

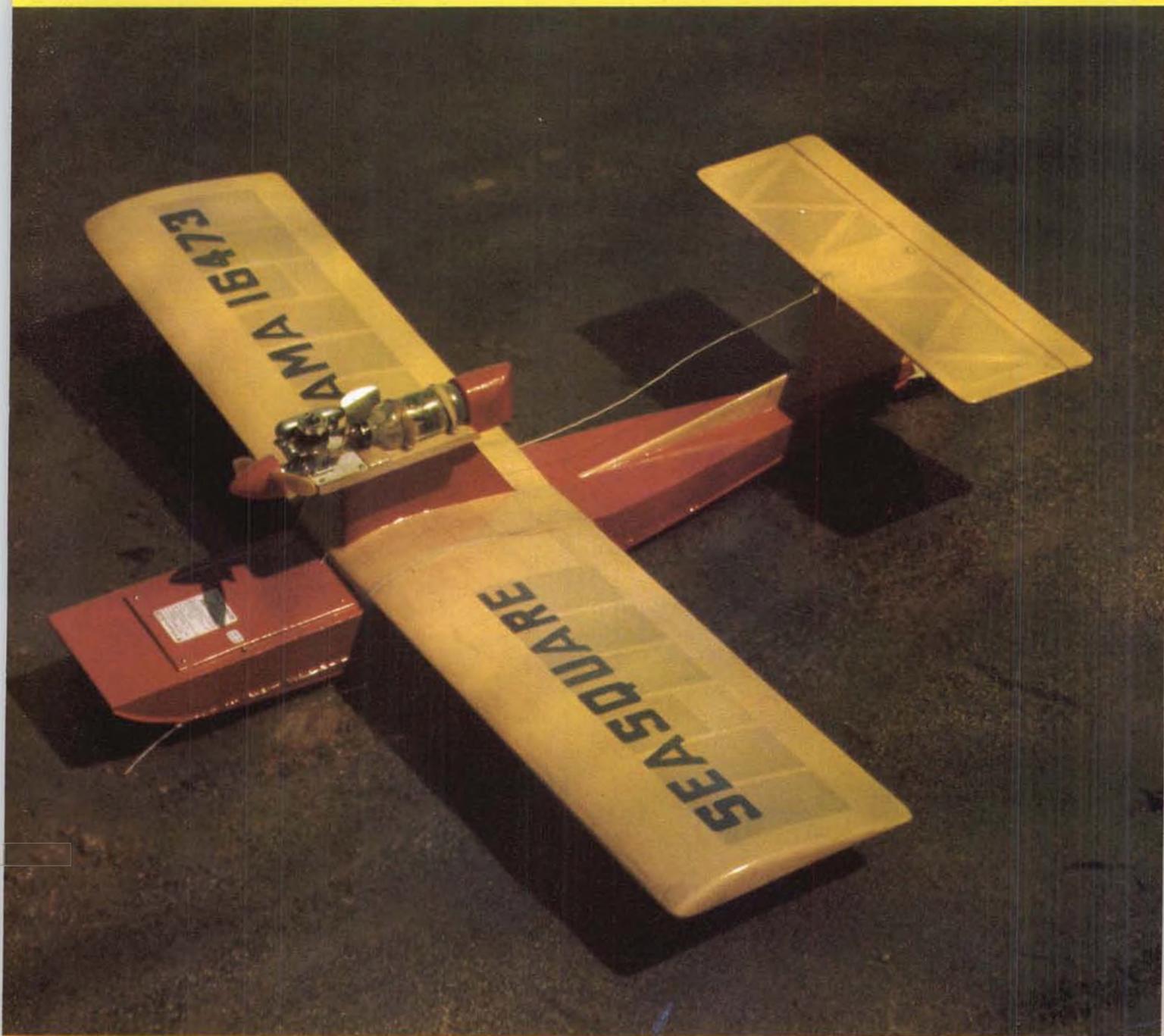
MODEL BUILDER



MARCH 1976

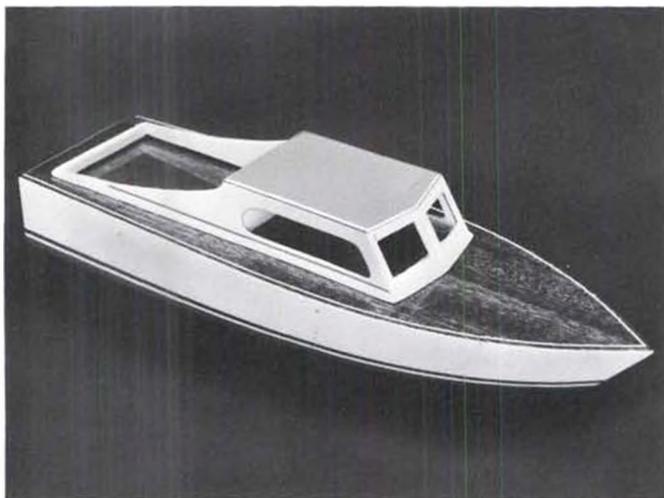
volume 6, number 51

\$1.50



NEW "HALF-PINT" CABIN CRUISER (Kit CC-10)

An 18" model that's easy yet satisfying to build. Makes an ideal "starter" for the beginning R/C boat modeler. Designed for .049 engine.



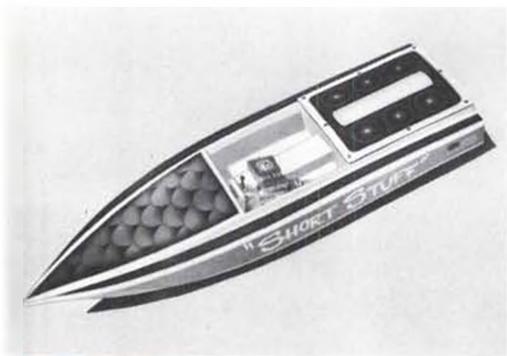
NEW SKEVEE 10 (Kit SKV-10)

Hours of fun are packed into this 18" wood ski boat model that has a V bottom for competitive racing even in rough water. Looks and performs like the "big boys"; uses .049 engine.



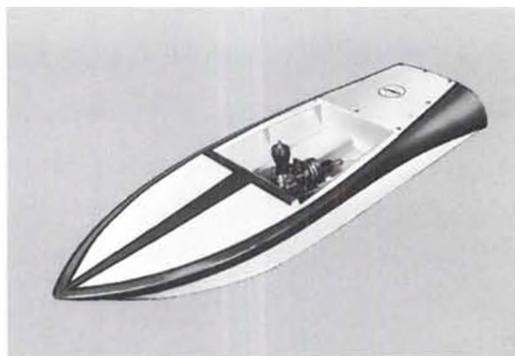
HERE'S A NEW RC MODEL BOAT RACING CLASS... AND IT'S EVEN POPULAR WITH YOUR WALLET!

All the fun of R/C model boating is yours at a price anyone can afford with a new Dumas 1/2 A kit, inexpensive to buy, build and run... minimum fuel consumption... and noise! ■ For under \$14.00 you can buy any kit on this page. And because they're just 18" long, they need only an inexpensive .049 engine and hardware. A 2-channel radio and you're ready to go. (Approximate Total Cost: \$160!) ■ Each Dumas model has been pre-tested for ease of building and performance. ■ See your dealer for a pre-packaged hardware kit with everything you need for running. Cool clamps and props available separately. If he can't help, write us.



NEW DEEP VEE 10 (Kit DV-10)

Here's an 18" long Deep Vee that's already proved itself in competitive racing. Built of mahogany plywood and veneer. Great in rough water or calm. Uses .049 engine.



TRIED AND TRUE SK-DADDLE JR. (Kit SK-3)

This hot little boat gets more popular every year. For swimming pool cruising with an electric motor or competitive racing with the 1/2 A's.

See your hobby dealer or send 50¢ for our complete catalog.

dumas
boats

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



CARL GOLDBERG

43" SPAN
29 1/2" LENGTH
390 sq. in. AREA



KIT G25 \$13.95

THE ALL *NEW* CONTROL LINE

FLYING TIGER

P-40 STUNTER

FOR .19 TO .35 ENGINES

PLANS ALSO SHOW R/C VERSION,
FOR 2-3 CHAN. RADIO, .15 - .19 ENGINES

EASY TO BUILD - EXCITING TO FLY

Something new! The thrilling and historic P-40 Flying Tiger becomes a great control line stunt model! It even has optional wing flaps! Or if you're an R/C modeler looking for something to keep you on your toes - this is it! Talk about performance - you've never seen such fast rolls and tight loops! Kit has huge decal sheet with authentic insignia and markings, many carefully shaped and die-cut balsa and plywood parts, adjustable threaded pushrod and quality nylon fittings, etc. Large, exceptionally complete plans show every step, every detail, and various options so you can build the P-40 you want! Fly the Flying Tiger!

For best service, see your dealer. If not available, write direct: add 50¢ per item (\$1.00 outside U.S.).

AVAILABLE
IN CANADA

CARL GOLDBERG MODELS INC.

4736 WEST CHICAGO AVE. • CHICAGO, ILLINOIS 60651



CARL GOLDBERG MODELS, INC.
4736 W. Chicago Ave., Chicago, IL 60651

I am sending 25¢ for 8 pg illustrated
Catalog with Basic Explanation of R/C
Equipment and Radio Control Definitions

Name _____

Address _____

City _____

State, Zip _____

MODEL BUILDER

AND

PANAVISE®

presents the

MASTER MODEL BUILDER of the month CONTEST

Send all entries to:

MODEL BUILDER/PANA-VISE CONTEST
1105 Spurgeon St., Box 4336,
Santa Ana, California 92702

COLBERT INDUSTRIES, manufacturers of PANA-VISE, the unique hobby vise which turns and tilts to any position, in conjunction with MODEL BUILDER magazine, is sponsoring a design competition for MODEL BUILDER readers.

This monthly contest will be judged for originality and/or craftsmanship for all types of models (excluding plastic static scale). Entries will be judged purely on the basis of photographs and drawings supplied by the builder of the model. Emphasis in judging will be on originality, technical achievement, and craftsmanship, as found in the submitted material.

A MODEL 301 PANA-VISE WILL BE AWARDED EACH MONTH TO THE WINNING ENTRY



Requirements for entries:

1. Any type model may be entered (aircraft, cars, boats, etc.). Kits may be entered if significant modifications have been made to the stock kit.
2. Do not send the actual model. Send only black and white photos, showing at least three views of the model. Include some familiar object in at least one photo to indicate the size of the model. Try to include photos of any significant details.

3. If photos cannot offer sufficient information about the model, the construction drawings may also be submitted. Drawings should be clean, pencil drawings with all pertinent dimensions indicated. A print of the drawing is acceptable.

4. A written description should be included with photos and drawings, explaining in fair detail any unusual features of the design, and explaining any unique technical difficulties that the model may have achieved.

5. Please do not submit any designs that have been accepted for use in another publication. MODEL BUILDER requests first option on publishing any submitted design. Payment for published designs will be at our regular rates. Any prizes awarded do not represent an agreement to publish any design.

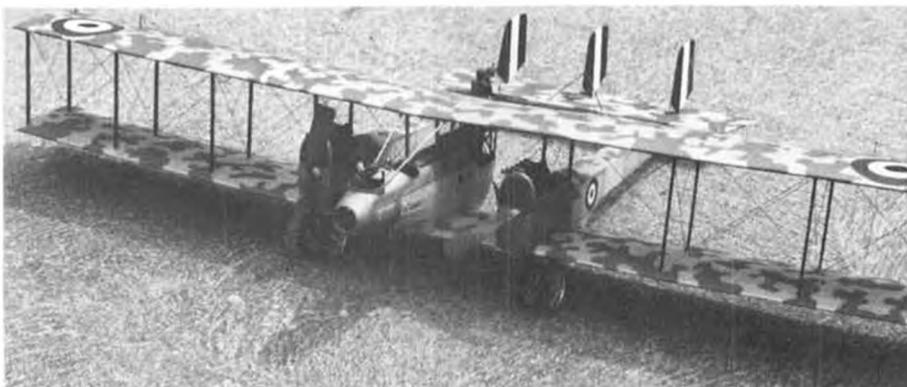
6. Entries will be judged by the modelers on MODEL BUILDER's editorial and art staff, and all decisions of the judges will be final.

7. Postage must be furnished if return of submitted entries is desired.

8. Deadline for entries in the first contest of the series is July 1, 1975, and winners will be announced in the September 1975 issue. Subsequent entries will be due the first of each month and winners will be announced the second month following each closing.

The winner for March is DENNIS NORMAN, Lakewood, Ohio. His entry is a 3-engined, rubber powered Caproni Ca 5 bomber.

Built to 1/2 inch scale, the bomber spans 39 inches, and weighs 6 ounces, without the three 6-strand rubber motors. Crew figures are carved from styrofoam, and the eight wire-spoke wheels were specially made for the Caproni by Fulton Hungerford. At the time of the photo, the ship had won numerous static scale trophies, but had not as yet been flown.



AN IMPORTANT ANNOUNCEMENT TO ALL MODELERS

Airtronics and Cox have joined hands! Both companies are world renowned for the highest levels of quality and performance and will provide you with a new systems approach to model products. A new company has been created to develop and produce products for the discerning modeler who is interested in value, quality and excellence in design. Look for our new logo — it's your guarantee of a superior product.



ENGINES AND ACCESSORIES

AND A BRAND NEW LINE OF RADIO SYSTEMS

Available in 2, 3, 4, & 6
Channels On All Frequencies

COX / SANWA

Exciting Technical Features
Including The World's Smallest Servo

SEE OUR EXHIBIT AT THE WRAMS AND TOLEDO SHOWS FOR FULL
DETAILS OR SEND 25¢ FOR OUR FULL 16 PAGE CATALOG

READY NOW AT YOUR HOBBY SHOP!

AIRTRONICS

Q-TREE

Kit

36 inch span, 252 square inches
16-20 ounce flying weight

- ★ For the novice who has never built or flown an R/C model.
- ★ Precision machined parts and all hardware included.
- ★ Perfect for schoolyard flying with the new Cox QRC Engine.



\$17.76

FOR ADDITIONAL INFO WRITE OR CALL:



Phone: (714) 540-8200
1525 East Warner Avenue
Santa Ana, Calif. 92702
a subsidiary of Leisure Dynamics Inc.

In Canada Contact:
Leisure Dynamics of Canada
1315 Lawrence Ave. East
Don Mills, Ontario, Canada

ANNOUNCING 2 NEW

COX

ENGINES

FOR THE MODELER INTERESTED IN MAXIMUM PERFORMANCE CONQUEST .15 R/C



\$59.95

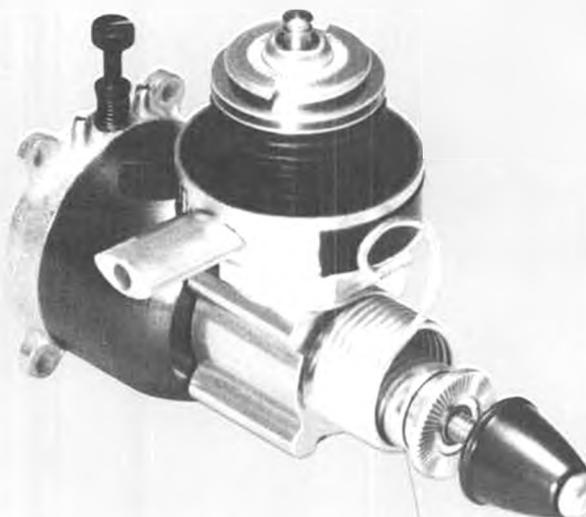
Cat. #2810

*FOR QUARTER MIDGET RACING
OR SPORT FLYING*

- ★ Schnuerle porting for highest rpm & power.
 - ★ High strength steel crankshaft running in 2 precision ball bearings.
 - ★ Fully counterbalanced for low vibration.
 - ★ Precision die-cast crankcase.
 - ★ Perry carburetor for smooth reliable idle.
 - ★ Optional muffler or exhaust extractor.
 - ★ World famous precision Cox craftsmanship.
 - ★ Replacement parts readily available.
 - ★ Also available without throttle for free-flight and control-line competition flying.
- Cat. #2800, \$55.95

**READY IN JUNE 1976
CONQUEST .40 R/C & SPEED**

FOR THE 1/2A SPORT FLIER WHO NEEDS QUIET POWER QRC .049



*MAXIMUM POWER WITH MINIMUM NOISE
FOR SCHOOLYARD FLYING*

\$12.95

Cat. #450-1

- ★ Factory installed muffler.
- ★ Oversize tank for longer flights.
- ★ Built-in spring starter.
- ★ Highest power reed-valve engine with specially ported cylinder for maximum power even when fully muffled.

*FROM THE LEADER IN 1/2A ENGINES
AND ACCESSORIES*

FOR ADDITIONAL INFO WRITE OR CALL:



Phone: (714) 540-8200
1525 East Warner Avenue
Santa Ana, Calif. 92702
a subsidiary of Leisure Dynamics Inc.

In Canada Contact:
Leisure Dynamics of Canada
1315 Lawrence Ave. East
Don Mills, Ontario, Canada

MODEL BUILDER

MARCH

1976

volume 6, number 51

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

STAFF

EDITOR

Wm. C. Northrop, Jr.

GENERAL MANAGER

Anita Northrop

EDITORIAL ASSISTANT

Le Gray

ASST. GEN. MANAGER

Dawn Garrott

ART DIRECTOR

Paul Plecan

SECRETARY

L. Gordon

SUBSCRIPTION MANAGER

A. Valcarsel

CONTRIBUTORS

Rod Carr	Fernando Ramos
Chuck Hallum	Char Rohring
Bill Hannan	Dan Rutherford
Walt Mooney	Bob Stalick
John Pond	John Tucker

ADVERTISING REPRESENTATIVES

WEST: Bob Upton, 20626 Clarendon Ave.
Woodland Hills, California 91364
(213) 884-2294

EAST: Walt Moucha, 38 Coppersmith Rd.,
Levittown, New York 11756
(516) 796-4898

JAPAN: World Media, Inc., Eiji Noguchi,
Director, Chinatown Bldg. 202,
Yamashita-cho Naka-ku, Yokohama
(231), Japan. Tel (045)
662-8128. Cable WOMEDIAC.

Subscriptions \$15.00 per year, \$27.50 for
two years. Single copies \$1.50. Add \$2.00
for postage per year outside of U.S. (Except
APO). Add 75 cents for Canada and Mexico.

Copyright 1976 by MODEL BUILDER
Magazine. All rights reserved. Reproduc-
tion without permission prohibited.

Published monthly by MODEL BUILDER
Magazine, 1105 Spurgeon, Box 4336, Santa
Ana, Calif. 92702. Phone (714) 547-3963.

Change of address notices must be received
one month before date of issue that new
address takes effect. Send old address with
new; old label preferred. Post Office will not
forward copies unless you pay extra postage.
Duplicate issues cannot be sent.

Second Class postage paid at Santa Ana, Ca.

CONTENTS

FEATURES

WORKBENCH, Bill Northrop	6
OVER THE COUNTER, Taylor Collins	7
REMOTELY SPEAKING, Bill Northrop	14
"IS SOARING FOR THE BIRDS?" (Part 2), Jim Gray	18
PLUG SPARKS, John Pond	19
CHOPPER CHATTER, John Tucker	24
STRICTLY SAIL, Rod Carr	26
FOR MS. ONLY, Char Rohring	28
CONTROL LINE, Dan Rutherford	32
R/C SOARING, Le Gray	36
PRODUCT\$ IN U\$E, John Pond	38
F/F SCALE, Fernando Ramos	42
HANNAN'S HANGAR, Bill Hannan	44
FREE FLIGHT, Bob Stalick	46
PRODUCT\$ IN U\$E, Bill Northrop	50
R/C AUTO NEWS, Chuck Hallum	54
"GO FLY A KITE!", Keith Gebers	56

SCALE VIEWS

CURTISS A-8 "SHRIKE", Peter Westburg	58
--	----

CONSTRUCTION

SEASQUARE, George A. Wilson, Jr.	9
"THE TRAINER" O.T., Chuck Blackburn	23
"FLIP" U/C, Dick Sarpolus	35
"ORCA" FAI POWER, Larry Sicuranza	41
PEANUT SPAD XIII, John Walker	46

Cover: The "Seasquare" is another in a long series of seaplane and flying boat designs by George A. Wilson, Jr. One of the reasons that George concentrates so much on water-type aircraft, is that it is only a short distance to the nearest "flying lake" from his home in Walpole, Massachusetts! That this cover photograph was enlarged 13-1/2 times from a half-size 35 mm transparency, speaks well for the lens in George's camera. A construction article for the "Seasquare" begins on page 9.



**from
Bill
Northrop's
workbench**



Behind every successful magazine, there's a woman . . . pushing, pushing, pushing! Here are two well-known "pushers" in the model airplane magazine business; Anita Northrop, of MODEL BUILDER, and Grace DeFrancesco, of MODEL AIRPLANE NEWS. The gals were photographed during a strategy meeting at the Las Vegas R/C International Championships by Don Fullmer, of Montesano, Washington.

PROPOSAL TIME . . . PLUS

• In the January issue, we mentioned the fact that proposals for possible rules changes in AMA model competition for 1978-79 must be submitted before June 1, 1976. We also mentioned that this was an impossibly short time after the 1976 rules changes went into effect, to be able to discover needs for new proposals and still get them posted on time. In some parts of the country, there will be almost no trial of new 1976 rules before the current proposal deadline time.

We're glad to see that other responsible modelers are putting their thoughts on this matter in writing, and sending them to AMA Headquarters. Almost all are suggesting a proposal deadline sometime after the 1976 Nationals. We heartily agree with this idea, and would like to pinpoint the time as September

15, 1976, a little better than a month after completion of the Nats.

Speaking of Nats, as most everyone now knows, it's to be in Dayton, Ohio, on Aug. 1 through Aug. 8, 1976. R/C and C/L will be at Wright Field, Dayton, while free flight will be at the airport in Springfield, about 20 minutes away. As usual, indoor is "out of town", this time in Columbus, about 1-1/2 to 2 hours away by car. We have more detailed info on the R/C schedule in "Remotely Speaking", as supplied to us by Dave Brown, who attended the Nats planning meetings.

IMPORTANT NOTICE
There is an important correction in the Control Line column, on page 33. We would like to call it to everyone's attention.

SCALE SPEED

One of our pet peeves about scale

model flying is the very non-scale speed of most models. The least offensive is F/F scale, and the worst is R/C. Of course, it all relates to the comparative wing loading of various types of models . . . the heavier the loading, the faster a plane must fly in order to maintain flight capability.

In the last couple of years, more and more scale modelers are becoming conscious of scale speed, though as yet, nothing has been done to establish recognition for this in AMA competition rules. We are pleased to note, however, that for the June, 1976 R/C and C/L World Championships in Borlange, Sweden, contestants are being requested to state on their score cards the cruising speed of the full size aircraft they have modeled, in addition to the exact scale relationship of the model.

Continued on page 93

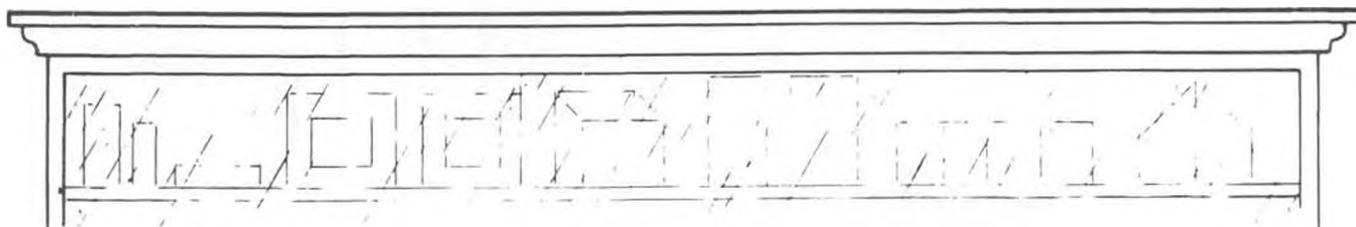
WIN A FREE SUBSCRIPTION TO
MODEL BUILDER / MAGAZINE

Out of the goodness of our hearts (heh, heh), we offer our readers the following opportunity to win a **FREE ONE-YEAR SUBSCRIPTION** (or subscription extension) to MODEL BUILDER Magazine:

Send us the name and address of any hobby shop in your area that does not carry MODEL BUILDER. We will then give them our sales pitch, and if they become an MB dealer, and if yours is the earliest postmarked letter about that dealer, you win the free subscription . . . for yourself or the person you name. If you already subscribe, you may choose to substitute an Uber Skiver precision knife set.

Send references to: MODEL BUILDER, Dept. D, Box 4336, Santa Ana, Ca. 92702, or phone (714) 547-3963.

OVER THE COUNTER



The 1" scale General "Aristocrat" by Flyline Models.

● The Sterling Waco SRE mentioned in last month's "Over the Counter" is now a reality. This 56 inch span R/C (or control-line) cabin biplane recreates one of the most popular of the cabin biplanes of the '30s. The kit features die-cut wood, formed landing gear and aluminum engine mount, as well as all necessary control linkage hardware. The molded plastic cowl has molded-in-place dummy engine cylinders, and molded

wheel pants are also included. The Waco SRE will retail for \$64.95.

Sterling's entry into the Peanut Scale market with three double kits is followed by a logical accessory . . . a rubber winder. The Sterling winder is molded of nylon and provides a 5 to 1 gear ratio. Compact, efficient, and inexpensive . . . only \$2.95. The Sterling line is available at hobby dealers everywhere.

* * *

What do you do to improve a line of classic free flight scale kits? Add yet another! Flyline Models is now shipping its General Aristocrat. This 36 inch span, .020 powered F/F (which can be converted to R/C) is a model of one of

the Golden Era's greatest aircraft. The kit features Flyline's usual high quality wood, precisely printed, along with a sheet of highly detailed plans. The Aristocrat can be built for gas, electric, or even rubber power, for a distinctive scale plane that will fly well. The \$12.95 General Aristocrat kit is available from dealers or direct from Flyline Models, 10643 Ashby Pl., Fairfax, Virginia, 22030.



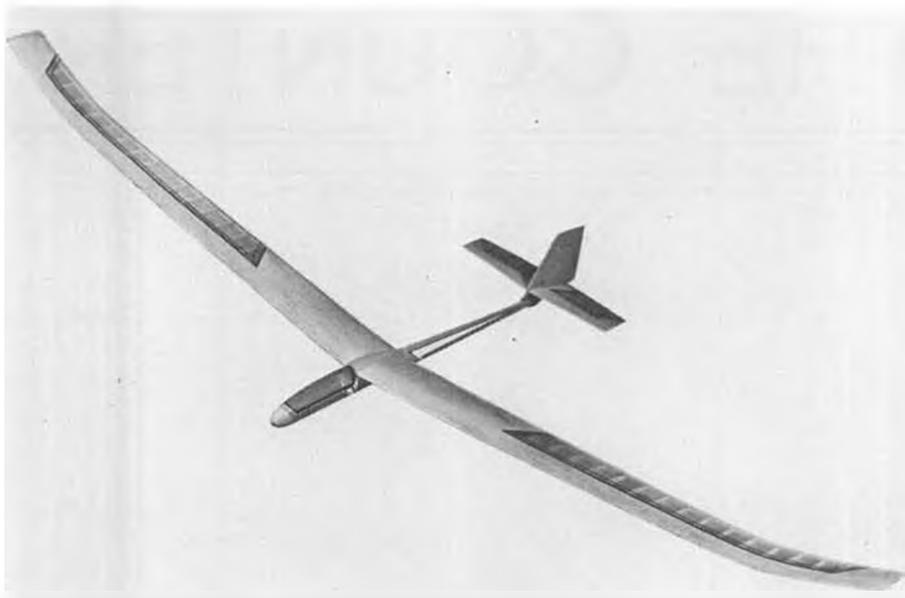
The Flite Lite, for voltage monitoring, by Advanced Devices, Inc.



Steerable, sprung tailwheel assembly for large R/C taildraggers, by C.B. Enterprises.



"Stay-Tray" by Applied Design Corporation.



Javelin II, 134" R/C sailplane by JP Models.

* * *

Stringent noise reduction requirements for FAI competition prompted the design of the new FAI model muffler from Semco Model Engineering. This closed type muffler is machined from aluminum, with the body tube anodized black. A muffler pressure tap is installed for pressurizing fuel systems. The Semco FAI muffler is available in two sizes to handle engines from .29 to .80 displacement, in either bolt-on configuration, or for use with the standard Semco adapters. The bolt-on style sells for \$13.95, while the adapter version retails for \$12.95. Both are available from hobby dealers or direct from Semco Model Engineering, 14 Water St., Waltham, Mass., 02154.

* * *

One of those "Why didn't I think of that" products is the Stay-Tray. This is a molded plastic tray with ridges on one side to hold tools in place, and a separate flat area for small parts. One ideal use for the Stay-Tray would be for disassembly of engines. The polyethylene plastic is chemical resistant, making it easy to clean. It would be

ideal to have at contests, providing a clean, organized work area for cleaning your powerplant after working it in the dirt. The Stay-Tray makes an ideal bench top accessory for working on any small parts project. It is marketed by Applied Design Corporation, 5531 Shoreview Drive, Palos Verdes Peninsula, California, 90274. Retail price is \$1.98.

* * *

After over a year of testing, modifying, and retesting, the Javelin II sailplane by JP Models is finally available. This 134 inch competition sailplane uses the same type rolled plywood fuselage as made popular by the other kits in the JP line. The fuselage comes absolutely ready to use with a tough white epoxy finish. With its molded fiberglass nose cone, this type of construction makes for an extremely rugged sailplane. The wings can be built in three configurations . . . straight Vee dihedral, conventional polyhedral, or with curved elliptical dihedral. The plans show how to build a simple curved building board for the elliptical dihedral. The kit comes complete with all hardware for rigging the all-flying stab and dynamically



Syringe-Fueler, by Tatone Products.

balanced rudder. The wing mount is a unique combination of the best features of plug-in and rubber band-on wings. The wings plug onto a basswood center block which in turn is held onto the fuselage with internal rubber bands. The JP Javelin II is available from hobby dealers or direct from JP Models, 26557 Mazur Drive Dept. B, Palos Verdes Peninsula, California, 90274. Price is \$69.00.

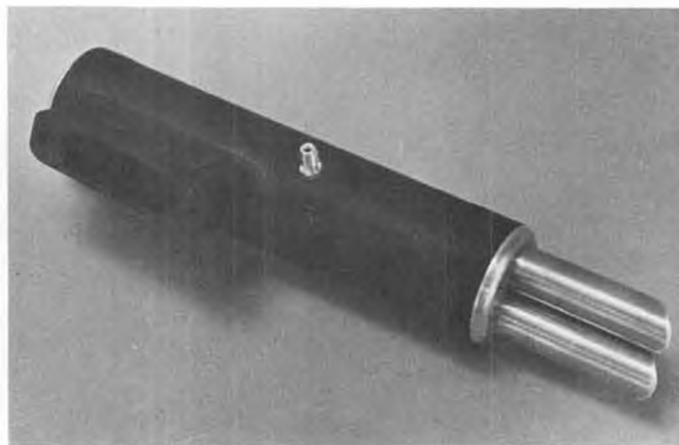
* * *

Advanced Devices Inc., Box 152, Rockville, Maryland, 20850, is manufacturing a voltage monitoring device for R/C transmitter and airborne battery packs. The Flight Lite is a visual indicator light that goes out before the batteries reach a critical low voltage. The Light Emitting Diode (LED) indicator mounts through a 1/4 inch hole in the fuselage side, acting much like a gas gauge on a car, to show the condition of the batteries. The Flite Lite is available in a standard version for flight packs without plugs for \$6.95, a deluxe version with Kraft or Deans connectors for \$9.95, or a 9.6 volt transmitter

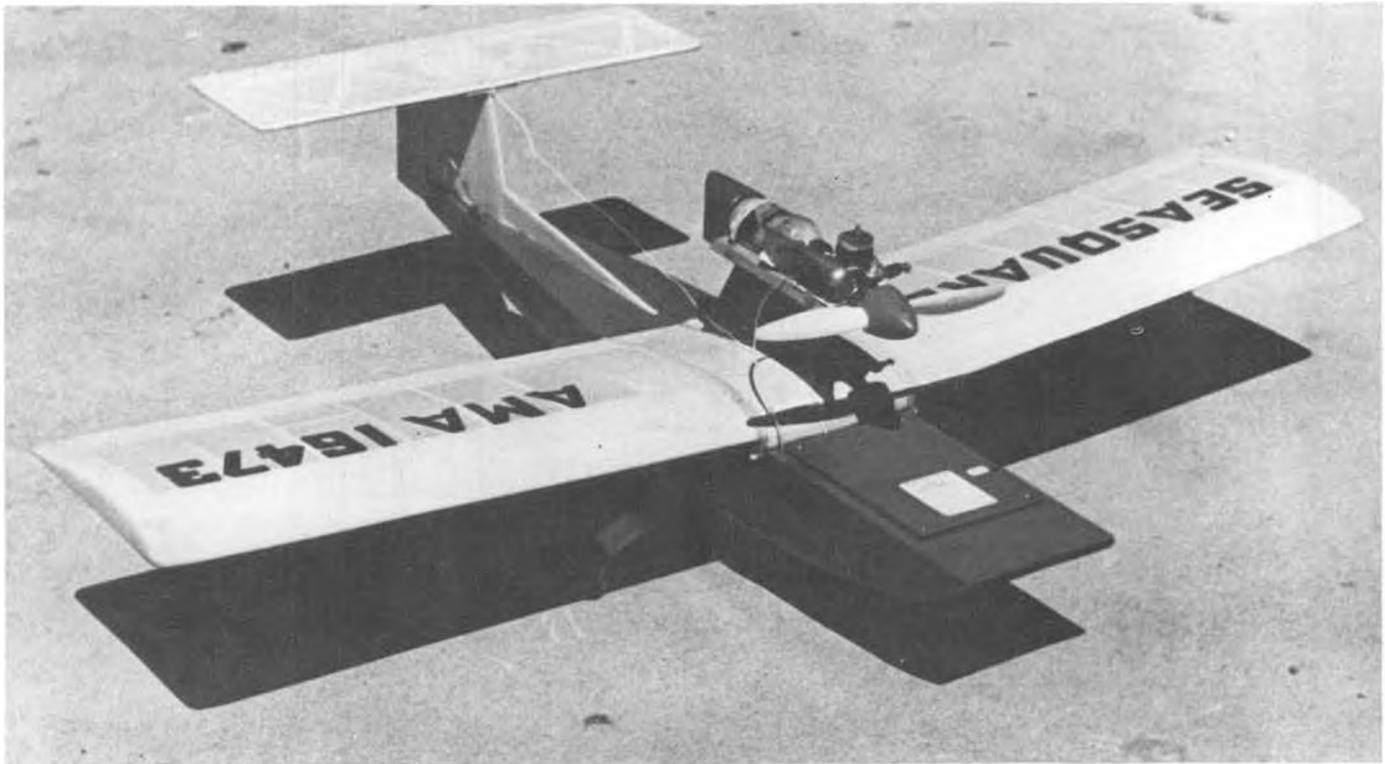
Continued on page 88



Saloma, 100" R/C sailplane by Hi Johnson Model Products.



Semco Model Engineering muffler meets new FAI requirements.



The "Seasquare" is appropriately named . . . it flies off the water and it IS square. It is also a very practical flying boat, and handles well on or off the water. Plans also show how to equip it with trike gear for operation off land.

THE SEASQUARE

By GEORGE A. WILSON, JR. . . . The author is one of the foremost designers of seaplanes and flying boats that really operate well from the water. The "Seasquare" is an economy size craft for 3-channel radios.

• The Seasquare is a functional Flying Boat for novices and experts. It has the following special features:

- Ease of construction.
- Small size for ease of handling and minimum cost.
- Rugged construction.
- Excellent water handling: the wing is close to the water.
- Minimum spray in the propeller because of the broad bow.
- Watertight compartment for R/C equipment.
- Convertible to a land plane with tri-

cycle gear.

- Tee-Tail to minimize water accumulation on the stabilizer.
- Simple, removable water rudder.
- Ample rudder and elevator area for aerobatically inclined.

Seasquare is a strictly functional flying boat that builds easily, flies well and handles on the water with ease. If it's a bit square to your eye, you'll appreciate this characteristic when you are putting it together. The Seasquare has no compound curves except for the wing and stab tips, and its simple curves are all

functional.

PERFORMANCE

Seasquare's hull is a radical design, and during the drafting and construction phase of the project we considered keeping the Seasquare in the secret classification in case it was a failure. However, fears and concerns were unwarranted! Without qualification, Seasquare has the best water handling characteristics of any seaplane model with which we have ever had experience.

Powered with an OS.19, and into about a 5 mph breeze, it is up on the



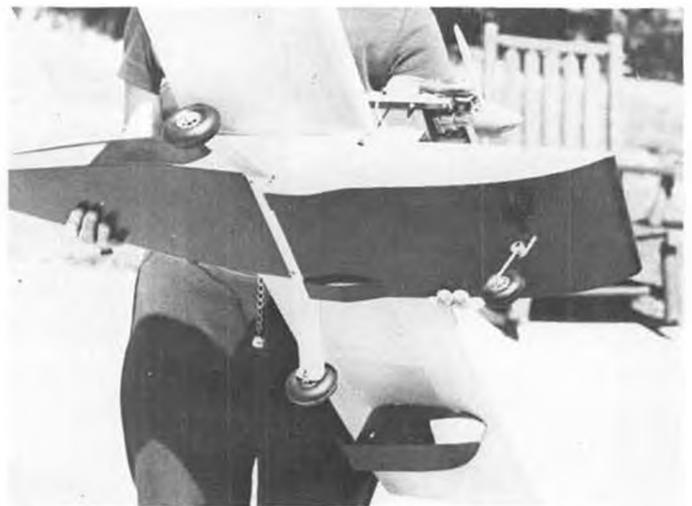
Seasquare is extremely stable, and easy to fly. A .19 R/C engine is sufficient for power, if weight is kept at 4 pounds or under.



The wide bow keeps water out of the propeller path, thus avoiding loss of power during takeoff. Hull rides on planing skids at speed.



Engine pod is simple and open, makes things easy to get at. Note throttle control cable and exhaust deflector, also hatch cover.



Underside photo shows demountable gear for land operation. Planing skids add a great deal to water handling at high speeds.

step as soon as full power is applied, and in the air within 20 to 30 feet. It taxis well at low speed, with the hull displacing water, and is a joy to watch as it moves along on the two planing skids at high speed. During design, these skids were added with the attitude that they would protect the bottom even if they were not functional otherwise. In fact, we feel that these skids contribute greatly to Seasquare's water handling.

As a seaplane with an OS.19 installed, the original Seasquare has an all-up dry weight of three pounds 13 ounces. With land gear installed, the weight increases to four pounds five ounces. The wing loadings are 17.6 and 19.9 ounces/square foot respectively.

With the CG about 1/2 inch ahead of the location shown on the plan, flying

characteristics are good and compare favorably with the performance of trainers with flat-bottom wings. Again, the concerns that existed before flight tests were unnecessary. The flat top and bottom of the hull does not seem to cause any tricky flying problems. Wind penetration is good, and was a necessity during the first test flight (As usual, we couldn't wait for good weather!). Transition from power-on to glide is gentle, and landings flair out easily.

During the design work, we were sure of the side hull's ability to keep water out of the propeller. We were more than pleased with the actual performance. It is the author's conclusion that a wide hull with flat (or near-flat) bottom is the most effective answer to the power-robbing problem of water

slowing down the motor.

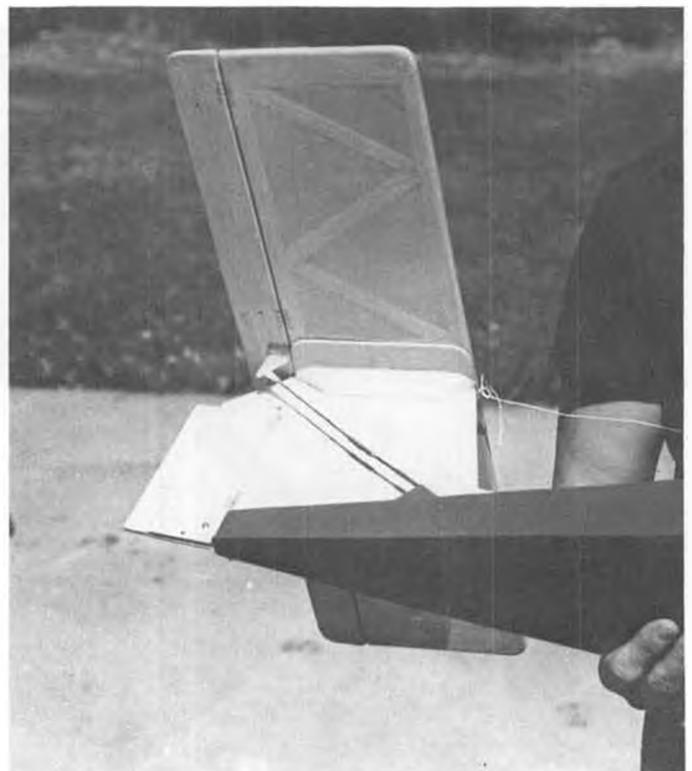
The hatch is thoroughly waterproof. But, we do admit to putting a patch of Silray over the nose-gear entrance hole to keep water out of the hull. Don't forget to put the main gear screws into the blind nuts in the hull before you go waterflying!

KITTING

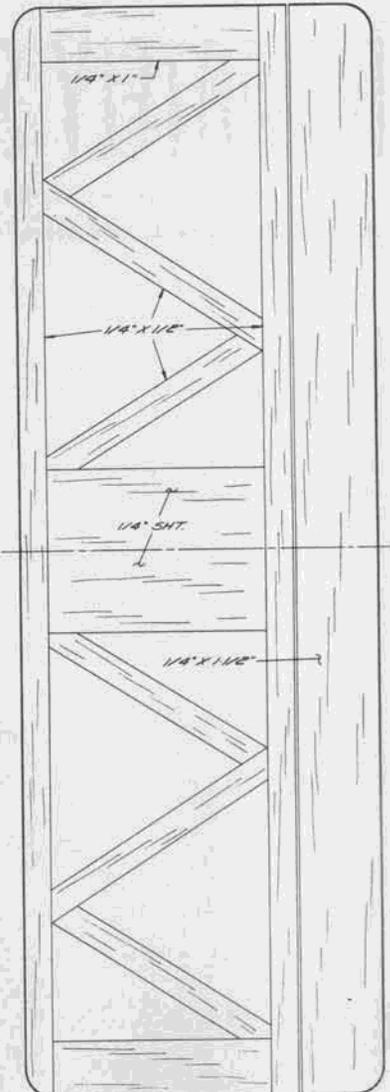
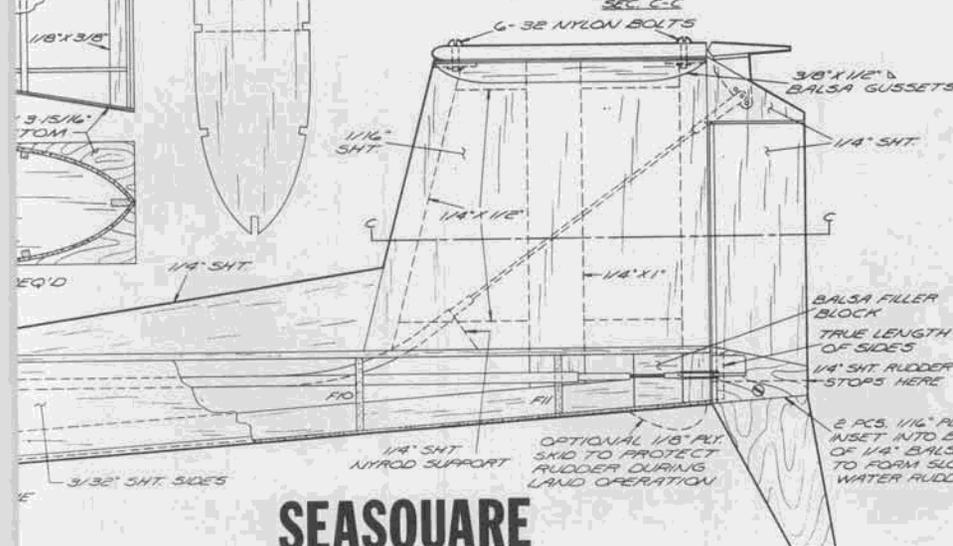
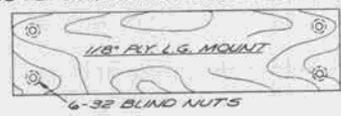
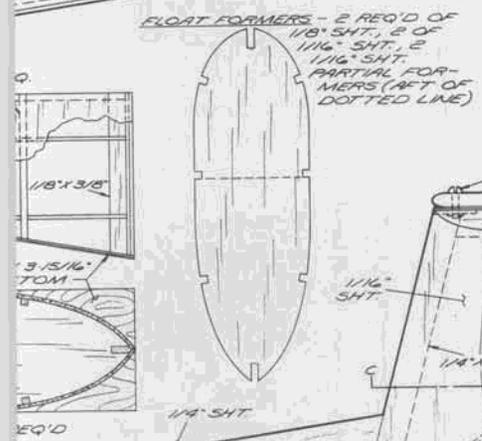
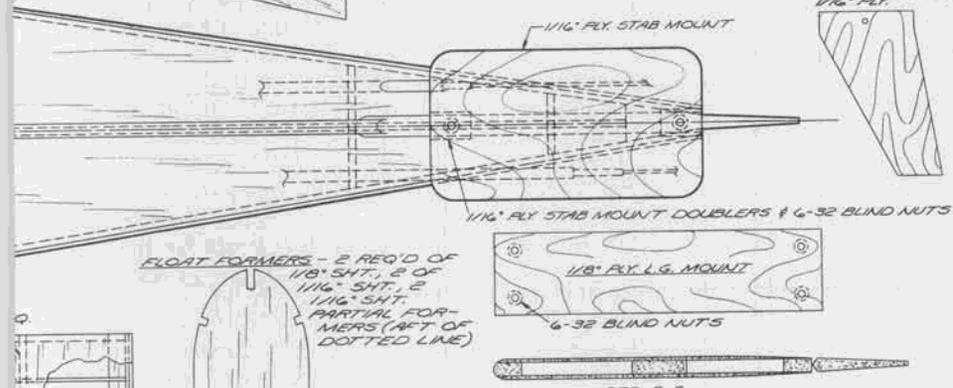
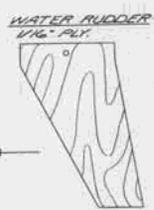
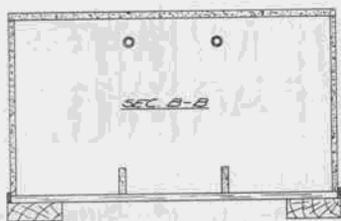
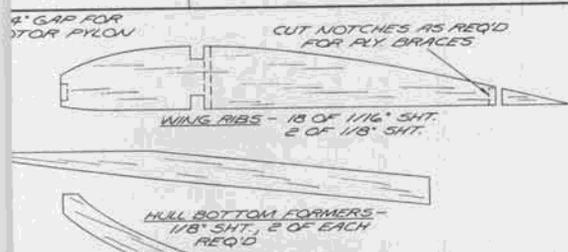
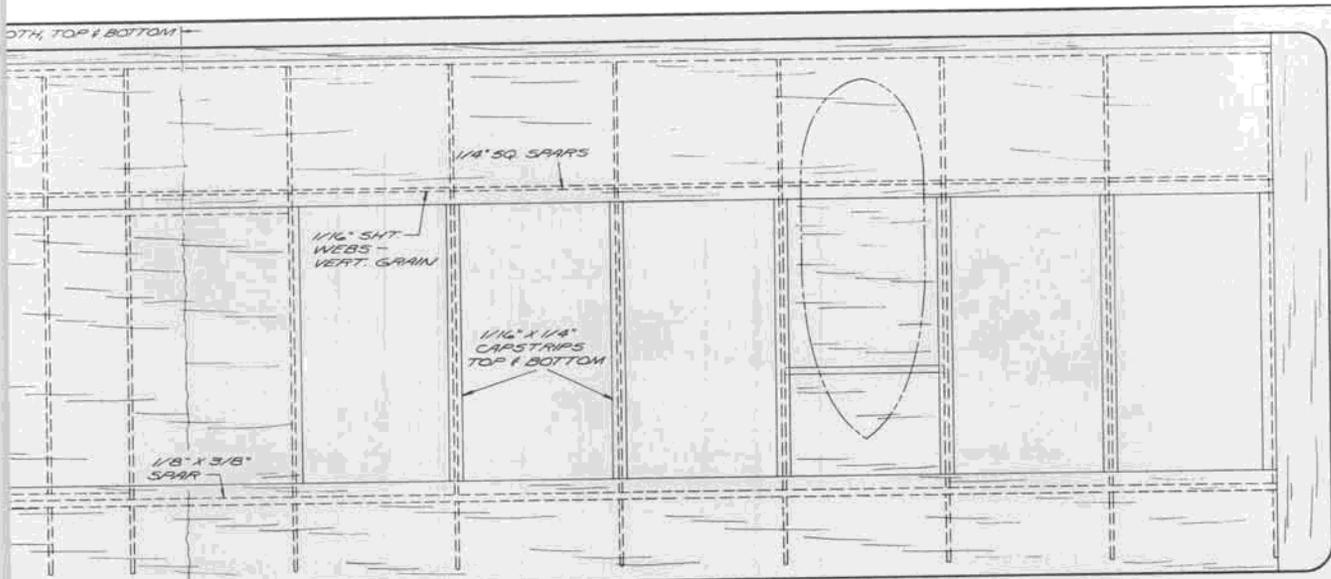
If you are an experienced scratch builder you will be acquainted with the savings in time that result from kitting. If not, let me urge you strongly to cut out ribs, bulkheads, hull sides, etc., etc. before you start construction. This process should even include cutting the wing spars and leading-edges to length and cutting as much of the wing and rudder sheeting to size as can be done without actual fitting. This process will



We don't like to put the Seasquare down, but the author/designer's wife, Eleanor, is the prettier model in this photo!



Control to the "T"-tail elevator may be exposed, but it sure is the easiest and most positive way to go. Sea rudder has been detached.



SEASQUARE

DESIGNED & DRAWN BY GEORGE WILSON
 TRACED FOR MB BY PHIL BERNHARDT
 SPAN - 50" AREA - 300 SQ. IN.
 WEIGHT - 4 LBS.
 POWER - 15-19

0 1 2 3 4 5 6 inches

MODEL BUILDER magazine
 1108 Spangon, Santa Ana, California 92701

Plan No: 3761



Most of this month's photos were taken at the Chicago Scalemaster's Seventh Annual Rally, in August. Photographer Larry D'Attilio did an excellent job. This is Mike Ilyin's 3rd place B-17 taking off . . . complete with scale mud splattering up from the wheels!

'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

● Being in a much more densely populated area of the country for the first time in four years, the 1976 Nationals will undoubtedly be the largest since the last Chicago Nats in 1972.

Although plans are still in a preliminary stage at this time, the following brief outline of the schedule is probably not too far out of line. Most of it was passed on to us by Dave Brown, who attended the planning meetings.

There will be four days of qualifying in Pattern, for all of the four new classes, from 2 to 8 pm each day. Trophies will be awarded to 10th place in each of the four classes, and in addition, there will be separate Junior/Senior

combined trophies in Novice, Advanced, and Expert. There will also be four rounds of finals, for all classes; three on Friday from 2 to 8 pm, and one on Saturday, from 1 to 4 pm.

Pylon will be run for six days, from 7:30 am to 1:30 pm, with three days each for Quarter Midget and Formula I.

Scale, both AMA and Sport, will be flown on Saturday, from 4 to 8 pm, and Sunday, from 8 am to 2 pm. It is believed that both classes will be flown together.

R/C Soaring will be flown at the free flight site, the airport in Springfield, Ohio, on Thursday and Saturday. As of now, it appears there will be no scale

soaring event.

At this point in time, no unofficial helicopter event has been scheduled.

Hopefully by next month, we will have more positive information to convey.

HOW NOW BROWN COW?

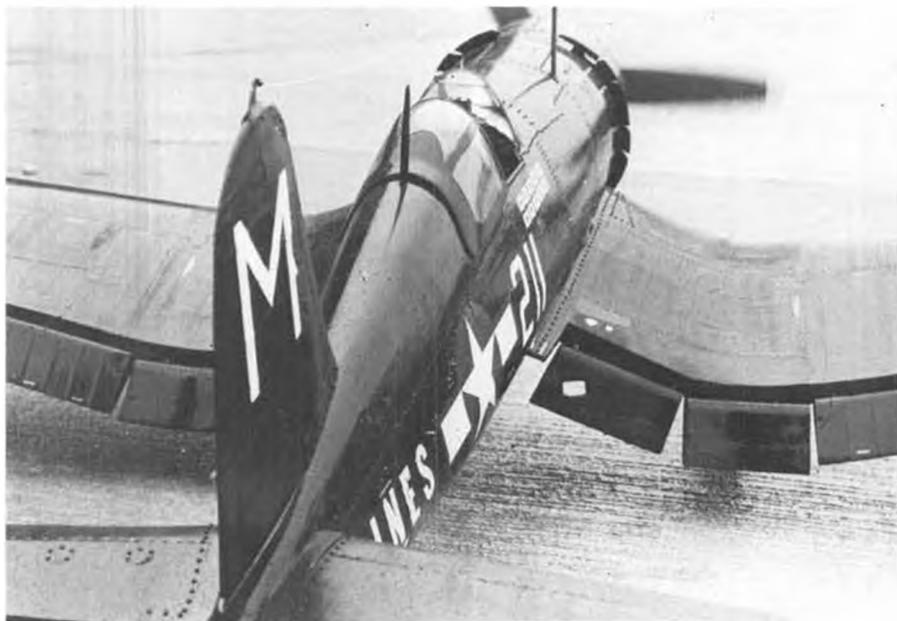
Ever hear that little line? It comes from a poem. We don't know the name of the poet, or the title of the piece, but the phrase has been used in diction and grammar exercises, particularly to show how emphasis can change the effect.

"How . . . now brown cow?"

"How now . . . brown cow?"

Is an Indian saying hello to a brown cow? Maybe a young bull has just been turned loose in the pasture for the first time, and is taking the direct approach. Who knows?

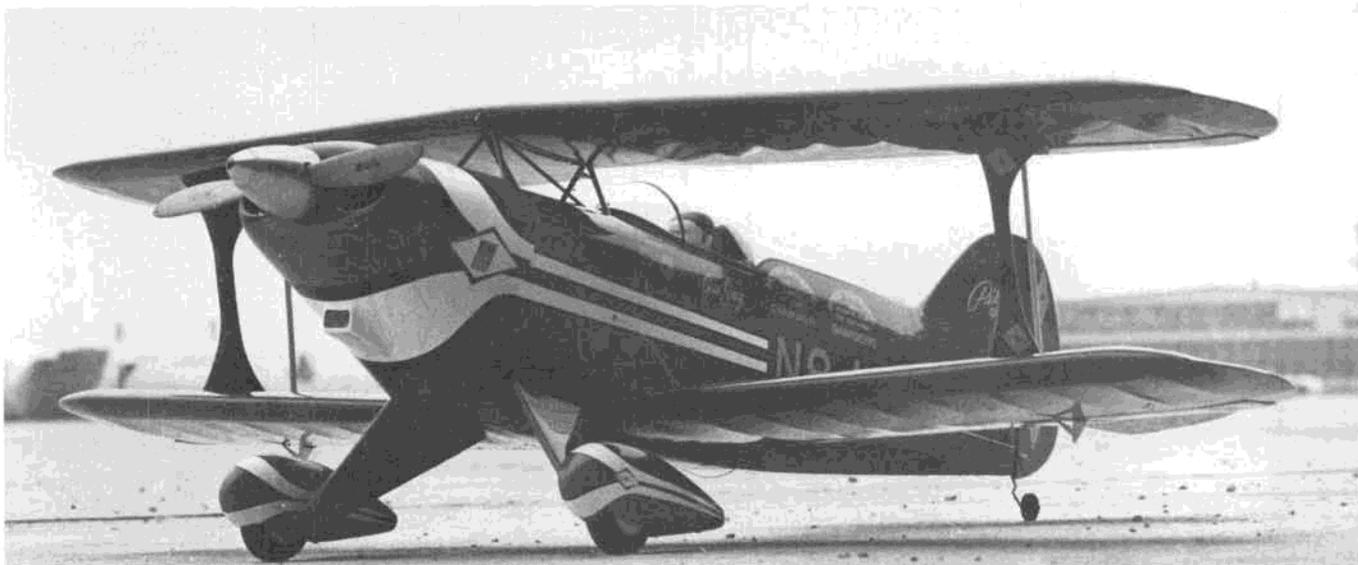
Anyway, all of this is leading up to the fact that some statements can be quite clear to the person who writes



Bill Hatcher's 1-1/2" scale F2G Corsair was not flown at contest. It is covered with sheet aluminum and \$70 worth of Sig rivets! (Shouldn't they be flush?) Ship weighs 9 pounds.



Oops! DH-4 by E. Betinis tries to bite the concrete. Good scale subject.



Bob Lillie's Pitts Special was 2nd in Sport Scale at the Chicago Scalemaster's contest last August. Could be from a Midwest Model Supply kit, info didn't specify. Excellent photo technique . . . low angle, and lens opened up so background is blurred out and not distracting. D'Attilio pic.

them . . . but not clear to anyone else. Try this:

"K factors are changed as follows. No K factor for landing inside 15 meter circle, change K factor for landing inside 30 meter circle from 10 to 5, change K factor for landing outside 30 meter circle from 5 to 1."

Now, if you take that as literally as possible, the above statement, which applies to FAI rule 5.1.13.16., Landing, would seem to say that if your plane first touches ground inside the 15 meter circle, your landing will not be multiplied by any K factor! And taken just as literally, one would assume that you can get the highest landing points by first touching ground somewhere within a ring 7-1/2 meters wide which surrounds that deadly 15 meter center circle!

More than likely, someone is probably trying to say that the 15 meter circle will no longer exist, and that any touchdown within the 30 meter circle will receive a K factor of 5 and anything outside receives no K factor.

Of course, saying it that way would be too easy . . . On the other hand, maybe from now on everyone has to try to hit that damn ring! Wanna bet?

CALLING QM'ERS

"The NMPRA has recently made organizational changes which will affect all Quarter Midget racers. A QM section was established, which has the responsibility and authority to make its own policy for the event.

