

# The MODEL BUILDER



APRIL 1973

85 cents

volume 3, number 17



# CARL GOLDBERG

## HOW CAN THEY BE ANY GOOD AT THOSE PRICES?

## CG RETRACTS

The only problem is there's no snob appeal in CG Retracts—they just don't cost enough to really impress your fellow modelers. All they do is work great and last long. The number of broken or worn-out parts has been unbelievably low—because the materials they're

made of are so tough and resilient. You can pay more, but you can't get better gear. If you're looking for dependable retracts, read what expert flier Jim Grier says:

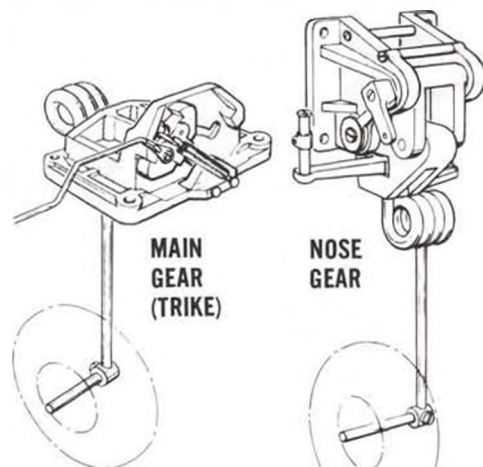


Dear Carl: Just a performance report I would like to share with other modelers. In 7 months

of flying my 8 lb. Mach 1 with Goldberg retracts, the gear has never failed. A lot of the time was on our club's rough grass field. Sure is easy on the aircraft (and builder!) to make all gear-down landings. Congratulations on a fine engineering job!

Jim Grier

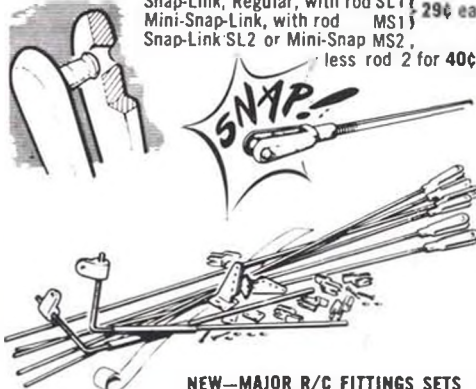
TWIN GEAR Retracts—RG2—\$14.95  
TRI-GEAR Retracts—RG3—\$24.95  
NOSE GEAR (Only)—RG1—\$10.00



**UNIQUE SNAP-LINK!** Patent Pending. Now for the first time—you can buy a truly safe link—the SNAP-Link!

- Tiny 45° shoulder snaps through arm, prevents accidental opening. So unique it's Patent Pending!
- One-piece design—no separate pieces that might come apart.

Snap-Link, Regular, with rod SL1 } 29¢ ea  
Mini-Snap-Link, with rod MS1 }  
Snap-Link SL2 or Mini-Snap MS2, }  
less rod 2 for 40¢



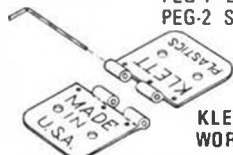
### NEW—MAJOR R/C FITTINGS SETS

Here's the economical way to buy the major fittings for your multi-ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material—and at a saving.  
R/C Fittings Set No. 1 for ship with standard ailerons. RFS1 \$3.50  
R/C Fittings Set No. 2 for ship with strip ailerons. RFS2 \$3.50

### NEW! KLETT PUSHROD EXIT GUIDES

To protect your fuselage and insure smooth operation of your pushrods. Precision made of tough nylon. Easy installation. Large for 5/64" wire, small for 1/16" wire.

PEG-1 LARGE 4 per pkg. 75¢  
PEG-2 SMALL 4 per pkg. 75¢



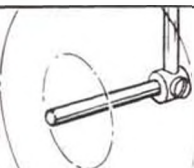
### KLETT HINGES — WORLD'S FINEST!

Designed and manufactured by Roy Klett, originator of world-famous RK hinges. An exclusive with Carl Goldberg, these hinges are made with exceptional care and attention to detail. The small RK2 hinges are so thin all you need is a knife slit. The regular size RK3 hinges are the slickest you've ever seen — try holding one leaf and waving the other! And both have removable music wire pins. Ask your dealer for the best — Klett hinges.

RK2-7 7 for \$1.10      RK2-15 15 for \$1.95  
RK3-7 7 for \$1.25      RK3-15 15 for \$2.35

### 5/32" ADJUSTABLE AXLE

Adjustable axle allows you to easily have the strut length you want. Both the axle and screw are hardened steel. Just file a flat on the strut, and tighten axle in place. AA1 75¢ ea.



### STEERABLE NOSE GEAR

Versatile — steering arm can be to either side, or slightly up or down, or mounted on bottom with extra collar in slot. Steering arm is nylon, stiff enough for good control, yet can flex under shock to protect servo. Collar is hardened steel — won't strip like brass. Screw is hardened steel, too. You can really torque it and get good grip on music wire strut without a flat.

Complete steerable nose gear with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers G16N \$2.50.



### NYLON STEERING ARM

Hardened steel collar and screw SA1 75¢.



### NYLON BEARING

One-piece design mounts to firewall without alignment problems. Includes blind nuts, screws and washers NB1 75¢.



### CONTROL HORNS

Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right size for 3/16" wire; nut plate for simplest mounting. Long horns CH1 or short horns CH2, with screws—50¢/2.



### NYLON REINFORCING TAPE

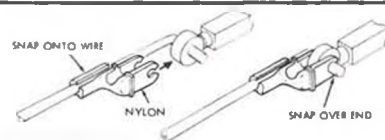
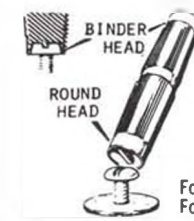
This nylon reinforcing tape is extremely tough when applied with epoxy around the center when joining wing halves. 2 1/2" wide x 5 ft.—N2 50¢. 3/4" wide x 5 ft. N1 25¢.



NEW KLETT SAFETY DRIVER SOCKETS DOWN ONTO SCREW HEAD — CAN'T SLIP OFF AND DAMAGE YOUR WING!  
Takes Round Head Screws and Binder Head.

### KLETT SAFETY DRIVER

For 3/8" Nylon Screws SD1 } 98¢ ea  
For #10 Nylon Screws SD2 }

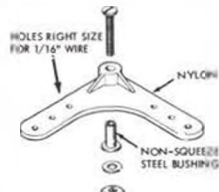


### SNAP'R KEEPER

Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Works on wire 3/4" to 1/2" diameter. SK1 50¢ for 4.

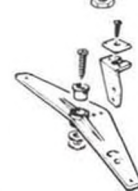
### REPLACEMENT FOAM WINGS, ETC.

To go with your own design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly — \$3.95. Stab and vertical fin, set \$1.95. Assembled Ranger 42 fuselage, plus bearings, nosegear, etc., \$9.95.



### AILERON BELLCRANK

Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise—all metal parts are screwed tightly together—AB1 50¢ for 2.



### 1/2A BELLCRANK and HORN

Made of nylon, this new set provides smooth 1/2A control line operation. Easy on dacron lines, too BCh1 25¢.



### SHEET METAL SCREWS

Like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers—#2 x 3/8 SMS2 30¢ for 10; #4 x 3/8 SMS4 30¢ for 8.

P.S. For best service, see your dealer for items you want. If not available, write direct; add 50¢ per item (\$1 outside U.S.). Minimum order \$1.

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Carl Goldberg Models Inc.  
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I am sending 25¢ for 8 pg. Illustrated Catalog with, "Recommendations in Starting in R/C," Basic Explanation of R/C Equipment and Radio Control Definitions.

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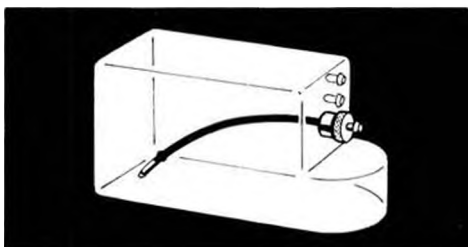
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8 OUNCE	2.250	1.875	4.681	\$2.39
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**KRAFT**  
SYSTEMS, INC.

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\$4.95

WINGSPAN: 34"  
WING AREA: 250 sq. in.  
ENGINES: .15 to .25

### AKROMASTER

THE BIGGEST LITTLE STUNTER ON THE MARKET

Patterned after the full-scale aerobatic design, this compact little beauty is rough, tough and sturdy. An ideal trainer for control-line stunt flying, it will do the entire AMA Precision Aerobatic pattern. Fast building, all-balsa construction provides light wing loading, stable flight and high performance.

Shaped Fuselage

Shaped Leading and Trailing Edges

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Formed Canopy

Ready-Bent Landing Gear and Pushrod

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Complete Building and Flying Instructions, Illustrated With Isometric Drawings.

1972 Nationals Winner  
1st Place-Free Flight Flying Scale



WINGSPAN 20"

KIT FF-23  
\$2.95

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CLASSIC  
SERIES

*Mr. Mulligan*

**A Full-Scale Model With Championship Flying Ability**

Complete Building and Flying Instructions  
Detailed Plans with Isometric Construction Views  
Formed Plastic Propeller  
Sig Contest Rubber Strip for Maximum Turns and High Flight Performance

Wheels Included  
Die-Cut Sig Balsa Parts  
Covering Material  
Full Set of Decal Decorations

Winner of both the 1935 Bendix and Thompson trophy races, Mr. Mulligan was one of the most famous racing planes of all time. The attractive lines have made Benny Howard's classic creation a favorite of modelers everywhere. Tom Stark, 1972 Nationals Scale Category Champion, has added the triumph of a Nationals victory to his fine rubber-powered version.

This is a scale model that really flies and its contest-proven construction has built-in durability. Builders of other Sig Classic fliers will have no difficulty with the scale structure of this racing beauty. The 8-page instruction book provides step-by-step guidance in building and includes tips for competition flying performance.

**SIG MANUFACTURING CO. . . . Montezuma, Iowa**



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BONETTI?  
HE'LL  
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YOU...**

**NO ONE SHOULD BE WITHOUT...**



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M ODEL B UILDER**

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# The MODEL BUILDER

APRIL

1973

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Cover: Santa Barbara Harbor forms an appropriate backdrop for this photo of Tom Protheroe, designer of the well known Santa Barbara One Design R/C sailing yacht, which is manufactured by Vortex Model Engineering. Tom is holding his latest design, the Pea Pod, which is featured as a construction article in this issue. Not only is the hull uniquely simple and fast to build, but the sail control system, entirely selective, is an ingenious device which costs practically nothing to make.  
Photo by Gary Zumdahl.



Now you see it and then you won't! Started the brush just after the new year, and this is the way it looked at the Toledo R/C Conference. It's gone now and not expected to return. Much more comfortable without it. . . Frito Bandito indeed!

## from Bill Northrop's workbench . . .

### WE'RE MOVING!

As some of you know, The MODEL BUILDER's home has also been the home of the Editor/Publisher and the General Manager. In the early stages, this was quite a satisfactory arrangement, since commuting to work consisted of walking from one part of the house to another . . . and it kept the overhead down. The main disadvantage was the fact that the "office" was literally open 24 hours a day, and curiosity usually overcame our determination not to answer the company phone when it would ring at odd times.

In recent months, the situation has become more and more unbearable as the magazine, like an early-show science fiction monster, has multiplied and expanded into every nook and cranny, taking over everything but the kitchen and front lawn.

Though no specific target date exists for a total and official move, we are

transferring the monster . . . er . . . magazine to its own headquarters and should be pretty well established by March 15. The new address is 1900 East Edinger Avenue (If you're interested, the "G" is soft.), Santa Ana, California 92705. The building is located just off the Newport Freeway, about 10 minutes from home, and 20 minutes from Disneyland. If you are in the neighborhood . . .

Our new phone number is area 714, 547-3963, and though we intend to keep more sensible business hours, don't be too surprised if you get an answer when calling at odd times.

### AND THERE ARE OTHER CHANGES

Perhaps you noticed a difference in the paper this month. Two reasons for it; one following the other.

In our search for a new printer (which we found), it was necessary to check various magazines and catalogs presented as samples of its work by

the printing house salesmen. One sample in particular caught our eye . . . the "Airborne ASW Log," published quarterly by Lockheed-California Co., a division of Lockheed Aircraft Corporation. It was printed on the exact type of paper stock we had been looking for (Naturally, it had to be a little more expensive!). The smooth, non-glaring finish produces clean, sharp photos and text, and the satin texture is very easy on the eyes. The high gloss stuff had always bugged us as being sorta chintzy. Anyway, we hope you like it as much as we do.

### AMA's CORNER

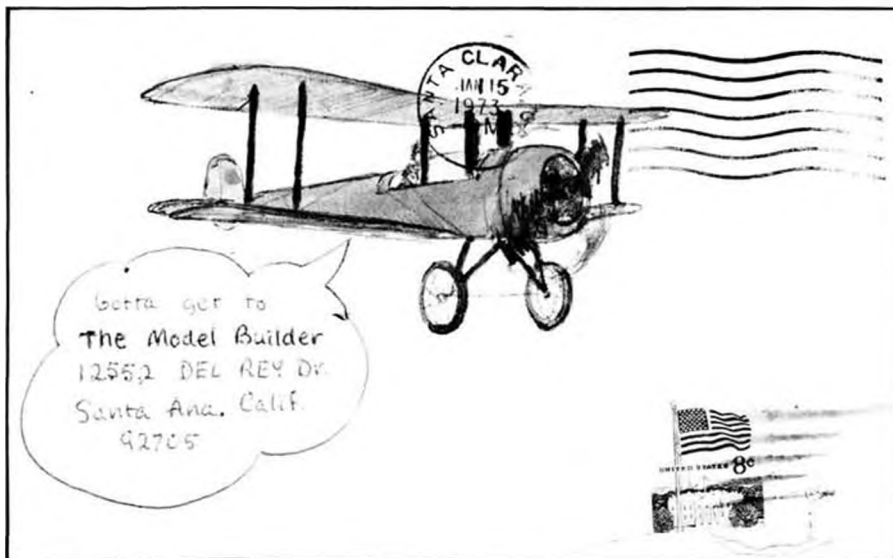
News about the outcome of the AMA Executive Council's decision on the Great Magazine Controversy is about as exciting as a mash potato sandwich. They have proposed that Open members get their choice of AMA news by itself for \$12.00 dues, or wrapped in AAM for \$15.00. HO . . . HUM . . .

\* \* \*

As of 10:30 pm, March 2, 1973 (that's when we're writing this) the 1973, "Now You See It, Now You Don't" Nationals will be held in Oshkosh, Wisconsin, the week of August 6 to August 12. Perhaps the best thing about it is the fact that the big EAA Fly-In takes place at the same site during the week before, and there's hardly any doubt that many modelers will be arriving early to take a look. We drove up there after the 1971 Nats and simply drooled all over the place. The Antiques and Classics on hand brought out one "Holy Mackerel! Look at that!" after another.

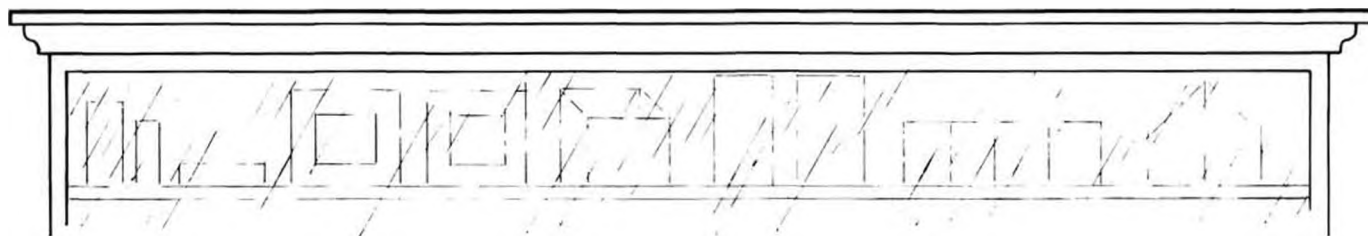
AMA will have a real challenge in putting on a Nats by itself, and it's probably just as well that we didn't

*Continued on page 59*



Eddie John, Santa Clara, Calif., has a unique way of addressing an envelope, don't you think?

# OVER THE COUNTER



"Model Helicopter News" is the name of a new magazine that has just entered the hobby market. It is published by Broz Enterprises Incorporated, which is also a manufacturer of model helicopter kits and parts, and is a source for plans and other model helicopter supplies.

Personnel in the company include Jerry Broz, President and Publisher; Mike Corbett, Editor; John Burkam, Technical Editor; and Eli Broz, Production Manager. To be published bi-monthly, the magazine costs \$1.00 per copy, and domestic subscription rates are \$5.00 per year. The address is 104 Lake Scranton Road, Scranton, PA. 18505.

The January/February issue includes among other items; an introduction and description of the Broz "Compact," a small, 3-1/2 pound 'copter to be released in kit form later this year; a question and answer department by John Burkam; a photo and word report on the Chicago and Orange (Mass.) contests; 3-views of the Enstrom F-28A, with many detail photographs; a complete set of proposed model helicopter contest rules; and, a small, rubber powered free-flight helicopter construction article with full size plans, by Bill Hannan.

\* \* \*

Ed Thompson, father of the Digitrio, the first do-it-yourself digital radio, and

now manufacturer of RC Manufacturing systems, Carmichael, Calif., sent us a picture of his latest development, a loop antenna for transmitters. Once you get over the shock of seeing a croquette wicket sticking out the top of your transmitter, this new antenna has many appealing advantages.

Electronically, the loop antenna has no null points in its signal output coverage, something that can occur with the usual, garden variety "stick" antenna. Physically, the antenna is much less dangerous in a crowd, especially to the eyes of those standing too close. It also permits you to swing around quickly without fear of pulling a "Mark of



Special magazine for model helicopters is now available, bi-monthly.

RC Manufacturing's new loop transmitter antenna. No nulls.

Zoro" on anything within a six foot radius.

Probably the best feature of all is the fact that the handle acts as a perfect carrying handle. Just watch the way you walk while you're carrying it though, it sure looks like a purse!

\* \* \*

MALCO is the name of a new R/C model kit manufacturer in Hamilton, Texas. The address is P.O. Box 508, Zip is 76531. Designed for .40 power, the A-TAK and Der Flug are the latest offerings by the company. Both kits feature machine-cut prefabricated wood parts, with the fuselage delivered in a semi-finished state. The A-TAK wing is balsa covered foam, while the Der Flug wing is built up with spruce spars. Both kits also feature a fiberglass engine cowling. Price, plus shipping are; A-TAK \$49.00, Der Flug \$45.00.

\* \* \*

Octura Models, P.O. Box 536, Park Ridge, Ill. 60068, has a new motor mount to accommodate .19 thru .40 engines. Called the "Slant 40," this mount is an aluminum extrusion which slants the engine 10 degrees, permitting the use of a straight exhaust stack that will clear engine bearers and/or the deck. Flanges may be trimmed or removed to facilitate mounting. Unit is 4 inches wide, 2-1/8 inches long, finished in anodized black, and comes complete with four 6 - 32 socket head screws for \$4.25 plus 10 percent postage and packing.

\* \* \*

Kraft Systems continues to add to its line of R/C accessories. Latest is an



"A-TAK" by MALCO. Has 50" balsa over foam wing. For .40 engines.



"DER FLUG" by MALCO. Built up 60" wingspan with spruce spars. For .40 engines.



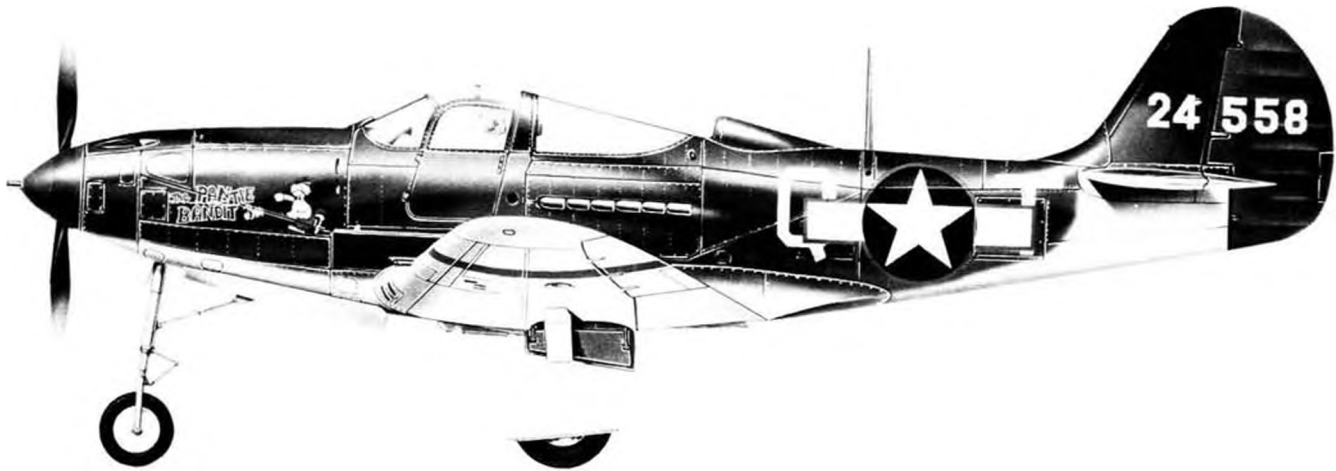
New "Slant 40" engine mount by Octura. Ten degree slant gets exhaust out of boat. Designed to take .19 through .40 size engines. Extruded aluminum, anodized black.

all-in-one package of plastic fittings called the Accessory Assortment (P/N 200-100) and retailing for a very reasonable \$1.95. Included are; 2 extra long horns, 2 regular horns, 4 horn plates, two 90 degree bellcranks, 1 flying stab bellcrank, 2 pushrod exits, 1 transmitter antenna flag clip, 1 receiver antenna retainer, one 6-32 nut plate, three 5/32 push-on collars, three 1/8 push-on collars, three 3/32 push-on collars, thirteen 1/16 push-on collars, two .045 push-on collars, ten 2-56 by 1/2 machine screws, two 2-56 nuts, and 2 bellcrank bushings.

\* \* \*

SuKarta Hobbies, 51 Hawthorne Avenue, Park Ridge, N.J. 07656 has introduced a receiver antenna coupler which permits switching your receiver from one plane to another, yet allowing permanent installation of the antenna. Giv-





Top Flite's newest addition to its line of WW II stand-off scale R/C models, the Bell P-39 Airacobra.

on the rather crude name of "Shove It," the package includes one female and two male gold plated connectors, shrink-tubing insulators, and an extra length of hook-up wire for a second installation. Price is \$1.29. A very handy item.

\* \* \*

K & B Manufacturing is continuing to expand in its finishing products field. Latest item may not seem like much, but they've been needed for a long time. Made of unbreakable Polyproprianate plastic, they're little one ounce shot

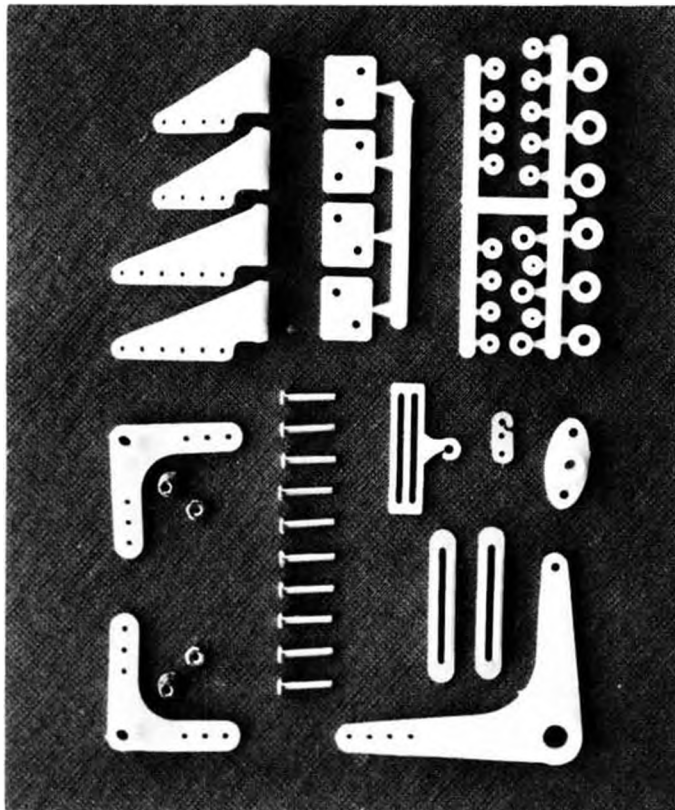
gla . . . er . . . measuring cups graduated in fluid ounces, drams, tablespoons, teaspoons, cubic centimeters, and milliliters. Epoxy, resin, and most model and craft cements will not stick to the plastic, so the cups may be used over and over . . . though at 24 for 98 cents, it's not costly to throw them away when they get tired.

\* \* \*

Top Flite Models, Inc. has just added the P-39 Airacobra to its line of WW II stand-off scale R/C models. We saw this

ship at the Toledo R/C Conference, and the "Iron Dog" quickly became our favorite of the three WW II ships available from Top Flite; the other two being the P-51 and the P-40.

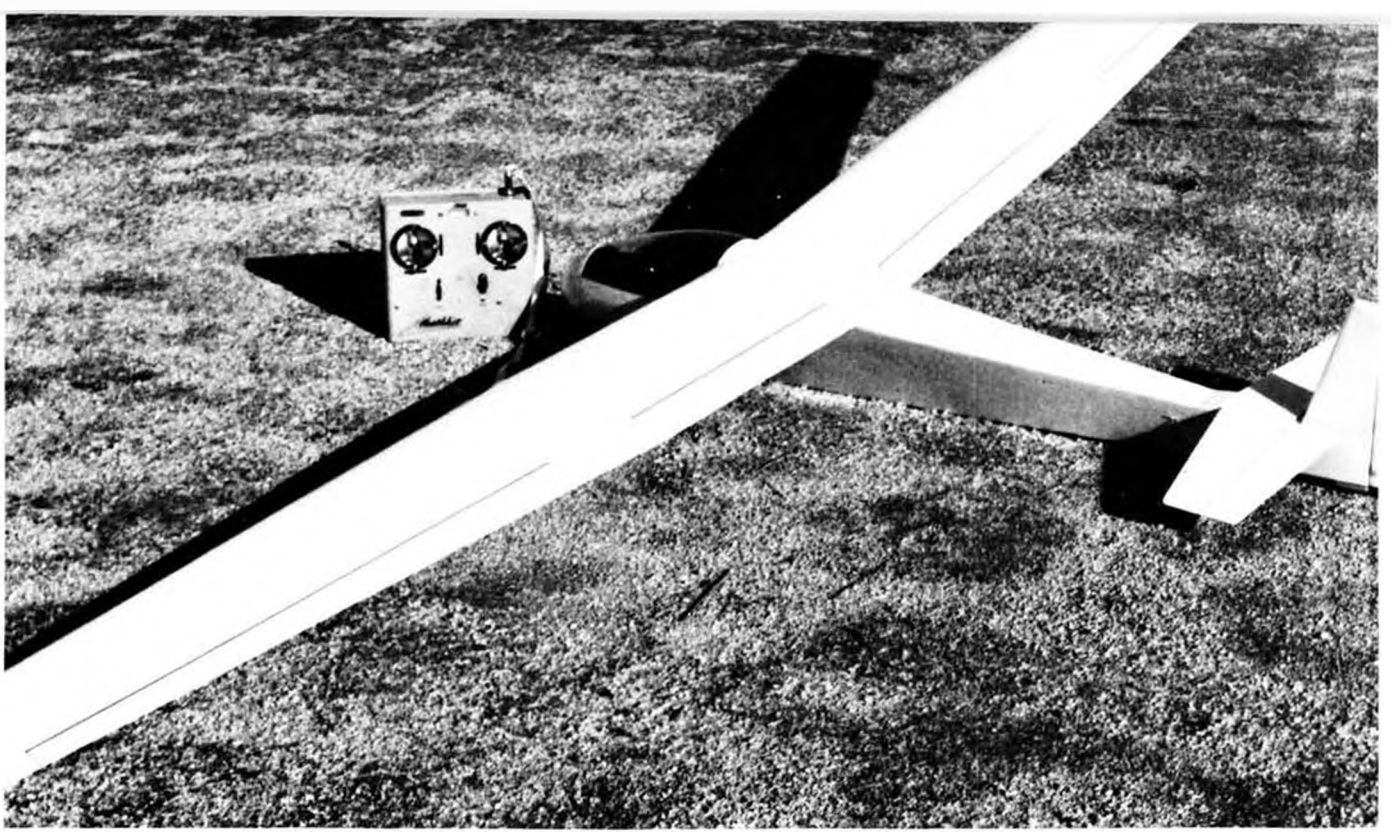
Incidentally, the Airacobra was covered in one of three new Super Monokote colors also introduced at Toledo. This was silver aluminum and it looked exactly like a well finished model sprayed with silver dope. The other two colors are Olive Drab and Dove Grey. All three have a flat to satin finish which seems just about right. ●



Kraft's Accessory Assortment, a complete package for \$1.95.



K & B's one ounce measuring cups for all materials.



# BRIEGLER BG-12

Following the simple basic structure of its full size counterpart, this 100" scale model sailplane doesn't have to compromise performance for appearance or vice-versa.

By CHRIS CHRISTEN

● The BG-12, a single-seat high-performance sailplane, is the twelfth in a series of famous designs by William G. "Gus" Briegleb. Briegleb, one of the Grand Gentlemen of Soaring, headquarters his Sailplane Corporation of America on El Mirage Field, near Adelanto . . . on the desert North of the L.A. magalopolis . . . California.

The BG-12 first took wind over its wings in 1956, and 17 years after that prototype flight, the design is still popular with sportsmen pilots and offers competitive performance as well as 1973-sleek appearance. The all plywood

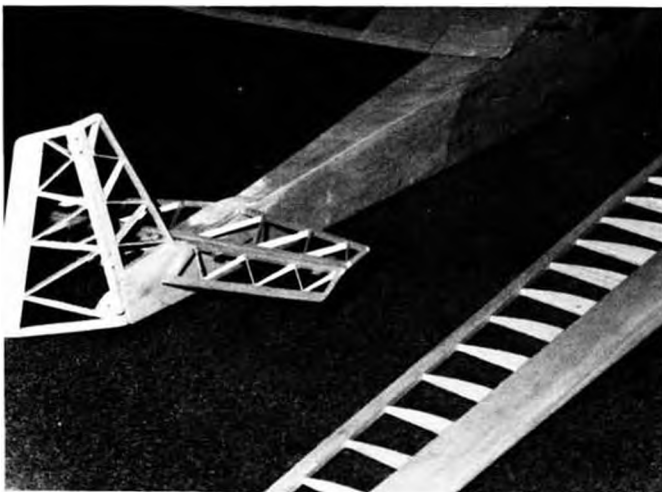
construction was designed especially for the home-builder, and is quite similar to model airplane practice.

The design specifications claim an L/D max of 34 at 56 mph and a minimum sink rate of 2.25 fps at 47 mph. In comparison, the latest Schweizer . . . the 1-34 . . . is quoted at an L/D of 34 at 55 mph, and a minimum sink of 2.1 fps at 47 mph. Little wonder that more than 200 kits for the BG-12 have been sold, and that many are still active throughout the world. It is quite a basement project.

