

.020 Replica Plan • The Toledo Show

\$1.00

47506
JULY 1977

flying **models**



R/C Boating

Stand-Off Scale
Fokker T-2



**A Canard
Controline
Stunter**

FM Kodachrome: Don McGovern



DUMAS' NEW OUTBOARDS MAKE A "HULL" OF A DIFFERENCE

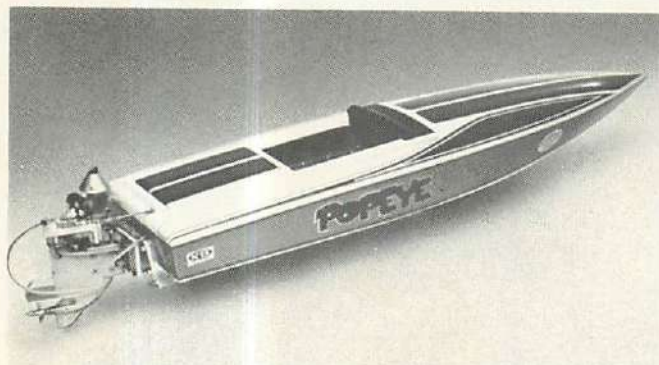
Whether you're running for fun or competition, Dumas' new Hot Shot, the outboard tunnel hull specially designed for the recently introduced 3.5 outboard engine, will blow your mind.

This 24" tunnel kit is easy to build from die-cut birch and mahogany plywood. All you have to do is add your radio and bolt on the engine... and you're ready to run.

You'll also want to look at the 30" Deep Vee 20CF fiberglass outboard kit.

With either of these two boats you can get into one of the newest and fastest growing NAMBA classes.

See your local hobby dealer and take a look at our new Hot Shot and the other Dumas boats or send us 50¢ for our new catalog illustrating the complete line of Dumas boats and hardware.



KIT DV 20CF
A competition Deep Vee.



HOT SHOT (Kit #1311)
Tunnel hull model designed for 3.5 outboard.

dumas
boats

Dumas Products, Inc., 909 East 17th Street, Tucson, Arizona 85719

HAROLD H. CARSTENS,
PUBLISHER

DONALD J. McGOVERN,
EDITOR

James A. Boyd, Associate Editor
Robert Hoeckele, Associate Editor
Gerald Dunlap, Contributing Editor
Robert Aberle, Contributing Editor
Edward Whalley, Modeling News Editor
Wayne M. Daniels, Advertising
Production Manager

Jane Witmer, Office Manager and Bookkeeper; Evelyn
Scheck, Asst.—Elizabeth Dickson, Circulation Manager;
Jeanne Sipley, Joan Andrews; Linda Jones, Judy Koester,
Assts.—Catherine Streeter, Dealer Service Dept.—
Miriam Lee, David Case, Janet Bodeman, Theresa V. Ma-
resca, Advertising Production Assts.—Greg Henderson,
Jim Evans, Shipping

Violations of the Prime Directive

The last big buck Carrier Pigeon punched out when he ignored that ancient mandate: "Thou shalt not fly on an empty stomach..." When he made an in-flight pit-stop on the belly feathers of an inverted eagle he got invited to lunch. So it goes... be alert. The whole modeling game has risen on the ashes of past aeronautical disasters and lies shakily balanced on the Holy Prime Directives, carved in stone for your well being. Abide by them, or thou shalt dork.

The world lost the last giant Moa if you remember in that dam-busting/skip-bombing episode. The beaver's river stoppage remained intact, but the tragedy of it all was that that last precious egg coasted and sank in the shallows, whereupon it got zapped by a love-sick electric eel, the first of us to be shellshocked. Checking the NOTAMS here we find: "There will be a slight landing charge at some seaplane bases..." That's aviation for you. Each new landing opens up a whole new set of possibilities for adventure. Take Chet's case for instance. His Brooklyn Dodger went over the fence at Creedmoor. So did Chet. Getting in was one thing, getting out quite another. Again, the awesome Prime Directive: "Thou shalt not tell the ground attendants at the State Mental Hospital that you can't find your airplane." Or perhaps my own case, none of us are infallible: "Thou shalt keep your servo-stricken soarer out of the Kingston, Jamaica prison." Sal's not perfect either: "Thou shalt weld a bob-wire cutter forward of thine trailbike for moonlight thermaling." And Leo Rutledge does not score too swiftly for another: "He shalt not dork his Detroit iron into the Navy's last Grumman TBF."

Even when you're obeying the P.D.'s you're in trouble. "Keep your eye on the sky at all times." Like as in don't take your bloodshot orb off your rotten, greasy airplane in the ground riser as you gallop cross-country in strange terrain. So, over the cliff-edge of the garbage-pit did I go, but don't laugh 'cause I saw the note you tore up from your teacher in 1940 while I was down there with the rats and paint cans.

Don

including FLYING ACES est. 1927



JULY 1977

VOLUME 80 NUMBER VII

NUMBER 481

AIRCRAFT FEATURES

THE WILD GOOSE Dick Sarpolus 20
A Canard Controliner for .35's

THE MATHES ELECTRONIC SYSTEMS SERIES
7500-D Bob Aberle 24
An FM Product Review: A new, high quality entry into the sub-mini R/C field

A HALF-SIZED SCRAM D.B. Mathews 28
An .020 replica of an old Flying Aces design

23RD ANNUAL TOLEDO R/C EXPOSITION Bob Hoeckele 32
FM's coverage of the big get-together

A STAND-OFF R/C FOKKER T-2 Don Martin 40
This ship went coast-to-coast in 1923, now it's SOS for .40's to .60's

MAXIMUM SAILPLANE SPEED Richard Weber 45
How to break a sailplane speed record

WITH MODEL BUILDERS Ed Whalley 48
News and Views from all over

R/C MODEL BOATING

BOATS AT TOLEDO Bob Hoeckele 57
A look at R/C boating at the Toledo show

HUGHEY BOATS' 20 RIGGER Bob Staat 60
A Dry Dock Review: Simple, accurate and fast record holding rigger

DEPARTMENTS

AIRMAIL	4	CLASSIFIED ADS	55
TIMETABLE	4	LETTER RIP!	64
FLYING REPORT	10	DEALER DIRECTORY	71
FM CLINIC	18	ADVERTISING INDEX	74

FRONT COVER: The full-size version of Don Martin's Fokker T-2 flew coast-to-coast on May 2, 1923. The box fuselage makes this one a simple but interesting Stand-Off project. Dick holds his Wild Goose, a Canard controliner stunter (lower right). It flies and flies well. FM Kodachromes Don McGovern and Jim Boyd.

FLYING MODELS is published monthly by Carstens Publications, Inc., Fredon-Springdale Road, Fredon, New Jersey. Mailing address P.O. Box 700, Newton, New Jersey 07860. Harold H. Carstens, President; Henry G. Carstens, Vice President; Robert R. Merkle, Treasurer; Phyllis M. Carstens, Secretary. Second Class postage paid at Newton, New Jersey, and additional mailing offices. Copyright 1977 by Carstens Publications, Inc. Printed in the United States of America.

SUBSCRIPTIONS: In U.S.A., Possessions, and Canada: \$9.00 per year, \$17.00 for two years, \$21.00 for three years. Foreign postage \$1.00 extra per year. All communications regarding subscriptions and changes of address should be sent to: Circulation Manager, Flying Models, P.O. Box 700, Newton, New Jersey 07860. Please allow six weeks for change of address and be sure to include your old address label.

CONTRIBUTIONS: Articles and photographs are welcome. Contributors are advised to keep a copy of their manuscripts and illustrations. When requested, we will endeavor to return all material in good condition if accompanied by return postage. Payment is made upon publication. Flying Models assumes no responsibility for unsolicited material. The contents of this magazine must not be reprinted without written permission of the publisher.

ADVERTISING: Main advertising offices: P.O. Box 700, Newton, New Jersey 07860. Phone: 201-383-3355. WEST COAST ADVERTISING REPRESENTATIVE: Joseph Mervish Associates, 4721 Laurel Canyon, Suite 211, North Hollywood, California 91607. Phone: 213-877-7556.

CALL TOLL FREE
1-800-428-4682

Indiana Residents 1-800-382-2087

For boat lovers we have the Blue Sonic 600. 24" long. A value for \$41.00. The Blue Sonic 900 is 36" long, 46" high. A value for \$109.00. The Blue Sonic 1300 which is 52" long, 66" high complete with fittings, hardware. A value for \$199.00.

We like to think that we have an extremely complete inventory of that good stuff that it takes to build the type of fine model that you want to build. Just for example, here are some of the lines we sell. Sig, Top Flite, Goldberg, Sterling, World Engines, Kraft, ProLine, Fox, K&B, Cox-Sanwa, OS, Supertigre, Enya. We sell wire, Midwest balsa, hardware, Monokote, Solarfilm, and Kwikcote. We also from time to time run a special on things like nickel cadmium batteries. Right at the moment we will sell you these batteries in lots of 12 for \$1.35 each, in lots of 8 for \$1.40 each, and in lots of 4 for \$1.50 each, or in lots of 1 for \$1.98 each.

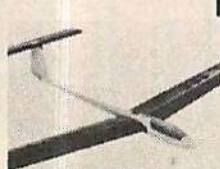
HELICOPTERS If you are interested in helicopters, please understand that Indy R/C specializes in helicopters and helicopter parts. Our Sales Manager, Steve Morphe, is an active helicopter flyer. If you want to talk helicopters, ask for Steve when you call on our toll free number 1-800-428-4682.

We are shopping the markets of the world to bring you interesting and useful model airplane merchandise at record low prices. Pictured on the right are just a few. The Capillo .09 engine our introductory price \$9.95. This engine swings a 7/4 prop with a 7/16" shaft. This is an excellent engine for many small R/C projects as well as many free flight U-Control projects. From Italy we are bringing you the M&B Condor. Here is a glider that easily comes apart and goes into a packing case so it can be carried with your luggage in a very small car. As sold, this gliding machine is fitted with a flying stab plus push rods and connectors so that it clips right on and you are in business ready to go. The fuselage is fiberglass and the wings are foam covered with wood and a finishing material on top of the wood. This is a beautiful project. Considering it is virtually all built, it is a real bargain at \$139.95.

We are importing four scale models from MK in Japan; the Spirit of St. Louis, a 60 size model for \$68.50, a Zero Fighter for 40 size engines at \$39.95, and Wolfgang Matt's Matillas 20 for \$32.00 and his 40 size acrobatic model for \$39.95.

DEALER'S FRANCHISE

We are franchising Indy R/C to dealers. We are signing dealers definitive geographical areas by contract. These dealers names will appear in our inside back



CONDOR 95" ARF FIBERGLASS SAILPLANE
Indy \$139.95



INDY FUEL PUMP AND CADDY
Indy \$18.95



MK SPIRIT OF ST. LOUIS
Indy \$68.50



MK ZERO R/C 40
Indy \$39.95



MATTLAS
(20) Indy \$32.00
(40) Indy \$39.95



CAPILLO .09 Cu. In.
Indy \$11.95

Air Mail

readers' forum

Lockheed Orion

After reading George Meyer's fine article on the Lockheed Vega in the February 1977 issue of FLYING MODELS, it struck me that you or your readers might be able to help me locate a set of plans for the Lockheed Orion low-wing monoplane. Any help would be appreciated.

Alvin Neubacher
8037 Whittaker Ave.
Detroit, MI 48209

Confused

I am just getting into R/C and it's time to buy a radio. There are so many different brands and different prices, I've no idea where to turn. Is there a big difference in brands of radios? If you read all the ads, everyone says that theirs is the best. Who should I believe, what should I buy?

Dennis M. Epperly
405 Sunset Dr.
Stanwood, IA 52337

☞ Your first step Dennis, is to find an R/C club in your area and ask the members what radios they're using and why. Maybe service in your area is better on certain brands, etc. You should also read Bob Aberle's radio system reviews in FLYING MODELS. These are comprehensive articles about one brand of radio noting both advantages and disadvantages—Ed.

Sopwith Tripe

I am a fifteen year old boy and have been building balsa models for approximately five years. I was looking through a book at our public library when I noticed a picture of a plane that I had never heard of until then, the Sopwith Triplane. I continue looking through the library for more information but couldn't find any. I would be grateful if your readers could help me

locate a set of three-views or even plans of any size. Thank you.

Larry Robertson
4 Mountain View Crescent
Deep River, Ontario
Canada

Jungster II plans

In the February 1976 issue of FLYING MODELS you offered the plans for the Jungster II by Al Wolsky. This plan no longer appears in the plan ad in the magazine. I now wish to build the plane and need the plans. Do you still offer them?

Lincoln Thormahlen
224 Lincoln Hills Dr.
Valparaiso, IN 46383

☞ The plan for Al Wolsky's Jungster is available from Carstens publications and is listed again in the plan ad. Order CF-397 and enclose \$3.50—Ed.

Timetable

coming events

CLUB SECRETARIES: Items for the FM Timetable are welcome. Submit items typed, double spaced, with necessary information, plus contact for complete data and entry blank. Specify AMA, FAI, etc., rules, classes. Allow at least eight weeks lead time. Items will not be picked up from club bulletins for inclusion. Items must be sent directly to this column. Give name of responsible club official. Column headings include: Radio Control, Control Line, Free Flight, Static Scale, etc. Specify.

R/C CONTESTS

SANTA CLARA, CALIFORNIA—June 4, 5. Pioneer Pylon Races for Formula 1 hosted by the Pioneer R/C Club. Contact: Tom Minger, 4459 Delores Dr., Union City, CA 94587.

YORKTON, SASKATCHEWAN—June 11-12. Yorkton's Outstanding Radio Control Society (YORKS) Fun Fly. Contact: Brent Reusch, 221 Roslyn Ave., Yorkton, Saskatchewan, Canada.

KINGSTON, ONTARIO, CANADA—June 18, 19. Kingston R/C Modellers' second annual Fun Fly. Camping available at flying field. Contact: John Burgher, 355 McEwen Drive, Kingston, Ont., Canada K7M 3W4.

ABILENE, TEXAS—June 19. Third Annual Texas Flying Scale Championships with events for R/C, C/L and F/F hosted by the Abilene R/C Society. The site is Sea-Bee Park north of Abilene. Events are: F/F Rubber Scale, F/F Gas Scale, F/F Peanut Scale, C/L Sport Scale, R/C 1/2A Sport Scale and R/C Sport Scale. Contact: Jerry Farr, 1410 Portland St., Abilene, TX 79605.

MUFF-LAIRE

UNIVERSAL MUFFLER

IDEAL FOR PLANES, BOATS, AND CARS.

Designed for installation on a wide variety of engines from .29 to .60 class. Varying the number of baffle plates controls noise level and back pressure to your desire. Extremely compact. New, "Never break" muffler straps.

ONLY
\$7.95
No. 143



**DU-BRO
PRODUCTS
INCORPORATED**

480 BONNER ROAD WAUCONDA, ILL. 60084

INDY R/C

10620 N. College Ave.
Indianapolis, Ind. 46280

Master Charge

BankAmericard

Carstens *The ANSWERS to BETTER FLYING*

PUBLICATIONS



MODEL PLANE BUILDING FROM A TO Z is one of the most useful model airplane books ever offered the flying modeler. Over 230 helpful hints, 36 selected airfoils with recommendations for different types of models, information on what you need for controlling model planes by radio, and the forces and adjustments that control flight.

Here too is information on gas motors, landing gear, control systems, control-line flying, wing structural problems, fuselage trouble spots, wing and tail hold-downs, and dozens of other vital flying subjects that you must have at your finger tips if you want to enjoy flying to the utmost, whether in RC, rubber, gas, or glider.

\$3.00



\$3.00

Back again and better than ever, the big new Second Printing of Decade of Design 2 from the publishers of FLYING MODELS. Here's a volume packed with plans for over sixty different aircraft designs. Choose from radio control designs, free flight, control line and combat, free flight and rise-off-water, rubber powered, helicopters, gliders, and just plain sports planes. Many plans require two pages to show all the component parts in their entirety.

DECADE OF DESIGN 2 covers ten years of model aircraft design and construction. The new Carstens Edition is printed on heavy coated paper with four color cover, and new introductory material. It's a must volume in any model builders' library.

This is one of the most exciting aviation racing books we've ever run across. The 1969 INTERNATIONAL AIR RACING ANNUAL is a veritable gold mine of information for anyone who has ever looked longingly at any racing plane. Remember the famed Doolittle Gee Bee Super Sportster, or the famous Ben Howard Racers? Or Art Chester's Jeep and the ill fated all-nose French Caudron Racer?

This 8-1/2x11" 96 page book is must reading for all aviation fans: full scale, model builders, designers, and 1/72" detail hounds. Packed in this one book are over 250 photos and drawings of these famous speedsters, many of them little larger than some of the bigger R/C aircraft seen at meets. Includes race results.

\$2.95



Your Hobby Dealer has Carstens Hobby Books

**Try your hobby dealer first.
If he can't supply you,
order direct.**

Carstens
PUBLICATIONS, INC.
P.O. Drawer 700, Newton, New Jersey 07860

CARSTENS PUBLICATIONS, INC.
P.O. Drawer 700
Newton, New Jersey 07860

Dept. 4400F

My dealer can't supply me. Please send the colorful Carstens Hobby Books I have checked below. I enclose \$_____ in check or money order. I understand that if I am not completely satisfied I can return any of the books within 5 days for full credit.

— Model Plane Building From A to Z, \$3.00

— 1969 Air Racing Annual, \$2.95

— Decade of Design 2, \$3.00

Name

Street Apt.

City State Zip

Please print or type legibly, N.J. residents add 5% sales tax.

We've got a quality story...

Pactra Premium **BALSA WOOD**



- HAND SELECTED
- PRECISION SANDED
- CONTEST GRADE ONLY

The finest available in the world. We have personally selected our BALSWOOD from only the finest growers in Ecuador. When we mill our Balsa each piece is hand selected—and only those pieces passing our rigid inspection are sold as PREMIUM BALSA WOOD. This means that any one of the 125 different sizes you choose to build your flying machine with is precision cut to exact measure... and double sanded to insure you of "Contest Quality" Balsa. Available in SHEETS • STICKS • BLOCKS • PLANKS • DOWELS • LEADING & TRAILING EDGES • PLUS 5-PLY BIRCH. Try it... and you'll know why the winners prefer it!!

TRY THESE OTHER "CONTEST QUALITY" PRODUCTS FROM PACTRA



Aero Gloss

HOT FUEL PROOF DOPE
"AWARD WINNING"
HI-GLOSS AND FLAT
FINISHES AVAILABLE
IN OVER 36 COLORS
IN BRUSH AND SPRAY.

Solar Film

EXCLUSIVE LOW-HEAT
COVERING FOR
FOAM & BALSA
FLYING MODELS
flexible • durable
fuel proof • lightweight



Pactra Industries, Inc. 7060 HOLLYWOOD BLVD., LOS ANGELES, CA. 90028

RHINEBECK, NEW YORK—June 25, 26. The first "Rhinebeck Classics Contest" hosted by the Mid-Hudson R/C Society at Cole Palen's Old Rhinebeck Aerodrome. R/C contest for scale models of a specific type of aircraft that made its first flight between January 1, 1919, and December 31, 1937. No civilian Jennys or aircraft that saw extensive squadron service during WWII will be eligible. Events for qualified planes will be AMA R/C Scale, AMA R/C Sport Scale, Barnstorming and Time Trials. Cole Palen's full scale flying events will complement the spirit of the contest. Contact: Damian J. Amodeo, Hill & Hollow Road, Hyde Park, NY 12538. (The traditional WWI Rhinebeck Jamboree will be held as usual on the weekend following Labor Day.)

ENDICOTT, NEW YORK—July 9-10. The Aeroguidance Society's 22nd Annual Pattern and Scale Contest. Contact: Bob Noll, 2317 Acorn Dr., Vestal, NY 13850.

YORK, PENNSYLVANIA—July 9, 10. Lancaster Area Soaring Society's 5th Annual R/C Sailplane Contest (July 9) and Lift Club of York's R/C Sailplane Contest (July 10). One of the most popular soaring weekends in the East. Contact: E.H. Parkhurst, Jr., c/o Ezra F. Bowman Sons, Inc., 149 N. Duke St., Lancaster, PA 17602.

SANTA CLARA, CALIFORNIA—July 23. Kosby Memorial Fun Fly hosted by the Pioneer R/C Club. Contact: Tom Minger, 4459 Delores Dr., Union City, CA 94587.

SAYRE, PENNSYLVANIA—July 30-31. Valley R/C Model Club of Sayre's 5th Annual Fun Fly. Contact: Donald W. Manvell, RD #1, Box 103A, Rome, PA 18837.

OLEAN, NEW YORK—July 30-31. Southern Tier Aero Radio Society, Inc. (STARS) R/C Glider Meet and Scale Fly-In at the Olean Municipal Airport. Saturday, July 30, will be the Glider Meet using winches for Class I and III, while Sunday, July 31, will be the Scale Fly-In. Admission fee for both days will include two chicken barbecue dinners. Motels close by and indoor hangar facilities in case of bad weather. Contact: Robert Brown CD, 1255 High St., Bradford, PA 16701, 814/362-7702.

HONEOYE, NEW YORK—August 6-7. The Flying Live Ones R/C Club Fun Fly with free barbecue for flyers and families and free camping at the field (no hookups). Contact: Red Randall CD, R.D. Dansville, NY 14437.

SANTA CLARA, CALIFORNIA—August 27. Pioneer R/C Club "All Comers Fun Fly." Contact: Tom Minger, 4459 Delores Drive, Union City, CA 94587.

SANTA CLARA, CALIFORNIA—3rd Sunday of each month. Pioneer R/C Club and the Red Barons R/C Club of Sacramento, alternate months for 1/2A races. Contact: Tom Minger, 4459 Delores Dr., Union City, CA 94587.

WEEDSPORT, NEW YORK—August 27-28. Finger Lakes R/C Club of Auburn Fun Fly at Whitford's Airport. Contact: Larry Abraham CD, 26 Utica St., Port Byron, NY 13140, 315/967-8890.

CONTROLINE CONTESTS

CHICAGO, ILLINOIS—June 12. Chicago Aero-Angels "Midwest Regional All-Combat Championships" at Forest Preserve on Irving Park and Cumberland, Ave. AMA (Fast) Combat, Slow Combat, FAI Combat and 1/2A Provisional Combat, all (J) (S) (O). Contact: Irv Zick CD, 5042 W. Altgeld, Chicago, IL 60639.

CINCINNATI, OHIO—June 19. "Model Aviation Day" hosted by the Queen City U-control Club. Events: Profile Carrier, 3 classes PAMPA Stunt, Rat, Slow Rat and Double Goodyear. Trophies through 3rd place. Contact: Paul Hartlaub, Jr., 6277 Sharlene Drive, Cincinnati, OH 45211.

MERCED, CALIFORNIA—June 12. Merced Model Wranglers' Annual Contest; all events plus a pie eating contest. Contact: John Justice, 1660 Marthella, Merced, CA 95340, 209/723-0654.

SAN JOSE, CALIFORNIA—July 4. Annual Firecracker Meet of the Aero Modelers of San Jose. Contact: Albert Montiel, 3776 Eastwood Circle, Santa Clara, CA 95050, 408/244-6936.

CONCORD, CALIFORNIA—July 17. Concord Model Engineers Annual Contest. Contact: Karlan Larson, 225 Babbette Court, Pleasant Hill, CA 94523.

FACTORY AUTHORIZED SERVICE

WEST
WENMAR ELECTRONICS
20017 San Miguel #22
Castro Valley, California 94546
(415) 582-2537
MC CARTHY'S RC SERVICE
2817 E. Lincoln
Anaheim, California 92806
(714) 630-5061

SOUTHWEST
DIGITAL CONTROL REPAIR
10044 Goliad
El Paso, Texas 79924
(915) 755-0202

NORTHEAST
BOBBY'S HOBBY LOBBY
65 East Main Street
Westminster, Maryland 21157
(301) 848-4350

AEROTEC HOBBIES & CRAFTS
Lincolndale Shopping Center
Route 202, P.O. Box 116
Lincolndale, New York 10640
(914) 248-7431
DE BOLT RADIO CONTROL
49 Golden Court
Buffalo, New York 14225
(716) 633-6623

CANADA
CHAPMAN'S RADIO CONTROL
14 Northfield Road
Scarborough, Ontario M1G 2H4
(416) 439-6382

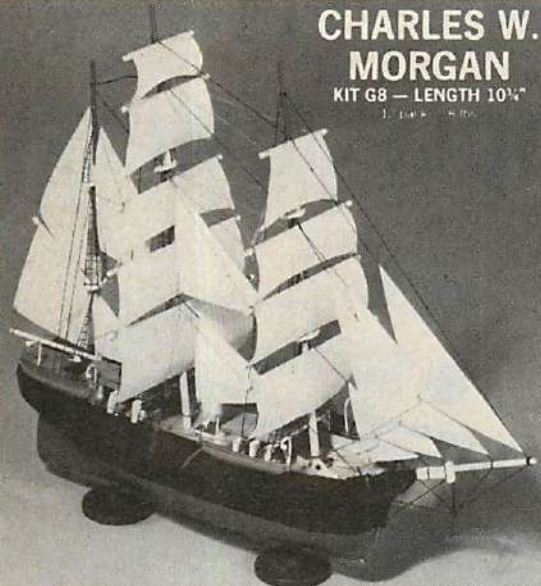
Warranty Service Available
Factory Only

AVAILABLE 1977
Complete Range of New Systems
illus. Product Information • 25c In Coin, Dept. FM

Orbit®
ELECTRONICS
8140 CENTER STREET
LA MESA, CALIF. 92041

THE TALL SHIPS ARE COMING!

CHARLES W. MORGAN
KIT G8 — LENGTH 10 1/4"



EMMA C. BERRY
KIT G7 — LENGTH 10 1/4"



U.S. COAST GUARD EAGLE
KIT G9 — LENGTH 11 1/4"



THEY'RE EASY TO BUILD

We know it seems unbelievable, but it's true. New techniques in the heretofore difficult rigging installation and ratline making, are simplified so that almost anyone can produce a craftsman-like job. Density selected prime balsa wood is a real pleasure to work with, and the step-by-step plan is clear, simple and complete.

• CARVED WOOD HULLS

THEY'RE COMPLETE*

With machine carved hulls, that require only a little trimming and sanding. Kits include many finely detailed cast metal fittings (as required for each kit) such as Life Boats, Windlass, Anchors, Steering Wheel, Water Cask, Lights, Screw (propeller), Ladders, Compass, etc. Black and Tan rigging line, Printed CLOTH Sails, Decals, Display Pedestals and much more . . .

*Dry Kits paint and cement not included.

THEY'RE HISTORIC

Sailing out of her home Port of New Bedford Mass., the square rigger Charles W. Morgan sailed further and killed & processed more Whales than any other Whaling Ships of her time. Today it is for ever enshrined in all its glory at Mystic Seaport Conn., where it can be boarded and its history relived. The Emma C. Berry is one of the oldest commercial sailing ships in American Documentation. Preserved in excellent condition it can be visited and enjoyed at Mystic Seaport Conn. Emma was launched in June 1866, Slooped Rigged. Further details can be obtained from Mystic. Originally the U.S.C.G. Sailing Bark Eagle was built for the German Navy. It was acquired by the U.S. Coast Guard in 1946 and has been used as a training ship since then for Future Officers; Carrying 200 cadets. For further details write to the U.S. Coast Guard.

• CLOTH SAILS

• CAST METAL FITTINGS, ETC.

THEY'RE UNIQUE

Because such amazing detail and authenticity is achieved in kits that are relatively easy to build. Plans include full size drawings, as well as assembly drawings for each step of the way. Authentic color scheme shows on full color kit box lid.

THEY'RE ONLY

6.95 ea.



STERLING MODELS • 3620 'G' ST. PHILA. PA. 19134

If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (60¢ minimum in U.S., \$1.25 minimum outside U.S.)

- ☐ Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories, etc. 50¢ enclosed.
- ☐ "Secrets of Model Airplane Building". Including design, construction covering, finishing, flying, adjusting, control systems, etc. 25¢ enclosed.
- ☐ "Secrets of Control Line and Carrier Flying". Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions 25¢ enclosed.

No checks. Only U.S. money orders or currency accepted.

Name _____
Address _____ City _____ State _____ Zip _____

AND THEY'RE AT YOUR DEALERS NOW

GET OVER AND SEE THEM . . . START YOUR ENTIRE KIT!

R/C Air Boat/Amphibian

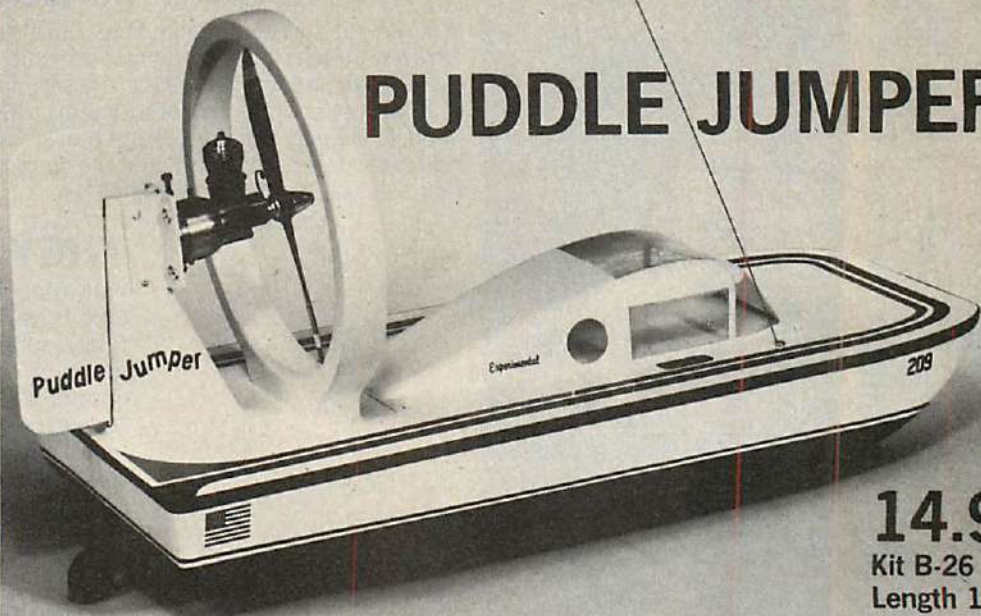
PUDDLE JUMPER



Run it on land



Or in the water



14.95
Kit B-26
Length 18 1/2"

Designed expressly for 2 channel R/C (plenty of room for just about any R/C) and .049 throttle control engine, this amazing air boat/amphibian will give you more pure pleasure than you can imagine — it's equally at home in a swimming pool or pond as well as a school yard or any smooth surface.

... And it's so easy to build — both the rugged plastic hull and cabin are precisely formed. Main inner structure and deck are accurately die cut plywood as is the balsa. Included is nylon motor mount — easy to follow step by step plans, decals, hardware etc. See this beauty at your dealer.

PALATINE, ILLINOIS—July 24. Chicago Aero-Angels "Midwest Regional Scale-Stunt Championships" at Harper Community College in Palatine. PAMPA Stunt (Beginner) (Intermediate), (Adv.-Expert); 1/2 A Stunt, AMA Scale and Sport Scale, all (J) (S) (O). Contact: Irv Zick CD, 5042 W. Altgeld, Chicago, IL 60639.

REDWOOD CITY, CALIFORNIA—August 28. Condor Legion & Flying Tigers' Annual All Combat Day. Contact: Norm McFadden, 252 Topav, Redwood City, CA 94062.

FREE FLIGHT CONTESTS

BONG FIELD, WISCONSIN—July 3. 34th Annual Midwestern States F/F Championships hosted by the Chicago Aero-Angels. Contact: Rudolph V. Schuh, 267 E. County Line Rd., Barrington, IL 60010.

R/C CARS

SEATTLE, WASHINGTON—July 23-31. Tenth Annual ROAR (Radio Operated Auto Racers) 1/12 and 1/8 scale Nationals at the South Center Shopping Center. Contact: ROAR Nationals, Don McKay, c/o JoMac Products, Inc., 12702 NE 124th St., Kirkland, WA 98033.

R/C BOAT CONTESTS

MIAMI, FLORIDA—June 4-5. IMPBA Record Trials in 1/8 straightaway and 1/8 oval hosted by the Gold Coast Racing Team at Snake Creek. See the Gators go go go. Contact: Don Pinkert, 3265 Franklin Ave., Miami, FL 33133, 305/446-5358.

HARTFORD, CONNECTICUT—June 4, 5. The 1977 Hartford Gold Cup Deep Vee Classic on the Connecticut River at East River Drive in East Hartford, Conn. NABMA sanctioned race for A, B and C Offshore hulls. Contact: Paul Stakun, 2486 Ellington Road, South Windsor, CT 06074. Phone 203/644-0269.

INDIANAPOLIS, INDIANA—June 4, 5. The Indy Unlimited hosted by the Indy Model Boat Club at Dandy T Lake. A unique IMPBA event featuring five heats of racing, all classes run together (unlimited). One boat per contestant. Contact: Fred McBroom, 8527 Quail Hollow Road, Indianapolis, IN 46260. Phone 317/926-3451.

EL MONTE, CALIFORNIA—June 11, 12. NABMA District 9 Points and Heat Racing at Legg Lake hosted by the Prop Nuts. Contact: Leonard Feedback, 7906 Spinel, Cucamonga, CA 91730. Phone 714/987-2863.

ANTIOCH, ILLINOIS—June 11, 12. NABMA District 4 Points, Heat Racing and Deep Vee hosted by the North Shore Model Boaters on the property of Richard Dauch. Contact: Mary Bowen, 2224 20th St., Zion, IL 60099. Phone 312/746-3363.

WELLINGTON, OHIO—June 11, 12. "Buckeye 880" IMPBA race for AB, CD, EF Mono and Hydro at Clare-Mar Lakes hosted by the Cleveland Model Boat Club. Lakeside camping with hookups available. Contact: Mike Bokulich, 916 Columbia Drive, Amherst, OH 44001. Phone 216/988-2345.

MARYSVILLE, WASHINGTON—June 11, 12. NABMA Record Trials hosted by the Seattle Model Yacht Club at Twin Lakes. Contact: E.L. Schumann 19005-108th N.E., Bothell, WA 98011. Phone 206/485-4789.

CHESAPEAKE, VIRGINIA—June 18. IMPBA Record Trials at Indian River Lake hosted by the Old Dominion Model Boat Assn. Contact: Paul Holloway, 704 Burksdale Rd., Norfolk, VA 23518. Phone 804/587-5027.

TOLEDO, OHIO—June 19. IMPBA open heat racing—"run what ya bring"—hosted by Propwash Unlimited at Lak Moon on Angola Road. Contact: Ron Haddad, 717 Chestnut, Toledo, Ohio. Phone 419/243-4352.

CHICAGO, ILLINOIS—June 19. IMPBA Heat Racing at Sundown Meadow Forest Preserve, Lake Ida, Rte. 66 and LaGrange Road, Hodgkins, Ill., hosted by the Minute Breakers, AB, DC, EF Mono and Hydro; 95db muffler required. Trophies and special trophies to top three juniors. Contact: Skip Horstman, 1683 Westberg, Glen Dale Heights, IL 60137. Phone 312/653-4781.

HAMMOND, LOUISIANA—June 25. IMPBA Record Trials hosted by the Southern Gentlemen Racing Association at Miller Pond. Contact: Lynn Dominique, 4711 Alexander Dr., Metairie, LA 70003. Phone 504/888-4505.

LAKEWOOD, WASHINGTON—June 25, 26. NABMA District 8 Points, Heat Racing and Deep Vee at Lake Waughop, Ft. Steilacoom Park, hosted by the Puget Sound Model Boat Club. Contact: Jerry Dunlap, 6702 Mt. Tacoma Dr. SW, Tacoma, WA 98499. Phone: 206/584-7131.

DETROIT, MICHIGAN—June 24, 25, 26. A weekend of activity centering around the full-scale Gold Cup Unlimited Race on the Detroit River on June 26. Model boat activities begin June 24 with IMPBA Record Trials at Thread Lake in Flint. On June 25 the Wolverine Miniature Race Boat Assn. will host the "Mini Gold Cup" IMPBA Hydro multi-racing at Blue Heron Lagoon in Belle Isle, Michigan. Watch the big boats run on Sunday in the Gold Cup Race. Contact: Lou Torovich, 17641 Rowe, Detroit, MI 48205. Phone 313/526-6909.

MIAMI, FLORIDA—July 2-3. NABMA Dist. 3 Points, Heat Racing and Record Trials hosted by the Florida Unlimited Racing Team at 133rd St. and Palmetto Expressway. Contact: Roy Cogburn, 581 S.W. 47th Ave., Miami, FL 33134, 305/443-5542.

CAMPBELL, CALIFORNIA—July 2, 3, 4. NABMA District 9 points, Heat Racing, Outboard, Scale hosted by the Marine Modelers of Santa Clara Valley at Percolation Ponds. Contact: Wm. Reutlinger, 10571 Rampart Ave., Cupertino, CA 95014. Phone 408/252-4987.

CALGARY, ALBERTA—July 2, 3. NABMA Dist. 16 Points, Heat racing, Enduro, Deep Vee Scale hosted by the Buoy Busters of Canada at Carburn Lake. Contact: Keith Warham, 42 Armstrong Cres., S.E., Calgary, Alberta T2J 0X3. Phone 403/252-6756.

AURORA, ILLINOIS—July 2, 3. NABMA Dist. 4 Points, Heat Racing, Deep Vee hosted by the Hobby Corner Racing Team at the lake in Aurora. Contact: Dick Kalous, 461 Howell Pl., Aurora, IL 60505. Phone 312/859-9216.

EDMONTON, ALBERTA—July 2, 3. IMPBA B, D, and E Heat Races Mono, Hydro and E Enduro. High point trophy per class. Hosted by the San Antonio Model Boaters at New Lake Site. Contact: Marvin Martin, 12702 La Quinta, San Antonio, Texas. Phone 521/653-4517.

SAN ANTONIO, TEXAS—July 2, 3. IMPBA B, D, and E Heat Races Mono, Hydro and E Enduro. High point trophy per class. Hosted by the San Antonio Model Boaters at New Lake Site. Contact: Marvin Martin, 12702 La Quinta, San Antonio, Texas. Phone 521/653-4517.

LONGVIEW, WASHINGTON—July 3, 4. Firecracker Off-shore Classic, NABMA Deep Vee hosted by the Longview R/C Boaters at Lake Sacajawea. Contact: Rick Hollister, 1220 Ocean Beach #6, Longview, WA 98632. Phone 206/423-6202.

CHESAPEAKE, VIRGINIA—July 3, 4. Deep Vee Offshore Race IMPBA hosted by the Old Dominion Model Boat Club at Indian River Lake. Contact: Bruce Snyder, 1816 Parkview Ave., Apt. B, Norfolk, VA 23503. Phone 804/583-3673.

COLUMBUS, OHIO—July 9, 10. IMPBA Heat Racing at Lewis Lake in Groveport hosted by the Columbus Piranhas Model Boat Club. Contact: Woody Werner, 1979 Iuka Ave., Columbus, OH 43201. Phone 614/444-6027.

CHICAGO, ILLINOIS—July 10. IMPBA Heat Race hosted by the Marquette Park R/C Boat Club at the Marquette Park Lagoon, 11:00 a.m. Contact: Randy Vitek, 5244 S. Parkside, Chicago, IL 60638, 312/767-5983.

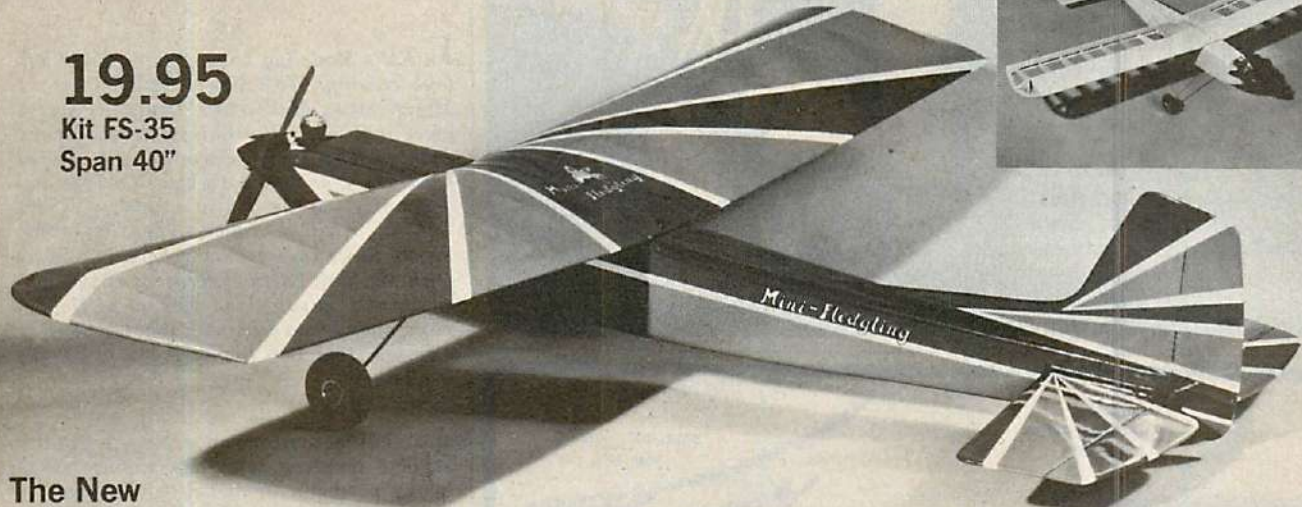
MIAMI, FLORIDA—July 9-10. IMPBA Record Trials hosted by the Gold Coast Racing Team. Contact: Don Pinkert, 3265 Franklin Ave., Miami, FL 33133, 305/446-5358.

MARYSVILLE, WASHINGTON—July 17. NABMA Heat Racing at Twin Lakes hosted by the Seattle Model Yacht Club. Contact: E.L. Schumann, 19005 108th N.E., Bothell, WA 98011, 206/485-4789.

For Beginners or Experts

19.95

Kit FS-35
Span 40"



The New

MINI-FLEDGLING

If you've seen or flown our Fledgling it will give you an idea of the great performance you can expect from its little brother. Maintaining top quality & simple construction, all balsa & plywood parts are accurately die cut including full length fuselage sides, includes R/C hardware, decals full size step by step plans. Recommended engines .049 or .051 & 2 channel R/C although other suitable equipment may be used.

STERLING MODELS • 3620 'G' ST. PHILA. PA. 19134

If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (60¢ minimum in U.S., \$1.25 minimum outside U.S.)

- ☐ Catalog of entire line of airplane control line model kits. R/C scale and Trainer kits, boat model kits, accessories, etc. 50¢ enclosed.
- ☐ "Secrets of Model Airplane Building". Including design, construction covering, finishing, flying, adjusting, control systems, etc. 25¢ enclosed.
- ☐ "Secrets of Control Line and Carrier Flying". Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions 25¢ enclosed.

No checks. Only U.S. money orders or currency accepted.

Name _____

Address _____

City _____

State _____

Zip _____

HODGKINS, ILLINOIS—July 15, 16, 17. IMPBA racing activities in the Sundown Meadows Forest Preserve at Rte. 66 and LaGrange Road hosted by the Minute Breakers. Record Trials on July 15 followed by Class Racing on July 16 and 17. Contact: Ben Baird, Jr., 1237 LaGrange Road, LaGrange Park, IL 60525; 312/482-9483.

BALTIMORE, MARYLAND—July 16, 17. NAMBA Deep Vee racing at Lake Roland in Robert E. Lee Park hosted by the R/C Model Boaters of Baltimore. Contact: Mike James, 1435 Barrett Road, Baltimore, MD 21207. 301/747-6777.

CHESAPEAKE, VIRGINIA—July 16. IMPBA Record Trials at Indian River Lake hosted by the Old Dominion Model Boat Assn. Contact: Bob Johnson, 6176 Edward St., Norfolk, VA 23513, 804/857-1017.

FLINT, MICHIGAN—July 16, 17. IMPBA Record Trials at Thread Lake hosted by the Wolverine Miniature Race Boat Assn. July 16 is for 10% only. Contact: Lou Torovich, 17641 Rowe, Detroit, MI 48205, 313/526-6909.

HODGKINS, ILLINOIS—July 16, 17. The First Annual Sundown Championship Race at Sundown Meadows Forest Preserve, Rte. 66 and LaGrange Road, hosted by the Minute Breakers. Class racing for AB, CD, EF Mono, AB, CD, E, F Hydro, and Scale Hydro. 95DB noise limit and muffler required; preregistration required. This race will take the place of the Dupue Championship held in 1976. Trophies and merchandise prizes and a hot dog roast after Saturday's racing. Contact: Ben Baird, Jr., 1237 LaGrange Rd., LaGrange Park, IL 60525, 312/482-9483.

BUFFALO, NEW YORK—July 17. IMPBA Scale "pre-Internats Warm-up" with scale predicted log and precision steering hosted by the Buffalo Model Powerboat Club at Delaware Park Lake, NY-198 and Elmwood Ave., Buffalo. Contact: Paul Gierdowski, 231 Zorab Ave., Cheektowaga, NY 14255, 716/685-4698.

LANSING, MICHIGAN—July 23, 24. "Motor State Classic" offshore model boat race for .20, .40 and .60 classes. IMPBA rules but not sanctioned. Hosted by the Lansing Model Boat Club. Contact: Gary Girvin, 1520 N. Jensen St., Lansing, MI 48915, 517/489-4058 or 517/882-0907.

BRISTOL, PENNSYLVANIA—July 23, 24. IMPBA racing from noon to dusk at Magnolia Lake hosted by the Del Val Model Power Boat Club. Time Trials on Saturday and Heat Racing on Sunday. Contact: Nick Monti, 402 Swarthmore Ave., Ridley Park, PA 19078, 215/487-0246.

BUFFALO, NEW YORK—July 23, 24. IMPBA Multi Racing at Delaware Lake Park, NY-198 and Elmwood Ave., Buffalo, hosted by the Buffalo Model Powerboat Club. Noise suppression equipment is mandatory. Contact: Shirl C. Riggs, 95 Hanwell Place, Depew, NY 14043, 716/681-1248.

FLINT, MICHIGAN—July 30, 31. IMPBA Record Trials at Thread Lake hosted by the Wolverine Miniature Race Boat Assn. Contact: Lou Torovich, 17641 Rowe, Detroit, MI 48205, 313/526-6909.

INDIANAPOLIS, INDIANA—July 30, 31. IMPBA Record Trials at Dandy T. Lake hosted by the Indy Model Boat Club. 1/2 straightaway and 1/2 oval. Contact: Marten Davis, 4120 Richlew Drive, Indianapolis, IN 46226, 317/898-8691.

CHESAPEAKE, VIRGINIA—July 30. IMPBA Record Trials at Indian River Lake hosted by the Old Dominion Model Boat Club. Contact: Martin Casey, 218 Twilley St., Norfolk, VA 23503, 804/583-0229.

IMPBA SCALE INTERNATS, Milwaukee, Wisconsin—August 6-7. The Badger Model Boaters of Racine and the Northwest Commodores of Chicago are hosting the IMPBA Scale Internats at Brown Deer Park, 7835 North Green Bay Road, Milwaukee. The events will include Precision Steering, Predicted Log, Scale Judging, Realistic Operation and a Conning Event. Contact: John Horton, 2110 Dwight St., Racine, WI 53403, 414/632-7493.

MANSFIELD, CONNECTICUT—August 6-7. NAMBA Heat Racing at Mansfield Hollow Dam hosted by the Greater Hartford Model Boat Club. Contact: Robert E. Spooner, 148 Maskel Rd., South Windsor, CT 06074, 203/644-8281.

1977 IMPBA INTERNATS, Hammond, Louisiana—August 8-13. A week of activities at Miller's Pond in Hammond hosted by the Southern Gentlemen Racing Association. Monday: Scale Hydro and Record Trials; Tuesday: 1/2 Trophy Trials, Record Trials; Wednesday: Oval Trophy Trials, Record Trials; Thursday, Friday and Saturday: Heat Racing. Y'all come! Contact: Glen Cupit, 1413 Eisenhower Ave., Metairie, LA 70003.

CHESAPEAKE, VIRGINIA—August 27. IMPBA Heat Racing at Indian River Lake hosted by the Old Dominion Model Boat Association. Contact: Paul Holloway, 704 Burksdale Rd., Norfolk, VA 23518, 804/587-5027.

RACINE, WISCONSIN—August 28. IMPBA Multi Racing at Badger Lake in Racine County hosted by the Badger Model Boaters Association. Contact: Gary Mueller, Rt. 3, Box 291, Burlington, WI 53105, 414/763-7444.

DATELINES

MINI AMERICA'S CUP—September 8-11. Newport, R.I. International R/C 12-meter challenge race sponsored by the Hobby Industry Association of America, AMYA and the Newport International Sailboat Show. Contact: Richard Palmer, 13 Hook Mountain Road, Pine Brook, NJ 07058. Phone 201/227-2666.

GOV'T. SURPLUS

MODEL 4 NICKEL-CADMIUM BATTERY, 1.2 VOLTS

Rechargeable thousands of times

Sintered-plate alkaline storage battery displays flat voltage curve during discharge, has high discharge rate (up to 50 amps), holds charge for a long period of time. Spillproof, may be used in any position. Approx. 4 ampere-hour capacity. Dimensions 6" high, 2" wide, 3/4" thick. Approx. weight 6 oz. Uses potassium hydroxide (30% electrolyte).



PRICE \$3.00 each, postpaid
Five for \$12.50, postpaid.

MODEL 7 N/C BATTERY, 1.2 VOLTS

Same general characteristics as battery above, but with 7 ampere-hour capacity. Dimensions: 4 1/2" high, 3/4" thick. Approx. weight: 9 oz.

PRICE \$4.00 each, postpaid.
Five for \$17.50, postpaid.

NICKEL-CADMIUM C-CELLS. 1.2 VOLTS

Gulton Industries nickel-cadmium C-cells, 1.2 volts, 1.9 ampere-hour capacity.



PRICE \$2.75 each, postpaid.
6-volt pack
(5 cells): \$10.00 postpaid

C & H SALES CO.

2176 East Colorado Street • Phone: 681-4925
Pasadena, California 91107

FLY ELECTRIC

- VL-101 Electric propulsion system shown—using Hytork 48 motor and planetary gear box, SJ-3 switch & charging jack, and B-33L fast charge ni-cad flight battery—total weight 2½ oz.—will power models 25 to 50" wingspan weighing up to 10 oz.
- Send 50c for latest catalog showing full line equipment & accessories.
- Hobby dealers send for information.



V L PRODUCTS
Division of Vista Labs
7023-D Canoga Avenue
Canoga Park, California 91303

Flying Report

news and comment

In FM's Modeling News Editor Ed Whalley's column, *With Model Builders*, in the March issue of *FLYING MODELS*, was a piece entitled "Be Careful with Epoxy Paints." This piece concerned the alleged hazards of using epoxy-based paints and originated in the house organ of North Central Airlines called *The Ungarbled Word*. Since then we have been in contact with Mr. Bob Pettit, President of the Pettit Paint Company, the makers of Hobby-poxy epoxy-based paints. What follows is a letter from Bob explaining what epoxy is all about.

The entire matter concerning the health aspects involved with the application of epoxy products to modelcraft appears to have originated in the house organ of North Central Airlines entitled "The Ungarbled Word." There was, incidentally, no reference to the actual person authoring the experience referred to.

It was unfortunate that Ed's editorial was much out of context in that he did not quote in its entirety the original article in "The Ungarbled Word."

At both the WRAM and Toledo R/C shows we encountered several modelers who were concerned if they should be particularly cautious about their health while applying our Hobbypoxy products, or other epoxy products, for that matter, to their models. Their questions were instigated after having read one of several reprints from "The Ungarbled Word," particularly that in *FLYING MODELS* where the subject of epoxy paints was presented rather ominously.

At this point, it would be best to quote that part of "The Ungarbled Word" which was omitted from Ed's column, *With Model Builders*—

"One of our number was lucky enough to live through the experience which he here details, so if you ever see the following words, by all means, pay attention:

'Warning: Vapor harmful or fatal. Avoid prolonged or repeated breathing or vapor or spray mist: Use with adequate ventilation.'

For whatever it's worth, I would like to pass on for the benefit of others a recent

SHU GEE'S
HALF-"A" MIDGET
.049 POWER

THE SHU-OFF
\$16.95

PATRIOT
\$5.95

SPORI F.F. .020
Span 30"

DISTRIBUTOR
INQUIRIES INVITED

1938 NATIONALS WINNER
Rubber Span 31"
or .020

BY HENRY STRUCK

.020 LOW WING
SPORT F.F.
Span 36"

1911
CAUDRON \$9.95

THE PUP II
\$9.95

POST OFFICE BOX 2527, LANCASTER, CA 93534

NOW!