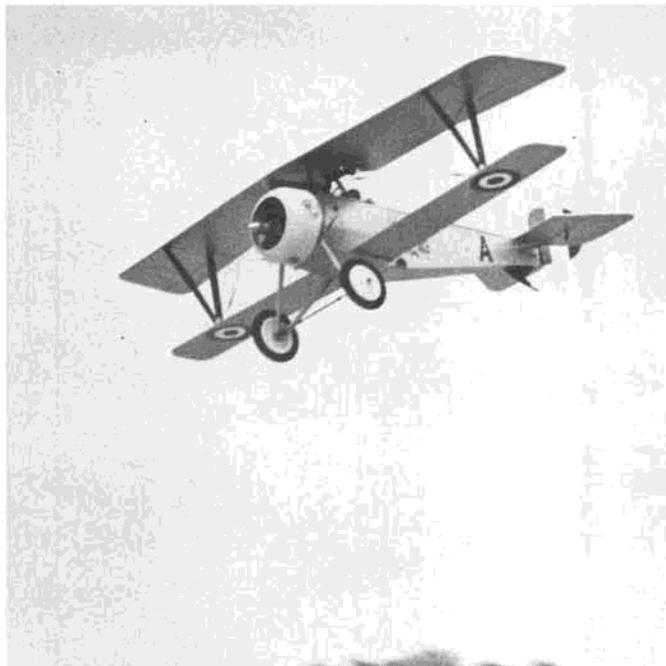
"Part of that policy is to re-evaluate the present AMA Quarter Midget rules and submit a complete rules package

to the AMA before the June 1 deadline (or whatever it may become. wcn). This rule package will be based on the results of a nation-wide poll of QM Contest Directors and inputs from QM enthusiasts. All interested QM fliers are requested to send their comments, suggestions and proposals to either George Zink, NMPRA-QM President, 80-28 222 St., Jamaica, N.Y. 11427, or Leonard Wiederhoeft, NMPRA-QM Executive Vice Pres., 27 Creek Rd., Camp Hill, Pa. 17011."

The above information was sent to us by George Zink, and we heartily endorse his efforts to initiate and centralize proposals for Quarter Midget rules. As we've mentioned before, the Contest Board doesn't make the rules . . . It administers the proposals made



Harold Parenti, starting his 1st place-winning Zero. It grooves like a pattern ship, looks scale-like in the air. "Meatballs at 9 o'clock!"



Nice looking Nieuport 17 by G. Turk, placed 10th in Sport Scale. Probably a VK kit.



Another look at Bill Hatcher's F2G Corsair. A beautiful job of aluminum sheet covering. We'd like to more about his technique. Pilot seems to be a little small in scale size.



Ed Guzick's P-51B taking off. Another fine photo: Normal, or scale eye-level angle, and by opening lens and panning with model, background conveys feeling of plane's motion. D'Attilio pic.



Mel Ford and his Etrich Taube with working wing-warp control, as seen at Flightmaster's scale meet, Sepulveda Basin, Los Angeles. Excellent flier. Photo by Bob Angel.



Mike Ilyan's B-17 on a leaflet mission. Ship flies at very close to scale speed. Must be light.

by AMA members, processes them, puts them into rule book language, and makes them official or throws them out, in accordance with the desires of AMA members. When these rules are vague or not well thought out, then the Board must make interpretations, based on whatever rules are available at the time. If these interpretations don't meet the approval of the majority of the membership, then it behooves the members to make proposals that will provide rules that don't need interpretation.

In regard to the latter discussion, there has been a lot of flap about the legalized Rossi engine, mostly from those who don't happen to own one. As time goes on, the flap has decreased in a direct ratio to the number of QMers that don't own Rossi's! Don Belote, co-director of the fabulous Toledo R/C Exposition, made a good point about this in a recent letter.

Don points out that the argument about the high Rossi price tag of \$83.95 is kinda ridiculous. He bases this on the fact that in the long run, the cost of one or two Rossi's, which run better and last longer, will be much less than the cost of numerous less expensive engines that wear out quickly, and even while they're new, don't run as well.

And once again, we'd like to explain that in spite of numerous requests to do so, AMA cannot put a price ceiling on the cost of competition equipment. This would be the equivalent of telling a manufacturer or importer how much he could charge for his product, or it would be like telling modelers that they must boycott a product unless the price is lowered to a certain level. In either case, the resulting lawsuits would come thick and fast!

LEGAL DESTRUCTION

R/C Sailplane rules are "soarly" in



Bob Lillie and his Pitts Special at the Chicago Scalemaster's contest. He placed second.

need of some type of control over the quality of landings in which points may be earned, specifically time-precision and spot. In the former case, it is important to make first contact with the ground at a precise moment in time, before or after which, points are lost. In the latter, it is important that the nose of the glider comes to final (and upright) rest as close as possible to a given spot on the ground. In many contests, there are tasks assigned that require both of the above in the same flight.

Unfortunately, competition soaring is "progressing" more and more toward deliberate, controlled crash-landings to accomplish one or both of these requirements. And just as unfortunately, there is nothing in the R/C soaring rules to prevent this backward progress. General AMA rule 17.1 is designed to allow a



Ran out of space last month and couldn't include this shot of Bill Hemple, Sr. pitting for Bill, Jr. at the Tucson Winter Nats. Bill Jr., at age 10, flies a mean QM race with ST powered Bearcat.

contest director to prevent a contestant from deliberately . . . or mistakenly . . . launching a plane into flight which is quite possibly unsafe because of damage sustained in a previous flight, or because of poor workmanship that makes the model unsafe for the type of flying it is supposed to do. Rule 17.1 contains no penalty for the way in which the damage was inflicted, and once repaired, the model may continue in competition.

In R/C soaring rules, the only reference to landing quality is 10e, which states that no landing points shall be awarded if the model loses non-jettisonable parts during landing, or if the model comes to rest in an inverted position. This means that even if the model's seriously broken in a landing, as long as the broken parts remain attached to the rest of the model, the landing is considered acceptable and the points

are counted. Ludicrous!

In many of the better R/C soaring contests, CD's have announced before the start of competition that if a glider is damaged during a landing to the extent that it cannot be flown again without repair, the landing points will not be allowed. If this is not announced, then 10e is the only control over landing quality.

To be facetious for a moment . . . Under the existing written rules, glider fliers should attach two foot lengths of string to the fuselage and to each part of the model that might detach itself in a crash landing, such as plug-in wing panels, plug-in stabs, and canopies. Then if any of these parts come off in a "landing", they will still be "attached" to the model and landing points will not be lost! Why not? The situation's pretty ridiculous anyway. ●



"Putty, putt, putt." Bill Rohring's Aeronca C-3 comes in for a landing at the Scalemaster's Annual. "C'mon, Bill, get that left wing down!"



• Land soarers have wingtip pinions, usually seven in number, these are the primary flight feathers or "fingers" of the bird. The pinions are almost perfectly aeroelastic, and appear to be spreadable and even rotatable by the bird. The late August Raspert, Chairman of the Aerophysics Department of Mississippi State College, measured the drag of vultures' wings in wind tunnel experiments, and often soared among these birds in an experimentally equipped research sailplane. He found that the tip pinions, when open, reduced the bird's drag by minimizing the wingtip vortices. Instead of one large vortex, the pinions produced smaller and less vigorous ones which totalled less than the large one. Thus he found that buzzards, vultures and virtually all land soarers which possess these pinions have higher effective aspect ratios than their geometry would seem to provide. Here, again, is one of nature's compensations.

Dr. Hoerner, in his masterwork, "Fluid Dynamic Drag," provided some insights into wingtip shapes for purposes of drag reduction. It would be of great interest, I should think, if some experiments were made using the "buzzard tips" on one wing of an R/C sailplane and "Hoerner tips" on the other, for comparison purposes. A static test could easily be made with a household fan, merely by taping a piece of ribbon to the tip and watching it rotate in the breeze. The faster the rotation, the "worse" the vortex. The object of course is to design a tip which permits the tip to "fly" without rotating the ribbon at all.

The albatross ranges far at sea and appears to use a type of lift that is either unavailable or not capable of being used by land soarers. Sometimes an albatross seems to find lift in the turbulence generated by the superstructure of a ship, effortlessly soaring back and forth in the "turbulence wake". At other times, albatrosses seem to make a game out of flying in a series of undulations or porpoise-like dives and zooms. Frequently, they fly in circles which are inclined to the surface of the ocean; that is, a gradual climb to an altitude of 100 feet or so, followed by a dive to the surface, and another climb. Each climb and dive has a reversal of direction at the end, which gives the appearance of inclined circles. How is this possible, and

"IS SOARING FOR THE BIRDS?"

By JIM GRAY . . (Part 2): Continuation of a series on birds that soar, and what we can learn from them. Required reading for R/C sailplaners.

what kind of soaring is this that seems so different from ordinary slope or thermal soaring?

I believe that the answer lies in a type of soaring called "dynamic soaring", wherein the size, weight, penetration and high L/D of the albatross enables it to exchange potential for kinetic energy by using wind velocity gradients in a shallow band or sandwich of lift close to the ocean's surface. His high wing loading helps the albatross overcome minor turbulence effects, while his weight creates a favorable momentum which carries him through the gusts without much displacement. It's a lot like a bowling ball and a balloon of the same size being exposed to a high wind. The balloon is at the wind's mercy, while the bowling ball is unaffected. Of course, I've never tried to soar a bowling ball, but I believe the principle is true.

In latitudes where the trade winds exist, the air far out at sea is quite laminar in its flow behavior. For long months of the year, these trans-equatorial winds blow across thousands of miles of open sea, having all their minor turbulences and "wrinkles" ironed out of them. They are essentially laminar and, at the surface, their velocity may be only ten miles per hour, while at altitudes of 100 feet or so they may blow at forty miles per hour. In this shallow band of wind, which has a velocity gradient or shear of perhaps as much as 25 or 30 m.p.h., the albatross can fly for hours, scarcely flapping. In the exchange of potential for kinetic energy, the bird's drag losses are compensated by even the slightest vertical component of lift, such as may be provided over a large wave, for example. Gliding downwind the bird picks up airspeed and "groundspeed" as it approaches the surface. Just above the waves it wheels into the wind, acquiring initial lifting acceleration from an increase in wing incidence and angle of attack. As the bird rises, it encounters ever higher wind velocity, thereby maintaining its airspeed and rising to the altitude from which it first descended on its glide, without expending any internal energy except perhaps enough to alter its wing airfoil shape and incidence angles. I've seen a few land birds make use of horizontal velocity gradients, but only rarely, and not for long.

The modern R/C sailplane flies with a sinking speed that approaches one foot per second; that is, in a range where dynamic soaring is or should be possible. Sensitive telemetry of lift conditions and good positive radio con-

trol could be used to teach us a lot about this as yet unexplored form of soaring for the sailplaner. I think that very high wing loadings would be required, as well as the availability of these shear forces in the wind. Typically, the air should not be affected by thermals, the flow should be laminar and the wind strong . . . the sort of a day when orographic waves exist in the atmosphere and when the lapse rate may be low.

GEOMETRY AND STRUCTURE OF SOARING BIRDS' WINGS

Even a qualitative analysis of the structure, aerodynamics and geometry of the wings of a soaring bird is a very risky undertaking for me, but I'll pass along a few of my thoughts, ideas and opinions, hoping that someone who really knows about these things will step forward and set me straight.

Perhaps the fundamental and first question we ought to ask ourselves is: "Can we as R/C sailplane modelers and fliers ever build machines as adaptable and responsive to lift as the best soaring birds?" The next question should then be: "Do we have to?" It is obvious that the second question can be answered easily, and the answer depends upon how easily you can be satisfied and what you wish to accomplish. With performance comes a price, and sometimes that price is too high to pay. I believe that the answer to the first question is a qualified yes at present, and a probable yes-definitely for the future.

GEOMETRY

The wings of soaring birds have some remarkable attributes, and I would rate flexibility at the top of the list. This includes aero-elasticity. A soaring bird can, at will, alter the shape of its airfoil from undercamber to reflex and positions in between, by merely exercising the appropriate muscles during flight. The planform can be altered from sweep-forward to sweep-back, and all intermediate positions; and dihedral can be changed from positive to negative over a range of perhaps forty-five degrees. Each wing is jointed at "hand", "elbow", and "shoulder", and the angle of incidence of each wing may be changed simultaneously or independently with respect to that of the other. To simplify things we won't even consider the flapping mode. It is a fact, however, that nature practices economy in some respects, and does not provide performance in excess of that needed for a species to survive, or at the expense of of some other requirement of the bird.

Continued on page 89



In memory. John Keller (deceased) was winner of the first SCAMPS Texaco event at Taft. Winning model was the PB-2.



PLUG SPARKS

By JOHN POND

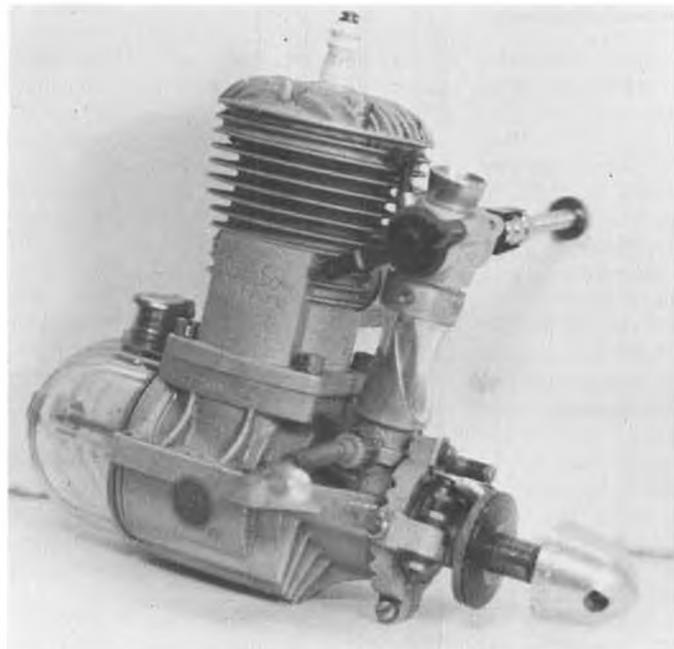
● As Mark Twain put it, "Reports of my death were greatly exaggerated." Despite the terrific amount of publicity generated for the John Pond Commemorative O/T F/F Radio Assist Contest,

the old boy is still kicking and doing his usual raucous grumbling. Good thing they didn't name the meet the Pond Memorial Contest!

Organized by Red Barrows, (No-

name club), Al Hellman (SCIFS), and Tom Bristol (SAM 21), the meet was held on December 14 at the Tri-Valley R/C Field in Santa Maria. John Le Seur was the going spark plug here, and what a wonderful time he provided for all!

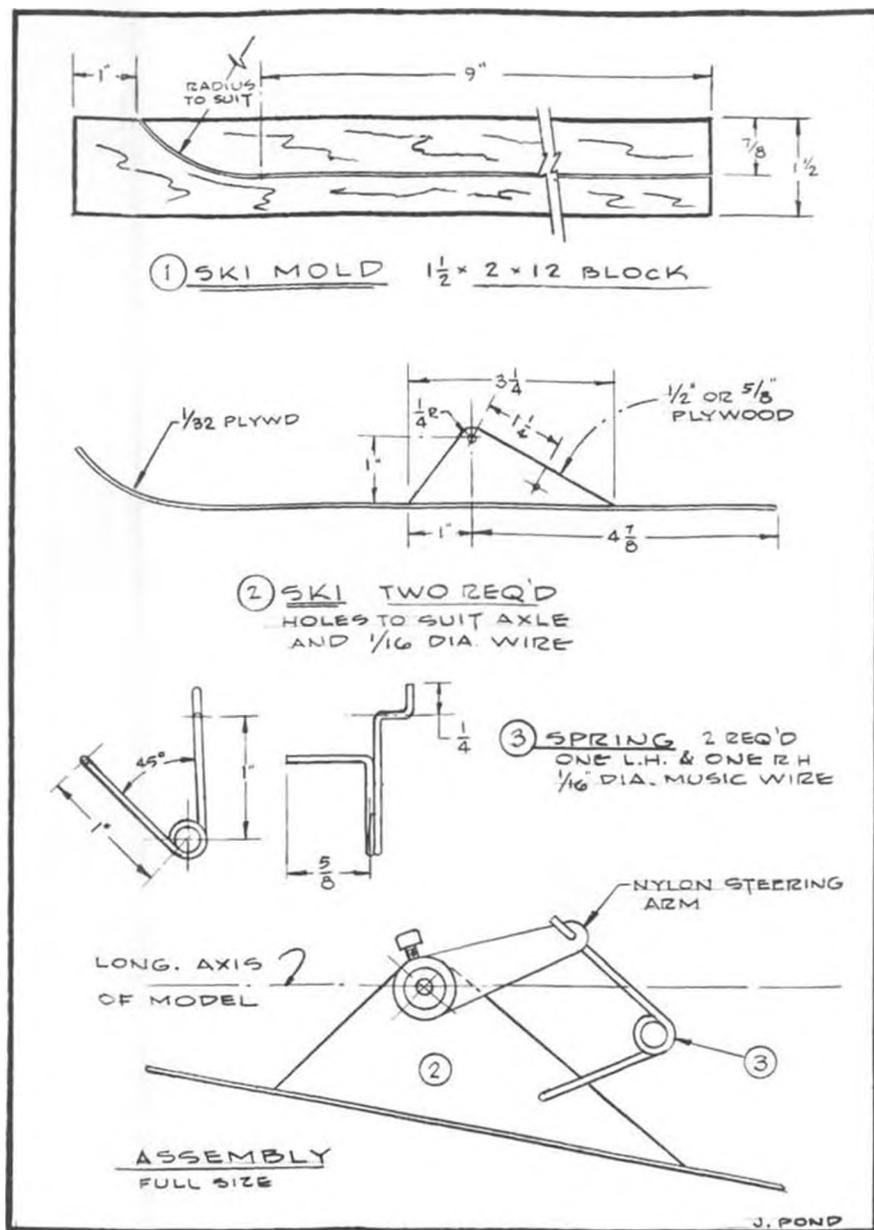
For openers, John set up reservations for all at the Holiday Inn. He then arranged for a real great dinner at the Howard Johnson hotel. The dinner featured organ music during the meal. Prior to that, during the "no-host" cocktail hour, Red Barrows set-up his video tape to play through the local television set. This featured some of the "outstand-



A quickie conversion to throttle control for an ignition engine in a radio controlled old timer. See the text for details.



Say goodbye to Bob Von Kinsky's Lanzo Record Breaker! Ignition Webra ran 10 minutes on 1-1/2 oz. of fuel during flyaway flight.



"Hello, Mable? I'm going to be late for dinner tonight." Nick Rankin's Bombshell, in Idaho.

in so many events that he eventually ran out of transmitter power. With no signal, the Clipper promptly demolished itself. Gerry is now interested in a Dallaire, for real performance.

Tom Bristol, the Co-CD of the meet, found time to win Class B and place second in the Texaco Event. Somehow or another, he never got around to Class C, which was won by Roger Larson of the local Tri-Valley Club. Surprisingly, Red Barrows placed third, using his big nine foot Dallaire in a 20 second event. Who sez those big ones won't climb?

Pond was accorded the honor of handing out all the prizes, consisting of gorgeous trophies and loads of merchandise. Otto Bernhardt was awarded the huge Pond perpetual trophy for outstanding flying. Next year it will be awarded or a Sweepstakes trophy, so beware of fellows such as Tom Bristol and Red Barrows! Much to the delight of all, there were actually a few merchandise prizes left over. These were promptly donated to the Tri-Valley Club for their next contest, in view of the tremendous amount of work accomplished by John Le Seur and Co.!

Next year's contest will be moved up from December, probably to September or early October. You couldn't actually complain about the weather too much, as the rain clouds had disappeared, but everyone agreed they would have liked the contest better in warmer temperatures. Look for the date in this column, we'll have it!

EUROPEAN SCENE

Just had a long talk with Jim Gerard of Sunnyvale, who visited most every engine manufacturer and collector he could find while abroad in England, France, Belgium, Denmark, Sweden, and Switzerland.

Jim was able to pick up a four cylinder Micron engine (a mere \$400.00!) and several other scarce items. He also brought back numerous catalogs of

ing" flying that was accomplished by the old man while he was associated with Red Barrows and the San Diego gang.

For those not familiar with Red Barrow's setup for TV tape photography, Red would take pictures all during the day's flying. Around 3 o'clock in the afternoon, the gang would adjourn to Red's place to view the day's activities on TV via the video tape. Talk about fun in being able to relive the day's flying. Every modeler should have one!

Directly after the meeting, Al Hellman traced the history leading to the formation of the annuals, and acknowledged all those who had so unselfishly worked to make the meet a success. This was followed by the 16 mm color films taken by Bob Bowen, of the original Stockton Old Timer Meet. These are a great record of what started this whole thing.

Sunday morning dawned bright, clear, and cool, with plenty of frost all

over the surrounding farms. However, things warmed up in a hurry, and good flights started coming in right away.

The most popular event, the R/C Texaco, pulled fifteen entries despite the lack of many familiar faces (yeah, you too, WCN!) (*Stayed away to give you a chance to win for a change, John. wcn*) Much to the columnist's delight, Otto Bernhardt found a beauty of a thermal for 35:36. The nearest to him was Tom Bristol, with 20:57 . . . and 14 minutes of that was engine run! The Merco 61 ignition conversion really shows its fuel economy. Al Hellman managed to squeeze in a third on his well known Flying Quaker. Incidentally, for those who don't think the GHQ Sportster can fly, Bruce McAvinen was up there with a flight of 12:31!

Gerry Wolfgang had his first try at flying old timers. His R/C gliding experience came in real handy, as he pulled a third place in Class B using a Comet Clipper. Gerry flew the Clipper



Typical Swedish O/T glider design, by N.O. Gustavsson, called "Sailplane." Wonder why?



Nice flying Scientific Commodore, built by Bruce Gale, a few years back. Was a fixture at all Northwest O/T contests.

French, German, and Swiss products. If you are interested in getting some info on those hard-to-get foreign items, and don't know where to write, try Jim at 1350 Phyllis, Mt. View, Ca. 94040.

ENGINE OF THE MONTH

Late in 1936, all modeling in Los Angeles was agog with rumors of the hot engine Irwin Ohlsson was putting out. This engine was called the "Miniature" and sold for \$18.50 (Brown Jr. was \$21.50).

From its humble start in a garage-type operation, Ohlsson, and his partner at that time, Frank Bertelli, moved their operation to the Alvarado Street plant. This was the first major step for Ohlsson in engine manufacturing.

At that time, Irwin was sub-contracting a considerable amount of machine work to Harry Rice. Several factors led to Bertelli leaving the firm and it was only a matter of time until Harry Rice became Ohlsson's partner. With the James engine (as manufactured by Rice) fading and Ohlsson needing a real production man, it was a natural meeting.

The first miniature engine featured a duraluminum head produced in conjunction with Frank Bertelli. Only 126 aluminum types were manufactured, making this model a real engine collectors item. This "original" was a "two-bolt" type, that is, the exhaust manifold was held on with two bolts. Open type ignition points were a distinctive feature of this engine, as were the cooling fins which formed the famous "step-fin" head. All miniatures featured these characteristics.

The dural model was followed by the "two-bolt" steel head and cylinder type. By the time this model arrived, Harry Rice was in charge of production. Interestingly enough, the first tanks employed on these motors were modified brass carburetor floats which adapted admirably to the miniature engine.

The engine, with a 7/8 inch bore and 15/16 inch stroke, was nominally rated at 1/5 H.P. (similar to Brown Jr.). Although the displacement was not speci-

fied, it was a slight bit over .60 (.62). The motor was provided with radial mounts only, although later on, custom-made mounts were manufacturing to all low different methods of mounting.

TEXACO

As has been written in this column many times, the originators of the Texaco Revival, the SCAMPS, are again putting on the Tenth Annual Texaco Event on April 11 at Taft.

Flown now as the "Dawn Patrol" with Sal Taibi doing the officiating, the contest begins at the crack of dawn (around 6 a.m.) and concludes at 9 a.m. Nice thing about flying in that real calm air at that time of the morning is the lack of flyaways. Real pleasant flying!

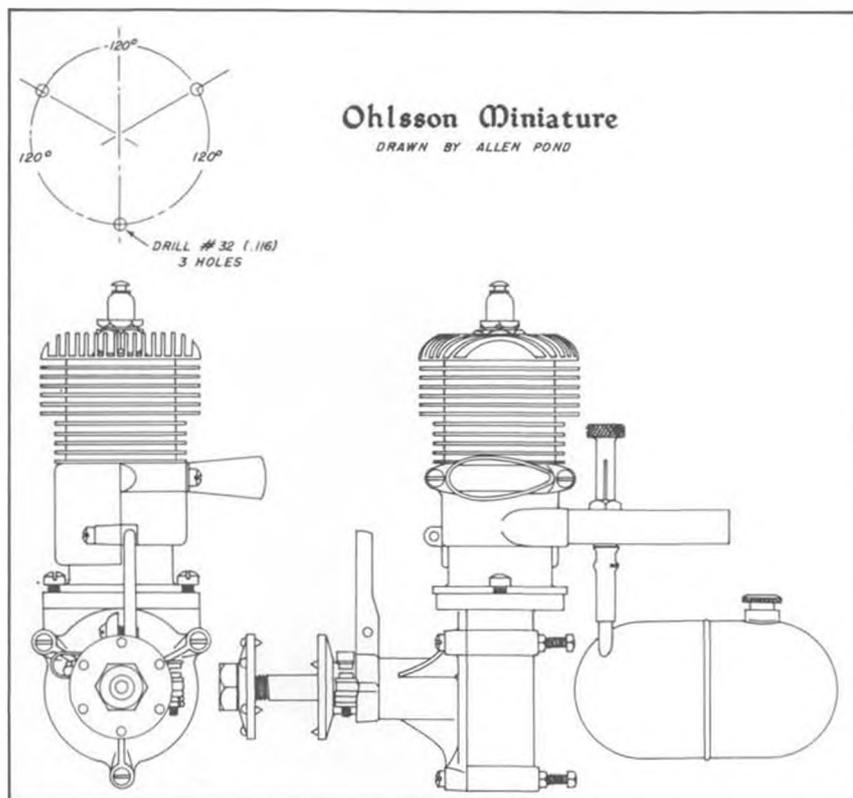
In line with this event, Sal and the SCAMPS have given their approval (through the efforts of Otto Bernhardt)

for the SAM 21 Club to stage the R/C assist Texaco Event, following the conclusion of the standard free flight Texaco (This writer is going to have a ball and enter both contests!).

To help entries, the BOM rule will not be enforced, however, the model may be entered only once. Two flights allowed, with the first flight being required to start by 12 o'clock. The contest will close at 3 P.M., with no model taking off after 2:30 P.M. Now don't say you didn't hear about it! GUTS OR NUTS?

When Bud McNorgan and son, Kit, decided to return to Old Timer models, it didn't take Bud very long to come up with the wildest idea of all.

According to Editor Jimmy Dean of the SCAMPS "Hot Leads", McNorgan has issued a challenge to all old timer





Hark Stumpf of Long Island, built this sharp looking Bay Ridge Mike. Look at the trees in that flying area . . . ouch!



A rare New Cyclone Co. "Lancer 72", built by Ron Raddon, Barnet, England. Looks somewhat like a Shreshaw design.

fans in the form of a meet called "They Went Thataway". This former dynamic SAM Director (who practically single-handedly organized the first series of Denver SAM Champs) puts out the following rules:

Any old Texaco type model can be entered. To enter, all one has to do is to put a five dollar bill under the designated rock, and let 'er go! One flight is all that will be allowed. No fuel limits, no flight time limits. As McNorgan puts it, "Here is a chance to retire (or lose) your old model". Anyway, the one longest flight wins what is under the rock.

As Brickner of the SCIFS observes, "They may call this meet guts, but I call it nuts!" We'll keep you clued in on this one occurring on January 18.

DECEMBER CONTEST

Seems hard for the rest of the country to believe, but the SCAMPS held an .020/Rubber Combination meet at Lake Elsinore in December, with three flyoff flights required to settle the .020 Replica Event! Weather was in the sixties, with about a 5 mile wind. WOW!

One feature of the contest was Jerry Vernon losing another model, an .020 Interceptor, this time. Full tank and timer off seems to be Jerry's bag.

However, Flightplug Editor Brickner thought that was such a good idea he repeated the incident. There must be a flock of models in those hills surrounding Elsinore!

The writer was rather pleased to see Brad Levine, a young newcomer to this game, walk away with the rubber event and also the Yearly High Point Trophy. These 36 inch rubber jobs do fly very well!

The new event, as originated by the SCIFS, .020 Antique Replicas, enjoyed a good turnout this time with 12 entries. Maybe this writer will have to eat his hat after all!

Continued on page 65



AIR TRAILS · TRAINER ·

OLD TIMER Model of the Month

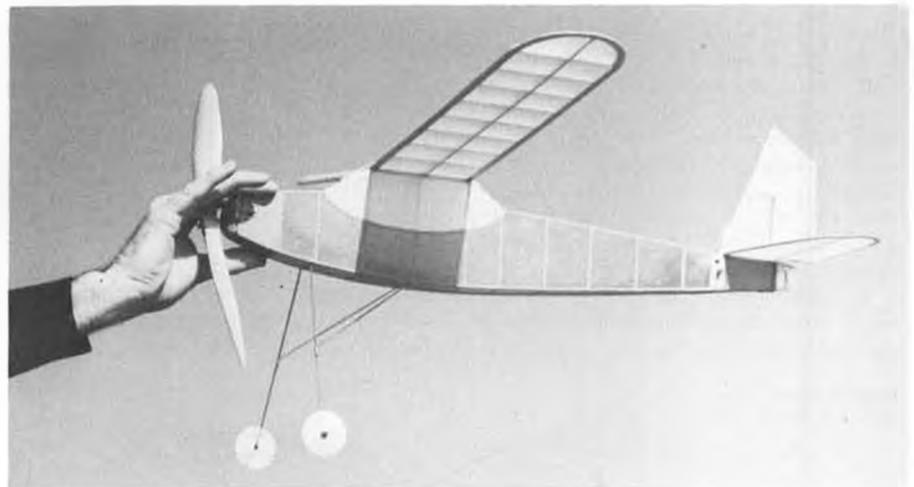
Designed by: Gordon Light (?)

Drawn by: Chuck Blackburn

Text by: Bill Northrop

• This little rubber ship was published in the May 1936 issue of Bill Barnes Air Trails (10 cents at your newsstand). It was billed as "The TRAINER", and it had no claim to fame whatsoever. The only thing we know is, it's damn cute, and one that we've always stopped to look at over the years, whenever thumbing through our treasured collection of old model magazines.

It's sort of a puzzler in a way. It was apparently designed by Gordon Light, who "conducted" the Model Workshop portion of Air Trails for many years, yet he picked it apart in the introduction to the extent that you'd almost think he



Bud McNorgan, Garden Grove, California, and his "Trainer." He added a DT hookup, and also installed a motor peg in place of the rear hook. Plane flies extremely well.

didn't like it!

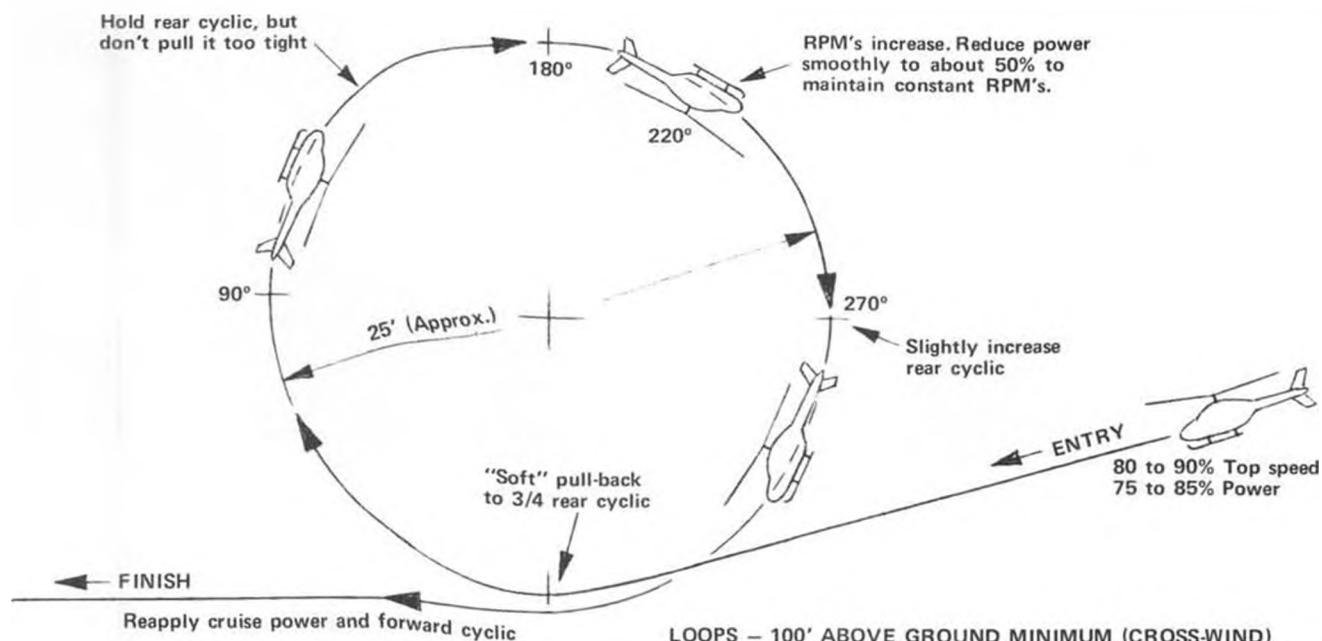
"The rubber motor runs through the fuselage and is attached to the front and rear of the fuselage instead of being mounted to a motor stick. With such an arrangement, the fuselage itself must stand the strain of the wound motor. Naturally, this distorts the fuselage and makes the safety of the model dubious when the rubber is tightly wound. But an 8-strand motor, as used in the Trainer, will not cause too much trouble. At least it will show you the advantages of using a motor stick! (Light's 1935 Wakefield winner used a motor stick, and he

was a firm believer in this method of carrying the rubber.)

"Another feature of this model, new to Air Trails followers, is the wire landing gear.(!) Its chief claim to fame is its flexibility. We still favor bamboo for landing gears. Let's see what you think."

Light's concern about the fuselage strength was needless. Bud McNorgan's "Trainer" is an excellent flyer, and the fuselage does not "distort" or look "dubious."

In fact . . . like we said . . . it's just damn cute!



CHOPPER CHATTER



By JOHN TUCKER

HELIX AUTOGYRO

• We concluded last month's column with having just completed building the "Helix" autogyro and were ready to begin flight testing. The night before we took it out to the flying field, Kim painted on some sexy stripes and outlined the entire bird with black trim, so it would be quite visible in all regimes of flight.

Saturday morning dawned as a perfect day... sunshine and warm temperatures, with no wind, all telling us it would be

a fun day! There was quite a crowd at the field when we finally arrived, all anxious to watch the strange contraption fly.

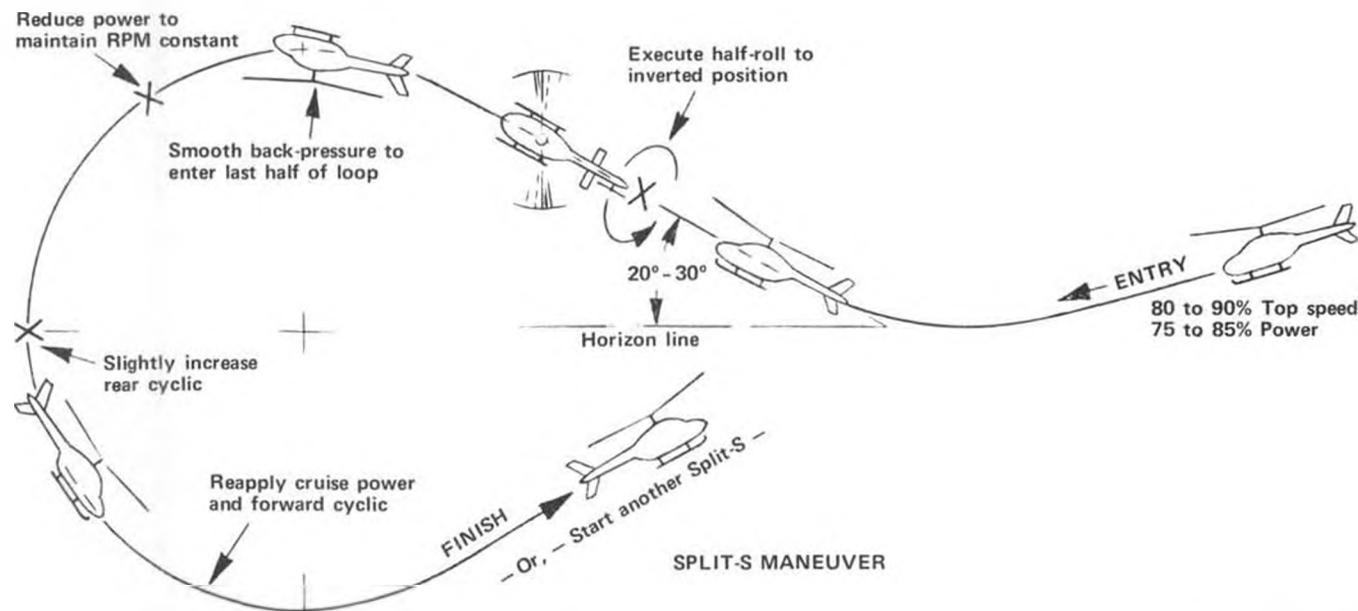
The first step was to wind up the string on the starter spool, fill the tank with fuel, and start the engine. The moment it burst into life, the string unwound from the spool and we shut down to wind it up again!

This time, we enlisted the aid of another helper to hold on to the spool! The next engine start was good but it

quit after 10 seconds of running. Subsequent attempts to keep it going were to no avail... we kept unscrewing the needle valve (it was starving from lack of fuel) until it finally came all the way out, hit the prop, and went sailing off into the wild blue yonder!

Well, that killed it for Saturday. We picked up the gyro and took it back to the shop for further checking and a new needle valve. As he defueled the tank, Kim said the only thing wrong was that it had no fuel in it... Of course I had filled that 16 ounce to the brim, so what was wrong? Sure 'nuff the fuel tank was empty... 16 ounces of K&B 500 had dribbled out of a hairline crack (in a new tank) and was still trapped in the belly of the ship!

It didn't take too long to clean up the mess and install a new tank, so we made plans to try again on Sunday morning. The preflight went well, the engine ran fine, and the string stayed on the spool, so we pointed her into the wind and crossed our fingers. I must say that the takeoff and climb-out went



exactly as the instructions indicated. Full power was applied and the gyrocopter made a perfectly straight ground-run, the string rotating the main blades as it accelerated. Finally, when it reached the end, the string came off the pulley and the gyro lurched forward at high speed for another 15 feet, then gently lifted off in a smooth climb. Control was soft and easy to handle, however, I did have to hold in a very slight amount of left rudder to keep it straight.

To be completely honest about it, I was so absolutely fascinated by the machine and the way it flew, I did the one thing you should never do with a helicopter, or a gyrocopter, that is, to let it get so far away that you lose visual reference, and ultimately lose control! IF YOU CAN'T SEE IT, YOU CAN'T FLY IT!

Very soon, I realized it was approaching the limit of my vision and started a gentle left turn to bring it back into the traffic pattern. Since the instructions had cautioned that "a steep turn would cause the rotor blades to stop and a crash would surely result", I played it around the turn real cool. About half-way around, I lost contact with its attitude and position, so in desperation, made a tighter turn to bring it back toward me. Just like they said, the rotor blades suddenly stopped in mid-air and the gyro did the darndest Lomcevak you ever saw, and tumbled end over end . . . all the way to the ground! I was so panic stricken, I didn't even throttle back the engine!

Well, the fuselage was cracked in several places, the windshield had disintegrated and one rotor blade was broken. At this time, we have patched up the fuselage and are now working on a new set of blades. Hopefully, we'll have it in the air again within the next few days . . . this time I'll let Kim fly it . . . his depth perception is much better than mine! I am convinced that gyrocopters have a lot to offer to the sport flyer . . . they are economical to build (and repair), they fly like an airplane, and do not require the special techniques that helicopters do, and, they are much, much fun to maneuver. My hat's off to the "Skip Ruffs" who spend most of their time developing new gyrocopters and exploring this new and unusual segment of our hobby.

LETTERS AND VISITS

Dave Martin, of Fairfax, Virginia wrote a short letter telling of an unusual situation with his Enstrom chopper. His helio was flying quite fast at 100 feet when he saw a white flash, heard a cracking sound, and instantly realized he had lost a main rotor blade, but still had reasonable control of the model. A normal landing (except for vibration) revealed that the entire balsa trailing edge of one main rotor blade was missing. Examination of the pieces showed that



Well known R/C aerobatic competition flyer of a few years ago, Fritz Bosch, now representing Simprop Radio, of Germany, spent several days with our "Chopper" editor, John Tucker.

the 5-minute epoxy used to join the leading and trailing edges had failed to penetrate very far into the balsa before setting up. Dave says the lesson here is not to use a quick-setting epoxy for fabricating rotor blades, especially if the blades are not covered. Undoubtedly an aliphatic resin glue like Wil-Hold or Titebond would penetrate the wood better and form a more satisfactory joint in such critical areas.

* * *

We also received a newsletter from the Florida R/C Helicopter Association, telling of their Jacksonville Fly-In during November. Of particular interest was the following quote:

"On the way to Jacksonville, we stopped at Aubrey Radford's home and found him working in the backyard on

his Jet Ranger. After tightening up a loose timing belt, he fired it up right there in his yard and wrung it out. He made 360° turns where there was hardly enough room to turn the lawn mower around, and climbed straight up among the lonesome pines with hardly enough room to even see, to say nothing of flying a helicopter! He then blew the pine needles off his roof with the rotor breeze! Aubrey's comment was, 'With this much invested, I have to find some useful purpose for it!' How 'bout that for a colorful character?"

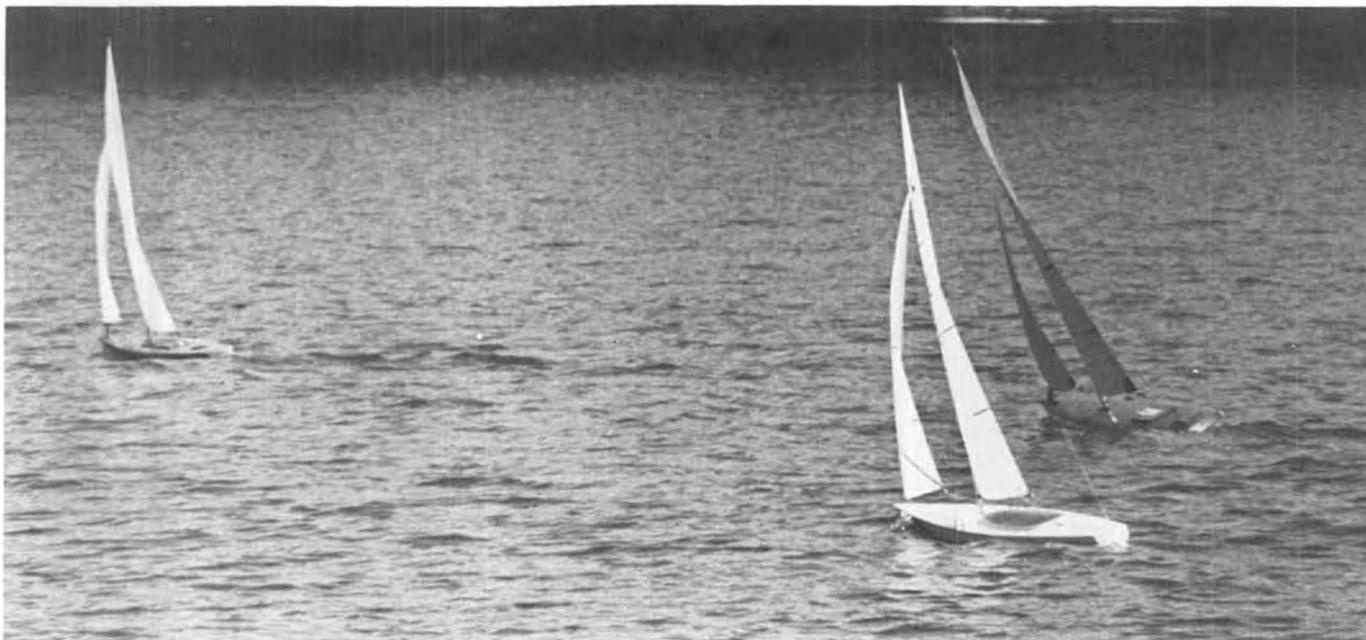
* * *

Bud Ashcroft, of Pomona Valley Hobbies, drove over for a visit last week and brought along his beautiful Jet Ranger. Bud has really detailed this

Continued on page 75



Bud Ashcroft, of Pomona Valley Hobbies, Pomona, Ca., equipped his Kavan Jet Ranger with control rod ball-link hinges on the cabin door, for realism and accessibility. Note interior detail.



R/C sailing in Paris . . . Paris, Illinois, that is. There's always something to be learned. The weather boat (far right) is over-trimmed for this leg, heeling more, and about to be passed by the Soling, to leeward. This, and other photos by Roger Bard.

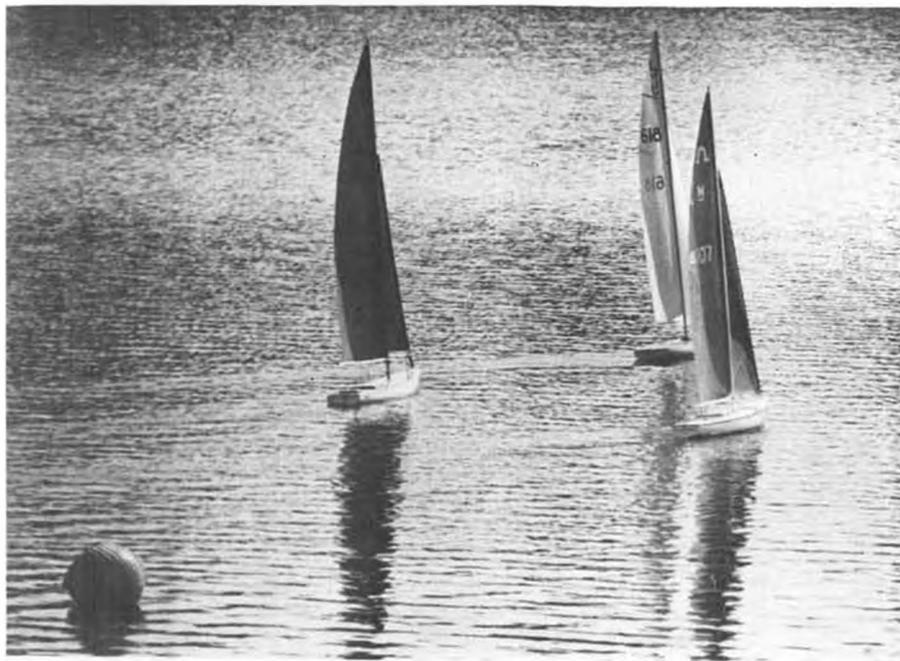
STRICTLY SAIL

By ROD CARR

● Got a letter from Bob Danks of the HMS Bishop, a new AMYA sanctioned club, Box 1026, Bishop, California 93514. He asked for some suggestions for reading material that would help introduce new skippers to the sport. I had to tell him that at present, one had to read about full-sized techniques and then transpose that to the models. The model yachting books available were,

by and large, old and not pointed directly toward R/C sailing.

I also heard from John Rosebery, secretary for the Tri-State MYC, who has recently been deluged with novices seeking help with their first boats. Though AMYA has been approached to sponsor a project which would provide a series of monographs with their Quarterly Newsletter, they are still working the



"Did Fred mine the lake again?"

idea over. Hopefully that undertaking will be well under way by the time these words appear in print.

In an attempt to help cure the information gap, this month's column is a simple run-down on the shelves of my bookcase. Each book is listed by author in the bibliography at the end of the column. Though lumped under different headings, each book may contain material on more than one area, and its place in this text should not be construed too restrictively. I merely sorted the books into groups based on how much use I have gotten from it.

If you are interested in building a library of your own, I would like to suggest that old American tradition, the book-club. In this case, it is the DOLPHIN BOOK CLUB, Camp Hill, Pa. 17011. You'll find their ad in any of the monthly yachting magazines, and should take advantage of their introductory offer.

Speaking of magazines, I recommend in order of importance to the R/C yachtsman, SAIL, YACHTING, and YACHT RACING. After you have renewed your MODEL BUILDER subscription, add one of these to your list of required reading. You might collar two buddies and subscribe to all three, swapping each month.

ROSS is undoubtedly the eventual bible of this area. The diagrammatic presentation makes it easy to picture his subject as occurring to your boat, so that you'll recognize symptoms in set and trim while sailing. Chapter 18 on measuring sails ought to be required reading for every race committee we have. Chapter 19 concerns itself with the vagaries of measuring sails under the IOR Rule that is presently used to rate full-sized ocean racers. Believe me, one look at that and you'll be glad to go

back to your one-design or 50/800.

HOWARD-WILLIAMS' two books are a bit more technical from the standpoint of sail construction. I think that if the average model yachtsman knew a bit more about what goes into a sail, there would be more satisfied skippers on the water. The photographs of sails full of air with various defects are quite valuable and should aid you in discussing your sails with your sailmaker.

MARCHAJ, though over 10 years old, still remains the basic theoretical text concerned with sail aerodynamics. Each individual section is understandable by itself, well documented with vector diagrams. The problem comes in trying to integrate all the different sections and come up with a path to follow in handling your sails. I've seen a number of skippers who read one small section, run out and take that recommendation to excess on their boat, and not realize that tuning and design is a continual series of trade-offs. Something that works well to weather, like a high-aspect sailplane, will not work well on a reach or run. An all-round boat will not go to extreme in any part of its construction. However, MARCHAJ does allow us to look at each part of the hull/keel/rudder/sail system, and makes a good volume to squirrel away in the nightstand.

FLETCHER and ROSS, are two Americans who use photographs to great advantage to cover a plethora of different class boats. They stick strictly to tuning of an existing boat, discussing sheeting, sail shape and their effects on boat speed and balance. I believe this is the first book I would go back into a burning house to rescue, as it has provided me with much food for thought.

WALKER, "Wind and Strategy", while not working down to the scale and altitude that we are concerned with, nevertheless gives a basic understanding of what is happening during the course of a day. I quiz the locals about the wind whenever I sail on "away water", and it is amazing that one is able to fit that kind of information into the more general picture that Dr. Walker presents. At the level of competition we have today, knowing which side of the course is most likely to feel new wind first early in the morning, or where it is likely to lose it in the afternoon, is very important. His comments on wind shadow by obstructions, and wind refraction (bending) by banks and shores, is most pertinent to our needs.

DESIGN

Here we seem mostly concerned with hull design, and probably more with 50/800's than any other class. I have found CHAPPELLE to be the most informative, as in Chapter 3, LINES, he takes the reader through all the necessary detail required to produce a complete description of a hull on a



"Last one home pays for the grog."

flat piece of paper. Calculations of displacement, center of buoyancy, and so on, help the novice designer to quantify his design on the board. We will go into this further in the pages of MODEL BUILDER as I find new designers who are willing to share their efforts with us. In the near future we will be looking at the WING 50/800, design by Forrest Godby, of Mt. Kisco, New York.

KINNEY has brought Norman Skene's design philosophy up to date and produced a very handy reference with a lot of scantling and strength of materials data included. The short chapter on tank testing is a good introduction to that practice.

HENRY & MILLER address themselves specifically to sailing yacht design and present a series of plots of acceptable ranges of parameters such as LWL vs. Beam, and so on.

RACING AND TACTICS

CURRY, though the edition I have was printed in 1948, still provides some very healthy observations on vessel performance as a function of sail shape and trim. The author was one of the first to record scientific tests made on sails in a wind tunnel under controlled conditions. His work makes a strong plea for maintaining the cambered shape of the sails all the way to the foot, with which I wholeheartedly agree.

ELVSTROM should be one of the first 3 or 4 books you add to your collection. This volume is really a compendium, and touches on all areas of interest, from the boat itself, to sails, to trim and helming, and right on through tactics and racing rules. The author's record as a racing skipper stands by itself, and his idea as a designer have recently culminated in a 6-meter which features a bulbous bow similar to that found on new supertankers.

SCHULT, on the other hand, concentrates only on tactics, and is especially concerned with the one-on-one types of

duels which seem to arise so often on the race course. My trouble is in finding skippers who have taken the trouble to learn enough to realize that they are getting "lee-bowed", for example. Most skippers are sadly lacking in elementary considerations of fleet or individual tactics. I will admit that Schult seems to be an entire barrage when a shot or two would be overkill, but here is another book which can be reread often with continual profit.

PINAUD is a recent addition. It is a wide-scope book with a lot of photo work and an equally impressive text. It is not particularly cheap, though few books are these days. It has complete segments concerned with fleet racing as well as care and feeding of sail plans. The investment is well worth it. His treatment of the aerodynamic theory connected with sails is written in a practical tone pointed toward results on the race course rather than elegant demonstration in the class room. As with all of my books, I like to be able to underline pertinent points that I have learned the hard way at the lake. For this reason I recommend that you buy the publications if at all possible.

TWINAME (1974) covers basically the same territory as ELVSTROM, but in a slightly abbreviated form. On page 3 he presents a flow diagram titled "First-Place Thinking". The caption starts out, "A race won is a series of decisions correctly made." Much room here for direct application to your own particular style of racing. He puts the responsibility for winning performance directly, and wholly on the shoulder of the skipper, not on the boat. This is something many model yacht skippers still have to accept. The number of folks who go out and immediately bid on the winning boat at a regatta, are examples. The boat didn't win the regatta, its skipper did!!! Twiname (1971) concerns itself directly

Continued on next page.

FOR Ms ONLY

(Mrs.) CHAR ROHRING
4494 Tanglewood Trail
Saint Joseph, Mich. 49085

• In the events of life there are the sad, the funny, the ridiculous, and what happened this morning at our breakfast table. It's so wild, you'll think I made it up last New Year's Eve. Most people sit at the breakfast table and talk about the kids, or the bills, or the happenings of the day to come. Some people don't talk at all at breakfast, and what a shame! This is when the mind is fertile and fresh. This is when unbelievable genius buds.

Bear in mind that it's the season of windy days, and here in Michigan the weather is starting to break. This means slope soaring at the dunes when the wind is out of the west. I don't want you to think that our glider pilots haven't been out there all winter. It's just that now their endurance doesn't have to be so peak, and there are more daylight hours.

But back to the breakfast table conversation. The playlet goes like this:

BILL (Speaking seriously): "I think I can play Yankee Doodle on my thermal sensor."

CHAR (Slowly and cautiously): "If that calls for an answer, I'll have to write to Ann Landers first."

BILL (Lost in thought and unimpressed by Char's comment): "I really think, with all the wind action along the dunes now, I could produce a tune that you could recognize."

CHAR (Glancing quickly to see if the children are in earshot): "Oh?"

BILL (Deep in thought. Right elbow on table. Making back-and-forth gestures with empty fork in right hand. Trance-

Continued from previous page.

with team racing, and I would recommend that club fleet captions take a good look at this as a style of competition which will liven up club activities.

OAKLEY takes half of his book to go over every solitary fitting on the typical racing boat. On our R/C versions, some of his advice is not applicable, but the value here comes from reading the words of a master skipper who continually stresses simplicity and strength in all fittings and gear. His approach to a big regatta, from preparation at home to the first gun of the first race, is quite valuable. We could certainly take heed of his suggestions, as I've



"WELL, I TOLD YOU NOT TO HAVE THE WEDDING ON A SUNDAY!"

like glaze in eyes.): "We could have a contest. All we need are two gliders with thermal sensors and a bunch of the guys."

CHAR (Aside to audience): "Good grief! He's serious!"

Now you have the picture. In the spring I thought a young man's fancy was supposed to turn to thoughts of love!

Knowing Bill, he'll try to organize this Sensor Serenade. I'll cover the event, when it happens, with my camera and tape recorder. You girls could promote this kind of club contest in your area. After you think about it for awhile, it starts to sound good. Just remember, you heard it first in MODEL BUILDER.

Here is the seed of the idea as I understand it from Bill. Start with two even teams. Each team must have one sailplane of comparable flying maneuverability. Two pilots, one from each team, are sent over to the person in charge of song titles. These two pilots agree on one piece of folded paper, which bears the tune each will try to reproduce with the sensor. Understand, both pilots are doing the same tune.

After both planes are launched, each team clusters around its pilot. An impartial judge, who is not an active tune-

guessing team member, is in each group, too. Teams should include girl friends, wives, mothers, fathers, friends, and relatives. Only the judge and the pilot know the tune that will soon float melodically from the sensor. The person flying is not allowed to talk, but keeps trying to repeat the familiar notes with the humming of the thermal sensor. The team members listen carefully, and call out titles of songs as they think they hear them. When someone does call out the right song title, the judge in that group momentarily stops the contest by a prearranged signal. At this time points are awarded to the successful team. Two new flyers come forward to draw another song title from the stock pile. These new pilots take over the controls of the plane, and it's their turn to strike up the sensor!

Keep the tunes simple. Use well known songs like "Twinkle, Twinkle, Little Star," "London Bridge is Falling Down," "America," or, "Mary Had a Little Lamb." Avoid songs with low register, especially "Asleep in the Deep!"

Girls, can you believe a day starting like this? I have the funny feeling you are all saying, "Yes!" Share that story with us.



seen skippers show up at lake side and embarrassingly drive home to pick up a forgotten mast. A simple check list would have avoided that!

BROWN, though previously mentioned in this column, deserves mentioning again. It is a programmed type of test that asks you for a decision in a tactical situation shown graphically. Then it provides you with an explanation of the proper response, and illuminates the appropriate controlling race rule. It is done utilizing the rules that you are most prone to encounter on the race course, so that you rapidly get checked out on the do's and don'ts that will help you avoid getting foul points.

HALL is a loose-leaf presentation

with a skimming treatment, sort of once-over-lightly. It is interesting, as many of the drawings are made as if seen from the water level, rather than from the Goodyear blimp. As many of our problem situations occur at the far mark, such a picture is a good help. He also provides a prototype log-book form which we should all be keeping in order to improve our set-up and trim on our boats.

OLD MASTERS

These three books are each full of all sorts of hints and tips. On top of it all, they were each written by a skipper of long experience, whose anecdotal style of illustrating a point makes for enjoy-

Continued on page 81



The prototype XA-8 had exceptionally clean lines. Top speed was 196 mph. MODEL BUILDER published 1-1/2" scale plans for the Shrike in the July 1974 issue. Designed by Charlie Smith, it could be flown R/C or C/L.

CURTISS A-8 "SHRIKE" PART ONE By PETER WESTBURG

● By 1930, the Curtiss A-3 Falcon had become obsolete. The fabric covered, tube-and-wood frame concept of structure was giving way to a new concept of all-metal monocoque structure design . . . and the biplane was giving way to the monoplane. The biplane fighter was still big in the thinking of military men all over the world, but on the horizon were the Boeing B-9 monoplane bomber, to be followed by the matchless Martin B-10. Attack airplanes were very much in the thinking of Air Corps planners, who decided to develop an entirely new type of attack aircraft to replace the A-3's and A-3B's. It was to be a heavily



The XA-8 during its extensive flight test program while at Wright Field, Dayton, Ohio, scene of this year's AMA Nationals.



The Y1A-8. Two Browning .30 caliber guns were located in each massive wheel fairing, with 600 rounds for each.



One of nine A-8's, while with the 37th Attack Squadron, Langley Field, Virginia. Note position of full-swiveling tail wheel. Control override system allowed steering when wheel was in the trailing position. See the knickers on the kids? Cars give away age of younger looking aircraft.

armed, all-metal monoplane, able to attack any ground target.

Two companies, Fokker and Curtiss, responded to the invitation to bid. Fokker's XA-7 was a monoplane with a thick low wing, a sharp spinner and sharply tapered engine section lines, and a large scoop under the belly . . . its performance was no better than its looks. Curtiss won the contract for 13 service test aircraft with its XA-8, a new airplane with several untried ideas that are common on airplanes today.

