

# MODEL BUILDER



DECEMBER 1975

volume 5, number 48

\$1.25



## FLYING LIBERTY BELL

TRANS-  
CONTINENTAL  
R/C MODEL  
FLIGHT



SANCTIONED  
BY THE  
ACADEMY OF  
MODEL  
AERONAUTICS

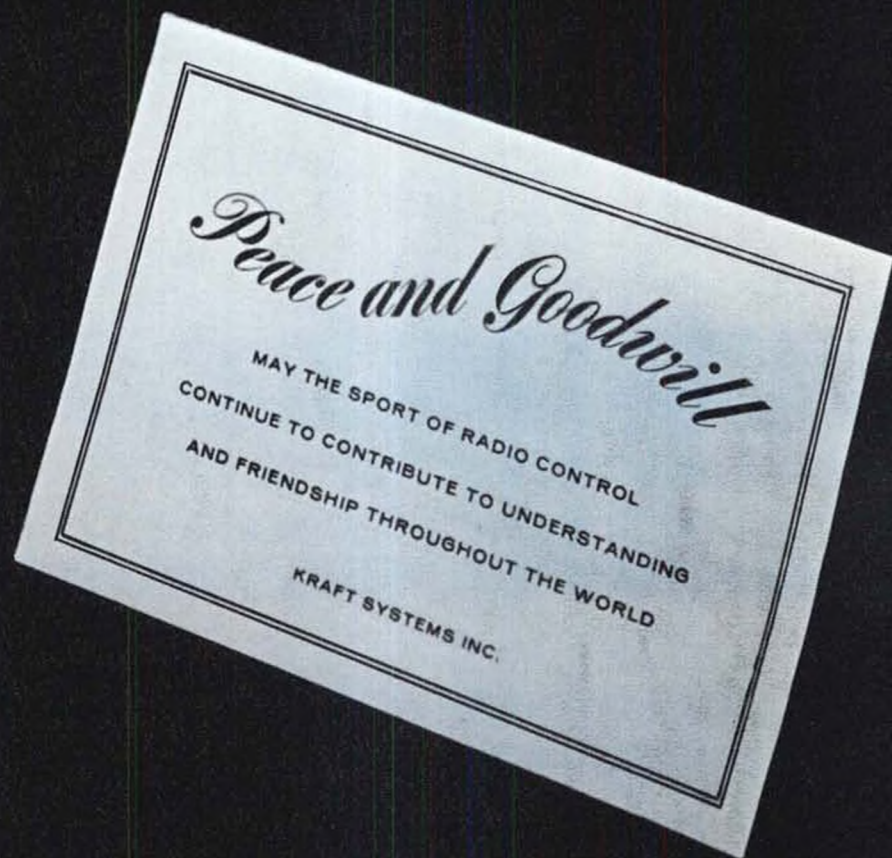
*Bob & Doris Rich*

ACE R-C  
AIRTRONICS  
C-B ALERT  
ALLIED HOBBIES  
BILL BENNETT  
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BRIDI HOBBY INT.  
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# QUALITY PLUS PERFORMANCE

## KITS AND ACCESSORY ITEMS FOR THE DISCERNING MODELER

Two Top Performing Sport Power Ships From The Pages Of RCM

Designed By Don Dewey & Lee Renaud

### NEW ERA III

.19 - .25

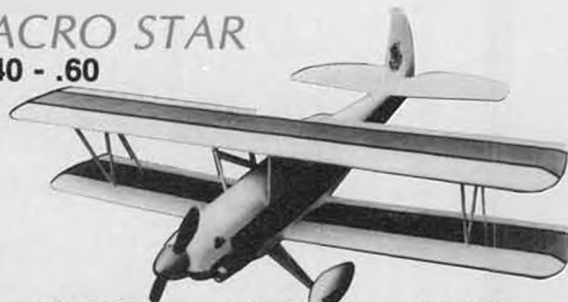


\$44.95

44.6" Span 400 Sq. In. 3-3½ lbs.

### ACRO STAR

.40 - .60



\$79.95

50.6" Span 820 Sq. In. 6-7½ lbs.

## PLUS SERIES KITS FOR LOW COST AND HIGH VALUE

### Q-TEE

\$17.76



36" Span 250 Sq. In. 16-20 oz.

*These kits include the same high quality precision machined parts as in our other kits. Very simple to build and easy to fly. Requires some minor cutting and pushrod hardware.*

Coming Soon

Gere Sport:

.15 Sport Scale Biplane

### SQUARE SOAR

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72" Span 500 Sq. In. 22-25 oz.

## THE MOST COMPLETE LINE OF R/C SAILPLANES & ACCESSORIES AVAILABLE

### QUESTOR

\$34.95



62" Span 409 Sq. In. 16-20 oz.

"The Hi Performance Compacts"

### SUPER QUESTOR

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80" Span 500 Sq. In. 20-24 oz.



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HIGH STARTS

Complete with 100 foot length

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Standard \$34.95

Heavy Duty \$36.95

Full Line Of Towhooks, Chutes, Canopies, etc.

### OLYMPIC 99

"The Trainer With A Contest Record"



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99" Span  
790 Sq. In.  
40-44 oz.

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99.9" Span  
810 Sq. In.  
40-44 oz.



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Glass \$79.95

Both Kits Include Optional Spoilers

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For The Competition Flier"

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### GRAND ESPRIT



134" Span  
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64-70 oz.



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## A Popular New Sport

When you get involved, involve yourself with the largest class. The Dumas 45" Star

This inexpensive model is easy to build, a delight to sail . . . and there are more of them around the country than any other class.

The Dumas 45" Star is a recognized racing class of the American Model Yachting Association (AMYA) which sanctions regional and national championship races for the class.

See the complete line of Dumas sailboat, powerboat, and scale model kits at your dealer's or send 50¢ for our complete catalog.



## for fun sailing

### 30" STAR (KIT RS-30) ▶

A smaller version of the popular 45" model. Has mahogany plywood frames, planking and deck of 1/12" mahogany. Built-up spruce mast 44" high, ready made sails. (Ballast and radio not included.) Can be sailed with 2 channel radio to control rudder and trim sails (jib and main together) using sail trimming mechanism (Kit RS-30-2)



**ACE RACING SLOOP  
(KIT RS-17)**

An all-time favorite for free sailing. 17" model — mahogany hull with die-cut parts, streamlined keel 21" birch mast. Includes sails, all necessary rigging and fittings.



**ALCORT SUNFISH  
(KIT RS-20)**

A scale model of one of the most popular small sailboats. Just 20" long with 6" beam, she has an all-mahogany hull, ready made sails with authentic red and white stripes and weighted daggerboard for sailing.



**19" LIGHTNING  
(KIT RS-219)**

A 1" — 1' scale model of the long-popular Lightning class sailboat. Plywood frames and mahogany planking. This kit is easy to build and makes an excellent model for display or free sailing.

### 45" STAR (KIT RS-45)

A 45" long, 12" beam beauty with birch plywood hull and mahogany deck. Includes built-up 66" spruce mast, brass turnbuckles, chain plates and ready-made sails. (Ballast and radio not included)

**Sail trimming mechanism (Kit RS-45-1)**  
For controlling sails independently. Lead screws with two Dumas/Pittman motors. Single motor sail trimming of main and jib together, **Kit RS-45-2**

**dumas  
boats**

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



# 11

# NEW

# CARL GOLDBERG

## CG QUALITY ACCESSORIES



Did you read the story in R/C Modeler (Aug. 1975) about Bob & Doris Rich? These great folks -modelers both-travel the country for us visiting model flying fields, clubs, hobby shops, etc. Among other tasks, Bob and Doris tell us what they find modelers are looking for. Here are the latest results. Try 'em - and tell us what you'd like to see!

### STEERABLE NOSE GEARS 2 SIZES



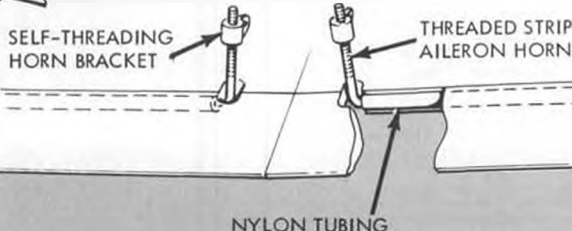
For large models, long 5/32" music wire strut and adjustable axle. Complete with blind nuts, screws, etc. SNA-532 \$3.29



For medium-size models, 1/8" music wire strut with fixed axle. Complete with blind nuts, screws, etc. SN-180 \$2.50

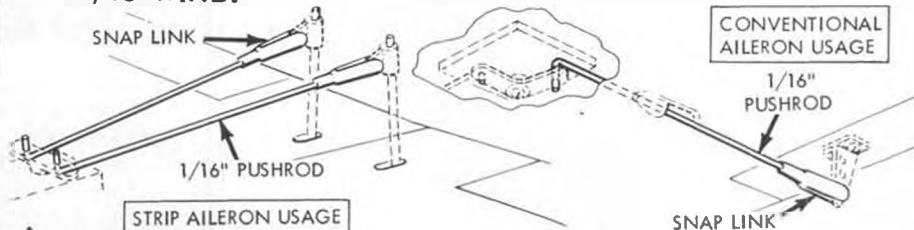
- Steering Arm alone, SA-180 75¢
- Nosegear Bearing, blind nuts and screws, NB-180 75¢

### STRIP AILERON HORN SET



This simple Strip Aileron Horn Set provides easy adjustment of throw, and long reach torque rods. Can be used with Carl Goldberg Aileron Pushrods. SAH-332 98¢

### AILERON PUSHRODS 1/16" WIRE!



Now you can stop drilling out your aileron servo output arms - these Aileron Pushrods are 1/16" wire! Modelers say this product has really been needed a long time. Two of our patented Snap Links and two 7" rods, AP1 75¢

### FREQUENCY FLAGS

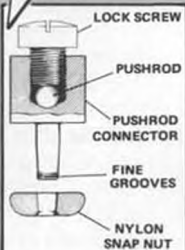
TRUE COLORS!

QUALITY MATERIALS!



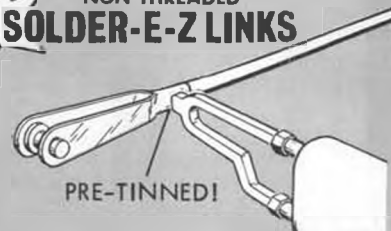
At last, really effective and beautiful frequency flags! Your choice of 7 popular color combinations. Nylon clips are joined with full-swivelling ball chain for free action. Antenna clip allows full collapse of thin final antenna segment to prevent damage. FF1 98¢

### PUSHROD CONNECTORS



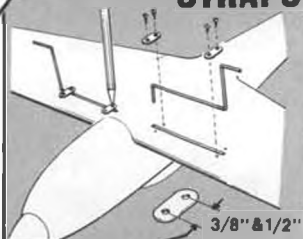
Once again, a CG accessory turns a tough, irritating job into a breeze! Our new Pushrod Connector requires NO SOLDERING or PEENING! Tough Nylon Snap Nut snaps easily over fine grooves, yet requires a knife blade to pry it off. Can be re-used over and over. PC1, 2 sets 98¢

### NON-THREADED SOLDER-E-Z LINKS



Solder-E-Z Links are tin-plated for easy soldering. A nice improvement - and note the price is easier on you, too! EZ3, 2 for 59¢

### LANDING GEAR STRAPS



TWO SIZES

These tough Nylon Straps provide strong and electrically noiseless strut retention. 2 sizes available, 4 Straps, 8 screws. LGS-38 and LGS-50, 50¢ a set

### WHEEL RETAINING SPRINGS



TWO SIZES - 1/16" & 3/32"

For many smaller models and tail-wheels, etc., these special springs do a good job of holding the wheels on. 2 sizes available, 6 Springs, 6 washers. WRS-116 and WRS-332, 39¢ a set

### WING SKIDS



Even top flyers can't keep gusty winds from dropping a wing tip to the runway while landing. CG Nylon Wing Skids help prevent ugly scrapes. WS1, 3 for 50¢

### SHEET METAL SCREWS

LONGER SIZES

#2 x 1/2"  
#4 x 1/2"

Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers. #2 x 1/2" SMS2-50, 35¢ for 10; #4 x 1/2" SMS4-50, 35¢ for 8.

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

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  
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# MODEL BUILDER

AND

# PANA-**WISE**®

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.

This month's winner is ALAN FRIEDMAN, Reston, Virginia. His entry is a Veco .19 powered, R/C "Stand-Off" 1/8 scale model of the 1972 Tyrrell Formula 1 car driven by the late Francois Cevert in the 1972 French Grand Prix.

Scratch-building of the car took 10 months. The chassis is aluminum monocoque construction, using .040" aluminum sheet for outer skin and bulkheads, all joined with rivets. Central monocoque "tub," or box, houses the receiver and servos, which are accessible through a bottom cover plate. Front suspension is scratch-built, with Delta servo-saver. Drive train is scratch-built, with lay-down engine, Delta clutch/flywheel, original belt drive, tank, and exhaust system. "Cold Air Box" is sheet aluminum, with hardwood intake scoop. Wheels and tires are MRP. Radio is Kraft. Finish is Hobbypoxy over special aluminum primer. Total weight is just 4 ounces over R.O.A.R. minimum of 5 pounds.

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.





# MODEL BUILDER



DECEMBER

1975

volume 5, number 48

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

Chuck Hallum

Bill Hannan

Walt Mooney

John Pond

Fernando Ramos

Dan Rutherford

Bob Stalick

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

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## CONTENTS

### FEATURES

WORKBENCH, Bill Northrop .....	4
OVER THE COUNTER, Bill Northrop .....	5
COVERING WITH METAL FOIL, by Art Hall .....	11
REMOTELY SPEAKING, Bill Northrop .....	13
CHOPPER CHATTER, John Tucker .....	18
PLUG SPARKS, John Pond .....	22
R/C SOARING, Taylor Collins .....	26
R/C AUTO NEWS, Chuck Hallum .....	28
STRICTLY SAIL, Rod Carr .....	30
CONTROL LINE, Dan Rutherford .....	36
TETHERED CARS, Ted Maciag .....	38
F/F SCALE, Fernando Ramos .....	40
HANNAN'S HANGAR, Bill Hannan .....	42
FREE FLIGHT, Bob Stalick .....	46
1976 WORLD F/F CHAMPIONSHIPS, Don Chancey .....	50

### SCALE VIEWS

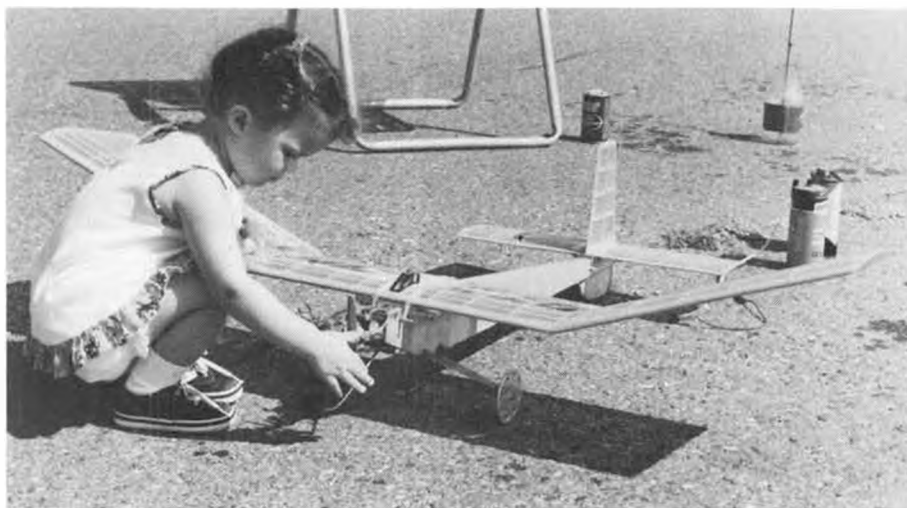
AERO A.100, Letectvi & Kosmonautika .....	17
---	----

### CONSTRUCTION

CLIPPER AMERICANUS, Art Hall .....	8
SHERESHAW'S "PIONEER" O.T., Phil Bernhardt .....	24
2-IN-1 FOUND SEAPLANE, Walt Mooney .....	32
PEANUT ROLAND D-XVI, Ed Heyn .....	43
STEPHANIE'S "SOLIDIFIER" A/1, George Perryman .....	53

Cover: This photo was taken moments after the couple in the picture, Bob and Doris Rich, had completed the first ever transcontinental U.S.A. flight of a radio controlled model aircraft. The gentleman looking up from lower right is a man who has been making model airplane history nearly all of his life . . . Carl Goldberg, manufacturer of the Senior Falcon kit from which the record-setting aircraft, "Liberty Bell," was built. For a more complete story on this flight, turn to page 4. Kodachrome by Bill Northrop.





We'll have to forgo the annual Christmas greeting from MODEL BUILDER's "homebuilt scale model." She's too busy getting to know all about model "yairpanes." This photo was taken recently, at Mile Square, Fountain Valley, California. Belinda's flipping the prop on Jim Scarborough's original design Clipper Cargo model. Jim didn't mind at all . . . he wasn't there!

## from Bill Northrop's workbench . . .

• This month's cover story is sorta super-colossal extra special. The co-stars, Bob and Doris Rich, are shown only moments after having completed an epic event in the history of model aviation. They flew a radio controlled model aircraft, named the "Liberty Bell" in recognition of our 1976 Bicentennial, across the country, from the Atlantic Ocean, at Kitty Hawk, North Carolina, to the Pacific Ocean, at Oceanside, California. Obviously not a non-stop effort, the trans-continental flight consisted of 120 short hops over a period of 29 days (one less than predicted), and covered 3,027 miles.

Three thousand miles? Yes. If you take the southern highway route across the United States, you'll find that you drive through 10 states and more than a score (that's about one-twelfth of a gross) of major cities. Now, doing that in a pick-up/camper while pulling a trailer is one thing, but if you can just imagine adding to that the trick of flying a radio controlled model while seated in a specially-built "cockpit" (complete with plexiglass windshield) built into the top of the camper, then you're just beginning to realize what this couple has accomplished.

Hey, just for the heck of it . . . the next time you go flying at your local R/C field . . . borrow a friend and his convertible, fuel up your plane and take off from the street in front of your house. Now get yourself about 300 feet of altitude, climb into the convertible, and while your friend drives . . . with someone else to guide him on direction and speed to keep pace with the plane . . . fly to your club R/C field . . . around buildings, along a row of covering trees, over an elevated cross-road, circle around while stuck at a stop-light, negotiate a clover-leaf or two, cross some high-tension lines, and whatever else you may

have to contend with.

Then, if you manage to get yourself . . . and your airplane . . . to your destination in one piece, just imagine repeating that stunt 120 times in succession, within a period of 29 days, in totally strange territory, through sun, wind, rain, and whatever else is available along that 300 mile trip.

If you get this much of the picture, you've still only got about one-tenth of it. Add to the above; landings in the most inopportune places . . . like on the highway in front of you because the engine cut prematurely and there's nothing but trees on both sides of the road, or like in the big city parking lots, as arranged by well-meaning non-modelers, who don't realize that light poles and power lines are not kind to model aircraft.

And how's this for fun: In Atlanta, Georgia, the highway crosses the huge international airport. The road is recessed below airport level and the main runways cross over the road! Permission was granted by airport officials for a quick passage over the airport. The runways were closed to air traffic so that the "Liberty Bell" could get across. So what happens? The fuel line chose this moment to pick up some dirt from the 32 ounce fuel bottle and kill the engine. The plane had to be dead-sticked on the six-lane highway, between runways, and no way to get a repeat shut-down of the airport to try again. "Liberty Bell" had to be surface transported to the other side of the airport to resume her flight . . . with a filter in the fuel line!

To complete this whole extraordinary picture, the toughest part of all must be considered . . . commitment. Just imagine one more factor about that flight from your house to the flying field. Let's suppose that one of your buddies, who knows you're going to try it, has a

public relations mind with the talents of AMA's Larry Bolich. About 6 hours after you've disclosed your intentions, he calls you on the phone and says, "Guess what, pal? I've arranged for the State Highway Patrol to give you an escort to the field. They'll be at your house Saturday morning at 8:30 am. On the way through town, you'll circle the elementary school and do a touch-and-go on the playground. The school board and PTA will be on hand and expect you about 9:15. Five minutes later, you'll land in the city park across from the Post Office, where you can refuel while the City Manager gives you an airmail letter to deliver to the Mayor, who along with some visiting dignitaries from the state capital, is going to be at the field awaiting your arrival. You weren't kidding when you said you were going to do it, huh pal?"

Now, you're getting the idea! It's one thing to say that maybe you'll try this little stunt . . . if it doesn't rain, or if you get home early from that party, or if you happen to remember to charge your batteries. It's something else to realize that you are committed to do it . . . that you've told everyone you'll do it, and that you've got people lined up along the way to cooperate in the endeavor. Now, you had better fly even if it rains, leave the party early . . . or don't go at all, and don't forget to charge your batteries . . . There's a packed house, the spots lights are on, the orchestra just finished the fanfare, you've been shoved out on the stage, and the curtain has closed behind you . . . You Gotta Deliver!

Bob and Doris Rich did just that. They had help from others; Ed Sweeney, Bob "Smedley" Sutalski, Lee Taylor, and many more along the way. But Bob and Doris were the ones who were truly

*Continued on page 82*

# OVER THE COUNTER



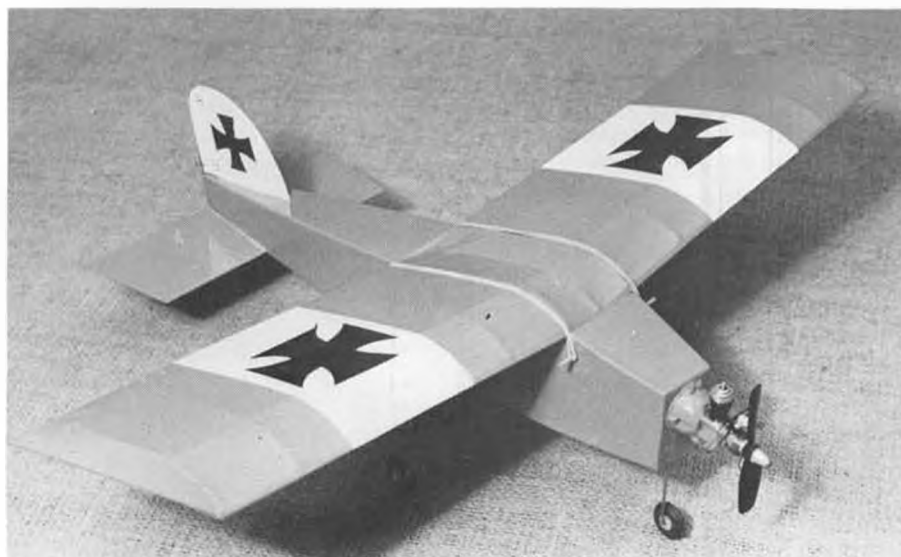
R/C Stinson Reliant, by Sterling. Spans 58 inches, for .40 to .56 engines.

• Any mention of the words "gull wing" brings the famous Stinson Reliant to mind. This classic lightplane of the '30s is being kitted by Sterling Models, 3620 'G' St., Philadelphia, Pennsylvania 19134. Scaled 1-3/8 inch to the foot, this 58 inch span beauty is intended for .40 to .56 power. All balsa parts are die-cut from density selected balsa and then numbered for identification. The cowl and wheel pants are vacuum formed from ABS plastic. Aluminum engine mounts are included, as well as formed wire landing gear. The Stinson Reliant should make an ideal first R/C scale model. The structure is designed with strength

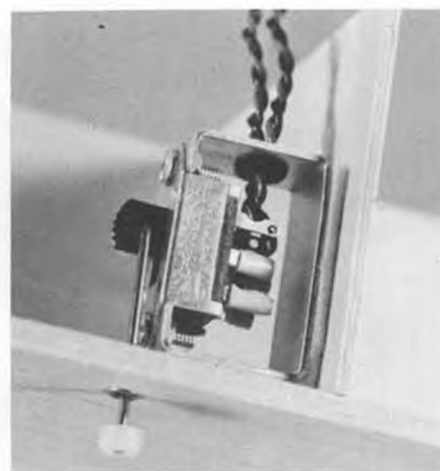
in mind. The large fuselage has lots of room for radio gear (and hands to install it!), and the large tapered wings have lots of area to lower the wing loading and increase stability. The Stinson Reliant is available from your dealer or direct from Sterling for \$54.95.

\* \* \*

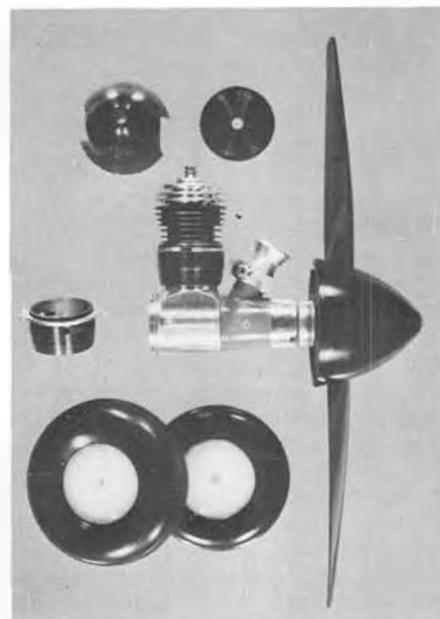
Phil Kraft's ubiquitous Ugly Stik has been miniaturized from Middle size, to Liddle size, to Baby Size, and now to Littlest Size. This tiniest of the "Stiks" is Ace R/C Inc.'s latest offering for the .020 power, single channel pulse proportional R/C market. The "Littlest Stick," designed by Fred Reese, spans



The "Littlest Stick", kitted by Ace R/C, for .010 or .020 and pulse rudder control.



Internal Switch Mount by Ace Radio Control.



New accessory items for 1/2A R/C by Ace. Wheels, spinners, and throttle.

a mighty 19-1/2 inches. All up weight, with the Ace Baby radio system installed, and a Cox .010 bolted on the nose, is 5.75 ounces. This "giant" can be built, covered, and readied to fly in one evening. It would appear that the age of "disposable" (less radio and engine!) R/C planes is nearly on us... retail price of the kit is \$3.95. Test gliding over tall grass, that sacred cow of R/C flight trimming, is not recommended for the Littlest Stick... you might lose it! Available from dealers or direct from Ace R/C Inc., Box 511, 116 W. 19th





A new dimension in Satellites, the 788 GLH, .29 to .40 engines.



A 9" long shrimp boat, by Plankton Boat Co.



Micro Models' small size Scientific Mercury, spans 48 inches. For .09 power and 3 channels of radio.

St., Higginsville, Missouri 64037.

Ace has also introduced several new accessory items for 1/2A sport planes and racers. Two sizes of wheels, in 1-1/2 and 1-3/4 inch diameters, are now available. These wheels are top quality, low weight, low drag, and low cost. The white nylon hubs have a 3/32 inch hole for the axle, and black rubber tires. Either size sells for \$1.49.

Two new spinners are also available from Ace. Since ordinary nylon will expand at the high R.P.M.'s that can be turned by engines such as the hot Tee-

Dee, these spinners are made of glass fiber-filled nylon. Available in white only, the 1 inch spinner sells for \$.98 while the 1-5/16 diameter version sells for \$1.19. Both are specifically designed for use on Tee-Dee engines.

Third channel throttle operation with 1/2A Cox engines is now possible with the Ace Tee-Dee Throttle sleeve. This machined unit provides very low idle speeds and minimal top end power reduction. The sleeve fits a stock Tee-Dee cylinder with only minor modifications, and will also fit Black Widow, Golden

Bee, and Medallion cylinders. Retail price is \$1.98.

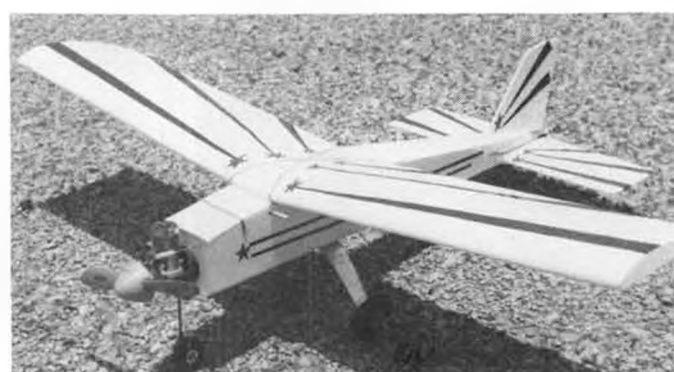
Pulse fliers will welcome the Internal Switch mount from Ace. This is a formed aluminum bracket with mounting hardware to fit the Continental Wirt (CW) switch that is supplied with the Ace Pulse and Digital Commander radio systems. The bracket mounts quickly with servo tape, allowing a concealed mounting of the switch, with an outside actuator. The Internal Switch Mount will retail for \$.89.

\* \* \*

Micro Models, P.O. Box 1273, Covina, California 91740, has introduced a new series of Old Timer replica models intended for R/C. The first of the series, which is available immediately, is a reproduction of the Scientific "Mercury." The 48 inch span reproduction of this famous old timer designed by Ben Shereshaw, can be flown with a hot .049, or better yet, an .09 or .10. The new series is intended for sport flying or S.A.M. competition with three channels operating throttle, rudder, and elevator. A similar kit of Scientific's "Miss America" will be available around January 1. All parts in the kits are pre-cut, which makes for very quick assembly time. Weight of the Mercury, with an O.S. .10 and Cannon 3 channel radio



Half-A Baby Stik, by Cathedral Model Mfg.



Celebrity, by Cathedral Model Mfg., for .09 to .25 engines and small radios. Span is 42 inches.



Plankton Boat Co. models are propelled and steered by pulse radio.



"Rubber Ducky" R/C glider, by Performance Flight Systems.



GloBee glow plugs.



Half-A Mini-Jenny, by Cathedral Model Mfg.

gear, is 26 ounces. The \$24.95 kit features machine-cut, selected balsa and hardwood parts and full size plans. The Mercury is scaled accurately from the original plans. Available direct from Micro Models or your hobby dealer.

\* \* \*

"Go Like Hell" is what the G.L.H. on the Satellite 788 G.L.H. kit means, and that is just what it does. This Class B/C/D competition free flight design holds the AMA records in Category 1 C-Gas Senior and Category 2 B-Gas Junior, as well as having won 1st in C Gas-Open at the USFF Champs at Taft. The Pro Kit, from Satellite City, 9486 Sandusky Ave., Box 1935, Arleta, Cali-

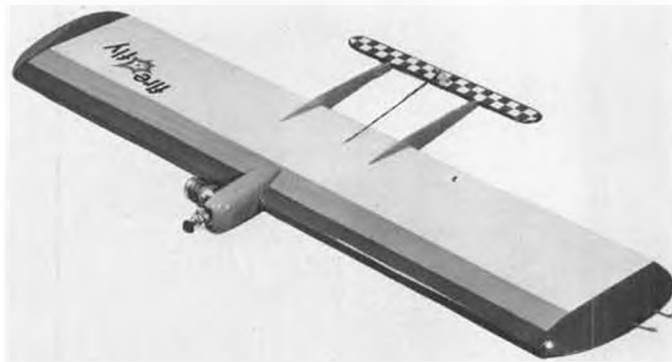
*Continued on page 85*



Ready-to-run R/C gunboat by Swank Products fires 20 ft. stream of water. Direct "water hit" by another boat is signalled by firing of ping-pong ball "depth charges."



"Lil' Snip" Half-A combat, by Midwest.



"Firefly", .15 to .19 combat, by Midwest.





# CLIPPER AMERICANUS

By ART HALL . . . Something really different for the sport R/C flier who wants a model that looks like an up-to-date aircraft rather than a clougey "trainer" . . . yet has the stability and flying ease of a trainer.

• A-mer-i-ca'nus (-ka'nus). n. One thing American.-Hall. A contribution to promote independent, imaginative and creative design philosophy for model builders and to commemorate the majestic beauty of American-designed, modern jetliners.

With many years experience in free flight/scale designing, building and flying, I am another slow starter in R/C flying. Flying with 1 and 2 channel equipment in .049 powered models was a start. My primary trainer had been an original design, square bodied, transport type model. She has performed for over 22 years as a free-flight, pre-determined control test bed, and R/C trainer. Her career almost equals the Ford Trimotors of Island Airways! The old trusty workhorse was getting heavy and weary so she was "retired" honorably to fly on forever hanging from the ceiling. Time for a new aircraft, and the next logical step was to get into aileron and throttle operation. Attempts to transition on my son's typical .35 low wing "bomb" soon convinced me that I needed a more docile and manageable trainer/workhorse of my very own.

This need for an aileron and throttle trainer was mixed with my old philosophy of designing miniature aircraft types

rather than "just models." A keen appreciation of America's sleek and majestic jetliners led to the design and development of the Turboliner "Clipper Americanus." The design of an "any jet" type transport involved a simultaneous solution to the problem of a powerplant since there are no practical and realistic jet engines available. A turbo-prop using standard model engines seemed most workable, yet the muffler sticking out the side was also a problem. With some imaginative design doodling, the twin-

turbine, turboprop power package was evolved.

"Clipper Americanus" uses this power package and features the swept-back, sleek modern look accentuated by rivet-detailed metal foil covering and a modern all-flying stabilator.

For initial flight tests, the prototype carried 4 channels; the three primary flight controls plus throttle. It was soon determined that it was a stable and controllable aircraft without rudder control. This permitted use of lightweight, 3-



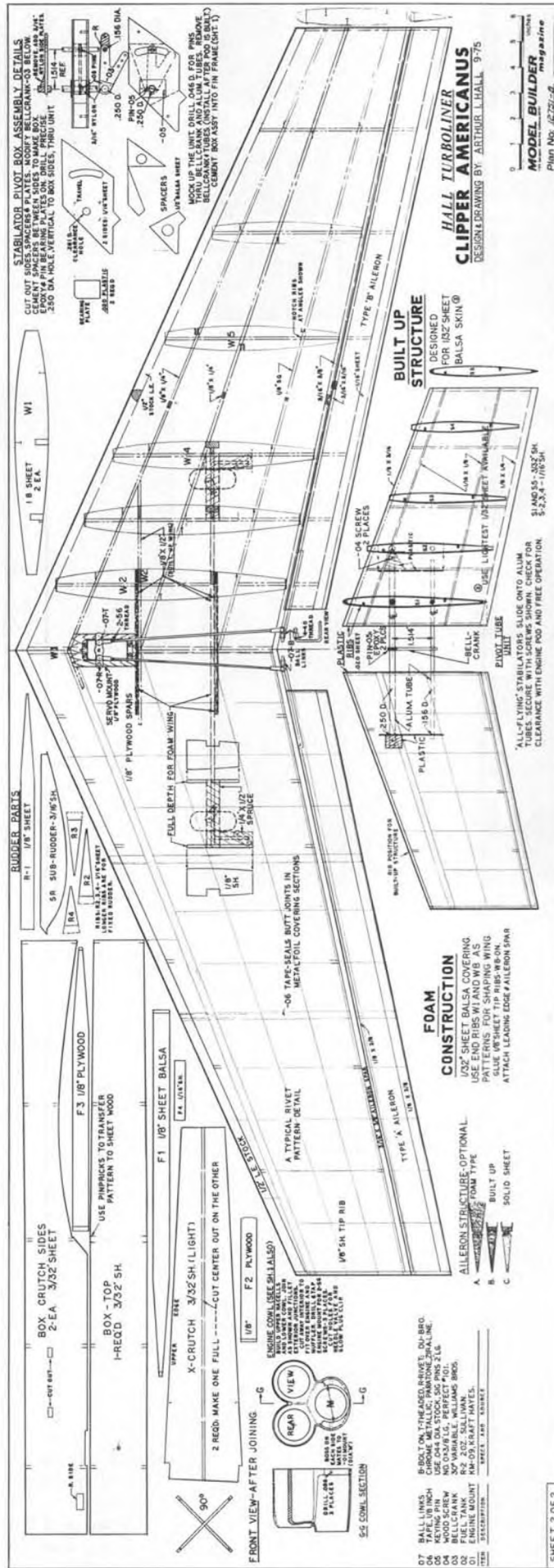
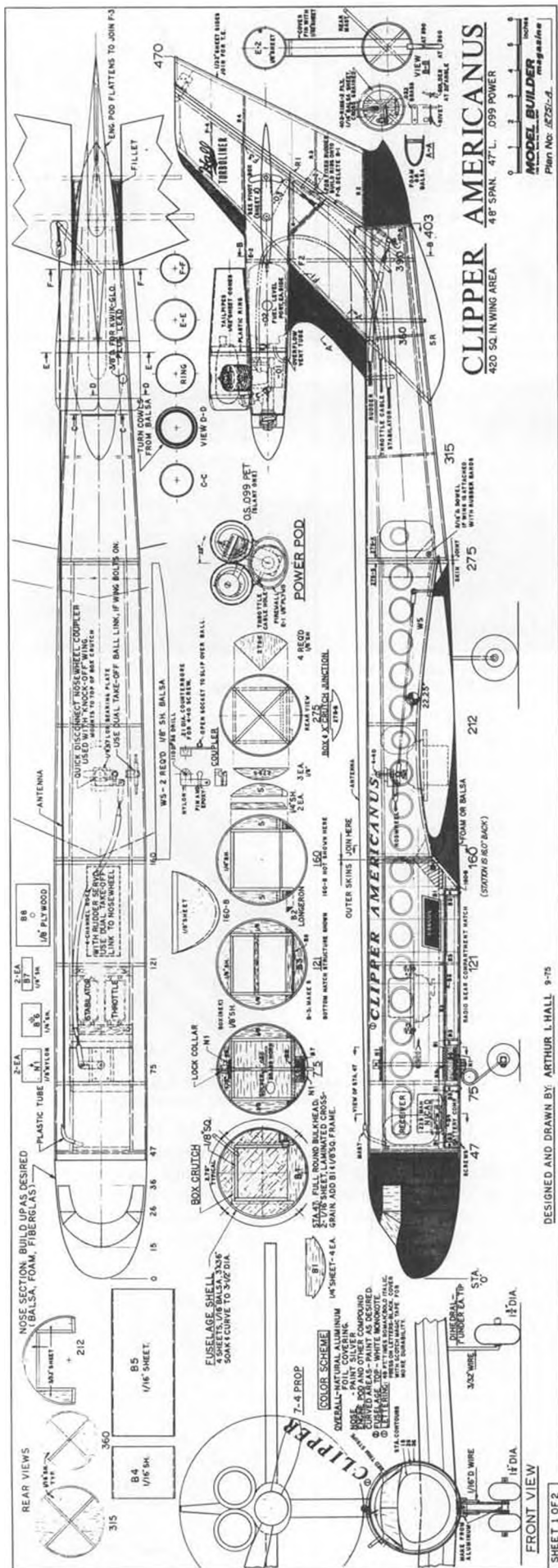
Without that propeller, the "Clipper Americanus" could easily pass for a jet-powered airliner. The metal foil covering completes the image.



The "Clipper" flies well with or without rudder control. The author wanted something easy to fly that looked different. He has it!



"Guests on this show were flown here by . . ." Horizontal stabilizer is all-moving, but surprisingly non-sensitive.







"Jet pods" house engine cylinder and muffler. Props last a long time!



A boarding passenger's-eye view of the "Clipper" accentuates its realistic lines. Article on next two pages explains the use of metal-foil covering.

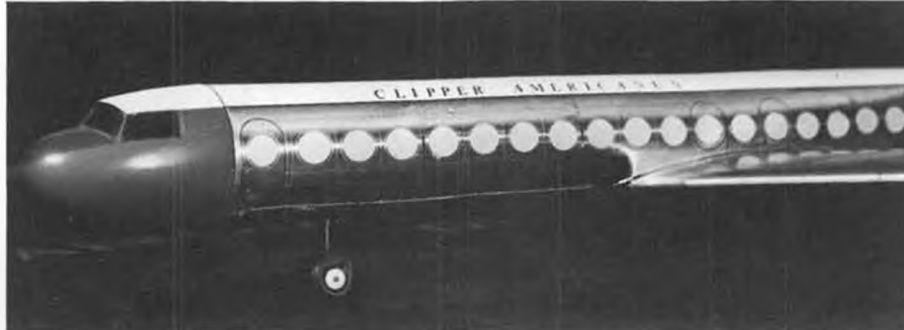


Art Hall hoists the "Clipper Americanus", giving an idea of its relative size.

channel gear . . . in this case, the Cannon radio. Nosewheel steering was coupled to aileron. With a generous 420 sq. inch wing, a relatively low power .099 engine, and a gross weight of only 3-1/2 to 4 pounds, the design philosophy and objectives of a realistic, manageable trainer were achieved. The stabilator proved to be surprisingly non-sensitive; and pitch control is smooth and positive. Others can develop larger, higher powered versions with full house radio and retracts, which would be interesting, however, this machine is designed just for R/C transition training and sport flying. If I can fly it, anyone should be able to!