Vibra-Tak \$6.95
Slo-Tak \$9.95

The Gift With A LIFETIME GUARANTEE

VIBRA-TAK®

- Know your exact RPM and engine operating peak.
- Engineer proven, VIBRA-TAK® is a precise, professional instrument of polished, high stress aluminum

Both "Taks" \$14.95

At your hobby dealer or direct (plus packaging & Postage)

DUO-TAK PAK

- One compact kit that combines VIBRA-TAK® and the new SLO-TAK Slide Rule Tachometers

VERDELL Instrument Sales Co. • P.O. Box 3821 • San Clemente, Ca. 92672

CAM ACTION STEERING "Soft neutral" provides you with easy initial movement of the wheel around neutral yet quickens as sharp turns are needed. **NEW HIGH-STRENGTH PS-6** Servo designed and built considering the special needs of car/boat competition. High-strength gear train minimizes stripping. **3-CHANNEL** system is built for cars/boats - no more buying an expensive 3 Channel in order to enjoy low cost weekend competition. Channel without wheel control in order to enjoy low cost weekend competition. **RECEIVER** has high selectivity and excellent adjacent channel rejection with parameter levels found only on top line receivers. **TRANSMITTER** Designed by leading R/C competitors to provide a unit that looks distinctive and feels comfortable in your hands. With function control and Wheel control designed for the hobbyist. Output power equal to full sized systems, resulting in more than ample range. **FREQUENCIES AVAILABLE** include 6-27MHz and 3-7MHz. **SYSTEM INCLUDES** transmitter, receiver, (3) PS-6 miniature rotary servos, 4 cell AA battery pack, appropriate frequency designation flag. **WARRANTY** covers materials and workmanship for 6 months from date of sale. **2-CHANNEL** Orbit SHARK is also available for car competition or power boating where a third channel is not necessary. **SHARK** system features all of the COBRA system features and comes complete with (2) PS-6 servos. **THOROUGH DESIGN** 5,000 plus hours of design, testing and engineering add up to another top competitor from Orbit... for the hobbyist.

AVAILABLE 1977

Complete Range of New Systems

Illus. Product Information • 25c In Coin, Dept. FM

Orbit®

ELECTRONICS

8140 CENTER STREET
LA MESA, CALIF. 92041

experience in the use of Toluol, Zylol, N. Propyl acetate, Methyl Isobutyl Ketone, better known as epoxy-based paint."

As it can be seen, if in fact the anonymous author did experience any health problems, it was definitely not from the epoxy resin in our product, but rather the solvent system which is common to so very many paint products we have all been exposed to so many times in our lives. There is nothing esoteric about these products. They can be obtained from all distributors of commercial solvents, and are used in various combinations in everything from nail polish and household alkyd paints to the many lacquers, dopes, and acrylics sold through the hobby stores.

We replied to the inquiries regarding the use of epoxy paints by indicating that epoxies have been and are approved by the Food and Drug Administration as linings or coatings for the insides of beverage cans and other food containers. They are used extensively, also, as protective coatings on the walls and other interior surfaces of hospitals and food processing plants. As a matter of interest, this resin, even in its uncured state, is classified as being relatively harmless, non-irritating, and non-sensitizing. American National Standard Institute has assigned this epoxy resin as Class 1 Type, which is the safest classification.

A completely erroneous statement made by the author was that the dust resulting from dry sanding of epoxy film is just as dangerous as the original wet spray. The cured Hobbypoxy enamel is, in fact, essentially totally inert and so is the dust resulting from the sanding of the cured film.

It would be presumptuous to comment on the medical problem experienced by the anonymous author of the newsletter. However, if it were in fact the result of spray application of an epoxy coating, the solvents, and not the epoxy resin, most likely were the major cause of his problems. In the more than 15 years that we have been marketing epoxy paints, to the very best of our knowledge, neither we, nor the largest suppliers of epoxy resins in this country, have had access to any data supporting the deductions made by the author.

NOW

BUCKEYE BALSA NOT ONLY OFFERS YOU THE BEST BUYS IN BALSA, BUT HAS ALSO INCLUDED A NEW ITEM, IN THEIR PRODUCT LINE FOR YOUR BUILDING PLEASURE THE FIRST TOTALLY ADJUSTABLE SERVO INSTALLATION KIT!

NEW

SERV-KIT 139



SERV-KIT OFFERS YOU ...

- Versatility!
- Light Weight!
- Super Strength!
- Allows complete Servo Tray, Servo and mount assembly to be quickly installed as a unit!
- Allows adjustable Servo Tray travel for easy and exact C. G. weight transfer!
- Allows Servo arms to be aligned perfectly with pushrods!
- Greatly reduces radio installation time!
- Sitka spruce for durability and gluing surface!
- Radio changes no longer tear up fuse sides!

BUCKEYE BALSA COMPANY

3330 Youngstown-Kingsville Road
Cortland, Ohio 44410

Dealer-Distributor Inquiries Invited

If your local dealer cannot supply, order direct

Send CHECK or MONEY ORDER plus 25 cents postage and handling

Ohio residents add 4% Sales Tax

WINNERS!

DU-BRO KWIK-LINK



The tried and true spring steel Kwik-Link. Ideal for any control linkage.

2 each.

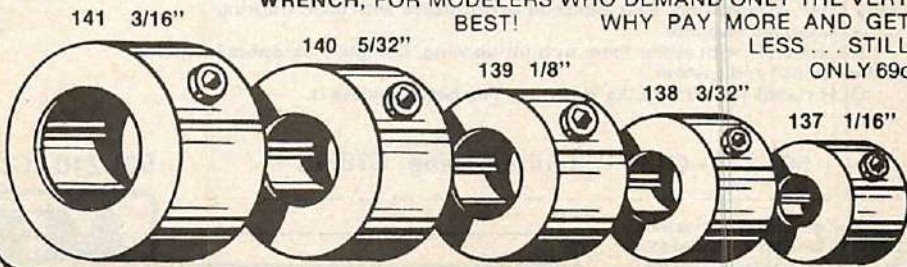
No. 109 75c

DU-BRO PRODUCTS INCORPORATED

480 BONNER ROAD WAUCONDA, ILL. 60084

DU-BRO PLATED BRASS DURA COLLARS

ENOUGH STOCK SO THAT THREADS WILL NOT STRIP. CAN BE RE-WORKED FOR OTHER USES — NOT LIKE HARDENED STEEL. A NICE IMPROVEMENT THAT HAS ALWAYS BEEN THERE. STILL AVAILABLE IN SETS OF 4, COMPLETE WITH ALLEN WRENCH, FOR MODELERS WHO DEMAND ONLY THE VERY BEST! WHY PAY MORE AND GET LESS ... STILL ONLY 69c



SCALE DRAWINGS SAAB SAFARI
1977 CATALOG 256
SE-751
MORRISON
48500 MC KENZIE HWY.
VIDA, OREGON 97488
REPLA-TECH
International



7037

The perfect finish for your project

Binks Wren airbrush applies almost any color or protective coating with superb texture and thoroughness. Easy to use. Precise atomizing control. Available in sets or complete outfits. See your dealer or send for Bulletin A59-6.



BINKS

Everything in spray painting

9201 W. Belmont Ave., Franklin Park, IL 60131

Certainly, when spraying epoxy paints in just the same manner as spraying other types of paint products, the solvents, in particular, should be treated with respect, and they should only be used with adequate ventilation.

In short, we feel that the author was very much overly dramatic, and we feel that his comparison of epoxies with cyanide and snake bites has done no justice to the hobby industry as a whole. We feel that the best justice and the best service to him would have been realized had he brought this matter directly to our attention, or to the real experts in this field, i.e., the manufacturers, themselves, of the epoxy resins—Robert A. Pettit, President, Pettit Paint Company.

Kitten going strong

The February 1977 issue of FLYING MODELS had a picture of Contributing Editor, Bob Aberle's Grumman G-63 Kitten on the cover and a very well researched construction article and plans inside. Since the publication of this fine stand-off scale design the response has been terrific. Besides a lot of you ordering plans (there should be a whole bunch of Kittens flying this season), Bob, an engineer from Grumman Aerospace Corporation and his Kitten, have been featured in Grumman's house organ *The Grumman Plane News* and in *The Smithtown News*, a local paper in Smithtown, New York.

Along with all this good publicity for our hobby, Bob was also recently visited by Franklin T. (Hank) Kurt, a Grumman retiree now in his 70's, and an aviation pio-

IN STOCK
D.C. QUICKSTART DIESELS

	SPITFIRE .036 DART . . . \$14.25
	.047 MERLIN . . 13.75
	.059 SPITFIRE . 13.85
	.091 SABRE . . 14.75

Please Add \$1.50 For Postage and Handling
N.J. Residents Add 5% Sales Tax

Eastern Diesel Supply
259 Outwater Lane Saddle Brook, N.J.
07662

PROCTOR HARDWARE



- WORKING TURNBUCKLES
- RIGGING & CONTROL CABLE
- CONTROL HORNS
- STRUT FITTINGS
- SHOCK CORD
- COCKPIT TRIM
- PULLEYS
- INSTRUMENT HOUSINGS




For additional information, brochure and catalogue send 0.50¢
PROCTOR ENTERPRISES INC.
P.O. BOX 9641
SAN DIEGO, CA. 92109
DEALER INQUIRIES INVITED
HQD., AT 6821 CONVOY CT., SAN DIEGO CA.

LOOK BEFORE YOU LAUNCH



A helpful hint from your FM Staff.

GLH II

Designed by
GEORGE KURRECK



SPAN: 32.25 in.
AREA: 204 sq. in.
WEIGHT: 20 oz. all up
ENGINE: Tee Dee .049/.051
FUNCTIONS: Ailerons & Elevator

An all out swept wing 1/2A racer that is currently sweeping West Coast competition. Fast and solid performance with good tracking and predictable response.
Kit available with either foam or built-up wing. Complete hardware including motor mount and spinner.
GLH stands for "Goes Like Heck!" You better believe it.

50L211—GLH II, built-up wing \$18.95

50L210—GLH II, foam wing \$16.95

Please send me your complete catalog. Enclosed is \$1.00 which is refunded on my first order. (Add \$.50 for 1st class mail return; add \$1.00 handling on all other orders.)

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

ACE R/C, Inc.

BOX 511H, HIGGINSVILLE, MO. 64037

neer reputed to have been the first person to receive an aeronautical engineering degree from the Massachusetts Institute of Technology in the early 1920's. The reason for Mr. Kurt's visit was that he had heard about Bob's Kitten and, since he was the man who made the first test flight in the original prototype, was interested in seeing it. Mr. Kurt was enthusiastic in his praise and particularly liked Bob's precise scaling.

Our congratulations to Bob and we hope that all his designs are as successful as the Grumman G-63 Kitten.

Product Notes

FUSITE DIVISION, EMERSON ELECTRIC CO., 6000 Fernview Ave., Cincinnati, OH 45212, has introduced the new GloBee Stinger, a cordless, self-contained 1/2A starter that delivers over 100 starts on a full charge while freeing modelers from the burden of hauling around a heavy separate battery with its dangling wires.

Two 2 VDC rechargeable lead acid cells (included) power the 9,000 RPM motor (5,000 RPM under load) with enough flywheel action to start even cranky engines. Its resilient drive cup adapts to various engines from .010 to .051 cid.

The sturdy black high-impact case is fuel-proof and fluted for a firm grip in all kinds of weather. An integral flywheel shroud protects the motor shaft and bearings from casual side thrust damage, while the anti-roll flange also serves as a finger stop.

Another special feature is the coaxial type recharge jack that prevents improper

PEANUT SCALE NEW! Kits

RUBBER POWERED FLYING MODELS



GIPSY MOTH
13 IN SPAN P-NUT KIT \$3.49



One Nite 28
28 IN SPAN SPORT \$4.75



Ganagobie
13 IN SPAN P-NUT KIT \$3.49



One Nite 16
16 IN SPAN SPORT \$3.49

PEANUT SCALE KITS

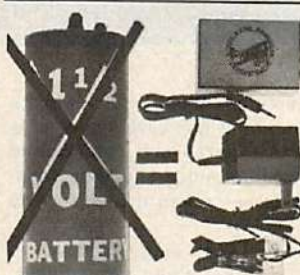
PIETENPOL	\$3.29
MILES	\$3.29
TURBULENT	\$3.29
PIPER J3 CUB	\$3.29
ANDREASON	\$3.49
COUGAR	\$3.49
MUSTANG	\$3.49
ZERO	\$3.49

SPORT MODEL KITS

STRINGLESS WONDER	\$2.49
PECK R.O.G.	\$1.39

KITS • PLANS • ACCESSORIES
CO-2 ENGINES SHARK & BROWN
REAL JAPANESE TISSUE-PROPS
COMPLETE CATALOG 50¢
MANY HARD TO FIND ITEMS

Peck-Polymers P. O. BOX 2498-FM LA MESA, CALIF. 92041
PHONE (714) 469-8675 or (714) 442-4636



THE EVER-GLO BATTERY PACK

No more dead or half-dead battery when you get to the field. With a fully charged EVER-GLO rechargeable ni-cad battery pack,

"THAT WILL FIT IN YOUR POCKET"

you will always get fast starts for your engines whether used in cars, boats, or airplanes. Send check or money order to:

ONLY \$16.95 INCLUDED BATTERY PACK, CHARGER AND CLIP

KITTYHAWK PRODUCTS
10937 Inglewood Avenue
Lennox, California 90304
Allow 2 weeks for delivery.

CLOCK WORK TIMERS



1/2A "TICK OFF"
0-25 second timer
\$11.50



"TICK OFF"
0-30 second timer
\$11.50



"DT-TICK OFF"
0-6 minute timer
\$11.50

EXTERNAL FUEL FILLER



SPINNERS



RAZOR BLADES



FUEL SHUT OFF VALVE



GLOW PLUG STARTER



BATTERY CHARGER



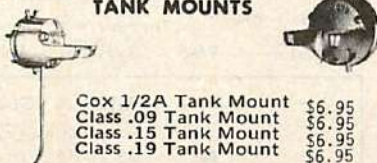
ENGINE MOUNTS



1/2A	Short or Long	\$2.50
.09	Short only	3.25
.15	Short or Long	3.25
.19	Short or Long	3.50
.29-.40	Short or Long	3.85
.45-.59	Medium only	4.15
.40RV	Long only	4.50
.60	Short only	5.00
.60RV	Long only	5.50

Special Mounts for:
Tee Dee .049 \$2.50
K&B .15 75 ser. 4.50
Testors .29-.40 3.85
K&B .40 Pylon 6.00

TANK MOUNTS



Cox 1/2A Tank Mount	\$6.95
Class .09 Tank Mount	\$6.95
Class .15 Tank Mount	\$6.95
Class .19 Tank Mount	\$6.95

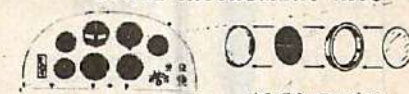
HINGES



HINGE SLOT SET



SCALE INSTRUMENT KITS



SPEED PANS

REGULAR	PROTO
1/2A - \$4.65; A - \$6.35 B - \$7.25; C - \$8.50	MR-2 1/2A - \$4.65 B - \$5.50

See your Dealer. If no dealer is convenient, order direct. Please add 10% or minimum of 50¢ for postage, and handling. Send 25¢ for illustrated catalog.



TATONE PRODUCTS

1209 GENEVA AVE.
SAN FRANCISCO, CA 94112

NEW 1977 CATALOG

1st Class Mail—\$1.00: 56 pages of the finest rubber-power models & supplies—plus, Classic Models, Flyline Models, R/N Models, Peck-Polymers, F.H. spoke wheels, Tissiman plans, & more!

Send SASE for latest price/ product list
DEALER INQUIRIES INVITED
VINTAGE AERO • 1 THE GLEN
TENAFLY, NJ 07670

BACK ISSUE MAGAZINES

OVER 200 Titles, 1890 to 1976: Time, Life, Look, Ebony, Newsweek, Nat'l Geo., Fortune, People, Esquire, Playboy, Penthouse, Ms., Gourmet, Vogue, Out, Photo, Movies, Art, Sports, Sci-Fi, Western, Pulp. Send stamped env. w/issue date for price & free list.

EVERYBODY'S BOOKSHOP Dept 7FMI, 317 W. 6th
L.A., California 90014

PROPEL MORE

Go further faster on same power!
Every Grish engineered TORNADO Propeller has true pitch delivers MORE of your engine's R.P.M.

FLY Propellers BY Tornado

2 Blade Tractor
5-3 5-4 each
5-3 5-4 30¢
6-3 6-4 35¢
7-4 7-6 7-8 50¢
8-4 8-6 8-8 65¢
9-4 9-6 9-7 9-8
10-4 10-6 85¢
1-4 11-6 11-8 \$1

RC 12-4
12-5 12-6 \$1.50

7-8 85¢
8-6 8-8 \$1.25
9-6 10-6 10-4
\$1.50
10-6 Pusher
\$1.50

2 Blade
Pusher
5-3 5-4 each
5-3 5-4 30¢
6-3 6-4 35¢
8-6 85¢
9-6 10-6 \$1
3 Blade Tractor
5-3 5-4
6-3 6-4 50¢
3 Blade Pusher
6-3 50¢

3-BLADE

Looks like metal.
Color all the way thru.
Specially designed for
RC and Flying Scale.
Provides welcome
ground clearance.

Metallic
Aluminum Color

GRISH BROS.
ST. JOHN, INDIANA 46373



terminal connections which can damage batteries. A matching 4.5 VDC charger is also available. All parts are replaceable and easily accessible, since the unit separates into two halves when a few screws are removed.

The Stinger is 11½" long by 1¾" in diameter and weighs about 28 ounces. When initial shipments are made to retailers about May 30, they will carry a special introductory package price of \$39.95 for both starter and charger together. As noted above, the Stinger comes ready to use with batteries included.

BUCKEYE Balsa Co., 3330 Youngstown-Kingsville Rd. N.E., Cortland, OH 44410, has introduced Serv-Kit, a servo mounting system that allows you to change the center of gravity after the plane has been flown or to change radios without tearing apart fuselage sides. The kit features easy to follow instructions, and comes complete with two machined sitka spruce side runners and two sitka spruce cross runners which you cut to your own size requirements. Serv-Kit also allows servo arms to be aligned perfectly with pushrods. Serv-Kit is available at a suggested retail price of \$1.39 each at your dealers or order direct by adding \$.25 for postage.

SIG MANUFACTURING CO., Monte-

zuma, IA 50171, is introducing the Sig ½A control line flight pack. The pack contains everything needed to start and fly a ½A control line model airplane except for the 1½ volt battery. The pack includes an adjustable handle, dacron flying line, line connectors, a pint of glow fuel, fuel filler bulb with fuel line, battery hookup wire and terminals and illustrated instructions. Suggested retail price is \$4.95 at your hobbyshop.

K&B MANUFACTURING, 12152 Woodruff Ave., Downey, CA 90241. With the addition of seven new model airplane engines, ranging in size from 3.5cc to 6.5cc, the K&B line now totals sixteen model airplane engines and four marine engines. The seven new engines include the K&B 3.25cc (.19) front rotor, the K&B 3.5cc (.21) front rotor, the K&B 4.9cc (.29) and the K&B 5.8cc (.35) front rotor, all for Free Flight or Control line. The K&B .35 R/C for the sport minded flyer, the K&B 6.5 R/C (.40) front rotor with Perry carburetor and the K&B 6.5cc (.40) front rotor for Free Flight or Pylon Racing. All K&B engines incorporate features exclusive to K&B and the total line of twenty engines now provides a range of sizes and types to meet every power plant demand. All are available at your local hobby dealer.



APPLIED DESIGN CORPORATION
738 Penn St.
El Segundo, CA 90245



MINI SANDER

ADJUSTABLE TENSION
HAND BELT SANDER

- FIRMLY HOLDS PAPER
FOR EASIER SANDING.
- Padded flats and curves.
 - Handy to Hold
 - Easy to Use

\$1.49

MINI — STRIPS
SAVES TIME
AND EFFORT

99¢

PRECISION DIE CUT
REPLACEMENT
SANDING BELTS.

Medium Garnet
Fine Garnet
Aist'd. Water Proof

MINI GLUE TIPS

MAKES ANY GLUE TUBE
AN "INSTANT GLUE GUN".
PUT THE GLUE WHERE
YOU WANT IT!

- Seals with a pin.
- No fuss to fill.
- No mess to clean.

NEW
4 for 99¢



Stay-Tray \$1.98

KEEP EVERYTHING
IN PLACE — NEATLY



This molded plastic work organizer tray is ideal to keep tools and parts clean and handy on bench, table, or in the field. Great while you build or take things apart.

new!

MINI SAW \$3.95

COMPACT 10 inch HACK SAW

SAWS ANYTHING, ANYWHERE



Saw has rugged die-cast frame with comfortable, chip-proof plastic inert handle. Recording, more and adjustable 6" blade gives good work access. Cuts wood, plastic, metal, and HARDENED MUSIC WIRE.

MINI - SAW BLADES

3 for 99¢

FINE TOOTH REPLACEMENT HACK SAW BLADES. (6 inch)
TEMPERED for cutting HARDENED MUSIC WIRE.

BOOKS
The World of MODEL AIRCRAFT
by Guy Williams
256 Pages
6.98

The World of Model SHIPS & BOATS
by Guy Williams
256 Pages
6.98

Over 230 Illustrations

AMERICA'S hobby center, inc.
146 W. 22nd STREET
NEW YORK, N.Y. 10011

'superstock'
BRAND NAME SAVINGS

ESTABLISHED 1931

Radio and Engines
NOT Included in Kits.

Amphibious Buggy
Operates in water as well as on land. Built in Engine starter. 19" Long.

69.95

TOWLINE GLIDERS

THERMIC '36'
Jato 36" Wingspan
Kit G-7
3.95

Simpson's TALON
Jato 80" Wingspan
Kit G-9
22.49

Midwest JETSTREAM
Kit 303
45" Wingspan
7.95

SINBAD 40
40" Wingspan
Sig Models
7.50

SUPER SINBAD
62" Wingspan
Sig Models
12.95

Star Pro SUPER CONDOR
72" Wingspan
Power
6.95

Sterling CIRRUS
87.5" 16" Wingspan
Kit E-7
15.95

Sterling DIAMANT
74" Wingspan
Kit E3
10.95

Sterling SCHWEIZER 2-32
42 1/2" Wingspan
Kit A-27
4.95

TRAVELER Sailplane
24" Span
Term Aero Kit No. 102
1.95

DRIFTY Primary
18" Wingspan
Term Aero Kit No. 108
1.95

HAND LAUNCH GLIDERS

THERMIC 'B'
20" Wingspan
Jato Kit SG-4
2.50

Jato THERMIC 18
12 1/2" Span
Kit SG-2
1.78

RUBBER MODELS

153 Stuka
Span PRICE
153 P-40 Warhawk..... 36" 4.95
153 Stuka..... 18" 3.95
154 Taylor Cub..... 18" 3.95
155 Cessna 185..... 18" 3.95
156 F-51 Mustang..... 18" 3.95
157 Messerschmitt..... 18" 3.95

SCIENTIFIC
160 Sky Master..... 36" 4.95

SCIENTIFIC
137 Mix Americall..... 20" 3.95
138 Piper Cub..... 20" 3.95
139 Cessna 180..... 20" 3.95

SCIENTIFIC
153 Stuka

SCIENTIFIC
153 P-40 Warhawk..... 36" 4.95
153 Stuka..... 18" 3.95
154 Taylor Cub..... 18" 3.95
155 Cessna 185..... 18" 3.95
156 F-51 Mustang..... 18" 3.95
157 Messerschmitt..... 18" 3.95

MONOGRAM
Cessna 180..... 18" 4.00
Cirrus..... 18" 4.00
Piper Cub..... 18" 4.00

RAZOR PLANNER
Converts the Safety Razor Blade into a handy Planner
2.49

Glo Bee GLO PLUGS
RACING GB-1 Long or Short **3 FOR 4.49**
R/C GB-2 Long or Short **3 FOR 3.39**
SPORT GB-3 Long or Short **3 FOR 2.25**

LIQUID Masking Film
Easily masks lettering, insignia, etc. on finish or surface. Thin, lines, and leaves sharp clean paint lines.
4.95 16 oz.

DeLUXE TORCH KIT
No. 4000
CONTAINS: TORCH, Flamingo, Brazing rod, Spark Lighter, & Microscope, 3 Bunsen, Welding Mask & Instructions.
No. 3100 BRAZING ROD KIT **3.39**

RUBBER BANDS
No. 62 or No. 64 Bands
1/4 lb. Box **1.19** Per Box

INSTRUMENT DECALS
7/16" Scale
49¢ Pkg. 3
SALE 100

FUEL PRIMING BOTTLE
With Self Sealing Spout. Ideal for priming your engine.
Star Pro Prod. **59¢**

TEE BAR ALUMINUM EXTRUSION
Small: 1 1/2" x 1/2" x 1/2" **1.95**
Large: 2 1/2" x 1/2" x 1/2" **2.99**

12 Volt ENGINE STARTER
Ideal for Airplane, Boats or Cars.
24.95

SMALL Handy Model
Ideal for Airplane, Boats or Cars.
24.95

HEAVY Duty Model
4 way starter for Airplane, Boats, Cars and Gliders.
29.95

READY-TO-FLY
Scale U.C. Airplanes
Approximately 12" Wingspan

Star Pro Product
1) A U.C. Model
For 409 Engine
All Balsa Construction
2.49

Do Do BIRD
18" Wingspan
2.49

SALE
2.49

SALE
2.49

Star Pro Product
1) A U.C. Model
For 409 Engine
All Balsa Construction
2.49

Do Do BIRD
18" Wingspan
2.49

U-CONTROL COMBO
3 Airplanes and One Engine
11.99

All 3 Airplanes PLUS Balsa
Bee 409 Engine. Each model can be built in 20 Minutes
Order Combo **11.99**

RUBBER POWERED MODELS

GUILLON
101 Mess. BF-109..... 24" 4.50
102 French Spad..... 18" 2.95
103 Fokker D-7..... 18" 2.95
104 British S.E.5..... 18" 2.95
105 Sopwith Camel..... 18" 2.95
106 Fokker D8..... 18" 2.95

GUILLON
201 T. Morse Scout..... 24" 6.95
202 British S.E.5..... 24" 6.95
203 Mess. BF-109..... 24" 6.95
204 Sopwith Camel..... 24" 6.95
205 Fokker Triplane..... 24" 6.95
206 Biplane..... 24" 6.95

GUILLON
301 Piper Super Cub 95..... 24" 4.50
302 Cessna 170..... 24" 4.50
303 Piper Super Cub 95..... 24" 4.50
304 Cessna 170..... 24" 4.50
305 Piper Cherokee..... 24" 4.50
306 Beech Musketeer..... 24" 4.50
307 Cessna..... 24" 4.50

GUILLON
401 Mess. BF-109..... 24" 4.50
402 N.A. Mustang..... 24" 4.50
403 Supermarine Spitfire..... 24" 4.50
404 Mitsubishi Zero..... 24" 4.50
405 P-40 Warhawk..... 24" 4.50
406 Fokker..... 24" 4.50

GUILLON
501 Sopwith Camel..... 24" 4.50
502 Cessna 170..... 24" 4.50
503 Cessna Skyhawk..... 24" 4.50
504 Stearman PT-17..... 24" 4.50

GUILLON
601 N.A.T.-280 Dragon..... 24" 2.25
602 Cessna 170..... 24" 2.25
603 DH-1 Chipmunk..... 17" 2.25
604 Skyraider..... 17" 2.25
605 P-51 Mustang..... 17" 2.25
606 Typhoon..... 17" 2.25


GUILLON
701 N.A.T.-280 Dragon..... 24" 2.25
702 Cessna 170..... 24" 2.25
703 DH-1 Chipmunk..... 17" 2.25
704 Skyraider..... 17" 2.25
705 P-51 Mustang..... 17" 2.25
706 Typhoon..... 17" 2.25

GUILLON
801 N.A.T.-280 Dragon..... 24" 2.25
802 Cessna 170..... 24" 2.25
803 DH-1 Chipmunk..... 17" 2.25
804 Skyraider..... 17" 2.25
805 P-51 Mustang..... 17" 2.25
806 Typhoon..... 17" 2.25

GUILLON
901 N.A.T.-280 Dragon..... 24" 2.25
902 Cessna 170..... 24" 2.25
903 DH-1 Chipmunk..... 17" 2.25
904 Skyraider..... 17" 2.25
905 P-51 Mustang..... 17" 2.25
906 Typhoon..... 17" 2.25

GUILLON
1001 N.A.T.-280 Dragon..... 24" 2.25
1002 Cessna 170..... 24" 2.25
1003 DH-1 Chipmunk..... 17" 2.25
1004 Skyraider..... 17" 2.25
1005 P-51 Mustang..... 17" 2.25
1006 Typhoon..... 17" 2.25

'superstock'
BRAND NAME **SAVINGS**

without Notice ***
N BELOW  F-777
17

17

MODELER'S DREAM CAME TRUE
100% THROTTLEABLE PRESSURE JET



NEW TINY
JET ENGINE
0. TO 5 LB. THRUST
PUSH-BUTTON STARTING
AND AIR RESTART
WEIGHS 1.5 lbs.

\$85.00 COMPLETELY ASSEMBLED
READY TO FIRE
SEND \$7 FOR INFORMATION PKGE.
TODAY • CONSTRUCTION PLANS
• 10x8 GLOSSY PHOTO
• BROCHURES & LITERATURE

EMG ENGINEERING CO.
18518-V S BROADWAY, GARDENA CA 90248

VINTAGE R-C PLANS



(1932) GEE BEE R-1 SR SPORTSTER
28" WING SPAN
TWO SHOTS OF DRAWINGS — PLANS \$ 4.95
OVER 50 OTHER MODEL PLANS AVAILABLE !!

SEND 50¢ FOR CATALOG TODAY !!
DEALERS & DISTRIBUTORS WANTED

WORLD WIDE

SID MORGAN
13157 ORMOND, BELLEVILLE, MICH. 48111 U.S.A.

FM Clinic

tips from the staff

A Stack of Ribs

A.L.: Is there any reason why I cannot stack all my rib blanks to be cut between the root and tip template? I refer to all the ribs for both left and right wing panels for a tapered wing in one bolted together sandwich.

ANSWER: No reason not to, it works well if you can dress down that wide a stack with your equipment on hand. Given just enough blanks of balsa for the left hand side of the wing each finished rib will have a slightly beveled edge, though this bevel will be reduced to half that if you cut all ribs together. As each succeeding rib comes out a tiny fraction smaller as you go down the line we suggest you take the first rib for the left root rib, the next for the right root, then the third rib for the right panel, fourth for the left, fifth rib for the left, sixth for the right, following in that order. The wing will then average out with about equal camber thickness aerodynamically. If chosen by the normal method, one left, next right, left, right etc., all the right ribs would measure a shade smaller than the left.

Covering Patterns

J.L.: How can I make the most economical use of a roll of iron-on covering material?
ANSWER: By planning it out first. If you ran short and had to buy an extra roll for the last piece it would hurt in the wallet area. If the situation looks really tight, take a few extra minutes and cut newspaper patterns to fit the various areas to be covered with a minimum but adequate overhang for handling. By laying these patterns out adroitly on the available material you can make the most of your available material. Do beware of the old trap of cutting two left panels when a left and a right are required. As the adhesive is on one side or the other lefts and rights do matter. Perhaps best to cut out left and right patterns as yesterday's newspaper is for free. Magic marker each with a mark facing up to avoid any confusion along the line. And re-reading the manufacturer's well thought out instructions might save you some more grief if you're not all that experienced in applying the covering. Take time to vacuum

Write For **FREE BROCHURE**

On Our Complete Line Of

R/C PROPORTIONAL EQUIPMENT

including

**WORLD'S SMALLEST SUPERLIGHT
DIGITAL CONTROL SYSTEMS**

SMALLEST SIZES

(PLEASE SEND AIRMAIL

LOWEST PRICES

POSTAGE)

13400-26 Saticoy Street

North Hollywood, Calif. 91605

Phone (213) 764-1488

**CANNON
ELECTRONICS**

Card Models

LIGHTER THAN AIR

NEW

MACON The 1933 Goodyear Airship, with parasite fighter and Mooring Mast. Model 27" long (1:350)
U.S. Made \$4.50

HINDENBURG Model 19.5" (1:500) with Mooring Mast and 1:200 model of passenger compartment interior.
U.S. Made \$2.75

GRAF ZEPPELIN Four feet long (1:200). From Germany. \$7.25

MONTGOLPHIER Early French hot air balloon. 14" high (From Germany) \$2.85

EXPRESS Mid 1800's proposed steam driven "commuter". Model 24" long (Germany) \$2.85

Fully colored, three dimensional, cut out and assemble scale models of paper. Not children's toy cutouts. Coded lives give cutting, folding, and location data. A "Method Sheet" in English supplies foreign language instructions with models from Germany(G). Over 200 models cataloged. Ships, planes, architecture. Most models are imports from Germany, France, Holland, England, and Austria.

From Germany



HENSCHEL HS-123 (1:50) Dive Bomber \$1.90
FIAT G-91 (1:50) Jet. Furnished cockpit \$1.90
FOKKER TRIPLANE (1:20) 14" span \$2.85

SANTA MARIA Columbus Flagship With sails. 11" \$2.85

LEIPZIG WW II Ger. Cruiser W/tr line 28" Deck plane. Detailed \$4.75

Catalog \$.25 (Free with order)

SHIPPING CHARGES

Under \$2.50 \$.45 \$7.26-\$12.00 \$1.50
\$2.50-\$7.25 \$.95 Over \$12.00 \$1.75

Cal. Residents 6% Sales Tax
FOREIGN-Postal M.O. or Bank Check (U.S. funds) No COD

JOHN HATHAWAY 410 W. 6th St/Box 1287 San Pedro, Calif. 90731

"HOT STUFF"™

GETS IT TOGETHER

FAST

AT YOUR
HOBBY
DEALERS NOW

1 ST. CHOICE AROUND THE WORLD

Over 1000 Single Drop Applications in Two
Bottle Unit. Formulated for Maximum
Strength/Shelflife.

- DEALERS call for
- Nearest DISTRIBUTORS
- (213) 899-2301

SATELLITE CITY,
P.O. BOX 1935
ARLETA, CALIF. 91331

14 grams = .493 fl. oz.

off the sanding dust and check the structure for rough protrusions.

Testing for Leaks

L.P.: How can I be sure a fuel tank won't leak once inside a model?

ANSWER: There is one simple test that will relieve much of your worry. Immerse the tank-to-be under a sinkful of water, vents sealed off with your fingers and a length of fuel line tubing attached to the filler line. Blow into the line and any leak that might be present will reveal itself as a stream of escaping air bubbles. If you solder up your own special tank this is a "must" before installing, but factory made products can have their moments too. Also, in case of leak trouble later on, try to shield your radio compartment from fuel excesses, provide drains.

A Twisted Fuselage

D.A.: Is there any way I can remove a twist in a fuselage framework. As is, the wing and stabilizer would have a difference of opinion as to what level is.

ANSWER: With rubber powered models the answer is simple, just an ideal number of turns in the rubber motor until the framework straightens, then cover and dope the fuselage with the 53 turns or however many still locked in the rubber. The technique would also work with a temporarily installed rubber motor of larger proportions in a gas engine aircraft, assuming it is not a stiff sheeted fuselage and that you have clearance to run the rubber within. It is the skin tension of the covering which will hold the final setting, so thickly sheeted fuselages and iron-on coverings may give you less in the way of results. Best idea is to start with true wood and good building techniques. Slight wing/stab alignment problems can usually be shimmed to perfection.

Lightweight Pushrods

T.R.: In certain applications I feel a lighter weight pushrod would be desirable. Can you offer any ideas on this?

ANSWER: Hard 1/4" squares of balsa, spruce or diameters of dowel came into use as pushrods back in the 1950's when rudder and elevators were actuated mostly by rotation of the 1/4" square rod. With push-pull servo action, a lighter "X" shaped cross-section of sheet will do the job, if adequately supported to avoid bowing under strong air loads. In certain applications it is a weight saver.

ATTENTION SUNDAY FLYERS!

HERE ARE FOUR NEW MOTORS CREATED ESPECIALLY FOR YOU.



FOX 15BB RC
ONLY 55.95

Easy starting, good idle, non critical handling characteristics with easy installation were the primary considerations in the design of the Fox 15BBRC. The side exhaust configuration fits the airplanes you now have. Power output does not suffer. The Fox 15BB is by far the most powerful side exhaust 15RC on the market and with suitable carburetor changes it will give the most expensive rear exhaust 15s a real run for their money. Install one of these new beauties in your 15 model - it's cooperative attitude will amaze and delight you.



FOX 19 RC
ONLY 31.95

The Fox 19 defies explanation. It has neither ball bearings or schneurle porting yet in Club 20 Racing it has so consistently outrun all comers that 1977 Club 20 rules handicap Foxes to 6 mm exhaust outlet. Webras, Tigres, Taipans, Qs & Vecos are permitted to run stock. For 1977 the Fox 19 has been given a beauty treatment, an improved carburetor and the crankshaft and rod have been beefed up a bit. We invite you to fit one of these remarkable motors in your model.



FOX EAGLE 60
ONLY 64.95

Improved for 1977. Case enlarged to accommodate a beefed up rod. New glass bead finish. Leaning out suffered by some of the earlier models has been eliminated. The two ring piston holds compression better and starts readily by hand. Burns less fuel and weighs less. It does not make very good sense to pay \$50 more for a fancy import when a Fox Eagle will deliver all the power you can use. The service on the Eagle is better too. In event of a minus two foot landing you can call the factory direct for parts and have your engine ready to go for next Sundays flying.



FOX 45BB RC
ONLY 64.95

The Fox 45 BBRC is alone in it's field. Schneurle ported. 15mm crankshaft. Fox patented crankcase. Two ball bearings. Aluminum piston w/ full floating ring. For 1977 the case has been restyled and a new button type head has been fitted. The Fox 45 BBRC is the most powerful 45RC available today. It is also the most rugged and crash resistant. Most 60 size airplanes designed three or more years ago are handled better on less fuel by our 45 BBRC. Try it. You will be pleasantly surprised.



MFG. CO.
5305 TOWSON AVENUE
FORT SMITH, ARK. 72901

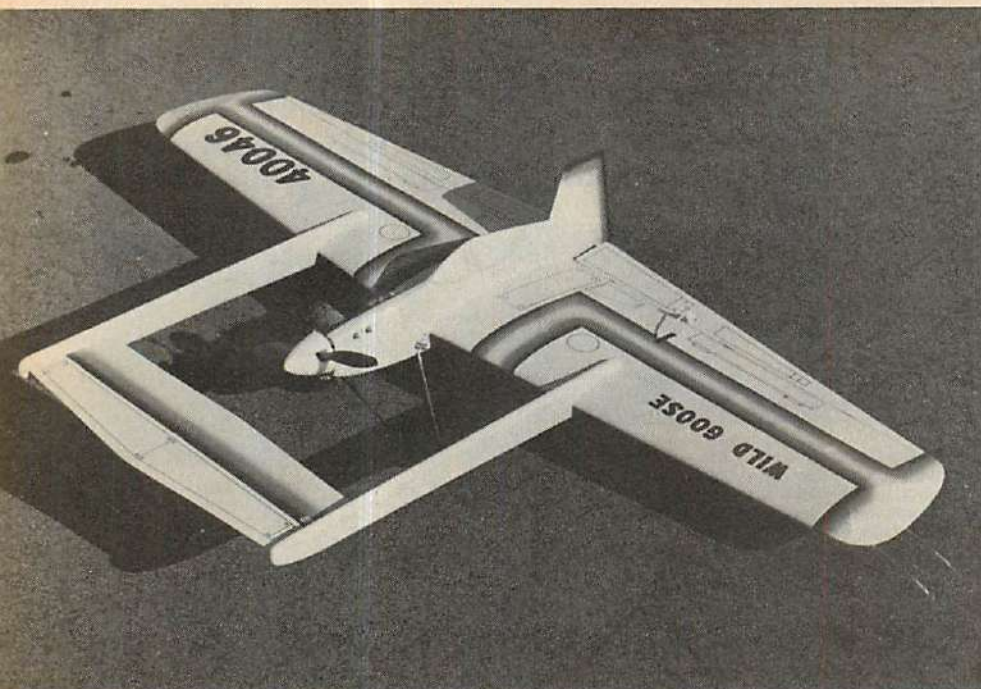


receivers. TRANSMITTER Designed by leading R/C competitors to provide a unit that looks distinctive and feels comfortable in your hands... with function control and Gimbal control designed for the hobbyist... Output power equal to full sized systems, resulting in more than ample range. **FREQUENCIES AVAILABLE INCLUDES** 7-72MHZ. receiver... (3) PS-6 transmitter... receiver... 4 call AA transmitter... appropriate frequency miniature rotary servos... WARRANTY covers battery pack... workmanship for designation flag. **GULL** is also available from date of sale. 6-months from date of operation. **2-CHANNEL** Orbit Gull is not necessary. **GULL** system includes all of the HAWK system features and comes complete with (2) PS-6 servos.

THOROUGH DESIGN 5,000 plus hours of design, testing and engineering add up to another top competitor from Orbit... for the hobbyist.

AVAILABLE 1977
Complete Range of New Systems
illus. Product Information • 25c in Coin, Dept. FM

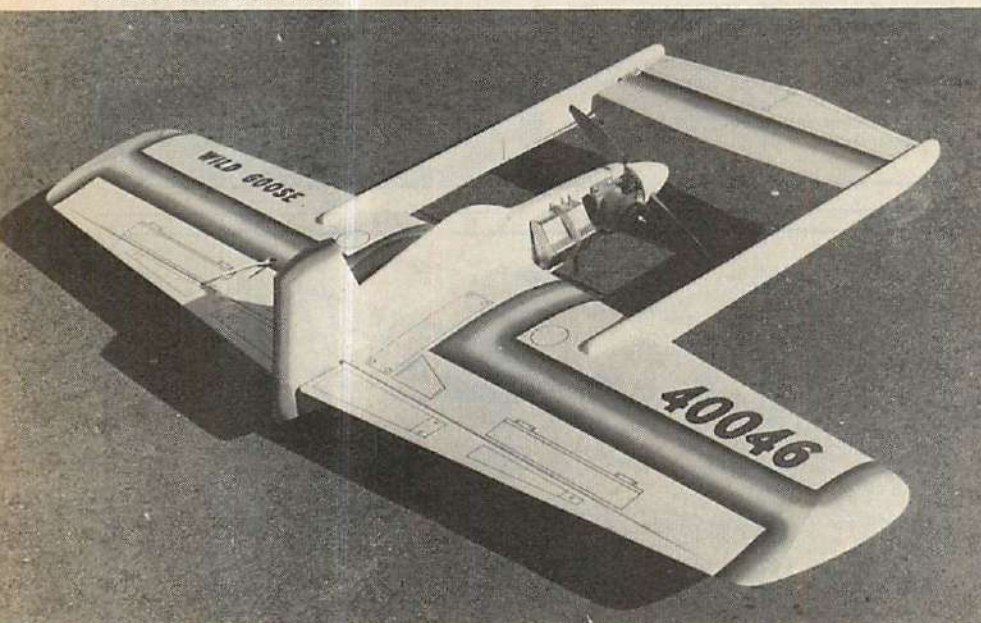
Orbit®
ELECTRONICS
8140 CENTER STREET
LA MESA, CALIF. 92041



The Wild Goose

Hungry hawks just don't know which end to eat first. Try a Canard controline once, it's different/Dick Sarpolus

PHOTOGRAPHY: DICK SARPOLUS



Cream and all kinds of good colors. Profile simplicity, interesting in planform. Flies backwards. Top: Prop would like to chew on the tail, follows it all over the sky. Capable of a Stunt pattern.

Canard configured aircraft have always been interesting; whether full scale or a model, they really stand out from conventional design approaches. It must be the "wrong way" appearance, the "you built it backwards" look. The Wright brothers' early aircraft were canards, but the design approach soon changed to what we now see as the conventional, tail in the back layout. Recent well known canards are the Swedish Saab 37 Viggen, an excellent jet fighter, and an American homebuilt, Rutan's VariViggen. Rutan's latest, his foam and fiberglass VariEze, is exciting many homebuilders with its excellent performance, low cost, and unusual construction and appearance.

I have seen many canard models over the years, mostly Free-Flight types, gas and rubber powered. My first modeling try at a canard was the Weird One, a ten foot span R/C sailplane developed with Arni Pedersen. (June 1975 FM) It took six months of trial-and-error design changes to get that sailplane to fly, but the final result was a good flying, most unusual model. Last year at Wright-Patterson Air Force Base I met two R/C canard enthusiasts, Captains Charlie Bair and Milt Sanders. It was a thrill to see their canard, the Zonker, fly, and they subsequently flew it at the 1976 Dayton Nationals in pattern competition.

Interesting to me was their design approach; with the aid of a computer, plus their Air Force engineering background and experience, their canard flew "right off the drawing board." After some discussions with them, I thought I'd take another crack at a canard, this time a powered version for Controline pattern flying. The canard configuration seemed to offer potential for increased maneuverability and the sharp corners so needed in controline pattern flying. I had seen canard controline ships in past years, but none which were really aimed at modern pattern capability.

To keep the construction time down, a profile fuselage and simple wing construction approach were used. For design layout, we were sure the balance point had to be somewhere ahead of the wing; with a pusher engine installation in the tail, it would not be possible to get the balance point ahead of the wing without using a lot of ballast. So—the engine was put in a normal tractor installation ahead of the wing, and the horizontal stabilizer was put ahead of the wing and engine, on two booms. Sort of a P-39 in reverse. Rudder area, extremely critical on R/C and F/F models, was thought to be not critical at all on a C/L plane so a normally sized rudder was used.

Moments and areas were frankly "eyeballed" until they looked right. Landing gear, again to keep the project simple, is a taildragger type mounted to the fuselage. Wing flaps were used for the usual reason, to increase maneuverability, although the canard set-up looked as though the elevator would furnish plenty of control power without needing flaps. Also considered, through some lively discussions with fellow club members, was the possibility of having both elevator and flaps coupled to move in the same direction. Opinion was divided on which hook-up would be best.

Well, the proof is in the flying. When the Wild Goose was ready, my son Rick and I headed for the flying field, just the two of us, for the test flights. To cut down on the suspense, if there is any, it flew very well. When Rick released the model, it made a smooth takeoff and flew level with no problems. We felt it out through a few wingovers, went into some inside loops, inverted flight, outside loops, and figure eights. All on the first flight. Everything was not perfect; the plane was somewhat too sensitive and had to be flown with a minimum of control deflection. Full control made too tight a maneuver with its attendant "bobble" in the corners. In addition, this writer is far from being contest capable at this time. A second flight was made for the benefit of arriving witnesses, and this being mid-February, made for enough time out in the cold. During the second flight, being careful with the controls, quite decent maneuvers were flown. Landings in particular were very nice. It was felt that the plane could be tail heavy (or is it wing heavy?)

We wanted to try several things on subsequent flights: decreased control surface deflection, added weight up front to move the balance point forward, front surface only for control, and having both surfaces move in the same direction. After the first two flights, we knew the canard configuration was practical; it worked. For a full competition machine, changed such as a full built-up fuselage, larger, thicker airfoil wings of lighter construction, etc., would be required.

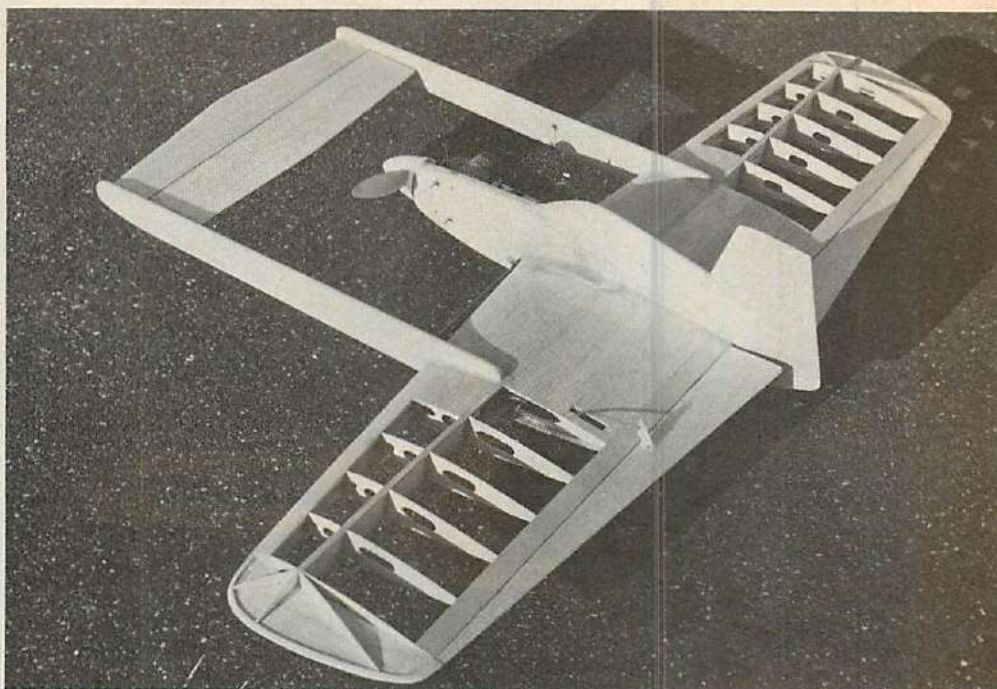
Your Flying Models editor, Don McGovern, likes these out-of-the-ordinary models and accepted the Wild Goose for publication. I visited Don to show him pictures of the model and couldn't get away without a session at the ping pong table. Don't trust anyone who invites you to play and then removes a custom laminated paddle from a zippered, lined protective leather case. I never learned to play cut-throat ping pong; I was too busy flying model airplanes.

Next flights were made with weight added forward, held on for testing with double-sided foam mounting tape. I had too much weight at first and the plane was definitely nose heavy, harder to maneuver. Each flyer must balance and adjust a plane to suit his own reflexes for his own style of flying. I then tried the Wild Goose with the rear flaps fixed in place and only the front elevator for control—it flew about the same, not turning quite so tightly.

It would seem feasible to build this model with only the front surface working, but I believe the wing flaps would be better for full competition. One thing I did not try yet is having both surfaces move in the same direction—don't think this is the way to go, but it will be tried. The plane maintains plenty of line tension as the balance point is quite far ahead of the bellcrank; it might be better having the lead-outs exit further ahead on the wingtip, even through the leading edge. As it is now, the plane flies fine—a good model in a unique configuration suggesting more development for a competition machine.