Curtiss chose the C-80 racing airfoil for the wing of the A-8, put slats on the leading edge to keep it from stalling too soon, and flaps on the trailing edge to slow it down for landing. It was the first Air Corps airplane to be equipped with such a wing, and the test pilots at Wright Field had a busy time learning to jockey the throttle and stick, crank the flaps down, and crank the nose of the horizontal stabilizer down to offset the pitching moment of the flaps during landing.

The XA-8 survived the test program after a number of changes in the slats and flaps, the oil cooler installation, and the rear cockpit canopy and layout. Of the 13 ordered, the first became a YA-10, with 625 hp P & W Hornet, and the prototype of the well known A-12 Shrike. The last of the series was engined with a geared Conqueror and designated the YA-8A, but the famous Conqueror engine had reached the end of the line and the YA-8A died with it. ●

(To be continued in April)



The A-8 was a tough, capable looking airplane. Oil tank was located on right side to obtain additional cooling. Fully cantilevered wings were still to be in the future. The A-8 was first Air Corps aircraft to have flaps and leading edge slats.



Sr. Slow Combat winners at '75 Nats (l to r): Victor Radisi (2nd), Marty Phillips (4th) kneeling, Bill Maywald (1st), David Aoyama (5th) kneeling, and F. Quezada (3rd). Tom Southern photo.



Paul Klahn, who will be W.A.M. Combat Director for 1976. He's holding a Matador, designed by the photographer, Rich "von" Lopez.

C

ontrol line

By "DIRTY DAN" RUTHERFORD
PHOTOS BY THE AUTHOR

• I think this column is going to be full of "odds 'n ends", as I don't have anything major for you. Bear with me and maybe you can pick up on something interesting.

Recently I received a newsletter from Orin Humphries in Spokane, Wash. Seems that Orin is heading up a new C/L club in that area, the Spokane U-



Well, this takes care of "See no evil." Name him and win a wire-haired cookie-pusher!

Control Assoc. An innocent enough name, I suppose, until you notice that the name of the club shortens to the SUCA's! That brings to mind all sorts of cute little jokes, but we have to keep MB's G rating, right Bill? (*Right . . . if it's not too late! wcn*)

Cox has been giving away foam wings with their .049 engines. These are the same wings that are used on the Cox Super Stunter and Super Chipmunk, except for the fact that they are not glued at the trailing edge. Has anybody come up with an interesting use for these foam wings?

Larry Renger, Project Engineer for Cox, sent me several sets of these wings, and the kids and I built a couple of .049-powered trainers out of them. My kids aren't old enough to work with all the little parts that go into a built-up wing, but can handle fuselage parts without too much problem. By using the Cox foam wings, they were able to do most of the work on the planes themselves, yet build a plane that can easily out-fly the usual slab-winged things generally used as trainers.

I have been going to come up with a design for .049 Combat that uses the Cox foam wings, but have yet to get started on it. I am thinking of a profile-type plane, and would want the wing panels to be easily replaced at the field. You know, an indestructo fuse and throw-away wing panels.

For those who prefer kits, take a look at the Skyfire from M&P. It uses

the Cox wing panels (included in the kit), so you know it is going to be easy to build. And the Skyfire is a good flying airplane, capable of inverted flight and all the other usual stuff that most .049 planes can't do.

As long as we're talking about the little planes, guess I'll ask about .049 Combat. Anybody out there doing much of it? Not .049 Combat with junkers and used-up reed-valve .049's, but with honkin' TD's and get-serious airplanes. We here in the N.W. keep developing our .049 Combat planes and are now to the point where we have planes that are really impressive. My latest design is big at about 175 square inches, and will make most anybody say "Far bleeping out!" On 35 foot lines it is almost too much to handle and takes a bit of getting used to before one can effectively fly the plane in a match.

I just sent one of the newest designs down to Charlie Johnson in SoCal (read San Diego) for him to try, and it will be interesting to see how he likes it as he presently can't hardly stand .049 Combat planes! Incidentally, I didn't just send Charlie a set of plans . . . I sent him a whole plane, built and ready to fly. Even put a pretty decent TD on the plane for Charlie, along with lines and a handle. Who says I'm not a nice guy?!

The next item is kinda tough to write about. I'm interested in pushing .049 Combat, don't want to discourage any



Phil Granderson, launching for Col. Howard Rush at '75 Nats. Good form. Note furled streamer, out of way, and about to open. Photo by Tom Southern.

manufacturer who is willing to come out with new C/L kits, and also want to be honest with readers of this column. As I have yet to try to deceive you by pussy-footing around and being cute with words that mean little, let's get into a little kit review that is honest and straightforward.

Midwest's kit of the Li'l Snip has been out for awhile now and I got one to try. Thanks to Midwest for sending the kit, let's see what it's like. First impressions: Packaging is very well done, nice kit box. Plans look good, are full-size, and fairly clear regarding construction details. Lots of hardware included in the kit. In fact, all necessary hardware is included, right down to a bladder tank.

Sounds good, so far, but there is more. The plans aren't clear on several points. The inboard panel is longer (like a Voo-Doo) but there is no men-



Gary Stevens, always a ready, willing, and able helper when not flying or pitting. A valuable asset to MACA. There should be more like him.

tion made of this fact and it is going to be very easy for many to glue the LE to the mounts with the LE centered. Almost did it myself! The diamond airfoil used on the Snip is great for building the plane with all ribs on the building board, yet the plans show a scheme that involves shimming up the bottom spar, gluing ribs to the LE and bottom spar with everything just hanging in the air, the aft end of the ribs elevated above the plans. After gluing the ribs to the LE and the bottom spar, the assembly is rocked back onto the board and then the aft end of the ribs glued to the bottom TE piece. It's all more work than is necessary, and a good way to build in some unwanted warps.

After the wing is framed, the plans suggest sanding it and then gluing on the booms and fairings. Always cover a Combat plane and then glue the booms on. Makes it much easier to cover if you don't have to work around the booms. Also, due to the center section sheeting not extending past the booms, the covering cannot be removed in this area to allow gluing the booms directly to wood. Ever try to glue something to Monokote? Didn't work very well, did it?

IMPORTANT NOTICE

In last month's control line column, Dan Rutherford made a gross reporting error, which we wish to correct at this time.

The Clary Corporation, 2931 S. Main St., Santa Ana, California 92707, manufacturer of the former Veco line of model accessories, has NOT filed bankruptcy.

Of course, Jim Clary wouldn't mind if you follow Dan's suggestion and "truck on down to the hobby shop and load up" on Clary bellcranks, C/L horns, fuel tanks, fuel line, spinners, wheels, etc. However, there's no need to become a hoarder, as the line will continue to be available.

Jim Clary has been a regular competitor in control line speed (FAI, Class A, Jet, and Half-A Proto), and along with partner John Newton, has held many records.

As long as material for a bladder is included in the kit, I think it would have been a good idea to give instructions on how to fill it and how to start an engine on a bladder. Bladders are simple and really work well, but can give a person fits if he has never previously worked with one.

The Li'l Snip does fly OK and shouldn't give even inexperienced fliers much problem. Mine is powered by a TD, but I have seen several with Black Widows installed that also flew OK.

If you are an experienced Combat flier, don't expect too much when flying a Snip, however. It doesn't have any nasty tendencies, but it isn't exactly exciting. When I was test-flying mine, I happened to have several of my latest planes along and we put one in the air at the same time as the Snip was flying, just to see how much difference there was in turning abilities. With the Snip in as tight a loop as possible without stalling, I was able to put my plane inside



"Visiting fireman" from England, Richard Wilkins, with his 460 sq. in. "Fast Blasta" FAI combat ship. Placed 5th in FAI, at '75 Nats.

the loop and do figure-eights. The spectators loved that, natch, but we almost had a mid-air and I had to get back out of the loop in a hurry!

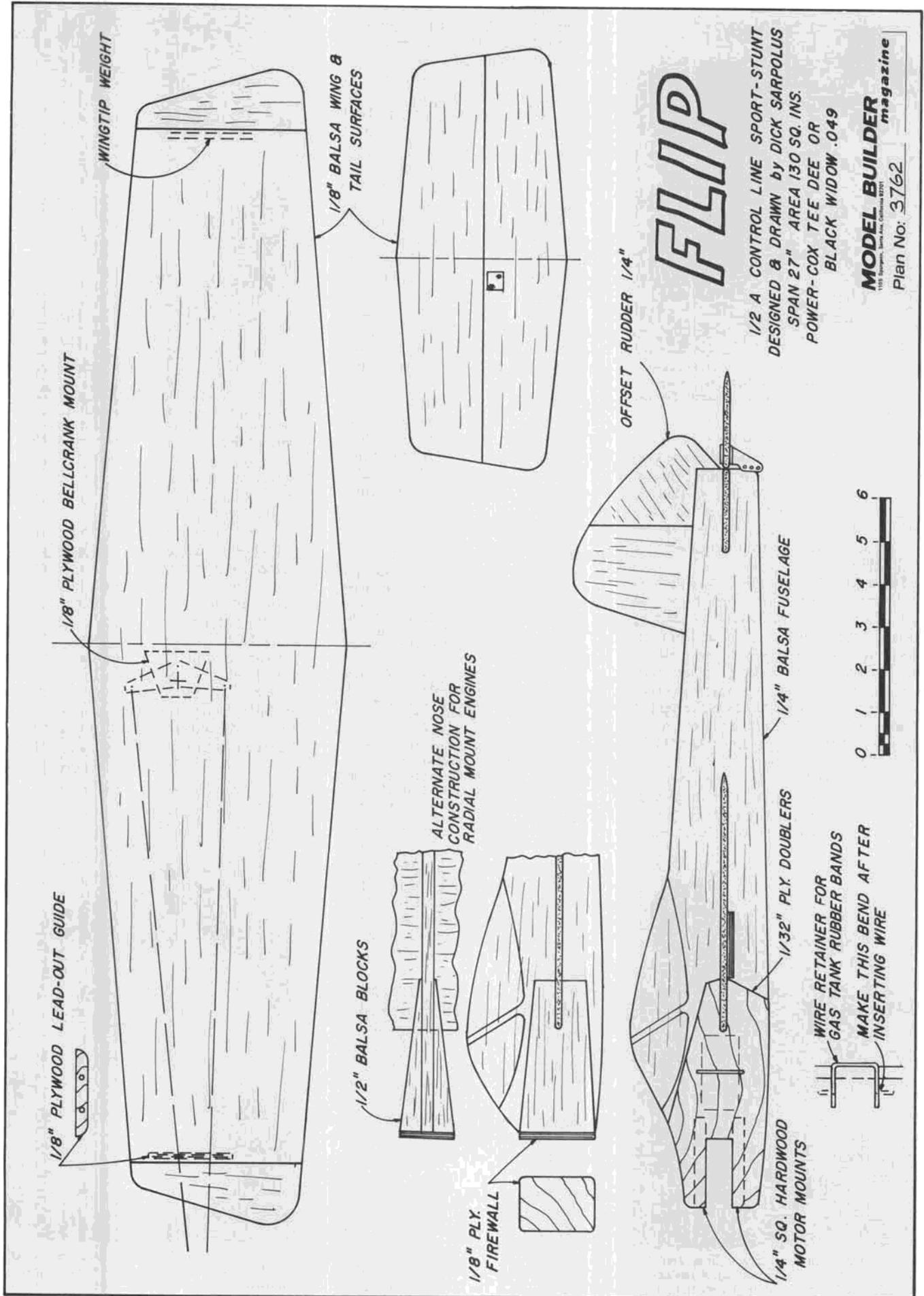
The Li'l Snip is a good first plane for somebody interested in getting into some .049 Combat, or for somebody who wants an easy-to-build and rugged sport plane. Price is a little high at \$6.95, but you don't have to buy hardware to finish the kit. My personal overall view of this kit: Coulda been better, but thanks for trying.

One of the recent issues of the PAMPA newsletter had an article in it that dealt with flying at night with little lights on a Stunter. The whole deal had

Continued on page 90



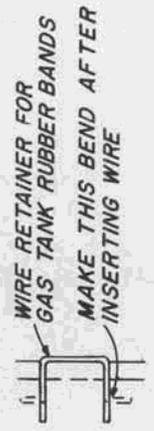
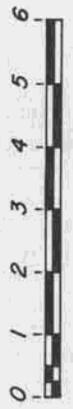
"C'mon, Duke, we knew who you were all the time!" Fox is a loyal friend of control line modeling, haunts combat circles at the Nats.



FLIP

1/2 A CONTROL LINE SPORT-STUNT
 DESIGNED & DRAWN BY DICK SARPOLUS
 SPAN 27" AREA 130 SQ. INS.
 POWER-COX TEE DEE OR
 BLACK WIDOW .049

MODEL BUILDER
1105 Bryn Mawr, Tempe, Ariz. October 1971
 magazine
 Plan No: 3762



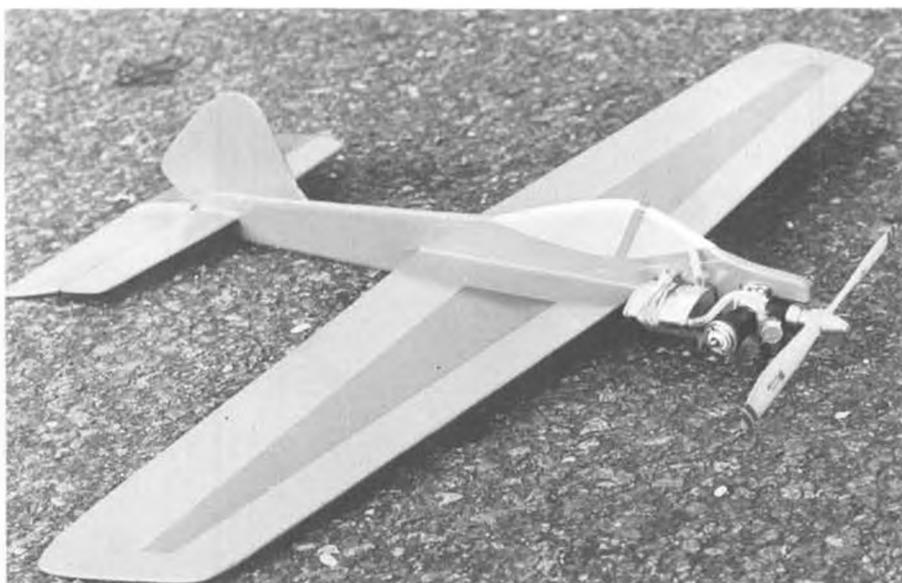
The FLIP

The

By DICK SARPOLUS . . . A fine project for any young modeler. Helps to get the feel of cutting, sanding, and finishing balsa wood. All parts easily cut from sheet stock . . . no fancy shaping required. And oh yes, it flies great, too!

• This very simple 1/2A model is a practical, capable stunter. It will perform all the pattern maneuvers . . . not quite like a "real" stunt model, but well enough for fun flying, and it offers some advantages as a stunt trainer. Our Flip was designed to see if it was possible to work within the limitations of using all sheet balsa, simple construction techniques, and still get a ship that would perform the pattern maneuvers well enough for a skilled flier to enjoy, or for a beginner to learn the maneuvers.

The May 1975 MODEL BUILDER issue had a "real" 1/2A pattern ship, the Gremlin. That was built just like the big ones; flaps, thick airfoil, built-up wing, full fuselage, etc., and it is the way to go for competitive performance in a small package. We wanted to get most of that performance with a model that could be built quickly . . . say, one hour or so. Experience with .049 engines made it obvious that Cox engines, in particular the Tee Dee or Medallion .049's, had ample power for good performance. Experience with the typical plastic ready-to-flies, and many



Note screen on Cox .049 Tee Dee intake to keep out dirt. Perfect 2/3 ounce tank was later replaced by 3/4 ounce unit. Easily strapped on with rubber bands.

of the all balsa kits on the market, showed us that they will fly but sure won't do for stunt capabilities. We believed the big problem was size . . . most 1/2A designs just don't have the wing area necessary for good aerobatic performance.

Aside from the model, those dacron flying lines have got to go! Just too much drag and stretch. Going to 35 foot, .008 or .012 stranded cable lines make a tremendous performance difference. One other design consideration was the landing gear . . . or lack of one. We fly almost exclusively over grass, where a landing gear is useless, as take-offs and landings can't be made with small wheels. Grass field flying also permits hard landings; the straight-in full bore type, usually with little or no damage. So we left the landing gear off and gained more performance.

The model ended up with a 27 inch span, 130 square inch wing area, and 20 inch length. And for us at least, the performance is pure fun. Speed is high, too

high for really smooth flying, but fun. Perhaps a reed valve engine like the Cox Black Widow or Golden Bee would give a more restrained performance; we show a mounting on the plans but have not tried that version. Speed does make it harder to learn the maneuvers, and there is a case for learning on a larger, .19 to .35 size, built-up ship. But a mistake with the larger craft gives you a broken plane; the .049, all balsa model will usually bounce back for more, or can be "Hot Stuffed" back together right away. Performance in a reasonable wind is not a problem with this small ship; line tension is good. The Flip has no difficulty with vertical and overhead eights.

Material selection was interesting . . . with an all wood wing we know we couldn't get much of an airfoil, so instead of trying to sand and carve an airfoil from 1/4 inch or thicker wood, we went to an absolute flat plate, 1/8 inch thick wing. It can flex while flying, is amply strong, and yes, it works. Tail surfaces are also 1/8 inch; more rugged

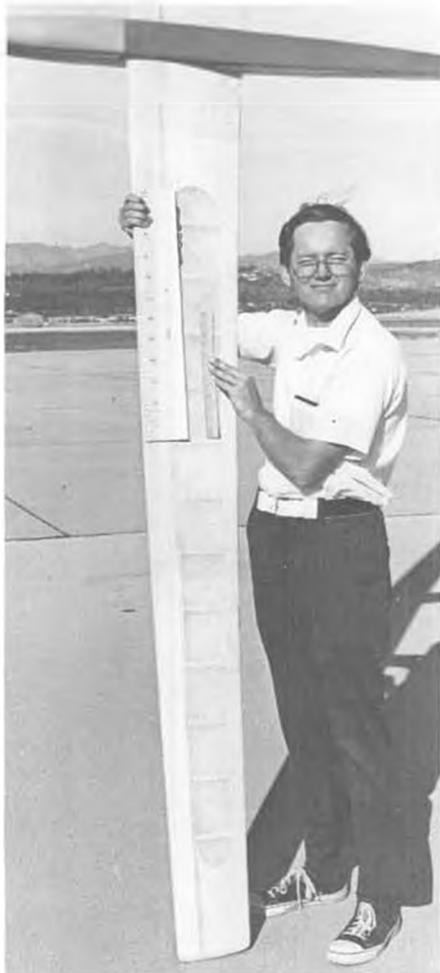
Continued on page 77



"Okay, Dad, I'll launch it one more time . . . then let ME fly it, for Pete's sake!" "Rapid Rick" Sarpolus, ready to flip Flip for the author.



Control linkage, engine mount, and tank installation are all "outside" and easily accessible.



Bob Gerbin used two scales for direct enlargement of the Windfree. Lister provides the formula for checking those new wing spars.

• . . . *The time has come, the Walrus said, to speak of many things; of ships and sails and sealing wax, of cabbages and kings . . . and wing spars?*

With sailplanes, more than with any other type of flying machine, the wing's the thing. Devotees of power modelling can argue the merits of various sizes and makes of engines, discuss the pros and cons of propeller diameter, pitch and shape, and even fuss a bunch at one another regarding fuel additives and mixtures. But when one pushes for mental rehabilitation, the wing . . . length, width, planform and cross sectional contours . . . is about the only subject open for debate. Now there are those who would chew and snarl over such small bones of contention as all-flying versus conventional horizontal tail surfaces . . . or even the vertical placement thereof. Then there's always the fiberglass-vs-built-up fuselage controversy; but who cares? Or internal as opposed to external ballast. So what? Or the legalizing of thermal sniffers. Ho hum. The point is that for the sailplane person, there's not much to cause a real, "You're a bigger one and so's your ole man" screaming logic-style quarrel.

At various times, MODEL BUILDER has presented data on most variables



Exactly one year ago, we published an article by Bob Gerbin, in which he explained how he went about building a 1-3/4 size Windfree. This discussion by Lister fits perfectly into such a project. This is Lee Buffum, launching Bob's ship on a hi-start . . . all 7 pounds of it!

R/C SOARING By LE GRAY

Our former R/C SOARING editor comes out of partial retirement to present an interesting article by the author of the "Sailplane Designer's Handbook", Eric Lister.

that should be considered in the design of sailplane wings; airfoil section, loading, aspect ratio, flying speed, span efficiency, covering materials and even leading edge turbulators. One significant point, however, has not been reviewed; spar design.

The merits of the numerous spar systems available to R/C sailplane designers could be presented ad infinitum, as well as ad nauseum. Weight, materials, complexity, rigidity are all potent sub-topics. But in the final analysis, the real world results of spar design kinda lets it all hang out, so to speak. Either the designer's theory and structure are sound, or he makes an unscheduled public confession of his erroneous calculations by a dramatic structural failure. This usually occurs under stress of tow-launch, in view of a cast of thousands, and the once proclaimed super-ship returns to earth on a flight path similar to that of a cardiac duck.

Determining how big, how strong, how thick, how heavy should the spar be for a given wing planform, vehicle loading, and flying speed can get quite involved. The problem can also be shrouded with considerable EBS ("E for esoteric), if the author is so inclined. However, a practical and workable mathematical . . . that is, it ain't hard . . . approach to spar design has been developed by Eric Lister. Lister's concept is based on known, acceptable wing spar

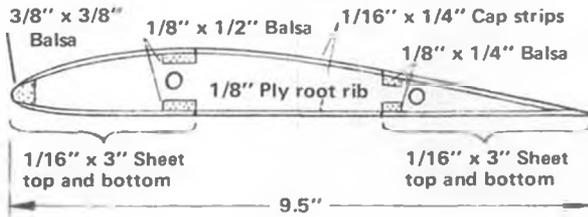
configurations and provides a method for "adjusting" a good design to any given wing size. Should take some of the excitement out of test flying . . . and that can't be all bad.

And so, Mr. Lister, you've got the floor

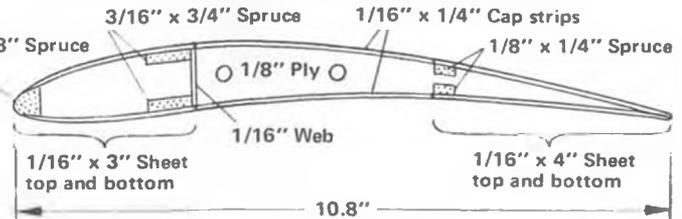
"A fellow sailplaner in Japan recently built a very high performance ship of 164 inch span that had broken a wing on the hi-start. His question was classic: what could he do to the structural design of the wing to avoid in-flight disasters? We've all faced the same problem ourselves at one time or another, and what is needed is some form of an analytical cut at how beefy to build a wing structure to keep it alive and well. The only other approach is to design structure on a pure gut level. I understand that approach because I've always done it that way myself. Maybe some folks run honest calculations, but that can be real work.

"It seems obvious that a base point for a new structural design could be some existing wing that has been proven structurally okay by numerous flights . . . even if of different span, spar thickness, wing loading, etc. All this past design had to do was *not* break on tow. If you've got one like that, or will accept a proven design such as featured in MODEL BUILDER, we can use that as the point of departure. This approach

THE OLD SYSTEM THAT WORKED (1)



THE NEW SYSTEM (THAT SHOULD WORK) (2)



alleviates the complications of starting completely from scratch. Such design decks for computers do exist, but unless your name is Grumman, McAir, LTV, etc., I don't think you'd be too interested. Rather, what is recommended is a procedure for new spar design, based on an existing spar system, which will provide margins of safety similar to those of the known spar, despite difference in span, wing loading, thickness, and material. It's sort of a bootstraps design process. Here's how it works.

Let's say you've got an old spar system that never failed in the type of flying you have in mind for the new design. Let's call that system number 1, noted by the subscript 1. The new wing, to be built with the same degree of structural safety, will be system number 2, and noted by the subscript 2. Other definitions used in the design calculations are:

S_r = rupture stress (breaking stress, strength of the spar material: Use 9400 for spruce, 3500 for balsa)

b = wing span, inches

w/s = wing loading: total airplane weight in ounces/wing area, in square feet

t = distance from the top of the top flange to the bottom of the bottom flange in the spar, in inches

A = measured cross sectional area of the flange, in sq. inches

d = distance from the center of the flange thickness on top to the center of the thickness on the bottom flange, in inches

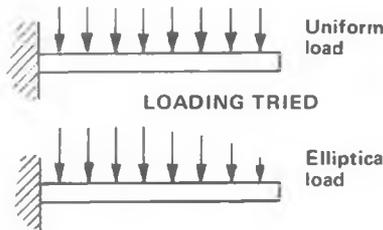
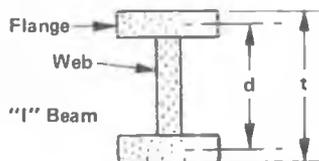
c = average wing chord length: wing area, in square inches/span

So much for the nomenclature, here's the expression you use:

$$1 < \left(\frac{S_{r2}}{S_{r1}} \right) \times \left(\frac{b_1}{b_2} \right)^2 \times \left(\frac{w/s_1}{w/s_2} \right) \times \left(\frac{t_1}{t_2} \right) \times \left(\frac{A_2}{A_1} \right) \times \left(\frac{d_2}{d_1} \right) \times \left(\frac{c_1}{c_2} \right)$$

"Just to give a little visibility as to where that came from all of a sudden, it's based on cantilever 'I' beam bending stress analysis. It means that two spar

systems have equal safety margins in bending at the root if they have the same ratio of bending stress to rupture stress. Two types of loading were considered and the results came out satisfactorily in both cases. The first type of loading considered was for the uniform case, and the second was for an elliptical loading, such as an elliptical wing would give. Both examples worked,



so the only wing shape feature that is important is planform. That is, both wing 1 and wing 2 must be elliptical, rectangular, 2/3 straight plus 1/3 tapered, or any other combination of rectangular and taper, so long as they are similar.

"If the values for a new spar design, and some older, successful design, are put into the above expression and the result comes out to be greater than 1.0, the new wing (that is wing no. 2) will have a greater margin of safety (won't break) than the old one. If the value is 1.0 on the button, each wing is just as capable in its application as the other. If the value comes out less than 1.0, the new wing will have a smaller margin of safety against bending and breaking than the original configuration.

"We'll go through an example in a moment, but first, in the interest of strong wings, a few general points are worth noting. For instance, at very high angles of attack, like on the hi-start

or tow line, the lift force on the wing moves to a forward location . . . about at the 25% to 30% chord region, particularly at the root. To help prevent wing flutter, the structural weight of the wing should be as close to the leading edge as possible. If the wing structure balances close to 1/4 chord, that's good. More forward . . . more better! The other anti-flutter gimmick is to use sheeting to increase the torsional rigidity of the wing. Diagonal braces between ribs and between the front spar and back spar or trailing edge is also helpful against flutter.

"O.K. . . here's the example. I took a spar system that had been used successfully on a 6 foot span, 9.6 oz. wing loading, average chord 8.6 inches, balsa spar wing, and redesigned that spar system to handle a 164 inch span, 12 ounce wing loading, average chord of 8-1/4 inches, and spruce spar ship. The 6 footer had a 10% thick airfoil while the big new design uses an 8% thick section. The aspect ratios are quite a bit different, but both planforms used a constant chord for the first 2/3 span and .4 taper on the outer 1/3 span."

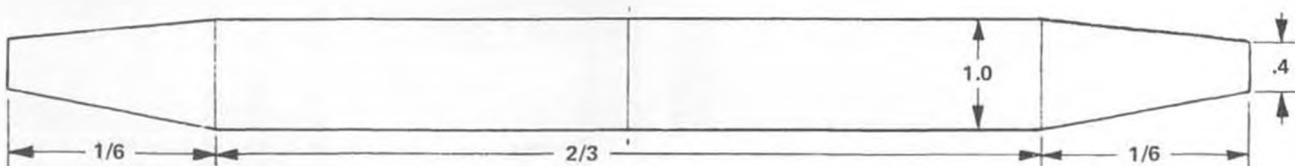
And there you have it. What you've always wanted to know about wing design but were afraid to ask . . . because you knew there'd be an answer from someone who also had no real knowledge, but who wouldn't admit it. And that really causes problems, since there's always the nagging concern down deep inside, "But what if he's right?"

So go forth and do likewise . . . Whatever that means.

Wing Area = 645 In ²	Wing Area = 1355 In ²
S_{r1} = 3500 PSI	S_{r2} = 9400 PSI
b_1 = 75 in.	b_2 = 164 in.
w/s_1 = 9.60 Oz/Ft ²	w/s_2 = 11 Oz/Ft ²
t_1 = .85 in.	t_2 = .865
A_1 = .0625 in. ²	A_2 = .141 in. ²
d_1 = .72 in.	d_2 = .677 in.
c_1 = 8.6 in.	c_2 = 8.26 in.
(645/75)	(1355/164)
Old wing	New wing

Putting the values for system 1 and 2 into the design equation, we get:

Continued on page 80





The author's test model of the Tyro Playboy Sr. Finished in red, white, and blue, it is very appropriate for our Bicentennial Year!

PRODUCTS IN USE

By JOHN POND

Tyro Model and Supply PLAYBOY SENIOR Old Timer.

• Every so often, a modeler will produce a kit that is in everyone's opinion, a modeler's kit. Such is the Playboy kit put out by Barnet Kernoff of Tyro Model and Supply, P.O. Box 11511, Palo Alto, Ca. 94306. This kit shows much preparation and thought, as the plans are straight forward and the parts fit beautifully. Price of the kit is \$39.95.

When the buyer first opens the kit, he is immediately struck by the neat arrangement of all parts that are carefully rubber banded together. Although it has been said many times before, a little time spent studying the plans and familiarizing one's self with the assorted wood strips and parts, there should be no shortage of strip sizes.

In constructing the model, the writer decided to use the new cyanoacrylate glue. With the fine balsa in the kit, it was indeed a pleasure to quickly "Hot Stuff" the structure together. During

construction of the fuselage, the writer made several small additions he feels are quite necessary to convert this excellent flying free flight to a potent R/C assist Old Timer competitor.

The pylon construction, which is made of three balsa laminations, was changed to include a 3/32 plywood core with the two balsa outside pieces. A slight bit of added weight, but one that is quite necessary for being able to stunt the model indiscriminately.

While on the pylon construction, also recommended is the addition of 1/4 inch triangle reinforcement strips which are added to the underside of the pylon platform. These simple triangular strips will add tremendously to the strength of the platform that supports the wing.

The tail was fitted to the fuselage with screws. The fuselage is provided with a plywood (or hardwood) strip about 1 by 2 inches wide. The tail is

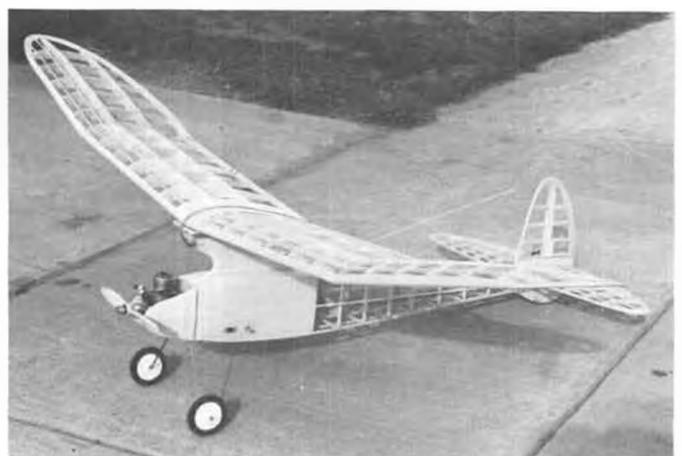
provided with small hardwood strips which are tapped after line-drilling both hardwood pieces (in the fuselage and tail). The writer used 10-24 nylon screws to attach the tail.

The fuselage was also provided with a hatch on the underside. This requires the purchase of a piece of 3/8 sheet about 6 x 3 inches. This provides the access to your set, which should be mounted with the servos facing down. Two 4-40 bolts are all that are necessary to keep this hatch in place.

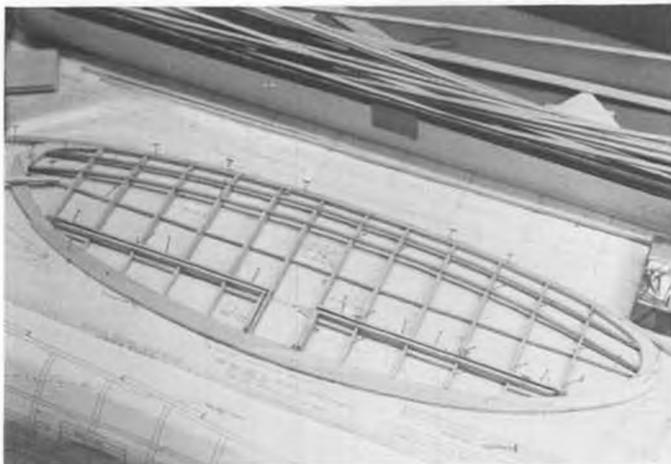
In planking the forward part of the fuselage, the writer was pleasantly surprised to find a novel change in the method of applying the sheeting. Instead of 1/16 or 3/32 vertical sheeting as originally designed, large tapered sheets, somewhat resembling King-size trailing edges, are supplied. These aid immensely in speeding up this tedious portion of the fuselage.



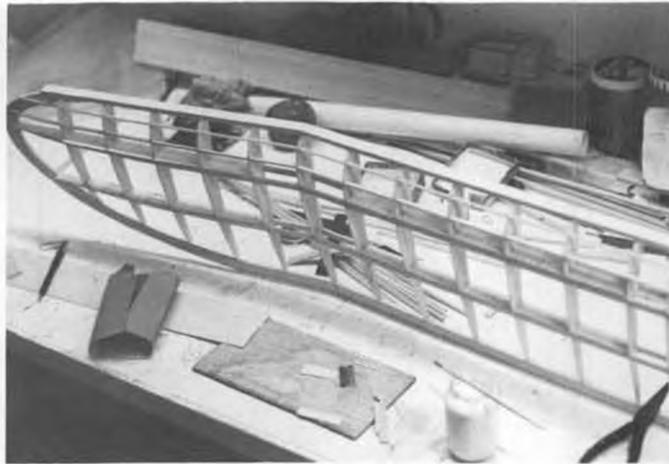
Hatch built into bottom of fuselage provides access to Kraft radio installation. Not bad work for an amateur builder!



Completed model, waiting for its Kote of Super Mono. Power is a Torp .35. Williams Bros. WW-1 wheels help preserve old timer look.



Stabilizer modified for radio operation. Elevator spar doublers for hinge installation. Tail fastened to fuselage with nylon bolts.



Wing has been placed on edge to install vertical webbing. Ply dihedral braces still to come. Note bottle of white glue and brush applicator.

The writer recommends that the sheeting not be completed until all radio gear is installed, including the push-rods (Nyrods were used in the hook-up of this model). In addition, this gives you a good chance to make sure the engine mount (Tatone used here) is checked for easy removal by using suitable blind nuts. Incidentally, a cowl was made for this model although no wood is provided. The builder used 3/8 sheet pieces, cut to the approximate shape of the dotted outline shown. In this case, the cowl had to be expected to match the motor being used. The "Cheek Cowls" were closed in on the bottom and rounded to present a clean profile. This simple front cowl improves performance immeasurably.

Accessories employed to complete this model were William Bros. WW-1 type 3-1/2 inch wheels, Tatone long mount, and a square one ounce modified Perfect tank. For an engine, the writer selected a series 64 Torpedo .35 which was originally in an early Good-year Racer. For purposes of simplicity, no fuel pressure system was employed, and a Perry carburetor was used to

throttle the front-rotor type K & B motor.

White Super Monokote, trimmed with metallic blue and Bridi Striping, was used to cover the model. As can be seen, the motif is rather patriotic (Spirit of 76!) in its red, white, and blue configuration. For those interested in weights, the completed items were: wing, 12 ounces; tail assembly, 3 ounces; and fuselage, complete with radio, motor, and wheels, was 2-1/2 pounds, giving a total of 3-1/2 lb. flying weight.

Test flights held at the Pond Commemorative Meet in Santa Maria were remarkably simple. The initial flight found the model with a natural left turn under power. A slight bit of right trim gave a beautiful spiral upward. All stops were pulled out on the second flight and wouldn't you know it, the unofficial flight was the only "Max" flight registered by this flyer all day!

The following "adjustments" were employed in this model: No downthrust, although several degrees would be preferable to putting in elevator down-trim. The model was balanced at the 45% point of the wing chord, measured

from the leading edge. Glide was found to be superlative. With all servos, batteries, and receiver mounted forward of the balance point, no lead weights were required.

A 1973 Kraft Sport Series with KPS-11 servos (three; rudder, elevator, motor) was employed, with Pylon brand Golden Rod control links. Several "def-eckilities" were noted, among the most prominent being the shutoff of the motor within the allotted 20 seconds. The writer recommends a mechanical timer, such as a Tatone Fuel Shutoff type, be employed. With this arrangement an even lower-cost, two channel radio set can be used. If a pressurized fuel system is employed, then the simple shutoff system so successfully used by Cdr. Jack Bolton in his Playboy is recommended. This consists simply of a control wire of about 1/16 dia with a right angle so that when the motor servo is pulled to full idle, the cross piece pinches off the fuel line. Simple, yet effective.

In conclusion, if you want to be a real "hot dog", the writer recommends
Continued on page 79



The completed model, all ready to go. Only one test flight was required. The second flight was an unofficial 'max' at the Pond Commemorative meet in Santa Maria, California.

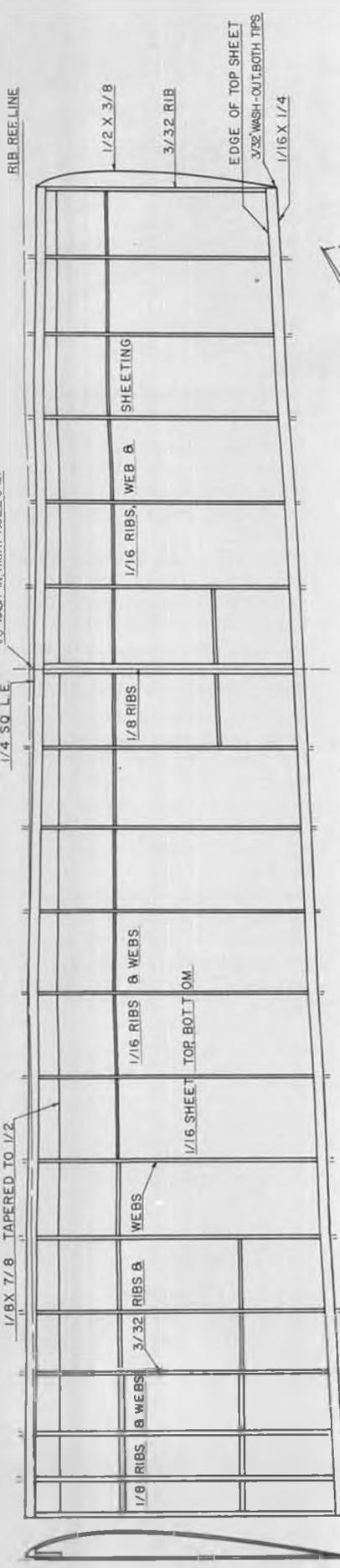


Mrs. "Daddy Warbucks", Maryann, holding hubby's handiwork.

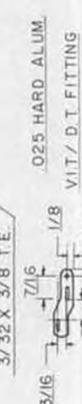
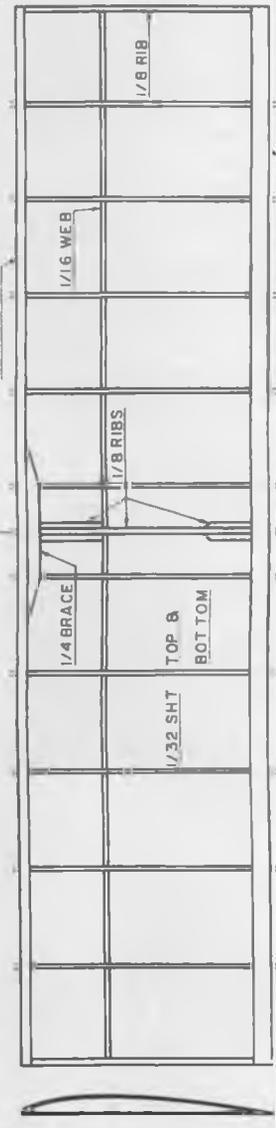
1/8 X 7/8 TAPERED TO 1/2

1/4 SQ. L.E.

1/8" WASH-IN, RIGHT PANEL ONLY

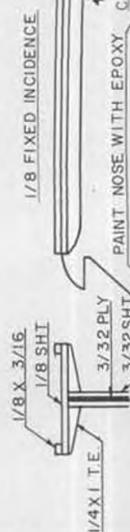


3/16 SQ. L.E.



0.025 HARD ALUM.
VIT/D.T. FITTING

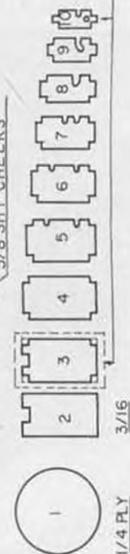
1/8 SHT TOP, BOTTOM & SIDES



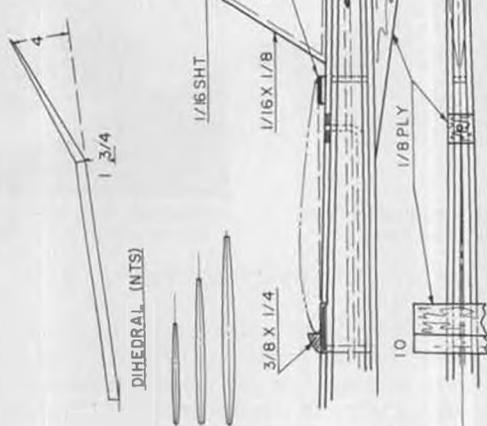
SEE TEXT FOR TIMER MOUNTING AND RUDDER HINGE.



TANK DETAIL



1/4 PLY, 3/16, 1/8 SHT FORMERS



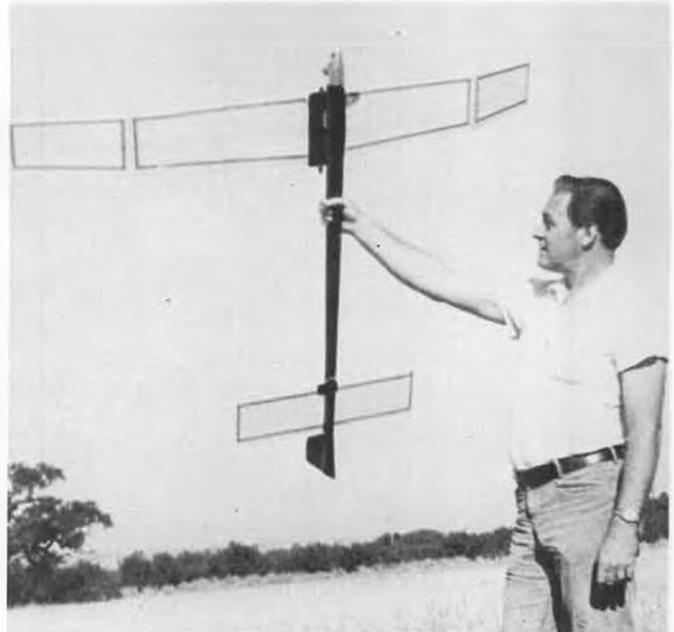
ORCA I FIC
PROJECTED SPAN 61 LENGTH 49
PROJECTED AREA 449 WEIGHT 27
STAB AREA 115
designed and drawn by Larry Scuranza

MODEL BUILDER magazine
Plan No: 3763
0 1 2 3 4 5 6 inches

10-12-75



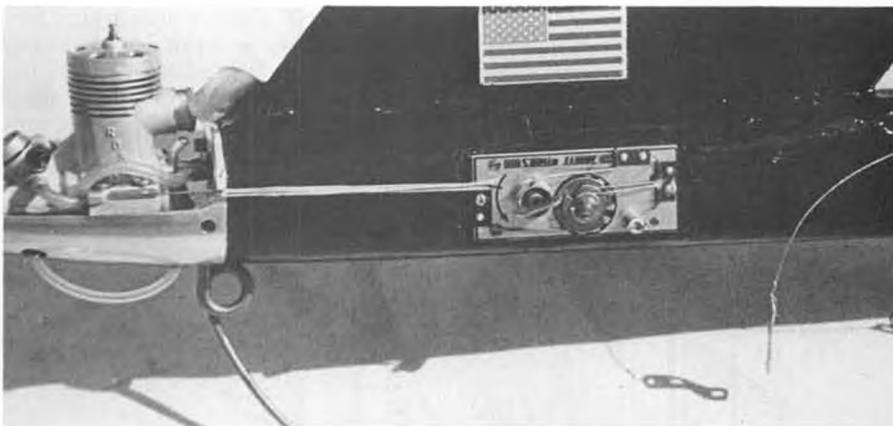
The author/designer, the "ORCA," and the inevitable model airplane trap . . . a lone, tall tree! Larry reminds you a little of Dick Korda.



The ORCA's lines are clean and simple. Fancy looks don't get the job done, but functional beauty does.

'ORCA' F.A.I. Power

By LARRY SICURANZA . . . This is not just a construction article. The author takes us on a complete tour of the FAI Power picture, and invites you into it. The tour is very well guided . . . and the model's good too!



Timer rigging for flood-off system. Timer releases pinched pressure line from tank, dumping fuel into carb . . . blurrp!



The single line V.I.T. fitting in climb position. First release puts stab in glide trim, second release is DT. Line with ring is to auto-rudder.

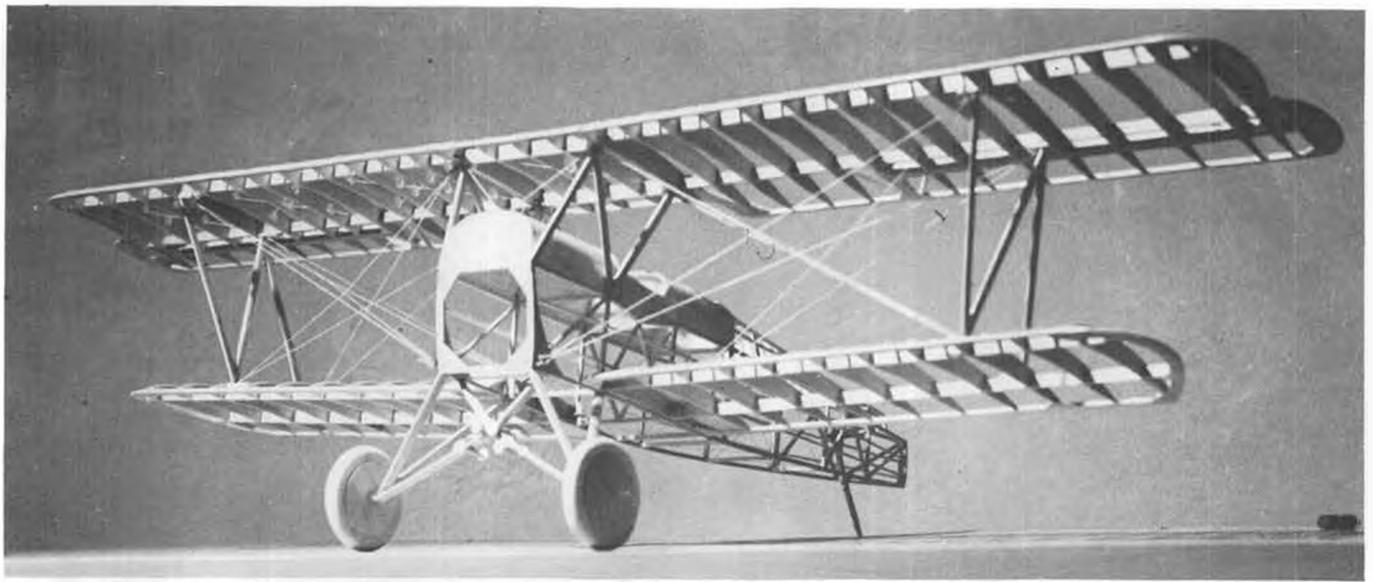
- Swift and graceful, Orca moves with effortless power through its three-dimensional realm. Whether rocketing up in pursuit or drifting under the sun, its black and white beauty dominates the eye with sheer majesty.

The above describes the real animal, which I first saw at Marineworld. I was so impressed by this marvelous creature that no other name would do for my new FAI ship. It was already black and white for air and ground visibility and had a pylon shape similar to Orca's dorsal fin.

Unlike the real Orca, known to those who know nothing about him as the Killer Whale, the balsa bird has evolved through only six Marks in three years. This article describes the current version and ignores the others, as everything learned from them is used in Mk 6.

If you've read this far, it's because the photos attracted you, or you're already a FAInatic, or you are thinking about maybe trying FAI Power. If the latter is the case, the only advice I can give you is *do it!* Try FAI. I got into it three years ago after reading the Zingo article in FM. I only wish it had appeared ten years ago! Up 'til then I'd thought that Power was too expensive, too difficult, too this or too that. Fish feathers! It's nothing of the kind. One thing it is, is demanding. None of the instant success or gratification so eagerly sought in our hollow society. You

Continued on page 82



Gorgeous framework of a 3/4 inch scale Travelair 2000, by Ned Kragness, of Virginia.

FREE FLIGHT SCALE

By FERNANDO RAMOS

• Even though only about three weeks have gone by, at this writing, since the February issue of *MODEL BUILDER* has been at your doorstep, the response to starting a National Scale Free Flight organization has been very pleasing and positive. One interesting note is that the letters have not been exclusively from major cities of the U.S., but from small towns in sparsely populated areas. All of the mail received to date is in favor of starting this organization, and only three letters stated that AMA membership should be a requirement. (These three letters represent less than 1% of the letters received.) If this trend continues, then it is clear that the majority of the response is in favor of dropping the AMA requirement. One comment that is common to many letters is that the AMA is primarily an R/C Club, and therefore there is doubt that it could help the F/F Scale modeling cause. At any rate, I'll wait until the next issue to give a final evaluation of the mail received.

While still on the issue of the "Organization", I've been doing a little pipe-dreaming, so let me ramble on a bit. In addition to bringing together modelers with a common interest, I think that one main objective would be to have an annual Scale F/F Nationals . . . not just a big local contest, but one with National, and possibly International, significance. The way I see it, it would have to be at least a three or four day affair, with one day devoted to judging, and the others for flying. It could include indoor as well as all of the outdoor events, plus perhaps a Thompson Trophy as an added bonus. The way the schedule would be set up, a contestant could fly in every event without feeling hurried or frustrated. Above all,

the overall atmosphere must be low key, to insure absolute fun. The idea behind all of this is kind of two-fold. One is to be able to show off your latest creation, and the other to have the pleasure of flying it as well . . . the Oshkosh of F/F Scale! Between flying, you can see where a multitude of ideas could be exchanged among the modelers. This whole concept is in no way meant to detract from the AMA National's, but to be something in addition to it.

If this whole Scale Organization gets off the ground, I will propose that the West Coast be host for the first Scale F/F Nats, in the summer of 1977. (It will take a good year of careful planning to make this very successful.) Many families plan vacations in California, for several reasons, and nothing could be better than to take in a Scale contest as

part of that vacation. The flying site we can use, is perfect for F/F Scale, and it is close to Disneyland, Knott's Berry Farm, Marineland, Universal Studios, etc., and only 10 miles from the Pacific Ocean. There are campgrounds which are close, as well as a multitude of motels in every price range imaginable!

Maybe this is just a pipe-dream, but unless we make an effort to do something to bring F/F Scale modelers together, we can't further our cause. Some of you may ask, "What is our cause?" Well, simply stated, I think it is to learn to build better flying scale models, and nothing helps more than to bring together modelers with similar interests and exchange ideas. Enough soap-boxing . . . until next month.

* * *

There have been many requests to

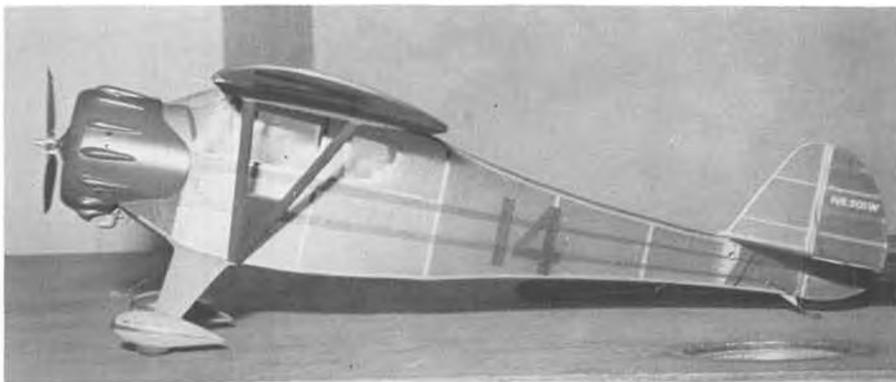


Peanut Scale Pietenpol was second in class at Chicago Scalemaster's August annual. Buil and flown by Phil Cox, Highland, Indiana. Photo by Larry D'Attilio.

once again go over the Floquil method of finishing models that I have been using for many years. In addition to this method, I will outline another one that some may prefer to use . . . in particular, for rubber powered models. I guess it has been about two years or so since I wrote anything about Floquil, and the way I rave about it, one would think I had some kind of financial interest in the product!

First, many of you who are new to modeling may not have heard of this paint. One reason perhaps, is that it is primarily a model railroad product. However, it is nothing short of sensational for flying scale models. It comes in an abundance of colors, with neat names such as Mud, Grime, Reefer Orange, Caboose Red, etc. There are also quite a variety of stains which are ideal for cabane and interplane struts on WW I aircraft, or wherever a natural wood effect is required. If there isn't a color you need, you can mix the various colors available until you get the one you want.

I use Floquil in several different ways. The first is to use it on bare wood, such as for wing struts, cabane and interplanes, landing gear, etc. The advantage is that it only takes one coat for the paint to cover adequately. But if you put one coat on and let it dry thoroughly, then sand smooth, and apply another coat, you'll have a neat job with very little grain showing. This material brushes quite easily, without streaking. For rubber powered models, this is the way to go, because there is very little weight build-up. If thinning is necessary, then use the thinner recommended by



Peanut Scale model of Johnny Livingston's No. 14 Monocoupe, built by Keith Ward, who is president of the Chicago Scalemasters club.

Floquil. Lacquer thinner can be used in a pinch. If spraying is desired, you must thin it down at least 50-50, and you MUST strain the paint. This is imperative, particularly if you are using an airbrush. I use a commercial paint strainer, but you can use nylon hose for this purpose as well. Spraying Floquil really does a super job. If you want to get shading for ailerons, ala Doug McHard, then airbrushing is recommended. Incidentally, Reefer Gray does a better job than black for this application, in most cases.

Another use for Floquil is to color nitrate dope. (Please note that it will not work for butyrate! This is great, since I don't like the way butyrate handles anyway!) Many have asked how much Floquil to mix with how much clear dope. I wish I could give you exact measurements, but I use the eyeball method for mixing the colors I need. A lot depends also on whether

the model is rubber or gas powered. Obviously, the rubber model must be kept considerably lighter in weight. For a rubber powered model, I'll cover it with tissue the same color as the basic color scheme. Naturally, that restricts you to only a few colors, if you are using Japanese tissue. If the color scheme is other than the standard blue, yellow, orange, or black, I use white.

Let me use my Sig Monocoupe, Oct. 1975 issue of MB, as an example of how I use Floquil for a finish on a rubber model. The Monocoupe has a real striking color scheme . . . one which in my opinion, is enhanced by using Floquil. The fuselage is all red with only a bit of white trim and lettering (the white trim and lettering is provided on a decal sheet in the kit). The wings and tail are predominately white with red trim. I covered the entire

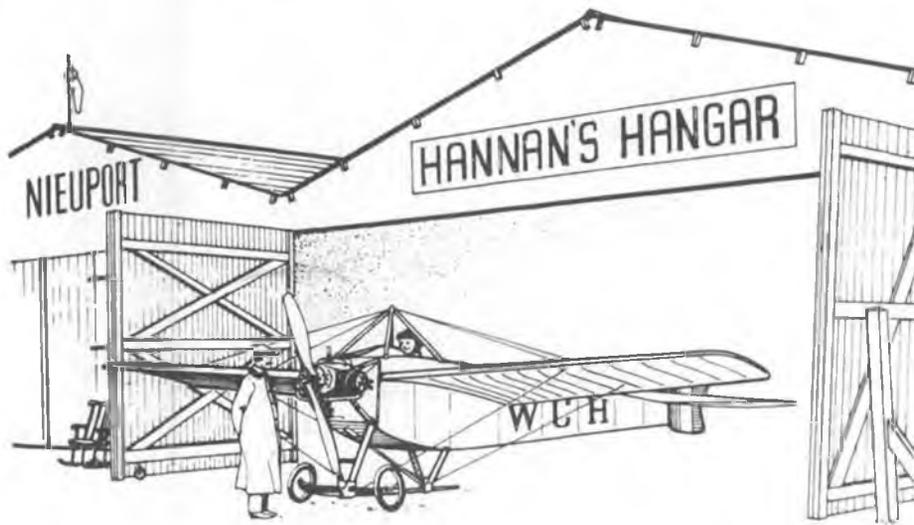
Continued on page 62



Watch those trees! Aeronca C-3 by Phil Cox took first in AMA scale at Scalemaster's Annual. This, and photo at right by Larry D'Attilio.



Ted Dock launches his Eastchurch Kitten, which placed third in AMA Scale at Scalemasters' Annual last August. Electric powered.



. . . being a concoction of everything from soup to Peanuts!

Speaking of which, Bob Peck recently sent to the hangar a tiny terrarium containing a for-real peanut plant. He sez its guaranteed to increase our output! **AND SPEAKING OF REAL PEANUTS**

Did you know they are not really nuts at all, but legumes? Neither did we, until we read the complete scoop, direct from Texas "nut farmer" Bill Caldwell, via Jack McCracken. Turns out the peanut was not originally native to the U.S., having migrated from its home in South America, to Spain, and then to Africa, before ending up in this country! And, according to the Department of Agriculture, Peanut Butter ranks among the most nutritious foods available, edging out eggs, dairy products, and most cuts of meat, in protein content. So there you have it folks . . . Peanuts are not really fun to build and bly, but can sustain you as well!

YOU'RE NOT GETTING OLDER, PILOTS ARE GETTING YOUNGER

It seems that aero photographer Warren Shipp was conducting an interview in preparation for an article on water bombers. Being a former crewman himself, he was particularly interested in a converted B-17, and asked its pilot if he had learned to fly the type during World War Two. "No", was the answer, "They didn't have any 3-year-old pilots in WW II!" Warren said he never felt so old so suddenly in his life! **AND THEN THERE WAS THE FELLOW . . .**

who stared intently at the self-addressed envelope, wondering how it did it! (courtesy Frank Scott) **NEW USE FOR "SUPER GLUES"**

From Alan R. Wall, of Australia, comes the idea of using cyanoacrylate glue for joining the ends of rubber



Aeromodeller magazine Flying Scale columnist Eric Coates, and his contest-winning D.H. 9A.

motors. He overlaps the ends about 1/2 inch, adds glue, then clamps the joint with a clothes pin, while it cures. We are quick to caution extreme care in the use of all such adhesives. Wall also suggests that wheels for small models can be retained to their axles with short slices of radio wire insulation selected for a snug fit, secured with a drop of super-glue.