**CONSTRUCTION:** The full size plans should be self-explanatory for the routine construction details. I show my recommended construction, but "builders' choice" and "modifications" prevail. So these instructions are limited to overall explanations and specific or unique aspects of construction.

**FUSELAGE:** The basic structure is a sheet balsa box crutch forward, and an "X" crutch aft, the whole covered with a sheet balsa shell. I formed the shell by wrapping water-soaked balsa



Close-up view of the Clipper's fuselage discloses the riveting pattern. Fuselage is sheet balsa, wet-formed over P.V.C. pipe. Radio hatch on bottom, in front of wing.

sheets around a 3-1/2 inch O.D. PVC pipe, covered with newspaper to help absorb the moisture for drying. Use one of these pre-curved sheets as a fixture to cradle the two crutches (top side down) for alignment and joining. Attach all bulkheads and the curved side sheets. Build up the nose wheel shaft unit before covering the forward fuselage top. Leave the shell off the top and bottom of the aft section and work on the fin assembly.

**VERTICAL FIN ASSEMBLY:** Build the basic fin structure on the "X" crutch noting that F-1, F-2 and F-3 all go through the crutch to the bottom shell and tie into the sub-rudder (SR). Do not cover the fin until one of the last steps, since there must be access to the pivot box to mount the bellcrank and aluminum tubes.

Build up the stabilator pivot box. Use a drill press to accurately drill the bearing hole in the side plastic plates for the front pivot tube. Mock-up the 30° variable bellcrank to the two tubes and drill the holes for the retaining pins. Remove the tubes and bellcrank and mount the pivot box into the fin's frame.

**POWER POD:** Make the pod shell from two plys of soaked 1/32 balsa sheet, rolled into a tube the diameter of former E-2. Position and cement E-2 in place. Cut out firewall E-1. Flatten the rear of the shell as if to fit against F-3, and the front end will assume the oval shape of E-1 which can then be positioned and temporarily pinned into place, slot the top and bottom of the shell to slide onto the fin structure.

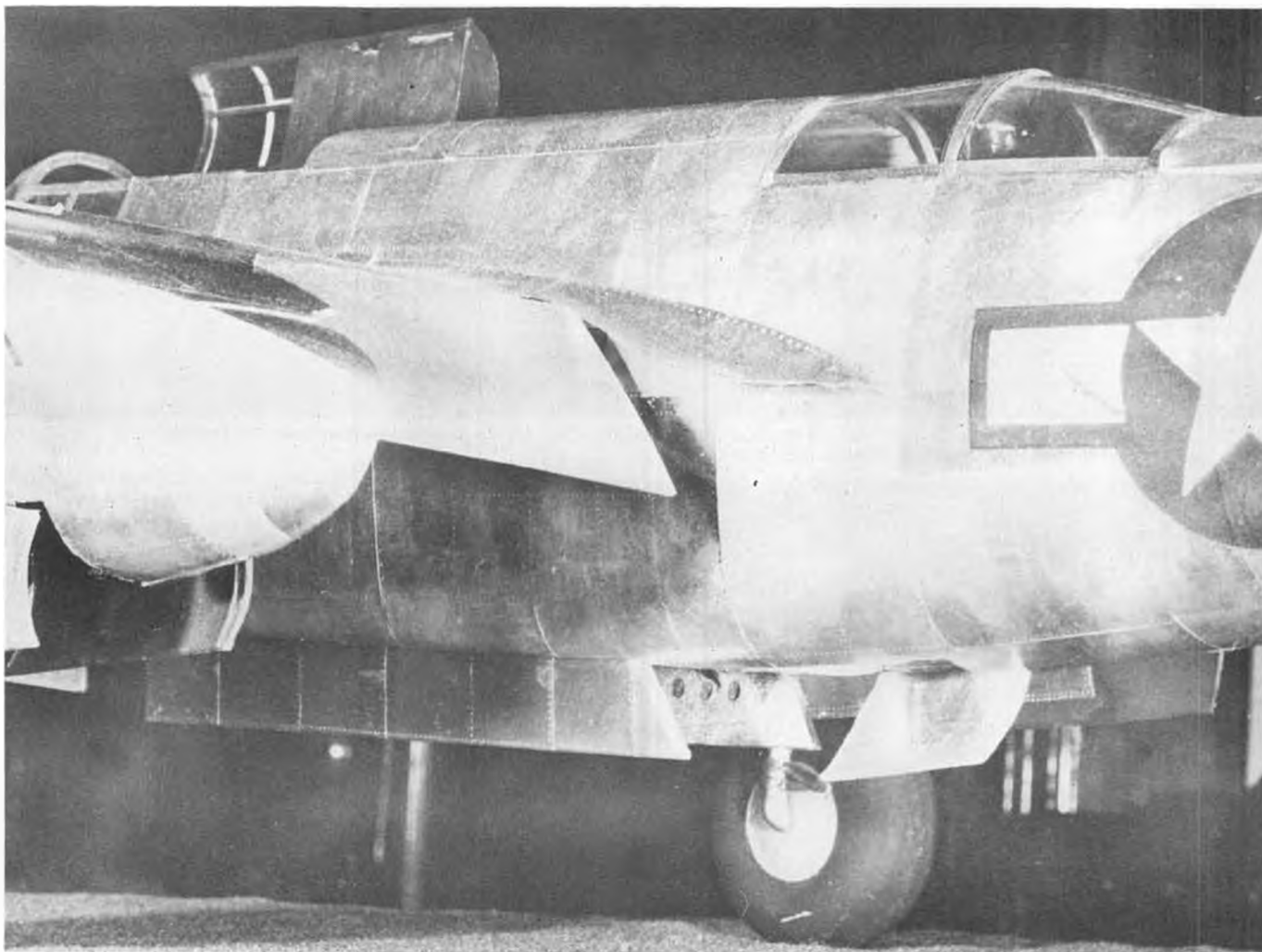


Pod and fin construction is strong and rigid. Bottle tank is directly behind engine.

Cement in place, with E-2 against F-1, and the aft end flattened against F-3 on each side. Locate and drill the pivot tube hole and travel slot each side. Make and attach fillets. Build up the bottle tank onto the firewall and attach the engine mount. Epoxy the firewall assembly into the pod.

**FINAL FUSELAGE ASSEMBLY:** Now, before covering the aft fuselage or fin, would be a good time to mock up your servo installations and run your Gold-N-Rod through the aft fuselage for elevator, throttle and rudder (if used). The fuselage may now be completed and covered. If rudder control is desired, build and attach it. If fixed rudder is used, build it onto F-3. Slip the bellcrank inside the pivot box and run the aluminum tubes into position; pin and

*Continued on page 84*



PHOTOS BY THE AUTHOR

The author's prize-winning A-20 entry in the 1948 Higbee National Model Plane Exhibit Contest. Remember the C Z Model Airplane Co. which sold aluminum foil-covered solid models just before World War II? This is the first we've seen on flying models.

## RIVET DETAILED METAL FOIL COVERING

By ART HALL . . . This article compliments that of the "Clipper Americanus", but can apply to any aircraft that warrants a natural, polished metal finish, complete with flush riveting.



The author with a metal foil-covered P-47 built while on a tour of duty in Iceland, 1954, as a USAF jet fighter pilot.

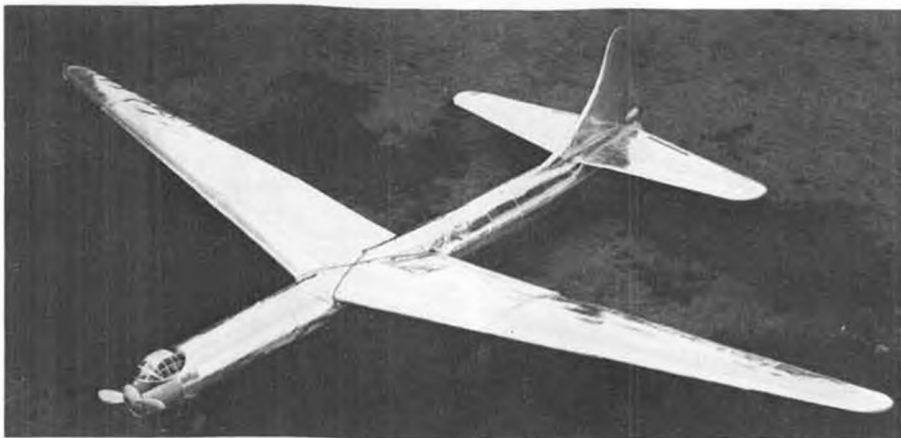
- All-metal aircraft have been produced in quantity for over 40 years, however, duplication of the rivet-detailed, metal finish for miniature airplanes has been a neglected craft with model builders. In 1947, the author first developed the "metal foil" technique described here to realistically model all-metal aircraft. This type covering has been used for several models built since then, as shown in the photos. The latest application of metal-foil covering was for the author's RC Turboliner, "Clipper Americanus" featured in this issue.

- The technique is not difficult, and the results are realistic. The "secret" of the technique is to use paper-backed foil, which makes it as easy as cementing paper to wood; the same as covering with stiff paper. Compound curved areas do present a problem. Use a conventional finishing technique with silver dope, or work in a color scheme to incorporate these "difficult" areas. Also, some pre-planning is required to make an overall





The "Clipper Americanus" (see page 8) is Art Hall's latest model using the metal foil covering technique described in this article. In this case, the foil was applied over a balsa sheet skin covering.



This free flight B-36 was also built during the author's tour in Iceland. On this model, the metal foil is the only covering, applied directly to the framework. Span was 66", with .049 power.



Art shows the technique of applying "rivets" to the metal foil. A brass clock gear is mounted on a convenient handle and rolled along a straight-edge. Takes some experimenting.

layout of the desired pattern of plates, junctions, rivet lines and spacing. Riveting tools are made from clock gears mounted on a handle. The gear is run along a non-skid ruler to imprint neat rows of rivets.

A proper work surface is required. It must be firm yet "give" enough to dimple the foil. Cardboard backs of lined paper pads is about the right backing material to use. For raised rivets, place the foil side down and run the rivets in on the back side; for "flush" rivets, run the rivets in on the foil side. Experiment with the backing surface

for the right effect. Small plates, junctions and other details may be imprinted with a sharp pencil or stylus using care not to tear the foil.

Two methods of metal-foil covering have been developed by the author. For scale models and RC types, which can stand the weight, a basic sheet balsa covering is applied, filled, and primed. For rubber or gas free-flight models, the paper-backed foil is the primary covering applied directly to the structure. In the latter case, overlapped joints can be used to advantage. Lightly score the lap area and peel the foil from the

paper backing. Cement the next "plate" to this area; use a rather heavy tissue cement or white glue.

Where the model is sheet covered, the foil plates are closely butt-joined in an overlay. Fit each plate, then rivet detail it and cement it in place. Tissue cement works nicely on a primed surface. Use a soft cloth to rub out any air bubbles. Clean off excess cement with thinner. Use tracing paper over work already laid down to trace the proper fit for adjoining plates. It is also useful to draw the desired patterns on thin tracing paper and emboss right through it onto the foil. This is particularly helpful for flush rivet patterns, as they can be laid out right side up, then the tracing paper can be turned over for working on the back side! A new technique of sealing the butt-jointed plates with press-on Chrome Metallic Tape (Paratone, Zip-A-Line) was used on "Clipper Americanus."

Attempts to find a regular source of paper-backed foil have not been too successful, and the only source known is the rolls of holiday gift wrapping. Plain bright, metallic aluminum foil is hard to find! Colored foils seem more available. These can be used and attached with white glue (A "Golden Clipper" would be spectacular!). Wash excess glue off with a water-wetted cloth as covering progresses. Do not try to use tissue cement, as it will remove the coloring from the foil. This can be turned to advantage, however, in that one can use thinner to wash the color off and get basic aluminum foil if it can't be obtained otherwise.

After covering the model, thinner or water (depending on the cement used for attachment) can be used to remove any excess on the foil surface. The foil can be polished for a slightly dull or worn look and it can be waxed. Avoid any sharp objects which can cause a scratch. Trim is best done with the press-on letters, tapes, or plastic trim film. India ink can be used if the surface is first rubbed with talc.

It might be interesting to try this realistic covering on that next replica of an all-metal aircraft. ●



Meet Ed Manulkin, chief-cook-and-bottle-washer of Sterling Models, Philadelphia, Pa. The beautiful Stinson Reliant "Gull-Wings" were built from the newest Sterling kit. Span is 57-9/16", length 38", scale 1-3/8", for .40 to .56 engines. An outstanding ship from the Classic era.

## 'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

• Last month, our radio column was completely taken over by the R/C Aerobatic World Championships. While we don't intend to allow the same thing to happen again *this* month, we *do* want to take some space to conclude our discussion on the flying seen at the World Champs. We'll also comment on some of the weak points in FAI R/C contest procedures, and will briefly discuss proposals that we'll submit to the CIAM R/C Subcommittee.

If you've never witnessed an R/C Aerobatic World Championship competition, you probably imagine that all of the flying is top caliber... Not so... In many of the competing countries, the lack of modeling activity, equipment,

flying space, and the like, has held back the development of flying skills by its modelers.

The standard of ability varies widely. Using our AMA classes as a measuring stick, you'll find everything from Sub-Class A to Super-Class D Expert... and the geographical size of the country has nothing to do with it! Liechtenstein and San Marino are smaller in size than the state of New Jersey... combined... yet one is the home of the World Champ and the second place team, while the other is at the bottom of the totem pole.

Among the top competitors, we noted several maneuvers that were consistently downgraded. Some of the er-

rors were ones that could be avoided by contest fliers of most any skill level, so it might be worthwhile examining them more closely.

The Takeoff maneuver in FAI is concluded when the model turns approximately 90 degrees out of the established takeoff direction. Until then, every slight deviation from the flight path is cause for downgrading. Yet, many pilots flew half way to China before turning. Until the maneuver is reworded, the plane may be turned as soon as you have room to bank without scraping a wingtip!

It's also surprising how many contestants "jumped" their planes off the ground. It's OK to adjust your gear so the plane sits at a negative angle, but



Darrel Tichaeck, Spokane, Wash., built this 9' span J-3 Cub. Throttle and stick are linked to pilot's hands and arms, move with controls.



Dean Hawks with his "Mini-Marquis" twin engine pattern ship. Uses Taipan .21 Schmeurle mills. Gold Metalflake with red trim.





Beautiful trophies awarded at "Western Front WW I Jamboree" held by Pioneer R/C Club, Sunnyvale, Ca. This is Col. Bob Thacker's.



Ken Stuhr averaged 108.3 mph with this speed glider, using differential elevators for pitch and roll control. Russian mark stands at 113.

PHOTO BY DAVE KATAGIRI

if you can't "rotate" realistically just prior to takeoff, it's better to set it up at a positive ground angle so the plane will lift off gently as it gains flying speed.

Shoving on full throttle and blasting off the runway helps to avoid weaving, which is more apt to happen if you accelerate slowly, but the point penalties are (should be) about equal.

Though it's understandably more risky to do well, and pilots prefer downgrades to zeros, many of the stall turns in the Figure M were really wingovers. However, paradoxically enough, if the maneuver is well placed, it's difficult for the judges to see the stall turn/wingover!

Of course, the most common error in the Cuban 8 is missing the crossover. Psychologically, a judge will be apt to score the maneuver higher, overlooking other minor infractions, if the plane hits the crossover on the button.

The top fliers seemed to earn higher

points on roll maneuvers than on looping maneuvers. The most common error in rolls, however, whether Slow, Four Point, Eight Point, or Three Horizontals, was inconsistent roll rate. In every case, the inconsistency came from rolling faster toward the end than at the beginning. "The Button" helps in curing this, however. Also, keeping your wings light toward the tips prevents the ship from building up momentum.

There were almost no good Top Hats ("Uber Hoot." by the German caller). We saw only 2 or 3 out of 156 that were as wide as they were high. Most of them were "Stove Pipes," and a couple were almost "Dunce Caps!" This brings up an interesting thought concerning the Figure M and the Top Hat . . . and what the judges should be watching for.

Most all of the better fliers poke holes in the sky while doing the Figure M and Top Hat . . . but look at the rules . . . there is nothing in either maneuver

description that calls for any straight vertical flight. In both of them, the roll starts immediately after the quarter loop . . . and the stall turn (Figure M), or quarter loop (Top Hat) at the top starts as soon as the roll is completed. We'd like to hear from some of our D expert ("Scuse me, "Master") fliers after trying these maneuvers without coming into them at mach 1 speeds. Can they be accomplished without going a mile high?

The Rolling Eight was more often than not a "Snowman." That is, a small loop at the top (and usually too high) and a whopper at the bottom! Judges also have to be careful with this one. From our low observation point, the upper loop will *appear* smaller, even if it's not.

We've commented about the rectangular approach and landing on other occasions, but it's worth mentioning over again. Hardly anyone, in all four days of competition flying, performed a decent Rectangular Approach. We sel-

PHOTO BY DAVE KATAGIRI



Jeff Breece, Auburn, Wash., with his scale Albatross, early German home-built. Unthrottled Fox 36 is quieted by muffler and 12" prop, giving slow, quiet flight. Bolt-on firewall holds fuel tank.



Sterling's "Best in any scale class" award went to Steve Sauger at '75 Nats, also check for \$100. Johnny Clemens delivers, while Kemp Bunting, R/C CD, looks on.



OS .35 powered Sig Cub, by Jim Houston, San Antonio, Tex., carries side-mounted camera equipped with automatic shutter/film winder.



Angle of shot from Houston's camera plane provides more realistic photos than those from straight-ahead types. Uses EK radio.



The prize photo! First known all-model, air-to-air picture. It took 17 shots in one flying session to get it. Hmmm . . . camera combat . . . ?

dom graded over a 6 for this relatively simple maneuver. For the most part, pilots began descending long before the turn into final, and nearly everyone was too low and too far out on final, making it necessary to add throttle and sometimes gain altitude, in order to reach the spot.

As for the Landing, the inner circle must have sunk about two inches after four days of being hammered down by "controlled crashes!" As for rolling to a stop, some of the models challenged the law of perpetual motion to its fullest extent. Anybody ever hear of drag brakes?

Now on to a very important matter concerning World Championship contest procedures . . . and from what we've read and heard, this applies to all other categories of model aircraft competition, as well as R/C. It is high time that contest procedures were standardized, and that to qualify as a host country for any given World Championship event, the modeling officials of that country must agree, without exception, to follow the procedures to a "T."

Carrying this a bit farther, the strict requirements and level of necessary competency has reached such a degree that we can no longer permit "honorary" appointments to critical official jobs in the operation of a major event. If the jury and judges can be "imported" to

work at a W/C contest, then so can key officials who operate the event "machinery." This should apply in particular where a host country has not held national contests that were at least as large as the W/C event, if not larger.

Let's take a look at some examples of a need for standardization of procedures as experienced in Switzerland. We hope that Edwin Wellenzohn, Arthur Hofer, Werner Koelliker, and other members of the Swiss Aero Club will understand that we are criticizing the system rather than their individual efforts. No doubt the monumental tasks

and the unexpected additional expenses were exceeded in size only by the beautiful Swiss Alps that occasionally looked down on us from the south!

The most critical need at an R/C event is frequency control. There is nothing more unsettling to all contestants, and officials, than to see crashes resulting from radio interference. At Berne, there were at least four interference crashes. Two of those were the result of poor frequency control. The others came from local CB operations that apparently were not out of the ordinary, but had not been checked



Tom Waller, Bronx, N.Y., built this sharp Curtiss-Wright Junior from MB plans. It won the MB/PanaVise contest in the October issue. Scaled at 2" to the foot, it spans 78 inches.



Julian Barrs, Director of the Jacksonville Recreation Department, cuts the ribbon officially opening the Gateway R/C Model Airport. Burnis Fields (left) and Bill Atkinson hold ribbon.

prior to the contest.

With the advent of the "clothespin system" in the U.S., some 10 years ago, much R/C-to-R/C interference has been collared. It was finally adopted at the Nationals a couple of years ago. There shouldn't be another R/C World Champs event of any kind without them. If they're too "primitive" for FAI status, use something more dignified, but whatever they're made of, the "no tickee, no washee" frequency clips must be made mandatory!

As for outside interference, the flight line light system, connected directly to a panic button at the monitors, is another must. In Berne, if interference were spotted, someone would casually say "Yup, danged if it ain't" (in German or French, of course), and a foot messenger would be sent out to let a contestant know why he crashed!

Judging is always a touchy subject to get into, but since we're a long-time member of this austere but downtrodden group... why not?

Selection of judges for R/C World

Champ competition is a perfect example of the "honorary appointment" system that needs to be abolished. We understand the national bias thing is worse in C/L stunt, but that doesn't give us reason to tolerate it.

The most flagrant example of national bias in R/C judging that we ever witnessed, took place at the Doylestown W/C in 1971, and as much as we object to dropping of the high and low scores, we must admit that it had merit in this.

Maynard Hill attempted to standardize R/C judging when he held a judge's school in Germany, in 1968. The following year, when the pattern champs were held in Bremen, things went pretty well. But the judging deteriorated in subsequent years as "honorarys" were given the appointment in place of "Graduates."

National bias is not the only problem. Many W/C judges, we're sure, have had little experience at the job, and what experience they've had, has been at small contests with inferior flyers. We doubt that some would know a really

well executed maneuver if they saw it! Furthermore, a couple of "training flights" the day before a contest is about as useful as studying first aid prior to performing brain surgery.

It is our opinion that the judges for World Championships should be selected on the basis of their past experience, performance record, and lack of national bias (evident from previous competitions). What country they come from should be of little consequence. Since only 10 judges do the scoring for 25 or more countrys, the matter of "competition without representation" is of no consequence. If all of the judges happen to come from only two or three countrys, it shouldn't matter, as long as they do the job well.

Selection of the judges should be handled by a special 3-man committee appointed by the C.I.A.M. The committee members should have judged at least three R/C World Champs (sure, we'll volunteer!) *Continued on page 75*



"Hey, Poppa, you told me 'WE' were going flying!" MB's editor gets in a little borrowed stick time, while daughter Belinda kibbitzes.

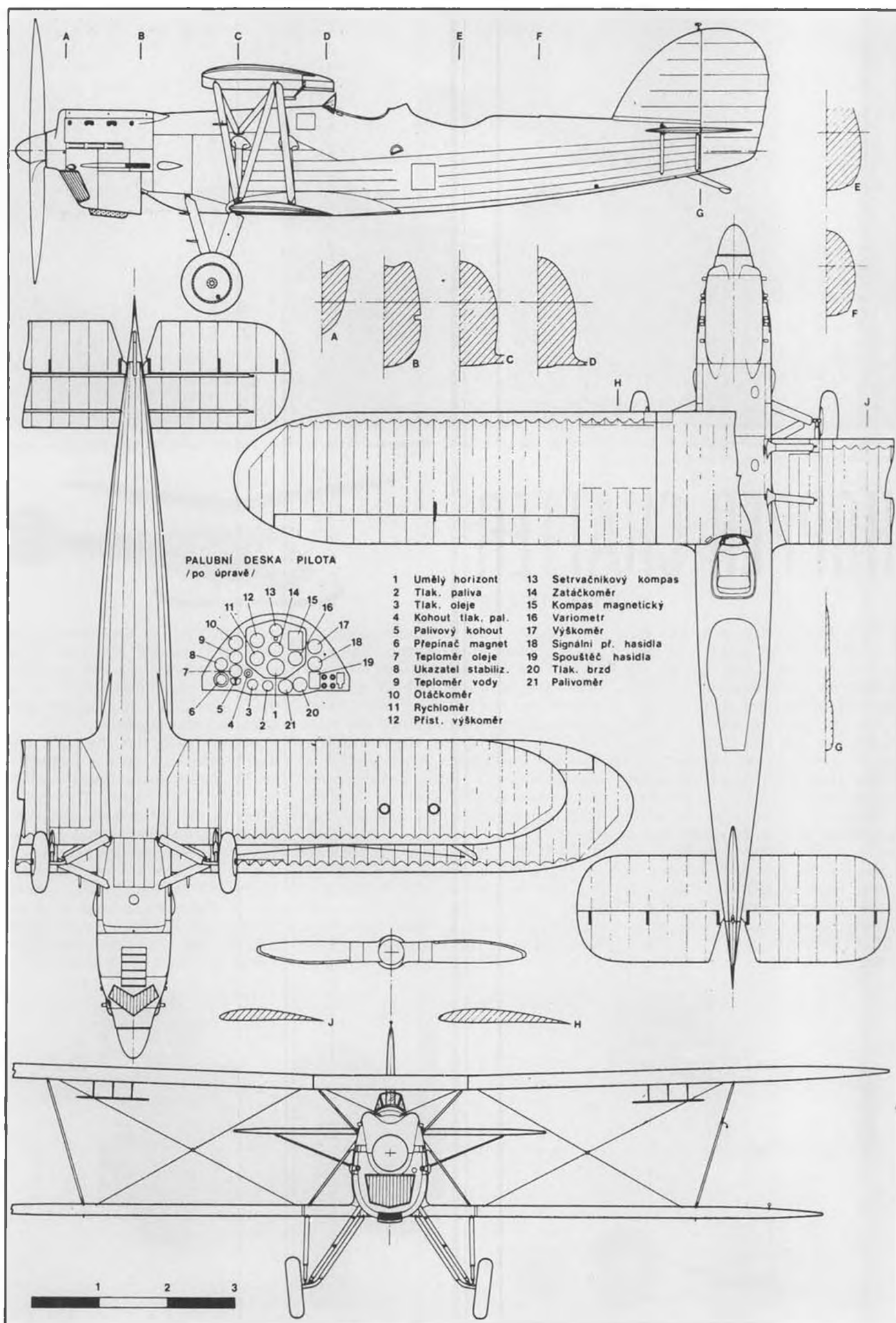


Harry Appoian with his WW II Waco powered glider, at the Flightmasters Scale Annual.



Joe Tschirgi, displaced long-time DCRC member, now in Orange County, with his Junkers, at the Flightmasters, Mile Square Park.





Courtesy of LETECTVI & KOSMONAUTIKA, Czechoslovakia



The Du-Bro "Tri-Star", with Hughes 500 body, as built by John Tucker for the review in this column. The kit includes a Scorpion body, while Hughes and Enstrom bodies are available as extras.

# CHOPPER CHATTER

By JOHN TUCKER



• It looks like another busy issue this time... there are so many new ideas coming in from the model builders, the manufacturers, and the club newsletters, it's difficult to know just where to begin. Well, I'm not going to spend any time on it, I'll just dive and lead-off with a review of the "Tri-Star" helicopter kit with the Hughes 500 body, designed and manufactured by Du-Bro Products Inc., Wauconda, Ill. We probably won't have room to tell you about the Kavan "Long"-Ranger built by Larry Bingham, but you can be sure we'll cover it in the next issue of *MODEL BUILDER* Magazine, complete with photos of how he extended the fuselage. Here we go... **DU-BRO TRI-STAR**

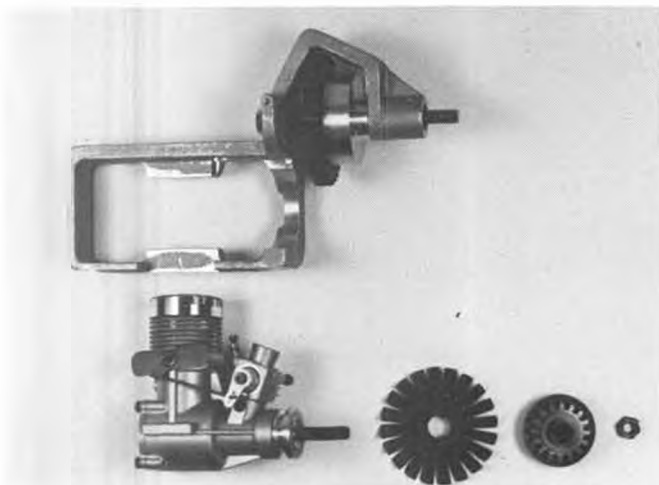
Awaiting my return from Germany

last month, were two large cardboard boxes containing the Hughes 500 body kit and the Tri-Star mechanics kit, complete with Scorpion body. I had previously seen the mechanics and was very impressed, but didn't particularly want the Scorpion body that comes with it as standard equipment. After looking it over carefully, however, I changed my mind and decided that any of the three bodies would make up a very sexy machine.

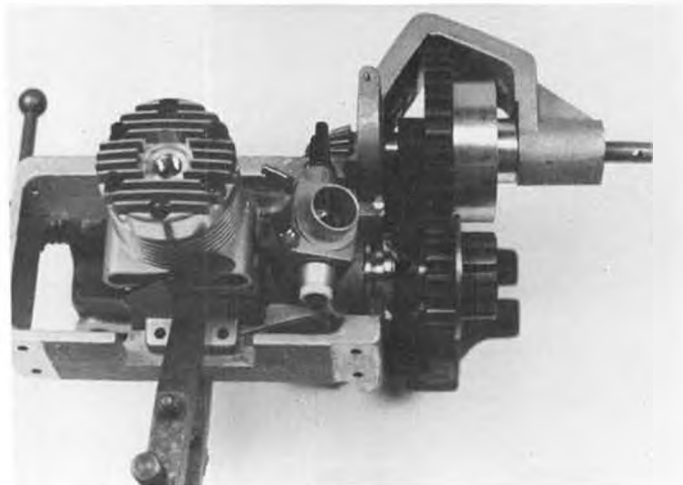
First off, I inventoried the contents of both boxes with the checklist which is conveniently provided in the last four pages of the 23 page instruction book. You might make a mental note right now that these last four pages are going to be very important to you in finding

the right parts in the right bag when you start building! And you *are* going to start building it when you see the pictures of the finished model or see it flying around the local pasture with an ease that's unbelievable.

Before laying out the parts on the workbench, let's take a moment and review the technical specifications of the "Bird." The name "Tri-Star" itself refers to the three body styles which can be interchanged within a matter of 5 minutes, namely, the Scorpion fuselage which comes with the kit, the Hughes 500, and the Enstrom, the latter two of which are optional body kits at \$34.95 and \$29.95 respectively. Actually, it's four kits in one, since the helicopter flies like a bird without any body



Starting assembly... main frame, OS .40 engine, fan, and starter gear.

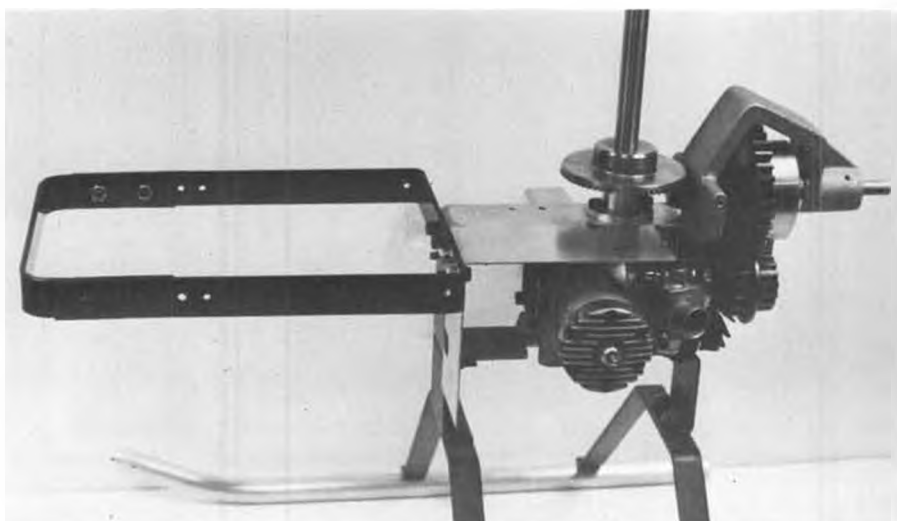


Engine and drive gears lined up and clamped for drilling.

at all! This configuration makes an excellent trainer; then, when you get it trimmed out and learn how to fly, you can show up at the model field with a different chopper each time!

The Tri-Star is an extremely rugged machine . . . all metal bolt-together construction, with heavy duty steel gears and ball-bearings throughout. A dual cooling system is used with a special heat sink and cooling fan supplied with the kit! That engine is going to run cool even when completely enclosed, and on a hot day. Length of fuselage is 36 inches, main rotor diameter is 45 inches, and flying weight varies with the selected body; from 6 to 7 lbs. Most any .40 engine will adapt to the mounting frame, but I heartily recommend the O.S. Max .40, since it drops right in place perfectly. A special timing gear attached to the drive shaft provides a unique starting system by pulling a timing belt through the gear. Coming soon, is a collective pitch head, which I understand can be fitted directly on the Tri-Star without a lot of modifying. It will also fit the other Du-Bro choppers, Shark and Hughes 300. I'm a confirmed collective pitch fan, so I can hardly wait to try it out.

Enough of that . . . Let's get right into construction details. First, sort out

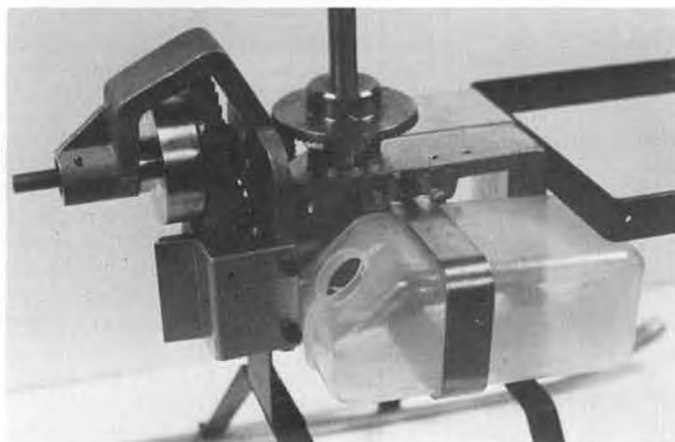


Basic assembly unit; engine, drive train shaft, landing gear, and front frame.

the 21 parts packages and lay them out where you can get to them without mixing them up. Unfortunately, the instructions do not refer to specific part numbers or bags during the building, however, you shouldn't run into any snags because of its simplicity!

Start actual assembly with bag No. 8, "assembly of the short gear shaft." The 1/2 O.D. x 1/4 I.D. bearings, No. 444,

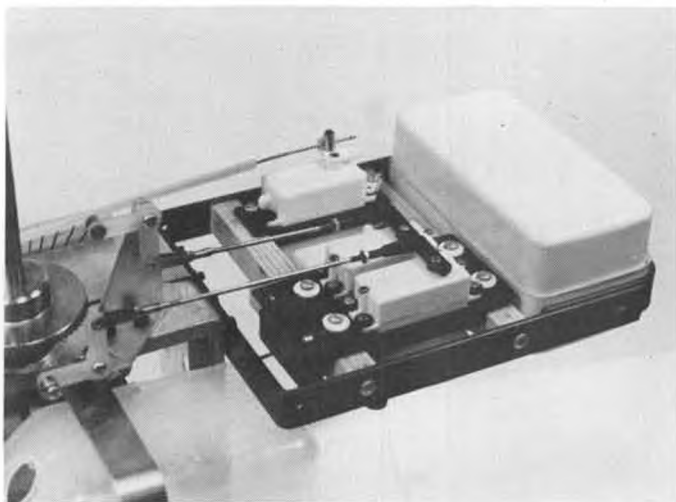
comes out of bag No. 18. Very light filing is required to clean up the sharp edges on the main frame casting. When setting all gears on their respective shafts, it might be wise to run the set-screws in and out once before sliding the gears into place . . . They do fit very snugly and might fool you into thinking they are set tight. When setting the first bearing into the frame, use the short gear shaft



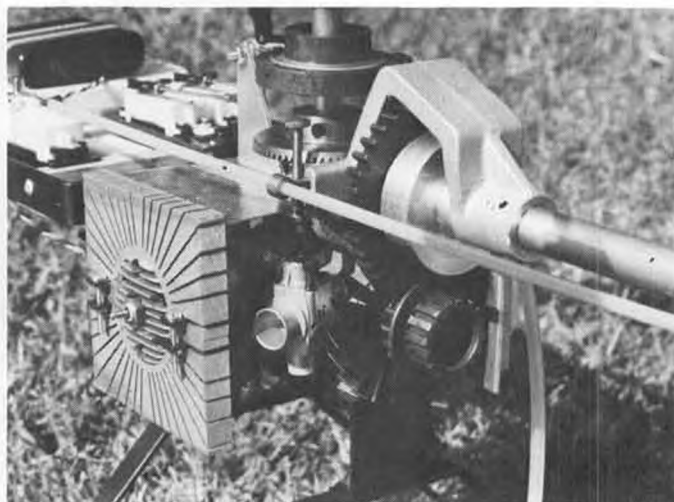
Sullivan fuel tank clamped in place.



Ball-peening "E-Z" connectors to bellcrank.



Servo trays and radio box mounted on main frame.

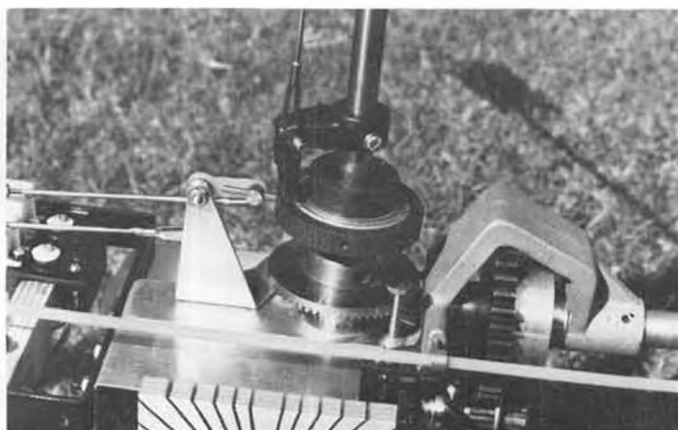


Heat sink, swash plate, and tail boom have been installed.





Servo and control-rod connections.



"Knee-action" swash plate driver assembled on main shaft.



Tail rotor drive and control assembly.

as a "line-up" guide.

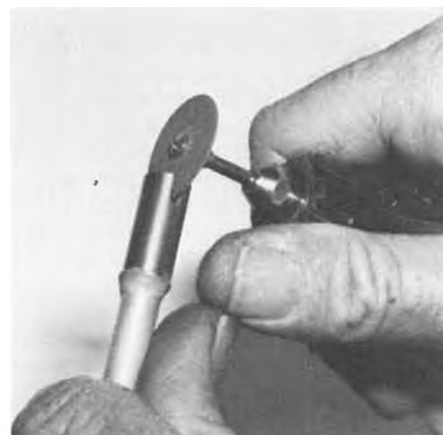
Assemble the clutch from parts in bag No. 18. Again, be sure you file any burrs off the clutch shoes so they work smoothly without cutting into the spring. Be especially careful when using Locktite on the clutch so that free movement is assured. When cementing the clutch lining into the housing, butt the ends together and slide it into place carefully. Quick-Fix is ideal for this operation.

During the fitting of the clutch/gear and shaft into the main frame, you will probably have to file away a small area

at the top of the frame to provide gear clearance (be certain that all bearings are covered with masking tape when filing frame). Before locking this assembly in place, the main shaft assembly must be placed into position so that proper gear mesh can be established. My chopper required 3 out of the 6 special thin washers supplied to properly mesh the gears. When a good fit is obtained, lock the clutch assembly in place.

The next step is to mount the engine, according to the instructions. Install the fan and gear very carefully on the engine prior to drilling the holes in the mount. The gear is used to line up the engine properly. When satisfied, clamp the engine in position and "spot" mark the holes. Then remove engine for actual drilling of holes in mount. Use a No. 36 drill and tap the holes for 6-32 machine screws.

