper's cradle! It now sails in the Central Texas area under new ownership. The point the picture makes is again the simple concept of parallel leaches on main and jib. Notice that even though the main twists off quite a bit, the jib leach follows it as one proceeds up the mast. Though it is risky to make suggestions on photographs alone, I would have possibly tried a little more tension on the main vang to slightly reduce the mainsail twist. On the other hand, if you're out front, don't get greedy and start fiddling with everything!!!

* * *

I recently heard a proposal made within the hallowed halls of AMYA that would have increased the penalty for committing a foul on the race course from 2 points to 3 points. The rationale was to make the penalty more severe and in so doing, encourage people to do a better job of learning the racing rules. When asked for my opinion, I hummed and hawed and finally came to the conclusion that the point assessment had nothing whatsoever to do with the actual goal . . . learning the racing rules better . . . I suggested that maybe a continuation of the racing rule discussion in AMYA's Quarterly Newsletter would help. But in addition, I think that we need a good, comprehensive reference that an individual skipper can study. Just reading the rules didn't seem to work for me. And since the rules themselves are not arranged in the order in which you are prone to meet the situations, it was hard to decide just which rules were important and which were only used sometime.

The answer lies in a beautiful book, INVITATION TO SAILBOAT RACING, written by the late Alan Brown and published by Simon and Schuster of New York. In Part I, he covers the layout of the course, start and finish lines, and the proper manner of sailing around the course. Part II explores the 6 Basic Rules and the maneuvering which occurs at the marks. Each page is text plus diagram, and the format is almost like the programmed learning text which many of us have encountered. The 6 Basic Rules cover 90 percent of the problems which you will encounter on the course, and are as follows:

1. The Opposite Tack Rule (NAYRU Rule 36)

2. The "Tacking Too Close" Rule (NAYRU Rule 36)
3. The Same Tack Rule (NAYRU Rule 37)
4. The "Buoy Room" Rule (NAYRU Rule 42.1)
5. The "Anti-Barging" Rule (NAYRU Rule 42.1 [e])
6. The "Over Starting Line Early" Rule (NAYRU Rule 44)

As you notice from the North American Yacht Racing Union (NAYRU) Rule numbers, the important ones are sprinkled all over the place, and some, such as No. 5, are sub-parts of other rules. Mr. Brown has done a beautiful job of providing us with the means to become knowledgeable skippers. He sets up a situation in words and a diagram, and then requires you to respond with an answer that demonstrates your grasp. After studying with him for a while you will find yourself seeing the same situations occur on your local lake. Now you are ready with the correct response for your vessel. I think any skipper without a copy of Brown's book is really lessening his chances on the race course, since he must not only be fast, but right, as tactical situations develop.

* * *

Since we first mentioned the prototype a few months ago, a number of new HUSON 36 models have been launched. At the MODEL MASTERS OPEN at Lake Fairfax, Virginia on Sept. 15, the boat's designer, Bill Huson, piloted his No. 125 to an effortless win, trailed by this author in a modified, flush-deck, bulk-keel version of the H36. Third place was taken by Bob Schumacher sailing a punkin seed looking LJ36, while fourth was taken by another Huson 36. As you can see in the photos, the little cockleshell really looks like an ocean racer. She carries two-channel radio and a Little Herc winch with ease, weighing out in the 10 pound area with a 50% ballast ratio and medium aspect sail plan. You will notice that the detailing which has been done to No. 125 in the way of handrails and port holes does quite a bit to enhance the appearance of the boat. Inquiries should be made to Leisure Products, 6920 Braddock, Annandale, Va. 22003.

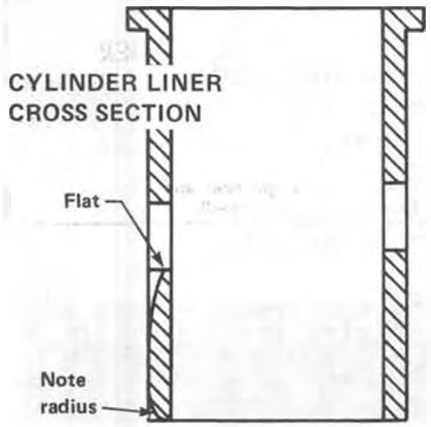
The interesting overhead shot taken of the winning boat will allow us to see a couple of points with regard to sail set. First and most obvious, is the amount of sag to be seen in the forestay. You can see how this sag has pushed extra cloth aft in the jib, making it very cambered, and opening up the slot about midway up the slot about midway up its leach. You can just see the foot at the clew starting forward toward the tack and it must be quite bellied after it passes out of our sight judging by the angle with which the foot is leaving the clew. The mainsail would benefit by having the mainsheet taken up to reduce the amount of twist which has developed in the sail. The amount of draft in the main foot could also be reduced by tensioning the outhaul, in order that the main would not be backwinded by the jib. The bottom batten is not quite parallel to the centerline of the boat, and I'm sure that she would point a good deal better if that was pulled in, as will happen when the mainsheet is shortened. Find a steep bank, set your boat up at the bottom of it and then climb up and squint down the mast, you will be surprised at what you see.

I'd like to thank the skippers who have taken the time to write to me. Their suggestions will be guiding my choice of subjects over the next few months. Your thoughts are solicited too, through MODEL BUILDER, or directly to: Rod Carr, 7607 Gresham St., Springfield, Va. 22151. ●

R/C Auto . . . *Continued from page 53*

The 1/8 dia. rounded tip carbide tool and a polishing wheel will be used. On the portion just below each intake port, the passage should be beveled inward at a rather shallow angle. Leave a slot of about 1/3 the liner thickness on the bottom of the intake port. The piston does not go down to the bottom of the intake port, so if the bevel goes all the way to the cylinder bore, the flow will

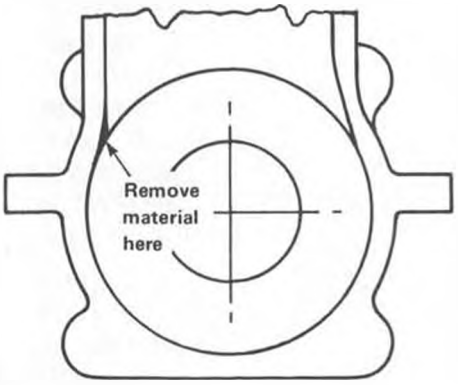
hit the side of the piston and have to go through another direction change, with some losses.



AFTER

At the bottom of the liner, where the liner is at the crankcase bypass region, the edge should be rounded. First slip the liner into the case, then, looking at the inside of the engine take a felt-tipped pen and mark the outer edges of the bypass path. Now round the edge between these marks. Be sure not to make the lower edge sharp, because it may actually reduce the flow. The polishing wheel can now be used to smooth out the liner regions that were trimmed.

Now back to the case . . . the silicone should be dry by now, or you could really do this first. At the point where the intake transfer passage and the case come together there is usually a step and some flashing.



CRANK CASE – REAR VIEW

Using the rounded tip on the carbide cutter, just barely take off the flashing and a little material to smooth out the step. The polishing wheel will take out some of the marks of cutter roughness.