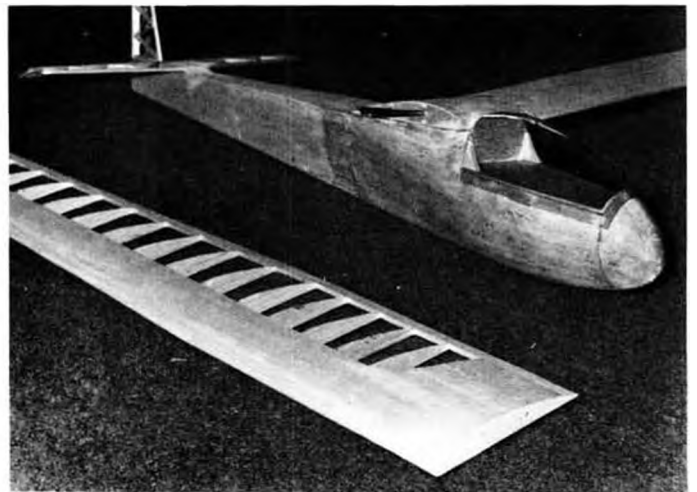
Briegleb's BG-12 has logged an en-

viable record for any single design, and especially for an amateur built configuration, having established records for distance, duration and altitude at various times in various countries. But perhaps the most important records are those of safety and longevity. Almost every issue of Soaring . . . SSA's magazine . . . lists BG-12's in the "For Sale" columns at prices to near \$4,000.

The original BG-12A utilized a three-piece wing. This was later revised in the -12B and subsequent versions to a two-piece with conventional center joining arrangement. Most BG-12's were and



Zig-zag ribs in tail surfaces provide strong, light, warp-proof structure. V sectioned fuselage is built upside down over top view.



Canopy is portion of a 16" Sig unit. Forward half of fuselage is strengthened by fiberglass cloth and resin. Wings plug in.



Clean simple lines show up well in this picture. Ship in the background is a Diamond.

are assigned to Open Class competition with wing spans 9 1/2 inches greater than the maximum 15 meters allowed in Standard Class. Also, all but one BG-12 incorporated center section wing flaps for glide path control, which is a feature not allowed in Standard Class.

The single Standard Class BG-12 was a -12C modified to 15 meter span . . . 49 feet-2 1/2 inches . . . with dive brakes (spoilers) and no flaps. These changes made it legal under FAI/OSTIV Standard Class requirements.

Gus Briegleb's "Briegleb Glider design Number 12" is an excellent modeling subject for all-around sport flying or for a serious scale project. It's no floater, but its light weight and clean lines give performance beyond what might be expected. Penetration is quite good, and if there's any thermal action worth working, it'll go up.

Exact scale outlines are noted on the drawings for the scale enthusiast, and many full size machines are still around and available for documentation purposes. The BG-12 is unique . . . literally

a modern classic.

—CONSTRUCTION—

WING

Begin construction of the wing by cutting all necessary ribs from straight grain medium weight 1/16 balsa. Make 6 Number One ribs from 1/16 plywood and 2 Number One ribs from 3/32 plywood. Drill all plywood ribs for wing wires. Make trailing edge stock by planing and sanding 1/4 x 3/4 balsa sheet stock . . . leave trailing edge about 1/16 thick.

Assemble the six 1/16 plywood ribs on two full length brass tubes and pin over wing plan at first six rib stations. Be sure everything is square . . . epoxy tubes to ribs. When set, remove from plan and cut tubes flush with two No. 1 ribs in center . . . you now have a perfectly aligned center section.

Build wing and fuselage on a flat surface such as a second-hand two foot wide door . . . these are inexpensive and very solid. Pin a 48 inch sheet of 1/16 balsa over plan . . . be sure to use wax paper or Saran Wrap. Add spruce spar

to rear edge of sheeting and while this is drying, fit lower center sheeting and glue. If 48 inch wood is not available, shorter sheeting with splices may be used. Be sure to keep all splices near tip and not overlapping.

Add all ribs, root assembly and shear webs to wing, capping with 1/8 x 3/8 subleading edge. Wing is finished by splicing and adding trailing edge and gussets . . . allow to dry over night. Remove wing panel and shape 1/8 x 3/8 subleading edge strip to ribs. Then fill area between spars and tubes with a mixture of resin and micro balloons . . . chopped fiberglass may be substituted . . . the main thing here is to achieve no root flex.

Repin wing assembly to board and finish by adding all top sheeting and a 3/32 facing rib to root of wing . . . this will later be sanded to match dihedral with wing saddle.

After all this has dried thoroughly, trim top sheeting at leading edge and add 1/4 x 1/2 balsa leading edge. The wing is finished by adding tip block and shaping leading edge.

The left wing panel is constructed over the back of the plan which is made visible by rubbing a small amount of cooking oil on the paper where the wing is located.

WING SADDLE

Bend the two wing wires to the angle shown on the plan . . . be sure that they match. Make up a sheet of 1/16 balsa 6 1/2 inches wide by 4 inches long (grain parallel to 4 inch side) and pin to plan against trailing edge. Glue both bottom spars and 3/32 ribs to this. Add 1/8 x 3/8 subleading edge.

Fit both wing wires, noting that rear lower spar needs to be notched to clear wire. Add both top spars and shear webs

*Continued on page 48*

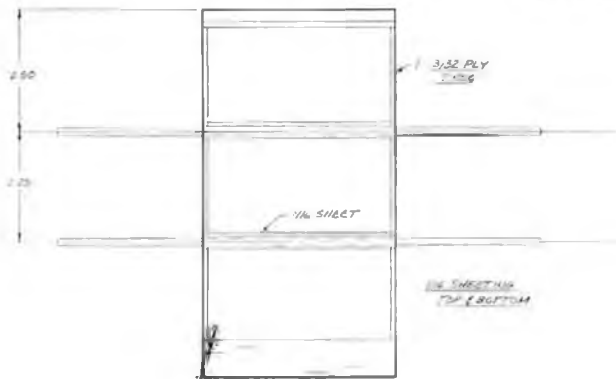
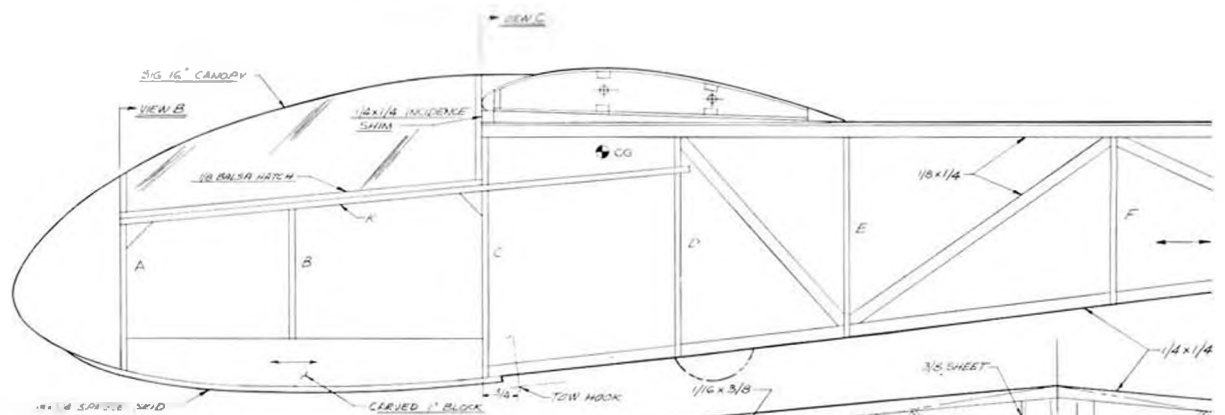
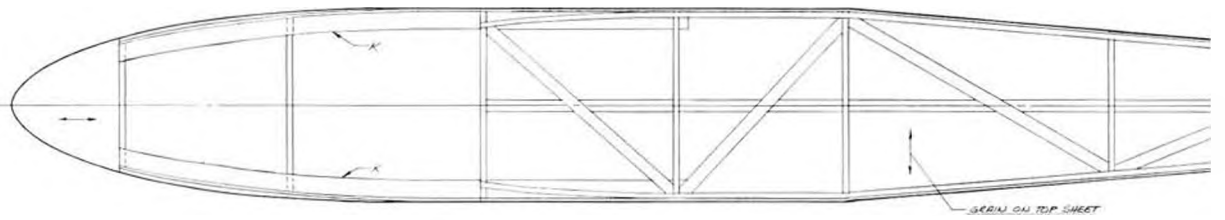
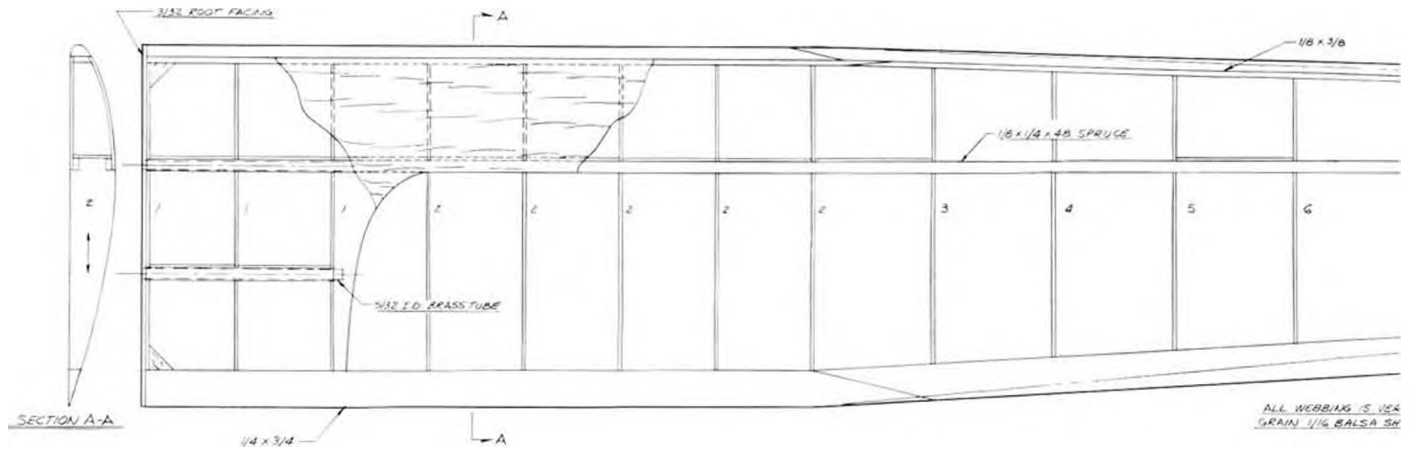
*Plans on next two pages.*

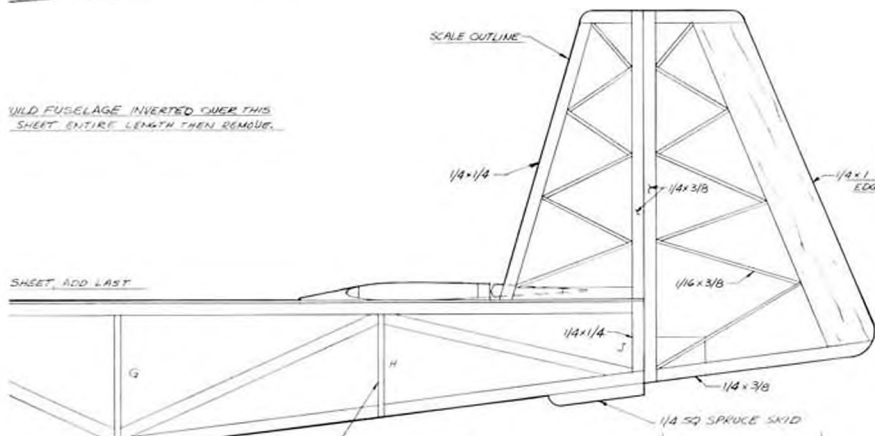
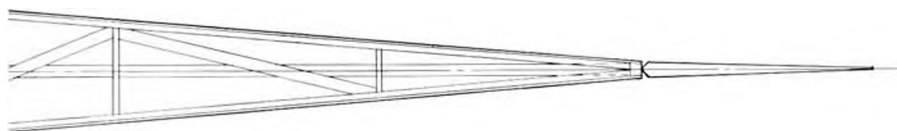
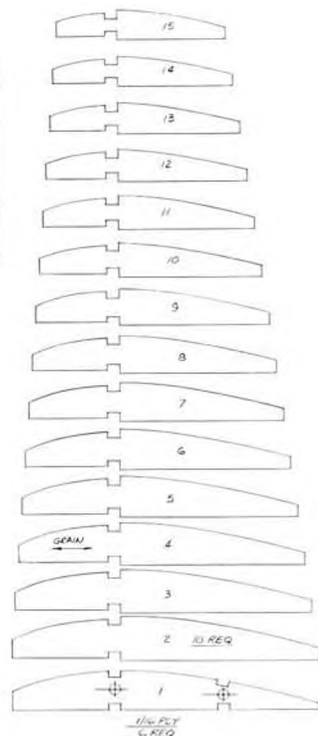
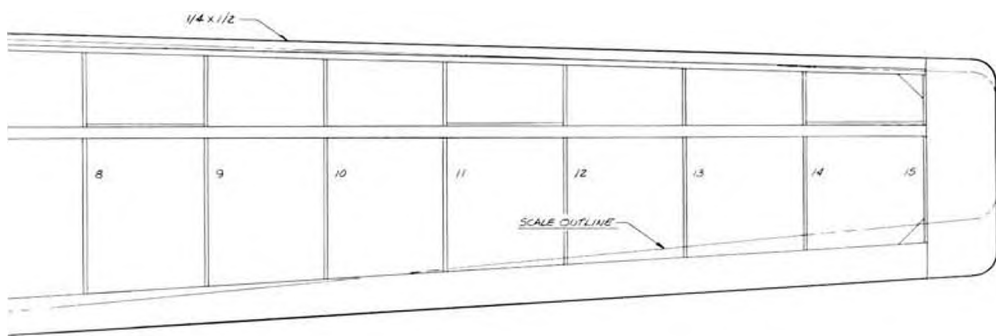


Structural design of wing allows almost complete assembly on bench before removal. Note those very important webs. Don't leave 'em out!



Chris looks as though he just felt a thermal drift by while posing with his BG-12. The 100" span is convenient for transportation.

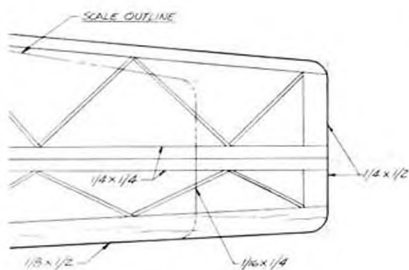




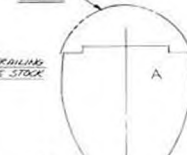
WELD FUSELAGE INVERTED OVER THIS SHEET ENTIRE LENGTH THEN REMOVE.

SHEET, ADD LAST

TAKE FROM 1/2 x 1/4



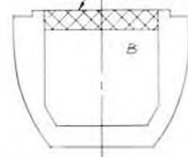
VIEW B



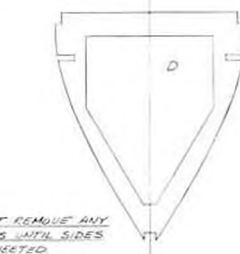
VIEW C



DO NOT REMOVE UNTIL FUSELAGE COMPLETE



ALL FRAMES 1/8 SHEET



DO NOT REMOVE ANY CUT OUTS UNTIL SIDES ARE SHEETED

**NOTES:**

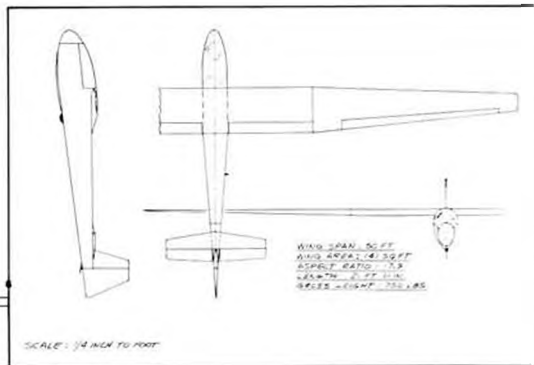
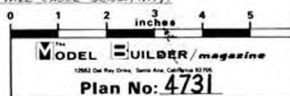
1. RIBS 3 THRU 15, 2 REQ, 1/16 SHEET
2. ALL MATERIAL IS Balsa UNLESS NOTED.
3. FILL CAVITY BETWEEN ALL WING WIRES, TUBES & SPARS WITH RESIN & MICROBALLONS.
4. FIBERGLASS NOSE TO REAR OF FRAME "E".
5. GRAIN IS VERTICAL ON ALL FUSELAGE FRAMES.
6. C.G. SHOULD BE 3/8" FROM WHERE SHOWN. SHORT TRAIL MOMENT WILL CAUSE SENSITIVITY.

**BRIEGLER BG-12**

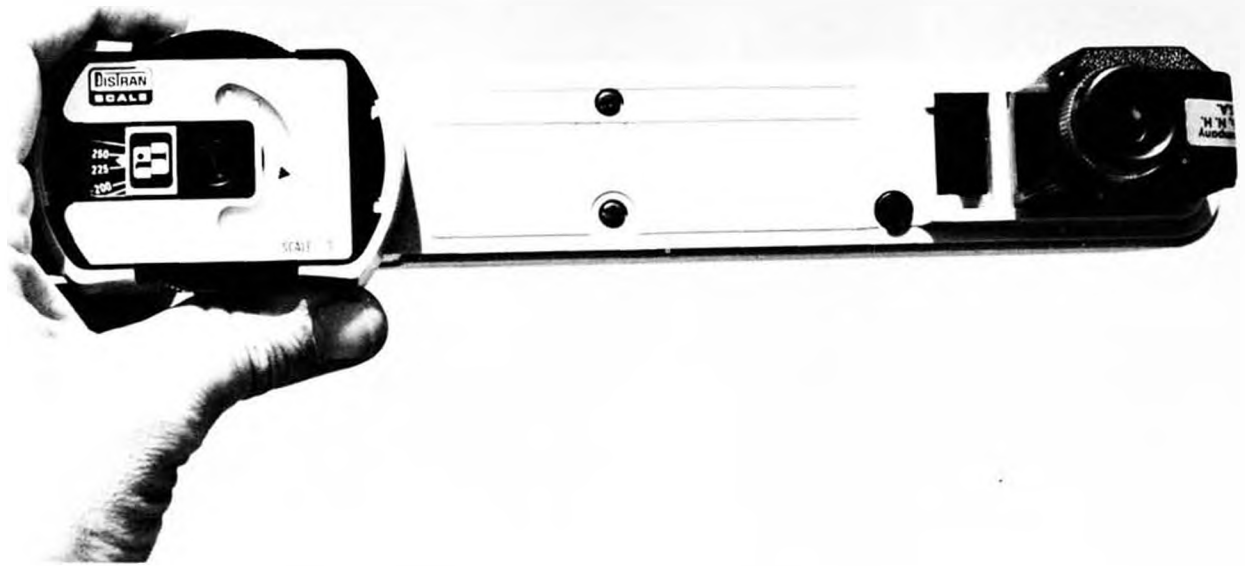
SCALE: 1/16 SIZE

DESIGNED & DRAWN BY: CHRIS CHRISTEN

WING SPAN: 100 IN. AREA: 618 SQ IN / 4.3 SQ FT  
 STAB: 91.55 IN (12%) FLYING WEIGHT: 38 TO 42 OZ.  
 1/16/73



FULL SIZE PLANS AVAILABLE – SEE PAGE 64



## PRODUCTS IN USE

BROOKSTONE COMPANY'S DIRECT READING RANGEFINDER, by Bill Northrop

Without going into all of the pro's and con's, logic, fairness, etc., we'll simply state that it has become increasingly popular in recent months to know "how high is up," particularly in the neighborhood of 400 feet.

Most inexpensive rangefinders require knowledge of the size of the object in question, and also several calculations, before being able to determine distance and/or altitude. The Brookstone Company, Brookstone Bldg., Peterborough, N.H. 03458, an outfit which specializes in fine quality hard to find tools, has carried the RANGEMATIC rangefinder in its fascinating 64 page catalog for some time now, and when we saw that it provided *direct reading* distance in yards to any *unknown size* object, we figured it would be worth the \$34.95

price. Having tried it out, we highly recommend it for any group or individual involved in free flight and radio control, particularly R/C soaring.

In operation, you simply find the object in the eyepiece, a 6x18 power prism monocular, focus the double image into a single one (much like focusing a camera), and read the distance on the focusing dial, anywhere from 50 yards up to 2 miles. The optical triangulation is better than 95 percent accurate at 500 yards.

Calibration of each unit is required, but is quite simple. All you need is to be able to focus on something at a known distance. We used a highschool football field, where the distance between goal posts is 120 yards (on pro fields, the posts are 100 yards apart).

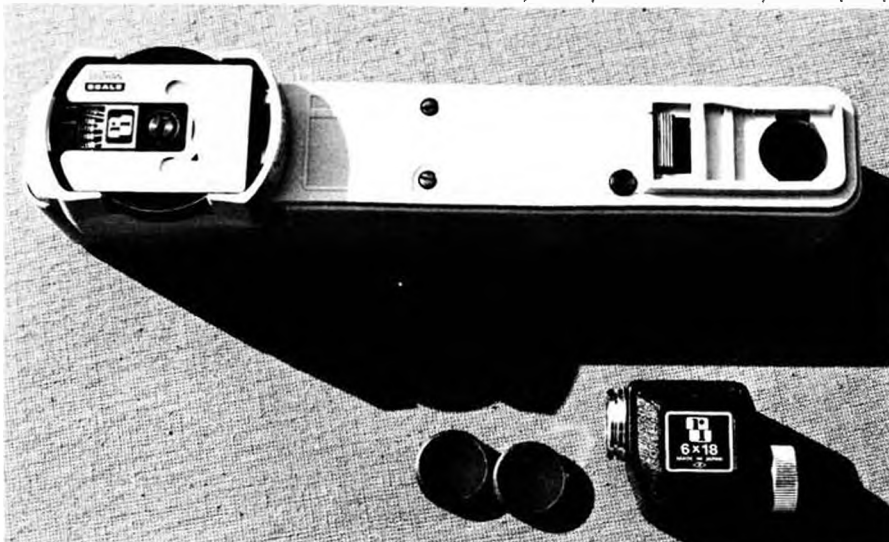
First, you focus the eyepiece to get clear, sharp images. Next, an image adjustment screw (both adjustment screws have coin slots) is adjusted until your double images coincide in *height*. Finally, using those goalposts or other known distant objects, the range dial is calibrated by turning the range adjustment screw.

After you have established the distance of every object that is more than 50 yards from your front door, you will begin to find many other uses for the rangefinder at your flying field: How much height are you getting on a 10 second engine run with that Starduster? What is your altitude off the winch? Check out your technique on the hstart. And of course, how high is 400 feet . . . in case you're interested?

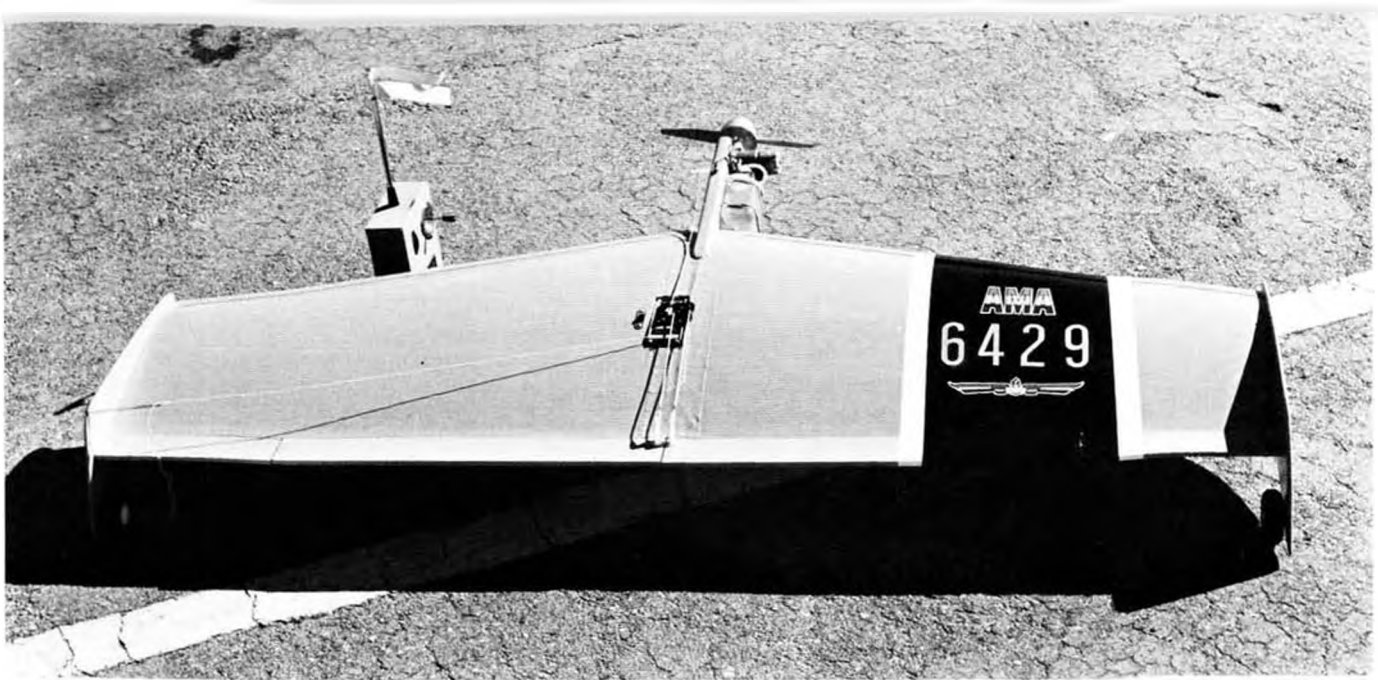
By now you're saying, "Fine. As long as I'm right under the ship, I'm reading altitude, but when it's off to one side, I'm reading slant range. Big deal!" Of course, this is correct, but let's look into it.

First, for the most part, the high altitude stuff is represented by the R/C soaring glider and the gung-ho free flight. *Usually*, it is not too much trouble to take a reading on an R/C glider almost directly overhead. Also, depending on the climb path, a free flight, in most cases, will pop into the glide just about overhead. As for any other circumstance, a quick mental calculation will get you pretty much in the ballpark. It all depends on how much accuracy you want.

*Continued on page 58*



This Brookstone rangefinder gives direct distances from 50 yards to 2 miles, is extremely accurate. Turn range dial until double images coincide, then read distance. Price is \$34.95



## PRODUCTS IN USE

KRAFT SYSTEMS' FIRST AIRPLANE KIT . . . THE WINGMASTER, by Bob Upton

● While conversing on the phone with Bill Northrop a few weeks ago he mentioned that he had received a flying wing kit from Joe Martin of Kraft Systems along with a Kraft KP2S radio, and would we like to glue all the pieces together for a new products test report? Being an adventurous sort, the answer was "Why not?"

Joe's Wingmaster was designed initially as an R/C combat type of machine for fun and games. Several Wingmaster prototypes have been flying down in "Kraft Land," Escondido, California, in the past few months with great success.

The model is the ultimate in simplicity. It is comprised basically of a

pair of large foam wing cores that are covered with cardboard, all of which is furnished with the kit. A pair of wing tip rudder plates double as main landing gear mounts. Outboard stabilizer "wash out" plates transition into a pair of inboard elevons which complete the flying surfaces.

An engine is mounted to a profile type engine mount fabricated from pre-cut hardwood that is epoxied to the leading edge center section after the wing has been covered, joined, and reinforced with glass tape. The engine mount block is predrilled to accept a nose wheel steering strut.

The kit comes complete with "My-

lar" type hinge material, formed nose wheel strut, pre-cut balsa and plywood, as well as the covering material. Also included is a very complete and concisely written set of instructions which we followed to the letter. A series of isometric drawings makes it pretty hard to foul up the assembly of this model. It took approximately 4 hours to complete this model, including painting. Incidentally, we painted the "Bird" with K & B "Superpoxy."

*Continued on page 46*



The author of this report, and MB's western ad rep, Bob Upton, with test Wingmaster . . . K & B racing .40 up front. Total building time is 4 to six hours. Almost no balsa, greatly prefabricated.



The Wingmaster in a simulated pylon turn. Ship is quick, responsive, yet easy to fly.



Another shot of the new Antic biplane by Proctor, this one shown on the floats that are also available in kit form. Ain't that purty?

# RADIO CONTROL REPORT

By FRANK SCHWARTZ

● Trying to keep up with the Editor's deadlines is a task in itself! Down here in Tennessee we have had so much rain this winter that R/C flying has just about come to a standstill. We had hoped to have some glowing type flying reports, but at this writing we can't give you too many. How's that for a negative start?

Then, of course, there is that deadline that means the stuff has to be in Wild Bill's hot hands, so this month we'll try something different. Last month we had all those diagrams and such, so this time we'll try to tell you about some of the R/C goodies that have passed through our hands recently. Next month we'll give you a Sport Flyer's report of the Toledo show. In case you are vague on the "Toledo Show," it's this: Every year at the end of February, the Weak Signals Club of Toledo sponsors the biggest R/C show just about anywhere. Almost every manufacturer shows his newest goodies and there are so many R/C'ers under one roof at one time that it just about boggles the imagination. Month after that we'll try to give you a report on a short visit to Hong Kong and Japan. We'll try to take in a couple of hobby shops over there and see what is going on in R/C in that part of the world, as well as visit one of the Japanese R/C magazine headquarters (Radio Control Technique).

But back to the subject at hand. We wanted to take this opportunity to thank all of you who have written and those who have an encouraging word. It was thought this kind of R/C column might be just right and you have confirmed it. Thanks again, all of you.

It might be worth mentioning here that of all the Sunday/Sport flyers who wrote in, there is a large variety of types. Some of you like slope soaring, some just like to fly around, and one fellow even flies small R/C planes in back of his house. The variety is wide as far as interests go, and we'll try from time to time to touch on all of

them.

As for small R/C type planes, we suggest you write to Ace Radio Control, Box 301, Higginsville, Mo. 64037. Their 1973 catalog is ready and in it you will find a wide selection of R/C material available and most especially there is a concentration on the sport flyer and his needs. Ace specializes in small sport type planes; they feature a very small and light weight, as well as inexpensive, single channel pulse rig that will easily go in some of the 1/2 A type plane kits they offer. The little planes mostly feature foam wings ready-to-go, and the planes build up easily. Ace also has



Chuck Curtis flies MB editor's 1964 Duster design in Bozeman, Montana, where the 5,000 foot altitude requires a Fox 59. R/C rig is his own 6 meter unit. Heath capacitor feedback servos.





Mark Smith and his Jonathan Livingston Seagull model, covered in Feathercote . . . No?



Sterling's Lancer SL-62 is a lot of plane for the \$39.95 price tag. The kit has many features that promote fast and accurate construction for this sport and contest type airplane. For .60 engines.

a two channel expandable (to more channels, that is) digital kit that has caught on very well with those who like to "roll their own."

From the little planes to the Whopperoonies, we find old friend, Lou Proctor, has a new Antic Biplane. The kit is rather expensive, but is complete with all fittings and builds up very easily. We have an old shoulder wing Antic that was built five years ago, and it still looks and flies good. The kids love it. What's an Antic? This is a scale type . . . repeat type. It isn't actual scale but rather is a composite. Has working turnbuckles and is one of the most fun

building planes we ever built. If you want more info you can write to Proctor Enterprises Inc., P.O. Box 9641, San Diego, CA 92109. Their poop sheet really gives you all the details.