This drive assembly is the sweetest I've ever seen! The gears are very high quality and the alignment is extremely precise. The gears really "sing" when properly set . . . no lost motion here . . . very compact, and very husky! It was necessary to relieve the frame slightly to permit full travel of the throttle arm (cut off corner slightly with a Dremel tool). Look closely where the main rotor shaft is secured in the frame by bolt No. 445 and washer No. 414. If the

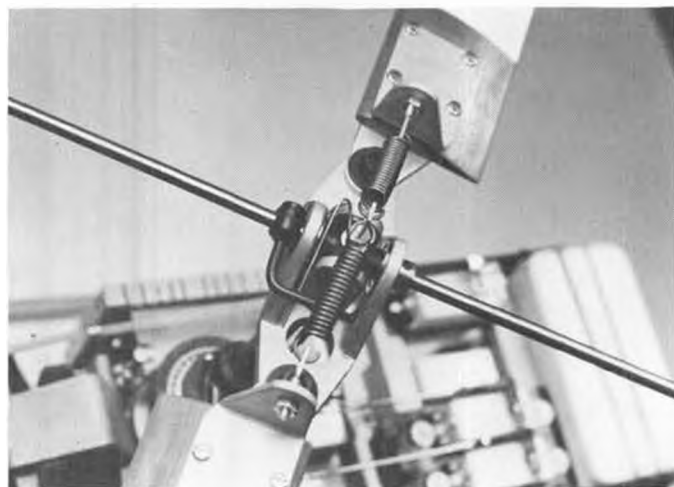


Cutting slot in aluminum tail drive shaft to aid disassembly.

washer jams against the mount, you might have to trim the frame a wee bit.

Landing gear assembly was straight forward after identification of parts bags. A nice touch is to burnish the aluminum skids with steel wool for that new look. The recommended 8 oz. fuel tank doesn't appear to fit, but sure enough, it does tuck in nicely under the steel frame.

Try as I might, I didn't get to first base in figuring out how to install the heat-sink on the engine. I was about ready to drill some holes for my own "Rube Goldberg" fix when my son, John Jr., showed me how the little straps act as



Main rotor hub assembly. Note 3rd wire spring to take out backplay of stabilizer bar.



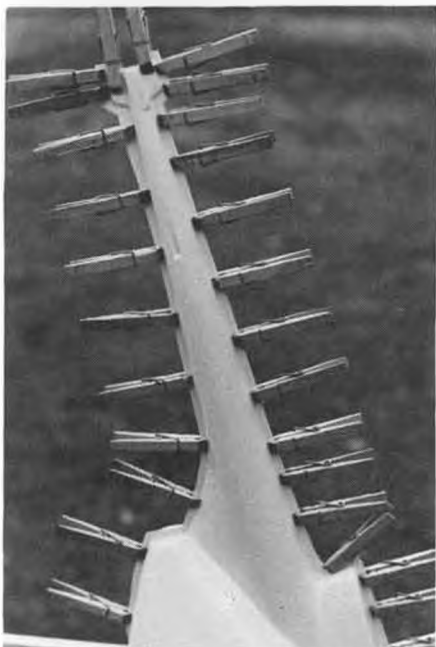
Method of setting blade angles with jig furnished in kit.



Front and rear Hughes fuselage shells trimmed to fit each other, and installed on mechanics unit.



Cutting of excess plastic from window shell.



Hughes fuselage sides clamped with clothes pins during cementing.

clamps. Sure 'nuff, a closer examination of the advertising photos showed him to be right. Boy, did I ever feel like a dum-dum!

When you get around to the bell-crank mounting, be sure to correct the sheet No. 1 drawing per the "amendments" instruction, otherwise you'll probably get the EZ connector on the wrong side of the bell-crank.

The tail rotor drive shaft is very novel in that it uses 5/16 aluminum tubing with steel couplers cemented to the ends and 2 nylon bearings to keep it centered inside the tail boom. My personal preference for cement in this case is Stabilit Express, however, I'm sure Quick-Fix will work just as well. Cut out the aluminum (slot area) very carefully with a Dremel tool and make sure the drive pin fits easily before cementing on the brass cover sleeve.

For the tail gear assembly, I reversed the drive shaft as instructed (in the Hughes 500 instructions) without difficulty. When installing the pitch-control shaft No. 483 into the rotor shaft, I

found the hole had been bored from both ends of the shaft and did not meet exactly in alignment. I simply redrilled the hole from one side only and the shaft went in smoothly. The bell-crank mount No. 482 was remade because crank No. 459 was too short to reach the pitch control shaft centerline. The hole was simply relocated 4mm closer to the pitch shaft, otherwise the mount is the same. In general, the entire tail drive assembly and control system is very, very smooth and of excellent design. Subsequent flight tests showed this unit to give better response than any other system tested to date! A final note in the assembly of the tail tube . . . be sure you don't cut the tail tube because it appears to be too long (I almost did!). This tube slides forward into the frame almost 3/4 of an inch, and is very deceptive. The bearing in the frame must be *all the way* forward and against the clutch bushing.

About the only area in the entire assembly process where the beginner could get into trouble is in the control hook-up from servos to swash-plate. The radio installation instructions are only fair, but the radio manufacturer will probably have supplied this data to the modeler anyway. I kept getting the feeling that there was a missing 3rd sheet, showing the control hook-up, or a drawing in some corner that I couldn't find. An experienced builder will have no dif-



Vertical fin clamped to stub for cementing.

ficulty whatsoever, and if you are reading this article, you'll have several photos to guide you. I chose the Orbit radio and enlarged the servo mount bearers to accommodate the standard servo mounts with provisions for the switch. The flat battery pack was chosen for ease of mounting (via double-stick foam tape) on the radio box. All cable connectors were located inside the box.

The main rotor was assembled per the instructions, without problems. Just make sure the bearings are installed in such a manner that the bearing mount

*Continued on page 83*



Completed basic Tri-Star chopper, less body, but ready to fly. For those hot summer days!



Dan Moore releases fellow SPOT Club member Cliff Schaible's Lanzo Record Breaker. The OS 60 engine features electronic ignition with inductive pickup for points. Lanzo plans available from Pond or MB.



# PLUG SPARKS

By JOHN POND

• If you couldn't contact the columnist during the month of September, it was because a long overdue trip to England and the continent was finally taken. At the risk of sounding like a Stanton Delaplane or an Arthur Frommer, some observations from a modeling standpoint are in order.

Much to the writer's delight, England is a hotbed of old timer enthusiasts. Small wonder that these events are staged on an official basis during the British Nationals. Although flying free

flight models in the London area is a rather hazardous proposition, there are fields easily accessible 20 to 50 miles out of town. Most fields, like the Shuttleworth Field, are surrounded by cabbage farms, making retrieving a delicate chore. In many respects, when viewing the flying sites, an American is reminded of East Coast flying conditions, with trees, brush, and other similar modeling obstacles.

Despite the loss of John Haggart, a real O/T spark plug, the gang is still carrying on in great style. Present plans call for a perpetual trophy in honor of Haggart's memory, to be awarded each

year to the outstanding old timer flyer. Sounds great!

When visiting London, four things (in the order of the writer's preference) should be seen: (1) The R.A.F. Museum at Hendon (outstanding!), (2) Science Museum collection of airplanes, (3) The Shuttleworth collection (if flying demonstrations are being given, this is number one), and (4) The Imperial War Museum. There are other things to be seen, like the DeHavilland collection and the "Toucan" man-powered glider at Handley-Page Field. Of course, visits to the Aeromodeler office in Hemel Hempstead (what a great host is Ron Moul-



Most unusual plaques awarded at the Berkshire Annual Massachusetts Old Timer R/C Championships.



Dan Stokes, 15, of Keller, Texas, proves that you don't have to be an "old timer" to enjoy building and flying Old Timers!



ton!) and to Heny Nicholl's Hobby shop on Holloway St. You won't regret any of it!!

Almost forgot to mention Ron Rad-don, who was a perfect host, doing most of the chauffeur work to all the great places. With hospitality like that, it was no wonder the columnist was able to see most everything, even to Pete Fisher, of Performance Models, out in the country!

#### MOTOR OF THE MONTH

During World War II, with materials in critical supply most model engine manufacturers turned their talents to producing small wartime accessories. When it was seen that defeat for Germany and Japan was inevitable, it was then that all the garage experimentation with engines that had been going on finally came to light.

The year 1945 was the one for new engines, and Bill Atwood's was no exception. In a small ad, Wentzel and Atwood Co., of Los Angeles, announced the new Atwood Champion Model H, priced at \$23.50. Thus opened the January issue of Model Airplane News for Bill Atwood and his myriad amount of engines.

The engine proved to be powerful . . . something the airplane, car, and boat boys were looking for. The immediate success of this motor brought on the Model J, followed by the Glo-Devil version. In every case the Champion gave good performance.

As with the Herkimer engine, many modelers did not like the rear intake, as this made mounting and cowl-ing the engine a little more tedious than the simpler front rotor engines.

Regardless, those fellows who appreciated good power used Atwood engines. The writer has yet to hear better sounding ignition engines than those Champions in Bill Burgess's Playboy Cabin, or John Droulliard's Westerner, the latter being the most spectacular both in performance and crash! To summarize, the Atwood Champ was Bill's best .60 cu. in. engine, regardless of any other special engines he built.

Incidentally, for those who wonder what happened to Bill Atwood, he has only recently retired from the L.M. Cox Mfg. Co., where he spent many years developing and perfecting good Tee Dee engines. Look at them carefully, you can see the Atwood influence!

#### SPOT SHOTS

Received several large brown envelopes with all sorts of goodies in them from Randy Carman, the top publicist of the SPOT club (Society for the Preservation of Old Timers), wherein she states that I don't have to write a column this time! Gotta agree. If all contributions were like the one Randy submitted, then MODEL BUILDER would have to expand to 150 pages! (*Groan! wcn*) All kidding aside, we can always use good material like that!



Here's the SPOT family (l to r): George and Bobby Haley, Jim and Marianne Clark, Andy Anderson, Shirley Moore, Howard Carman, June Anderson, Randy Carman, Betty and Cliff Schaible, Norma and Don Hartman, and Dan Moore. Society for Preservation of Old Timers!

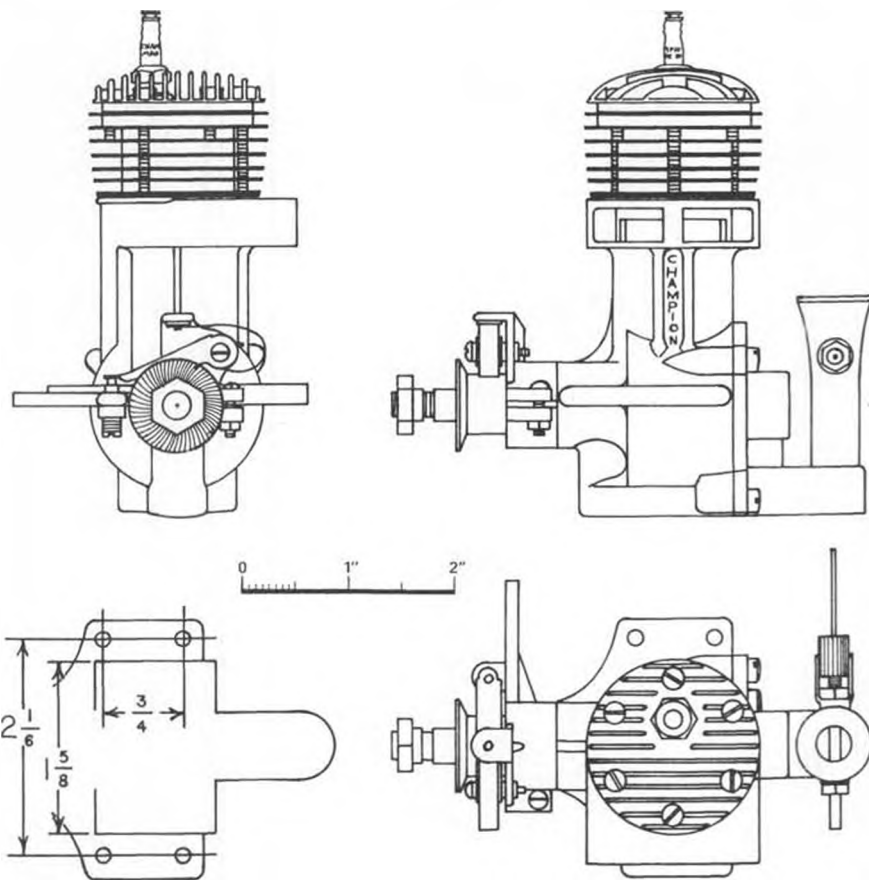
First, Randy sent us photos and a write-up on the 2nd Annual Berkshire R/C Flying Club O/T R/C Massachusetts Championships (*would you mind repeating that? wcn*) on August 10. Weather was the best yet, according to all, being one of those great hot days that you generally have to work on.

Cliff Schaible wowed everyone with his ignition powered Lanzo Record Breaker in the new Texaco Event. With a converted O/S 60 engine, he obtained an eight minute motor run for a total flight time of 20:57. No one even came

close.

Not to be outdone by Cliff's impeccable work, Esio Grassi produced a gorgeous Miss America, complete with all trimmings, including the flag and name as originally advertised. Flew good too, placed second in Antique!

The Texaco Event, which seems to be catching on back east, had many entrants. Called the Fuel Allotment event, most any old timer model can compete. President Ricco Dus, of the Berkshire Club, flew a Brooklyn Dodger clear out of sight, spun it down and lost a wing.



ATWOOD CHAMPION

Drawn by TEX NEWMAN





Revival of the Kite and Model Aeroplane Association Days, held at Old Warden Aerodrome, England. Bob Kinroy, Alwin Greenhalgh, Evelyn Barret, C.R. Moore, Peter Spence, Howard Boys.



Phil and Otto Bernhardt accept trophy from "Daddy Warbucks" at Taft SAM 21 contest.



Rare stick gas job designed by Frank Ehling. Bob Schafer built it from plans in the 1936 Zaic Model Aeronautic Yearbook.



Winners of 1st place at First Annual SPOT OT contest (l to r): Vince Bonema, Ray Hinds, Ted Patriola, Mark Patriola, and Cliff Schaible.

Ricco bravely says it will fly again!

To make a long report short (*Too late now, John! wcn*) the Massachusetts skies were filled with many pretty birds, and thunderheads that never materialized into storm. Incidentally, their club paper, "Berkshire Buzzard" is an excellently done publication by George Parker, jack-of-all-trades man; editor, contest director, competitor, etc.

Leaving hard-working George, Randy comments on the First Annual SPOT OT R/C contest on Sept. 28 by saying the contest enjoyed great weather in spite of Thursday, Friday, and Saturday looking just terrible with rain.

Registration was light until seven

hawks were spotted thermalling across the field. The rush for registration and flights was something fierce. Unfortunately, strong winds came up shortly thereafter, and flying slowed, with most pilots indulging in "strategy flying."

Some of them must have missed because Jack Van Dusen picked up his Red Zephyr on the other side of the river, Tom Acciavatti dropped his Miss Philly in the RCA Complex, and Cliff Schaible demonstrated how to land a Lanzo in water, without floats. Don Hartman's So Long broke a wing when he let the model loop on him. He is now conferring with Dan Moore, the all time pro at breaking wings for help. Haw!

Everyone from AMA V-P Dist. II John Byrne to SAM Prexy Joe Beshar thought it was a great contest. Joe, never at a loss for words, praised the SPOT Club for their activities. Wait until next year!

#### ANNUAL NORTHWEST O/T CHAMPIONSHIPS

With contest reports coming thick and fast, the columnist couldn't overlook the material submitted by Bob Stalick (remember him? He writes on free flight). As usual, a great time was had by all, with a noticeable increase in contestants. Must be doing things right as this contest gains in stature every year. *Continued on page 65*

#### OLD TIMER Model of the Month

Designed by: Ben Shereshaw  
Redrawn by: Phil Bernhardt  
Text by: Bill Northrop

• To quote Ben Shereshaw, from the January 1938 issue of *Flying Aces*, in which the "Pioneer" construction article was published, "Regardless of the fact that during the past several years I have designed and built scores of gas models of all shapes, sizes, and styles, none has given me greater personal pleasure and satisfaction than that derived while working on *The Pioneer*, which was the first real gas model that I made."

## Ben Shereshaw's "PIONEER"

So it would seem that the Pioneer is aptly named, for many beautiful designs materialized from Ben's drawing board in subsequent years, with the "Custom Cavalier" being the best known of all. By the way, Ben is the key figure behind Bantam Model Products Corp., manufacturer of the famous pre-war Bantam engine, and currently producer of the revolutionary new primable glow plug, the "Head Start."

For a picture of the Pioneer, check back to the "Plug Sparks" column in last month's issue. The parasol wing and high thrust line should make the ship

extremely stable, and with moderate power and radio control, it should make a very picturesque figure, "putty-putting" around the field at low altitudes. It also qualifies for and should make an excellent contender in the Texaco and Antique events.

Once again, the old magazines did not over-concern themselves with balance point location, and none was specified for the Pioneer. Considering the force layout, along with a symmetrical rather than lifting stab, we'd suggest starting at about 4 to 4-1/2 inches back of the wing leading edge. ●





Chris Corven, age 11, from Warren, Michigan, with his Legion-Air. He was 1974 N.S.S. Junior Champion. He also flies an Airtronics "Aquila" in Standard Class.

# R/C SOARING

By  
TAYLOR  
COLLINS

• Remember as far back as your high school physics class? What was it they said about the way to make things strong? Something about inelastic members in tension and compression which are prevented from buckling by braces or webbing? Somewhere along the line, the fancy terminology escaped me, but the idea came along for the ride.

The whole point is that if you can make a structure having strong outer edges that won't stretch or break, and can put something between those outer members to keep them from bending under load, then you've got a pretty darn strong structure. It's this basic rule of engineering that has brought about a lot of things that we tend to take for granted.

Take most big buildings for instance. Practically all of the basic structure is built from steel I-beams. Why the "I" shape? Because the "I" provides the simplest, most economical fulfillment of our rule. The top and bottom portions of the "I" comprise the "inelastic members." It's a pretty safe bet that no matter what happens, you aren't going to stretch or break this heaviest part of the "I." The inner, vertical part of the "I" forms a web. Its purpose? Just to keep the outer edges from pulling apart or crushing together. Anything more in the center would be wasteful. In a solid extruded piece, such as a steel I-beam, there are no worries about weak spots in the material, or concern about adhesive failure. So the concern in building an "I" is just to maintain an adequate

cross section of material to give adequate strength in tension and compression.

So what does all of this have to do with toy aeroplanes? In case you haven't noticed, most glider wings use a built up "I" beam for a wing spar (*Most of us lazy modelers put the web in front of or behind the spars, forming a channel, which is structurally OK too. wcn*) Now, armed with this rather crude introductory engineering lesson, the causes of some model wing failures should be more apparent.

Remember the whole load is carried by the wing spars in tension... that means pulling loads. Also, remember that wood, be it spruce, pine, oak, whatever... has far greater strength in tension than in compression. Fine, the material we are using for spars is probably pretty good.

But, the problem comes in keeping the outer spars in the place where they belong. When your plane comes in contact with turbulence, killer thermals, or your heavy foot on the winch switch, the wing spar does a lot of flexing. This is fine, up to the point where the glue joints which hold the whole affair together start to fail. As soon as one shear web comes unglued, the whole system falls apart at the seams. When the spar separates from the shear web, it has room to flex and immediately takes on a compression load. Pow! There goes the spar, the wing, and the plane!

So what can we do to improve the odds? The most obvious thing is to be



Chris Corven and his father, Dave, are members of the C.A.R.D.S. (Capitol Area Radio Drone Society).

certain that the wood we are using for spars can take the load. Spruce has a far greater strength-to-weight ratio than any other wood, which explains why it is so popular for spars... but there is spruce and there is spruce. When you are in your friendly neighborhood hobby emporium laying down your hard earned shekels... be choosy! Find some good, straight and close-grained wood for your wing spars. If the spar material supplied in the kit you are building isn't up to par... replace it! Remember, that bird is going to haul a couple of hundred bucks worth of radio.

Something else to think about for your own design. The strength we are

after is in tension. To increase the load carrying ability of the spar, we need to increase its tensile strength. The only way to do this is to increase the size of wood carrying the load. But since the outsides (top and bottom surfaces) of the spar are doing the work, why not put the increased wood on those surfaces. Why not use thinner but wider spars? This will give a broader surface between the spars, allowing the use of wider shear webs. By using wider shear webs, we can effectively use a wider gluing area. And this wider gluing area should decrease the number of glue joint failures. Glues are rated on their strength per square inch of bonded surface. Increase the bonded surface, and you have increased the strength of the structure.

All of this brings us a step further. But first, we have to analyze just what we were working towards. What is a wing? It's a flat sort of a structure with a curved cross section. What does it have to do? It must be light weight. It should have as uniform a contour as possible. It needs to be strong enough to withstand winch and high-start launches, as well as to be able to carry the loads imposed on it by a fuselage full of radio gear. Its cross section, plan form, size, and area will affect the flight performance of the glider, but these things (within limits) have little to do with the structural design.

So now that we've defined the requirements of a glider wing a little more clearly, let's consider some other items. Cost is very important. Few of us are in the position to consider building a glider



George Steiner mounted a camera on his Graupner Cirrus to get this startling photo during a winch takeoff at the 1974 North-South Challenge, Famosa Field, Bakersfield, California.

as part of our jobs . . . so whatever funds go into our toys are robbed from the family budget. Weight is another important consideration, also strength, as well as ease of working with the materials.

One material that stands out above the others is styrofoam. It is inexpensive, strong, lightweight, and very easy to work with. The primary objection that most people have had to styrofoam wings is in their appearance and/or weight. Efforts at making foam wings look as good as built-up wings have resulted in very heavy wings.

Recently, however, there have been some developments in the modeling

field that have eliminated the equation "appearance equals weight." And along with these techniques of working with foam, there have been some increases in building efficiency, resulting in wings that are stronger and faster to build.

Most of the techniques that I'm going to describe have been stolen from a variety of people. Where possible, I'll give credit to my benefactors.

To date, there are two types of styrofoam wings used in large, R/C type models (Cox is making a small C/L wing from a molded foam shell). One is injection molded, the other is cut from

*Continued on page 60*

PHOTO BY MIROSLAV KVAPIL



Milan Kacha, Czechoslovakia, launching his "Gulf Coaster". It's covered with Monokote and is controlled by a Kraft radio.



Crazy Dave Thornburg, Albuquerque, N.M., and his "Sweepette" RC H.L.G. blown up to 6 feet! "Green clay ballast" hides battery pack.



Cars from Phoenix, San Jose, San Diego, Los Angeles, and Orange County at the Long Beach Grand Prix demonstrations.

# R/C AUTO NEWS

By CHUCK HALLUM

• Well, we're finally getting into suspension systems. First I'm going to go over a little on what current plate type chassis do, and get into simple front and rear "rocker" suspensions. This will provide a base so that we can go on to the more sophisticated types of suspensions.

The first thing people ask when I mention suspension systems is, "Why do we need suspension?" I must admit it's hard to answer that question, because R/C cars are going super-fast, and at best, suspension will improve performance only a small percent, particularly on the kind of track surfaces we normally race on here in the U.S. But who knows where R/C cars will really end up in a couple of years? Suspension systems will really help on rough tracks

and rough terrain, such as for dune buggies . . . but not for dusty tracks, as most people believe. With a good suspension system, both front and rear, adjustments can be made for different tracks if the car enthusiast knows what he is doing. Certainly the full advantage of suspension systems cannot be realized by a beginner.

On current plate type chassis, the plate provides some flexibility to give some roll rate to both the front and rear ends. The shape and thickness of the plate and the location of the weight can make the front and rear roll rates a little different. Tire hardness, or flexibility, also contributes to the roll rate. In general, one wants the front roll rate to be higher than the rear roll rate to

help provide some understeer (front end turning forces lower than those of the rear to reduce the probability of spin-outs). With a higher roll rate at the front, there will be more weight transfer at the front during cornering. The proportionately greater weight transfer at the front causes the front tires to become less effective in turning while the rear tires work more uniformly and keep traction capability higher. This is one of the reasons that hard front tires (no extra springing) provide understeer and stability.

How do you measure the roll stiffness of an R/C car? It's rather complicated and possibly not worth the effort, but some reference values are needed before we continue, so here goes. What we want to do is to measure how much torque it takes to twist the rear axle, in the lateral plane, a certain amount with respect to the chassis plane at the C.G. location. But we should include tire flexing because that contributes quite a bit in R/C car suspension, so we have to make these measurements while the car is resting on a horizontal surface. Here is the method I have come up with to determine front and rear roll stiffness.

1. Place the car on a flat horizontal surface. Determine the fore and aft C.G. location by lifting the car with two fingers, one on each side of the car, under the chassis, until the balance point is located. Now firmly tape a 2 ft. piece of piano wire under the chassis laterally, perpendicular to the fore and aft centerline. Place the car on the surface and

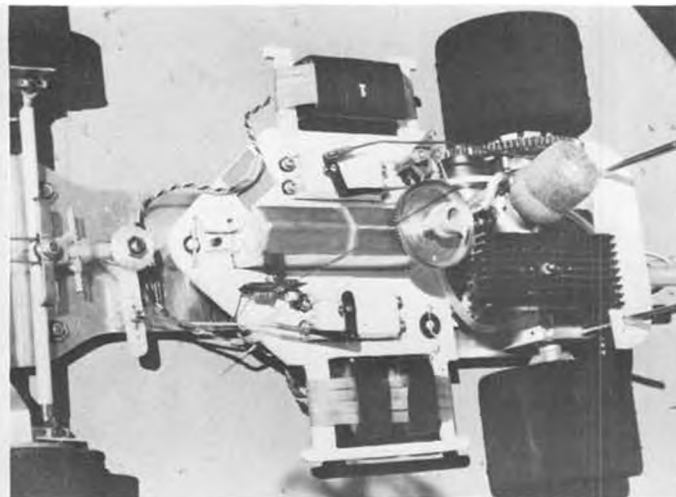


An early practice session at the Long Beach Grand Prix, before the crowds and sunshine arrived. Demonstrations drew lots of spectators any time they cranked up.





Delta front suspension on Arturo Carbonell's 1974 road car. Chassis provides more flex than the front rocker motion.



Extra front flexibility can be provided by a narrow chassis in the front, as in Earl Campbell's Associated car.

bend or adjust the wire until the ends are the same distance above the surface.

2. The following procedure will be done on each of the wheels . . . but let's start with the left rear (LR). Place 1/16 to 1/8 inch pads of wood or metal under the right rear (RR), right front (RF) and left front (LF) tires. Lift the LR tire at the center with a weight-measuring device until the C.G. wire ends are the same distance above the surface. Note the LR force, which is the weight carried by the LR tire. Call this WO(LR). Also measure the height of the center of the LR wheel rim and record it as HO(LR).

3. (LR measurements cont'd). Now remove the pad from under the LF tire . . . the left side of the C.G. rod will drop. Now lift the LR tire again until the CG rod ends are equidistant from the surface. Record the force and height as W1(LR) and H1(LR) respectively. What we've done here is twist the rear of the chassis while keeping the CG plane horizontal and know the extra force required for that twist.

4. Now we can calculate the (LR) roll stiffness. Calculate the difference in weight required to level the CG rod and the height change by,



Front suspension on Ray Carboneau's Thorp car is a "rocker." The rubber bushings springing, as well as some damping.

$$\Delta W(LR) = W1(LR) - WO(LR) \text{ lbs.}$$

$$\Delta H(LR) = H1(LR) - HO(LR) \text{ in.}$$

The roll stiffness (S) is equivalent to the weight difference divided by the height difference or,

$$S(LR) = \Delta W(LR) / \Delta H(LR) \text{ lb/in.}$$

5. Repeat steps 2, 3 and 4 for the right rear, determining S(RR).

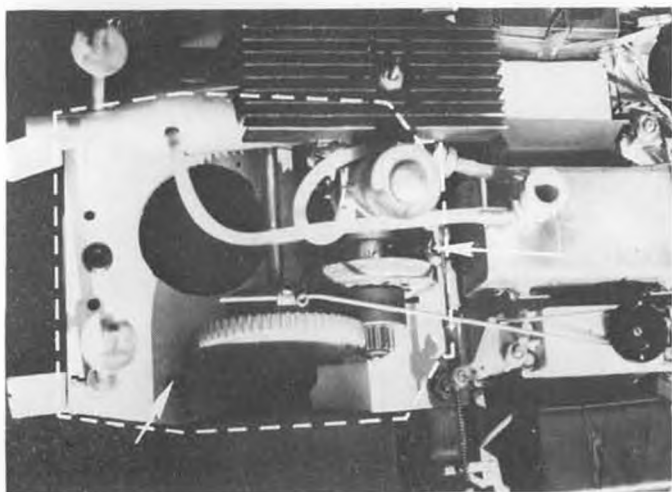
6. The stiffness of the left and right

sides may be a little different due to non-symmetry of the chassis, weight locations, or errors. So let's average these to get the nominal rear stiffness.

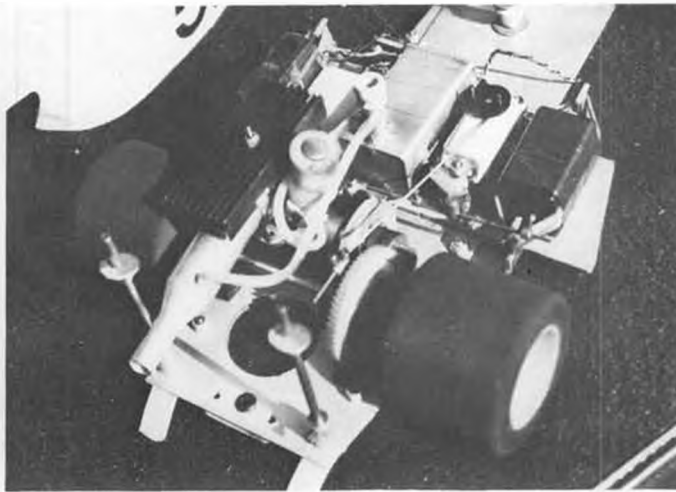
$$S(R) = S(LR) + S(RR) \div 2 \text{ lb./in.}$$

7. Repeat steps 2, 3 & 4 for the right front getting S(RF).

8. Repeat steps 2, 3 & 4 for the left front, getting S(LF). *Cont. on page 77*



Rocker rear end (outlined) on Chuck Hallum's HRE car. Attachment bolts (arrows) at rear moved to outside to reduce motion.



Another view of rocker and chassis plates on HRE car. Large holes for reduction of weight.



Big J-class boats racing at Pewaukee, Wisconsin. Real grabber of a photo was taken by Catherine Millican.

• Our lead photograph this month is not of a sailboat. Indeed, I don't know if this ever was powered with sail, but since the prototype was built in 1920, I would imagine that somewhere along the way, somebody tried it. At any rate, Ray Borden of Model Services, P.O. Box 214, Farmingdale, N.J. 07727, was kind enough to respond immediately to my request for information about his 42 inch LOA Jersey Skiff. He sent sample plans which he has told me will retail for \$7.95. Full size templates make the hull job quite straightforward. As you can see, it is an extremely realistic model, and Ray took it to its ultimate end by putting the rudder servo inside the torso of the fisherman. The hull is of lapstrake construction and took 2nd place at the WRAMS R/C Show last spring. What a beautiful sight on the water.

Of the many people and firms that I write to in trying to gather information for this column, Ray Borden deserves loud applause. His reply was quick, complete, and to the point. This is a far cry from some of the firms (indeed, advertisers in model magazines, some of them) who answer their inquiries late if at all. I'm getting so disappointed at the track record that I'm almost to the point of putting out a list of all the manufacturers who have failed to respond. You'd be surprised at the folks who would make the list!!!

The next breathtaking sight is that of a fleet of J-boats heading for the weather mark at a recent contest held in Pewaukee, Wisconsin. My spies tell me that builder Chuck Millican won the event, his big-boat sailing expertise was

# STRICTLY SAIL

By ROD CARR

standing him in good stead with the models. I would expect to see some new faces gathering J-silver next season, as model yachtsmen from other classes try their hand at this boat. Bud Salika has announced that the class has attained the 20 boat registered minimum required for AMYA sanction. This will allow 1976 to have Divisional and ACCR events under the AMYA umbrella.

At the present time, the J is not for the novice skipper. The assistance you get in outfitting the bare hull is almost non-existent, and one must call upon experience from other boats. If enough interest is shown, I would be willing to provide a later column devoted to the J-boat, but no interest, no column. So let me hear from you.

At the present time, Don Schricker,



Full width extruded aluminum traveler on Rod Carr's national champion Star 45 allows full control of main leech tension. Will go flush with deck next year.

of California, holds the record, and is using 10 (ten) Fisher turnbuckles in an attempt to stay his limber mast in some sort of regular curve. Don, get yourself a nice, dry telephone pole and a spoke-shave, roll up your sleeves and get to work!!!!

The boat really requires a careful hand, as it appears to be tender, much like the East Coast 12-Meter. Having built a number of sails for the J, I have adopted a form which leaves the upper third of the mainsail quite flat, while keeping the bottom full for power. The jib is kept flat in order to take advantage of the pointing ability of the hull. We have six J's in various stages of completion between here and Richmond, and I would suppose that we will probably have some sort of an event for them next year, maybe a Divisional, but only if we can hire a bull gang of ex-Mr. America's to help lift the monsters in and out of the water!!!!

As of this writing, I have heard nothing concrete from the Dumas folks about their plan to put out a fiberglass STAR 45. The man in charge of the STAR 45 Class for AMYA is the 1976 Class Secretary, Dave Holmes, 77 Stephen Drive, Pleasantville, New York 10570. The final decision as to how AMYA will react to changes in the boat resides with him, so talk directly to him, not me. I have heard of a couple of other folks who have voiced interest in a 'glass STAR hull from a production standpoint, but

*Continued on page 68*



Ray Borden's Jersey SEA SKIFF, 42" long. Even the waves seem to be scale size! R/C model was displayed at the 1975 WRAM show.



Another view of Borden's SEA SKIFF, showing excellent scale details. Fishing pole apparently doubles as radio antenna.



Full view of Carr's champion Star 45. Is it named after a dog? And if so, why?

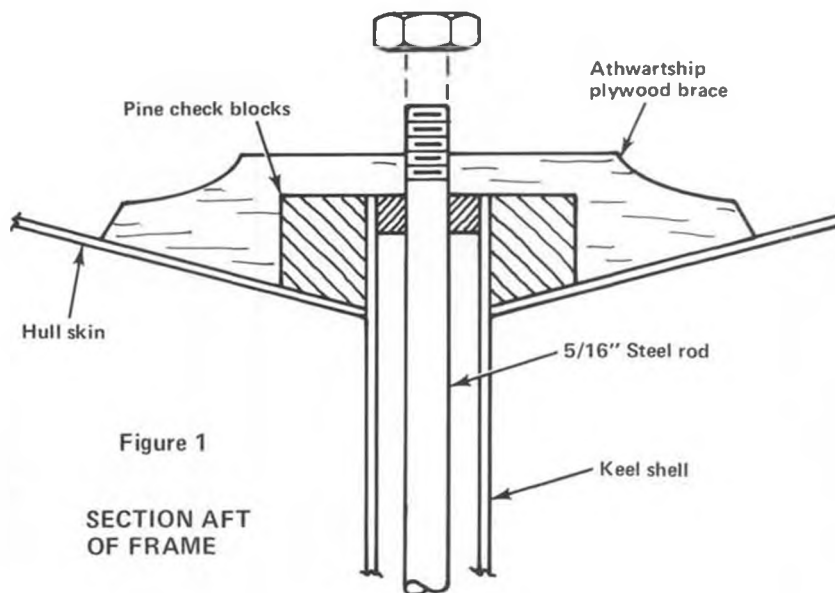


Figure 1

SECTION AFT  
OF FRAME





# FOUND

PHOTOS BY FUDO TAKAGI

By WALT MOONEY . . . Another 2-in-1 design from the King of the Peanut Gallery. Considering his ability to dig up unusual and rare aircraft, it is only natural that he should . . . er . . . find the Found . . .

● In Canada there is an aircraft company by the name of Found Brothers Aviation. Over the years they have produced some very fine utility aircraft. They are true "Bush" airplanes, and as such, have been convertible to both skis and floats.

This model is particularly suitable for a seaplane . . . capable of taking off from the water unassisted, and putting up good duration flights. The model in the photo was drawn up on a Monday, and flown in the Flightmasters seaplane contest on the following Sunday. It flies as well as any other rubber powered seaplane I have seen, but in a single week of evenings, the scale details were rather stark and the model only made it to second place.

The Model was purposely designed with a wing span of 26 inches so that Bill Northrop of MODEL BUILDER could shrink it down to Peanut size for the magazine. Because it is difficult to come up with Peanut Scale ripples, I suspect the larger model will be the more successful seaplane, so details have been added to the plans for a landplane peanut version.

With the exception of the floats, which are round topped, the only other area of the model needing countouring is the fuselage forward of the windshield. The engine cowl and nose block is carved from block balsa. Except for landing gear or float struts, there are

no struts on the Found, which makes for minimum aerodynamic drag. The real airplane has a propeller spinner, shown in the top view, but not included on my model for simplicity (Some of the scale points were lost this way, no doubt.).

There is nothing new or revolutionary in the design or building of the Found, so other than describing the structure of the various components, we won't go into a step by step "how-to-build-it" article, but will put more of the article into a "let's-try-to-fly-seaplanes" effort.

The wing is a conventional stick-and-tissue structure, using notched ribs, three spars, a leading edge, trailing edge, and tips. The real airplane has dihedral breaks about half way out the semi-span, and so does the model.

The tail is also conventional and similar to the wing, except that both the vertical and horizontal tails are built flat over the plan, without the spars, and the spars and rib pieces are added after the flat surfaces are removed from the plans. A spar on both sides tends to reduce warping tendencies. Sandpaper is used to obtain the cross section desired.

The fuselage is a simple, built-up box structure. Sheet balsa is used at the tail cone area to support the tails. Four blocks of balsa provide the nose contours. Remember to hollow out the top block to allow clearance for the propeller

hook and rubber motor. Use thin sheet balsa to fill in around the windows.

The floats have a single top keel, ten formers, and are covered with sheet balsa. A single sheet of three inch wide balsa will just cover the top of the floats. The floats have block balsa noses and sheet metal water rudders.

We used a seven inch diameter Peck Polymers plastic prop, a ballbearing thrust washer, and two of their nylon thrust buttons . . . the last items to be sure of a consistently aligned prop shaft. For the large model, drill out the thrust buttons to accommodate the shaft wire.

All parts of the model are covered with tissue and doped until they are water proof. I suggest several coats of dope all over the uncovered fuselage structure to prevent it soaking up water when it gets dunked and the nose plug comes out.

The floats are held parallel to each other by hardwood spreader bars. These penetrate the skin of the floats and butt against the keel. This must be a water-tight joint.

The landing gear wires are cemented to the fuselage structure at their upper ends, and are attached to the spreader bars by wrapping with thread and cementing. Add strut fairings and the diagonal struts.

Note that the rear motor peg is not



Walt's 26" version of the Found shortly after an easy takeoff from the waters of Mission Bay, Dan Diego.



The Found on a takeoff run. It becomes "unglued" with only a moderate amount of power.

very far behind the trailing edge of the wing. This was done because it's amazing how much rubber it takes to R.O.W. a seaplane model, and it's important to have the rubber C.G. close to the flight C.G. Otherwise you have to reballast the model every time you increase the engine power.

Now, let's try to fly Scale seaplanes. First, a seaplane ought to take off unassisted. In fact, at the Flightmaster's seaplane contests, unassisted R.O.W. is required. To do this successfully requires several things, as follows:

1. The model must float and not get water logged.
2. The model must taxi in a straight line, thus the water rudders are essential.
3. It helps if the spray from the floats doesn't hit the propeller, so add the spray dams, made from thin plastic, to the inner side of each float nose.
4. Have the C.G. in the right place. It should be just forward of the step.
5. The model must be trimmed out to fly nicely, it must climb straight, or in a very wide turn.
6. It must have enough power to take off, and it's even better if it takes off quickly.

All of the above items are important and have been observed to be important over years of observations in flying both models and full sized seaplanes.

Test glide your model until it has a reasonably straight glide, and will land in the water safely. Try low power hand launches until you have a good climb that is also fairly straight, use thrust line adjustments to obtain this. Now try some moderately wound taxi runs. Be prepared to get the model quickly if it dunks so it doesn't get a lot of water in it. If the model turns much in taxi mode, bend the water rudders to straighten it out. Bend the rudder on the float towards which the model turns... the other float will be tending to lift out of the water and its rudder won't be very effective. If the model turns inconsistently, that is, in either direction, bend both rudders inward... or replace

them with slightly larger rudders.