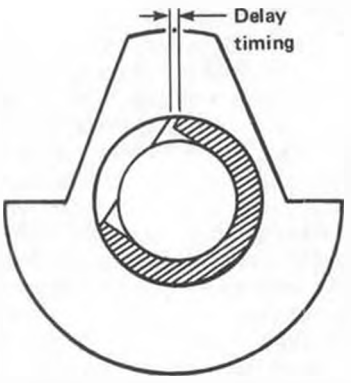
That's it for the semi-stock engine. Assemble the engine per the earlier instructions, making sure everything is clean. For this mild engine, I would recommend use of the low compression sport head. Also use 5%-15% nitro fuel with 25% castor oil. It seems that with mufflers, the best plug to use (with the low nitro), is the Fox long plugs. With higher nitro or more compression, other plugs will work with mufflers. I used this semi-stock engine throughout the '72 season and won the '72 Nats road race and the '72 Southern California Series. With the semi-stock engine a gear ratio of 4.25:1 to 4.5:1 works well. Fuel mileage is good, and is around 12 minutes for a 4 ounce fuel load.

SUPER STOCK

After you get where you can really drive a car with the semi-stock engine, you will find that you may want a little more "hole-shot" and top end. It's time to make a few more changes. You'll need additional tools; a drill press and fixture vise, and maybe epoxy.

The biggest difference is going to come from the use of a larger carburetor. I would recommend a Perry .45 carb, because the same mounting procedure could be used as with the 19 carb. The Perry .40 carb has the same internal dimensions, but the outlet tube has a larger O.D. Both require case modifications. Disassemble the engine completely and mount the engine so that it can be clamped in a fixture vise. Slip a 3/8 inch drill or ream into the case venturi opening, chuck in the drill press and clamp engine in the vise. This aligns the venturi with the drill press centerline. Switch to the appropriate drill or ream ("W" for the 45 carb and 7/16 inch for the 40 carb). Use a relatively slow drill rpm and drill or ream down to the shoulder on the inside of the case venturi bore. The new carb can now be mounted. If you have a 40 carb it should be epoxied in. Epoxi-Patch, by Hysol, works well here. Wipe some on the carb outlet tube O.D. and the case venturi bore I.D. Press together. Using more epoxy, build up a smooth layer around the lower part of the carb and the venturi boss. Wipe out any excess inside the carb bore and crank shaft bore. Don't forget you were supposed to taper ream the bottom of the carburetor bore. Let this cure for 24 hours.

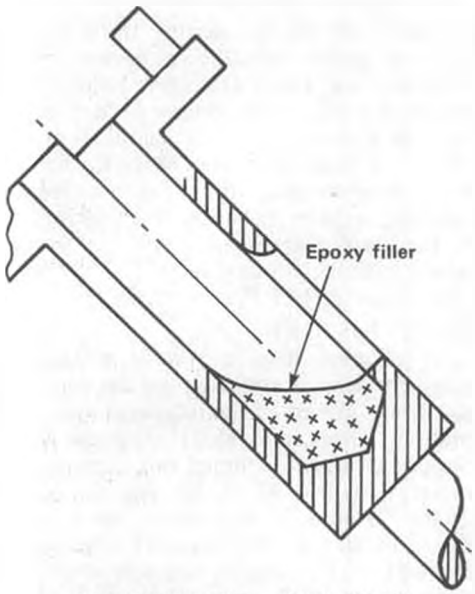
There are two changes which have to be made to the crank shaft, and a couple of optional things. First, the timing will be changed to delay the closing so that the engine can run faster (retard the timing). The cross section below shows what we're going to do:



CRANKSHAFT FRONT VIEW

With the Veco lapped piston I would only recommend changing the closing of the intake port, or the delay timing. Blue the crank on the delay side of the port. With a pair of calipers, scribe a line .020 inches to the delay side. Now take your Dremel and the small taper cone abrasive tip and grind out to the line. Round out the front and rear corners.

Now it's time to pack and smooth the front of the crank bore. Thoroughly clean the inside of the crank bore and mix up a batch of epoxy (the Hysol brand used on the carb works here too). Take a small wood stick or screw driver and pack the front of the crank bore as shown below:



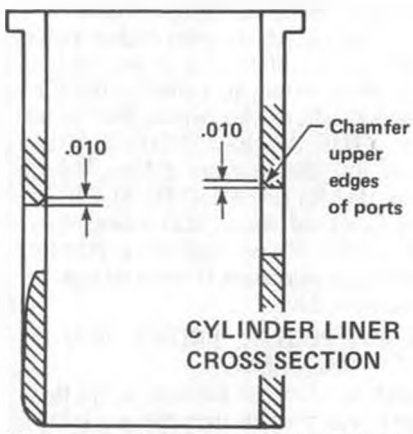
CRANK SHAFT – SIDE VIEW

After packing, clamp lightly in a vise at about a 45 degree angle so that the epoxy will settle in the desired fashion. Don't over pack. The epoxy has a rather coarse texture, but in a couple of minutes it smooths out and develops a surface glaze. Let it cure 24 hours.

The port timing could have been modified so that the closing was delayed up to .035 in. and advanced .010 to .015 in., but for the lapped steel piston, I don't think this gives you much. The crank transfer bore could also have been increased, but again I don't think this really helps.

Some very slight changes to the cylinder liner sleeve can be made to help the top end a little more. A small square stone is recommended, but a jeweler's file can be used if you are careful. The upper inside portions of both the intake and exhaust, and the sides of the exhaust ports can be chamfered or rounded a little. This will effectively raise the ports about .010 inches, and will also increase the exhaust flow area. The sketch at the right illustrates the work to be done.

After removing the required material, take a small pointed model knife blade and skin off any burrs by drawing the blade out as you go around the ports. Then take some fine crocus cloth and lightly sand the inside bore of the liner in the port region. If you intend running this engine for a while, it would be a good idea to get the liner chromed and the piston lapped to fit.



CYLINDER LINER CROSS SECTION

Now clean and assemble the engine. The only other change to make is to use the Veco high compression head. This head will boost bottom end torque and help on the top end too, with the port changes made. Again I would recommend that you use a maximum of about 20% nitro and 25% pure castor oil for lubrication.

I would like to thank Dick McCoy for reading this article and offering suggestions. In this way I'll (have to) keep honest. Besides, I can't think of a better proof reader.

Well, that takes care of the semi-stock and super-stock engines. Next month we'll cover the McCoy conversion of the Veco engine to really get the go power and speed. If you have questions, comments or want copies of this article (or any past ones), write to me c/o MODEL BUILDER, or c/o HRE Inc., P.O. Box 4658, Irvine, CA 92664. Don't forget that on engines, your throttle finger, and life . . . Easy Does It. ●

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

"Dapper Dan" Burnett, who worked on Lindbergh's original "Spirit of St. Louis." Dan and his crew are currently reconstructing a Curtiss "Jenny," and the workmanship is outstanding. Regardless of your particular interest, you are almost bound to find something in the museum to capture your attention.

THOUGHT FOR THE DAY

"Scale is in the eyes of the beholder."

TAUBEN GALORE

A series of 3-view drawings depicting Taube-type aircraft are now available from Richard M. Zasadney, 2664 Beck Street S.E., Warren, Ohio, 44484. Presently offered are: ALBATROS FT, BRISTOL-HALBERSTADT, D.F.W., ETRICH 1913 and AII, GOTHA, JATHO, JEANNIN, KONDOR, plus three types of RUMPLERS. Many people are unaware just how many varieties of these bird-like machines were manufactured, and Mr. Zasadney has rendered a great service in helping to sort them out in such an orderly manner. Many of these would serve as the basis for delightful models. The 3-views are priced at 40 cents each or 3 for $1.00 in 1/72 scale, but are also offered in 1/2" - 1' size, at $1.50 each.