This column sounds commercial doesn't it? Well, nevertheless, it is hard to see new items appear and not get excited about them. What really grabbed us was a phone call from John Elliot, of Orbit Electronics, which was followed up a few days later by a big packet of literature on the latest Orbit R/C gear. The name Orbit is one of the oldies in R/C, and the company has always prided itself on being one of the

leaders at introducing the newest. Their latest rig features, among many new things, some open gimbal stick assemblies, and all their equipment goes through some unbelievable environmental tests before it is O.K.'d for delivery. One hobby shop dealer actually takes a cell from the battery pack, collapses the transmitter antenna, and flies demonstration flights with the Orbit rig . . . with only three cells in the pack. This will convince any doubting Thomas type as to the reliability as well as the quality of the Orbit system. They have a very comprehensive catalog and a

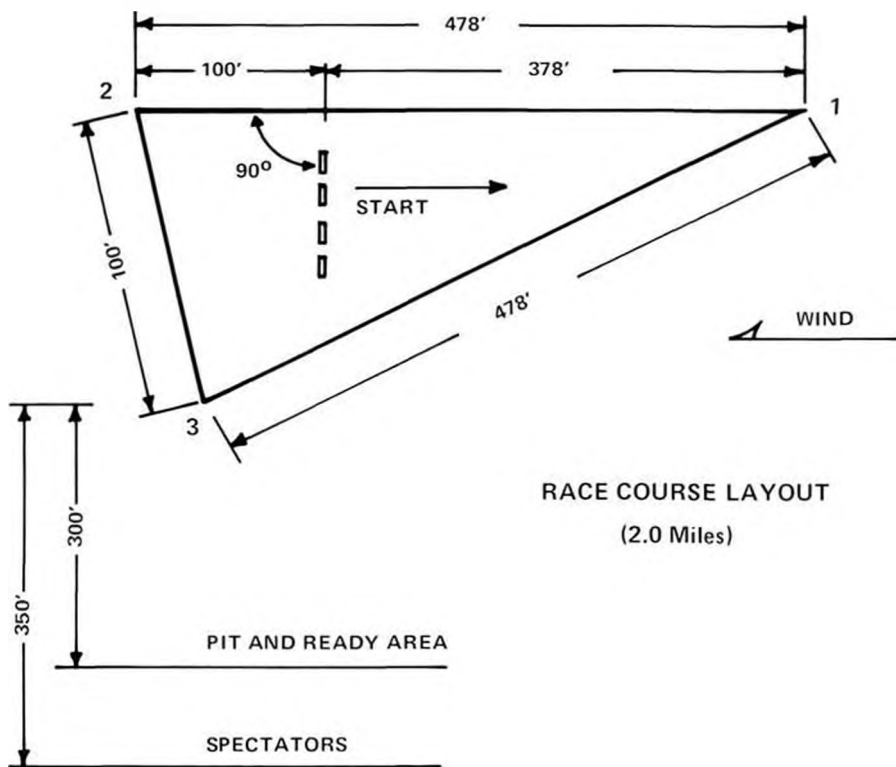
*Continued on page 62*



The RC Manufacturing Series 800 which Frank mentions in this column. Designer Ed Thompson created the famous Digitrio.



Van Highers, of Hobby Lobby, with the huge Senior Telemaster. It's impossible to keep up with the orders for this one. A trend?



# PYLON/4

A single set of rules for Quarter Midget racing was ground out during the Toledo R/C Conference. Try them on for size!

In a 5 hour meeting held on Friday afternoon, Feb. 23, 1973, during the Toledo Weak Signals R/C Conference, a common set of Quarter Midget racing rules were compiled and *agreed on* by a group of modelers representing various areas of the U.S. Thus, for the first time since the event came into prominence, all QMer's will be able to fly under one set of national rules and develop the event for AMA adoption.

Using reprints of the QMRC Rules which were published in the January '73 issue of *The MODEL BUILDER* as a basic outline, the group, under the direction of M.A.N.'s pylon editor Cliff Weirick, and monitored by MB's editor (as R/C Contest Board Chairman) took each section of the rules, point by point, and hashed it out to a conclusion. Naturally, there were strong disagreements in certain areas, but through head-to-head discussion, gracious concession, and Cliff's firm hand during occasional impasses, the job was done.

Voting representatives at the meeting included; Bill Cooper, Louisville, Ky.; John Elliot, Santa Ana, Ca.; Gale Jacobson, College Park, Ga.; Bob Penko, Kirkland, Ohio; Bob Reuther, Nashville,

Tenn.; Pete Waters, Livonia, Mich.; Ernie Weiss, Oakhurst, N.J.; Steve Warren, Toledo, Ohio; Bob Browning, Chicago, Ill.; and Jack Clark, Des Moines, Iowa.

The rules that follow represent the decisions made at Toledo. Some of the wording has been revised to suit AMA rule book language, but none of the intent has been changed. It is hoped that QMer's around the country will race according to these rules throughout 1973 so that any possible problem areas may be discovered before the Contest Board passes them into provisional status for 1974.

Anyone wishing a reprint of the rules that follow may send a stamped, self addressed envelope to *The MODEL BUILDER*. Groups desiring more than one copy, send 5 cents per copy in stamps or check.

## PYLON RULES

### 1. OBJECTIVE

To provide closed course racing for the sport flyer and novice racing enthusiast.

### 2. GENERAL

All AMA and FCC regulations covering the R/C flyer, his plane, and equipment shall be applicable to this event,

except as noted herein. The contestant shall be allowed an unlimited number of entries provided all of his back-up airplanes are on the same frequency as his number one model. Alternate models will be used only if the first is not flyable. The contestant may not return to his first plane until it has been checked by the C.D. Consideration for the safety of spectators, contestants, and contest personnel is of the utmost importance.

### 3. MODEL AIRCRAFT REQUIREMENTS

Models entered in this event shall be semi-scale or recognizable replicas of propeller driven aircraft that have been designed for or have competed in closed course, speed record attempt, or cross country racing. No deltas and/or tailless type aircraft shall be allowed. In the case of unusual or little known designs, the flyer shall produce documentation to verify that such a plane or special design did exist.

### 4. ENGINE(S)

Total displacement shall be not over 2.60 cc (or .1524 cu. in.). Engine(s) shall be stock R/C types (no reworking) of which at least 1000 shall be available through normal (?) retail channels in the U.S. The carburetor, whether included with the engine, or one which is specifically cataloged for the particular engine by another manufacturer, shall also be one of which 1000 is available through normal retail channels in the U.S.

No crankcase, exhaust, muffler, or other type of pressure shall be applied to the fuel tank(s). [No pressure of any type, other than atmospheric, shall be applied.]

No diesel engines will be allowed.

### 5. MUFFLERS

Only commercially available mufflers shall be utilized if so required and specified in advance by C.D. No tuned pipes.

### 6. ACCESSORIES

Items such as wheels, spinners, and general hardware shall be commercially available through normal retail channels and be available in quantities of 1,000 or more.

### 7. PROPELLERS

Two bladed fixed pitch propellers, commercially available through normal retail outlets shall be used. Material may be removed from one blade for reason of balance only. The other blade must remain unaltered.

### 8. SPINNERS OR PROP NUTS

A rounded spinner or AMA prop nut shall be used.

### 9. FUSELAGE

At the widest point the basic fuse-

*Continued on page 60*



## ESPIRITU DE SAN LUIS

DAVE THORNBURG brings us the little-known story of a famous south-of-the-border aeroplane of yesteryear. Lines of the small craft may look vaguely familiar, but scale is scale, and never the twain small meet.

● The year 1972 was a memorable one for the small Central American country of Burlazon: it was the year of the Carloston, a dance craze that swept the small republic like a Caribbean hurricane; it was the year that Enrique Ford, father of the country's vast and profitable sandal industry, finally dropped the venerable all-leather Model T (for *trasto*, "antique") in favor of the radically new Model A (for *abatarar*, "to improve") a sandal made entirely from used automobile tires. And it was the year that a little-known stunt pilot, Carlos Aguila, captured the imagination of the entire western world by flying his small single-engine monoplane, the *Espiritu de San Luis*, across the Caribbean to San Juan, Puerto Rico, alone and singlehandedly (his left hand was in a sling, having been caught the week before in a hydraulic retractor at the Ford Sandal Works, where he moonlighted.)

Aguila warmed the stout hearts of newspaper readers everywhere by modestly insisting to the San Juan reporters that he had had no intention of performing so celebrated a feat. "I was merely flying formation with a flock of seagulls," he said, "when my omni shorted into my autopilot and I found myself hopelessly jammed onto a skip signal from San Juan. I slept most of the way." Newsmen who heard this explanation merely laughed and dubbed Aguila

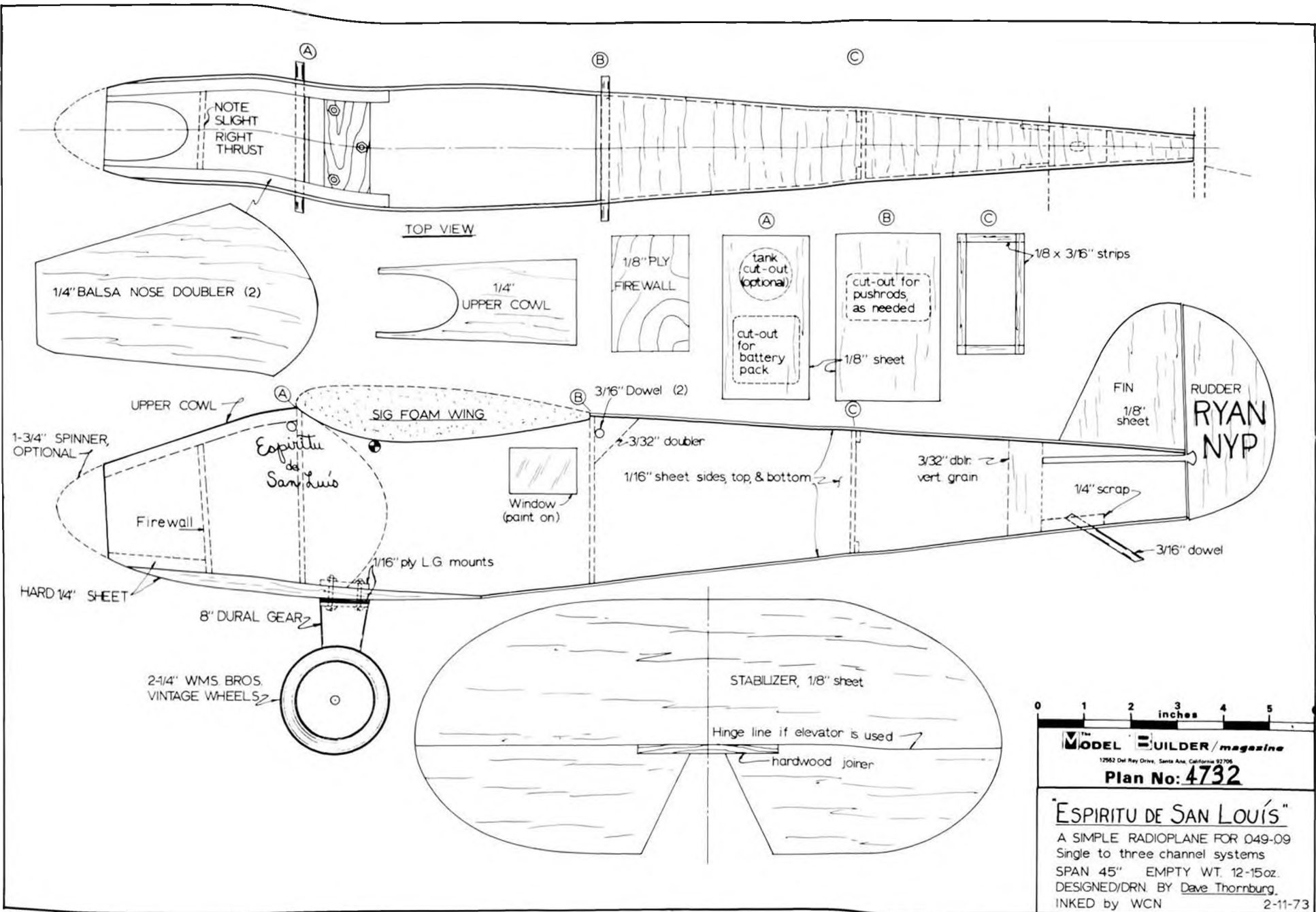
"The Lone Seagull;" then, stuffing their notepads into their pockets, they pitched in to help the admiring crowd save the airplane from posterity.

And what an airplane it was, before the crowd reworded it! You could tell at a glance that it must have been designed by a modeler. Its tail moment was daringly short, its rudder and stabilizer petite . . . it had more area in its

maze of wing and undercarriage struts than in its entire empennage. Unfortunately for the exacting scale modeler, no drawings were ever made of this intricate strut pattern, and the originals were claimed by the fans and well-wishers of San Juan. In other respects, however, the model presented here is a roughly accurate copy of the original *Espiritu*, the skeletal remains of which



The Kraft 2-channel brick rests comfortably in the fuselage. Balance was achieved without placing the battery pack way up in the nose, though there is room for it.



0 1 2 3 4 5  
inches

**MODEL BUILDER** magazine  
12962 Del Rey Drive, Santa Ana, California 92706

**Plan No: 4732**

**"ESPIRITU DE SAN LOUIS"**  
A SIMPLE RADIOPLANE FOR 049-09  
Single to three channel systems  
SPAN 45" EMPTY WT. 12-15oz.  
DESIGNED/DRN. BY Dave Thornburg,  
INKED by WCN 2-11-73

FULL SIZE PLANS AVAILABLE - SEE PAGE 64

were destroyed in a museum fire during Burlazon's Glorious Revolution of 1929-1968.

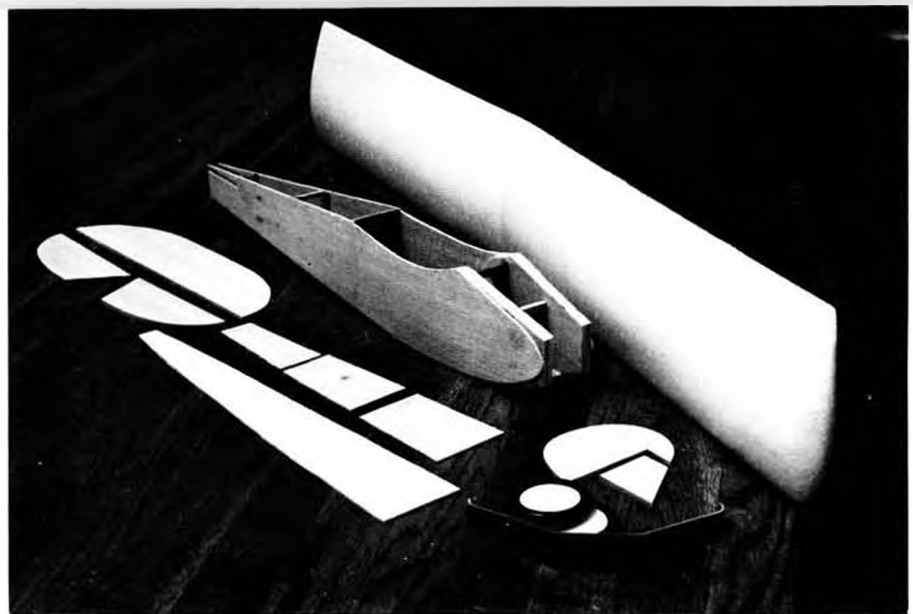
As a nostalgic, sentimental, history-minded, forward-to-yesterday sort of person, you will probably want to build a model of this famous airplane. The editor will like that; for a trifling sum he will send you full-size plans (be advised that trifling is now more expensive than it formerly was.) Meanwhile, assemble for your convenience the following materials, borrowed or bought:

- A 45 inch Sig foam wing;
- Two pieces of hard 3/32 x 4 x 36 for the fuselage sides;
- A sheet of even harder 1/16 x 2 x 36 for the top and bottom;
- A sheet of incredibly hard 1/4 x 3 x 36 for the noseblocks;
- A piece of medium 1/8 x 4 x 36 for the empennage;
- A scrap of 1/8 plywood for the firewall and two smaller scraps of 1/16 plywood for the landing gear mounts;
- A foot of 3/16 dowel;
- Epoxy and white glue;
- A dural landing gear blank;
- A pair of 2-1/4 inch Williams Bros. antique wheels;
- An appropriate (hot .049 to meek .09) engine;
- And a couple of hundred bucks worth of radio!

A small 3-channel digital and an .09 make the optimum combination; for two channel (one hundred bucks worth), use rudder and elevator and an unthrottled .049. Try to stay under 12 ounces radio weight, to avoid scale flying characteristics. If the entire airplane, ready to fly, can be kept under 27 ounces, then you too will be able to fly it singlehandedly - - instead of singlemindedly, as most small RC's have to be flown.

If you're new at this business, begin construction with the wing to gain confidence. Hold a 45 inch Sig foam wing in your left hand and paint on one coat of Sig white Plastinamel with your right (*A brush is neater. WCN*). When this is thoroughly dry (usually 2-3 days) spray it lightly with aluminum-colored butyrate dope. This completes the wing construction - - don't RC planes go together easily? . . . Wait 'till you see them come apart!

The fuselage is only a bit more complex. Cut out one side by the plans, then use the first side to cut out the second . . . that way, even if they don't look like the plans, they'll look like each other. Whack out two 1/4-inch doublers from good hard stock, and while the wood's handy cut out the top and bot-



The Sig foam wing contributes a big short cut to the construction. Cutting out all parts prior to the start of building also makes things go faster. Newest silver Monokote would look great on it.

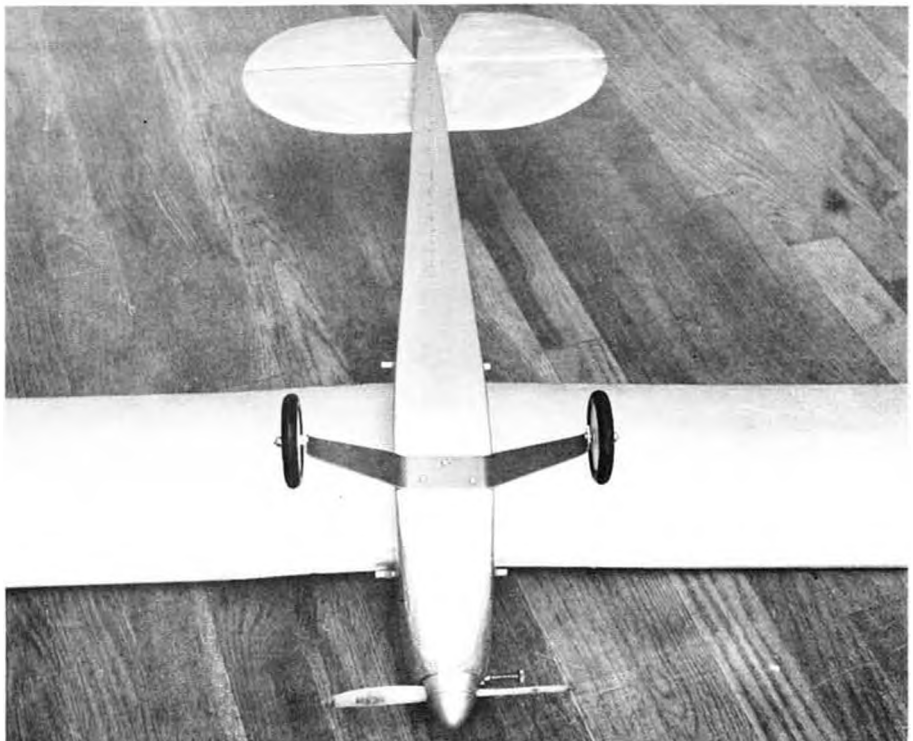
tom cowl pieces as well. Cut the formers from 1/8-inch balsa, keeping the grain horizontal for maximum squeeze-prevention.

The firewall is 1/8-inch plywood. It's not really for preventing fires . . . it burns very well when it becomes fuel-soaked . . . but it comes in handy for mounting engines. That's why it's called a firewall. If you plan to use an engine without an integral tank, you'll want to cut an additional hole in Former A for a 1-ounce nylon clunk tank, which will almost certainly leak on your battery pack . . . but that's what you get for not flying sailplanes (*If you insist on going through with it, put the battery pack in a Baggie to protect it. WCN*). Plan your

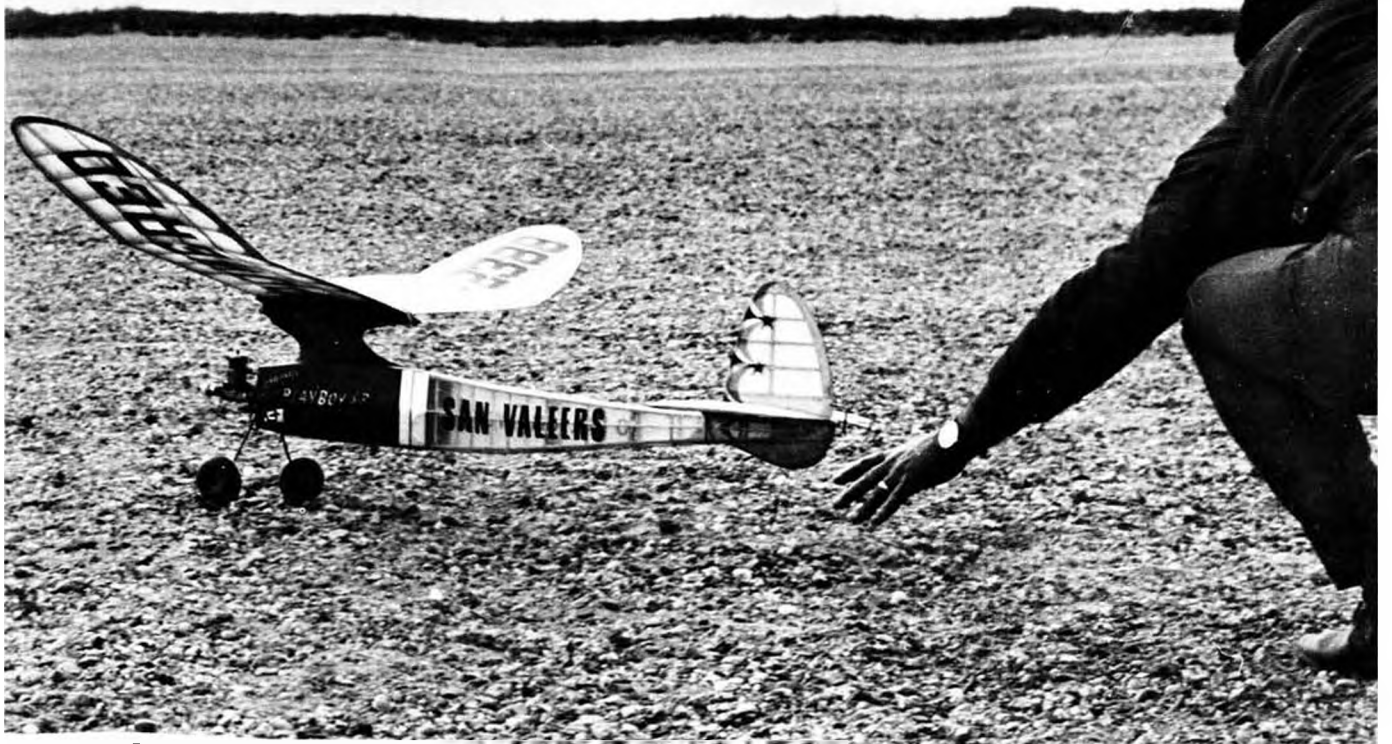
engine installation now, drilling the appropriate holes in the firewall for engine mounting, fuel line, throttle push-rod, etc.

Glue the doublers to the fuselage sides, then assemble the sides around the firewall and Former A, aligning things over the top view on the plans. The downthrust isn't too critical unless you are planning to fly the plane rudder only, but the right thrust is good for everybody. When the firewall is dry, pull the tail together around Formers B and C. Don't omit the doublers in the rear section: the triangle beefs up the wing dowel and the one in front of the stabilizer slot is a must for preventing

*Continued on page 46*



Dave says this is the typical landing position of the model. We hope Carlos Aguila was a better pilot. That wouldn't be a very dignified landing position after crossing the Caribbean!



Bob Hunter, Open Sweepstakes winner at the Phoenix Southwestern Regionals, releases his K & B 29 RR powered Playboy Senior.



# PLUG SPARKS

What's the difference between Old Timers and Antiques, ignition and glow rules? How do you get reliability from an ignition engine? We've got answers this month. You too young to remember "Vic and Sade?"

## SAMCHAMPS!

The Society of Antique Modelers (SAM) will hold its 7th Annual Championship contest on June 19, 20, and 21, 1973, at Taft, California. This year's affair will be co-hosted by the Southern California Antique Model Plane Society (SCAMPS) and the Southern California Ignition Flyers (SCIF's).

Contest Director for the meet is

John Pond, 4135 Avati Dr., San Diego, California 92117, and Contest Manager is Gene Spence, 618 N. Lincoln, Taft, California 93268. Contact John or Gene for detailed info on events, awards, meetings, socials, etc., all related to the contest. Motel info is also included.

The contest events include; A Pylon, C Cabin, Combined Rubber and Scale (June 19); B Pylon, A Cabin, .020

Replica, 30 Second Antique, "Texaco" Dawn Patrol (June 20); B Cabin, C Pylon, Unlimited Antique and "Old Ruler." If some of those event names leave you scratching your head, check the complete run-down of SAM rules presented further on in this column. O.T.'s AT PHOENIX

Roger Gudahl, who paid a higher price than he cared to (his Comet



Tom Cope, Issaquah, Washington, and his Arden 199 powered Megow Ranger at Bong, 1972. All Bong photos by Bob Watson.



Joe Beshar, from New Jersey, at Bong with his OS Max .35 powered Zipper, on R/C.



Herb Wahl, Pennsylvania, at Bong, with Hurlman .46 powered Comet Clipper Mk I. Note dethermalizer set-up.



Jack Chilmark, a member of the famous Connecticut "Flying Aces" with Ohlsson 60 powered Buccaneer.

Clipper I with O&R 60 aboard flew O.O.S. and has not been heard from since!), won first in O.T. Cabin at the Southwest Regionals, Buckeye, Arizona.

Reporting on the O.T. events at this January 20 and 21 contest, Roger points out that it was very windy and cold both days, so much that on Saturday, official flying in O.T. Cabin was non-existent until late afternoon. There were 5 entries, with Roger first (140, 180, 159-479) Mark Carman second (Long Cabin; 92, 67, 61-220), and Mark Fechner third (Bombshell/Super Cyc.; 47, 160-207).

On Sunday, H. Lee took first in O.T. Rubber (Stickler; 180, 180, 175-535); T. Cunningham second (unknown; 70, 170, 180-420), Jim Quinn third (unknown; 168, 66, 146-380).

In O.T. Pylon, R. Wubben's Eastern States Champ/Cyclone was first (180, 180, 180, 100-640); W. Conley was second (Playboy/O&R 60; 180, 180, 180, 0-540); and G. Davies took third (Playboy/Cyclone; 108, 180, 180, 0-468). There were 10 entries in the latter event, 6 in rubber.

Roger has a regular O.T. "Air Force," as the picture he sent along illustrates. Starting at the lower left and moving clockwise, you'll see a Demon/Forster 29, Rocketeer "A"/Arden 19, Buccaneer 48/O&R 23, Interceptor/Arden 19, Bombshell/Super Cyc., Zipper/Madewell 49, Brooklyn Dodger/Forster 29, Clipper/O&R 60 (The one that went O.O.S. . . . sniff!), Sailplane/Anderson Spitfire, Clipper/Madewell 49, and Snuffy/Arden 19. Quite a squadron!

#### THOSE SAM RULES

Following are the SAM rules as published in "SAM SPEAKS," official publication of the organization, Carl Nye editor:

#### RULES

**PREAMBLE:** The competition flying of free flight model aircraft of vintage design is intended to be casual, enjoyable and interesting for both competitor and spectator alike. It is neither desired to

advance the state-of-the-art of aeromodelling, per se, other than to increase participation in the sport generally, nor to prove again that which is already recorded in aeromodelling history books. The intent of these rules is to categorize the basic types of vintage models and establish an equitable and simple framework of regulations for competition purposes. Therefore, model designs that revolutionized free flight competition and necessitated the formation of two basic classifications, "ANTIQUE" and "OLD TIMER," are expected to compete in the Old Timer events.

#### SECTION I - Definitions and Basic Regulations

1. Old Timer and Antique categories are defined as model aircraft which have been designed, or kited or for which plans had been published, prior to December 31, 1942 and December 31, 1938, respectively. Authentication of design is responsibility of Contestant.

2. Models shall be flown in one of the following categories:

- A. Antique
- B. Old Timer Pylon
- C. Old Timer Cabin (defined as a model having the wing mounted upon a cabin enclosure similar to that of a full scale aircraft)
- D. Old Timer Rubber (cabin and stick)
- E. Vintage Special Events

3. Antique Category models shall be powered with ignition engines only and shall be divided into two events: Fuel Allotment Antique (6 ft. minimum wingspan) and 30 Second Antique (no size limitations)

4. Old Timer Cabin and Pylon models shall weigh a minimum of 8 ounces per square foot of wing area (planform).

5. Ignition engines are defined as those engines using a spark plug,

*Continued on page 56*



Roger Gudahl's "O.T. Air Force" is fully described in the text.



Fastest 1/2A kids in the west! Proto (profile) is really a family affair with the Westbrooks. At the So. Calif. Controlliners Assoc. Western Champs held at North Island Naval Air Station, John (center) was 1st at 84+ mph, Rick (lt) 2nd at 78+, and Eddie (rt) 3rd at 77 mph.



● A lot of letters from column readers want to see a discussion of pure basics of hardware--what works best and how to use it. Let's consider lines for a while. Not much choice there, you say? How about deciding what length is best for different airplane sizes? Line diameter requires some thought too . . . and, we might as well think about the handle and line connectors while we're at it.

Let's assume the basic aim is not competition flying under AMA rules, because some of those, as they apply to the real world of model airplane safety, are becoming ridiculous and they just foul up the sport flyer. We want to select lines that make the airplane fly best with safety. Nobody bothers to use solid lines any more because their inconvenience offsets any aerodynamic and cost advantage.

Solids bind up after a few consecutive loops, making control difficult. They also kink too easily, and once kinked,

## CONTROL-LINE

By Dick Mathis

break more frequently than braided types. They are smoother aerodynamically, however, so they give more speed due to reduced drag. To me though, they are also heavier feeling and seem prone to causing the airplane to jerk inward in sharp directional changes unless corrections to the airplane's trim are made (like more tip weight). I think

Bill Werwage, the reigning world stunt champ, is still using solids for their aerodynamic advantages but he is rather more serious than most flyers.

Braided lines are almost universal now because they can be walked on, get twisted, grimey and slimey and still work. They can be bought over the counter ready-to-use in lengths of 26,



Navy Cdr. A. W. S. Snyder, a former Aviation Machinist's Mate, mechanicked 9 speed planes for his three children at the North Island contest, where he was also the representative host.

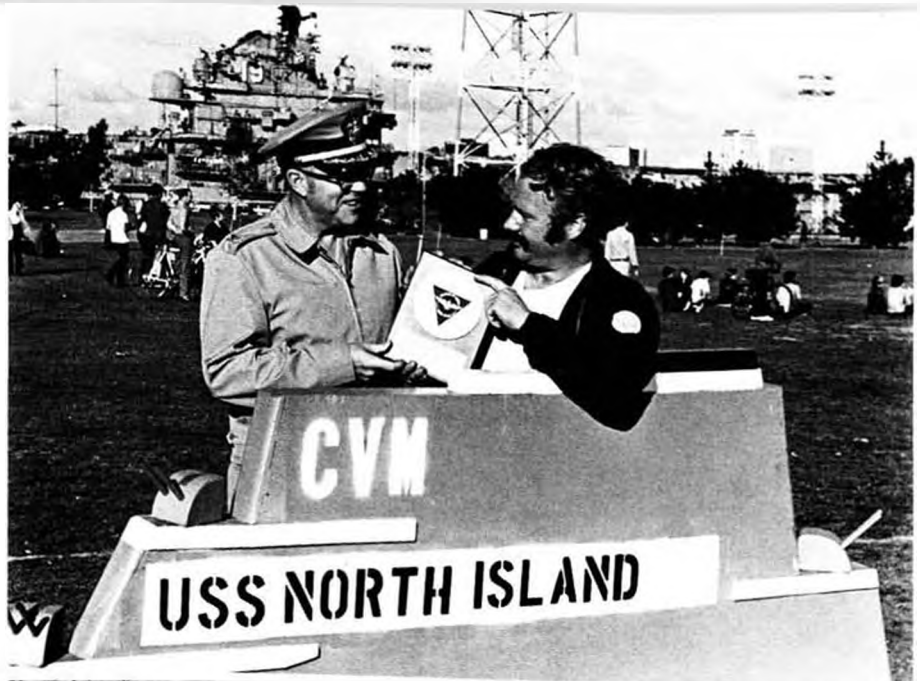


35, 42, 52, 60, and 70 feet. Diameters available are .008, .012, .015, .018, .021, and .027.