Construction Notes

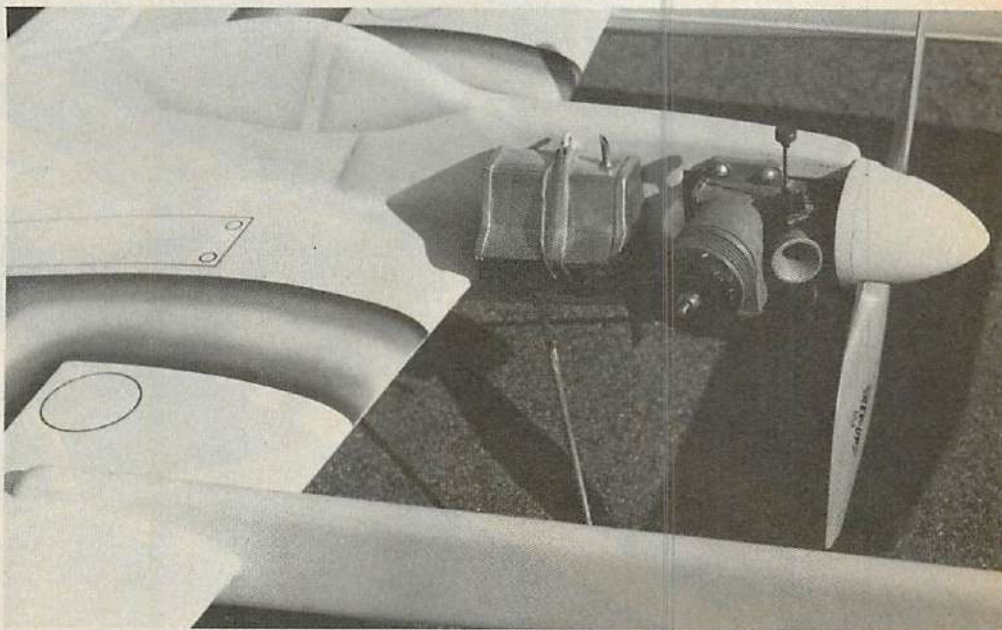
Not too much to say here due to the straightforward construction used, about



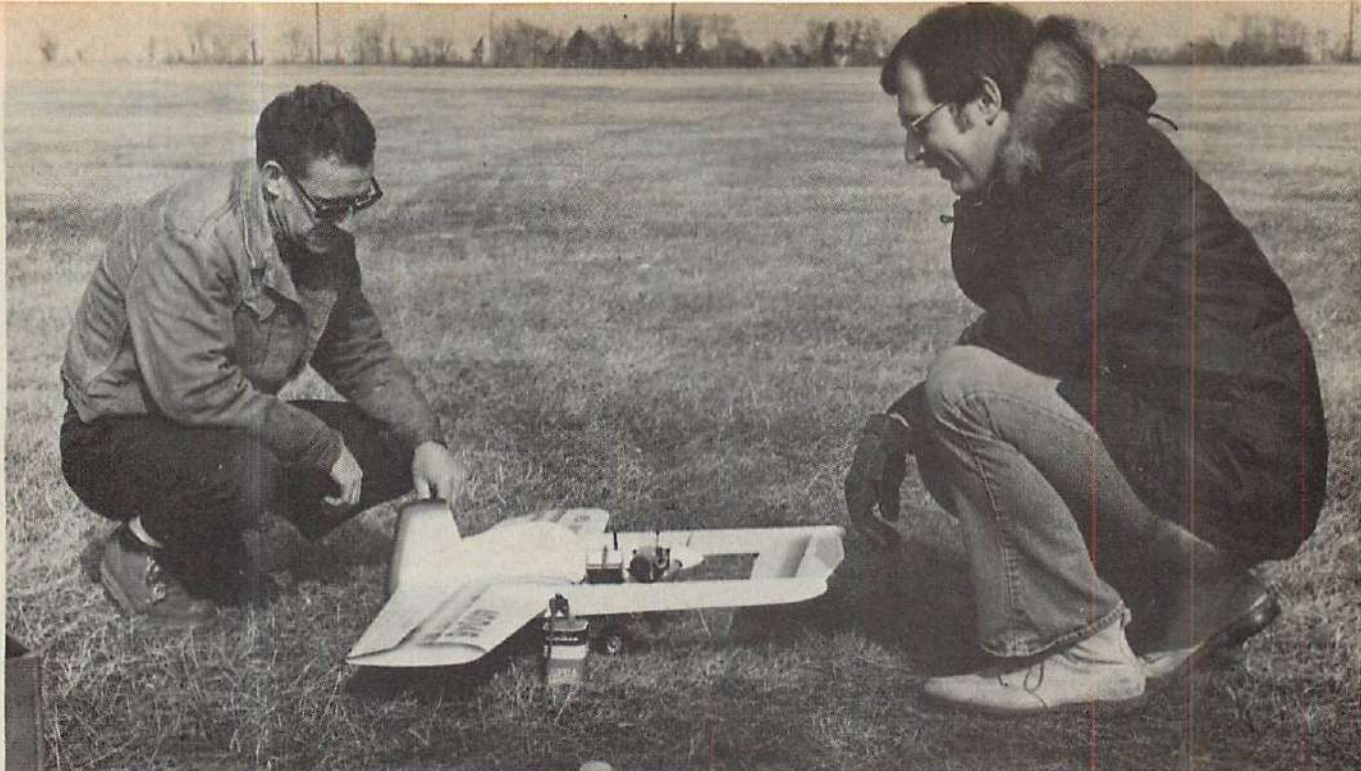
like any typical kit profile model. We do recommend cutting out all parts before starting construction; make your own kit. The wing ribs require the most cutting. Use a root and tip template, sanding the blanks stacked between to shape, or cut them out individually using the plan patterns. Pre-shaped leading edge stock is usually available at a good hobby shop, or shape your own from 1"x1" stock. The full depth spar is cut from 1/8" sheet, notched for the ribs. The trailing edge must be shaped from 1/2"x1" stock. When assembling and gluing the ribs, spar, leading and trailing edges—the ribs must be blocked up on your building board to keep the leading and trailing edges level for a warp-free wing. The plywood bellcrank mount should be securely epoxied in place. As an afterthought, the bellcrank and its push-

rods could have been put in the outboard wing—that way less wingtip weight would be required. That's the way we'll do it next time. Wingtips are 3/16" sheet with 3/32" sheet braces and the center-section is planked with 1/16" sheet.

Fuselage must be added next, so you'll have to build it now. Piece 1/2" balsa stock together to get the necessary fuselage height. Motor mount stock, 3/8"x1/2" maple spaced to suit the engine used, is epoxied in place and the 1/8" plywood fuselage doublers are epoxied on. Sand the fuselage completely before installing it on the wing; round all edges well and taper it toward the rear. Remember to notch the fuselage by the leading edge of the wing cut-out for the landing gear; put the landing gear in place before sliding the fuselage onto the wing. Epoxy well and reinforce with



Side mounted, .35, cheap and easy. Rev-Up prop, tank lashed on profile style. At top: The skeleton is self explanatory. Note leadout position. Plan shows a better location after further testing.



It does so fly, only it gets confusing to look at it. Be prepared to answer lots of questions. **At top:** Get out of the way Dick. A little delay here while we find who's blocking the runway. **Beneath:** Orville started it, the tail-firsters wrote the book on aviation. Fun experimenting.

cloth and epoxy near the leading edge for more resistance to vibration.

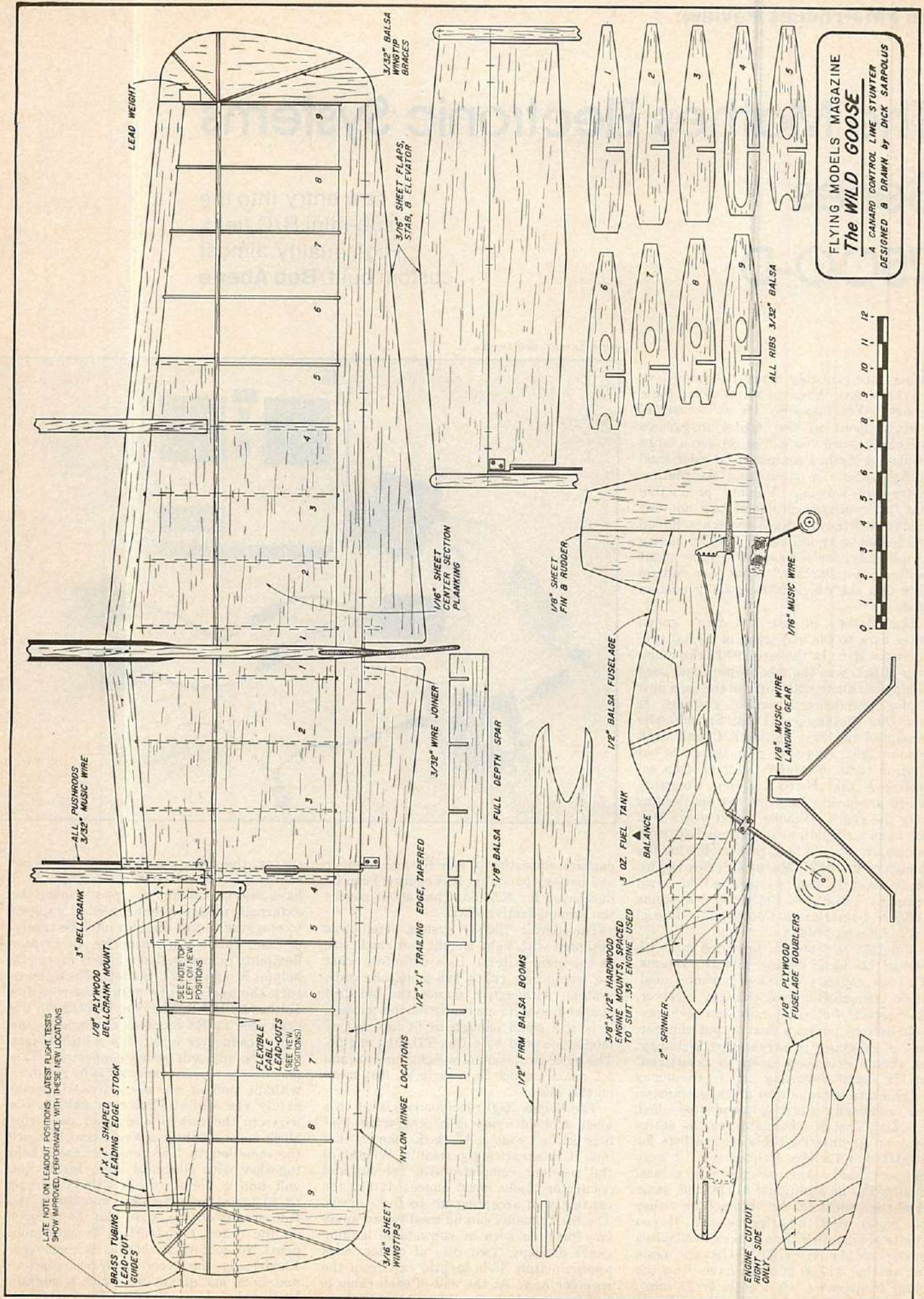
The booms are cut from $\frac{1}{2}$ " balsa, the stabilizer and elevator from $\frac{3}{16}$ " balsa. Alignment is of course important; booms mounted parallel to the wing center line so the horizontal stab and the wing are both level. Be sure the control surfaces move smoothly with no drag.

Silkspun Coverite was used on the wing panels; only a few coats of clear dope are necessary before spraying on the color finish coats. Keeping the weight down, the wood surfaces received only clear dope and a few coats of fillercoat, sanded well, before the color finish coats were sprayed on. Butyrate dope was used on the original model. Base color was cream; the

trim design masked off and orange and brown airbrushed on for a different appearance. A drafting pen (number 3) was used for the panel lines and everything received three coats of clear for protection.

The model was powered by a McCoy .35 stunt engine. Other hardware included a DuBro muffler and wheels and a Fox profile style fuel tank. I'm glad the project turned out well; it's always fun to show up at the field with a different type of model and show the skeptics that unusual configurations can fly well. Perhaps the next project can be the full competition version mentioned earlier; I do feel that the configuration can be fully competitive with conventional models. Dare to be different—try flying backwards.





The Mathes Electronic Systems Series 7500-D

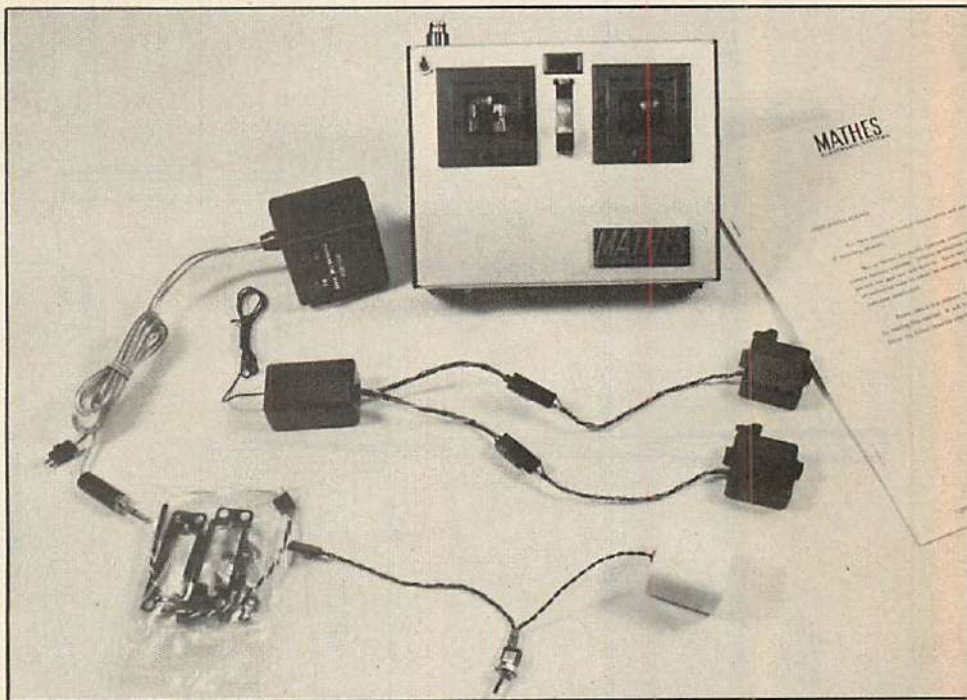
A new entry into the sub-mini R/C field. High quality, almost custom built/**Bob Aberle**

There are probably many R/C modelers who have never heard of Mathes Electronic Systems. You may only see an occasional advertisement in the model magazines and chances are you will never see a large display of Mathes equipment at your local hobby dealer. To quote from the Mathes instruction manual, "Volume production and its associated problems are not our goal nor will they be. Each unit is assembled and tested on an individual basis to assure its integrity, performance, and subsequent customer satisfaction." What you end up with is a set which is essentially custom made.

Don Mathes, in case you didn't know, dates back to the beginning of digital proportional R/C. In the late 1950's the mainstay of R/C was the non-proportional reed equipment along with some of the then new analog proportional control systems. It was Don Mathes and Doug Spreng who marketed the first digital R/C unit back around 1962. Anybody remember the old Digicon radio systems? Later on Don established the Micro-Avionics Company which produced many fine system designs over the years. In more recent years Don has been a consultant to various R/C companies. He was, in fact, responsible for the design of the MRC Masters Series radios. Most recently Don established his own company, Mathes Electronic Systems (1229 N. Lake Havasu Court, Lake Havasu City, Arizona 86403).

For this review Don provided me with one of his basic Series 7500-D systems. This set consists of a five channel, dual-stick transmitter, five channel receiver, four servos, full nickel-cadmium rechargeable battery packs, a dual output charger, and a grouping of accessories including, an aileron extension cable, an assortment of six servo mounting trays, frequency flags, extra servo output arms, grommets, etc., and finally an instruction manual which contains a set of schematics for the entire system. As described this system lists for \$400.00 (on 72 mhz frequencies). It may be purchased direct or through a local dealer. For an additional \$10.00 this same dual-stick outfit can be obtained on either six meter or 27 mhz frequencies. If you prefer single stick, Don makes available a system on 72 mhz for \$420.00 list and again for another \$10.00 you can have it on the other frequencies (six meters or 27 mhz). For those interested a complete airborne

PHOTOGRAPHY: BOB ABERLE

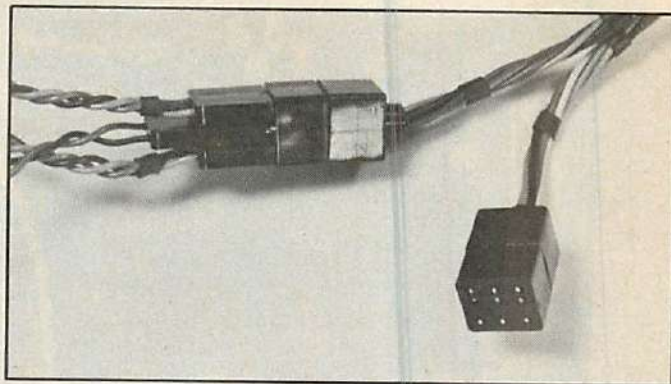
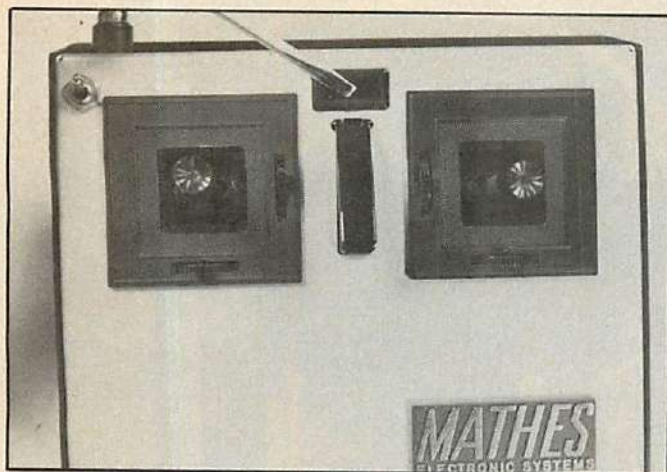


package consisting of four servos, receiver and battery pack (but less charger) can be purchased for \$250.00. That about covers the administrative data.

The Series 7500-D system itself was designed with light weight and small size as the main criteria. It is definitely what we would now call a sub-miniature radio system. Although it is not the smallest available system currently on the market, it is still small enough to fit into a tiny model powered by a Cox TD .010 engine. The basic two channel weight runs around 5.1 ounces which is very light. But more on this later.

The Series 7500 receiver is housed in a black molded nylon case measuring 1 7/8" long x 1 3/16" wide x 7/8" thick (sketch that out, it is surprisingly small!). Weight of the receiver complete with cabling and connector blocks is 1.5 ounces. It has the capability of accepting up to five servos. The fifth channel can be used for an auxiliary function such as retractable landing gears or flaps. Two sets of cables, each approximately 4" in length, exit from the receiver case. At the end of each cable is a connector block. One block accepts three

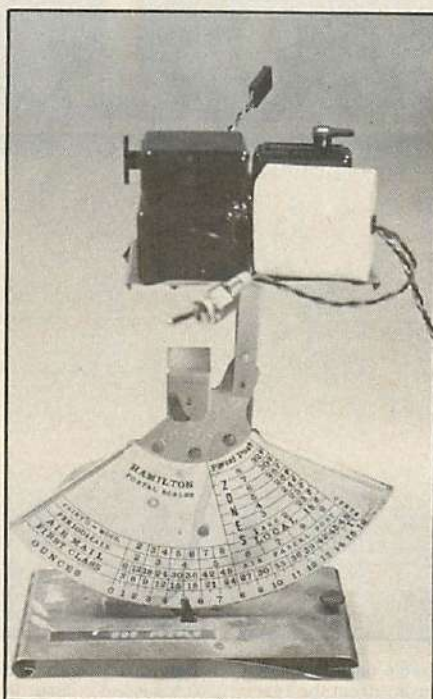
servos, the other receives two additional servos plus the power connection. As I have said in so many reviews, I favor the externally mounted connectors, as opposed to plugging servos directly into the receiver case. This method provides for greater flexibility in installation which is especially helpful in small R/C models. The connectors themselves are manufactured for Mathes by D.&R. They are identical to the type used on RS Systems equipment. The power connector is actually a little longer than the adjacent servo connectors. This permits the power connector to be removed without pulling on the wires. Unfortunately you will still have to pull on the wires in the case of the other connector block since all three servo connectors are the same length. The receiver case is held together with electrical tape. Inside you will find a double deck, printed circuit (P/C) board arrangement, containing the R-F circuits on one board and the decoder on the other. Construction is extremely neat! No conformal coating is employed. Electrically the receiver draws approximately 20 ma. of current which is slightly higher than I usually see. The remaining



Two D&R connector blocks exit from receiver. One links three servos and the other two servos, plus power input. Left: Screwdriver points to LED shroud, glows steadily with power on, flashes when voltage drops to 8.8.



Larger 500 mah battery pack comes with a Noble switch and charging jack; smaller 200 mah pack (optional) uses subminiature toggle and doesn't have a jack to save grams. Facing page: Mathes 7500-D is sold with 4 servos for \$400 list. Only two miniature D-5 servos visible in photo. Right: 2 channels with 200 mah pack, airborne, 5.1 oz. 4 channels, full house, about 6.7 oz.



receiver electrical parameters include a sensitivity of 2 microvolts (nominal), selectivity of 6 db at 3 kc and image rejection of 6 db. Second harmonic and all other spurious signal rejection: 60 db minimum. On an individual basis the receiver lists for \$125.00.

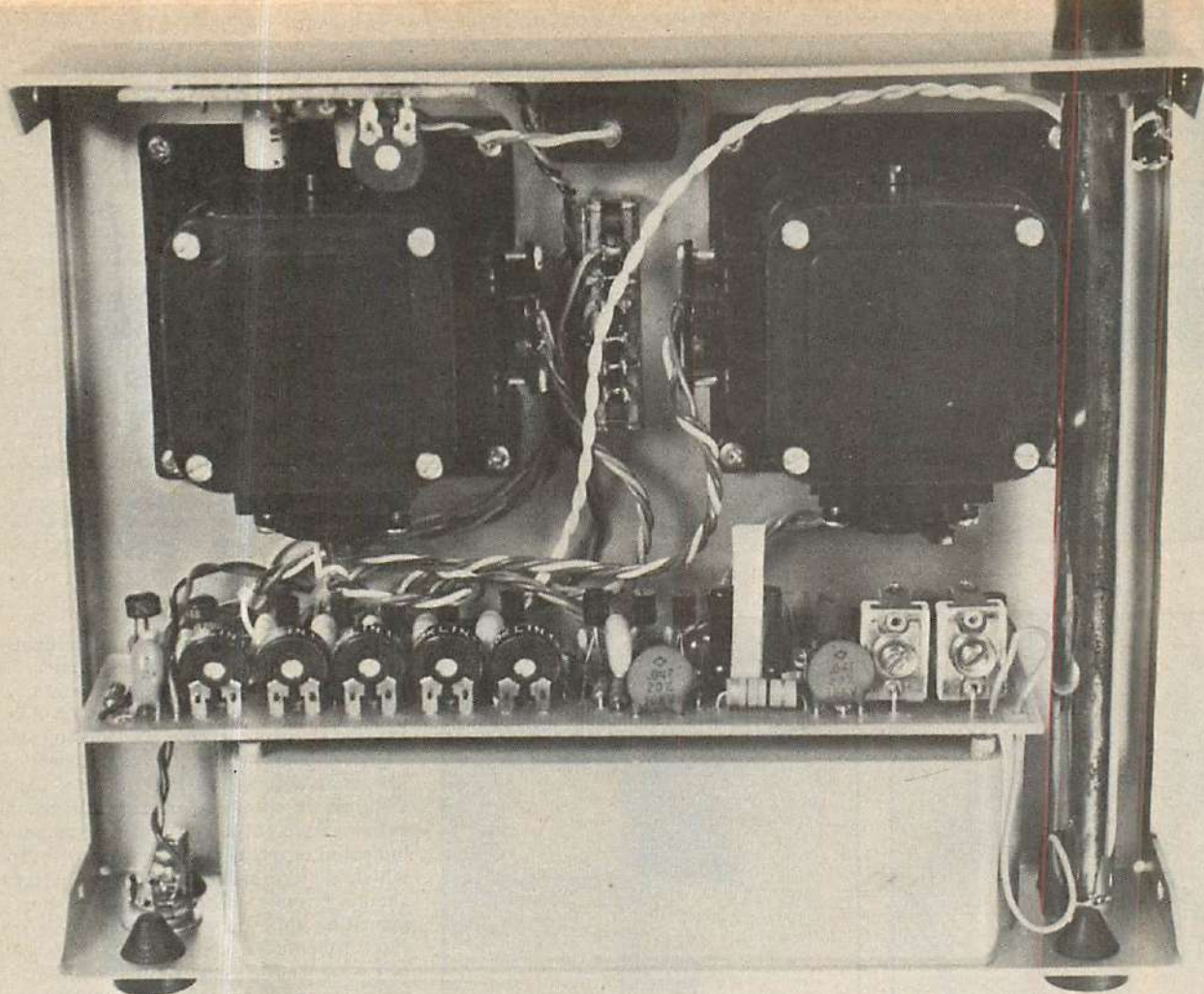
The heart of this lightweight system is the tiny Dunham D-5 servos. These units measure $1\frac{1}{4}$ " long x $1\frac{1}{4}$ " high x $\frac{5}{8}$ " thick (less output arm and case clips). Weight is only 0.8 ounces. Inside these Dunham D-5 servo mechanisms are special Mathes designed amplifiers. Resolution is excellent and the transit time is approximately 0.5 seconds for the full 90 degree rotation. The cable length on each servo is a little over 1" in length. These servos can be held in position with double sided mounting tape or you have the option of using special trays which are supplied with the system. On the very small models (Cox TD .010 or .020 power) the mounting tape seems to be the way to go. I noticed on the list of contents (for this system) that special long servo output arms are supposed to be included. I didn't receive any in this case. Servo arms longer than the standard tri-

angular shaped type are definitely required for most aileron servo applications. I might add that the Series 7500-D system is sold with a choice of servos. You can obtain the subminiature D-5's as just described or if you like you can receive the larger Dunham D-1 servos. These servos weigh approximately 1.2 ounces each and resemble the D&R. Bantam servo in physical size. Transit time is about the same, however, the D-1 servo will provide more output torque which is required for the larger models. Although it was originally thought that the little D-5 servo could only be used in very small models (only up to .15 power) I believe that actual experience will show them capable of flying models up to at least .35 power. This is strictly my own observation. Mathes offers additional D-5 servos at \$45.00 list and the larger D-1 at \$35.00.

Now for the transmitter. The basic unit is housed in a distinctive black and brushed aluminum finished case measuring $6\frac{1}{2}$ " wide x $5\frac{1}{2}$ " high x $1\frac{5}{8}$ " thick (exclusive of the control sticks). A ten section whip antenna collapses almost completely into the case for storage. Control stick assemblies are the popular Dunham type. These sticks

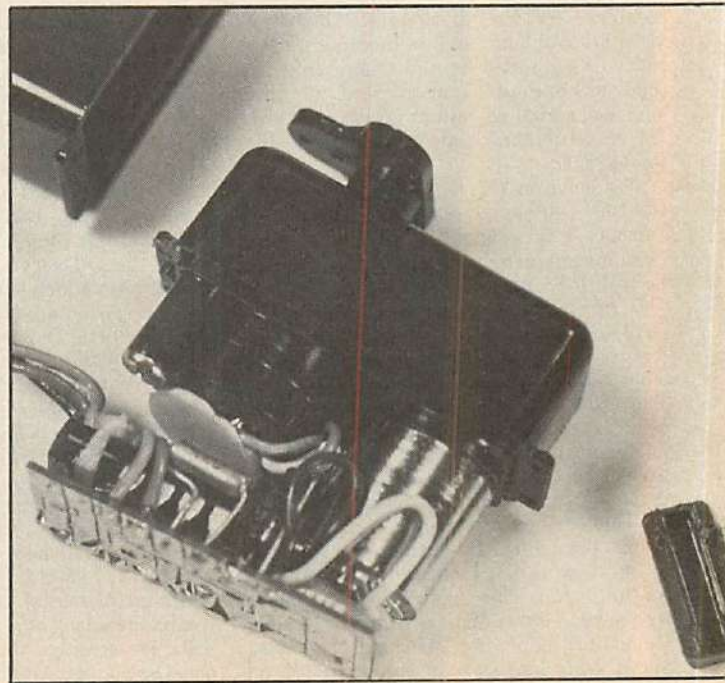
are smooth to operate but unfortunately the spring tension is not adjustable. An eight cell (9.6 volt) nickel-cadmium rechargeable battery pack is mounted into the lower part of the transmitter case. These cells are of the 500 mah variety and are manufactured by Panasonic of Japan. Total power drain is around 130 ma. My rather crude output measuring equipment indicated approximately 600 mw output which is quite high. Transmitter batteries should provide more than four hours of operating time on a full charge. As such the transmitter batteries will actually last a lot longer than the airborne battery pack. Don added a neat little voltage sensing circuit to his transmitter. When a preset minimum voltage level of 8.8 volts is reached a small LED will begin to flash as a warning. Above that 8.8 volt level the LED simply remains on (steady). The LED itself is housed in a special shroud which permits observations in bright sunlight. No R-F output meter is provided. A fifth channel retract switch is mounted on the upper left corner of the case. Operating this switch will cause a servo (Auxiliary position) to revolve one way or the other (full rotation). This can be used to operate a retractable landing gear system. For flaps you would only be able to obtain a discrete setting (not proportional).

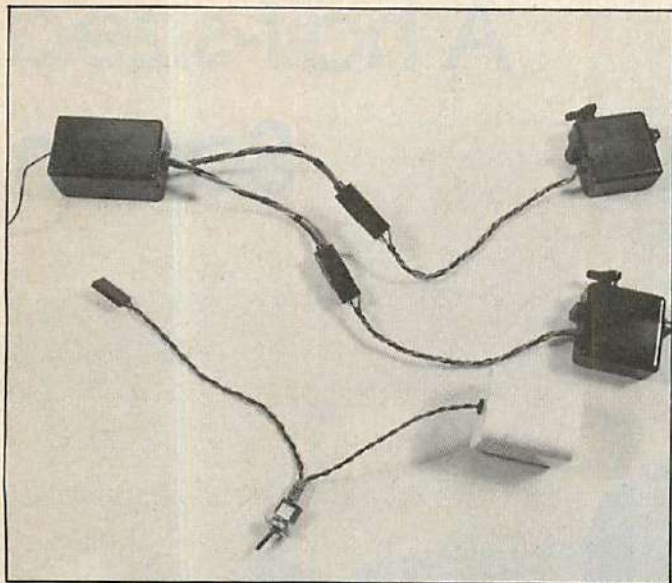
The final item is the airborne battery pack. Two styles are offered. It is strictly your option depending on your specific needs. The larger pack contains four, 500 mah Panasonic cells and measures $1\frac{1}{4}$ " square x $2\frac{1}{4}$ " long. The weight of this pack is 4.1 ounces, including the integral Noble switch and charging jack. This pack should be capable of powering a full four channel system for over three hours (depending, of course, on the amount of control commands issued). For the smaller models Don is offering a special 200 mah battery pack which measures $1\frac{3}{16}$ " square x $1\frac{3}{8}$ " long. This pack has a tiny integral toggle switch and no charging jack (to save weight). The weight of this nickel-cadmium battery pack is 2.0 ounces. A dual output charger is included which provides 50 ma. (c/10 rate) current to both the receiver and transmitter battery packs. Charge period is 14 to 16 hours. Two LED's indicate when the charger is in operation. This is important since the switch (on the 200 mah pack) must be turned on before it will accept a charge. Always make sure the LED is



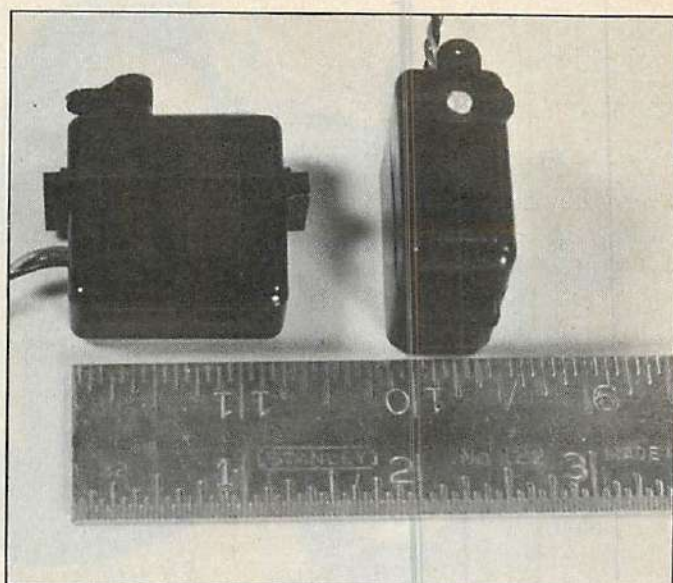
Inside the transmitter. 500 mah nickel-cad rechargeable pack is located below the PC board. The control assemblies are enclosed (from the rear). Small PC board upper left contains the LED flasher, detects low voltage.

Below: D-5 Dunham designed servo is a work of art, rotates 90 degrees in 0.5 seconds, case design still offers ease of maintenance. Bottom left: A look at receiver. R-F PC board is at left, note crystal. Only 1.5 oz.

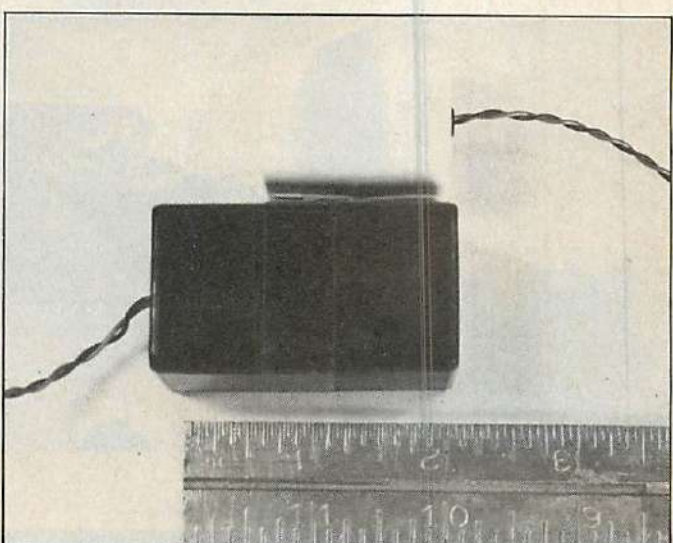
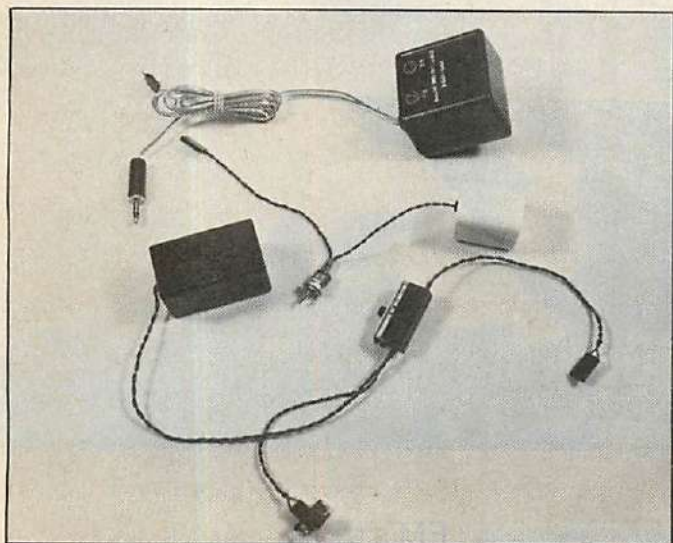




A typical 2-channel hook-up, perfect for Pylon, or 1/2A Stand-Off designs. Below: Dual charger (14 hrs. C/10 rate) takes either pack, transmitter.



0.8 oz. Dunham servos weigh 0.8 oz. or option of stronger Dunham D-1's. Beneath: Airborne pack option, 500 mah weighs 4.1 oz. 200 mah, 2.0 oz.



glowing before you walk away from the charger. The Panasonic 200 mah cells are of the heavy duty variety and will take the 50 ma. charge rate without the need for a separate dropping resistor. If you decide on the small battery pack you might want to consider a slight problem. Using this 200 mah pack and four servos (let's say in a .049 or .09 powered full house pattern model) you might expect around 45 minutes of flying time. During good flying weather that may not be enough to satisfy an active flyer. Recharging using the Mathes standard charger would take another 14 hour period. If you contemplate four channel operation you will probably need some kind of field fast charger. The new Battery Management System offered by D. & D. Electronic Specialists (Box 2102, Lake Havasu City, Arizona 86403) might be considered for this function. It is claimed that it will charge a 200 mah battery from a 12 volt source in less than 25 minutes. In fact it will actually put back in what is necessary to achieve a full charge and then automatically terminate the charge. This device may be worth looking in to. Of course if you are interested in flying

1/2A R/C Pylon you should expect around 1 1/4 hours of operating time when using two servos and the 200 mah battery pack. That would amount to a lot of racing before it became necessary to recharge.

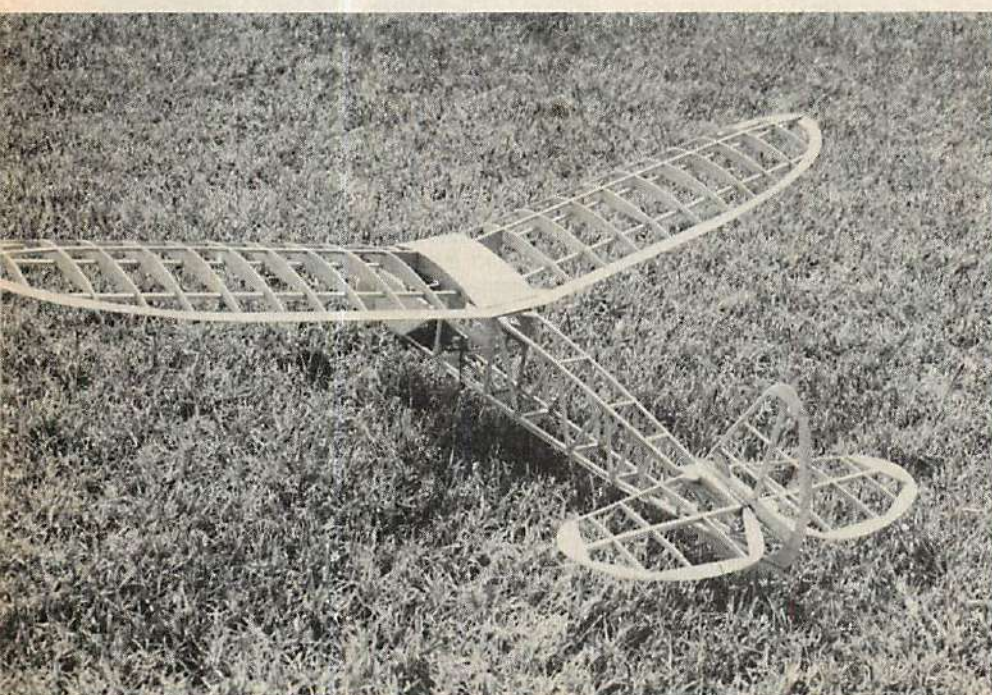
Since this is a lightweight system I thought I would summarize some of the possible weight combinations. Using the larger D-1 servos and the 500 mah battery pack the four channel airborne weight would be 10.4 ounces. The same four channels with the lighter 200 mah battery pack would weigh 8.3 ounces. If you option for the smaller D-5 servos and the 200 mah battery pack the four channel weight would only be 6.7 ounces. This would make a full four channel .049 powered model quite practical. If you are only interested in two channels and use the D-5 servos with the small battery you can expect a total flight pack weight of just 5.1 ounces. At that weight you could easily fly a Cox TD .010 powered R/C such as my Lil' Eaglet (see FLYING MODELS June 1977).

Since we were experiencing some very cold weather here in the northeast I found it impossible to do any flight testing with

this system. I did manage one range checking session lasting about an hour in 20 to 25 degree temperatures. Both the antenna retracted range test suggested in the manual and a full antenna extended check indicated no problems. That isn't surprising considering the 600 mw radiated output from the transmitter. In general I found this subminiature radio system a work of art! True, it is more expensive than some, but in this case you get what you pay for. Even the circuitry is unique. For example, if one cell drops out in the receiver battery pack the system will continue to function although the servos will all operate at a slower than normal speed. Thus a potential problem can be detected quickly and a crash, in most instances, can be avoided.

Mathes Electronic Systems provides a sixty day warrantee on all it's equipment. All service and repairs are performed by Moses Electronics in Garden Grove, California. If you are looking for both quality and reliability this is a system worth considering. Write to Don Mathes for a complete brochure and price schedule on this system.

A half-sized Scram

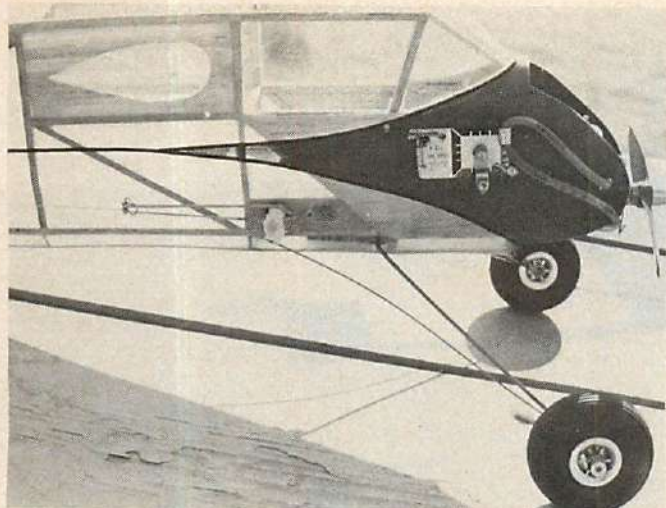


FM's roots trace back to Flying Aces. July, 1938 featured a Brown-powered Scram. An .020 replica/D.B. Mathews

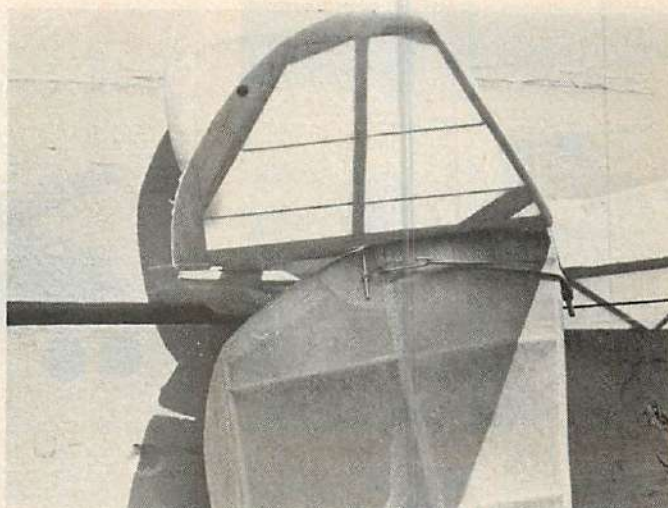
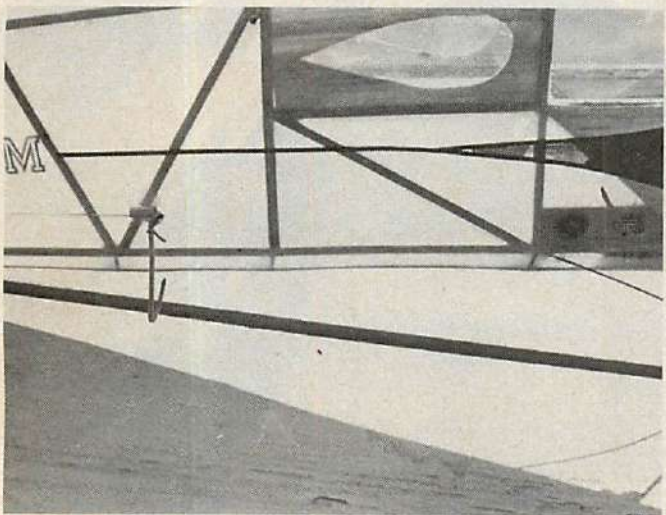
The .020 Old Timer event has continued to grow each season since its inception by Frank Ehling. Many non-old timer contests even include it as an event. The entries at the Dayton Nationals were nearly a hundred, everyone who flies it, seemingly, has a ball. What makes this event so popular? Many factors to be sure, but simplicity, low cost, survivability, closeness of competition, and the R.O.G. requirement, all are definite pluses. Another strong plus for this event has been the wide variety of prototypes to choose from, all of which look like airplanes.

The pulling power of Cox's .020 T.D. is absolutely astounding, these little screamers haul models of incredible size, as witness the Cargo event. I constructed a Cargo entry for the Dayton Nationals at the urging of an addicted friend. I still can't believe I got an 18 oz. 300 sq. inch model to R.O.G. with that small engine.

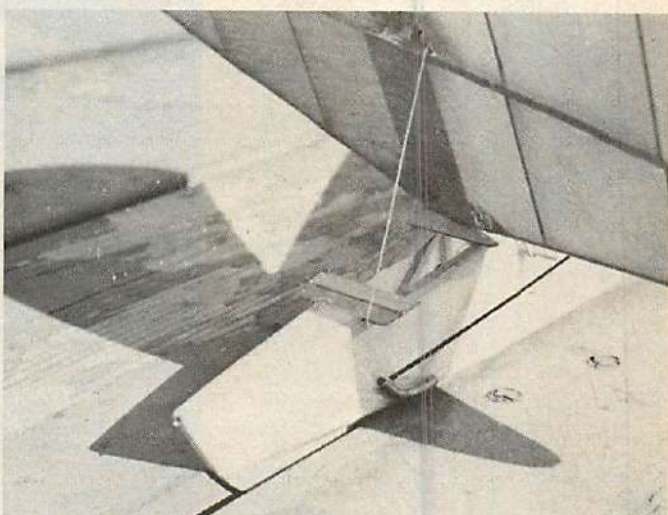
It's the way things were built 40 years ago, kind of satisfying fun to see it grow by the piece. At top: The author's daughter Shelly hanging on in the wind. R/C flyers might do some modifying.



The front end business. Gear forward protects prop, but causes rebounds which makes almost as many splinters. Below: Sunlight illuminates the aft cabin area. Make good glue joints, double-coat end grain of your balsa.



Tailplane is typical of the day, followed full scale appearance. Keep it light to balance. Beneath: A practical modification, pop-up D/T. Hardly visible, but you get the ship back. The Scram delivers good performance.



Don't think for a minute that the little .020 replica's are underpowered—they flat move out—the reason they are relatively easy to trim is the inherent stability built into the designs.

If you have not tried the .020 Old Timer events, let me recommend that you begin right here. If you already know how much fun they are, and are looking for something unusual that will compete with the ordinary designs, by all means don't pass up this Scram.

The original design by Ray Heit appeared in *FLYING ACES*, July, 1938, the ancestor of today's *FLYING MODELS*. It was an 83" model of 3 lbs., powered by a Brown Junior. Later designs by Heit were the more familiar Bay Ridge Mike and Ike, both bearing a strong family resemblance to the classic lines of the Scram.

The model as presented in this article uses the original Gottingen airfoil and is faithful in all dimensions and construction with the exception of a modified stab mount in the interest of safe dethermalizing. This .020 powered model is 1/2 the size of the .60 powered original—think about that!

In General

Protect your plan with Saran Wrap and

build on a flat surface. (I have used 2 foot x 4 foot Celotex ceiling tiles for many years.) Aliphatic Resin is used throughout construction, except where epoxy is specified.

Wing Assembly

Building the wing first will generate some scrap for use on the remainder of the project. Trace the wing rib pattern onto typing paper, cut to outline and spray it with contact cement. Adhere it to 3/32" or 1/8" ply and cut the rib out. Stick the ply rib outline onto a previously prepared stack of 1/16" C-grain blanks and cut out on a jig or coping saw. Check the fit of spar stock in slots, then sand the stack with #220 on a block and the ribs are ready. Repeat the procedure for 1/8" sheet tips and tip ribs.

Assembly of the parts is straight forward, just be sure to shim the T.E. stock and tips to follow the airfoil. Build one right and one left panel. Note: Double the ribs at the center-section joint, these center section ribs are vertical while the outside ribs are set and contoured when the dihedral is sanded in.

Block up each tip 3 1/2 inches, sanding in contour against square surface (table edge) ala—H.L.G. technique. I prefer to assemble

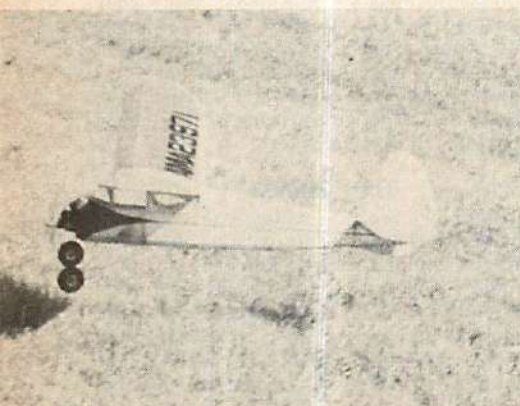
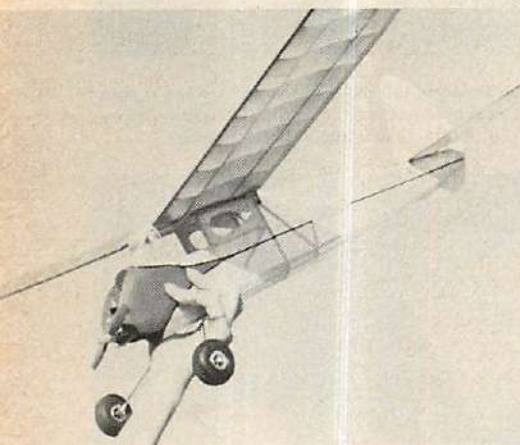
the three panels with 5-minute epoxy, then add ply main gusset by cutting rib slot with a hacksaw blade. Regular epoxy is used for all gussets. Add the center-section sheet with cyano-acrylate, then sand wing to contour and cover.

Stab and Rudder

Outlines are 1/8" stock, C.A. together, add center spar and rib blanks, allow time for good resin cure, then sand the airfoil and taper in using a sanding block. Sheet the stab center section again using C.A., cut the rudder slot, cover and then assemble. Hooks are of paper clip wire held securely with 15 minute epoxy.

The Fuselage

Build two identical sides, one on top of the other, then separate with a table knife after a complete cure. The planking and window sheet are not placed until final assembly. Frame the fuselage inverted, using 90° triangles and a square to align at the wing saddle area. The inside edges of tail post should be sanded to a matching bevel (see plan). After the resin is set, pull the tail post together, using clothespins as clamps. Mark the mid-line on cross-pieces for reference of straight edge to position tail at the same line. Add the re-



The shots above catch the 1/2 scale Scram in all kinds of situations, from bare bones to takeoff action. Straight wood please, good glue joints. The ship offers reasonable thermal performance



At least you don't have to feed a thirsty .60. This half-sized oldie goes with spirit on an .020. Forward wheels save props but foul up the CLA. Sub-rudder compensates a bit. Another event to fly.

maining cross-pieces, checking alignment with a triangle, holding the assembly with masking tape until a cure is complete.

Landing gear is formed using a vise grip plier. Do not bend the axle until final assembly. Wrap the gear to the plywood with carpet thread and C.A., then epoxy it to the fuselage bottom. Epoxy the firewall (with T-nuts installed) at the same time.

Complete your fuselage by positioning the bottom formers with C.A., hold stringers in place, mark and notch formers and add side sheeting and window frame. Cut the nose block from cross-grained laminations of 1/8" sheet and position, then add snuffer tube frame, etc. Cover and dope the structure, then add dowels, saddles, hooks, and tubing. Windows are .008 plastic sheet—C.A. in place.

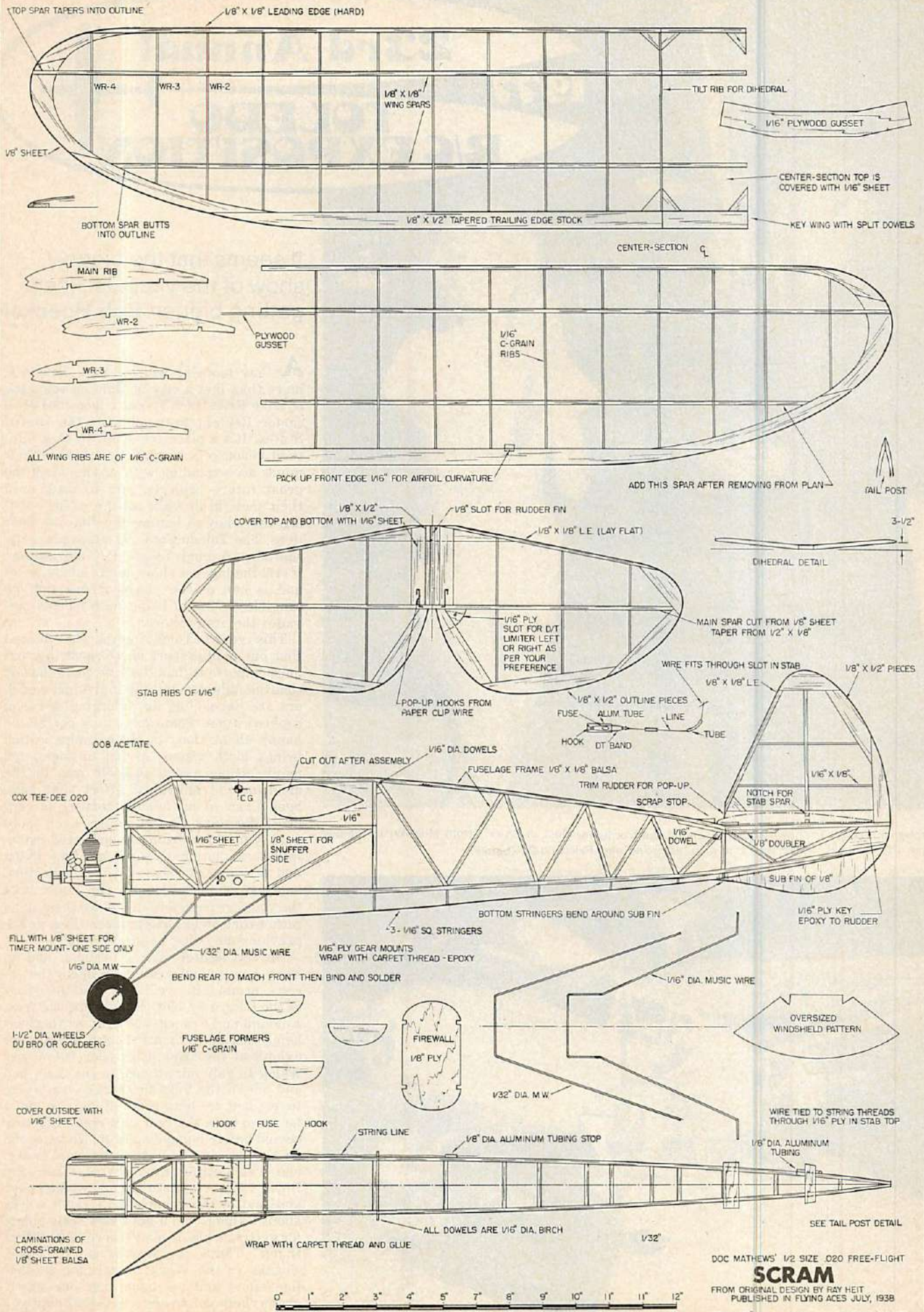
Bend axles to even height, wrap and sol-

der near leg, add the wheels, engine, timer, and the line for D.T. Check the C.G., adding ballast as needed. Carefully observe the surfaces for warps and remove them by steaming. Some wash-out (T.E. up) in wing panel tips is helpful.