MIAMI NEWS

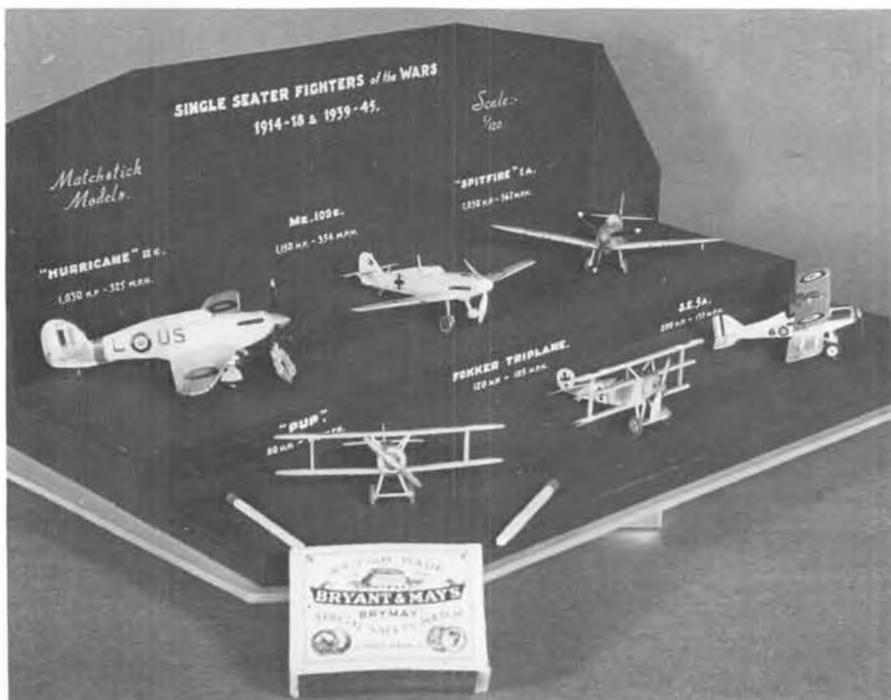
From Dr. John Martin comes copies of "THE HANGAR PILOT", from which we have abstracted the following: "Granted that indoor isn't for everyone, we should still share this great good fortune with those who have never tried this sport, and who may become 'hooked' as the rest of us hangar pilots. Remember the thrill of YOUR first 3 minute Easy-B flight, or your first R.O.G. Scale flight? These are enduring pleasures and we should try to stimulate interest among our friends, and also befriend those who show up at our contests, who are new to the game, to help them to success."

ALSO FROM MIAMI

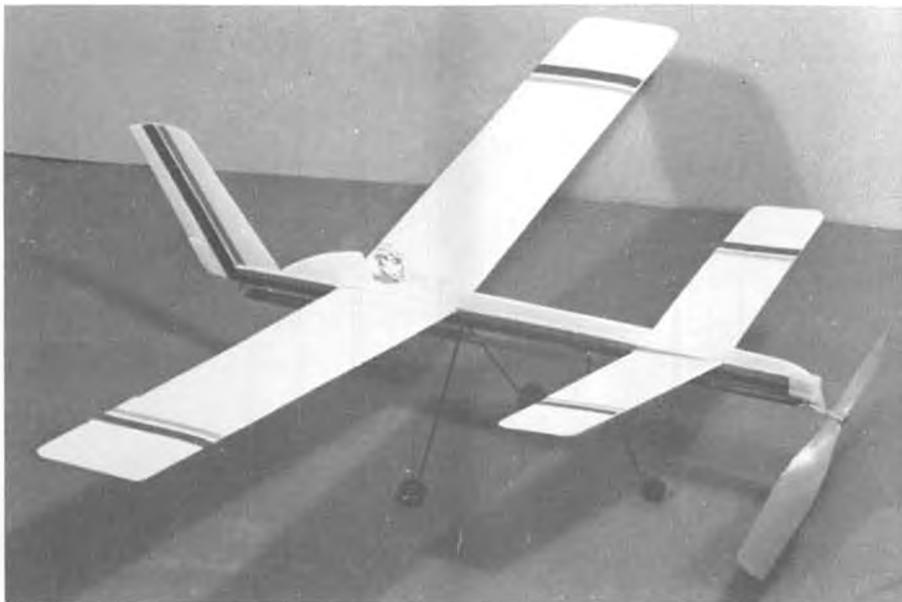
Among the regularly scheduled events are interspersed novelty competitions, using strictly "top of the head" rules. Intended just for fun and games, the winners of these grand efforts receive NO annual points, lots of abuse from their fellow pilots, and totally worthless prizes. For these reasons (???) the events are usually hotly contested!

THE CROWDED SKY

Unfortunately, active promotion can achieve TOO MUCH in the way of results, as Dr. Martin comments: "The second contest was a great artistic success, but had forebodings of future problems . . . namely . . . Will success spoil indoor? We used to say, 'Indoor isn't for everyone', but looking at the herds of folks standing around the hangar I now ask, 'Is indoor getting too popular?' There were 42 entries in the meet . . . 36 flew . . . but at least that many



A display of solid scale models constructed entirely from wooden matchsticks! Models and photo by P.T. Capon, England. All are to 1/120 scale.



Just one of many of Ray Malmstrom's delightfully original sports models is this rubber-driven tactor canard. See story in text.



First place in the recent Marseille (France) Model Air Club Peanut Scale contest was taken by this Polish RWD 8, by J. L. Rouquier. Photo by Lucien Millet.

more were milling about the floor, flying gliders, Sleek-Streaks, Skeeters, and other assorted ballistic missiles, all of which were hazardous to contest planes, and sometimes life and limb. Do we now need a Sargeant-at-Arms? Several times I tried to pick out a piece of floor to ROG a Peanut but no matter where I turned, I gazed into a forest of legs, knees, and buttocks. OK, since we DO have fly-ins once a month, I suggest that flying, AT CONTESTS, be restricted to contestants."

RALPH SCOTT'S HANDY HINTS

"Moisten the inside of a Baggie plastic food sack with rubber lube; drop the rubber motor in and rumple the bag thoroughly. Leave the motor inside for a while or overnight if time permits. Carry this lube bag to the field with you for additional use. It will add enough lube but reduce the problem of motors throwing off excess tissue-staining quantities.

"Take along a styrafoam cold box and freeze packs to the flying field. Heat is murder on rubber motors, cement and beverages. I carry a good supply of motors, soft drinks, cement and a ham sandwich. As late as the following mornings, things will still be cool."

NEWS FROM FRANCE:

Courtesy of Jacques Pouliquen, we present the results of the November 1975 Model Air Club de Marseille contest:

Classement General (Peanuts):

1. J.L. Rouquier RWD 8 (see photo)
2. J. Pouliquen Waterman Racer
3. W. Mooney Renard 17
4. J. Frugoli Laird
5. Roger Aime Bucker Jungmeister

Classement Maquettes (larger than Peanut scale models):

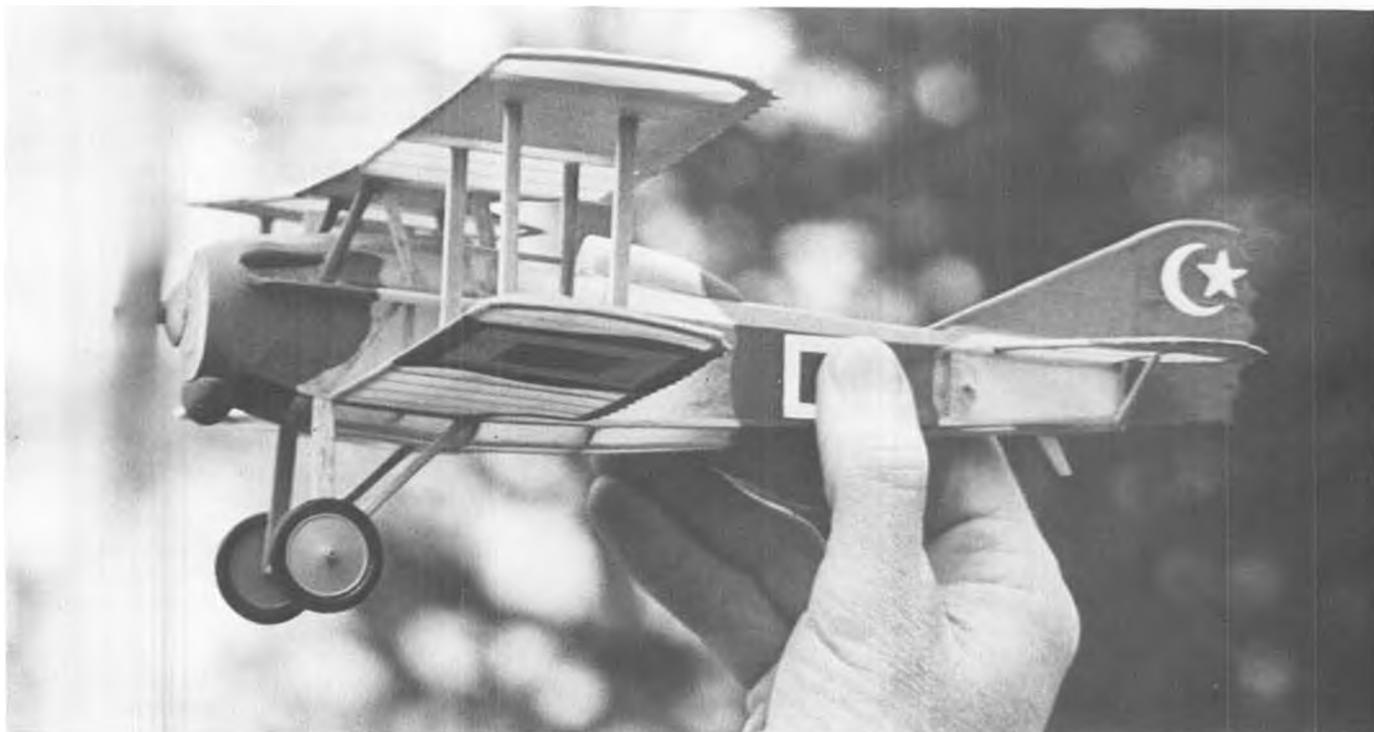
Continued on page 79



Otakar Saffek with CO₂ model and engine made in Czechoslovakia.



Otakar Saffek's wife holding his all-balsa model of Otto Lilienthal's hang glider.



Peanut © SPAD XIII ©

By JOHN WALKER . . . A particular airplane can be so well known and popular that it gets completely overlooked! Such is the case of the famous Spad XIII. The matter has now been attended to.

• The Spad XIII was preferred by such famous Allied aces as George Guynemer, Rene Fonck, Eddie Rickenbacker, Frank Luke, Phineas Pinkham, and G-8 because it was a solidly built fighter that did not shed wing fabric in a long dive, as did the more lightly built Nieuports. Sixteen pursuit squadrons of the AEF were equipped with Spad 13's.

Designed in France by the Societe pour Aviation et ses Derives (headed by Louis Bleriot), the fighter was developed from the earlier Spad A.2 and Spad 7.

The craft had a span of 26 ft.-11 in., a length of 20 ft.-8 in., and was powered by a 200 HP Hispano-Suiza engine. It is thought to have been the first French plane fitted with twin synchronized machine guns. Spad 13's flown by Guynemer and Fonck were fitted with single shop 37 mm cannon that fired through the hollow propeller shaft. Top speed was 130 MPH at 6,500 ft., with a maximum service ceiling at 22,300 ft.

After the war, many of the 8,500 Spad 13's that were produced, could be found in flying services around the world (including the U.S.) as first line fighters, well into the 1920's.

BUILDING THE MODEL

Mount the plans on a flat building board. Protect it with clear plastic sheet. We save the left over backing from Monokote for this purpose.

Start by constructing identical fuselage sides from firm 1/16 sq. balsa. Hot

Stuff or Zap adhesives greatly speed up construction. Assemble the finished sides starting at the nose. Make sure your work is square. We use aluminum blocks that were machined square at the local high school machine shop to keep the sides square during assembly.

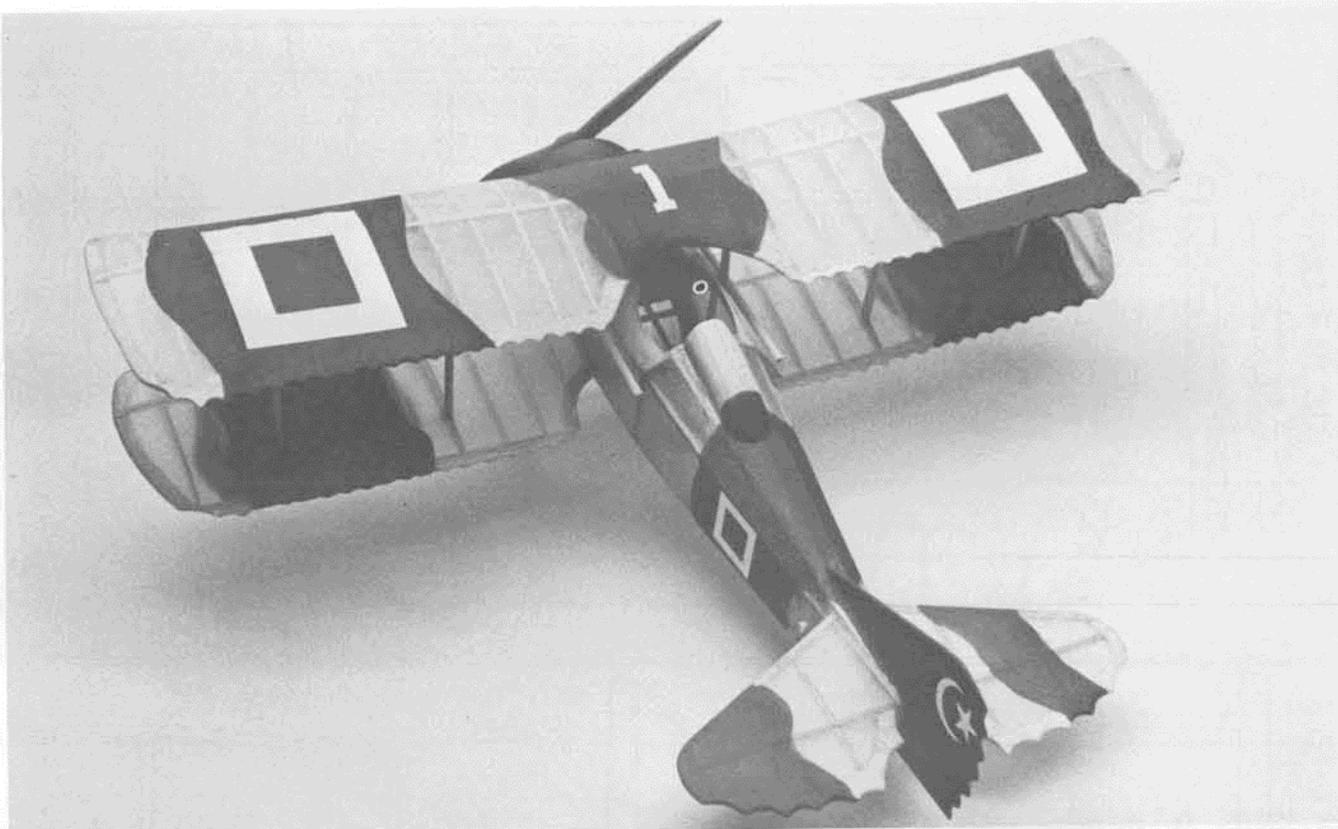
Add the formers and stringers. Strengthen the area in the tail where the

dowel holding the rubber will be mounted. One advantage of using Hot Stuff or Zap is that excess adhesive adds very little extra weight, and is absorbed into the wood to make it stronger. Lightly sand the fuselage structure before covering. Bond paper of 1/64 balsa may be used around the cockpit area.

Construct the landing gear legs and



Nose moment of the Spad is short, but with a plastic, or carved bass prop, note too much ballast will be needed. A small blob of clay can be seen under the cowl in the top photo.



What would Phineas Pinkham say if he saw his favorite aeroplane done up in Turkish colors!? He'd probably think it was just a water-pipe dream . . . Haw-w-w-w!

cement them into place. Hard balsa or bass wood should be used. Don't forget to round the edges of the L.G. struts before assembly. Williams Bros. vintage wheels were used.

Assemble the tail surfaces. **KEEP THEM LIGHT.** Remove sharp edges by careful sanding.

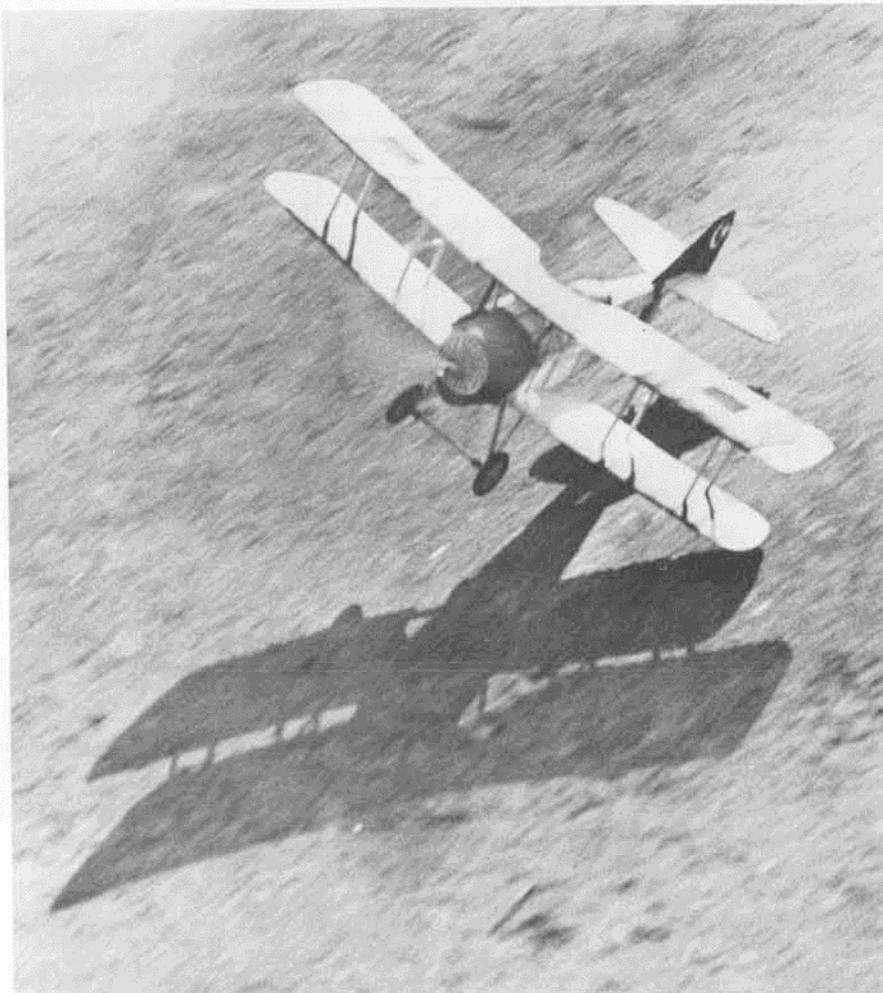
Last, but not least, we come to the wings. "If one is good, two have to be better." (*That's the spirit! wcn*) Use care so that they will be warp-free. Curved sections are shown on the plans cut from solid sheet wood. Weight can be saved by fabricating them from thin strips of balsa formed over cardboard patterns. They may even be formed from bamboo, if you want to track down the wood. We found that some shoe stores use a good grade of bamboo strip to hold display shoes in shape.

Cover the model using your favorite technique to attach the tissue. Shrink the tissue with water or rubbing alcohol. When thoroughly dry, apply two coats of thinned, plasticised, nitrate dope. The camouflage was added using colored dope.

Since Spads were used by many flying services after the Great War, we selected and added Turkish insignia to our model. The center square is red and is outlined in white. The center was painted using dope. The outline was made from white trim Monokote. The moon and star on the rudder were also cut from trim Monokote.

Assemble the wings and tail surfaces

Continued on page 60



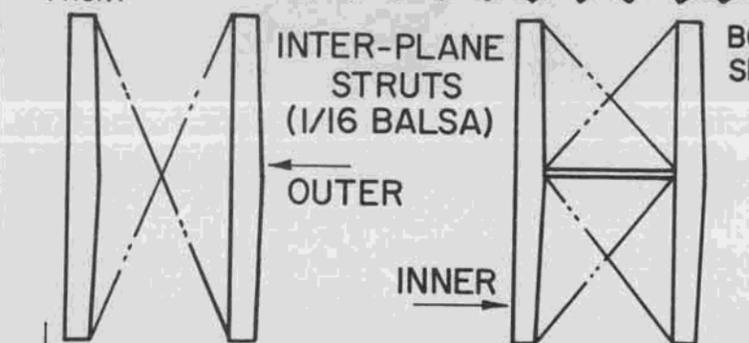
Hit the deck, gang, here comes Phineas again! A loop of 3/16 rubber provides these exciting takeoffs for the author's Spad.

RIBS 1/32 THICK EXCEPT WHERE STRUTS ARE ATTACHED. THESE ARE 1/16 THICK

1/16 DIA. DOWEL LEADING EDGES



FRONT

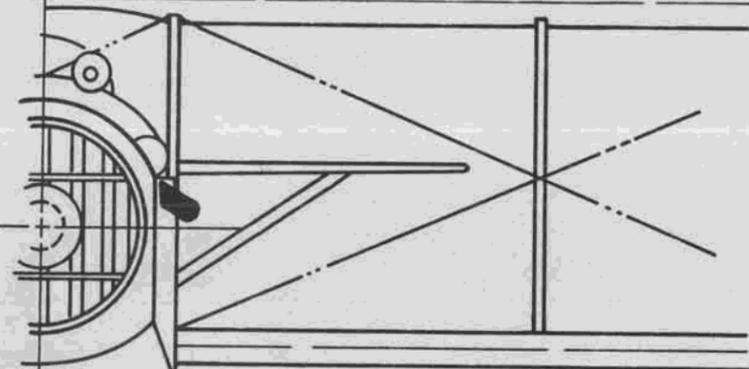


INTER-PLANE STRUTS (1/16 BALSA)

OUTER

INNER

BOTTOM WING SHOWN SHADED



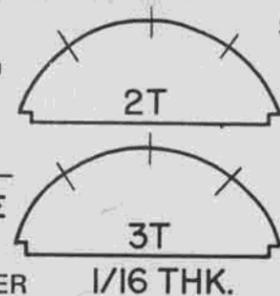
NO DIHEDRAL ON REAL SPAD, 3/8 DIHEDRAL UNDER EACH WING ON MODEL.



BIND WITH THREAD

AXLE .030 WIRE

5 DIA. PROP.

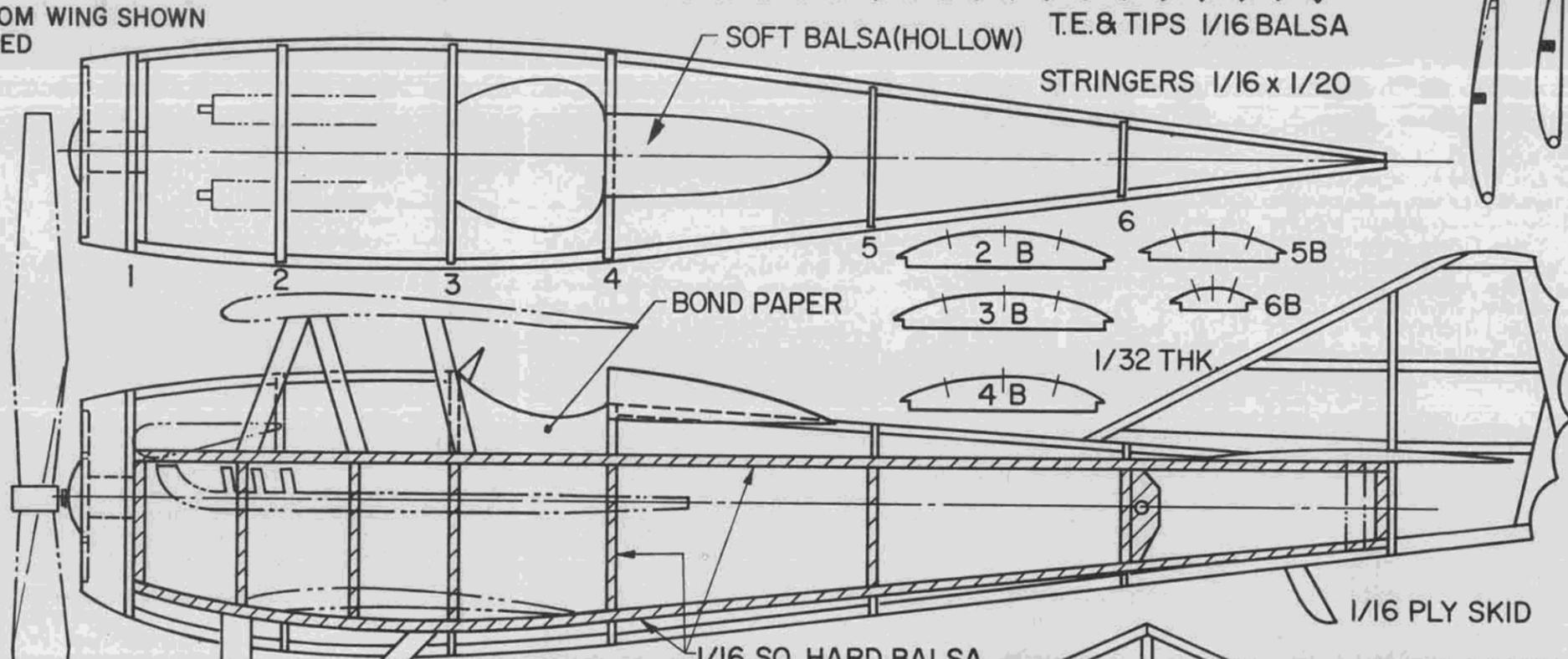


1/16 THK.

1/32 THK.

MAKE EXHAUST OF 1/8 DOWEL (2 REQ'D)

SPAD XIII



SOFT BALSA (HOLLOW)

T.E. & TIPS 1/16 BALSA

STRINGERS 1/16 x 1/20

BOND PAPER

1/16 SQ. HARD BALSA

L.G. 1/16 HARD BALSA

NOTCH ALL FORMERS TO RECEIVE STRINGERS

1 1/8 DIA. WHEELS

1/16 THK.

1/16 x 3/32 SPAR

TOP WING

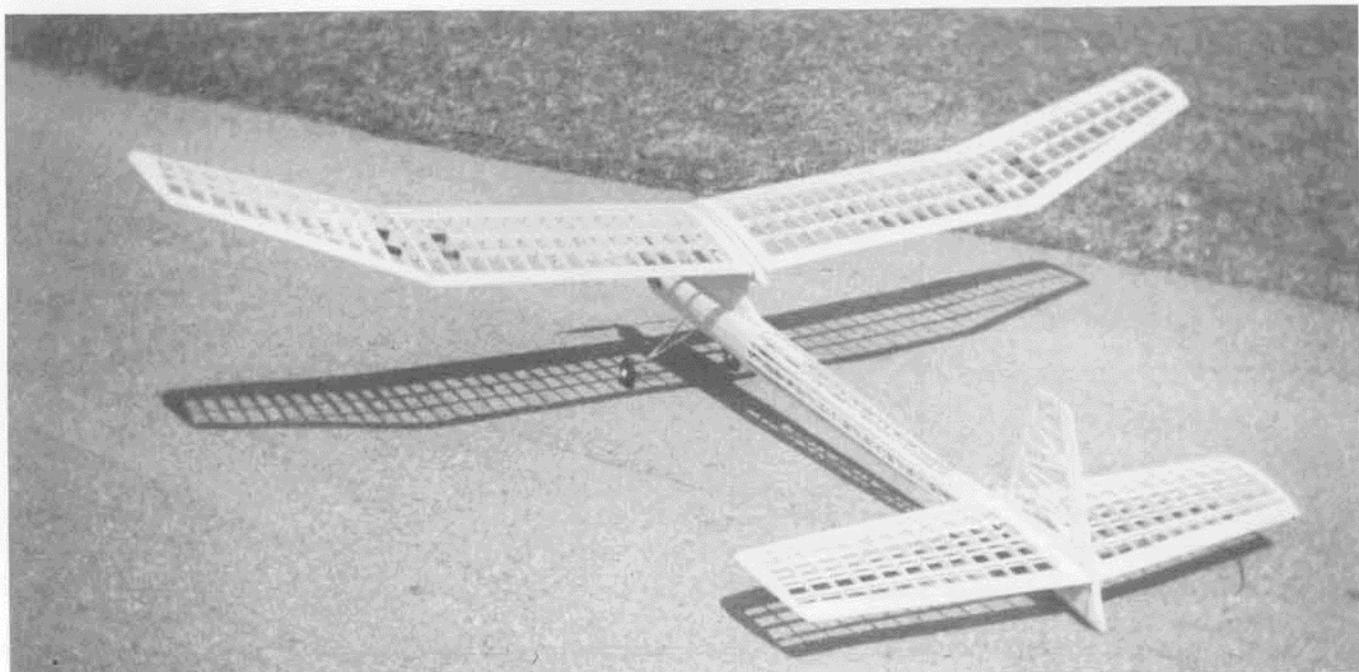
BOTTOM WING

1/16 PLY SKID

TAIL SURFACES 1/16 BALSA

ELEV. BRACE, 2 REQ'D

Drawn by JOHN WALKER



Vic Didelot not only sent in an answer to January's Mystery Model puzzle, he also sent this photo of the framework of his version of the model! It was Frank Huffman's "Li'l Richard", which caused a sudden overcast whenever it was flown.

FREE FLIGHT

By BOB STALICK

• As this month's column of Model Builder Free Flight was being constructed, it seemed to be time to go up to the top of the mountain and visit with the wise old sage I have spoken with in times past. Seeking advice for the upcoming contest season, I scrambled up the slopes. Apparently he saw me coming, for when I reached the wind-blown top, he had already opened his tattered old book of wise sayings. I was greeted with:

"A very wise man bought a 1942 GHQ engine. He cleaned it and polished it, packed it in cosmoline and hid it away in a strong box. Today, it is

worthless."

"But," I said, "Wise Old Man, I came to find some predictions for my readers for the 1976 contest year."

He countered with, "The earth is like a grain of sand, only heavier."

"How about the CIAM rules affecting FAI Competition," I queried?

"Man has never built a decent chicken," he replied.

"Will VTO be reinstated," I asked?

"A condemned man does not request egg salad for his last meal, nor does he order Alka-Seltzer."

Thus enlightened, I slipped down the hill, hoping to engage my typewriter in

intelligent dialogue. (*Could be you live too near Dan Rutherford. wcn*)

DARNED GOOD AIRFOILS . . .
Eiffel 400

One of the oldest airfoils in use today. This section, or its derivatives, was used on the famous Wally Simmers 'Wock series of rubber models. A look through the old magazines will show this foil universally accepted for rubber power, some early gliders and even an occasional power model. Not used much in contemporary designs, it is nonetheless notable in that it is a non-critical, easily adjusted section that adapts to many uses. Since it has ample depth for spars, it can be built into a strong, warp free wing, with some attention being given to the trailing edge, which is just a bit on the thin side. For sport enthusiasts, it is suitable for all kinds of applications. If you plan to use it for com-



Bill (left) and Alan Lovins, with Bill's original design FAI power ship, the "Scion." Hmm, has "Brokenspar" been playing with your paint jars, Bill? The pair will be at the '76 team finals.



Dave Linstrum and his old "Spirit" Coupe. Wing and tail are 10 years old. Jeez, Dave!

PHOTO BY BILL RUMLEY

petition applications, think again, however.

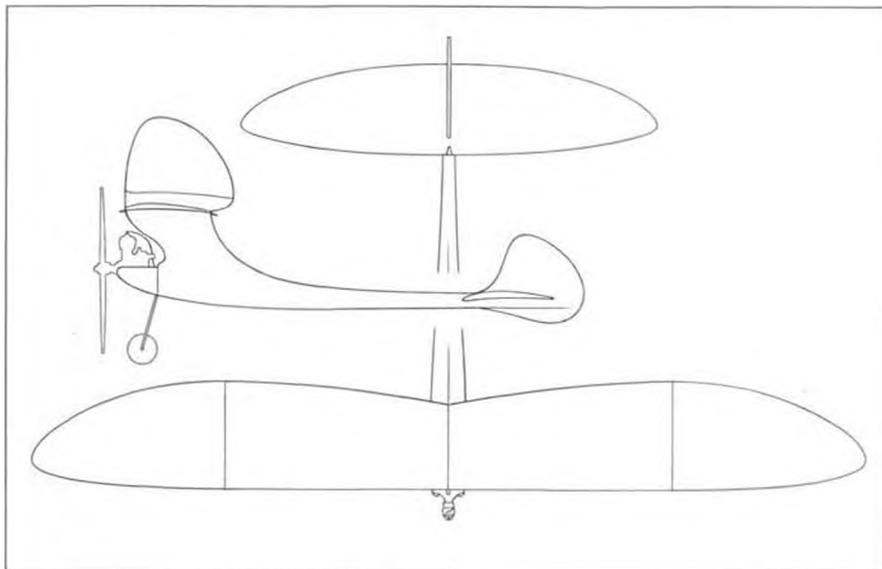
THREE-VIEW OF THE MONTH . . .

Stevo Helmick's Schlitzer 2-43

I first saw this model at the August, 1975 FAI Trials sponsored by the Kent Strat-O-Bats. At that time, I suffered from a massive case of disbelief, as the model sported an honest-to-gosh wheel! Well, Stevo, has since gone on to disprove all of us scoffers. The model flies, and flies well (*how well does it taxi? wcn*) Even though it has a painted-on "cabin" (shades of Dave Linstrum) and a wheel, it is an excellent performer with several innovative features.

Specifically, it has the stab mounted on top of the fin, with the d.t. line being carried to the stab via NFFS nylon tubing. Additionally, the fuselage boom exits the pod at the wing center line, which places the stab at a substantial distance above the wing.

Steve says the following about his ship: "It was to be a blend of the Seelgull windy-weather design and the calm-air Swizzle-Stick (how about those names!). The fuselage pod is quite roomy for various circle towhooks, and that was responsible for the semi-scale look. It is really an ugly design made tolerable by camouflage. The design has worked out very well as built. Plans are to move the towhook slightly forward, tissue the stab (in place of mylar), and do a few detail changes. The T-tail has



MYSTERY MODEL FOR MARCH

worked out perfectly, as had the circle tow. In fact, the model handles beautifully on the line, showing a tolerance for being pulled either direction crosswind . . . a rare quality. It must be stated that this is a matter of having symmetrical wing warps more than anything else. Both tips must be washed out, but the main panels should be flat."

MODEL BUILDER Free Flight recommends the Schlitzer as a Nordic to

build.

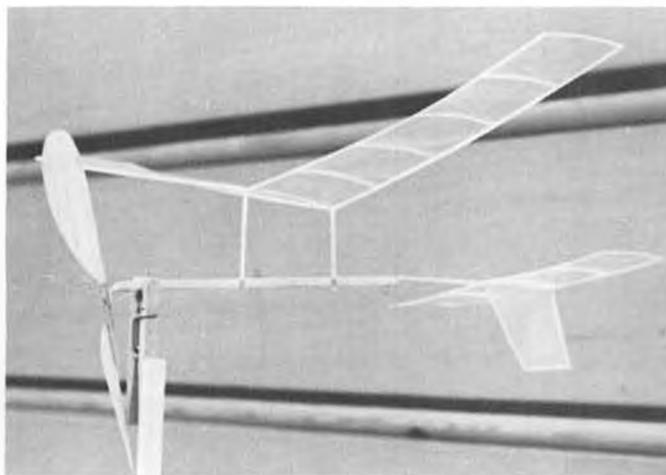
MYSTERY MODEL FOR MARCH

This month, MODEL BUILDER is turning the tables on F/F editor, Bob Stalick! We're supplying the Mystery Model, and he won't see it until he receives his copy of the magazine, which is mailed right along with all other subscriptions. Let's see how many of you can beat him to the punch!

(January's Mystery Model brought about one of the largest number of

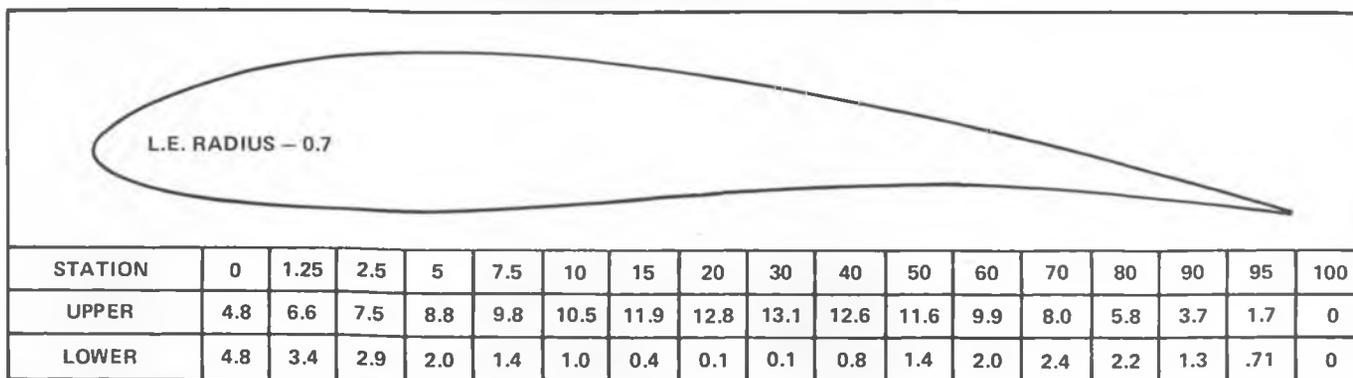


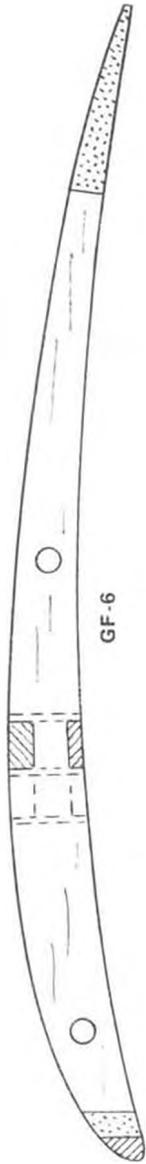
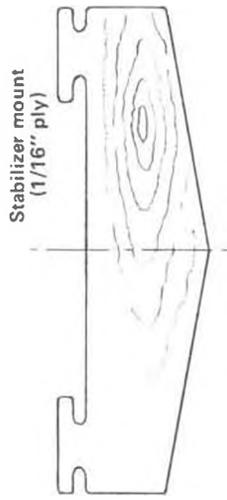
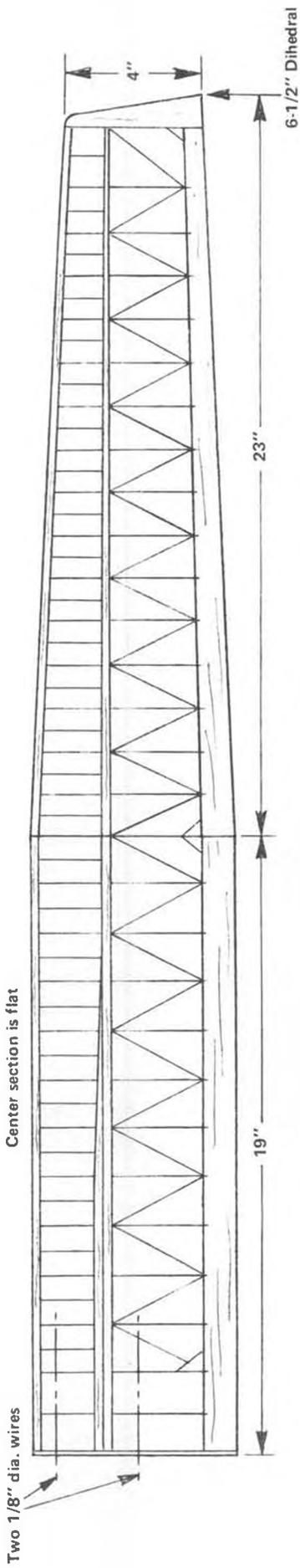
What is Steve Helmick really like? Who else would stand in the shade when it's raining? Ed Lenderman about to launch A/2 Nordic.



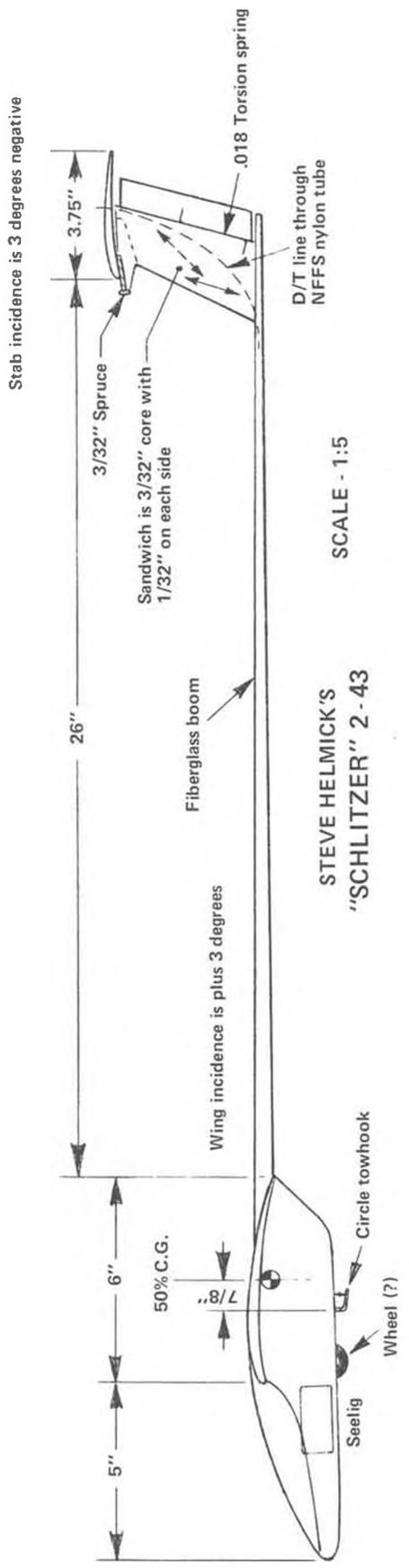
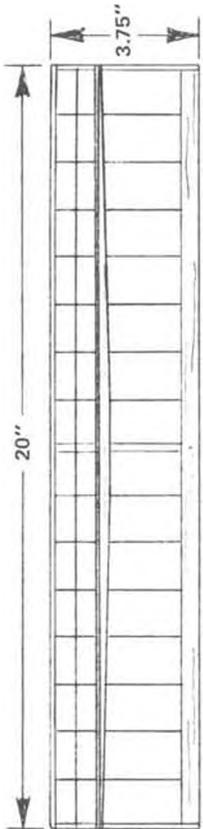
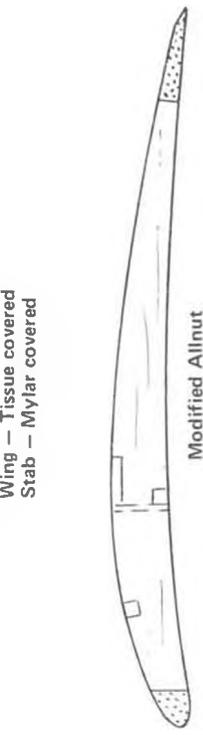
What the well-dressed Easy-B indoor model looks like. Ship held in place by model clamp designed to look just like a clothes pin!

DARNED GOOD AIRFOIL – EIFFEL 400





Wing - Tissue covered
Stab - Mylar covered



responses we've had in the series. In fact, Vic Didelot, Erie, Pa., sent along photos of his version of the model, along with his correct entry. However, Jim Sullivan, of Lexington, Massachusetts was the "firstest with the mostest." The model was Frank Huffman's "Li'l Richard," published in April/May 1961, *Flying Models*, and we can't help but wonder if Frank took structural design lessons from FM's editor, Don McGovern. It sure looks like a typical multi-sparred, multi-ribbed McGovern balsa behemoth. wcn)

CIAM CHANGES

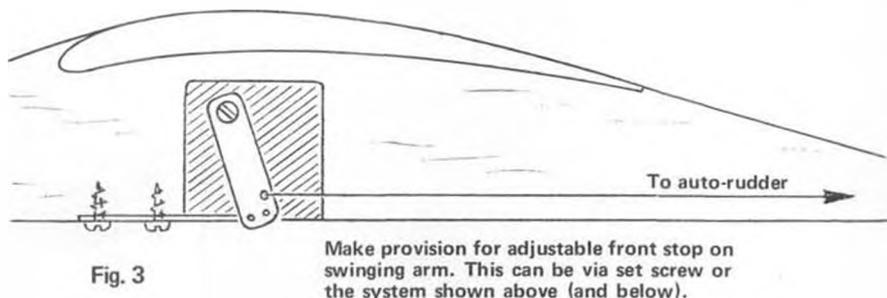
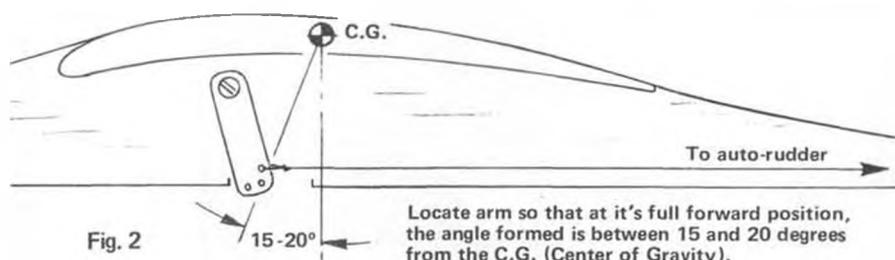
If you are an FAI flier, the chances are that you wait, with some baited breath, the results of the annual meetings of that organization (the CIAM). Usually, there are substantive rules changes proposed. These would change the current events in many ways. Among those considered during the 1975 meeting were:

1. Nordic: Change length of launching cable (towing) by decreasing length to 35 meters (USSR proposal)
 - : Towline must be attached directly to the tow ring. The tow ring must be a homogeneous closed ring (outlaws spring-and-ring systems). (Finnish proposal)
2. Wakefield: Change the maximum weight of the model without the motor to 200 grams. (USSR proposal)
 - : Reduce maximum motor weight to 30 grams (USSR proposal)

There were other proposed changes, too. I just excerpted several which struck me as wrong. Many of the items covered in the 8 page outline had common sense reasons. The results from the meeting's decisions have now been distributed and, happily, they represent cooler thinking on the part of the delegates. The only substantive changes have been in flyoff procedures meet organization, age of contestants, and steering of models (for indoor). The above Nordic and Wake proposals were thrown out.

In substance, the rules changes are as follows:

1. Flyoffs: For all future W/C, flying in non-thermal parts of the day are required.
2. Nordic Glider, Attempts: (definition) "When the model or the launching cable collides with another cable during towing and the model is released from the cable within 1 minute from the moment of linecrossing, should the model continue its flight in a normal manner, the competitor has the right to demand the flight be accepted as an official flight, even if the demand is made at the end of the attempt."
3. All events: Deletes the old four



minute flyoff launch period, replacing it with a 15 minute launch period. Establishes a starting line for power flyoffs.

4. Coupe D'Hiver: Clarifies by adding, "Minimum weight of the model 70 grams, not including rubber motor."
5. Indoor: Allows steering of model from front of model only. Also defines attempt as 60 second minimum time.
6. E.Z.B.: Referred to committee for further study was the adoption of Easy-B rules.

International Competition Dates and Sites: Established Indoor World Championships site as Cardington, England for August 28-30, 1976. Outdoor Free Flight: Offer from Finland withdrawn. No other offers received.

COUPE d'HIVER SWITCHES SITES AND DATES

For years and years, the French have

sponsored what has become known as the Coupe d'Hiver Internats. Usually held outside Paris in February, the event this year (1975) was switched to R.A.F. Halton, just outside of London, England. The following report is submitted courtesy of Ron Moulton, with additional comments by Dave Goodwin of the Vulcan F.F. Group.

"We tried our best to convince the French that the grey mantle of cold dampness that smothered the U.K. through the last day of November was exceptional, but the message didn't get through. They'll say we were trying to excuse a tradition. On the European Continent, everyone expects to find fog in England at this time . . . and we weren't letting them down! Actually, it rained so much on November 28 that the whole country swelled up like an over-leavened loaf of bread and hit cloudbase!

"Many were the tales of ice faired aerals and wing mirrors on cars that loomed out of the clag at Halton's airfield gate, from parts as far away as Yorks, Lancs, Somerset and Kent, and it says much for the rose tinted optimism of aeromodellers that many were actually on the apron waiting for the start at 0900 hours. Visibility at that time was 50 metres. Exploratory checks with chuck gliders showed that the air was surprisingly bouyant: When a couple of R/C electricians were put together, hopes were raised for discovery of the vertical visibility and sure enough, the Kloudrider could be seen for all of a hundred feet upwards. Yuck! After cavorting around, the whirring soarer ditched itself into the frosty grass . . . frozen out of the sky with great globs of ice all over its wing and the elevator gap filled solid. Brhhh!

"Meanwhile our French friends and just a few British diehards were showing

Continued on page 60



Bill Hunter and what else? A hardly-decorated-at-all Satellite 1000X. Southwestern Regionals.



Our "Trident II" out for its shakedown cruise, takes on a full-size Soling in Newport Beach Harbor. Hate to rub it in to our friends back east, but this photo was taken in January!



Wide spread of outriggers affords great stability without needing deep keel or heavy ballast.

PRODUCTS IN USE

By BILL NORTHROP

The PROBAR 36-600 R/C TRIMARAN "TRIDENT II" and SAIL CONTROL UNIT.

• The "Trident II" is a radio controlled, 36-600 racing trimaran, produced in kit form by ProBar Design, P.O. Box 639, Escondido, Ca. 92025. The selling price is \$100.00, or if you are more accustomed to bargain pricing, \$99.95 . . . plus a nickel for old time's sake.

Trident prototypes won the 1974 and 1975 ACCR Regattas for the 36-600 class. ProBar, by the way, stands for Don Prough (pronounced "Pro") and Bill Barton; designers, producers, and winning sailors of the Trident.

A 36 inch over-all length and 36 inch

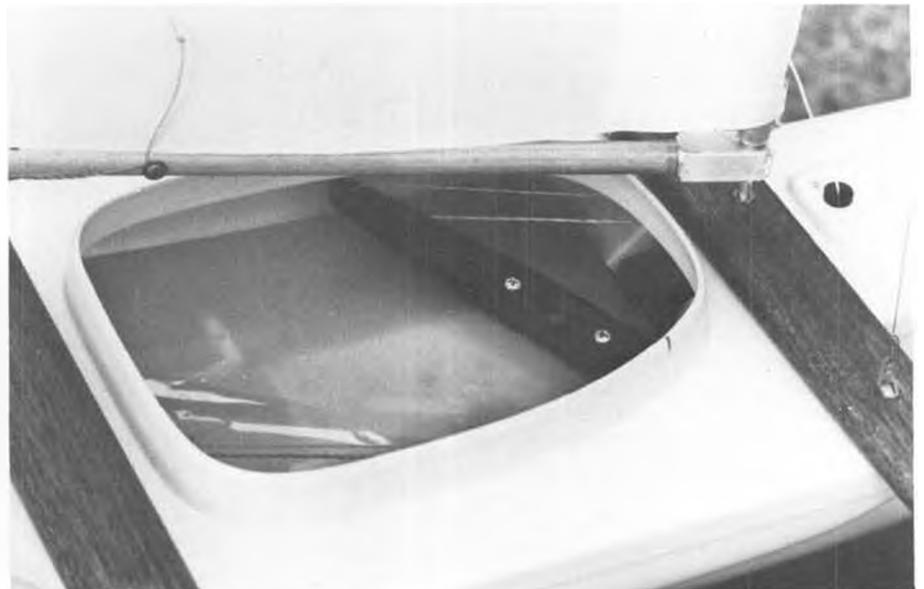
beam may seem to be strange dimensions for a boat, but in this case, it stands for the length of the main, or center hull, and the center-to-center distance between the two outrigger hulls. The trimaran configuration has many interesting and different sailing characteristics from the more common monohull, not the least of which is its fantastic acceleration. This comes from the fact that the trimaran gets its stability from the outrigger hulls, and therefore does not require the deep, ballasted keel of the monohull. Consequently, it is much

lighter (only 6-1/2 pounds), and the slightest breeze gets it moving like a scalded cat. Conversely, the light weighted boat will lose headway almost immediately if the air is dumped out of its sails, so it is necessary to sail full bore right up to the mark and then come about quickly before momentum is lost.

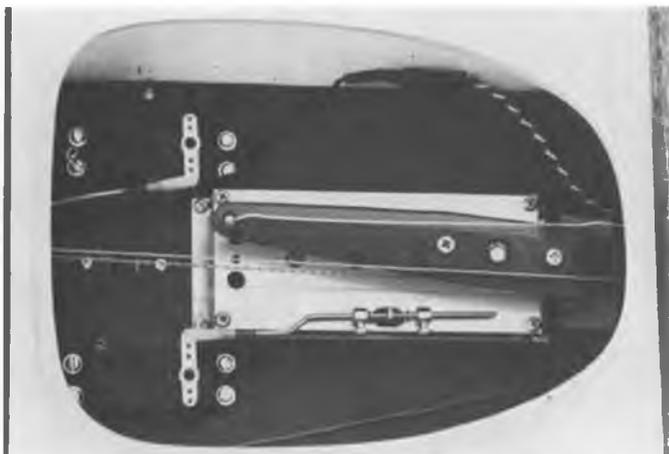
This writer, though not currently an active R/C sailing skipper, has owned and sailed a Santa Barbara One-Design since 1965. Our first S/B came directly from designer, Tom Protheroe, before



High impact polystyrene molded hulls are tough and maintain a brilliant white.



Plastic sheet fits over all radio and servo fittings so that main and jib sheets will not foul and cause a jamb-up. Mark on coaming is the balance point. Molded sheet exit guide ahead of mast.



Mahogany plywood radio mounting board fits through deck opening for easy removal. MRC servos and Probar sail control unit installed.



Operating lever to sail control limit switches is located between two adjustable override springs, to prevent servo burnout.

production was taken over by Vortex. In 1970, we took possession of our second S/B, No. 319, on a Saturday, and placed 7th out of 15 in a regatta the next afternoon, in the harbor at Santa Barbara, California. Since then, unfortunately, it has only been in the water a few times. (With our newest home being about 50 yards from the water in Newport Beach, the S/B will probably begin to see more action.)

Because we thought it would be helpful to ProBar to show that an amateur could easily build the Trident . . . and because we selfishly wanted to add it to our own collection . . . we took on the project of reviewing this kit!

The Trident kit consists of 3 hulls and decks, all molded of high impact polystyrene plastic. In addition, the kit includes an aluminum tube mast, hardwood dowel material for main and jib booms, pre-cut mahogany outrigger cross beams, plywood keel and rudder, and *all* hardware and rigging materials required to complete the boat, less sail winch and radio control equipment. Completely finished and sewn dacron sails are also included, along with an assembly drawing, and 24 pages of excellently written and illustrated

building instructions.

The toughest job in constructing this boat is the shaping, sanding, and finishing of the wooden parts. In fact, if you get these out of the way first, the rest of the assembly is a breeze, and in fact, interesting, because it goes together so rapidly.

We finished the rudder, keel, and cross beams by shaping with a coarse rasp, followed by course, medium, and fine sandpaper. Two well-brushed-out coats of K & B Super Poxxy coating resin, each followed by sanding, and then a final, thinned coat of coating resin, left all parts with a smooth, polished finish, which was left natural. The grain in the mahogany cross beams came up beautifully, without any need for staining before applying the Super Poxxy.

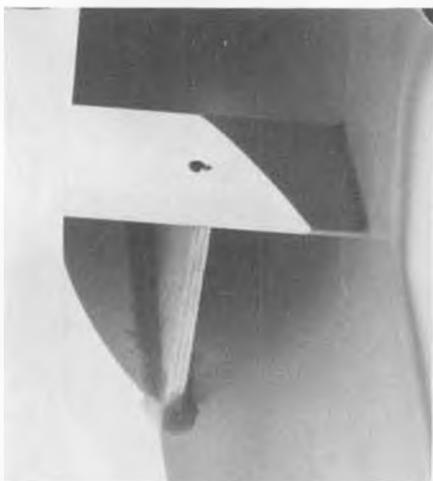
The remainder of the construction is simply a matter of following the detailed, illustrated, step-by-step instructions. We would recommend two changes in the sequence, however. *Before* the deck of the main hull is glued down forever, it is easier if the radio mounting board is fastened to the mounting rails and the assembly checked

for fit in the hull. However, it should not be glued in position unless the deck is in place on the hull, glued or not. Reason for this is that the open hull spreads a little, and the deck pulls it together to its normal position.

The second suggestion is that, *without exception*, the sheet exit guides should be installed in the deck *before* the deck is finally glued on. We did it according to the instructions . . . after the deck is installed. Aside from turning the air blue and flirting with an ulcer, there just ain't no good reason for putting them in after the deck's in place! Incidentally, the exit guides are available separately at 50 cents each, and are very effective in providing a smooth passage for any lines that must operate through the deck.

Radio installations will vary, depending on the system used, and the sail winch employed. We installed the ProBar winch, which sells for \$50.00 (\$49.95 plus a nickel), and used a Mark V MRC radio with two separate servos. The sail control winch is simply an electric motor and an all-metal gear train which provides 40 inch-pounds of effort through a rotary output, for hauling in and letting out the sails.

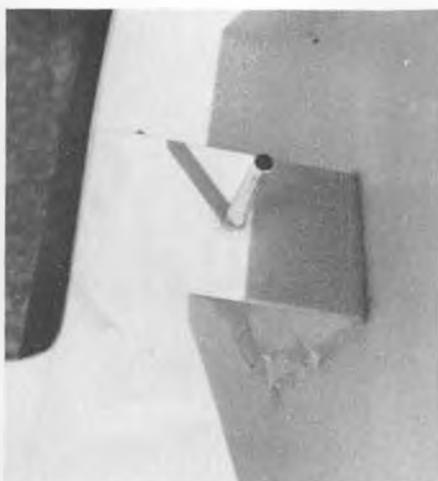
Continued on page 77



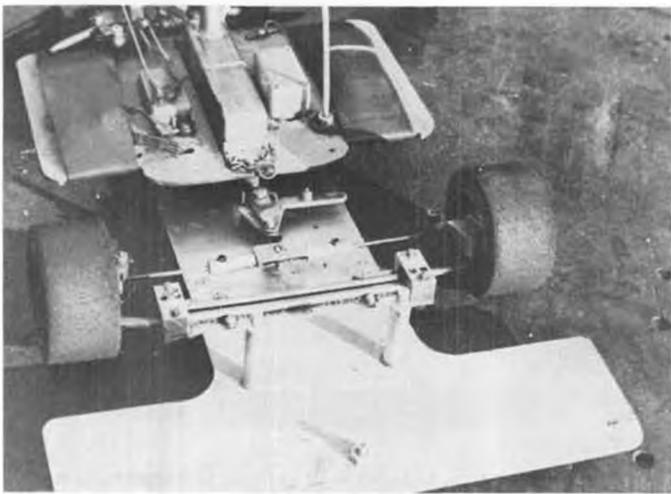
Keel is mounted through slot in hull and epoxied inside only. Ply thwart plate adds rigidity.