Now try a full power takeoff. If the model takes off, WOW that's great! And what a lot of fun!

If the model taxis real fast and looks like it might take off, but doesn't quite make it, add another loop of rubber and try again.

If the model noses up and drags the aft end of the floats in the water, the C.G. is probably too far aft relative to the step. Ballast the nose to move the C.G. forward and add up elevator to maintain your flight trim.

If the model taxis at a high speed with a very flat attitude, with the aft end of the floats out of the water, you have the opposite problem and should use the opposite cure. It is not unlikely that the model will do this very long, because it has lost the stabilizing effect of the water rudders, and it will also tend to dig in the nose of the floats and tip over.

In fact, if you have too little power

to take off, or even if there is just barely enough power to take off, the chances are the model will tip over most of the time. This is because of the non-scale water. It has waves that are too big and surface tension that is too strong... not much can be done about that... except more power to get off faster and miss that rogue wave.

The power required to take off will vary depending on where you fly. For instance, the model in the photos required 10 strands of the brownish Sig contest rubber to take off at Lake Elsinore (altitude 1250 feet) consistently. Whereas, it jumps off every time at sea level with eight strands.

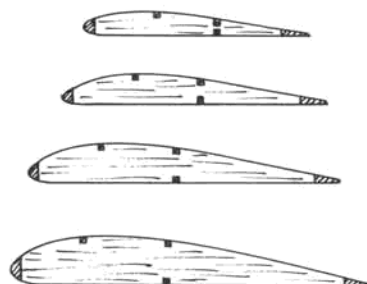
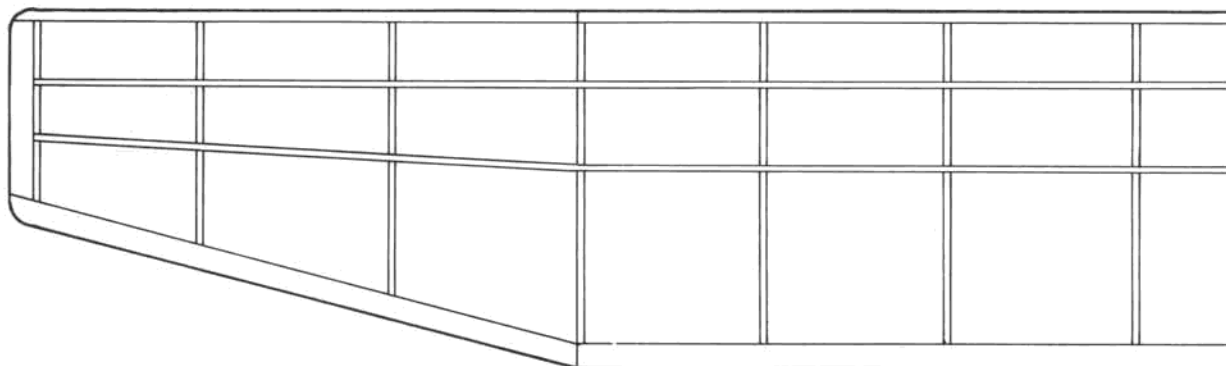
It will actually get off at Elsinore on eight strands, but not consistently. The taxi runs are about twenty five feet long and all the little variations in the surface of the water tend to dunk the model about 50% of the time. With the bigger motor, at least 95% of the takeoff

*Continued on page 85*



Shades of the old Scientific "Red Zephyr!" The flat center section with tip dihedral seems almost too good to be true... er... scale!

THE WING STRUCTURE HAS LEADING EDGE, TRAILING EDGE, THREE SPAR



WING RIBS



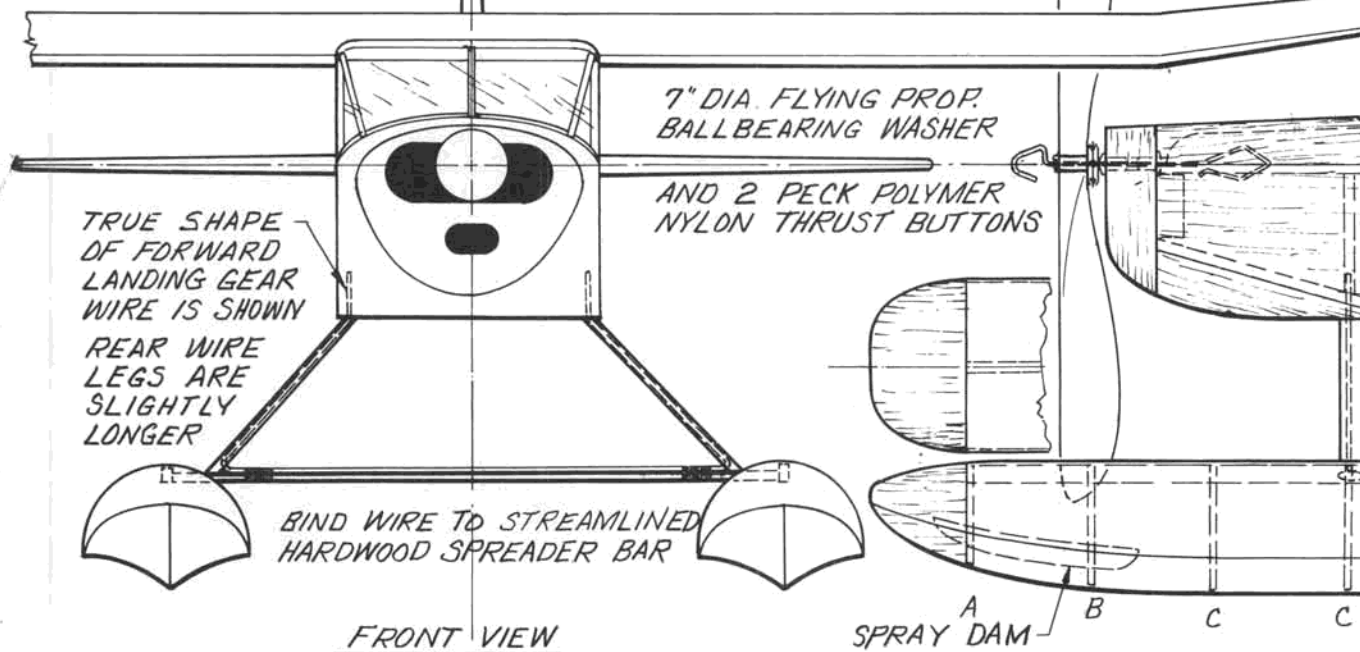
TYPICAL TAIL RIB

WING

C  
FLOAT FORMER  
WINDSHIELD AND  
THIN TRANSPARE

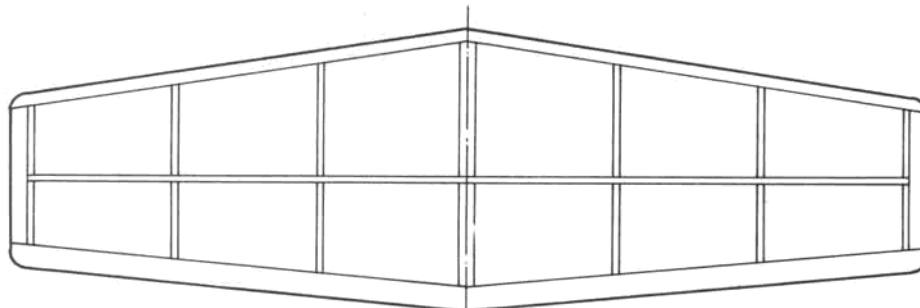
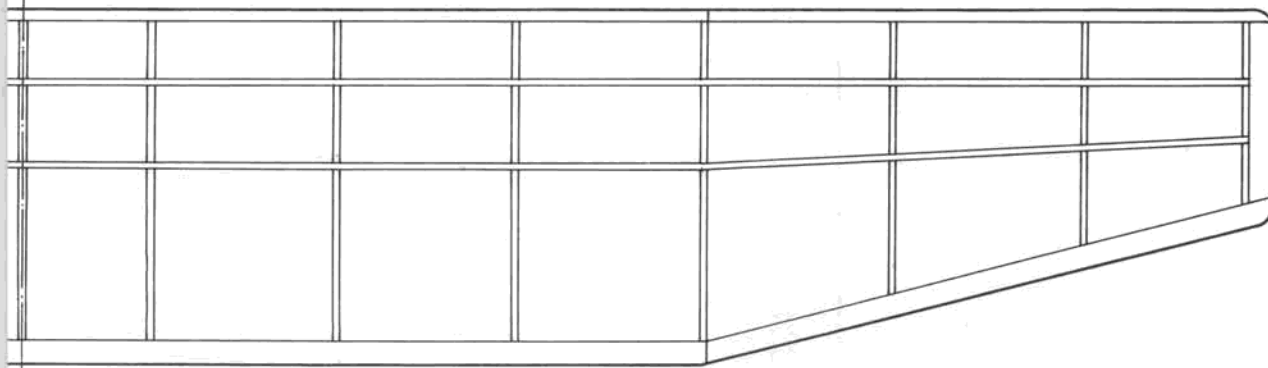
NOTES:

1. EXCEPT WHERE OTHERWISE INDICATED ALL PARTS ARE Balsa
2. FORWARD OF THE CABIN THE NOSE CONTOURS ARE CREATED FROM CARVED Balsa BLOCKS
3. FLOATS ARE COVERED WITH SHEET Balsa - USE A CARVED BLOCK FOR THE FLOAT NOSE
4. POWER WITH 4 OR 5 LOOPS OF 1/8 TH FLAT RUBBER
5. FLIGHT CENTER OF GRAVITY INDICATED BY





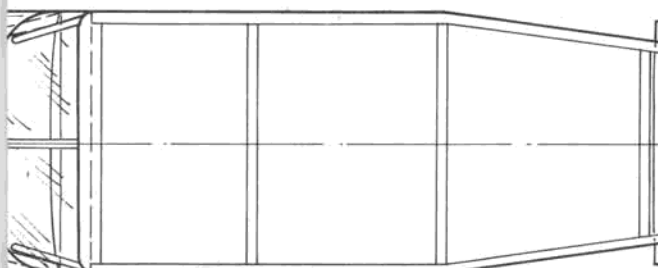
FIFTEEN RIBS, AND TWO TIP PIECES — SEE FRONT VIEW FOR DIHEDRAL



HORIZONTAL TAIL

FILL IN TAIL CONE WITH SHEET BALSA

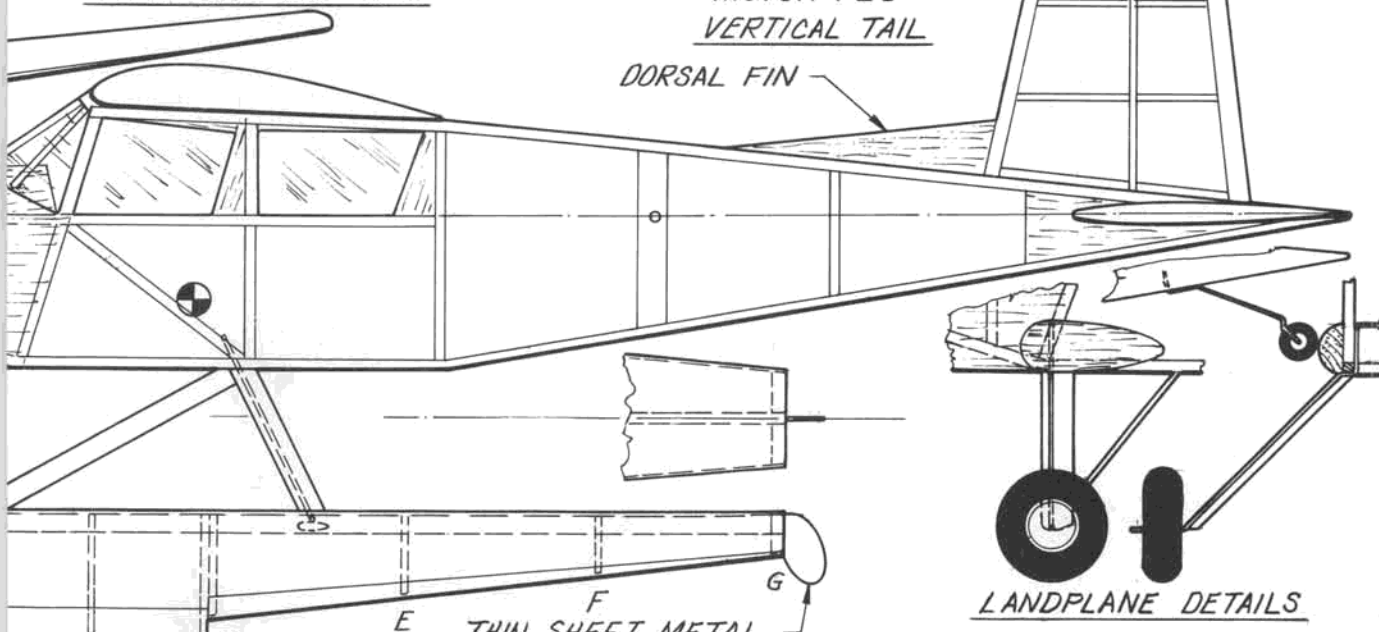
WINDOWS ARE  
NOT PLASTIC



FUSELAGE TOP VIEW

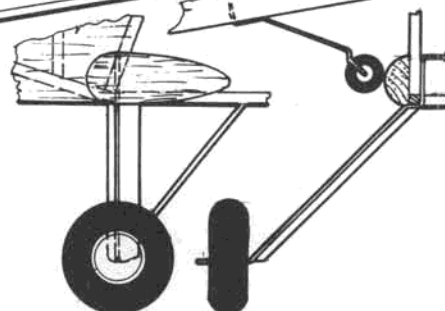
BIRCH DOWEL  
MOTOR PEG  
VERTICAL TAIL

DORSAL FIN



SIDE VIEW

THIN SHEET METAL  
RUDDERS ON EACH  
FLOAT



LANDPLANE DETAILS

FOUND FBA-2A

By Matt Mooney

Plan No.

12752

FULL SIZE PLANS AVAILABLE — SEE PAGE 88



Marty and Howard Phillips (left) loading up their model aircraft trailer. It's designed to hold a wide variety of planes. Note .020 Payload strapped down with C/L ship. Norm McCreight helps.



R/Cer Brian Dickerson looks over a Ukiah ship. What's he thinkin'? Dirty Dan tells all!

## Control line

By "DIRTY DAN" RUTHERFORD  
PHOTOS BY THE AUTHOR

• You almost missed last month's column. And, with such choice bits of prose like the "Ballad of the Folken-A," that would have been a shame.

When I was first talking to WCN about doing the C/L column, he made it clear that deadlines were to be met when submitting material. I assured him that I could meet deadlines without trouble and that this would not be a problem. Last month's column went together pretty easily and I told Bill that I might even have it to him ahead of schedule. He said that was fine, but that it might be quite a shock to have something come in early and that it might get lost if it was early. Huh?!

As it turned out, I didn't get the column in early, but I did mail it on time, so it wasn't late. Then 10 days after the deadline I got a call. They couldn't find the column! I called back the next day, expecting to get chewed-out for missing a deadline. But they found it somewhere . . . In some forgotten waste basket, no doubt.

Submit the material early, it might get lost. Submit it on time, it might get lost anyway. Submit it late, you're really a bad guy. Sigh. So it goes. (Boy! The things we let him get away with! wcn)

As long as most of the pictures used in this month's column are ones I took, I am going to give you a little background on one of them. See the guy kneeling and holding a Combat plane? That is Brian Dickerson, one of the more active R/C fliers here in the N.W. Brian flies most all manner of Sport R/C planes and also does some Half-A, Quarter Midget, and Formula 1 Pylon

racing. Brian can hold his own with most anybody when it comes to flying R/C. So he is good in R/C, what does that have to do with C/L? Good question. Keep reading and you will find the answer.

Brian occasionally stops by the C/L area to B.S. and listen to honkin' engines ("Golly shucks, how do you guys make your engines run so good?"). On the day that this picture was taken, Gary Stevens and I were out testing new Combat planes. Things were going well and Gary put up some good flights after Brian arrived. We were packing up to go and I noticed Brian holding one of Gary's "Tyrantulas" and giving it a good hard look. I couldn't resist

and took the picture. The obvious, an R/Cer holding a Combat plane, is not the important part of the picture. The important part is something not visible, and that is what thoughts are going through Brian's mind as he looks over Gary's plane . . .

"Gad, these C/L guys have really got their act together. Their engines run like Jack the Bear, they never have trouble getting them started . . . even without electric starters, and their needle settings always seem to be right on. And this plane! Wow, how can they build planes so light and still have them stand the stresses they put on them?"

"Wish I had a straight edge. I don't ever recall seeing a wing as straight as



Dan's flying partner, Gary Stevens, holding up one of his "Tyrantulas," a Phil Granderson design. It may be kitted soon.



"Deck hand" Howard Phillips removes son Marty's Profile Carrier after another win.

this one. Kind of looks funny not having any warps like all of the planes in the R/C area."

"I should drop R/C and get into some serious C/L flying. And I would if I thought I could handle one of these planes, but they go so fast and turn so tight I'm sure I would crash. My reactions are geared to semi-responsive R/C planes. These C/L planes move when you do. Must be a neat feeling to have your plane instantly respond to every move of your hand.

"Yep, I really should step up to C/L flying but I don't think I'm good enough. Better stick with something I am pretty good at already. Guess I'll wander on over to the R/C area to see who is boring who with what... all the spectators are over there now anyway. Funny how the crowds move to the R/C area as soon as the C/L guys pack up... And move right back when these guys start flying Combat."

Hullo, Brian ol' Buddy. Told ya' I was going to do a little write-up on you for MB. Little did you know what form it would take! You are now the latest to know why most people call me Dirty Dan.

\* \* \*

Last month I told you about Midwest's new .049 Combat plane, the "Li'l Snip." Rich "von" Lopez informs me that Midwest is also going to kit his design, the Class A "Firefly," and that the kits will be released about one month after the Li'l Snip. The Class A Firefly is designed for .15's and .19's and should be competitive in both WAM "A" Combat with a .19 for power, and in FAI Combat with a .15 up front.

Rich also sent along names of the winners of the WAM perpetual Combat Championship trophies. In WAM, they keep track of the winners of each contest and at the end of the season, total up the points to determine the Combat Champ for each division. These trophies are awarded at the end-of-the-season WAM Parade of Champions Dinner. Here are the 1975 winners: Top club was the San Francisco Flying Tigers.



Rod Lammers and his ST X-15 powered Goodyear. Rod's top Senior for this event in N.W.

In 1/2A Combat, it was Rich "von" Lopez in first, followed by Edmond L. Bridant, Norm McFadden, and Andy Prior. Tops in A Combat was Edmond L. Bridant, with Rich "von" Lopez in second, and Jeff Skalisky and Drew Lance III in third and fourth, respectively. BC Slow Combat Champ is Mike Spindler, followed by Edmond L. Bridant, Jeff Lung, and Jeff Skalisky. BC Fast Combat was won by Paul Klahn, with Edmond L. Bridant second, Drew Lance III third, and Rich "von" Lopez in fourth.

In Top 15 Overall, Edmond L. Bridant, Rich "von" Lopez, Drew Lance III, and Mike Spindler head the list.

Notice that "Fast" Eddie Bridant placed either first or second in 1/2A, A, BC Slow and BC Fast. He must be some kind of mean Combat flier to place so high in four different categories of Combat. To keep you from thinking



Clarence Haught, a busy N.W. modeler, with his stunt ship. Lookit all them ribs, man!

that the competition is easy in WAM Combat, making it easy for "Fast" Eddie to dominate, here are the total number of fliers that accumulated points in each category: In 1/2A, 18 people received points. In A there were 21, in BC Slow, 36, and in BC Fast, 49. Lots of fliers means stiff competition. I'll bet Bridant worked hard for all those trophies.

The 1976 Control Line World Championships will be held in Holland next year, and we have a strong team to represent the U.S. in Stunt. Gene Schaffer, after a bunch of second place finishes, (second in '71, '73 and '74 NATS, second in '73 FAI tryouts) put it all together and is the No. 1 man on this year's FAI Stunt Team. Backing Gene

*Continued on page 70*



Dave Corey and Patty DeLaney preparing to pit Ken Ferris' Goodyear. She also flies Goodyear, Slow Rat, and Slow Combat. Dist. XI V.P. Homer Smith, in back, helped with timing of heats.





"The view is great, Ted, but how the hell do we get out of here!?" The author's newest OPS powered car assumes a precarious pose.

## TETHERED RACERS!

By TED MACIAG  
PHOTOS BY AUTHOR

Includes results of the 1975 A.M.R.C.A. Nationals

• The 33rd A.M.R.C.A. Nationals was held at the Whittier Narrows race track in August.

Thirty-Third? . . . Dang right, sonny, we've been around a long time. Model race car progress paralleled and often led the airplane branches of modeling in the late thirties and forties. The hottest engines (McCoy, Dooling, and Hassad) were designed by car enthusiasts. With cars regaining their place in the modeling world you can look forward to them leading racing engine development in the future. As I was saying, the Nationals were held in California, and won by Garold Frymire. He pulled out a win the last run of the meet, after helping everyone else running Frypan cars to go faster than ever before, and rebuilding his own cars each night after many pro-

blems with them during the day!

There were a lot of new faces at the race this year. Among them, Ray Yates, who is a dried-out R/C boat man, and Greg Parsons, who was a motorcycle fanatic before he was bitten by the car bug. Roger Phillips came from New York to run his Arrow with electronic ignition. Capacitor discharge ignition systems are the way of the future for speed events and will add considerable power to the ignition engines in the old timer events. Mike LePurge was running cars before WW II and he was out running at the '75 Nationals with the same cars! See, I told you they never wear out! This includes the cars *and* the people.

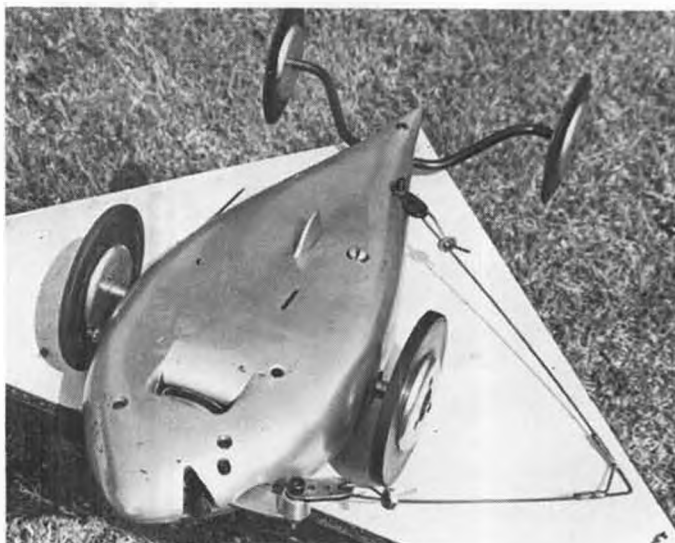
A new event was tried out this year, to give the people with cars that were not competitive in their regular class.

The entrant would post a time and then try to come as close to the posted speed as possible, without going over.

I took so much time building my OPS car that I wasn't able to complete the 2.5cc car that I hoped would give the smaller European cars a run for their money. The car will use an H.G.K. 15. The H.G.K. is ideal for a car or boat, since the front and back plate are reversible, allowing the exhaust to come out the same end of the engine as the crankshaft. Preliminary runs on a propeller show it to be rather touchy, but very hot. More on this when I get it in a car and go after the European Rossi's and homebuilts.

### SPUR CARS

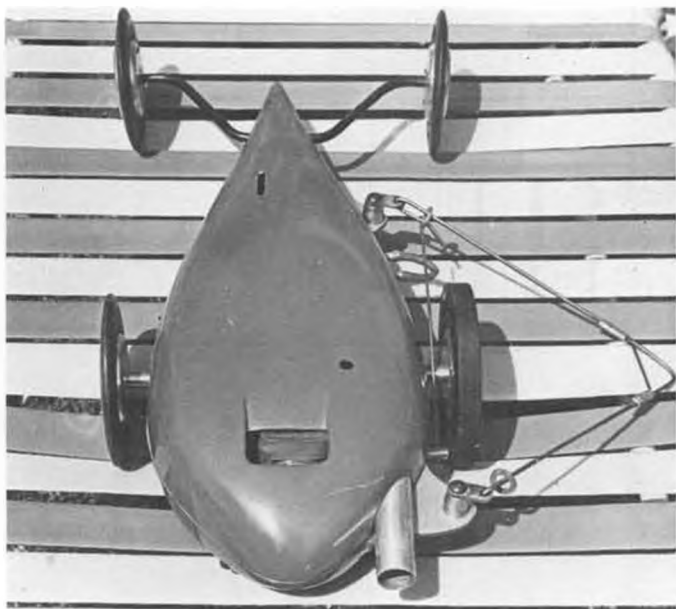
The most unusual of the tethered race cars is the "spur gear" car. More



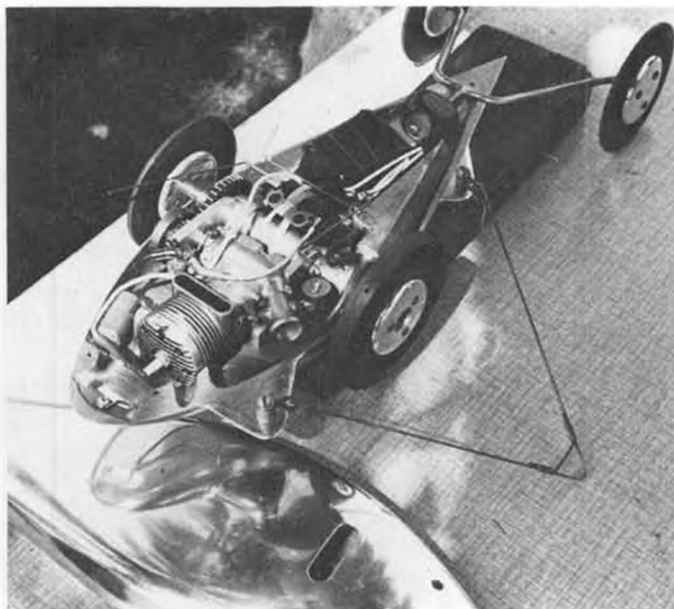
A Borden spur car, as described in the text. Looks like a fish that got tired of swimming.



Mike LePurge, left, looks over the spur car he designed 30 years ago. And that's the real Dick McCoy on the right!



A McCoy spur car.



Interior details of a Borden spur car.

spectators are interested in these fish-like cars than any of the others. Using spur gears allows the engine to be laid down for a more streamlined shape. The tear-drop shape was developed as the most efficient design. The components are crowded in the body shells that are usually made of sand-cast aluminum. In the traditional layout, the cars are front wheel drive and bridled so that when they are running, the outside wheels are lifted off the ground and the car runs on the two inside wheels. Notice that there is one large drive wheel and the others are streamlined. Often, with a good running spur car, the rear end of the car is also in the air, so the car is going around on one wheel! To complete this strange picture, the car appears to be running backwards, or blunt end forward, rather than pointed end forward, as they look like they should.

The spur car was designed in the forties as the ultimate shape for speed.

The first car to reach 100 mph was the Matthews spur car. Following the war, the spur car and engine designed by Dick McCoy held the records at around 112 mph. Many other designers tried the flattened fish-like layout... the most successful of these was the Borden. This car was made as small and streamlined as possible. The mounting lugs and cooling fins were turned off the engine to cut down the frontal area, and fit in the small pans, crowded in among the ignition system and fuel tank. The engine was mounted by the front and back plates. The fastest that a spur car ever went in an official meet was 147, by a Borden car.

Sooooo, if the spur car did so well why didn't it continue to out-perform the more conventional cars? The problem is in the drive system. Though the spur gears are more efficient in transmitting

the power of the engines than bevel gears, in the usual spur gear arrangement the gear is bolted directly on the crankshaft of the engine, when the car is running, the side loads of the spur gears are transmitted to the engine, and distorts the case which, slows the engine down. With the modern, high RPM, low torque engines, the slightest drag is responsible for a large loss in speed. Clamping the front plate of the engine directly behind the gear helps, but in the early fifties, when the bevel gear cars were running 150 mph, the spur gear cars were no longer the fastest cars on the track.

Now the gears are grinding... not in the car, but in my head. What would happen if you used the efficient hex

*Continued on page 74*



George Bryant (left) and the fastest man, Garold Frymire.



Ready-line of piped cars.



The author, sweeping the track... oops, no, he's about to push off his .15 powered car.



Winner in Scale Gas at the Flightmasters 1975 Annual was this 1" scale BE-2E, built and flown by our own Fernando Ramos. Power is a Merlin diesel, turning an 8/4 prop. Look at that wing gap! Can't say they weren't working at 100% efficiency.

## FREE FLIGHT SCALE

By FERNANDO RAMOS

● The 26th Flightmaster' Annual, which typifies the best in flying scale, was another enjoyable and successful contest. As per usual, the judging takes place on Saturday evening while the flying is on Sunday. For the first time in 26 years, both the judging and flying sites have been changed from the Los Angeles area to Orange county. This year the new judging site was Trident Jr. High School, in Anaheim. (Yes, I know, "the home of Mickey Mouse"!)

The advantage to this change is that the facility at the school is much larger than the one previously used, and there are plenty of motel accommodations for those contestants who are from out-of-state or from San Diego county. The distance for the latter has also been shortened considerably.

The flying site was Mile Square Park,

which has to be one of the finest places anywhere to fly scale models. R/C, U/C and F/F scale can be flown, all at one time, without the least bit of interference with each other. On top of that, there is a tall grassy area that is ideal for test flying. Add to this beautiful weather, and you have the ingredients for an exceptional contest.

I know that many of you prefer "how-to" articles rather than reading about contests, so I'll let the photos speak for themselves. However, I would like to point out a couple of observations that I made during the contest that may interest you. The number of entries this year was down from previous years, and many thought that the change in location was partly responsible for this... I think not. The change is going to do the club some good. There were many

new faces and new models, which in part, is the aim of any model organization.

Of the 65 models entered, the majority of them were rubber powered, with Peanut leading the pack. There is no question that rubber scale is fast becoming the favorite event for F/F scale modelers... not just here on the West Coast, but anywhere that F/F scale is popular. Why? I feel that there is something special about seeing a rubber powered scale model take-off, and fly overhead with the sun shining through the tissue, exposing the delicate framework... all this with the absence of noise. Cost is negligible compared to most forms of modeling, particularly R/C, and most school yards can be used for flying. Yet, to the uninitiated, building and flying rubber scale models, Peanuts



Walt Mooney releases his electric powered Skyraider. Difficulty of adjusting thrust line makes trimming a bit tricky.



Larry Moss' P & W Longster makes beautiful takeoffs under electric power.





Bill Stroman's electric DH 10 in flight.



Joe Tschirgi's .020 powered Ponnier, 7/8" scale.

included, is not easy.

There are a few contestants whose models fly exceptionally well, with duration, but do not place. Often, these modelers let their feelings be known, but they forget that scale models must also score well on the static judge's sheet. This is what makes rubber scale so difficult and challenging. It is not easy to build an accurate scale model with a great deal of detail, yet light enough that it can have good endurance. Workmanship also plays an important part in the total points of the scale presentation. Too often, a modeler hangs everything but the kitchen sink onto his model, thinking that the judges will be impressed. Maybe so, but it is the way that everything is attached and finished on a scale model that reflects the workmanship. It is better to see a rather plain, but cleanly constructed model, than one that has every detail, but poorly done.

An excellent lesson can be learned by these sullen contestants, if they can be given an opportunity to static judge. This way they will be able to compare their workmanship with those of others. Maybe if more scale modelers were given this chance, there would be less groaning and a better understanding.

Electric scale is drawing more and more interest. I keep hearing it's due to the fact that there is no mess to clean-up and no noise to speak of. One thing is certain, electrics do make beautiful re-



Supermarine "Walrus", .15 powered by Bob Haight, of the Las Vegas "Vultures."

alistic take-offs regardless of how the rest of the flight may turn out. There were a couple of unusual electric powered models at the annual. One was a Douglas Skyraider, entered by Walt Mooney, which also took-off most realistically, but had difficulty in the flight pattern. The other was a WW I DH-10 twin-engined bomber, built by Bill Stroman. Bill had a few problems during the contest and was unable to qualify, however, at a test flying session a week earlier, I did see the DH take-off and fly for a bit. Once the bugs get ironed out, it is going to be something to see. The sound from a twin powered electric is rather interesting, to say the least.

There seems to be a divergence of opinion regarding the type of design to use for electric power. Some like the large, "lots of drag," slow flying models, while many prefer the very clean, low drag types. Personally, I haven't seen too many scale electrics perform as well as Mattel's Super Star, for flight or duration. I'm sure that the added weight of most scale models hinders performance somewhat.

Now for a few comments about my favorite event . . . F/F gas scale! I've said it before, and I'll say it again. F/F gas scale, in my opinion, has to be the toughest of all modeling events. Many

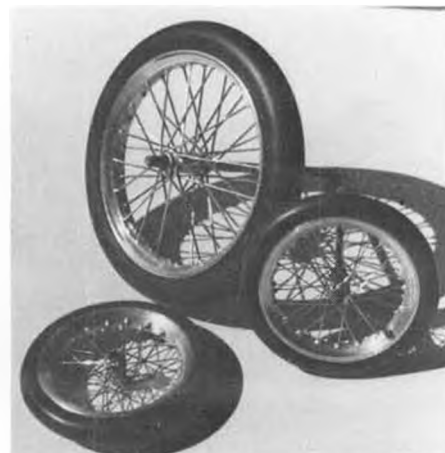
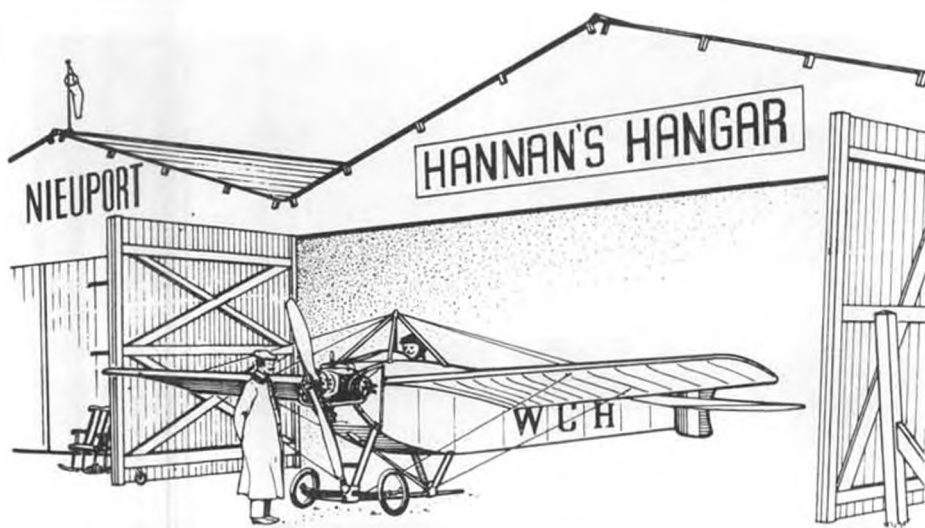
*Continued on page 85*



"Brick" Brickner's .049 Rearwin Sportster, nicely detailed.



No title necessary.



Latest wire wheels from Fulton Hungerford are stainless steel. To be in a variety of sizes.

... being a collection of aeronautical crankcase drainings ...

#### A LITTLE FRENCH LESSON

● By courtesy of Georges Chaulet, we present a few abstracts from a report on a French Peanut Scale meet, which was reported some time ago in the magazine *LE REDUIT D'AVION*, which is the oldest of all aviation magazines in France: "If there is now more interest in scale contest, this is due primarily to the R/C and C/L modelers, for the F/F scale contests are rather rare, and the last one was organized by MRA in 1968.

"This contest was rather a test, because it was chosen the new but very interesting category of Peanuts. Scale models of 1 foot span. The choice was done with the help of Emmanuel Fillon, a passionate modeler filled with experience (let me add that Fillon is the ONLY FRENCH MODELER to have won the Wakefield Cup, around 1938 (1937, to be exact. wcn). Organizers waxed the inscriptions of contestants with some fear, because the enterings were somewhat impeded by the postage strike. Several scale models came from the USA, but unhappily only the RE-NARD R 17 from Walt Mooney (plane and glider pilot, great Peanut eater) came in due time. The other planes, from Warner, Hannan, Stroman etc. were stopped somewhere. But at last

there were some 45 models for the contest.

"It was a windless day, ideal for that kind of model. The most remarked model was Walt Mooney's, with his radial engine, detailed (Hungerford) wheels and "without dihedral" wing and symmetrical wing section—but that flies!—proxy flown by Jacques Laruelle.

"We had the feeling that everyone was happy with this good mood day. Contratulations to the jury members and Mrs. Pouliquen who worked at the results board.

"Then a Martini was served, with plenty of peanuts of course, and medals and cups were given, with kits and souvenir ashtrays. The MACNSE will organise a new contest in spring, with a new category, a scale over one foot. Let's go to our building boards ..."

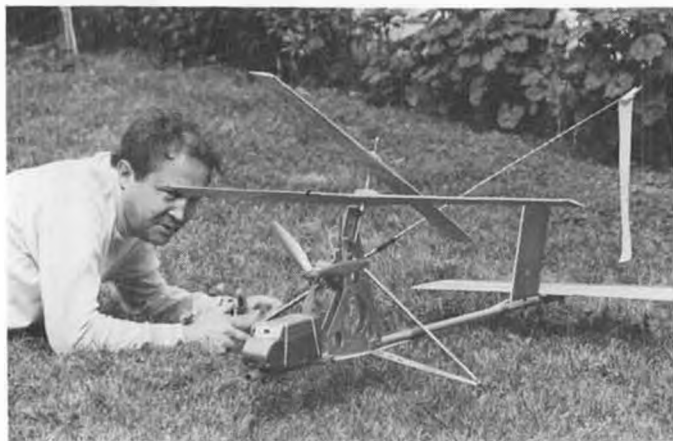
#### LATEST "GOOSE STEP"

It seems our farewell to the "Spruce Goose" poem a couple of issues ago was premature. According to a UPI release, billionaire Howard Hughes still has a fondness for his huge flying boat, and

*Continued on page 63*



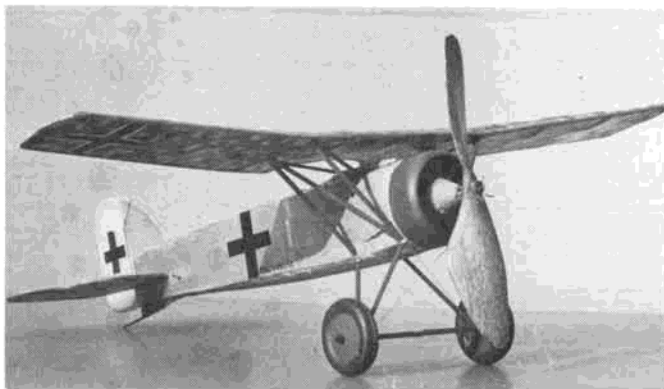
Travel Air "Mystery Ship" built from a kit by Chris Fulmer, wife of Mike Fulmer, professional model builder. This was her first attempt at model building!



R/C contra-rotating rotor autogyro by Georges Chaulet, Antony, France. It's one of a series ranging from small rubber powered jobs.



Bristol Brownie rubber powered flying scale model by John Blagg, England. Photo by Alan Callaghan.



Original carved balsa prop was good but was replaced with plastic for added nose weight.



Camouflage on upper surfaces shows well here. Author tells how he did it, in the text. Note bond paper decking and side cowl fairings.

PHOTOS BY THE AUTHOR

# Peanut ROLAND D-VIII

By ED HEYN . . . Before building this Peanut, make yourself a sign that says, "No, it's not a Fokker D-VIII." Otherwise, the judges might downgrade you for the wrong tail outlines! Camouflage technique is clever.

● Picture a half-dozen daring but tense pilots holding their fully wound quivering stick-and-tissue creations in sweaty hands, awaiting the launch signal. Now! Six little WW-I Peanuts grab for altitude with near misses and an occasional mid-air collision. Last man down is the winner and gets into the next round. Exciting? You bet! That's WW-I Peanut Combat at the Glastonbury Modelers (Conn.) meets. In looking for a model other than the usual Fokkers, SE-5's, Nieuports, etc., I came across this little jewel. The rarer little known aircraft types have always initiated massive doses of rubber lube surging through my aging veins and this little monoplane fighter is no exception. As it turns out it is also doing quite well in regular Peanut events.