Flying

Power pattern is a rather open left climb with a right glide. Control the power with engine side thrust, the climb angle with a shim under stab, and the glide by tilting the stab (high side—glide side). This little doll will R.O.G. with the greatest of ease. It will climb tremendously high on a 20 second motor run, glide as long as you want (well almost), and D.T. onto the gear beautifully.

It's hard to believe how much fun a few dollars worth of airplane can be, you'll have to try it to be a believer too. ☺



23rd Annual 1977 TOLEDO R/C EXPOSITION



Stephen J. Sauger is shown above receiving the trophy for Best in Show from Miss Weak Signals Angie Cholewinski. Steve won this with his brand new Fairchild-24 (below).



It seems that the biggest show of the year just keeps getting bigger/**Bob Hoecke**

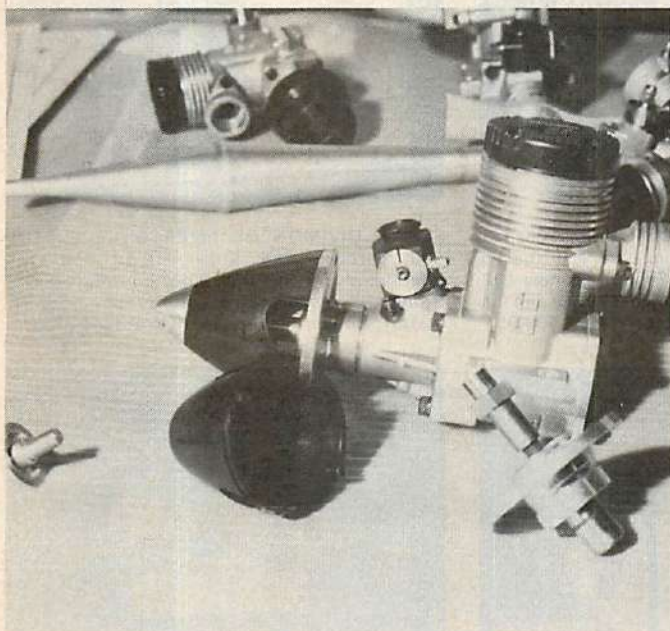
As any modeler will tell you, Toledo is more than just a city in Ohio on the bank of Lake Erie. Once a year it becomes Mecca for R/Cers from all over the United States. It's a place for them to look until their vision gets fuzzy, to dream until their minds are exploding with visions of all the great future projects, and to walk until their feet throb while all the while insisting that they're having the time of their lives. The Toledo Show, or more properly, the 23rd Annual Toledo R/C Exposition, is still the biggest show in our hobby/sport and is one of the places where that intangible feeling of being with friends pervades the atmosphere.

This year's Toledo gathering showed that our hobby/sport is still growing, but more important than the growth, it showed that the industry and the individual modelers are developing an enlarging sense of sophistication. Some folks may not be too happy about that, to them sophistication brings forth visions of big business, too many people and a possible loss of the idealism and individual effort that have been a part of our hobby/sport for so very long. We think that it means even more quality products from our dedicated manufacturers, more individuals building, flying and striving for that elusive perfection, and just as much idealism and effort from the younger modelers in honing their skills rather than struggling to learn them as the previous modeling generation did.

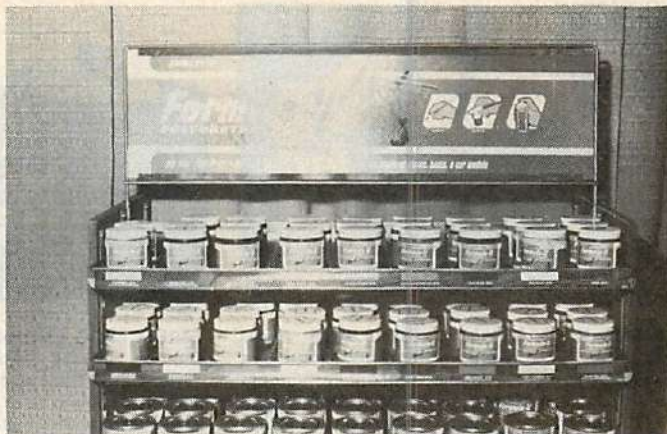
On the lighter side of things, and to show how model aviation reflects the society around it, we'll tell you the story of the Concorde. Not the full-size one from England and France, but a model that was being carried in by a French/Canadian for exhibit at the show. This poor fellow was trying to gain admittance to the main hall and one of the folks in charge was trying to explain to him that all entries must be brought in the rear entrance to be processed before being displayed. There seemed to be a communications gap and everyone was getting exasperated when Jim Boyd, FM's Associate Editor, walked over and said to the Frenchman, "Don't worry about a thing, you'll get extra scale points for getting a hassle over where to land that thing." That's the way it is at Toledo. Thanks to the Weak Signals for another fine effort and we hope that our photographs help you to see what went on if you missed it.



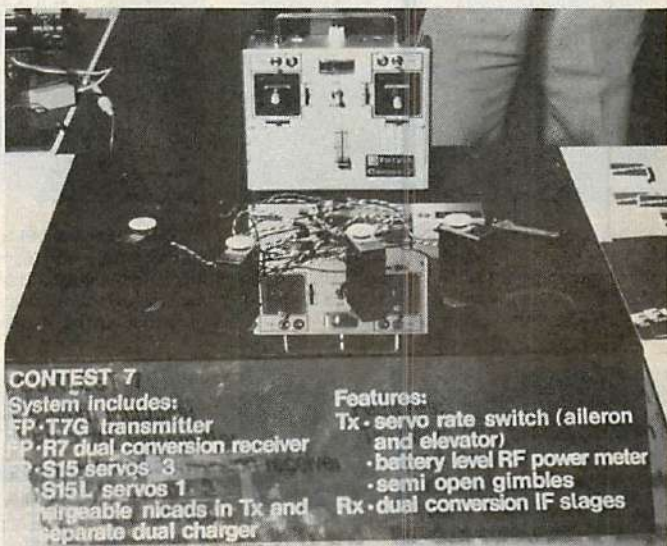
BOB SMITH R/C AIRCRAFT, P.O. Box 543, Chatsworth, CA 91311, had Bob Smith and noted pylon racer Whit Stockwell showing Bob's fine line of aircraft including Patricia. All the kits feature epoxy-fiberglass fuselages.



SHAMROCK COMPETITION IMPORTS, P.O. Box 26247, New Orleans, LA 70186, is offering, along with the fine OPS pattern .60 engine, a fine line of machined and balanced spinners for OPS and ST engines. Retail price \$9.00.



PACTRA INDUSTRIES, INC., 7060 Hollywood Blvd., Los Angeles, CA 90028, has introduced two new paints, Formula-U, a polyurethane, fuel-proof finish and Aero-Foam, a high-gloss finish for all-foam airplanes.



CONTEST 7
System includes:
• FP-T7G transmitter
• FP-R7 dual conversion receiver
• S15 servos 3
• S15L servos 1
• rechargeable nicads in Tx and separate dual charger

Features:
Tx - servo rate switch (aileron and elevator)
• battery level RF power meter
• semi open gimbles
Rx - dual conversion IF stages

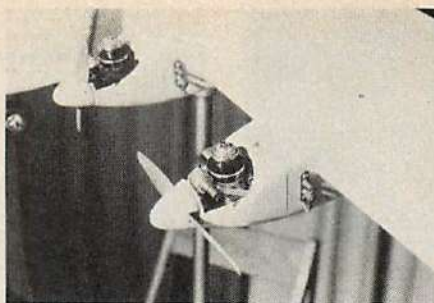
FUTABA INDUSTRIES, USA, 630 West Carob St., Compton, CA 90220, was showing their Contest 7, a new 7-channel competition radio which is their entry into the fine high-quality super-radio field. No price yet.

DU-BRO PRODUCTS INC., 480 Bonner Rd., Wauconda, IL 60084, needs a big booth to show all the fine products in their extensive line. Latest is the Kwik-Switch mount. Install in minutes drilling one 3/8" hole. \$1.75.

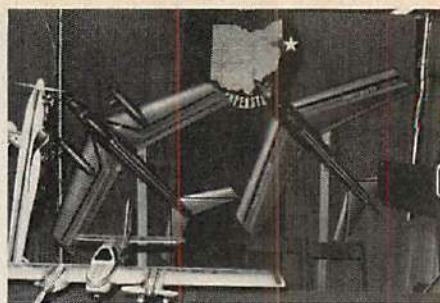




HOBBYPOXY PRODUCTS, 36 Pine Street, Rockaway, NJ 07866, had Bev Smith and Bob Pettit showing the winner of the Hobbyposy Winners Circle award, this Sterling Emma C. Berry, built and finished by Nancy and William Shaub of N.J.



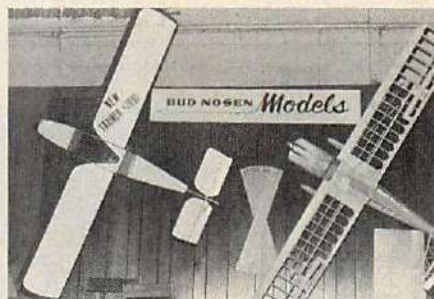
TARNO AERO ENGINES, 942 Grou, Montreal, Quebec, H4N 2C7, was showing their new 1/4A Tarno Carb. They also have a new line of mufflers that come with or without pressure fittings. Also available are angled exhaust manifolds.



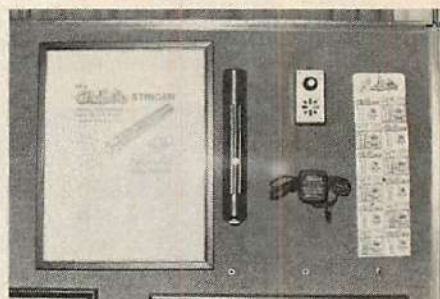
OHIO SUPERSTAR MODEL PRODUCTS, P.O. Box 2522, North Canton, OH 44720 is offering this sleek pattern ship in single or twin versions as well as their new Two Easy, a twin for .35's with a foam wing and balsa fuselage for \$74.95.



R/C KITS MANUFACTURING, 353 Briar Ave. North Canton, OH 44720, is offering this Lockheed U-2, a stand-off scale version of the famous spy plane, for use with ducted fans. The 8-foot wing is foam. Retail price is \$119.95.



BUD NOSEN MODELS, INC., P.O. Box 105, Two Harbors, MN 55616, is going strong in the big airplane business. Shown here are his new 102-inch span trainer, retail price \$79.95 and his nine-foot span, 1/4 size Citabria for \$99.95.



FUSITE DIVISION OF EMERSON ELECTRIC, 6000 Fernview Ave., Cincinnati, OH 45212, is offering, along with their fine line of glo-plugs, Stinger, a rechargeable, battery powered 1/4A starter. No more wires to tangle around props.



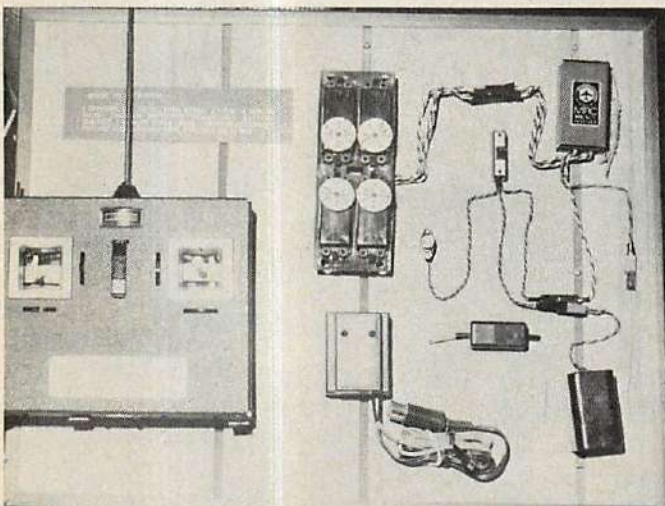
R.C. SPECIALTIES, 900 Hopkins Street, Unit 2, Whitby, Ontario, L1N 6Y9, presented their new MK-VI-F86F Sabre Jet with a 64-inch span. The ship weighs 8 1/2-10 lbs. and is designed for ducted fan power. No price available yet.



ECONOMY PLUS, P.O. Box 4145, New Windsor, NY 12550, was busy showing their complete system of cyanoacrylate adhesives and support products like Hobby hands (gloves), hobby apron, and handy Mixit Cups. A complete product line.



FLITEGLAS MODELS, R.R. 1, Box 324, Neoga, IL 62447, now has available Ivan Kristensen's Saturn in fiberglass and foam. The basic kit retails for \$69.95 while the deluxe kit, with complete hardware, retails for \$99.95.



MODEL RECTIFIER CORP., 2500 Woodbridge Ave., Edison, NJ 08817, was featuring their new 775, 5-channel radio that features very smooth open gimbal machined metal sticks. The radio's suggested retail price is \$349.95.



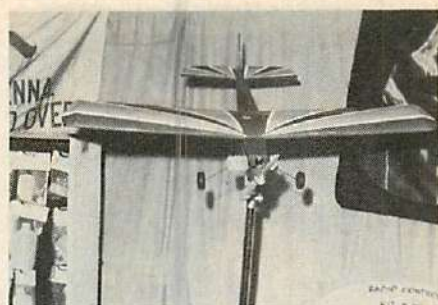
FLYLINE MODELS, 10643 Ashby Place, Fairfax, VA 22030, had Hurst Bowers (left) and friends showing the complete line of classic stick and tissue aircraft for .049 power and mini-R/C as well as rubber and CO₂ power.



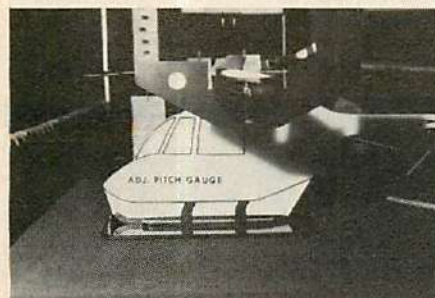
FOX MANUFACTURING, 5405 Towson, Fort Smith, AR 72901, had Duke Fox showing his latest brainstorm, the Fox aftermuffler "Sitesaver," which is attached to the outlet of your standard muffler and results in another 5db drop. \$8.95.



GENERAL ELECTRIC COMPANY, Battery Business Dept., P.O. Box 114, Gainesville, FL 32602, had Red Scholefield explaining the inner workings of nickel cadmium batteries in general and GE's in particular to the assembled multitude.



STERLING MODELS, 3620 "G" Street, Philadelphia, PA 19134, was showing their Mini-Fledging, a 1/8A version of their larger popular Fledging. This all-balsa kit includes all hardware and uses a two-channel radio. Suggested list is only \$19.95.



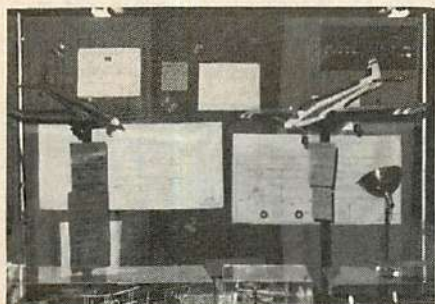
BACA PRODUCTS, 19 Hawthorne Lane, Streamwood, IL 60103, was showing their line of helicopter pitch gauges. The adjustable Pitch gauge retails for \$19.95 and eliminates the guess work in setting rotor blade pitch angles.



MODEL JETS INCORPORATED, 2002 Bickmore St., Dayton, OH 45404, introduced their C-101 single engine jet trainer with epoxy-glass fuse and foam wing for ducted fan power with a .40 size engine. Suggested retail kit price is \$180.00.



CYT-4 INDUSTRIES, 617 South East Ave., Oak Park, IL 60304, introduced Form-A-Balance, a high-density black powder that you mix with epoxy or resin to form a balance weight in any shape. The retail price is \$2.95 for 14 ounces.



MICRO-X PRODUCTS, P.O. Box 1063, Lorain, OH 44055, was showing their entire line of indoor model supplies as well as the Exeter, a 45-inch span R/C pattern ship designed to be flown with .25 to .35 engines. All wood construction.



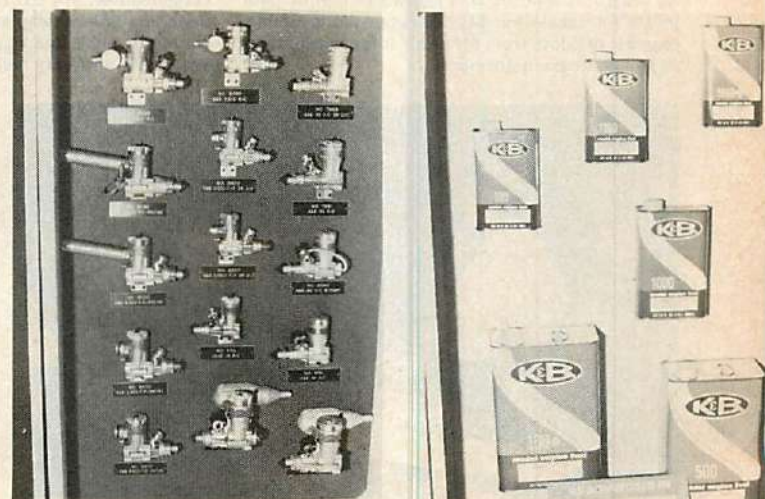
JOHNNIE CASBURN MANUFACTURING CO., 5821 East Rosedale, Fort Worth, TX 76112, had Johnnie himself showing their beautiful new LFX III a high performance pattern ship in fiberglass and foam. Basic kit \$74.95. Deluxe, \$139.95.



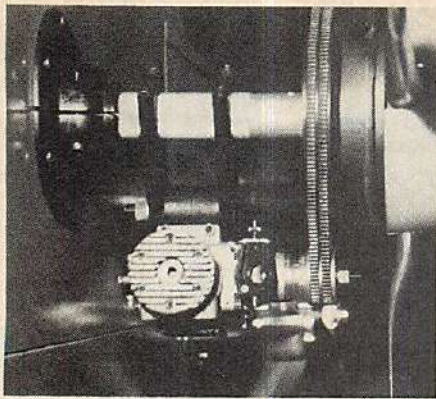
INDY R/C SALES, INC., 10620 N. College Ave., Indianapolis, IN 46280, was showing their Fuel pump/Caddy (fuel, pump and battery in one container) for \$18.95 and the Cipolla .09 Italian engine (not R/C) for Indy's price of \$9.95.



BAND J DESIGN CORP., P.O. Box 6035, Bridgewater, NJ 08807, is offering a new kit of the DeHavilland Mosquito in 1 1/2" to 1" scale. Wingspan is 81 1/2" and uses two .60's. Kit features include a molded fuse. Price \$195.



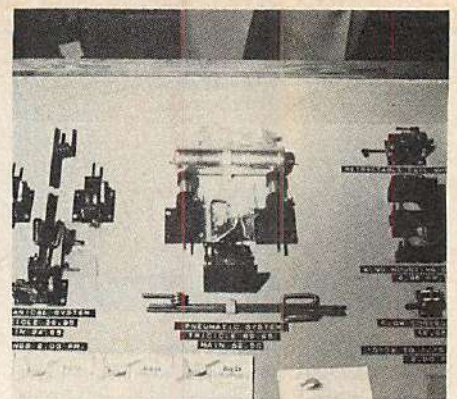
K&B MANUFACTURING, 12152 Woodruff Ave., Downey, CA 90241, was showing their complete line of model aircraft engines (left) that now numbers 15 as well as their quality controlled line of fine fuels for modelers.



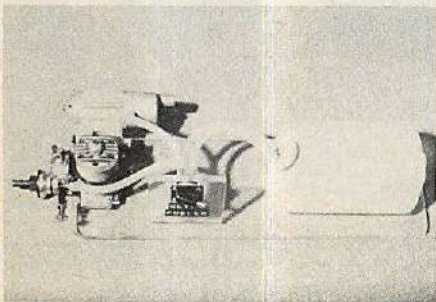
BYRON ORIGINALS, MIDWEST INDUSTRIES, INC., Hwy. 59 and 175, Ida Grove, IA 51445, was showing their new mechanical speed reducer for large scale R/C planes. The unit uses a flexible belt instead of gears. No price yet.



SIPPEL, Rumelner Str. 4, 4100 Duisburg 14, West Germany, introduced R/C Pulse jet engines that they have been flying in R/C jet models since 1969. They claim high performance, easy maintenance and easy operation for \$239.50



B&D ENTERPRISES, Box 2268 Pike Station, Rockville, MD 20852, displayed their fine line of accessories including a new set of pneumatic retractors that are injection molded of glass filled nylon. Also shown was a $\frac{1}{2}$ A main retract gear.



ROBART, P.O. Box 122, Wheaton, IL 60187, introduced this fuel system manifold that really takes the mess out of fueling your R/C ship. With a flick of the knob on the outside of the ship you go from till to run mode.



CARL GOLDBERG MODELS, 4734 West Chicago Ave., Chicago, IL 60651, was showing the latest in the fine line of Klett plastic products, Flex Point Hinges. They should help prevent winding hinge slots. Retail price is 18 for \$1.20.



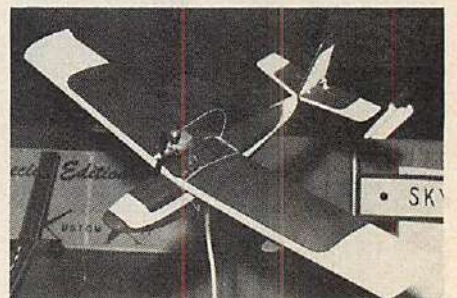
PERFORMANCE MODEL PARTS, INC., 1015 S. 6th St., Minneapolis, MN 55415, has made TWA engines available again after 2½ years of development and refinement. Features include Hi-silicone aluminum piston in chromed brass.



AIRCOM, LTD., P.O. Box 302 Bloomfield Hills, MI 48013, is offering this Luftwaffe fighter pilot in 1½"=1' scale for \$12.95 retail along with a long list of pilots from other air forces and styles of flying like barnstormers.



GEE BEE, P.O. Box 18, 214 Main Street, East Longmeadow, MA 01028, was at the show with their fine line of seaplanes, the Mallard, the Islander, and the Sea Hawk as well as their indestructible and very well known line of floats.



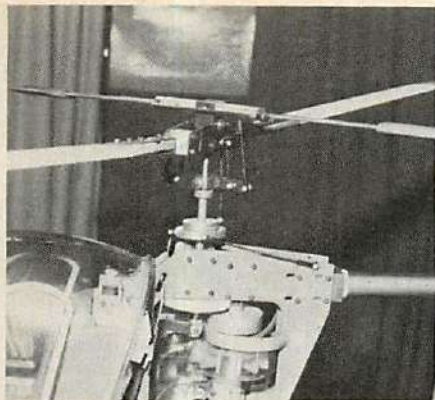
SPECIAL EDITION PLANS, P.O. Box 2555, Schenectady, NY 12309, was showing Corky II, a $\frac{1}{2}$ A, throttled, 3-channel seaplane. The kit features all push rods, cables, horns, clips and fully detailed plans with clear, concise photos.



HOUSE OF Balsa, 2814 East 56th Way, Long Beach, CA 90805, kept Fred Reese, the designer of their line of $\frac{1}{2}$ A stand-off scale ships, very busy telling everyone about this fascinating new form of model aviation.



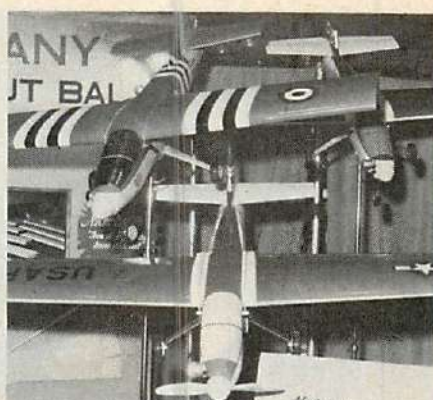
COX HOBBIES INC., 1505 East Warner Ave., Santa Ana, CA 92702, introduced their R/C Cessna Centurion which comes complete with engine and everything but the radio. The recommended radio is the Sanwa 2-channel.



AMERICAN R/C HELICOPTERS, INC., 23811 Via Fabricante, Suite 102, Mission Viejo, CA 92675, is now offering a collective pitch assembly for their popular Rev-olution .40 powered helicopter kit. Suggested retail price is \$79.95.



JZ PRODUCTS, 23018 South Normandie Ave., Torrance, CA 90502, is offering Zinger propellers. They are designed for maximum thrust and efficiency and JZ says that they are all true pitch and balanced before packaging.



MIDWEST PRODUCTS CO., 400 South Indiana Street, Hobart, IN 46342, was showing their latest, the Attacker, an all-foam airplane for .40's and Styro-Mate a new sealer for finishing foam ships that protects foam but adds little weight.



BOB VIOLETT MODELS, 26516 Aiken Dr., Clarks-burt, MD 20734, is offering this ducted fan powered kit of the Skyhawk that features a light epoxy-glass fuse, tailpipe and wheel pods and a high efficiency ducting system. Retail price \$99.95.



DAVE PLATT MODELS, 2657 N.E. 188th Street, Miami, FL 33180, had Dave Platt hard at work telling folks about the Dualists. A pair of twin engine sport planes for two .19-.40's and for two .40-.60's. No price information.



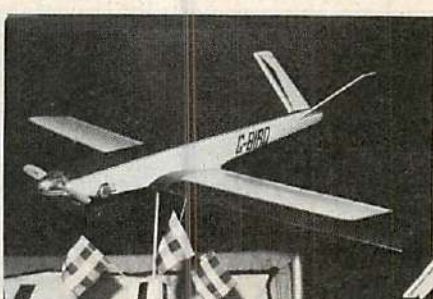
SONIC SYSTEMS, P.O. Box 192, Whippany, NJ 07981, was showing their complete line of pneumatic actuators for retracts as well as their slim and strong retracts. Sonic Systems also makes a fine air pump to replace the freon system.



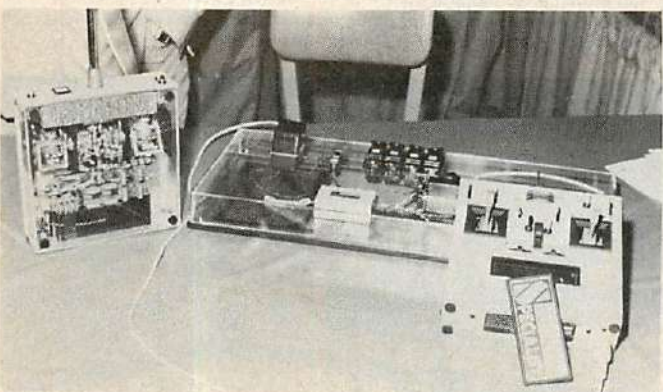
BIG ARTS MODELS, 20620 Emmet, Taylor, MI 48180, was offering their Lr-1A Pogo pylon racer in three sizes, Formula 1, Quarter Midget and 1/2A. The kit prices are \$49.95, \$29.95 and \$22.95 respectively. All have epoxy-glass fuselages.



ARCHAEOPTERYX AIRFRAME, 7830 Airpark Rd., Gaithersburg, MD 20760, introduced the Safari, an Almost Ready to Fly airplane with a patented new wing construction using paper-foam-paper laminate process. Retail price is \$129.00.



MR. G'S PRODUCTS AND SUPPLY, P.O. Box 161, Marysville, MI 48040, is offering the G-Bird a .30 to .46 powered ship with an epoxy-glass fuse and foam wing featuring a v-tail. All the hardware is supplied. Introductory price \$89.95.



MILLCOTT CORP., 1420 Village Way, Unit E, Santa Ana, CA 92705, introduced the Specialist, a new 8-channel radio with crossed trims, front panel controls, metal open gimballs, variable dual rates and many more options.



ASTRO FLIGHT INC., 1377 Beach Ave., Venice, CA 90291, had Bob Boucher diligently explaining the mysteries of electric flight and showing electronic speed control, mechanical speed reducer and Astro 075 motor.

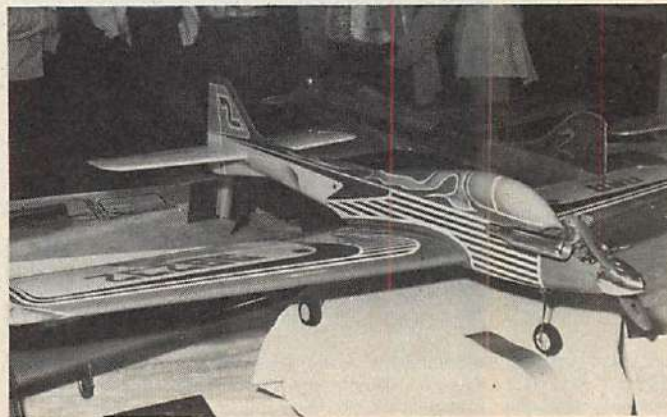


Windlord (above) by Ken Bates of Michigan was the first place winner in Sailplane. Charles Nelson's Jenny (right), which was featured in the April FM, took the first place honors in Military Scale.



Kathy Newman, wife of Midwest's Jim, took second in a nearby cake contest with this Boeing P-26. Henry Minnig took 3rd in Military SOS with his B-24.

Ralph Mutchler of Indiana built this impressive Delta Tri Star powered by 3 K&B 6.5 engines and 3 Scozzi ducted fans. John Blackwell of Illinois took home second place in Best Finish with his beautiful Dirty Birdy.





The quality of competition is always improving at the Toledo Show as evidenced by the fine displays of Old-Timers (above) and Helicopters (below). Turnout was excellent both in entries and spectators.



Director's Award
Loren Zimpfer, Oh.

Yamato

Best of Show
Stephen Sauger, Mich.

Fairchild 24-R

Old Timer R/C Plane
1. Chet Lanzo, Oh.
2. Joe Bashar, N.J.
3. Gordon Pearson, Mich.

Lanzo R/C 1937
Brooklyn Dodger
Albatross

Sport Bi-Plane
1. G. Prentice, Ont.
2. R. David Stephens, W. Va.
3. Larry Miller, Ind.

Super Biplane MK II
Pulsar
Acro-Star

Military Stand-Off Scale
1. Richard Barron, Mich.
2. R.E. Brennon, Oh.
3. H.G. Minnig, N.J.

Curtiss Goshawk
P-61 Black Widow
B 24-H

Non-Military Scale
1. Stephen Sauger, Mich.
2. Casey Solewski, Ill.
3. Herb Lindsay, Minn.

Fairchild 24-R
Waco F-3
Druine Turbulent

MonoKote
1. Ramona Schultz, Oh.
2. Dan Deluca, N.J.
3. Al Schmidt, Oh.

Stearman Biplane
Mini-Pathfinder
Olympic 99 Sailplane

Pylon Racers
1. Bill Hager, Oh.
2. Wayne Yeager, Mich.
3. Greg Doe, N.C.

Prather "Little Tony"
Prather "Little Tony"
Prather "Little Tony"

Military Scale
1. Charles Nelson, Wis.
2. Ed Wissner, Pa.
3. William Fuori, N.Y.

Curtiss JN 4-D Jenny
Albatross D-5
FW 190 G

Helicopter
1. Walter Farrell, Oh.
2. Wendell Hostetter, Oh.
3. David Swanger, Oh.

Bell Huey Cobra
Jet Ranger
Hughes 300

Sailplane
1. Ken Bates, Mich.
2. Dave Corven, Mich.
3. Dennis Harvey, Oh.

Windlord
Impulse
Starfire

Best Finsh
1. Duane NeeFa, N.Y.
2. Jon Blackwell, Jr., Ill.
3. Bill Basler, Ia.

Compensator
Dirty Birdy
Dirty Birdy

Original Design
1. Charlie Barr, Oh.
2. Don Prentice, Ont.
3. Richard Klein, Oh.

Zonker 40 II
Float Plane
Super Corr V

Non-Military Stand-Off Scale
1. Albert Kretz, Ill.
2. Ronald J. Woody, Pa.
3. Ronald Eversole, Oh.

Curtiss Wright Condor
Alon A-2 Aircoupe
Waco UMF-7

R/C Cars
1. John Nicolaides, Tor.
2. Joe Sullivan, Tex.
3. Jack Hadlock, Tex.

"Soladin" Armourer Car
Porsche 936
Porsche 917-10



PHOTOGRAPHY: BOB ABERLE

A Stand-Off R/C Fokker T-2

Non-stop coast to coast, May 2, 1923. Simple in line, it makes an interesting ship for .40-.60 mills /**Don Martin**

While looking for a radio control Stand-Off Scale project recently, I attempted to find something out of the ordinary that hadn't been modeled before. My interest was in aircraft involved in history making "first" flights and to my surprise I found the choice in this category was narrowing down.

One airplane in this select group did stand out as being neglected by modelers, the Fokker T-2. This aircraft made the first successful non-stop flight across the United States on May 2, 1923. Powered by a 400 hp. Liberty engine it lifted 10,695 pounds off the runway at Roosevelt Field, Long Island, N.Y. and under the skillful guidance of Lieutenants John Macready and Oakley Kelly landed safely 26 hours and 50 minutes later at San Diego, California. Considering the lack of navigational aids and the relatively

primitive aircraft and engines of the day, this was truly a remarkable accomplishment.

Why then should the Fokker T-2 with this outstanding contribution to Aviation history be neglected as a subject for modeling? Perhaps one contributing factor is its very boxy design with proportions not readily suitable to a stable flying model. I have to admit I passed it by at first for this very reason, and perhaps it was that same reason that made me reconsider. Certainly it would be a challenge, so I decided to give it a try.

It was quite obvious that some modifications would have to be made, but since this was to be a Stand-Off Scale, it seemed feasible that a presentable model could be constructed. My first source of reference was an article in National Aeronautics for Spring 1973 which

contained a reduced copy of blueprints obtainable through the Smithsonian Institution. I send for the drawings and these plus a borrowed copy of "Armchair Aviator" for July, 1973 featuring the T-2 story was all I needed to get started.

The size of the model was chosen to make use of an Enya .45 which had been sitting idle in the shop for some time. This gave me a fuselage large enough to contain most any size radio gear. Since I believe in making use of all equipment that is still in good working order I planned on utilizing an older Heath 3-channel receiver and some World Engines S4B servos. In fact, the transmitter for this rig is a Heath GD-47 modified for single stick and converted to 53.3 mHz.

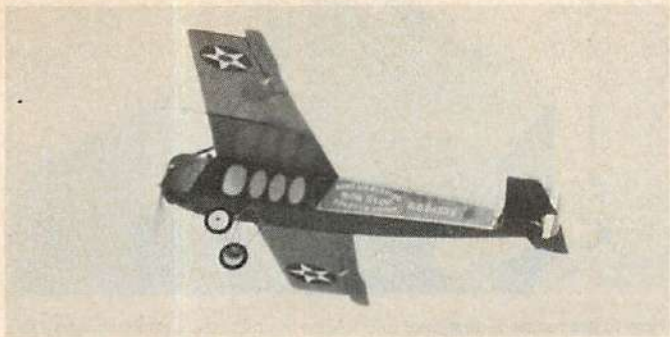
The major changes incorporated in the final design include lengthening the nose moment, enlarging all tail surfaces and the ailerons as well as changing the contour of the cowling to accommodate the Enya .45. All things considered the finished model measure up quite closely to my original expectations.

Construction

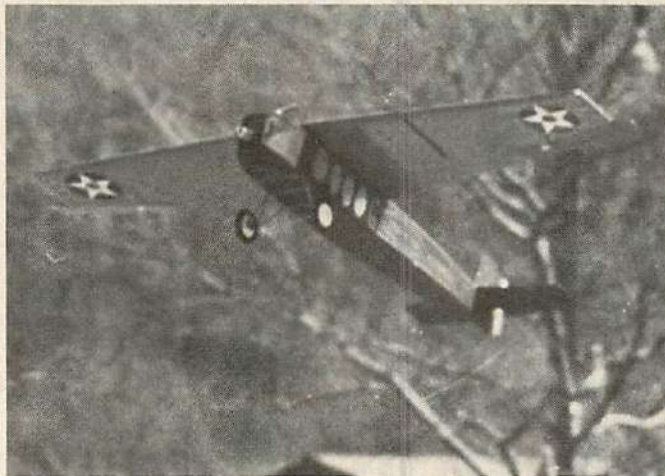
Let's start by building the wing spar. Yes, you read it correctly, the wing *spar* and if you will bear with me I think you will agree it is a simple way of building a wing. Trying to join two completed wing halves at the proper dihedral angle while fitting and gluing gussets plagued me from the beginning of my modeling career until I built my first gas model. The method

PHOTOGRAPH COURTESY OF COLLECTAIR PHOTOS





First flight. Climbing away. Sensitive to elevator, so don't overdo it. At right: Coming in to land, dead stick. It threw the prop at altitude. Facing page: A still-life scene, awaiting the moment to try its wings. Lower left: Sans cowl, historic Collect-Air photo of the full scale prototype captures the T-2 on the apron in 1923. It spanned the U.S.A. Beneath: Simple in line. Seen here before the finishing, an easy design.



used made wing construction so much easier I can't remember using any other method since then and the T-2 is no exception.

The entire main spar from tip to tip is made flat on the building board, complete with dihedral gussets before any other framework is added. This method will work with any type of dihedral and will present no problems even when using a wing jig.

Since it is impractical due to limited space on the plans to show more than half the wing on a plane this size it will be necessary to draw out the other half of the spar. I usually keep a roll of shelving paper on hand for this purpose and it shouldn't take more than 15 or 20 minutes to layout a workable drawing.

This done, cut to length the top $\frac{3}{8}$ "x $\frac{1}{2}$ " spars and pin in place on the plan. Next cut the center filler gussets from two thicknesses of $\frac{3}{16}$ " sheet to extend between the two R-3 ribs and the tip filler pieces to extend between R-9 and R-10. Then cut the bottom $\frac{3}{8}$ "x $\frac{1}{2}$ " spars to length and cement the whole thing together on the plan just as you would the built up side of an Old Timer fuselage. I use epoxy for this operation since this will be the heart of the wing. When the epoxy has cured remove the assembly from the plan and cut plywood gussets to fit over the center-section. Leave them a little large and trim them down later. Clamps will hold them securely in place. I used $\frac{3}{32}$ " plywood on each side of the

spar, but $\frac{1}{8}$ " on one side only would be sufficient. (I've been accused of being overly cautious, but I've yet to have two wing halves part in flight.)

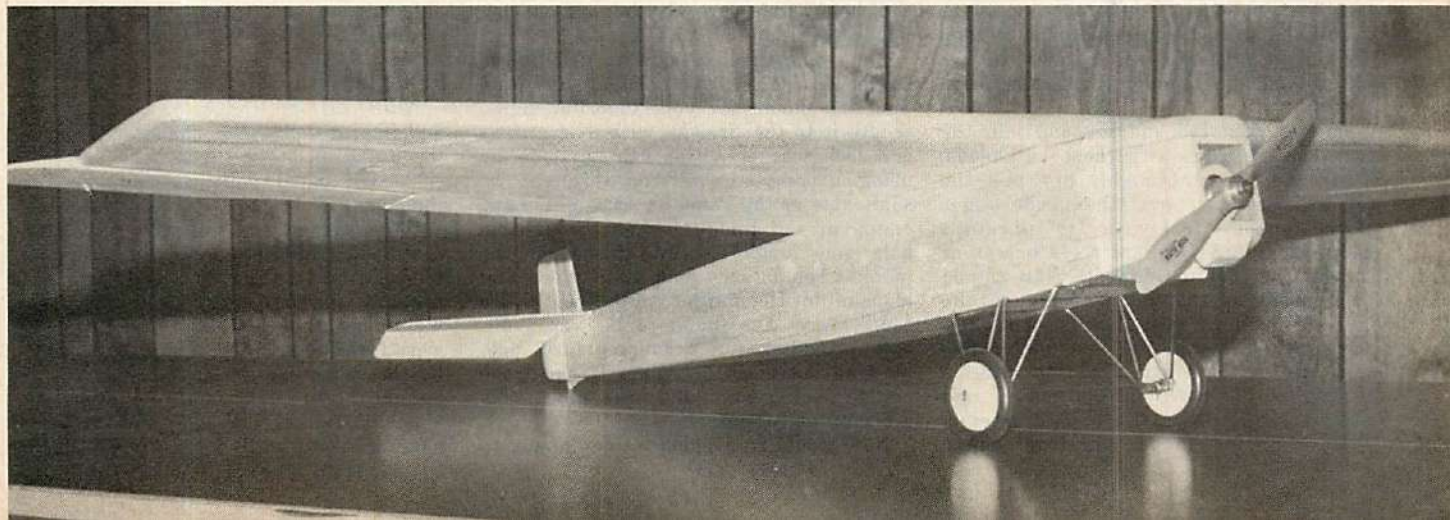
While the epoxy on the gussets is curing, make up the bottom wing skins from three sheets of $\frac{1}{16}$ "x4" medium balsa. Cut them to extend from R-2 to R-10 and do not include ailerons at this time. The piece cut from the leading edge taper is used to fill out the trailing edge to complete the skin from three sheets. Now you are ready to make these parts look like a wing.

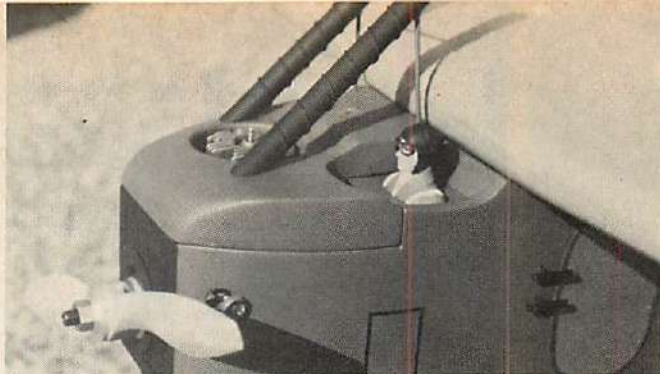
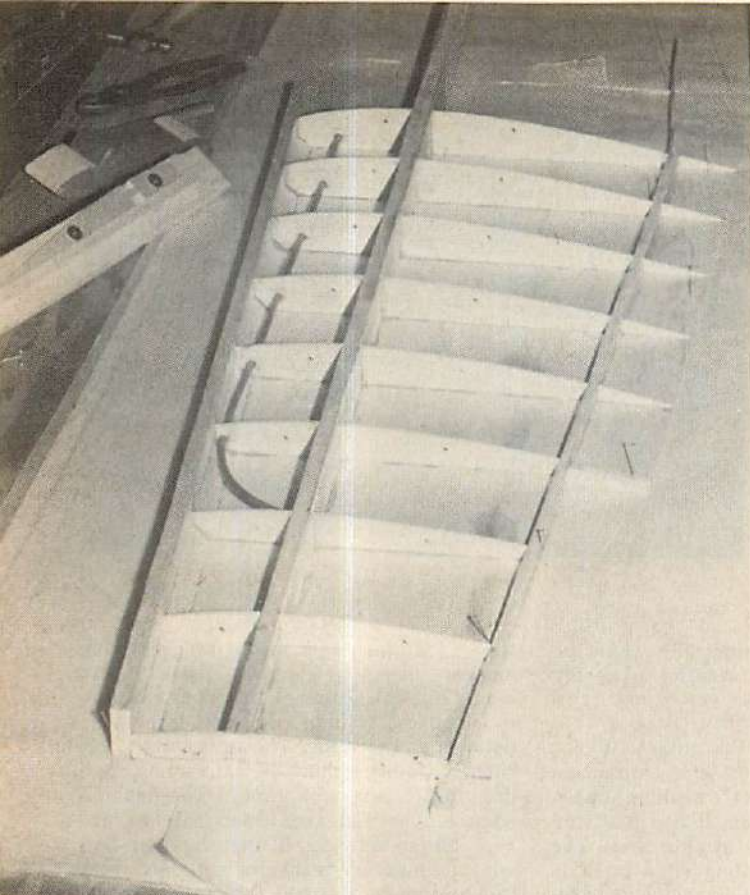
Since this is a flat bottom wing it will be built directly on the plans instead of in a jig. Taper some scrap balsa to go from nothing at R-7 to $\frac{5}{16}$ " at R-10 directly under the rear spar. Next cut three pieces tapering from the piece just used to nothing at the leading edge to fit under R-8, R-9, and R-10. When the bottom skin is placed on the plans over these pieces it will give the required wash-out in the tips. Pin the skin for one half down securely and then position the main spar assembly over it and glue and pin in place. The rib and spar lines have been extended on the plans to aid in their alignment with the skin in place. Now glue the rear bottom $\frac{3}{32}$ "x $\frac{1}{4}$ " spruce spar in position and also the $\frac{3}{8}$ "x1" leading edge and $\frac{3}{8}$ " triangle stock on top of the skin.

While this is setting up cut the root and tip rib templates from $\frac{1}{8}$ " plywood and the $\frac{3}{32}$ " sheet blanks for stacking and cutting the ribs. I tack-glued and bolted

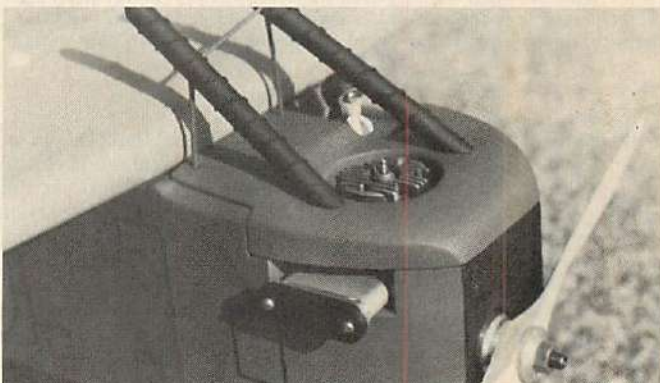
these together and made progressively smaller blanks to conserve balsa. I also would like to recommend carving only the top, bottom, trailing edge and front spar notches at this time. The first stack I cut came out a little short on the leading edge due to the extreme taper. The leading edge length and rear spar notches are best trimmed while fitting the ribs and when trimming the height cut only from the bottom of the rib. Cut a filler piece to extend from R-7 to R-10 between the top and bottom rear spars and fit and glue all ribs in place and add the top rear spar.

Next glue in the $\frac{1}{16}$ " vertical grained webbing between the ribs at the main spar. Now mark off the ribs $\frac{3}{8}$ " up from the bottom skin and $2\frac{1}{4}$ " forward from the front of the spar. These will be the center of the holes for the Gold N' Rods for the aileron controls. Cut a scrap piece of $\frac{3}{16}$ " sheet balsa next to R-8 at the proper angle and make the holes in the ribs, webbing and bottom skin. I find a small round file works just great for this. Slide the flexible (red) Gold N' Rod through the holes making sure the inner piece is in place. This will prevent the outer section from breaking when making the bend. (I learned the hard way!) With the top raised up on the taper sections for washout, you should be able to push enough through the bottom skin to be trimmed off flush later. After epoxying this in place and checking all glue joints the top skin can be fitted and glued. This completes half of the wing.





How to get roasted, deafened and frozen in one breezy cross-country. The pilots of the era were worthy of your salute. **At left:** The wing takes on shape. Notice fully assembled spar, Gold-N-Rod installation, tip wedges for washout. **Beneath:** Du Bro Muff'l Aire minimizes non-scale departure.



Build the other half in the same manner and when completed the center-section skin can be fitted. Don't forget the $\frac{1}{16}$ " ply inserts and reinforcements for the wing hold-down bolts. The cut-out for the aileron servo will have to be tailored to your particular servo and favorite mount and linkage. A modified Goldberg aileron coupler worked fine for me. Glue the tip blocks on and put aside to dry.

The ailerons are made by cutting top and bottom skins and a tapered spar per the plan. Pin down the bottom skin, glue on ribs, spar and ply insert for the aileron horn screws and glue the top skin in place. Set aside to dry.

The Fuselage

Using $\frac{1}{8}$ "x3" medium sheet balsa make up the sides to the outline shown on plans. Cut the $\frac{1}{8}$ "x $\frac{1}{4}$ " spruce stringers and diagonals and glue in place. Now the $\frac{1}{32}$ " plywood doublers and epoxy in place. Don't forget to make a *left and right side*. Resist the temptation to beef up the fuselage aft of the wing. It is strong enough as shown and an effort must be made to keep the tail as light as possible since the T-2 has a long tail moment and short nose moment.

Cut out F-1, F-3 and F-4 and join the two fuselage sides with these bulkheads. When they are thoroughly dry pull the tail together and bevel the inside edges at the tail post to give a $\frac{3}{16}$ " thickness and glue. Use $\frac{1}{4}$ " square cross braces as shown from F-4 to the tail. F-1B should be epoxied at this point. Next fit the grooved landing gear blocks and filler pieces, then install F-2 and determine from the servos being used the location of the Gold N' Rod controls and fit and epoxy these in place. If a hidden antenna is desired, install an additional outer

Gold N' Rod section along one side of the fuselage. Cover the top and bottom with light $\frac{1}{8}$ " sheet balsa with grain running lengthwise.

At this point the engine mount should be fitted to the firewall and the holes drilled along with the tank outlet and vent holes. Install the blind mounting nuts for engine mount and epoxy them in place. Now cut out the bottom and side cowl blocks to rough shape and glue in place. When dry carve to the final shape, then build up the radiator screen. This is formed by sandwiching aluminum screening between two layers of $\frac{1}{32}$ " plywood with a third layer as a border around the screening. Once this is dry, sand the edges square and glue in place on the side and bottom cowl blocks. Now cut the top cowl block to shape. This may have to be altered to suit your particular engine and will be made removable. The plans show the location of a $\frac{3}{8}$ " diameter dowel insert which is drilled to accept the single 6-32 hold-down screw. Drill this hole and secure the blind mounting nut at this time.

Let's take time out now to test fit the engine in place. After drilling and tapping the mount for your favorite engine secure it to the firewall with 6-32 screws and lock washers. This can be done by using a long screwdriver through the shaft hole in the radiator screen. Tip the engine up and guide the shaft through the hole and "angle" it into place on the mount. Temporarily bolt it in place and mark off for the muffler cut-out. A Du Bro Muff'l Aire was found to be very suitable providing for a minimum of bulk hanging out of the cowling. Remove the engine and mount and carefully make the muffler cut-out.

Now would be as good a time as any to

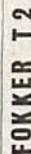
tackle the landing gear. Using $\frac{1}{8}$ " diameter wire make two identical outer struts and following the side view plans join the short bent ends with small pieces of brass tubing. The inner struts are bent in a similar manner, but are made to rest on top of this tubing with enough room between the ends for the $\frac{5}{32}$ " diameter axle to fit. This whole assembly is wrapped with wire and soldered. A torch or heavy duty iron is required for this and the results looks pretty much like the full size gear where the axle is wrapped on with bungee cord for shock absorbing. A simple jig is helpful while making this assembly.

The tail surfaces are built up of $\frac{3}{16}$ " sheet balsa using medium grade for the fixed surfaces and soft for the movable surfaces. Hardwood inserts are used as noted on the plans for control horn mounting and rudder leading edge and to join the two elevator sections. While the full scale plane had a full flying rudder it was felt a conventional fixed fin and movable rudder was more practical for the model.

Finishing

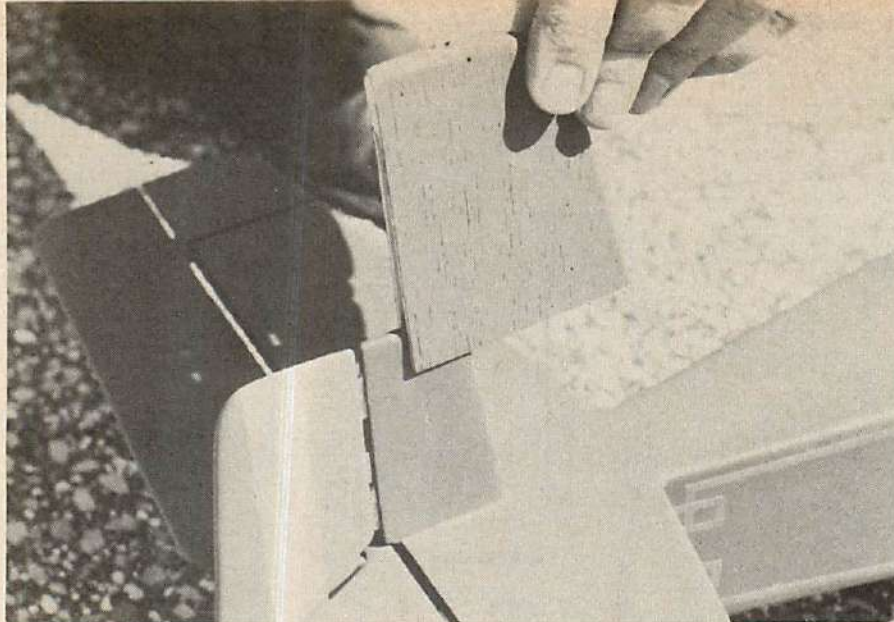
After carving the wing leading edge and tips to the proper shape and sanding these and all other surfaces smooth with #320 grit paper you are ready for final finishing.