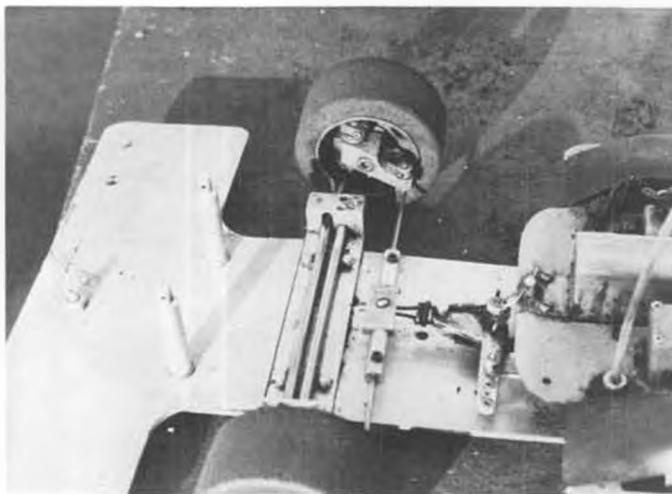
Extremely light boat is more ON the water than IN. It accelerates rapidly in any air.



Heavy polystyrene thwart holds brass rudder tube in place. Shaft is retained by tiller.



Glenn Stone's twin-beam independent front suspension system. It's rugged and practical.



Block clamps end of one axle beam, and is slotted for vertical motion of other beam. Slot gives some friction damping.

R/C AUTO NEWS

By CHUCK HALLUM

• Competition suspension systems are few and far between, but we'll look at a couple that were run at national events, and some more that have run at local races. The biggest problem with good geometry suspension systems is that they are fragile. Competition suspensions have to be rugged, and quite often, compromise on good geometry. But there are several guys still giving it a try, with some good results coming out of their efforts.

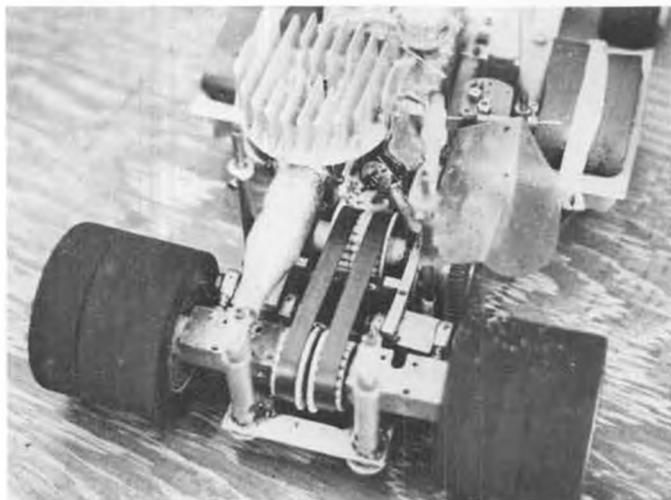
We looked at the suspension effect of the basic plate chassis and "rocker suspension" systems in the first article of this series of two. The general conclusions were that only a little motion was required, and damping was very important. In general, the cars discussed in the first article only had a "rocker" on either the front or the back, and this influenced the conclusions. If both ends had motion capabilities, the allowable

motion of each end would be a little higher before we got into problems. All of the competition suspension systems I've seen so far have only been on one end or the other. So I don't think the full benefits of suspension have been seen on the track, yet.

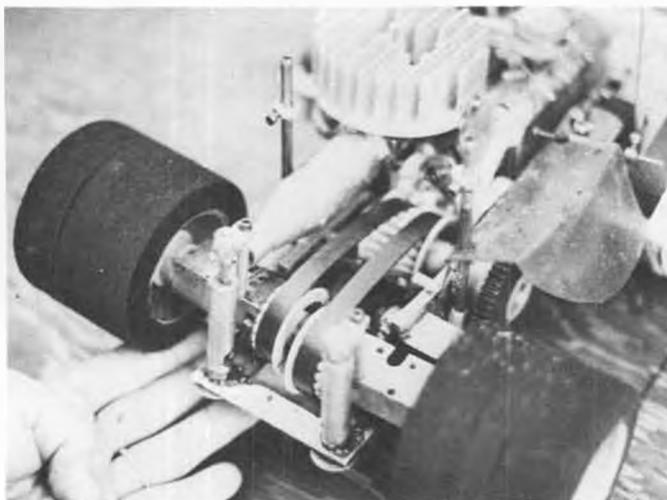
I have seen only one reasonably good front suspension system for competition so far. Glenn Stone has modified his Thorp front end so that it uses two cantilever bars, one for each wheel, rather than the single one with center pivot, "rocker," on the stock chassis. One of the photographs shows Glenn's set-up. The cantilever bars, which look like a Ford pickup twin I-beam suspension, run through vertically slotted blocks at the outside to allow vertical motion, but restrain fore and aft motion. The cantilevered bars provide the springing and the slotted blocks give some friction and damping. The front

suspension is very rugged, 'cause I've never seen Glenn Stone out of a race because of it, and the car has taken some pretty hard knocks, as any competition car does. There are a couple of limitations of this front-end set-up: 1) the cantilevers must be strong enough to maintain king pin location, both angular and fore and aft, and 2) there is no adjustment of spring rate. Since strength determines the minimum cantilever bar size, the spring rate cannot be decreased below some value, but clamping the cantilever at different positions could provide a variable adjustment, if necessary.

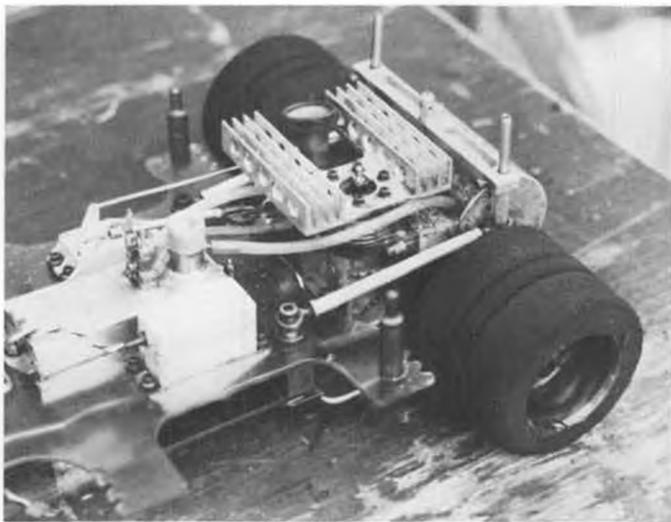
There have been other types of front suspensions, like upper and lower A-frames on the old Dynamic and Racar chassis, but they couldn't take the abuse of competition. The suspension action was good, but complicated and delicate. The Futaba Dune Buggy has front suspension with upper and lower arms, with



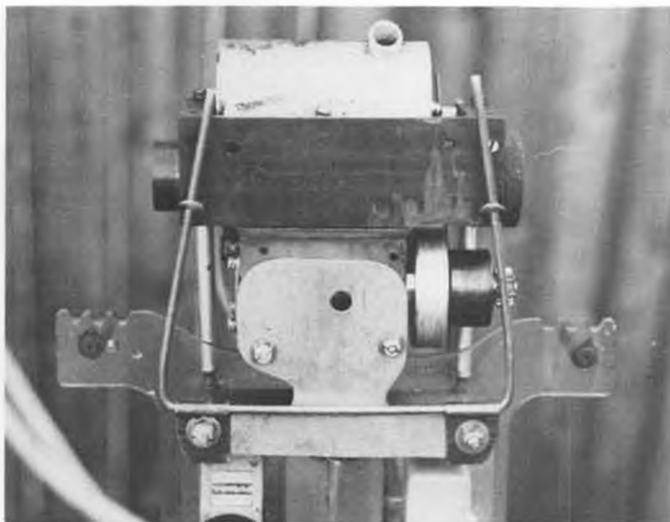
Gary Walker's independent rear suspension system. Ball joints are on front of two arms from each axle corner.



Vertical motion of each wheel is about $\pm 3/8$ inch. Spring and damper towers to rear of each axle carrier.



Suspended power pod on Ted Longshaw's car (He's from England). Upper arms stabilize and restrict motion to the vertical plane.



Bottom view of Ted's car shows flex-plate and stabilizer bar for variable roll rate. Note large, supr-quiet muffler.

ball joints, rubber bushings and torsion bar springs. The Futaba suspension is strong enough for low speed encounters with obstacles, but not for being hit by a 35mph, 6 lb. competition (?) car. The Kyosho Dune Buggy front suspension, with upper and lower leaf springs, is probably a little stronger (in concept), and with some beefing up might be good for competition cars. In any case, it appears that more design work is required to get a good front suspension system.

More effort has really been spent on suspension. That's where it should do the most good, but it's also the most difficult. The only rear suspension car that is run with any regularity that I know of belongs to Gary Walker. Gary's system has been running for a couple of years, with limited success, in various types of cars. One of the photographs shows Walker's approach to independent rear suspension (IRS). Each wheel is mounted on two trailing arms, and wheel motion is essentially vertical. The front of

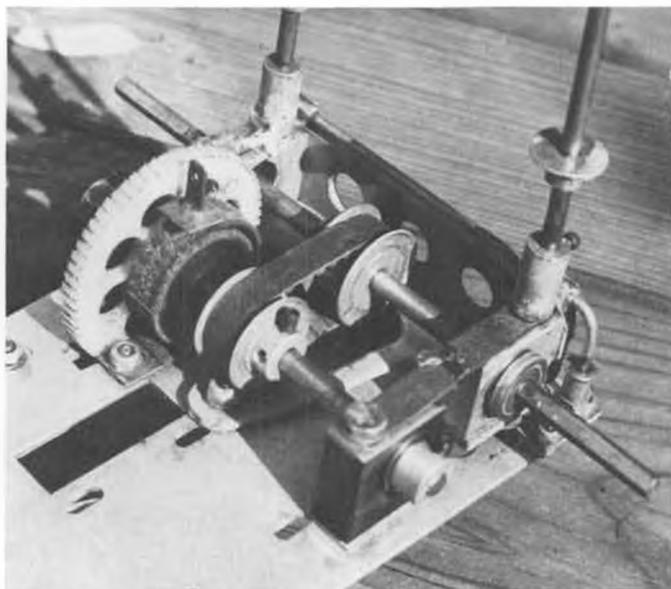
each arm is a ball joint. Bolts secure the ball joints to the chassis through rigid blocks. I believe Gary has the trailing arms and ball joints staggered vertically to attain some rear wheel camber change, with vertical motion, to aid free contact. Each rear wheel is driven through a cogged timing belt/pulley from a common jack-shaft. To the rear of each half-axle is a spring tower, which includes an air damper. The spring/damper towers are pivoted, through rubber grommets, at both the top and bottom, so there is no alignment problem.

Walker's IRS car is fairly reliable and rugged. The car is unmistakable. Here on the West Coast, when his car went over a "Botts-dot", the rear of the car would bounce up and down for a few feet, but the wheels seemed to stay on the track pretty well. In stock cars, a small sedan body, it seemed to work very well. But in sports cars, the weight seemed to be a disadvantage, and he never seemed to have quite enough front traction. The

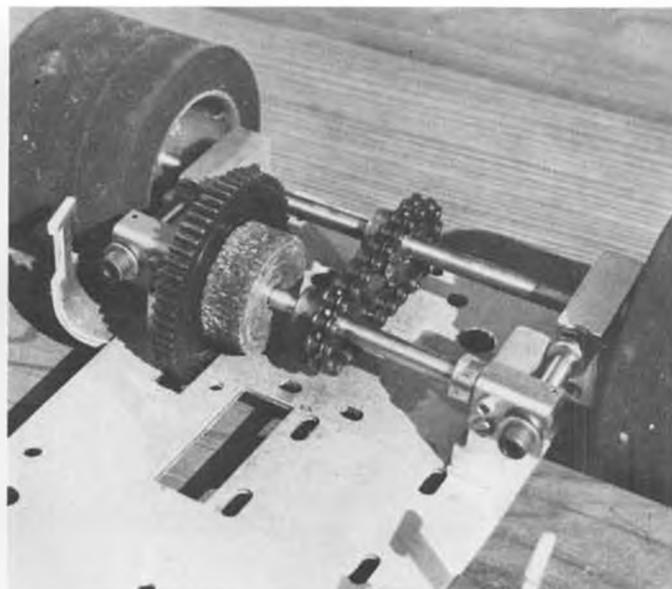
cogged belts on the IRS are quite loose, to keep the bearing loads and friction to a minimum. One of the problems with true rear suspension cars, and Walker's is no exception, is that weight is pushed forward because of all the junk at the rear. So in cornering, because of the forward weight and low rear roll rate, the inside front wheel lifts quite a bit and front traction drops, hence, a very understeering car (the same problem as with the rear rockers discussed in the first suspension article).

At the 1974 ROAR Nationals, I ran a rear suspension car. The layout was relatively simple, but nowhere near strong enough. It stayed together well during shakedown runs at home, and was running laps under the existing track record. At the Nats, things went well in the qualifying heat races, but one good whack in the rear end in the main event and I was in and out of the pits for the rest of the race. Anyhow . . . another photograph (or two) shows my

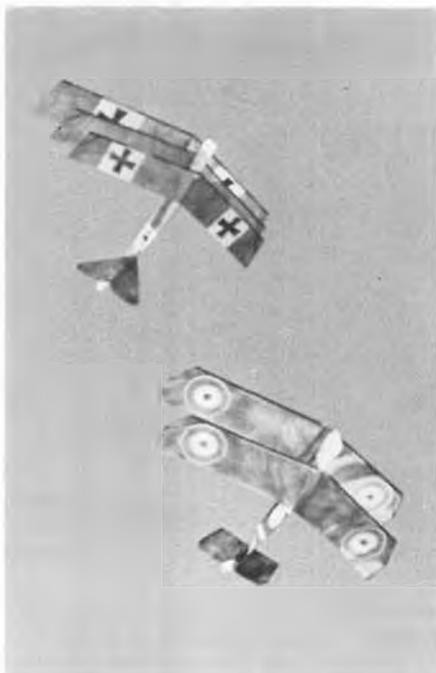
Continued on page 77



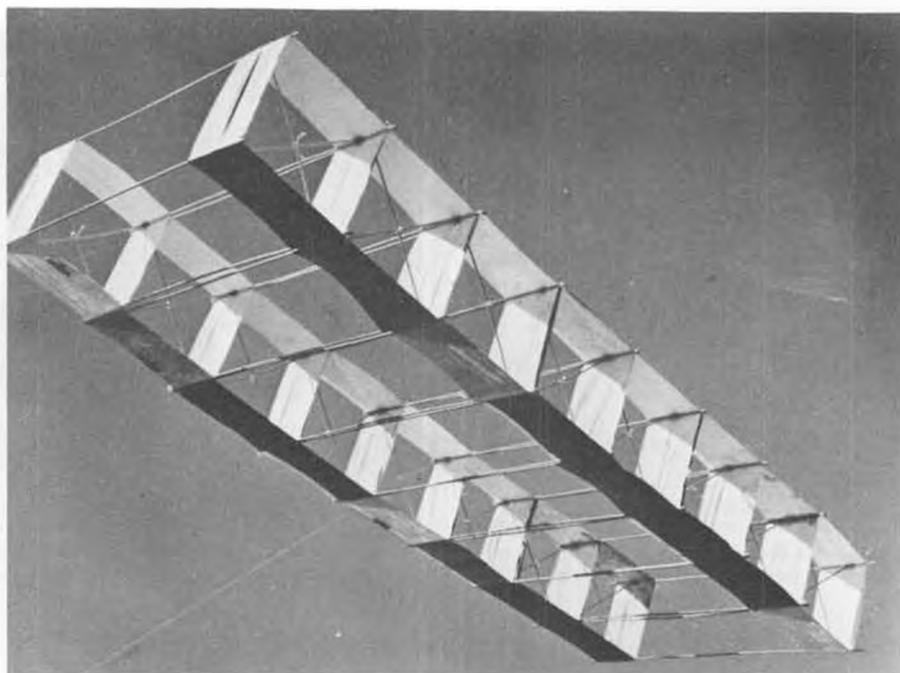
The author's 1974 rear suspension system with cog belt drive and cantilever springs. Dampers outside of each rear bearing block.



One of the author's rear suspension attempts that didn't work out. Chain drive worked well, and will go on next system.



Fokker Triplane and Sopwith Camel airplane kites by Stratton Air Engineering. They are built in the same way as model airplanes.



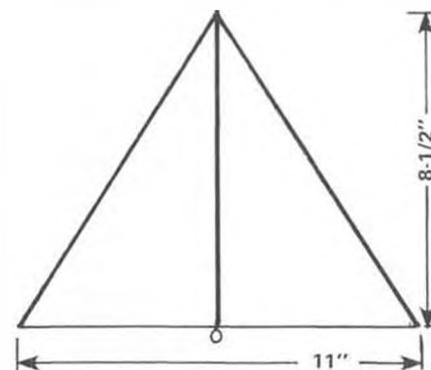
The Giant Skyscraper is a current favorite among scientific kite enthusiasts. It was designed by Ray Holland, and is produced by Airplane Kite Company, which supplied the photo.

IT IS ALMOST THE TIME OF YEAR TO GO FLY A KITE!

By KEITH GEBERS . . . Just as model airplanes have a "toy" image to "outsiders", kite flying must live with the "dime store two-sticks-and-tissue" image. It ain't true with them like it ain't true with us. Read about it.

● Kites are no longer JUST for the very young. Today, a whole new generation of kite enthusiast looks at his hobby as a science, and unlike twenty, or even ten years ago, many of this new breed are also model airplane builders. Today, a variety of kites, both commercially and scratch built, will appeal to the most avid model airplane enthusiast.

The new generation kite flier views a kite as an aircraft, not merely as a toy. They have found that there are as many aerodynamic factors in a kite as any other airborne device, as well as an equal number of challenges. The turn of events in modern kiting came in 1940 when Francis Rogallo patented his flexible parafoil. For years this device was considered by the military for full scale aircraft, and some prototypes were



built.

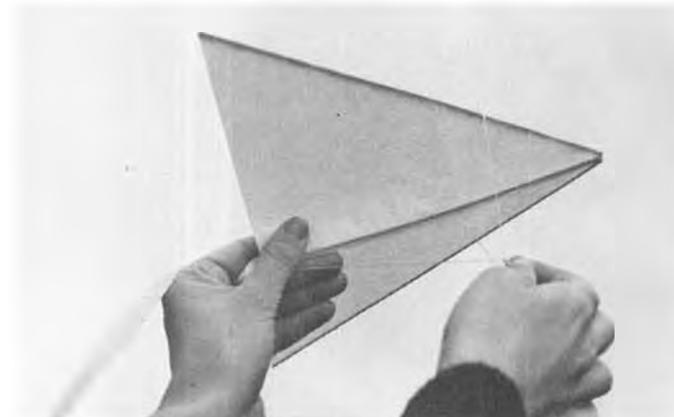
During the early years of the Space Program, experiments were conducted to make the parafoil a re-entry vehicle, but storage problems could not be surmounted. Kite builders adopted the

principle and it became very popular, and has even gone from there to the field of hang-gliding. These parafoil kites can be made extremely large, or very small. Many enthusiasts have even constructed them from a sheet of typing paper.

Another advancement in kiting came with the design of the Flying Sled by Frank Scott, son of Sir Francis Scott, also of kiting fame. Sled-type kites are marketed by a variety of commercial producers, and can be easily scratch-built with everything from plastic sheeting to paper. Sleds can be flown completely tailless and are very aerodynamic, thus appealing to the aeromodeler. Their vented surface literally rolls with the wind, and although sometimes rather tricky, they are dependable, fun flyers.



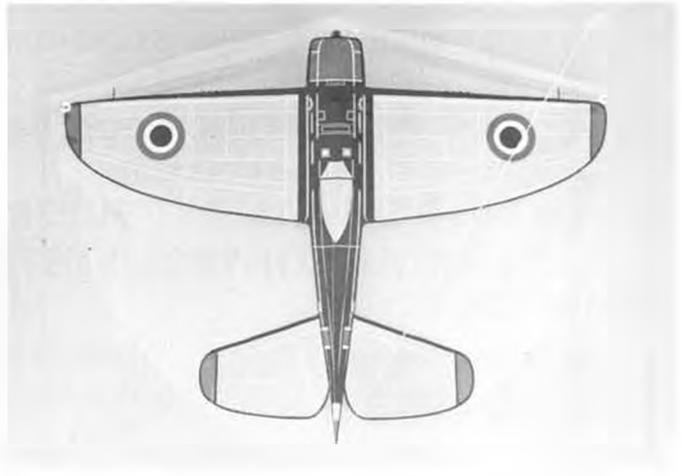
Scratch-built airplane kite designed by the author features balsa wing and tail surfaces. Flexible keel/fuselage is a sheet of typing paper.



Flexible parafoil kites don't have to be large. This one made from one sheet of typing paper and 1/16 square balsa.



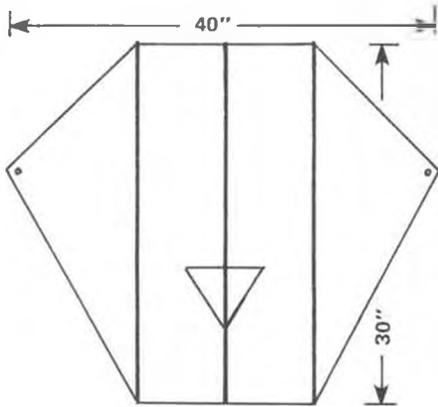
P-A-X Jungmeister is bottom view of plane painted on transparent flight surface. West German import displayed by author's son, Mike.



Another example of a sheet plastic "simulator" kite. This P-47 kite was made by the Knoop firm, of Holland.



In the air, the Gunther Bonanza "simulator" has been mistaken for an R/C model.

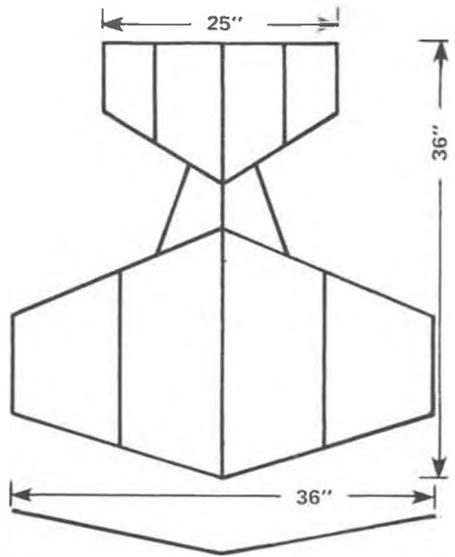


Model airplane builders might find their biggest kite challenge with what is known as the airplane kite. This field remains wide open for design and construction innovations. A whole core of airplane kite enthusiasts exists, among them Ray Holland, Craig Stratton, Gary Hinze, and Bill Bigge. These men frequently correspond with the author, telling each other about the latest innovations they have created.

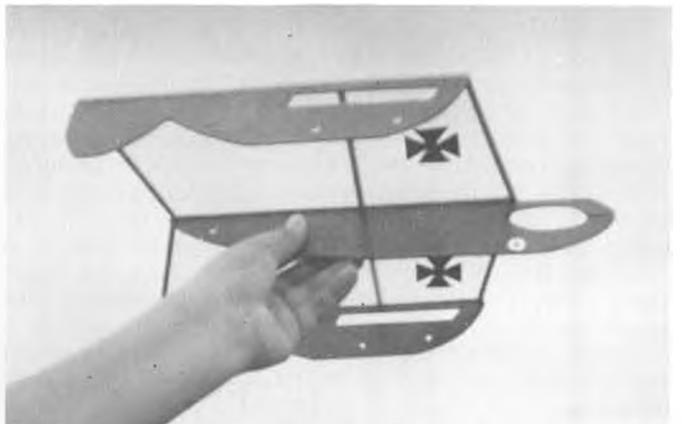
For years, an airplane configuration was not considered suitable for kites. An airplane is designed to fly forward; velocity being the name of the game. A kite works just the opposite, with the forces of the wind pushing against a tethered object to gain lift. Thus stability in an object with such small lifting surface as an airplane is difficult to achieve. Frequently an airplane kite will just spin on the end of the line, or if stable (like a tow-line glider), it will forget it's a kite and continue its forward movement right over the flier's head and into immediate trouble.

Numerous theories have been advanced on airplane kites. One is that a kite is merely an airplane that flies backward. Experiments have been conducted where a very light model plane is tethered at the tail. Some of these experiments have been successful, others not.

Balance, lightness, and drag seem to be all-important in constructing a successful airplane kite. There have been some airplane kites built much like a profile model plane. The vertical position of the fuselage provides a nice vane to keep the kite stable. But even so, they are not always successful. Give airplane kites a try. As kite authority Wyatt Brummitt says: "Airplane kites can be built successfully, but it takes an awful lot of skill and patience."



Built-up airplane kite, designed by the author, features model airplane-type construction. Open fuselage gives boxkite stability.



A simple, small rigid-frame kite with center fuselage and outriggers. Extremely stable, it needs no tail.

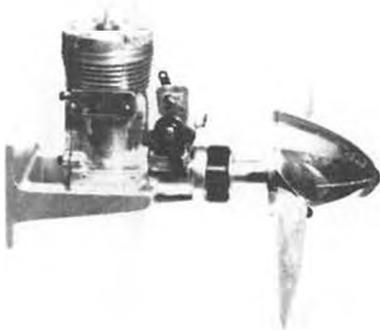
Write For **FREE BROCHURE**
 On Our Complete Line Of
R/C PROPORTIONAL EQUIPMENT
including
**WORLD'S SMALLEST SUPERLIGHT
 DIGITAL CONTROL SYSTEMS**

SMALLEST SIZES

LOWEST PRICES



13400-26 Saticoy Street
 North Hollywood, Calif. 91605
 Phone (213) 764-1488



60 IS A LITTLE BIG ???
 THEN TRY THIS NEW
FOX 40BB

The Fox 40BB has all the things you want plus some you haven't thought about.
 Schneurle Porting.
 2 Ball Bearings on Main
 Cylinder - Unique 9 port design.
 Carbo nitrided for long wear.
 Piston - Aluminum with free ring.
 Super sturdy construction.

FOX 40BBRC	24100	59 95
FOX MOTOR MOUNT	50404	4 50
FOX PROP EXTENSION	90413	2 25
FOX SPINNER	60308	9 00
FOX TUNED MUFFLER	90302	19 95

FOX MANUFACTURING COMPANY
 5305 Towson Ave. / Fort Smith, Ark. 72901

There are really two types of airplane kites. First, the real thing, which has just been covered. Then, there are *simulators*, which are really conventional transparent kites with airplanes printed on them. These are called plane-type kites, and are generally frowned upon by airplane kite enthusiasts. However, some recent examples are outstanding. The best ones are made by the Gunther Flug Spiele of West Germany, which is one of the world's largest builders of kites and aerial toys; the Pax Company, also of West Germany; and the Knoop Company, of Holland. What makes the latest types so attractive is that they feature bottom

views of real planes, thus from the ground, they look like an actual aircraft.

The author was flying a Gunther Beechcraft Bonanza in front of his home and a group of high school students drove their motorbikes over two miles just to see what they thought was the town's latest radio control model. In addition to the Bonanza, there are now available from either Gunther, Knoop, or Pax a couple of jet fighters, a Bucker Jungmeister, a P-47, and a Good-year Racer.

Kites have always been described, even by model airplane buffs, as relaxing. But to the new breed of kite enthusiasts they go a lot farther. There is enough aeronautical challenges in the modern kite to whet the appetite of the most ardent model airplane builder. But don't completely overlook the so-called garden variety kite available at the toy shops and quite a few supermarkets. Many of the new ones reek with sophistication. During recent years, inflatable kites have made their debut. These require a good, hard, steady wind, and have disappointed many novice kite fliers. But the inflatable kite provides a beautiful airfoil structure. When well balanced with a healthy wind, they can afford hours of enjoyment.

Providing tremendous help to the serious kiteflying fraternity is the American Kitefliers Association, Box 1511, Silver City, New Mexico, 88061. For four dollars per year, members come in contact with other kite fliers with similar interest, in addition to a beautifully produced quarterly magazine, edited by A.K.A. president, Bob Ingraham. All types of advanced kites are covered in this publication, in addition to simple dime-store kites, as well as plans.

The field is still wide open. Kite builders are experimenting with highly maneuverable kites, equipped with adjustable rudders and elevators. Experiments have even been conducted with radio controlled kites.

The challenge is there! Build a kite, feel the tug of the line, and get bitten by the bug. Go ahead! Become a kite-naut! ●

Spad Continued from page 47

to the fuselage. When we built our first biplane waaaay-back when, the local club expert told us to build in a bit more incidence into the lower wing than into the top wing. Apparently this causes the lower wing to stall first . . . the plane remains a relatively stable high winger. Keep in mind that a carefully aligned and rigged airframe is one secret of successful flight.

Two wings produce a considerable amount of lift, so more weight than usual is required in the nose of a biplane. A propeller carved from bass wood is the easiest way to get this weight.

Where do you get bass wood and have it cut to outline shape? Visit the Industrial Arts department of the local junior high school. They usually have bass wood, and the instructor will cut you enough prop blanks for ten years of model building by just coming in with a few of your models and talking to his classes.

Use the "old tall grass" bit for test gliding your model until it is trimmed out. We used one loop of 3/16th in. rubber for power. It provided enough oomph to permit the model to R.O.G. (rise off ground). You might have to use more or less power depending upon the weight of your model. ●

F/F Continued from page 53

a mixture of impatience and blind hope by putting a few Coupes together. As precious daylight hours slipped by, and the field became alive with scattered bodies chasing strange silent shapes above, the visibility improved to all of a hundred metres by 11:30.

"From nowhere but the model box and small knapsacks, the French extracted tents, Nelly boots, 20 ft. thermistor masts, floating drift streamers and all the paraphernalis of professionals . . . They'd seen the new trophies; Maurice Bayet's Coupe de Paris for 100 gr. models, and the Aeromodeller Trophy commissioned from Ian Dowsett for 80 gram models. It's such a beautiful piece of art that it possibly accounted for all the over-wound broken motors of the day. Ian made a scaled down Coupe in silver plated metal, designed a mould, produced a title plaque and had the job set in clear acrylic. The result is something to treasure . . . a superb honour for the winner to keep for the year. And quite a few eyes glowed at the thought of taking it home. By 11:45 the barbeque had been set up, so that at least there was to be some action, if only to raise a man made thermal. General bustle gave an impression that the contest might be viable, so control was established for a start . . . 3 hours late, and about 300 metres out into the eerie grey of a seemingly endless void.

"To cope with the conditions, time-keepers were allowed to follow under the model. Drift was a mere 3 mph, and tests had shown that 90 second flights were easily followed from launch to touchdown.

"So at noon, the first official flight was made by Peter Cameron . . . and when the timer came back with the card, it was a max. Two minutes upwards until d.t.ed. Second flight by Len Ranson went the same way; but the d.t. failed . . . and within the first quarter hour, we had seven maxes on the score cards."

"So it went. Through just over three hours of the weirdest, yet most pleasant contest flying in ages. Out of 266 flights recorded, almost a third were maxes, and despite the visual limitations, only three models remained lost at the end. One of these was Claudine Dupuis, the only lady competitor, whose husband dominated both classes. One might say the British were 'Duped' by this dedicated pair from Chatelleroux. Louis (like all others from France) was deliberately flying at over 100 grammes weight in the 80 gramme class to ridicule the claim that the 20 grammes makes any difference. In fact, he won the 80 gr. class with a 107 gr. model, came 2nd in the flyoff and 4th in the 100 gr. class, to total up to 10 maxes in eleven flights! He was beaten only by French C.d.H. champ, Bernard Boutilier, with a better flyoff decider, and even then, with his own motor which he



VL-101 ELECTRIC FLIGHT SYSTEM

Featuring
HYTORK 48
MOTOR & PLANETARY GEAR UNIT

Complete flying weight 2½ oz. — will power Models 25 to 50" wingspan weighing up to 10 oz.

- Send 25¢ for Catalog showing complete line of Electric Flight Equipment and Accessories
- VL-101 System \$19.50; Hytork 48, Prop and Instruction Book \$9.00; Fast Chargers \$14.50 to \$29.50
- See your Model Dealer or order Direct (add 10% for Postage and Handling - Calif. Residents also add 6% Sales Tax) send Check or M.O., No. COD's
- Hobby Dealers send for Information



PRODUCTS

DIVISION OF VISTA LABS
7023-D Canoga Ave.
Canoga Park, Ca. 91303



Stearman C3B
\$13.95
35" WINGSPAN, 049 POWER FOR RADIO CONTROL UP TO THREE CHANNELS (A HISTORY MAKER BEFORE WORLD WAR II)



The GENERAL
"Aristocrat"
\$12.95
36" WINGSPAN, 020 POWER. FOR RADIO CONTROL OR FREE FLIGHT. ONE OF THE GOLDEN ERA'S GREATEST AIRCRAFT



The 1929
Velle Monocoupe
\$6.95
22 1/2" WINGSPAN FOR RUBBER, CO2, OR 020 POWER. A BIT OF HISTORICAL AND A DELIGHT TO BUILD.

AMERICAN CLASSICS



BELLANCA
"S8" Rocket"
\$9.95
55" WINGSPAN, 020 POWER FOR PULSE AND SMALL MULTI-RADIO CONTROL UNITS CAN BE FLOWN FREE FLIGHT ON POWER OR RUBBER



Burtin ROBIN
\$12.95
41" WINGSPAN, 049 POWER. FOR RADIO CONTROL UP TO THREE CHANNELS. A TRUE CLASSIC AIRCRAFT FROM THE "GOLDEN ERA"



PIPER CUB
\$12.95
36" WINGSPAN, 020 POWER FOR FREE FLIGHT OR RADIO CONTROL. PLANS ONLY



FLYLINE MODELS
1064J ASHBY PL. FAIRFAX VA 22030

ON DIRECT ORDERS ADD 10% FOR PACKING AND POSTAGE. VA RESIDENTS ADD 4% TAX.
SEE YOUR LOCAL HOBBY DEALER

RESULTS:		80 Gramme, 5 x 120 seconds, Hand Launched		100 Gramme, 3 x 120 seconds, R.O.G.	
		41 entries		26 entries	
1. Louis Dupuis	France	600 secs.	100 gr. model	1. Bernard Boutilier	France 360 ≠ 113 flyoff
2. George Matherat	France	586 secs.	100 gr. model	2. Louis Dupuis	France 360 ≠ 88 flyoff
3. Henry Tubbs	G.B.	550 secs.	80 gr. model	3. Frank Monts	U.S.A. 303 "old" Chicken Coupe
8. Bob White	U.S.A.	519 secs.	100 gr. "Beaucoupe"	9. Bob White	U.S.A. 234 "Beaucoupe"
(proxy: P. Chaussebourg)				(proxy: Chaussebourg)	
15. Dave Linstrum	U.S.A.	479 secs.	80 gr. "Rubber Duckie"	11. Dave Linstrum	U.S.A. 214 "old" Spirit
(proxy: P. Cameron)				(proxy: Chaussebourg)	
23. Fudo Takagi	U.S.A.	436 secs.	80 gr. 10 yr. old model	12. Charlie Sotich	U.S.A. 207 "Big Shot"
(proxy: Johnson)				(proxy: Goodwin)	
				13. Stuart Savage	Canada 195 "Gannet"
				(proxy: Dowsett)	

sportingly loaned. Ice on the propeller blades, frozen fuse, soggy tissue, and masses of rubber breaks (one entrant broke 14 motors), some spectacular climbing episodes, gallons of coffee and pounds of sausages and beefburgers consumed, will be remembered as part of a true Winter Cup story.

"By 1600 hours it was dark and the entourage moved off to the Sergeant's Mess Annex, where warmth and prizes awaited the first 28 in 80 gramme and all 26 who flew in 100 gramme."

Special note from Dave Goodwin: Matherat and Boutilier flew huge models (280 sq. in. wing) approximately 50 inch span with 23.6 x 21.6 prop on 6 strands and 52 second prop run.

CIRCLE TOW FOR ALL OCCASIONS REVISITED

In the December, 1975 issue of

MODEL BUILDER Free Flight, I featured a simple Circle Tow system which had been worked out by John Lenderman and the author. As soon as the magazine hit the newstands, I received 3 letters (in fact, I received one letter before I got my copy of MODEL BUILDER). All three, Tom Hutchinson, Steve Helmick and Bob Hatscheck pointed out a very obvious error in the 3 views presented. Additionally, they made some suggestions for improvement of the system. I take the liberty of passing them on to you now.

First, Hutchinson: "It is very important that the swinging arm have some sort of mechanism to stop or limit the forward travel." (This was also pointed out by the other two. See sketch which corrects this error).

Fig. 1

Modify the swinging arm by moving hole for rudder line to 1.2" from pivot point.

This sheet is cut to the size of the bottom width of the fuselage and slotted. Bolts or wood screws are then used to fasten this sheet to the fuselage (as in Fig. 3). By loosening screws, the sheet can be slid fore or aft until proper setting is obtained. The screws are then tightened. (Suggestion compliments of Ron Davis).

MARCH 1976

WHEN CONTACTING ADVERTISERS, TELL 'EM MODEL BUILDER SENT YOU!

61

OUT OF THE BOX!

It's NEW!
It's POWERFUL!
It's a K&B...

The K&B 6.5cc. RS III has been exhaustively tested in actual R/C boat races... it's a winner!

Design features include:

- ABC Piston & Liner—for longer life
- Advanced By-Pass Porting
- High Density Aluminum Die Casting—for greater strength
- Con Rod—bushed both ends
- Water-cooled head
- Ball Bearings
- Exhaust Butterfly Throttle
- Beefed-up Shaft
- Rotatable case (center block)—permits changing of exhaust from forward to aft position.

SOUNDS GREAT! IS GREAT!

Watch for our all new K&B 3.5cc. Inboard and Outboard engines.
K&B... the engines that have long led the field in R/C Flying... now, also, lead in R/C Boating!



K&B MANUFACTURING

12152 WOODRUFF AVE., DOWNEY, CA. 90241

"Additionally, the swinging arm should be raked back about 15 degrees from vertical in the straight rudder position to get the model circling when I want it to."

"John Clear's plunger system is ideal for the variable rudder stop. However, the drawings are a bit misleading. The differential between circle tow and glide position is less than 1/4 inch, which calls for a much smaller piece of spring. By the way, DuBro makes a couple of items which are perfect for this. Their threaded couplers for Kwik-Links are 2/56 thread and can be used stock by masking down on the hollow end to secure the rudder line. Their rigging couplers are even better... these are head-

less 2/56 screws with a .032 hole in them for attaching the line. I twang my magic twanger by plucking the taut line like a guitar, which is a better way of describing the action than merely "abruptly released." I have had no problems releasing doing it this way.

"Thanks for being the first in print with this ideal circular-tow system and letting the rest of the A/2 world know about it. Don Zink and Ken Bauer placed 1st and 2nd with this system at the Fresno Semis... look for use to spread now that the world's out."

Stev Helmick suggests: "With your swinging lever arrangement, I suggest that you make your forward lever stop adjustable, so you can crank in a slight

forward slant of the lever and that way get a zoom rudder effect as the glider comes up on the top of the line. For timer and plunger release system, I'd suggest using a heavy monofilament pin such as Jim Walters uses."

"Hatshek (who bills himself as the world's leading expert on flawed tow-hook systems): "The hook must have a forward stop for two reasons. First, as presented, all forward pull on the system is applied directly to the rudder horn and adjusting screw. This is too much. Second, the hook must have a rearward rake angle so it doesn't come off the forward stop when the glider is kiting straight overhead (again, see sketch)." Bob passes along some other good points and food for thought, but these will be covered in future columns.

For right now, get out your December issue of Model Builder and turn to page 48. Using this sketch and the sketch included in this month's column, you should be able to modify your system so that the above-mentioned flaw can be corrected just in time for the upcoming contest season.

With all of the above, there is no space for a humor section this month... Hey... Who is the guy in Possum's Breath, Arkansas, who said, "Thank Heavens?" I heard that!

F/F Scale Continued from page 43

fuselage in red Japanese tissue and the wings and tail in white. I gave the fuselage four coats of clear dope, the wings only three, and the tail just two. I use nitrate dope exclusively... plasticized with tricresyl phosphate.

Now is the time to mix some paint for the Monocoupe. I use the smallest baby food jars available, since very little is needed. Mixing more paint than you need results in waste, and with the prices of everything nowadays, one can't afford to be wasteful. Another reason you don't need much paint is that Floquil covers very quickly. I start with 1/3 of a jar of uncut, clear nitrate dope. This is followed by the plasticizer, and thoroughly mixed. For the Monocoupe, I used Caboose Red, and Reefer White. I add about 1/3 to 1/2 of the bottle of caboose red into the dope and again mix thoroughly. I then thin the dope 50-50. For the white, I do the same thing, except I use at least 1/2 of the bottle of white, or just a bit more. Once again I strain the paint in preparation for spraying.

I first painted the wings and tail white, making certain that I have an even coat on each of the surfaces, and that's all. No more spraying is required on these surfaces. If you lay the paint on too heavy, you will get pin holes, since the tissue's pores usually are not filled with just a few coats of dope. The fuselage was painted red in the same manner. After the wings and tail were thoroughly dry, I masked them off

where I wanted the red trim. I use drafting tape for this purpose, since it doesn't have as much adhesion as regular masking tape. With this tape you don't have to worry about tearing the tissue covering. The edges of the tape are sealed with clear dope to prevent the color from slipping under the tape and giving a rough edge. A light, even coat of red was given to the leading edges of the flying surfaces. Immediately after spraying, I remove all of the masking very carefully . . . the paint sets-up quickly. The contrast between the two lightly painted surfaces of red and white make a pleasing sight.

After the model was completely assembled, the decals were put into the proper place with the aid of Walther's Solva-Set. This solution softens the decal and makes it snuggle over every little nook and cranny. When the decals have completely dried, I spray them with Testor's Dull Cote, which eliminates the high gloss, blending them in with the rest of the finish. The overall weight increase is so slight that there will be virtually no penalty involved for finishing your model this way, and still it has the transparent look that gives rubber models such character. It also beats cutting tissue paper for trimming purposes!

On gas models (even on my R/C jobs), I still prefer to use Floquil. It isn't fuel-proof, but since I use nothing but diesels anyway, I don't have to worry about fuel-proofing. If you use glow, then finish with clear Hobbypoxy. It isn't that much of a hassle, and there is no appreciable weight gain from this technique. Depending on the color of the model, I mix basically the same way as before, except perhaps I may use all of the bottle of Floquil in a lesser quantity of dope. This way I'm getting excellent coverage with little weight increase. Light colors, such as Reefer Yellow, do not cover as well as some of the darker colors, so I use more pigment in the dope. I also apply more coats of paint on a gas model.

Another use I have for Floquil involves the bright silver, again in the clear dope. I use this mixture instead of clear doping after water shrinking the tissue. This has a couple of advantages. One, it is an ideal base for a model that is going to be silver as the finish color, and two, silver makes an ideal base for any color, since flaws are quickly seen and can be corrected prior to the finish color. Aluminum powder in clear dope works the same way as well, and can be picked up in art supply or Standard Brand Paint stores.

As I've stated before, I can't say enough good things about Floquil . . . you'll have to give it a try if you haven't already done so. I think that you will be highly satisfied with the end results.

* * *

Now here is another approach to

DO THE HOBBYPOXY TWO-STEP

The easy way to a "Standoff Finish"*

- 1.** Brush on a coat of Hobbypoxy color.
- 2.** Brush on another coat of Hobbypoxy color.

Okay, okay, it's not really that simple, but almost! You should sand the balsa before step one, then let the paint dry thoroughly and sand it before step two. Will you settle for the Hobbypoxy four-step?

Seriously, this method will give you a tougher, more flexible, more fuel proof, super-shinier finish than a half-dozen coats of dope will. Cheaper and quicker, too. It's ideal for the weekend flyer who's in a hurry to get in the air, and will have his dope-happy buddies eating their hearts out.

** For best results, view from two feet away. For an even better finish, add another coat or two. For a perfect finish, send for our free booklet, "Hobbypoxy Painting Pointers". Ask for our latest color card, too!*

HOBBYPOXY PRODUCTS

A Division of Pettit Paint Co., Inc.
10 Pine Street, Rockaway, N.J. 07866

finishing a rubber model, as used by George James. George uses a dye called Dr. Martin dye. This company has something like 115 different colors available, and these can be mixed to make countless other shades. George first covers his models with white tissue. He water shrinks with an airbrush, to mist it on. He pins down the structure to dry, and hastens drying by blowing cool air over the structure, using the airbrush. Once the tissue has dried and become taut, Dr. Martin dye is sprayed on lightly, building it up to whatever color intensity is desired. Clear doping is next, once the dye has dried.

Interestingly, spraying scarlet over yellow tissue gives an orange color, blue over yellow gives green, and so on. If

the dye is diluted instead of being used full strength, pastel colors are possible. The dyes are not cheap, but they go a long way. This method is mainly for rubber models, since the finish is transparent . . . typical of this type model.

Several months ago, in MB's "Over the Counter" column, there appeared a brief article regarding a plan and a brochure which is available on the Heath Baby Bullet. Along with these items, vacuum-formed parts for the cowl sections and an epoxy cast engine were also available. I gave this bit of information only a parting glance and promptly forgot about it. Then I got this packet of goodies in the mail, and couldn't believe what I saw! First, there were these drawings for a 1-1/2 inch

R / C ELECTRIC FLIGHT SYSTEMS*

*Patent Pending

from 

ASTRO FLIGHT INC.
PIONEERS IN SILENT FLIGHT
13377 Beach Avenue
Venice, California 90291

3 CHANNEL SPORT TRAINER
3-CHANNEL
SPAN 60" AREA 800 SQ. IN. FLYING WT. 3 LBS.
ALL BALSA
DESIGNED FOR ASTRO 25
BUSHMASTER \$39.95



ELECTRA TWIN
\$119.95
Span — 72" Area — 780 Sq. In. Flying Wt. — 7-9 Lbs.
4 Channel Radio
Fiberglass Fuselage — Balsa Wing Sport Flyer — Astro 15 Twin
A/B Pattern — Astro 25 Twin



FOURNIER RF/4 \$34.95
3 CHANNEL R/C
SPAN — 76" AREA — 600 SQ. IN. FLYING WT. — 60 Oz. w/Astro 15
Scale Electric Powered Sailplane
All Balsa / Spruce Construction
DESIGNED FOR ASTRO 15 ELECTRIC OR 15 GLOW MOTORS



2 CHANNEL SPORT TRAINER
DESIGNED FOR ASTRO 5 - 10 MOTORS
\$22.95
ALL BALSA
Span — 45" Area — 350 Sq. In. Flying Wt. — 34 - 44 oz.
ELECTRA-FLI



PARTENAVIA P-68 VICTOR
All Balsa
Designed for Astro 05 Twin
4 CHANNEL R/C
\$49.95
Span — 49" Area — 390 Sq. In. Weight — 56 Oz.



FOR ASTRO 005, 3 AND MARINE 10 INDICATED CONDITION OF BATTERY AND AUTOMATICALLY TERMINATES CHARGE
RAPID CHARGER
\$24.95



CHARGES ALL ELECTRIC SYSTEMS AS WELL AS TRANSMITTER AND RECEIVER COMPONENTS FOR TRANSMITTER AND PROPS
FOR ASTRO 10, 15, & 25
FIELD CHARGER
\$38.00



12V BATTERY CHARGER
\$8.95
CARRY THIS MINI CHARGER IN YOUR FIELD BOX. DON'T BE CAUGHT WITH A DEAD BATTERY.



NEW R/C SYSTEM ANALYZER — RAPID CHARGER
R/C SYSTEM ANALYZER—RAPID CHARGER
\$38.00 retail



ASTRO-5 (Astro Pup) \$39.95
ASTRO-10 \$69.95
ASTRO-25 \$99.95
ASTRO 15 \$84.95
ASTRO-020 \$19.95 F.F.
ASTRO-020 \$22.95 R.C.
BATTERY INCLUDED



NEW MARINE SYSTEMS
ASTRO \$10.95
ASTRO 10 \$32.95
ASTRO 15 \$32.95
ASTRO 25 \$44.95
SYSTEMS \$27.95
\$59.95
\$84.95
\$99.95
Shown Above in Dumas SK20



This is the answer to your battery problems. Two years of development by the company that knows batteries best — Astro Flight — has resulted in a great little unit that will:

- Charge your receiver in 15 minutes.
- Charge your transmitter batteries in 15 min.
- Test for a high resistance cell in two min.
- Test for a shorted cell.
- Indicate the capacity remaining after a day's flying in 10 minutes.
- Measure the capacity of a fully charged battery in 10 minutes.

This unit tells you what you have and allows you to do something about it at the field, not after you get home. This unit obviates the need for battery discharge units, expanded scale voltmeter and quick chargers.

SPECIAL TWIN PACKS

ASTRO-02	\$ 30.00
ASTRO- 5	\$ 50.00
ASTRO-15	\$115.00
ASTRO-25	\$150.00

R / C SAILPLANES AND ACCESSORIES

AS - W15
High Performance — Std. Class
Slope or Thermal
RUGGED ONE PIECE PLASTIC FUSELAGE IN RED, WHITE, BLUE, GREEN, YELLOW, ORANGE
\$54.95
2 CHANNEL R/C Span — 100" Area — 650 Sq. In. Flying Wt. — 38 Oz.



AS - W17 \$79.95
Scale Beauty
Outstanding Performance
2-3 CHANNEL R/C
BEAUTIFUL WHITE GEL COATED FIBERGLASS FUSELAGE
SPAN — 132" AREA — 950 Sq. In. Flying Wt. — 60 Oz.



MALIBU
Holds Closed Course World Record of 189 Miles
Thermal and Slope Soarer
ALL BALSA CONSTRUCTION
\$25.95
SPAN — 76 Inches AREA — 450 Sq. In. Flying Wt. — 25 Oz.
2 Channel R/C



MONTEREY
Perfect Thermal Trainer and Good Competition Plane
ALL BALSA SPRUCE CONSTRUCTION
\$34.95
2 CHANNEL R / C
SPAN — 100" AREA — 600 Sq. In. FLYING WT. — 30 Oz.



Stake, line, reel, parachute, all hardware included. Std. Hi-start, 100 ft. Surgical Tubing — \$29.95. Astro Start — for big planes — 100 ft. Bungee — \$34.95



STANDOFF SCALE MESSERSCHMITT Bf 109 E PRIDE OF GERMAN LUFTWAFFE

WING SPAN 64"
WING AREA 660 SQ.
LENGTH 54 1/2"
WEIGHT 6 1/2-7 LBS.
ENGINE .56 to .71
RADIO 4-6 CHANNEL



\$79.95

MOLDED FIBERGLASS FUSELAGE WITH INTEGRAL FIN. FIREWALL INSTALLED, FOAM CORES, MOLDED CANOPY & EXHAUST STACKS, DECALS, ACCURATE 3 VIEW DWG. OF ME 109 E INCLUDING COCKPIT DETAIL, SCALE ROBART GEAR STRUTS, NO Balsa WOOD INCLUDED.

GAS MODEL PRODUCTS

110 VALLEY VIEW

SOUTHGATE KENTUCKY 41071

KWIK SET 6 MINUTE EPOXY



\$5.95

A TWO PART, TWO COLOR FOR EASY MIXING EPOXY ESPECIALLY FORMULATED FOR MODEL CONSTRUCTION. GRADUAL CURING, AVAILABLE IN EASY TO USE POLY BOTTLES. 12 OZ.

DISTRIBUTORS
FOR
MICRON
Multi-Cylinder Engines
SPAN AERO
FLITE GLASS MODELS
HOBBY HOUSE

DEALER
INQUIRIES INVITED.

scale F/F model of the Heath. They are magnificent! The model can be built as rubber, gas, or electric powered, with each different configuration shown on the drawings. The brochure has more pictures of the Heath Baby Bullet than most people have ever seen. Included are beautiful 3-views, as well as a copy of the original constructional drawings as they first appeared in "Modern Mechanics/Flying Manual." As an added bonus, there is an 8 x 10 glossy print of the Baby Bullet. The packet also has a complete set of instructions, a page of templates so that the plan doesn't have to be cut up, and there are decals for all of the numbers and letters, plus a copy of the instrument panel which is to be used on the model.

Gene Thomas, the guiding light of this outstanding enterprise, feels that what he has to offer is a package from which a modeler can build a complete scale model, then use the brochure as his scale documentation. Believe me, the work is first rate. I got so excited about it that I completely framed the fuselage in one afternoon. I plan to have it ready for a contest in March, and I'm building the power version, using a Cox Pee Wee. I'll have some pictures of this little jewel as soon as I get it finished. Gene also has several other scale models that he is presently working on, and they will each be available in different scales, from peanut size on up to R/C. The Heath is available in peanut as well. It would be worth your while to drop Gene a line and ask him for a listing of what he does have available . . . you won't regret it! His address is, Thomas Studio, 16 Scott Dr., Huntington Sta., Long Island, N.Y. 11746.

In closing, I want to thank all of you who have taken the time and have written your favorable comments regarding this column and magazine. I appreciate the ideas you are giving me for future articles. Also, for those of you who are planning to respond to the F/F scale organization issue, and haven't yet done so, please do so as soon as you can. Send them either to MB, or to me

OLD-TIMER R/C SCALED FOR .049 - .15 POWER

"Small enough for a schoolyard - large enough to compete."

Authentic Scaling
Full Size Detailed Plans
Machine Cut Parts
Selected Balsa & Hardwood
Meets S.A.M. Rules

1935 "MISS AMERICA"
48 in. Span
310 sq. in.
30 oz. - 3 chan.

\$27.95

Dealer/Distributor inquiries invited.
Mail orders: Add 10% for postage & handling
Calif residents add 6% sales tax

at the following address: 19361 S. Mesa Dr., Villa Park, Ca. 92667.

Plug Sparks . . . Continued from page 23 IGNITION CONVERSION

With all the mention this column has made of engines available, it took a phone call from Otto Bernhardt to remind the writer of this excellent source of O.S. ignition converted engines. Otto has a complete selection of O.S. engines ranging from .15 cu. in. to .40 size. Most all prices are in the \$40 range, with exception of the .40 Schneurle conversion offered . . . at \$85.00. Before you fall off your chair, the 40 includes a beautiful custom exhaust, unique chrome tank, and racing spark plug. Not sold separately!

Called the 77 Products Co., located at 17119 So. Harvard Blvd., Gardena, Ca., 90247 (you can call at 213-329-4863), many ignition items are offered, such as coils, one hour dethermalizer timers, clockwork ignition timers, etc.

The latest item received is the shielded spark plug lead which has been so successfully employed in Larry Clark's Miss America, using a Futaba radio. Otto is interested in developing a line of ignition equipment (shielded of course!) for O/T R/C enthusiasts, and needs to know if there is a sufficient market. The only solution for that is to write, fellows! Lettun know you are interested!

In addition to the standard line of converted O.S. engines offered by 77 Products, a custom ignition conversion service is offered, which embraces just about any motor from Cox to Torpedo. The general conversion price is in the 30 to 40 dollar range, so if interested, write to Otto describing, the particular motor you want converted.

OLD TIMER KITS

If there is anything this columnist has been queried about, it is the availability of old timer kits. Of course, the original kits that are left are collectors items, and are priced accordingly. This column has also mentioned that Chuck Gill Distributors offers the Powerhouse and Coronet kits, while Tyro Models is producing the Playboy.

In the new reduced scale models, Cal-Aero offers the 50 inch span Powerhouse, while Sam Blumberg, of Micro-Models, is now producing the Mercury and Miss America R/C kits for .09 to .15 engines.

However, the biggest producer, P & W, seems to have been mentioned once and then only in the dim past. Gene Wallock (the W of P & W) offers partial kits of the Megow Ranger, Aircraft So Long, Comet Clipper MKI, Megow Kor-da, Taibi Powerhouse, Comet Sailplane, Cleveland Playboy Jr. and Playboy Sr., and the 1939 Comet, Zipper. The MKI Clipper and Skyrocket B (Shulman) are

A Note From Jef's Friends

In our last ad Jef's Friends publicly challenged Radio Control Modeler Magazine to actually test the Western Wind - our all cardboard sailplane.

The Challenge was necessary because RCM had published a misleading "review of the Western Wind without even trying it!"

RCM never took up the challenge. If they had we know what would have happened. For here's what happened when Taylor Collins flew the Western Wind for a review in the January 1976 issue of Model Builder. In a very complete article he said, "Since the ship is ... very inexpensive, a beginner can throw it off the cliff without being terrified." "Your total cash outlay to complete the Western Wind, other than for the radio, will not exceed \$4.00." "Construction is easily completed in two to three hours." "The rudder is quite responsive. Elevator response is adequate for normal flying and can be reduced for training purposes." "You will probably never break one." "The Western Wind is tough."

In R/C Sportsman Dr. Larry Fogel commented, "I can testify that this cardboard creation really flies," and he cited its durability too.



The Western Wind has proved itself and we're glad that we can now devote our efforts to supplying flyers with good airplanes. Western Winds are stocked by many dealers (and distributors) but if not locally available you can order direct from Jef's Friends, Box 511, Brisbane, CA 94005. Send \$12.95 plus \$1.25 for shipping. California residents add 6% sales tax (\$.85).

being discontinued for lack of interest. All kits have been "proofed", that is models have been built directly from the parts. The kits offer all wing and stab ribs, fully notched, and cut long to allow for trailing edge notching technique. While gusset joints (such as dihedral, rib, etc) are not furnished, formers and outline parts are included along with the plywood firewalls. These kits are extremely accurate and cut from Grade AA wood. No junk here!

For prices and catalog, write to Gene at P & W Model Service, P.O. Box 925, Monrovia, Calif. 91016. You won't be sorry! (To further clarify, P & W kits do not include strip and sheet stock,

 <p>MINI GLUE TIPS MAKES ANY GLUE TUBE AN "INSTANT GLUE GUN". PUT THE GLUE WHERE YOU WANT IT! ● Seal with a tip ● No fumes to fill ● No mess to clean. 4 for 99¢</p>	 <p>TEE BAR ALUMINUM EXTRUSION SANDING BLOCK for use with RUFF STUFF "Self adhesive sandpaper" NEW ● Large True Surface ● Won't Wear Out 11 inch - \$1.69 ● Handy to Use 22 inch - \$2.89</p>
 <p>RUFF STUFF "SELF ADHESIVE SHEET SANDPAPER" MAKE YOUR OWN SPECIAL SANDING SHAPES ● Adheres to most Materials ● Easy to film ● No messy glue, or drying time 39¢</p>	 <p>MINI SANDER ADJUSTABLE TENSION HAND BELT SANDER FIRMLY HOLDS PAPER FOR EASIER SANDING ● Padded Palm and curves ● Handy to Hold ● Easy to Use \$1.39</p>
<p>ADIC APPLIED DESIGN CORPORATION 1631 SHOREVIEW DRIVE PALOS VERDES PENINSULA, CA 90275</p>	

nor do they include plans. These items must be obtained separately. wcn)

SAD NEWS

Seems as though it was just yesterday when we were talking to Joe Dodson, former Hampton Roads Brainbuster, at Lake Charles, during the Old Timer Events. Although Joe was coughing badly we didn't think it was serious.