THE TINY TWIN PUSHER

Shown in one of this month's photos, the miniature metal model was constructed by the late Christy Magrath, who in Bill Winter's opinion, may have been one of the finest scale model builders who ever lived. This particular example of Christy's work belongs to Ed Lockhart, of Lakeside, California. Spanning about 3 inches, the model is fabricated primarily from stainless steel, except for the free-wheeling propellers, which are wood. Even the twisted strands of "rubber" are made from metal, but treated in a manner to render them very realistic in effect. The pedestal is polished wood and features an engraved dedication plate. Both Magrath and Lockhart have models in the Smithsonian collection, which may be the crowning accolade for any scale modeler.

BIGGE DOES IT AGAIN

Well-known indoor model specialist, Bill Bigge, has succeeded in recapturing the world's record for the number of kites flown on a single line. According to "THE WINDY NOTICE" for October, 1974, Bill lofted a total of 261 kites, in the presence of seven witnesses. Tiny, transparent sled-type kites were utilized, to best the former record of 204 on one line, held by Goro Kudo of Japan. Not content to rest on his laurels, Bill already has his sights set on even higher goals: "Given good conditions, it would take about three hours to launch 1,000" he stated. Readers who would like to receive "THE WINDY NOTICE," can obtain full details from Editor Valerie Govig, MARYLAND KITE SOCIETY, 7106 Camfield Road, Baltimore, Maryland 21207. Please include a stamped envelope, as everyone is short of postage funds these days.

FRENCH POSTAL PROXY PEANUT POSES PROBLEMS

And speaking of postage, a monkey-wrench was thrown into the works by a strike of the French Postal people, preventing two of the planned U.S. entries from participating. Walt Mooney's early entry, the Renard from MODEL BUILDER for September/October, appears to have missed the embargo and may have arrived in time. Thus, American colors may be upheld, even if the model is of foreign origin! Until the strike is settled, we will be as nervous as a counterfeit krone collector, awaiting results, but watch this column for details as soon as they become available. Meanwhile, we have heard from Milan Kacha, of Czechoslovakia, that Peanuts are catching on in that country. Perhaps this is the year that Peanuts will eat the world, rather than vice versa! *(He's also entered our P.P.P.P.P. contest. wcn)*

COMET HISTORY

A clipping from a WW II vintage magazine was recently sent to the Hangar, which presented the following information: The Comet Model Airplane & Supply Company shipped out approximately 10,000,000 model sets during 1940. (Wonder if that many are produced by all the companies put together these days?) Founded by two high school boys during 1929 on a capitalization of $5.00, the Comet company employed several hundred people in a 70,000 square foot Chicago factory by 1940. At the time, the firm claimed production of 90% of all U.S. model aircraft propellers.

ELECTRIC WINDERS, ANYONE?

Djau Carter, of Vienna, Virginia, has developed a novel winder for small rubber-powered models, which eliminates the need for a helper. Often, lone flyers resort to some sort of "stooge" for holding the model during the winding process, but Djau's approach involves a geared electric winder, which is held in one hand while the model is held in the other. A flashlight case forms the handle and battery holder, and the device is designed to stall as the rubber motor approaches full turns, thus protecting against over-winding. If readers are interested in more complete details, perhaps you will drop us a note, and we'll ask Mr. Carter to do a construction article.

PEANUT PROXY REMINDER

Requests for entry blanks are pouring into the MODEL BUILDER offices, and we hope many of you will get in on the action. Farthest-away inquiry received is from Australia, showing the

widespread interest being aroused. Remember, there is no entry fee, other than postage required, but time is growing short! We would like to see a truly international representation in this premier event.

SILLY SIGN-OFF DEPARTMENT

The old master himself, Frank Zaic, posed this question . . . which we were at a loss to answer: "How many Peanuts does a Peanut model weigh?" ●

F/F Scale . . . *Continued from page 35*

they will go over, and nitrate dope isn't one of them! Instead of a smooth, glass-like finish, I had a cobble-stone effect. Instead of using a polyester resin, one can use an epoxy resin, such as Hobbypoxy. This will go over nitrate dope with no problem at all.

One other advantage to silkspan is that it comes in longer lengths than tissue, and some fuselages just don't lend themselves to a splice along their sides . . . And with the scarcity of Japanese tissue, silkspan may become more popular than ever.

Silk is by far, in my opinion, the best and only way to cover larger gas powered scale models, particularly if the prototype was fabric covered. Silk is very easy to apply but . . . that's it! To get the weave to hold dope is another story. It takes the patience of a night stalker to dope silk without getting large lumps of dope on the underside of the fabric. These lumps are magnified ten-fold when the model is painted. To make matters even worse, silk is very costly. So why even consider it?

Well, as mentioned earlier, silk gives a model the look of the real machine, and in this day and age of the iron-on super-glossies, that's saying something!

I have heard of all kinds of ways to help seal the open weave of silk; from spray starch to Knox gelatin, and even milk!

There are better ways. One is to cover the model with tissue first. Some of you may feel that this is too heavy or too much work for just an effect. I've yet to see an excellent scale model that didn't take a great deal of time and perseverance. As far as increased weight is concerned, there really isn't any. By covering with tissue first, there aren't nearly as many coats of dope required to obtain a good finish.

The following procedure is the one I use and prefer: I cover the entire model with tissue, including the sheeted areas. Depending on the size of the model, I will give the tissue two or three coats of clear nitrate. One definite factor is that the tissue must not have any wrinkles, or even as much as a brush hair, lest you want to see them in your final finish. If you find a wrinkle, cut it out and recover that section, and re-dope.

Before applying the silk, it is best to iron it wrinkle free. Cut a piece just large enough to do the job. Wet it thoroughly and place it between a couple of towels to remove any excess water. Put it in place and pull only enough in all directions to get it smooth, removing any air-bubbles. Whatever you do, do *not* pull it taut! The normal shrinkage of the silk will take care of that. Use lacquer thinner to adhere the silk to the tissue, only around the edges, in the conventional manner. Follow this up with a couple of coats of dope around these same edges.

It isn't necessary to cover the sheeted portions of the fuselage with silk, since these are to simulate metal panels. Once the silk has dried, brush a thinned coat of dope over the silk. You will be happy to see that there are no pores staring you in the face. I experimented with a test panel on which I brushed a single coat of dope, two coats, and three coats, on different sections. When dry, I sprayed a color coat over the entire panel. Amazingly, the area with a single coat of clear dope looked pretty darn good, although three coats naturally looked better. If you really want a super finish, spray the second and third coats of clear, sanding ever so lightly between coats. You are now ready to apply your favorite finish.

I might add that if you continue to apply dope to the silk, you will add unwanted weight, in addition, you may cover up the weave, which is the reason for using silk in the first place. The tissue/silk combination gives a great deal of strength, and it is almost puncture free. Incidently, check on military surplus stores for old silk parachutes used for dropping flares or whatever. Tell the proprietor that you will even settle for ones that have a few holes in them. The price should be considerably less than in a yard goods store, and you will have a near life-time supply.

I'm not much for the iron-on type of coverings for scale models, but every once in a while, the paintable type can be used to advantage. One example is using it over the sheeted areas of a fuselage that are to simulate metal panels When painted, they will have a much higher gloss than the fabric, which is the effect that is wanted.