Play like you have a Ringmaster with a McCoy (Testors) .35 motor. The most suitable lines for its size and speed will be the longest and smallest you can use without overloading the airplane with drag or causing safety worries. Usually that would mean 60 feet by .015. If you used 52 foot lines, it would seem too fast, but it would be much easier to keep out on the lines (more centrifugal force caused by same speed but smaller diameter flight path). The shorter lines (same diameter) would be good only for learning to fly where line tension is always a problem. They would become unpleasant later on as you fly more because of the seeming greater speed, and the extra line pull gets tiring on the arm. For .15 powered trainers such as the Snorky, I would suggest .012 diameter by 52 foot lines. Primary trainers with .35 power should use the same length but .015 diameter.

How about the 1/2 A types? Lines affect the flying characteristics of 1/2 A's more than any other type because they are relatively more handicapped with their low power and tiny size. If you've never flown a 1/2 A on steel lines you will be amazed at how much better they work. Nylon, dacron or any other non-metal lines are not recommended. They billow in the wind, stretch unevenly causing uncertain feeling controls, and are just generally a mess to fly with.

Plastic ready-to-fly 1/2 A's do fine on 26 or 35 foot by .008 lines. Half-A combats are perfect on 35 foot by



North Island's commanding officer, Capt. Robert P. McKensie, presents command plaque to Fred Bauschbaum. Superstructure is new CVM North Island, to be used for sanctioned contests.

.008's. Larger aerobatic 1/2 A's need 42 foot by .008's. These are available from the Sig line and you will have to tie them off yourself, but it's worth it. Up until now, all of the lines mentioned are available in the Pylon line.

If you have a scale type airplane that is overweight, underpowered, tail-heavy, as they all are, the best lines to use would be 52 foot and either .015 or .018, depending on how big the engine is. This way, there will be good line tension and it will be possible to "whip" more effectively if the need arises. "Whipping" is leading the ship around with exaggerated arm motion. The longer the lines, the less effective whipping can be to increase speed, control, and line tension.

About the only case where lines longer than 60 feet are good is with .45 or bigger engines on very large airplanes that are capable of handling a lot of line weight and drag, like a Shark 45. With some .35-.40 powered stunters, it is possible to use 65 foot lines to advantage. The big reason for longer lines is to make things happen slower so the old reflexes can keep up!

While .018 by 60 foot lines are required for AMA combat contests, few of the kits available were designed for them, so sport flyers should use .015's, which are plenty safe and fly a lot better. FAI combat lines are perfect at 52 foot by .012 and they are legal too. Lines 52 feet by .012 are just about

*Continued on page 49*



Jet speed team of Jerry Thomas and Jim Wade won first with 196.68, but couldn't back it up so had to settle for 191.67 record. They could probably gone faster except for an undiscovered air leak!



"Sounds like a C sharp. Blow in my ear again and I'll follow you anywhere!" Dusty Rhoads toots the tailpipe as Norm Drazy listens for air leaks that can cause loss of power . . . and speed.



The finish paint job on Fernando's Messerschmitt ME 109E-3 added only 1.3 grams to the total weight. Read how he does it!

## FREE FLIGHT SCALE

By FERNANDO RAMOS

● Seldom does one ever find a painted rubber powered flying model (that flies well). Weight is just too much of a penalty factor in the endurance and performance of this kind of model, and the fancy paint job just won't do. Therefore, colored tissue is usually the only way that a "paint scheme" can be accomplished, and as you all know, there are about six colors of tissue to choose from. Well, you needn't be limited any more! There is a way that rubber models can be "painted" or even camouflaged, with very little appreciable weight gain. The intent of this article is to show you how this can be done.

Several years ago, while preparing a rubber model of Art Chester's Goon for the Flightmasters Annual, we came to the realization that for a cream colored aircraft, white or yellow tissue wouldn't do. We had hoped to take cream colored dope and add a little of it to some clear dope, and then spray on a light coat of this mixture. Unfortunately, the cream dope on hand had dried out completely. On top of that, it was the evening before the contest! (For sure, none of you have ever found yourself in this situation before, right?) To make a long story short, in a move of desperation, we tried mixing some model railroad paint in with the clear dope. To our pleasant surprise, it worked; it was compatible with the nitrate dope we were using.

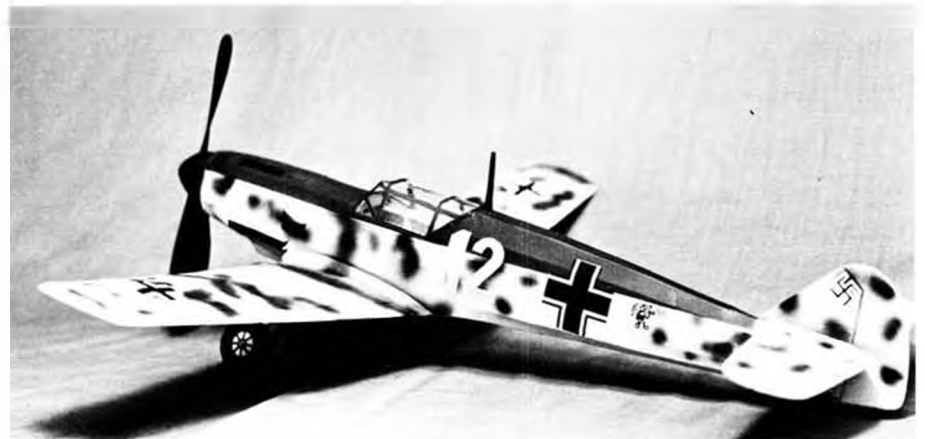
The model railroad paint we used is

Floquil. I am sold on this product in more ways than one. Probably one of its greatest assets is that the pigment used in Floquil is ground extremely fine. The advantage here is that it takes very little paint to cover, and a little paint means a little weight. Before continuing, we should mention that this technique ought to be done with an airbrush. This is really the only satisfactory way to do an adequate job, because with the airbrush you can "fog" on a coat of paint without weight build-up. Larger spray guns will work, but they are more difficult to control on smaller models. (There will be a future article on the various kinds of airbrushes and their uses).

The model we have chosen for this project is the Messerschmitt ME 109E-3 of I/LG2 at Calais-Marck, and the color

scheme was taken from the book titled, "The Ausberg Eagle," written by William Green. This book has the whole story and evolution of the ME 109 with more color schemes (in actual color) than one can imagine. The 109 has long been a favorite of ours, and is a good flying subject. We did not try to make this an ultra light contest model, but one to show this system of finishing a rubber model. We deliberately picked out a plane with a fairly wild color scheme to show that this method will not appreciably increase the weight of your model.

When you go into a model shop that carries Floquil you will not be able to buy it in Cub yellow, or Stinson red, etc., but rather in Reefer Yellow, Caboose Red, Rust, etc. The variety of



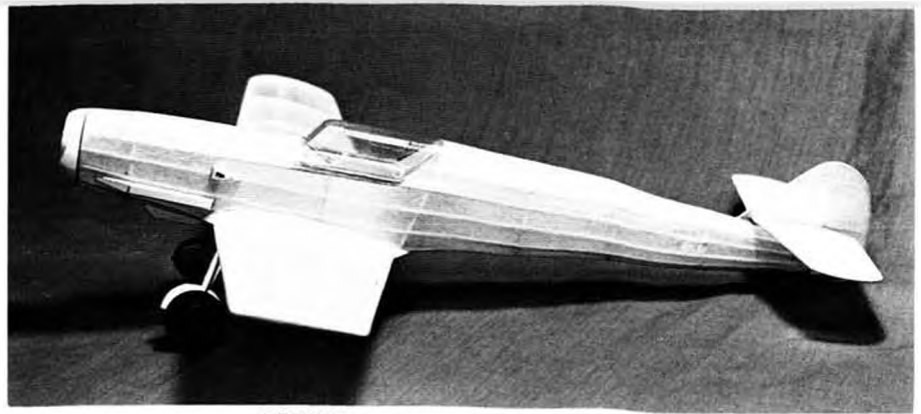
Another view of the finished product. Total weight of the plane is only 31.3 grams, without prop and rubber.

colors is such that mixing to obtain the particular color one needs is very easy. In fact, many colors can be used just as they come. For example, Roof Brown resembles very closely the brown or kaki used in WWI, usually made from lamp black and ochre. Pullman Green is only an eyeball away from olive drab and so on.

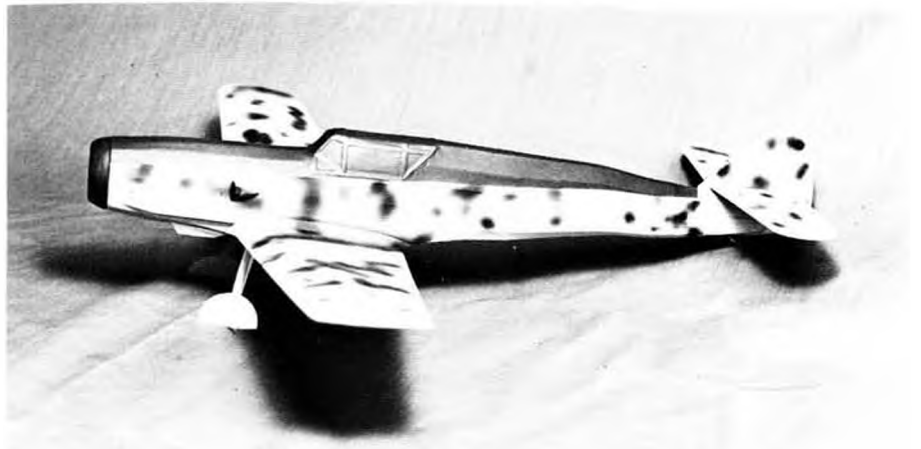
Our demonstration model was covered with white Japanese tissue, and given only one coat of thinned, plasticized nitrate dope. The plasticizer used is tricresyl phosphate (TCP). (TCP is available from the following chemical supply house, which has many branches all over the U.S.: Sargent-Welsch Scientific Co., 1617 East Ball Rd., Anaheim, CA 92803; for the Midwest, 7300 N. Linden Ave., Skokie, Illinois 60076; and for the South, 5915 Peeler St., Dallas, Texas 75235 . . . wouldn't exactly call Dallas South, but more South than Denver right? And for the East, 35 Stern Ave., Springfield, N.J. 07081. We would recommend using a business letterhead for ordering or they may not sell to you. Unauthorized people cannot easily buy chemicals. TCP runs about \$3.00 a pint.

O.K. Back to the project. First mix the paints to the colors that are required for a particular plane. The sky blue was made by using Reefer White as a base plus Light Blue and a dab of Reefer Grey. For the upper part of the wings and tail we mixed Reefer Grey, and a pinch of Pullman Green. The dark green required for the upper part of the fuselage, and the mottle color, was made by using Pullman Green, Light Green and Engine Black. Once the colors are mixed, add them into bottles containing clear NITRATE dope. CAUTION . . . this method will *not* work with butyrate dope. We prefer using nitrate dope for all model work, and it can be found at most aircraft supply houses located usually on or adjacent to airports. We thin the mixture to a 50-50 ratio, using laquer thinner, then add about 10 drops per ounce of TCP. It is imperative to strain the paint before using it in the airbrush, otherwise you'll have it stopped-up in no time at all.

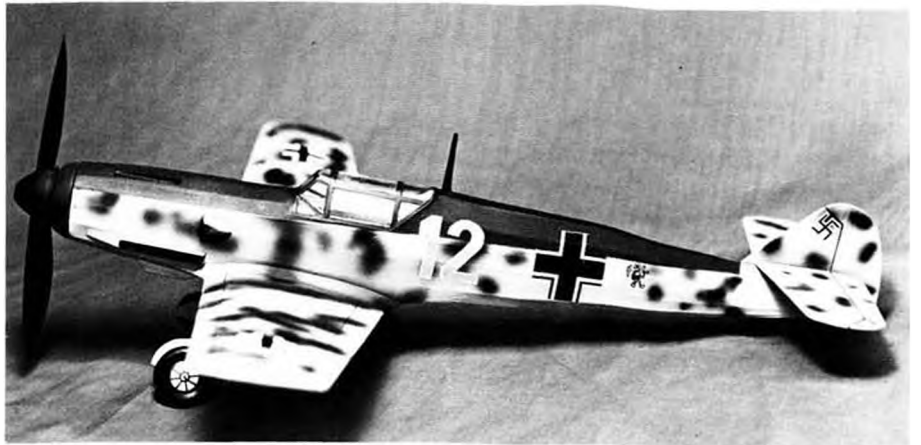
The model of the ME 109 weighed 30 grams, covered with only one coat of clear dope. More dope is not necessary, you only build up weight. All light colors should be applied first. If you want to paint on the markings such as the crosses, you would first spray a coat of reefer white in the respective areas. When dry, simply cover the area with a cross pattern cut from frisket paper. Don't use regular masking tape



BEFORE . . . . .



DURING . . . . .



AFTER . . . . .

or you'll tear the tissue as you pull it off. We used decals in order to save time.

We sprayed the entire underside of the model with the sky blue. The technique here is to *lightly* fog on an even coat of paint. If you don't and lay on the paint like you would for a gas model, you'll find small pin holes in the covering caused by having only one coat of clear dope underneath. It's better to apply another light, dry coat than to try finishing in one application. If the pin holes do show up, there's only one remedy, and that is to brush on more clear. So, here goes the weight build-up; therefore just take your time

and do a good job.

The very top of the fuselage is dark green and has a definite parting line. This was masked off using drafting type tape. This kind of tape has less adhesive, and it won't tear the tissue covering when you remove it. The edges were given a spray coat of clear dope to seal them, then the dark green was applied. By this time you should be amazed at the covering power of these mixtures, due of course, to Floquil. The mottle effect on the wings, tail, and fuselage is easy to do using the airbrush, and after painting the top of the wings and tail; this was next. Detail steps

*Continued on page 44*



Some of the winners at the North-South meet: (l to r) Mark Smith, Jim Haldy, Steu Horton, Fred Weaver, Jeff Walters, Rick Walters, John Baxter (Over all winner for the third year), Bill Hinman, Buck Faure, Kneeling is Hans Langer, while Konrad Nierich does the Al Jolson bit.

# R/C SOARING

By LE GRAY

This month, Le gives way to BARBARA HENON, for a first hand report on the Third Annual North-South battle of sailplane enthusiasts. Photos by Dick Shilling.

●The third annual North-South Challenge meet was held at the Famoso drag strip near Bakersfield on January 27-28. The original premise of the contest was spirited rivalry between soaring clubs of Northern and Southern California, but with 100 entrants from 16 different clubs as far away as Phoenix, Arizona, as well as individual participants who were not members of any club, the contest has become less of a team event and more like any open contest. Although the North was represented by only 18 of the 100 contestants, their top five pilots thrashed the South's top five by 1500 points. John Baxter of the South Bay Soaring Society was the overall winner for the third consecutive year with 7334 out of a possible 8000 points. Placing second in the speed and duration events, he flew an orange and purple prototype of the Soarcraft Kestrel (Marketed by Windspiel). Second and third were the well known competitors Rich and Jeff Walters of Saratoga, flying their inimitable "White Trash."

The first flight of the contest got underway a mere three minutes behind the scheduled 0800 launch time. The weather was cold, with frost on grass and cars, but later warmed to provide plentiful thermals. Sunday's weather

threw a scare into those staying in Bakersfield as we awoke to 30 mph winds. Twenty miles away at the contest site, however, the air was calm, providing just enough breeze for a good launch.

In precision rounds, interesting techniques were displayed by some of the pilots. Rich Walters, winner of this event, spirals his White Trash in front of the landing circle until just before touchdown and manages to land very

close to the spot at exactly or almost exactly on the prescribed time. Mark Smith of the Torrey Pines Gulls, who placed third in this event, was seen touching his Windfree down outside the landing circle on the exact time and then bouncing it into the circle to hit the spot.

Speed events were interesting in this contest because of a rule change that planes must fly at the same weight throughout the contest. In former con-



Windspiel Models' Pete Bechtel, Harry Menke, and reporter/contestant Barbara Henon, holding Astro Flight AS-W17. Barbara was winner of the 1972 LSF Tournament.



Glider guiders soon became oblivious to the crop duster that was in and out many times during the contest, for purposes of reloading.



Mike Fox urges his Grand Esprit past the end pylon of the speed course. The only obstruction at Famosa field is the ground!

tests, pilots would add as much as two pounds to the CG to get more speed from low wing loading planes.

This event was won by Konrad Nierich of the Harbor Soaring Society, flying a Tern, designed by Ralph Grose. This plane features full length, self compensating flaperons, no dihedral (negative when at rest), and is equipped with a thermal sensor. The plane weighs in at 7 lbs. with a wing loading of 18 oz. Most impressive! Konrad's fastest time for the two lap 300 meter course was 41 seconds. Dave Shadel, of the Soaring Union of Los Angeles flew his Dodgson Design Todi to a close third place behind of pro John Baxter. As the first and third place planes both had flaperons, this aerodynamic "gadget" looks like a real help for the speed event. Hans Langer placed fifth in speed by bravely flying his full scale ASW 15 in open competition. The model has ailerons, spoilers, and a retractable landing wheel.

In spite of the no weight change rule, Rich Walters managed to turn in a respectable 57 sec. round with White Trash, indicating that pilot skill is often more important than wing loading. In Saturday's competition, only about 2/3 of the pilots managed to complete the speed course. By Sunday's flight, either because of practice or realization of the heavy penalty in scoring, only three pilots failed to complete the course.

Duration was won by Jeff Walters and his White Trash with a perfect 4000 points. He was followed closely by the ever present John Baxter, and Ken Wagner of the San Fernando Valley Silent Fliers was third with his Cirrus.

This years contest was run by the Torrey Pines Gulls of La Jolla, California, Buck Faure, President of the TPGs, served as contest director as well as a very entertaining master of ceremonies at the Saturday night banquet at the Ramada Inn. Faure also flew in the contest, placing eighth overall. The events and organization of the contest were modelled after the 1972 LSF contest with contestants grouped into flight

groups. Fliers from one group were called upon to time fliers from other groups. The timing task was sweetened by giving the timer of each round a chance on stopwatches that were awarded at the end of the contest.

Rod Smith, as winchmaster, incorporated improvements in the winch system which allowed the contest to run smoothly both days. No noticeable delays were caused by line breakage or tangling, and when the fourth round was completed at 3:30 Saturday, 400 flights had been launched!

Scores were promptly computed by

George Lounsbury and displayed after each round for all to see.

This was the best contest yet in terms of organization and planning, as well as efficiency, in getting a large number of flights flown in a short time. It would also seem that the level of performance and skill of the fliers has improved tremendously with many more making the spot, hitting the time, making good time in the speed events and, of course, finding the old thermal. All of which means there's going to be a lot of practicing going on between now and the

*Continued on page 49*



Dick Shilling launches his WIK Kestrel as Barbara lends a hand on timing. Harbor Soaring's Jim White seems to be official timer.



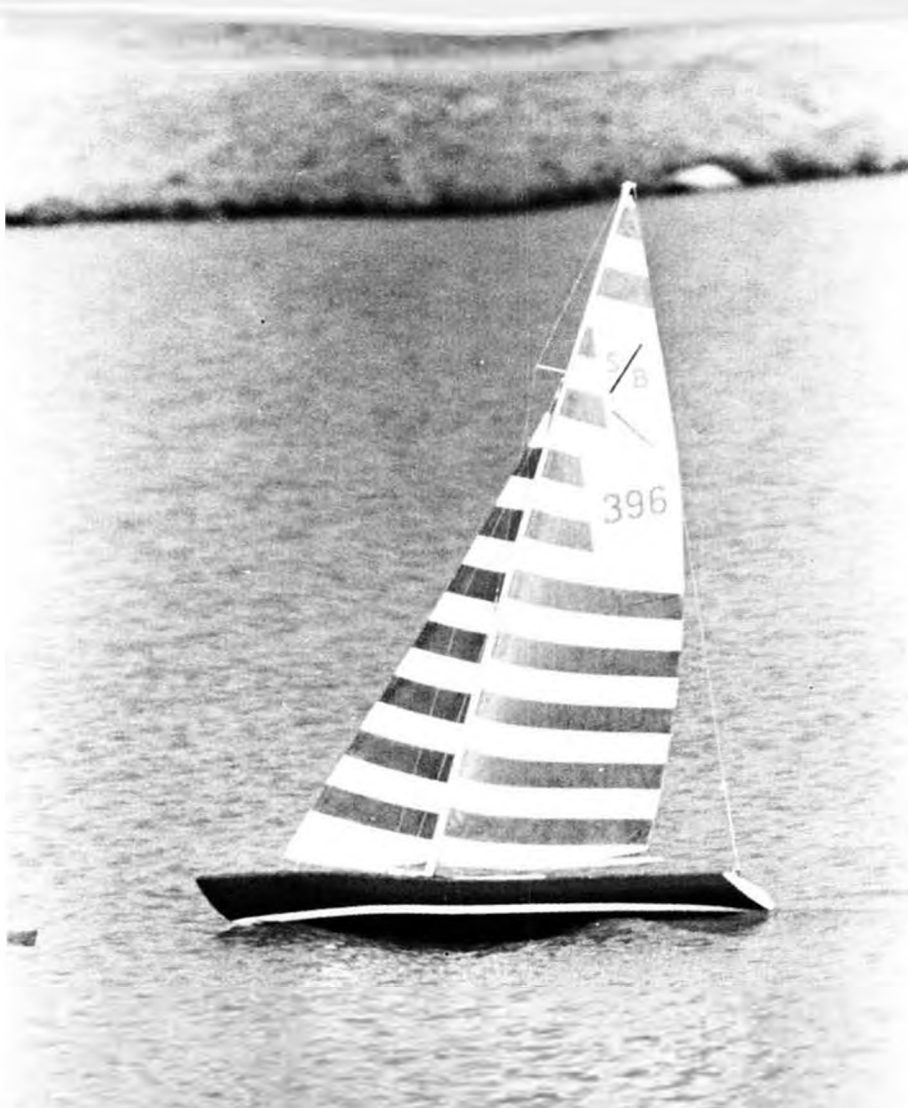
Konrad Nierich holding Tern, designed by Ralph Grose. Wings flex from anhedral to zero dihedral in flight. Ship weighs 7 pounds!

● If it is possible to identify those who have contributed to the growth and development of R/C model yachting as an organized sport, probably one of the hallmarks of such an animal would be that he was appointed to the "CHOSEN 9," a motley collection of individuals who were given the task of pulling a national organization together from all the local pockets of activity which had begun to sprout from coast to coast. In his infinite wisdom, the father of American Model Yachting, Ray Hottinger, chose the most vociferous, most intransigent and least tractable of all the motivated skippers who had written to him. Ray had established himself as a reference point with his popular column "TILLER TALK," which appeared in the late Model Boating World News.

At the time of this writing, a goodly number of the original "9" are still to be found haunting the administrative hallways of the AMYA. Some have become Directors who were actually elected by the membership. Some have graciously agreed to further assist the organization by taking on new administrative duties which are a result of the growth of the AMYA. While there is no way to lessen the impact these men have had upon our sport, nevertheless it is our opinion that the basic strength of AMYA, the basic responsibility for continued growth will have to be placed squarely on another group. These are the Class Secretaries!! Each Class Secretary has arisen from the ranks of a sanctioned AMYA Class, nominated and elected from within his own competition group. Unless we have been grossly misinformed, it is our feeling that the primary responsibility of the Class Secretary is to provide a point of contact for potential new class members, to promote and to push his class as *THE CLASS* for the new comer to consider entering; and, if the need arises, to have dictator-like powers over class business in order that a taut ship be maintained.

It is on the former point that we would like to aim a broadside!! At the present time, there are two individuals who are actively engaged in the national promotion of R/C yachting utilizing communications media . . . Rich Matt of Chicago who manfully wrestles with the AMYA Quarterly Newsletter, and the poor sap who is sitting behind this typewriter . . . If you have not seen anything in print recently about your class, blame it on your class secretary, and ride the bum out of town on a rail. Both Rich and this sa . . . writer have got holes in their gloves from

*Continued on page 47*



The author's Santa Barbara going to weather. Sails are a product of Carr's Boat Yard. Beverly Carr photo.

# STRICTLY SAIL

By ROD CARR



The Vortex 50/800 Soling prototype, August of 1971 in Memphis.



. . . . Being an assorted collection of aeronautical trivia . . . . By BILL HANNAN

**TRY SOMETHING DIFFERENT FOR A CHANGE**

● We've long felt that most of us become too involved in one specialized area of model building, and that there is a lot to be gained by looking into other phases of the hobby. Within the last couple of months we were pleased to learn of two different clubs which decided to help promote this line of thinking. How about the control-line organization in Oregon that has taken

up indoor free flight? And the real topper in diversification has to be the Bakersfield, California Blue Dolphins R/C BOAT Club which recently held a Peanut Scale contest!

**ON THE CO<sub>2</sub> SCENE**

Bill Watson, of Van Nuys, California, has worked out an extremely clever refueling system for his CO<sub>2</sub> powered models, which features a small fire extinguisher bottle rather than the usual "soda fizz" cartridges. These can be re-

filled at low cost, and Bill reports hundreds of loads per filling, averaging out at less than one cent per flight. Bill has been flying a CO<sub>2</sub> powered Waterman "Aerobile" with great success at the Sepulveda Basin as well as indoors. Flight durations range from 1 minute 20 seconds to 2 minutes.

We have found the model railroad brass screws and nuts (size 00-90) are perfect for mounting the Brown Jr. CO<sub>2</sub> engines, and allow easy thrust adjustments, if required.

**CLEMENTS' CLASSICS**

We have recently examined some of Vern Clements' construction drawings, and would rate them among the finest available. His Gee Bee and Culver Cadet plans must certainly represent hundreds of hours in research and delineation effort, and will withstand even the minutest nit-picking. Dedicated scale builders will particularly appreciate the complete specifications and color information. See Classified Ads in this issue for ordering information.

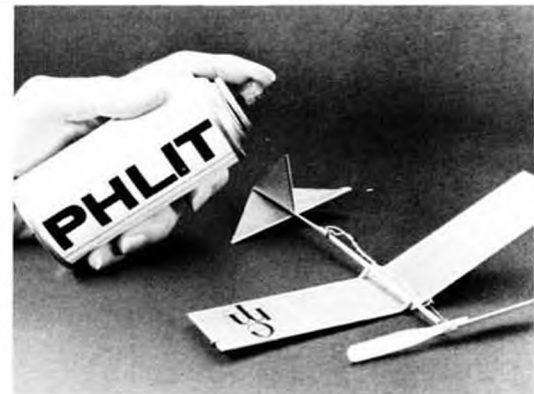
**ENGINE vs. MOTOR**

For years engineers have been trying to "educate" the rest of the population regarding the difference between an en-

*Continued on page 56*



Peanut Scale Japanese "Raiden" model constructed by Pres Bruning. Ship is now in the Russ-Craft model museum. Tynee Vidal photo.



How to get rid of Escondido Mosquitoes!



Dave Stott's BFW-M23c, from early MAN and photo in Jane's, plus some common sense.



Close-up of controversial drive-train in Bill Warner's Petite Brochette. See text.



## EVANS VP-2

Construction of this model is so simple that WALT MOONEY skipped over it, and instead, has answered our request to expound on flight trimming rubber selection for small free flights. It's a gem . . . don't miss it.

● This is an all sheet Peanut Scale model of W.S. Evans' two place version of the Volksplane. Basically, the real airplane is a little wider version with a little more wing area so that it can carry two people. The design is a good one for a person wanting to build his first airplane because of its simplicity, and that very simplicity makes it a good design for a model to be built in a hurry and within the capability of near beginners.

Evans Aircraft, P.O. Box 744, La

Jolla, CA 92037, has an excellent brochure on the VP-2 for \$3.00 and sells plans for the full size airplane for \$45.00. The brochure is a good place to get a 3-view and details.

This particular design was evolved so that the author's whole family could each build themselves a model for the Las Vegas New Years Peanut Scale contest. Five models were built in one evening; the details and decorations were put on in an hour or so of the following day, during the 1972 Christ-

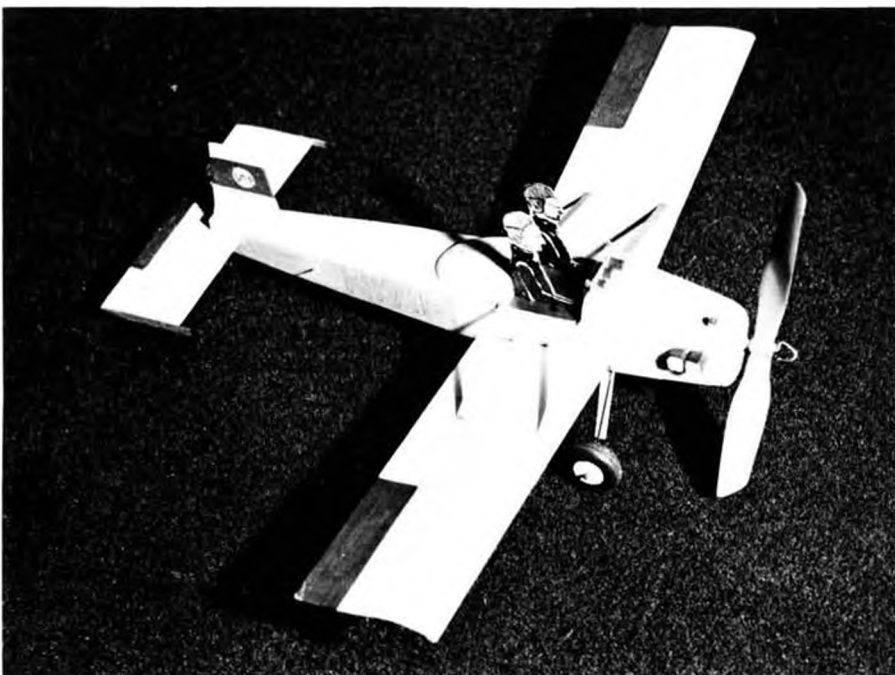
mas vacations. Dad added pilots, instruments and dummy cylinders to his. One son added a fancy felt pen color scheme. Mom added a little color and a girl pilot, and Daughter and the other son left their pretty plain.

In Las Vegas, they all flew, but the author's wife got the longest flight out of hers by  $2/5$  of a second, leaving him second best, as usual.

Because the model is so simple and because construction articles have been done so often before, and because the editor says the author is guilty of glossing over the techniques of flying these things (*And he admits it, too! WCN*), the construction will not be mentioned. It is assumed that you have a finished model and are about to start flying it.

After many years of observing my models and other people's models, we have concluded that the reason for poor flying characteristics narrows down to only a few specific problems.

First and most common is the center of gravity being too far aft. The further forward the airplane's balance point (Center of Gravity), the more stable the model will be. This must not be carried to extremes or the model will have the absolute stability of a bomb. Nevertheless, if your model flies erratically in any fashion, check to see that it balances at the point shown on the plans, and even if it does, it may be worth your while to ballast the model to move the balance point an eighth of an inch or so further forward.



Simplicity of this design makes it a natural for sheet balsa construction, which also makes it a natural for a family or beginner's project.