The Roland D-XVI was the next to last fighter type to be developed by L.F.G. prior to the 1918 Armistice. The L.F.G. Company (Luftfahrzeug Gesellschaft) was established in 1912 to construct non-rigid Parseval airships, but upon the outbreak of war in 1914, turned to the development of military aircraft. L.F.G., in order to avoid confusion with the L.V.G. Company, produced their aircraft under the trade-name "Roland." Although best known for the types which achieved substantial production runs, such as the D-I to D-III, C-II and D-VIb, many other experimental types of monoplane, biplane and triplane configurations were developed. How much influence the successful Fokker D-VII had upon the D-XVI is, of course, guesswork, but there is a general resemblance. I have been unable to determine how many were actually produced and apparently no factory drawings have survived. Photos and data in various books and magazines, as well as plans by Bob Holman and Gordon Codding were used to create this Peanut

version. Bob Holman has plans available in larger 3/4 inch and 1 inch scales. Two different rotary engines were used in this aircraft; the 170 hp. Goebel III and the 160 hp. Siemens-Halske SH-II. I chose the latter, as there are excellent detail drawings of this engine presented in "Scale Models by Wylam, Book III."

I must admit that this was a fun plane to build and fly, even though I am admittedly one of "them-there biplane nuts." The fuselage is the usual square box of 1/16th, sq. balsa. Note that there are no top or bottom stringers, the shape being maintained by the curved bond paper decking. Make small square cutouts in the decking at the strut locations to allow the cabane struts to be glued directly to the top longerons. All struts were made of basswood strip

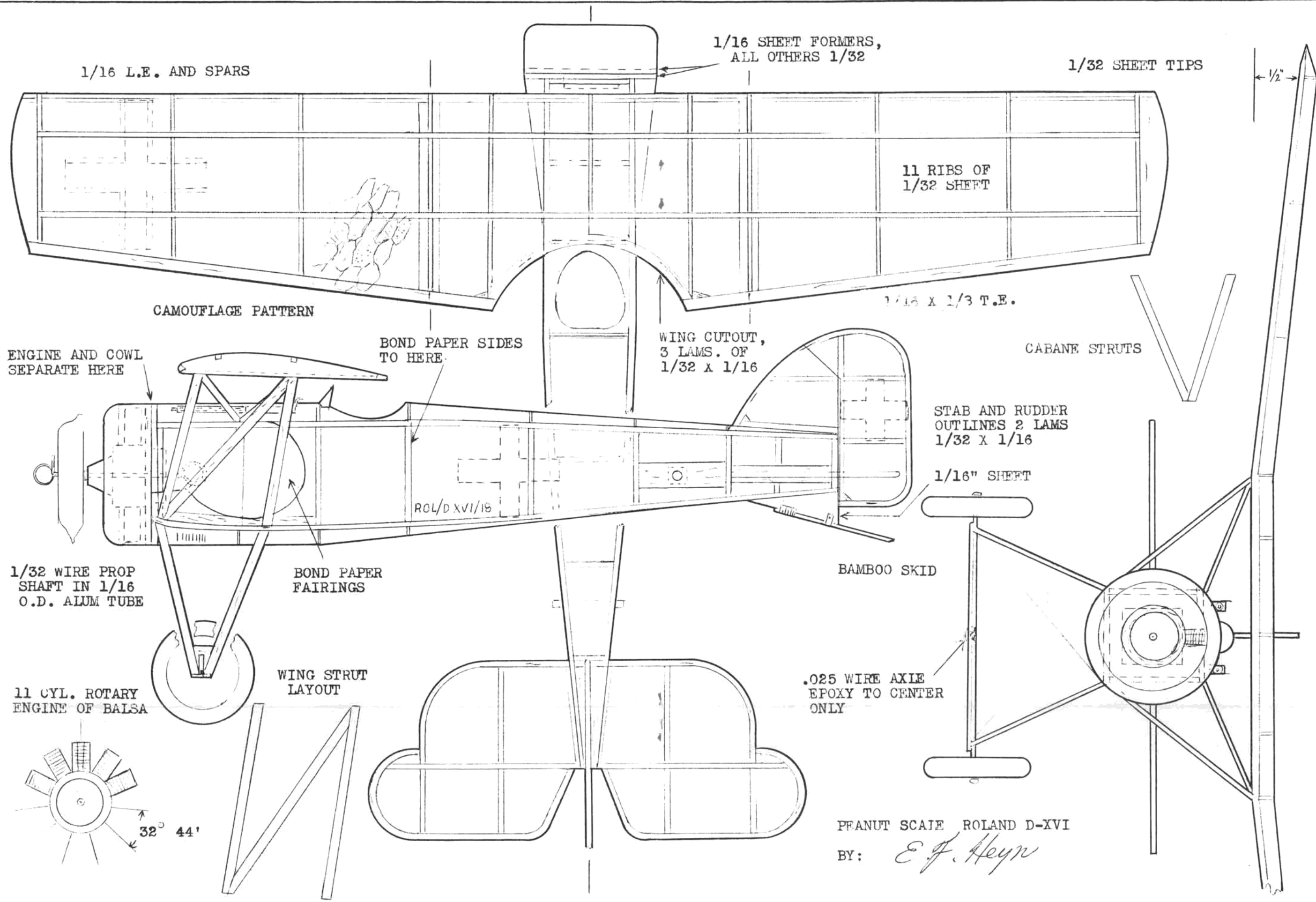
and were secured in place with 5 min. epoxy. Make left and right "N" struts and assemble the upper vee struts before installation, so there will be fewer pieces to handle. Paint with Floquil Dark Green model RR paint and set aside. Cover the rear of the fuselage with white tissue and add the paper side cowl cheeks. To simulate the clear varnished, all plywood fuselage of the prototype, I used a small piece of soft rag and rubbed the fuselage all over after shrinking, but before doping, with Glid-Tone #246 Wheat wood wipe-in stain. The nose plug/cowl support former, engine and cowl is removable and will stay with the prop for winding. With a little extra work, the engine could be made to rotate with the prop,

*Continued on page 62*



Wing and cabane strut layout shown in detail here, also wire axle springing. Wheels were heat-formed over wooden master.





PEANUT SCALE ROLAND D-XVI  
BY: *E. F. Heyn*



John Ferrer brought this biplane to the Thunderbugs Clipper Cargo meet. Shall we call it the "Dragger", John.



Joan Calhoun, Palos Verdes Peninsula, Cal. launching her 226 Satellite at the 1975 Southwestern Regionals. Photo by Sheri Lee Calhoun.

# FREE FLIGHT

By BOB STALICK

• It must be time for indoor building and flying. One of these months, I think I'll really let loose and extol the virtues of indoor scale, especially Peanut, and incur the wrath of Walt Mooney and Bill Hannan! Not that indoor duration isn't fun, but indoor scale is even more so. When you get down to it, fun is what you do . . . or else you shouldn't do it, right? After all, no one is forcing anyone to build and fly models.

The Willamette Modelers Club, of which I am a member, has for several years now, held an event in conjunction with its series of indoor contests, called the Earle Moorhead event (named after our esteemed club President). The event is for any unusual or strange flying contraption. The only condition is that it must be able to fly for at least 5 seconds. The ships (if that is the word) are judged by good old Earle himself, on a weird-

ness factor that takes into account all of the unusual un-airplane-like features of the model. Ships are then rated from one to however many there are entered, and provided they make the 5 second flight, the winners are in the order of their weirdness factor. Strange as it may seem, there tend to be as many entries in the Earle Moorhead event as any of the others . . . and some models that you wouldn't think could ever fly, don't . . . but some, surprisingly, do. It's all in fun anyhow, because the big prize winner last year walked off with his very own tube of Pactra Cement!

Back to the point . . . the whole notion of model airplane building and flying is fun. Some get their jollies out of building strange flying beasts, some from meticulous research and scale construction, some from climbing higher and staying up longer than anyone else,

some from winning contests, and others from just being where free flight is. And where it is is right here in MODEL BUILDER.

## MYSTERY MODEL FOR DECEMBER

The last time we featured a flying wing type as a Mystery Model, it took several months for the correct answer to hit the MODEL BUILDER offices. Here's another. This one is also an early free flight type, for 1/2A engines, and is less a competition design than a sport-type. But it supposedly climbs like a rocket, and with pendulum control on the "elevators" it was supposed to be very stable. Bill Northrop gives away a nice prize to the person who first identifies this ship. (*Hey guys, we go by the postmark date, not when it gets here, so don't waste money on special delivery. wcn*)



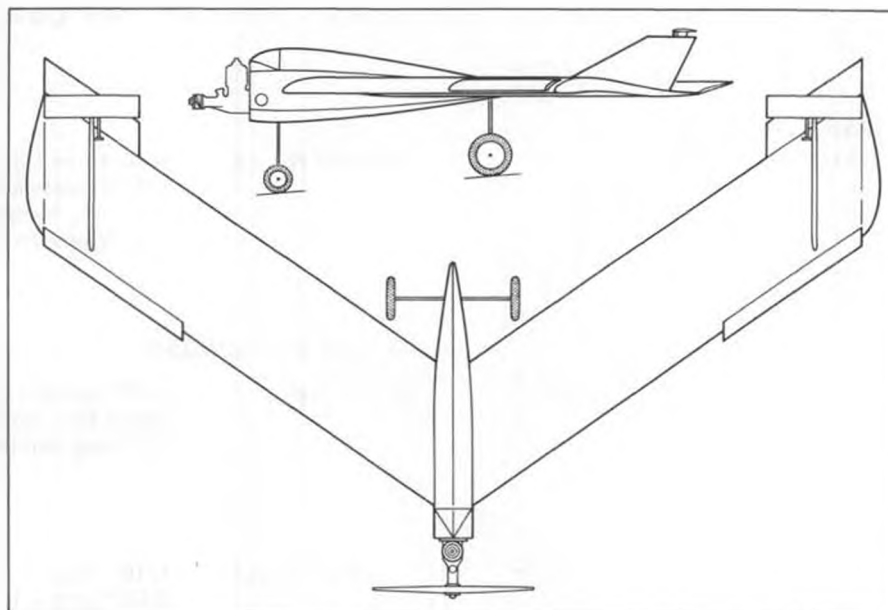
Another biplane for the T-Bugs Clipper Cargo meet at Mile Square Park, this one by Ed Eliot. Some kind of configuration!



Dick Petersen releases Jim Scarborough's Clipper Cargo ship for an attempted proxy flight. Joe Norcross was winner of the event.



Lee Campbell, Michigan, ready to launch Beginner's Luck, unlimited rubber ship designed by England's Tom Stoker.



### THE TWANGER TOW HOOK

Last month, I ran a picture of Tom Hutchinson's Twanger tow hook. Tom had unlatched some of the mechanism from his circle tow hook and installed the Danish ring system for his circle-tow glider. After some study and a great deal of talking, John Lenderman and I sat down with a sketch pad and pencil and worked out our ideas for a simple circle-tow system using the twang hook. The "three-view" of the month details how to build one yourself. All that is needed is some very basic hand tools and a soldering gun.

1. The swinging arm is simply hack-sawed and filed from a piece of 1/8 thick aluminum sheet. The appropriate holes are drilled. This assembly is installed in the fuselage of the glider... one inch in front of the center of gravity. The arm should be freely moving, but firmly anchored into the fuselage. A piece of lightweight monofilament line (10 lb. test or so) is attached to the arm and run through the fuselage to be attached to the left side of the rudder

horn (the directions given are for models that glide in a right turn).

2. The Auto-Rudder Plunger is identical to the one designed by John Clear, and featured in the September, 1975 issue of MODEL BUILDER Free Flight.

3. The Twang hook itself is made up of a spring of approximately 1/8 inside diameter (although this is not critical) to a length of about 5 inches (again not critical). Small diameter door closer springs are acceptable, provided they will stretch out with about a 4 pound pull and return to normal dimension. Cut the spring to size. Bend a piece of hard 1/16 music wire to the shape shown. Insert the leg of the 1/16 hook into the spring, about half-way, and solder the spring to the hook. This joint must be very well executed. Bend a loop on the bottom of the spring and run the towline through the spring, tying it off at the top and the bottom so that about a 10 inch length of line is in the spring... to limit its travel.

4. Install all parts. Run all lines to the auto-rudder and plunger setup. Fasten the fishing swivel to one of the 1/16 holes on the swinging arm. Fasten the split ring to the swivel. Adjust all set screws, etc.

5. Operation: All circle tow functions are directly controlled by the swinging arm. As the model is towed forward, the swinging arm is pulled forward, which sets the rudder in the straight position. As the towline is pulled down or back, the swinging arm moves back and the rudder moves to the circle position, with the plunger being set to allow as much rudder throw as needed. When the model is ready to be launched, the towline is tightened and the rudder straightens out bringing the model directly overhead for release.

6. Twang release: The towline is pulled down, extending the spring to its full 10 inches, and then the line is abruptly released, allowing the spring to return to its normal length, which in

### DECEMBER'S MYSTERY MODEL

### DARNED GOOD AIRFOILS — MVA 123 and Go 495

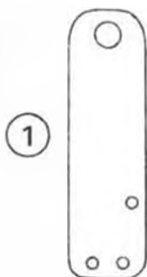
MVA 123																	
STATION	0	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	4.5	7.1	8.4		10.1	11.2	11.9	12.3	12.5	12.5	12.0	11.1	9.7	7.9	5.8		3.7
LOWER	4.5	3.7	4.1		5.1	5.9	6.3	6.7	7.1	7.1	6.7	6.1	5.5	4.8	4.2		3.5

Go 495																	
STATION	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	1.15	2.8	3.5	4.55	5.35	6.0	6.95	7.7	8.55	8.75	8.35	7.5	6.2	4.45	2.45	1.3	0
LOWER	1.15	0.35	0.15	0	0	0.1	0.45	0.85	1.65	2.35	2.8	2.95	2.75	2.15	1.2	0.65	0



PARTS NEEDED:  
(Sketched full size)

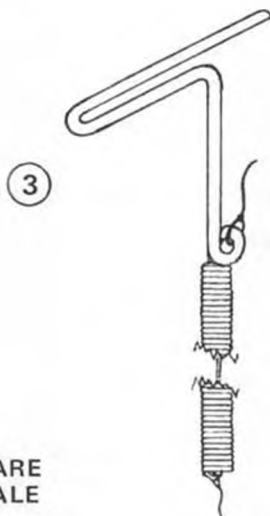


**SWINGING ARM:** Made from 1/8" aluminum stock, 1.4" long and .4" wide. 1/8" Mounting hole drilled at top. Two 1/16" swivel mounting holes drilled at bottom. 1/16" Auto rudder hole drilled on right side (edge toward rear of model).



**AUTO-RUDDER PLUNGER:**

1-1/2" Length of 2-56 threaded rod and two nuts. Spring from ball-point pen. Mounted in a 3/32" I.D. by 3/4" long aluminum tube. Solder wire to front end of rod.



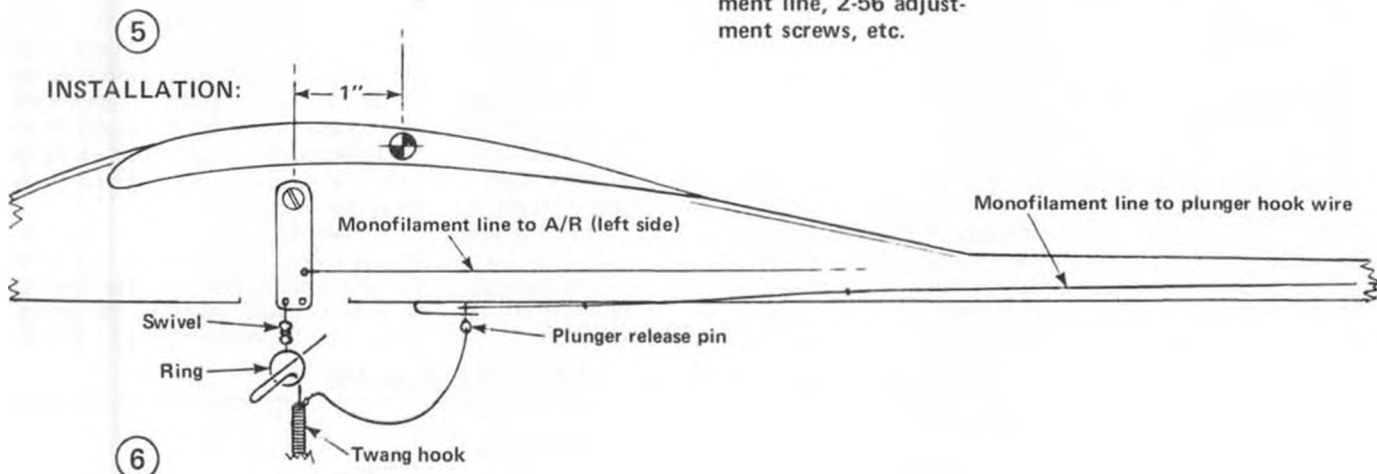
**TWANG HOOK:** 1/16" Music wire hook bent as shown and inserted about 2-1/2" into a 1/8" I.D. hardware spring. Spring is 5" long. Hook is soldered onto spring at top. Towline is run through spring and tied at top and bottom, allowing spring to extend to 10" length.

4

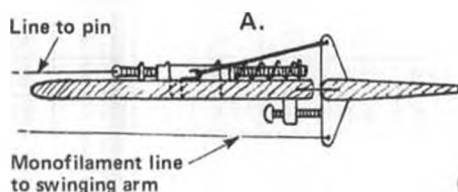
**MISCELLANEOUS PARTS:**

Fishing line swivel, 1/2" diameter split ring, turnbuckles, monofilament line, 2-56 adjustment screws, etc.

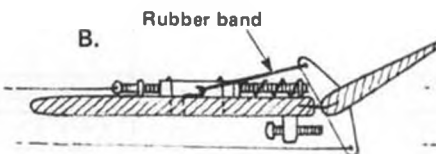
DETAILS BELOW ARE  
TO REDUCED SCALE



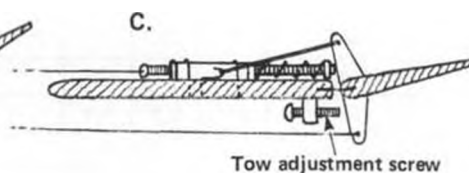
**OPERATION:**



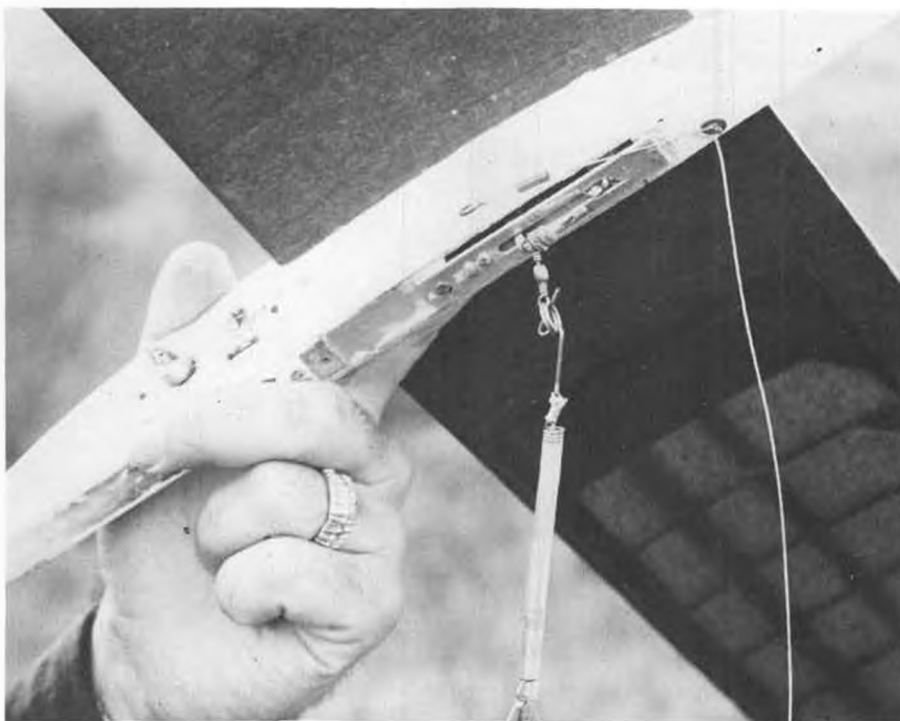
**TOW MODE:**  
Under tow, the Auto-rudder is set for straight ahead condition. The monofilament line is kept tight by line pressure on the swinging arm, which pulls it forward.



**CIRCLE MODE:**  
The swinging arm is not under line pressure by the towline, so it moves back which allows the monofilament line to slacken. The rubber band pulls the rudder to full right for circle. The Auto-rudder plunger is set to adjust the Auto-rudder travel to the circle mode.



**GLIDE MODE:**  
In the glide, the twang hook is released and the plunger line is also released when the plunger release pin disengages under the fuselage. This allows the plunger to move to its glide setting.



Tom Hutchinson's Twanger Hook, shown one more time to illustrate text explaining operation. Also see sketches at left.



Ted Stalick placed 2nd at Silents Please meet with this Reid Simpson Jetex rocket model.

turn kicks the hook off the ring. When the hook releases, the plunger release pin is pulled out, and the plunger is released to its pre-determined glide setting.

The twanger hook and the above circle-towing system once again put A/2 glider into the class of the readily available. No longer do you need a machine shop or many dollars to get competitive. You do, however, need to spend time practicing circle-tow, as it is the practice which makes the flier. You are also encouraged to read the recent series on the development of circle-towing in *Aeromodeller Magazine*, written by Elton Drew.

**DARNED GOOD AIRFOILS —**  
Go. 495 and MVA 123.

As part of the series on Airfoils which



Bob Hunter demonstrates athletic prowess required to launch an .049 Satellite!

concludes this month, I thought it would be interesting to give you two undercambered sections. The MVA 123 is one that I have used on the Auntie-Freez Coupe d'Hiver, by Dave Linstrum. This is a slow high lift section, which because of its thickness (or thinness), is ideally suited to light, low powered ships... such as the Coupe or the Jetex types. The Go. 495 is a bit thicker and a bit faster (notice the nose entry upsweep). Except for the thin trailing edge, this section might be well considered for windy weather A/2, low aspect ratio Wakefields, or Hand Launch Gliders. The only problem with the thin trailing edge is structural. One could thicken it up slightly to reduce the warp probabilities it has in its stock form.



Loren Williams and his "Stab? What's a stab?" biplane. One way to eliminate stab warps!

### AIRFOILS — PART III

Completing the series which began in October.

The Advantages of Flat Bottomed Airfoils:

Not only do the Go. 795 and Go. 796 airfoils (see October "Darned Good Airfoils") offer advantages over those with camber, judging from this test data, but they are also much easier to use. Proof of the latter characteristic is their general application in elementary models with their simple and strong construction. Additionally, such wings possess inherent torsional stiffness. There is no need to remind anyone of the trouble which cambered sections cause in this respect.

The center of pressure travel is governed by the camber of the mean line of the airfoil. If the camber is small, so is the center of pressure travel. The airfoils generally used for glider and rubber powered models have mean line cambers of approximately 6 percent, compared with 2.4 per cent for the Go. 795, and 3.7 percent for the Go. 796. This means that for a given size of tailplane, the moment arm can be safely reduced, which in turn, decreases the moment of inertia. In other words, such models will recover still faster from any displacement.

### FLIGHT TESTS

To test these theories, an A/1 wing was constructed using the Go. 795 airfoil. For a wing chord of approximately 4.4 inches, it used a 5/8 inch wide leading edge. Though not expertly finished, its performance was nevertheless up to present standards in all respects.

For years, airfoils with straight or only slightly concave bottom surfaces have been used for power models, and they have yielded excellent results both in climb and glide. The Benedek B 8452-B, designed for use in power models, is almost identical to the Go. 795. A radio controlled glider of A/2 dimensions

*Continued on page 79*



Bob White, second in Wakefield in Bulgaria, at work on his model. Winding rig is a little different from Bob's favorite station wagon tailgate model holder!

## WORLD F/F CHAMPS, BULGARIA 1975

By DON CHANCEY . . . This event is being well covered by all of the publications, but Don's point of view, as a team member, may be just a little different . . . besides, we promised equal time with the R/C report!

• I won't go through all of the details of our travel to and from the World Champs. Besides, it would be impossible to put down on paper words that would accurately describe just what we did go through.

The team and its supporters arrived at the student hotel at various times. The last to arrive were: myself, Frank Wolff, Willard Smits, and Mr. and Mrs. Jim Walters. The date was the 14th, and the contest was to begin on the 17th. It was really getting close now.

That night, Bob Hatschek showed up, aiming to do some coverage for Flying Models magazine and enjoy the contest.

Not so. We put him to work! He did his coverage, he launched all 22 Nordic flights, and helped us out on numerous problems. His previous experience was invaluable to us and the team! He would make an excellent future team manager. That is, if he isn't already on the Nordic team (which is entirely possible!).

The next night, Bill Hartill came in around 9 or 10 o'clock to do the coverage for "Scatter." Everyone was here now. The list included several wives, Dick Lyon's son, Bob, Bob Piserchio, and of course, "Sarah" was there with Jon Davis.

The following two and a half days

were really filled! We practiced from around seven-thirty in the morning to as late as six or seven at night. For the most part, the weather was beautiful. Everyone worked especially hard. I don't know what the other two teams did for practice, but one thing that seemed helpful was an idea of Jim Walters'. The three of us would be on the line at once. We stayed a safe distance apart and towed around for awhile. Then one of us would yell "OK, four minutes." This meant that we had four minutes to seriously look for, and successfully release into good air. This is an exercise that is good practice for anyone.



Canada's Andy DeMello, 52nd.



Urs Schaller, Switzerland, placed 6th in power.





W. Isaenko, 15th, member of winning Russian Nordic team.



Dave Rounsaville was 39th in power.



Echjenkov was 1973 Champion, from Russia.



Pácel Dvorak was 1971 Champion, from Czechoslovakia. Placed 48th this year.

The Plovdiv town square was the original site for the official opening of the "1975 World Free Flight Championships," but the Bulgarians decided that just wasn't quite good enough. For the last couple of days, we had noticed that the town had taken on some sort of change. There was just an air about things. First there were a few scattered posters around the town square. Then more posters and signs with FAI, and a symbol designating where the proper routes were to the flying field and to the cafeteria. The next day, as we headed for the field to practice, we saw large colorful posters (like 3x5 feet or so) of airplanes and the official logo for this year's contest. On the way back we noticed there were huge banners of all colors on both sides of the streets. These hung from almost every light pole on the main routes. Even the student hotel had a new face. First there was a huge banner right in the front of the building, hanging from the balcony of the 7th floor. The banner was white with a rainbow colored arc with two-foot letters,

"FAI," underneath it. About 2 floors down was a red banner with white lettering proclaiming some sort of Bulgarian welcome (I couldn't read it).

Oh yes, back to the opening ceremony. We all boarded the red and white busses that were used to take those without transportation to and from the field, Chow Hall, etc. Now they were taking us to some unknown destination for what we thought would be a normal, but enjoyable, opening ceremony. Boy were we surprised! We pulled up in this beautiful athletic facility and stopped in back of the huge soccer stadium. The teams were asked to line up 3-abreast behind the flag and sign of their country.

As we waited to enter the stadium, the show started. First a Russian biplane made a low pass over the stadium, towing behind it two of the most beautiful sailplanes I've ever seen. Next, two piston aircraft did a series of slow graceful loops, rolls, and turns. It was about this time that someone noticed the plane now circling overhead at several thousand feet. We all kind of looked at each other and everyone *must* have been thinking "surely not . . . skydivers!!!" Well sure enough, on the next pass, out came the test streamer. Then another, and another. The drift was almost zero! On the next pass we saw them jump. A total of 15 or so skydivers jumped in all. As they came down we were treated to a fantastic display of sky diving. The divers had multi-colored flares attached to their feet, which they swirled round and round while each just sort of "sat" above the stadium awaiting his turn to descend on down into the center of the soccer field. All the people cheered.

Now, it was our turn. We didn't really know what to expect. We then marched team-by-team, out onto and then around the outside of the field. There sure were a lot of people (Plovdiv has the championship soccer team and tonight was an important game. It seems the contest people had sort of borrowed the crowd for



Bob Isaacson placed 32nd for the U.S.

an hour or so before the game!).

The rest of the ceremony included many speeches, fireworks, and flowers. It was truly more than anyone had expected.

#### SUNDAY, AUGUST 17

The day started out perfectly. Winds would be light and variable with temperatures around 80° or 90°. There was a slight haze around the field (always!). Chasing would be no problem, as average drift all three days would be 1/4 to 1/2 mile, with only a few exceptions.

The first round began at 8:30 a.m. and saw our first man, Lyons, max easily. Frank Wolff was next and maxed, but his air wasn't quite as good. His flight was about 3:05 or 3:10. The chasing crew was on the ball, swinging jackets and sweaters wildly under the model, hoping to break loose any tiny bubble that would keep the model aloft just enough longer. It worked!! Later on, as many as 15 or 20 people could be seen "beating" under models 200 feet above, in obvious lift (seemed like wasted effort). Dave Rounsaville completed the



Mike Thomas, from Canada, placed 13th in Wakefield.



Dick Lyons, placed 19th in F1C for the U.S.



Bob Pesercho was Bob White's helper.

The first round of the flyoff started at 6:00 p.m. The engine run would be 8 seconds. Dave would fly in approximately 18th position and Lyons would go next to last. The models would be launched two minutes apart. Possible time to get them all in was  $2 \times 41 = 82$  minutes. Dave's model went slightly left at the top of the climb and did not transition properly. He was down at 2:49. Dick Lyons maxed as did 36 others. By now it was too dark to see the models for three minutes. The F1C flyoff was to continue the next day after the F1A flyoff was completed.

#### MONDAY, AUGUST 18

Today would be a carbon copy of the day before, except for late in the afternoon. Winds were light and *variable* until late in the 5th round, when they picked up slightly and the clouds moved in. The glider team was out very early and put up one check flight on each of their models. The flying order would be Isaacson, Chancey, Walters. Bob Hatschek would do *all* the launching.

The flyers were ready!! The green flare went off and Bob was up on the line. He circled up wind and off to the side. After 10 or 15 minutes, he finally found lift and maxed. I was all hooked up and ready to go just as soon as Bob maxed. I had an easy time. I towed straight to the tip, circled once and "zoomed" off into an obvious thermal marked by several models. The model got very high, DT'd and landed about 100 yards away. Now it was Jim Walters' turn.

I would run along with Jim (as Jim did later for me) as a trouble shooter. Probably 85% to 90% of the contestants were equipped to circle-tow, and conditions got extremely crowded and hectic at times (I had nightmares about line tangles the night before). I carried a knife to cut intentionally-crossed lines or clear away the large weeds that occasionally snagged the lines. Many carried scissors or knives. F1A was a crowded, hectic event with many, many line tangles.

round with an easy max.

The next round was the same, except that Lyons had an overrun, but easily maxed on his second attempt. The third round was a copy of the second. The fourth round saw Lyon's saved this time by an overrun. His ship was down in the crowd at about 2:10. The re-flight was an easy max. It was time to break for lunch and we had all maxes so far. Then Lady Luck took her toll on Frank Wolff.

Just as Frank was about to put his model up for the lunch break, a Taft-like Dust Devil ripped the model from his hands. The body broke right in front of the stab. Frank made repairs during lunch, the model was tested, and looked OK. In the fifth round, a somewhat less than perfect launch (too flat) spelled disaster and totally destroyed the power pattern. Frank was down at about 2:00. Dave Rounsaville had a real squeaker. His ship hit at exactly 3:00!

The 6th and 7th round went smoothly, and we had two in the flyoff... Lyons and Rounsaville. The only problem was the 38 others who also made the flyoff.



Willard Smitz placed 37th in Wakefield for US.

Back to Walters. Jim towed off to the right a bit and started circling close to a streamer. I kept him advised of other models and lift conditions around him. After a few minutes of circling the lift came and Jim was off. Within one-and-a-half minutes I counted 32 models in the same thermal with him.

The next round was basically the same as the first. It was the third round that spelled disaster for me. Isaacson maxed and it was my turn to go. The wind kept shifting and I waited. Finally I towed up, circled a few times and spotted 3 or 4 models in obvious lift about 100 yards downwind. I circled downwind under the rising models, circled a couple of times to be sure, and decided to go. The model was in a fast right turn, setting up for the "zoom," when Andy DeMello's line wrapped around mine. Due to speed I had already built up for the launch, the model quickly veered left, and Andy's line caused mine to unlatch prematurely. The model recovered very low to the ground. The result was a 92 sec. flight. There should not have been any problem, except that neither of our

*Continued on page 56*



# Stephanie's "SOLIDIFLIER"

By GEORGE PERRYMAN . . . No, it's not a big hand launch glider, but the construction is very similar. If you have a cravin' for carvin' and cringe at cutting ribs, then here is your painless Nordic A/1 !!

• In this computer age that sometimes makes our head swim with complexities, here is a little model which is an escape from turmoil. I remember when I was just a boy (Gad, what a memory), that an old country blacksmith told me a great truth. I used to play checkers with him, since he always kept a cool jug of fresh apple cider, complete with a gourd dipper, down in a spring which ran by his shop. I learned at an early age that his generosity with that cider, was *directly* proportional to how many checker games he beat me. Needless to say, my winning efforts were very sparse. He was designing, while he built, some tractor parts, and he let me in on his secret for success, and Old Calip was a great blacksmith. He said, "Boy, you know hits *easy* to design something *hard* to build, but hits *hard* to design something *easy* to build." Ponder that just a moment and you can appreciate Old Calip's wisdom.

When broken down in simplest terms, all models from a peanut scale to a half scale Graf Zeppelin, are built *one stick at a time*. I've had the pleasure to work with young modelers for many years, and when they first view plans their comment is usually, "Look at *all them parts!*" When I show them that only one stick is put in at a *time* it becomes fun and easy.

My little granddaughter, Stephanie,

age 6, and my pride and joy, has been gluing one stick to another for over half of her young life. One of my greatest pleasures is watching her develop into a competitor.

Stephanie had been bugging "Big Daddy" for quite some time to let her build a little towline glider. How many of you have helped a kid fly a glider? Most kids go by the theory that if a *little* running does a little good, a lot of run-

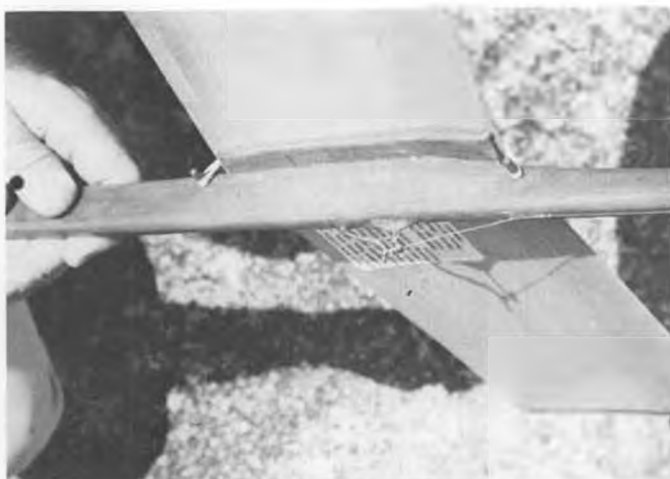
ning does a *heap* of good. This may be true in part, except most glider wings are weaker than the speed kids can attain. Usual sequence is: 1. High speed run. 2. Screams from older helper to slow down. 3. Loud crack accompanied by fluttering sounds. 4. Second loud and agonizing noise when pieces strike "terra firma" from vertical descent. (The firma the terra the greater the terror). 5. Anguishing sobs from young builder



Stephanie and grandpappa George pose with "Super Maxer" and "Solidiflier." If it ain't got polyhedral in the stab, it ain't Perryman's!!







Simple tow hook, with combined auto-rudder and "autos tab" line hooked up.



No, it's not a hand launch glider wing, it's "Solidiflier's" stab, showing the "autos tab" for calm weather towing. Good idea.

who sees long hours of stick gluing lying inert in an embarrassing pile. 6. Either scolding from older helper or, "Hey this mess will be easy to fix, mix the epoxy."

Stephanie and I have tried to make a "kid proof" wing. There is no such thing as "fool proof," as I will attest by having hanging in my shop several aft parts of fuselages, wings with no tips, wake-field props only 2 inches long, and flat stabs... with polyhedral forcibly removed.

By using a piece of Sig 1/4 x 1-1/4 inch T.E. stock for wing L.E., and also T.E., with a good piece of soft Sig 3/8 x 3 inch wide balsa, a simple, strong, and efficient wing resulted. This wing is basically 3 pieces of wood, and 6 glue joints for the entire structure. Caution: Use light 3/8 balsa for center and the piece of T.E. stock for T.E., or wing will be heavy. L.E. can be firmer balsa, but here again, not hard. The spruce strip on L.E. will help keep down nicks.

Begin building the wing by making the world's simplest wing jig. It consists of a flat piece of 1/8 balsa 3 inches wide for the center section, and tapered to fit 3/8 wing tips. Lay saran wrap over it and place on table. Pin 3/8 x 3 x 30 long, soft balsa through 1/8 wood beneath, and into table. Glue edge of T.E. stock to 3/8 piece to form leading edge. Repeat for trailing edge. Trailing edge stock is beveled, naturally, which forms undercamber of a sort. For tips, repeat steps above except 3/8 wood is cut on a taper before you glue on front and aft pieces.

Stephanie sanded the lower surface first, using a vibrator sander. A paper towel, folded and slipped under the sandpaper, will form curved undercamber easily. Upper surface is formed using vibrator sander with spanwise strokes. Make 1/16 plywood templates off the plan to check sanding progress, and avoid taking off too much wood and make flats in the airfoil. When center section and tips are sanded to shape, glue dihedral in. Stephanie brushed 2



And here's Stephanie herself, with Stone Mountain in the background. Note sculpture at base.

thin coats of clear dope on finished wing. Due to her inexperience with a vibrator sander, she left a few pits and bad spots, so we elected to cover some of her blemishes with a coat of tissue. This step isn't mandatory, but in her case it made a better looking job, although a heavier wing, which is more durable and less resistant to splitting and warping. This extra weight in the wing caused her model to exceed 5.08 ounce minimum, and her "Solidiflier" weighs nearly 6 ounces.

The fuselage and stab is made exactly like a hand-launched glider. The fuselage is 1/2 inch medium balsa, and the stab is 1/8 light balsa. Shape the stab exactly like a H.L.G. wing. It too may be tissue covered, along with 1/8 sub-fin. Make wing and stab mount from 1/8 sheet and glue on, along with dowels for holding wing and stab to fuselage.

**IMPORTANT: BALANCE FINISHED MODEL AS SHOWN ON PLANS.** More models crash or fly poorly when this small point is ignored than most other factors combined. Drill holes in nose and add lead fish sinkers to bring into proper balance. Stephanie got the balance point as shown, removed about an 1/4 oz. sinker and coated over nose and sinkers with epoxy, which helps keep fuselage from splitting during "hard landings." Some of hers have approached 90° from the horizontal.

Now, with my preceding ramblings concerning kids who run *too fast* during tow, there comes a time when even us "older kids" just aren't as *brisk*. Have you ever tried towing on a hot day with no wind? Even worse, when the wind shifts during two and even Foolish Pleasure couldn't get one up over 50 ft. After getting hit in the back by a tow-line glider in a downer while running at my full speed (measured at something below the speed of light), I said to myself, "Big Daddy, there has gotta be a better way." The little piece of half-moon shaped plastic on the left T.E. of the stab I fondly call "Autos Tab." It allows, during calm weather, a more leisurely tow and control by not having to locate the tow hook too close to the C.G. You may note that the left-hand inboard stabilizer is shorter than the right side. This is to compensate for added area of the "Autos Tab." When hitching up "Autos Tab" for calm weather flying, you will have to give a little left to the auto rudder, since "Autos Tab" tries to turn the model right under tow due to its rudder effect. Well built models are important, but *flying* makes or breaks them. Never test fly a brand new model on a windy day. Try to launch over a grassy area with more shock absorption than a concrete runway. In a battle between concrete and models, the present score is Concrete - 10,526,421, Models - 0.

One small point to remember while flying A/1 gliders. Most people use the same tow reel and line to fly both A/1

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and A/2. The line weight and drag required by heavier A/2 can be reduced by using 6-10 lb. test monofilament fishing line. You will have a better chance of getting 'em to the top of the line, and reduce wing breakage as well. I'd rather break a line than a wing.