* * *

Bob Peck, of Peck-Polymers, continues to add new kits to his line of outstanding Peanuts, along with many new accessories, including one called P-P tissue (?). His two latest two kits have already been mentioned in "Over the Counter," but until recently, I hadn't had a chance to see them first hand. They are truly outstanding kits. I'm not all that enthralled with WW II aircraft (although I do have a few favorites), but after seeing the Japanese Zero, in

particular, I had to build it. The materials furnished are really first rate. Bob is now including 1/20 square strip wood, which is ideal for Peanuts. He is also handling Lee's Hobbies' flying scale Peanuts aircraft of World War I. His seven page, 1975 catalog is a delight to see, especially for the "Peanutphile."

Any comments and/or suggested topics you want to see covered will be greatly appreciated. Just drop me a line and I will try to do the best I can. Fernando Ramos, 19361 South Mesa Drive, Villa Park, Calif. 92667, or care of MODEL BUILDER. ●

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

fabricating that propeller. Once you try it you'll be hooked.

"Over the years, the Wakefield specifications have been made more and more stringent until we have a set of rules at present that appear to have stabilized. With only 40 grams of rubber in a 230 gram total weight model, it takes a lot of work, thought, and ability to produce a model which can be flown over 3 minutes, 3 out of every 4 flights. If you can maintain this average . . . 3 out of 4 . . . on all occasions, you are doing pretty well. The 40 gram Wake is a nice compromise; there is still sufficient power available to tempt the gadgeteers into devices to control the initial burst, and yet there is not so much power that one cannot strike a good trim without such gadgets. On reasonable rubber, the Wakefield can be consistently climbed to well over the height of an A/2 Nordic and, from that height, can often be made to glide nearly as well as the best A/2's.

"Wakefield is a class for the loner. It relies on nobody but the individual himself. True, it is sometimes necessary to enlist the aid of a helper to hold while winding, but with only a little bit of thought, one can devise a self-winding rig to render oneself completely independent of outside assistance. It is quiet, clean and inexpensive to fly . . . it offers great opportunity for the 'gamesman' to indulge in tactical flying in contests. The only real problem with Wakefield is that more people don't fly it.

"A few conclusions come out of my various experiences with Wakefields. No doubt many experts will disagree with the below, but they are what I now use for my guidelines:

1. Don't build a model of over 55 inch wingspan. Chord sizes below about 4-3/4 inches are very inefficient at Wakefield glide speeds, and big models don't reap the theoretical improvement in glide performance.

2. Build the model as long (in tail moment) as you can before it exhibits pitch instability in turbulence . . . the lighter you can build in the rear (keeping strong) the longer you can build it. A 30 inch tail moment seems to be the practical limit.

3. Build the nose as short as possible. If you could manage it, 7 inches would be great. To do this requires a very heavy prop assembly and/or blades, and with such a long model having such a heavy nose, the use of a D/T timer isn't practical due to the weight it adds.

4. Build a 2-piece wing and 2-piece fuselage. Very convenient and very resistant to breakage at wing root and tailboom joint.

5. Fly the model right/right by using an auto rudder that comes in when the prop folds. Use slight right tail tilt, about 1/16 inch washin on the right inner wing panel, straight rudder for power, and right rudder for glide, about 5 degrees downthrust . . . measured from the wing zero incidence line . . . and right thrust to taste (4 degrees or so).

6. It doesn't matter what *sort* of prop you use as long as it is:
   a. thin in blade section.
   b. made of very hard wood.
   c. identical along both blades in pitch and mass balance.
   d. finished with a high-gloss surface.
   e. pitched to give about 35 seconds motor run with "good" rubber.

7. Set the wing at zero or slightly negative with respect to the fuselage center line . . . Put the wing on a 1-1/2 inch or so pylon. Set the tail at about minus 3 degrees to the fuselage center line. With this layout:
   a. The fuselage flies straight into the airflow during the burst when the wing is operating at about -1 degree, thus causing minimum fuselage drag in this high speed portion of the flight.
   b. During glide, the wing is raised sufficiently above the tail to cause the wing wake to flow above the tail for all angles of attack; from immediately after the initial burst, to normal minimum sink angles of attack.

8. Give the wing about 5 inches dihedral at the tip and fiddle with the fin size to reach an optimum balance for power control and consistency, and a reliable, consistent glide turn.

9. Use a constant tail size (depending on moment arm) and fiddle with tail, thickness and camber until a good compromise is reached in pitch control during climb and glide.

10. Cover the wing with lightweight modelspan and try for a good surface finish. Cover tail with Superfine tissue and keep the tail weight under 1/4 ounce (6 grams should be the target), if at all possible.

11. Store the model in a container that imposes no twisting loads on the flying surfaces and keep the light off it. Tissue fades and becomes too brittle if the model is stored in the light. If you have space and inclination, keep the wings

and tails on "warp" boards set to have exactly the desired warps built in."

Lagan's article will be continued in the February issue.

LAST SECTION

Corrections: In the September/October issue of MB, I included a picture, taken by M.A.N.'s F/F correspondent, Dave Linstrum. I also enclosed with it the caption that Dave provided. Unfortunately, as has been brought to my attention several times so far, it was miscaptioned. The fellow with the Rebel decorated Centaur is not O. C. Stewart, as captioned, but "Buckets" Johnson. Sorry O. C., sorry Buckets, sorry Dave.

* * *

Regarding the taking of pictures, I have written a brief treatise on the subject and decided that it is apropos for printing. Bill may disagree in which case he will not print it. *(Printed, but with noted comments. wcn)*

Every modeler owns some sort of camera . . . or so it seems. And when contest time rolls around, some free flighters take their cameras with them. Some of these some take their cameras from their cars to the flight area. A few of these some actually pick up their cameras and take pictures. One or two of these few take pictures which could be used in publications such as MODEL BUILDER (there are others?), except that:

1. The pictures are taken from too far away and the subjects are unrecognizeable in such sub-miniature form, or

2. The background is so cluttered that the subjects are indistinguishable the cars, trees, brush or other what-have-you, or

3. The pictures show the backs of the contestants, or *(Their faces are shadowed so much that they look like silhouettes, wcn)*

4. The pictures are taken in color, or Polaroid and so the magazines cannot reproduce them.

(Surprising how many send in color photos, expecting them to be printed in black and white. When absolutely necessary, due to subject value, we'll print them . . . but the quality is almost always poor . . . very dark, not much contrast, etc.

The idea that (black and white) Polaroid photos are unacceptable is an old wive's tale (whatever that means!) Probably it comes from the fact that in its early days, Polaroid was only used by the rankest of amateurs, and consequently the picture quality was consistently poor. This same rank amateur would get lousy pictures with any camera, from Hasselblad to Nikon.

We use a 4x5 Graflex with a Polaroid back for many last minute photos printed in MB, and we've received many equally good Polaroids from other sources. If the quality and subject matter is good, it doesn't matter what type of camera . . . or film . . . or printing paper, is used, wcn)

This syndrome I have taken the liberty of naming "Stalick's photographic law of diminishing returns." And, since we are a technical society, I have reduced this law to a formula which is expressed in mathematical terms:

$$N = 100/FF\ (X/F) \div K(D/f5.6) + P$$

Where: 100 equals the percent of available cameras

FF equals the number of free flighters

X equals the number of free flighters who go to contests

F equals the number of free flighters who go to contests who take cameras from cars and take pictures

K equals Kodak (for obvious reasons)

D equals distance at which pictures are taken

F 5.6 equals lens aperature

P equals cost of stamp to send pictures to magazine.

Get the picture? If you do, send them in. Fame and fortune await you . . . I do request that you caption them correctly.

More next month . . . if all of us can stand it. ●

Tugboat . . . . *Continued from page 19*

fitted and epoxied, do not glue to Cabin but rather, leave this as a removable section.