Tom Carman and his K & B powered Texan 1000. Looks a little cold!

guide to formulating the next team selecting program, due to be announced in March). The results of this poll should go a long way towards settling some major points of contention, particularly between those who prefer a single-site final flyoff and the other group who favors a return to multiple-site flyoffs.

The turnout was pretty high for a mail-in questionnaire, with 237 replies from 407 mailed out by AMA. The overwhelming majority (77 percent) of those responding support a single site flyoff, even if it is not centrally located. This majority opinion is reinforced by what the polled flyers feel is the most important factor in selection of a flyoff site. Of the replies, 63 percent named site flyability (based on field size, type of terrain, chasing conditions and probability of good weather) as the most important thing to consider, with 25 percent naming similarity to weather conditions at the World Champs. Only 8 percent considered a central location as a prime consideration. So, it would appear that those who were so vocal in objecting to a non-central site for last year's flyoff represent only a small minority among the active FAI free fliers.

There was a space on the questionnaire for listing a preferred site for a final flyoff, and the results are pretty interesting here, also. Of those listing a choice, 60 percent named Taft, 12 percent named Bong Field, 5 percent named Galeville, N.Y., and 19 percent named various other sites. So, it would appear that the prejudices against a West Coast

site have slowly crumbled as a result of 2 consecutive windy Finals. When this is coupled with the strong desire for a flyable site, even if not centrally located, don't be too surprised if the next FAI flyoff is held at Taft (where, according to FAI tradition, there will occur wind and rain during the contest, accompanied by light to variable earthquakes!).

Inputs have been coming in from all parts of the country, and we'd like to add details of a meeting that took place out here late last year. Bill Hartill hosted a bunch of about 25 interested flyers to discuss and gather ideas on how the next team should be selected. The most interesting result was that all were able to come to a fairly unanimous conclusion, even though it took the better part of a day to do it. After considering nearly every type of selection program, we finally decided that the present system had much to recommend it, if a few details were modified.

There was unanimous agreement that the final selection of the team should happen at a single flyoff site, no matter where in the country it was located. We talked about many different schemes for qualifying for this final flyoff, but eventually concluded that the present method of regional semi-finals, though not perfect, had much to recommend. There was a very strong feeling that the

*Continued on page 54*



Bob de Shields and hot Okie Bird.

## EASTERN F/F REPORT

with RON EVANS

● Why a column about Eastern Free Flight? Well, for one thing, consider the advantages; we fly at *least* 5 of the 12 month per year, it has *never* rained on more than 50 percent of the meets in a given season, and it is usually calm for at least one round per contest. Within the highly active states of Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania, there is only ONE "3 minute" field. All the others are smaller, usually only adequate for a 2 minute or 90 second max. In spite of this, the area mentioned contains as many "FF'ers per square mile" (Based on an NFFS Member/Area breakdown) as the state of California, which is considered to be densely populated with free fliers. The "3 minute" site described is Galeville (*Sounds sort of windy! WCN*) (Walden, N.Y.) with a fenced-in area of slightly more than one mile square. This field has the additional advantage of being located in a valley, sheltered from local winds. It is not unusual to fly a weekend there with winds never exceeding 10 mph. So Galeville is used for FAI Semi's, large AMA or FAI meets, and qualifying trials. Other locations, such as Johnsville, Pa. (An active N.A.S.) and Bridgewater, Mass., (The open land surrounding a correctional institution!) are hosts for smaller meets.

The conditions described have caused the emergence of a somewhat different breed of flier than his Western counterpart. We rarely use a 'bike for chasing (most sites do not allow it) and a careless D.T. of more than 30 seconds extra usually means an off-field chase. The surrounding terrain consists of trees and/or homes, neither one being conducive to the long life of a model.

If the portrait I've painted sounds grim, remember that most FF'ers are flying for the challenge of our sport, and you must agree, there is plenty of challenge in Eastern Free Flight!

A few of the apparent trends here are; smaller models to cope with shorter engine runs, auto-surfaces for the same reason, and mylar covering to handle varied weather conditions and tissue-puncturing terrain. Weather-proofing, both in construction and covering, is important. Reliable D.T. and retrieval systems have high priority.

*Continued on page 60*



Sal Taibi and 900 Starduster. Night flying light unit dangles underneath.



Bill Hunter and Satellite.

## PHOENIX SOUTHWESTERN REGIONALS By Tom Carman and Paul Ryan

The 23rd Annual Phoenix Southwestern Regionals contest is over, but not forgotten by the multitude who attended this year. In spite of the slightly undesirable weather, the contest was a pleasure, as usual.

Our entourage arrived shortly after official flying started on Saturday (Due to getting lost!). Evidently the wind arrived with us, because we witnessed several airplanes landing about a mile from the launch site. By the time we unloaded, the wind had become a virtual gale. The only flights put up until late afternoon were a couple of large Class D jobs. Even these were blowing out of sight! Late in the afternoon the wind let up, and official flying was extended for an hour. The last two hours saw a flurry of activity. Several old time cabin entries were seen lumbering across the field.

Night flying was held on Saturday night in the bitter cold. Cat II rules were observed.

Sunday dawned clear and cold, with Saturday's gale only a memory. The rest of the day by no means followed suit. A cloud cover quickly blotted out the sun, and remained blotted the rest of the day! A mild wind blew from time to time, but it was nothing compared to the day before. At least it was nothing to the die-hard free fliers on the field. The cold was by far the worse aspect of the weather, with chicken sticks and electric starters being the order of the day. Oh! The bite of a prop on an already numb finger!

Within the first hour of official flying many maxes were recorded in Class C and A gas. Notables among these were

the Satellite 1300's and Mel Schmidt with his ST 46 Shocer. Jerry Dyer was going strong with a 900 Duster. My own 9 year old Texas 1000 was looking good, but unfortunately, I wasn't. Strangely enough, many of the A entries were .051 powered 1/2 A's. "Okie Birds" did very well in this class. Randy Bunch, a senior from Phoenix, had a hot modified Shocer, built very light by way of minimal structure. He obviously went a little too minimal, as something twisted in flight and it splattered after folding up about six feet before impact. Randy did a lot of flying though, and was duly rewarded with senior sweeps for the second year running. Bob Hunter, flying anything and everything, won open sweeps. He was seen flying a hot K&B 29 RR powered Playboy, and also a Korda Wakefield in Old Time Rubber. How does he have time with all of those Satellites?!

A small contingent of flyers was having it out in Wakefield. These guys rely very heavily on thermal detectors, and all types were seen, from exotic electronic heat sensors to cattails floating away in the wind. All seem to work well. Jim Quinn and Al Hotard could usually be seen holding their tightly wound ships, intently watching for indications of lift. Some, like Bill Thieme of Arizona, still use the old method of "get ready and fly," but the new methods seem to put you in the winners circle more often.

A/I was a pleasure to fly because you could run all day and not suffer from the usual heat exhaustion. Lift was very hard to find. Thermals were generally small and undependable. Randy Bunch

flew a design featuring low wing and high tail with a fiberglass boom. The boom was at a 10 degree angle in the glide, giving it a downhill appearance. Mel Schmidt has been very successful with this configuration recently. Brian Van Nest, who won A/2, also did very well in A/1.

Hand launch glider flyers were having a great deal of trouble finding maxes. Bob de Shields and Brian Van Nest ended up dominating the event. Bob was flying a giant glider that presumably took advantage of the almost non-existent lift.

F.A.I. power was poorly attended, but those who flew made up in enthusiasm what they lacked in number. The only people we saw fly were Bill Hartil and John Warren. Bill flew a Rossi powered Road Runner, and John flew a Rossi powered Vela design. These aircraft were trimmed to perfection, and it's a shame there wasn't more competition for them.

As far as trends go, high powered AMA ships are fast becoming the rule rather than the exception. Naturally, their life expectancy is down. Many were seen flying to pieces in the air! Mini Pearls are very popular in 1/2 A, as are Shocers, Satellites, and of course, Stardusters. Many of the smaller original Dusters and Duster X's are showing up. Texas 290's and 319's are also good choices.

Class C and D gas are becoming the most competitive (and spectacular) gas events. Those big 1300's are really a sight to behold! Nothing seems to match

*Continued on page 55*



Al Hotard launches his Coupe entry.

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Buy and build either of our great 8-channel systems and you save twice. In addition to the traditionally low kit-form price, you save another \$34.70 over the cost of individual components when you order transmitter, receiver, battery pack and four servos as a package. You end up with an 8-channel system for what you would normally expect to pay for a quality 6-channel rig. And what a system it is!

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# PEA POD

by TOM PROTHEROE



The Pea Pod takes off on a starboard tack . . . which won't hurt as long as you don't sit on it!

If R/C sailboats turn you on, but the initial cost turns you off, never fear, the PEA POD is here! Unless we miss our guess, the PEA POD, complete with jam cleat sail control, will get many would-be sailors off their . . . .

● R/C Model yachting interest and activity has been growing rapidly since the forming of the American Model Yachting Association.

There are good kits and sail control units available as well as reliable two and three channel radios. These are all key factors in the growing sport and fill the need of the racing skippers pretty well. However, it does put a slight dent in the budget to purchase some of this equipment and it has probably discouraged some beginners.

The PEA POD is not only very economical to build and rig, it is simple and fun to put together. It literally pops into shape without having to build any interior framework whatsoever.

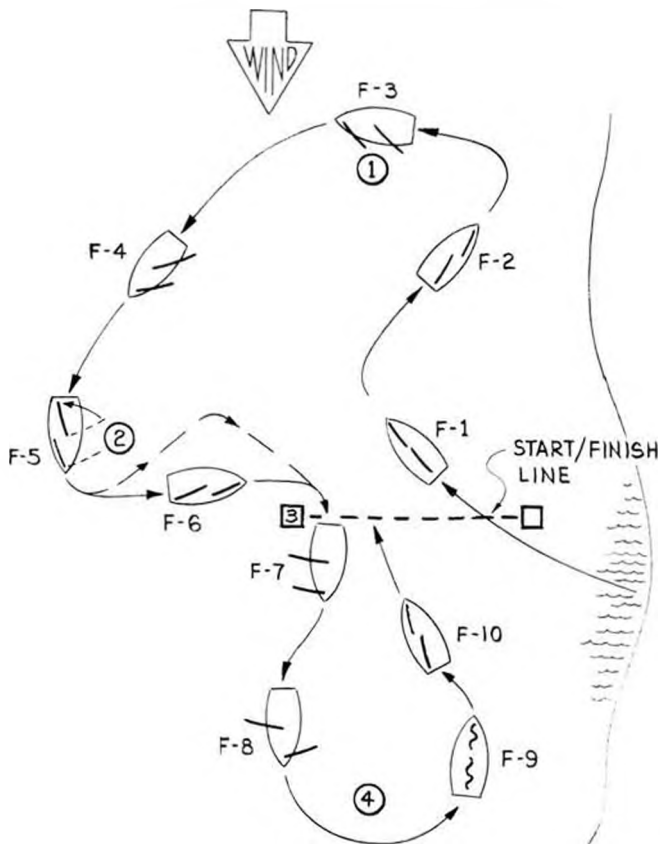
No special yacht fittings are required and materials are available from the local lumberyard, sporting goods store, model airplane-type hobby shop, or that old box full of goodies in your own

workshop.

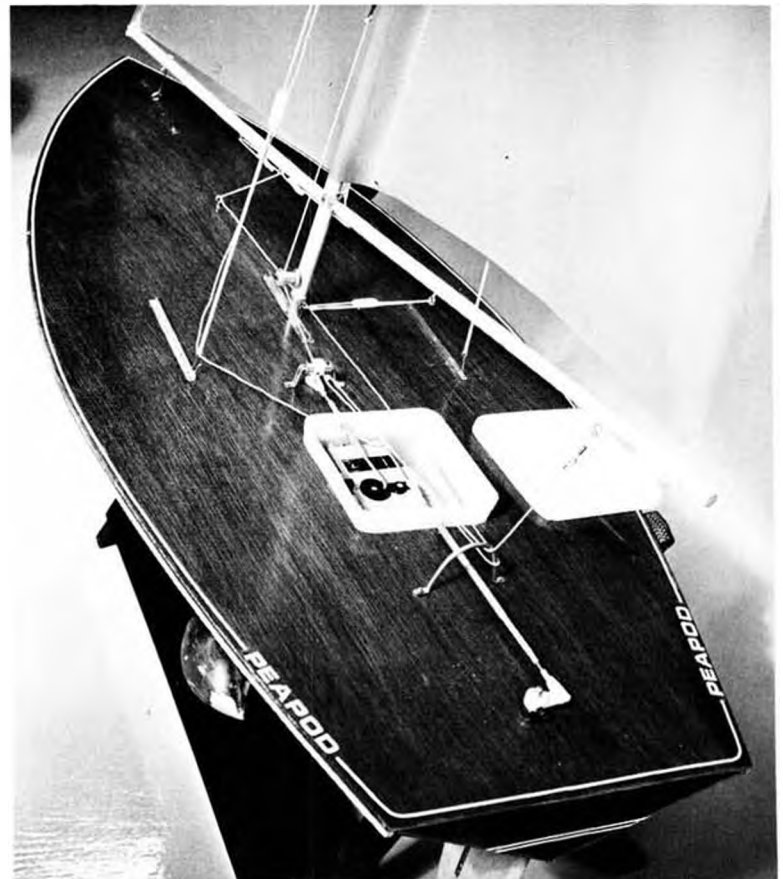
For a variety of reasons, most attempts at small non-competition R/C sailboats have used only rudder control and are sailed without sail control units. The sails are usually tied off half way out, which limits the boat's ability to sail into the wind and is not an optimum setting for sailing downwind.

The funny-looking stuff on the PEA POD's deck, and a length of 1/8 inch flat rubber, will enable you to position the sail for every point of sailing. Assuming you already have at least a two-channel radio, it will only cost about \$1.00 to set it up!

The basics of this system are (1) a jam cleat which will retain or release the mainsheet on command, and (2) a long length of 1/8 inch flat rubber which will take the slack out of the mainsheet. To "pull" the sail in, head the boat into the wind 'til there is no



A modified Olympic sailing course, as described in the text. Half the fun, and a big help toward winning, is hitting that start line on time.



Here's the whole sail control ball of wax, right before your eyes! It's so darn simple you can hardly believe it.

wind force on the sail and open the jam cleat. The rubber band will pull the sheet through the jam cleat. Then close the jam cleat to retain that particular setting. To let the sail out, open the jam cleat and head the boat downwind. Wind force on the sail will overcome the rubber tensioner and the sail will travel out. Then close the jam cleat to prevent the setting from changing.

#### SAILING THE PEA POD

The main sheet must move freely through the jam cleat when it is open, and requires at least 5 lbs. of tension before it slips when the cleat is closed. In other words, you can almost lift the boat with the mainsheet. In very light winds, use as little rubber tension as you can get away with. Use just enough to pull all the slack out of the main sheet when the boom is over the centerline of the deck. As wind velocities increase, tension of the 1/8 inch flat rubber can be increased.

#### SAILING DIAGRAM

The course shown in the diagram is a modified Olympic course, and it will demonstrate most of the common sail settings and maneuvers.

Prior to launching, make one more check of the strings and things to assure yourself everything is in proper working order. When you are satisfied, batten down the hatch (that means put the freezer lid on). Face the boat into the wind and actuate the jam cleat so the sails are pulled all the way in. With this sail setting, launch the boat at a 60 degree angle to the wind.

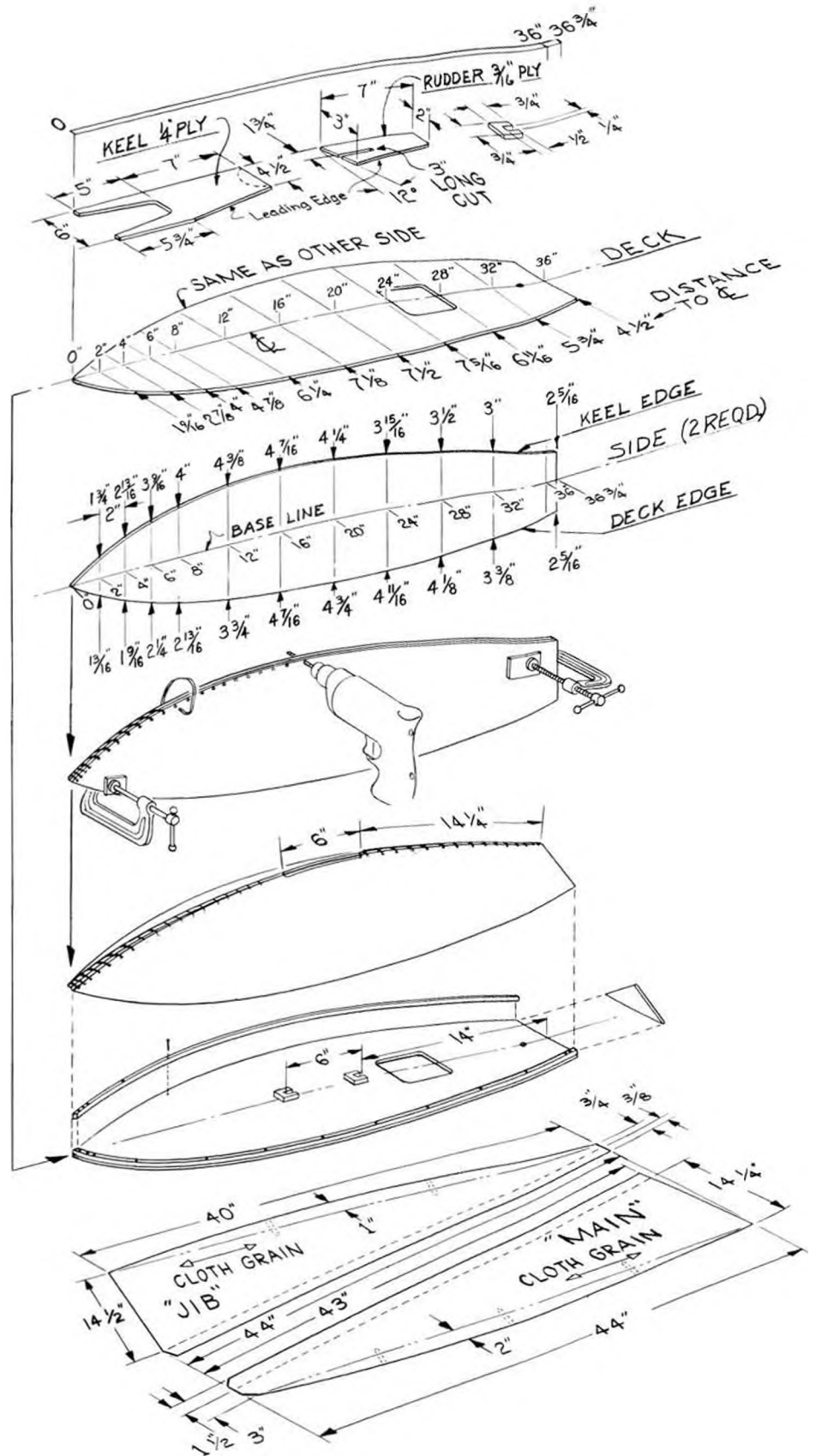
As the boat picks up speed, head it up to a course of about 45 degrees to the wind. (F-1). If the sails start to shake (luff) steer a course a little further off the wind. (In this case, it would be to the left). You are now beating to windward on a starboard tack . . . in case you wondered.

It is impossible to round the windward mark (1) if the yacht remains on this course, so two tacking maneuvers are required. Application of right rudder is the only control necessary to bring the yacht around through the eye of the wind to a course that is 45 degrees off wind. (F-2). You are now beating to windward on a port tack.

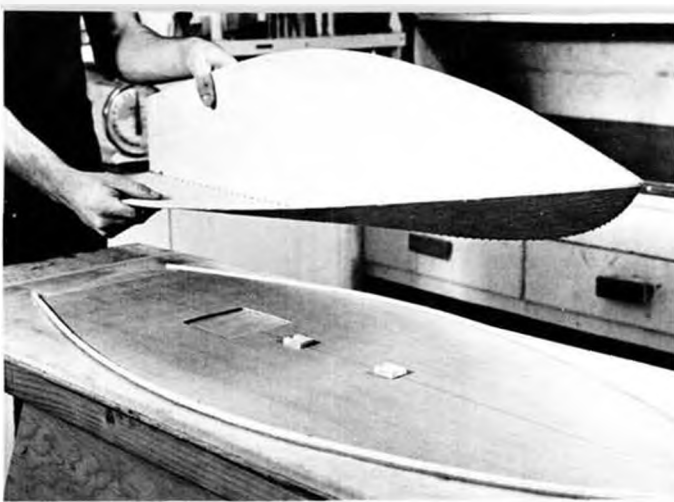
When No. 1 marker is at a 9 o'clock position, switch over to a starboard tack for the mark.

The next leg of the course is a broad reach, which is a lot of fun . . . even with a sailboat. It is the fastest course of sailing for most yachts.

As you round the No. 1 mark, blip the jam cleat control lever to ease the sail out. (F-3). The boom position



FULL SIZE DRAWINGS AVAILABLE – SEE PAGE 64  
(INCLUDES FULL SIZE DECK AND SIDE PATTERNS)



Deck is placed inverted on bench. Spruce strips are temporarily nailed down, keel blocks epoxied in. Sides have been stitched together.



Sides have now been spread apart and pressed down and outward toward side strips. Entire hull of 1/8" Luan mahogany plywood.



Resin is first brushed onto the keel seam where weights will rest. After placing the weights over waxed paper to prevent sticking, the rest of the keel and side seams are resined. Presto! A hull!

should be about 45 degrees off the centerline of the yacht. (F-4). Steer a straight course for the next mark, which incidentally can be a real dilly to round in a strong wind with this sheeting system.

You will notice that to round No. 2 mark, the boom will swing from the left to the right side of the boat. (F-5). This is no problem . . . the trick is to accomplish this (rather fast) maneuver on course to No. 3 mark with a sail (boom) setting of about 20 degrees. To obtain this setting, open the jam cleat as you start to round the mark. The moment the main boom swings across the stern, close the cleat, stopping the boom just off the centerline of the yacht. (*You gotta be quick on that one! Ed*) Continue your turn and sail for the next mark. (F-6). If you didn't catch the sheet soon enough and the sails are too far out, continue your turn up into the wind with the jam cleat in the open position. As soon as the boat is pointing about 20 degrees off the wind, close the cleat and apply right rudder to steer back on course. (As indicated by the broken arrows).

Rounding No. 3 mark is done by



The completed Pea Pod with 4 pound fishing weight for keel ballast. Sails of cloth or plastic.

applying right rudder and opening the cleat to let the sails all the way out. The jib is not working too well on F-7 because it's being blanketed by the main. Slight application of right rudder will

*Continued on page 50*

#### PARTS LIST

##### JAM CLEAT

- A. Small Du-Bro steering arm
- B. 5/32" wheel collars - 2 req'd.
- C. 5/32" OD K & S brass tubing

##### RIGGING

- D. Small screw eye - 7 req'd.
- E. Perfect line connectors - 6 req'd.
- F. 1/8" flat rubber - 40" req'd.
- G. 7/16" Dia. hardwood dowel - 77" req'd.
- H. Bicycle spoke & nut
- I. Veco tail wheel hub
- J. 1" nail
- K. 7/16" ID x 1" K & S brass tubing
- L. 1/2" No. 2 wood screw - 3 req'd.
- M. 5/32" x 3" K & S brass angle - 5 req'd.
- N. 5/32" ID x 4" K & S brass tubing
- Y. Plastic bowser - 7 req'd.
- Z. Perfect brass hinge

##### KEEL WEIGHT

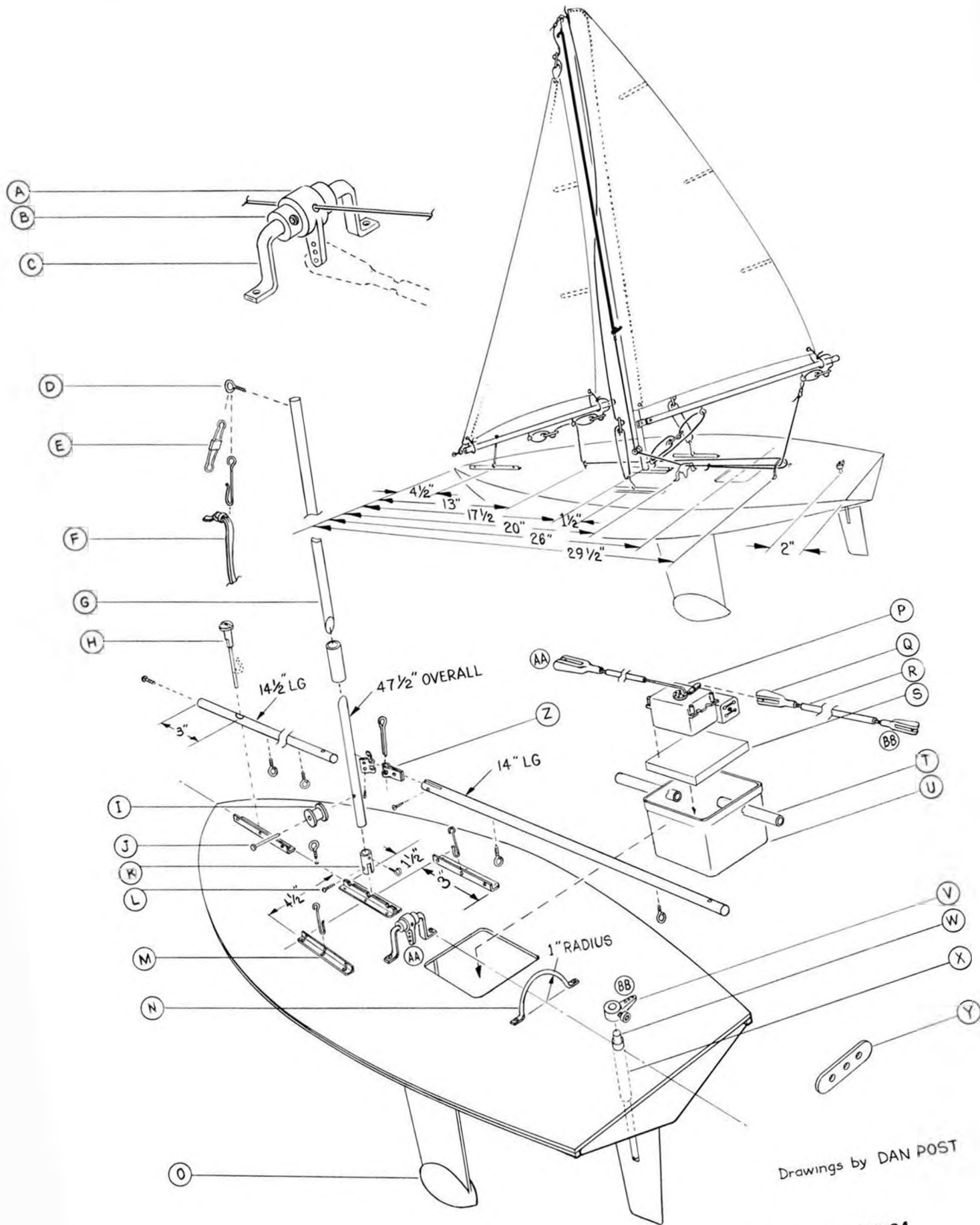
- O. 4 lb. fish sinker or lead shot & resin casting

##### R/C INSTALLATION

- P. Kraft KP-2 (shown)
- Q. Plastic clevis - at least 2 req'd.
- R. Small Dia. Ny-Rod
- S. Wood spacer block
- T. Large Dia. Ny-Rod
- U. 1/2 pint plastic freezer container

##### RUDDER

- V. Small Du-Bro steering arm
- W. 5/32" OD x 6" K & S brass tubing
- X. 5/32" ID x 3" K & S brass tubing



Drawings by DAN POST

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\* Dry Kit, paint and cement not included.



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**CONSTITUTION**  
KIT G2 — Length 11"



SPANISH  
**GALLEON**  
KIT G1 — Length 10"



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**BLUE NOSE**  
KIT G3 — Length 11 1/4"

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Plying the Spanish Main, the Galleons carried the treasures of the New World back to Spain. Outfitted with cannon they were used both as merchant men and warships . . . The Blazing Guns of the *Constitution* helped to establish our Nation. Now enshrined in Boston Harbor, it is the oldest commissioned vessel in the U.S. Navy . . . Built by Angus L. Walters the *Bluenose* was one of the finest Schooners to take the water. It came to world-wide fame racing against the *Gertrude L. Thebaud*. *Bluenose* captured the hearts of U.S. and Canada to such an extent, that today it is on the back of every Canadian Dime.

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You don't have to STAND OFF to admire this

# CITABRIA



KIT FS31  
**29.95**

*Span 54" Area 415 sq. in. Length 36" For Engines .23 to .35 Scale: 1.61" Equals 12.0"*

## SPECIAL THANKS

The beautiful Citabria is manufactured by one of the oldest and respected names in American Aviation, The Bellanca Corporation, who so graciously provided us with the plans, photos and details of the full size aircraft. With this illustrious lineage, it is not surprising that the Citabria is just about unbeatable as a fun plane. Primary trainer, or for Aerobatics.

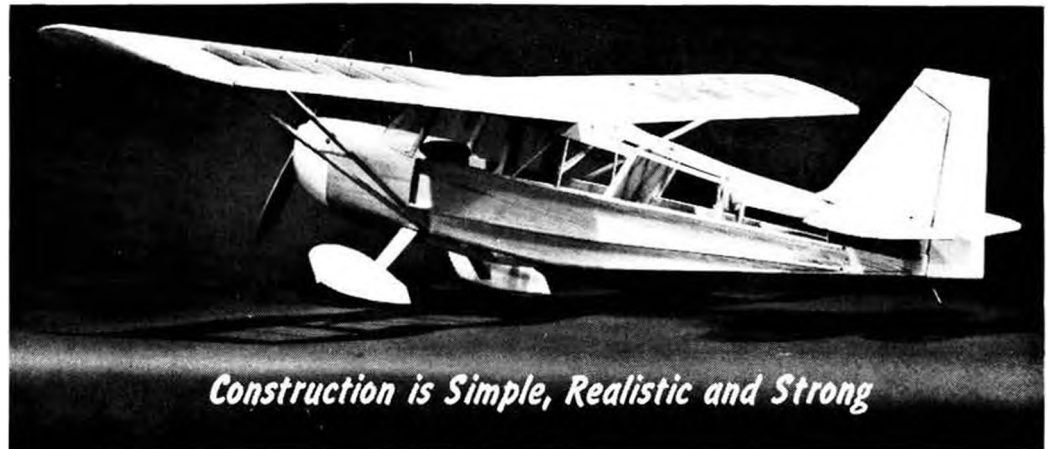
## CITABRIA IS FOR YOU

If you're a Sport Flier, if you have a feeling for Scale, if you love R/C\*, then this is your ship. It's a beautiful machine that builds easy—goes together fast—plenty of room for any equipment—rugged for hard use—flies great—and is just about the right size.

\* Can be flown Control Line too—instructions on plan.

## ABOUT THE KIT ITSELF

This kit is a real joy . . . Balsa Wood is the finest grade, density-selected and sanded to micrometer tolerance; as is the imported Finland Birch Plywood. Every part is numbered to insure fast and accurate assembly as shown on the easy step-by-step plans.



*Construction is Simple, Realistic and Strong*

## WING AND TAIL SURFACES

Complete wing is built on work bench without having to remove it—so it's flat and warp-free. Parts are die cut and carved. Balsa sheet cover makes for tough wing. Wing is installed like it ought to be—with dowel pins and nylon screw in wood nut-block. No unsightly rubber bands to deteriorate, break or slip. Rudder and Stab are die cut sheet for simplicity and no warp. Included is all the linkage hardware: pushrods, aileron and elevator horns, bellcranks, clevis, connectors, etc., plus giant authentic decals, plastic windows, etc., etc.