The fuselage and tail were given two coats of nitrate dope over the bare wood, followed by two coats of K&B primer in preparation for epoxy painting. With winter weather and a confined working area I decided that brushing it on would be the better approach, but epoxies are not meant to be brushed on. I had just about convinced myself that I would have to wait until spring to finish the

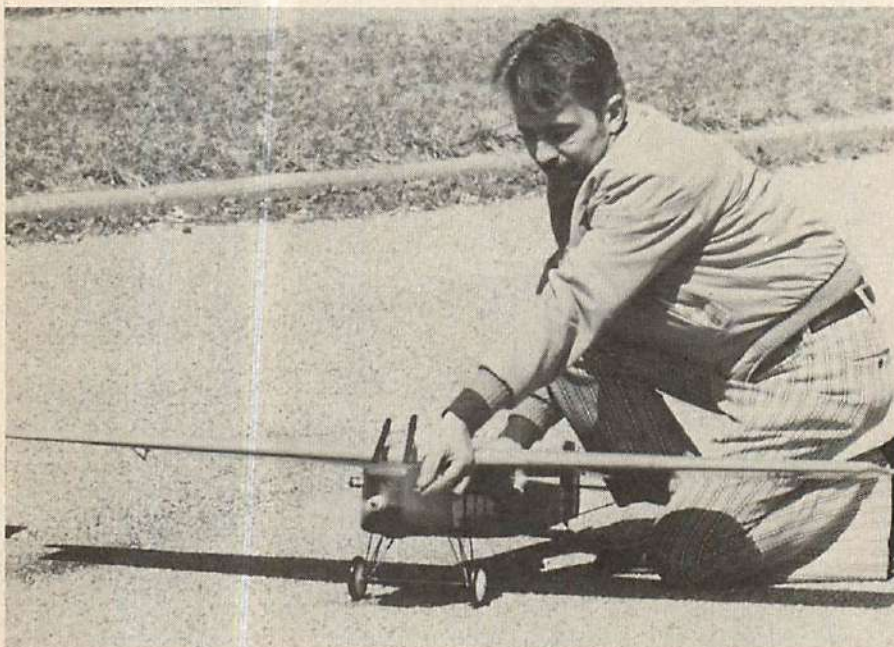


DESIGN AND PENCILS BY DON MARTIN	INKED BY QJM
A STAND-OFF SCALE R/C INTENDED FOR 40 TO 60 ENGINE SIZES	TOTAL WEIGHT: 5 LBS 12 OZ
WINGSPAN - 66"	AREA - 680 SQ IN
WING LOADING - 19.5 OZ / SQ FT	FOR 3 OR 4 CHANNELS OF RC

FULL SIZE PLAN AVAILABLE THROUGH CARSTENS FLYING PLANS



A good idea for a lot of test flights, as the scale rudder fin is very tiny to say the least, an enlarged fin was built with a slot within. It just slips over the scale fin for test purposes. One pin retains it. No stability troubles were encountered, but be wary in slow-flight range to be sure.



T-2 when I remembered reading a product report on R&S Products Perfect Paints with emphasis on their ability to be brushed on. A call to R&S Products confirmed these claims.

I wasted no time in getting a can of Perfect PC39 Army Green Camouflage paint and put a coat on the fuselage and tail. The results were amazing! The color was just right and brush marks were almost non-existent. The desired finish was accomplished with a second coat.

The windows are trim MonoKote and the gold striping is $\frac{1}{8}$ " Bridi Quik Stripe tape. Lettering is done with Presto Stik Vinyl Plastic Letters by Visu-Com Inc., available in any art supply stores.

From the information available the best I could determine was that plywood covered wings of this vintage were of an orange colored finish. After covering the wing with heavy white Silkspar I gave it three coats of nitrate dope, then orange Perfect paint was applied. One coat did the trick in this case and although it may

be a little too bright to be truly authentic, for this project it is quite acceptable. Apply the red, white and blue striping to the rudder and when everything is thoroughly dry, hinge the rudder, elevator and ailerons in place.

No attempt was made to super detail the model since after all it is a Stand-Off Scale project. The exhaust stacks were made from $\frac{7}{16}$ " diameter dowel wrapped with string to simulate corrugations. Braces are of $\frac{1}{16}$ " diameter dowel, all epoxied in place and painted black. The pitot tube was fashioned from $\frac{1}{8}$ " and $\frac{1}{16}$ " diameter dowel and fine wire for bracing. Tail braces are also of $\frac{1}{8}$ " dowel. Side vents were outlined with $\frac{1}{16}$ " black tape as were the approximate scale hinge lines of the control surfaces. The tailskid was placed further aft than scale to make it steerable for ease in ground handling. A Goldberg nylon tail wheel bracket was used to keep the strain off the rudder.

Before beginning any detailing however,

it is advisable to obtain a set of plans from the Smithsonian Institution, Fiscal Division, Section M, Washington, D.C. 20560. In addition, I consider a copy of "Armchair Aviator," July, 1973, with its many fine photos of the Fokker T-2, a valuable source of reference for scale detailing. This issue and also separate photo sets may be obtained from Mr. Leo J. Kohn, Collect-Air Photos, P.O. Box 14234, Milwaukee, Wisconsin, 53214.

Radio Installation

Placement of the radio will be largely determined by the equipment the builder has available. In general the batteries should fit either under or alongside the tank and right up the firewall with the receiver next to the tank as far forward as possible. Wrap each unit in foam for protection and also be sure to pack foam around the fuel tank. Mount the switch on a bulkhead or on the fuselage side bringing the actuating wire out the bottom of the fuselage preferably through the hardwood landing gear mount. Route the antenna along the side of the fuselage and push all the way into the Gold N' Rod outer section installed earlier for this purpose. I used an antenna connector by Sukarta Hobbies, Park Ridge, N.J. This handy gadget allows you to make a permanent antenna installation and simply unplug it to remove the receiver.

Flying Notes

The finished weight of the T-2 came out at 5 pounds 6 ounces and to get it to balance properly an additional 6 ounces weight was needed in nose. Even with this the wing loading comes out a very reasonable 19.5 ounces.

On the first flights I fitted an enlarged "slip-on" extension to the vertical fin since the scale sized fin seemed awfully small for adequate control. This will be trimmed down on successive flights until it is felt that the optimum size has been reached. The outline is shown on the plans. It is suggested that the builder use the same method if he has any doubts about the rudder size. Otherwise the T-2 showed no bad tendencies and the Enya .45 proved to be adequate power. Keep an adequate amount of control movement at first, especially rudder control. About $\frac{5}{8}$ " throw each way is suggested for a start. Not too much elevator seems to be the way to go, pending further flight tests.

As suggested earlier, this could be just the project to make use of that older R/C system and/or engine that doesn't quite have what it takes anymore for that hot pattern ship or pylon racer. The extremely fast control response and power required by today's planes in these two categories are not necessary for a Stand-Off Scale model of this type.

As a final note I would like to make a suggestion for those who are looking for a new challenge. Since a coast to coast flight by a radio control model is now a reality, perhaps the next logical step would be to re-create as closely as possible the actual historic flight of a full scale aircraft. Why not a scale model Fokker T-2 following as much as the original route as practical? Anyone care to try?

Interest in the FAI R/C sailplane speed record has been renewed by the recent Austrian claim of 303 km/hr (188 mi/hr). The present official record is 183 km/hr, set in 1971 in the USSR. In order to find out what maximum speeds are possible, as well as how to go about reaching them, a detailed mathematical analysis of the problem has been carried out.

Important FAI rules for sailplane speed include maximum weight 5 kg, maximum surface loading (wing + stab) 75 g/dm², maximum launch line length 300 m, and timed course length of 50m, flown both directions on the same flight. Complete FAI record rules are contained in the FAI Sporting Code, available from AMA for \$2.50.

It is no surprise that a sailplane de-

$$v_T = \sqrt{\frac{2mg}{\rho S C_D}}$$

where m = mass of aircraft (kg)
 g = acceleration of gravity (9.8 m/sec²)
 ρ = air density (1.225 kg/m³ at sea level)
 S = wing area (m²)
 C_D = overall drag coefficient referred to wing area

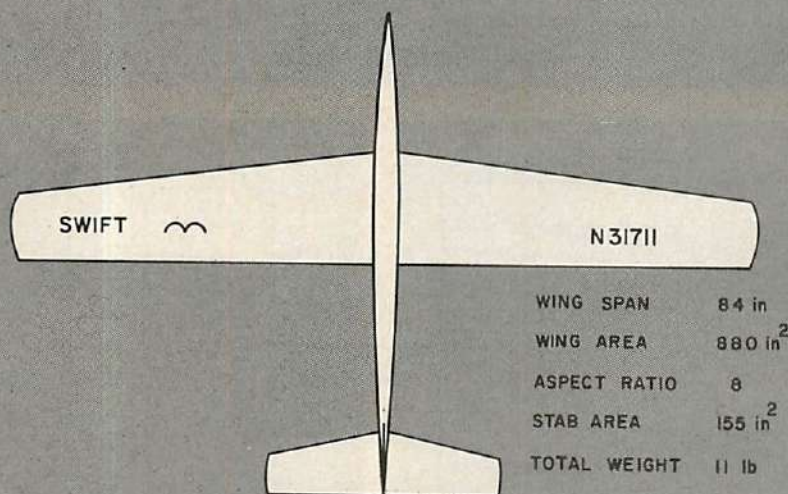
Terminal velocity increases as the square root of weight (mg), but decreases as the square root of drag (SC_D) and density (ρ). For the highest possible terminal velocity, use the heaviest allowable surface loading (75 g/dm²), the skinniest wing and fuselage you can produce, and maybe fly at

course, a speed limit, at the terminal velocity. The left side of each altitude curve merges into the same line, equal to the terminal velocity. An airplane having a terminal velocity of 25 m/sec (Antic?) will reach that velocity in a dive of less than 300 m. Our super swift record breaker with a terminal velocity of 125 m/sec will be going 91 m/sec after a 600 m dive. Start higher and go even faster, but it will never exceed terminal velocity.

Figure 3 shows the speed change during a 10 g pullout from vertical dive to horizontal flight. The speed ratio found in the figure is multiplied by the speed at the start of the pullout (entry speed) to get the horizontal speed after the pullout (exit speed). This ratio and the 10 g pullout radius are plotted for two entry speeds.

DRAWINGS: RICHARD WEBER

Fig. 7



Maximum Sailplane Speed

Just what it will take to extend the World Sailplane speed record/Richard Weber

signed for speed will be different from those normally seen at the flying field. The speed model must be heavier and stronger. Also we know that diving from higher altitudes should result in higher speeds through the timed course. But these common-sense notions are not enough to earn a world record. Just how should a speed model be designed, how should it be flown, and how important is a longer dive? We will take a careful look at these questions, aided by plots made from computer solutions of the relevant second order differential equations of motion. This analysis shows what is needed to have a sporting chance at breaking the record.

The excellence of a speed sailplane design ultimately depends on just two things—its weight and drag. There is a single number which tells everything about its aerodynamic potential. This quantity is the terminal velocity, the highest speed it could reach in a very long dive. At terminal velocity the aircraft weight and drag are balanced. Terminal velocity v_T is given by

Pike's Peak where the air is thinner. A maximum sized model will weigh 5 kg and have a total surface area of 66.66 dm². The better visibility of a large model will help the pilot fly a good course.

Terminal velocity is used on the horizontal scale of Figures 2-6, ranging from values of 0 to 125 m/sec. At the maximum allowable surface loading a terminal velocity of 125 m/sec corresponds to an overall minimum drag coefficient of about 0.008 at sea level. With great care it may be possible to achieve this, and have a terminal velocity of 125 m/sec (279 mi/hr).

The best flight path for a speed run is shown in Figure 1. It consists of a long vertical dive, a pullout near the ground, horizontal flight through the timing traps, a quick pullup, and a vertical zoom climb to trade the leftover speed for some of the altitude needed for the next dive. We will examine exactly what happens to the speed during each phase of the speed run.

The speed reached at the end of a vertical dive is plotted in Figure 2 for several starting altitudes. The higher you start the faster you finish. But there is, of

Values for different entry speeds can be estimated from the two shown. The most important fact found here is that the speed does not change much in the pullout, since the speed ratio is near unity for practical cases. This means that altitude used up in the pullout does little to help accelerate the model. Consequently, the highest timed speeds will be reached by pulling out from the dive at the last possible moment, and at the highest g loading which the wing can take without breaking or stalling. A 5 kg model times 10 g works out to 110 lb. Can your wife stand on your model without damage? (Would she like to anyway?) A tapered wing and moderate aspect ratio will help reduce the stress on the wing root, but severe taper might lead to tip stall. A tip chord of 60% of the wing root and an aspect ratio of near 8 should be reasonable choices.

The speed loss in horizontal flight is given in Figure 4 for three horizontal path lengths. Similar to the procedure for Figure 3, multiply the starting horizontal speed by the velocity ratio found on the plots to get the final speed. These curves

Fig. 1

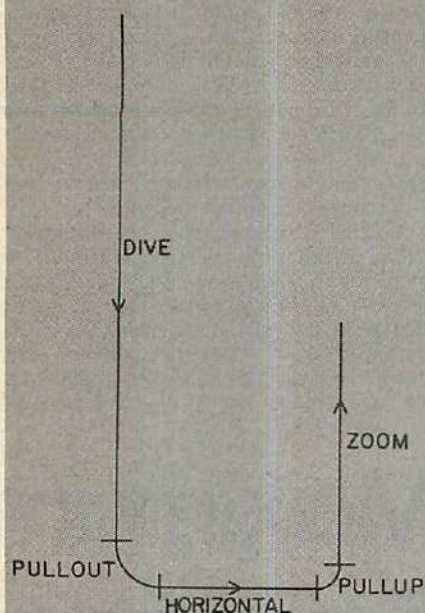


Fig. 2

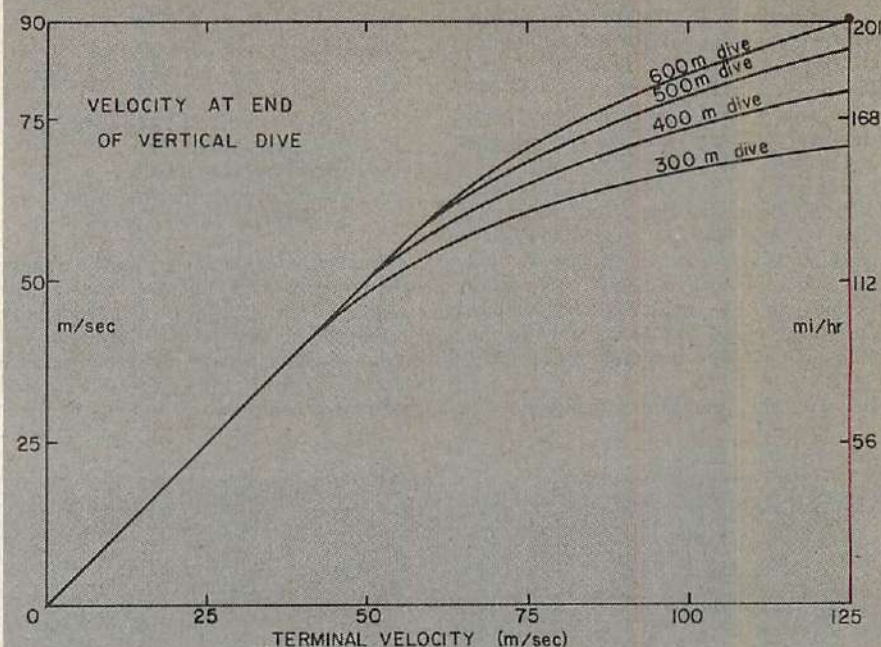


Fig. 3

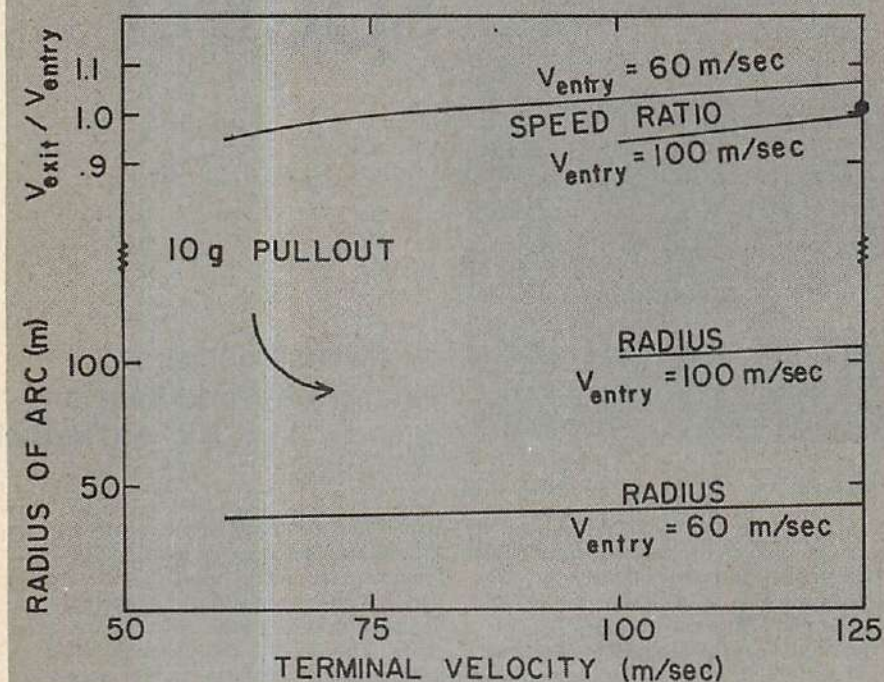
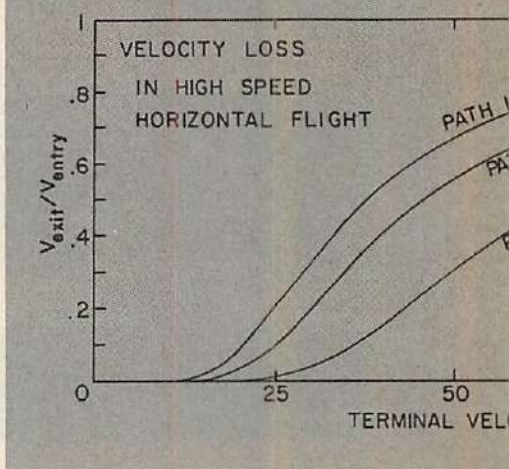


Fig. 4



neglect lift-induced drag. Near stall speeds induced drag becomes important, but at high speed it decreases drastically and may be ignored. For record attempts, 100 m level flight is required, consisting of 25 m before the timers, 50 m timed, and another 25 m before pullup.

Figure 5 shows speed loss during the pullup from horizontal flight to vertical climb. It is used just like Figures 3 and 4.

The most efficient way to regain altitude after a high-speed pass is a vertical zoom climb until most of the speed has been converted to altitude. The curves in Figure 6 show how high the model can climb for three different initial vertical velocities. Curves for other initial velocities can be estimated.

Now let's put it all together by working through an example of a flight profile for an ultimate model having a terminal velocity of 125 m/sec, and starting the dive 700 m (2300 feet) above the ground. Dots on the figures show the values used in this example.

Metric Conversion Table

1 meter (m)	= 3.28 ft
1 kilogram (kg)	= 2.205 lb
1 gram (g)	= 0.0353 oz
1 kilometer (km)	= 0.621 mi
1 m/sec	= 2.236 mi/hr
1 square decimeter (dm ²)	= 15.5 in ²
66.66 dm ²	= 7.176 ft ²
75 g/dm ²	= 24.57 oz/ft ²
300 m	= 984 ft

A Decade of Sailplane Speed Records

		km/hr	mi/hr
Austria	1976 Tentative	303	188
Russia	1971	182.3	113.2
Germany	1970	149.7	93.0
USA (Willoughby)	1969	139.3	86.5
Germany	1967	125.5	77.9

Fig. 6

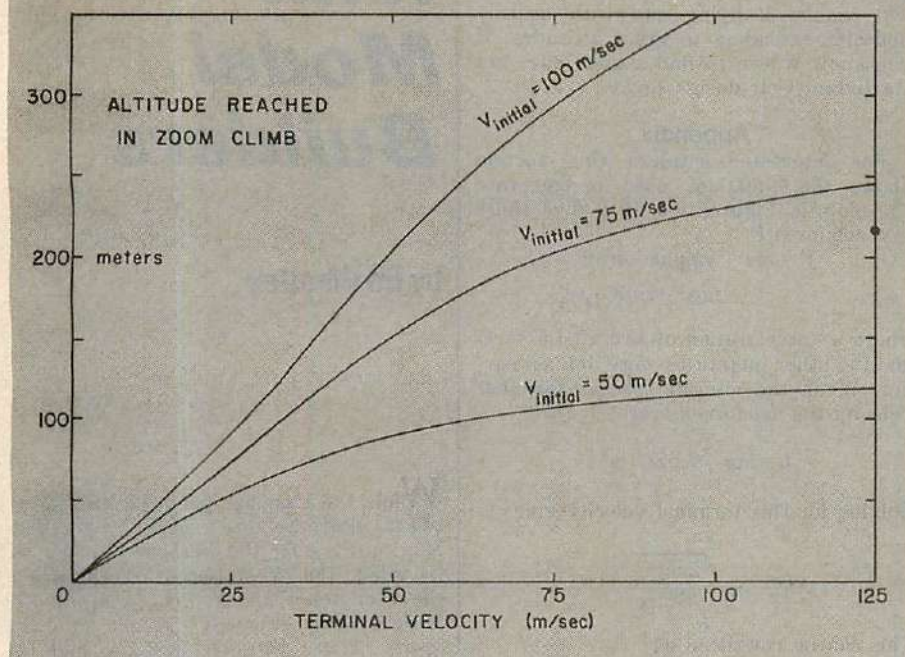


Fig. 8

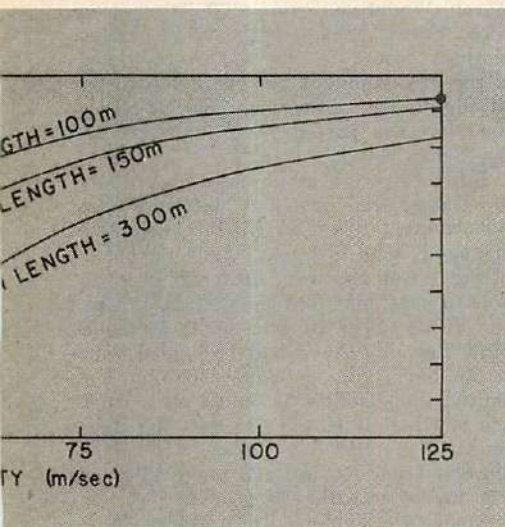
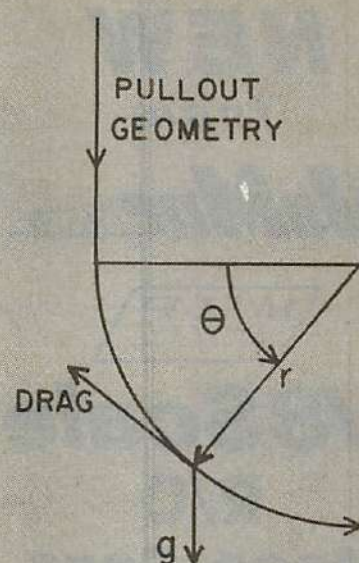


Fig. 5

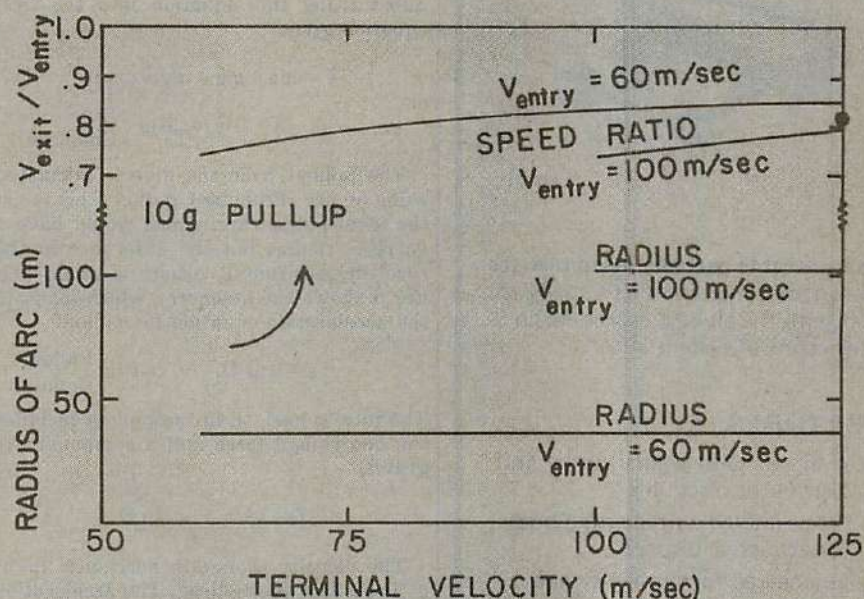


Fig 2) A vertical dive of 600 m ends with 91 m/sec

Fig 3) The 10 g pullout has a radius of 90 m and an exit velocity of:
 $1.01 \times 91 \text{ m/sec} = 92 \text{ m/sec}$

The model is now flying 10 m above the ground.

Fig 4) a 100 m horizontal flight beginning at 92 m/sec ends at $0.94 \times 92 \text{ m/sec} = 86 \text{ m/sec}$

Fig 5) The 10 g pullup has a radius of 80 m and an exit velocity of $0.82 \times 86 \text{ m/sec} = 71 \text{ m/sec}$

Fig 6) A vertical zoom climb starting at 71 m/sec reaches 220 m, for a total altitude of $220 \text{ m} + 80 \text{ m} + 10 \text{ m} = 310 \text{ m}$

The timed horizontal velocity is approximately equal to the average of the horizontal entry and exit velocities.

$V_{\text{ave}} = (92 + 86)/2 = 89 \text{ m/sec} = 320 \text{ km/hr} = 199 \text{ mi/hr}$

So how might a good design look? Swept leading edges will help discourage flutter during the dive. We might dispense with

ailerons to reduce drag, but will that make it too difficult to fly a good course? Heavier models fall faster (Galileo didn't have a sailplane), so use the maximum permissible surface loading. Invest weight in structural rigidity, not lead. Study Formula 1 construction and surpass it. Formula 1 builders are trying to hold down weight, you need more

The Austrian design, shown in the March '77 issue of *Model Airplane News* is good. It has one major shortcoming, which is insufficient weight. Its surface loading is 34.6 g/dm^2 , less than half of the ideal maximum allowable 75 g/dm^2 . That is equivalent to using a .19 engine in For-

mula 1.

Flying an ideal course will not be easy. The dive should be vertical, since that is the only way to gain full advantage of the gravity "motor." Pullout must be low and tight, to allow for maximum dive. A minimum of guidance corrections should be used, since a control surface has more drag when it is deflected. Keeping the model in the groove will take practice and skill.

All of the foregoing discussion may have looked fine. Build a large, heavy, clean model and fly the curve in Figure 1. There is, of course, a hitch to separate the men from the boys: how to gain enough

NEW
from

JoMac 



1/8 Scale R/C Race Cars



Cars available partially assembled, as shown above, or complete, ready to run with the all new JoMac Mach 3 radio control system

FEATURES

- Available with regular dealer and distributor discounts
- Preassembled with painted body for attractive display
- Engineered for simplicity and reliability
- Only "out of the box" race competitive 1/8 scale R/C car available
- Backed by JoMac Products, the leader in the R/C car industry.

MRP 1/8 scale R/C cars are now available exclusively through JoMac Products, Inc.

Write for a catalog today.

JOMAC PRODUCTS, INC.
12702 NE 124th Street
Kirkland, Wash. 98033
(206) 827-8606

altitude with such a heavy ship. A thermal sniffer may help. The high wing loading will require a flying site with healthy updrafts extending to great altitudes. If you know where to find a good site, get started on your design today

Appendix

For interested readers this section shows the equations used to generate the plots in Figures 2-6. In a dive there is a net force F

$$F = ma = \text{weight} - \text{drag} \\ = mg - \frac{1}{2}\rho SC_D v^2$$

where a = acceleration of aircraft (m/sec^2) and the other quantities were defined earlier. When the aircraft reaches terminal velocity the net force is zero

$$0 = mg - \frac{1}{2}\rho SC_D v^2$$

Solving for this terminal velocity gives

$$v_T = \sqrt{\frac{2mg}{\rho SC_D}}$$

This can be rewritten as

$$\frac{1}{2}\rho SC_D = mg/v_T^2$$

Substituting this equation into the first equation gives

$$F = ma = mg - mg(v/v_T)^2$$

or

$$a = (1 - v/v_T)^2 g \quad \text{Dive Equation}$$

The pullout from the dive is calculated using an arc of constant radius. This is not the ideal pullout arc, which would have a variable radius, but the difference in the resulting horizontal velocity is small. Figure 8 shows the geometry which leads to the acceleration equation for pullout

$$a = (\cos \theta - (v/v_T)^2)g \quad \text{Pullout Equation}$$

The total g load, Q , in the pullout includes the centrifugal force and a component of gravity

$$Q = v^2/r + g \sin \theta$$

The velocity change in horizontal flight is just a loss due to drag. The acceleration is always negative.

$$a = -(v/v_T)^2 g \quad \text{Horizontal Equation}$$

Next, the pullup from horizontal flight to vertical climb uses the pullout equation again, beginning the calculations at $\theta = 90^\circ$, the bottom of the arc.

Finally, the vertical zoom climb to maximum altitude has both gravity and drag opposing the velocity, so

$$a = -(1 + (v/v_T)^2)g \quad \text{Climb Equation}$$

The acceleration equations for each part of the flight are all second order differential equations. The velocity change (accelerated) depends on the velocity squared. This cannot be untangled by simple algebraic manipulation, so if you are not familiar with differential equations, ask a friend for help or just use the plots. They should contain everything you need. Good Luck! ☺

With Model Builders

by Ed Whalley

While the East has been vacillating between alternate doses of February and May, waiting for the weather to make up its mind, the West Coast has continued the even tenor of its ways, and the FF faithful have enjoyed a couple of good meets. Times were remarkably high at the Eagles' first Annual at Taft in mid-March. Would you believe 100:00 even in Nite Flite? Well, that's what Hulan Mathies posted to win the event. Some of the guys thought he was going to fly all night. By comparison, second-placer Joe Norcross posted 18:40; third-placer, Bob Scully, 14:42.

But there were other quite high times, too: Dave Kerzie racked up 30:00 in A Gas; Bill Hunter, ditto, in C. Bill Valentine managed 26:18 in 1/2 A; Scully, 26:52, in B. Steve Calhoun went up for 25:00 even in D to beat John Trevino's 24:49. It took Lee Hines 14:40 to win in A/2—that's 24:00 flat. Irv Aker had two good wins in Rubber: 12:60 in Wake; 10:83 in Unlimited. Bob DeShields pulled off a clean win in HLG: 10:00 even to best Bill Blanchard (8:19) and Bob Boyer (5:56). Jack Moreland took A/1 in 12:23, and Ed Carroll won in Power with 11:85.

Among the Juniors, Keith Morgan took 1/2 A with 16:37, and Jeff Cunyngnam won in A with 11:03. Eddie Wogulis took Junior Handlaunch with 2:47.

Earlier, in late February, Scully beat Mathies 40:00 to 29:46 to win in BC at the T-Bug's semi at Elsinore. Lee Hines beat Don Zink in Nordic, 12:14 to 11:87; and Andy Faykun bested both Jim Quinn and Bob White to take Unlimited with 14:33. Bob Boyer topped the glider chuckers with 7:33. And Junior Darryle Stevens had a field day with wins in Gas (6:56), HLG (10:56), and ROW (6:10).

All this, we suspect, was merely a warm-up for the FF Champs at Taft over the Memorial Day weekend.

Indoor Windup

☺ Some 50 program participants returned the FAI ballot with 44 voting approval (88%) of a diluted point system for Team selection. The deal goes like this—Points are awarded for a guy's two best out of six flights at each of two regional meets. The max score carried forward to a Finals is 200 points. And you have to have a minimum of 160 to gain entry. Travel funds, if available, will go to the holders

A FLYING CIRCUS OF GREAT AVIATION BOOKS FOR YOUR LIBRARY

2914-LZ-129 HINDENBURG, Robinson. Denied access to helium, the world's most advanced airship was doomed to a fiery death at Lakehurst. Paperbound. \$2.95

8162-FORD TRIMOTOR, Rice. The plane that put America in the airline business. Well written & illus. many pages, paper bound. \$4.50

8156-HANDBOOK OF AIRFOIL SECTIONS FOR LIGHT AIRCRAFT, technical data on wing sections representing most notable designs. 144 pages. \$5.00

8158-AIRCRAFT HARDWARE STANDARDS MANUAL, engineering reference on aircraft "nuts and bolts." 142 pages. \$7.50

8164-STORY OF THE TEXAN, The AT-6 popular training plane. Covers development first to last model, illus. w/complete man for AT-6. 60 pgs. \$4.00

2902P-AIRLINERS OF THE WORLD, Morgan. There's plenty more to travel than 727's, Conquairs, and DC-8's. Paper. Good reference. \$1.95

2911H-FIFTY FAMOUS AIRCRAFT, hardbound library edition. \$3.50

8155-VOL III, SEAPLANES & MOTORS, WWI Sporter's Manual, reprint of 1918 government manual document. 96 pages. \$2.50

2956-STUKA AT WAR, Smith. The most famous German aircraft of World War 2. Over 150 pix, 6x9 192p cloth. \$6.95

8159-AIRCRAFT DETAIL DESIGN MANUAL, 3rd Edition by Dzik gives data on design and repair of light planes, 161 pages. \$10.00

2964-AIRCRAFT 71, Photo album cov. pix, 7x10 96p cloth. \$3.95

4110-PIONEER AIRCRAFT, Munsen. Early days of aviation. \$2.95

9832-CLEMENT ADER, Gibbs-Smith. His flight claims and place in history. Hardbound. \$5.85

2928H-NORTH AMERICAN P-51 MK. I-IV, Hardbound library edition. \$5.00

8160-HELICOPTER DESIGN & DATA MANUAL, 12th printing, revised edition. \$5.95

8161-THE FLYING WINGS OF NORTHROP, an historical study of flying wings. \$4.50

8175-X-15 RESEARCH AIRPLANE, Till now little has been published about the trainer for today's astronauts. Exciting reprint from the NASA collection, exc. photos. \$2.00

2940P-NAKAJIMA KI-43, HAYABUSA III, Photos and markings. 8 color pages. AAS-15. 7x10 paperbound. \$2.95

2929H-SUPERMARINE SPITFIRE MK. I-XVI, Hardbound library edition. \$5.00

2929P-SUPERMARINE SPITFIRE MK. I-XVI, Packed with insignia and full color diagrams. 7x10 paperbound. \$2.95

2946P-SHARKMOUTH, VOL. 1, Photos and Markings. 8 pages in full color side views. AAS-21. 7x10 paperbound. \$2.95

2947P-SHARKMOUTH, VOL. 2, More Sharkmouth, color markings. AAS-22. 7x10 paperbound. \$2.95

2930P-NORTH AMERICAN P-51 B/C MUSTANG, More great Mustang markings and insignia. 7x10 paperbound. \$2.95

2926P-NORTH AMERICAN P-51D MUSTANG, Brief history, photos, 48 full color side views of markings, unit insignia. AAS-1. 7x10 paperbound. \$2.95

2926H-NORTH AMERICAN P-51 MUSTANG, Hardbound library edition. \$5.00

2930H-NORTH AMERICAN P-51 B/C MUSTANG, Hardbound library edition. \$5.00

2945P-NAKAJIMA KI. 27, In photos, markings, many in color. 7x10 paperbound. AAS-20. \$2.95

2943P-MITSUBISHI ABM-ZERO-SEN, Japan's famous fighter. Pix, markings, many in color. AAS-18. 7x10 paperbound. \$2.95

2926H thru 2954H, AIRCRAFT AVIATION SERIES identical to paperbound series but in hard library reinforced binding for permanency. each \$5.00

2908-CIVIL AIRCRAFT OF YESTERYEAR, Munsen. A photo album air craft spanning half a century. 260 illus. \$5.95

2937P-AVRO LANCASTER, Markings of famed British bomber, many in full color. AAS-12. 7x10 paperbound. \$2.95

9830-AERONAUTICS 1796-1855, Cayley, Gibbs-Smith-Historical treatise. Hardbound. \$5.40

2953P-VOUGHT FAU CORSAIR, In photos, diagrams, color markings. AAS-28. 7x10 paperbound. \$3.25

2958-PICTORIAL HISTORY OF THE RAF, Volume 1, Taylor & Noyes. From 1918 to 1938. 6x9 hardbound. \$4.95

2927H-P-47 THUNDERBOLT, Hardbound library edition. \$5.00

2905H-B-24 LIBERATOR, hardbound edition. \$5.00

8156P-B-24 LIBERATOR, Biddle. All. Shows the development of this famed World War 2 bomber. Scale drawings. \$2.95

2903P-THE AT-6 HARVARD, Morgan. Probably the most famous trainer of all time, complete with scale drawings. Paper. \$2.95

2917H-THE P-40 KITTYHAWK, hardcover library edition. \$5.00

2965-FIGHTERS OVER THE DESERT, Shores & Ring. Fantastic volume on the air battles of the Western Desert. Commonwealth vs Luftwaffe. 256p. 7x10, hardbound. \$8.50

8157-NORTH AMERICAN F-51 MUSTANG, truly the best fighter of the war. \$6.95

2915P-THE MESSERSCHMITT BF-109, One of the most famous fighters of all time. Many rare photos, data, plans. Paper. \$2.95

2915H-THE MESSERSCHMITT BF-109, Hardcover library edition. \$5.00

2909-THE DOUGLAS DC-3, Morgan. Possibly the most famous one of them all and still flying. Includes military C-47 data. 95p. Paper. \$2.95

2910P-THE F-86 SABRE, Childers. Fascinating data on the famed fighter jet with plans, photos. Paper edition. \$2.95

2910H-THE F-86 SABRE, hardbound library edition. \$5.00

2938P-BATTLE OF BRITAIN, Markings, photos of Hawker Hurricane, Supermarine Spitfire, Messerschmitt Bf109, AAS-13. 7x10 paperbound. \$2.95

2906P-THE B-58 HUSTLER, Robinson. Development of the SAC supersonic bomber built by Convair. Drawings. \$2.95

9803-OBSERVER'S WORLD AIRCRAFT DIRECTORY, illustrated. Hardbound. \$5.95

2907P-THE BOEING 707, Schiff. The commercial plane that ushered in the jet age in the USA. Very complete, drawings. \$2.95

9831-AERONAUTICS FOUR-IN-ONE BOOK, Flying up to 1909. Flying since 1913. Power to fly. Aeronautics prices. Hardbound. \$3.50

2907H-THE BOEING 707, hardcover library edition. \$5.00

2938P-SUPERMARINE SPITFIRE MK. XII-24, SUPERMARINE SEAFIRE MK. 1-47. Marking, many in color. AAS-8 7x10 paperbound. \$2.95

2903H-THE AT-6 HARVARD, hardbound edition. \$5.00

7262-FLIGHT MANEUVERS MANUAL, Haldon. How-to book showing 24 basic flight maneuvers. A advanced maneuvers recommended by FAA. Learn how the real ones operate. 500 illus. \$4.95

2916H-THE P-38 LIGHTNING, hardbound library edition. \$5.00

2918-THE P-47 THUNDERBOLT, Morgan. World War 2 single engine fighter in its many versions. Drawings. Paperbound. \$2.95

8176-PILOTS MANUAL FOR THE F-82 TWIN MUSTANG, This plane is actually two Mustang fuselages placed side by side. \$5.00

2921-WARPLANES OF YESTERYEAR, Munsen. Photo album covering the 1913-1946 period. Many rare, unusual, and exciting views. Cloth bound. \$5.95

4118-FIGHTERS BETWEEN THE WARS, Munsen. From biplanes to Spitfires, military aircraft developments in text and color drawings. Hardbound. \$3.95

2951-PICTORIAL HISTORY OF THE USAF, Monday. 70 years of Air Force history captured in text and 250 photos, 6x9 144pp hardbound. \$6.95

2955P-BILL DEAN'S BOOK OF BALSA MODELS, Instructions for making 18 models, gliders, boats, cars, etc., with full size plans. 64p. 8x11. \$2.95

2749-AIRSHOW PICTORIAL, Johnson. 350 photos capture thrill and excitement of airshows in US and Canada. Prop and jet. Statistics. 8-1/2x11-1/2 hardbound. \$17.95

8174-MANUAL FOR P-63 KING COBRA OF FUEL AIRCRAFT, Larger & more powerful than its little brother P-39. King Cobra had greater firepower & laminar airflow wings. Just published. 72 pgs. \$4.50

7261-FEDERAL AVIATION REGULATIONS (For Pilots), Simonson. Govt. rules prescribing requirements for obtaining various pilot licenses. Operational flight rules for piloting an airplane in USA. 96p, 7x10, paper. \$7.00



2925-JANE'S ALL THE WORLD'S AIRCRAFT, 1919, Over 1000 pix, plans, diagrams. Facsimile edition, 808p., 12-1/2x8-1/2" hardbound. \$25.00

9852-AIRCRAFT AVIATION ALBUM VOL. 6, Verneille-Sperry R-3 racer, Cessna Aircraft, Beech 18 Twin, Grumman J2F, Bert Acosta, more. 56p. 8x11, paperbound. \$3.50

9853-AIRCRAFT AVIATION ALBUM VOL. 7, Curtiss Tractors, Martin Straltoners, P36 Hawk, XB-70 Valkyrie, more. 56p. 8-1/2x11. \$3.50

9856-HISTORICAL AVIATION ALBUM NO. 10, by Paul R. Matt, including Curtiss PW-8, Aerona C-1 through C-4, Laird-Turner LTR-14 and biography of Charles Walsh. Softcover. \$5.00

2901-PLANES THE ACES FLEW, Morgan & Shannon. Brings back all the thrills of WW1 aerial days. Paper. \$2.95

2913P-THE LOCKHEED CONSTELLATION, Morgan. The famed triplane rudder commercial job still used by the Navy for weather work. Plans. Includes the Presidential plane. Paper edition. \$2.95

4518-THE SAGA OF THE TIN GOOSE, Weiss. The plane that opened up commercial aviation. 288pp 5 1/2 x 8, 60 pix, hardbound. \$2.95

2928P-NORTH AMERICAN MUSTANG MK. I-IV, Markings and insignia including 48 in full color. AAS-3. 7x10 paperbound. \$2.95

2931P-CURTISS KITTYHAWK MK. I-IV, Loads of markings, many in full color. AAS-6. Paperbound 7x10. \$2.95

2932P-CURTISS P-40D-N WARHAWK, Loaded with views of squadron markings, many in full color. AAS-7. Paperbound 7x10. \$2.95

8178-MANUAL FOR THE OLD OX-ENGINE OF JENNY FAME, A delightful little reprint on the engine that flew the Jenny. Covers operation, assembly, & repair of the 90HP powerplant. 20 pgs. \$2.00

8165-LOCKHEED P-38 LIGHTNING, Feared & revered fighter of WWII. Statistical study of its uses war. 78 pgs. photos. \$4.00

8166-HAWKER HURRICANE, The Hurricane made up 60% of Battle of Britain. Soft cover. 44p. \$2.00

8167-CURTISS P-40 WARHAWK, 8 page manual. Brought to fame by the Flying Tigers, magnificent plane famous for its ruggedness. Used mostly in action against Japanese. \$3.50

8168-ME262STURMVOGEL, World's first jet fighter. Text made possible by captured documents from German files. 66 pgs photos, schematics full-page foldouts, pilot's notes. \$5.00

8169-REPUBLIC P-47 THUNDERBOLT, The Jug weighed more than 21,000 pounds, carried more gas than any other WWII fighter plane. Brought air superiority to Allies in Western Europe. \$4.00

2957-PICTORIAL HISTORY OF THE LUFTWAFFE, Price. Over 200 photos show how the Luftwaffe grew from a nothing to a formidable force in only six years. Rare data. 212 pix, 160p. 6x9 hardbound. \$5.95



2929H-SUPERMARINE SPITFIRE MK. I-XVI, Hardbound library edition. \$5.00

2929P-SUPERMARINE SPITFIRE MK. I-XVI, Packed with insignia and full color diagrams. 7x10 paperbound. \$2.95

2946P-SHARKMOUTH, VOL. 1, Photos and Markings. 8 pages in full color side views. AAS-21. 7x10 paperbound. \$2.95

2947P-SHARKMOUTH, VOL. 2, More Sharkmouth, color markings. AAS-22. 7x10 paperbound. \$2.95

2930P-NORTH AMERICAN P-51 B/C MUSTANG, More great Mustang markings and insignia. 7x10 paperbound. \$2.95

2926P-NORTH AMERICAN P-51D MUSTANG, Brief history, photos, 48 full color side views of markings, unit insignia. AAS-1. 7x10 paperbound. \$2.95

2926H-NORTH AMERICAN P-51 MUSTANG, Hardbound library edition. \$5.00

2930H-NORTH AMERICAN P-51 B/C MUSTANG, Hardbound library edition. \$5.00

2945P-NAKAJIMA KI. 27, In photos, markings, many in color. 7x10 paperbound. AAS-20. \$2.95

2943P-MITSUBISHI ABM-ZERO-SEN, Japan's famous fighter. Pix, markings, many in color. AAS-18. 7x10 paperbound. \$2.95

2926H thru 2954H, AIRCRAFT AVIATION SERIES identical to paperbound series but in hard library reinforced binding for permanency. each \$5.00

2908-CIVIL AIRCRAFT OF YESTERYEAR, Munsen. A photo album air craft spanning half a century. 260 illus. \$5.95

2937P-AVRO LANCASTER, Markings of famed British bomber, many in full color. AAS-12. 7x10 paperbound. \$2.95

2923-JANE'S ALL THE WORLD'S AIRCRAFT, 1909, Hundreds of photos, plans, diagrams. 12-1/2x8-1/2" hardbound. \$17.50

7217-FLYING FORTRESS, Jablonski. Claimed as the definitive work on WW II's B-17 bomber. Illus., 3 views, 7x10 1/2, 362p. hdbnd. \$12.95

2904-B-17 FLYING FORTRESS, Birdsall. Shows the differences of this famed bomber in various sub-classes. Scale drawings. Paper. \$2.95

2942P-BOEING B-17 FLYING FORTRESS N44, Photos, markings of the famed bomber. AAS-17. 7x10 paperbound. \$2.95

2934P-SPAD SCOUTS XVII-SXIII, Fabulous photos show development of the Spad. Markings, many in color. AAS-9 RAF, US, Italy, Japan, USSR, other. 7x10 paperback. \$2.95

2302-GERMAN AIRCRAFT OF WORLD WAR II, Turner. Introduction by Adolf Galland. Hard cover. Detailed information giving all technical information for aviation enthusiasts and zero-modelers. Color photos showing marvelous detail. \$10.95

2927P-REPUBLIC P-47 THUNDERBOLT, AAS2, Packed with group insignia detail, 48 in full color. 7x10 paperbound. \$2.95

2924-JANE'S ALL THE WORLD'S AIRCRAFT, 1913, Facsimile edition. More than 500 photos, plans, diagrams. 12-1/2x8-1/2", 314p., hardbound. \$14.95

8177-OPERATION MANUAL FOR THE PIPER J-3 CUB, Reprint of the original. Marks & operates, spans, length, the "Volksvanger" the air. Special bonus drawings of construction in blueprint fashion on large heavy paper. Size 7x22". \$4.00

8179-MANUAL OF INSTRUCTIONS FOR THE CURTIS JENNY, WWI trainer, served as a bomber. Well into the 1930's. Many photos. 76 pgs. \$4.00

2301-BRITISH AIRCRAFT OF WORLD WAR II, Turner. Introduction by Douglas Bader. Superb color photos in beautiful detail. Lists tables of important marks & operators, spans, length, height, weight, etc. of each of the 49 aircraft. Biographies of each plane, hard cover. \$10.95

2939P-FINNISH AIR FORCE, 1918-1968, Treasure trove of aircraft, photos, markings, many in color. AAS-14. 7x10 paperbound. \$2.95

2911P-FIFTY FAMOUS FIGHTER AIRCRAFT, Groh. Data and illustrations of each type. Paperbound. \$1.95

2999-INTERNATIONAL 1969 AIR-RACING ANNUAL, Tegley & Berliner. History, photos, statistics, people involved in air racing. Records. 8x11 96p. paper. \$2.95

4051-THE TOY COLLECTOR, Hertz. Must reading for collectors of toy cars, planes, getting started, tools, solid models, gas engines, C/L clubs, instructions, etc. 60p 6x9 (1946). \$6.00



2917P-THE P-40 KITTYHAWK, MacDowell. The world's single engine prop fighter of World War 2. Plans, photos, data. Paper. \$2.95

2913H-THE LOCKHEED CONSTELLATION, Library hardbound edition. \$5.00

8002-WINGED ROCKETS, Sparks. The history of rockets from ancient China to World War 2 and the future. Hardbound. \$4.50

2935P-LOCKHEED P-38 LIGHTNING, USAF, French, Italian, Chinese photos and markings. 48 in color. AAS-10 7x10 paperback. \$2.95

2944P-NORTH AMERICAN F-86A-H SABRE, VOL. 1. Photos and markings, many in full color side views. AAS-19. 7x10 paperbound. \$2.95

2748-ALASKA BUSH PILOTS, Satterfield & Jarman. Airplanes vs the wilderness and the people who fly them. Hardbound. \$11.95

2966-FORGOTTEN FIGHTERS AND EXPERIMENTAL AIRCRAFT OF THE U.S. NAVY, Bowers. More forgotten fighters that never went into production. 108 pix, 8-1/2x11 80p paper. \$3.95

2096-BUILDING AND FLYING SOLE MODEL AIRCRAFT, Musciano. Updated 3rd edition of an all-time classic. 245p 6x9 hardbound. \$3.95

2941P-REPUBLIC F/R-84F THUNDERFLASH/THUNDERSTREAK, Markings and photos. 8 color pages. AAS-16 7x10 paperbound. \$2.95

3303-CONCORDE (The Inside Story), Geoffrey Knight. Gives the inside information from the revolutionary beginning to the final aircraft. 176 pgs. photos, hard cover. \$8.95

7706-AIRPLANE MODEL BUILDING, Johnson. Beginner's guide to model airplanes, getting started, tools, solid models, gas engines, C/L clubs, instructions, etc. 60p 6x9 (1946). \$6.00

2905H-B-24 LIBERATOR, hardbound edition. \$5.00

8156P-B-24 LIBERATOR, Biddle. All. Shows the development of this famed World War 2 bomber. Scale drawings. \$2.95

2903P-THE AT-6 HARVARD, Morgan. Probably the most famous trainer of all time, complete with scale drawings. Paper. \$2.95

2917H-THE P-40 KITTYHAWK, hardcover library edition. \$5.00

2965-FIGHTERS OVER THE DESERT, Shores & Ring. Fantastic volume on the air battles of the Western Desert. Commonwealth vs Luftwaffe. 256p. 7x10, hardbound. \$8.50

8157-NORTH AMERICAN F-51 MUSTANG, truly the best fighter of the war. \$6.95

2915P-THE MESSERSCHMITT BF-109, One of the most famous fighters of all time. Many rare photos, data, plans. Paper. \$2.95

2915H-THE MESSERSCHMITT BF-109, Hardcover library edition. \$5.00

2909-THE DOUGLAS DC-3, Morgan. Possibly the most famous one of them all and still flying. Includes military C-47 data. 95p. Paper. \$2.95

2910P-THE F-86 SABRE, Childers. Fascinating data on the famed fighter jet with plans, photos. Paper edition. \$2.95

2910H-THE F-86 SABRE, hardbound library edition. \$5.00

2938P-BATTLE OF BRITAIN, Markings, photos of Hawker Hurricane, Supermarine Spitfire, Messerschmitt Bf109, AAS-13. 7x10 paperbound. \$2.95

2906P-THE B-58 HUSTLER, Robinson. Development of the SAC supersonic bomber built by Convair. Drawings. \$2.95

9803-OBSERVER'S WORLD AIRCRAFT DIRECTORY, illustrated. Hardbound. \$5.95

2907P-THE BOEING 707, Schiff. The commercial plane that ushered in the jet age in the USA. Very complete, drawings. \$2.95

9831-AERONAUTICS FOUR-IN-ONE BOOK, Flying up to 1909. Flying since 1913. Power to fly. Aeronautics prices. Hardbound. \$3.50

2907H-THE BOEING 707, hardcover library edition. \$5.00

2938P-SUPERMARINE SPITFIRE MK. XII-24, SUPERMARINE SEAFIRE MK. 1-47. Marking, many in color. AAS-8 7x10 paperbound. \$2.95

2903H-THE AT-6 HARVARD, hardbound edition. \$5.00

7262-FLIGHT MANEUVERS MANUAL, Haldon. How-to book showing 24 basic flight maneuvers. A advanced maneuvers recommended by FAA. Learn how the real ones operate. 500 illus. \$4.95

2916H-THE P-38 LIGHTNING, hardbound library edition. \$5.00

2918-THE P-47 THUNDERBOLT, Morgan. World War 2 single engine fighter in its many versions. Drawings. Paperbound. \$2.95

8176-PILOTS MANUAL FOR THE F-82 TWIN MUSTANG, This plane is actually two Mustang fuselages placed side by side. \$5.00

2921-WARPLANES OF YESTERYEAR, Munsen. Photo album covering the 1913-1946 period. Many rare, unusual, and exciting views. Cloth bound. \$5.95

4118-FIGHTERS BETWEEN THE WARS, Munsen. From biplanes to Spitfires, military aircraft developments in text and color drawings. Hardbound. \$3.95

2951-PICTORIAL HISTORY OF THE USAF, Monday. 70 years of Air Force history captured in text and 250 photos, 6x9 144pp hardbound. \$6.95

2955P-BILL DEAN'S BOOK OF BALSA MODELS, Instructions for making 18 models, gliders, boats, cars, etc., with full size plans. 64p. 8x11. \$2.95

2749-AIRSHOW PICTORIAL, Johnson. 350 photos capture thrill and excitement of airshows in US and Canada. Prop and jet. Statistics. 8-1/2x11-1/2 hardbound. \$17.95

8174-MANUAL FOR P-63 KING COBRA OF FUEL AIRCRAFT, Larger & more powerful than its little brother P-39. King Cobra had greater firepower & laminar airflow wings. Just published. 72 pgs. \$4.50

7261-FEDERAL AVIATION REGULATIONS (For Pilots), Simonson. Govt. rules prescribing requirements for obtaining various pilot licenses. Operational flight rules for piloting an airplane in USA. 96p, 7x10, paper. \$7.00



2917P-THE P-40 KITTYHAWK, MacDowell. The world's single engine prop fighter of World War 2. Plans, photos, data. Paper. \$2.95

2913H-THE LOCKHEED CONSTELLATION, Library hardbound edition. \$5.00

8002-WINGED ROCKETS, Sparks. The history of rockets from ancient China to World War 2 and the future. Hardbound. \$4.50

2935P-LOCKHEED P-38 LIGHTNING, USAF, French, Italian, Chinese photos and markings. 48 in color. AAS-10 7x10 paperback. \$2.95

2944P-NORTH AMERICAN F-86A-H SABRE, VOL. 1. Photos and markings, many in full color side views. AAS-19. 7x10 paperbound. \$2.95

2748-ALASKA BUSH PILOTS, Satterfield & Jarman. Airplanes vs the wilderness and the people who fly them. Hardbound. \$11.95

2966-FORGOTTEN FIGHTERS AND EXPERIMENTAL AIRCRAFT OF THE U.S. NAVY, Bowers. More forgotten fighters that never went into production. 108 pix, 8-1/2x11 80p paper. \$3.95

2096-BUILDING AND FLYING SOLE MODEL AIRCRAFT, Musciano. Updated 3rd edition of an all-time classic. 245p 6x9 hardbound. \$3.95

2941P-REPUBLIC F/R-84F THUNDERFLASH/THUNDERSTREAK, Markings and photos. 8 color pages. AAS-16 7x10 paperbound. \$2.95

3303-CONCORDE (The Inside Story), Geoffrey Knight. Gives the inside information from the revolutionary beginning to the final aircraft. 176 pgs. photos, hard cover. \$8.95

7706-AIRPLANE MODEL BUILDING, Johnson. Beginner's guide to model airplanes, getting started, tools, solid models, gas engines, C/L clubs, instructions, etc. 60p 6x9 (1946). \$6.00

9857-HISTORICAL AVIATION ALBUM NO. 11, by Paul R. Matt, including LWF Butterfly and Owl, Curtiss-Wright C-1 Junior, Cicero Flying Field and Douglas C-2 through O-25. Softcover. \$5.00

2906H-THE B-58 HUSTLER, hardcover library edition. \$5.00

BOATS

3317-MODEL BOAT BUILDING, Loez. Four boat patterns, all made from cardboard. 48p., color illus., hardbound. \$3.50

2920-JANE'S FIGHTING SHIPS, 1898. Magnificent facsimile edition of rare Jane's complete with schematics and technical details. 12 1/2 x 8 1/2, 232pp hardbound. \$14.95

2602-USS ALABAMA. Heavy model battleship of World War 2. Text, photos, color charts, operational history and campaigns. 36p paper. \$ 2.50

2970-SHIPS AND AIRCRAFT OF THE US FLEET, Fahey, US warship handbook. Over 300 illus., paper. 9th edition. \$ 7.95

7701-SHIP MODELS, VOL. 1. From earliest times thru 1700AD. \$1.80

7702-SHIP MODELS, VOL. 2. Sailing ships from 1700AD. \$1.80

7703-SHIP MODELS, VOL. 3. British Small Craft. \$1.80

7704-SHIP MODELS, VOL. 4. Foreign Coast craft. \$1.80

7705-SHIP AND AIRCRAFT FIGHTING AND DEVELOPMENT. \$3.00



2922-JANE'S FIGHTING SHIPS, 1914. Over 3000 photos, silhouettes, diagrams. Facsimile edition. 624p., 12 1/2 x 8 1/2, clothbound. \$19.95

7700-SHIP MODEL BUILDING, Johnson. Enlarged revised 3rd edition, 1000 illus., describes hull carving, superstructure how-to. 320pp. \$6.00

2963-SHIPS 71, Parsons. Wide ranging album of ships from minisweepers to NATO. 83 pix, 7 dwgs, 7x10 cloth. 96p. \$3.95

2960-THE METAL FIGHTING SHIP, Archibald. Fantastic illustrations of metal hulled ships from 1860 to present. 350 illus., 9x12 240p. \$19.95

2961-SHIPS AND AIRCRAFT OF THE U.S. FLEET, Fahey, 9th edition U.S. warship handbook. Over 300 illus., paper. \$3.50

2962-JANE'S FIGHTING SHIPS 1939, MacMurtrei. Facsimile reprint 12x8. 550p cloth bound. \$29.95

2997-SHIP MODELING HINTS AND TIPS, L. O. Comm. Craine, unrivaled authority on model ships of every kind. Concise compilation of fifty years experience in the field. 5 1/2 x 8 1/2, 117 pgs. hardbound illus. \$6.95

2968-HANDBOOK OF MODEL PLANES, CARS AND BOATS, Bill Winter. Directions for making many model planes & boats such as Sopwith Pup, or a radio controlled gas engine hydroplane 6 1/2 x 9, 104 pgs, cloth. \$3.50

2601-USS NORTH CAROLINA (BB-55), America's 1940 vintage 40,000 ton battlewagon. Text, photos, color charts, operational history. 36p paper. \$ 2.50

CARSTENS PUBLICATIONS Dept. 5405
P.O. Drawer 700
Newton, New Jersey 07860

I am enclosing check or money order for \$..... Please send me the books I have checked below. (If you do not care to cut magazine, print or type titles on separate sheet.)