Just received a note from Carl Bryan (another Brainbuster), announcing Joe's death on December 4. Truly a shame, as Joe wasn't even retirement age yet. Joe was a good modeler and an even more ardent competitor. We're gonna miss that boy around here!

SATELLITE CITY

If you are still looking for those .020 Replica kits put out by Cal Aero, you'd better write to Bob "Hot Stuff" Hunter, as he has taken over the sales of the remaining kits. Not too many left!

EASY R/C CONVERSION

While we have been talking at length about converting glow engines to ignition a rather interesting development came to light the other day while bench running engines with Tom Bristol and Bob Von Konsky.

Tom had a Spitfire he wanted to try with R/C but had no immediate means of installing a throttle. So a jury rig was made up consisting of a length of nylon tubing to fit over the existing intake of the Spitfire, while in the other end a Perry carburetor was mounted. Despite the length of the tubing (1 to 1-1/2 inches long), the engine drew fuel excellently and idled beautifully.

Further tests also indicate this is an excellent way of avoiding the close fit engendered by the sloping intake and the clearance to the propeller. In this case, the tubing can be lashed to the cylinder fins with no apparent damage. So what if it does deteriorate in time ... the tubing replacement is simple! Try one and you will be pleasantly surprised at the simplicity of installation and excellent throttle response gained.

BROWN JR. MOTORS

Since Herb Wahl embarked on producing the 40th Anniversary Brown Jr. motor, many people had the mistaken

idea that Herb would not be able to handle repairs and parts of old Brown Jr. motors needing resuscitation. Nothing could be farther from the truth. Herb is not only producing 375 of the 40th Anniversary Browns, but is also providing an ignition engine service, has Hurlman engines and parts, does Brown Jr. overhauls, parts, and service, and writes a few letters in his spare time, to wit:

"This 40th Anniversary Motor project has turned out to be a lot more work than I figured. There are 361 operations required on each engine! Can't count the hours on each engine, as I am busy from 9 a.m. to midnight, seven days a week. Every engine is a challenge in itself, and I learn as I go ... with internal variances and improvements as I proceed. I'm three months behind planned schedule but can hold it there.

"Probably the biggest and happiest surprise is that each and every engine to date has started like a dream. Using no starter and opening the needle valve a couple of turns, I prime it and in three to four flips the engine starts. It's unbelievable! Occasionally, there are internal problems, but when disassembled and cleared, no more trouble.

"I believe I'll make 400 engines, as orders total 356 now, with many international money transactions pending. When all is done, a list of all will be given, together with the total actually made.

"My planned schedule stretches to July 75 (the author just received his in January, No. 074), and will probably end in August or September. At that time, I will probably make a few more .48 Hurlman engines, and probably 12 to 15 more Twin Hurlmans with the improved crankshaft. Then I will start my 1977 project."

Herb concludes by saying he has had about a dozen letters from distributors (mostly abroad) wanting to carry his products. However, based on the response to the 40th Anniversary Brown Jr., the magic number for sales seems to fall in the 300 to 400 mark. There simply does not seem to be enough for a

SURVEYS SHOW
"HOT STUFF" **USERS MAKE**
BETTER
LOVERS!!
THEY, DON'T HAVE TO:
STAY IN THE BUILDING ROOM ALL NIGHT!!

product line.

It is the columnist's opinion that in this case, price has ruled out large sales. However, you get what you pay for, and in this case, there is no substitute for quality.

SCAMPS OLD RULER

Just received the latest contest schedule put out by the SCAMPS. They are staging their usual number of contests, but this year have added a new twist.

For 1976, all contests sponsored by the SCAMPS will have old timer gas events run under the "old ruler" concept. This means any spark engined model that meets the 8 ounce per sq. ft., 80 oz. per cu. in. of motor, and meets the L²/100 cross-section rule, can be flown in its appropriate class.

Wow! Anyone for pencil bombers? With those high pylons, they do make the cross-section!

SKI RIGS ANYONE?

Well, if you are still in the snow, the most recent "Spot Shots," edited by Randy Carman, gives the latest scoop on how to very simple convert your old timer to snow ski flying.

Howard Carman (hubby) sez here is a way to convert your old timer (or any tail dragger) without having to modify the model, use pins, belts, hooks, or rubber bands.

As can be seen from the sketch, a ski mold is made from any type of wood block sized 1-1/2 x 2 x 12 inches long. Cut apart as shown on a band saw. Using two pieces of 1/32 plywood, 2 inches wide by 12 inches long, coat one side of one piece with five minute epoxy. Now stick the two pieces together, cover with Saran wrap, and quickly clamp in the mold. You can make the second one five minutes later.

Now, make the upright pieces from 1/2 to 5/8 inch plywood. Epoxy to the skis. The axle hole on the upright can be the same distance from the skis as the radius of the wheels you are replacing. If the propeller clearance is not a problem, you can shorten the distance.

Make two springs, one right and one left hand from 1/16 spring steel (music

- Antique F.F.
- Coupe d'Hiver
- R/C Scale
- Sport

**AVRO-BLERIOT-
CAUDRON-PT-1-
LINCOLN BEACHEY**



R/N

Models

P.O. BOX 2527
LANCASTER, CA. 93534

Distributor Inquiries Invited

wire) and purchase two nylon nose wheel steering arms. The assembly is then slipped on the axle. Secure with a wheel collar. Then adjust the steering arm to hold the skis at approximately 10 degrees (positive) to the model.

If that doesn't sound like fun, and easy at that, the writer is going to eat another hat! (*Looks as though Howard saw Pete Waters' article on making skis, in our Dec. 1974 issue. wcn*)

FLORIDA FLASHES

Hadn't heard from Jim Kloth since the Lake Charles Nationals. Small wonder, as he reports that he was slapped into a hospital as a result of a heart attack. While under care, he did a lot of investigating to find out why Florida O.T. modeling activity is at such an all-time low (?). The only bright spot has been the advent of Jack Bolton in Pensacola.

Having built a lot of models for KOI, Gil Cochrane and Bill Kirby have insisted on doing the retrieving for Jim! Great stuff! On his end of things, Kloth expects to take over the Florida Newsletter and get the word out. He hopes to pattern it after Brickner's "Flight Plug."

So Florida fans take heart. Jim sez there will be elections for new officers to plan out future activities. What is needed are active officers and most of

PROTECT YOUR INVESTMENT WITH **FLIGHT LITE**



SHOWN ACTUAL SIZE

THE ON BOARD BATTERY MONITOR LIGHT THAT GOES OUT WHEN 10-20 MINUTES OF SAFE CHARGE REMAINS.

- DOES NOT FADE OUT
- SNAPS IN 1/4" HOLE
- DETECTS BAD CELLS
- PILOT LIGHT
- GUARANTEED

48+ NIBAO **6.95**
AS SHOWN

With Kraft Type or Duesen Conn. **9.95**
DELUXE

SEE THE LIGHT!

CAN YOU AFFORD NOT TO?



ADVANCED DEVICES INC.
P.O. BOX 152 ROCKVILLE, MD 20850
SHIPPED VIA 1ST CLASS MAIL

Dealers Invited

all, a good field (who doesn't these days?). One thing for sure, Jim is going to hit up the Navy again. Maybe we can get some influence from Jack Bolton.

Kloth reminds the columnist that Dayton is the scene of the 1976 AMA Nationals, the Old Timer Championships, the Annual MECA Collectogether, and the Air Force Museum. Really makes it worth your time to go as a spectator!

BEER DRINKERS FOREVER!

The columnist has been ragged for years about his penchant for beer, particularly on a flying field where the heat and dust seem to accelerate the need for a libation. We (the beer drinkers) always knew there was an excellent reason for indulging but this has now been proven to be a fact!

Next month we will feature compressed air tank construction by Bert Pond, who utilizes aluminum beer cans to make excellent air tanks. These really work and are actually lighter than the brass tanks being used now.

That'll teach you skeptics the value of beer drinking. Haw!

Seasquare . . . Continued from page 11

Pin down over the plan (wax paper first) the bottom leading and trailing-edge sheeting. Mark the rib locations on the sheeting and lightly draw lines at

WACO S.R.E.

**RADIO CONTROL
MODEL**

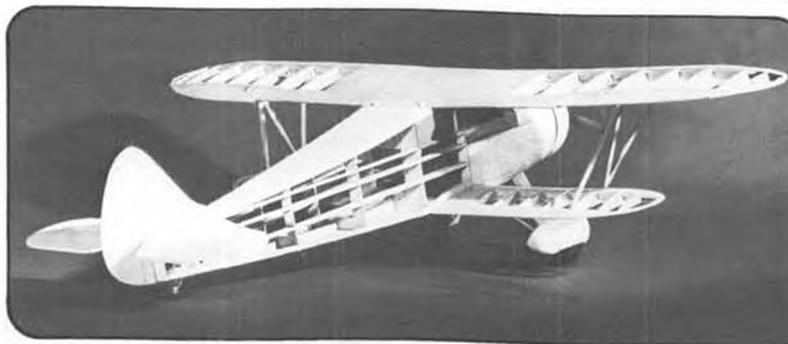


64.95

KIT FS-34

SPAN: 56 1/2" LENGTH: 45 3/32" ENGINE: .40 to .60 SCALE: 1 5/8" = 1 FT.

Its hard to find words to describe the breathtaking beauty and great flight performance of this graceful and beautiful cabin bi-plane of the "Golden Thirties". If you're an R/C flyer, whether Sport or Scale, then you are bound to fall in love with this magnificent aircraft. Beautifully engineered for ease of assembly and long-lasting ruggedness: the Waco S.R.E. has loads of room for R/C equipment and scale detail, (it can also be built for control line). It's truly a joy to fly and likewise just to look at, whether on the ground or in the air. The kit's a real dandy too . . . top grade-density selected balsa, sanded to micrometer tolerance. Die cut & numbered parts make assembly swift and sure as you follow the detailed step-by-step plans and instructions that cover every phase of construction. Formed Landing Gear, Alum. Engine Mounts, Giant Scale Decals, Linkage Hardware includes Pushrods, Aileron & Elevator Horns, Bellcranks, Clevis, Connectors, etc. . . also Plastic Cowl with molded-in-place dummy engine cylinder, Wheel Pants, and much more . . .



Magnificent-Framed or Finished-Flies Like A Dream



STERLING MODELS • 3620 'G' ST. PHILA, PA. 19134
 If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (60¢ minimum in U.S., \$1.25 minimum outside U.S.)

- Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories, etc. 50¢ enclosed.
 - "Secrets of Model Airplane Building". Including design, construction covering, finishing, flying, adjusting, control systems, etc. 25¢ enclosed.
 - "Secrets of Control Line and Carrier Flying". Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions 25¢ enclosed.
- No checks. Only U.S. money orders or currency accepted.

Name _____
 Address _____ City _____ State _____ Zip _____

2^{IN}1 Peanut Scale

EACH KIT MAKES 2 MODELS



KIT P1 BUILDS
S.E. 5A & FOKKER D-8

KIT P2 BUILDS
MONOCOUCPE & CITABRIA

KIT P3 BUILDS WACO S.R.E.
& INTERSTATE CADET

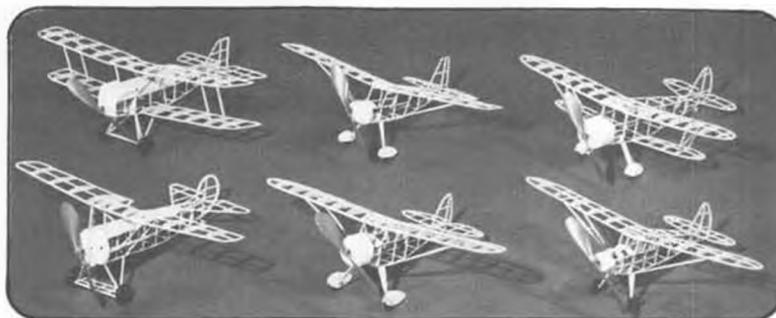
3.95

RUBBER POWERED *FLYING* SCALE MODELS OF REAL AIRCRAFT

Peanut Scale models are rubber powered flying models scaled from real aircraft. Span is strictly limited to 13" and they may be flown indoors or outdoors. Sterling "Peanuts" are fun to build and fun to fly. Designed by experts, they are remarkably realistic in appearance and are great flyers. All material required is in the kit for models except glue & dope (paint). In addition you need pliers, straight pins, hammer, tweezers, single edge razor blade, flat building board, Saran Wrap (or similar).

Balsa and Tissue Construction.

Parts printed on fine quality balsa wood, density selected and sanded to micrometer tolerance. Strip Balsa, Colored Tissue, Scale Decals, Wheels, Propellers, Fittings, Contest grade Rubber Loops, Light-Strong Detailed Scale Plastic Parts—Clear—easy to follow step-by-step drawings and instructions—both models are fine flyers if built according to plan.



Frame Photo Reveals Simple-Rugged Construction.

RUBBER MOTOR WINDER



A MUST FOR RUBBER POWER MODELERS

2.95

Molded of tough virgin Nylon this five to one ratio winder is a must for long flights and competition endurance. Compact and efficient, the Sterling Winder is just perfect for models using up to three loops (6 strands) rubber motor.



TWENTY-SECOND ANNUAL TOLEDO RADIO CONTROL EXPOSITION

TOLEDO SPORTS
ARENA
ONE MAIN STREET
TOLEDO, OHIO

**APRIL
2, 3 & 4, 1976**

FRIDAY - 9 AM TO 6 PM
SATURDAY - 9 AM TO 6 PM
SUNDAY - 9 AM TO 3:30 PM

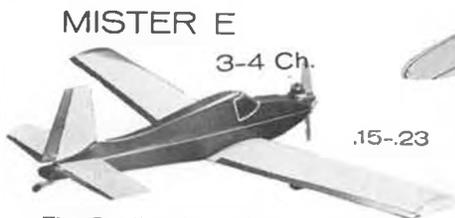
UNQUESTIONABLY,
THE WORLD'S
GREATEST RADIO
CONTROL SHOW!

OPEN TO
PUBLIC ALL
THREE DAYS



PRESENTED BY
**WEAK SIGNALS
R/C CLUB**
PO BOX 5772
TOLEDO OHIO
43613

Champagne Flying on a Beer Budget



MISTER E
3-4 Ch.

.15-.23

The Gentle Intro to Multi. All die cut, formed gear, aileron material
Another easy-to-build kit \$29.95

See your dealer or order direct.



CHICKEN HAWK

34/25"

O49

1-2 Ch. All die cut parts, formed dural gear. Simple Construction. Proven Performer \$15.95

Special Edition Plans

P O Box 7555, Schenectady, N. Y. 12309

each rib location to help align the ribs when they are installed. Add the bottom cap strips, center sheeting and lower main spar. Install the ribs (except the center ribs each side of the pylon), the top main spar, rear spar and sub-leading edge.

The bottom sheeting is glued to the curved bottom part of the ribs and the sub-leading edge with the aid of the curved pieces you saved (I hope) when you cut the ribs. Apply glue to the sheeting under the ribs and sub-leading edge, and then slide the curved scrap pieces under the sheeting *at* and *between* each rib location. This will lift the sheeting snugly against the bottom of the ribs. At this point, cut the central ribs to accept the dihedral braces. Trim the sub-leading edge and aft spar flush with the tops of the wing ribs and install the rear sections of the wing ribs including those at the center. Allow this much of the wing assembly to dry well before it is unpinned from the work surface.

Make the dihedral joint by pinning one half of the wing to your work surface, gluing the dihedral braces in place in both halves of the wing and allowing the assembly to dry with a block supporting the end of the wing which is not pinned down. Make sure the assembly is true at this point; don't build in any warps. When dry, add the 1/4 inch plywood center section of the motor pylon, using as a guide a block of scrap balsa cut to the dihedral angle. Add the center ribs and again let things dry. Before adding the top sheeting, dope or epoxy the inside the wing structure, including the inside of the top sheeting. The top sheeting, cap strips, tip block, and pylon faces complete the wing assembly. Don't forget to taper the trailing edge of the rear, top sheeting before it is installed. This is easily done using a razor plane.

The motor bearers are attached to the pylon by means of medium-hard balsa blocks cut as shown on the plan. These blocks are hollowed out to fit a round tank, or a flat tank may be used without hollowing. Clamp the motor bearers and attachment blocks together

while the glue is drying. The fairing at the aft end of the pylon behind the tank can be omitted or made as fancy as you desire. Its effect on flight characteristics will be very little.

TIP FLOATS

The tip floats are built upside down on your work surface. Pin down the 1/8 top former, and space the 1/16 mid-former above it, using 3/4 in. scrap blocks. Cut to length and install the vertical stringers and glue them in place in the top and mid-formers. When dry, add the half-former. Dope or epoxy (see directions for hull) the inside of the structure and one side of the sheet to be used for side covering, the plywood and balsa sheet bottom pieces. Apply 3-inch section of the side covering about half-way from front-to-back and on sides of the floats. Trim the remaining side covering to approximate size and install it. Finish, trim, and sand the rear bottom, then install the plywood aft-bottom. Rough out the balsa fore-bottom block. Now finish, trim, and sand the floats all over. The fore-bottom block is not rounded at its chine edges; leave the chines square in keeping with the overall square motif.

The floats are attached to the wing after the model has been covered. The floats may be glued permanently to the wings or attached with double sided adhesive material. Double sided tape was used on the original Seasquare and it works real well.

RUDDER AND STABILIZER

The remaining frame pieces and dorsal fin are added to the vertical fin, and a piece or two of flat stock pinned to the frame work to assure that the fin dries flat and true. Dope or epoxy the structure and the inside of the sheeting material. Add the sheeting with grain vertical. Add the doublers and blind nuts to the stabilizer saddle and then glue it to the vertical fin, checking carefully to see that it is at right angles with the vertical fin. When dry, add the triangular saddle supports and fair them at their leading and trailing edges.

The rudder and elevator are made from medium-soft balsa sheet. The

CONCEPT



The Kraft Systems engineering group pioneered the concept of digital proportional control and subsequently created the innovations responsible for the level of R/C performance accepted as standard today. It's not surprising, therefore, that the new Kraft line represents a major advance in the state of the art.

Additionally, because the new crystal filter I.F. receiver does not have to be tuned to its transmitter, complete interchangeability is obtained and component rather than system merchandising is made possible.

To utilize this advantage, components have been priced so that there is little price penalty in purchasing individual components over the system price. For convenience, components are individually packaged and the purchaser may select items to custom tailor a system to his preference.

Some of the features of our Bicentennial Series are shown here.

Triple use meter reads RF and transmitter battery voltage and also automatically converts to read receiver battery voltage. It has an electronically expanded scale for accuracy.

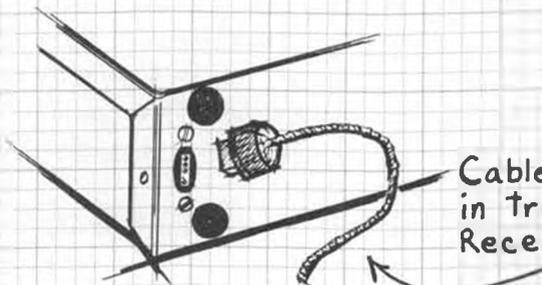
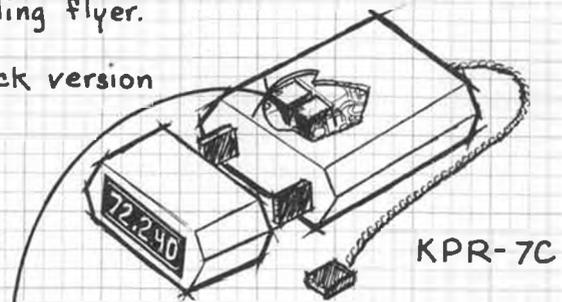
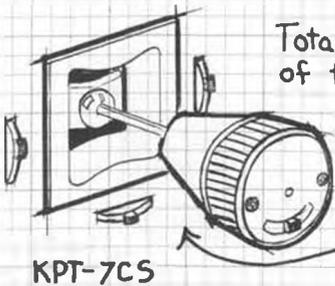
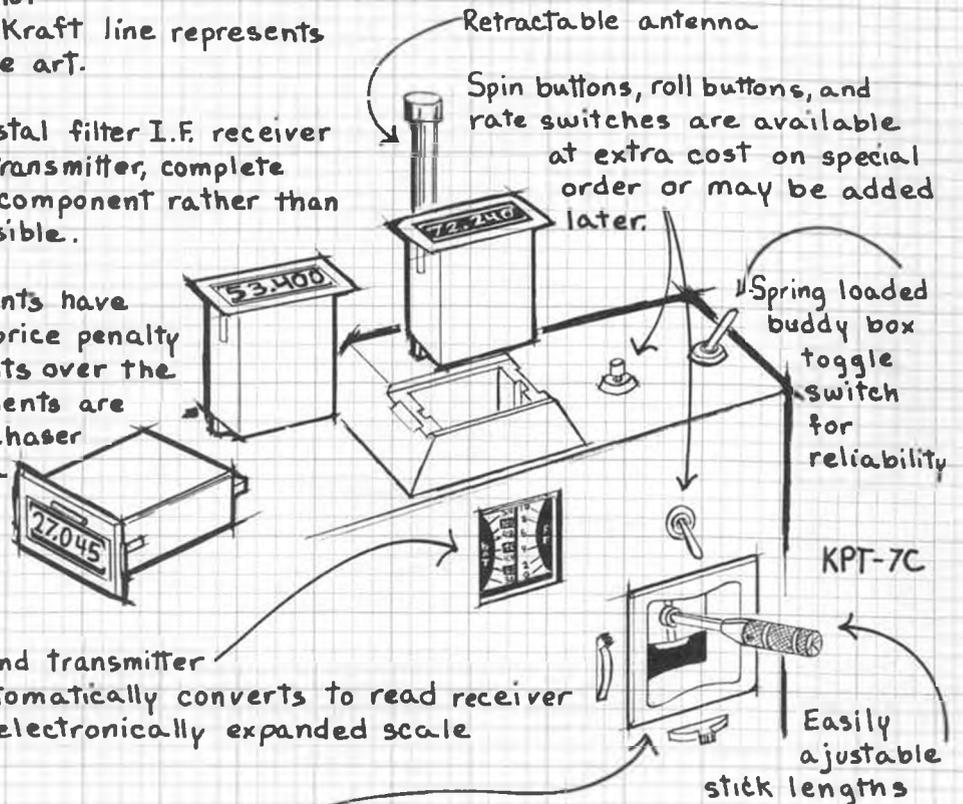
Totally new two-axis open gimbal stick assemblies are of the highest quality yet produced. This design eliminates any possibility of centering error and has excellent feel to satisfy the most demanding flyer.

A new open gimbal single stick version is available at no extra cost.

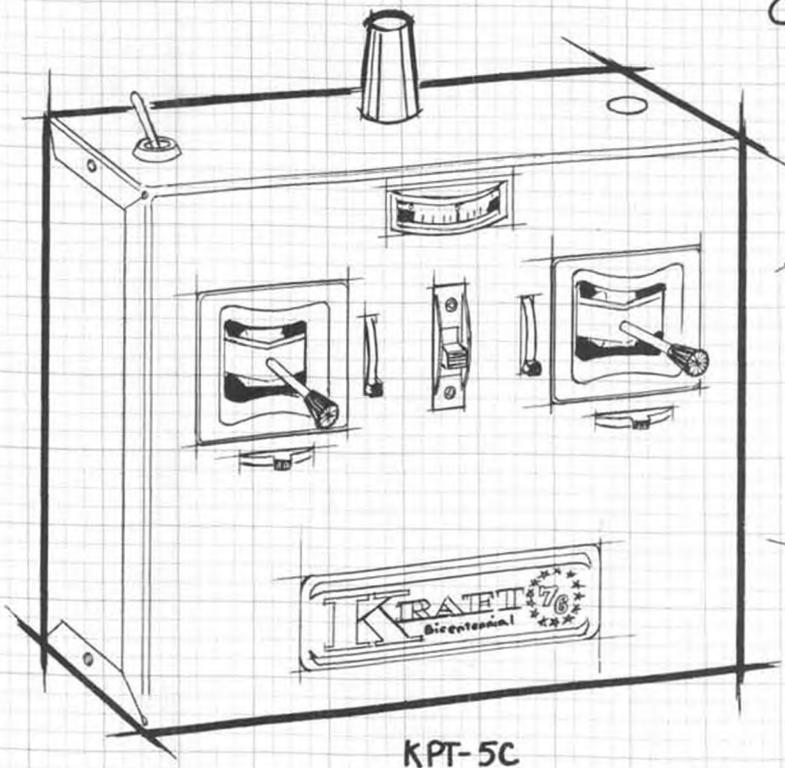
Plug-in transmitter and receiver modules provide instant change between the 17 standard R/C frequencies.

New solid state crystal filter I.F. receiver makes possible plug-in frequency modules and provides improved selectivity for better rejection of strong adjacent channel interference. An advanced design dual conversion plug-in receiver is available at extra cost.

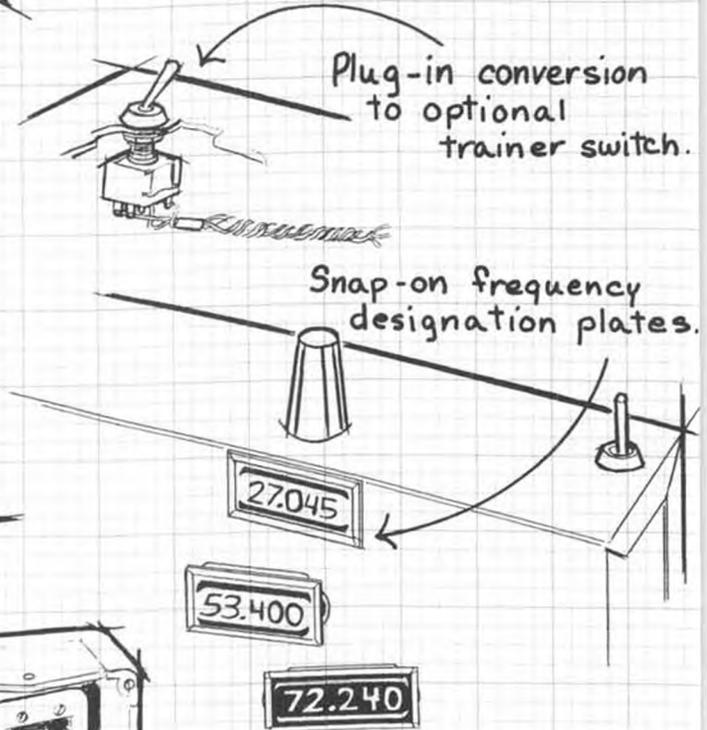
Cable interconnects battery test circuitry in transmitter to receiver charge jack. Receiver battery is tested under load.



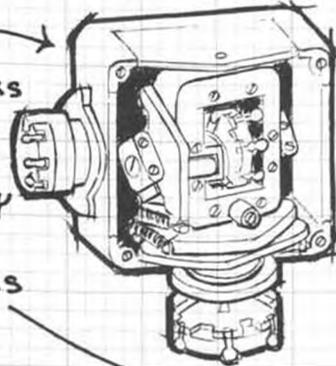
Contest performance and reliability at a moderate price. A superior replacement to our world famous KP-5 Sport Series.



KPT-5C

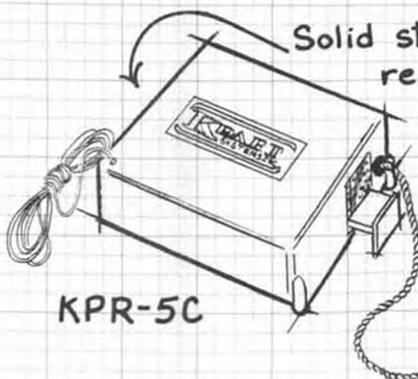


Super-precision open gimbal sticks as used for entire line. Wire-wound control potentiometers are used for superior linearity



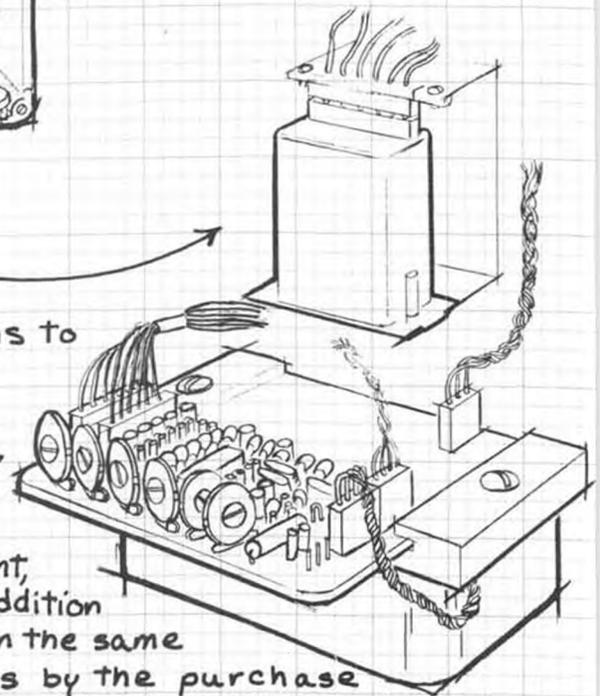
Plug-in transmitter R.F. modules are accessible by removing transmitter back.

All models feature plug-in modular encoders as well as R.F. sections to provide standardization for improved quality and faster service.



KPR-5C

Solid state crystal filter I.F. receiver eliminates the requirement for alignment, thereby permitting the addition of airborne packages on the same or different frequencies by the purchase of off-the-shelf receivers. While this receiver does not have the plug-in R.F. module, its price is sufficiently modest to permit the customer to add a different frequency receiver to his system for greater flexibility. The list price for the plug-in R.F. section for the transmitter combined with a new receiver is only \$74.90.



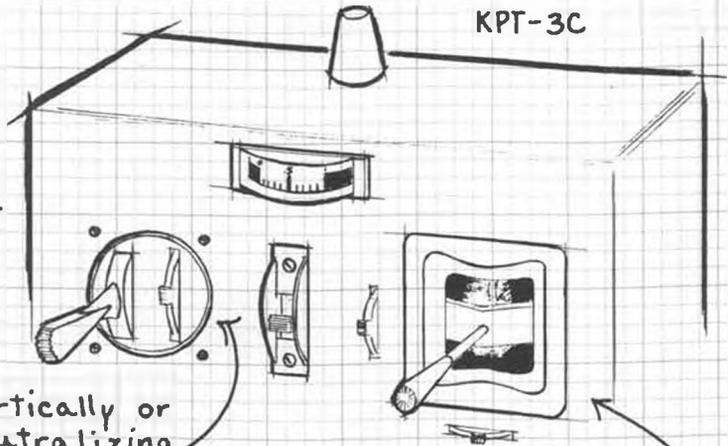
Note: If plug-in frequency conversion is desired with the KP-5C, the KPR-7C receiver may be substituted at a slight extra cost.

Our new 3 channel system offers greater utility than previous models because of the new control stick configuration.

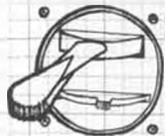
Despite price advantages, troublesome unreliable dry batteries have been eliminated and all systems now include rechargeable transmitter and receiver nickel cadmium packs with charger.

The transmitter has plug-in R.F. modules accessible by removing transmitter back.

The left-hand stick may be mounted vertically or horizontally and may be either self-neutralizing or positionable with brake. For glider enthusiasts this permits rudder on the left stick, with aileron and elevator on the right stick.



Super-precision open gimbal stick. Vertical axis may be self-neutralizing or positionable with fine tooth ratchet.

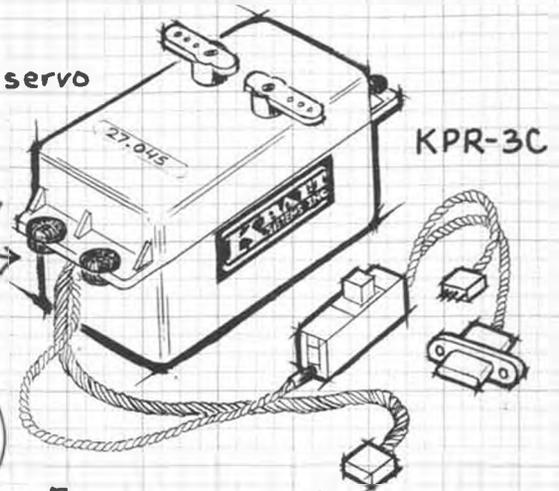


Stick configuration can be easily changed by owner.

Integrated circuit decoder and servo amplifiers are now standard.

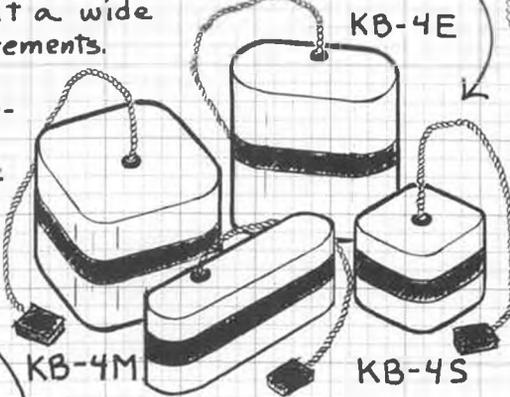
All new mechanics are smaller, stronger, and feature the rugged KPS-14II gear train.

Internal reversing plug matches channel output to desired control stick configuration.



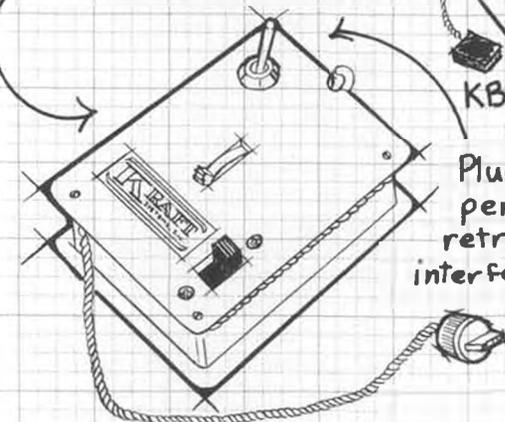
One 550 MAH battery pack and two compact, light weight 450 MAH battery packs are optionally available to suit a wide range of installation requirements.

For high current drain application, a 1,000 MAH heavy-duty pack is available at extra cost. KB-4F



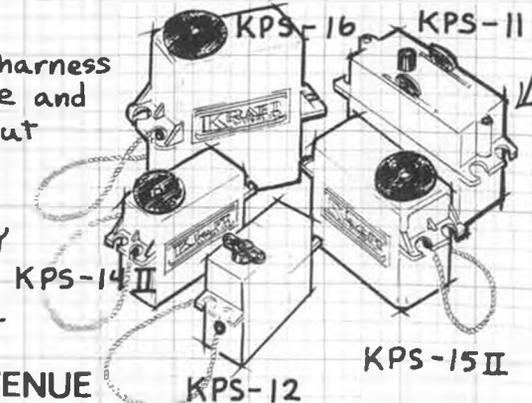
Four servo mechanics are optionally available to suit individual preference. All feature our exclusive integrated circuit servo amplifier for unequalled accuracy, smoothness, and efficiency. Special high torque and high speed servos are also available at extra cost.

DIRECT SERVO CONTROLLER



Plugs into charge jack of switch harness permitting operation of throttle and retractable landing gear without interfering with others or being interfered with.

An indispensable accessory for crowded flying fields



WRITE FOR FREE CATALOG

450 WEST CALIFORNIA AVENUE
P.O. BOX 1268 · VISTA, CALIFORNIA 92083



World's Largest Manufacturer of Proportional R/C Equipment

saloma

WING KIT for
SALOMA-DX
kit No. K1
\$24.95

Span 135.5 in.
Area 1140 sq. in.
Wing loading 8.3 oz./sq. ft.
Makes the SALOMA
a FLOATER

Airfoil JC-25-12
(very undercambered)
Polyfoetal 4 degrees to 10 degrees

Have a 1/16" slot 1/8" in diameter

Span 90.8 in.
Area 776 sq. in.
Wgt 47-48 oz.
Wing loading 8 oz./sq. ft.

kit No. S-1
\$44.95

If not at your Dealer, order direct
check money order, UPS C.O.D.
Prepaid orders shipped by air
(UPS BLUE LABEL) — Calif
residents add sales tax



FOAM WING
FOAM SKINS
FOAM TAILFEATHERS
ASA PLASTIC FUSELAGE

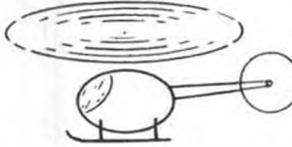
SUPER PERFORMANCE
SOARING TRANQUILITY
SERENE IN ITS EXCELLENCE
A BIRD OF PURPOSE

No other covering needed on the
hull, you may cover ORPESKIN
with any of the low loss thermes
skins covering. Various Solar
Film, Titebond, etc. covering
hull, rudder and fuselage covering
is compatible.

Dealer: Distributors inquiries invited.
Hull, fuselage, rudder
kit items

Send \$54 for catalog of
100 great items
Radio control
Control line
Free flight

HI JOHNSON MODEL PRODUCTS INC.
11916 Glenoaks Blvd., Pasadena, Ca. 91131
Phone #2131 999-4312



Day: 635-8147
A/C (318) Night: 861-2790

REPLACEMENT ROTOR BLADES
Jet Ranger

X-pert . . . \$11.50
Regular . . 10.50

GULF-SOUTH AERO MODELS
5603 WEST CANAL
SHREVEPORT, LA. 71108

WACO ATO • GULFHAWK IA • O-43A

**SCALE
PLANS**

by WESTBURG

30 x 40 DETAILED
BLACKLINE PRINTS

SEND S.A.S.E.
FOR COMPLETE
PRICE LIST

PETER WESTBURG
834 Seventh St. No. 6
Santa Monica, Calif. 90403

DAVIS D-1K • T.A. 2000 • O-46A • O-35/B-7
FOK D-17 • A-8 • O-25 • O-31C/YO-43

XO-36/XB-7 • METEOR • O-18/A-3 • O-31A/B
O-38 • AVIA B-534 • XP/YP-23 • FURY

water rudder and its mounting parts on the air rudder are from 1/16 plywood as shown on the plan. The central horns are added after covering is completed. Be sure to remove the covering where they are attached and epoxy them directly to the wood.

The stabilizer is a simple, flat structure. Dope or epoxy the structure on the inside before it is covered. Use plenty of plasticizer in the dope used on the stabilizer to avoid over-tightening and warping. The author uses castor oil as a plasticizer. Four drops to the ounce is normal; six to eight drops per ounce can be used in this case. If too much plasticizer is used, drying will be very slow; it's best to check a sample for drying properties before you dope a surface on the model.

LANDING GEAR

As a seaplane, the hull and tip floats function conventionally. Planing blocks were added at the step to provide minimum water contact at the moment before take-off. They also protect the hull

when it is sitting on the beach. The long water rudder is necessary to assure that the model tracks straight when it is planing on its flat hull. If the rudder comes out of the water at too low a speed, Seasquare will wander about until it has speed enough for the vertical fin and rudder to take over.

As a land plane, it may be necessary to lengthen the main and nose gears to prevent the hull from being damaged on rough landing. The length can be adjusted to the builder's own taste.

Don't forget to plug the nose gear hole and put screws into the blind nuts used to secure the main gear when you are flying from water!

CONTROL INSTALLATION

Control equipment is installed in the waterproof hatch. More than enough room exists for even the largest proportional servos, receiver and batteries. The control rod installation for the rudder and elevator are detailed on the plan. Use nylon tube inside nylon tube where the rods pass through the hull,

and make the bend going up to the elevator. One-sixteenth music wire can be used inside for the remaining length. This will minimize the effect of the nylon expanding and contracting. Note that the outer nylon tube is epoxied where it passes through the hull, but is left free to expand or contract as it passes through the bulkheads.

The connection from the rudder servo to the nose wheel bell crank is made inside the hatch.

The connection from the motor servo to the throttle is made using a wire-inside-nylon-tubing installation. The tube passes out of the hull in front of the leading edge of the wing. The throttle end is held by a metal clip near the motor. Use a nylon clevis for the throttle. The clip and clevis must disconnect by themselves (break free) in case of a crash where the wing is torn from the hull.

OPTIONS AND TECHNIQUES

Every scratch-builder has his own approaches to model building and this is as it should be. The comments that follow should be treated as suggestions . . . an effort by the author to pass on information that he has found useful.

It is obvious that the simplicity of the Seasquare lends itself to major variations in construction techniques. The foam approach is an obvious variation, even the hull is a natural for easy cutting. The following specific suggestions are made:

GLUE

Standard model airplane cement, such as Ambroid, Testors, or Aerogloss may be used. However, if you waterproof the insides of your model, white glue (Sig, Wilhold, Sears, Elmers, etc.) or Titebond may be used for general construction. The latter cements have ideal drying times for most construction work. In any case, if an accident occurs, drain the water out of the structure as soon as possible and allow the insides to dry thoroughly. It may be necessary to remove covering material to achieve adequate air circulation for rapid drying.

COVERING

The preferred method of covering is with silk or silk/rayon (Silray, Silron, Rayspan, etc.). Fiberglass and resin should be applied to the fore bottom and top center section of the wing (4 inches each side).

Paper (light Silkspan) may be used in place of silk on the hull sides and top, the rudder and the motor pylon.

Iron-on covering is not generally recommended for seaplanes unless special sealing techniques and care are used to assure water tightness. If water enters through a seam, it will soak into the structure and cause the model to become unbalanced. Water that enters in this manner is very slow to dry out, and permanent weakening of the structure may result.

DRILLING HOLES

Holes in balsa and plywood may be drilled using thin wall brass tubing with outside diameter equal to the hole size. File saw teeth on the edges and rotate back and forth as you push the tubing through the wood. Back the piece of wood being cut with another piece of wood to assure clean break-through.

Larger tubing sizes (1/4 and up) can be sharpened on the inside before the teeth are filed. The teeth can be quite irregular without apparent loss of cutting ability.

SCREW-TYPE HOLD DOWNS

Stabs and hatches are attached using screws. It is necessary to use large washers upon the screw heads to distribute the pressure and not mash down the balsa under the screw head. An even better technique is to cut short pieces of dowel, equal in length to the thickness of the surface being held down (for 4-40 screws use 1/4 or 3/8 dowel. For 6-32 use 3/8 or 1/2 dowel. For larger screws increase the dowel diameter appropriately.). Drill a hole through the surface to be held down the diameter of the dowel and glue the dowel into this hole. The screw hole is now drilled through the dowel which, takes the place of the washer and distributes the force evenly to the surface being held down.

Choppers Continued from page 25
one, with opening doors, floor carpets and flocked side panels. The red, white and blue bi-centennial paint scheme was something to see. A close examination of the doors show that ball-links make perfect hinges, especially when the door opens on an angle. Naturally, they can be completely removed by "snapping" them off, and the accessibility to the interior is fantastic.

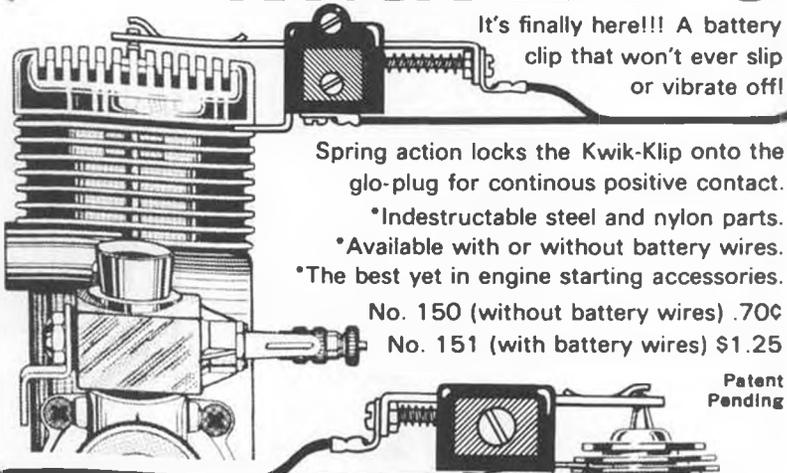
* * *
Over the holidays, I was honored with a visit from Fritz Bosch, General Manager of Simprop Electronic, Harsewinkel, Germany. Simprop, as you might know, is the manufacturer of some of the world's finest R/C equipment, as well as kits and other R/C related accessories. If the name sounds vaguely familiar, Fritz is Mike Bosch's father . . . and any helicopter nut knows who Mike is! A few years back, Fritz was the top European pattern flyer, and he is still pretty sharp with a helicopter too! During his stay, we managed to work in a day in old Mexico (sampling Margaretas), another day flying R/C airplanes and helicopters, and even managed an afternoon at Torrey Pines, where a lot of hang-gliding was taking place over the cliffs. Of course, we took along my Kurwi sailplane and indulged in some leisurely soaring. What a nice way to spend the holidays!

HELICOPTER AEROBATICS

With R/C helicopter loops becoming

Introducing... NEW SPRING ACTION
KWIK-KLIPS

It's finally here!!! A battery clip that won't ever slip or vibrate off!



Spring action locks the Kwik-Klip onto the glow-plug for continuous positive contact.

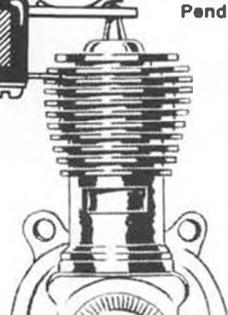
- *Indestructible steel and nylon parts.
- *Available with or without battery wires.
- *The best yet in engine starting accessories.

No. 150 (without battery wires) .70¢
No. 151 (with battery wires) \$1.25

Patent Pending

1/2 A KWIK-KLIPS
For engines .020 to .074.

No. 149 (with battery wires) \$1.15
No. 148 (without battery wires) .65¢
Shown actual size on an .049.



DU-BRO PRODUCTS INCORPORATED
480 Bonner Road Wauconda, Illinois 60084 U.S.A.



almost commonplace, and reports of slow-rolls and even Cuban eights being performed regularly, my curiosity finally got the better of me and I decided to do a little research on the subject; to discover the secrets of helicopter aerobatics. Although the findings are not really super-secret, nor are they particularly difficult to do. Like everything else, it requires a good basic knowledge of maneuvers, lots of practice with the simple patterns, and a gradual work-up to the more difficult looping and rolling maneuvers. Most of the R/C helicopter aerobatic data which follows, resulted from conversations with the top heli-pilots Ernie Huber, Mike Bosch, and Kavan's test pilot, Herr Heid. Each one does the maneuvers a little differently, but the basic techniques are similar.

To begin, all aerobatic maneuvers consist of combining 5 basic regimes of flight, (1) climbs, (2) dives, (3) loops, (4) rolls, and (5) turns. High speed stall configurations are utilized in airplanes, but never in helicopters! Since helicopter aerobatics are almost identical to airplane aerobatics, it would be wise to brush up on your airplane before trying something new in your 'copter. Start by practicing climbs and dives only, until you get the feel of the machine, then try steep turns left and right.

After you have achieved a good level of comfort with the above basics, you should start combining the elements,

such as climbing turns and diving turns. For example, practice a climbing left turn and rolling out into a diving right turn. One of the best practice maneuvers is the chandelle, which is performed by executing a shallow dive, followed by a steep climbing turn, and rolling out 180° from your entry direction. Next on the practice list are wing-overs and lazy-eights. The wing-over naturally leads directly into the hammerhead (or stall) turn maneuver and is probably the best way to get a feel for how the 'copter will perform in a loop, since steep climbs, turns and steep dives are involved. Rather than describe the game-rules, it is better that you dig out your magazines and read about the performance of the maneuvers and visualize them in a helicopter instead of an airplane. The techniques are almost the same!

Now, before we get to the loops and rolls, let's talk about your chopper and how it might be bettered for aerobatics. Make no mistake about it, your chopper should have a fast, positive response to your control inputs. Generally speaking, a stable chopper will not react fast enough for aerobatics, and must be modified. Conversely, the aerobatic chopper will not be the most stable, nor easiest to fly. A good compromise must be worked out to your ultimate satisfaction.

Since the Kavan Jet Ranger is used



STRIPING TAPES

SUPER STRIPE

THIS NEW ULTRA THIN TAPE HAS FANTASTIC CONTOURABILITY AND WILL CURE ON YOUR FINISH FOR A FUEL RESISTANT ACCENT OR TRIM

GLIDER STRIPE

THIS TAPE WAS DESIGNED FOR NON FUEL PROOF APPLICATION. IT HAS GREAT CONTOURABILITY AND ADHESION AT LOW COST.

BOTH TAPES COME IN: RED • WHITE • BLUE • ORANGE • YELLOW OR BLACK.

PRICES PER ROLL	SIZES	1/16"	3/32"	1/8"	1/4"
		108"	.69	.89	.99
	30'	\$1.49	1.59	1.99	2.79

	1/16"	3/32"	1/8"	1/4"
	108"	.49	.59	.69
36'	.99	1.19	1.49	1.89

RON'S VARAGOLD Trim sheet

Beautiful wildly colored designs and letters.

Pressure sensitive adhesive backed.



Polyester mounted variegated gold leaf.

5" x 15" \$1.99 ea.

RON'S compensator TOW HOOK

For any size glider.

Complete hardware



Virtually unbreakable.

\$1.89 ea.

Distributor/Dealer inquiries invited.

All items postage paid. Calif. res. add 6% tax.

If not available at your dealer, send check or money order to: J.L. Wittman Co., P.O. Box 2857, Laguna Hills, Ca. 92653

THE ANTIC A FUNTYPE. FLYING MACHINE.



- LEARNING HOW TO FLY?
- NEED TIME TO THINK?

TRY THE ANTIC. IT ALLOWS YOU TO DO BOTH AT THE SAME TIME A TRAINER THAT IS TRULY DOCILE.

For additional information, brochure and catalogue send 0.50¢ TO— PROCTOR ENTERPRISES INC.

P.O. BOX 9641
SAN DIEGO, CA. 92109

MFGD. AT 6821 CONVOY CT., SAN DIEGO CA.

Superior

Aircraft Materials

For the finest quality wood products available. SPRUCE — PLYWOOD — BALSAM WOOD — FAA AIRCRAFT SPRUCE (up to 60" lengths).

1/64" Birch plywood. PREMIUM grade balsa wood. Send S.A.S.E. for a free catalog and order form to:

Superior Aircraft Materials
P.O. Box 8082
Long Beach, Ca. 90808

for more info, call (213) 421-3935
Monday to Friday, 9 A.M. to 9 P.M.

by all three of our acro-experts, we'll confine our discussions to that chopper.

(1) The Jet Ranger should weigh in at 12 to 13 lbs. for best performance, and a powerful engine is a must! Recommended were U.S. Max Schneurle, Webra Speed, Webra Blackhead, and Super Tigre Bluehead (in that order).

(2) Use the "expert" main rotor blades with one large lead-ball weight in the tip of each blade. The hardwood leading edge should be firmly bonded to the balsa trailing edge at the root-end by wrapping a 4" wide layer of fiberglass and resin around the blade prior to cementing on the hardwood reinforcement plates. After installing blades in the blade holders, set the adjustment screws (against the blade tongues) so that each blade has a slight lag in the direction of rotation. To accomplish this correctly, set the alignment "string" in tip notches, cut 1/4 inch or 7 mm back from the leading edge rather than at 17 mm as mentioned in the plans.

The main rotor head should be as rigid as possible on the shaft. Wrap the head with electrician's vinyl tape so as to stiffen up the oval rubber damper as much as possible.

(3) Use the new "wood" stabilizer paddles to match the expert rotor blades.

(4) All control linkages from servos should be located in outside holes for maximum throw. Main rotor blade pitch should be reduced slightly below standard settings to obtain higher rotor speed. About 1-1/2 to 2 turns less on the blade pitch control links should produce a desirable 5100 rpm on the tail rotor.

(5) The helicopter should be balanced to a slight nose heavy attitude. Add weight or shift components as necessary.

For your first loops, start at no less than 100 feet of altitude to allow for errors, and preferably work cross-wind in a light breeze, so that headwind/tailwind components will not affect your speed judgment. Many pilots find

it most convenient to work from right to left when performing loops. Enter the loop from a shallow descent, at something less than high-speed flight. Excessive speed may cause uncontrolled pitching, and is not really required for the maneuver. The correct entry speed can be determined by doing steep wing-overs or lazy-eights until you get the feel of control response, then simply straighten it out and enter your first loop. Pull back very softly with your elevator to about 3/4 rear cyclic (stick) and plan on a 25 foot diameter loop. Power/pitch should be about 75 to 85% (not full-power) and should be maintained until the chopper is completely inverted and starts to slide downhill on the backside of the loop. At about 220° (on the downhill inverted), you will hear the engine rpm automatically go much higher because the blades are unloading. This high rpm is undesirable because it produces blade tip stall, and resultant loss of control. As the rpm goes up, you should reduce power/pitch accordingly to maintain a constant rpm

... power will probably end up at approximately half-throttle for the rest of the maneuver, until the chopper resumes level flight. When the chopper is at the 270° position, straight down, it may be necessary to slightly increase back pressure (softly again) to round off the return to level flight. The model may tend to climb into another loop immediately, so be alert to apply forward cyclic to prevent this from happening. Incidentally, Ernie feels that a movable elevator (stabilizer) does more harm than good, and Mike says it provides better control, so you will have to make up your own mind on that one. Perhaps an adjustable elevator is the answer, so you can experiment with which is best for you.

The Jet Ranger will roll almost identically to an R/C airplane, up to the inverted position. Then it has a definite tendency to rotate about its vertical axis. The best way to roll, is to enter the maneuver in the same fashion as a loop and begin a barrel roll, just as the nose is above the horizon about 20 degrees. If you haven't the stomach for this, try a half-roll to inverted, then pull back softly and complete a smooth "split-s" maneuver. Ernie says this is a snap and provides practice for both rolls and loops! Just fly it like an airplane and you shouldn't get into trouble. Once you are proficient with Split-S maneuvers, you can enter them consecutively in a Cuban Eight series.

There you have it for this month. Go out and practice, but don't write me your sad letters if you bust up that beautiful bird because of this article on aerobatics. I repeat, you must be an excellent pilot before attempting these unusual positions, and only you can determine when you're ready to do some acro-flying! BCNU next issue. ●

"HOT STUFF"™

GETS IT TOGETHER

FAST

AT YOUR HOBBY DEALERS NOW

DEALERS AND DISTRIBUTORS
CALL (213) 899-2301

SATELLITE CITY, P.O. BOX 1935
ARLETA, CALIF. 91331

\$5⁷⁰
PER UNIT

(Two large bottles)

THANKS TO TREMENDOUS
WORLDWIDE MODELER
ACCEPTANCE

EK-logictrol

RELIABILITY IS WHY R/C SCALE CHAMPIONS USE EK LOGICTROL RADIO SYSTEMS

For our full line brochure, write EK-logictrol, Dept. SRM,3322 Stovall St., Irving, Tex. 75061. Distributors, jobbers and dealers contact us for our new plan.

Reliable radio control systems

Flip *Continued from page 35*

than 1/16 or 3/32, and the weight is not a problem. Fuselage is 1/4 inch balsa, typical profile construction, with 1/32 inch plywood nose doublers over hardwood motor mounts. The whole thing can be built from one piece of 1/8 x 6 x 36 and one half of a piece of 1/4 x 3 x 36 balsa. No, don't ask the hobby shop for an 18 inch piece of 1/4 balsa; buy the whole piece and build two models.

There's our rationale and sales pitch for the Flip; now we can get into some construction comments. As mentioned, we need only 1/8 and 1/4 inch balsa plus some scraps of 1/8 and 1/32 inch plywood. Six inch wood doesn't have to be used for the wing; 3 inch planks can be edge-glued to get the necessary width. Make up the fuselage, epoxying the 1/4 inch hardwood motor mounts in place with the correct spacing for the engine being used. We assemble the entire plane using five-minute epoxy for all joints. Cloth or sewn hinges can be used; be sure they are free. Any commercial bellcrank is fine. We use an R/C-type horn on the elevator as very little throw is needed; also prefer a 1/16 inch pushrod to insure no flexing. Lead-outs are thin wire or flexible cable. Engine is installed with two washers under the front holes of the mounting lugs, for thrust offset. Tip weight is a length of

large solder. Gas tank is mounted with rubber bands; we put a small piece of foam rubber between the tank and the fuselage.

Everyone has his own finishing technique; a quick method for us is to apply four coats of clear dope, sanding well between each coat; spray on one or two coats of color, trim, and top off with two coats of clear. We feel an epoxy finish would also be most desirable.

For flying, it's fast and lively. Adjust elevator throw to suit your taste; it doesn't take much.

We understand our MODEL BUILDER editor has never flown control line (*well, almost never. wnc*) as he is the editor of a full coverage publication, we think the C/L fliers in his area should get him out to the circles. You owe it to your readers, Mr. N! ●

Trimaran *Continued from page 55*

Operated with a pair of limit switches, the device can be powered by the receiver/servo pack or by a separate 4.8 volt airborne pack. The output arm travels approximately 180 degrees in 5 seconds, and the 2 by 2 by 5 inch unit weighs only 8 ounces. The switching mechanism is operated by a push-pull rod from the radio sail servo, and overload is handled by two coil springs and two wheel collars, for simple installation and easy adjustment.

The balanced rudder is controlled by a second servo through a conventional push-rod and an aircraft nose-wheel tiller mounted on the rudder shaft. We chose to use the aileron/elevator stick of the Mode II MRC Mark V transmitter for controlling the rudder and sail, permitting one-hand operation of the boat.

All-in-all, the ProBar Trident is an easy boat to build and an easy boat to sail . . . and sail reasonably well. Just one warning for those of you who race a trimaran for the first time, after having some experience with a monohull . . . Watch yourself rounding those marker buoys. That 36 inch beam will fool ya every time! ●

R/C Cars *Continued from page 57*

modified HRE car with rear suspension. As you can see, it's a solid rear axle arrangement, the simple "live axle" concept, with cog belt/pulley drive, upper leaf spring trailing arms on each side, lower trailing arms which go from the lower outside of the bearing blocks forward to the center of the car, and dampers to the outside rear of each bearing block. The lower arm, which goes forward and to the center, provides sideways stability like a Panhard rod, as well as the lower pivot or flexing member. Individual spring leafs could be added or taken out to change spring rate, and roll rate changed accordingly,

NEW **"Glo-DEVIL"**
PLUG



for
R/C, SPORT,
+ RACING

Challenger II

\$5.00 FACTORY REBATE AVAILABLE,
send self addressed, stamped
envelope for complete details.
Offer good for limited
time in U.S.A only.



SONIC IRONICS INC. 2 S SYLVANIA AVE PHILA PA 19111

CLOUDBUSTER RACE WINGS



RUBBER SCALE PLANS FOR SIX (6)
FLIGHT-PROVEN, RARE & UNUSUAL
RACING PLANES: **CROSBY, FLOYD
BEAN, TWO FOLKERTS, SMIRNOFF
BEARCAT, and CHAMBERMAID.**

Complete set, postpaid, only **\$4.00**

order from:

CLOUDBUSTER VENTURE
P.O. Box 2921, Livonia, Mich. 48154

BETTER THAN A THIRD HAND!