Stephanie's "Solidiflier" is a real fun model, and maybe when she learns to tow as good as most of you, it will be a competitive model. Will be glad to hear from you if yours is fun to build and fly. Any model you enjoy is successful.

**F/F Champs . . . Continued from page 52**  
timers would admit that we had indeed crossed lines! We were not allowed to

take the flight over!

In the meantime, Walters got his max. The 4th and 5th round was all maxes for the team. Bob and I maxed easily in the 6th. Jim Walters hit trouble then, when the latch on his towhook suddenly opened. The model came off the line and was down in just under 2 minutes. Isaacson was the only one left with all maxes.

The 7th round went very smoothly and we all maxed. All attention was then focused on Bob Isaacson and how many others would be in the flyoff. Would you believe 40?

The flyoff was to start at 6:30. The weather had changed considerably . . .

it was not overcast and threatening rain. The temperature had dropped somewhat. The green flare went up and so did Bob and several others. Bob's hook also came unlatched and he towed straight upwind as far as he could. He released the model in what looked like good air at first, but the ship was down in 2:08. So much for that. There were only two who made the 4:00 max.; V. Tchop (a 21 year old Russian, currently in the military), and Peter Allnut (a retired Canadian airline pilot). They were to meet head-to-head for the World Championship.

When the green flare went up, so did Allnut. He towed straight to the top and let off in what he later said felt like good air. He was down at 131 secs. In the mean time, Tchop had gone upwind some distance and found, of all things, a thermal! He made a beautiful "zoom" launch and the model gracefully floated out towards the horizon. It was still at least at towline height when it DT'd at 5:00. He was truly the champion!

Despite having the individual champion and the team championship, the Russians did have their share of bad luck in the flyoff. Andres Lepp (designer of the first tension release towhook) had his No. 1 and No. 2 models run over by a car! Using his No. 3 model, he still placed 10th. W.I. Isaenko's model was also run over by a car when it landed on his flyoff flight! He placed 15th.

**TUESDAY, AUG. 19th**

Wakefield was today, and still no power winner yet! The day started out exactly as the others had . . . beautiful. The flying order for today would be: Smitz, White, Davis. This changed from time to time due to broken motors, etc. The first two rounds went smoothly. We had all maxes so far. Willard was flying a relatively new model with a lot of John Gard influence. It had an excellent glide (even though un-turbulated).

Smitz and White maxed in the third round but Jon Davis was a bit short on time and got in the air very near the end of the third round. The result was a 110 sec. flight.

On the first flight of the 4th round, Willard's model climbed very high in good air. It seemed there could be no way not to max. At about two minutes, the model started stalling violently from the lift. It stalled into the ground at 178 seconds. White and Davis had relatively easy maxes and we broke for lunch.

Round five saw trouble again for Willard. Down in 123 seconds. Davis and White continued to max. The sixth round found Willard at the end of the round and running out of time. He launched just as the round ended. With very little thermal help, the model still did 173 seconds! Jon Davis put up a beau-



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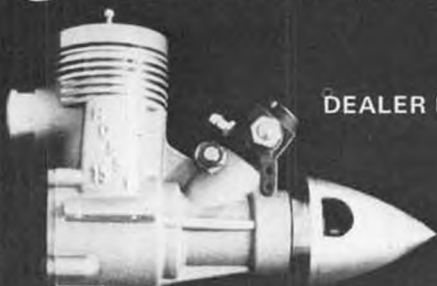


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tiful max with what seemed like little effort. Not so for Bob White. He had to do it the hard way... another flight that landed at exactly 180 seconds! Remember Dave's 4th round power flight?)

The chase crew and supporters really worked hard swinging blankets, umbrellas, and jackets, and if nothing else, just wished the model up. What ever they did, it worked.

Here we go, one more round. Willard put up his prettiest flight of the day. Jon Davis launched into air that wasn't quite as good as we all thought it was. He still almost maxed, dropping only 16 seconds in spite of the bad air.

And now, twice in a row, Bob White had put in seven straight maxes at the World Champs. Everyone was happy for Bob. He was in the flyoffs again! We quietly waited to see how many others would also be in the flyoff, while Bob readied his ship and gathered his thoughts. As it turned out, only 14 would fly off for the Wakefield title. Just because there weren't as many as in power and Nordic, don't think it was easy. It may have been the toughest flyoff of all!

The green flare went off. Bob White started winding immediately, as only four minutes were allowed to get in the air.

By now it was overcast and slightly cooler. Several models went off together, including Bob White's No. 7, which out-

climbed them all. The air was decent, but it wasn't an "up-and-away" type thermal. Bob's model hit very close to the 4:00 min mark, and less than 100 yards from launch point... but it had maxed. At this point he could place no less than 7th because that's all that were left.

As Bob readied old No. 7 for the next flyoff round, it started to mist slightly. Several of us held umbrellas, etc. over the model to protect it from the falling moisture as much as possible. Again, the green flare went up, signalling the start of the round, and again, Bob started winding immediately. This time, all seven remaining models were launched simultaneously. Again No. 7 outclimbed them all. The power was beautiful! But, again, all seven maxed. By now (in fact by the first flyoff round), Bob was out of good motors. When the model was retrieved, he carefully inspected the motor and found two or three tiny nicks. These were tied off and the motor re-installed.

Again the flare went up and all 7 wound frantically and launched at very close to the same time. This time, Bob's ship didn't get quite as high as it had before. It still out-climbed the others, however. The crowd was cleared away so that the timers could see every second. The ship hit at 4:41 (281) which was one second better than the Austrians

280. Then we noticed the North Korean ship *was still up*. We were all worried then. Sure enough, Paik Chang Sun's model hit the ground at 303. Bob White had won 2nd place though! A truly fine performance.

The Team Championship was also won by the North Koreans, who had placed 1st, 4th and 34th. The Polish team was 2nd, and the Canadians were third. The U.S. team was 6th.

Back to the power flyoff. Twenty flyers were left now. The engine runs would be 4 seconds. Most all of the models performed beautifully, but naturally only 3 could be winners. Lars Olofsson, of Sweden, won. Verbitzki of Russia had a short motor run of 3 seconds and still came in second. Burns of Canada was third. Our man Dick finished an impressive 19th. Dick had put in a really good effort! It was now over, and all-in-all, it had been a great contest. **NEW INNOVATIONS**

I didn't see very many new things. Denmark's Tom Koster *was* still working with his Flapper. He was flying a straight-up power pattern. About one second before the engine cut, he would put down in the stab to point the nose level. Then the auto-rudder and stab kicked in as usual. When it worked properly it was quite spectacular. In fact, it went beautifully in practice. It seemed to me that Koster, as with the other Danes, tried to "over-trim." They looked great for a couple of flights. Then they would change something and "stack in." Koster busted up his only remaining ship testing before the first round. He repaired it and maxed just as the round ended. He wasn't so fortunate in the second round. A 25 second flight spelled the end of the day for him. I think I heard him say that he was finally going to abandon the "Flapper."

Verbitzki, of Russia, had, in my opinion, the most consistent model on the field. It had a cowled Rossi (as did all Russian ships), and the entire airplane was absolutely beautiful. He's really a hard worker. Cowled engines were very popular.

Urs Schaller, Switzerland, had a beautifully cowled model with all sheeted flying surfaces. It had a higher aspect ratio wing than most other ships. The climb wasn't spectacular (it was adequate), but the glide was exceptional. Urs had really bad luck in the final FIC fly-off. His model was still several feet high when the busses pulled between it and the timers. The last several seconds of his flight could not be seen. As it was he placed 6th.

I didn't see any significant changes in Wakefield. The majority of fliers were using winding tubes and winding without the prop. The Russians used a prop guard and wound with the prop still attached.

Maybe I'm just prejudiced because I fly the event, but Nordic seems to



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have undergone the most drastic change of any of the events. Almost everyone circle-towed. Some used offset hooks and "shock" releases, but most used the Russian or Czech style tension release hook. Wing structures have become extremely rigid, as have tail booms... the reason being the speed and pressure built up by the "zoom" launches.

The one new thing that impressed me most was the aileron used by the Russians. It was used to make the zoom safer and as a means of getting even more altitude. In most cases, a Nordic is banked into the glide turn by starting the rudder to move slightly, just as the

tow hook starts to move. To keep the model from spinning down, washin must be used in the inboard wing panel.

It is still a little bit tricky to fly. The Russian method is to use an aileron (or flap) on the out board wing tip. The flap is timer-actuated and kicks up (washout) one second after release, remains up for 2-1/2 seconds, and returns to neutral. The result is quite spectacular. Upon release, the model kicks slightly over for one second, then the flap kicks up and pulls the out board wing down, causing the model to climb straight into the wind for 2-1/2 seconds. When the flap goes down, the model

begins to turn again. Using this method, it is possible to make very significant, yet safe gains of altitude.

The Russian method of towing hand-over-hand, without a tow reel, seems to be the best way going. It enables the flyer to tow up-wind or down wind at will. It is much easier to circle tow using this method than with a tow reel. They use a large diameter monofilament line that does stretch some for thermal flying. For flyoff situations, a very taut line with minimum stretch is used.

**Soaring . . . . . Continued from page 27**  
sheet foam with a hot wire. Injection molded wings are very strong, very accurate to reproduce in quantity, can be made in any sort of configuration, such as elliptical planform, and cost a couple of hundred thousand bucks for the first set. If you want to make your own injection molded foam wings... great! Send me an airplane ticket to meet you on the Riviera and we'll discuss your project further. The rest of you guys read on!

Hot wire cut wings have the disadvantage of needing to be cut in sections which have straight leading and trailing edges. But they can have progressive airfoil sections, wash-out and wash-in, and are dirt cheap! Hence our interest in them. I'm not going to discuss the cutting of foam wings in this article. There has been a lot written on the subject, and there are several firms around the country who will do the job for you. Most clubs have two or three guys already set up to cut a set of cores for you. So, get a set of foam cores by whatever means is handiest, then read on.

There are three basic ways of handling wire-cut foam wings. One method is to sheet the entire wing with either balsa or plywood. This method has the advantage of being very strong and the disadvantage of being heavy. Many of the current pattern airplanes are built in this manner... power fliers can tolerate a 24 ounce per square foot wing loading... glider fliers cannot!

The second method was devised by Hi Johnson, owner of Hi Johnson Model Products, Inc. He will be producing foam wings in the near future which are sheeted with a material he calls "green skin." This is a rubbery sort of styro-foam sheetings which is lightweight and strong. It is similar to the material that is used for the molded trays that meat is packed in at the supermarket. It can be painted, or will accept the low temperature iron-on coverings such as Flite-Kote, Solarfilm, or Kwik-Cote.

The third method of constructing a foam wing employs a full-depth spruce or hard balsa spar, with conventional sheet balsa leading edges to produce a "D" tube type construction, similar to conventional balsa structure.

Hi Johnson has developed a very

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strong, lightweight spar/covering system for foam wings. Realizing the total strength in a spar system is in the tensile strength of the spars, Hi decided to use 1/16 plywood strips for the spars. A 1/2 inch wide strip is adequate for almost any wing, providing a wide gluing surface, phenomenal strength, and very light weight.

This spar system, together with either a sheet balsa leading edge sheeting and cap strips, or sheeting with the "green skin" foam plastic, yields a strong, lightweight, attractive . . . and most importantly . . . an accurate wing. Next month we'll cover the step-by-step procedures on building such a wing.

#### FROM THE HANDY HINTS DEPARTMENT . . .

I've found that hi-start rubber, which begins to get flaky and break after prolonged exposure to sunlight, can be preserved with a product that is used in the photographic industry to preserve rubber rollers in print processing machinery! The product, simply called Rubber Preservative, is sold by Peck Sales Co., 7949 Laurel Canyon Blvd., North Hollywood, Calif. 91605. To use the preservative, wash the rubber with soap and water, dry with a towel, and then wipe the preservative onto the rubber. Repeat this process every three or four months and your hi-start rubber will last seemingly forever. I've been using the same rubber for over two years without any signs of flaking or tendency to break (*Armor-All is more readily available, and should also do the job, but it more expensive. wcn*)

Cecil Cutbirth, of Rolling Hills, Calif. has discovered a skid material for sailplane competition that seems to work equally well on all types of surfaces. Many fliers have been using foam rubber insulation tape, but have found that it won't work well on bare ground, where the layer of loose dirt on top acts like ball bearings to propel the model forward. Also, the foam doesn't seem to work well on wet grass. Cecil is using strips cut from a cheap rubber door mat. The mat has 1/8 inch diameter "fingers" which project up about 1/2 inch from the 1/16 inch sheet rubber base. A strip of this material can be glued onto the bottom of the fuselage with Goodyear Pliobond or Wilhold Fixture Adhesive, or can be held in place with sheet metal screws. On asphalt, the rubber is soft enough to provide great friction to stop the model. On grass, whether wet or dry, the fingers grab the grass, and on bare dirt the fingers act just like a rake, bringing the plane to a halt in short order. As a fringe benefit, the door mat material doesn't wear out as rapidly as the foam tape, and isn't nearly as expensive as some of the other skids tried, such as automotive timing belts which sell for as much as \$15.00. Like the ad says . . . "let your fingers do the stopping." . . . Oooooooh!

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#### A HOBIE TALE

Kelly Pike sent us a report on the first ever Atlantic City Boardwalk Hobie Hawk Contest. This contest, sponsored by Coast Catamaran, was arranged by Kelly, who until very recently, traveled the eastern part of the U.S. promoting the Hobie Hawks. Kelly enlisted the support of the Atlantic City town fathers who also donated \$350 for contest prizes. But even more interesting than the contest itself (which incidentally was won by Dick Pike, no relation to Kelly) was his description of the preparations. Naturally you can't just assume that because a site appears to be large enough, that it will be suitable for a soaring contest . . . you have to try it

out yourself. And that is just what Kelly did . . . the afternoon before the contest. And here is the gospel, as told by Pike . . .

"I drove down to the beach site and set up my high start. The wind was blowing offshore (that means the water is downwind from the land), so it was necessary to wade out into the surf about 100 feet to stretch the tow. This also meant that the pilot was 100 feet from shore. It was quite comfortable in the cool, waist deep ocean water, feeling the sun on my back. 'Just don't drop the transmitter' I told myself.

"Now those of you who frequent the movies or read the newspapers should begin to recognize this scene. Here I am splashing around in the Atlantic Ocean,

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at a resort town, all by myself. Sounds a little bit like the movie 'JAWS,' doesn't it? Now understand that I don't recommend that you go see a movie like that a week before planning to travel to the seashore . . . and I'm the type of person who can really become involved in a movie.

"I had just launched the Hawk for about the fifth or sixth flight when I felt a sharp pain in my foot. The possibility of what this meant hit me immediately. I scanned the surrounding water and imagined a hundred sharks at the edge of a frenzy bearing down on me. I could see tomorrow's front page picture . . . a lone, tattered arm still clutching a transmitter, washed up on shore. I caught my breath and tried to run across the top of the water, producing little or no progress toward shore.

"Through all of this frustration, I managed to regain my senses and decided to check for damages. Bravely I gritted my teeth, and expecting to see nothing below the ankle, I raised my leg for examination. As the foot came to the surface, still connected to my leg, I saw the demon of the deep that had caused me pain . . . a ferocious sand crab.

"She was about the size of my palm and at this moment was clinging to my little toe, swinging her free pincher threateningly. With a little urging she

dropped off, as glad to be rid of me as I was to be rid of her.

"My attention waned from the 'victim' toe as I realised this epic battle between man and beast had been witnessed from the beach by a considerable crowd, drawn together earlier by my loud shrieks of 'Shark! Shark!' Turning to greet their growing laughter I revised my report with 'Crab! Crab!'

"This would be a proper ending to the scene if we were not left with the question, 'Where is the sailplane I just launched?' No sooner thought than the question was answered by the reentry of my forlorn Hobie Hawk, still attached to the towline, as it whistled into the beach. As the parts and spray settled, I turned and submerged in the surf, making noises like shark bait. How would I ever explain this to Hobie?"

Can't you just hear the local beach bum types yelling "Surf's Up! Hawk's down!?"

**Roland . . . . . Continued from page 43** however, in Peanut size, there could be a weight penalty.

Fortunately, I had the foresight back in '39 or so to put away in the scrapbox some small spun aluminum cowlings which were than a common hobby shop item. Assuming that you would probably not have a comparable cowl handy. I

would suggest the turning of a hardwood master, and either heat or vacuum forming a cowl of .010 or .015 sheet butyrate plastic. You can, of course, carve the cowl from a block of medium hard balsa. Paint the cowl the same as the struts or conjure up your favorite color. Engine details are on the plan. Some photos show a balsa prop, but this was replaced with a heavier Williams Bros. prop to add nose weight. Prop was later painted with Flat Brown Testors plastic paint.

Cut patterns for the stab, elevator and rudder laminations. My favorite form is of Bainbridge board, with the edges lightly waxed to prevent sticking. Assemble stab and rudder as per plan. Cover rudder with white tissue. My insignia was modified from that in a Guillows 18 inch D-8 kit, but may be cut from SIG's black decal sheet.

Make one master wing rib template of 1/16th ply to cut all ribs. Maintain the nose contour and trim for the taper from the trailing edge. Block up the center of the laminated circular wing cut-out 3/16 in., and trim center rib to fit.

Perhaps the most time consuming part of building this model is the application of the polygonal camouflage pattern on the upper and lower surfaces of the wing and stab. A reasonable substitute for camouflage would be to cover the top surfaces in green tissue and the bottoms with light blue. My process is as follows. Make a frame of scrap wood approximately 12 by 15 inches and dope on a piece of SIG's lightweight tissue. Dissolve some blue food coloring in alcohol and spray. When paper is dry, remove and dope on a second piece. Spray this with alcohol in which a few drops of Burnt Umber oil mixing color has been dissolved. This should give a light tan effect which is used as the base camouflage color on top of the wing and stab. Bottom surfaces are covered with the blue tissue. Use felt tip marking pens of several colors to apply the pattern. If any spot becomes too soggy stop, let dry and come back to it. This is not super scale, so I eyeballed the shape of each patch of color. Finish off the job with one coat of clear nitrate dope. Although somewhat tedious, the results just might stagger the competition and bring forth cries of amazement from the local spectators.

Next add the landing gear and the cabane struts. Cut a temporary spacer of scrap wood to fit between the top decking and the bottom of the wing to obtain the proper incidence, and glue wing to top of cabane. Add tail surfaces.

Without any ballast or thrust adjustments, my prototype flew left-left with a steep left-hand climbing turn and a gentle rollout. There is quite a bit of initial torque and you might have to launch with the right wing slightly down. Power is one loop of 4 or 6 mm rubber.



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With lower power and resulting less speed, I found this plane somewhat difficult to trim indoors. I recommend outdoor flying.

There is only one more thing to do, and that is to make up a sign which states, "This aircraft is NOT a Fokker D-VIII." Smile!

**Hannan . . . . .** Continued from page 42 has decided to keep it . . . at least for a few more years. To this end, has renewed his lease on the Long Beach, California hangar, to the tune of \$100,000 per year!

### ANOTHER ARTIFISIAL SHORTAGE?

According to Frank Scott, Ohio hobby dealers are pointing an accusing finger at fishermen when the general non-availability of rubber is mentioned. Seems the sportsmen are buying up all they can find, for use in a new fangled fishing system: They tie a rock to a short piece of string, which is in turn tied to the end of a LONG piece of rubber. To the end of the rubber is attached a fishline and baited hook. To use the affair, the rock is thrown, shot or carried by boat to a likely spot. When a finny denizen takes the bait, the fisherman cranks him in by the time-honored fashion, but in so doing, the rubber is stretched. He removes the fish, re-baits the hook, and lets go of the line. The rock-anchored rubber then pulls the line

and hook back to the same spot! Wonder if Pirelli would catch Italian fish?

### NEW LOOK FOR SMITHSONIAN

Carl Hatrak brought in a TWA newsletter, which featured an artist's rendition of a portion of the Smithsonian Institute National Air and Space Museum, due to open on July 4, 1976. This particular exhibit will be devoted to air transport of the 1930s, and will feature a Northrop Alpha, Douglas DC-3, Ford Trimotor, Boeing 247, and a Pitcairn biplane. Evidently, most of the aircraft will be suspended, model airplane fashion, with some mounted on plinths.

### HANDY HINTS DEPARTMENT

Ralph E. Scott (no relation to Frank Scott) mailed in several clever ideas which we felt were well worth reporting:

"Pliobond and 5-minute epoxy both work better for cementing sheet acetate windshield than other glues. Be sure to roughen the mating areas of the sheet with sandpaper.

"Keep your cottonpickin' fingers off the back of transfer (rub-down) letters. There's cottonseed oil on them.

"Tissue sometimes seems determined not to stick down at the edges of lightly doped Peanuts. Try a touch of 'tacky' glue, which is available from craft shops.

"A length of bar stock iron from the hardware store 1/2 x 2 x 8 inches makes a fair anvil; a handy-to-have weight for

holding things down, and also for cutting aluminum tubing: Slip a piece of music wire inside the tube, lay it on the iron bar, and cut by pressing the edge of a kitchen paring knife against it as you roll it back and forth. It cuts true leaving only an easily removed burr. Any old knife will do and needn't be sharp. I bought a paring knife at a flea market for 5¢, and it has been worth dollars in saving my sharper blades for more worthy cuts!

"Up here in the country, we are both blessed with many acres of sheep pasture and rangeland, and cursed with foxtails and summer heat. For the foxtail problem, I borrow from my snow-tromping friends and wear bread wrappers inside my boots over my sox. True, my feet do sweat a bit, but it sure beats throwing sox away, or spending time picking sticklers out of them!"

### SPOKESMAN FOR THE INDUSTRY

Fulton Hungerford strikes again. With the world-wide acceptance of his silk thread spoke wheels for rubber-powered models and dacron thread spoke wheels for larger models, it was inevitable that requests would be received for metal spoked wheels for heavier models, as well as for museum-type static display aircraft. Featuring stainless steel construction, the new line of wheels is the result of many months of experimentation in manufacturing methods, and should be available by the time you

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### HEAVIER LIGHTPLANES?

Not the aircraft, but the newly revised book, "THE LIGHTPLANE SINCE 1909," by John Underwood and George Collinge. The original volume "THE LIGHTPLANE" is now out of print, and was considered one of the better reference books for scale model enthusiasts. This latest publication contains all the fine photographs and three view drawings of the earlier release, plus four extra pages featuring new photographs. Starting with Santos-Dumont's famous "Demoiselle," this book traces the evolution of light aircraft through the years with special attention to the innovative types which have exerted influence on the entire aviation industry. From a modeler's point of view, this is a real winner, with sparkingly clear photographs well reproduced, approximately 37 three-view general arrangement drawings, plus nine cut-away illustrations of aircraft which almost cry out to be modeled! We received a copy of the early version of this book back in 1970, and have probably referred to it more frequently than any other publication in our fairly extensive archives. Whether your interests run to free flight, R/C, or control-line scale, you are likely to

find something of interest between these covers. Available at better aviation book stores, or directly from the publishers: HERITAGE PRESS, Box 167, Glendale, California 91209, for \$5.95 plus 50¢ postage and handling charge.

### BILL HANGAR?

This is how a letter from reader Rick Sierk was addressed, which gave us a much-needed early morning chuckle. Enclosed was a tear sheet from a classified advertisement which demonstrates the ridiculous status of today's prices. Offered for sale is a Mattel Vac-U-Form at \$75.00!! While we wish the seller the best of luck, we recommend psychiatry for the buyer.

These Vac-U-Form toys do make Jim-Dandy additions to a model builder's bag of tricks, particularly for forming small canopies, spinners, wheel pants, etc. However, if you want one, we suggest first checking with your local Salvation Army or Goodwill stores. Going prices locally have averaged anywhere from \$1.50 to \$5.00. Swap meets also yield these items, at prices naturally subject to negotiation, but certainly less than \$5.00, except perhaps for an absolutely mint, complete-in-the-original-box example, which might justifiably fetch \$10 to \$12. If you are unable to locate any in your own area, ask a friend living near any of the larger cities. These toys were sold by the hundreds of thousands (even by Sears and Roebuck), so the woods SHOULD be full of 'em!

Two different school teacher/modelers told me that they obtained theirs by posting a sign on the bulletin board . . . again, at VERY low prices. As a desperation attempt, a small classified advert in your local newspaper would undoubtedly yield a Vac-U-Form. P.S. Please don't ask us to find you one! NOT FOR MS ONLY

With apologies to Char Rohring, we are very proud of the females in OUR audience, and are always happy to extend recognition to them. One of our photos this month (if Bill Northrop doesn't swipe it for Char's column) depicts a Travel Air "Mystery Ship," constructed by Chris Fulmer, from a plastic kit. Seems that Chris had been watching her professional model builder husband, Mike, produce static display models for several years, and decided to try her hand at it. The results speak for themselves, but we point out the fact that this first-ever model features complete rigging, difficult-to-do scalloped and striped paint scheme, and a number of details not found in the original plastic kit, such as pitot tube and individual cockpit instruments. The topper to the achievement is the fact that one of her husband's customers liked it so well that he bought it!

### PHILATELY, ANYONE?

According to our mail, quite a number of model builders are also stamp collectors. Research buffs find this an added bonus when corresponding with overseas enthusiasts, and not surprisingly, the majority concentrate on stamps featuring aircraft. We note that the latest "200 Years of Postal Service" issue features a sort of "stand-off-scale" Jenny. It ought to be less tail-heavy than usual with the length missing from the fuselage, but with the prop it has, it may never leave the ground. Oh well, perhaps someone will be lucky enough to get one that has been printed upside down!

### ELEMENTARY MY DEAR WATSON!

Bill Watson, king of the novelty model, has joined forces with famed hang-glider designer Taras Kiceniuk Jr., to produce a man-powered aircraft. Both fellows have extensive model building experience, and in fact, the present project has been well tested in miniature form. Featuring a high percentage of foam in its structure, the craft will be covered by some sixty rolls of Solarfilm, contributed by the manufacturer. The seriousness with which the design is regarded may be appreciated by the fact that National Geographic magazine has taken an interest in the progress.

### AND ANOTHER

In England, yet another small group of model builders is graduating to the fabrication of full-scale aeroplanes. The Early Aircraft Construction Group, led by David Deadman, proposes to build a two-seater of vintage design. Participants will have shares in the end product, including occupancy of its passenger seat!

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**WORLD WAR I AEROPLANES**, is the name of a newsletter-type publication published by Leonard E. Opdycke, Greenbriar Apts., A-12, 347 South Rd., Poughkeepsie, N.Y. 12601. This volunteer operated publication is devoted primarily to coordinating the efforts of people who are restoring or reproducing full-scale early aircraft. Quite a deal of information useful to model builders also appears, including 3-views and detail drawings, as well as photos and descriptive text. The September issue features information on the aircraft located in the Polish Air Museum, and also a round-up of information on the Nieuport Monoplanes, special favorites here at the Hangar! Why not send \$1.50 for a sample copy?

#### HANDY HINTS DEPARTMENT:

There seems to be no end to the ingenuity displayed by our readers, and here are a few we felt were worth sharing: Don Typond says that the handiest new item on his building board is a polyethylene plastic cutting board, designed for kitchen use. Don uses it for a base while cutting out formers, ribs, and suchlike. He points out that it will not dull your uber Skiver, as some other cutting surfaces might. Then too, he mixes epoxy on it, which peels right off when dry.

Ralph E. Scott favored us with a flock of good suggestions, but here are a couple that we especially liked: Pre-coat strips of paper matchbook cover and paper matches with cement and carry them with you. They will grab quicker when used for nose-block thrust adjustment shims. A thin coat of added cement will dry quickly and securely if the balsa has been doped too.

Transfer letters used for markings on scale models work better when warm. If the sheet won't lift off leaving the letter intact, then warm a pencil eraser thoroughly near a light bulb, and hold on the sheet. In cold weather the sheet

may be warmed before each application by holding near to the light. A pre-warmed leather-working tool makes a helpful stylus. More of these ideas next month.

#### SILLY SIGN-OFF

It seems this kangaroo sauntered into a hobby shop one day, and asked for a tube of glue. The proprietor placed the cement on the counter, took the ten-dollar bill proffered by the customer, and as he turned to his cash register, he thought: "What can an animal possibly know about money, anyhow?" Thus, he handed back only a five-dollar bill and turned away. The kangaroo put the fiver and the glue into his pouch, and continued browsing around in the store. The dealer, perhaps feeling a bit guilty said: "Ya' know, we don't see many kangaroos in here." "Well," said the 'roo, "At five bucks a tube for glue, I'm not surprised!"

#### Plug Sparks . . . Continued from page 25

The contest was preceded by the Annual WMC-MECA Collectogether. Originally, this was a get-together held at Bob Stalick's home, but because of the Stalick hospitality, it simply outgrew the homestead. The Tangent Community Center was employed, with a large room for displays and side rooms to show slides and movies. Something going on every minute! No question about it,

this was the largest MECA showing in the Northwest.

Stalick further reports that because the field had not been burned (quickie way of clearing), there was ample grass for soft landings and even harder crashes. To top this off, the weather was near-perfect, with variable winds, necessitating a crew to keep switching the take-off boards. Actually, with one or two mph winds, this was a luxury when combined with a weather temperature of 84.

The columnist was rather surprised when his reservation with Jupiter Pluvius for good weather actually materialized. In an encouraging letter to Stalick, good weather for the Annual had been guaranteed. Just a case of knowing the right people . . . haw!

To try and list all the events (10) and the winners is a little beyond the scope of this column but Don Nordlund, Tom Alden, Rod Russell, and Ray Chalker ran off with most of the prizes. Best time of the day was taken by Tom Alden's rubber cabin model, a 1936 Canadian Wakefield design. To show it was no fluke, his 1937 Mulvihill stick rubber job did the second highest accumulated time!

Erle Moorhead lost his bet with Al Grell when he failed to complete his model for the contest. After having to pay \$10.00, he was forced to pose with Bob Schafer's Red Zephyr just to remind

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# WANT TO WIN?

## Pearls Take U.S.F.F. Team Championship!

Pearl Team #2 won the prestigious team honors at the U.S. Freeflight Championships at Taft, California, over the Memorial Day Weekend. In addition, Guy Kirkwood set a new Class A record of 43:31, using his FAI Midi-Pearl to make four flyoff flights after he damaged his own "A" ship.

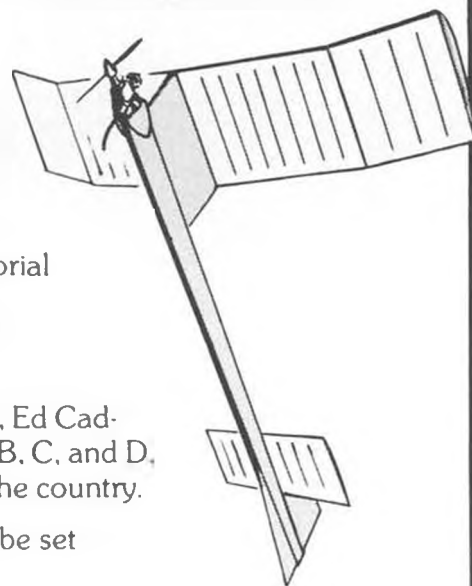


Pearl team members were Gene Simpson, Ed Cadwell, and Bill Moore. Flying Pearls in 1/2 A, A, B, C, and D, they outscored the toughest competition in the country.

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Erle what one looked like. Some guys are real gluttons; Erle now has another \$10 bet with Al for the October 26 contest. Barnum was right!

### 11th ANNUAL ERIE ANNUAL

In the crush of a tremendous amount of news, last year's E.M.A.A. O/T Annual got blue pencilled because of late submittal. This year, Lin Reichel took time to advise this writer of the good time had by one and all.

Being just across the lake from Canada, this meet draws Ontarians, giving the contest an international flavor. Held at Chagrin Falls, Ohio, the contest was a social and competitive success. Despite threatening skies and brief showers, the contest was favored with 43 entries. Surprisingly, the best times were obtained in the morning and showers. When the sky cleared, with help from the wind, the wind stayed and two minute flights were clear off the field. Rough retrieving!

Vic Didelot, the perennial C.D., did his usual outstanding job of running the meet. Uncle Bob Reuter paced the boys with two firsts, while nephew Bill Reuter copped two places to show that the younger set could still do it. Some were not so fortunate, like John Grigsby, who ruined two models. Early winter wheat planting, eh?

### SAM 21 TEXACO MEET

This meet suffered from the panic of the modeling clubs who cancelled all meets in September based on the ru-

mored report that a racial parade would be held in Taft, California to protest the ejection of two students from Taft Jr. College. To everyone's chagrin, nothing happened, and several excellent contests went by the board.

The SAM 21 meet, to be held in conjunction with the SCIF-SCAMP F/F Meet in September, went off as scheduled but suffered heavily from lack of participants. Original estimates of attendance fell far short, as most modelers still thought the entire meet was cancelled.

In the flying, the bright spot of the day was the spectacular 30 minute flight by Otto Bernhardt's Lanzo Record Breaker as flown by son Phil. As second placer Pond said, "It took both of them to beat me."

Biggest problem now in flying at Taft will be the securing of motel reservations as the sudden shift and cancellation of meets left many motel operators with a large number of unfilled long-range reservations. Never saw it to fail, the modelers do it to themselves!

### LAS VEGAS BASH

Here's a tremendous meet that draws well because of the night entertainment available at Las Vegas. As pointed out last year, the SCAMPS make this an annual pilgrimage with a large group going up staying at the same motel.

This year, C.D. Gene Wallock had to call a halt to the Sunday flying after

a beautiful day of flying on Saturday. As wag Jim Dean put it, the wind got up before the contestants.

Regardless, a goodly amount of flying was enjoyed by all. Bob Hunter, sporting a converted K&B Torpedo 40 ignition motor, showed the boys how to make a Sailplane perform. With the engine turning at an estimated 16,500 using 5 to 1 fuel featuring Blenzoil lubrication, the model practically climbs out of sight in 25 seconds. Something to think about men!

Winners were: Jerry Vernon in Class A, Bob Chambers (Las Vegas) took Class B over his idol Sal Taibi, Bob Hunter easily won Class C, while Bob Oslan won both 30 second Antique and the .020 Replica Events. Mark your calendar for next year. This meet is a real funfest!

### NEW O/T KITS

Just got a call from Sam Blumberg, of Micro Models, who has been spending his last six months working on an RPV project. Now that this is pretty well wrapped up, Sam is going to produce 300 sq. in. size old timers especially for R/C flying. The models should accommodate .049 to .09 engines. Of course, if you want a hot one, you can always use a .15 size engine.

Sam sez the Scientific Mercury and Miss America 300 sq. in. versions should be ready for release on Nov. 1. That's a little optimistic, but if you want to be



among the first, send your \$24.95 to Micro Models, P.O. Box 1273, Covina, CA 91722. Good trainers!

Blumberg further states he will produce more designs if the demand warrants it. This is great stuff! With Bob Oslan producing 50 inch scaled down kits, the guy with the thinner wallet for R/C in old timers is getting a real break!

Before we completely forget it, the models have been flown with Kraft bricks, Cannon Twin-Blocks, and Futaba 3 channel sets. That should be versatile enough.

#### MORE FREEBEE PLUGS

CPM announces another fine O/T replica, this time, the "Soaring Glider," an old Modelcraft design. With Conley Moody's usual quality balsa and Japanese tissue covering provided in the kit, this is a real super-flyer modestly priced at \$3.98. Get yours while they're hot! DENVER ECHO

Phil McCary, Sweepstakes winner of the 1975 SAM Nats, came in for a good amount of roasting at the SAM Victory Banquet when he was awarded a set of panties by Roy Turner. In winning the Sweepstakes Trophy, Phil lost his rubber powered Lanzo stick model. Upon his return home, he received a letter from one of the local farmers stating, "I found your toy airplane in a wheat field. It is powered by a long rubber band." Phil relied on Turner to get his model, and Turner promptly mailed the model in a huge 3 ft. square by 6 ft. long cardboard box with the inscription, "World famous record breaking toy airplane powered with long rubber band. Handle with care." The SCIF members are still laughing.

Got another note from Joe Beshar, S.A.M. Prexy (you haven't lived until you get a letter from Joe!) wherein attention was drawn to the fact that Tim Dannels is the committee chairman to study the converted ignition engine problem. Write Tim with your suggestions!

#### MORE METHODS ON TRACING TEMPLATES

Jim Thomas just sent this columnist a Dritz wheel, together with instructions on how to use same. Jim says he gets extremely accurate results with this gadget. He uses the Dritz by placing carbon paper above the wood and the parts or plan outline above that. When he uses the same concentration with the wheel as he does with a razor blade, he finds results are good.

Actually, Jim modestly says the idea is not new, as his secretary reminds him that the Dritz people also make a model with a serrated wheel. This type tracing wheel could be useful in marking hinge lines, etc., with some sacrifice of damage to the original plan when cut exactly on the marked line. Worth looking into, men!

#### POLYESTER COVERING, ANYONE?

As a followup to the writeup on polyester covering featured in this column

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several months ago, Ralph Dodsworth of Saskatoon, Canada, offers this information in response to the columnists letter of inquiry.

First, the polyester lining (as it is used in dresses, etc.) is available from most yard goods stores at about \$1.00 to \$1.25 per yard (compare this with silk!). Best part is that it comes in 42 or 44 inch widths, and can be bought in any length up to 20 yards.

The material is handled very similarly to silk, only the framework is given four coats of dope. The acetate sheath is then attached to the model framework using thinner. As Ralph points out, the various brands will either shrink or loosen when dope is applied to the covering, so make sure your covering is tight to begin with!

As to colors, this is the most intriguing part of the use of this material. Practically any color in the rainbow can be obtained. Don points out there are six shades of yellow alone! It is just worth the time to go down to the store and see the various colors available.

The material is actually stronger than silk. Ralph rates the polyester lining to silk the same as he would rate silkspan to silk. Convinced yet? Here's more!

The lining is heavier than silk. Estimates say twice (big deal!), but the attractive part of the polyester is that it does not warp over a period of time. The material is tough and does not puncture

easily. Having very little grain, it does not tear readily.

To wrap up the subject, Ralph Dodsworth says the use of this material in Canada came about because of the extreme shortage of silk. Actually, this has turned out to be a blessing in disguise, as the polyester lining has proven to be a most satisfactory covering.

#### NOTES FROM WCN

*We've got a nibble on the 1940 photo by Al Hellman that was published in the August issue. Al Pinson, Atlanta, Ga., a fellow well known by early R/Cers, writes to identify the owner of the giant R/C ship as an electrician by the name of Freeman. This was the first and only ship he built! Al Pinson was there himself... in fact, he's the guy with his nose in the cabin. Anyone from the Miami area know if Mr. Freeman is still around?*

*Next, we received a criticism from SAM President Joe Beshar for suggesting that one bay be added to each wing panel of Pete Bowers' "Pursuiter," published in the September issue, in order to increase the wing area slightly to qualify it for a larger engine in R/C O.T. Naturally, Joe is correct. As the rules now stand, the whole ship should be slightly enlarged to maintain proper proportions. However, we feel that the .10 cubic inch per 225 sq. inches is too arbitrary a ruling, and that a more*



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*logarithmic rating system should be used. Not only that, it should probably be broken down into "cabin" and "pylon" classes. We'd like to work up a proposal to SAM for this, and invite suggestions for area vs. displacement limits. Come to think of it, we've become so embroiled in O.T.'s that we've never thought to send in our money and become a voting member! Guess we better*

*put first things first!*

### FINAL WORD

Just received a letter from Russell Stokes, who is rightfully proud of his 15 year old son who builds old timers with a passion. Dan has been modeling ever since six years old and really came of age when he won the Old Timer Event at the Southwest Model Airplane Championships with his Zipper. To show this was no fluke, he had previously built a gorgeous Super Buccaneer when barely 14 years of age.

Dan had really planned for the SAM Championships at Denver having four models all completely checked out. Matter of fact, Dan was so confident he had pre-paid all entry fees.

Well, wouldn't you know it, the doctors found something wrong with him and an immediate operation was in order. That did it for the O/T Nats. Dan is now planning a model for each event in the 1976 SAM Champs. Now how about that?

Dan is a triple threat man, being an honor student, top athlete and star football player. To top it off he is absolutely "bananas" about model airplanes. Then I just heard the other day from an old modeler who plaintively said, "Who is is going to take our place? "Well men, as long as we have young fellows like Dan Stokes coming up, no worry about the old timer kick. Who said, "I'll drink to that?"