## THE FUSELAGE

Fuselage sides are die cut full length. Cabin sides and inner doublers are plywood as are the firewall and landing gear bulkheads. It's easily assembled with die cut balsa bulkheads, nose block, formed music wire landing gear, custom dural engine mounts, etc. Cowling and wheel pants are rugged plastic.

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**Mooney . . . .** *Continued from page 31*  
ily, its time to start the powered test flying. Here, the procedure is to add power (winds) a little at a time, flight by flight, so that the model doesn't do anything grossly unexpected and spoil your whole day. Adjustments during this phase should be done primarily with thrust line modifications. The basic idea is to point the propeller in the direction you want the model to fly. If the model loops or climbs steeply and stalls, downthrust is in order. If the model turns tightly to the left or rolls to the left, right thrust is in order. Here again, small, careful adjustments are the order of the day if surprises are to be avoided.

Obviously, if you are flying outdoors, wide gentle turns are perfectly O.K., and often desirable. If the flying sight is indoors, the model must make circles smaller than the room is wide or the model must ultimately be built harder than the walls! (One of Murphy's more unpopular Laws!)

Indoors, careful thrust line adjustment and careful rudder adjustment also may be required to get the model to turn tight enough to miss the walls. If the model is determined to spiral dive when it's adjusted to fly in small enough circles, either the model is too big or the hall too small. Warping the wing to resist the roll may help and can be tried. Another thing that can be used is a drag flap on the inside wing. Typically, on a Peanut scale model, the drag flap is a piece of 1/32nd thick balsa, 1/4 by 1-1/4 inches long. This is cemented under the trailing edge with its long dimension spanwise and its quarter inch dimension hanging vertically downward. Thus it makes a little drag brake to force the model to turn without increasing the lift of the inside wing, which would tend to enlarge the circle.

The model now should be adjusted,

so next, how about more duration . . . longer flights.

A winder is a must. Indoor commercial winders, having 9 to 1, and 16 to 1 ratios are available (Marlow Engineering). Outdoor winders usually have to be made from hand drills and have ratios like 4 to 1. These are used for the larger models. For Peanut scale 16 to 1 is just fine.

Rubber lubrication is important. It will allow you to put in more winds and the motors will last longer. There are good commercial rubber lubes on the market. Castor oil, glycerine, and some silicone lubricants can also be used. The motor should have enough lube on it to look wet without being drippy.

Slack in the motor is important. The number of winds that can be put in a motor is proportional to its length. A long motor is not easy to wind by hand, but if you have a winder, most peanut scale models can use a loop of rubber that is at least twice as long as the distance from the front hook to the back peg.

Stretching the motor before you start to wind it up is important. Usually, as you start winding it, the motor should be stretched out at least five times its unstretched length. Then about half of its maximum turns can be put in. As you put in the rest of the winds, the procedure is to slowly let the motor work its way back into the model, so when you have completed the winding, the nose plug will be exactly ready for installation in the nose of the model.

Once you know about stretching, slack, lube, and a winder experimentation with the motor size and length are what will lead you to the longest possible flights with your rubber powered scale model. Indoors, this is the only way. Outdoors, there are thermals, and a clever modeler will learn how to spot them and launch into them occasion-

ally, if not most of the time. Rubber strip is available in a wide variety of widths from 1 mm up to about a quarter of an inch. For the larger models the experimentation consists of trying longer motors and in adding to the number of loops powering the model. For smaller, indoor models the experimentation consists of trying longer motors and in varying the size of the rubber strip used in the motor. Generally, longer loops result in longer propeller runs, but slower climbs and lower altitudes reached. This is sometimes desirable, for instance, if your model climbs rapidly and runs into the ceiling of the room, you can cure this with a longer loop of motor and get a longer flight at the same time. Indoors, the ideal motor is the one that will take the model up just short of the ceiling and then let it down with the last ten or twenty winds still in the motor. Needless to say, this may take quite a few experimental flights, but it is all fun.

It is extremely important to remember that when you change motor size, the model may have to be rebalanced if the C.G. is to remain in the proper place. ●

**F/F Scale . . .** *Continued from page 25*  
like painting the gun troughs, wheel wells, radiator screens, exhaust etc. are painted using straight Grimy Black Floquil.

The various wing and fuselage decals were applied, using Solvaset to snug them in place. When these were dry, a coat of Testor's Dull Cote was sprayed on. This takes the gloss from the decals. The ailerons, flaps, elevator, rudder, etc., separations were done with a straight-edge and a Rapidograph pen filled with Pelican ink. The Mickey Mouse character was done free-hand, again using the Rapidograph.

Now, the moment of truth! After letting the model dry thoroughly, it weighed 31.3 grams. In other words, the paint job increased the weight by 1.3 grams. Not bad eh? As stated earlier, we have been using this system for years, and have found it satisfactory for all types of rubber models, scale or not. Also, we have used this same technique on some gas models, and since we use diesel engines, we never have to worry about fuel-proofing. If you use glow engines, just spray on a coat of clear butyrate over the entire model when you have finished painting.

Another innovation that works ex-  
*Continued on page 46*

beautiful

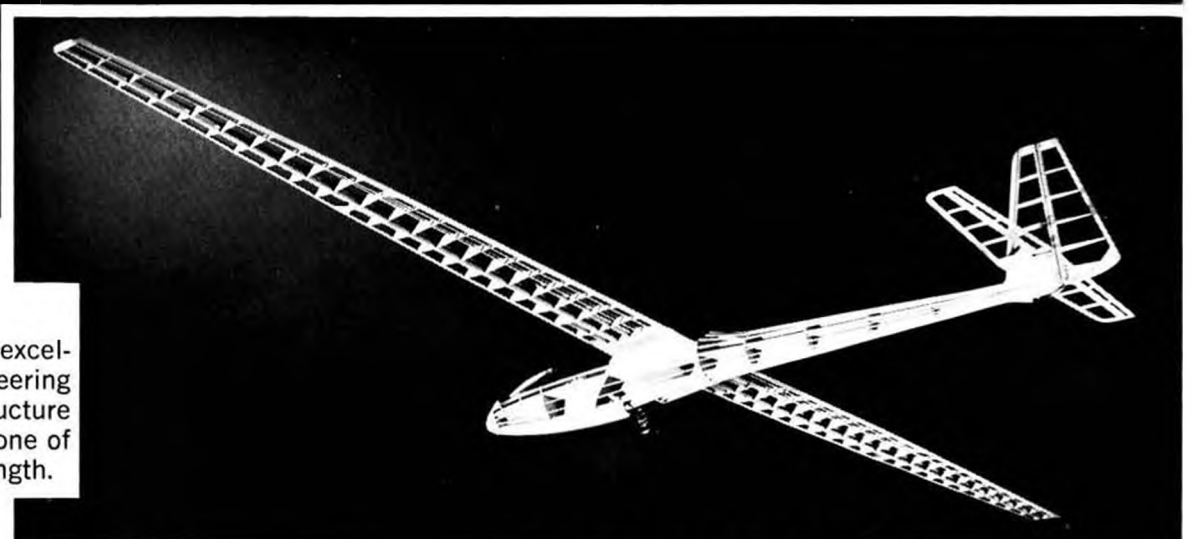
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**F/F Scale**... *Continued from page 44*  
tremely well is to take a shade of Floquil that closely resembles the colored tissue you use. For example, Reefer Yellow mixture sprayed over yellow tissue really looks great. So does Caboose Red, Reefer Orange, Light Blue, and Engine Black on the respective colored tissue. The beauty is that you do not lose the "see-through" appearance that so typifies rubber models.

This particular method gives you a matt finish. If you want to add some gloss to the finish you can add another Floquil product to the mixture, called Glaze. We sure would like to receive

any comments that you may have regarding this procedure or answer any question you may have. Mail your queries to Fernando Ramos, 19361 South Mesa Dr., Villa Park, CA 92667.

**Espiritu**... *Continued from page 19*  
split fuselages in hard (ie, vertical) landings.

Glue the bottom nose cowl in place and, after checking alignment over the top view again, add the 1/16-inch sheeting to the aft end. Spot-glue the upper cowl block in place (you'll want to

move it later for engine mounting) and carve the nose into a reasonably round-cornered, streamlined shape. Now pop off the cowl block and give the entire nose area, inside and out, a thorough fuelproofing. Clear Hobbyoxy or fiberglass resin is great for this purpose... the average plane can always use a little extra weight in the nose. Mount the engine and tank, glue the upper cowl in place permanently, and cover the fuselage with aluminum Monokote... or a half dozen coats of nasty, smelly, heavy old dope. (Rubbing talcum powder into the grain between coats helps fill the wood with less dope.)

Cut out the rudder and stabilizer from medium 1/8-inch balsa; Monokote or paint them before adding the hinges. Bolt the landing gear in place; add the tailskid and wing dowels; install the radio and start looking for a balance point. Wherever it is now, it's got to wind up within 1/2-inch of the point shown on the plans for your plane to fly. If this means adding noseweight, do so - - scrap tireweights glued into the cowl below the engine work well. A spinner helps. Don't forget the prop, but don't count on the tank of fuel... the stuff has a way of disappearing in flight. Generally speaking, the farther forward the CG lies, the easier the plane will be to fly.

If you're a rank beginner, try to find help at this point. Very few people are able to keep their first plane together long enough to learn to fly it, when they go it alone. If it's just not possible to obtain help, here are a few things to check before that first flight: engine thrust line (does it point down and right, as the firewall drawings on the plans indicate?); rudder throw (it should be no more than 1/8 to 3/16 inch each way); elevator throw (1/4 inch each way is enough); point of balance (it should be NO MORE than 1-3/4 inch behind the wing leading edge.)

Don't throttle the engine back for the launch, especially if you're using an .049. Slow-flying power jobs tend to stall and snap-roll into the ground very easily. Throw her fairly hard and straight into the wind... with any luck she should fly off with wings level and climbing. Make those first turns very gingerly... Caramba! You are on your own, my friend! ●

**Wingmaster**... *Continued from page 13*

The two channel "brick" with the Kraft elevon linkage mechanism attached thereto makes for a very neat and

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simple installation. Nose wheel steering is accomplished by using the left-right Aileron Servo linkage. The nosewheel steering pushrod is prevented from buckling by a stiffness bracket mounted to the motor mount midway down the push rod. This arrangement, by the way, works out fine.

We originally mounted a K & B RR racing 40 up front, which results in a very lively machine indeed.

A call to Bill Northrop and we converged on Whittier Narrows one fine Saturday morning for a picture taking session and some test flying. The Wingmaster, it turns out, is a very groovy airplane, much to our surprise, yet when you really "haul" on the elevator it practically bites itself. We made several really tight pylon turns with the Wingship and it really "hangs in there" with no tendency to fall out of the turns. It seems that it would make a fine trainer for those aspiring to be pylon pilots as well as a really fun machine for just plain "horsin' around." We handed the box to Bill who "tweaked" the stick with a silly grin on his face, which I took to mean that he was happy with the machine. If he can easily handle the "beast" with a racing 40 up front when he's become accustomed to handling nothing swifter than a glider for the last couple of years, I'd say it's a pretty good flying machine.

I have subsequently installed a new front rotor K & B "sporty forty" up front, which I feel is ideal for the Wingmaster. Joe Martin agrees, even though he's been "scarin' hell" out of everybody with a big 60 in his.

We can envision, along with Joe Martin, "Wingmaster" racing events

where several club members participate. The "Bird" can easily be assembled in a couple of evenings and Joe tells us they are almost indestructible. He has piled his in, dusted it off, and flown it again with hardly a wrinkle in it.

Joe says the Wingmaster will sell for around thirty dollars, and when the kit comes on the market, we heartily recommend it for novice and expert alike. Its truly a "ball" to fly. ●

**Strictly Sail . . . Continued from page 28** knocking on doors and begging for material from each sanctioned AMYA Class. We offer completely unedited use of class materials, subject only to our editors requirements, and we cry for unashamedly pointed propaganda materials. All to little avail. As a result, we do not hesitate to show a definite relationship between the number of vessels registered in a given class, and the type of publicity which has been circulating for that class. Let's use the top three AMYA Classes as an initial example:

**Santa Barbara** - A proprietary class, headed luckily enough by a manufacturer who has supported AMYA to the hilt. VORTEX has probably done more to promote yachting than any other manufacturer, and with it's long history in the sport has become the Chris Craft of the hobby.

**50/800 Class** - The American founded vane class, converted to R/C in recent years. No push from the AMYA to cause the large number of registrations, rather it has been the 30 years of plans and vane sailing which

have seen more Marbleheads built in this country than any other class of yacht. It is the inherent characteristics of size and weight which have produced the popularity of the class. But recent interest in 50/800's specifically designed for R/C can be shown to have made significant contributions.

**East Coast 12-Meter** - A one-design, but not proprietary in any sense of the word. This class has just had the backing of a fairly wide geographical nucleus of enthusiasts. It has maintained one-design control, yet provided inexpensive hulls for building up to the money conscious skipper. Recently, a second manufacturer has begun to produce a complete kit, and though price-fixing has never occurred, each manufacturer has the support and assistance of the other.

The next step down in the registrations has half as many boats as the EC/12's, so there seems to be a definite break between the "Top Three" and the other sanctioned classes. There are definitely other reasons for relative vessel popularity in addition to Class Secretary performance. But no class, no matter how well supported by the manufacturer, can long exist without the concerned care and feeding which only a class secretary can give. Well . . . enough of a gentle harangue. Class Secretaries out there . . . drop us a note . . . We know you're alive . . . We can hear you breathing.

Sometimes it is forgotten that equal time is also owed the epitome of model yachting success . . . the Santa Barbara Class. This is only because, like a big brother, it always seems able to take

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care of itself. If you ever get the opportunity to visit that crew of nuts in Santa Barbara, California, don't pass it up. We were lucky enough to have the chance last spring. Ed Shipe gave us the cook's tour, and we managed to bring production down about 80 percent by the time hands had been shaken all around and embarrassing questions asked about the 50/800 SOLING which was just nearing production release. Back here on the East Coast we had heard of the competition monster named Protheroe. It was a shock to find that he did not breathe fire, nor was he 6 foot 8. Unfortunately, our schedule required an early return to Washington and we didn't get the opportunity to sail with the Converse, Protheroes and Shipes. It's a sure thing that we'll eventually meet on the water, and it's equally certain that this writer will learn a great deal, and rapidly too!!

Our local sailing group managed the necessary requirements to register as Santa Barbara Fleet No. 7 during the 1972 season. There is no doubt in our mind that the closest to actual one-design racing available today is in the Santa Barbaras. We typically ran 10 heats on a Sunday afternoon, and found the winner to have amassed 23 1/2 points with the number 5 man only 3 points away at 26 1/2. Racing like that, within a well matched fleet with skippers of similar skill, is exhilarating, is exciting, but is not relaxing at all . . . until we call it quits, total up the points and then sit down to rehash the heats. We'd buy a video tape machine for instant replay if our wives would allow it!!!

Appended for general interest are two photos. The first is a look at the pre-production SOLING which Don Prough brought to Memphis in August of 1971 to show to the participants in the first EC/12 ACCR. Little did we realize the tremendous interest this ves-

sel would spark in the 50/800 class.

The other photo is a port quarter view of our Santa Barbara going to weather in about 6 knots of wind. Note the bow wave just below the jib tack, and the next crest which occurs just under the main clew. This is the wave pattern which imprisons a displacement hull, for as the speed of the vessel increases, the second crest drops further behind, until a point is reached where the boat is trying to climb up the hill formed aft of the bow wave. Luckily, the Santa Barbara responds to increased drive by climbing out on top of the water and actually planing!! We thought we were prepared for such a happening, but we're telling you, the first time No. 396 flung herself up and out we almost dropped the transmitter . . . Still looking for a hydroplane to challenge!!!

Let us hear from you. Are you sailing something different, or wonder where the action is? We want to hear about the first, and will help you track down the second. Write to: Rod Carr, 2713 Blaine Drive, Chevy Chase, Md. 20015. And while you have the stamps out, send in your \$3.65 AMYA dues to C.H. Black, 4761 Niagra Avenue, San Diego, CA 92107. He is without a doubt the fastest man with a vessel registration ever seen, and while we're not sure he can leap tall buildings at a single bound, it's a bet he can rig a 36/600 in a phone booth in 30 seconds!!! ●

**BG-12 . . . . .** *Continued from page 9* with wire fitted. Temporarily add wing panels to saddle . . . support panels on board and be certain everything is square . . . now is the time to fix any misalignments. When you are sure everything is right, epoxy wires to ribs and let set.

Remove wings and saddle from building board. Mix some more resin and

micro balloons and fill area between spars and wires.

Now complete saddle by adding top sheeting and leading edge . . . do not shape leading edge until saddle has been epoxied to fuselage.

#### TAIL SURFACES

When building both the stab and rudder, be careful to shim leading and trailing edge material to be in center of 1/16 rib stock. Rudder outline shown on plan is scale and works very well with the wing dihedral shown.

The scale outline for the stab is also shown, but is not recommended for beginner pilots or sport flying. The scale stab is only 10% of the wing area and requires very attentive piloting.

After the surfaces have been assembled and allowed to dry thoroughly, sand both to the symmetrical airfoil shapes shown.

#### FUSELAGE

Begin construction of fuselage by cutting all frames from clear, medium grade 1/8 balsa sheet. The cutouts shown on frames D, E, F, & G may be omitted if you prefer to use Nyrod push rods. If cutouts are retained, be very careful in cutting so that they may be refitted during construction . . . see plan note.

Entire construction will be done over the top view on plan. Pin and jog frames C through G, and J at locations shown . . . check for squareness. Install special cockpit stringers, "K," with frames A and B. Prop securely to proper height above building board.

Now add side stringers, keel, and one inch nose block. Carefully shape and add gussets to frames A and C. Using 1/8 x 1/4 balsa, add frame H.

Install 1/8 x 1/4 top diagonals between frames and corners of side stringers . . . be sure these are flush with building board. Now locate diagonal side braces in the following sequence . . . top right "D" to bottom "E;" bottom "E" to top left "F;" top left

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of "F" to bottom "G;" bottom "G" to top right "H;" top right "H" to bottom "J."

If you wish to add wheel detail to the fuselage, see the "Yankee Gull" in March/April, 1972 Model Builder, and install mounting plates now but do not cut keel until sheeting has been completed.

Add 1/16 sheeting to sides now . . . curvature in area of nose, forward of frame "C," is best done with several narrow sheets.

When dry, remove fuselage and add nose block. Install 1/16 sheet to top of fuselage under wing saddle only, using epoxy or resin . . . be liberal.

Build wing incidence block using scrap 1/4 sq. and 1/4 x 3/8 balsa . . . attach on sheeting using epoxy or resin.

Prepare some additional resin to be used to install wing saddle. Mount wing panels onto saddle when epoxying saddle to fuselage in order to give greater length for triangulation in aligning wing to fuselage center line. Secure saddle to fuselage with pins when properly aligned. Remove panels as soon as center section is pinned, before epoxy sets up.

Build 1/8 sheet canopy tray to outlines shown on plan and shape nose block and filler on wing saddle to match . . . allow for canopy thickness.

Complete fuselage by adding push-rods, top sheeting and tail surfaces . . . add shims to stab to maintain it parallel to top sheeting . . . check squareness with wings mounted. Install tow hook block or support and complete wheel detail, if installed.

Fiberglass the fuselage from the nose to 2 inches in the rear of wing trailing edge, using Le Gray's methods as out-

lined in Model Builder (February 1972).

The canopy is fabricated by trimming to fit from the rear portion of a Sig 16 inch canopy.

### FINISH

Cover entire airplane in your favorite material . . . yes, Super-Monocote will stick to fiberglass. When covering wing panel, be sure to warp in at least 1/4 inch washout in each wing tip, beginning at rib No. 8.

### FLYING

Adjust rudder throw to maximum for initial flights; the elevator needs only 1/4 inch throw. As you become used to flying the short tail moment, pitch sensitivity may be increased.

Check all controls for proper operation and their return to neutral. If wing incidence is correct and C.G. is as shown, the model will exhibit a straight and fast glide from a firm running hand launch . . . caution, fuselage is difficult to hold.

Take your time in these first flights and I'm sure that you will enjoy many flying hours with your Briegleb. ●

**C/L . . . . . Continued from page 23** right for any kind of .15 powered airplane or for those powered by .19's.

Line care is pretty simple. Older lines deserve at least an occasional wiping off with a dry rag as you run them out. To be really serious about it, soak the rag with rubbing alcohol. Periodically check the ends of your lines where they are crimped for the line connectors. If you spot a frayed strand, simply cut off the end and re-wrap it, and readjust the handle to compensate for the shorter

line. It's hard to tell when a kink is too bad to let the lines continue to be used. Usually, if the kink has resulted in the strands becoming separated from each other, it's time to get new lines. Never splice lines in the middle, or anywhere for that matter. The splice will unravel, hangup on the other line, and cause too much drag.

It's a good idea to give any new set of lines, especially the ready-made kind, a stern pull test. I've seen them come apart at the ends in midair often enough to conclude that defective lines can get through the manufacturer's inspection. Never use solder on lines. It causes them to lose their heat-treated qualities and renders them so inflexible that it is inevitable that they are going to break. The ends can be bound with soft copper wire rather than being soldered.

Line connectors are another critical area. Do not use fishing swivels! Use line connectors available in the hobby shop. Small sizes are suitable only for 1/2 A, medium for .15's, and large for everything else.

The leadouts on the airplane that connect the lines to the bellcrank should be at least triple the diameter of the lines used if the leadouts are braided, and at least double if the leadouts are solid music wire. Solder should be avoided on them as well. ●

**R/C Soaring . . . Continued from page 27** next contest. See you all there, guys!

### RESULTS

Overall

1. John Baxter, South Bay Soaring So-

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  4. Bill Hinman, San Fernando Valley Silent Fliers, Cirrus
  5. Mark Smith, Harbor Soaring Society, Windfree
  6. Fred Weaver, (no club)
  7. Steu Horton
  8. Buck Faure
  9. Col. Bob Thacker
  10. Jim Haldy

**SPEED**

1. Konrad Nierich
2. John Baxter
3. Dave Shadel
4. Fred Weaver
5. Hans Langer

**PRECISION**

1. Rich Walters
2. Buck Faure
3. Mark Smith
4. Col. Bob Thacker
5. Konrad Nierich

**DURATION**

1. Jeff Walters
2. John Baxter
3. Ken Wagner
4. F. Malsbury
5. C.R. Von Hellems

**PEA POD . . . Continued from page 40**  
pop the jib out on the opposite side, then application of left rudder will get the yacht back on course. (F-8). You're now sailing "wing and wing."

The next leg of the course is a beat to windward for the finish line. This requires the sails to be in as tight as possible.

In rounding Mark No. 4, apply your left rudder, open the cleat and continue the turn clear around the mark. When the boat is facing directly into the wind (F-9) close the cleat and continue the turn 'til the sails fill. You should now be on a course that is 45 degrees to the wind on a starboard tack and driving for the finish line. (F-10).

If for some reason you are still floundering back there at the mark with the boat heading directly into the wind and no control whatsoever, quit jumping up and down . . . relax . . . this condition is known as "being in irons" and was practiced to perfection by the inventor of the sailboat way before the escapement era of R/C.

To get the boat back in gear again requires (somehow) positioning the sail more broadside to the wind (*Wading out to the boat is not permitted . . . even if possible! Ed*). First release the sheet momentarily to make sure the sail is

not going to be all the way out when it fills. Don't tinker with the sail any more. Sometimes the bow will drift around and the sail will start working enough for you to gain sufficient headway to get going again. Hold rudder direction to take you on a course more broadside to the wind.

If you have succeeded in doing a wonderful job of getting "in irons" and the bow doesn't swing one way or the other, just be patient and wait a few seconds. The boat will finally start to move backwards. If you feel embarrassed about going backwards . . . forget it . . . it happens to everyone who sails at one time or another. Look on the positive side, as we now have water moving past the rudder which means there should be some rudder effect. Application of right rudder control will swing the stern to the right and the boat will back around broadside to the wind, the sail will fill and the boat will take off (P.S.: going forward!).

When you have mastered this little boat you will have learned a great deal about sail trim and sailing in general.

This sail control system is not intended for competition sailing against the more sophisticated units but racing against four or five other yachts of identical design and equipment can open up a whole new sport for you.

Pooling facilities with a few of your R/C buddies and cutting out five or six kits at once will save you considerable time and money. It's more fun to struggle through the learning stages with other people who know as much about it as you do.

It will become obvious there will be a race on when more than one boat is in the water . . . it just happens naturally.

At least one of the crowd should squander \$3.65 to join the American Model Yachting Association. AMYA Secretary-Treasurer: Mr. Charles H. Black, 4761 Niagara Avenue, San Diego, California 92107. This investment will result in all kinds of good stuff, like: methods of running regattas (races), race rules, race courses, regatta schedules, a list of specifications on the official one-design and development classes, and a quarterly newsletter which is worth the price alone.

I would like to comment on the race rules before you have a chance to read them. They are almost identical to the rules used in fullsize racing with a few minor modifications.

Ordinarily, when the word "rules" is mentioned there is a natural inclination to be "turned off." Basically, the



race rules are written to prevent two (or more) yachts on a converging course from crashing into each other. They will state that one yacht may hold its course, while the other(s) must do something to avoid a collision.

The theory used by a yacht racing skipper is not only to go fast (and quite often this is secondary), but to place his yacht in a favored position in relation to the other yachts.

If you study the rules and use them to your advantage (this is known as racing tactics), you'll be able to figure out all kinds of ways to get your boat to the front of the pack.

Then you discover one of the other skippers has the same thing in mind and finally comes the dawn . . . you have found yacht racing!

#### CONSTRUCTION

Gather the materials and start construction by marking the outlines and cutting out all the plywood parts. Mark the centerline for the deck parallel with the grain and one edge of the sheet of plywood. (About 8 inches from the edge).

Locate each station along this line. Use a square to extend the stations exactly 90 degrees to the centerline. Measure out from the centerline and put a pencil dot to correspond with each station measurement. When this is finished, open your new box of nails, grab the 1/4 inch square spruce or pine, and start nailing it down next to (outside) the pencil dots. Start at the stern (not the pointy end) by placing the 1/4 inch square even with the first dot and pound in the first nail. Even it up with the next dot and pound in another one and so on 'til the edge of the 1/4 inch square is bent around connecting all the dots. If it doesn't form a smooth curve and looks lumpy, check your measurements and re-locate the nails at the bad spots. When things look O.K., mark the outline (connecting dots), remove the 1/4 inch square and repeat this system for marking the outline for one side.

Cut these parts out, a little oversize, and block-sand down to the line. Use the first side for a template to mark out and cut the second side.

#### SIDES

When both sides are cut out, clamp or tape the sides together. Drill 1/16 inch dia. holes, 1/8 inch in from the keel edge, spaced 1/2 inch apart. Reduce the spacing to 1/4 inch for the first 2 inches at the bow.

Unclamp the two sides and bevel off the sharp corner on the inside edge of the keel seam.

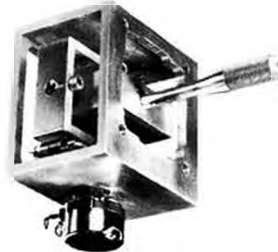
Re-clamp the pieces and sew them

# CONFIDENCE

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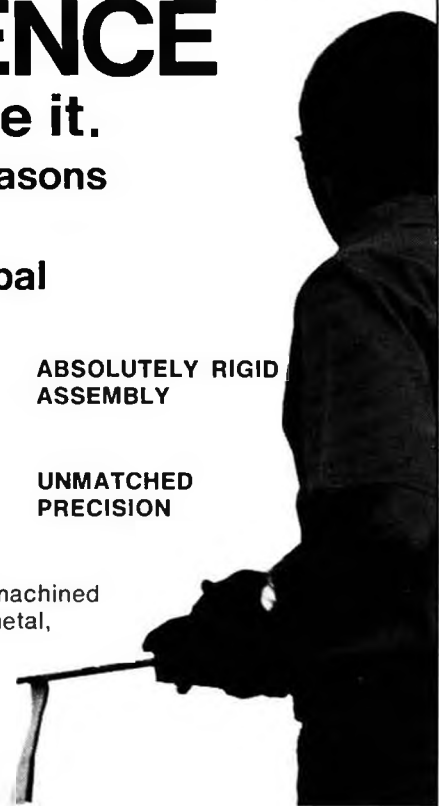
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together by double-stitching with carpet thread near the bow and stern. A simple, single looping stitch is used throughout the remainder of the seam. When this is completed, lay it aside and start on the deck . . . quit playing with it . . . we know it looks like a big moccasin.

#### DECK

Locate the hole for your freezer container between stations 24 & 28, and size the hole so the tapered container will be a snug wedge fit into the deck with about a half inch sticking out the top.

Lay down some wax paper or Handi-Wrap to protect your building board. Place the deck on the wax paper with the pencil-marked centerline up.

Glue the first 1/4 inch ply keel brace block 14 inches from the stern and the second block 6 inches forward.

Bevel the front ends of the two 3/16 inch square spruce pieces so they will fit together at the bow. Nail them to the deck with about 10 3/4 inch 20GA nails per side. The outside of the strips should be flush with the outside edge of the deck. Leave the heads of the nails up about 1/16 inch so you can pull them out later. If you are going to use resin for bonding it's not necessary to glue the stringers down. The resin will seep under the stringers when the sides are bonded to the deck.

Deck/Sides bonding. It will require at least 25 lbs. of pressure at the keel seam area to hold the sides out against the deck stringers, so find something to do the job. Make sure you use something that won't fall off the inverted, V bottom keel seam.

When that problem is solved, mix two oz. of resin and squash the sides down on the deck so they contact the stringers. Hold them down with one hand and paint the keel seam (use an acid brush) in the area that you are

going to place the weight. Then pick up the strip of wax paper we forgot to tell you to have on hand and place it over the seam, and then the weight on top of that. Continue painting the keel and deck seam with resin.

When the resin has set up, measure exactly 14-1/4 inches from the stern, along the keel seam to mark the trailing-edge of the fin keel. Place another mark 6 inches forward for the leading edge. Now cut a slot 1/4 inch wide between these two marks. Lift the assembly off the building board and check the keel for a proper fit into the keel brace blocks by peering through the gaping hole in the back end. The fin is permanently bonded later, after the weight has been attached and finished.

#### KEEL WEIGHT

The easiest way out is to purchase a 4 lb. fishing weight. If you live in trout fishing country, the guy at the sporting goods shop will think you are crazy, so instead, buy 5 lbs. of bird shot from him. Then go to the supermarket and purchase something that comes in a 12 oz. cylindrical vinyl or cardboard container (about 2 to 2-1/2 inch dia.), and some modeling clay at the dime store. Remove the top from the container, dump out the contents and force clay down to the bottom. The clay is used to form the pointed end of the teardrop weight. Use a kitchen knife to form the clay.



Cut a 1/4 x 4-1/2 inch slot in the container and insert the fin. Use masking tape to seal the seam between the container and fin. Mix a 1/2 oz. of resin and pour this mix into the container. Roll it around to seal the clay. When this has cured, mix 6 oz. of resin with a minimum amount of catalyst. Pour this into the container, followed by the lead shot. Fill the container right up to the top with the shot and resin.

If the resin generates too much heat



during the curing cycle, it may fracture. Submerge it in a bucket of cold water if it seems to be getting too warm.

The container and clay is stripped off and the front end is rounded off with rough sandpaper, disc sander or file. The final smooth finish is acquired by using plastic filler or multiple coats of resin. When completed, the fin and bulb should weigh 4-1/2 to 5 lbs.