PANAVISE

Available through your dealer.

Write for a free catalog.

Dept. 21R

10107 Adella Ave., South Gate, CA 90280

as there was no separate roll rate control. The car worked quite well, but I had to have the dampers (just friction) or the car bounced too much. Since I used one belt for the power drive, it had to be relatively tight, or it would jump teeth on the pulley during acceleration, so there was a noticeable increase in bearing friction. As I would expect now, the car had quite a bit of high speed understeer, even when I had a reasonable high spring and roll rate at the rear. The car was quite easy to drive and you could really get back on the power very early in cornering and really be going coming out of the corners. The rear suspension worked quite well, but it just wasn't strong enough. After a couple of blasts in the rear during the Nats Road Main, all the flexing members were collapsed. A good rear bumper would have helped, but a good hit on one of the rear wheels would probably do the same thing.

At the 1975 ROAR Nats in Massachusetts, Ted Longshaw, of England, had a rear suspension car. There was a picture of Ted's car in the first article on suspension, and there is another picture (or two) showing Longshaw's rear suspension set up here. Longshaw's car

has the complete engine and drive train unit suspended on two upper solid trailing arms, with ball joints at each end, a metal flexure element at the front bottom, a rubber shock mount in the front center, and a stabilizer bar on the bottom. The metal flexure element is about 1/32 in. thick and 1 in. wide at its narrowest point. The flexure element and rubber shock mount allow vertical and torsional motion of the power pod. The stabilizer bar active arm length can be changed to adjust roll rate. I didn't check the vertical spring rate, but I imagine it is relatively high because of the flexure element motion (both ends clamped), and the rubber shock mount being so parallel. The set-up is very sturdy and looked in great shape after all the racing was over. The one drawback on Longshaw's car is that the sprung weight (the whole power pod) is high, so that the suspension performance cannot be optimum. One thing on Ted's car that is different is the dual lexan plate chassis, which is quite stiff. Suspension cars may require a rather stiff chassis to keep the motions in the suspension components where they can be controlled better.

The old Dynamic and Racar rear

suspensions were similar to actual automotive suspensions, having an in-line engine with the power going through a right angle transfer case to half axles, with universal joints on each end, and the rear axle hub carriers on two A-frames. Both were complicated, with many parts, and very delicate. With normal driving, they would come apart, much less any shunts or bumps by other cars in competition. The Futaba Dune Buggy rear suspension seems to be reasonably rugged, but the layout not too good. In the Futaba, the engine is in line with the power drive going back to a gear box, then out, going forward under the input through a U-joint to a 90° drive and a solid rear axle. The axle is sprung at the sides. The U-joint and axial drive allow essentially vertical axle motion as well as roll. But because of the layout the c.g. is very high.

So we don't have very much for a good competition suspension system. But I know there are several people out there still working on the problem. In my own case, I have decided that to get the most out of rear suspension, there must also be front suspension, so the problem is a little worse than I originally thought. Also, because of my experience with the cogged belt drive, my last suspension car used a chain drive. The results were encouraging, and my next suspension car will be chain driven also. The chain does not have to be overly tight to function properly and there is very little friction loss and no problems with slipping.

Have you wondered why I've been writing this series of articles on suspension? Well, its primarily because I have been trying for some time to come up with a good suspension system myself and haven't been able to do it. The task is much more difficult than it first appears. By writing this article series on suspension I've had to review what I've seen and understand about suspension and put it in a semi-logical sequence and

NEW!

PLASTIC SCALE GOLDEN AGE ENGINE PRATT & WHITNEY "WASP"

Molded in two colors of plastic, this model consists of more than 200 parts. Included are: nine cylinders, crankcase, carburetor, carburetor stack, two magnetos, fuel pump, oil pump, starter, propeller hub, vinyl ignition harness, and display mount. Suitable for exhibit by itself, or installation in a scale model aircraft. $1\frac{1}{2}'' = 1'$ SCALE Price: \$11.95

ALSO AVAILABLE: WRIGHT J-5 "WHIRLWIND" $1\frac{1}{2}''$ SCALE KIT AND LE RHONE ROTARY $1\frac{1}{2}''$ and $2''$ SCALE KITS



MARTIN B-10B 1/72 SCALE PLASTIC SCALE MODEL KIT

The MARTIN B-10B was a forerunner of advanced WWII bombers, and spanned the 1934-1942 era. B-10s were used by the U.S., Holland, Russia, China, Siam, Turkey, and Argentina. This aircraft featured such refinements as fully enclosed crew, retractable landing gear, controllable pitch propellers, and revolving gun turret. Kit features: Landing gear may be installed in your choice of positions. • Choice of hard or flexible tires • External bomb rack and bomb • Micro Scale decals with choice of markings • Plastic display stand Price: \$4.95

BOEING 247 1/72 SCALE PLASTIC SCALE MODEL KIT

Forerunner of today's transports, the BOEING 247 incorporated such advanced features as all-metal construction, retractable landing gear, de-icers, and controllable pitch propellers. Model may be finished as Roscoe Turner's racer or a United airliner. Kit features: Two types of windshields • Landing gear may be installed in your choice of positions • Choice of hard or flexible tires • Decals by Micro Scale (racer and transport markings) • Passenger seats • Turner's long-range fuel tanks • Plastic display stand Price: \$4.95

FROM YOUR DEALER OR ORDER DIRECT, ADDING 15% POSTAGE AND HANDLING
SEND 25c FOR COMPLETE CATALOG



DEPT. MB • 181 PAWNEE STREET
SAN MARCOS, CALIFORNIA • 92069



explain why some things work and others don't. In this way I have been seeing what seems to be important, as well as how much. With this understanding, maybe I can now go back and design a competition suspension system that might work. When I have something reasonably good, you'll be the first to hear about it.

Playboy Continued from page 39
a .29/.35 engine combination, fully pressurized, that will give you a potent machine in both Class B and C. Full access to the cowled engine area should be maintained for easy interchange of motors. Now, you have the dope, get yourself a real competition machine, and see how good you are at picking thermals . . .

Hannan Continued from page 45

1. M. Jeansoulin Mister Mulligan
2. J. Pouliquen BD 6
3. M. Xamena Mocoque

Note that Walt Mooney's proxy Peanut is still placing well, having already won several prizes in past contests. The turnout for the Peanut class resulted in 35 qualifiers, compared to only 3 in the Maquette class. The variety was outstanding, and included, in addition to the models already mentioned: Evans VP 2, R.E.P., Cougars, Hawker Fury, Wittman (type not specified), Mustang,

Zero, Bat Baboon, Mauboussin, Piper Cub, Druine Turbulent, Supermarine Sparrow, Farman 231, Huntington, Hirondelle, and a Stalwerk. A surprisingly large percentage of entries were constructed from Model Builder plans, proving that our centerfolds are being put to good use . . . internationally.

HANNAN'S HANGAR OVERSEAS

As promised, we intend to share some of the pleasures of our recent trip with our readers. We had the rare opportunity of visiting with many model builders, authors, historians and all-around enthusiasts, and returned home secure in the knowledge that we are truly fortunate to be members of the aviation fraternity.

A VISIT WITH ERIC COATES

Your author and J.D. Gillies had the pleasure of meeting Eric Coates, who edits the flying scale model column of the English "Aeromodeler" magazine. He and his wife, Pat, reside in a home with a name, "AROSA", rather than a number, an idea which seems to be very human, unlike the coldly impersonal numbering system.

Eric showed us to his well-equipped workshop, located in an upstairs room. Eric's aeromodeling interests are well-balanced, and include everything from Peanuts and CO2 types clear through large R/C models . . . all scale, of course. His models overflowed from the work

area into various other rooms in the house, yet his wife seemed unusually tolerant of this!

It was also reunion time for me, as Eric brought out the little Farman Moustique Peanut, which he has been proxy-flying for me in the Cardington Airship hangar contests.

We broke away from our model aircraft discussions long enough to enjoy a truly exceptional meal served by Pat Coates, topped off with raspberries and ice cream. Then, back to the workshop to see more models! Eric takes his scale-modeling seriously, and prefers his detailing "in the round" rather than graphically applied, and backs up every item with comprehensive proof-of-scale presentations.

As an example of his dedication, his latest project, a WW I Martinside "Elephant" R/C model, consumed some 4,000 man hours. His journalistic efforts have contributed a great deal to the resurgence of flying scale activities in all classes, and we can wholeheartedly recommend reading his Aeromodeler column.

OUR NEXT STOP . . .

was at the home of P.T. "Pete" Capon, Pete is an autogiro expert, having spent a number of years working with 'giro' inventor Juan de la Cierva. Additionally, he served as a designer with several English aircraft firms, including Superma-

KAVAN QUALITY PRODUCTS

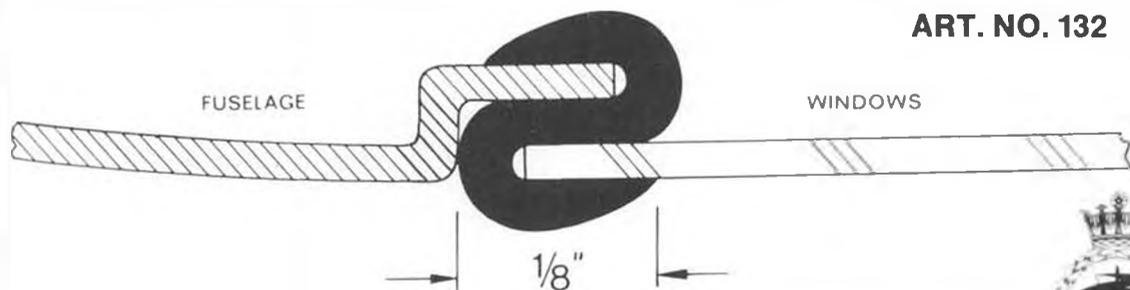


WINDOW



MOUNTING CHANNEL

ART. NO. 132



For installing windows in helicopters, boats, etc. Also for installing canopy on fixed wing models. For use with fibre glass or other thin mounting surface. 16 feet per package. 3 packages per card.



KAVAN MODEL AIRCRAFT INC.
PHONE: 714-835-7788 1424 E. BORCHARD
AVE. SANTA ANA CA. 92705

JUST ONE OF OVER 130 ITEMS
manufactured by Kavan
WRITE FOR FREE CATALOG

rine. Among other tasks, he was responsible for the tailplane configuration of the record-breaking S6-B floatplane racer. Now retired, he devotes much of his spare time to aviation historical activities, drawing upon his extensive archives of photographs and first-hand recollections. Like so many enthusiasts, Pete has a strong background in model building, and over the years has participated in virtually all facets of the hobby, including display models, Wakefields, gassies, and gliders. One of our photos depicts a display of tiny models constructed entirely from matchsticks. The fuselages, for example, were carved from laminated blocks of the matchwood. All insignia has been hand-painted, as has the minute lettering of the title and individual captions!

Betty Capon staunchly supports her husband's interests, and is outspokenly in favor of such activities. In addition, her culinary art is simply out-of-this-world!

THE RAY MALMSTROM EXPERIENCE

This exuberant, warm-hearted gentleman was waiting for us in front of his home near Cambridge University, where he is an Art Professor. Ray's home, like Eric Coates, has a name, "Haslingfield", rather than a number. After the introduction to Ray's family, and tasty refreshments served by the charming Mrs. Malmstrom, we retired to

the workshop. Here was found a more-or-less typical model-builder's hangout: Piles of magazines and plans; parts of uncompleted models . . . the usual. But not the models . . . they were anything BUT usual! The latest project was a Cox .010 powered semi-ducted fan craft with a fascinating original configuration. We were struck by the comparison of Ray's work with that of Walt Mooney . . . both are well-known for their enthusiasm and clever model designs.

Ray Malmstrom has been conducting model clubs for nearly 30 years, passing his knowledge and zeal onto countless youngsters, and has also authored many magazine articles and books on the subject.

Ray suggested a quick trip to the local flying field to demonstrate a new pusher-puller model, so Ray, Doug, Ray's grandson, and yours truly piled into the family Mini car, and headed into the dusk. After a time, we reached the site, which turned out to be a pasture, complete with cows, not to mention their "used hay" calling cards. By now, it was almost totally dark, but what the heck, we came to fly model aeroplanes.

With the aid of a large hand-drill, Ray wound the rubber to the accompaniment of encouraging words from his small "gallery". As he prepared to launch the contrivance, he paraphrased Louis Bleriot's classic remark, uttered

prior to crossing the Channel: "Which way is England!" This really "broke us up", and added to the delightful absurdity of an Englishman, an English lad, a Scotsman and a Californian, out in the middle of a cowfield in the dark, flying a "toy aeroplane". All we lacked was a mad dog. And yet, we couldn't have been happier, and the model flew excellently. Had a constable happened by, he probably would have arrested the lot of us for drunkenness . . . yet we were stone sober.

Regretfully, since the cows were upset by our presence, not to mention the fact that the aircraft was scarcely visible when airborne, we left this magic spot, deeply aware that we had participated in an enchanting experience. ●

Soaring Continued from page 37

$$\left(\frac{9400}{3500}\right) \times \left(\frac{752}{164}\right) \times \left(\frac{9.6}{11}\right) \times \left(\frac{.85}{.865}\right) \times \left(\frac{.141}{.0625}\right) \times \left(\frac{.6772}{.720}\right) \times \left(\frac{8.6}{8.26}\right) = ?$$

$$(2.69) \times (.21) \times (.873) \times (.982) \times (2.25) \times (.89) \times (1.04) = 1.01$$

"Since the value is greater than 1.0 . . . (by a hair) . . . the new spar system should be at least as safe in the new design as the old one was in the old application." ●

SailingContinued from page 28

able reading. They all touch on all of the major areas of our interest, and all make a strong plea that sailing is a sport that we engage in for fun . . . fun . . . FUN.

McDERMOTT spends half of his volume talking about specific sailing techniques on each leg of the course. His discussion can be taken word for word and applied to your boat.

SHIELDS is more conversational, but I learn from him without feeling that I am studying.

KNAPP steers a middle course between these two, and gets into some specific discussions of equipment presently available for modern racing boats. Any one of these three is worth its price. They are all trying to sing the same song, but with slightly different emphasis.

Well, there you are. Not an exhaustive list of my holdings, but a culling of the ones that I've found most helpful. R/C yachtsmen must share with their full-sized counterparts a requirement for resourcefulness. Just because a printed page addressed to your problem of the moment does not fall into your hand is no reason to give up. Get out and dig, you might be surprised what is leaning up on the shelves at the local library.

I'm indebted to Roger Bard for the photographs of the Paris, Ill. 50/800 regatta that accompany this article. No specific comments on the photos except to say that I think they convey the relaxing time that awaits anyone who goes "to Paris for the weekend." Thanks again Roger.

Remember to send your \$5.00 AMYA dues to the Secretary, 3917 Sunnyside Ave., Brookfield, Ill. 60513. And while you have your checkbook out, make sure you take out a bi-centennial year subscription to MODEL BUILDER. Send questions directly to MODEL BUILDER or to me at: Rod Carr, 7608 Gresham St., Springfield, Va 22151.

BIBLIOGRAPHY

BROWN, Alan, *INVITATION TO SAILBOAT RACING*, Simon and Schuster, (1972) Lib. Cong. No.-70-154095

CHAPELLE, Howard I., *YACHT DESIGNING AND PLANNING*, W.W. Norton and Co. (1936) copyright renewed 1964.

CURRY, Dr. Manfred, *YACHT RACING, THE AERODYNAMICS OF SAILS AND RACING TACTICS*, Charles Scribner's Sons (1948)

ELVSTROM, Paul, *EXPERT DINGHY AND KEELBOAT RACING*, Quadrangle Books, (1967) Lib. Cong. No.-67-25632

FLETCHER, Mike and Bob ROSS, *TUNING A RACING YACHT*, W.W. Norton and Co., (1974) American Edition.

"NEWS FLASH" HP WINS AGAIN

Dave Platt first to fly
a R/C Ducted Fan Aircraft
in R/C Scale at the NATS
with the HP40R



Dave says: "I have no doubt that ducted fans are the coming thing and the HP 40R will be a favorite choice for high power, easy starting, good idle and amazing durability: even an occasional lean run doesn't bother it. I'm impressed!"

AVAILABLE AT YOUR FAVORITE DEALER



NELSON MODEL PRODUCTS

6929 WEST 59TH STREET • CHICAGO, ILLINOIS 60638 • (312) 586-7101

HALL, Major, *COMPETITIVE SAILING, REFLEX AND DECISION*, American Design Industries, Box M, Rochelle Park, N.Y. 07662 (1974)

HENRY, Robert and Captain Richard MILLER, USN, *SAILING YACHT DESIGN*, Cornell Maritime Press, Inc. (1965)

HOWARD-WILLIAMS, Jeremy, *SAILS*, John de Graff, Inc., (1971)

HOWARD-WILLIAMS, Jeremy, *RACING DINGHY SAILS*, Quadrangle Books, Inc. (1971) Lib. Cong. No.-74-143578

KNAPP, Arthur Jr., *RACE YOUR BOAT RIGHT*, Grosset & Dunlap, (1973) Lib. Cong. No.-73-6898

KINNEY, Francis, *SKENE'S ELEMENTS OF YACHT DESIGN*, Dodd, Mead and Co., (1962) Lib. Cong. No.-62-16304

MARCHAJ, C.A., *SAILING THEORY AND PRACTICE*, Dodd, Mead and Co., (1964) Lib. Cong. No.-64-13694

McDERMOTT, Thomas, *MANUAL OF SAILBOAT RACING*, The Macmillan Co., (1964) Lib. Cong. No.-63-16113

OAKELEY, John, *WINNING*, Quadrangle Books, (1971) Lib. Cong. No.-70-143577

PINAUD, Yves-Louis, *SAILING FROM START TO FINISH*, Adlard Coles Ltd., (1975)

REMCO 29

PRICE \$42.50
(engine only)
Plus \$1.25
for postage
and insurance.

\$51.00
Complete -
with ignition
package (coil,
condenser, plug,
high tension lead).
Plus \$1.25 for postage
and insurance.



ALL NEW IGNITION ENGINE

NEWLY MANUFACTURED 1/4 x 32 SPARK PLUGS

Now you can once again run
your old ignition engines and
join the Old Timer movement.

\$2.50 each,
plus 50¢ postage.



List, 25¢

Ignition coils, \$6.00
plus 50¢ postage.

Spark plug (not a "reject")
tie tack or lapel pin. A neat
way to carry a "spare"!
\$5.00 plus 50 cents
postage and handling.

REMCO MFG. CO., P.O. Box 22414, Denver, Colorado 80222

FOR THAT PROFESSIONAL LOOK . . .

\$2.49
"HOOKER"
ADJUSTABLE
TOWHOOK



"BALLAST-LOK"
\$1.95



BOTH FULLY ADJUSTABLE

AVAILABLE AT FINE HOBBY SHOPS EVERYWHERE

Add 35 cents postage and handling.

California residents add 6% sales tax.

SCOTT RESEARCH CO., P.O. Box 22, Costa Mesa, Ca. 92627



BOLT ON A 25% POWER INCREASE
AND BE QUIET TOO'

Tests show a Fox Muffler increases power
while lowering noise level at no increase in
fuel consumption.

Construction Features:

Chamber machined from solid bar, integral
fins cool and stop wall resonance.
All parts buffed to high luster.

60 size supplied with cast adapter and
machined to fit most popular motors.

40 size supplied with adapter for FOX 40
and FOX 45 motors.

Other adapters available soon.

Be the first on your field to sport this classy
new look.

Note - These mufflers meet all AMA requirements
for sport and pattern flying.

40 SIZE MUFFLER #90302 \$19.95
60 SIZE MUFFLER #90303 \$24.95

FOX MANUFACTURING COMPANY
5305 Towson Ave., Ft. Smith, Ark. 72901

ROSS, Wallace, *SAIL POWER*, Al-
fred A. Knopf (1975) Lib. Cong. No.-
77-154937

SCHULT, Joachim, *TACTICS AND
STRATEGY IN YACHT RACING*,
Dodd, Mead and Co., (1970)

SHIELDS, Cornelius, *CORNELIUS
SHIELDS ON SAILING*, Prentice-Hall,
Inc., (1968) Lib. Cong. No.-64-14011

TWINAME, Eric, *DINGHY TEAM
RACING*, Adlard Coles Ltd., (1971)

TWINAME, Eric, *START TO WIN*,
W.W. Norton and Co., (1974) Lib.
Cong. No.-74-10814

WALKER, Dr. Stuart, *WIND AND
STRATEGY*, W.W. Norton and Co.,
(1973) Lib. Cong. No.-72-6453

*** - Lib. Cong. No. refers to Library
of Congress Card Number.

ORCAContinued from page 41
don't buy the pieces, assemble it and
win your first contest. The planes are
not easy to build . . . half-baked methods
will not do the job. So if you aren't
ready to earn the rewards with care and
attention to detail, maybe FAI is too-
too for you. Of course, any event can be
equally demanding, if you intend to win.

This is exactly the point of this semi-
sermon. If you are, or want to be, suc-
cessful in AMA events, you can shut 'em
down in FAI too!

I will now proceed to tell you how.
Build an Orca. But first, a few hundred
words on the stuff it uses. These come
first because they affect construction.
ENGINES

There are no less than nine engines
to choose from, ranging in price and
availability from great to miserable (*The
new Cox .15, due to be released at any
moment, makes it ten. wcn*). The Rossi
has been boss since it appeared and is
my first choice (as of the moment) for
performance and handling. I quite often
hand-start it, and it never acts up. Avail-
ability is improving, thank goodness. If
you can't go the \$75 for a Rossi, look at
the Kosmic and the Taipan. Both are
less expensive, easier to find, and both
are good enough to win. They'll turn
over 22 grand stock. A new entry is HGK
but I haven't seen one run yet. Engines
in the works are the OPS, the new KB,
Cox, and the STX. Two mills readily
available but not competitive in stock
form are the ST and KBS. However,
you can send them to Ron Sheldon
(the Pylon guy) and have him give them
the treatment he gave mine. The KB is
now turning near 22, and the ST is over
that on the ground. Ron's address, and
others, are at the end of this mess.

To make a long story short, there is
an engine you can afford and get hold
of, that is competitive. And remember
that consistency is more important than
top revs . . . Every time.

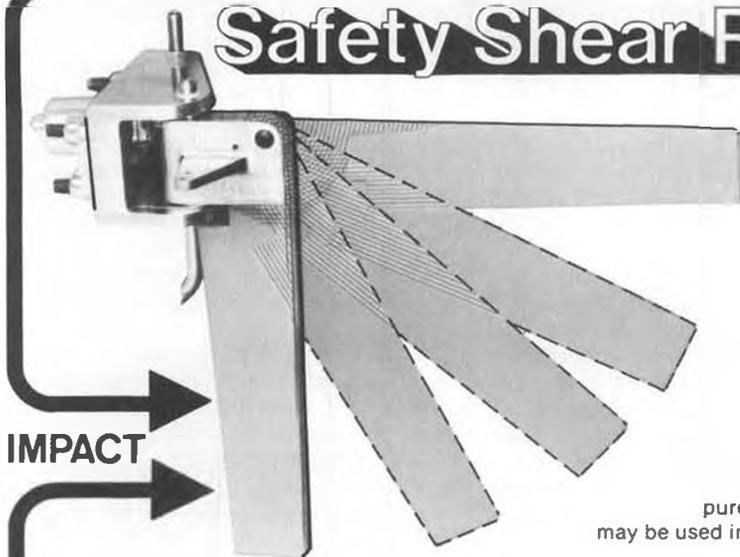
MOUNTS

The engine you settle on will deter-
mine the mount you use. There are five
to choose from this time. For the Rossi,
ST and Taipan, there are pans by Ken
Oliver, Guy Shaw and ST. I like the
streamlined circular section of the Oli-
ver, but you might like the extra room
behind the engine available in the Shaw
mount. The ST is similar to the Oliver,
but lighter and, in my opinion, more
fragile. They all cost within pennies of
each other, but the ST is a little harder
to find. The other pan mount is by
Tatone. It's the cheapest to buy, but
often needs work to dress the mounting
surfaces and clear the engine. For the
Kosmic and KBS engines, the best
mount is not a pan, but a machined
forging by CB. It's big, heavy and
nearly indestructible. I believe it was
designed for QM Pylon racing, and
provides the solidest mount of all. Also
the least expensive. If the CB or Shaw
mount are to be used, you'll have to
deepen the nose of Orca to match.
About an 1/8 inch or so.

TIMERS

The choice of timer is improving,
too, with Seelig and Monks foremost
for automatic airplanes, and Tatone and
KSB for conventional. I've built a couple
in according with Bill Hunter's article
in MB (March '75) and really like them.
Took about fifteen minutes to make a
flood-off for my A ship. Cost under \$5
to boot. It's pretty much a toss-up be-

Safety Shear Rudder Assembly



Now available, after three years of testing and development, a precision die cast aluminum Safety Shear Rudder Blade Assembly for .40 and .60 class boats. **SS Rudder Assembly complete** \$12.95 includes: Safety Shear Rudder Blade, Shear Pin, Shear Pin Retainer, Control Arm, Pivot Pin, Pivot Bracket, Mounting Plate, extra Shear Pins and extra Shear Pin Retainers. All seven component parts can be purchased separately. **SS Rudder Blade only** \$7.95 may be used in Marine Specialties HBR and 2/3AR Rudder Assemblies.

CATALOG \$1.00

FULLY GUARANTEED DEALER INQUIRES INVITED P.O. BOX 588 SARATOGA, CA 95070

tween the Seelig and Monks. Both have all necessary functions, both cost over \$20, both are mail-order. Pick a color. I use the Seelig, and when I mount it properly and keep it clean, it (they) work fine. I'm going to see how much I can get out of the home-made type, that's for sure.

PROPS

The most attention I've seen paid to props is in RC Pylon and CL, and the least is by the majority of free-flyers, It's astounding! A prop has to be matched to the engine, airplane and launch method. An awful lot of fliers ignore the last, by the way. One who doesn't is Mel Schmidt. He sure seems to win a lot. Might there be a connection, d'you s'pose? Fortunately the rules of the event narrow down the prop requirements. With a given weight and total area, the ships are alike as peas in a pod. The difference in performance then boils down to airfoils, aspect ratios, moment arms, incidence, and stuff like that. All right, peas from different pods, but still peas.

The prop you'll need will be seven inches in diameter to start with, and 3-1/4 to 3-3/4 in pitch. The safest props are the full-strand fiberglass types, like K&W and Bartels. Don't use plastic. Period. Notice I said safest, not best. The ones I use are heavy and not always pitched correctly, and they're hell to balance. The weight has become a problem with the new, and ridiculous, seven second engine run. A front rotary engine can windmill a measurable length of time, and the rear rotors are worse. The cure is to short-change yourself on engine run, which is silly, or use a prop brake, which just reduces reliability of the system. One more gadget to piddle with that will go bonkers at the worst possible moment. I'm gonna try a third alternative (if I can ever get my mitts on the wretched things)

and that's good ole wood. Well, not old wood, exactly, but the nice, maple ones made by Rev-Up that I order from every hobby shop in town every other week and haven't seen yet! Interestingly, I use Rev-Ups in all AMA classes, except 1/2A, and have never had to re-pitch one. Since wood is lighter than glass, the fly-wheel effect should be lessened. No matter the type, constant inspection is necessary, and I mean before every start. Both my good engines turn over 24 and I never forget it. Don't forget my earmuffs very often, either.

We're almost to the airplane, but first here's where you can get the good stuff you'll need.

Engines and rework: Ron Sheldon, 3157 Alum Rock Ave., San Jose, CA.

Oliver pans and Seelig timers: Doug Galbreath, 707 2nd St., Davis, CA 95616.

Shaw pans: FAI supply, Box 9778, Phoenix, AZ 85068.

Monks timers: Colony Enterprises, 2337 Ewing St., Los Angeles, CA 90039.

K&W props and pitch gauge: K&W Enterprises, Box 18895, Phila., Penna, 19119.

Bartels props: Aeromodels, Box 245, Culver City, CA 90230.

If I've missed a related product or source, it's because I didn't know it was there.

Finally, the ORCA. (*Thought you'd never get to it! wcn*)

Orca has been flown in all configurations; conventional, auto-rudder, and

TRIDENT II RACING TRIMARAN FOR R/C

FIRST PLACE IN 1974 AND 1975 36-600 ACCR REGATTAS

- STYRENE HULLS AND DECKS
- SEWN DACRON SAILS
- HARDWARE
- 36" L.O.A.
- 36" BEAM
- 6.5 LBS. DISPLACEMENT
- 600 SQ. IN.
- COMPLETE PLANS
- COMPLETE KIT (LESS WINCH) \$100.00



SAIL CONTROL WINCH \$50.00
CUSTOM R/C DESIGN FOR ALL BOAT SIZES

POWER - 40 IN. LB.
FAST - 5 SEC.
VOLTAGE 4.8 - 6V.
LIGHT - 8 OZ.
SMALL - 2"x2"x5"

FIRST PLACE
IN '73 S/B ACCR,
'74 36-600 ACCR
& '75 50-800 ACCR

SHEET EXIT
GUIDES -
\$.50 EACH

Dealer inquiries invited.

PROBAR DESIGN

P.O. BOX 639 ESCONDIDO, CA. 92025



Sailing Yachts For Radio Control



TAHOE 600

AMYA 36/600 CLASS

LENGTH 36 in
BEAM 9 1/4 in
SAIL AREA 600 sq in

\$38.95

VALKYRIE

AMYA 50/800 CLASS

LENGTH 50 in
BEAM 11 1/2 in
SAIL AREA 800 sq in

\$74.95

Complete kits include molded plastic hull and components, all rigging, finished sails and semi-finished wooden parts.

TAHOE SAIL SYSTEM **\$27.95**

VALKYRIE SAIL SYSTEM **\$35.95**

VICTOR MODEL PRODUCTS

11715 Adenmoor Ave. Downey, Ca. 90241

Calif residents add 6% tax **DEALERS WELCOME**



automatic. It's safe in all of them, too, but top performance demands the auto set-up. Why? Glad you asked! In conventional form, incidence is fixed at one and one-half to one and three-quarters degree and CG is at 80%. For a good transition, climb turn is necessary, detracting from the altitude it can reach. Down and left thrust are required, further inhibiting climb speed, and the low incidence makes stall recovery dicey at times. Adding auto-rudder reduces the climb turn from 1/2 in seven seconds to 1/4, increasing altitude appreciably. The AR also insures a good transition, but you still have that low incidence! The automatic configuration allows a

nearly straight-away climb (I still like to see some right tendency), auto-rudder brings the nose down smartly, and the two-and-a-half degrees of incidence (CG is now at 67%) give a smooth, buoyant glide, with quick recovery from turbulence upsets. Considering the ultra simple single-line V.I.T. system described and shown, I don't see much point in building the conventional version. An automatic Orca will beat it's ears off. You might as well face it now; in any FAI competition, you just aren't going to find any bum birds or fliers to walk over. At the USFFC there are generally 20 to 25 guys entered in Power and I ain't too happy about taking on ANY of them. To rub salt in, I now have BOTH of the Simpson brothers within 100 miles. Oh, well . . . back to the bird.

For those of you fond of numbers and reasons and such trivia, here's Orca's vital statistics. Projected wing area (what holds it up) is 448, and aspect ratio is around 8.4, also projected. Double taper platform is used to give a high aspect ratio while providing a large root section for strength. The airfoil is the Neel-meyer, a DGA from MODEL BUILDER. The foil operates at near 1-1/2 degrees in the climb and another degree in glide. Stab is 27% of the projected area and 8% thick. It's a zip-zip airfoil, but I was looking at the Rhode St. Genese 28 while I was zipping. Wing is 1/16 sheet and stab is 1/32, necessary to achieve the 67% CB without ballast. This is the first Orca to weigh less than 28 ounces. It weighs 27, less fuel. Moment arm is moderate at 43% to handle turbulent air, which is what I mostly find to fly in.

Experienced builder or not, if you choose to make this monster, read the rest of this book. Peer at the plans. Ask yourself, "What the hell is this weenie doing?!" And read it again, I know what I'm doing; this whole thing is to explain to you what I'm doing, and maybe help you avoid busting yourself in the foot on your first flight.

So shape up! Mercy!

I always build the stab, fuse and wing, in that order. When you're all

through yelling, "so what," I'll tell ya! It's so's I'll finish the miserable thing, that's why. When you build a wing or fuse first you can sometimes put it aside or lose interest or be diverted, and say, "Oh, I'll finish it some other time." But nothing nags me more than to have a stab laying there, leering, humming 'I ain't got nobody', Drives me berzook! So I build a fuse and pin it on to shut it up. Well, when you're that far, you know you'll finish the toad. Who can ignore a four-foot fuselage with a happy tail?

So let's start with the stab. All right, be pugnacious, skip to the wing. I don't care, you'll come back here sooner or later. See you then.

STAB CONSTRUCTION

If you're using the CB or Tatone mount, use hard wood for the whole stab. Otherwise, use 6 to 8 lb. stock. The stab bottom sheeting is trimmed, butt glued with Titebond, and pinned flat. Doesn't have to be over the plans, 'cause you gotta mark the rib and web positions anyway. The leading edge is glued on top of the sheet and the trailing edge is butt glued to the edge. Now install the ribs and webs, one bay at a time. That way you don't need a micrometer eye to get the webs the right length. Let this dry at least over night. You can chop out wing ribs while you're waiting, or chuckle over what you're going to do to your favorite competition enemy, who's usually your best pal. I find this very enjoyable. You wouldn't believe what you can do while crouching over damp glue.

Our scene opens next day to find you unpinning the framework and trimming the leading edge to match the rib contour. The top sheeting butts against the trailing edge and laps over the leading edge. Use water-thinned Titebond to glue and masking tape to hold the works together. Now pin it flat and forget it for a couple or more days. White glues takes forever to dry when enclosed. When it is finally dry, sand the leading edge round, knock the edges off the tips, and epoxy a two-inch length of one-inch wide nylon tape around the leading edge center. That's all at this point.

FUSELAGE CONSTRUCTION

Which includes the fins. Several sub-assemblies can be made while other parts are drying, which can save some time. The key to this technique is to make up a kit of all the parts involved. Then when you get to the glue slinging stage, you can move like a 1930 movie.

Did you remember to mark a centerline on each former? Select a piece of straight-grained (whatever that is) 1/8 sheet about 2 inches wide and four feet long, and mark a centerline along its length. Mark the former positions and pin it down. It's nice to have a flat bench for this, but you can do with less . . . I do. Using fast epoxy or Hot

CARR SAILS

7607 GRESHAM ST.

SPRINGFIELD, VA. 22151



STANDARD ON ALL CARR SAILS

Finest American-made DACRON sailcloth.
Vinyl, press-on numerals and insignia.
Heat sealed edges eliminate fraying.
Coated, stainless steel jibstay installed.
Rolled-edge grommets in tack, clew & head.
Bolt-rope mains'l luff mast attachment.

Santa Barbara - - -	\$30.00	10-Rater - - -	\$30.00
East Coast 12-Meter - - -	\$30.00	50/800(M-class) - - -	\$30.00
36/600 - - -	\$25.00	Internat. A-class - - -	\$35.00
West Coast 12-Meter - - -	\$30.00	Star 45 - - -	\$30.00
Vanguard "J"-boat - - -	\$10.00	T&A Petrel - - -	\$30.00

Scale vessels, special purpose boats, one-of-a-kinds: Write for a quote, and for our 1975 Brochure and Used Sails List.

Stuff, install the formers, matching centerlines. Don't put in the firewall yet. Be sure there is one degree of left thrust cut into the end of the sheet. Now, Titebond the spruce bottom longerons in place.

While this is drying, laminate the pylon, using epoxy, Titebond or Weldwood contest cement. Believe it or not, the tank is next. Modify a Perfect No. 6 tank, or equivalent, per the plans. No leaks, please, unless you have a passion for apoplexy. Before soldering in the tubing, make a paper template of the end of the tank, clearly marking the tubing locations. Now laminate the firewalls with epoxy. Is the fuselage dry yet? How about the pylon? Figures. We don't need the pylon yet, but you can shape and sand it if you're in the mood. Now that the bench is covered in wet parts, trace the side onto some straight 1/8 sheet. The left side should be shorter to maintain the left thrust and both sides should show one degree of down thrust.

Is anything dry yet? The firewall is? Peach-keen, drill it to match your motor mount and install the mount to seat the blind-nuts. Now position the tank template on the back of the firewall about 1/4 inch up from the bottom edge. Mark the tubing positions and drill through firewall and mount to clear the fuel and pressure lines. Now see if the tank lines poke through. Glad that chore is done! By now the fuselage sub-assembly should be dry. If your bench really is flat, I'll buy it! Meantime, glue the right side in place. If your bench is like mine, unpin the frame and glue the side in in the air. The straight bottom of the side will align the rest of the assembly. While this is drying, cut and glue the wing table together. Follow by fabricating the fin. Hot Stuff is handy here. Now go back to the fuse and glue in the upper right longeron and then the upper left. Cut and bend the AR and VIT tubing and glue into the appropriate notches. Where they cross, the VIT line goes inside. Sorry you started this heap? That's why we built the stab first!

Now's the time to pin the left side in place so you can locate and cut the tubing exits. When this is done, glue the left side in place. This is followed by the doublers in the nose. Use epoxy here.

Assembly kits for r/c

Aluminum spars.

Stainless steel

glass-filled Lexan® fittings.

50" SOLING-M \$377 complete

70" SANTA BARBARA \$378 less ballast

VORTEX MODEL ENGINEERING

210 EAST ORTEGA STREET
SANTA BARBARA, CA 93101

Mail order only. No discounts. Write for information.

Now, put in the front and rear stab rests, with epoxy around the tubing and in a fillet around the front rest. Now have a cup of coffee, I've run out of lead.

Next comes the top sheeting and nose doubler. While this dries, glue the trailing edge stock to the bottom of the wing table. When this is dry, epoxy the table to the pylon. It's easier to keep it square at this point. Carefully cut the slot for the pylon and trial fit to check the incidence. The front of the table should be not less than 1/8 higher than the rear, while 5/32 is even better. This is measured from the bottom of the fuselage. With the pylon in place, poke the tank through the firewall and trial fit this assembly to the front of the fuse and the pylon. Trim to get a good fit. Now epoxy everything that isn't already, and head for the nearest bar.

PEA POD
DESIGNED BY Tom Protheroe

NEW

709 807

AMYA CLASS 36/600

\$29.95

WRITE or CALL 213-661-7928 FREE CATALOG

KIT FEATURES

- COMPLETE SAIL CONTROL MECHANISM
- MACHINED WOOD AND METAL PARTS
- COMPLETE BASIC HARDWARE PACKAGE
- ALL RIGGING & A FULL SAIL PLAN
- A BASIC COURSE IN SAILING

R/C SAILPLANES & ACCESSORIES

AVATAR₇₂ \$32.95 CURIO \$44.95

HI-STARTS - PARACHUTES - RUBBER

DEALERS & DISTRIBUTORS STD. TERM

M.S. LIMITED
P.O. BOX 38748
L.A. CA. 90039



EASY AS 1,2,3!

HUSON 36's FINISHED FIRST, SECOND AND THIRD AT THE AMYA'S 1975 EASTERN DIVISIONAL CHAMPIONSHIP FOR THE 36/600 CLASS AT RICHMOND, VIRGINIA. FEATURED IN THE AUGUST ISSUE OF POPULAR MECHANICS, OUR COMPLETE KIT INCLUDES FIBERGLASS HULL/DECK, FINISHED SAILS, ALL HARDWARE AND RIGGING, REQUIRING ONLY R/C, SAIL WINCH AND LEAD SHOT BALLAST. **AVAILABLE NOW --\$125.00 FOB**



LEISURE PRODUCTS

6920 BRADDOCK ROAD
ANNANDALE, VIRGINIA 22003

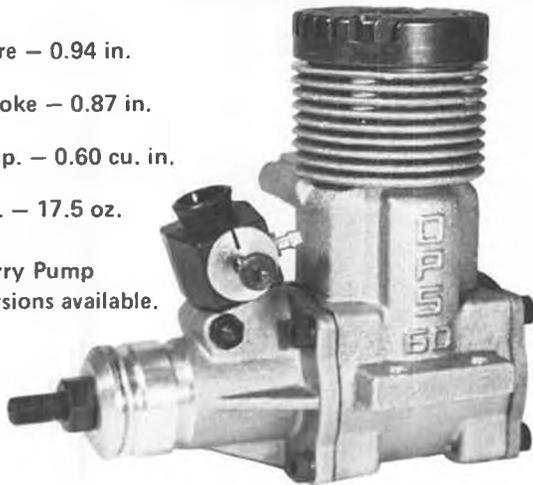
BRUTE POWER!

by
ops

URSUS .60 R/C

Bore — 0.94 in.
Stroke — 0.87 in.
Disp. — 0.60 cu. in.
Wt. — 17.5 oz.

Perry Pump
versions available.



Power to spare for R/C scale, pattern and sport. The Ursus .60 R/C puts out a full 1.55 HP on FAI fuel, more with the Perry Pump and even more with nitrated fuels! It's the most powerful front intake R/C engine available today! The Ursus has the usual fine engineering and craftsmanship found in every OPS engine. Remember, all engines have Schnuerle porting and ABC piston and sleeve design. Go with OPS and you go with the best.

Shamrock Competition Imports

P. O. BOX 26247-A, NEW ORLEANS, LA. 70186
1- (504) 242-5967

I really like sheet wings for their strength and airfoil fidelity. Build in four, separate panels. Again, use 6 to 8 lb. wood for the sheeting. Note that rib thickness and web thickness and spacing are graduated. Don't deviate. There's enough of them running loose already. The four skins can be cut to shape and butt glued. Don't really need the plans, again, as all members have to be marked.

Pin down a bottom skin, glue in the leading edge doubler and follow up with the leading edge. Look at the plans and pick out the line labeled Rib Ref. Line. Hold the front of a full size rib against this line and cut at the inside of the leading edge. Whack the rear end of the rib off 1/4 inch short of the trailing edge of the skin.

Now mark the proper leading edge height, measuring down from the top. Place a straight-edge from here to the trailing edge (which comes to a point) and lop off the excess with your purple-handled Uber Skiver.

This method keeps the high point of the foil in a straight line. The wing has zero sweep in spite of the taper. When the rib shape is right, cut the notch for the doubler and glue in.

Once all ribs and webs are in, it's time for the built-in warps. Unpin the edge of the panel, shim up the proper amount, and pin down again. The top sheeting will lock the warp in. The top sheeting butts against the inside of the leading edge and stops 1/4 inch short of the bottom trailing edge, a separate cap strip is used to fill the gap.

After drying for a couple of days, trim and sand the edges and ends and we're on the home stretch! Caramba! Epoxy the tip panels, blocked to the correct height, to the mains. Repeat with the mains. Using epoxy, wrap the tip joint in 1-1/2 wide cloth tape, and the center joint in 4 inch wide cloth tape.

COVERING AND FINISHING

We both thought we'd never get here! The wing and stab are covered and trimmed. About 5 coats of thinned dope (any kind) will do nicely. I cover the fuselage (up to the pylon) with silkspan, using 6 or 7 coats of dope. The nose and pylon are painted with thinned Hobbydope II. Use dope thinner to cut it. Color scheme should include a dark color for air visibility and a light one for ground. The 1/32 ply scuff plates are epoxied to the wing and stab trailing edges. Bend up and epoxy the stab hooks in place. Locate and drill a 1/8 hole in the stab in line with the tubing in the rear stab seat. Glue 1/32 ply around the rear stab seat to form a well around the tubing. Mount and square up the wing and add split dowel keys. The stab doesn't need keys.

HARDWARE

Now for the tricks! The flood-off release is clearly shown in the photos. Or buy one from Crockett, they're neat.

JCR
FREE FLIGHT HARDWARE
TOOLS, ACCESSORIES & PRECISION CASTINGS

WINDING HOOKS
UNLIMITED TO PEANUT

BALSA STRIPPERS
18" AND 36" LENGTHS

JETEX 150 MOUNT NOT-WIRE

CIRCLE-TOW

COUPE HUB

O-T KIT PLATE HOOKS

NEW RADIAL ENGINE MOUNT FOR O-T
FITS: FORBYER 20, RAB TORPEDO, O&R 18 AND 23
CATALOG \$1.00

JIM CROCKETT REPLICAS
1442 N. FRUIT AVE.
FRESNO, CA. 93728

DO YOU REMEMBER...

... this beautiful Monocoupe by Megow?
One of the four most super-detailed plans that Megow ever made.
We have this, plus many others, printed in clean black line. For catalog, send .50¢, refundable with first order.
GOLDEN AGE REPRODUCTIONS
P. O. Box 13, Braintree, Mass. 02184

Back to the salt mines. Remove the mount from the firewalls and put a dab of clay in the blind-nuts to keep the glue out. Cut and taper the right cheek and glue in place. Now for the left cheek, which is not just slapped on. First, locate the timer position on the fuselage side, and cut an opening that the mechanism will just fit through. Locate the timer position on the cheek, and cut an opening that the whole timer will slip through. Glue the cheek in place. You now have a recess with a ledge at each end. Cut two pieces of 3/32 aluminum to fit these ledges. Epoxy in place. Now cut two pieces of 1/16 plywood to the size of aluminum and epoxy them over the metal.

We now have nice, solid nutplates for mounting the timer. They're drilled and tapped later. Fill in between the stab rests, and behind, with medium sheet. Cut and glue the end cap for the rear end. At long last, epoxy the fin and sub-fin in place, carefully aligning both with the pylon. Carve and sand the corners to a radius and fair the front end into the mount. Using epoxy, wrap the nose and firewall with 2 inch wide nylon tape. Set the hateful thing aside, run out and kick the fire hydrant or bite the garden hose... Wizz on the petunias?

WING CONSTRUCTION

Wing construction is almost conventional... for a sheeted wing, that is.

THE QUIET WINNER



READY-TO-RUN
ELECTRIC-POWERED
Jerobee "Greenwood Vette"

W/PROPORTIONAL THROTTLE,
DYNAMIC BRAKING, LEXAN
CHASSIS, REAR TIRES AND
WHEELS "GLUED AND TRUED."

Car without radio \$99.95

Car with Jerobee radio . . . \$179.95

Car with Futaba radio . . . \$219.95

Complete electric conversion
chassis, w/ power train . . . \$57.95

Charging cord fits cigarette lighter —
recharges in 20 minutes.

Master Charge
accepted

LEISURE ELECTRONICS 11 Deerspring, Irvine, California 92705 Phone: (714) 552-4540

Mount the pan, engine and flood-off device. Cut the exhaust deflector from .010 brass and install. Mark the timer holes, drill and tap 2/56 and mount the timer. Now for the auto-rudder. Thought I'd forgotten, din'cha? You're right, but no harm done. Cha-cha to the end of the fuselage with the fin on it and whack a rudder out of the trailing edge. Use a sharp whacker. Recess the fuse at the base of the rudder about 1/16 inch. Epoxy a piece of 1/16 plywood into the recess for the adjustment bracket seat. Bend, drill and tap the soft aluminum 'U'-bracket, and screw and epoxy in place. Cut 3/32 off the bottom of the rudder to clear this fitting. Now epoxy the aluminum tubes in place on the rudder and fin. Epoxy thin brass or glassboard plates to both sides of the rudder where the adjusting screws will ride. To mount the rudder, cut a small slot in the fin along the hingeline. Slip the wire hinge post through all three tubes, tuck it into the slot, and fill with epoxy. Bend a small hook and epoxy it to the right side of the fin at the base and well forward. This is for the AR tensioner rubber band. Cut the ply rudder horn and trial fit. Trim to avoid interference with the bracket, and epoxy in place, with a fillet all around. Run braided nylon trolling line through the AR tubing, and tie to the horn. Run 2/56 nylon screws into the bracket and adjust for neutral rudder with tension on the line. Slip a ring over the AR release wire of the timer and tie the other end of the line to it. Adjust the right screw for about 3/32 travel with the tensioner band installed.

Stop making noises like an engine, and let's finish this flaming fliegle!

Procure (how's that for class?) or otherwise obtain a piece of hard aluminum, about 3/8 by 1-1/2 by .030 thick. Mark a line the length of the piece about 1/8 from what will be the bottom. Drill a hole, about .040, on the right end of the line 3/32 in. Drill two more holes about 3/16 apart another 1/4 inch in. Look at the photos again. Now drill out the metal between these holes and file

the jagged gap into a smooth slot. Mark a second line 5/32 above the existing one. Mark a spot on this line 17/32 to the left of the left end of the slot. Drill a hole here. Cut both release arms of the timer, the VIT arm to 3/16 and the DT release to 1/4. Slip the piece over both these arms and check to see where the VIT arm lays. Elongate the DT hole along its centerline until the VIT arm is hard against the front of its slot. Carefully elongate the DT hole forward of the pin 1/8. This is the glide incidence setting. When the VIT lever releases, the piece rides back against the DT pin, allowing the stab trailing edge to rise. The VIT pin should slip completely through its slot. Be sure it does. At DT time, the piece is released and acts as the DT limit. One line. No hammers. No screws. Now trim away all excess metal, leaving a smooth curve like a very flat S. (Would you mind going over that paragiraffe again? wcn)

Bend up the stab retainer from .040 wire, squashing the loop a little. Use 1/2-A control line lead-out cable for the VIT/DT line. Loop an end through the stab retainer, wrap and solder. Keep this joint small, to avoid interference. Run the cable through the fuselage and strap the stab on snugly, retainer in place. Slip the VIT fitting on the timer with both levers engaged. Run the free end of the cable through the hole in the fitting, pull tight, wrap and solder. Strap the stab on as for flight and check the operation of the whole system several times. For a starting point, set the AR to trip a blink after flood-off, and VIT about 1 second after AR. Run through several times. The first mistake will cost you the ship. Depend on it.

PREFLIGHT

A little time here will be well spent. Now's when we look for little things like missing needle valves, warps, holes and such-like. And find 'em! From the nose; a balanced pitched prop, snugged down, no cracks or discolorations. Engine bedded down, fuel and pressure lines installed and unkinked, flood-off release free, wing keyed, timer operation



TERN AERO

**TAKE A TERN
FOR THE BEST!**

WITH THE

THE QUALITY LINE

OF

FLYING MODEL AIRPLANE KITS

Scale • Semi-scale • Non-scale

CATALOG 35c

TERN AERO CO., inc.
CHICAGO, ILL., 60666

including the timed DT. Stab snug and square, auto-rudder position and a dab of silicone or rubber cement on the screws. And we're ready to fly! You believe that? Gotcha! We didn't check CG position. Should be 5-1/4 to 5-3/8 from the leading edge at the root.

Wrap a Baggie around the engine and off to the tall grass. Hand glide, with stab and rudder in glide position, looking for a trace of right turn and no out-right stall or dive. At this point we want enough of a glide so the thing won't crash before it can DT. Run up the engine and check all timer functions. While you're at it, set the needle valve for about 18 grand and be sure the flood-off really shuts it down. Rossis' and Tigres' will idle along quite happily at times if the flood is insufficient. It's embarrassing, if not fatal.

Set the timer for 3 seconds engine and 30 to 40 seconds DT and light off the engine. Launch at 45 degrees into, a bit right of, the wind. At this power setting, Orca will move at a good clip in pretty much a straight line. She may lean a little to either side after 2 seconds. So far, so good. Don't expect much of a transition, but watch the glide. Trim by adding weight to the appropriate end, leaving incidence alone. Use the same timer run and wind the engine up a little tighter, 19 to 20.

What kind of covering do you prefer?

TISSUE? If you like tissue, we recommend Silkspun Coverite. It looks like tissue but it's 10 times stronger, and goes on with a household iron, in half the time. It can be used as is (the filler coat is built in) or painted, requiring one-third the paint. It's very economical. **SILK?** If you like silk, we recommend Super Coverite that can be easily ironed-on. It looks like silk, but it's 100 times stronger. Like Silkspun, it can be used as is or painted. Being a woven fabric, it's very authentic. **MYLAR?** If you hate to paint, but are tired of the way plastic film mylar scratches, sags, rips and shatters, we recommend iron-on PermaGloss Coverite. It comes with 4 coats of special paint bonded permanently to its upper surface. Paint that won't scratch, is fuelproof, rotproof and fadeproof. It is 150 times stronger than mylar, tissue, silk or anything else. **ONLY COVERITE COVERINGS MEET THESE RIGID TESTS:** *Shrink Test:* With household iron, shrinks drum tight, wrinkle free (even around compound curves). Will not sag like plastic mylar films, nylon, tissue or silk because Coverite has a permanent shrink memory, but will not warp airplane structure. *Abrasion Test:* Withstood 3600 cycles on Taber abrader (500 gram load). *Sunlight Test:* 6 months under glass exposure in Florida sun, retained 4X more original tensile and tear strength than silk. *Temperature Test:* Withstood up to 400° F. Did not become brittle at below freezing temperatures like plastic films. *Chemical Test:* Virtually impervious to engine fuels. *Humidity Test:* Resists water which causes other coverings to swell and sag. *Rot and Mildew Test:* Buried in soil 8 weeks without change. *Strength Test:* Far in excess of 25,000 PSI tensile strength.



COVERITE IS EASIEST TO APPLY 1) Requires no fancy tack irons; ordinary household iron is fine. 2) New improved Quickstik adhesive surface sticks tighter than ever when properly heated. 3) Requires minimal sanding. Hides far more defects than any other covering. 4) Requires no pre-doping of structure. 5) Takes less paint due to built-in filler coat. But all Coverite coverings can be used as is, without any paint whatsoever. PermaGloss, however, has 4 coats of almost indestructible paint bonded to its upper surface. 6) Requires no special handling. Won't scratch or burn up during application. 7) Can be trimmed with paint, any decal including mylar, or with itself (which is goofproof because it can be re-heated again and again).

IRON ON IRON TOUGH COVERITE

2779 Philmont Ave.,
Huntingdon Valley, Pa. 19006, USA

There'll be a noticeable difference in climb speed and this time we'll correct any left turn tendency with a touch of right rudder. If all's well, keep the engine setting and increase the run. Once past 4 seconds, the transition should shape up. At full power and 7 seconds, it may be necessary to delay AR to prevent an actual dive. Likewise the VIT to prevent zooming. With low incidence, a straight-away climb is impressive, but makes me nervous. I like to see some right, just to know it won't go left in a gust. Trim the glide turn for about 45 seconds using the rudder and, if necessary, stab tilt. Treat Orca with respect, she's got teeth! Fly safely and fly free.

Counter *Continued from page 8* version for \$8.95. Custom voltages are available on special order. The Flite Lites are available at hobby dealers or direct from Advanced Devices.

If you fly free flight scale, or sport free flight, or can remember Megow kits, or if you just like model aeroplanes, you need a Vintage Aero catalog. This company specializes in the old, obscure, and unique in aeromodeling. It offers recreations of the Ideal kit plans, Megow and Continental replica kits, and an incredible assortment of rubber power materials and accessories. Included in the catalog is a 15 page reprint from

The Boy's Model Airplane Book, on scratch building a compressed air engine. This reprint alone is worth the price of the catalog . . . a scant \$1.00. A complete product and price list is available for another \$.30. The 1976 edition of the Vintage Aero catalog is available from Vintage Aero, 1 The Glen, Tenafly, New Jersey, 07670.

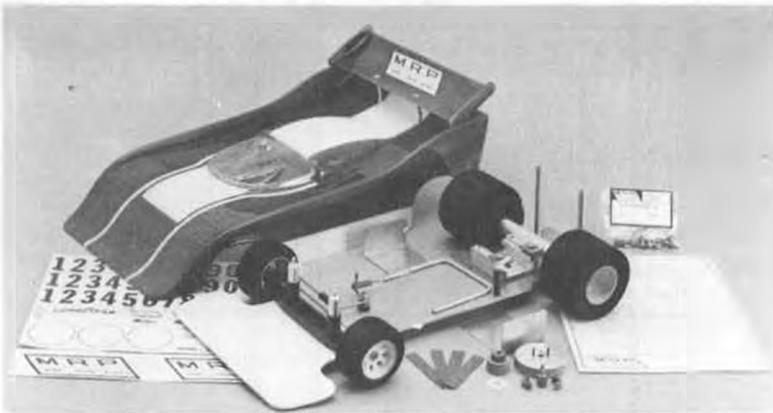
Fulton Hungerford, the spoke wheel man, will soon be producing stainless steel wire spoke wheels for gas models. Sizes and prices have not yet been firmed up, so if you are interested, it would be best to contact Fulton directly. His address is 1770 Lilac Circle, Titusville, Florida, 32780. If you are not familiar with FH wheels, ask a F/F scale nut. FH silk thread spoke wheels are nothing short of incredible.

After several years of development, Hi Johnson Model Products is ready to release the Saloma R/C sailplane. This kit is totally different from anything offered before. It uses wire cut foam wings, which are sheeted with a high density foam sheet (see January 1976 MODEL BUILDER for details on construction methods) and a four-piece vacuum formed plastic fuselage, to produce a 100 inch span sailplane suitable for experts or beginners. The wing uses a progressive airfoil which changes from a 12% thick undercamber at the root to a 12% flat bottom at the tip. Each wing panel has 3 degrees washout built in. The large all-flying stab and dynamically balanced rudder provide smooth control, which can be adapted to the pilot's flying ability by changing the amount of throw. The kit comes complete with all necessary hardware, including Hi Johnson Trim-lock push-rods, Hi-Loc control horns, and polypropylene hinges. The modulated airfoil provides a broad speed range for competition, and the long nose and tail moments provide stability to make the Saloma suitable for beginners. The ASA plastic fuselage can be glued with most model cements, and is easily repaired. Available from dealers or direct, the Saloma will sell for \$44.95. Manufactured by Hi Johnson Model Products, 11015 Glenoaks Blvd., Pacoima, Calif., 91331.

Fact of life . . . it takes pressure and control to fill a pen bladder or pacifier fuel tank. One cure for the problem is the new Tatone Products Syringe-Fueler. This is a molded polyethylene syringe with a neoprene plunger. The plunger has a built-in stop ring to prevent it from being accidentally pulled out of the barrel, unlike most medical-type syringes. Also, it is graduated in 1/4 ounce increments. Any dirt or sediment can be easily seen through the clear plastic barrel. For \$2.95, the



MODEL RACING PRODUCTS, INC.
12702 N. E. 124TH STREET
KIRKLAND, WASH. 98033
PHONE: (206) 827-8607



Model Racing Products Inc.

M 500 ROAD RACE KIT

NOW YOU CAN GET THE BEST HANDLING STOCK CAR KIT,

less body, for those who have a preference in body styles. Includes: Power pod with axle brake, 65 tooth drive gear, complete 14 tooth clutch and flywheel, nylon wheels with tires mounted and trued, aluminum chassis, offset kingpin kingpin front end assembly . . . guaranteed not to break, bumper, wing and mounts, hardware, linkages, and instruction manual.

ASSEMBLED AS SHOWN, LESS BODY \$110.00

Syringe-Fueler is available from dealers, or direct from Tatone Products, 1209 Geneva Ave., San Francisco, Calif., 94112.