**Sailing . . . . . Continued from page 31**

they too are working through Dave in order to meet AMYA specs. I would imagine that the 1976 season will be most heavily sailed in the wooden boats, with maybe a few 'glass ones in the hands of manufacturer's personnel. I'll be sailing my SPOI, which won the '75 ACCR, and that will provide us with a benchmark, as I do not intend to make any

changes except for new sails and to move the traveler for the mainsail down to a position flush with the deck. Here is a description of what I did to my boat in preparation for the 1975 ACCR.

**HULL:** I substituted 1/16 plywood sheathing for the 1/8 which came in the kit box. I understand that Dumas has now switched over to this thinner stuff which is much easier to work. I built up my own keel (the strip which runs down the centerline of the hull on the bottom) by laminating it up out of 1/2 x 1/2 pine. This required that I notch the frames somewhat differently before assembling them. I also removed 3/4 of an inch of height from each frame to bring the freeboard (distance from water to deck edge) back to the scale measurement. The extra 3/4 was added to the early boat due to the extra weight of older forms of R/C gear in use back then.

All frames were opened up on the inside until only about a 1/2 inch or so remained around the outside. This was to reduce weight, as well as to open the hull in preparation for a swing-arm winch. I used a solid noseblock forward of the No. 1 bulkhead. This was to prevent damage to the hull skin in the inevitable collisions which occur in competition. Of special need is to open out the frames just forward of the transom. I found that it is a fine place for stuffing a ballast bag on windy days when you want to prevent nosediving and promote planing.

I installed a Yankee keel, ballasted to 6.5 pounds, in much the same way as on the Yankee. I decided that making swappable keels on the STAR would be frowned at, so fixed this one in place (Fig. 1). Three top boats at the '75 ACCR had keels with slender bulbs, and they finished 1-2-3 in every heat sailed. I for one, would approve of leaving keel



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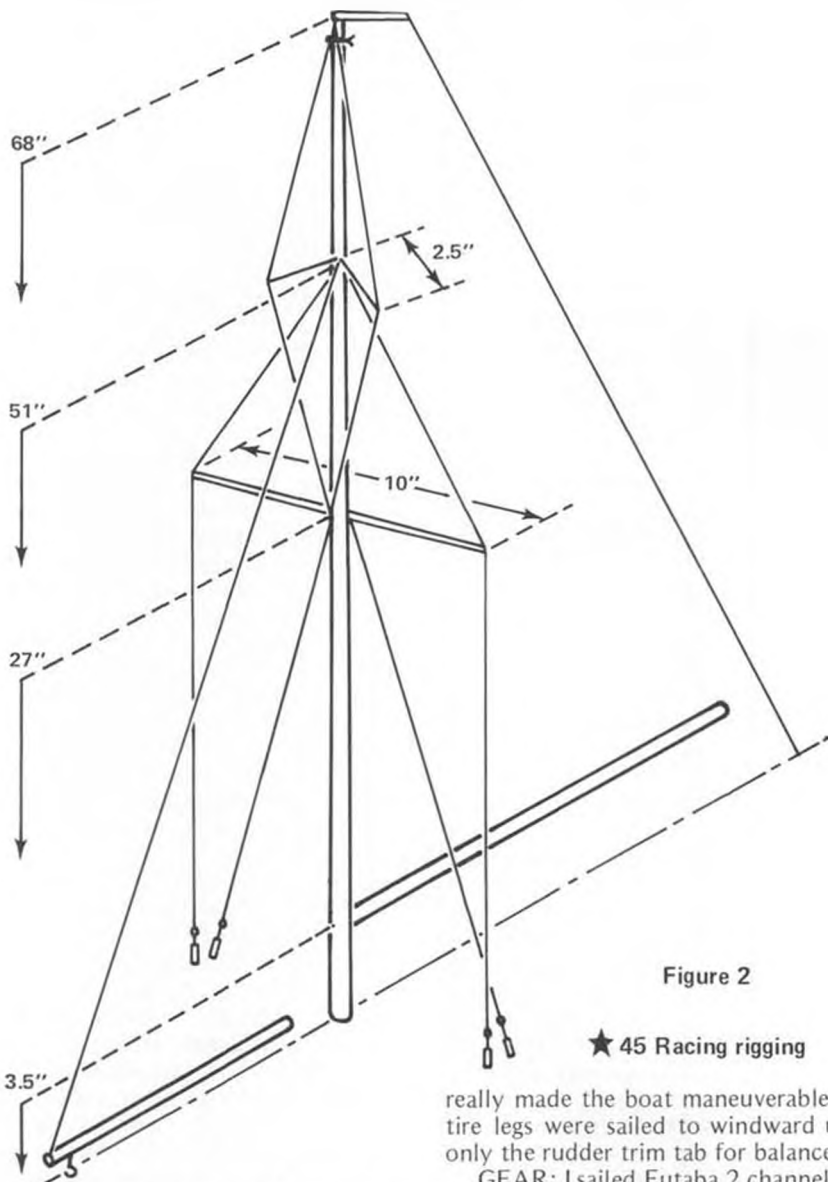


Figure 2

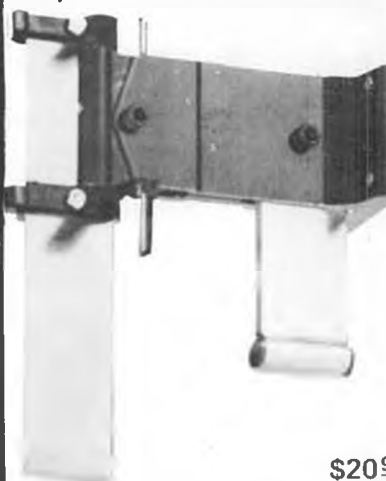
★ 45 Racing rigging

really made the boat maneuverable. Entire legs were sailed to windward using only the rudder trim tab for balance.

GEAR: I sailed Futaba 2 channel, originally but have now switched back to Kraft 3 channel. I may put a control on the traveler to allow it to be moved

shape and weight optional, but requiring that it be fixed and of some maximum draft. A Soling rudder was put in, and

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while underway (see photo). A Sail Engineering SE-1P proportional sail winch was used and it performed faultlessly during the entire season. I used a 2:1 purchase on the jib sheet, and a 3:1 purchase on the mainsheet, as I elected to sheet the mainboom almost directly under the clew of the main. This allowed precise control of the main leech, and by moving the mainsheet only 1/2 inch,

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I was able to make the boat snap to weather in the puffs, then slack off and close reach with excellent speed, without touching the rudder. This boat was tacking through an included angle of no more than 75-78°, and is much closer winded than anything I have sailed, except possibly Chuck Black's BINGO. I hope to get on the water with these two boats, and see if the STAR will outpoint the 50/800 which won the '75 ACCR for that class.

**RIG:** I used a single panel rig, with 3 oz. dacron in both main and jib. The main changes were in the manner of rigging, and there is a direct line from the Yankee rig to this one. A dimensioned drawing is included for your use. I am quite sure that the sails make the major difference, since at the ACCR, there was only one boat with the stock cotton variety, and of the boats operating, he finished dead last. Even a good skipper cannot make poor sails perform, but on the other hand, there is a definite problem with kit prices if racing

sails are included. I think Dumas has done the right thing by pointing their kit toward getting people into the hobby. Only about 25% of the boats would be expected to come out to race, and those skippers will undoubtedly add the new gear that they feel is necessary to become competitive.

Though long touted as a dog when compared with other boats, both AMYA Pres. Bob Harris and I were greatly impressed with the performance of the STAR. Raced as a one-design, its maneuverability at the starting line is great fun, and a real test of a skipper's reaction time. I'm so amazed at the pointing ability of the hull, that my drawing board has a 50 inch version with which the M-class may have to reckon in the near future. Forest Godby, 5th place finisher at the 50/800 ACCR this year, was sailing a hard chine boat, and is now at work on modifications. Won't that be an interesting addition to AMYA's largest class? But I digress. Next year, I'm going to take SPOT to a couple of

those "under 50" events we hear about out in the Midwest. Bet you a new jib that she cleans house!!!

A tentative location for the STAR 45 ACCR will be Pitman, New Jersey, according to the Class Secretary. Date has not been picked yet. If you have an old STAR in your attic, dust it off and come out and enjoy the sailing!!!

Remember to send your 1976 AMYA dues into Bud Salika, 3917 Sunnyside Avenue, Brookfield, Ill. 60513. This is the season that Bud breaks out the new vintage of his famous blueberry wine and makes up the new class lists and membership cards. Remember also, to list all your active boats when you renew your membership. You don't owe a dollar on a boat unless you have let it lapse by failing to report it last year.

I'll field questions directly at 7608 Gresham St., Springfield, Va. 22151, or in care of MODEL BUILDER.

C/L . . . . . Continued from page 37

is current World Champ, Bob Gieske, in second place, and Bill Werwage in third. Les McDonald just missed making the three man team, coming up 21 points short of Werwage's third place score.

This year's FAI tryouts were held in Dayton, Ohio. Not all of the wind is in Kansas, and Seattle isn't the only place where it rains. They had both rain and wind in Dayton.

Prior to the tryouts, there were fears of too many contestants (some expected as many as thirty to show up), but by Friday there were twenty-one that actually showed up to fly, ensuring that the FAI tryouts wouldn't be rushed and hectic.

It was a good field that did show up. All of the Top Ten at the '75 NATS were there, with the exception of Jim Lynch (7th) and Bob Whitley (8th).

Bob Gieske, using his '74 plane, (the '75 plane was damaged at the NATS), was top man on Saturday with a high score of 938.67 in the first round, and high score of 984.67 in the second round. After completion of Saturday's flying, Gieske was leading, followed by Gene Schaffer, Les McDonald, Bill Werwage, Al Rabe, Wynn Paul, Bob, Jerry Pilgrim, Kent Rogers and Fred Miles. Fifteen finalists were chosen using their top single score.

It was windy again on Sunday. Several fliers did an anti-wind-and-rain dance, but it didn't seem to help. Les McDonald and Gene Schaffer led early in the first round on Sunday with 920 and 929. Then Bill Werwage put up a good flight for a score of 946.33, which was top score in this round. Bob Gieske had some wind on his flight and scored a low 888.0. As Sunday's first round was completed, conditions got worse and nobody was able to challenge the leaders.

By the second round, things were pretty well wrapped up. Les McDonald and Al Rabe were the only ones to



have a shot at taking a team slot. Rabe was only able to score a 769.33 and was out of it. Les made a try for the team by putting up the best flight of this round, scoring 918.67, but he was still 21 points short. Gieske was sure of a spot on the team and elected not to fly in the final round.

Team placings were determined by the total of each flier's two best flights. Gene Schaffer came up with 1880.67, Bob Gieske with 1872.67, and Bill Werwage ended up with 1864.67. That is pretty close competition. Looks as if we have a very good team to represent us at the upcoming World Champs.

Keith Trostle, Pres. of PAMPA, that super Stunt group, ran off the FAI tryouts in a superb manner. I'm sure that Keith had lots of help, but it always takes one guy with initiative to run a good contest, and Keith is the one who did it this time.

All of the above concerning the FAI tryouts was freely and liberally stolen from my latest issue of Stunt News, edited by Wynn Paul. I want to thank Wynn for the results, but I can't help but wonder why nobody bothered to send in some pics from this very important contest. Names and scores only tell part of the story, pictures tell the rest of it.

Also included in Stunt News were complete specs on the planes used by the top three. Even though it will take up a lot of space in this month's column, I found the spec sheet to be very interesting, so I've decided to put it in. Again, thanks to Wynn for gathering dimensions and publishing the spec sheet.

1st FAI, Gene Schaffer. Airplane: own "Statesman" ST 46, 47 oz. Wing: Built-up D tube, 56 in. span. Root chord 10 in., tip chord 8 in., sweep 2 in., tip weight 1/4 oz., equal length panels, 640 sq. in., adjustable leadouts. Flaps: Root chord 3 in., tip chord 3/4 in. Both flaps span 27 inches. Tail: Stab span 25 in., stab root chord 3-1/4 in., stab tip chord 2-1/4 in. Elevator root chord 3-1/4 in., tip chord 2-1/4 in. Moments: front 9-5/8 in., rear 15-3/4 in. Engine rework: Hand fitted, full circle crank in '73 case, .003 ring clearance. Muffler: Art Adamisin, muffler pressure used. Tank: 4-3/4 oz., uniflow, home made. Plug: Fox 2 volt. Fuel: K&B 100 (X2C). Prop: Rev-Up 12-6. Lines: 60-1/2 ft., stranded, own handle. Paint: Sig. Misc.: Outboard wing built 1/2 oz, heavier by using heavier wood.

2nd FAI, Bob Gieske. Airplane: Gieske Nobler, Fox 35, Wing: Span 50-1/4 in. The ribs of a Nobler kit were traced with a fat ball-point pen and then cut. Bob says, "Don't laugh. That wing won the NATS twice and won the World Championship. Sure wish I had another wing like it." The wing is straight Nobler on everything else. This wing was completed and used on Bob's 1968 plane. In '74, Bob built a new fuse

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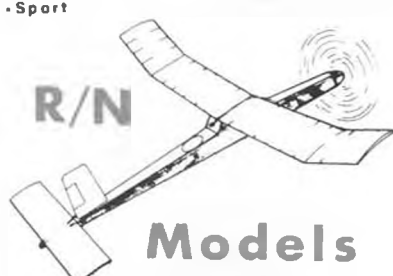
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and used the '68 wing. Flaps: Root chord 2-3/4 in., tip chord 3/4 in. Left flap spans 19-3/4 in., and right flap is 20-1/4 in. . . . That's right, outboard flap is longer! Tail: Stab span 20 in., elevator root chord 3 in. Moments: front 9-1/4 in., rear 14 in. Plug: K&B 1L. Prop: Rev-Up 10-6W. Fuel: Sig. Half Klotz oil, half castor oil. Line length: 59 ft.

3rd FAI, Bill Werwage. Airplane: own U.S.A. 1, ST 46, 51 oz., plane completed in '72. Wing: Built-up I beam, 62 in. span, root airfoil 17%, tip airfoil 16%, root chord 10.5 in., tip chord 9-1/2 in., sweep 2-3/4 in., 730 sq. in., no tip weight. Adjustable leadouts when

first built. Flaps: Root chord 3 in., tip chord 1 in., Left flap 24-1/2 in., right flap 22-1/2 in. Tail: Stab span 28 in., stab root chord 3-1/2 in., stab tip chord 2-3/8 in. Elevator root chord 3-1/2 in., tip chord 2-3/8 in. Moments: Front 10-3/8 in., rear 17 inches. Engine rework: Old style case, new crank, old re-done sleeve, single ring, new head, longer rod. Muffler: Enya, muffler pressure. Plug: K&B idle bar. Fuel: Own brew. Prop: 13 x 5-1/2 cut to 11-3/4. Tank: 5-3/4 oz., made by Randy Hancock, suction with pressure. Line Length: 68 ft., solids used in AMA, stranded in FAI, own handle. Paint: Sig

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That was really a pain typing up those  
specs, and I don't want to do it again  
for awhile, so don't lose this issue of  
MB! (You shoulda heard what our com-  
poser operator had to say about it! wcn)

\* \* \*

A couple of issues back I expressed  
my opinion about the future of Rat.  
In case you don't recall, I said that Rat  
is dying a slow death and that there is  
probably no way to save it. Here in the  
N.W., most all of the Rat fliers have  
quit the event already, with most of  
them going into Slow Rat and Goodyear.

Mike Hazel, of Eugene, Oregon, is  
pushing to change the rules used here  
in the N.W. so we can get the Rat fliers  
back and also pick up some new ones.  
Mike proposes dropping AMA Rat alto-  
gether and replacing it with a new event.  
The new event would be much like pre-  
sent Rat, but engines could be no larger  
than .36 and profile fuselages would  
be required. Planes would be like the  
old Quicky Rat and Skat Rat. Pressure,  
shut-offs, fast fills, and anything else  
you can dream up, would be legal.

Mike's idea is that by going to smal-  
ler engines and "dirty" planes, speeds  
should drop into the 120-130 mph  
range and we could go back to flying  
three-at-a-time. Also, equipment won't  
be quite as exotic and expensive, open-  
ing the door to many would-be Rat  
fliers. To help keep it simple, Mike also

suggests the use of .018 stranded lines,  
which sounds OK to me. They're plenty  
strong for the speeds these planes will  
be going . . . and a lot easier to get than  
solids.

At present, our N.W. Slow Rat event  
is fairly unrestricted, allowing pressure,  
fast fills, etc. In the past several years,  
our Slow Rats have become fairly so-  
phisticated, one-event planes, which was  
not the original idea behind Slow Rat.  
So Mike also proposes to change Slow  
Rat to an event that will be *really* slow.  
Profile fuselage planes with canopy, rud-  
der and separate, movable elevator (no  
stabilizers). Wings must be 300 sq. in.  
minimum, tank must be forward of the  
L.E. Engines must be plain bearing and  
run on suction feed. No limit on tank  
capacity, but fast-fills and shut-offs  
would not be allowed. Lines would be  
.018 x 60, stranded.

We still have some work to do on  
the final set of rules to be used next  
season, but they will be basically as  
presented above. Let me know if you are  
considering doing some changing to your  
Rat and Slow Rat rules. Somebody out  
there must have the answer to the pro-  
blems in Rat.

Incidentally, there will be a Slow  
Rat event in next year's AMA rule book,  
don't expect much. As a member of the  
CLCB, I have been in on the voting on  
the Slow Rat event. I predict that the

rules to be published in the '76-'77 rule  
book will be a mess, and not too widely  
used. The published rules will probably  
be a combination of three separate pro-  
posals for a Slow Rat event, and I don't  
think it's going to work.

\* \* \*

Carrier Fliers, do you feel ignored in  
this column? No doubt you do, as this  
is the first item I have concerning Carrier.  
Sorry, I don't fly the event (yet) so I  
don't keep up with all of the latest Car-  
rier stuff. Check in with R & R in MAN  
for Carrier items. Harry Higley is a Car-  
rier Freak and has a lot of good stuff  
about the event. Tell 'em Dirty Dan  
sent ya!

But I do have one thing to throw  
out to all of you who are into Carrier.  
Have you seen the new fuel pumps and  
large-bore carbs that Perry Aeromotive  
has come out with? In R/C, Perry carbs  
are highly regarded for their quality,  
availability of parts, and good high speed  
and low speed performance. Perry makes  
quality stuff.

The fuel pumps go on the engine in  
place of the existing back plate and are  
a diaphragm pump. The carbs are huge,  
as they don't have to depend on venturi  
effect to draw fuel. The pump forces  
fuel to the carb, just like the normal  
pressure system you are used to seeing  
on Carrier and Racing engines.

At present, the pump/carb systems  
are only available for 60's, and then  
just for the Veco 61, O.S. Max Schnuerle  
60F-SR, O.S. Max Gold Head and Black  
Head, Webra Blackhead, OPS 60, Super  
Tigre 51-56-60 ST Series and the Super  
Tigre G 60.

The pumps sell for \$23.95 and the  
carbs go for \$16.95. Don't buy just the  
carb or just the pump. Each item is a  
special thing and they have to be used  
in sets. The carb won't work properly  
without the pump, and vice-versa.

Although the Perry pump doesn't  
provide as much pressure as regular  
crankcase pressure, it does put out  
enough to give a good improvement in  
performance over a suction system . . .  
provided you also use the matching carb,  
of course.

Seems to me that an engine equipped  
with a Perry pump/carb combo would  
be a most attractive alternative to the  
normal engine pressure/fuel regulator  
seen on most Carrier II planes. Initial  
set-up of the system would be easy  
enough and adjustment of top-end and  
low-end settings ought to be a snap.  
Also, the system should be very reliable  
and trouble-free. A number of R/C fliers  
in this area are using them and have  
nothing but good to say about the latest  
from Perry.

If you are out to set a new record in  
Carrier II, it could very well be that  
you are going to have to use engine  
pressure to get that last little bit of  
power for those important high-speed  
points. But if competition in your area



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doesn't demand record-setting performance, or you just want to break into Carrier flying with a minimum of hassle, I think you ought to be looking at the Perry pump/carb combos.

By the way, K&B put out the .61 R/C engine with a Perry pump/carb already installed. Check it out.

\* \* \*

My Sig kit of the P-51 Stunter is done now, and I have about 20 flights on it. It takes a while to get used to a new Stunt ship, but so far I am pleased with mine... I better qualify that a little. I am convinced that the best flying Stunt planes are built from scratch. You know... hand-picked wood and all that. I decided to build Sig's P-51 because it is easy to build (I needed a plane in a hurry) and looked as if it would fly OK. And it does... Fly OK, that is... Not like a top-level Stunt plane does, but it flies very well for a kit-built plane.

I set my plane up exactly as shown on the plans and I am very pleased that the control horn for the elevator is external. With everything installed per plan, the flaps have way too much movement. By moving the pushrod up one hole on the control horn, I got more elevator movement and the plane flies better this way. I can go up one more hole on the control horn and probably will before I go flying next time.

As the plane was built for practice flying, I used Monokote on the flying surfaces just to make life a little easier (and the plane a little lighter) and painted the fuselage with Hobbypoxy. The fuse came out pretty nice but the Monokote is another story. I never have liked covering with plastic films of any kind and my covering jobs show it. A few little wrinkles and a whole bunch of dents in the wood. Oh well. It is a practice plane after all. When I go flying, Stunt planes go in first and Combat planes get stacked on top of the Stunters, so the plane is going to get dented up a little anyway. (*Sounds like Dan needs a few lessons, Sid. wcn*)

For power, I settled on an O.S. Max 35. This is my first O.S., but it won't

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be the last. The engine is really great. Lots of power (maybe even too much for the P-51, which is a little on the small side) light weight, easy starting and a nice, consistent four-cycle. Only problem with the engine is that there isn't a good, light muffler available for the engine that can be bought in your average hobby shop. O.S. does make a muffler for this engine, but it is held on the engine with a strap and that means cutting yet another hole in my cowl for access to the strap. And the muffler has to be removed before you can take the cowl off. Too bad O.S. quit making their small muffler for this engine. It was light and was held on by a single bolt through the muffler and into the threaded portion of the exhaust stack where the R/C baffle is attached.

Having decided that I just had to have a muffler of some kind, I thought I would make one out of a cigar tube.

Stopped into the local smoke shop and asked for a cigar in a tube. The biggest one they had.

"Yes sir, we have cigars in a tube. What brand would you like?"

"Couldn't care less. I want the biggest one you got."

"That would be this Dunhill cigar, sir."

"Yeh, that looks about right. How much?"

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"Let's see, that cigar is a dollar eighty-five."

"I don't want a whole box Can I just buy one?"

"They cost a dollar eighty-five each, sir."

"You're kidding! A buck eighty-five for one little cigar?"

"Yes sir, this..."

"You don't have to call me sir. Not if you're going to rape my billfold."

"Right, turkey. If you expect to walk out of here with this cigar it'll cost you a dollar eighty-five. Plus tax, of course. If you want it, OK. If not, please leave. Your gnashing of teeth is bothering the other customers."

What could I do? I bought the cigar, picked up a Semco adapter and a 1/2 inch extension and made a muffler that didn't work. Vibration got to the cigar tube on the very first flight, cracked it all to pieces, and it fell off. I know the cigar tube could be made to work. But I don't dare go back to that cigar shop to buy another one.

Right now I am using a short piece of thin-wall aluminum tubing as a pseudo-muffler. It doesn't muffle at all (the tube is constant diameter and there are no baffles in it) but it does direct a lot of the exhaust noise back along the side of the plane (Along with all of the exhaust gook) so I don't have to listen

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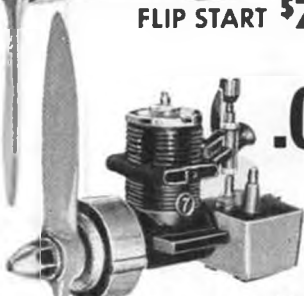
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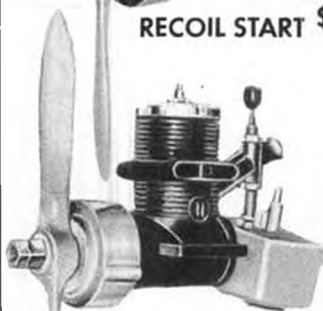
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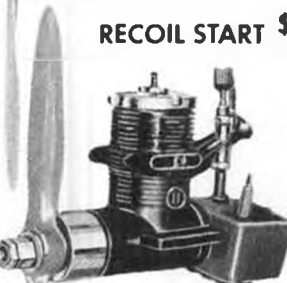
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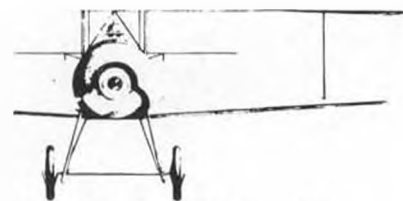
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to the bark of the motor while flying.

Art Adamisin makes a really good-looking muffler for the O.S., so I am going to get one to try. I'll let you know how it works.

I've got to quit writing. I'm getting a little dizzy. Waste not, want not, so I am smoking my \$1.85 cigar as I write this. It has to be the strongest cigar I have ever smoked. Does burn slow, though. Should have saved it for lighting

DT fuses at the next F/F contest. Bob Stalick would be very impressed . . . •

## Tethered Cars . Continued from page 39

type universal, as in a conventional car, coupled to a spur gear drive? It took some fancy design work but I have started on a design like this. If I ever finish it, I may be a winner . . . that is if I ever finish it.

## RESULTS

### AMERICAN MINIATURE RACE CAR ASSOCIATION

August 21—23, 1975

#### CLASS I COLD

1. Bill Pistoll	Arrow	Doolling	130.24
2. Ed Baynes	Arrow	Doolling	129.87
3. George Bryant	Arrow	Doolling	109.22

#### CLASS II HOT

1. Roger Phillips 2	Arrow	Y.J.	146.34
2. Roger Phillips 1	Arrow	Y.J.	144.92
3. George Cooley, jr.	Arrow	Doolling	113.49

#### CLASS II COLD

1. George Cooley, Jr.	Invader	Doolling	105.75
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#### CLASS III HOT

1. Loyd Torrey	Rouse	Y.J.	151.26
2. Roy Torrey	1234	Y.J.	151.26
3. Ben Laureano	Frypan	O.P.S.	147.78
4. Bob Sorrell	Frypan	O.P.S.	138.46
5. Ted Maciag	1234	Y.J.	138.46

#### CLASS III COLD

1. Loyd Torrey	Rouse	Y.J.	138.46
2. Bob Murphy	40 Car	K&B	125.87
3. Bob Murphy	Rouse	Y.J.	122.78
4. Bill Dyer	Davis	Rossi	122.11
5. George Bryant	Bryant Slab	Doolling	Pass

#### CLASS IV HOT

1. Ed Turnross	Papina	McCoy	112.35
2. Ted Dodd	Papina	Hornet	106.38

#### CLASS IV COLD

1. Bob Murphy	Doolling/F	McCoy	84.98
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#### CLASS VIII (inc. spurs)

1. Mike Lepurage	Spur	Doolling	104.52
2. Chris Lupo	Matthews	Hornet	59.24
3. Mike Lepurage	Spur	Doolling	Pass

#### MITES 15-19 & 29's

1. Ed Turnross	Turnross	McCoy	84.19
2. Butch Williams			73.11



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2. Chris Lupo	Frypan Mk 4	O.P.S.	168.85
3. Loyd Torrey	Frypan Mk 4	O.P.S.	168.85
4. Tonnie Pegue	Frypan Mk 4	O.P.S.	168.53
5. Roy Torrey	Frypan Mk 4	O.P.S.	167.59
6. Ray Yates	Frypan Mk 4	O.P.S.	167.28
7. Paul Kruse	1234	O.P.S.	165.44
8. Ed Turnross	Frypan MK 4	O.P.S.	164.53
9. Jack Boudakian	Baynes	O.P.S.	161.29
10. Ted Dodd	Frypan MK 4	O.P.S.	160.71

## TRACK RECORD

Garold Frymire	Frypan MK 5	O.P.S.	170.45
RUN WHAT YOU BRUNG		PREDICTED SPEED	ACTUAL SPEED
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2. Ben Laureano		151.00	138.88 under
3. Phil McDonald		153.77	139.75 under
4. Jerry Anderson		125.00	156.52 over
5. Bill Dyer	100.00	102.62 over	

**BEST ENGINEERED:** Ray Yates.

**BEAUTY CONTEST:** Ted Maciag.

**46 Entries** — States Represented: California, Colorado, Georgia, Indiana, New Jersey, New Mexico, New York, Ohio, Pennsylvania.

## Remotely . . . Continued from page 16

One other comment about judging. It is a tough job. A contestant is "on" for about 10 to 12 minutes, maybe twice a day . . . a judge is "on" from the first flight in the morning to the last flight in the afternoon or evening, and he had to watch each and every maneuver of each and every contestant. If the sun is hot, he boils; if it rains, he gets soaked; if it turns cold, he freezes his butt (and if it doesn't get frozen, it gets numb anyhow, from the long hours of sitting).

The recognition afforded the judges in Switzerland was not unusual . . . it was par for the course. At the banquet, when everyone had finished eating, they had the award ceremonies. Following introductions of contest officials, and talks by local dignitaries, the individual and team winners were called up to receive their trophies. Following that, all team managers were called up to receive souvenir medals of the 1975 World Championships, and following that . . . we went back to eating and drinking. While we were thus involved, a meet official

came by the judges table, and almost furtively, pressed a souvenir medal into the hand of each judge. It was similar to watching a small-time fence artist passing stolen goods. Whoopee.

Anyway, back to procedures . . . Treatment of the press . . . It continues to amaze us how, year after year, the modeling press is handled like an uninvited guest at World Championships. If these folks weren't there, at their own time and expense, to record the event in words and photos, the modeling world would have to depend on word-of-mouth to find out the results, and learn what happened to whom, and why.

In Berne, for example, responsible members of the world's modeling press were continually being shooed away from the action by our flight line director, who on his own, created more distraction than all the press put together. He was constantly strutting up and down the line, in front of the judges, chattering like a one hundred and eighty pound magpie, into a shoulder harnessed walkie-talkie that was totally unneces-

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sary because you could hear his voice all the way to the French border!

Members of the Modeling press (note underline) should be individually identified and given specific privileges as to times and places they may trespass the hallowed area around the flight line... no more, no less!

Tabulation is another area that needs standardization. Though it probably did not affect any of the relative standings, no one noticed until it was too late that tabulation would be dropping the high and low scores of *each maneuver*, rather than each complete flight score! Of course, this would be a hopeless task to do manually, but the computers were

at it again this year! (In Bremen, 1969, we insisted on writing down scores, rather than relaying them by push-button directly to the computers. Officials ran the computers anyway, since they were all set up, and they crapped out on the first flight!)

As mentioned last month, the computer print-out dropped each flyer's lowest score and showed only the three that counted. Consequently, after the contest, no one could tell which score was made in which round... Great!

We have mentioned only a few contest procedures that must be standardized and followed exactly by each hosting country. In an effort to compile a complete proposal on this matter, we invite comment from those who have witnessed, or been a part of World Championship competition, and who have noted procedures that must be standardized in order to assure more smooth-running and equitable competition.

\* \* \*

**WHOOPS!**  
In case you don't see it in AMA's magazine, we've already had to issue a clarification on the new Pattern rules for 1976-77. This came about because three of the proposals which were just voted in by the Contest Board have a certain amount of overlap that could lead to some confusion.

The three proposals are as follows:  
RC-76-11: Eliminate present Class C and adopt the Sport Biplane event as put forth by the MABA (Miniature Aerobatic Biplane Association).

RC-76-13: Change contestant classification titles from A, B, C/N or DN, and C/E or D/E, respectively to Novice, Advanced, Expert, and Master.

RC-76-14: Replace A, B, and C pattern maneuvers with three new schedules, with maneuvers and upwind/downwind sequence derived from the current FAI pattern.

The confusion obviously stems from the fact that proposals RC-76-13 and 14 have to do with a new name and a new pattern for Class C, whereas proposal RC-76-11 *eliminated* Class C!

Actually, the situation is not serious, and the solution to the problem is not difficult... it just needs to be stated. First of all, the C/N and C/E titles in proposal 13 become null and void (Kaput?), as they are eliminated by proposal 11. The former D/N now becomes "Expert," and the former D/E becomes "Master."

As to which maneuver schedule is flown, looking at proposal RC-76-14, this can be the choice of the contest sponsors, but it must be announced in pre-contest advertising. One choice is that, in accordance with proposal 14, the "Expert" pilots will fly the new Expert Schedule of 14 maneuvers, and the "Master" pilots will fly the full FAI pattern. The other choice, which is similar to the current situation, is that both "Expert" and "Master" can fly the full FAI pattern, with separate awards being made for the two classifications. The latter choice is the easiest and least confusing to administer and judge, from the contest sponsor's point of view.

### AIR-TO-AIR PHOTO

Jim Houston, of San Antonio (or is it Jim San Antonio, of Houston), Texas, has sent us what may be the first air-to-air photo ever taken of a model, by a model.

Jim installed a Cannon Dial 35 camera in his O.S. 35 powered, Sig J-3 Cub. This one pound camera has a spring-wound shutter/film advance mechanism, which permits shooting numerous half-frame 35 mm photos on a single flight, using a servo operated shutter release. The camera is mounted to shoot out the open scale door, making the photos more realistic because every exposure includes the bottom of right wing and the wing struts. It took 17 attempts at one session, to get the air-to-air shot of the Ugly Stik which is reproduced on one of these pages.

Unfortunately, the Cannon Dial 35 is no longer made, though it may be possible to pick one up in a shop that carries a large selection of used cameras.



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This camera is ideal since, in addition to the motorized shutter/film advance, it has an automatic lens diaphragm, thus ensuring correct exposure from most any attitude.

#### SMIFF, SNIFF

If the above report gets you to thinking about unique uses for R/C model aircraft, try the following on for size:

A clipping from the Fort Worth "Star-Telegram," October 17, 1975, reveals that... "The Harris County (Texas) Pollution Control Department has formed its own dirty air force... a model airplane capable of lightning swift samplings of emissions from industrial smoke stacks in the Houston area."

The newspaper story goes on to say that the "smog spies" are really shaking up the polluters. In the past, pollution control officers had to monitor manufacturing plants' emissions from the property line, where bad weather and strong winds made measurements almost impossible.

Officials are getting reactions from the polluters similar to those who object to radar speed control on highways, and expect the first court test case to come after the first of the year. However, the collected samples and techniques meet all the requirements that courts have needed in past cases.

#### STRING ALONG WITH AKITOSHI

Still another R/C model adventure... According to a report (with photos) in the "National Enquirer," June 10, 1975, the Yamanashi (Japan) Police District reports two situations in which a radio controlled model helicopter, built and operated by Akitoshi Tsukahara, saved a total of seven lives.

According to Yamanashi Police Chief Hidetashi Akaiki, the chopper took a light lead line to the top of a mountain ledge where a family of five had become trapped following a picnic. It was near dark, and the temperature was expected to drop to 2 above zero. The light line was attached to a heavy rope, which the father pulled up and secured to a rock so that rescuers could climb up and bring the mother and 3 children down.

In a another situation, the chopper

took a light line to a small island where a couple were stranded. Using this, a life raft was pulled to the island, and then the raft, with the people aboard, was pulled to shore by a heavier line which had been attached to it.

... Ya know? It just might not be a bad idea if some of us were to acquaint our local police forces with the capabilities we can offer along these lines. If any of us could be of use in an emergency situation, we would not only have the satisfaction of lending a hand, but we would also enhance the image of modeling and put ourselves in a better bargaining position relative to flying sites and unfair complaints.

#### R/C Auto . . . . Continued from page 29

9. Calculate the average front stiffness by

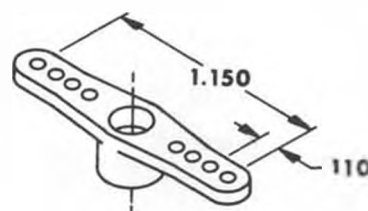
$$S(F) = S(LF) + S(RF) \div 2 \text{ lb./in.}$$

The two front stiffness numbers are probably closer together than the rear (unless the chassis is really tweaked) because the weight is further away. One can visualize that the softer rear tires will provide some decrease in the rear roll stiffness.

One of my cars, with the body and wing on, has a front stiffness of 10.0 lb/in. and a rear roll stiffness of 8.1 lb/in. Based on these numbers, my car is set up about right. I was very surprised by these numbers. However, since more weight is on the rear wheels, they should be harder to lift. During cornering, more weight is going to transfer at the rear. In my road car, the total weight is about 5.5 lbs, with 57-43 weight distribution (calculated from the individual wheel forces). If there is a total weight transfer of one pound, a first approximation is that there will be a 0.57 lb transfer at the rear and 0.43 lb transfer at the front. Hence the uncoupled (or free) rear deflection would be .070 inches (0.57/8.1), and the uncoupled front deflection .043 inches (0.43/10.0). You can see here that the rear deflection wants to be more than the front, which means that the effective rear roll rate is lower than the front.

The actual chassis deflection can be envisioned in the following manner;

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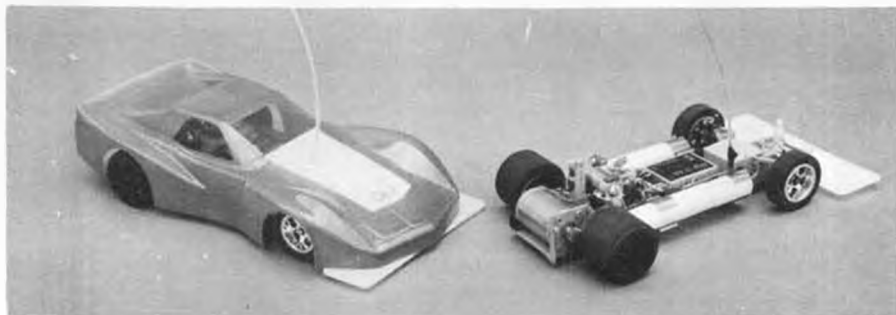
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after the chassis deflects the equivalent of .043 inches, the front and rear axles have deflected the same amount... any further chassis deflection will load the outside front tire more than its proportionate share since the front has already deflected its free amount and the rear has not yet reached its free deflection. The rear end weight transfer will consequently be a little lower. So, the front and rear roll stiffness numbers should be divided by the amount of weight they carry to find the effective roll stiffness numbers.

Hope I haven't lost you this far in talking about current cars. The above roll stiffness factors are considered in

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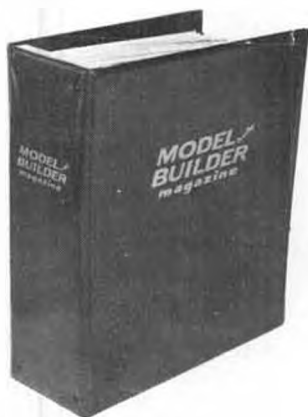
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the same manner for cars with suspension. However, it should be noted here that aerodynamic forces and front end geometry can alter these roll stiffness values during cornering at different speeds. But I don't want to get into that yet.

Some of the things I have talked about here assume you know a little about tire traction (for instance). A previous article on "Tires and Weight Distribution" explained some of the details. If you want a copy of that, or any other article, write to me at the address given at the end of my column. In general, the tire article explained that tire traction is best when it is lightly loaded

and when weight transfer is minimized. Track conditions, such as a dusty surface, can change these characteristics.

Anyhow, if a car always has problems with the front end not providing enough turning force, a front suspension can help. Suspension provides the front of the car with a decreased roll rate, so that less weight is transferred . . . therefore front traction and side force during cornering, remains near maximum. At the same time, more weight transfer occurs at the back end and there is a reduced side force capability. So when you do something to help the front, you hurt the rear. Hence only small changes should be made.

Usually cars which have a lot of weight on the front wheels (45% to 50%) have an understeer problem. First the weight is high, second the weight transfer is high, and third, harder and narrower front tires are normally used to give the car reasonable low speed handling characteristics.

Two cars currently manufactured have front suspensions, or a normally available front suspension; Delta and Thorp. Both of these suspension systems are called "rockers." The front axle is pivoted on the car axial centerline and rocks in the lateral plane. The Delta car normally has the majority of weight on the rear wheels, and the front action is highly snubbed. In fact, the front axle motion is normally only used to provide adjustable chassis "tweak." The Delta car really doesn't need front suspension.