25. The Cupola is made in a boxlike manner from 1/16 and 3/32 plywood. Epoxy Cupola to Cabin Roof, allowing just enough clearance to install and remove the Pilot House.

26. With Epoxolite, fill the bottom edges of the Cupola to the outer edges of the Cabin Roof to give a beveled appearance, and sand smooth.

27. Cut the Stack from 1/16 plywood and, with the grain running vertically, epoxy to a 3/4 x 2-1/8 x 4-3/16 inch piece of spruce. Immerse this unit in warm water for about five minutes and complete forming the stack, using nails. Carefully cut the Stack Top from

3/32 plywood and sand symmetrically to fit snug in stack. (Make two inserts if desired, one top and one bottom.)

28. Cut eight pairs of Cabin Doors from 1/32 plywood (cut eight pieces at one time for uniformity) and laminate. Insert 1/16 x 1/8 long wood dowels in the dowels in the slots and cement. Sand the door lightly to remove all corners.

29. The Grating is made from 1/32 or 1/16 x 1/8 spruce strips as shown on the drawing.

30. Details:

Bell-Kemtron #390 or Walthers #X-12 ("O" gage train bell)

Tires - 1/25 scale truck kits

Life Preserver - 1/25 truck tire cut down the middle and wrapped with 1/4 inch masking tape.

Portholes - 1/2 inch brass tubing cut into 1/8 to 3/16 inch in length

Front Bumper - heavy terry cloth soaked in dark stain

Rope - corded string soaked in medium and dark stain

Cabin Roof Failing - 1/16 O.D. Brass tubing uprights are drilled for 1/32 diameter brass wire over which lengths of 1/16 O.D. brass tubing are slipped for horizontal separators, then soldered.

Cabin Hand Rails - 1/16 brass wire or tubing.

Horn and Searchlight - purchased or fabricated

31. It is suggested not to go to extreme on sanding and painting for ultra finish. Finsih with a touch of roughness to give tug a little character. Use of the tug will add weathering which will enhance the general appearance of the model.

32. The drive can range from one Dumas Pittman motor to two motors and geared from 1-1/2 to 1 to 4-1/2 to 1, depending on the purpose of the tug. A 1-1/2 to 1 would be for normal running and 4-1/2 to 1 for pulling barges, etc. The motors should be powered with two "YUSA" #6N11A-4D wet cell motorcycle batteries. Use Dumas running gear, or small industrial gears.

33. Bow Thrusters may be installed by using a Ford window washer repair kit ("Trico" #AWE-1, 12 V.).

34. Make the Rudder Post from 5/32 O.D. brass tubing and solder a 1/8 inch square brass tube inside. This will fit over a 3/32 inch square brass tube which has been soldered to the Rudder. By lifting the Rudder Post, easy removal of the Rudder can be made for propeller changes. ●

Beach's . . . . . *Continued from page 27*

to press on with a 36 inch span, all sheet version. When this was finished, I selected the right size motor by the time honoured method of throwing it across the sitting room while making engine noises. After making all the noises from a Bambi to a McCoy 60, I decided an E.D. .46 cc Baby would be just right.

"Flight tests proved what I suspected, it *really* flies. After a few trimming hops, the second flight was a five minute thermal flight. As shown on the plans, it should fly just about straight off the board and must be one of the simplest models that has a real performance. If you want to savour all the thrills of early aviation, just get a few sheets of balsa, spare a few hours from the Telly, put your cap on backwards, and throw your "Flyer" skywards.

"Construction: Edge-glue two sheets of 36 x 3 x 1/8 balsa together for the bottom wing, and repeat for the top wing. Lay the bottom wing down, score and crack upwards at the dihedral joints, put temporary blocks under the wing tips to hold the dihedral angles and glue the bottom spruce spars over the joints. Don't attempt to bend the tips of the spars together yet. Glue on the 1/8 inch wing spacers. Make the dihedral angle in the top wing by scoring and cementing, then glue to tops of wing spacers. When this is dry and *not* before, bend the tips of the bottom spars together and bind with thread. Glue top spars to top wing joints and let dry thoroughly. Make sure the bottom wing is fastened down securely to the building board, then flex the tip of the bottom spars up and put a temporary 1 inch block under the tip. Now bend the top spars down and glue and bind securely to bottom spars with thread. This is rather important, as it sets all the incidence correctly, and if you neglect it, it just won't fly.

"Make the front stabilizer from 1/8 inch sheet and glue it at the correct dihedral angle. Make and glue in place on top of bottom spars a thin ply platform so the stabilizer can be retained with rubber bands. This will save a lot of damage as the stab is rather vulnerable. Glue motor mounts on the bottom wing to suit motor and glue in the between-wing braces to sides of motor mounts and top wing. Run over all the joints with cement and glue strips of cement-soaked 1 inch bandage over all dihedral joints. Clear dope and fuel proof as necessary.

"Trimming: All angles and incidences should be right and to get a good glide, all that should be necessary is to add weight to the forward tip until the ship balances between 5 and 6 inches forward from the leading edge of the bottom wing. There is a fair latitude in the CG position, but don't make the mistake of taking off front stabilizer incidence and moving the CG back . . . it won't work!

"When the glide seems all right, try a short power flight and watch for any turns that seem to be tightening up. This is the one point that is a little tricky and needs watching. If this does develop, cut a slit in the lower right wing tip, viewed from behind, so that you have an aileron about 1 x 4 inches. Bend this up or down to correct the turn. It only needs a little movement and this seems to be the best method for trimming turn direction on my model.

"I would suggest that you don't overpower this design, as it seems to be an essentially slow flying layout with a surprisingly good glide. Treat it more as a powered glider. Put your name and address on it and be prepared for some cross country running." ●

R/C Soaring . . *Continued from page 22*

excess of 500 miles were recorded by Ka 6's.

The Schleicher K 8B is another design by Rudolf Kaiser, and was developed

from the Ka 6. Whereas the Ka 6 featured such sophisticated construction as a monocoque, plywood fuselage and a laminar-flow, all wooden wing, the K 8B was planned with simplified structure suitable for the amateur builder. The prototype K 8B first reached for Teutonic blue in November 1957. Within fifteen years, production quantities had passed well beyond the 1,000th unit, and deliveries continued into the mid 1970's.

The Schleicher K 8B was developed primarily for club use . . . to provide a simple and robust aircraft with good flight characteristics. The design emphasized rugged construction, good climb ability in thermals, and docile handling characteristics. Millions of flights by thousands of pilots over almost two decades have verified the success of these original design goals. In 1968, Karl Striedieck of the U.S. made a 476.6 mile Out-and-Return flight . . . more than 950 miles total distance . . . for the world O & R record. It stood for only 10 months, but it took an all-up competition machine of modern design to top the Striedieck K 8B performance.

The Schleicher sales propaganda sheets define the K 8B as a utility and performance single seater that has proven itself in years of hard use. The PR department claims that the machine is especially suited for areas with weak soaring conditions . . . that good flight characteristics and respectable performance make it the ideal club ship. Low maintenance is promised due to its "straight forward" design utilizing a welded steel fuselage.

The fuselage is of conventional, welded steel-tube construction with spruce longerons providing classic lines. The extreme forward nose is a fiberglass shell, but the balance of the structure is fabric covered. An aero tow hook is located just forward of the landing skid, and auto or winch tow is accommodated by a CG positioned hook. The blown plexiglass canopy and adjacent cockpit cover panels are hinged on the side for access and egress.