If you are lucky enough to find a 4 lb. fishing weight, then cut the fin to fit the contour of the weight. The weight is first glued to the fin using resin that has been thickened with talc, milled fibers, or plaster of Paris. After the resin has set, reinforce the joint with two strips of cloth (approx. 1 x 4-1/2 inch) on each side. (The keel should be filled and sanded to a smooth finish).  
**FIN KEEL/HULL BONDING**

Apply the resin to the ends of the legs of the fin and slip it through the slot in the keel seam. Seat the legs into the two U-shaped keel brace blocks on the under side of the deck. While the boat is resting upside down, tape the joint between the hull and fin with 1/4 inch or 1 inch masking tape. Mix one ounce of resin. Turn the boat rightside up, supporting it by the fin

keel and starting at the stern pour the resin down the inside of the keel seam. Lower the bow so the resin will run down the full length of the keel seam to the deck. Then clamp the fin in a padded vise, and position the boat so the excess resin will settle around the fin/hull seam.

#### RUDDER & SHAFT

Press a 6 inch length of 5/32 inch OD brass tubing into the slot in the rudder blade. Tape the slot on one side, turn it over and pour resin in on top of the shaft. When cured, remove the tape and fill the other side with resin. After the second resin application has set, sand and finish.

#### SHAFT LOG

Cut a 3 inch length of 5/32 inch ID brass tubing. Drill a 3/16 inch hole, located on the centerline of the hull, 2 inch from the stern. Insert the tube and secure it with resin. The tube should protrude 1/4 inch above the deck.

#### TRANSOM

Use the actual boat stern as a template to mark the transom piece. Sand the edges so it fits fairly tight. Insert it from the inside. Tack, glue or tape it in place. Mix 3/4 oz. of resin. Hold the boat, stern down, and pour it on top of the transom. Roll it around to glue the transom and then support the boat on edge so the excess resin will drain down one of the side seams. When the resin has jelled, mix 1/2 oz. of resin and reinforce the other side seam in the same manner.

#### EXTERIOR FINISH

Block sand the complete boat. Sand off all the exterior thread stitches using 80 grit paper wrapped around a hard block. Coat the hull and keel with surfacing resin, block sand, and either paint, varnish, or add a second coat of resin for a final finish.

#### INTERIOR FINISH

Mix 4 oz. of varnish with 2 oz. of thinner. Pour this inside and roll it around to seal the interior. Drain the excess out the hatch.

#### MAST

The mast is fashioned from 7/16 inch dia. x 48 inch hardwood dowel. Since 36 inches is the most commonly available length, it is necessary to join two lengths of dowel with a 4 inch piece of 7/16 inch ID brass tubing. A 1 inch length of the same tubing is pressed onto the bottom of the mast to prevent it from splitting.

Saw a 3/8 inch deep slot in the bottom of the mast and drill for a 1/2 inch No. 2 screw located 1/4 inch from the end. The screw fits into the small slots in the mast step fitting and enables

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you to change the mast location easily. Use a small nail to mount the model airplane tail wheel hub 1-1/2 inches from the bottom of the mast. It must rotate freely.

#### GOOSE NECK FITTING & MAIN BOOM

Saw a slot 5/8 inch deep in the end of a 14 inch length of 7/16 inch dowel. Insert the brass elevator hinge (Perfect Brand) and drill a pilot and clearance hole for a 1/2 inch No. 2 wood screw. Spread the other half of the hinge out and form it around the mast. Fasten it with four 1/4 inch wood screws. Refer to illustrations for details on fittings and their locations.

#### SAILS

If you use plastic material for the sails, it is not necessary to sew them along the leading edge. Plastic tape is sufficient.

Dacron and nylon can be cut with a small solder gun with a sharpened end.

#### MAST & RIGGING POSITIONS

The multiple mast & rigging positions are used to trim the boat out for different wind velocities. An explanation, that may be over-simplified, is to move the sail area (or force) forward in strong wind, and aft in light wind. Play around with the different positions and note the effect.

#### MISCELLANEOUS RIGGING

All other rigging is self-explanatory. Consult the parts list and isometrics for materials and location.

#### JAM CLEAT

The combination mounting bracket and shaft is made from a 3-1/2 inch length of 5/32 inch OD brass tubing. Heat the tubing to a cherry red and then allow it to cool. This will soften the tubing so you can flatten and bend it.

Center the 1 inch Du-Bro steering arm and the two 5/32 inch ID wheel collars on the tubing. Adjust the collars so the tiller rotates free with a minimum of side play. Do not over-tighten the set screws as it will distort the tubing and cause the tiller to bind. The set screw must remain in the arm to prevent the brass bushing from rotating in the nylon body.

Flatten the brass tubing and bend it down to form the legs. Then bend the ends out to form the mounting tabs. The legs should be 3/4 to 1 inch long. You will have to shorten the steering arm to clear the deck and drill a new hole for the nylon clevis.

Replace the protruding set screw in the steering arm with a flush-fitting set screw from a wheel collar. Position the arm down and drill a 1/16 inch dia. hole clear through the steering arm body and

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5/32 inch OD brass tubing.

The hole will be very close to the set screw, so start your drilling from the set screw side of the steering arm.

The 60 lb. Dacron fishline should run through the hole without snagging. Mount the jam cleat so the string lines up with the center of the wheel hub on the mast.

## RADIO INSTALLATION

Press the freezer container—radio compartment in place (The container was merely a press fit in the prototype Pea Pods, so that it could be shifted from one experimental hull to another. Almost no water got inside the hull. For a more permanent installation, put the container in place with bathtub sealer [Dow Corning Silicone Rubber] before installing the transom.). Insert a spacer block of appropriate thickness in the bottom of the container, using double-stick foam tape. Next, double-stick the brick or individual receiver, servos and battery pack to the spacer. Finally, install the Nyrods. Drilling holes slightly undersize and forcing the tubes into place should be sufficient for a water-proof seal.

Set up the linkage from your servo to the jam cleat so neutral stick position on the transmitter will hold the string

and forward stick deflection will release it.

Before test sailing, refer to the sailing section of the article to refresh your memory on the use of this particular sail control system. GOOD SAILING!

## BUY LIST

- LUMBER YARD  
1/2 sheet of 1/8" Imported Luan plywood  
3 7/16" OD x 36" hardwood dowel  
1 Small box 3/4" 20GA nails
- DIME STORE  
1 Spool of carpet thread  
1-1/2 Yards of sheet plastic (sails)  
1 1/2 pint plastic freezer container
- SPORTING GOODS STORE  
1 4 lb. fish sinker or  
5 lbs. lead shot (see text)  
20 ft. 60 lb. test Dacron line  
1 Bicycle spoke & nut or fish swivel
- HOBBY SHOP  
1 6" x 12" x 1/4" plywood (keel)  
1 3" x 7" x 3/16" plywood (rudder)  
2 3/16" sq. x 48" spruce or pine  
1 1/4" sq. x 48" spruce or pine  
1 12" length 5/32" OD K & S brass tubing  
1 12" length 5/32" ID K & S brass tubing  
1 12" length 7/16" ID K & S brass tubing  
2 12" length 5/32" K & S brass angle  
2 Small Du-Bro steering arms  
2 5/32" ID Du-Bro wheel collars  
1 Perfect brass elevator hinge  
8 Perfect line connectors  
14" Ny-Rod  
2 Plastic clevises  
1 Small tail wheel hub  
40" 1/8" flat rubber  
24 1/4" No. 1 wood screws  
3 1/2" No. 2 wood screws  
1 3" x 3" 1/16" plastic  
5 Small eyelets  
1 pint Francis resin  
1 2 channel radio

**F/F . . . . . Continued from page 35**  
format of these semi-finals should be modified to stress consistency of performance at an earlier point in the team selection program. Many felt that the semi-finals were a tougher contest than the team finals, since one bad flight at the semi-finals could put you out of contention quicker than a comparable

bad flight at the finals (George Xenakis narrowly missed making the Nordic team last year, despite 2 zero rounds at the Caddo Mills flyoff). The recommendation of our group was that the semi-finals be flown to the same format as the team finals, in order to insure that the most consistent flyers make it to the final flyoff (this would mean that all events would be flown each day rather than just one day, with 5 flights a day for 3 days). This would have the advantage of insuring that multiple event qualifiers would be capable of flying 2 or more events simultaneously before reaching the finals.

. . . AND, AS LONG AS WE'RE TALKING ABOUT FAI, WHAT ABOUT FAI ENGINES?

Standard equipment for the well dressed FAI Power model is a Rossi .15. There's no question that this is the hottest non-piped, non-nitro 2.5 cc engine in the world (to the point where demand has far outstripped supply), with an amazing consistency of performance between samples (far better than any other engine we've ever heard of). But even among Rossis, there are some differences. The latest issue of the Toronto FAI group newsletter, carried an irresistible article on the art of picking a particular engine specimen that should be equally applicable to other brands.

"HOW TO GET A HOT ROSSI STRAIGHT FROM THE BOX AS I DID," by Dave Sugden.

"It is a simple matter to test run engines and pick out the hot ones (defined as 25,000 rpm plus with a Bartels 7x 3.5 Cox prop on an average summer day), but none of us have this opportunity. If we are lucky, the best selection we can make is from 2 or 3 engines wrapped inside plastic bags! With exceptional good fortune, I was twice able to run a Rossi prior to purchase. Both were good, both yielded to tuning and one was the engine used in Sweden. A third engine, though, was "hot" straight from the box.

"Rossi .15's are exceptionally well-made (this is an obvious requirement of a hot engine), but I believe that there are 3 ingredients that are also required, namely: (a) luck, (b) knowledge and ingenuity, (c) scrupulous care and cleanliness. The most important of these is LUCK.

"All engines are not created equal, however, and despite the high quality of Rossi's, there seems to be sufficient variation that many are only mediocre (relative to other Rossi's). Thus I like to think that the application of (b) and (c)

above can raise an engine from the mediocre to the "hot" category.

"If some selection is possible without the opportunity of bench running, check the smoothness of shaft rotation, wear marks on the piston that indicate misalignment, and the shape of the liner as indicated by the type of compression of the piston. Make your selection on the basis of your intuition. DO NOT RUN IT, but strip it down immediately. The following notes apply primarily to an engine which has not previously been run:

"Wash out all the oil, etc. Most likely the bearings will feel lumpy and these will also have to be removed for cleaning. Maintaining cleanliness verging on sterility at all times, check all the parts in the most minute detail.

(These comments refer to a completely dry set of parts).

-Sometimes bearings *sound* to run smoother on one side than the other. Insert back into the case in the appropriate direction.

-Check the alignment of the crank pin relative to the shaft; mike around the periphery of the crank web. Check the finish of the pin and the radius at the web. Check that the bearings will fit correctly in their respective locations.

-Check the alignment of the cylinder bore in the case and the fit of the cylinder. This may need easing in *with care*.

-Check the rod carefully. Although they are very well made, there are minor variations in the surface finish of the holes. Check the fit of the rod on the shaft. There may be one way round that has the least tendency to lean from perpendicular to the shaft. Use gauges if possible.

-Check the fit of the wrist pin in the piston, keeping an eye also on the finishes of the holes in the piston and then check the way the piston "sits" on the rod.

"The alignment and motion of the piston must be completely true for optimum output and the permutations and combinations of the positions of the rod, wrist pin and piston can be used to optimize this. This is where your ingenuity plays a major role in making the best selection of positions of these parts, bearing in mind everything you have learned about their finish and accuracy. Having decided which way they are going to fit together, mark them and proceed to assembly.

"The bearings are inserted with heat and are *not* pressed in, since this distorts the outer race and housing.

"The shaft must spin with complete

freedom. Assemble the remaining moving parts and the cylinder after checking it, if possible, for contour. Engines made after the fall of 1971 seem to have fairly well-contoured liners. THIS IS IMPORTANT.

"Now check the sound of the piston moving in the liner (all parts are still *very clean* and *very dry*). The piston makes a slight rasping noise which may be slightly greater at the top of the stroke. If this noise is uneven, switch the parts around until it is minimized. Now you may have a good-running engine. Certainly, my best-running engines happen to make very little noise in this configuration. The piston will also fall from top to bottom of the cylinder bore. Being satisfied that you have done your best, insert a few drops of oil and complete the assembly, using about .012 in. of gaskets under the head to avoid burning the plug (Cox type). Bench run and lean in immediately for periods of no longer than 15 seconds, just long enough to check the rpm. Flood-off is possible.

"Reduce the gaskets under the head to optimize the rpm, and with lots of item (a), you may be aslucky as I was.

"NB- *Don't* waste fuel, time and engine life on break-in. An engine that is well set up will produce its peak rpm IMMEDIATELY. (!!?-Hutch)

"If the engine does not come up to par, disassembly and examination of parts may reveal misalignments that can be corrected. The liner can also be re-contoured at this time IF improvement is considered possible.

"Don't waste time polishing parts or rounding corners or changing timing, etc. This all makes no difference in my experience.



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"I've worked on many engines and built several of my own design, yet there still seems to be no rule for insuring top output. However, the better the parts are finished and fitted, the better the chances. (The engine was bought in the fall of 1971. Maybe I was just lucky.)" ●

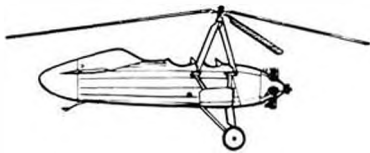
**Regionals . . . Continued from page 36**  
the thrill of a two-plus horsepower behemoth blasting off.

Class A gas was well represented. Dee Wood flew the only Galaxy that we saw, and he did a good job of it! Texans, Satellites, Shocers, and converted 1/2 A's made up most of the competition.

Gadgetry seems to have fallen pretty much by the wayside in AMA gas. The slight weight sacrifice and labor penalty along with decreased reliability (in many cases) probably account for the general return to straight forward ships. A rather outstanding exception was Wes Morris's electronic engine shutoff and D-T. For test flying it can be actuated by R-C with the flick of a finger. A good airplane saver! Electric starters are fast becoming the accepted thing. You can really get a fast start when that thermal comes through!

As usual, contest organization was excellent. Trophies were all handed out within an hour after the close of the meet. Nothing left but to load up and head for home, looking forward to next year. And that elusive trophy?!

# PLANS & PEANUTS & WHEELS & THINGS



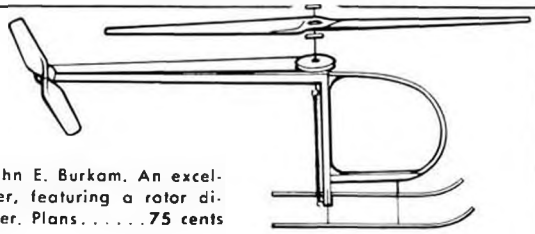
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Hannan . . . . . *Continued from page 29*

When concerned with electricity (motor) and gasoline (engine) the distinctions seem clear enough, but when one wanders into the area of CO<sub>2</sub> or rubber bands, the going gets stickier. Ed Toner, a Boeing 747 chauffeur, who describes himself as a Jumbo pilot who likes Peanuts (scale that is), has raised an interesting question regarding Bill Warner's Petit Brochette. Since there is a rubber-band drive between the prop and the electric motor, Ed feels that the model just might be classified as rubber powered. His reasoning is that the wound rubber band actually turns the prop, while the electric motor simply rewinds! He points out that there is nothing in the rules against using an electric winder. (*An nothing that says the winder can't go along for the ride!* WCN)

### HISTORICAL NOTE

Richard (hang-glider) Miller has been doing some research into the origin of turbulators. It seems that prior to World War One, Prandtl in Gottingen, Germany, and Eiffel (of tower fame), in Paris, France, were both working at measuring the drag of spheres in wind tunnels. The two men corresponded and were puzzled at the wide discrepancies in their results. With his slower speed wind tunnel, Prandtl was getting higher values than Eiffel's (more than double). The anomaly was finally traced to separation of the laminar flow, and Prandtl resolved the entire matter by the addition of a thin wire around the sphere just in front of the separation point, with a resultant decrease of drag. Thus this first recorded deliberate use of a turbulator occurred about 1914.

### BUILT-IN RECOVERY SYSTEM

Tired of chasing free flight models, but can't afford R/C? How about a variety that needs no retrieval! We refer to good old-fashioned boomerangs. Here at the hangar, we have been having lots

of fun with a pair of genuine made-in-Australia examples. Although we had tried toy boomerangs on various occasions, this was our first exposure to really scientifically designed types, and they bear a closer relationship with model aircraft than might at first be suspected. They feature airfoils, are usually fabricated from wood, and must be properly balanced for efficient flight.

A definite knack is required to properly launch them (a hand-launch glider nut should be a whizz at it), and as it turns out, they are adversely affected by wind, just as are "regular" aircraft. We were surprised to learn that the typical boomerang duration is only about 12 seconds (another record for the glider boys to shoot at), although they can cover quite a bit of ground in that span of time. The experts, incidentally, CATCH them as well as launch them, but to date, we have been rather "chicken" in that respect. One wonders what could be done in the way of applying model aircraft techniques, airfoils, turbulators, etc. to improve performance. Should you care to delve further into these fascinating aerial objects, a catalog of offerings, including a book of instructions, as well as finished products, may be obtained from: Ruhe-Rangs, Box 7324, Benjamin Franklin Station, Washington, D.C. 20044. IMITATION IS THE SINCEREST FORM OF ETC.

Back in May of 1970, your author published a little just-for-fun parlor flyer called the "Escondido Mosquito." To our pleasant surprise, the tiny (8 inch span) insect was again published in the 1970-71 edition of Aero Modeller Annual. Just recently, in the East German publication "Modellbau," lo and behold an amazingly similar craft appeared under the title "Blecha" (floh) which translates to flea. Although slightly altered, there could be no possible doubt that it was essentially our faithful old

hangar flyer. Although we feel that politics has no place in aeromodeling, we couldn't help but chuckle at the fact that this model, which in its original form flew in right-hand circles, is now transformed into an Iron Curtain version which flies to the LEFT! ●

Plug Sparks . . . *Continued from page 21*

batteries, coil and condenser (or magneto) to ignite the fuel.

- Fuel for all Spark Ignition engines shall be gasoline only.
- Rubber models must use the same prop design as on original model (folding, single blade, free-wheeling, etc.). No limit on amount of rubber used.

### SECTION II - Modifications

- An Old Timer may be modified only in the following ways: minor changes to thrustlines, i.e., upright instead of inverted; strengthening of structures and provisions for dethermalizing. Areas and moments may not be changed. All changes must be in the character of the original model, i.e., substitution of sheet balsa fuselage for original built-up structure is NOT approved. Beef up the built ups! Flat airfoils may not be substituted for cambered foils, no reduction or enlargement of model size, etc.
- It shall be the responsibility of the contestant to prove the validity of the model and fidelity to the original design by submitting the actual construction prints to the Contest Director upon request.
- No modification may be made which would prevent the model from making normal, unassisted R.O.G. takeoffs. Therefore, no dropping gears, NO VTO, and no

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catapult devices are approved. Two wheels may be substituted for single wheel gear, but one wheel may not be substituted for two.

## SECTION III - Power and Classes

- Except as provided elsewhere, Old Timer models may be flown with either ignition, diesel or glow engines.
- Classes of Old Timers shall be established, where practical as follows:
  - Class "A" .000 to .200 cu. in. displacement.
  - Class "B" .201 to .300 cu. in. displacement.
  - Class "C" .301 to 1.20 cu. in. displacement.
- Engines above .65 cu. in. displacement must be spark ignition and must have been in production prior to 1950.
- Ignition engines and glow engines may compete only with sufficient time handicaps to be determined by Contest Director.
- For engine run purposes, diesel engines manufactured prior to 1950 shall be termed as ignition engines. After that date they shall be termed as glow engines.
- Where practical, engine runs for Old Timer category models shall be:
  - Glow, hand launch --- 10 sec.
  - Ignition, hand launch - 20 sec.
  - Glow, R.O.G. - - - - - 15 sec.
  - Ignition, R.O.G. - - - - - 25 sec.

## SECTION IV - Basic Events

- Basic events shall be those events which conform to Sections I, II, III, above, specifically as pertains to construction, classes, categories and definitions.
  - A. These Basic Events shall be:
    - Class "A" Cabin
    - Class "A" Pylon
    - Class "B" Cabin

- Class "B" Pylon
- Class "C" Cabin
- Class "C" Pylon
- Fuel Allotment Antique
- 30 Second Antique
- Cabin Rubber
- Stick Rubber

- Specifically, Fuel Allotment Antique models are allowed 1/8 oz. of fuel per pound of model weight, with a maximum model weight of seven (7) pounds. R.O.G. required.
- Specifically, 30 Second Antique models are allowed a 30 second engine run and must R.O.G.
- Stick Rubber models are those built to a cross-section rule not greater than L2/200, where L = length of fuselage. Models are hand launched.
- Cabin Rubber models are those built to a cross-section rule not less than L2/100, and must R.O.G. unless combined with Stick Rubber as a single event in which case they may be hand launched.

## SECTION V - Special Events

- Provisions are made for the flying of special vintage or Old Timer type events.
- Any event which deviates from the requirements of the Basic Events shall be termed a Special Event. (reduced scale, post-1942, etc.)
- Special Events shall be in keeping with the intent of the PRE-AMBLE.

## SECTION VI - Rule Change Proposals

The Society of Antique Modelers shall be designated as a clearing house for all rule change proposals. The Society shall appoint a contest board member from each of its areas to review and submit proposals.

## SECTION VII - Records

No official records will be established on any of the Old Timer Categories.

## SECTION VIII - Safety

All pertinent A.M.A. Safety Rules, not covered above, shall be in effect covering the model, modeler and equipment.

## WHAT MAKES THAT PLUG SPARK?

The Engine Collectors Journal is a publication of The MODEL MUSEUM P.O. Box 15162, Lakewood, Colorado 80215. It is edited and published by Tim Dannels and a donation of \$4.00 (U.S., Mexico, and Canada; \$6.00 for foreign countries) will bring you 6 issues.

In the Sept-Dec. 1972 issue, Harry Lowe, a member of the SCIF's, offered the following ideas on the "care and feeding" of ignition engines . . . to some, a reminder . . . to others, an education.

"This article is directed to spark ignition as it applies to the model aircraft engine. The ignition system consists of a 3 volt battery, coil, condenser (capacitor), spark plug, breaker points, flight timer and wire.

"First, let's examine the spark coil. It consists of two sections. A low resistance choke wound around an iron core, usually made of many soft iron strips. A choke is a coil of wire wound in one direction over a core. It has a unique property; it resists any change in current flow. Around this choke is a secondary winding consisting of thousands of turns of very fine enameled wire which is impregnated with beeswax. Together with a set of breaker points and a capacitor (condenser) you have a special purpose electromagnet.

Now to discuss the ignition cycle. When the points close, both sides of the capacitor are grounded and it discharges. Current starts flowing in the primary of the coil, and, if we assume no lead or contact resistance, reaches a level of 6 amps. (Figure 1) At this point there is a strong magnetic field stored in space around the coil. When the points open,

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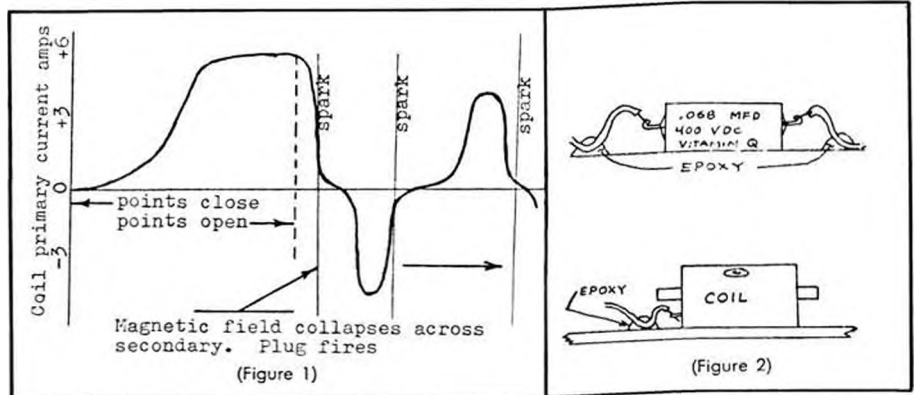
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current continues to flow through the primary into the capacitor. Although the battery voltage was only 3 volts, the capacitor will charge up to greater than 200 volts! At this point, the capacitor attempts to discharge back through the coil primary. For an instant, the coil primary goes to zero current. At this time, the magnetic field around the coil collapses and as it does, it induces voltage in the secondary which fires the plug. The above events occur in a few millionths of a second, and the cycle is not over yet.

"Next, the capacitor discharges back through the primary and a magnetic field of reverse direction is generated. The capacitor again halts the energy and this somewhat weaker field fires the plug again. In a good ignition system, the plug fires many times before the energy is dissipated.

"I made mention of resistance before. This is the basic reluctance of any material to allow electrons to flow from molecule to molecule. In order to get maximum voltage at the plug, you have to have the least possible circuit resistance. The relationship of secondary voltage is Energy/Time.

"The smaller the resistance component, the faster the field collapses, and the greater the voltage induced in the



secondary. Any leakage in the capacitor has the same effect as resistance in the circuit.

Consider the following:

1. Oxidized oil is a good insulator. It is a good practice to run a flex lead from the timer case to the battery ground lug. Braid works fine here.
2. Selection of capacitor. Correct value is 0.05 to 0.1 microfarads, 300 to 400 volt. Mineral oil filled, glass sealed units such as SPRAGUE "Vitamin Q" are excellent. Also very good are the Epoxy sealed units available at electronic stores. Avoid wax sealed radio quality condensers. Fuel (gasoline is an excellent solvent for wax!), temperatures and vibration are too much for them. Good capacitors are available from any electronic supply store.
3. Wire size; 18 gauge stranded is the smallest wire to use for a reliable circuit. Smaller wire will work, but it will cause hard starting when flooded or in cold weather, and shortens the effective battery life.
4. Flight timer contact resistance: If you use the old Austin timers, polish between the spring contact and rivet before flying with 600 wet-or-dry paper. Then fold the No. 600 inside out and run through to remove foreign material. Since 1962 I have been using micro switches epoxied to Tatone Flood-Off timers. They are highly reliable, low resistance and the timers are more accurate.
5. Coil Installation: Consideration should be given to the location of the coil, as any iron or steel close to it will distort and weaken the magnetic field around it during operation. Maintain at least 1/4 inch between the primary wire and ground lead. Keep the high tension lead as far as practical away from the rest of the ignition circuit.

6. Condenser Installation: Keep the capacitor as close to the points as practical. Remember that heat is the worst enemy of a capacitor, so try to avoid direct engine heat. The worst combination would be a tightly cowled engine with the capacitor clamped to

the mounting lug directly under the exhaust stack.

7. Wiring: Make good mechanical connection and clean the wire and terminal before soldering. Since solder wicks up the stranded wire close to the joint, it is good practice to use a short loop from the point and epoxy the wire to the frame. (Figure 2). On the solder lugs for timer and engine ground, use heat shrink tubing, available at most hobby shops' R/C supply counter.

"With the above ideas in mind, ignition troubles should be a thing of the past. My first Old Timer was a Buzzard with an Ohlsson 60. I flew it for three years and it rarely took more than two chokes and two flips to start. However if the troubles persist and you feel an ulcer coming on, there are alternatives. Hand Launched Gliders, Gollywocks, . . . or, Sailboats??"

**Rangefinder . . . Continued from page 12**

Back to the little red schoolhouse for a moment. Without going into all the trig theory, the sine of an angle in a right triangle is equal to the opposite side divided by the hypotenuse. In our case, the "opposite side" is the desired altitude and the "hypotenuse" is the slant range. Solving for altitude, you simply multiply the range by the sine of the angle: The sine for 30 degrees is .50, for 45 degrees it's .71, for 60 degrees it's .87, and for 80 degrees, it's .98. Obviously, if the angle is 80 degrees or more, a direct reading is good enough. For lower angles, you can approximate, or rig a simple hanging inclinometer. It's all according to how much accuracy you want.

The Brookstone RANGEMATIC can be a lot of fun, and many uses will develop as you continue to experiment with it. We had a distance guessing event at a recent Harbor Soaring Society contest. We would call out "Mark" as we got a solid image on a glider in the air, and the contestant would immediately estimate the distance. Results from 15 contestants showed no definite trend, with errors being equally divided be-



tween too high and too low, and percentage of inaccuracy varying from only 1.5 percent off to 200 percent! The closest was young Annette Faure, who missed 405 feet by 5 feet, which was within the accuracy of the instrument!

Just one more thought. When you take readings on full size aircraft flying below their legal limit (we observed several within a few hours), something you could only guess until now, don't report 'em. The pilot might be a modeler, and furthermore, he might have been flying *under* your model! ●

**Workbench . . . Continued from page 4** have total Navy support last year so that we could sort of taper into a self-supporting situation.

**FOR WANT OF AN "O."**

What a difference one letter of the alphabet can make, particularly when it manages to find its way into the wrong position.

Last month, in our "Over The Counter" column we intended to write the following about the new Dumas Drag'n Fly 40: "The Mark II version provides all out speed and maneuverability in a radio controlled boat."

Sounds fine, right? Now remove the "o" from "out" and substitute a "b" as we managed to do, and see how it reads . . . It's a darn good thing that Dumas' Jay Brandon has a sense of humor. It was he who first called it to our attention during the Toledo show. All we can say is, "Sorry, it won't happen again, Mr. Brandbn!"

**SOARING EDITOR MAKES BOO-BOO**

The following correction comes from Le Gray:

Robert B. Asdel, Sunnyvale California, was first to nail us. He's absolutely correct. The January 1973 issue discusses thermal forms and structures and included illustrations of both bubble and column thermal structures. The drawing of the column thermal is incorrect. It should indicate the maximum height as "Top-Out Altitude" rather than "Cloud Base." Cloud base should be indicated by a second horizontal line located at some arbitrary distance below top-out altitude. It's the cloud tops that indicate maximum . . . or very near maximum . . . thermal height, not cloud bases. Keep them cards and letters comin', folks. And thanks, Bob . . . Honest.

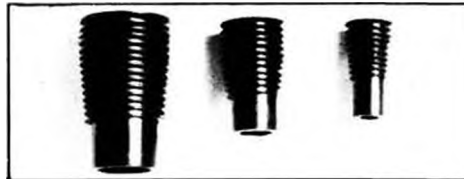
**THINGS TO DO**

R/C systems manufacturer, Orbit Electronics, 1641 Kaiser Ave., Santa Ana, Ca. 92705, has announced sponsorship of the Orbit Invitational R/C Helicopter

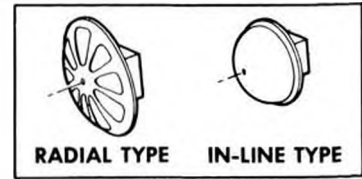
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Contest. The AMA sanctioned meet, intended to become an annual affair, will take place on June 30 and July 31, 1973, in close cooperation with the annual MACS show at the Anaheim Stadium, next to Disneyland.

John Elliot, active modeler and member of the Orbit firm, will be Contest Director. He points out that "Orbit intends to make this contest into an annual proving ground for the world's best flyers and equipment, and to be able to make a substantial contribution to both FAI and AMA contest rules and events. This year, we will draw on the proposed rules from both organizations for our events, as well as other interesting proposals."

Anyone interested in further details should write to John at the above address.

\* \* \*

If R/C sailboating is your bag (or "rag"), here's the super-delux affair of the year; the 1973 Mid-Pacific Model

Yacht Regatta, put on by the Hawaii Model Yacht Association. Also involved are the American Model Yachting Association (AMYA) and the North American Model Boating Association (NAMBA).

In case you hadn't already guessed, the regatta takes place in Honolulu during the week of June 30 to July 7, 1973, with tours of the island, cocktail parties, award banquet, and if there's enough time left, model yacht racing for three days.

Naturally, various package trip arrangements are available in the 300 to 350 dollar range, per person. For more information, write to Model Yacht Regatta, Group Travel Unlimited, P.O. Box 2198, Honolulu, Hawaii 96805

\* \* \*

While we're on the travel kick, here's another one. The BIRDS club of Carson, California, with the help of Worldways Travel Corp., is planning a 9 day trip to Mexico City, including an R/C con-

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test hosted by Associated Modelers of Mexico.