Name	State
Street	Apt.
City	State
City	State

Please add 25¢ postage on orders under \$2.00
Please print or type legibly. N.J. residents add 5% sales tax

Copyright © Carstens Publications, Inc.

WRIGHT FLYER

Recommended for teens and adults
58 inch wing span

- Unique double-dihedral wings
- Cutout pilot
- Key plastic pieces
- Moving control surfaces
- String or free flight
- All spruce framework
- Disassembles
- Detailed assembly instructions

STATTON AIR ENGINEERING 10859 Portal Drive - Los Alamitos, California 90720

Kit No. 202

of the top nine regional totals. A flyer's Finals score will be based on the formula —flyer's time/top time x 100 and then multiplied by 10 for a top Finals score of 1000. An absolutely perfect score (regionals plus Finals) would come up to 1200 points.

By this time, most clubs are concluding their Indoor programs. Typical of what's been flown are the results of the Woodland AC's meet at Chicago's Madison Rockwell Armory. Earl Johnson took a first in CO₂ with 4:30.8 to beat Tom Anderson (3:23.1) and Phil Cox (2:37.2). Dave Lindley took the Junior version in 3:05.4. His dad, D.L., took Peanut Scale with 142.8, winning handily over Bob Diedentopf and winning handily over Bob Siedentopf and Ed Mate. Jim Connor won in Junior with 113.4.

Nats Indoor events will be flown at Norton AFB near Riverside, and the NIMAS Internats are set once again for West Baden, Indiana. Projected dates for the Indiana venue are June 2-3, and the same deal on meals and lodging as last year's is expected.

And it looks as though the Manhattan concept first broached by Ed Whitten back in '65 has finally come of age. At a number of sites, notably the library rotunda at Columbia, Penny Plane and Peanut Scale have taken a back seat to the event which has been gaining momentum ever since the MIAMA group got behind it. Ron Moulton even carried a history of the event in the current Aeromodeler Annual, and it looks like the idea is catching on in England. With more people getting into the act all the time, it's only

natural that there's a hot discussion going on over rules interpretations and possible revisions. The heart of the concept, the idea that insures some similarity to a passenger-carrying airplane, is the stipulation that the fuselage must be able to enclose a "box" 2½ x 2x4 inches and incorporate a windshield and side windows. Other basics: twenty-inch wing and twenty-inch fuselage (tops); solid prop; fixed, two-wheel l.g.; and, paper covering except for "windows." I'll build to that!

WAM Stunt School a Success

WAM does a lot of good things. One of them is training Stunt judges via Stunt judging schools like the one held at Kofu Park in Lodi back in March. Arlie Preszler, WAM Stunt Director and upcoming Nats honcho, ran this one and reported a good and enthusiastic turnout.

Under the WAM system, judging is divided into four categories: ½ A and Novice, Beginner, Advanced and Expert. The idea is to give a guy who judges the chance to fly—but in a non-conflicting category. For example, guys whose performance records dictate that they fly in Advanced may be called upon to judge in the Expert category—and vice versa. And the idea of using a two or three judge panel in hotly competitive classes has also come into vogue. The panels are widely used in BC Expert, for example. All of this adds up to the need for quite a few judges.

WAM has a dozen or so qualified judges, and six or eight show up for every contest. This year's effort was directed at getting the Advanced flyers certified to

judge for the Experts. The effort paid off not only for the officials but also for the flyers.

Early on, the practice judging saw wide discrepancies in assigned scores. But at day's end, scoring had become unbelievably consistent. The reason was that each flight was thoroughly hashed and rehashed with "no-holds-barred" criticism until all the "whys and wherefores" were pretty well agreed upon by everyone. This frank discussion which got right down to the nitty-gritty also proved invaluable to the flyers making the flights for scoring. There's nothing like learning how someone else sees your effort to really open your own eyes. And all of this took place without anyone's feathers getting ruffled. Everyone understood that they were out to improve the system, and each became the devil's advocate. Not only that, they paid for the privilege.

One week later it was all put to the test at the San Jose FAI contest.

Ideas To Ponder

The Southern Alameda County R/C'ers have come up with the idea of a club-sponsored program of life insurance from which the club itself would ultimately benefit. Other non-profit organizations, apparently, have done the same thing. The idea is for the club to insure some of its own members and have the organization named as the beneficiary. I guess you've got to be sure the club is going to last; but the SACRAT bunch seems to qualify as stickers. It might be one way to invest some of the funds in a fat treasury.



CAM ACTION STEERING "Soft neutral" provides you with easy initial movement of the wheel around neutral yet quickens as sharp turns are needed. **HIGH-STRENGTH PS-6** Servo designed and built High-strength gear train minimizes stripping. **2-CHANNEL** system is built for cars, boats - no more buying an expensive 3 Channel in order to enjoy low cost control in competition or sport racing. **RECEIVER** has high selectivity and excellent adjacent channel rejection with parameter levels found only on top line

receivers. **TRANSMITTER** Designed by leading R/C competitors to provide a unit that looks distinctive and feels comfortable in your hands... with function control and wheel control designed for the hobbyist... Output power equal to full sized systems, resulting in more than ample range. **FREQUENCIES AVAILABLE** include 5-72MHz and 3-72MHz. **SYSTEM** includes transmitter, receiver, 4 (2) PS-6 miniature rotary servos, appropriate AA battery pack, and work-cell AA battery designation flag. **WAR-RANTY** covers materials and workmanship for 6-months from date of sale. **THOROUGH DESIGN** 5,000 plus hours of design, testing and engineering add up to another top competitor from Orbit... for the hobbyist.

AVAILABLE 1977
Complete Range of New Systems
Illus. Product Information • 25¢ In Coin, Dept. FM

Orbit®
ELECTRONICS
8140 CENTER STREET
LA MESA, CALIF. 92041

☞ In the field of frequency control at the flying site, the same bunch does this: Transmitters are left in place in the impound area. As a flyer finishes flying, he puts his rig back into its place-slot in the impound area and passes the frequency pin to the next transmitter down the line. The place in the lineup determines the flying order, and a guy has to wait until the pin gets back to him before his next turn. It is also understood that if you have trouble getting off the ground in a reasonable time you return the pin and wait for your next regular turn.

☞ Wynn Paul recently suggested that AMA help the various Controline groups to put out a unified Controline bulletin. The idea was to get AMA to print, address, and mail the publication. The idea has met with something less than enthusiasm. Critics point to problems in logistics (costs, scheduling, production) and to a masking of identity as one group or another assumes dominance in the bulletin.

☞ The complaint raised by George Rich in regard to manufacturer's liability in cases of product misuse seems to be spreading if one is to judge by the increased numbers of disclaimers appearing on packages. More than one bulletin editor has pointed to the phenomenon as evidence of a sick society. Whatever happened to the concept of individual responsibility?

☞ Then there's the matter of what Bill Savage calls the "naked navel syndrome" in the DCRC Newsletter. Have you noticed fewer ads and magazine covers featuring this portion of some gal's anatomy?

He ponders its demise. It seems to us that there's been less skin and more model coming through lately.

Nats Stunt: Another Point of View

In previous columns, we've presented an overview of PAMPA's efforts to upgrade the Nats program, generally, and to select the Nats Open Champ in particular. No one will argue with ideas that allow contestants "more flying for their Nats dollar" or which improve the odds of picking the best Champ. But Ted Fancher makes a case for not forgetting the guys who are good enough to become semi-finalists. The Nats is a milestone to these flyers, and Ted wants to see them get something out of it, too.

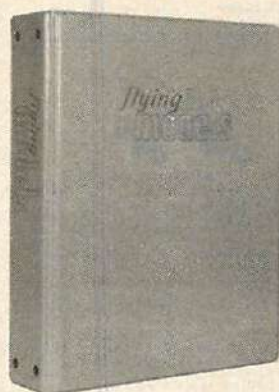
To these guys, says Ted, placing is important as a gauge by which to judge their progress. The end result of the competition should be some form of ranking or rating to serve as an indicator. The problem, as he sees it, is one of getting these guys up before each set of judges. Let each fly one official before each set of judges, he says. Then derive a placing from the total score achieved on all circles. The idea has advantages:

1. All pilots would have to perform for all judges which should help stifle charges of favoritism, etc.

2. It would require all pilots to fly two flights to qualify, thus eliminating the luck of the draw in regards to weather, flying position, etc., and making consistency more important.

3. Since qualifying scores would be the total of flight scores in front of all judges, they could be used meaningfully

FLYING MODELS BINDERS



PRESERVE YOUR COLLECTION

Keep your FM collection neat, organized and safe. Handsome official blue binders stamped in gold hold 12 issues, open flat for reading, and are removable for shop work. Be sure to include your street address in addition to P.O. box number for expedited delivery. NJ residents include state sales tax.

\$6 Canada and foreign **\$5**

CARSTENS PUBLICATIONS, INC.
Reader Service Dept. 4402
P.O. Drawer 700
Newton, New Jersey 07860

The Paper Cub

HIT OF THE WRAM SHOW



SPECS.

WING SPAN _____ 53 1/2"
WING AREA _____ 508.25 sq in
ENGINE SIZE _____ 35-46

BUY IT TODAY AND FLY IT TOMORROW!

Unlike any kit you've seen before this one *does* build fast. The precision die cut corrugated allows for exact and easy assembly, eliminating construction error, so she'll fly as easy as she builds. The pre-painted mylar skin lamination means fuel proofed, long lasting, and substantial savings in time and money of covering materials. The corrugated walls makes for a super strong construction, the kind that can take punishment, like the hard landings of a novice. She'll give you confidence quick, just the right combo of maneuverability and hands off stability lets you fly like a pro. This kit gets you off the ground and in the air quick, buy it today and fly it tomorrow!

PHOENIX INDUSTRIES INC.
60 ENGINEERS DRIVE HICKSVILLE, N.Y. 11801

\$21.95
REG. \$29.95

KIT INCLUDES

- PRECISION DIE CUT PARTS PRE-PAINTED AND COVERED WITH FUEL PROOF MYLAR SKIN LAMINATION.
- COLOR MATCHED TRIM TAPE.
- ALUMINUM FIREWALL AND ABS LANDING GEAR MOUNTING PLATE
- FORMED ALUMINUM MAIN LANDING GEAR.
- STRONG SPRING NOSE GEAR WITH CONTROL ARM AND BRACKET.
- STEP BY STEP DETAILED INSTRUCTION BOOK.
- MOLDED PLASTIC HINGES.
- MOLDED NYLON CONTROL HORNS.
- SNAPLINKS, ASSORTED HARDWARE.
- INCLUDES 4 OZ. OF MUNG SUPER GLUE.

NAME _____

ADDRESS _____

STATE _____ ZIP _____

☐ RED AND WHITE ☐ BLUE AND WHITE

Add \$1.50 for postage and handling in Continental U.S. U.S. C.O.D. welcome. Add 85¢. Outside Cont. U.S. add \$10.00 for post. & handling, any overage refunded. N.Y. State Res. add 8% Sales Tax.

11

MINIATURIZE YOUR WIFE!

THE MINIATURE MAGAZINE

THE FASCINATING WORLD OF DOLLHOUSE MINIATURES



ACCESSORIES ROOM SETTINGS DOLLHOUSE PLANS FURNITURE

Wives put up with a lot from model builders. Balsa wood, pins, and razor blades strewn around. Big birds stored everywhere, engines, fuel. Help her liberate herself with a copy of THE MINIATURE MAGAZINE and get started with this exciting new hobby that will help her think small, too. Be a big hero and introduce her to doll house miniatures and the fun of creating miniature rooms. At your favorite hobby shop, newsstand, or send us her name and address and a buck. By the publishers of FLYING MODELS.

CARSTENS PUBLICATIONS, INC.
Reader Service Dept. Dept. 2301
P.O. Drawer 700
Newton, New Jersey 07860

to tank those flyers not qualifying for the finals.

4. This would impose no additional work load on the judges. They'd still judge a morning and an afternoon round consisting of half the semi-finalists.

And on another Nats point, Ted feels very strongly that the Junior and Senior Champs should always be included in the Walker Cup flyoff.

Old-Timers' Row Revisited

We've been presenting views on the conversion-engine issue on the Ol' Timer movement, most of them from "pure spark" boys. Here's one from John Pond, the fellow who's been at target center most of the time. It's from a letter to Bob Stalick:

Pond can see no advantage to "splitting off"—rather, he would try to "focus on the problem within the group." Nor does he see any advantage to having separate FF and RC officers: "We aren't getting enough work out of the present officers," he says, "and with more bodies to vote, we'll never get anything done." He lists five specific proposals:

1. Only allow registered FF or R/C members to vote on rules affecting each category (self-determination, pure and simple).
2. Clean up the SAM chapters by requiring paid membership as the basis of belonging (a not unreasonable condition).
3. Restrict SAM contests to SAM members. There's too much free-loading, he says, and this applies particularly to the SAM Champs.

4. Poll the membership frequently via a questionnaire to find out which way people want to go.

5. Require each regional VP to write a column for SAM Speaks which would reflect the views held in his district in order to achieve cross-fertilization.

John admits that he's just throwing ideas out; but, he argues, if enough people start doing it, maybe they'll be able to come up with a coherent program in time for the SAM business meeting.

Another guy with a few thoughts is Bob Schafer from Spokane. He took a look at the vote on conversion engines and decided that they were here to stay. (Over 1000 nominal members didn't vote at all.)

One of the quickest ways to kill OT's, he says, is to make the rules too complicated. He sees the answer to the basic problem as the need to create a separate category for converted engines. Such a move would provide:

1. No complicated rules and easy contest administration.
2. Insured continuance of the sport by not cutting-off anyone.
3. No obstacle for the "pure spark" fan to overcome.
4. No conflict with the current preamble to the SAM constitution.
5. A means of reconciling varied interests within the contest structure; e.g., separate classes (A, B, C), combined events (Cabin, Pylon), etc.

The main point to be made is that these things could come off without changing the rules drastically—just by putting the converted engines into a category of their own. The purists wouldn't have to fear putting up a spark job against a hot mill. And each could compete in the way that suited him best.

Auctions Raise Money

Sooner or later every group runs an auction to raise funds. Going through the bulletins, we note that some clubs call them "white elephant sales" or "junk nites." The gang in Salt Lake, the Northern Conn. R/C bunch, the MACK boys out in Kansas, and lots of others have had them. Usually they're run in conjunction with a club meeting or banquet or some other event. Some fast-talking dude is picked as "auctioneer" and the show takes off from there. Sometimes it's a "Chinese auction" deal and the prices start high and work down until someone bids an acceptable figure (usually set by

LOOK WHAT'S NEW!

The KINNER "SPORTSTER" #106

39" wingspan, 049 power for up to 3 channels r/c. A great sport trainer of the 1930s. \$12.95

AND LOOK WHAT'S COMING!

The FAIRCHILD "22"

48" Wingspan
09 to 25 Power
3 Channel R/C #107

price to be announced

AMERICAN "CLASSICS" worlds' finest models

Send for free brochure.

The Aristocrat #105

36" wingspan, 020 power. FOR RADIO CONTROL OR FREE FLIGHT. \$12.95

The BELLANCA #102

35" wingspan, 020 power, FOR PULSE AND SMALL MULTI-RADIO. CAN BE FLOWN FREE FLIGHT. \$9.95

Stearman C3B #104

35" wingspan, 049 power. FOR RADIO CONTROL UP TO THREE CHANNELS. \$13.95

BURTON ROBIN #103

41" wingspan, 049 power. FOR RADIO CONTROL UP TO THREE CHANNELS. A TRUE CLASSIC AIRCRAFT FROM THE "GOLDEN ERA" \$12.95



Monocoupe #101

22 1/2" wingspan FOR RUBBER, CO2 OR 010 POWER. \$6.95

tel. (703) 273-9593



FLYLINE MODELS

10643 ASHBY PL. FAIRFAX, VA. 22030

FACTORY AUTHORIZED SERVICE

Complete Service Available • All Orbit & Micro-Avionics

E.O. BABB
1590 Norrend
El Cajon, California 92021
(714) 447-4115

SOUTHWEST
DIGITAL CONTROL REPAIR
10044 Goliad
El Paso, Texas 79924
(915) 755-0202

NORTHEAST
BOBBY'S HOBBY LOBBY
65 East Main Street
Westminster, Maryland 21157
(301) 848-4350

AEROTEC HOBBIES & CRAFTS
Lincolndale Shopping Center
Route 202, P.O. Box 116
Lincolndale, New York 10640
(914) 248-7431

DE BOLT RADIO CONTROL
49 Golden Court
Buffalo, New York 14225
(716) 633-6623

CANADA
CHAPMAN'S RADIO CONTROL
14 Northfield Road
Scarborough, Ontario M1G 2H4
(416) 439-8382

Warranty Service Available
Factory Only

AVAILABLE 1977
Complete Range of New Systems
Illus. Product Information • 25¢ In Coin, Dept. FM

Orbit[®]
ELECTRONICS
8140 CENTER STREET
LA MESA, CALIF. 92041

FM CLASSIFIED ADVERTISING

CLASSIFIED ADVERTISING: 25¢ per word, minimum order \$3.00. Count all initials as words. Ads payable in advance. Fourth consecutive insertion of same ad is free. We must have home or business addresses for all ads using P.O. box numbers. Ads must be sent to Newton not later than the 20th, three months preceding date of issue: i.e., April 20th for July issue. SEND ALL ADS TO: Classified Ad. Dept., FLYING MODELS MAGAZINE, P.O. Box 700, Newton, N.J. 07860. Ads sent to other departments may be delayed or lost. Classifications are available. All ads are accepted subject to the approval of the publisher.

FLYING MODELS SUPPLIES

1958 REVELL, ADAMS, ORIGINAL ROCKET and Missile Kits. Specify wants. SASE for Reply. C.T. McCowan, 9441 Warsaw Rd., LeRoy, NY 14482. 7-77

FAMOUS BRITISH DIESELS P.A.W., M.E. and D.C. Engines, RC and CL. Finest diesel fuel. Diesel Data Sheets. Aeromodeler Plans. Handbooks and Annuals, Veron Rubber and RC scale kits. Catalog 25¢. Hobby Hideaway, Dept. FM, R.R.2, Delavan, IL 61734. TF

MODEL PLAN SERVICE has new catalog featuring "Miss America of 1935," "Custom Privateer," and "Mosquito Bomber." Send 25¢ for catalog and Flying Models close-out listing to: MPS, 1008 E. Chalmers, Orange, CA 92666. 7-77

CAR BATTERY STARTS—Glow Plug Model Engines. Adapter \$5. Delux \$9.00. From Dee Wizzard, 309 S. Marina, Prescott, Ariz. 86301. 8-77

CAR BATTERY STARTS GLOW PLUG Model Engines Delux Driver \$9.00. From Dee Wizzard, 309 S. Marina, Prescott, Ariz. 86301. 8-77

SALE Large stock of Super Tigre, DS Max and miscellaneous other parts. Also Sig Paint and hardware. Send SAE to Danny's Model Shop, 208 Bellemonte St., Middletown, OH 45042. TF

PLANS

MODEL PLANS CATALOG. Scale plans R/C, U/C, F/F. Send 25¢ for postage and handling to Hobby Helpers, 1543 Stillwell Ave. Bronx, NY 10461. TF

BOATS

RIDGE MODEL MARINE—Hardware, Kits, Accessories, Lowest Prices, Fast Service. Outriggers our specialty. Complete Catalog including building tips—75¢. 231 Outer Drive, Oak Ridge, TN 37830. 8-77

BOATS: Dissatisfied with tuned pipe couplers—melting, splitting. Try Ours! Virtually indestructible Nylon Reinforced 20-40 size \$9.00. Foot \$2.25 coupler, 60 size \$11. Foot \$2.50 Coupler. Empire Model Marine Supply, 544 Nassau Blvd., W. Hempstead, NY 11552. 9-77

SOUSA'S R/C BOATING Catalog \$1.00. Open Eves. 7-10, Sat. 10-5. 9 Wheeler Ave., Melrose, Mass. 02176. 617/662-7237. 10-77

CRAFTS

IS THE WIFE BUGGED about that nifty new Stuka kit you gave her for Valentine's Day? If she tolerates, but doesn't groove on our hobby, you should take a look at something that's right up her alley—Creative Crafts magazine. Crafts are all the rage today, and six times a year Creative Crafts can bring the latest and the best of the craft world to your lady. There's miniatures, ceramics, nature crafts, découpage, film, decorating ideas, scrap craft, egg craft and many more—great for beginners or advanced crafters. So order a gift subscription—it's only \$4.50 per year or \$8.00 for two years in the U.S. and Canada. Add \$1. per year for other countries. Carstens Publications, Inc., Creative Crafts Circulation Mgr., P.O. Box 700, Newton, N.J. 07860. TF

FLYING MODEL BOOKS

INDISPENSABLE: That's Model Plane Building from A to Z. Over 230 tips, 36 selected airfoils and many, many hours of good nuts-and-bolts reading that help you lick those construction problems. A must. Only \$3.00 postpaid from: Carstens Publications, Inc., P.O. Box 700, Newton, N.J. 07860. TF

WANTED: FLYING ACES MAGAZINE. First issue Volume 1. Must be in at least reasonably good condition. Also other issues of Volume 1. Advise price and condition. Write Harold H. Carstens, Publisher, Flying Models Magazine, PO Box 700, Newton, NJ 07860. TF

GREAT PLANS abound in the new, second printing of Decade of Design 2. Back by popular demand, it's loaded with over 60 designs for R/C, rubber, gas or glider. Only \$3.00 from: Carstens Publications, PO Box 700, Newton, N.J. 07860. TF

the owner as the least amount he'll take for his article)—as long as the bid is over that figure the auctioneer can accept it. Needless to say, the fast-talking auctioneer is "asking" for bids most of the time and trying to make the crowd think he's received an acceptable bid in an attempt to bring the bidding back up. Sometimes a wink into the crowd and the fast query "who'll make it two-fifty—two seventy-five?" gets the bidding turned around.

The club sometimes works a deal whereby the money over the lowest acceptable price goes to the club treasury. Sometimes all the articles are donated and the auction is all profit. Either way, the club can't lose.

The DCRC boys had one in connection with their annual March General Membership Meeting at the Johns Hopkins facility. Jim Miller and John Spalding were pressed into service as auctioneers and got the show on the road in a hurry after a very short business meeting. It was reportedly one of the most successful auctions on record, and very few of the items went home with the same owner. All told, something over \$2000 changed hands.

Coleman Wins at Manassas

Nope, we're not trying to rewrite history; we're just reporting on the DCRC glider group's March Fun-Fly. It was held on a Sunday late in the month, and the weather was gorgeous. The site was the Manassas Battlefield on the way down to Warrenton. This is horse country, and I rode all over it when I was with the cavalry at Ft. Myer. It's rolling country with wide stretches of meadow—an ideal site for a glider meet.

Either the weather or the growing reputation of these monthlies brought about a good turnout, and 27 contestants showed up. CD Gus Burgin had the 5-min. task end through a gate aloft; the landing was greased-in along a strip and ended touching the strip. Everything was low-pressure and fun.

For the second month in a row, winners were all from different states. John Coleman (Virginia) was first; Bob Gill (Illinois), second; and Bob Baugher (Pennsylvania), third. Each received a trophy donated by Skip Schow. These were plastic photo holders with a sailplane and contest legend worked-in. The winners were photographed in color at the close of the meet, and their pix were inserted to give the trophies a highly personal touch.

Taibi Tops at Taft

All of the good ol' boys (and some that weren't so old) went up to Taft for the SCIF meet and had a good time getting their ships bent (well, some of them anyway). Unc'l Jim Adams is going to be known as "Jonah" from now on: every time he "helped" someone, the ship pranged. But with ol' Sal Taibi it was a different story.

Sal took C Cabin with a modest but creditable 8:54. He got a second in AB Pylon with 14:43—seventeen seconds behind the winner, T. O'Meara; and, he had another squeaker with Al Hellman in 30-second Antique. Al posted 12:13; Sal, 11:48. Then, just to round his string out,

SUMMER BACK ISSUE SPECIAL flying models

COMPLETE YOUR FILE



Now is the time to build up your library of FLYING MODELS by sending for our SUMMER BACK ISSUE SPECIAL. Get your choice of any 25 available back issues for only \$12.50 in the United States, \$13.50 in Canada, \$14.50 foreign. Please give some extra choices as some issues are in very short supply.

- | | |
|---|---|
| <input type="checkbox"/> 1968—June | <input type="checkbox"/> 1974—June |
| <input type="checkbox"/> 1968—November | <input type="checkbox"/> 1974—July |
| <input type="checkbox"/> 1969—January | <input type="checkbox"/> 1974—August |
| <input type="checkbox"/> 1969—February | <input type="checkbox"/> 1974—September |
| <input type="checkbox"/> 1969—March | <input type="checkbox"/> 1974—October |
| <input type="checkbox"/> 1969—April | <input type="checkbox"/> 1974—November |
| <input type="checkbox"/> 1969—May | <input type="checkbox"/> 1974—December |
| <input type="checkbox"/> 1969—June | |
| <input type="checkbox"/> 1969—July | <input type="checkbox"/> 1975—January |
| <input type="checkbox"/> 1972—February | <input type="checkbox"/> 1975—February |
| <input type="checkbox"/> 1972—April | <input type="checkbox"/> 1975—March |
| <input type="checkbox"/> 1972—May | <input type="checkbox"/> 1975—April |
| <input type="checkbox"/> 1972—June | <input type="checkbox"/> 1975—May |
| <input type="checkbox"/> 1972—October | <input type="checkbox"/> 1975—June |
| <input type="checkbox"/> 1972—December | <input type="checkbox"/> 1975—July |
| | <input type="checkbox"/> 1975—August |
| <input type="checkbox"/> 1973—September | <input type="checkbox"/> 1975—September |
| <input type="checkbox"/> 1973—October | <input type="checkbox"/> 1975—October |
| <input type="checkbox"/> 1973—November | <input type="checkbox"/> 1975—November |
| <input type="checkbox"/> 1973—December | <input type="checkbox"/> 1975—December |
| <input type="checkbox"/> 1974—January | <input type="checkbox"/> 1976—January |
| <input type="checkbox"/> 1974—February | <input type="checkbox"/> 1976—February |
| <input type="checkbox"/> 1974—March | <input type="checkbox"/> 1976—March |
| <input type="checkbox"/> 1974—April | <input type="checkbox"/> 1976—April |
| <input type="checkbox"/> 1974—May | <input type="checkbox"/> 1976—May |

IMPORTANT: Be sure to give 2nd and 3rd choice as many issues are in very short supply. Magazines are all complete, in good condition. If you don't want to clip magazine, place order in a letter and print or type legibly.

FLYING MODELS MAGAZINE

Reader Service Dept.
P.O. Drawer 700
Newton, New Jersey 07860

Dept. 6404

Enclosed find \$..... Please send me the back issues of FLYING MODELS which I have checked above:

- ☐ Summer Special. Any 25 copies for \$12.50.
☐ Any 10 issues for \$7.00.

☐ **PUBLISHERS CHOICE:** If you prefer, leave the choice to us and we'll see that you get those copies which are shortest in supply, possibly including some not included here.

NAME.....

STREET.....

CITY..... STATE..... ZIP.....

Copies postpaid in USA. Please add 50¢ per 10 issues to Canada, \$1 per 25 copies to Canada. \$1 per 10 issues foreign, \$2 per 25 copies foreign.

A HOBBYPOXY HOW-TO:

WHAT'S A MICRO BALLOON?

I guess most of you have heard of micro balloons, have read about them in construction articles, and seen them advertised — but do you know what they are? Well, they're just what their name implies — microscopic hollow spheres made of glass or a phenolic plastic material. Because they're hollow, they don't weigh very much, and since their diameters are measured in millionths of an inch, they can be used to thicken epoxy and polyester resins without making them lumpy or grainy. The result is that you can use micro balloons to make a putty that's perfect for fillets and filling dents — it's incredibly strong, yet it's as light as balsa.

When using micro balloons with epoxy glues, measure out the correct proportions of glue first, but don't mix them together! Put each portion in a suitable container and add the same amount of balloons to each part. The higher the balloon content, the lighter the weight — with only a slight loss of strength. The reason for adding balloons to both Part A and Part B of the glue is to make them easier to mix together later, and also to

establish the viscosity of the final mix beforehand. If you use two sealable cans or jars, you can keep the unmixed putty indefinitely — using it as you need it — but the resin/balloon ratio of each part should be as close to identical as possible to allow you to measure out equal parts for proper mixing proportions.

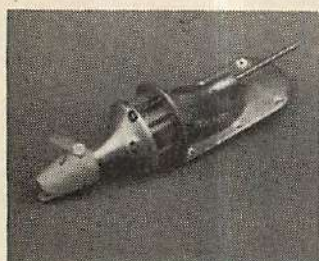
Obviously, you can mix balloons with any of our epoxy glue formulas, but probably the most useful will be Formula 4 for quick-setting patches and dent filling, and Formula 2 for a longer working time when making fillets, setting sailboat keels, and the like.

When you apply the epoxy putty, smooth it as much as possible before it cures. Although it's light, it's quite hard, and not too easy to sand — especially when applied to balsa. When making fillets you can do a nice job of shaping and smoothing by using a finger, dipped in water. After it's cured, a light sanding followed by a couple of coats of Hobbypoxy Filler or Stuff will produce a smooth surface ready for paint.

John E. Poxy

HOBBYPOXY PRODUCTS

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



Send Today for Free
Brochure & Pricing

Mark I MY-T-JET WATER JET PROPULSION for DEEP "V" R/C BOATS

- Complete precision engineered assembly
- Cast aluminum housings with stainless steel hardware
- For engines of .30 to .60 displacement
- Fits most Deep "V" hulls
- Thrust reverser for backing down
- Optional "closed Loop" cooling system for engine.

HILBIG INDUSTRIES, P.O. BOX 245, BONITA, CALIFORNIA 92002

Sal came fourth in .02 Replica, an event won by Jerry Vernon with 9:00 even.

Jim Quinn was second in .02 with 8:27, but he won in Rubber with 15:00 straight. This was a good event, with Wade Wiley posting 13:16; Andy Faykun, 11:25. Ray Berens in fourth place had 10:23. Rudy Calvo and his Valkyrie beat Ken Sykora to take .02 Antique in 8:26. And Wiley put his act together to take AB Cabin quite handily in 14:21.

The top time of the day was posted by Bob Oslan in C Pylon—19:16. This was far and away the best time of the event, too. Chris Christiansen seconded in 11:50. Larry Clark was third with 7:42. And Leon Nadolki and Walt Parker split fourth and fifth with a 5:00 tie.

Quotes and Quips

On the need for growth: "We must grow if we are to maintain our hold on the club flying field. Remember, it is county properly, and the county must use it to the best advantage for the public good. We need to swell our ranks to justify keeping such a large amount of prime land for our exclusive use."—Ed Higgins, *Exhaust Fumes*.

The above ties in with a question we've always had about public golf courses. Here in the Bay State, golfing came in dead last in SCORP report participation figures. (That's Statewide Comprehensive Outdoor Recreation Program, Sam) and believe it or not, model flyers didn't figure in the report at all. (It was way out of focus in other respects, too.) Unless you can get to these bureaucrats in some way, your need for recreation facilities will be ignored—and remember, a lot of this is tied to BOR (Bureau of Outdoor Recreation) funding which is federal. You pay for it.

Hal DeBolt was formally inducted into the Model Aviation Hall of Fame at a February banquet in snowy Syracuse. Following the example of the Dean Martin shows, Hal was "roasted" by his peers on the dais. The event was organized by the Central New York Association. About 150 people from all parts of the country came to "roast" Hal. It couldn't happen to a nicer guy.

Check your lines: Everyone who is charged with inspecting lines at meets reports that flyaways more often than not result from breakage at the point where the tubing is crimped at the eyelet — check it out.

+ Schnellboote GERMAN WWII E-BOAT

Exceptional high speed planing performance and excellent stability. For electric or gas operation with 2 channel R/C. Full size detail plans and instruction booklet. Molded fiberglass hull 43 inches long, birch aircraft plywood deck, aircraft quality spruce and balsa and all necessary metal fittings needed to complete the kit including three individual deck gun kits; single 20mm bow mount, dual 20mm anti-aircraft mount and single 37mm cannon with shield.

IMMEDIATE DELIVERY

ORDER DIRECT FOR \$69.95 complete

Check or M.O. No COD

Send to:

ACCUSCALE

5942 Dovetail Dr., Agoura, Calif. 91301

25¢ for brochure



INDIVIDUAL DECK GUN KITS NOW INCLUDED

AT NO ADDITIONAL CHARGE!

Boats at Toledo

The R/C boating bug is spreading/**Bob Hoeckele**

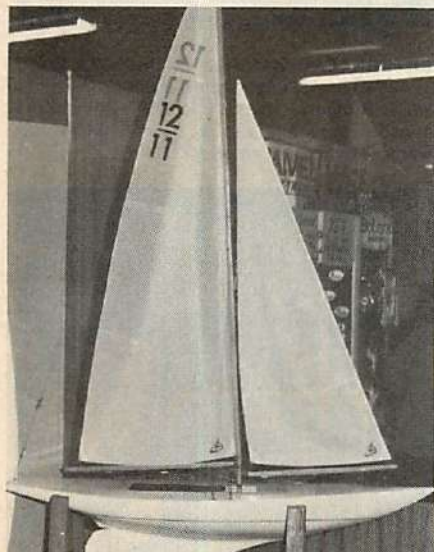
R/C model boating was represented at the 23rd Annual Toledo Exposition better than it has ever been. Every year our boats seem to be not only getting a foothold in the R/C industry, but settling into a very well-deserved place alongside the airplanes. Any model boater who visited Toledo and stuck only to the boating section of the exhibits really did himself an injustice, for there was model boating interest scattered

all through the show. Many airplane-only manufacturers of kits and accessories are slowly starting to branch out into the boating field. Every time this reporter turned around, there was another new boat staring him in the face. It was gratifying. We hope that our photos help to show you what R/C model boating was all about at this year's Toledo Show and urge you not to miss it in '78.

PHOTOGRAPHY: BOB HOECKELE AND JIM BOYD

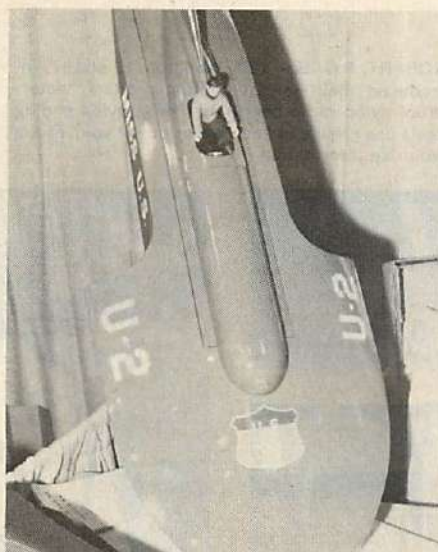


Both IMPBA and NAMBA were well represented at Toledo. Both organizations did a great job disseminating info and interesting people in boats.



CRUMP AND ASSOCIATES, INC., 1301 US 131 South, Petoskey, MI 49770, introduced their East Coast 12 meter yacht for racing. Hull is white fiberglass with brass fitting by Fisher and Carr sails. Suggested retail price is \$199.50.

FLYING MODELS



A&B MANUFACTURING, 2034 South 11 mile Rd., Auburn, MI 48611, introduced their Miss US scale unlimited fiberglass hydro for .60's. A&B says that over 70 different scale hydros can be built from this hull. Price \$124.94.



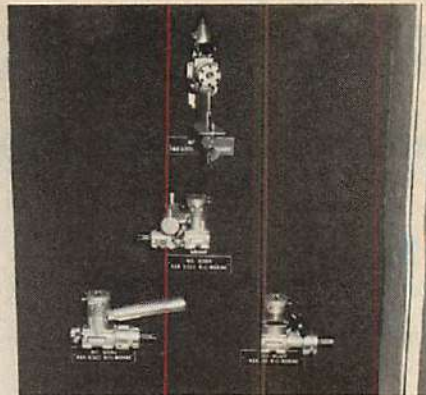
DUMAS PRODUCTS, INC., 790 S. Park Ave., Tucson, AZ 85719, introduced their new East Coast 12 Meter racing yacht. Hull and deck are white fiberglass and all hardware is included. Designed by Buddy Black. Retail price is \$225.



SHAMROCK COMPETITION IMPORTS, P.O. Box 26247, New Orleans, LA 70186, had smilin' Bob Murphy himself showing the new OPS 3.5cc engine. The marine version with tuned pipe retails for \$84.95. All parts are readily available.



DIAL-A-PROP, 840 East 64th St., Indianapolis, IN, had Dee Hughey showing his prop-making process as well as his new prop maintenance kit, for straightening, balancing, repitching and changing blade shapes. Suggested retail is \$36.40.



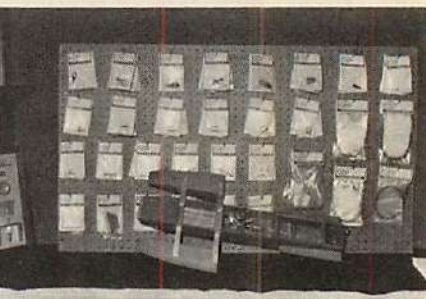
K&B MANUFACTURING, 12152 Woodruff Ave., Downey, CA 90241, was showing their fine line of marine engines featuring their newest 3.5cc out-board that's starting a revolution in R/C model boat racing. It's quick, easy and reliable.



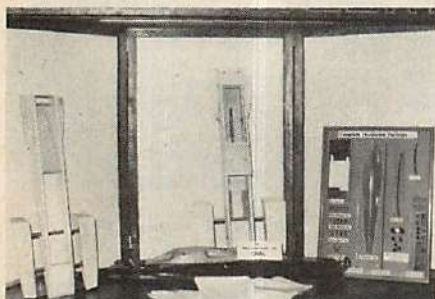
3-D MODELS, P.O. Box 972, Port Huron, MI 48060, had Tom Daniels showing the winning line of Ruff Stuff deep-vee fiberglass hulls as well as his new Hot Shot II, a hydro racing boat that's reported to really move on the water.



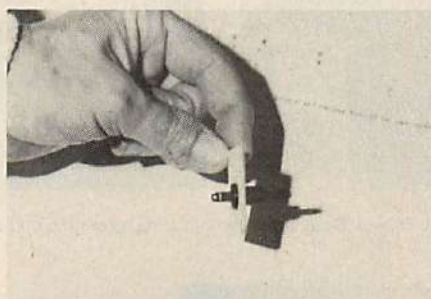
G&M MODELS, P.O. Box 342, Broadview, IL 60153, manufacturer of the Lightning Bolt Monos and Misty and Whirl Wing hydros were there with all their wares. G&M also deals mail order and has everything a model boater could want.



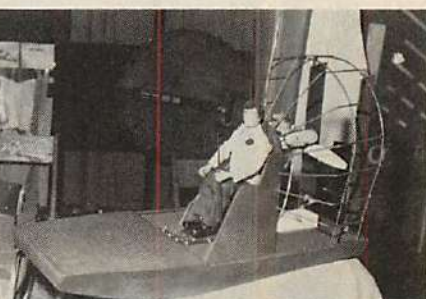
HUGHEY BOATS, P.O. Box 68328, Indianapolis, IN 46268, was there showing the new 20 and 40 Riggers as well as their prop pitch measuring gauge, four hydro sizes, 19, 40, 50, and 60 and their complete line of model boat hardware.



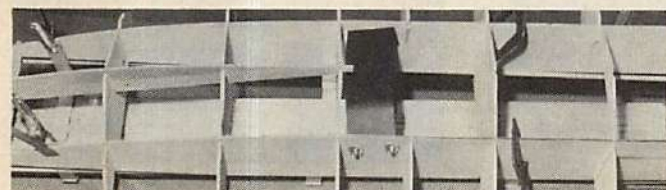
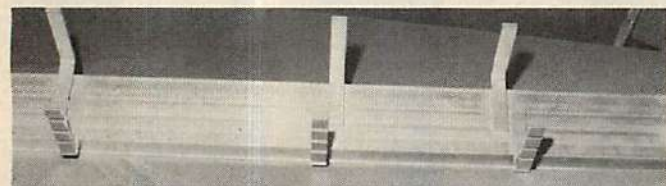
PRECISION BOAT MANUFACTURING, 4120 Richelieu Rd., Indianapolis, IN 46226, had owners Joey Albeanese and Marten Davis showing their record-holding Crapshooter outrigger. Comes in three sizes-with or without complete hardware.



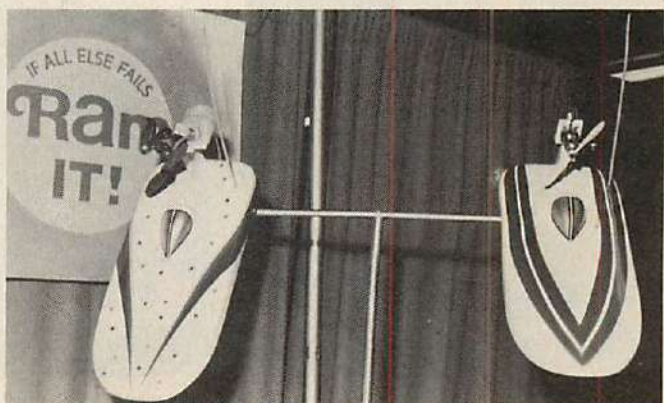
ROBART, P.O. Box 122, Wheaton, IL 60187, introduced their newest boating product, waterproof nylon radio box seals. These nylon sliding seals use grease to keep water out of your radio. No price information.



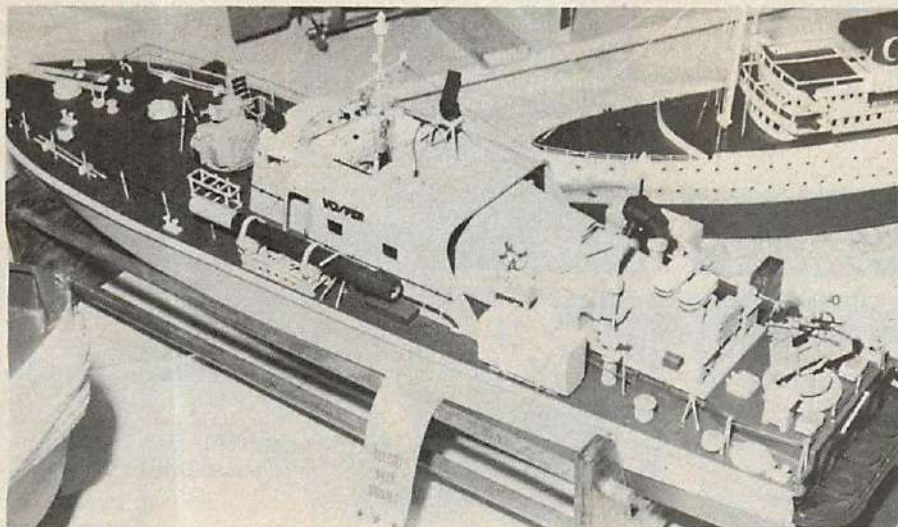
VENTURE AERO-MARINE, P.O. Box 5273, Akron, OH 44313, introduced their newest product, the Swamp Runner. It uses .19 to .35 engines and is 24-inches long and has a 10-inch beam. The Swamp Runner will retail for \$24.95.



OCTURA MODELS, 7351 North Hamlin, Skokie, IL 60076, introduced their new model boat building jig. The jig is aluminum and is shown here with and without a partially completed boat on it. A handy item at \$33.50.



RADIO CONTROLLED MODELS, 3631 N. Kedvale Ave., Chicago, IL 60641, introduced the Quickee 18, an all-molded plastic airboat that assembles in 18 minutes for .049 to .10 engines and two channel radios. Retail \$24.95.



Ralph Newman of New York took first place honors in R/C Scale Boats with this Vosper torpedo boat which is being manufactured in kit form by Staubitz of Buffalo, 48 Freeman St., Buffalo, New York 14215.

Competition Monos

1. James Chromik, Oh.
2. Alvin Bohler, Ill.
3. Ken Bergman, Mich.

Deep-Vee
Grey Ghost
DeFiance

Competition Hydros

1. Martin Casey, Va.
2. Bill Brown, Oh.
3. Lou Torovich, Mich.

Agitator
Atlas Van Lines
Wicked Wanda

R/C Scale Boats

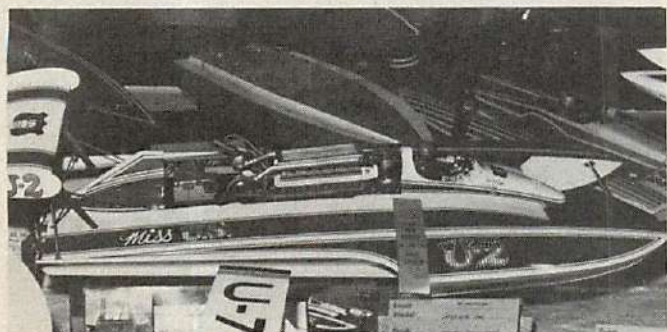
1. Ralph Newman, N.Y.
2. M.G. Lederer, N.J.
3. Bob Cline, Ind.

Vosper
German "E" Boat
Titanic

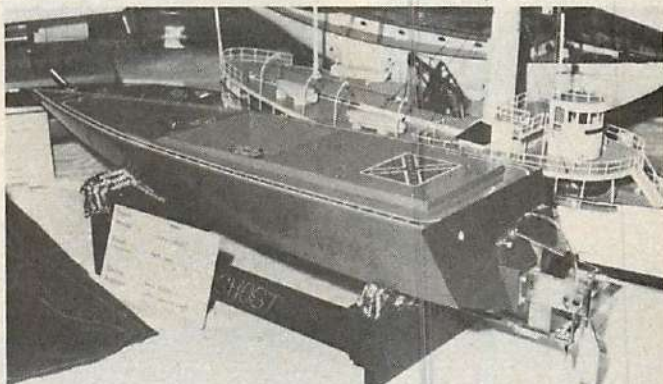
Stand-off Scale Racing Boats

1. Don Boka, Mich.
2. Ron Treichel, Mich.
3. Rick Jacobs, Oh.

Miss U.S. U-Z
Vernors W-64
Miss Budweiser



The Miss U.S. U-Z was built by Don Boka of Michigan (above) and took first place honors in SOS Racing Boats. Alvin Bohler of Illinois won 2nd in Competition Mono with this Grey Ghost Deep Vee built from FM plans.