The cantilever wing is of single spar construction with plywood D-tube leading edge, and is fabric covered. Schempp Hirth upper and lower terminal velocity dive brakes are fitted. A vertical dive, with spoilers open, will not exceed maximum allowable red-line speed.

The wing section is the 16.7% thick Goettingen 533 from root to aileron, changing from aileron to the wingtip into Goettingen 532. The ailerons are plywood-covered, top-hinged, pushrod actuated. Travel, measured at the trailing edge, is -30° (up) and +12° (down,) giving good differential for easy coordination and minimum adverse yaw. Dihedral angle is 3°.

The symmetrical section is cantilever type with single-spar, plywood-covered fin and horizontal stabilizer. Rudder and elevators are plywood torsion tube structures, fabric covered. The elevator incorporates a trim tab. Push rods are utilized for elevator actuation. Elevator travel is ± 20°. Stabilizer incidence setting is -2½° with reference to lower surface of wing at the root. Rudder travel is 60° total, actuated by cables from adjustable rudder pedals.

The landing gear consists of a noseskid mounted on rubber blocks, and a non-retractable, unsprung monowheel, 4.00x4. A steel tailskid protects the aft fuselage.

Dimensions and Areas:	
Span	49' 2-1/2"
Area	152.3 sq ft
Aspect Ratio	15.9
Wing Chord (Root)	4' 3"
Wing Chord (Tip)	1' 7-1/2"
Length	23' 0"
Area, Tailplane	20.5 sq ft
Weights and Loadings:	
Empty	420 lbs
Useful load	265 lbs
Maximum Gross	685 lbs
Wing Loading	
Gross	4.5 lbs
190 lb load	4.0 lbs
Performance:	
Speed, Min Sink	37.5 mph
Best Glide Ratio	45.5 mph
Stalling	34.0 mph
Max (Smooth Air)	124.0 mph
(Rough Air)	81.0 mph
Max aerotow	81.0 mph
winch	62.0 mph
Minimum Sink Rate	2.13.ft/sec
Glide Ratio	27

The Schleicher K 8B is an ideal subject for a scale R/C sailplane. (A couple of German model manufacturers offer semi-scale kits.) Typically, the fuselage will seem oversize . . . wide and deep . . . compared to functional models, but the significant dimensions are well within model aerodynamic requirements. The structural possibilities offered by the contours of the K 8B make a 1/6th (2" = 1'-0") size model a light weight feasibility, but the larger 1/5th scale (2.4" = 1'-0") will provide greater overall performance. Comparative dimensions for each size are as follows:

		1/6 Scale
Span		8'-2.4"
Length		3'-10"
Wing Area		4.2 sq ft
Weight, @	8 oz/ft	2 lbs, 2 oz
	10 oz/ft	2 lbs, 10 oz
	12 oz/ft	3 lbs, 2 oz
		1/5 Scale
Span		9'-10.1"
Length		4'-7.2"
Wing Area		6.1 sq ft
Weight, @	8 oz/ft	3 lbs, 1 oz
	10 oz/ft	3 lbs, 13 oz
	12 oz/ft	4 lbs, 9 oz

Basic, built-up model construction techniques will simulate the structure of the full-scale K 8B very closely. An inverted crutch . . . corresponding to the upper shoulder longeron positions . . . would be a practical approach to the fuselage. Appropriate bulkheads could be mounted inverted on the crutch, and stringers and keel attached before removing the basic assembly from the building board. Wing root mounts and stabilizer and fin attachments would then be added to the top of the crutch. A fairing block here, a skid or canopy there, mount the wheel, add the skid . . . and start on the wing.

Flying surface construction is obvious. Rudolf Kaiser must have had today's R/C scale modeler in mind when

he designed the K 8B. Even the D-tube leading edge structure follows typical model techniques . . . And there's plenty of room through the scale canopy-hatch for access to internal mounted equipment.

The Schleicher K 8B offers real performance as an R/C model . . . lots of personality . . . and a reasonable scratch building project. Future scale competitions could well be paced by the flight capability and static point potential of classics such as the K 8B and its contemporaries. ●

Plug Sparks . . *Continued from page 49*

cently remade contact with modellers of the '36-39 period. Present address is 20 Cambridge Avenue, Craighall Park, Johannesburg, South Africa.

"Dennis Fairlie is still actively modelling; took part in our Aeromodeller all-scale event at Old Warden on June 16th. He is a top class illustrator for industry, still working on a consulting basis for General Motors (UK), and contributed many fine sketches to those early issues of Aeromodeller.

"Hope this is of interest to you and possibly model builder readers . . . it is nice to see these reflections on the past, and to realise how successful so many of the pioneers have been in their subsequent commercial careers. Modelling plays a considerable part in the development of character and certainly brings its rewards."

Yours sincerely,
R. G. Moulton

From Al Courtial:

"Presently, I live in Slidell, La., (a short distance from Lake Charles!) and am employed by Bell Aerospace (a Textron Co.). Our product line is surface-effect ships and amphibians. Been in field at Bell since 1960.

"The 36 Nationals Picture surely produced fond memories of boyhood model competition days. That was my last year of competition. Since then my life briefly has been as follows:

1936-39—University of Illinois and Parks Air College

1940—Lockheed, Burbank, Engineering department

1941—Curtiss Wright, St. Louis, Mo.

1941-46—Pilot and Commanding Officer in RCAF and U.S. Army Air Corps, B-29 Aircraft Commander (Tinian) during Japan Air Offensive

1946-50—McDonnell Aircraft, Engineering department and test pilot of B-29 for XF85 (parasite fighter) program.

1950-1964—Bell Aircraft, Buffalo, Chief of Flight Test and graduated from the Naval Test Pilot School at Patuxent River, Ind.

1964-67—Electric Boat, Groton, Ct., Designed and built Skip I, an ACV, (Air-Cushion Vehicle).

1967-present—Back at Bell, on ACV's. Technical Director for Army SK5's, designed ACV Voyager being produced by Bell Canada for Arctic Logistics. Now in New Orleans on the 2000 ton surface-effect ship.

"Recently got the RC bug and have Sig's Clipped Wing Piper Cub just about completed. Will send you a picture before I bust it up. As a pilot with thousands of hours, I appreciate the problem of orientation with the black box when the model is head on."

In many respects, as the winner of the identification contest, Jim Adams, said, this was a lot of fun. One of these days, we'll do it again. All we have to do is find another good photo with a collection of characters clearly shown. Anybody got one out there?

SECOND NOTICE

Although this column did carry the announcement that Tim Banaszak would sponsor a Compressed Air Event at the National Model Airplane Championships in 1975, Tim feels that maybe not enough fellows are aware how he is going to run the event.

The event will be run after five o'clock, when the breezes die down and the weather gets lovely. The exact evening has not been selected, but it does appear, the event will be stretched over several nights.

Now there is no reason why a showing can't be made, especially in view of the fact that the old master, Bert Pond, is still producing his famous "Hoosier Whirlwind." Prices are much more reasonable than comparable gas engines. His address was given previously, so go gettum Tiger!

OLD PLANS (OR ANOTHER SAD STORY)

Probably one of the most interesting things about collecting old plans is the amount of detective work involved. There is a great deal of satisfaction in running down a particularly rare plan. The following report from Don Assel could make one cry, but it has happened countless times.