This trip is being arranged in conjunction with the MACS Trade show in Anaheim, California (next to Disneyland), which takes place June 29 and 30, and July 1.

For further info, call Joe Bridi at (213) 834-0701 or (213) 326-5013, Don Gutridge at (213) 423-9437 or (213) 646-2143, or Alice Langton (Worldways Travel) at (213) 466-5356.

**Pylon/4 . . . . . Continued from page 16**  
lage must be at least 2-3/4 inches wide, measured within the wing chord area. At the deepest point the fuselage must be at least 5 inches deep (including windshield, canopy, or headrest). These points need not coincide.

### 10. LANDING GEAR(s)

Landing gear shall be non retractable and wheels must be free rolling. A tail skid, if utilized, shall point to the rear of the aircraft. No brakes allowed. Minimum wheel diameter shall be 1-1/2 inches.

### 11. WING(s)

No minimum span required, thickness shall be 7/8 inch measured outside fuselage wing fillets and progressing in a straight line taper to the tip. Wing area shall be a minimum of 300 sq. inches.

A biplane shall have not less than 5/8 inch upper wing thickness, measured on a line projected vertically from fuselage side, as in a top view, at the point of fuselage and wing intersection. Lower wing shall be not less than 1/2 inch thick at projected root, provided its area is not less than 2/3's of upper wing area.

### 12. WEIGHT

Ready to fly weight, less fuel, shall be 2-1/2 pounds minimum and 4 pounds

maximum.

### 13. MATERIALS AND WORKMANSHIP

Materials and workmanship shall be of a satisfactory standard as to not be a safety hazard. The C.D. and/or race starter shall be empowered to disqualify any unsafe or damaged aircraft.

### 14. RACING NUMBERS (Optional)

Racing numbers shall be at least 1-1/2 inches high and placed in scale racing positions.

### 15. REGISTRATION NUMBERS

Registration numbers shall be at least 1-1/2 inches high and shall consist of the last 2 or 3 numbers of the entrant's AMA number and placed on the upper right and lower left wing panels. The letter N will precede the registration number and the initial of the entrant's last name shall follow the registration number. Alternate: Registration numbers at least 1 inch high may be placed on both sides of fuselage.

### 16. STARTING TIME

Contestants will have a maximum of 1-1/2 minutes to start engines. If after 1-1/2 minutes have elapsed, an engine has not started, or quits, a zero is given for that heat.

### 17. IDLE REQUIREMENTS

Engine idle before a race shall be spot checked to the C.D.'s and/or Starter's satisfaction. Those being checked shall, upon signal from the starter, throttle back their engines for 10 seconds. If the engine quits or fails to idle to the satisfaction of official observers, the pilot is disqualified for that heat. No restarts allowed.

At the completion of every heat, all airplanes must land with the engine running at point of touch down. Pilots landing deadstick shall be penalized one half point.

### 18. FUEL

Fuel shall be commercially available,

contain not over 15% nitro, and shall be supplied and/or specified by the hosting group.

### 19. RACE PROCEDURE AND SCORING

Procedure and scoring shall be in accordance with all paragraphs in Sections 23.12 and 23.13 of the 1972 AMA Rule Book for Radio Control Pylon Racing - Formula I and II.

### East Coast FF . Continued from page 35

Have you considered trying auto-surfaces, only to be turned off by the complexity of the systems presented? Or perhaps you would like a selection of mechanisms to chose from, rather than one writer's favorite? Most of the set-ups described in magazine articles are not adaptable to Tatone or single function timers, which again leaves many fliers "out." Read on, and you will find 3 auto-rudders and 3 auto-stabs (Variable Incidence Tailplanes, or VIT) described, two of each being designed for use with Tatone timers, the 3rd of each for Seelig multi-function timer installations.

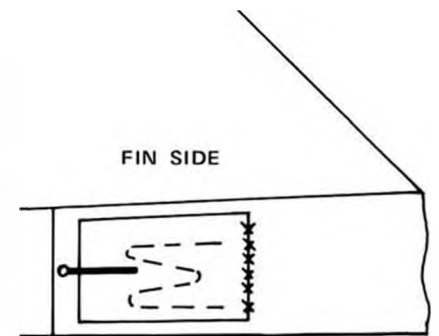
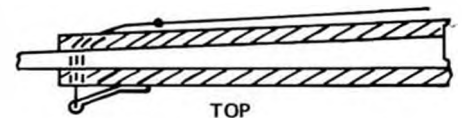


FIG. 1



The first A/R shown (Fig. 1) is a modification of the Bob Sifleet FAI Power model system. It is little more than a hinged door on the right side of the rear fuselage, set to open just as the engine cuts, to aid power-to-glide transition. It is *not* a true "rudder" in the sense that it does not control the glide phase of the flight; it merely slides the model into the right turn just before the engine shuts off. A Tatone timer need only have a small cam added (with a slot, Fig. 2) for actuation. The torsion spring is very fine music wire embedded into the rear fuselage so that the flap can close flush. Adjustments can be made by simply tying a knot in the

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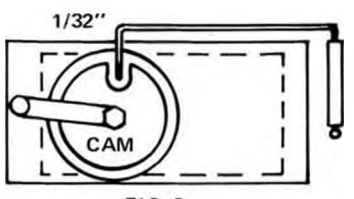
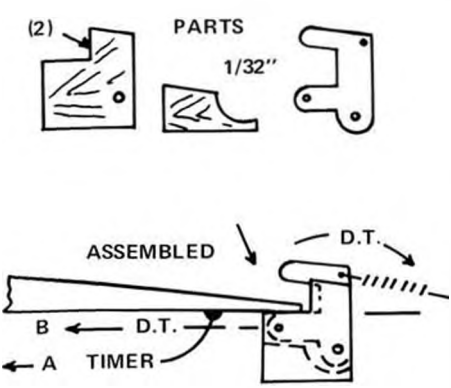


FIG. 2

line, or by adding a set-screw. Timing is not as critical as with a full rudder; as long as the flap opens before the model slows to glide speed, it will do the job. If it opens much too soon, it will cause a "round and round" pattern, and if it's too late, the model will probably stall. Power pattern trim is done by either (1) normal rudder adjustments, (2) thrust adjustments, (3) or putting shims behind the flap. Glide trim is achieved by normal stab tilt.

Figure 3 (Bob Lipori's idea) is a simple VIT set-up for models having a fuse D.T. and a Tatone "Flood-Off" timer. It is made from 1/32 inch ply and thin aluminum. The line tied *directly* to the stab goes to the timer actuator arm. The D.T. line attaches to the VIT limit arm, which swings rearward after

FIG. 3



D.T. Note that line A then becomes the D.T. limit line, so it must be allowed to hang free about 4 inches during flight. This should give proper D.T. angle. The reason for suggesting the use of a "Flood-off" timer is that a "Flood-off" continues to run after shutting the engine down; a "Tick-off" does not. If a VIT system kicks in glide-stab before the engine stops, there will be a terrific "gallop" before transition . . . Waiting until the engine has been stopped for a couple of seconds will allow the model to slow down for a good transition.

The VIT set-up in Fig. 4 is a refinement of the earlier system, with a screw adjustment for power and glide, but still with only one actuator arm, which means you can still use single-function timers. Line A is held in place by the timer cam, and line B by the D.T. fuse line. This system is better for smaller, faster models requiring smaller increments of adjustment.

FIG. 4

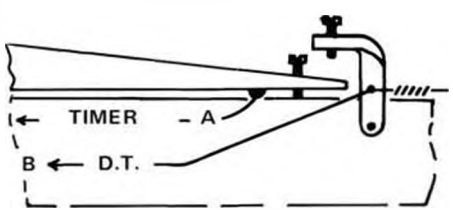
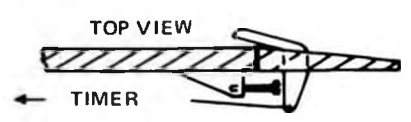


Fig. 5 shows an A/R set-up that has one screw adjustment for the power phase of the flight, while glide trim is done by bending a wire stop, or shaving away a ply stop. This is a true rudder in that it will control the glide circle size without stab tilt. The control horn should be wide enough to contact the (power) adjustment screw fully, so pads

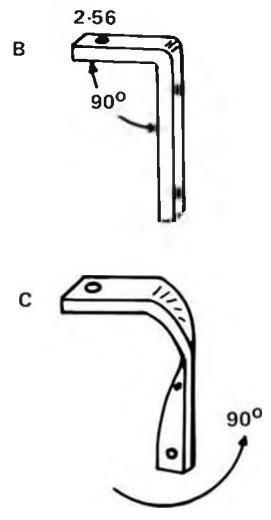
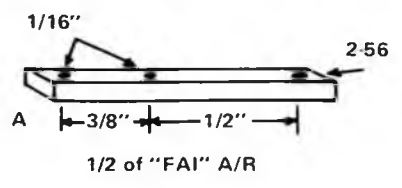
of a split 1/8 inch dowel can be added to the top and bottom at the contact point.

FIG. 5



The last VIT system is for full micro adjustment of both power and glide phases; the arms are made from aluminum stock or bent from an FAI Model Supply "A/R Stop" as shown in Fig. 6.

FIG. 6



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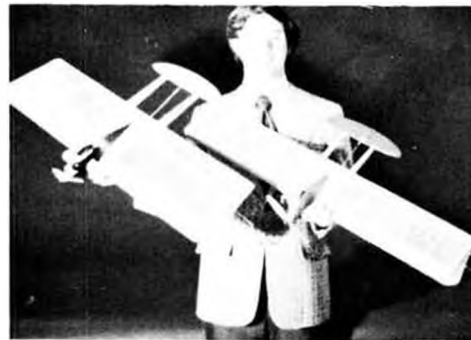
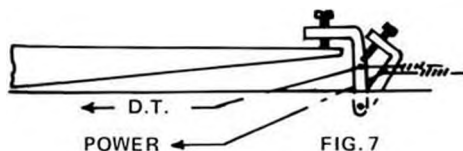
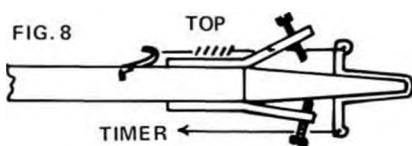


Fig. 7 shows the complete installation:



The central pivot is a 1/16 inch O.D. tube with a spacer of acetate between the arms to prevent binding. The 2-arm system is adaptable only to multi-function timers such as the "Seelig Mini-Combo" or "FAI" timers. The Digest of the National Free Flight Society (Bob Meuser, 4200 Gregory St., Oakland, CA 94619, is editor) has the address and prices. The cams are staged to follow this sequence, assuming a 10 second engine run: At 9.5 seconds, the A/R deflects from power position to glide . . . within 2/10's of a second the engine cuts . . . at 11 seconds the stab rises to glide setting . . . and D.T. is at 3.00 minutes, or what ever the max is.

An A/R with screw adjustments in both power and glide is shown in Fig. 8.



A multi-stage timer will allow the timing sequence to be advanced or delayed by movement of the cams.

A few words of caution regarding auto-surfaces in general; a metal or

nylon screw contacting bare balsa surfaces will soon wear a depression in the wood, changing settings. A simple aluminum saddle will prevent this. Most stabs are reluctant to rise the first few degrees of upward travel when the limit arms move aside; they will then move rapidly the remainder of the angle. It is simply a matter of the hold-down bands working at an awkward angle while the stab is flat. This can be cured by placing a small coil spring or foam rubber pad beneath the stab T.E.

Where actuator lines do not have to make sharp bends it is much safer to use braided control-line wire; typical sizes run to .008 for 1/2 A's, and .015 for FAI thru C gas. DO NOT use solid wire, as it kinks easily, which can't be detected in most installations. It will then break at the kink after 2 maxes, guaranteed!

Small springs of high quality can be obtained from typewriter repair shops, usually sold by the dozen. If not, try a letter to a large typewriter manufacturer requesting prices.

VIT arms should *not* have the vertical portion engage the stab T.E. at any time; a small ply stop limiting forward movement can prevent this. The reason here is the stab has enough problems trying to rise those few degrees (remember the comments earlier?) without binding on the VIT arms also.

The systems shown may give you a start in auto-surfaces; just remember that they are not a cure-all, and can't make up for pilot goofs. Like anything else, they must be tried and tested before expecting to perform as advertised.

One last note, completely aside from

any auto gadgets; The NFFS Symposium 1973 is alive and well, with MB's Free Flight Editor Tom Hutchinson doing the Editor's chores. Now this writer has the honor of joining the staff. Tom has chosen Dave Linstrum to Edit the popular "Ten Models of the Year" section, and Dave, in turn, has appointed committee chairmen for the various divisions. I am chairman of the "International" committee, which is empowered to pick the top Wakefield, A/2 Nordic, and FAI Power models of the year. My 6 man committee will have (as befitting an "International" selection) members from Canada, England, Denmark, New Zealand, and the USA. The committee chairmen for the remaining divisions are; Dave Rounsaville-AMA Gas, Bud Tenny - Indoor Endurance, Willard Schmitz - Outdoor Rubber, Chuck Markos - Hand Launch Glider, and Bill Hannan, Special classes. Stay tuned for further details. ●

R/C Report . . . Continued from page 15 note to Orbit Electronics, at 1641 Kaiser Ave., Santa Ana, CA 92705, will get you one. Please tell John Elliot we sent you.

Nice letter from W.A. Robinson of Campbell, CA who says R/C soaring is really his bag. He feels it is a good way for beginners to get started. Safer on the plane and cheaper, too. He's got a good point. Not a whole lot of soaring activity locally, but in this area (The South) we see quite a few sanctions for AMA contests featuring just thermal soaring. Guess we'll have to give it a

try. Have a Cumulus 2800 under way . . . will have to finish it up come warm weather . . . also will use the power pod with it.

Couple of issues back we mentioned trainer type planes in some detail. About the time the article came out, Sig introduced their Kaydet trainer. The Great Editor ordered one and when it comes in we'll tell you more about it. From what we can gather, it will be an ideal type safe trainer, and has some unique construction features that enable fast building.

If you just can't go the trainer type but still want a good plane that is aerobatic, but not one of the speed-of-light types, take a look at Goldberg's Falcon 56 and the beautiful Sr. Falcon. Bridi has his Kaos which not only has countless contest wins, but in the hands of only a fair flyer, will make a believer out of you. It is a very easy building kit, too. Joe just introduced his Super Kaos, which he flew at the last Nats and the Huntsville Masters. Same quality and good flying features.

Probably one of the biggest sleepers around is the Senior Telemaster being offered by Hobby Lobby. This plane has to be seen to be believed. It is just a plain airplane; high wing and very orthodox appearance. BUT, it has a span of just about eight feet and a chord of fourteen inches! It is a lovely, slow flying plane, and a .45 to .60 takes it up with no sweat. It builds up easily and they literally can't keep them in stock. Seems that nobody makes this type of plane, and there really is a demand for a nice, big, slow flying plane. Price is reasonable at \$57.95 when you consider the size of the kit and plane.

We recently received for evaluation (that means they own it and I get to try it out!) one of the latest R/C Manufacturing Series 800 rigs. This is a beautifully constructed outfit, and is available in many different ways; five, six or eight channels, all popular frequencies and with a variety of servos. The one they let us use has the KPS II type servos and we dropped it right in the old Lucky Fli that used to have the Pro Line with the same size servos. System worked beautifully and we were pleased to have the opportunity to fly it. They also have a "servo service" feature that enables you to work your servos from the transmitter without turning on the transmitter . . . Nice when you want to run the engine up or down or check controls. Just plug the special cable in the transmitter and then to the special plug on the receiver harness.

This outfit is designed by Ed Thompson, of "Digitrio" fame. We have been very pleased with this rig and hope they forget they only lent it to us! You can write to them for catalog and poop sheet. One of the magazines recently did a specialized product report on it so there is no sense in getting technical. Write 'em. RC Manufacturing, Radio Control Division, 7717 Fair Oaks Blvd., Carmichael, CA 95608.

Here's a challenge for you: Reader Albert L. Wahrhaftig, 928 Wagon Rd., Sebastopol, CA 95472, would like for some readers to design a plane for him. His problem is specialized and we quote "I live on several acres of land surrounded on all four sides by high redwoods. Therefore I need a plane that can fly in a confined space (There is already a Mayfly with ACE pulse R/O lodged in the top of these trees). The land is covered with bushes and scrub. Therefore, I need a plane that can be landed by steering it into a bush and plucking it out undamaged (No silkspan or tissue)." Any budding designers have a small, sturdy "bushwhacker" we might publish???

By the time you read this, we will have gotten married to a lovely red-headed gal named Emily, who in addition to being number one with this old balsa butcher, is a darned good sport with a sense of humor. The past weekend was spent helping her pack up her things at her apartment and moving them into our R/C hovel.

Sunday was one of those few good days that we knew the whole gang would be at the R/C site and we weren't, but being a generous and good soul, we didn't complain. However, just for fun we suggested stopping by the field to watch and maybe just for laughs, flying our little Mattel Super Star electric free flight.

We stopped near the U-Control circle and proceeded to fly the Super Star. Of course, if we went to the flight line where the R/C planes were we would never get the moving and packing done. So, in the middle of flying the free flight, which wasn't doing too well, Emily became fascinated with the R/C birds overhead. Naturally, we began to watch, too. Five to ten minutes elapsed . . . all the time the Super Star was taking a heck of a charge . . . so it was decided to have just one more flight and leave. We launched the little plastic and electric motor job. Up it went . . . it just kept on going up . . . Finally, at about three hundred feet, it hit a downwind rising air mass and began going away.

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We jumped in the old truck to chase it and Emily was rolling on the ground laughing. It was necessary to get her in the truck for fear of running over her. Guess the look on our unbelieving face when that little dinky plane went West was too much for her. By the time we got on the road it was gone. Then she became concerned. Did her laughing make us angry? No, but she must remember that it isn't good form to laugh if somebody's R/C bird crashes.

What about the free flight? Then we confided that it wasn't ours anyhow . . . the local discount jobber had given it to us to try out, so we didn't care if it flew away or not . . . she nearly fell out of the truck laughing this time . . . See you next month. ●

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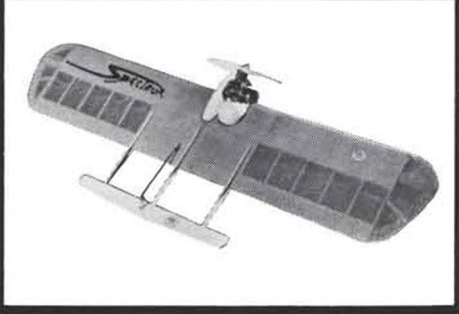
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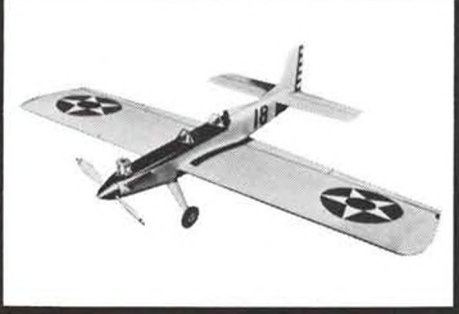
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Jim Quinn's Wakefield grabs some sky at the Phoenix Southwestern Regionals.

# FREE FLIGHT

In addition to TOM HUTCHINSON's column, we have a report on the Phoenix Southwestern Regionals by TOM CARMAN and PAUL RYAN; also a new Eastern F/F report by RON EVANS.

● I've just begun to realize that this second column may be as frustrating to write as the first one, perhaps even more so, since I don't have any reactions from my initial offering (it hasn't appeared in public as of this moment of writing) to use as springboards for further discussions. But, on the other hand, I'm batting 1.000, since I haven't heard any objections, either. So . . . plunging ahead courageously . . . let us continue.

## US FREE FLIGHT CHAMPIONSHIPS

You snow-bound Easterners had better begin making plans for the great trek westward this Memorial Day Weekend. The advance scouts from Snider Swamp and other cultural centers have made the journey out to Taft for the past 2 years, and reported back the news that Free Flight is alive and well on the West Coast, where the natives gather for celebrations to the thermal gods every year in the most unbelievable free flight contests ever held. Initial planning has started on this year's US Free Flight Championships at Taft, California, and all indications are that this year's event will be as well-attended and successful as the past two have been.

The schedule of events is:  
Saturday, May 26  
A Gas

- FAI Power
- Coupe d'Hiver
- HL Glider
- 30 sec. Antique
- .02 Old Timer
- Night Flying
- Sunday, May 27
- 1/2 A Gas
- C Gas
- Wakefield
- A/1 Glider
- Rubber Scale
- Gas FF Scale
- A Old Timer
- B Old Timer
- C Old Timer
- Monday, May 28
- B Gas
- D Gas
- Unlimited Rubber
- A/2 Glider
- Rocket
- Payload

As you can see, every type of free flight model has an event at this meet. In addition to those listed, there will be special sweepstakes awards for individuals (Junior, Senior and Open) and Teams.

For further information, contact the contest director, Al Vela, 11807 Crystal, Chino, CA 91710.

## RESULTS OF FAI TEAM SELECTION

## POLL

This may overlap Al Vela's bailiwick somewhat, but we'd like to give the results of a poll taken by AMA HQ, which sampled the opinions of FAI free fliers on various ways of selecting the 1975 US team. (We're on the NFFS committee which is using this poll as a



Mel Schmidt placed second in Class D with his K & B 41 powered SHOCer 750.

The second most common problem is warps, or surprisingly, the lack of them. Significant non-symmetrical warps are obvious problems, and should be eliminated. On most models there is one wing warp that is, if not absolutely essential, at least almost always beneficial. This warp is referred to as "washout," and is a symmetrical warp in which the trailing edge of each wing is warped up as it proceeds towards the wing tip, so that the tip of the wing flies through the air at a lower angle of attack than the wing root. A model that stalls and then drops a wing can be a disaster; one that wobbles from side to side is a disaster waiting for a place to happen, and "washout" will usually cure the problem. (Please take note of the VP-2 wingtips in the photos).

The above are the two most important items; all the other problems can be solved with propeller thrust line changes, or elevator and rudder setting changes . . . except one. This last one is rare, but occasionally a modeler will put on a propeller that is too big, or has too high a pitch, and the model will be unflyable for any length of time. Generally, it is easier to adjust a model to fly consistently with a small propeller than with a larger one. Durations are lower with a smaller propeller, however, and therefore if you are interested in long flight time you will tend towards the larger diameter, slower turning,



With pilots THAT skinny, you don't hardly need a wider cockpit!

higher efficiency propellers.

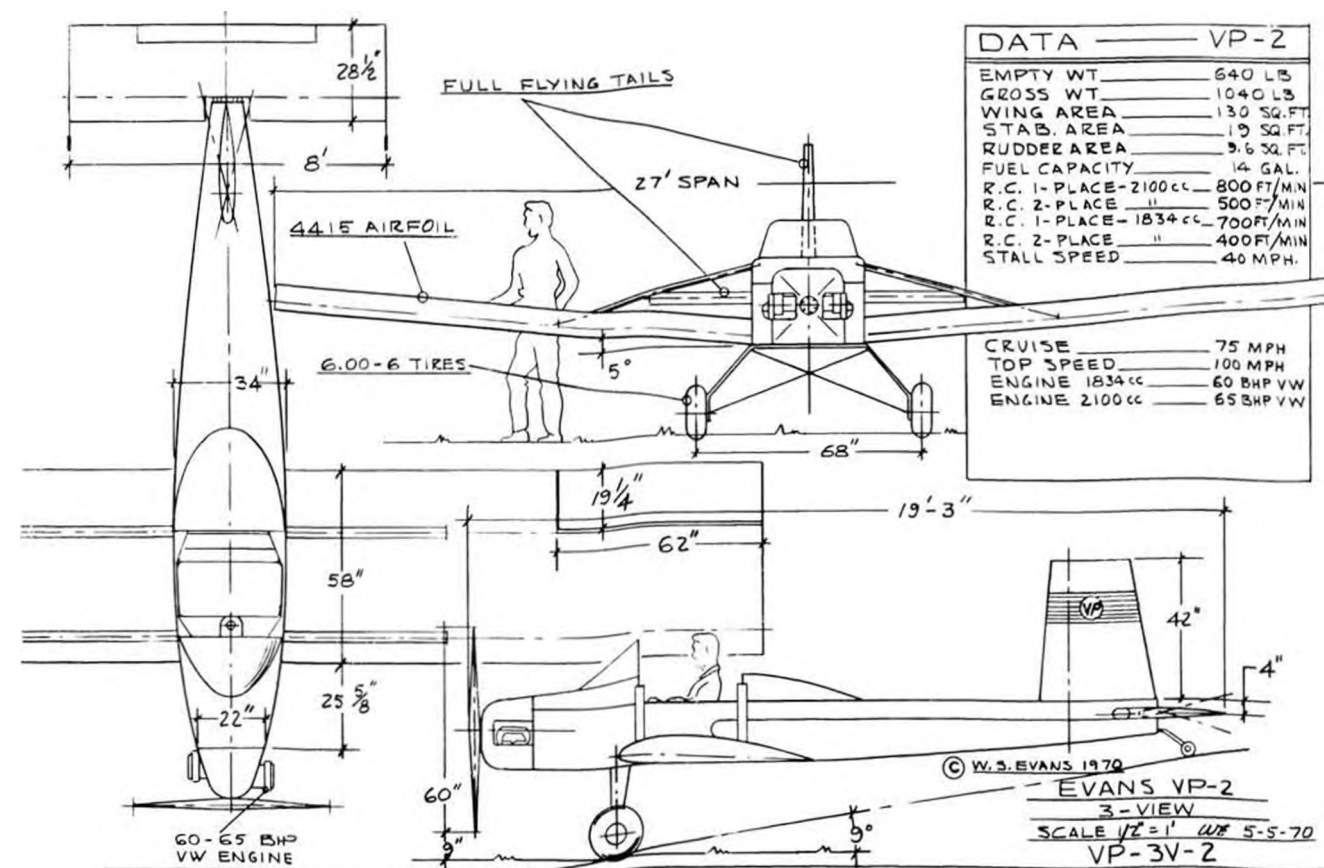
Once the model is balanced right and has no wrong warps . . . and enough of the right ones, it should be glided power off, that is with the propeller free wheeling, or with very few, (not more than 50) winds if you don't have a freewheeler. The glide path is adjusted with the horizontal tail. If the model dives . . . that is, continues in an ever steeper arc towards the ground while its speed keeps increasing, bend the trailing edge of the horizontal tail up. If the model pitches nose up, slows down almost to a stop, and then dives (this is known as stalling), the trailing edge of the tail should be bent down. The amount of displacement of the

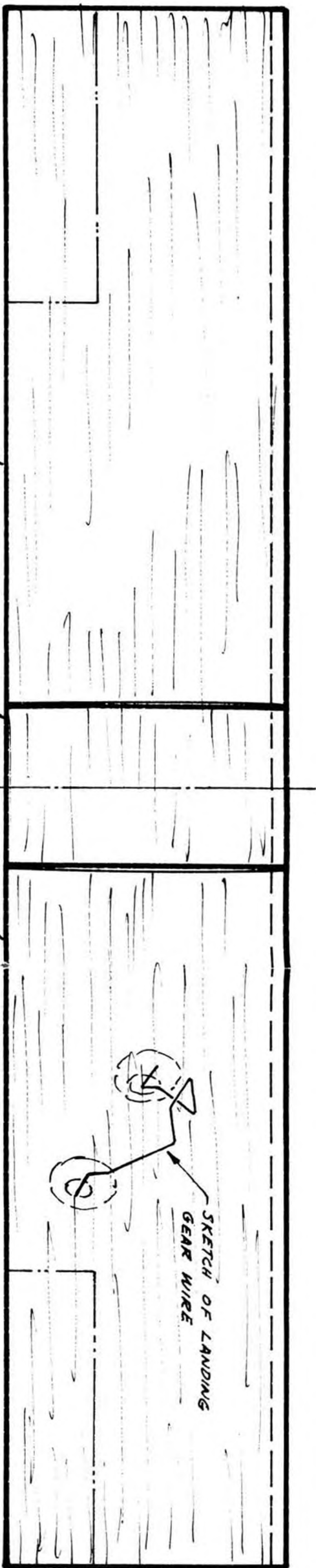
trailing edge of the tail to provide enough adjustment is fairly small, so proceed carefully and take your time at this stage.

The model should glide in a relatively straight line. A sharp turn can be corrected by moving the trailing edge of the rudder in the direction away from the turn. However, if your rudder looks straight at this point, a turn is almost always because of a warp in the wing. Sometimes, if the propeller is large and does not freewheel, its effect is to make the model roll and turn to the right, hence the reason for the few winds during the glide tests.

Once the model is gliding satisfactor-

*Continued on page 44*





1/16 x 1/8 LEADING EDGE REINFORCEMENT

WING AIRFOIL CURVATURE (AIRFOIL) SHAPE IS OBTAINED BY GIVING UNDER SIDE IN THIS AREA ONE COAT OF THIN DOPE.

FOR BEST FLIGHTS USE A MOTOR OF 1/8TH FLAT RUBBER IN A LOOP AT LEAST 14 INCHES LONG

CENTER SECTION

LEFT WING

RIGHT WING

PLASTIC PROPELLER WITH A PECK POLYMERS THRUST BUTTON. HOOK IS BENT FROM 1/32 ND. DIA. WIRE - NOTE WINDING HOOK ON FORWARD END IN SIDE VIEW AND HOOK SHAPE IN TOP VIEW. CYLINDERHEADS ARE SCRAP BALSAM



WINDSHIELD PATTERN HOLE IN BOTTOM SKIN SO YOU CAN SEE RUBBER WHEN INSTALLING IT

DIHEDRAL

TOP VIEW

REAR MOTOR PEG

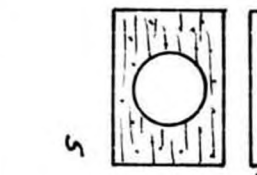
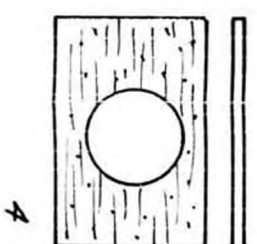
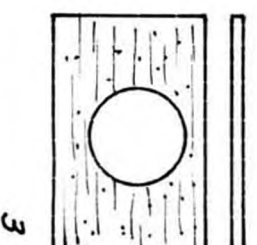
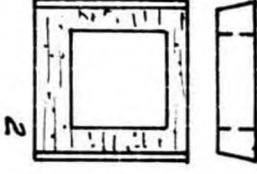
VERTICAL TAIL

SIDE VIEW

2 PILOTS ARE 1/32N SHEET BLOCK BALSAM TURTLE DECK

BLOCK BALSAM FRONT GOWL

1 2 USE MASKING TAPE TO ATTACH LANDING GEAR WIRE - WIRE IS 1/32 ND. DIAMETER



THIS SHOULD FIT SNUGLY IN HOLE IN NO. 2

The MODEL BUILDER

The MODEL BUILDER

SAND LEADING EDGE OF WING ROUND, FROM THIS TO THIS

GLUE FAIRING ONLY TO FUSELAGE, NOT TO WIRE

ANY SUITABLE WHEELS HOLD ON WIRE WITH A "BLOB" OF CEMENT

TAIL ENDPLATES

HORIZONTAL TAIL

NOTE: ALL PARTS ARE SHEET BALSAM UNLESS OTHERWISE NOTED. 1 & 2 ARE MADE FROM 3/16 TH THICK STOCK, 3, 4, 5, & 6 ARE 1/16 TH THICK, ALL THE REST OF THE SHEET PARTS ARE 1/32ND SHEET. NOTE GRAIN DIRECTION.

All SHEET DEANUT EVANS VP-2" Matt Moroney 12-27-72