Thorp cars, on the other hand, have quite a bit of weight on the front wheels because of the lay-down engine and/or the belt drive. Consequently, the Thorp front end suspension has more motion, but it is too hard to be reasonably limited. Usually heavy rubber bushings are placed on the axle and provide rather stiff springing. As was stated earlier, only a little front end motion is required, since rear traction is decreased while front traction is improved. Front rocking action will very quickly change understeer to oversteer, particularly when

power is applied to the rear wheels. Cars with a light rear end already have a slight problem with rear traction during power application, and the rocking front suspension tends to aggravate the problem. Hence a lot of Thorp cars run with differentials which limit the amount of power that can be applied during cornering (by letting the inside wheel spin freely when it lifts off the ground).

There are still a lot of things which I don't fully understand about rear "rock-er" suspension systems. Again, the general idea (of the rear rocker) is to improve traction, but funny things can happen. Only one car that I know of is sold with a "rocker" rear end, the A-D, sold in the San Jose, California area. Several others, which are scratch-built or test units, were on HRE and Scorpion cars, and also NorKar, a couple of years ago. When the rear rockers are rather free, the cars exhibit severe understeer at high speed, and power oversteer at low speed . . . not very desirable characteristics. The rocker rear end does keep the rear tires on the track better during cornering at speed . . . but a lot of weight transfer occurs at the front, decreasing front traction. With even what seems to be a reasonable amount of rear rock, the inside front wheel will lift off the track, obviously reducing front traction. To combat this problem, the Scorpion car I saw had the rear wing mounted to the main chassis plate, not the rocker, to attempt to hold the front wheels on the track during cornering at speed. But rear rockers (with rather free motion) also have a power delivery problem with low speed rear end traction. When accelerating from low speed, the rear end gets loose pretty easily, even in a straight line. Possibly the rear end wiggles too much because there isn't enough damping. To get my HRE rear rocker to work properly at both low and high speed, I had to really restrict the rocking motion. All that my car ended up with was a little more rear end flexibility!

So it seems that any suspension systems for R/C cars really only has to



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provide a very small amount of change for front and rear roll stiffness. Several things that suspension systems can provide are damping, controlled roll stiffness, and spring rates both front and rear. I think damping is a very important thing here, and suspension is not practical unless there is good damping. Current plate type chassis do give roll stiffness and some flex springing, but they are not controlled and there is little damping. So there is still a long way to go.

My next article on suspension systems will get into the more sophisticated approach to suspension. I'll cover the full front and rear suspensions that I've seen and comment on them and try to tell you what I think we have to do to get a good suspension system.

### LONG BEACH GRAND PRIX DEMONSTRATION REPORT

Thought you might like to read about an interesting demonstration of R/C cars we had in Long Beach, California, on Sept. 27 and 28, 1975. The demonstration was part of the Long Beach Grand Prix (LBGP). Moe Loara worked very closely with the LBGP Association to acquire a site and make all the arrangements for the demonstration. On Friday, only about six drivers and cars were on hand since a track was not set up. Even at that, several of the big car drivers were pretty interested in our "little toys."

About 24 drivers and cars that were invited showed up on Saturday. The early birds set up the track perimeter barriers, chalked the track and put down the corner boards. At first, the track was a little slippery, but as the day wore on, the traction got reasonably good. The LBGP Association had requested that we run Formula cars on a road course, so we noticed the traction problem a little more than usual.

We got in several practice rounds before the LBGP spectators started to arrive. Then we began a continuous series of 10-lap heat races so the spectators could see a lot of action all the time. There were about a hundred people watching at any one moment with

quite a turnover of people as the spectators went to their grandstand seats and new arrivals stopped to watch. As soon as the big F-5000 cars would get on the course the crowd would dwindle to a few and most of the R/C car drivers would disappear to watch the big cars practice. But I think we exposed quite a number of people to R/C car racing.

Moe Loara did a great job of organizing and being race director at this demonstration. All the drivers I talked to had a great time and enjoyed watching the F-5000 cars practice. Thanks Moe, and thanks to Jim Cade, who also put in a lot of effort too!

Well that's it for the month. If you have any questions, comments, or want to get back articles (35¢ each), write to me c/o MODEL BUILDER, or to Chuck Hallum, c/o HRE inc, P.O. Box 4658, Irvine, CA 92664.

F/F . . . . . Continued from page 49  
sions, built by Werner Thies, is equipped with the Go. 795. This model possesses very good flight characteristics and high performances.

A Wakefield model was built to test a wing with the Go. 795 section. For a wing chord of 5 inches, the rib spacing was 1 inch. Sag between wing ribs was very slight, but initial test flights were disappointing. The glide, when handlaunched, was very flat and the model behaved in the expected manner.

When we check the airfoil charts of the Go. 795, we find that it attains its optimum lift value quite near the stalling point. On a comparatively small model having a wing with no washout, asymmetrical stalling of one wing panel is bound to occur under transverse flow conditions; this in turn results in quite uncontrollable flight behavior. Slight washout should therefore be incorporated in the outer wing panels, when using such airfoils.

### RESUME

Werner Thies, in his research, has evaluated new scientific data. These theoretical results and practical data indicate that the commonly used thin and heavily cambered modern airfoils do not

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guarantee optimum performances for model work. Contrary to common opinion, flat bottomed or only slightly concave sections are not only advantageous from a constructional point of view but they seem to be superior performance-wise at low Reynolds numbers. To believe that the performance of a model is solely governed by proper airfoil selection would, however, be incorrect, since other factors must also be considered, which may well have a more decisive influence on the final results.

'POXY PAINTIN' POINTERS, by Steve "The Batman" Helmick

"In the last ten years, I've used four

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### Special Swap Shop Note

Over the past few years, the Swap Shop has been inundated with built-up models making it extremely difficult to fairly display them all. To provide maximum exposure of each built up model on display in the Swap Shop, 1976 Swap Shop Registration for complete models and airframes will be limited to one per registrant.

Make sure you make your plans now... 1976 will be the biggest and best WRAM's SHOW ever!



Show hours are 10 AM to 6 PM on both days. It's a weekend you can't afford to miss... see you there.

For further information, write to Frank DeVore, 18 Grove Ave., Larchmont, N.Y. 10538.

different brands of epoxy paints, including Woolsey and Poly Aqua boat paints. Back when I flew Ukie speed (tsk, tsk), the boat paints seemed durable, but I really couldn't swear to it. They also seemed to give better results, but now that I've tried both Hobby Pox and K&B Pox using the same techniques, they work very well too. This article is to let you know how to do it right the first try, so you won't go away swearing at the stuff like I did.

"Preparation for painting is the secret to getting a good finish, as with any kind of paint or dope. The best thing is a good coating of polyester resin. For balsa with open grain, you should

add some micro balloons for filler. Wet-sanding works wonders on polyester resin, but scraping with a sharp razor blade works very well on a hard surface like spruce, plywood or basswood.

There are several brands of polyester coating resins available from Prather Products, K&B etc., but they are all just coating resins. One thing with polyesters is that you gotta use fairly fresh stuff. Don't take a chance with that three year old can you left from the boat! It may not harden.

"Preparation of the paint is very important. If the instructions say to mix 50-50, do just that. Then forget everything else. Do, however, use the proper

thinner. Mix the paint at least two full days prior to your EDS (estimated date of spraying). Thin it at the 24 hour point, and let it sit another 24-48 hours, at room temperature, in a sealed, clean bottle. Seldom is it necessary to mix more than one or two ounces of paint, and frequently you will finish the job and still appear to have as much paint as when you started. Or even more!! (Steve has been sniffing the epoxy again, Bill.)

"Application of the paint is also very important, and here, the time honored brush doesn't cut it. Spraying gives far superior results, and a small cheap air brush is the most suitable. I've used a

### SOCIETY OF ANTIQUE MODELERS

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In making this application for membership to the Society of Antique Modelers, I agree to abide by the rules set by the Society and realize that the goals of S. A. M. and the Old Timers movement are to encourage participation above competition and is dedicated to the preservation and reproduction of vintage model aircraft.

Signed \_\_\_\_\_

DATE REC'D. \_\_\_\_\_

NO. \_\_\_\_\_  
DO NOT WRITE IN THIS SPACE

\$40 spray rig, an Ambroid Sprayer, which is an aerosol type, and a Badger Airbrush. The Badger is perfect. Guntis Sietins tells me he has a Badger and a Miller Airbrush, and likes the Miller better, but I don't know how expensive it is. The cheap Badger will do all we'd normally ask of it. The expensive Badger, etc. are only used for fogging, creating splotchy camouflage, and that "aged look" on scale or custom paint work. The Badger is adjustable for various spray densities, and really works well. It is also very easy to clean. The one with the smallest bottle is probably best for our use, and if you need more paint capacity, you can get a bigger bottle for it.

"There you have an easy way to get a very good finish, with durability far superior to normal dope finishes." NIGHT FLYING... Hand Launch Gliders!

We have all read about it, and many have actually flown at night, using chemical lights, so that we can keep our eyes on the drifting ship. Some use battery-powered lights and on a clear night, it's amazing how long you can see these ships as they join the lights of the stars.

In a recent issue of the Airfoiler, there was a bit that caught my eye. Night flying Hand Launch Gliders. How? Battery powered lights? Chemical lights? Nope. Chuck Anderson, editor, reports it this way: "While watching the night flying, one of the California flyers suddenly said, 'Look,' and pointed towards the dorm. I turned around but the only thing I could see was some lightning bugs. He then asked if those were fire flies. It seems as if there were none where he lived. The fire flies and night flying started another contest: night hand-launched glider. Several modelers had brought HLG's, and soon the air was filled with HLG's sporting lights on the wing tips (Fire flies Zapped, or Hot Stuffed to wing tips). One lesson learned: At night, the ground is just as hard, and the trees are just as high."

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model building or flying, here are 10 tried and true responses which you should copy down and glue to the back of your AMA License, so you can always find them. Nearly every one will fit nearly every occasion, but you will probably find one or two favorites. Permission is granted to use any or all. Another suggestion would be to have a card printed up with all of these sayings engraved thereon. By looking over the card, you can choose the proper response to use and simply read it off to the offending questioner. Here 'tis:

1. I tried that once before, and it didn't work.

2. I don't have the time.
3. You're right in theory, but ...
4. You're five years ahead of your time.
5. That may work in California, but it won't work here.
6. I'm just different.
7. I've always done it this way.
8. Let me think about it.
9. I don't have the energy.
10. I'm too old to change.

So, that about wraps it up for another month. Let's get busy building and flying free flight. Excuses number 1, 2, 9 and 10 are not acceptable for just sitting there ... now, number 6, I'd accept. ●



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**Workbench . . . Continued from page 4**  
"on stage" and had to deliver. Pardon our dramatizing, but we've tried to convey something other than the facts and figures that you'll see plenty of elsewhere.

It was an outstanding feat, and it took a lot of guts, determination, and planning to pull it off. Our heartiest congratulations to both of you!

#### CHALK ONE UP FOR MB

In our July 1975 "Workbench" column we published information sent to us by one of the country's elder statesmen of modeling, Bert Pond. This information made it fairly clear that the 1975 Nats was not the 44th, as proclaimed by AMA, but rather, the 49th! Aside from the fact that some early national modeling competition needed recognition, there was the frustrating possibility that the 50th Nats, certainly an important milestone in modeling history, might go by the board without proper fanfare. A flurry of correspondence among noted modelers and AMA, including Bob Meuser and Jim Noonan, the latter being another of the country's elder statesmen of modeling and one who really knows its history. It all culminated in a letter from John Worth to Bert Pond, of which we received a copy, stating that "At the October 25 Executive Council meeting in Dallas, recognition of the 1976 Nats as the 50th was approved. The effort you (Bert Pond) and Jim Noonan put forth to clear up the record on this is much appreciated. We now have great documentation concerning model his-

tory in the 20's, so you both have contributed considerably to our historical knowledge."

It seems that everything is falling into place . . . 50th Nats, Bicentennial year of 1976, Wright Field as the Nats site . . . has the makings of being the greatest ever.

#### TRADE SHOWS ARE A-COMIN'

With winter coming (the temperature plummeted to 55 out here last night!), it's getting near time to think of the annual trade shows. We checked around and have come up with the following schedule for the major modeling extravaganzas of 1976.

The RAMS, in Seattle, Washington, February 7 and 8.

The WRAMS, in White Plains, New York, February 28 and 29.

The Weak Signals "Toledo Show" . . . the biggest biggie . . . Toledo, Ohio, April 2, 3 and 4.

The MACS, in Anaheim, California, May 1 and 2.

A few preliminary details on Toledo indicate that all three days will be open to the public. Most dealers could not take advantage of their special times because of their store schedules.

The biggest problem at the new Toledo site was parking. This year, when the main lot is filled, a large free city lot, only half a mile away, will be opened, and free shuttle-bus transportation will be available. Tentatively, exhibitors will have parking space reserved for them up to 11 am each day, after that . . . rottsa ruck. A good idea, and under-

standably, they can't reserve space all day for exhibitors who don't take advantage of it.

Stop by our booth and say "Hello."

#### LETTERS

One very nice off-shoot of publishing a model magazine is the receiving of many pleasant (fortunately) letters from our readers. We hope that Ray Malmstrom, of England, doesn't mind if we share his letter with you, because it tells an interesting story and illustrates what we have just said.

"What a great surprise! I have just received the Phineas Pinkham Scrapbook . . . your prize for my being the oldest contestant in your recent Parcel Post Proxy Peanut contest . . . and I just had to write these few lines in gratitude. I do not think you could have sent me any prize that I would have appreciated more! What a flow of nostalgic memories Phineas brought back to me.

"I must not take up your valuable time, but must say that dear old *FLYING ACES* was my great magazine thrill before World War II. I bought my copies from a tiny news agent on a back street of old Portsmouth . . . and how I pored over the full-size plans (Ah yes! Always FULL-SIZE plans in those great days!!) laughed fit to bust at old P.P., and read every ad down to the very last full-stop.

"Had a great collection of F.A's, but during the war my home at Portsmouth was bombed, my parents evacuated, I myself away in the R.A.F. . . . and I never saw those precious copies again. And now, thanks to your kindness, the memories come back and Phineas raises the laughs as of old.

"All my thanks, all my good wishes . . . and another huge Parcel Post Proxy Peanut contest in 1976!

Very Sincerely, Ray Malmstrom"

Red Barrows, of the R/C Old Timer "No Name Club" of San Diego, sends an apology for the last-minute switch of dates on a recent R/C O.T. contest at Lake Elsinore, California . . . especially to Don Kiehl, who came all the way from Reno, Nevada on the old date, to find no contest!

Red also reminds us that the John Pond commemorative R/C C/T contest takes place on December 14 (absolutely!) in Santa Maria, California (north of Santa Barbara). This is short notice, but for more information, contact John Lesuer at (805) 922-5100.

#### SEASONS GREETINGS!

As the year comes to a close, we want to take this opportunity to wish all of our readers the very best Christmas holiday, and a very successful 1976.

And speaking of '76 . . . a sincere Happy Birthday to the good old USA . . . You're still the best, so help me John Wayne!!

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## Choppers . . . Continued from page 21

sleeve No. 431 lines up with both bearings and is free and easy to move. Re-seat the bearings as necessary to get this precision fit. The installation of the little spring (takes out control slop) was a bit tricky. I found the best way was to bend the "U-elbow" upward to give the proper clearance. Do not rebend the curve, it's just right! Final balance of main rotor was right on, without additional weight! They must use excellent production techniques to turn out this kind of quality.

The body shell was trimmed in accordance with instructions and literally dozens of clothes pins were used to clamp the shells together. Line up the "inside" of the body shells for the best possible fit. MEK or Plastic Weld is recommended for all joints. Work slowly in applying MEK to the inside seams where they can be easily reached. Rather than rigging up a long-handled brush to reach inside the tail boom, it's just good sense to tilt the body almost vertically and use a large brush (really loaded with MEK) at the top of the seam. The MEK will run down-hill, following the seam. Be sure to shake out any excess MEK in the tip of the tail before setting it aside to dry (at least two hours).

The instructions tell you to either cut out the windows, or leave them in and paint them. I recommend cutting them out for the tremendous improvement in looks (and it would be a real shame not to use the beautiful green windows supplied with the shell). All cut-outs were made with small scissors, then trimmed with a Moto-Tool sanding drum, working to the "inside" lines which are more distinct than those on the outside. Final window clean-up with sandpaper will complete the task. Read the instructions carefully when fitting the windows . . . The Du-Bro approach is to leave all windows intact and un-separated from one another . . . simply cut away the excess plastic and cement them in as a unit. And it really works too! See the photos for details.

Completing the body installation on to the basic frame was a snap, using the 4 stand-offs supplied with the body kit. All screw holes were reinforced with additional layers of plastic and the empennage was constructed very carefully with minimum cement (too much MEK will dissolve the thin sheets used in the tail group). Spars of balsawood were placed inside stabilizer and rudders with contact cement, for rigidity. UHU-Hart or Duco cement may be used to fillet around the tail group, if necessary, but use sparingly.

Having now spent all of two evenings constructing this little gem, I had to leave my happy home and go back to work Sunday PM. I left the chopper on the bench and when I came back home

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the next week-end my first peek inside the workshop disclosed the prettiest little chopper in my stable, all painted and striped by son Kim, who took it upon himself to decorate "his" helicopter. Every time I complete a new one, he takes over, makes a small modification, and claims it for his very own! Actually, he did an excellent job (being an ardent modeler himself). Final color was metallic red and white, with gold

stripe. You'd better believe it's a fine looker!

Because of the timing on getting this article in by deadline, we were able to fly only 3 or 4 test flights . . . with and without the body shell. The trim was almost exact, but as usual, required a slight adjustment of tail rotor trim. First flights were made without the body, and because of the light weight, it literally leaped off the ground just as soon

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as the throttle was advanced. Directional control was a little too sensitive, so we moved the servo link a little closer to the center of the arm. This helped a lot, and even though the wind conditions were gusty, the little chopper exhibited excellent control. Remember too, that without the body, there are no tail-feathers out on the boom to help stabilize it.

After a couple of tanks of fuel in this mode of operation, we took our allotted 5 minutes to install the Hughes 500 body and flew it again. It was necessary to add a couple of ounces of lead weight in the nose to counterbalance the added

weight of the tail boom. Again, the response was terrific, and she flew with all the grace of the larger helicopters. I think my first reactions to the plastic body were from pre-conceived ideas resulting from other unsatisfactory experiences, but I certainly am pleased with the Scorpion and Hughes shells on this kit, and expect a long life-span due to the fine materials used and design techniques involved.

## FINAL APPROACH

This Tri-Star just has to be a winner in anybody's game . . . she's beautiful, inexpensive, right size, and flies very well for the experienced chopper pilot.

I would, however, hesitate to recommend it as a beginner's machine for two reasons . . .

First, the instructions and drawings supplied with the kit are inadequate, unless you've had previous experience in constructing helicopters (the photographs with this article should help considerably in "visualizing" the missing drawings.)

Second, the directional stability leaves a lot to be desired, since the tail rotor control is so very sensitive! Adjusting the tail rotor linkages to absolute minimum throw did help a bit, but I'm not too sure it's the final answer . . . perhaps the Kavan gyro will tame it enough for the beginner . . . or an added vertical fin might help.

Anyway, this next weekend I'll put her through her paces, though I'm already convinced she'll prove to be a very active machine for the money. BCNU next month. ●

**Americanus . . . Continued from page 10**  
epoxy them. Now cover the fin sides with 1/32 sheet.

**WING AND STABILATORS:** Both foam and built-up structures are shown. Recommend either be covered with 1/32 balsa sheet, particularly if the metal-foil covering is used. Note the use of sheet plastic root ribs and screw retainer plates on the stabilator. I used .018 poly-carbonate sheet which is a very tough plastic!

**ENGINE COWLING:** The mounted engine was wrapped in paper towels with no undercuts, plaster applied, and then shaped for a male mold of the lower cowl. This was used to make a fiberglass cowl. The balsa jet nacelles were then fitted to this and faired with cloth and glass. Pull this off the engine and shape the inside, reinforcing with fiberglass where necessary. (An alternate method of making the cowl is to build up and shape from balsa blocks). The tail-pipes are 1/32 sheet tubes, attached with 2-56 screws to the nacelles.

Nose and tail were shaped from urethane foam and lightly glassed. Hollow out the tail cone for weight savings. Ambitious builders may build up a hollow nose section with detailed interior and clear plastic windows. Or, leave it solid and use Monokote black windows. The cabin windows are also patches of black Monokote (sticky-back trim).

**RADIO INSTALLATION:** Mock-up your particular radio equipment to locate the C.G. near that shown on the plan. Better more forward than aft! (Put the battery in the nose if need be). Installation of the 3 channel Cannon is shown, giving elevator, throttle and aileron, with coupled nose wheel from the aileron servo. If rudder is used, couple nosewheel to it as usual.

**CONCLUSION:** I preferred shock mounting the wing with rubber bands. Most all other components are attached

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with screws. The finishing technique is at builder's option, but I used rivet-detailed metal foil covering. (See separate article in this issue by the same author. wcn)

This miniature Jetliner takes more time to build than the typical square "ugly" something, but the results usually speak for themselves. With your own ideas, imagination and efforts, you can be a part of the jet age with your own "Clipper Americanus."

**F/F Scale . . . . Continued from page 41**  
 will argue that R/C scale is the toughest one. After all, look at the amount of time and bucks that go into the good AMA scale R/C model. I agree, but with good, sound, reliable radios that are commonplace today, and a proficient pilot at the transmitter, the chances for flight and survival are excellent.

There is nothing more that can weaken the heart and send one's pulse rate sky high, than to start your model's engine in preparation for the first flight. In many cases, years of work is on the line on that first launch. A need for tall grass is evident . . . but once the model has been trimmed to fly the way you want it to . . . there is nothing more gratifying.

The question in my mind is, why does there appear to be a lack of interest in gas scale? Even on the Nationals level, there are seldom more than 30 gas powered scale models, and that's including Juniors through Open members. That doesn't come close to averaging one model per state. Now that rubber scale has experienced a renaissance, what can be done to get the same kind of action for F/F gas scale? Why can't there be some kind of international competition for both rubber and gas scale?

With only 6 AMA scale entries this year at the Nats, three of these six entrants will be representing the United States in international competition. Wouldn't it be nice to have a F/F scale team chosen from fifty or sixty competitors and going along as well? Maybe this is what it will take to put gas scale into the swing of things, and I for one, will see what can be done. How about you?

**Found . . . . . Continued from page 33**  
 attempts are successful. I believe that the rubber I was using is not quite as powerful as Pirelli, or the newer black Sig contest rubber.

Dead calm glassy conditions are fine for test flying, but they are a little harder to R.O.W., because the surface tension is harder to break. Have a friend throw a pebble in the water just before you attempt the R.O.W.

The best conditions for R.O.W. flying include a very light breeze to lightly ripple the water, and a drift that will bring the model back to you if it lands in the water. The breeze also shortens



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the takeoff run and gets the model on step quicker.

It is not always easy to observe everything that occurs during a takeoff attempt. If the propeller throws a lot of spray, either add spray dams, lengthen the spray dams that you have, or shorten the propeller a little. Water thrown back on the model is another source of drag and excess weight during the takeoff.

If the model dunks itself several times, give it a chance to dry out. The extra weight of a water-logged model is unfair to the poor little thing.

Go out and have fun with your Found. It's the best excuse a person ever had to go wading along a muddy shore.

**Counter . . . . . Continued from page 7**  
 fornia 91331, comes with 96 pre-cut parts which are machine cut and hand finished from the finest balsa. The kit comes complete with all hardware, but the necessary sheet and strip stock is not supplied. This holds the price of the kit

down to a very reasonable \$25.00. The three large plan sheets are beautifully printed in blue-line, and together with the step-by-step instruction booklet, makes assembly of the kit very clear and straight forward. This semi-kit puts the latest design trends, incorporated into a quality kit, well within the reach of the average modeler. The Satellite 788 GLH is available direct from Satellite City. Californians remember to include an extra 6% "mad money" . . . Oh . . . be sure to stick it together with Satellite City's "Hot Stuff!"

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tuator output drives the boat forward through the water. Plankton sells the radio units, as well as offering plans packages for the small scale boat hulls. Write to Walt Whippo, Plankton Boats, 110-M Sunset Drive, Cocoa Beach, Fla. 32931.

Polk's Hobbies, 346 Bergen Ave., Jersey City, New Jersey 07304, has introduced a new item that is one of those things that you'll want to have immediately, even though you probably don't need it right now, but some day... Hide-A-Wire is a lamination of hair-thin insulated wire to 1/2 inch clear pressure sensitive tape. Intended for low voltage applications, it can be used as antenna wire, or speaker wire for AM, FM, and TV applications. Hide-A-Wire is nearly invisible on application, and can be painted or wallpapered (Monokoted?) over to make it completely invisible. The most obvious use for modelers would be as a receiver antenna for R/C applications. Scale modelers may want to use it to route current to wing tip lights, landing lights, etc. There are probably a hundred other applications for modelers... your imagination is the only limit. Hide-A-Wire retails for \$2.49 for a 24 foot roll, available from dealers or direct from Polk's.

A hundred and forty-four pages of model aircraft know-how that is as current as any available. That is the best way to describe the Aero Modeller Annual for 1975-76. Compiled and published by Model and Allied Publications (the publisher of Aero Modeller Magazine), the Annual is a survey of achievements in the model aviation field. It is packed with the best of topical features and designs from all over the world. The 1975-76 Annual is the 28th in the series. Special features include a large section on Old Timer models (featuring MB's own John Pond on the cover, no less!), a section on finishing models with the latest materials, a pictorial tour of the O.S. engine factory in Japan, and a survey on control line combat design and tactics. Also covered are Pennyplanes for indoor sport flying, a low-down coverage on gyroscopic effect, and 36 reduced plan outline drawings of the most progressive designs of all types of models (Jon Davis' "Groovy Tuna," featured in March '75 MB, is incorrectly credited to M.A.N.). The Aero Modeller Annual is available from better dealers, or direct from Model & Allied publications, P.O. Box 35, Bridge St., Hemel, Hempstead, Herts, HP1 1EE, England.

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**OLD TIMER MODELS:** Beautifully built and covered with transparent Monokote. Each model is custom built by Dale Myers. Will sell or trade for ignition engines. Box 66, Stewartstown, PA. 17363.

**SAILPLANE DESIGNER'S HANDBOOK:** Design instructions, 180 airfoils, 63 designs, 3rd printing, \$4.96. Eric Lister, 953 Klockner Rd., Trenton, N.J. 08619.

**PEANUT SCALE:** Great old plans, photo reduced, printed black on white, Comet, Megow, Peerless — 50¢ ea., any 10 for \$4.00. Send S.A.S.E. for list. Marc Tackett, 214 So. Brookhurst, #2, Fullerton, CA. 92633.

**ENGINES:** Latest selection of new and used ignition, glow, and diesel engines. List 25¢. T. Crouss, 100 Smyrna, West Springfield, Mass. 01089.

**EXHIBITION MODEL PLANS:** Northrop T-38A Jet Trainer used by Airforce Thunderbirds. Called "Little Tiger" in Vietnam. A real knockout. \$4.00. 26" long, 15" wing-span. R. L. Stearns, 514 Holden St., Raleigh, North Carolina 27604.

**WANTED:** Old ignition and glo racing engines, such as Dooling, Hornet, McCoy, etc. Send price with first letter. Guy Livingston, P.O. Box 94, Rockland, Mass. 02370.

The Baby Stick features a built up wing, using the machine-cut parts supplied. The kit, which builds up into a 30-inch span plane, comes complete with formed dural landing gear, a sprung music wire nose gear, all pushrods, control horns, nuts and bolts.

The Mini-Jenny uses an Ace foam wing and all machine-cut balsa and ply parts to build a 31 inch sport plane. With modifications shown in the kit, the Mini-Jenny can become a full fledged 1/2A racer that is hard to beat. Retail price for either kit is \$19.95.

Also from Cathedral is the Celebrity. This is a 42 inch span trainer which flies with three channel radio gear, operating rudder, elevator, and throttle.

## INDEX TO ADVERTISERS

Ace R/C Inc. ....	6th Cover
Airtronics .....	3rd Cover
American Balsa Corp. ....	66
Astro Flight Inc. ....	60
Applied Design Corp. ....	70
Bill's Miniature Engines .....	58
Cannon Electronics .....	58
Carr Sails .....	82
Century 21 .....	65
Cloudbuster Venture .....	85
Coverite .....	76
Jim Crockett Replicas .....	85
Custom Craft Products .....	76
Dumas Products Inc. ....	4th Cover
DTC Design .....	74
Du-Bro Products Inc. ....	71
Flyline Models .....	60
Flying Scale Models .....	72
Glider Guiders .....	75
Carl Goldberg Models .....	1
Golden Age Reproductions .....	75
HRE Inc. ....	84
Jo-Mac Products .....	85
K&B Mfg. ....	56
Kraft Systems .....	2nd Cover
Leisure Electronics .....	78
Leisure Products .....	82
Micro Models .....	81
Model Builder Binders .....	78
Model Builder/Pana-Vise Contest .....	2
Model Builder Products .....	5th Cover
Model Racing Products .....	68
MKM Designs .....	86
Model Rectifier Corp. (MRC) ....	8th Cover
Walt Mooney Peanuts .....	86
Sid Morgan (Vintage Plans) .....	86
M&S Ltd. ....	79
Nelson Model Products .....	61
Bud Nosen Models .....	64
Octura Models .....	69
Pana-Vise .....	75
Proxy Peanut Contest .....	59
Peck-Polymers .....	67
Plankton Boats .....	73
Polk's Hobbies .....	74
John Pond O.T. Plan Service .....	81
Proctor Enterprises .....	86
Raceplanes .....	73
R/N Models .....	71
Rocket City Specialties .....	77
Satellite City .....	65
SC Modeler .....	70
Scott Research .....	67
Sig Mfg. Co. ....	7th Cover
Special Edition Plans .....	62
Jack Stafford Models .....	79
Sterling Models .....	57
Sullivan Products .....	69
Su-Pr-Line Products .....	77
Swank Products .....	73
Tern Aero .....	71
Tyro Model & Supply .....	75
VL Products .....	62
Victor Model Products .....	68
Vintage Aero .....	74
Vortex Model Engineering .....	83
Peter Westburg .....	81
Wilhold Glues Inc. ....	60
Williams Bros. ....	63
WRAM Show 1976 .....	80

The Celebrity is designed for .09 to .29 power. The very complete kit is sold with a Kraft-Hayes fiberglass motor mount, formed landing gear, and all necessary control linkage hardware. All balsa and plywood is hand selected and machine-cut. The Baby Stick, Mini-Jenny, and

are claimed for the plugs. Effective January 1, the present direct sales program will be discontinued, and GloBees will be available only from model/hobby dealers. At that time R/C and sport versions of the plugs will also be in production. For additional information on GloBee racing plugs contact Fusite Division, Emerson Electric Co., 6000 Fernview Ave., Cincinnati, Ohio 45212.

Cathedral Model Manufacturing has entered the very popular 1/2A sport R/C market with two miniature versions of larger popular sport designs. The Baby Stick is a shrunk-down Ugly Stik, and the Mini-Jenny is a 1/2A size version of Hal deBolt's popular sport trainer.

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Celebrity are available from Cathedral  
Model Manufacturing, 200 Hunter Street,  
McComb, Mississippi 39648.

\* \* \*  
The Introduction (that's right!) to  
the instruction booklet that accompanies  
the Rubber Ducky, from Performance  
Flight Systems, 2840 Seattle Drive, Los  
Angeles, California 90046, states that  
"the Ducky will thermal with all but  
the lightest floaters, yet when the ther-  
mal dies it can get to the next one  
minutes ahead of the competition." This  
combination slope/thermal design uses  
a semi-symmetrical airfoil with a light  
wing loading to give it this unique ver-  
satility. The Ducky uses a four-piece  
ASA plastic fuselage which is assembled  
by the builder with conventional model  
cement (Testors or equivalent), and a  
foam wing which is partially sheeted and  
capstripped with 1/16 balsa (sheeting  
material is included in the kit). For slope  
aerobatics, the stock 75 inch wing can be  
cut to 60 inch span.

The Ducky can be flown with any  
combination of controls to suit the  
builder. Options include rudder, elevator,  
ailerons, flaps, conventional or Vee-tail,  
or various combinations of coupling of  
these. Full size templates are included  
to cut the tail pieces to shape. The fast  
assembly kit comes complete with every-  
thing needed except covering material,  
paint, and glue. Due to the speed of  
flight, and sensitivity of controls, the  
Ducky is not recommended for begin-

ners, but it would be ideal for an ex-  
perienced power flier who wants to try  
soaring. The Rubber Ducky is available  
from hobby dealers, or direct from Per-  
formance Flight Systems for \$44.95.

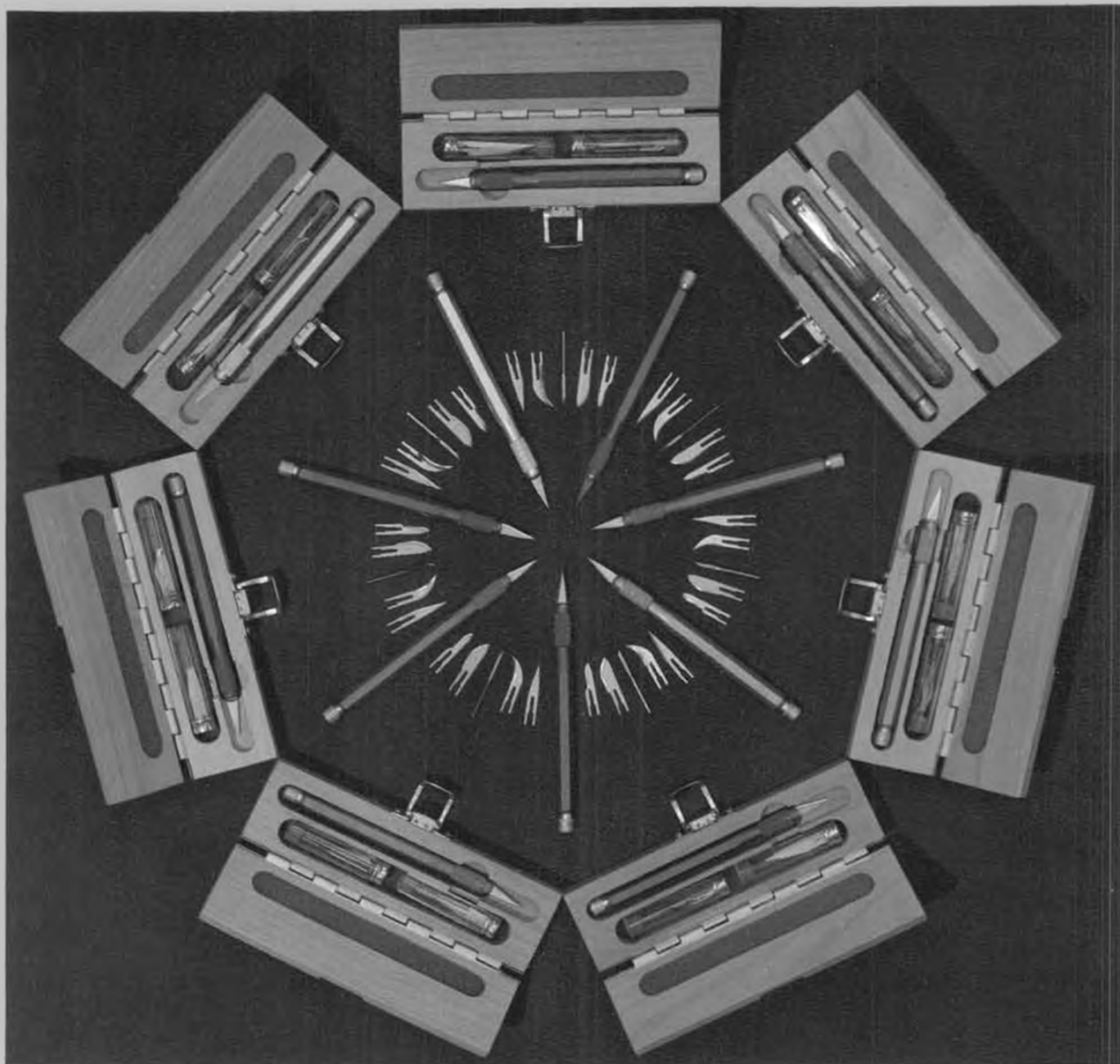
\* \* \*  
Bob von Hellens, 1974 Western Soar-  
ing Champs winner, has formed a new  
company, Glider Guiders, to manufac-  
ture the "Fly Hook." Fly Hook is an  
indestructible, adjustable tow hook de-  
signed for competition and sport flying  
of R/C sailplanes. It is made of rigid,  
high carbon steel rod stock, and is welded  
to add extra strength. The hook is fin-  
ished in matte black, and comes com-  
plete with mounting hardware. The best  
feature of this hook, unlike others on  
the market, is that it cannot be bent  
with your bare hands. It is strong enough  
to be used as a landing skid, and can be  
landed on concrete repeatedly without  
damage or appreciable wear. Need we  
say more? The Fly Hook is available  
direct from Glider Guiders, P.O. Box  
1400, Valley Bank Center, Phoenix,  
Arizona 85073. The Fly Hook was de-  
signed by competition sailplane fliers  
who know the strains that hooks are  
subjected to. The manufacturer is so  
confident, that he offers an uncondi-  
tional guarantee. If the Fly Hook is ir-  
reparably damaged or broken, Glider  
Guiders will replace it at no charge  
(other than 30 cents for handling and  
postage).

\* \* \*

Combat fliers should welcome the  
addition of two new designs to the  
Midwest Products Co. line of control  
line kits. The Lil' Snip is a 24-1/2 inch  
span plane designed for the growing  
1/2A combat event. It was designed by  
leading combat flyer, Rich "Von" Lopez  
(and originally published in MB, Feb-  
ruary 1974). The kit, which includes die  
cut balsa and plywood parts, and all  
hardware including a fuel tank, can be  
built in two versions. One version uses  
an enclosed fuel tank (which is included)  
with a Tee-Dee .049. An alternate ver-  
sion uses a ply firewall and either a  
Black Widow or Golden Bee radial  
mounted reed valve engine. The Lil'  
Snip uses a diamond airfoil for maximum  
ease of construction. The tail booms are  
die cut from plywood to survive the  
inevitable crashes. Retail price is \$6.50

The larger Firefly, designed by Ed  
Bridant, uses a more conventional sheet-  
ed D-tube type wing. The 35-1/2 inch  
ship is designed for .15 or .19 size en-  
gines. The Firefly also includes all hard-  
ware and fuel tank components. The  
Firefly will sell for \$10.95. Both kits  
are available from your hobby dealer or  
direct from Midwest Products Co., 400  
South Indiana St., Hobart, Indiana  
46342. Early in 1976, a .35 powered  
combat design will be available from Mid-  
west. The Matador will be similar in  
design, and the kit will be equally com-  
plete as the Lil' Snip and the Firefly. ●

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12  
15  
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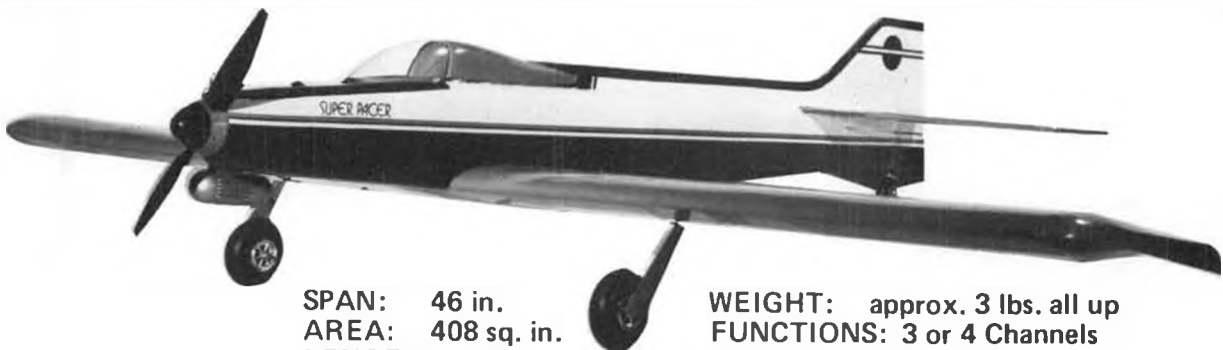


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