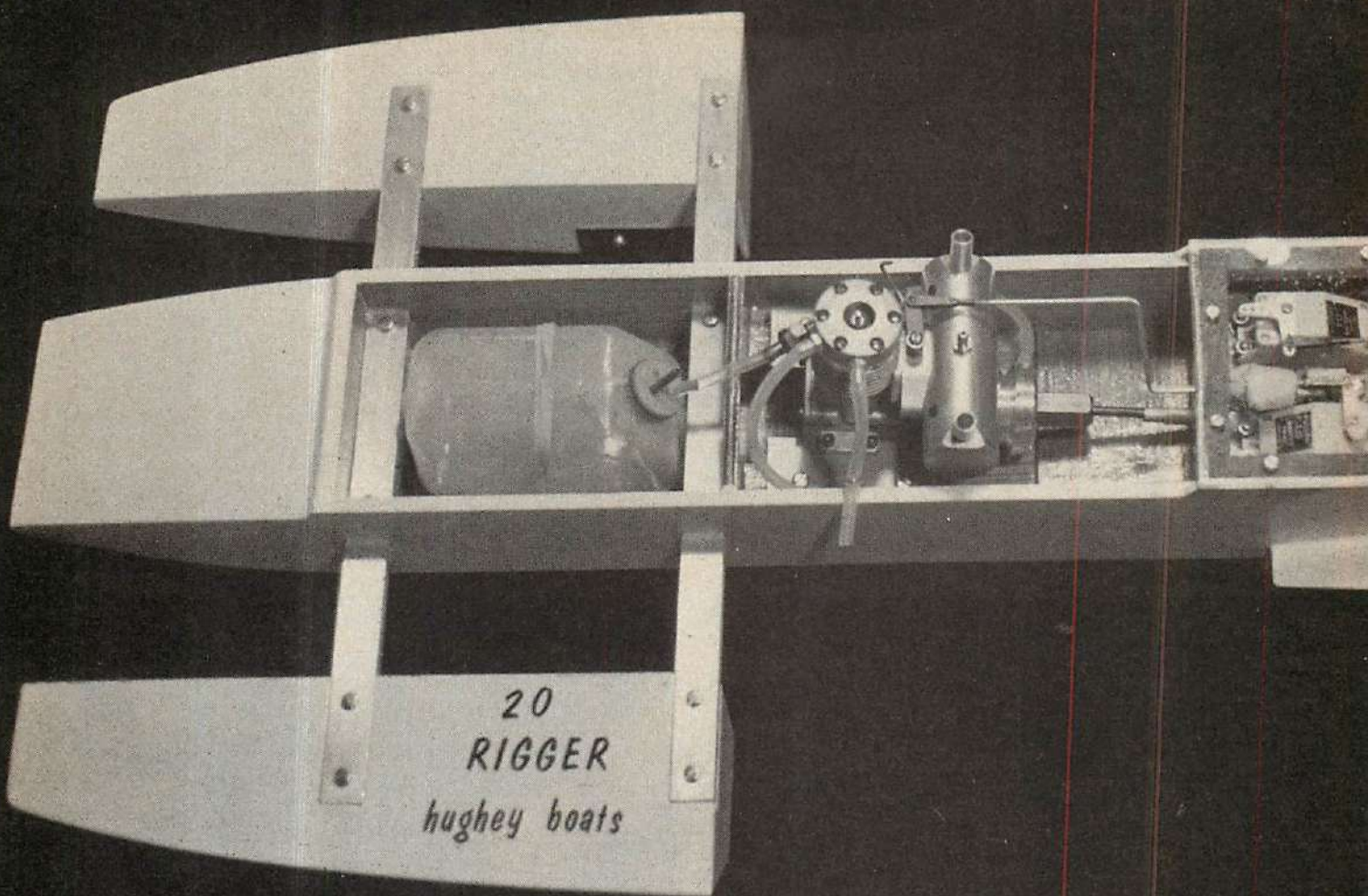


The Vernors W-64 shown above was built by Ron Treichel of Michigan and won second place in Stand Off Scale Racing Boats while Martin Casey of Virginia took first in Competition Hydros with his beautiful Agitator.



The Atlas Van Lines U-71 above was built by Bill Brown of Ohio and took second place in Competition Hydros. Miss Budweiser (right) by Rick Jacobs of Ohio took home third place in Stand Off Scale Racing Boats.





Hughey Boats has produced another winner, the 20 Rigger. This long awaited outrigger and its big brother, the 40 Rigger, are now on the market. Hughey first announced their line of outriggers a little over a year ago and the initial response was enthusiastic, however, Ed Hughey wasn't satisfied with his design. He could have put what he had out as a kit and been successful from a monetary standpoint. But Ed is a patient fellow who believes that a kit should reflect the best efforts of the manufacturer and from that standpoint he wasn't ready to kit the original prototypes.

Throughout the Bicentennial summer Ed worked methodically and meticulously with his designs trying different angles of attack, checking sponson location, hull and sponson relationship—any aspect that could influence the performance of the boat was evaluated. It seems almost incidental that part of the 20 Rigger development included bringing home hardware from the '76 IMPBA Nationals and setting a 1/8th mile straightaway record at 59+ m.p.h. The final version of the 20 Rigger upped the straightaway record to 61.15 m.p.h. and turned the 1/3 mile oval course at the record speed of 35.21 m.p.h. Power for Ed's record runs was supplied by a smooth K&B 3.5 fitted with a large bore K&B carburetor. The 40 Rigger

hasn't broken any records yet, but the prototype with K&B 6.5 has been over 74 m.p.h., and it won the '76 IMPBA Nationals straightaway.

The 20 Rigger kit is typical of what we have come to expect from Hughey Boats, urethane foam castings and precision cut mahogany plywood and hardwood. According to Ed, the 20 Rigger kit is accurate to within at least 1/32" of the record setting prototype. As with other Hughey boats, the kit incorporates the necessary hardware including the Hughey stainless steel prop and flex drive shaft. The 20 Rigger also comes with a stainless steel rudder assembly. The overall quality of the kit is excellent, one of the best I've ever built.

Plans and instructions for the 20 Rigger are more than adequate. There is a full size 3-view page and this sheet is handy for exact measurement and placement of the various bulk heads. The isometric drawing is useful for general perceptions and numbered part locations.

Construction of the 20 Rigger was one of the most pleasant experiences I've had while writing for FLYING MODELS. The construction notes say to build the boat by assembling the parts in numerical order. In other words, start construction with part number one and proceed. Careful assembly of the first few parts is

critical for a successful boat. Make sure that the tank and engine compartment doublers are placed in exactly the right location and leave room at the bottom for the 1/8" plywood floor. Also, don't make the mistake of building two right sides of the hull. The sides should be mirror images of each other.

A flat and true center hull is essential. The only way I've found to accurately build one is to use a jig. I made mine out of 1"x6"x30" quality pine with lengthwise 1" square risers spaced 4" apart. A few nails driven into the sides to hold the rubber bands finished the jig. Epoxy was applied to the tank and engine compartment bulkheads and the bulkheads butted into the hull sides. The loose assembly was then set into the jig and strapped into place. Use a scrap piece of 1/8" plywood to check the bulkhead bottom clearance and true-up the unit with a small square. Once the epoxy has cured, the rest of the center hull literally falls into place using the numbered sequence. I added a 1/16" plywood hatch over the opening between the radio compartment and the stern.

The foam outrigger sponsons need to be fitted with hardwood mounting plates. Indentations in the casting indicate the approximate locations for the cutouts. The surface skin is tough but will yield

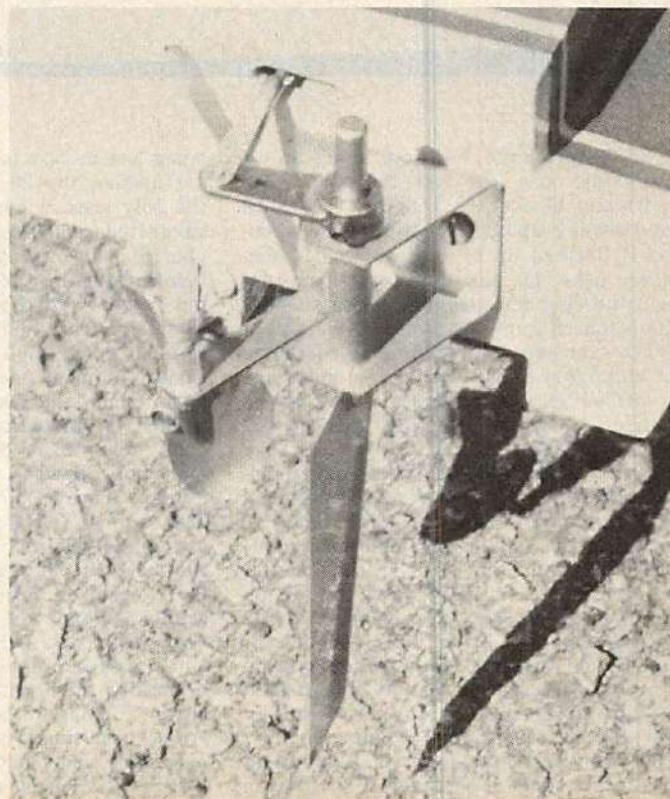
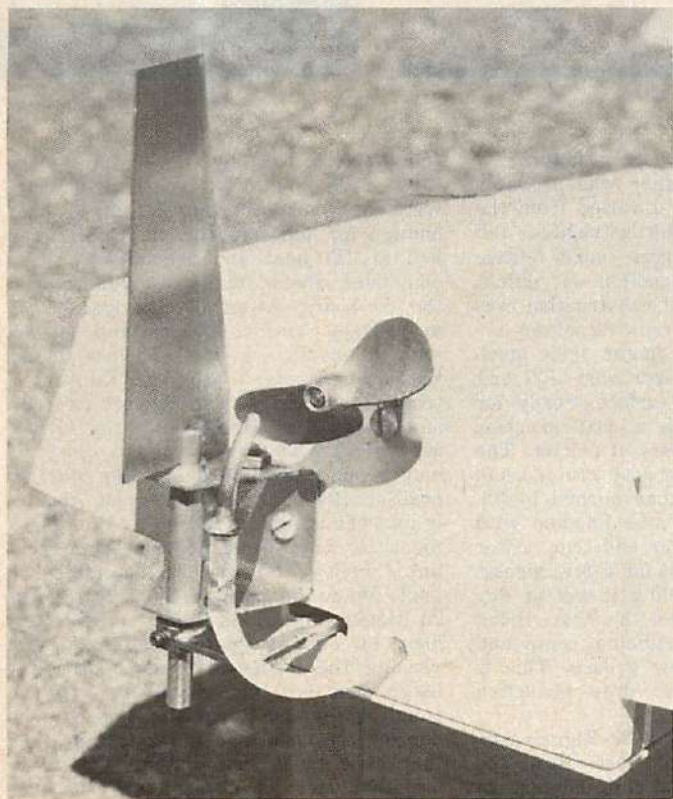
A DRY DOCK REVIEW:

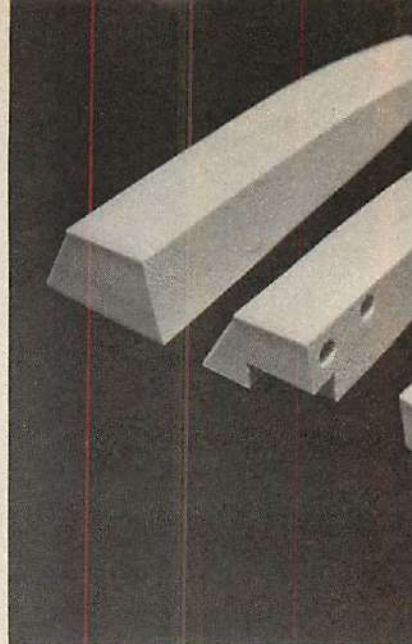
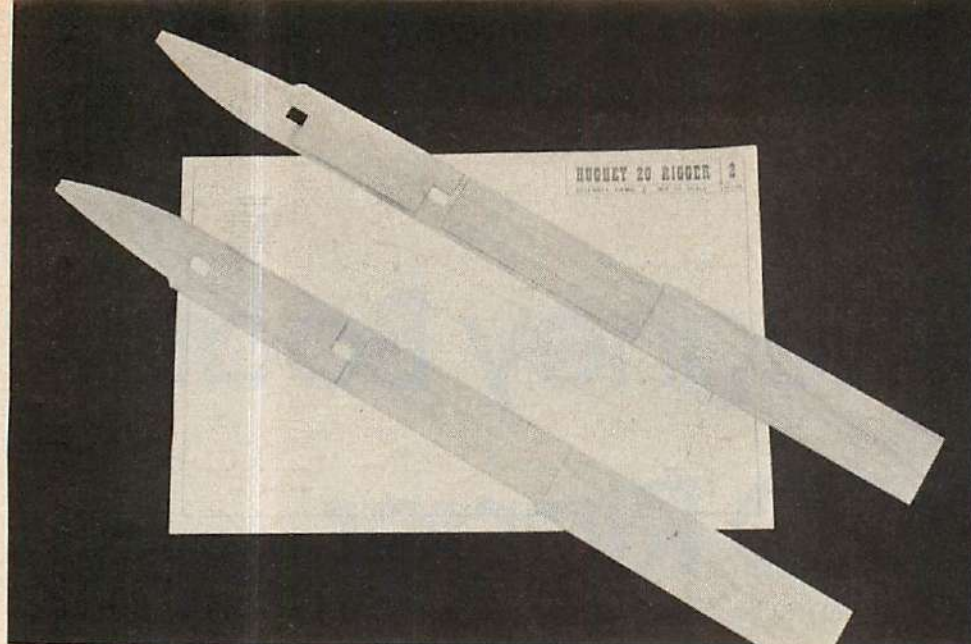
Hughey Boats' 20 Rigger

Ed Hughey seems to have a magic touch with Hydros as evidenced by this latest offering for 20's/**Bob Staat**

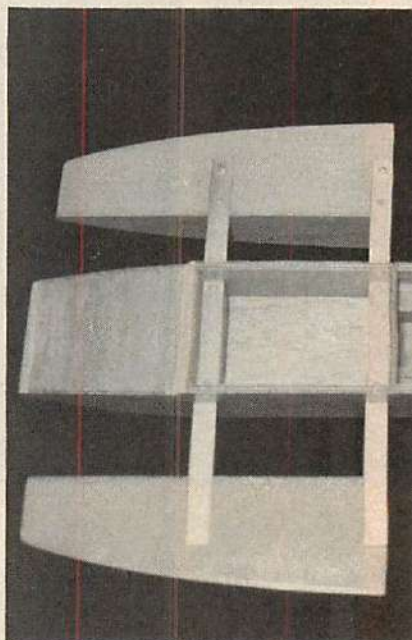
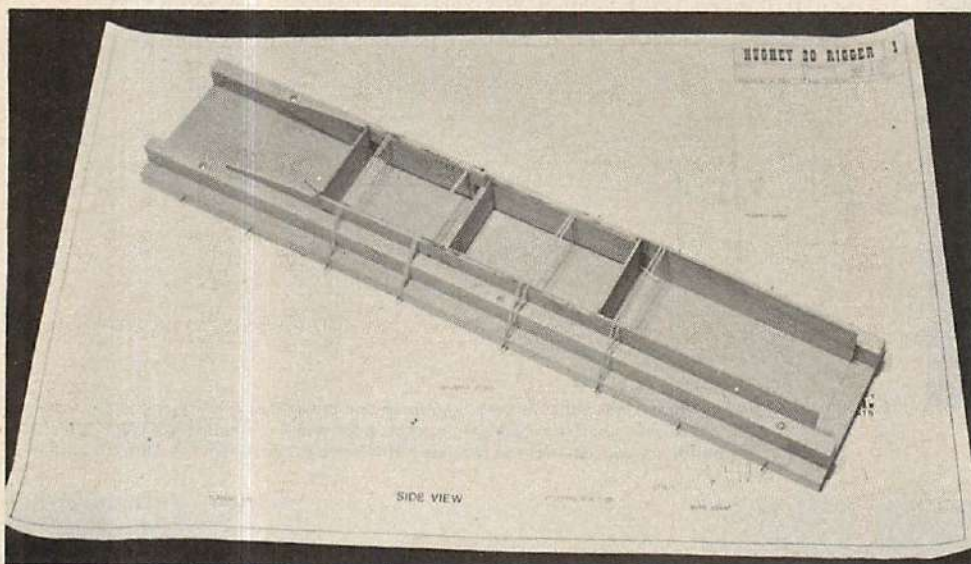
The Hughey 20 Rigger (above left) shows a very functional and clean layout. Very important for a racing boat. All the hardware that you'll need to complete this boat short of engine and radio is included in the 20 Rigger kit. Below are two views of the Hughey hardware on the transom. A simple installation.

PHOTOGRAPHY: BOB STAAT





Accurate assembly of the two opposite fuselage sides (above and below) is a must for a predictable boat. A jig makes alignment almost goof proof. This shot (above right) shows the Hughey 20 and 40 Rigger sponsons with the 20's prepared for the support blocks. The boat (below right) is sanded and ready to finish.



to an X-Acto knife, however, don't be too ambitious once through the skin. The mahogany blocks are held in place with slow setting epoxy. The right side sponson is finished up by boring two $\frac{1}{2}$ " diameter holes for the dowel sections that hold the skid fin anchor screws. The left side sponson gets one ounce of weight.

The sponsons are mounted to rectangular aluminum extrusions. Screw holes are predrilled at the factory and are asymmetric in location. The left sponson extends out from the hull $\frac{1}{4}$ " farther than the right side. It is also necessary to incorporate $\frac{1}{32}$ - $\frac{1}{16}$ " toe-in for each sponson. Use a straight edge along the flat side section of the hull as your reference point.

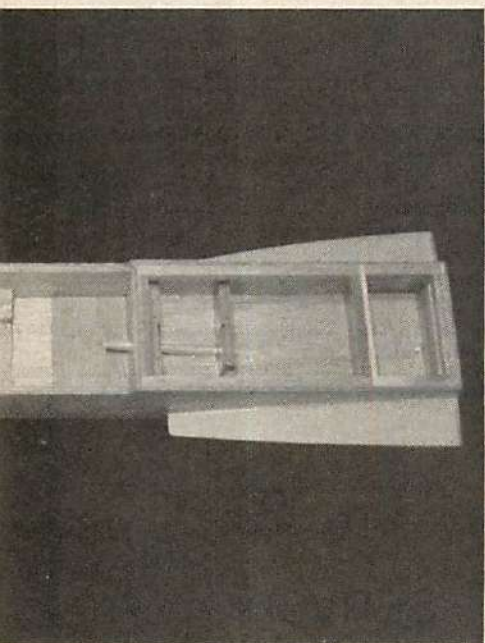
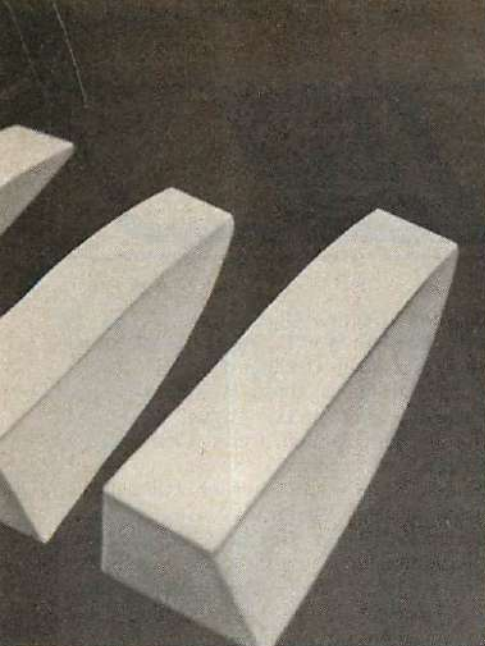
Installation of the hardware is straightforward and covered in detail in the instruction sheet. One improvement in the typical Hughey drive train should be noted. The threads on the Hughey prop are now recessed so that an unthreaded portion of the stub shaft is covered by the prop resulting in a stronger assembly. Also, a tubing retainer on the upper end of the flex shaft might keep a shaft from

being lost in case of set screw failure.

Finishing the 20 Rigger was probably the only area in which I varied from the suggested sequence. The instructions tell you to clean off any excess mold release before starting construction. I didn't, but rather waited until construction was complete. This made removal of an occasional epoxy blob or finger print much easier. A quick once over with 400 grit paper made the foam surfaces ready for primer. I started with a coat of clear epoxy followed by 3 coats of primer. The mahogany plywood is coarse grained and it takes more primer than normal to fill. The sanded 20 Rigger was finished with a couple of coats of color and trim. After the epoxy finish has set for a few weeks, find some well worn 600 grit wet or dry sandpaper and wet sand the boat. Bring the gloss back with rubbing compound and an excess of elbow grease. This is especially important for drag reduction on the running surfaces.

The first time I saw a 20 Rigger running was last summer just after the IMPBA Nationals at a club contest in

Indianapolis. The day was breezy at the "Just Add Water" Marina and there were only a dozen or so entries, not enough for separate classes. Ed Hughey had his 20 boat and registered a mild complaint about having to run against the 60 boats. After all, the water was near Deep Vee conditions and we all know about little hydros and how touchy they are—er—don't we? Well, Ed ran the second heat and was up against two 60's and one 40 boat. He launched the 20 Rigger with an easy throw and worked his way around the buoys into the starting position. His K&B 3.5 was running smoothly but was easily out voiced by the bigger pipes. As they came across the starting line I believe Ed was in the number 3 spot. When he popped the throttle, the 20 Rigger jumped up higher on the step, blew by one of the 60 boats and was chasing the leader. Two laps later, the bigger lead boat got tangled up with the rough water and Ed coasted home a winner for that heat. So much for the idea that little boats are difficult to run in less than ideal conditions. Not only was



the 20 Rigger fast, it finished in conditions that stopped many of the much bigger boats.

My 20 Rigger exhibits the same stable characteristics of the prototype. Although it does require a thrown launch, the boat is forgiving. A little right rudder helps to hold the boat on course until the surface prop takes a full bite of water. Once under way, a straight rudder means straight running. I've found the boat to be very responsive in the turns and has excellent straightaway acceleration using a prop with around 3" of pitch. Ed suggests a prop in the area of 3.4" pitch for top-end straightaway time trials.

In concluding this Dry Dock Review, I feel that the new line of Hughey Riggers (both 20 and 40) are some of the best kits on the market, superior in a number of aspects to Eds already acclaimed, traditional hydros. The 20 Rigger is a no frills, fast and functional boat. When my K&B 3.5 is a little looser, I'll take my kit 20 Rigger up to Indianapolis to see if I can't close in on the two class records currently held by Ed Hughey's prototype.

Two New Winners from **STEVE MUCK'S**



LIL LIGHTNING

- All new tunnel outboard hull
- Designed by George Campbell
- Uses the K&B 3.5cc outboard engine
- 30 inches long; 12 inch beam
- Scaled from a current outboard 16-foot racing hull
- All plywood pre-cut kit
- Includes radio box lid & screws

SEND SASE FOR PRICES & CATALOGS:
6003 Daven Oaks Dr., Dallas, TX 75248
Phone (214) 661-1572

R/C Model Boats



BUSHWHACKER 20

- 30 inch outrigger type hydroplane
- Designed by Frank Farm III & Marshall Mizobe of Hawaii
- All plywood pre-cut kit
- Uses any 3.5cc engine
- Includes all running hardware, prop, cable, strut, turn fin, engine mount, rudder, bracket

STAINLESS STEEL DRIVE SHAFTS 17-4PH HEAT TREATED

Special Hardcoat will wear many times longer

If your dealer can't supply
order direct, send check or M.O.

LENGTH REG. HARDCOAT

3/16"x24"	\$4.80	\$5.90
3/16"x16"	3.70	4.80

MR.G's

Products & Supply PO Box 161
Marysville, Mich. 48040

**Dealer and Distributer
inquiries invited**



- ALL HARD WOODS—NO BALSA PARTS, NO PLASTIC
- PRE-CARVED SOLID WOOD HULL
- PRE-CUT PARTS, NO CUTTING NEEDED (except the pre-formed keel which needs only to be trimmed)
- KIT COMPLETE WITH WOOD SAILS, RIGGING THREAD, AND FITTINGS
- PARTS GUARANTEE: S.M.E. HAS A PARTS GUARANTEE UNEQUALLED. WE STAND BEHIND OUR KITS 100%!
- KIT INCLUDES THREE LARGE DRAWINGS OF ASSEMBLY PLANS
- PACKAGED IN COLORFUL STRONG BOXES
- ORDERS SHIPPED VIA UPS WITHIN 24 HRS OF RECEIPT
- TO COMPLETE THIS HANDSOME MODEL, SIMPLY SAND THE PARTS LIGHTLY, STAIN ALL PARTS IN YOUR CHOICE OF COLORS, THEN ASSEMBLE

THREE MAST CHINESE JUNK

Kit No. GC 503 Length 27"

Complete kit, \$62.00 ppd

Dealer inquiries welcome

Ship Model Emporium, 15260 Linden Ave. No., Seattle, Wash. 98133

Enclosed is my cash, check, or money order for \$62.00. Please send Kit No. GC 503 (Three Mast Chinese Junk) to:

(Name) _____

(Street Address) _____

(City) _____

(State) _____

(Zip) _____

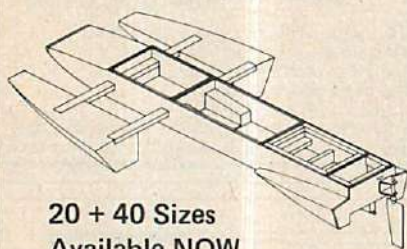
HUGHEY RIGGERS

ANOTHER GREAT SERIES

★ 20 BREAKS ALL RECORDS ★

Straightaway 61.14 MPH avg

1/3 MI Oval 34.08 sec



20 + 40 Sizes
Available NOW

- *New surface drive hardware
- *Hollow aluminum extrusions
- *Adjustable molded sponsons
- *Precision sawed wood



P. O. Box 68328
Indpls., IN 46268
(317) 299-3303
291-1101

CATALOG 50 cents

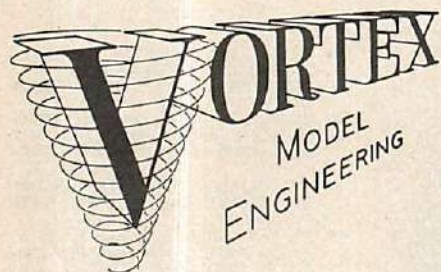
Letter Rip!

When one thinks of sailing he thinks of sunny California and Florida since that is where the water is—right? Wrong! The Midwest, Illinois, Indiana, Ohio and Kentucky, will be "the" place for R/C sailing in 1977. From April through October there will be eleven regattas including 2 divisional championships and 3 national championships.

In addition to these 5 big name events the Midwest clubs have organized a Midwest Racing Series (MRS) for the purpose of encouraging new skippers to try their hand at competitive racing. The regattas will be 2 day events with the 50/800 class racing Saturday and the 36/600 class racing Sunday. Emphasis will be placed on helping the new skippers learn the rules and proper sail trim. Trophies will be awarded to first, second and third finishers in each class. In addition, ribbons will be awarded for first, second and third in each heat race. This will encourage the beginner who can't place high enough to win a trophy to come back and try again. Awards will also be given for first through fifth place to series winners in each class at the end of the year. There will be 4 MRS regattas in 1977. Indianapolis, Indiana April 30, May 1;

Bowling Green, Ohio, June 25 & 26; DuPage County, Ill., July 16 & 17; Louisville, Kentucky October 1 & 2.

The Midwest Race Week will begin Saturday and Sunday August 13, 14 with the 36/600 Annual Class Championship Regatta sponsored by the DuPage County Model Yacht Club. Action will continue Tuesday and Wednesday August 16, 17 with the Santa Barbara Annual Class Championship Regatta sponsored by the Chicago R/C Model Yacht Club. Thursday, August 18, will be a travel day to Indianapolis for a continuation of the activities. Friday, August 19, will be set aside for practice and technical inspection for the 50/800 Annual Class Championship Regatta on Saturday and Sunday August 20 and 21. The Indy Model Yacht Club, in addition to sponsoring the regatta, will host the annual American Model Yachting Association meeting on the evening of August 20th. The Chicago area skippers will be providing transportation from Chicago to Indy for the fly-in skippers. For further information on any of the midwest sailing events send a self-addressed stamped envelope to Ted Brindle, 8338 East 36th Street, Indianapolis, Indiana, 46226—Ted Brindle.



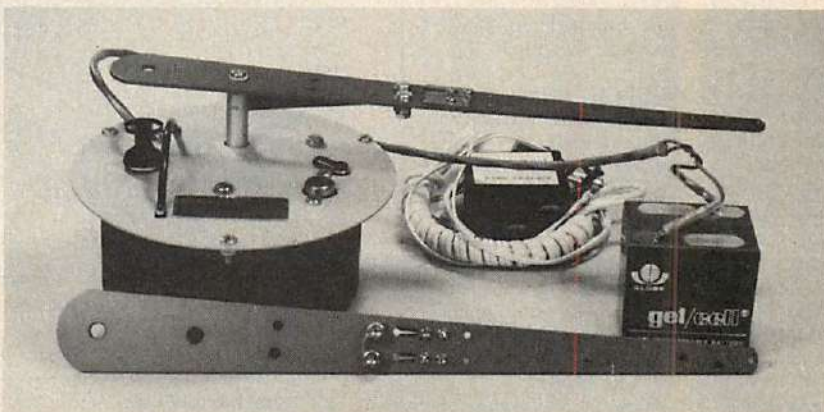
SC-3

6 volt
SAIL
SERVOMOTOR

- Heavy-duty 5-stage Delrin® geartrain
- 90 lb-in stall torque
- 8½ or 10 inch swing radius
- 4 second travel time, 158°
- Weight 17 oz
- Corrosion-resistant materials
- Sealed case
- Built-in charging voltage regulator

\$ 75.50

With 1 amp-hr gel/cell® battery and charger, \$95.00. Shipped postpaid.



Mail order only, California residents add sales tax. No dealers or distributors. For illustrated brochures describing all of our model yacht products, send \$1.00.

Vortex Model Engineering
Department FM
210 East Ortega Street
Santa Barbara, CA 93101

IMPBA Internats Preview

Come on down to the Land of plenty! The music is great, the food sublime, the sights are fantastic, the folks the friendliest, and the boating is going to be the best yet.

The most exciting, competitive, hobby-sport: for spectators or contestants. All the thrills, spills, crashes, ingenuity and craftsmanship of fullscale boat racing.

The Southern Gentlemen Racing Association are your hosts for the 1977 IMPBA Internats. If you have attended one of our Invitationals you already know what New Orleans and your fellow boaters have in store for you. If you haven't been down here before, come see what you have been missing.

Our lake is just 45 minutes out of New Orleans with a KOA campground across the street and motel accommodations just 2 blocks away. The Straightaway course is set on a 2500 foot section and is separate from the Oval course. The Oval course is within a 1200 foot straight section and is at least 300 feet wide.

The Internats will be held August 8 thru August 13. The schedule is as follows: Monday-August 8: Scale Hydro and Record Trials, as time permits; Tuesday-August 9: 1/6 Trophy Trials and Record Trials, as time permits; Wednesday-August 10: Oval Trophy Trials and Record Trials, as time permits; and for added Lagniappe—THREE DAYS OF HEAT RACING (Thursday, Friday & Saturday-August 11, 12 & 13).

The festivities will conclude Saturday night with a BBQ Party-Banquet at Mashburn's Restaurant, a 19th century style Dutch Colonial Farmhouse.

SOOOOOOOOOO, keep in mind the week of August 8 thru 13 and YA'LL COME—Sherry Matthew, Southern Gentlemen Racing Association.

NAMBA and IMPBA

I would like to know how I can obtain copies of the NAMBA and IMPBA rule books. I am planning to race next season with some of my own boat designs and want to know if they are legal.

Randy Cook
R.F.D. 4 Box 397A
Gilford, NH 03246

Look on page 69 of this issue and you'll find an advertisement that gives the addresses of NAMBA, IMPBA and AMYA. The folks who receive your note will be

glad to send you complete membership information—Ed.

Coke Special

In the July issue of FLYING MODELS there was an article by Bob Hoeckle entitled Race at Stone Mountain in the R/C Model Boating section. I am interested in the deep vee pictured called the Coke Special built by Dave Field. I was wondering if you could get the plans or any other information on this boat for me. Thank you.

Mike Heller
20 Blue Hills Dr.
Holmdale, NJ 07733

Dave's boat, the Coke Special, is a stock Dumas Deep Vee 60 CF fiberglass boat available at your hobbyshop or direct from Dumas. Check their ad on the inside front cover of this magazine for the address—Ed.

Thanks for the help

Thank you very much for putting my letter asking about plans for a stern-wheeler in the Letter Rip! column of R/C Model Boating. Because of it, I got letters from fellows all over the country, one from England and even a long distance call from people wanting to give me some assistance. It was really a great feeling. Thanks again for the help and keep up the good work on your great magazine.

K.E. Alexander
6 Kanawha Ave.
Nitro, West Virginia 25143

R/C Sub

I've just received my February issue of FLYING MODELS and when I saw the article by Bill Jung on his Nautilus sub I just about flipped. I've had the desire to build an R/C sub but never had the nerve before. Now I'm charged up to go. My question is, is his scratch built or from a kit? Are plans available?

James L. Penrod
HQ, USAREUR; DCSLOG-MM
APO New York 09403

No plans are available at the present time Jim. Bill's Nautilus was totally scratch-built to test his ideas for control and sealing—Ed.

Product Notes

PEERLESS/KYOSHO, 3919 M Street, Philadelphia, PA 19124, announces the release of another new R/C kit, the Sydney

FRANK WARD PRESENTS



"FORMULA VEE" .40-.60

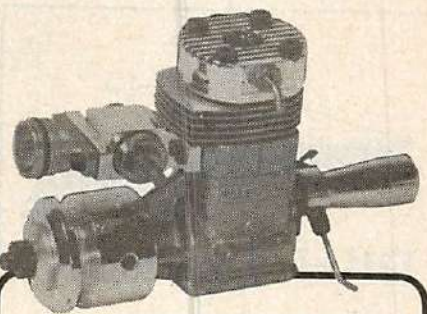
*1st. South African World Championships
*NAMBA Record Holder one way over 50 MPH
*A Winner For You!!! *Super Handling

*Kit Includes—Hand Laminated Fiberglass Hull & Deck, Motor Rails installed "Picture Plans," Complete building & running instructions. Transom support installed.

*Complete Hardware Kit—Heat treated flex cable drive—stainless rudder, strut & ride plates—Stainless steel turn fin, nuts & bolts—needle bearing rudder & strut.

WARD CRAFT MARINE

P.O. BOX 2579, Lynwood, Wash. 98036
Phone 1/206/775-3969



EXHAUST THROTTLES

COLLECTIVE VENTURAS

AIR/WATER COOLED HEADS

PRECISION FLYWEELS

"DRAW" CARBURETORS

5201 COLFAX PLACE, OKLA. CITY, OKLA. 73112

405-946-1709

DEALERS
ENQUIRIES
INVITED



NORCO EAGLET CONTEST PROVEN



LENGTH 25-1/2" WIDTH 14"

This boat was designed for competitive racing, but is also suitable for the beginner. The K-B 3.5 engine is recommended but other engines of similar size can also be used. Plans show construction details and location of engine, radio and outdrive unit. Kit comes complete with all wood parts hand cut and sanded from top quality plywood.

Price \$38.95

Send 30¢ in stamps for literature to:

NORCO
Marinecraft
Established Since 1955

13556 Chase St., Arleta, Ca. 91331



NEW!

42 in. almost scale offshore racer for 40 or 60 engines

L.O.A. 42 in.

Beam 12 in.

weight 4 lbs.

ONLY \$85.00



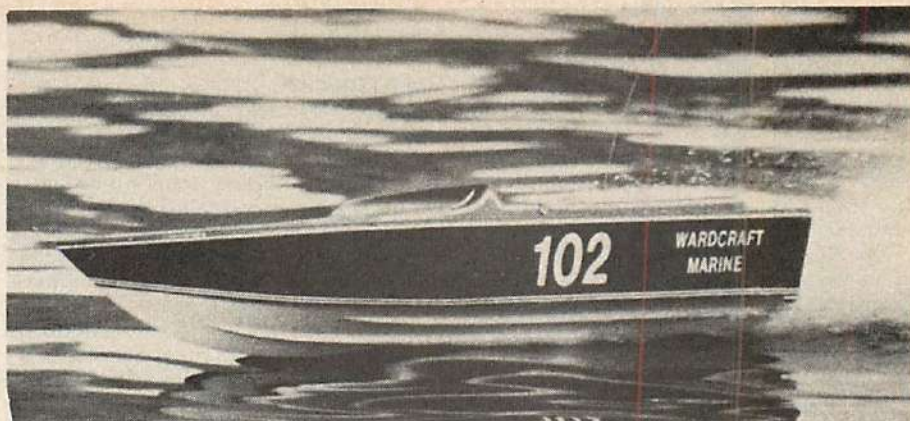
BOX 452 / ANZA, CALIFORNIA 92306

A WHOLE NEW WAY TO FLY!

Inches off of the ground or water....
on a cushion of air!



R/C HOVERCRAFT KITS
by Venture Aero-Marine
Box 5273, Akron, Ohio
44313



Wardcraft Marine's Formula V

R/C Sailing Yacht. Everything necessary to build the model is in the kit; pre-finished ABS vacuum formed plastic hull, cabin and hatch with a minimum of trimming, precision die-cut plywood parts including a printed deck, factory finished sailcloth sails, mast, pre-formed and drilled keel weight, and 70 precision metal fittings. There are instructions and full-size step-by-step plans. Length of the model is 32 inches and the sail area totals 406 sq. inches. The suggested retail price is \$79.95.

WARDCRAFT MARINE, P.O. Box 2579, Lynnwood, WA 98036, now has available the record holding "Formula V" 39 inch deep vee hull. This boat is the current N.A.M.B.A. record holder in the .40 Vee Class with a speed of 48.6 mph two way average and a one way pass of 50 mph. The design was recently used by Ed Fisher of Seattle to win the World's Championship Enduro in .40 Class and place second in .60 Class. Ed traveled to Johannesburg, South Africa in September to compete in this world class competition.

Designed by Frank Ward, whose previous model design credits include the DragN' Fli hydroplane, the "Formula V" was developed over a two year period of time. The boat is styled after the Thunderbird Formula Deep Vee offshore racer. The boat has a 16½ degree vee at the transom and carries a beam of 12 inches. The running weight of Frank's record holding boat is 8½ pounds.

The kit features hand laid up fiberglass hull and deck parts with the motor mount stringers and transom plate glass-

ed in the hull. The motor mounts are predrilled to accept the Marine Specialties Quick Change Multi Mount. The hull and deck parts are separate to facilitate the installation of the running gear, fuel system and radio system. It is not necessary to have worked previously with fiberglass to affix the hull and deck parts. A full set of instruction featuring over 20 photos to show installations and construction techniques is included with the hull.

Wardcraft Marine is also offering a hardware kit custom designed for the "Formula V." This hardware package features stainless steel strut and rudder bracket, stainless steel rudder, flex drive prop shaft and ride plates. Needle bearings are used in the strut and also the rudder.

For the model boater interested in building a scale appearing deep vee, an optional cockpit cowl with provisions for three drivers is available. Two large engine scoops are part of this scale option.

The "Formula V" is priced at \$79.95, the scale cockpit cowl is \$9.95 and the hardware package is \$49.95. 10% should be added for shipping. At this time, the kit is available only in white gel coat. This provides the builder with an excellent base on which to apply a paint scheme of one's own choice.

IMPBA Roostertail

Winter is gone and the racing season is here. The Toledo R/C Show was the great success it has always been. The IMPBA is especially grateful to Howie Whitaker and Bill LeFeber for the work they put



RKH Products

**R/C Model Boats,
Hardware, Radios,
Engines, Custom
Made Boats**

SPECIALS EACH MONTH

MAIL ORDER & WHOLESALE
ONLY.

WE CAN HELP YOU PARTNER.
Y'ALL GET ON OUR MAILING
LIST. CATALOG \$1.00
SEND SASE FOR MONTHLY
SPECIALS.

RKH Products

**RIP HOLDRIDGE
3019 ORADELL LN.
P.O. BOX 20292
DALLAS, TX 75220
(214) 350-7335**

QUICKEE 18 COMPARE QUALITY & PERFORMANCE

All Molded Plastic
Only 5 Structural Parts
Assembles in 18 Minutes
No Painting Necessary
All Linkage Hardware Included
Step by Step Photo Instructions

Virtually Unsinkable
Tunnel Hull for Speed & Stability
Uses any 2 Channel Radio
Simple Air Prop Drive
No Expensive Marine Hardware
Perfect For Quickee 18 Sport Racing



A.R.F.
(Almost Ready to Float)
For 049-10 Aircraft Engines
Length 18 Inches

\$24.95

Ram DIO CONTROLLED
MODELS

3631 N. KEDVALE AVE., CHICAGO, IL 60641

Dealer and Distributor Inquiries Invited



**Vortex Model Engineering
Department FM
210 East Ortega Street
Santa Barbara, CA 93101**

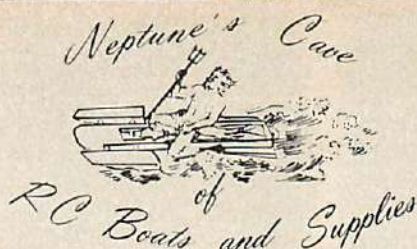
Partial List of Stock Items:

Octura, Marine Specialties, Dumas, Futaba, Sonic-Tronics, Hughey Boats, "Dial-A-Prop", Crapshooter Boats, 3-D Models, Arrow Marine, OPS Engines & Parts, K & B Engines & Parts, Exhaust Throttles, Custom Hardware, and many, many more. We build ready to run boats.

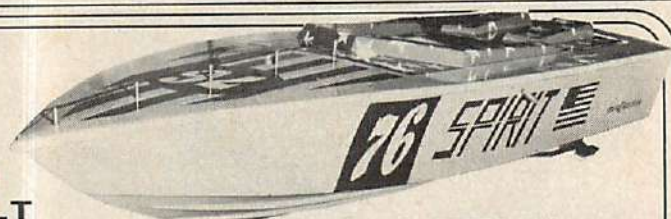
We are mail order, boats only, and if we can be of any assistance to you in your boating needs, call or write us. Send \$1.00 for catalog.

NEPTUNE'S CAVE
P.O. BOX 26201
INDIANAPOLIS, IN 46226

Phone answered 7 days
Joey or Lacey Albeanese
317/898-3223



EKIM
CUSTOM
BUILT



BOATS CIGARETTE 39"

**PRE-ASSEMBLED IN ALL COLORS
PLUS METAL FLAKE & RALLY STRIPES**



MONOS: 4 sizes Sidewinder, 3 Pointless, Marquette 19
HYDROS: 4 Hulls/3 sizes, plus Ding Bat, Out Rigger
VEE BOTTOMS: 4 sizes of Cigarette, 5 other Hulls



SEND SASE FOR DETAILS

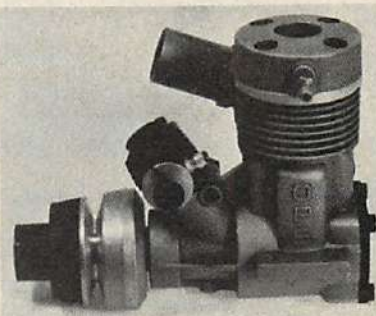
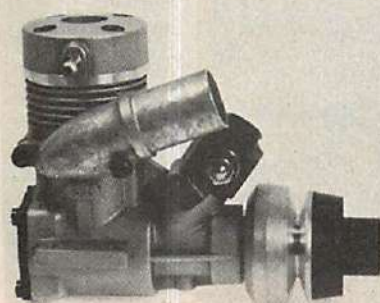
EKIM • P.O. BOX 144, PALMETTO, FLORIDA 33561 • 813-722-4005

AVAILABLE NOW!
ops 3.5

AT YOUR LOCAL HOBBY SHOP

Bore - 16.6 mm., Stroke - 16 mm., Displacement - 3.46 cc.

- MARINE - With Flywheel, Universal, Exhaust Adaptor, Water cooled Head, RC Carb., and Tuned Pipe.
- RC CAR - Heat Sink Head, and RC Carb.
- RC AERO - RC Carb.



ALL OPS ENGINES ARE DESIGNED FOR COMPETITION PERFORMANCE AND INCORPORATES SCHNUERLE PORTING AND ABC PISTON & SLEEVE.

ASK FOR IT AT YOUR LOCAL HOBBY SHOP!

Shamrock Competition Imports

P. O. BOX 26247 • NEW ORLEANS, LA. 70186 • (504) 242-5967

into designing and building the new IMPBA booth. Thanks is also in order to Ron Witt (District I Director) for the fine job he did in constructing a new set of shipping containers for IMPBA equipment. One of the big hits at the show was the 16mm film of the 1976 Gold Cup Race at Detroit. Spectacular is the only word for it. John Bridge procured the film for the IMPBA and it is available for IMPBA club use. Consult the IMPBA 1st quarterly report for more information on obtaining the film for your club.

Congratulations are in order to all those who won the static display competition at Toledo. Special recognition is in order to Don Boka for his most impressive model of the unlimited hydroplane "U-2 Miss U.S."

Pat and Charlie Pottol of Marine Specialties fame sponsored a booth at the Toledo Show which included a model boater's "Pit Stop." They greeted us each morning with a hot cup of coffee and goodies to get us going. The next time you see them, say thanks for all the great things they have done for model boaters. Better yet drop them a line.

In mid-March I had the opportunity to race with the NAMBA people in Fresno, California. As I had always suspected, there is absolutely no difference between model boaters in this country no matter where you go. In practice on Friday morning, I took Joe Albeanese's Super .60 Crapshooter with one of Martin Davis' OPS 60's and proceeded to blow the engine. After my mishap, Gary Delana, the contest director and his partner Bob Cook lent me an OPS .60 out of their racing stable. It's funny that I mentioned things like this occurring in last month's article. Thanks a lot guys for the great time I had. I enjoyed meeting the West Coast crew and hope that we can pit together

PEERLESS
KYOSHO

**MARINE
DRIVE ACCESSORIES**

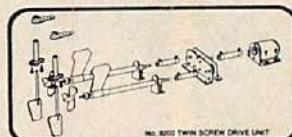
HERE AT LAST...

A line of top quality electric marine drive accessories at unbelievable low prices... and the star feature is a special 12 volt D.C. Mabuchi motor of fantastic power engineered and manufactured by the largest motor manufacturer in the world.



And, you can buy them separately or as a set... motor with single screw drive and motor with twin screw drive. Also available are the marine drive parts individually packaged.

Only the finest materials are used in the manufacture of these units. For example, the motor mount is zinc plated steel, the flexible coupling is durable heavy rubber with metal ends. The Propeller Shaft, Stuffing Box, Stuffing Box Bracket and Rudder Assembly are all Chrome Plated steel. The Propeller and Propeller Bracket are CHROME PLATED BRASS!



AT YOUR DEALER NOW

SEND S.S.A.E. FOR MARINE DRIVE LITERATURE ONLY
COMPLETE CATALOG \$1.00 U.S.A. ONLY DEPT. RC

PEERLESS CORPORATION
3919 'M' STREET
PHILADELPHIA, PA. 19124



R/C BOATING *at its Best!* with **K&B** MARINE ENGINES...

K & B 3.5cc (.21) OUTBOARD ENGINE

(not illustrated) Here's a tough, hot K & B 3.5cc engine... the first of its kind. Destined to set a pace others will follow! With ABC piston and liner, this water cooled competition engine is the ultimate in outboard engines. It offers the superior control characteristics of outboard drive.

It features: • Ball Bearings • Fly-wheel designed for cup electric starter • Close, simple steering and throttle linkage • Underwater pick-up • Integral cavitation plate and skeg • Tough transom mounting plate to withstand stress of flat-out racing.

K & B 3.5cc (.21) R/C ENGINE Designed specifically as a marine engine. Powerful, rugged and dependable. Will provide countless hours of high-performance operation. Easy to start, no break-in required. Precision machined U-Joint Nuts fit most existing ball drives.

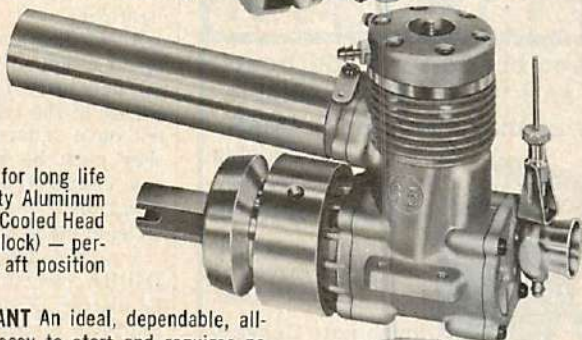
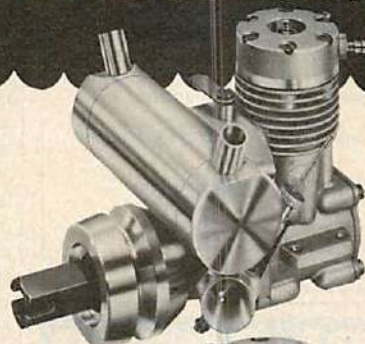
Features include: • Efficient Muffler — under 90 decibels • ABC Cylinder and Piston • Ball Bearings • Water-Cooled Head • Rear Exhaust — Butterfly Throttle • Rotatable Case (center block)—permits changing exhaust from forward to aft position.

K & B 6.5cc (.40) RC/RS III MARINE RACING ENGINE A new all-marine 6.5cc engine. Equipped with rear exhaust, rear rotor, and exhaust — butterfly throttle. It has been thoroughly tested in many R/C races.

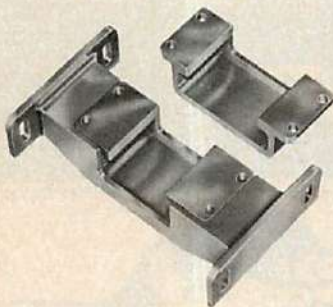
Features include: • ABC Piston & Liner — for long life • Advanced By-Pass Porting • High Density Aluminum Die Casting — for greater strength • Water-Cooled Head • Ball Bearings • Rotatable Case (center block) — permits changing of exhaust from forward to aft position • Con Rod — bushed both ends.

K & B .40 R/C MARINE SPORT POWERPLANT An ideal, dependable, all-purpose engine. It has superb power, is easy to start and requires no break-in. For consistent peak performance in all marine engines fill the tank with K & B fuel. Your choice of six blends.

Features include: • Perry Carburetor • Water-Cooled Head • Balanced Fly-wheel • Precision-Machined U-Joint Nut — fits most existing ball drives • Install, start, and go-o-o-o!



**MARINE SPECIALTIES
HARDWARE**

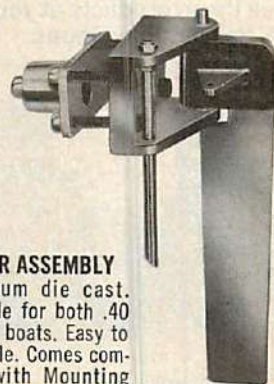


MOTOR MOUNT SET Die cast aluminum, complete with 5" Master Mount, Screws and Washers, and Insert Adapter for .40 or .60 engine. Inserts can be rail mounted in boats with confined engine placement areas.



DOUBLE RUDDER

OUTDRIVE ASSEMBLY For .40 or .60 boats. Aluminum die cast. Complete with Master Bracket (designed with twin ribs for individual modification), 2 Rudder Pivot Brackets, 2 Retainer Plates and all necessary Mounting Screws and Washers. Also includes Adjustable Strut—with installed Olite Bushings, Pivot Pins — with Nylon Bushings, 3 Control Arms — with set screws and 2 Rudder Blades (2 ARB for .40, 3 ARB for .60). The **SINGLE RUDDER OUTDRIVE ASSEMBLY** is the same as the above, except it only includes 1 Rudder Blade, Rudder Pivot Bracket, Pivot Pin and Control Arm.



RUDDER ASSEMBLY

Aluminum die cast. Available for both .40 and .60 boats. Easy to assemble. Comes complete with Mounting Plate and Screws, Pivot Bracket, Rudder Blade, Pivot Pin — with Nylon Bushings, and Water Pick-up — threaded and adjustable. The .40 and .60 Rudder are identical, except the .60 Rudder Blade is 1/2" longer.

Send for your K & B Catalog, "Matched Finish System" Handbook and Super Pox Paint Chart. Include 25¢ to cover postage and handling. Address to Dept. SR.



K&B MANUFACTURING
DIVISION OF AURORA PRODUCTS CORP.
12152 WOODRUFF AVE., DOWNEY, CA. 90241

FUTURAGLASS DESIGN Fiberglass Boats



*Competition proven Deep Vee's in three sizes—priced from \$52.95

*Kits—Hull and Deck Joined—Ready to Run

*Also, 50-800 Sailboat and Outrigger Hydro

FUTURAGLASS DESIGN

One Cannon Drive
Nashua, N.H. 03060
1-603-888-3576

*Dealer Inquiries Invited

VARI-SPEED

Speed control for model boats,
6V and 12V models available.
For all motors up to 6 AMPS.