* * *

The M.A.B.A. biplane fliers should be glad to see the introduction of a high quality, sprung, steerable tailwheel assembly. The C.B. Enterprises Tailwheel assembly uses a leaf spring assembly together with a double-sided rudder horn and heavy duty axle mount to provide a rugged tailwheel mount for large R/C biplanes. The leaf spring assembly is shipped straight, but can be bent by the modeler to any curvature. Coil extension springs protect the rudder servo from shock damage. The tailwheel assembly, complete with one-inch wheel sells for \$7.95. C.B. is also marketing the fiber-filled nylon double control horn separately. These horns are molded with a "U"-shaped channel section which wraps around the control surface. They can be mounted with nuts and bolts or epoxied in place. Both the tailwheel assembly and the control horns are available from C.B. Enterprises, 21658 Cloud Way, Hayward, Calif. 94545.

* * *

Harold Cunningham has completed a book entitled "The Model Engine." The fully illustrated book covers the workings and problems of glow engines, including chapters on Tips on Easier Starting, Mufflers, and Problem Solving Made Easy. "The Model Engine" will be sold through hobby dealers for \$2.95, or can be ordered direct from JR Sales Co., Box 552, Bowie, Texas, 76230. Harold has combined information from engine manufacturers and others with his own experience, to provide an excellent trouble shooting manual for the beginner and sport flyer.

Birds Continued from page 18

The "total" bird is therefore a blend of features, and sometimes a compromise is necessary. Nature practices "design trade-offs" in its engineering, too!

Consider the wing of a soaring bird: being jointed at the "elbow" it can allow the bird to sweep his forearm (outer wing panel) forward and backward with respect to its upper arm (inner wing panel). If the center of pressure (c.p.) is considered to be in the vicinity of the 30% chord point, then by sweeping his wing fore and aft, the bird can change the relationship between its center of gravity and its c.p. This will create a pitch-up or pitch-down moment, respectively. In most under-cambered wings, the center of pressure travel is rather large for normal changes in the angle of attack; but in wings having reflex or even semi-symmetrical airfoils, the c.p. change is either small or non-existent for all useful angles of attack. Thus, by changing the shape of its airfoil, the soaring bird can control c.p. movement or stabilize it in the precise location needed. Neat!

In a rearward sweep of the outer wing panel, a couple of interesting things happen: projected area decreases, c.p. moves aft, and the mean chord of the wing moves inboard. The pitch-down moment and reduced wing area put the bird into a high-speed glide, while the inwardly shifted mean chord allows the wing to better stand the increased forces produced by the higher speed. For extreme diving speeds, the bird folds his wings . . . outer panels first, and if necessary, inner panels, whereby it plummets!

In an extreme forward sweep of the outer panels, maximum projected area is achieved, c.p. moves forward, dihedral is increased, and camber control prevents



TYRO PLAYBOY SR. 80" SPAN

Old Timer R/C or F/F. Completely pre-cut. Formed wire landing gear. Stressed for R/C. Meets all Old Timer requirements.

\$39.95 — (Plus \$1.50 postage)

TYRO MODEL & SUPPLY
P.O. Box 11511, 1930 Edgewood Dr.,
Palo Alto, California 94306
Phone: (415) 321-2898

excessive pitch-up. Tip pinions are spread, and optimum soaring configuration is achieved, wherein the bird can circle tightly without stalling. Although the mean chord moves outwardly in this mode, the elbow joint is locked and the total wing assumes an almost perfect elastic curve.

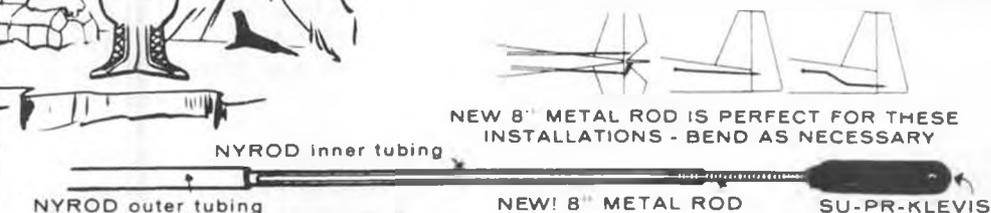
Strangely, the tail is not primarily a pitch control device; that is, an elevator. To be sure it can be used this way when necessary, but it is not ordinarily needed. The tail is employed for yaw and roll as well as for a drag flap. I've watched red-tailed hawks from a distance of only ten feet or so, soaring outside my canopy in the same thermal. Their tails are constantly adjusting by "twisting", that is, rotating about the centerline of their bodies. In extreme cases, the tails rotate almost vertically, becoming rudder and fin when vertical area aft of the c.g. is required. This happens quite often when birds such as the purple grackle and blackbird are in their high-speed gliding or "planing" mode, with wings sloped in anhedral fashion. The tail in this case seems to add yaw stability

NEW...TEMPERATURE COMPENSATED

NYROD®

A ROD FOR ALL SEASONS





NEW 8" METAL ROD IS PERFECT FOR THESE INSTALLATIONS - BEND AS NECESSARY

NYROD inner tubing
 NYROD outer tubing
 NEW! 8" METAL ROD
 SU-PR-KLEVIS

SU-PR-LINE PRODUCTS
 PLAINFIELD, ILLINOIS 60544

Are you suffering from wear, damage, collapse or premature release? If your suffering is caused by tow hooks, relieve yourself and install a guaranteed

FLY HOOK™

The Fly Hook tow hook and mounting hardware for gliders and R/C sailplanes can be yours for \$1.75 post paid (Az. Res., add 5% tax)

G L I D E R G U I D E R S

P.O. Box 1400
 Valley Bank Center
 Phoenix, Arizona 85073

to the bird. Tails are seldom motionless, however, and it seems the bird has need of a tail . . . even if it's not for climbing or diving. In most soaring, the bird's legs and feet are streamlined close to the body and trailing behind, but movement of legs and feet to a more forward position has the effect of bringing the c.g. a bit forward. This is particularly useful in landing and striking. The land bird strikes with talons extended, legs forward and down. The sea bird uses its webbed feet as landing skids and water brakes. When necessary, the tail is lowered as a drag flap, and the entire side view of the bird with lowered tail assumes an almost perfect undercambered shape. I believe that this improves the bird's lift coefficient still further for extreme high angle of attack flight, such as alighting in the smallest possible space under perfect control.

The tip pinions are aero-elastic marvels which, when bending upward under flight loads, also rotate or twist automatically . . . like feathering propellers. I'm convinced that these primaries achieve washout for the wing as well as provide vortex cancelling for improved soaring ability. I also believe that the bird's spanwise lift distribution is as close to being elliptical as it is possible to achieve, such that the approach of airflow to every chordal section along the span is at exactly the same angle. I would like to see some

experimentation with tip pinions and gull-shaped wings on R/C sailplanes, because it is possible that we could improve soaring performance by 20% if we adopted some of the bird's tricks.

In an extreme soaring mode, when the undercamber is maximum and the wings are very close to the stalling point, a row of leading edge feathers automatically pops up, adding turbulation to the approaching flow as it meets the wing. The alula or vestigial "thumb" near the wrist joint also behaves as a leading edge slot to delay the stall and provide turbulation at the angle "break" in the leading edge.

(Next month, Jim Gray continues with the structure of soaring birds' wings. wcn)

C/L Continued from page 33

something to do with proving that Stunters are not capable of turning a 5 foot radius as the AMA rule book calls for. I found the whole thing slightly boring, but it did bring back an idea we had awhile ago but never got around to trying. Being a part-time F/F Freak, I have been aware of the night flying done at Taft and of the availability of lightweight, chemical lights. In a bull-session about two years ago, we decided that it would really be neat to fly Combat at night, but never did get around to doing it.

If you would like to try some night-flying (it's all the rage right now among the R/C glider-guiders) I would suggest using something like a Slow Combat that is expendable and has a handy fuse-lage for attaching the light. The lights are fairly easy to get. You can order them from RCM (check a recent issue for ad and ordering instructions) or, if that is stooping a little low, order the lights from the Brookstone Company. Best bet is to write to them, asking for a catalog and then ordering. More trouble but cheaper, as RCM sells three lights for \$4.75, and Brookstone sells five for \$5.25. Write to: Brookstone Company, 121 Brookstone Building, Peterborough, New Hampshire 03458.

The other day I received a flyer about a new product called Lumiweld. It's a special rod that supposedly allows you to repair aluminum and aluminum alloys with nothing more complex than a simple LP gas torch. I personally can't think of what I would want to weld that is aluminum, but if you have need for such a product, contact H.M. Sadler, 2105 School Drive, Rolling Meadows, Illinois 60008.

Been thinking about building a Slow Rat for the new AMA event? John Kilsdonk has already designed one that will be published soon, if it hasn't already. Motors are going to be a problem for this event. Who will be first to tackle the problem head-on and simply sleeve-down a 40 to the 36 maximum displacement? Several people in this area have been doing just that for the past couple years and, although they have had problems and it is a lot of work, they have proven that a sleeved-down 40 is fast and almost bullet-proof.

While shrunk-up 40's make good Racing engines, kind of makes it tough on the novice or low-bucks racer out for a little cheap racing. It would sure help if some manufacturer would come up with an engine that doesn't break cranks, eat bearings or split its case wide open.

Hey! I just remembered that K&B recently came out with a "stroker" version of their "snarly" 40. The stroker is

THREE TIME NATS WINNER!!

Rhett Miller & Southern R/C Compensator



- 73, 74, 75 NATS WINNER
- U.S. TEAM MEMBER

DELUXE KIT 114.95
STANDARD 79.95
64" SPAN, 54" LENGTH, 7½-8 LBS.



SOUTHERN R/C PRODUCTS INC.

RT. 3 BOX 47 NIMS LANE PENSACOLA, FLORIDA 32503

a 41, and if you don't know anything about F/F, you probably don't even understand why a perfectly good 40 was punched up to a 41 (it allows the use of a 40-size plane in Class D Gas). Wonder how a K&B 40 with a short leg and/or squeezed-down bore would work as a 35 for Slow Rat. How about it, Johnny B.? There are a lot more Rat Freaks around then there are F/F guys competing in D Gas, so don't tell me you can't do it because the potential market is too small.

Continuing along with "odds & ends", how about a how-to-do-it tip for all of the how-do-I-do-it modelers out there in MB land?

Needle valve settings and how to get them: Whether you are out sport flying or competing, it is almost impossible to consistently pull out your plane, start it up, and have the perfect needle setting on that first flight. As long as you aren't going to have the magic engine run first time up, why not play it safe and do as I do? I always start the engine, allow it to get warmed up completely on a slightly rich setting, and then set the needle, being careful to set it on the rich side just a touch. I then fly the plane and listen carefully to the engine both in level flight and in maneuvers. After the flight, the first thing I do is reset the needle, according to how the engine ran in the air. Then I refuel, fire it up and fly it again, without adjusting the needle a second time. If the setting isn't right on the second flight, I just go through the above again and keep at it until I get it right. The important thing, I feel, is to *not* set the needle with the engine running (except for the first flight, of course), as there are a number of things that can give you a false setting on the ground. The bladder can be too full, giving extra pressure and a rich-sounding engine, the fuel can sometimes foam

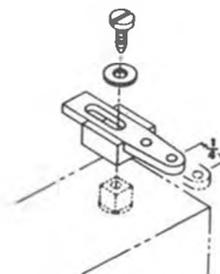
from vibration making the setting sound like it is too lean, the engine may have cooled considerable and not be up to operating temperature prior to the launch, etc.

You don't care how the engine sounds on the ground, you just want it to perform in the air, so listen to the engine while flying and then adjust the needle accordingly, without regard to how the engine sounds on the ground. If you consistently use this method of "needling it", you will find that soon you can put up one test flight, reset the needle, and have a perfect run second flight almost every time. And only rarely get an over-lean run, which is, of course, to be avoided whenever possible.

If you still have trouble getting needle settings, write to me and for \$5.00 in cash, check, money order, stamps, used-up streamers, blown plugs or caster oil residue, I will send you, postpaid, twelve assorted needle settings, ranging from "zonkers" lean to blubbery rich. Washington state residents please add 5.3% sales tax.

A while ago, I got a new style Super-tigre G-21/35 from World Engines, and supposedly I am testing it. Only trouble is that our weather is not very good right now, so I can't always go flying when I have the chance to do some testing. So the engine is only barely broken-in so far, and has only been in the air five times. So far, the new Tigre doesn't seem to be much faster than the old G-21's, which is a little surprising as the new engine has, as supposed improvements, a double-dimple head, full-circle crank, raised exhaust timing, and the exhaust stack cut off short, removing the small, threaded divider that used to be there. The divider certainly looked offensive sitting right there in the path of the hot exhaust, but I doubt if it

ADJUSTABLE SERVO ARM



This accessory will permit you to preset the required arm length to match any throttle or control surface movement that is desired. We now mfg. this accessory to fit the following servos. Order by Stock No.

.98¢ each

- Stk. No. 33 - fits KPS 9
- Stk. No. 67 - fits KPS 10
- Stk. No. 44 - fits KPS 11
- Stk. No. 45 - fits KPS 12
- Stk. No. 46 - fits KPS 14 & 15
- Stk. No. 47 - fits World Eng.
- Stk. No. 48 - fits D&R
- Stk. No. 56 - fits EK Servo
- Stk. No. 64 - fits KPS 14 & 15 II

Add .25¢ on direct orders.

ROCKET CITY SPECIALTIES
103 Wholesale Ave., N.E.
Huntsville, Ala. 35811

really hurt anything. Having the stack cut off short does make it easier to get at the mounting bolts, and that is nice.

For break-in, I ran the engine on a test-stand for almost an hour total running time. Break-in fuel was mild, 5% nitro. Prop used was a nylon Top Flite 10 x 3-1/2 cut down to 8 inches and balanced. After about a half hour of

JOHN POND

Old Time Plan Service

The largest selection of plans in the world at the most reasonable prices. Each list 75c

- No. 5 OLD TIMER F/F GAS
- No. 5 OLD TIMER RUBBER/TOWLINE
- No. 6 OLD TIMER FLYING SCALE A through K
- No. 6 OLD TIMER FLYING SCALE L through Z

P.O. Box 3113
San Jose, Calif. 95156
Phone (408) 292-3382

VINTAGE R-C PLANS



**CONSOLIDATED
PBY-5A "CATALINA"**

9 FT. WING SPAN
ALL RIBS & FULL FORMERS SHOWN ON PLANS !!
PLASTIC ENG. COWLS \$9.00 PR. (9 FT. MODEL ONLY)
CLEAR GUN BLISTERS \$6.00 PR.

4 LARGE PLAN SHEETS — Plans \$13.50

6 FT. WING SPAN MODEL PBY-5A
ORDER ONE NOW!! Plans \$10.00
ADD \$1.00 POSTAGE

CATALOG-OVER 50 PLANS 50¢ DEALERS WRITE

WORLD WIDE

SID MORGAN
13157 ORMOND, BELLEVILLE, MICH. 48111 U.S.A.

FAMOUS BRITISH DIESELS



P.A.W., M.E. &
D.C. Motors.
Finest diesel fuel.
Diesel Data Sheets

**AEROMODELLER Plans,
handbooks, and Annuals**

**VERON Rubber & RC Scale
kits. Catalog 25 cents.**

HOBBY HIDEAWAY, R.R. 2
Delavan, Illinois 61734
(309) 244-7389

Kustom Kraftsmanship

ROSSI

STOCK OR CUSTOM
TUNED ENGINES

PARTS AND
COMPETITION
ACCESSORIES

COX

SUPER-
TIGRE
OS MAX

Fiberglass props, fuel shut-offs, solid lines and many other specialties you cannot find in hobby shops.

also

A complete line of COX .049/.051 custom engines, including R/C modifications.

All 1/2A products formerly by Kirn-Kraft/Jim Clary Racing are now available solely from Kustom Kraftsmanship.

For detailed brochure,
send 13 cent stamp to:

KUSTOM KRAFTSMANSHIP
P.O. Box 2699
Laguna Hills, Ca. 92653

running, the engine would pull a flat 18,000 rpm with the 8 x 3-1/2 and 5% fuel. On the last run of the break-in period, the engine launched the rear bearing, throwing off the retainer. I thought ST solved that old problem when they went to a rear bearing with a steel retainer. Guess not. Luckily, the full-circle crank did a great job of containing the shrapnel from the bearing, which means that the piston, cylinder and head weren't crashed-out from passing odd bits of retainer material.

I pulled the engine down and put in a Fafnir bearing (thanks to American manufacturers for knowing how to make good bearings) and ran the engine again. With the same fuel and prop I was now getting a solid 18,600 rpm. A change of bearings picked up 600 rpm. Hmmm . . .

Next time out we will do a little experimenting with the engine in an effort at getting some hoped-for good speed out of it. Wood, narrow-blade props may be required to get the engine to really honk, along with some 40% nitro fuel in order to make use of the raised exhaust timing . . . hope the crank can take it. I'll let ya know what happens.

Every once in a great while I run across somebody who is willing to go to great lengths toward making this hobby of ours as enjoyable as possible. One

such person is Bill Pardue. I have never met Bill, but I get a lot of letters (volumes of them!) that he has written, and I am aware of most of the many things he is into in promoting C/L in general and Speed in particular. It seems that all of Bill's energy that should have gone into growing big and tall has gone into typing and paperwork that benefits us all (that was your basic, left-handed compliment!).

The latest thing from Bill is a very complete list of where to get supplies for Speed flying. Products, services, names and addresses, the whole shot. If you need it, but don't know where to get it, Bill's list can be a big help.

Although I have a copy of the list, there is not room in this column to give it to you. But you can get a copy if you are willing to help Bill out by listing any sources of Speed-related items that you are aware of and sending them to Bill so he can add them to the list. Also enclose an SASE and Bill will send you an up-dated copy of the list. Write to: Bill Pardue, 1201 Surry Drive, Greensboro, N.C. 27408. Tell him Dirty Dan sent ya!

The modeling industry is presently catering to the R/C market, and a lot of C/L people kind of resent this, as they feel ignored. I think that is a little selfish and shortsighted on their part. There is money to be made in R/C, and that means that many manufacturers are out spending tons of money to develop new and better accessories, many of which work very well on C/L planes. Just because it says R/C on the product, don't think that you can't use it on that new Stunter or Combat ship.

Due to R/C's popularity, we have never had it better as far as engine selection and quality, neat control linkages, Hot Stuff at \$5.70 instead of \$8.00, super-easy covering materials, amazingly low prices for supplies (due to the volume selling that R/C has added to the industry), and on and on.

In future columns, I will be turning you on to a bunch of R/C-oriented items that I'll bet you never even knew existed, and could use to advantage. In preparation, whip on down to the local hobby shop and ask for (1) Rocket City stock no. 69, (1) 12 inch pushrod, threaded 2-56 on one end, (1) DuBro solder link, and (1) 4-40 bolt, 1-1/2 inches long. Lay everything on the counter and try to figure out what to do with these goodies. OK, I'll give you one hint. Think control horn and what one that is adjustable right down to itty-bittses would be worth to you on that honkin', sensitive Combat plane.

Also due to R/C's popularity and the amazing variety of Scale ships (both in Stand-Off Scale and For Real Scale) that are being offered by the manufacturers, it kind of amazes me that there isn't more activity in C/L Scale. The vast majority of R/C Scale kits are of very high quality and are easy to build.

CLASSIFIED ADS

Non-commercial: Rate is 25 cents per word with a minimum of \$3.00 worth.
Commercial: Rate is 40 cents per word with a minimum of \$5.00 worth. No mail-order discount house ads knowingly accepted.

All ads are payable in advance and may be for any consecutive insertion period specified. Name and address free. Send ad and payment to: The MODEL BUILDER, Classified Ads, 1105 Spurgeon, Box 4336, Santa Ana, California 92702

WANTED - Will buy multi-cylinder model airplane engines. In particular, the older spark ignition and certain glow ignition. All letters answered. Russel Sprague, 8800 Green Lane, Randallstown, Md. 21133.

EXTENSIVE COLLECTION, magazines and vintage plans. Lists \$1.00. Guerrieri, 107 Alameda, Redwood City, Calif. 94062.

"SAILPLANE DESIGNERS HANDBOOK." Easy, complete instructions. \$5.96. Eric Lister, 953 Klockner, Trenton, N.J. 08619.

FOR SALE: MODERNISTIC MODELS
The late Hal Swanson's plan service: 5000 plans, \$750 worth of new blue-line prints, 300 steady customers, two large storage cabinets, etc. Bids start at \$1000. Phone (213) 766-5868.

WANTED . . . Back issues of 'Model Builder', Sept/Oct 1971, September, October, and December 1972. John Garret, 1834 Kinglet Court, Costa Mesa, California 92626.

OKIE BIRD . . . 1/2A contest F/F. Wing area 286. Kits \$7.95 each. Add 10% for postage. CLEMCRRAFT, P.O. Box 524, Sand Springs, Oklahoma 74063.

TISSUE PAPER, 10 cents per sheet, 19 colors, send SASE for sample. Bill Wilson, P.O. Drawer U, Kountze, Texas 77625.

BOATS . . . R/C ELECTRIC . . . Solid state electronic, full variable speed controls, motors, special machined shafts, props, drive systems, multiplex control panels, fire hose nozzles, sirens, whoopers, boat whistles, fiberglass hulls, etc. Free literature. Write to: INTERNATIONAL MARINE EXCHANGE 17, Al Gray, 24501, Los Serranos Dr., Laguna Niguel, Ca. 92677. New ideas and products welcomed.

ANTIQUE KITS . . . Solid scale, U/C, some F/F, Stanzel, Girard, Edco, Berkeley, Modelcraft, Comet, Maircraft, Hawk, etc. Send S.A.S.E. for list. The Control Tower, Middle Island, New York 11953.

FIBERGLASS sailboat hulls, R/C: classic FRIENDSHIP SLOOP (43", hull 33"); INTERNATIONAL STAR BOAT (AMYA 45 Class). S.A.S.E. to D.L. Mainwaring, Heritage Marine Models, 36 Hawthorne Avenue, Needham, Mass. 02192.

WANTED . . . Plans for large Delta or straight flying wings, U-control type. Information on how to design wing ribs. Earle A. Robinson, 1970 N.E. 45th St. Ct., Des Moines, Iowa, 50317.

And there are many Scale accessories available (interior kits, decals that look good, realistic wheels, retract gears) for the Scale builder to use to advantage. Look at a Lou Proctor catalog sometime; all kinds of really neat Scale items. Several sizes of turnbuckles, spoke wheels, instruments that look like instruments, rigging cable, strut fittings, and a bunch more. Without the R/C industry, there would be no Proctor accessories at all, let alone being able to go down to a well-stocked hobby shop and buying them right off the wall.

There is no need to be a frustrated Scale nut, just because you fly C/L. Truck on down to the hobby shop, pick out an R/C kit that turns you on, and convert it to C/L. ●

Workbench . . . Continued from page 6

This will help judges to properly evaluate realism of flight. An official rule change at the December 1975 FAI meeting was responsible for this, and we're happy to see that it's taking effect immediately. Let's hope AMA rules will follow suit.

Incidentally, some pretty wild formulas have been put forth on how to calculate scale speed. Actually, it's very simple. First, change inch-to-the-foot scale to direct ratio, i.e., 2 inches to the foot is 1/6 of full size, 3 inches is 1/4. Then, just multiply the actual speed in mph by the fractional ratios

and you've got it. For example, at 2 inch scale, or 1/6 size, a 300 mph P-51 Mustang should fly at 50 mph. At 3 inch scale, or 1/4 size, an 80 mph Gipsy Moth should cruise at 20 (mine did).

ONE GRAND SAM!

Just received word from Joe Beshar, President of the Society of Antique Modelers, that *he* just received word from Sec.-Treasurer Tim Banaszak, that SAM membership has now passed the 1,000 mark!

Congratulations, SAM, and we're proud to have SAM No. 1, "Daddy Warbucks" himself, as a member of our writing staff.

WELL, SOME NYLON . . .

In the January F/F column, we inserted a comment about our experience with nylon as a covering material, back in the late 50's. The comment related to Bob Stalick mentioning that modeler Ray Chalker covered his Starduster 900 with psychedelic nylon material.

Ray sent us a note, enclosing a sample of the material (wild colors!), and pointed out that this nylon wasn't like the stuff we had both tried some years ago. The "new" nylon weighs about 3/4 oz. per square yard, and takes less dope than silk. Water has no noticeable effect, before or after doping. It goes on easily, and because of its different weave, Ray was able to cover the top and bottom of one panel, without cutting at

INDEX TO ADVERTISERS

Ace R/C Inc.	95
Advanced Devices Inc.	67
Astro Flight Inc.	64
Applied Design Corp.	66
Cannon Electronics	60
Carr Sails	84
Cloudbuster Venture	78
Coverite	88
Cox Hobbies	3, 4
Jim Crocket Replicas	86
Dumas Products	2nd Cover
Du-Bro Products Inc	75
E.K. Products	77
Flyline Models	61
Fox Manufacturing	60, 82
Gas Model Products	65
Glider Guiders	90
Carl Goldberg Models	1
Golden Age Reproductions	86
Gulf South Aeromodels	74
Hobby Hideaway	92
Hobbyoxy Products	63
Jef's Friends	66
Hi Johnson Model Products	74
Kavan Model Aircraft	80
K & B Mfg.	62
Kraft Systems	71, 72, 73
Kustom Kraftsmanship	92
Leisure Electronics	87
Leisure Products	85
Micro Model	65
Marine Specialties	83
Model Builder/Pana-Vise Contest	2
Model Builder Products	3rd Cover
Model Racing Products	89
Model Rectifier Corp. (MRC)	4th Cover
Sid Morgan (Vintage Plans)	92
M & S Ltd.	85
Nelson Model Products	81
Pana-Vise	78
John Pond O.T. Plans Service	92
Probar Design	83
Proctor Enterprises	76
REMCO	82
R/N Models	67
Rocket City Specialties	91
Satellite City	67, 77
Scott Research	82
Shamrock Competition Imports	86
Sig Mfg. Co.	96
Sonic-Tronics	78
Southern R/C Products	91
Special Edition Plans	70
Sterling Models	68, 69
Superior Aircraft Materials	76
Su-Pr-Line Products	90
Tern Aero	87
Toledo Exposition	70
Tyro Model & Supply	89
VL Products	61
Victor Model Products	84
Vortex Model Engineering	85
Peter Westburg	74
Williams Brothers	79
J. L. Wittman Co.	76

the dihedral joint, with one piece of the material! He says it stays somewhat elastic, like Monokote; and does not add significant rigidity to the structure. At a buck-fifty a yard, it sure sounds worth trying. Oh yes . . . plain colors are available.

GLOW DRIVER PUZZLE

One way to find out how popular a construction article may be is to publish

FULL-SIZE PLANS SERVICE

(with instructions)

No. 3761 SEASQUARE	\$5.00
A .19 powered flying boat for 3-channel radio. Span is 50". By George Wilson.	
No. 3762 FLIP	\$1.00
Easy-to-construct, all balsa 1/2A sport/stunt control liner. By Dick Sarpolus.	
No. 3763 ORCA	\$4.00
Hot FAI power model with all gadgets. Sheet covered surfaces. Larry Sicuranza.	
No. 376-O.T. A.T. TRAINER	\$1.50
Sport rubber model from 1936 Air Trails. Good flier, 30" span. Chuck Blackburn.	

No. 2761 DRAGONFLY	\$4.00
R/C funship, looks like giant rubber stick model. Superb trainer. By Tex Newman.	
No. 2762 "KILLER" SAUCER	\$1.50
For C/L combat, or just attracting attention. 22" diameter. By Howard Evanson.	
No. 2763 AMERICAN "EAGLET"	\$3.50
F/F scale 1930 lightplane, for rubber or electric power, 48" span. By Tom Laurie.	
No. 276-O.T. "LONG CABIN"	\$3.50
Good looking, stable cabin gas model of the 1937 era. Span 78". Phil Bernhardt.	
No. 1761 PATTERN SPITFIRE	\$4.00
Scale-like .61 powered pattern ship flown at 1975 World Champs. By Tore Paulsen.	
No. 1762 TEXAN 750	\$4.50
Popular Class B-C free flight, modified for today's engines/rules. Jim Scarborough.	
No. 176-O.T. KORDA WAKEFIELD	\$2.00
The classic of all rubber powered competition free flights. By Phil Bernhardt.	

No. 12751 CLIPPER AMERICANUS	\$4.00
Composite scale R/C model of modern jet airliner. Span 48", .09 eng. By Art Hall.	
No. 12752 FOUND	\$1.50
Scale rubber powered seaplane of Canadian design. Span 26". By Walt Mooney.	
No. 12753 SOLIDIFLIER	\$2.00
All-balsa A/1 Nordic with ribless Jedelsky wing. Span 47". By George Peryman.	
No. 1275-O.T. THE PIONEER	\$4.00
Earliest gas job by Ben Shereshaw. Parasol, 80" plug-in wing. By Phil Bernhardt.	
No. 11751 NAVY FLYING BOAT	\$6.00
"Composite" scale R/C flying boat biplane, 6 ft. span, 40-61. George Clapp.	
No. 11752 "TWIRP"	\$0.75
Beginner's fuselage rubber powered ship. Teaches stick 'n' tissue. By Dave Gibson.	
No. 11753 "LUNAR TIC"	\$3.00
Classic-looking, high performance Half-A free flight. Easy to build. Harry Murphy.	
No. 1175-O.T. FOO 2-U-2	\$2.50
A pre-Zipper design by Dick Obarski, reduced to .020 Replica, by Ron Sharpton.	
No. 10751 THE LITTLE ONE	\$4.00
Economy size, .40 powered pattern ship has rolled ply fuselage. By Dick Sarpolus.	
No. 10752 MISTER MULLIGAN	\$4.50
Jumbo scale rubber model of famous Ben Howard racer, spans 56". Tom Houle.	
No. 10753 SUPER PUP	\$2.50
Profile C/L stunt ship for .29 to .36 power. 42" span. Easy-built. Mike Parenteau.	
No. 1075-O.T. SKYLARK	\$3.50
Pleasing Class A/B Louis Garami design. Shoulder wing, 50" span. Phil Bernhardt.	
No. 9751 BABY ALBATROSS	\$8.00
Exact R/C scale model of famous Bowlus sailplane. Span 122". Col. Bob Thacker.	

STICK 'EM PATTERNS

Complete sets of pressure sensitive patterns provide "printed wood" . . . on your stock . . . for selected MODEL BUILDER plans. Press all patterns for ribs, bulkheads, tips, etc., on proper thickness sheet balsa or plywood, and cut 'em out! No tracing, no transferring, no plans tearing, no inaccuracies. Just like making up your own kit with printed wood.

"Stick 'em Pattern" numbers correspond to plan numbers. Order with plans and they'll be mailed together . . . 3rd Class. Add 50¢ per set to mail patterns 1st Class.

CALIFORNIA RESIDENTS ADD 6% TAX.

No. 775-O.T.SP BOMBSHELL	\$3.25
No. 575-O.T.SP MERCURY	\$3.25
No. 11743 SP "C-QUELL"	\$3.95
No. 1174-O.T.SP LANZO STICK	\$1.95
No. 91074-O.T.SP BUHL PUP	\$4.95
No. 8741SP WOODY PUSHER	\$1.95
No. 874-O.T.SP POWERHOUSE	\$3.95
No. 7741SP CURTISS A/12 SHRIKE	\$3.95
No. 774-O.T.SP OUT 'O SIGHT	\$2.45
No. 6741SP TRIXTER BEAM	\$2.95
No. 674-O.T.SP RED ZEPHYR	\$3.95
No. 12711SP CURTISS-WRIGHT Jr.	\$3.95
No. 574 O.T.SP T-D COUPE	\$2.95
No. 11731SP BIG JOHN the FIRST	\$5.95

No. 9752 FIREDRAKE	\$3.00
Half-A free flight featuring fast climb, flat glide, penetration. Larry Sicuranza.	

Price includes 3rd Class postage and reprint of building instructions (if any). Add 45¢ PER PLAN for 1st Class postage. Add 50¢ for overseas orders (except APO's).

Send self-addressed, stamped business size envelope for free copy of complete plans list. CALIFORNIA RESIDENTS ADD 6% TAX.

SEND TO:

MODEL BUILDER PLANS SERVICE
1105 SPURGEON, BOX 4336,
SANTA ANA, CALIFORNIA 92702

it with a few critical errors. If you get no reaction, you can write off the article as a dud. As for Brian Ellis' Glow Driver in the January '76 issue of MB, *every modeler in the country must be building one!*

Within a week after its publication, three errors made themselves evident; two in the wiring diagram on page 42, and one in the schematic on page 41.

In the schematic drawing, resistor R-8 is shown as 10,000 (10K) ohms, when it should be 10 ohms . . . as correctly stated in the parts list. On the wiring diagram, the identities of resistors R-4 and R-5 have been transposed. Also, a wire lead should be shown from the emitter (E) of transistor X-3 to a common ground. In this diagram, it went to the left end of the upper 10 watt, 1 ohm resistor R-11. In the right hand photograph on page 41, showing the under side of the perf board, this is the long wire lead on the far right side of the board.

We're sorry these errors sneaked through, and will check more closely on some additional electronic construction articles which Brian is planning for future issues of MB. Watch for 'em!

SIG BOND & FOAM

While on the subject of corrections, an error in our January R/C Soaring column, relating to foam wing construction, earned us a letter from Claude McCullough, Product Engineer for Sig Manufacturing Co. In part, Claude says:

"In listing model cements not to be used on foam wings, Sig Bond was one of the examples given. Sig Bond is an aliphatic resin glue and can be used on foam without problems. We recommend its use in all of our foam wing kits for gluing on the leading edge, trailing edge, and tip blocks.

"I expect you were thinking of our model cement, Sig-Ment, which will eat up foam! Incidentally, Sig-Ment has recently been improved and now is stronger and works better in gluing ABS plastic than did our previous formula."

BULL . . . ETIN BOARD

Nino Campana, Canada's bone-bending radio controller, writes to remind us that the Sault Modelers Radio Control Club will be holding its Annual Upper Great Lakes Model Meet on May 29 and 30, at Sinclair Park Model Airport, in Sault Ste. Marie, Ontario, Canada. The MAAC sanctioned event

will have three classes of pattern, plus stand-off scale. All MAAC and AMA members are cordially welcomed. The CD is Jack Mertes, 44 Oregon Rd., Sault Ste. Marie, Ontario, Canada. His phone is (705) 254-3388. Pre-registration would be appreciated.

TOP FLITE FACTS

Rumors can sometimes get pretty wild if allowed to go unchallenged, so after hearing 3 or 4 "positive" and very different tales about Top Flite, we sought out the correct story from Mike Schlesinger, who in partnership with Sid Axelrod, has pretty well covered model aviation in recent years . . . ahem.

Sid and Mike closed an agreement in December 1975 with Wm. C. Nickels, head of Replogle Globes, Inc., of Chicago, for the total purchase of Top Flite Models, Inc. Replogle is a major manufacturer of the familiar geographical globes seen in school classrooms, libraries, and the show windows of airline ticket offices.

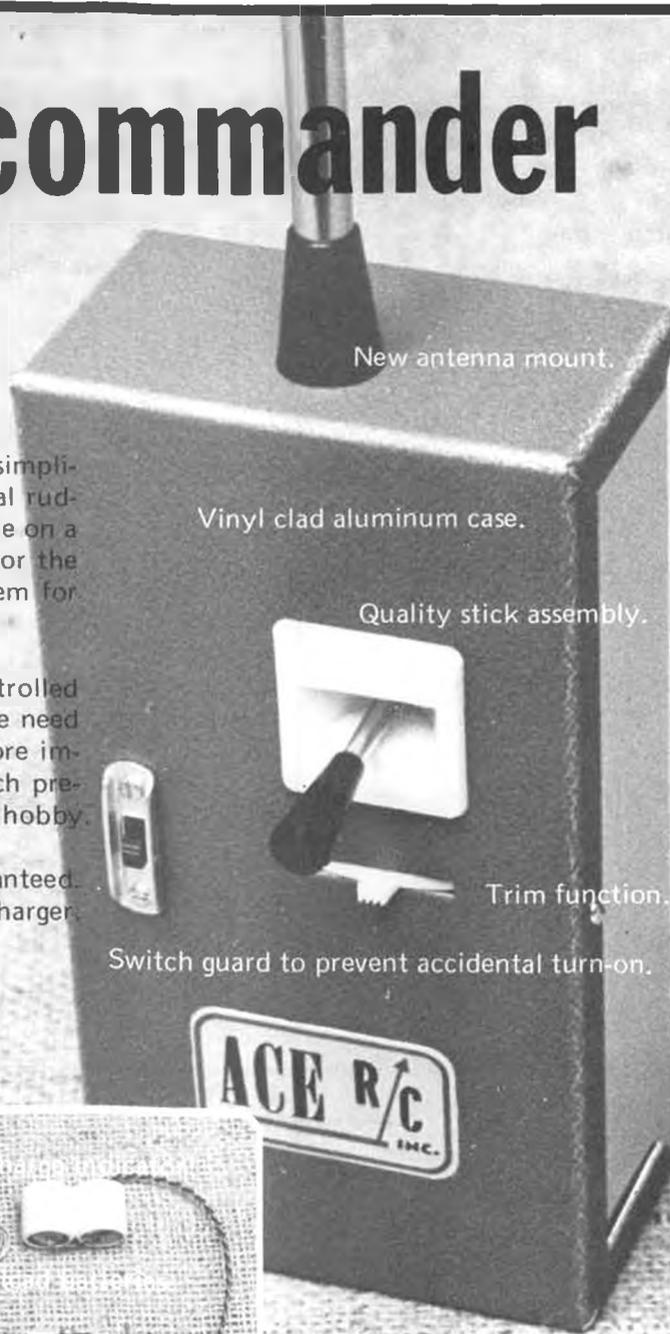
As in the cases of World Engines with Consolidated Foods, and Kraft Systems with Carlyle Rubber, Sid and Mike will continue to operate Top Flite Models in the manner to which we have all become accustomed. ●

pulse commander

Due to its small size, light weight, simplicity, and low cost, pulse proportional rudder-only flying is an ideal way for one on a budget who wants to get into R/C or the sport flyer who needs a second system for fun flying.

The sensibility of small, rudder controlled airplanes continues to increase as the need to economize becomes more and more important. Don't let an economic pinch prevent you from enjoying your favorite hobby.

Units are wired, tested, and guaranteed. Complete with airborne nicads and charger.



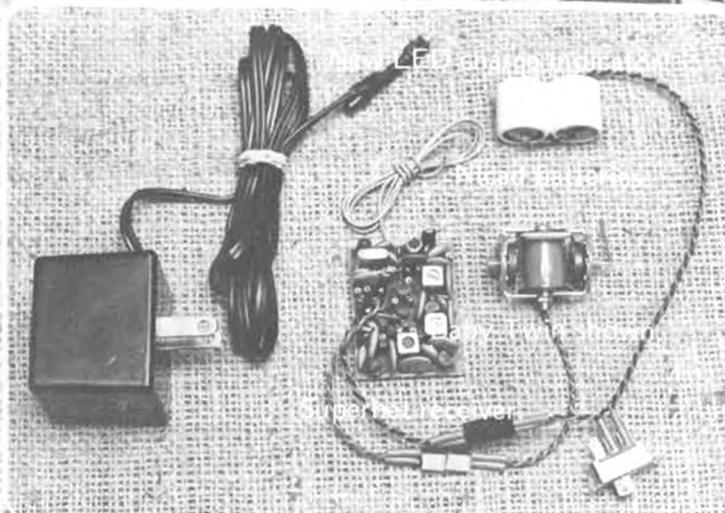
New antenna mount.

Vinyl clad aluminum case.

Quality stick assembly.

Trim function.

Switch guard to prevent accidental turn-on.



AVAILABLE ON: 26.995, 27.045, 27.095, 27.145, 27.195 MHz

BABY \$69.95 (10G15)

- Airborne weight = 2.35 oz.
- Recommended for .010 and Pee Wee .020 planes not greater than 36" span.

BABY TWIN \$72.95 (10G15T)

- Airborne weight = 2.55 oz.
- For Pee Wee .020, Tee Dee .020, and slow flying Babe Bee .049 planes up to 40" span.

STANDARD \$71.95 (10G16)

- Airborne weight = 3.7 oz.
- For Babe Bee and slow flying Tee Dee .049 ships up to 42" span.

STOMPER \$74.95 (10G17)

- Airborne weight = 4.1 oz.
- Recommended for hot .049 to slow flying .15 powered ships.

ACE R/C, Inc.

BOX 511 D HIGGINSVILLE, MO. 64037

MARCH 1976

WHEN CONTACTING ADVERTISERS, TELL 'EM MODEL BUILDER SENT YOU!

95

Please send me your complete catalog. Enclosed is \$1.00 which is refunded on my first order. (Add \$.50 for 1st class mail return)

Name _____

Address _____

City _____ State _____ Zip _____

NOW! MORE SIZES IN SIG BALS

STICKS 36" Lengths		STICKS 48" Lengths		SHEETS 36" Lengths		BLOCKS 3" Lengths		BLOCKS 12" Lengths		BLOCKS 24" Lengths		C-GRAIN AAA 8-12 LBS.	
1/16 x 1/16	07	1/8 x 1/8	12	1/32 x 2	40	1 x 1	11	1 x 1	38	1 x 1	73	1/32 x 2	45
1/16 x 1/8	08	1/8 x 1/4	18	1/16 x 2	46	1 x 2	20	1/2 x 2	50	1 x 2	147	1/16 x 2	51
1/16 x 3/16	10	1/8 x 1/2	26	3/32 x 2	51	2 x 2	27	3/4 x 2	63	2 x 2	193	3/32 x 2	56
1/16 x 1/4	12	3/16 x 3/16	17	1/8 x 2	57	1 x 3	27	1 x 2	74	1 x 3	193	1/8 x 2	62
1/16 x 3/8	14	3/16 x 1/2	33	3/16 x 2	72	2 x 3	36	1/2 x 2	83	2 x 3	278	3/16 x 2	77
1/16 x 1/2	17	3/16 x 3/4	40	1/4 x 2	92	3 x 3	54	2 x 2	97	3 x 3	420	1/4 x 2	97
1/16 x 3/4	24	1/4 x 1/4	27	3/8 x 2	100			1/2 x 3	61	1 x 4	242	3/8 x 2	105
1/16 x 1	28	1/4 x 1/2	35	1/32 x 3	55			2 x 2	78	2 x 4	378	1/32 x 3	59
3/32 x 3/32	19	1/4 x 3/4	46	1/20 x 3	58			1 x 3	97	3 x 4	554	1/16 x 3	65
3/32 x 1/8	10	5/16 x 5/16	35	1/16 x 3	60			1/2 x 3	116	1 x 6	370	3/32 x 3	77
3/32 x 3/16	10	3/8 x 3/8	44	3/32 x 3	72			2 x 3	139	2 x 6	554	1/8 x 3	89
3/32 x 1/4	12	3/8 x 1/2	50	1/8 x 3	84			3 x 3	210	3 x 6	820	3/16 x 3	110
3/32 x 3/8	15	3/8 x 3/4	65	5/32 x 3	95			1/2 x 4	97			1/4 x 3	121
3/32 x 1/2	19	1/2 x 1/2	58	3/16 x 3	105			3/4 x 4	111			3/8 x 3	155
3/32 x 3/4	25	1/2 x 3/4	80	1/4 x 3	116			1 x 4	122				
3/32 x 1	30			5/16 x 3	135			1/2 x 4	156				
1/8 x 1/8	10			3/8 x 3	150			2 x 4	188				
1/8 x 3/16	12			1/32 x 4	89			3 x 4	278				
1/8 x 1/4	15			1/16 x 4	96			1/2 x 6	134				
1/8 x 5/16	16			3/32 x 4	110			3/4 x 6	156				
1/8 x 3/8	18			1/8 x 4	128			1 x 6	184				
1/8 x 1/2	21			3/16 x 4	142			1/2 x 6	237				
1/8 x 3/4	30			1/4 x 4	168			1-1/2 x 6	277				
1/8 x 1	35			3/8 x 4	215			3 x 6	410				
3/16 x 3/16	14			1/16 x 6	176								
3/16 x 1/4	17			3/32 x 6	195								
3/16 x 3/8	19			1/8 x 6	215								
3/16 x 1/2	24			3/16 x 6	235								
3/16 x 3/4	32			1/4 x 6	285								
3/16 x 1	38			3/8 x 6	335								
1/4 x 1/4	21												
1/4 x 3/8	25												
1/4 x 1/2	28												
1/4 x 3/4	39												
1/4 x 1	49												
5/16 x 5/16	24												
5/16 x 3/8	32												
5/16 x 1/2	37												
5/16 x 5/8	46												
5/16 x 1	54												
3/8 x 3/8	37												
3/8 x 1/2	42												
3/8 x 3/4	48												
3/8 x 1	59												
1/2 x 1/2	47												
1/2 x 3/4	63												
1/2 x 1	79												
5/8 x 5/8	58												
5/8 x 1	84												
3/4 x 3/4	79												
3/4 x 1	91												

SHEETS 18" Lengths		48" AAA SHEETS	
1/32 x 2	20	1/32 x 3	76
1/16 x 2	23	1/16 x 3	81
3/32 x 2	25	3/32 x 3	96
1/8 x 2	28	1/8 x 3	110
3/16 x 2	36	3/16 x 3	134
1/4 x 2	48	1/4 x 3	158
3/8 x 2	50	3/8 x 3	200
1/32 x 3	27	1/16 x 4	120
1/20 x 3	29	3/32 x 4	135
1/16 x 3	30	1/8 x 4	155
3/32 x 3	36	3/16 x 4	178
1/8 x 3	42	1/4 x 4	210
5/32 x 3	47	3/8 x 4	270
3/16 x 3	52	1/16 x 6	222
1/4 x 3	58	3/32 x 6	235
5/16 x 3	67	1/8 x 6	258
3/8 x 3	75	3/16 x 6	292
1/32 x 4	44	1/4 x 6	347
1/16 x 4	48	3/8 x 6	400
3/32 x 4	55		
1/8 x 4	64		
3/16 x 4	71		
1/4 x 4	84		
3/8 x 4	107		

ODDS & ENDS PACKAGE OF BALS Package 125		36" TAPERED TRAILING EDGE		AIRFOILED SHAPE SHEETS	
1/2 x 1/2	47	1/8 x 1/2	28	3/16 x 3 x 36	112
1/2 x 3/4	63	3/16 x 3/4	36	1/4 x 3 x 36	127
1/2 x 1	79	1/4 x 1	46	1/4 x 4 x 36	172
5/8 x 5/8	58	5/16 x 1-1/4	57		
5/8 x 1	84	3/8 x 1-1/2	65		
3/4 x 3/4	79				
3/4 x 1	91				

LEADING EDGE SHEETS 36"		BAGS OF BALS	
1/2 x 3/8	49	Bags of Balsa	1.69
3/4 x 5/8	74		
1 x 3/4	100		

BULK BALS - 3" x 36"		PLANKS 36" Lengths	
Not Stamped or Sorted Sold Only in Standard Packs			
Standard Packs in ()			
Price Shown List Per Sheet			
1/32 x 3 (50)	42	1 x 1	1.05
1/16 x 3 (50)	45	1/2 x 2	1.45
3/32 x 3 (35)	53	3/4 x 2	1.85
1/8 x 3 (25)	62	1 x 2	2.16
3/16 x 3 (20)	76	1-1/2 x 2	2.47
1/4 x 3 (20)	94	2 x 2	2.76
3/8 x 3 (15)	116	1/2 x 3	1.74
		3/4 x 3	2.26
		1 x 3	2.79
		1-1/2 x 3	3.42
		2 x 3	4.10
		3 x 3	6.20
		1/2 x 4	2.89
		3/4 x 4	3.30
		1 x 4	3.57
		1-1/2 x 4	4.62
		2 x 4	5.57
		3 x 4	8.35
		1/2 x 6	3.94
		3/4 x 6	4.62
		1 x 6	5.52
		1-1/2 x 6	6.93
		2 x 6	8.15
		3 x 6	12.35

CONTEST BALS 4.6 Lb Stock Very Light		36" BALS		
1/32 x 3	65	TRIANGULAR CUT		
1/16 x 3	70	1/4 x 1/4		28
3/32 x 3	82	3/8 x 3/8		33
1/8 x 3	89	1/2 x 1/2		41
3/16 x 3	110	3/4 x 3/4		52
1/4 x 3	121	1 x 1		69
3/8 x 3	155	ROUNDED EDGE		
		AILERON & ELEVATOR STOCK		
		1/4 x 1		63
		3/8 x 1		74
		1/4 x 2		86
		3/8 x 2		97
		TAPERED CUT		
		36" Lengths		
		Tapered to 1/16" Edge		
		1/4 x 3		121
		1/4 x 4		163

HARDWOOD DOWELS

SELECTED WHITE BIRCH
STRONG, STRAIGHT AND SMOOTH

1/16 x 6	.01	1/8 x 36	11
1/8 x 12	.05	5/32 x 36	12
5/32 x 12	.06	3/16 x 36	15
1/4 x 12	.07	1/4 x 36	18
1/4 x 12	.08	5/16 x 36	20
5/16 x 12	.09	3/8 x 36	23
3/8 x 12	.12	7/16 x 36	28
7/16 x 12	.13	1/2 x 36	35
1/2 x 12	.14	5/8 x 36	40
5/8 x 12	.18	3/4 x 36	65
3/4 x 12	.25		

SIG AIRCRAFT PLYWOOD

TOUGH BIRCH PLYWOOD LAMINATED WITH WATERPROOF GLUE

1/64" PLYWOOD WINGSKINS		THREE-PLY		FIVE-PLY	
1/64 x 12 x 12	1.20	1/32 x 6 x 12	.60	3/32 x 6 x 12	.80
1/64 x 12 x 24	2.40	1/32 x 12 x 12	1.20	3/32 x 12 x 12	1.60
1/64 x 12 x 48	4.80	1/32 x 12 x 24	2.40	3/32 x 12 x 24	3.20
1/64 x 24 x 48	9.60	1/32 x 12 x 48	4.80	3/32 x 12 x 48	6.40
SPECIAL 3-PLY PLYWOOD		1/16 x 6 x 12	.70	1/8 x 6 x 12	.85
1/8 x 6 x 12	.40	1/16 x 12 x 12	1.40	1/8 x 12 x 12	1.70
1/8 x 12 x 12	.80	1/16 x 12 x 24	2.80	1/8 x 12 x 24	3.40
1/8 x 12 x 24	1.60	1/16 x 12 x 48	5.40	1/8 x 12 x 48	6.80
1/8 x 12 x 48	3.20	LITE-PLY PLYWOOD		3/16 x 6 x 12	.85
		1/8 x 12 x 12	.65	3/16 x 12 x 12	1.70
		1/8 x 12 x 24	1.30	3/16 x 12 x 24	3.40
		1/8 x 12 x 36	1.95	3/16 x 12 x 48	6.80
		1/8 x 12 x 48	2.60	1/4 x 6 x 12	.85
				1/4 x 12 x 12	1.70
				1/4 x 12 x 24	3.40
				1/4 x 12 x 48	6.80



CATALOG 34

SIG'S LATEST CATALOG!

"The Modeler's Wishbook"

Every workshop needs our latest Catalog. The complete line of Sig kits and supplies is shown plus practically all other lines available. For sale at your local hobby shop or send \$1.50 for your postpaid copy. TO ORDER KITS AND SUPPLIES: See Your Dealer First! If he cannot supply you, order direct. Add \$1.00 postage and handling in the U.S., \$1.50 in Canada. Minimum order is \$1.00. DO NOT send cash, send check, draft or money order. No C.O.D. Prices subject to change without notice. Double check to be sure you have included your name, address and zip code.

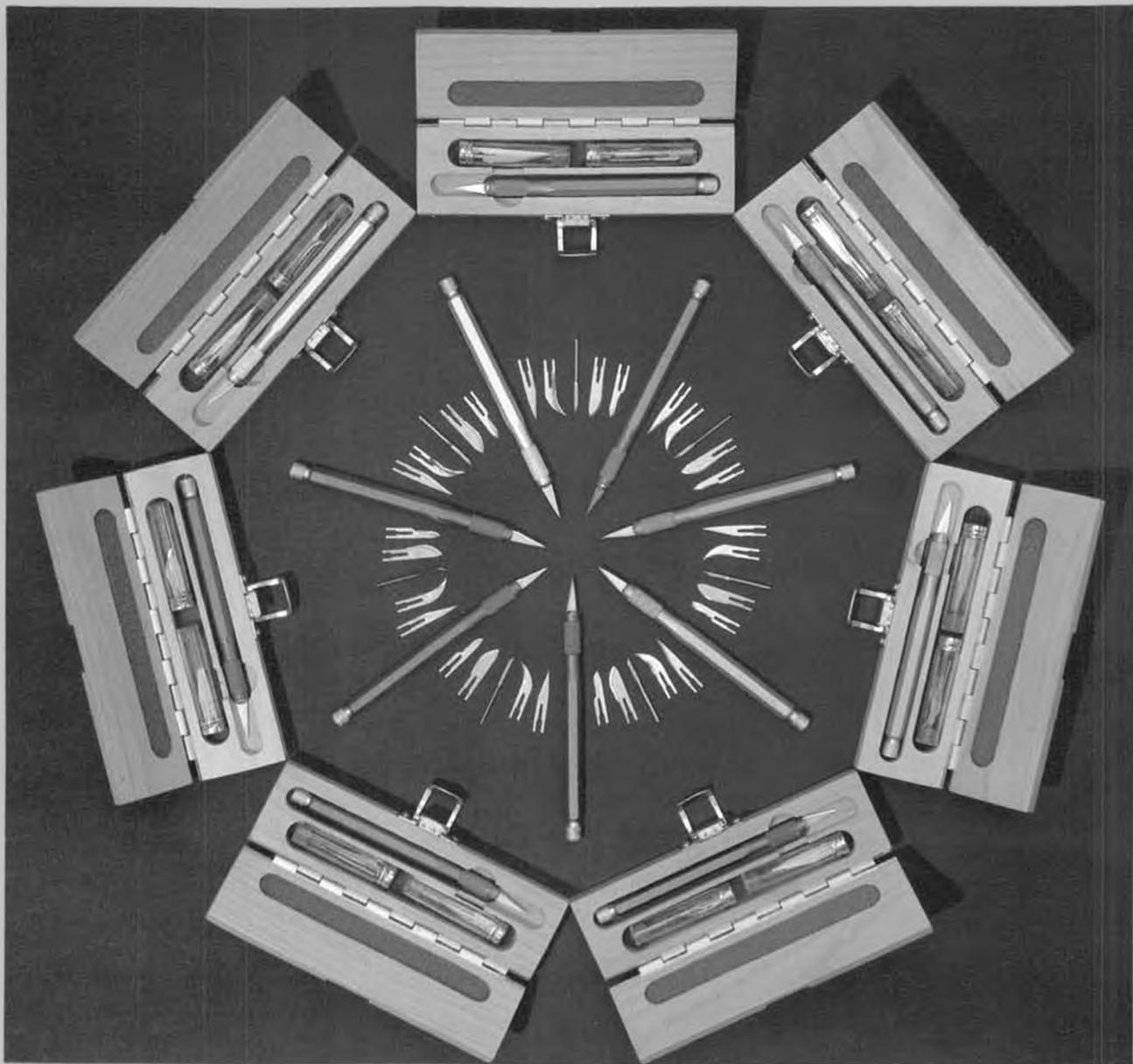
HARD MAPLE MOTOR MOUNTS

3/8 x 3/8 x 12	.30	3/8 x 3/4 x 12	.45
3/8 x 1/2 x 12	.35	1/2 x 5/8 x 24	.85



SIG MANUFACTURING CO. Montezuma, Ia. 50171

IN THE BEST CIRCLES, IT'S **über skiver**



A PRECISION INSTRUMENT FOR THE DISCRIMINATING MODELER

- *Safe, Rear Draw-Bar Clutch*
- *Precision, Instrument-Quality Materials*
- *Strong-Holding Advanced Collet Design*
- *Non-Rolling Hex Cross-Section*
- *Deeply Knurled, Non-Slip Grip*
- *Long-Life, Stainless, Surgical Steel Blades*

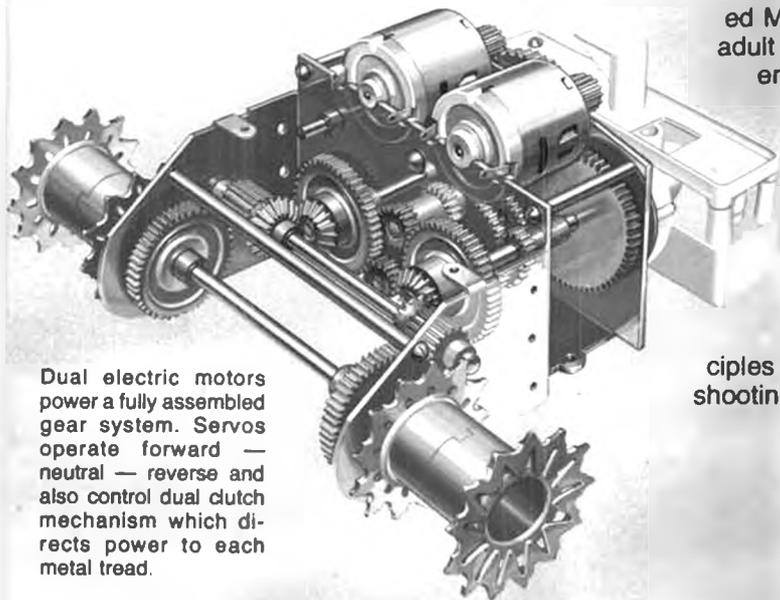


Available in seven anodized handle colors:
silver, blue, red, green, gold, copper, violet.

Complete set in fitted hardwood case; includes über skiver, together with two vials containing six No. 11, six No. 15, one No. 12, and one No. 20 . . . A total of 14 blades \$12.95
Individual handles (specify color) \$5.10
Vial of 6 blades (No. 10, 11, 12, 15, or 20) \$2.10

See your dealer, or order direct.
Dealer inquiries are invited.
All direct orders sent postpaid in U.S.
California residents add 6% sales tax.

MODEL BUILDER  **PRODUCTS**
1105 Spurgeon, Box 4336, Santa Ana, California 92702



Dual electric motors power a fully assembled gear system. Servos operate forward — neutral — reverse and also control dual clutch mechanism which directs power to each metal tread.

You don't need a flying field to enjoy R/C! Most solid terrain or even indoors is a place to operate the new electric motor powered MRC/TAMIYA tank model. Here's the ideal vehicle to get the adult members of your family involved in sharing, understanding, enjoying and supporting your R/C habit. MRC-TAMIYA's 1/16 Scale R/C Sherman M-4 tank kit is engineered and tooled with a thoroughness that marks a breakthrough in its field. Hundreds of die cast and stamped metal parts are combined with precision modeled nylon and ABS plastic using the most suitable material for each component. Building the tank is made simpler by a complete descriptive 8 page manual containing about 50 photographs, exploded views and drawings. An additional 18 page Manual takes the modeler through principles of radio control, real and model tank operation and troubleshooting. Construction requires adult modeling skill but many complex subassemblies like the motors and driving gears come preassembled. MRC's 1/16 Scale R/C Sherman M-4 is a sophisticated piece of engineering that provides a running challenge for R/C expert or novice. It's a change of pace that can add hours of pleasure and a new dimension to your hobby just for the fun of it . . .

RT 1601 Tank Kit—Less than \$110.
Complete with Digital Proportional R/C—Less than \$250.

MODEL RECTIFIER CORPORATION
2500 WOODBRIDGE AVENUE
EDISON, NEW JERSEY 08817

Take Command Of An R/C Tank just for the fun of it!

MRC 