Don became interested in the whereabouts of the 80 inch Rearwin Speedster put out by Kansas City Model Airplane Supply. Knowing that Bryan Wheeler was closely connected with "Pop" Schreiber, then the proprietor, it was a natural (and easy) to contact Bryan in this regard. Don received a letter back stating that Marvin Mayo (one of the K.C. Group) had received a call to look over all the old stuff (mostly Jimmy Allen) stored in an old warehouse. Wouldn't you know it? Marv arrived a day late. All the stuff had been taken to the dump, including many recordings of the old Jimmy Allen radio series. A quick investigation of the dumps revealed how efficient those bulldozers could be. Everything was completely buried! No way to tell where the stuff was. Well, that is this month's sad story!

OLD TIMER SAM CHAMPIONSHIPS

The writer has been remiss in not explaining the present setup of the SAM Champs. They are held on a rotating site basis, very similar to what AMA used to do when the Navy was sponsor. The writer has been asked innumerable times what the schedule is, so pay attention, here is the order:

1. East Coast (probably Lakehurst)
2. Denver (East Colfax Airport)
3. Midwest (Bong AFB)
4. West Coast (Taft, what else?)

In 1975 the Denver Model Museum Club will host the meet. The East Colfax Airport (on Hwy. 40) is presently

uncertain, but rest assured, there are some beautiful wide open green fields to fly from. Announcements of the meet will probably be forthcoming early in 1975, hopefully, February.

CONTESTS

Despite all pre-contest grumblings, the San Diego Orbiteer's meet was run under SAM rules (finally!), and was a real pleasure to attend. Held at Lake Elsinore, the day featured an overcast that contained some unexpected thermals.

Jim Robinson, from Ohio, visiting the West Coast, had the foresight to put several models in the car. Certainly did pay off, as Jim walked (literally!) off with the .020 Event. His comments about California being the place to fly in the late fall makes one realize how lucky we are to live in California.

Hugo Lung was the big winner this time, garnering firsts in Class A and Class C. Of course, old trophy hound, Larry Boyer, took three home, with a first and two thirds.

Couple of models dropped in the lake, while the writer could only claim foul when his Dallaire R/C got shot down after 25 minutes in the R/C Texaco Event. Maybe it was the "Red Baron" as R.G. Brickner, editor of the SCIF "Flight Plug" slyly suggests.

MASSACHUSSETS OLD TIMER R/C CHAMPS

Received an excellent report from George Parker of Lee, Mass. on the O/T R/C Championships. George did such a good job on the writeup, that this writer is quoting practically verbatim:

"In spite of some dire predictions on the part of the New England weatherman, the Massachusetts Old Timer RC Championships were held on September 29th at Pittsfield's Brattlebrook Park. The weather before the contest was terrible (New England liquid sunshine) but somebody up there must like us old timers; the sun came out and there was blue sky, when the contest began on Sunday morning. Fortunately, the rain held off until 3 P.M., after most of the flying had been completed. Lift conditions were rather poor, with only bubbles of lift here and there, but there was enough to allow some very good flights to be put in, including one perfect flight, a 10 minute max by Ted Patrolia with his Sailplane.

Al Schwankert flew his Sailplane to a near-perfect flight, only one second over. That Al Schwankert is really a relaxed flyer . . . he put in his flight while stretched out in a lawn chair! We all thought he was taking a nap!

"Some excellent flying was also put in by Cliff Schaible. He was a study in concentration as he flew his Playboy Sr. to first place in Class C. Jim Clark put his Cadet through some wild gyrations, including full power loops, in the process of winning Class A. Jim sure builds strong wings!

"Howard Carman took first place in Antique with his Powerhouse, pulled aloft very smartly by a Fox Eagle 60. A beautiful ship in flight, and some good flying by Howard.

"SAM Prez Joe Beshar had some transmitter problems on his way to third place in Class B. At one point he felt it necessary to warn the ladies that he might have to remove his shirt to get better transmitter output! he didn't . . . guess he was afraid to chance it!

"Woody Woodman took second in Class D, and ended up fifth in Class B. Good flying was put in by many others, such as Tom Acciavatti, Don Hartman, and Cliff Campbell. The only casualty of the day was Cliff Campbell's Gas Champ, which didn't quite make it back to the field, resulting in a broken pylon. But 5-minute epoxy (they didn't have that in 1941!) got him back in the air again! Frank Fay's silk and doped Pylon Buster won him the Most Authentic Award, while Tom Acciavatti's Jersey Javelin got the Most Unique Design trophy. By virtue of entering all four Old Timer classes, and doing well in three of them, the Grand Champion trophy was awarded to Al Schwankert.

LAST WORD

If you haven't joined SAM as yet, better do it quick! Maybe SAM doesn't offer too much for the three bucks, but one thing for sure; you get to say what rules you like and what you don't. There are a flock of Rule revisions to be voted on, so make sure you have your say! See the membership form in this issue. ●

O.T. Model . . *Continued from page 49*

The Flying Quaker in the photo belongs to our "Free Flight Scale" editor, Fernando Ramos, and now enjoys life as an R/C Antique, with several lazy, half-hour thermal flights to its credit.

OLD TIMER CORRECTION

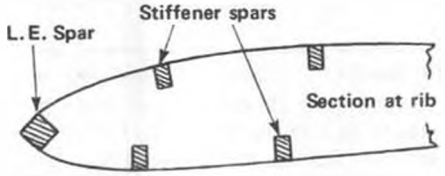
In our text about Chet Lanzo's 1940 Nats Rubber Stick winner (November 1974 issue), we relayed some incorrect information and also missed an interesting technical point. This was called to our attention by a very reliable source . . . Chet Lanzo himself.

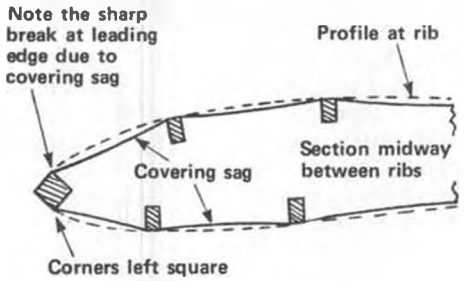
Chet now lives in Valley City, Ohio, and the following are excerpts from his letter:

"I was well aware of the turbulator effect at the time, but I think you missed the main turbulator effect when you (only) picked out the three top spars as doing the job. Actually, the sharp leading edge was a major factor.

"From the sketch (slightly exaggerated) you can see that the leading edge was a major factor in turbulating

the air over the airfoil. The sharp edges produced by setting the leading edge spar on edge, as shown, gave a more favorable profile to the airfoil for turbulation."





Chet goes on to point out that the original auto rudder was *not* for glide circle, but was actually one of his first ever dethermalizers! The pneumatic timer was set for 20 to 30 minutes and pulled the rubber tab over enough to create a tight spiral that would bring the ship down. In the original article, this was wrongly identified as being an auto-glide circle action, and we merely quoted that incorrect statement. Chet says "The editor at that time couldn't conceive, I think, that anyone would want to have a device to make a model come down out of a thermal. All efforts up to this time had been to keep your model in the rising air currents.

"I had built and lost 6 of the 'Lanzo Nats Stick Models' in the previous year on O.O.S. flights, and cooked up the rudder D/T to get some of the models back for use at the following contests."

Chet seems to rightly claim that he was the inventor of the dethermalizer. Any challenges? ●

AVRO ..... *Continued from page 39*

side as well). A slit is cut in the bottom of the fuselage and the landing gear wire is inserted up into the nose and cemented to the sidewalls of the fuselage. Following my usual custom, the landing gear struts are built up and cemented in place on the fuselage, but not attached to the wire. The wire is thus allowed to flex on a hard landing and usually the struts will not break, because they don't feel the impact. Fill in the little triangle at the bottom of the aft end of the fuselage to support the tail skid.