Full	Variable
Reverse:	Reverse:
\$26.95	\$36.95

Requires only
one servo for
full operation.

Immediate Delivery
from Stock

DCR Electronics
2022 St. Mary's Ave.
Fort Wayne, Ind. 46808

again soon.

Of late I have been questioned about the differences between the Canadian and the U.S. laws regarding the operation of radio control equipment. In my conversations with the FCC and the U.S. Treaty Department, they have indicated that you must abide by the laws of the country in which you are operating at that time. In a discussion with the frequency committee officials of the AMA and MAAC, the following differences in law were noted. Under paragraph 77A of the Canadian regulations, 72.960MHz is stipulated for model aircraft use only and 75.60MHz is stipulated for operating any model. The Canadian frequency committee official indicated that an error was made in making the frequencies different from the U.S. regulations and that a submittal was already in process to make the frequencies identical.

A clarification rule has been made regarding lapped straked mono hulls. It is not necessary for lapped strakes to terminate at the transom, however they cannot have squared ends (creating a step), they must be faired. In addition to this rule clarification, the Northwind and the new Dumas deep vees have been approved as legal mono hulls.

I would like to announce two new IMPBA directors. First is Howard Hole in district X from Hawaii and Howard Smith in district VI from Iowa.

The following people have been submitted for nomination to the Model Boating Hall of Fame: Jay Brandon, John Bridge, Ed Hughey, Mike Meelbush, Mert

Mishnick, Don Pinkert, and Gary Preusse. From these nominees, two people will be voted into the Hall of Fame. As with the baseball and football halls of fame, I am sure that all of these people will be recognized in time. I feel that it is an honor for all of these people to be nominated by their peers as having contributed greatly to our hobby of model boating. I for one, will have a difficult time voting for only two people. Congratulations on your nomination!

The months of June and July are very busy for model boating. Consult the FM timetable at the front of the magazine for the full schedule. Don't pass up the opportunity to see the real unlimited hydroplanes racing on the Detroit River on June 26th. On June 25th the Mini Gold Cup takes place on Belle Isle in Detroit. It promises to be a great week-end as always. The full IMPBA racing schedule is now completed and available from the IMPBA office.

Don't forget to sign up for this year's IMPBA Internats to be held in New Orleans from August 8th thru the 13th. They have scheduled an open pit barbecue party at Mashburn's restaurant which is a place you'll never forget. The feast we had there last November was undescrivable. Three days of heat racing are scheduled to start on Thursday August 11th. Contact Glen Cupit for more information and registration form. Glen Cupit, P.O. Box 26881, New Orleans, Louisiana 70186, Phone (504) 888-7500. Have a happy and safe model boating season—Leonard Skwier, President IMPBA.



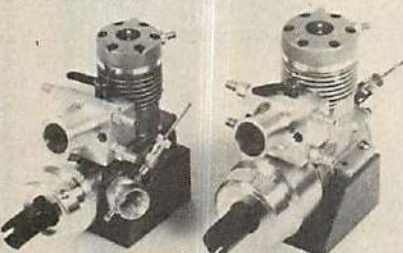
INTERNATIONAL PRODUCTS

MODEL PRODUCTS DIVISION
Phone (408) 733-1165

217 East Washington Street,
Sunnyvale, California 94086

See these products at your
local Hobby Shops.

K&B 3.5 with adapter.



K&B 6.5 with adapter.



International Products Adapter.

K&B 3.5 and K&B 6.5 engines, using International Products' water cooled butterfly throttle exhaust adapter.

Also, water cooled adapter made for most engines manufactured. Write for information.



CONGRATULATIONS

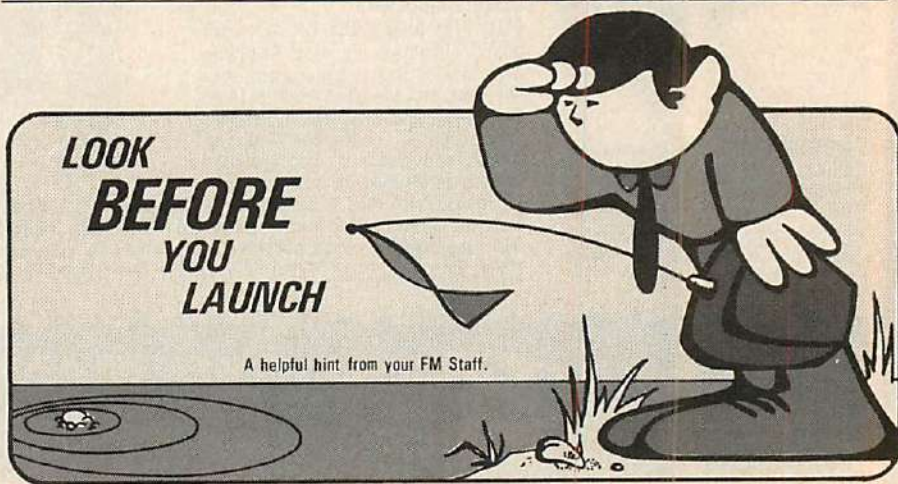
LARRY GODDARD!!

Larry set a new NAMBA International record of 20.58 mph for over 12 volt class. He used twin astro 25s in his dumas SK-20. The results speak for themselves.

ASTRO FLIGHT
13377 Beach Ave.
Venice, CA 90291

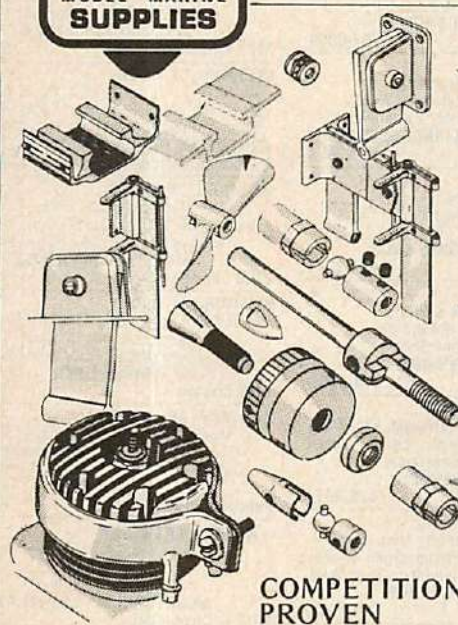
LOOK
**BEFORE
YOU
LAUNCH**

A helpful hint from your FM Staff.





ASK THE WINNERS WHY THEY PREFER OCTURA



**COMPETITION
PROVEN
HARDWARE**

SEND 25c FOR CATALOG AND PRICE LIST



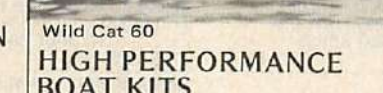
White Lightning 60



Wing Ding 40



Wing Ding 60



Wild Cat 60

**HIGH PERFORMANCE
BOAT KITS**

Sure, we can tell you how Octura hardware is precision made from the finest materials and has proven superior time and time again in the toughest competitions throughout the world and that Octura pioneered such things as the extruded engine mounts, the Strudder, the Kool Klamp and the Octura boats were winning prototypes before ever being produced as kits. Don't take our word for it, ask any model boater who is a consistent winner --- our best advertising is word of mouth.

OCTURA MODELS P.O. BOX 536 • PARK RIDGE, ILLINOIS 60068

NEW PHONE:
(312) 674-7351

R/C Model Boating National Organizations

A.M.Y.A.

American Model Yacht Association

Bob Crysler, A.M.Y.A. Sec.
2709 South Federal Hwy.
Delray Beach, FL 33444

N.A.M.B.A.

NAMBA International

Mrs. Myrtle Coad
Rte. A, Box 19
Lower Lake, CA 95457

I.M.P.B.A.

International Model Power Boat Association

IMPBA Office
24310 Prairie Lane
Warren, MI 48089

FLYING MODELS MAGAZINE RECOMMENDED HOBBY CONSULTANTS

DEALERS: WRITE FLYING MODELS MAGAZINE, P.O. BOX 700, NEWTON, NJ 07860 FOR FULL INFORMATION

ALABAMA, BIRMINGHAM

For Hobbies it's Spivey's
Most complete line of bargains in So. East
Planes, Boats, cars, trains, rockets, R/C
SPIVEY DISCOUNT STORES

3033 Tuscaloosa Ave. 785-9690

ARIZONA, PHOENIX

The
Model Builder's
Shop
WEBSTER'S HOBBY SHOP

30 E. Camelback 266-5343

ARIZONA, TUCSON

Southern Arizona's Largest Hobby Shop
Complete lines of Goldberg, Guillows, Dumas
Sterling, Dremel, Unimat, X-Acto, Pactra, etc.
TUCSON HOBBY SHOP

4352 E. Speedway 326-2565

CALIFORNIA, BELL GARDENS

Planes, Trains, Rockets, Boats
Radio Control Specialists
Custom Builder
SIR JOHN'S HOBBY CENTER

6614 S. Eastern 773-2229

CALIFORNIA, BURBANK

Import & domestic Engines
Ships-boats-fittings & accessories
Unimat-Dremel-X-Acto, etc.
BURBANK HOUSE OF HOBBIES

923 W. Olive Ave. 848-3674

CALIFORNIA, CONCORD

Radio Control Systems—planes—
boats—cars, H, O & N Ga Trains.
Dremel and Unimat tools & equip.
HOWARD'S HOBBY HOUSE

228 Sun Valley Mall 685-0215

CALIFORNIA, COSTA MESA

When in Orange County, visit us
for Planes, Gliders, Cars, R/C &
Trains, Supplies. Open Daily—Closed Thurs.
COLONEL BOB'S

1913 Harbor Blvd. 642-0343

CALIFORNIA, GARDEN GROVE

R/C Specialists, Planes, Cars, Boats
Hardware, Accessories, Rockets
Open 7 days, Master Charge, BankAmericard
ORANGE COAST HOBBIES

P.O. Box 557 534-0420

CALIFORNIA, LAKEWOOD

Airplanes Galore—We have it all; line control,
Radio Control, Free Flight, Sailplanes, Heli-
copters, Boats, Cars, "The Largest Store in Cal."
HOBBY WAREHOUSE

4128 South St. 531-1413

READERS—

If your local dealer does not stock this maga-
zine, or if he continually runs out before you
can obtain your copy, send us his name and
address and we'll make sure he receives an
ample supply.

CALIFORNIA, OCEANSIDE

New/used planes, gliders, cars,
Boats, engines, R/C Systems,
Trains, soldiers, tools & supplies
UC HOBBY CENTER

1120 So. Hill St. 722-2363

CALIFORNIA, MOUNTAIN VIEW

Huge stock of boats, fittings, etc.
Aircraft, engines, parts, books
Magazines, foreign & domestic
SAN ANTONIO HOBBY SHOP

413 San Antonio Rd. 941-1278

CALIFORNIA, PARADISE

Planes, RC, U Control
Trains N. HO
Plastic Models
L & L TRAINS & HOBBIES

6412 Skyway 872-1070

CALIFORNIA, RIVERSIDE

Planes, Trains, Boats, Cars
R/C, Free Flight, U-Control
All Accessories, Unimat, etc.
HARPER'S HOBBY SHOP

6574 Magnolia Ave. 683-5865

CALIFORNIA, SAN DIEGO (LA MESA)

Hobbies—Crafts
Toys—Games
Open Sunday's
MINI-CITY

8363 Center Drive 461-5933

CALIFORNIA, SAN DIEGO

R/C, C/L, F/F, Planes, Boats, Gliders
Ace, Futaba, EK, Sig Dealers
Same location since 1938
HILLCREST HOBBY CRAFT

3921 Fifth Ave. 295-9111

FLYING MODELS MAGAZINE RECOMMENDED HOBBY CONSULTANTS

DEALERS: WRITE FLYING MODELS MAGAZINE, P.O. BOX 700, NEWTON, NJ 07860 FOR FULL INFORMATION

CALIFORNIA, SAN FRANCISCO
The Bay Area's Complete R/C Store
featuring Kraft, Futaba, World Engine, others
Mon-Thur 11-7, Fri 11-9, Sat 10-6, Sun 12-5
HOBBY COMPANY OF SAN FRANCISCO
5150 Geary Blvd. 386-2802

CALIFORNIA, SAN FRANCISCO

Try Us

FRANCISCAN HOBBIES
1935 Ocean Ave. JU4-3919

CALIFORNIA, SAN JOSE
Planes, R/C, U-Control, free flight, rockets.
Trains, Boats, Cars, Science, Items, Games.
All Accessories
ED'S HOBBY SHOP
1362 Lincoln Ave. 294-7074

CALIFORNIA, SANTA CLARA
No. Cal's Largest R/C Model Boat Dealers
Complete selection hrdwre
& radio control gear
HOBBIES GALORE
3414 El Camino Real 244-6267

COLORADO, COLORADO SPRINGS
R/C planes, systems, accessories
We build & fly what we sell
U-C, FF, Rubber, Sig Balsa, etc.
CUSTOM HOBBIES
2408 E. Platte Ave. 634-7400

COLORADO, PUEBLO
Large Stock HO, HO3, N trains, accessories
Best Lines Brass Imports
Airplanes, RC Gear, Cars, Boats
D & S PAINT CENTER, INC.
715 W. 12th St. 544-4714

CONNECTICUT, BETHEL
Alco, Balboa, Hallmark, Gem, LMB, NWSL,
PFM, Sydnam, Westside brass imports, Marklin,
scratchbuilders supplies.
BETHEL HOBBY SHOP
Bethel Plaza 743-7088

CONNECTICUT, BRISTOL
We're #1 in Conn. Radio & U-Control. Complete
Ass't. AHM, AFX, Lionel, Tyco, Repair Serv.
Radio Control Ground School on Premises.
BRISTOL HOBBY CENTER
641 Farmington Ave. 583-7273

CONNECTICUT, NORWALK
We fly Radio Control
Complete Line Model Airplane Supplies
Custom Ordering
AL'S HOBBIES
54 Chestnut Hill Rd. 846-9090

DELAWARE, WILMINGTON
All gauges, Model Supplies, Brass Engines,
New & Used. Expert repair service. We trade
or buy Used Trains. "Del. largest hobby dealer."
HOBBY HOUSE, INC.
Midway Shopping Center 999-0144

DELAWARE, WILMINGTON
Largest stock brass locos in Del. PFM, Gem,
Balboa, Westside, NWSL, Hallmark, Alco,
MEW, Sydnam, LMB, Kidder, Walther's
MITCHELL'S FAMILY STORE
Fairfax Shopping Cntr. 652-3258

FLORIDA, CAPE CORAL
Planes, Boats, Trains, Cars, Crafts
Parts & Service. If we don't have it, we
will try to get it. Mon-Sat 9-7, Sun 12-5:30
A & J MODELS INC.
4527 Del Prado Blvd. 542-8858

FLORIDA, FT. MYERS
Southwest Florida's Most Complete
Hobby Shop
Mon-Thur 9:30-6, Fri. 9:30-8, Sat. til 5.
HOBBY WORLD
3920 Cleveland Ave. 939-2255

FLORIDA, ORLANDO
Full Line Hobby Shop
Located in Parkwood Plaza
Open 10AM to 7PM, Mon-Sat.
SUNSHINE HOBBIES
3223 West Colonial Dr. 298-4130

READERS—
If your local dealer does not stock this maga-
zine, or if he continually runs out before you
can obtain your copy, send us his name and
address and we'll make sure he receives an
ample supply.

ILLINOIS, ANTIOCH
HO & N Gauge trains, ships, cars, planes
Science Access. for all. If we don't have
it, we'll try to get it.
THE HOBBY BARN
Rte. 83, 1/2 Mi. So. of Antioch 395-4080

ILLINOIS, BUFFALO GROVE
C/L kits and supplies
Open 7 days a week
BOB'S HOBBY SHOP
Plaza Verde Shop. Clr., Dundee & Arlington
Hts. Rds. 1215 W. Dundee Rd. 392-7726

ILLINOIS, CHICAGO
Complete R/C Boat Headquarters
Octura, Dumas, M. Specialties, Bishop
Planes, Trains, Doll Furn., Plastic Kits
HOBBYS-A-PLenty
4075 N. Milwaukee Ave. 777-6559

ILLINOIS, CHICAGO
Boats, Planes, Trains,
Steam Engines castings, Lionel & Amer. Flyer
Try us first this time
SIMONSEN MODEL SUPPLIES
3060 N. Lincoln Ave. 327-1565

ILLINOIS, CHICAGO
Hundreds of Books, Tools & Engines
Complete Line of Model Airplane Supplies
Mon-Fri 12-9 Sat 9-6 Sun 1-4
STANTON HOBBY SHOP, INC.
4734 N. Milwaukee Ave. 283-6446

READERS—
If your local dealer does not stock this maga-
zine, or if he continually runs out before you
can obtain your copy, send us his name and
address and we'll make sure he receives an
ample supply.

ILLINOIS, DES PLAINES
Hdqt's for over 150 Major Model RR lines
O, On3, N3, HO, HO3, N — Try Us First.
M-Th-F to 9PM-Sunday 11AM-3PM
THE TOY & HOBBY HOUSE
1486 Miner St. 827-6550

ILLINOIS, EAST MOLINE
O-HO-N Trains & Accessories. PFM-Balboa-
Alco-Hallmark-NWSL-Westside-GEM. Repair
Service. Mon-Fri 9-9, Sat 9-8, Sun 10-5
RIDGEWOOD VARIETY & HOBBY
623-42nd Ave. 755-2661

ILLINOIS, GREENVILLE
RC, Planes, Boats, Free Flight, Rockets,
HO Trains, Tyco Service, X-Acto, Dremel,
Hrs: M-T-W-Th-S 9:30-5, Fri. 9:30-8
WILL-O'-TH'-WIND
603 Harris Ave. 664-3353

ILLINOIS, PALATINE
Complete selection of R/C & U Control, Planes,
Boats, Cars. Also Gliders, Rockets & More
Open 7 days: mn-Fri til 9, Sat 9:30-5:30, Sun 12-5
HOBBY HUT
1228 W. Northwest Highway 991-0610

ILLINOIS, PARK RIDGE
Over 100 different brass locos, HO, HO3,
O, N, Tractor, Lionel, Flyer New & Used
We trade or buy in any gauge
BILL'S HOBBY & COLLECTORS' SHOP
106 Main St. 823-4464

ILLINOIS, SKOKIE
Trains, Military Miniatures, Custom Painting
We buy brass. Both New and Used.
Open Mon. and Thur. Evenings
THE HOBBY CHEST
8808 Bronx Ave. 675-4811

INDIANA, BREMEN
R/C Plane Specialists — Complete Inventory
HO & N Gauge trains — check our prices
M, Fri. 9-9, Tu. Th 1-5&7-9, Sat. 10-6
HEUBERGER'S HOBBY SHOP
3 blks. N. of US 6 on Ind. 331 546-3807

INDIANA, INDIANAPOLIS
Your one stop Plane, Boat & Car Center
Located Eastgate Shopping Center
Daily 10-9, Sat. 10-6, Sun. aft. in winter
TOM METZLER HOBBY CENTER INC.
7150 E. Washington St. 357-1617

INDIANAPOLIS, INDIANA
Planes, Boats, 1/8 Scale Cars
We service what we sell
Open 7 days
WESTSIDE HOBBIES
5235 Rockville Rd. 244-3297

INDIANA, LAFAYETTE
Airplane Kits & Parts
Radio Control Gear — U-Control
Power Boats, Fittings, Service
WEBER'S HOBBY SHOP
522 Main St. 742-2045

INDIANA, SEYMOUR
(Site of the World's first train robbery)
We have it all here in a big new store.
Come look & buy. 9-8 everyday.
SPENCER CRAFT-HOBBY
2015-2017 Ewing St. 522-7480

IOWA, MARSHALLTOWN
Sterling, Top Flite, Goldberg, Sig, X-acto, Cox
HO, N gauge trains & complete craft dept.
Mon. 12-9, Tues-Fri 10:30-5:30, Sat. 9:30-5
HOBBY CRAFT SHOP
118 W. Main St. 752-0809

KANSAS, TOPEKA
2000 loco & car parts
Atheam, Tyco, Hobbytown & AHM.
Tyco Service Station, AHM "Parts Depot"
PETERSON ELEC. APPLIANCE SERVICE
1234 Clay St. 232-1854

KANSAS, WICHITA
Airplanes,
Accessories
THE MODELER HOBBY SHOP
845 S. Hillside 681-2941

KENTUCKY, LEXINGTON
R/C, C/L, Planes & Boats
Only 3 mi. from 1-64 & 1-75
A Complete Hobby Shop
X-CELL MODELS INC.
347 Eastland S.C. 254-2406

LOUISIANA, NEW ORLEANS
Tenshodo, United, Gem, Cal-Scale, Etc. Daily
9-6 for your HO kits, tools, books, parts,
supplies, etc. Closed Wednesdays.
HUB HOBBY SHOP
2618 S. Broad St. 822-3914

MARYLAND, BALTIMORE
Baltimore's complete hobby shop. Over
20,000 HO items. Lower Prices. Open Thurs.,
Fri. 12-8:45 Sat. 10-5:45 Closed Mon. Tues. Wed.
CITY WIDE HOBBY SHOP
7715 Hartford Rd. NO8-9200

MASSACHUSETTS, LAWRENCE
Complete shop for the Model Builder. Open
til 9 PM; Sat. til 6 PM. Specialty—HO trains;
plus Planes, Boats, Gas Engines, R/C.
MODELLER'S HAVEN
80 Manchester St. 683-3222

MASSACHUSETTS, SHARON
South Shore's finest hobby store.
You can get it here. O, HO, N, N gauge.
Open daily 12 noon to 9 PM.
SHARON HOBBY
124 E. Foxboro St. 784-5724

MASSACHUSETTS, WORCESTER
HO, HO3, N Ga. Lionel, Sets, Kits & Parts
PFM, Hobbytown, Alco — all leading lines.
Books. Daily 9:30-5:30, Wed. til 9 — Since '46
HENRY'S HOBBY HOUSE
34 Franklin St. 754-5604

MICHIGAN, EAST DETROIT
Radio Control, Plane Kits, Engines
Boats & Fittings,
Dremel, Unimat, Etc.
JOE'S HOBBY CENTER
17900 E. 10 Mile Rd. 773-8294

MICHIGAN, DEARBORN
Radio Control, Plane Kits, Engines
Boats & Fittings,
Dremel, Unimat, Etc.
JOE'S HOBBY CENTER
7845 Wyoming Ave. 933-6567

PLANE MODELERS:
Others may come and go, but your local
hobby retailer is in your neighborhood 52
weeks each year to serve you with supplies,
materials and kits. He is always ready to
help you.

MICHIGAN, FARMINGTON
Radio Control, Plane Kits, Engines
Boats & Fittings,
Dremel, Unimat, Etc.
JOE'S HOBBY CENTER
33419 Grand River Ave. 477-6266

MICHIGAN, GRAND RAPIDS
Scale & Tintplate O-S — HO — N Op. layouts.
Auth. Lionel — AF — Tyco — AHM — PFM Sales
& Service Open 9:30-9 except Sunday
CARL A. MEYERS HOBBY HOUSE
2136 Plainfield Ave. N.E. 363-8347

MINNESOTA, MINNEAPOLIS
Specializing in R/C Boat & Supplies
Plastic Models, Cars, Planes, Ships
Open til 9PM, Sat. & Sun. 12-6
MODEL MARINE PRODUCTS
3015 E. Franklin Ave. 341-4087

MISSISSIPPI, LAUREL
Your complete Airplane Shop
Fox Engines, Enya Engines, Sig Planes and
Parts RC Boats, cars: Ace RC Dealer
HOBBY CORNER
1534 N. 1st Ave. 649-7378

MISSOURI, KANSAS CITY
Model Railroad Headquarters — O — On3 — S —
HO — HO3 — OOO. Lionel — American Flyer.
Most complete stock
SPOTLIGHT RAILROAD
7427 Troost Ave. HI 4-7331

MISSOURI, ST. LOUIS
HO — HO3 — N scale, PFM, Peco, Walther's,
Mini-Trix, Vollmer, Access. Tools, NE Bass
Wood & Balsa Unimat — Parts 11AM-10PM.
CHECKERED FLAG RACEWAY & HOBBY CTR.
157 Concord Plaza (Lower Level) VI 3-9797

MISSOURI, ST. LOUIS
Quality Scale Model R/Ring. PFM,
Balboa, LMB, USH, Quality Craft, & all the
best in kits, tools & accessories.
HENZE'S HOBBY HOUSE
2160 Chambers Rd. 869-3450

MISSOURI, ST. LOUIS
Kits and RTR equip. in O, HO, HO3, N gauges
Large selection of brass.
Mon., Thurs. & Sat. 9:30-5; Fri. 9:30-9.
TINKER TOWN
9666 Clayton Rd. 991-0154

MONTANA, GREAT FALLS
Model Railroad is our specialty.
Over 50 Brass Locomotives in stock.
Daily 9:30-6; Mon., Thurs., Fri. 9-PM.
HOBBYLAND
Holiday Village S.C. 453-3131

NEVADA, LAS VEGAS
Not All of our Trains
are for Sale.
Visitors Welcome
HOBBY HOUSE — LAS VEGAS
2011 E. Charleston 382-5249

NEW HAMPSHIRE, NASHUA
Radio Control 1/8 Car & Boat Specialists
Featuring Fiberglass comp. Deep Vees
Ready to run models — fittings — service
HOBBY HILL
One Cannon Drive 888-3576

NEW HAMPSHIRE, STRATHAM (Exeter)
Radio Control Specialists
HO & N Gauge, all Kinds
Open 7 days per week
FITTS PHOTO & HOBBY SHOP
Kings Hwy. Plaza 778-8802

NEW JERSEY, CLAYTON
Specializing in Radio Control
Airplanes, Boats, and Cars
CLAYTON HOBBY CENTER
542 S. Delsea Dr. 881-1771

NEW JERSEY, CRANFORD
HO & N Gauge Trains, Plastics of Cars, Ships,
Aircraft, Armour, Rockets, HO Racing, Wooden
Ships, Dremel, Revell, 1/32 Racing.
DICK'S HOBBYLAND
16 No. Union Ave. 272-7660

NEW JERSEY, EAST RUTHERFORD
Most complete RR Headquarters
O, HO, N ga. Equip., Radio Control.
Plane Kits, Engines, Boats & Fittings.
PAUL'S HOBBY SHOP
540 Paterson Ave. GE8-0192

NEW JERSEY, FREEHOLD
European HO, N Ga. Trains & Access.
Auth. Marklin HO parts — repair serv.
Old Marklin Toys & Cat. Bought/Traded.
CONTINENTAL HOBBIES, INC.
25 Broad St. 462-8937

NEW JERSEY, JERSEY CITY
Model Hobby Needs, Loco Repairs
Plastic Models R.C. & U.C. Planes & Boats
Military & Historical Min. Ships & Access.
CAMPBELL'S HOBBY CENTER
61 Baldwin Ave. 432-6373

NEW JERSEY, OAKLAND
Airplane Dept., Rubber, U/C, R/C, plastics,
Trains, Lionel, HO, Brass, N plus accessories
Boats, Kits, Rockets, Dollhouse Line, AFX, etc.
RICH'S HOBBYTOWNE
350 Ramapo Valley Rd. 337-5300

NEW JERSEY, PRINCETON
Radio Control Boats & Planes
Complete Building Supplies
Sig Models — OPS Engines
NASSAU HOBBY
142 Nassau 924-2739

PLANE AND BOAT MODELERS:
If your local hobby retailer does not stock
Flying Models, be an FM Good Guy and slip
him the hint. Only FM has regular model
aeronautic and model boat sections each
month.

FLYING MODELS MAGAZINE RECOMMENDED HOBBY CONSULTANTS

DEALERS: WRITE FLYING MODELS MAGAZINE, P.O. BOX 700, NEWTON, NJ 07860 FOR FULL INFORMATION

NEW JERSEY, RAMSEY
One of the largest selections of R/C equipment, kits & accessories, plus a knowledgeable staff to help
HI-WAY HOBBY HOUSE
Rt. 17 327-0075

NEW JERSEY, WEST ORANGE
U/C & R/C Cars, Boat, Airplanes
Doll House Kits, Plastics, Crafts,
Most Complete R/C Car Shop in NJ
THE 'LIL' HOBBIE HOUSE
414 Main St. 731-7227

NEW MEXICO, ALBUQUERQUE
O, HO Standard Narrow Gauge Brass Imports
& Domestic Parts & Supplies. Planes - slot
cars - science. Open eve. & Sun.
HOBBY KORMER
6693 4 NW (US85N) 344-3267

READERS
If your local dealer does not stock this
magazine, or if he continually runs out be-
fore you can obtain your copy, send us his
name and address and we'll make sure he
receives an ample supply.

NEW YORK, BROOKLYN
R/C, U/C Planes, boats, cars and supplies
HO, N gauge trains, plastic model kits, AFX,
racing, rockets etc., etc. Open 7 Days
A HOBBY HUT
2835 Nostrand Ave. (Nr. King's Hy) 338-2554

NEW YORK, BUFFALO
Best in HO (Tenshodo, Akane, Max Gray,
Kidder, Tyco, Athearn, Cal-Scale, Selley).
Mon-Thurs-Fri 10-9, Tues-Sat 10-6, Closed Wed
FIELD'S HOBBY CENTER
3177 Bailey Ave. TF 6-7832

NEW YORK, CENTEREACH
Comp. stock HO kits, locs & parts. Service.
Tenshodo, Arnold Rapido, United.
10-8 Daily, 10-2 Sun. Closed Monday.
FLETCHER'S HOBBY HOUSE
2585 Middle Country Rd. JU 5-8327

NEW YORK, EAST MEADOW, LI
Trains from the world over!
Accessories, parts and repairs, all gauges.
Marklin, World's leading hobby house.
POLK'S HOBBY DEPT. STORE
2072 Front St. IV 9-1166

NEW YORK, EAST NORTHPORT
O, HO, N ga. Railroad Supplies, Complete Line
R/C Supplies, Planes, Boats, Cars, Plastic Kits.
Mon-Fri. 12 noon to 9 PM. Sat 10 AM-6 PM.
LARRY'S HOBBY SUPPLIES, INC.
3018 Jericho Turnpike 864-7166

NEW YORK, ELMIRA
R/C Planes, Ships & Cars, HO, N Trains
Everything in Craft, Slot Cars, Rockets
Open daily 10-5, Thurs. & Fri. 10-9
HOBBY HUT
1000 College Ave. 733-2607

NEW YORK, ELMSFORD
Specializing in Radio Control
Open 'til 9 during the week.
Repairs available.
ANDY'S HOBBY SHOP
36 E. Main St. 592-5176

NEW YORK, FRANKLIN SQUARE
On, HO, HO3, N scales - kits, parts and
repairs. Lionel, AF, Tenshodo, United Balboa,
LaBelle. Old Trains. Open Mon & Fri. Eve.
TRAINS
81 Franklin Ave. 354-4470

NEW YORK, HAUPPAUGE
A little bit better than ordinary dealers of
HO, U control and free flight equip. Come
and visit us in our new location
THE FROG HOBBY CENTRE INC.
595 Old Willets Path 862-9386

NEW YORK, MAMARONECK
All ga. Train Sales, Serv., Repairs.
Slot Race Cars, Plane Kits, Used Collector
Trains at low prices. Parts & Service.
BOB'S HOBBY & SLOT RACING SHOP
120 Mamaroneck Ave. 698-4655

NEW YORK, NEW YORK
R/C Planes, Boats, Engines
Motors, Accessories,
Everything for flying or boating
AMERICA'S HOBBY CENTER
146 W. 22nd St. 675-8922

NEW YORK, NEW YORK
HO, Arnold-Rapido, AF, Marklin, Sales & Serv.
Radio Control Equip., Planes, Boats, Crafts
Daily 9-9, Sun. and Hol. 11-7
D & Z HOBBY MART
525 8th Ave. BR 9-5869

NEW YORK, RIDGEWOOD
Model Railroad in "N," HO, O, 9 to 6
Model Planes, Ships, Cars, Rockets
Crafts, Science Center, Tools, Fri. 9-8
NAGENGAST HARDWARE
68-02 Fresh Pond Rd. 821-0958

NEW YORK, ROCHESTER
All makes N ga. Trains & Access.
HO - Brass Imports - Dremel & X-Acto Tools
Hobbies-Crafts-Coins-Aurora HO Slot Cars
CARL'S HOBBY HOUSE
1310 No. Clinton Ave. 266-4706

NEW YORK, STATEN ISLAND
RC Cars, Planes, Boats - UC - FF - Rockets
Fuel - Parts - Instruction - Service
Mon-Fri. Noon 'til 8, Sat. 10-6
BROWNE'S PRO & SPORT HOBBIES
122 Bennett St. 727-2194

NEW YORK, SYRACUSE
Central R/C Hq. for EK-MRC-Sig-FF-UC
Complete line Planes, Engines, Rockets, Trains
Conv. Located Rt. 11, Rt. 81, Thwy. Exit 36
CENTRAL HOBBIES, LTD.
Ponderosa Plaza 455-1321

NEW YORK, UTICA
All Gauge Railroad Trains, Kits & Repairs
R/C Planes, Boats, Rockets & Supplies
Mon-Sat 11-5:30, Mon & Fri 9-9
A & J HOBBY HOUSE
20 Auburn Ave. 735-1815

NORTH CAROLINA, CHAPEL HILL
Mid-Atlantic's leading hobby center
Scratchbuilding goodies. Brass locos. Repairs.
Open 10-9 Mon.-Sat.
BILLY ARTHUR, INC.
University Mall 942-5562

NORTH CAROLINA, RALEIGH
Train specialists with a large selection
N, HO & O Scale RTR, Kits & scratch supplies.
Brass, books & Lionel.
THE HOBBY SHOP
2020 Cameron S. (Cameron Village) 833-1123

NORTH CAROLINA, RALEIGH
Complete Stock for Model Railroaders.
Kits, tools, supplies - Domestic & Imports.
HO & Arnold-Rapido N ga.
NORTH HILLS HOBBY SHOP
125 N. Hills Rd. 787-6101

NORTH CAROLINA, SALISBURY
"Piedmont NC's Largest Hobby Shop"
Controlline Models - Kits and Built-up
10AM-9PM Mon-Fri, 10-6 Sat.
CHARTREUSE CABOOSE HOBBIES
Towne Mall 633-1120

NORTH CAROLINA, WINSTON-SALEM
For the Finest in Hobbies
TINY TOWN
Thruway Shopping Ctr. PA 5-8971

OHIO, CINCINNATI
O - S - HO - TT - Hn3
Complete Repair Ser. in Our Roundhouse
Open Mon-Fri. 4-8 Sat. & Sun. 12-8
HOWARD'S HOBBY HOUSE
Cincinnati Union Terminal 421-4004

OHIO, CLEVELAND
Large stock HO, N ga. trains, Domestic &
Foreign. Also kits, parts, supplies, scenery,
paints, wood tools, books, mag.
NATIONAL HOBBY, INC.
5238 Ridge Rd. 749-4750

BOAT MODELERS:
When you are traveling between patches of
blue water, take along a copy of FM and check
out hobby retailers away from home. You'll
meet fine people who stock interesting prod-
ucts.

OHIO, COLUMBUS
Sig Super Tigre, Enya, Cox, K&B, McCoy
Guillow, Sterling, Veco, Top Flite,
Midwest, Balsa, Parts & Accessories
HALL'S HOBBY SHOP
2753 Winchester Pike, Berwick Piz. 231-8742

OHIO, PROSPECT
Most Complete model airplane
Supply Co. in Central Ohio. Free-flight,
U-Control & R/C, Bi-Plane Headquarters
LIGHTHOUSE HOBBY SUPPLY CO.
507 E. North 494-2110

OKLAHOMA, BROKEN ARROW
Planes, R/C, U-Control, Freeflight, Rockets
O, HO, N gauge trains, AFX Roadrace
Books, Tools, Crafts Supplies, Corgi Toys
S&S HOBBIES AND CRAFTS
108 S. Main 251-0330

OKLAHOMA, MIDWEST CITY
Planes, Trains, Crafts, Rockets, Science
OS - Super Tigre - Enya 6" Balsa
RC planes & engines, tools, etc.
KELLER SPORTS & HOBBIES
1430 N. Key Blvd. 732-1100

OKLAHOMA, OKLAHOMA CITY
Planes, Trains, Crafts, Rockets, Science
OS - Super Tigre - Enya 6" Balsa
RC Planes & Engines, tools, etc.
AERO HOBBIES
6238 S.E. 15th 737-1085

OREGON, HILLSBORO
R/C Planes, Systems, Accessories
Ships, Cars, Crafts-many plastics
10 to 6 Daily-Open Sundays
HILLSBORO HOBBIES
351 E. Main St. 648-3788

OREGON, MILWAUKIE
Specializing in R/C Boats
Buy & Sell Used Boats
Headquarters for Your Hobby Needs
MILWAUKIE HOBBY CENTER
11008 S.E. Main St. 654-4916

OREGON, PORTLAND
Portland's favorite Hobby & Craft Shop
RC, Ukite, Freeflight, Rubber, power boats
Open 10-9 10-6 Sat., 12-6 Sun.
TONY'S CRAFTS & HOBBIES
4454 N.E. Cully 288-4004

OREGON, PORTLAND
"The best selection of R/C
in the Pacific Northwest"
Noon to 8PM, Sat. 10AM to 5PM
STRICTLY R/C
7868 S.W. Capitol Hwy. 244-3356

PENNSYLVANIA, ALLENTOWN
Boats, R/C & C/L Planes
Largest Stock HO, N in Area
Acres of Parking, Daily 10-10, Sun. 1-10
DON MOHR'S HOBBYLAND
6 Miles W on Rt. 22 395-2842

PENNSYLVANIA, BATH
Trach R/C Hobbies
R/C Air Planes, Boats & Cars
Rockets, Plastics, Crafts
TRACH R/C HOBBIES
RD #1 759-4603

PENNSYLVANIA, LANSDALE
Large Stock of R/C, U/C and F/F
Airplane Kits - Engines - Hardware
Radios - Also R/C Boats & Cars
PENN VALLEY HOBBY CENTER
837 W. Main St. 855-1268

PENNSYLVANIA, MONROEVILLE
Planes & Boats - Cars - Trains
Radio Control - Crafts - Artist Supplies
Photographic Equip, Sales & Rentals
LORESKI'S INC., YOUR HOBBY HQRTS.
"Miracle Mile" 372-5155

PENNSYLVANIA, MOORESTOWN (BATH)
Specializing in R/C Hobbies.
Plastic Kits, Rockets, Crafts
Books, Tools, & Full Line Accessories
TRACH R/C HOBBIES
RD 1 759-4603

PENNSYLVANIA, NEW OXFORD
Specializing in Model RR-all gauges-Repairs
& Custom Painting. Daily 11:30AM-8:30PM,
Sun 1-5 closed Tues. In the cars at the tracks
PAUL'S MODEL R.R. SHOP
201 Lincolnway West 624-6116

PENNSYLVANIA, WILLOWGROVE
R/C Equipment & Supplies
Boats, Cars, Planes, Trains
Repairs on all trains & R/C Equip.
JC R/C HOBBIES
23 Easton Rd. 659-0770

RHODE ISLAND, WARWICK
Specializing in R/C Planes & Supplies
Futaba Radios, Boats & Fittings
6:30-10, Eves. Sat. 10-5, Sun 8-10
RAY'S R/C HOBBY
5804 Post Rd. 884-1330

TENNESSEE, NASHVILLE
R/C Boats, Cars, Planes, Motors, Marine
Engines, Sport & Competition Accessories
A Full Line Hobby Center
THE TOY MART
113 Gray Lynn Dr. 883-1648

TEXAS, HOUSTON
Complete line of Planes and Accessories
R/C U-Control Free flight and Rockets
We fly them too, need help - see us
WINGS 'N' THINGS, INC. #1
316 Winkler Dr. 649-0790

TEXAS, SAN ANTONIO
Buy 'Em Where They Fly 'Em
DICK'S HOBBY SHOP
Terrell Plaza Center 512-826-7941

TEXAS, PLAINVIEW
Flying Model Airplanes - R/C, U/C, F/F, Gldr.
Custom Built Airplanes - Low Prices
Trains, Cars, Boats, Rockets, Ceramics
BOKA SCALE MODELS
410 W. 9th 296-7767

TEXAS, SAN ANTONIO
Specializing in R/C airplanes with
largest selection in Southwest. Also
Boats, Cars and Rockets - Open Mon-Sat 10-7
HOBBY CENTER INC.
3439 Fredericksburg Rd. 735-4218

UTAH, SALT LAKE CITY
Authorized Kraft, RS and World Dealer
Radio Repair Service - All makes, Open
7 Days a Week - if we don't have it we'll get it
FOOTHILL MODELERS SUPPLY
1625 Foothill Dr. 583-4940

VERMONT, MIDDLEBURY
Northern New England's "Most Complete
Hobby Shop" RC, CL, FF, Boats, EK-Logictrol,
World Engines, Sig. OS Max, Super Tigre etc.
MIDWAY SHOP
57 Main St. 388-2922

WASHINGTON, SEATTLE
HO & N Trains & Accessories, Plastic Model
Kits, Balsa Planes & Boats, Model Rocketry
Open Thurs. evenings
CAMPUS HOBBY CENTER
4738 University Way LA5-2222

WISCONSIN, ELKHORN
HO Trains, RC Planes & Boats,
Rockets, Ships, Balsa, Tools,
Magazines, Crafts Mon-Sat. 9AM-5:30PM
GENE'S HOBBY SHOP
34 S. Wisconsin 723-4048

PLANE MODELERS:
Others may come and go, but your local
hobby retailer is in your neighborhood 52
weeks each year to serve you with supplies,
materials and kits. He is always ready to
help you.

CANADA

ONTARIO, ST. CATHERINES
Specializing in Radio Control
Planes, Boats, Helicopters, Rockets
Engines, Tools, Unimat Lathes & Access.
BRED'L PHOTO HOBBY SHOP
458 Scott St. 934-6830

ONTARIO, TORONTO
Complete line of HO, N, Traction
Scratchbuilders Supplies, All RR Books
Daily 9-6, Thurs.-Fri. 9-9
NORTH YORK HOBBIES & CRAFTS
1910 Avenue Rd. RU 1-4139

ONTARIO, TORONTO
Ships, Nooks & Crafts, Radio Controls
Tues.-Fri. 12-9, Sat. 10-6
CAL'S HOBBY SHOP
1626 Bayview Ave. 484-8173

QUEBEC, MONTREAL (ST. EUSTACHE)
Complete Selection R/C & U Control planes,
Boats & Cars. Complete stock of supplies. HO
& Lionel Trains. Complete Crafts & Art Supplies.
ALEXANDER'S
Place St. Eustache 627-2460

QUEBEC, MONTREAL
Radio Controls for Planes - Boats, etc.
Boat Access., Balsa Wood, Plastic Models,
This store is run by Modelers who can help you.
CARL'S R/C HOBBY SHOP
6056 St. Hubert 273-6008

QUEBEC, ST. LAMBERT
Planes for U-Control, FF & radio
Trains, Slot Parts, Boats, Balsa,
Mags. Definitely no charge for advice.
ST. LAMBERT HOBBY SHOP
444 Rothesay Ave. 671-8727

MEXICO

MEXICO 9, D.F.
Radio Control Specialists.
Motors, Radios, Planes, Service.
Now with Private Flight to fly.
MATHELIN MODELISMO
Retorno 3 de Gral. Ignacio Zaragoza No. 47

Accuscale	56
Ace R/C, Inc.	12
America's Hobby Center	15, 16, 17
Applied Design Corp.	14
Astro Flight, Inc.	70
Binks Mfg. Co.	12
Bishop Marine Designs	65
Buckeye Balsa Co.	11
C&H Sales Co.	9
Cannon Electronics	18
Carstens Flying Plans	52, 53
Carstens Publications	49, 54
DCR Electronics	70
Du Bro Products	4, 11
Dumas Boats	Cover II
E.M.G. Engineering	18
Eastern Diesel Supply	12
Ekim	68
Everybody's Bookshop	14
Flying Models	51, 55, 71-73, 74
Flyline Models	54
Fox Mfg.	19
Futura Glass Design	70
Grish Brothers	14
Hathaway, John	18
Hilbig Industries	56
Hobbyoxy Products	56
Hughey Boats	64
Indy R/C	4
International Products	70
In Scale Productions	5
J.V.S. Products	65
Jomac Products	48
K & B Mfg.	69
Kittyhawk Products	13
Mr. G's Products & Supply	63
Model Rectifier Corp.	Cover IV
Morrison Repla-Tech	12
Neptune's Cave	68
Norco Marinecraft	65
Octura Models	71
Orbit Electronics	6, 10, 19, 50, 54
Pactra	6
Peck Polymers	13
Peerless Corporation	68
Phoenix Industries	51
Proctor Enterprises Corp.	12
RN Models	10
RKH Products	66
Radio Controlled Models	66
Satellite City	18
Shamrock Competition Imports	68
Ship Model Emporium	63
Sid Morgan Plans	18
Sig Mfg. Co., Inc.	Cover III
Sterling Models	7, 8, 9
Steve Muck's R/C Model Boat Supplies	63
Stratton Air Engineering	50
Tatone Products	13
VL Products	10
Venture Aero Marine	66
Verdell Instrument Sales	10
Vintage Aero	14
Vortex Model Engineering	64
Wardcraft Marine	65

when you're talking MODEL AIRPLANES & RADIO CONTROL

you're talking flying models

We've packed FLYING MODELS full of goodies, like the great field-tested aircraft designs found every month in FM's pages. Here are designs to suit every taste, pocketbook, and building skill: Radio Control in scale and original designs, sea planes and soaring; Control line ships; Free Flight; Rockets; and more.

FM CLINIC helps readers with their model building and flying problems... FLYING REPORT reviews all the new products, from tiny framis screws to the biggest in kit built planes and radio gear... TRADE WINDS reviews all kinds of new products in detail... AIRMAIL provides FM's readers with a soapbox to their opinions... and FM TIMETABLE is a listing of events of interest to model builders everywhere.

SUBSCRIBE TODAY and have FLYING MODELS delivered right to your home mailed flat in a weatherproof sealed poly-bag.

FM'S UN-COUPON: You don't have to clip your magazine. Put all your information on a sheet of paper.

SUBSCRIBER SERVICE

Mail to Miss Elizabeth Dickson, Circulation Manager, Flying Models Magazine, P.O. Box 700, Newton, New Jersey 07860.

Please include your FM address label to insure prompt service whenever you write about your subscription.

To subscribe: mail this form with your payment, and check ☐ new subscription, ☐ renew my present subscription.

Subscription rates in U.S.A. and Canada: 1 Year, \$8.00, 2 Years, \$15.00, 3 Years, \$18.00. Add \$1.00 per year for all other countries.

ATTACH
LABEL
HERE

FOR CHANGE OF ADDRESS

If you're moving, please let us know six weeks before changing your address. Place FM address label below. Be sure to include Zip Code.

name

street

city

state

zip

F

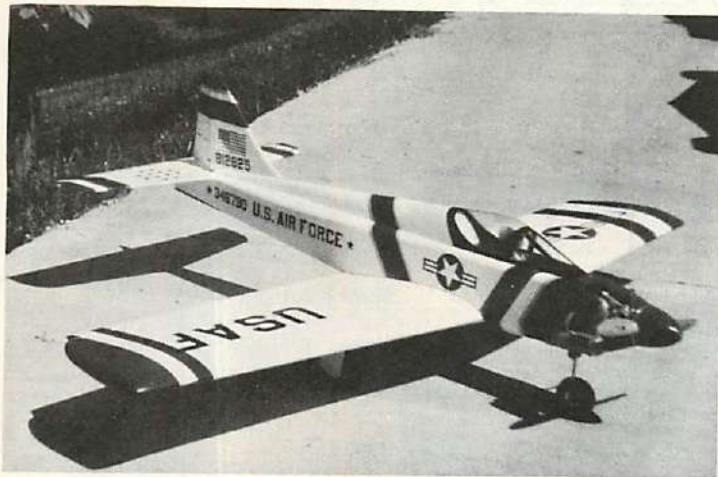
Do not write in this box

Please print or type legibly

**12 VOLT BATTERIES
AND
EMPTY
FUEL CANS
DON'T
MIX**

An FM staff helpful hint.

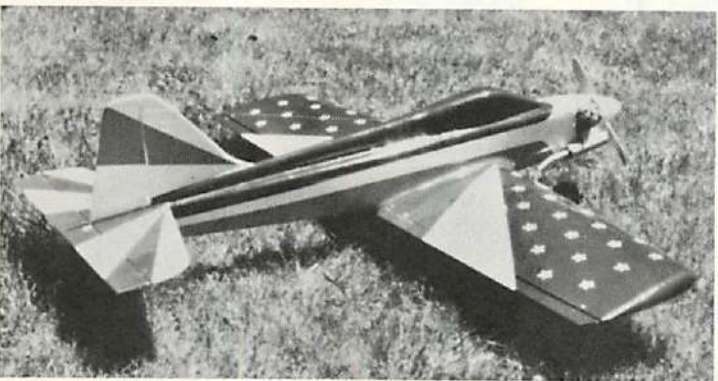
SIG KITS AROUND THE WORLD



Irwin Goldberg (Rockville, MD) says: "Beautiful - Wow! What a docile bird. Those were the words exclaimed as the Kougat took off for its maiden voyage. We put it through snap rolls and anything else we could think of and it performed beautifully. The takeoff was a thing of perfection...."



Larry Sartor (Bartlesville, OK) has a Super Tigre .46 mounted exactly horizontal, without angle, and finds the offset construction of the standard Super Tigre muffler clears the fuselage of his slick Kougat without much cowl cutting. The canopy is attached to a removable top hatch cover.



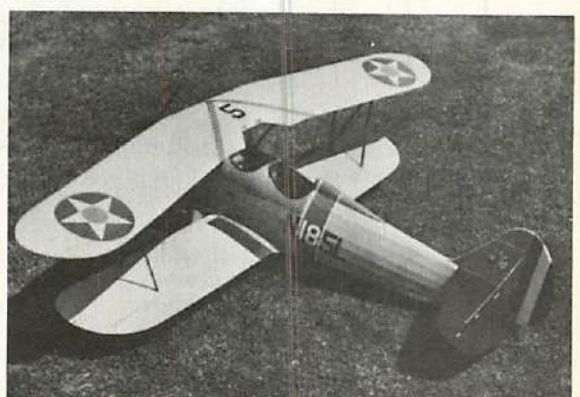
Ed Kurzynski (Ford du Lac, WI) said in a recent letter: "This is my second plane..... The Sig Kougat is one of the best planes on the market today. The performance and maneuverability is unbelievable quick and accurate, yet very gentle to learn on, with take-off and landing a breeze."



Marvin Bliss (Burnsville, MN) plans to make use of all those lakes. His Kadet has Gee Bee floats with steerable water rudders, driven by cables attached to the nose wheel steering mechanism. Has fuselage doped inside, silicone sealed wing saddle for waterproofing. K&B .40 power aids takeoff.



Don Godfrey (Binghamton, N.Y.) added wheel pants to his Clipped Wing Cub for a distinctive appearance. The inverted O.S. Max .40 with a Du-Bro Muffler allows full dummy motor detailing. The yellow and white sunburst color scheme is accented with black pin stripes. This sharp looking effort was built in five weeks. Don writes, "Marvelous kit. It goes together very well...."



W. R. Cooksey (Gisborne, New Zealand) said in a recent letter: "My Liberty Sport is a very nice airplane to fly and has drawn much favorable attention here in N. Z." Bill's model is powered by a Webra Blackhead .61.



RC-26 Clipped Wing Cub \$37.95
RC-35 Kougat \$42.95

RC-33 Liberty Sport \$63.75
RC-31 Sig Kadet \$33.95
GEE BEE 33" Floats \$22.95

See your dealer first. To order direct add \$1.00 postage in the U.S., \$1.50 in Canada. No C.O.D.

PLACE YOUR ORDER FOR SIG'S LATEST COMPLETE CATALOG - \$1.50 POSTPAID

SIG MANUFACTURING CO., INC. Montezuma, Iowa 50171

If you don't know the difference between MRC's 775 and ordinary sets... there's a lot you don't know

Precision machined all metal open gimbal sticks honed to critical tolerances, outlast and outperform plastic open gimbals.

Sticks are virtually free of play at neutral. No zig-zag. Smooth motion throughout.

Sealed conductive pots supported by bearings minimize friction and play.

Ratchet electronic trim control with 22 detents for precise adjustment.

Hinged TX guard prevents accidental turn-on.

Miniaturized receiver only 2½" x 1¼" x ¾" is metal encased for added protection, better shielding.

C-Mos receiver circuitry for low current drain, increased dependability.

Charging jack on the switch harness mounts neatly into the side or bottom of your model.

Compact, lightweight flight pack ideal for ¼ midgets.

Select from 8 different servos including ball bearing coreless motor and mini type.

System includes reverse servo for easier installation.

And there's one more thing you should know. The difference in price between an ordinary 5 channel and MRC's 775 professional system is less than what you'd probably spend for a couple of gallons of fuel. That's a small price to pay for the best. See the difference at your hobby dealer, today.

Send \$1.00 for full color, 44-page, 1977 MRC Model Aircraft Product Catalog