Wing and tail structure is generally conventional. The wing cutout is framed out of 1/8th thick balsa sticks. The tail is built up out of 1/16th square sticks and then the top and bottom of the ribs are added as soft balsa sticks which are then sanded to the rib section shown.

All the struts are made from 1/32nd thick model railroad basswood. At the top and bottom of the struts, as indicated by the small dots, drill a small hole. This hold will make rigging the wires much easier after assembly.

After sanding the structure thoroughly, the model is covered with lightweight tissue. This model was painted with silver lacquer, so to keep the paint job as light as possible, it was covered with black tissue. The tissue covering was water-mist shrunk, and after it was dry, two light coats of clear dope were applied overall, with four coats over the balsa on the nose. When the dope was dry, the lettering was masked off, using letters cut from drafting tape. Then, using a can of silver lacquer spray, a light coat of silver was applied on all surfaces. Silver covers very effectively, so make sure the coat is as light as possible. Real airplanes painted silver are not very glossy, so the peanut shouldn't be either. After the silver paint is dry enough to handle, carefully remove the masking tape. The black tissue thus uncovered makes just fine lettering, as shown by the photos.

To assemble the model, make a jig-board out of a piece of one sixteenth sheet. This piece should be as long as the top wing center section is wide, and as wide as the distance between the front of the front spar and the back of the aft spar. Make a notch in each corner of the jig-board to locate the top ends of the center section support struts. Press the top ends of these struts into the notches, and then cement the bottom ends of the struts into slots cut into the top fuselage covering at the proper places. The jig can now be carefully adjusted to properly simulate the wing center section. When this assembly is dry, the jig can be removed from the top of the struts, which will now be rigidly secured in the correct position for attaching the upper wing. The lower wing halves are simply cemented to the sides of the fuselage and the outer wing struts are cemented in place. The outer wing struts are located on the third rib from each wing tip, directly over or under the spars, as the case may be.

There are two horizontal tail braces going from the lower longeron to the leading edge and to the spar at the second rib out from the fuselage. These are 1/16th by 1/32nd basswood.

Details are what give these old biplanes character. The exhaust stacks are made from 1/8th diameter aluminum tube. The rim around the cockpit is made from a piece of brown plastic tube. My source was the insulation off a common piece of household electric cord. Slit the insulation carefully and remove the wire, then fit the slit around the edges of the cockpit opening and

cement in place.

A detail on my model that was not visible on the real airplane is wire wheels. Fulton Hungerford, of 1770 Lilac Circle, Titusville, Florida 32780, makes such nice wire wheels that I hate to cover them with fabric, as they were on the full size airplane. They are 1-3/8 inch diameter by 3/16 wide for this model.

The last detail is the wire bracing. I prefer monofilament fishing leader for this, but any thin thread will do, if you prefer. This is where the holes in the struts come in handy. Just thread the wires through the holes, pull them taut, and tape them in place with masking tape outboard of the struts. Then put a small drop of cement on the strut where the wire enters it. When dry, cut the excess wire off the outside of the strut and remove it and the masking tape. It's easy to get tight wires this way. Incidently, use monofilament of five pound test or less. I used 20 pound test on the model, and it has so much stiffness that it is too hard to straighten out under tension.

My model was very tail heavy, and required ballast to get the balance point in the position shown. Normal flight flight adjustments; elevator, rudder, and thrust line, can be used to adjust the flight path once the model is balanced.

GO BABY, GO! ●

Remotely . . . . *Continued from page 58*
didn't have any ailerons. Observing it in flight, it was smoothly maneuverable. On the landing approach it floated purposefully, like another Colorado biplane, the Alexander 'Eaglerock.'

"Sad to relate, the OS 'coughed' on takeoff one day, and the lower wing was 'lost' in the resulting crump-landing. Ever the experimenter, Duane faired-in the lower wing m ount and flew the ship as a parasol *monoplane!* It was a tad faster than the two-winged version but it still flew, and flew well. In fact, either 'version' could be considered a true beginner's ship.

"Some undetected upper wing spar damage (caused when the lower wing was shattered) and the extra stress of monoplane, flying wrote 'finis' to the old bird, but not before it had provided numerous stable and pleasant flights. Duane's planning on building a second version of the Bi-Prentice . . . this time with ailerons. The reason for the wing-flappers? To make the new model roll faster!"

The Bi-Prentice, like its monoplane forerunner, the Apprentice, was designed as a large, light wing-loaded model, and under normal circumstances, a .40 would be considered "hot," in spite of the plane's size. The original Apprentice, published in M.A.N. around 1966 or 67 had a 6 foot wingspan, yet flew extremely well with a Max .19 . . . a true trainer.

The airfoil and built-in tip washout in the wing (used on both models) is exceptionally stable, and permits relaxed inverted flying, in spite of no ailerons. Granted, rolls are a little slow, but they're surprisingly smooth . . . and almost AXIAL! We hope Duane drops the dihedral to one degree or so when he adds ailerons, otherwise they and the dihedral will have a running battle to see who's going to have the most control of the plane!

Inverted flight without ailerons always brings up an interesting argument, which will go on just as long as the upwind/down-wind turn debate. When inverted, it would seem that you should left rudder to turn right and vice-versa. T'ain't so! Our R/C Powerhouse old timer has lowered dihedral, but no ailerons. Inverted flight is tricky, but we've done it, and sure enough, to turn left, we use left stick. This means that the rudder, now upside down, is moving to the right, yet the plane is turning left. Try *that* on your kazoo!

IDENTIFIED!

The model we were holding in that picture in the December "Remotely Speaking" was Willie Smith's "Torero," published in a very early issue of RCM. It was correctly identified by Bob Mackey, of Milltown, New Jersey. It flew small, tight, constant-speed maneuvers. Power was a Super Tigre .51. If this "frame" thing gets serious, we may find ourselves going back to this type model.

GOOD NEWS

Just received a note from Lou Andrews with the news that Aamco is back in business at P.O. Box 231, Topsfield, Massachusetts 01983, phone (617) 887-8546.

The famous Aeromaster R/C Biplane is the first kit to be run off the new production line, and deliveries will take place in January 1975 (as this issue hits

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the newsstands).

You may recall that Aamco was completely wiped out in a disastrous fire early this year. Lou deserves a lot of credit for having the gumption to crank up again after such a horrible blow.

Welcome back to the hassle, Lou! ●

Counter . . . . . . *Continued from page 8*

he built an R/C version of the Vari-Viggen to test the stall/spin characteristics of the canard configuration. Both the model and the full size aircraft have been extremely successful. The original model, unfortunately, succumbed to an elevator linkage failure. However, this was not before it proved the exceptional stability of the canard configuration. It could be flown, as can the man . . . er, people carrying version, with full back stick without stalling or losing control.

This is all leading up to the fact that Rutan is now making a complete plans package available for the 18% scale model of the VariViggen. The package includes full size plans, scale 3-views, building instructions, and photographs of the prototype for scale judging purposes, and sells for $7.50, plus 50¢ for first class postage. The model spans 41.2 inches, has 555 sq. in. area (640 including canard), uses 4 or 5 channel radio (trike gear retracts on prototype), and can be powered with .35 to .61 engines. Fuselage is ply and balsa, while all surfaces may be balsa covered foam (shown on plans) or built up.

To cap it all off, Burt Rutan is offering a free VariViggen technical demonstration and an opportunity to fly the full size VV to the person who builds the best scale model by December 31, 1975! Bet we'll see a few at the Nats. ●

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