

C/L World Champs • Rubber Scale • R/C SOS

\$1.25 NOVEMBER 1980
(ISSN 0015-4849) 47506

FLYING
MODELS

flying **models**



PHOTOGRAPHY: RICHARD URAVICH

R/C Boats

C/L Stunter



Goldberg's

P6E Hawk



Λίγα λόγια για μένα.

Είμαι Μηχανικός Ηλεκτρονικός και αυτό είναι το αληθινό μου επάγγελμα εργασίας.

Από μικρός δυο πράγματα μου κέντρισαν το ενδιαφέρον και ασχολήθηκα με αυτά.

Πρώτον ο ηλεκτρισμός και δεύτερον το απέραντο γαλάζιο του ουρανού και ο αέρας αυτού.

Το χόμπι του αερομοντελισμού το πρωτογνώρισα τον Οκτώβριο του 1973.

Μου αρέσουν οι ξύλινες κατασκευές αεροπλάνων και σκαφών από το μηδέν.

Ξεκίνησα να συλλέγω σχέδια, άρθρα, βιβλία και ότι άλλο μπορούσε να με βοηθήσει στο χόμπι από τα πολύ παλιά χρόνια.

Έχω δημιουργήσει μια πολύ μεγάλη προσωπική συλλογή από αυτά.

Από το 2004 άρχισα να ασχολούμαι με την ψηφιοποίηση τους, τον καθαρισμό τους αλλά και να τα μοιράζομαι μαζί σας αφού τα δημοσιοποιώ στο διαδίκτυο (όσα από αυτά επιτρέπεται λόγω των πνευματικών δικαιωμάτων τους).

Σήμερα μετά από όλη αυτήν την εμπειρία που έχω αποκτήσει, αποφάσισα να ψηφιοποιήσω, να καθαρίσω και να ξαναδημοσιεύσω σε ψηφιακή έκδοση και ελεύθερα όλα τα τεύχη του περιοδικού RC Modeler από το 1963 μέχρι το 2005.

Σίγουρα είναι μια πολύ μεγάλη, δύσκολη και επίπονη εργασία αλλά πιστεύω με την βοήθεια όλων σας να την τελειώσω σε ένα καλό αλλά μεγάλο χρονικό διάστημα.

Ζητώ συγγνώμη εκ των προτέρων γιατί τα Αγγλικά μου είναι φτωχά.

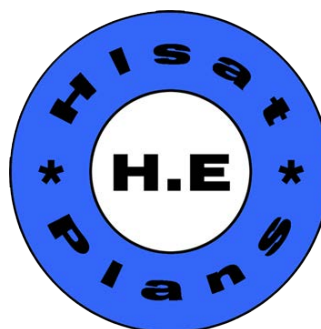
Δεν είναι η μητρική μου γλώσσα γιατί είμαι Έλληνας.

Εύχομαι σε όλους εσάς που θα επιλέξετε να τα συλλέξετε και να τα διαβάσετε αυτήν την εργασία μου καλή απόλαυση και καλές κατασκευές.

Το όνομα μου είναι Ηλίας Ευθυμιόπουλος.(Η.Ε)

Το ψευδώνυμο μου Hlsat.

Η χώρα μου η Ελλάδα και η πολη μου η Ξάνθη.



A few words about me.

I am Electronic Engineer and this is my true work job.

From small two things attracted my interest and I dealt with them.

First electricity and secondly the blue sky and the air him.

The model aircraft hobby met him in October 1973.

I love the wooden structures from scratch airplanes and boats.

I started collecting plans, articles, books and anything else that could help the hobby of many years ago.

I have created a very large personal collection of them.

Since 2004 I became involved with the digitization, clean them and to share with you since the public on the internet (as many of them are allowed reason of copyright).

Now after all this experience I have decided to digitize, to clean and to re publish in digital edition and free of all issues RC Modeler magazine from 1963 to 2005.

Certainly it is a very long, difficult and tedious task but I believe with the help of all of you to finish in a good but long time.

I apologize in advance because my English is poor.

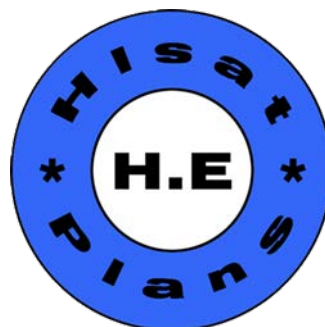
It is not my mother language because I am Greek.

I wish all of you who choose to collect and read this my work good enjoyment and good construction.

My name is Elijah Efthimiopoulos. (H.E)

My nickname Hlsat.

My country is Greece, and the my city is Xanthi.



Flying Models Magazine Editing and Resampling.

Work Done:

- 1)Advertisements removed.
- 2) Plans building plane removed and hyperlinked.
- 3)Articles building plane removed and hyperlinked.
- 4)Pages reordered.
- 5)Topics list added.

Now you can read these great issues and find the plans and building articles on multiple sites on the internet.

All Plans can be found here:

Hlsat Blog Flying Models Magazine (Covers - Plans - Articles).

<http://www.rcgroups.com/forums/showthread.php?t=2445105>

AeroFred Gallery Free Plans.

<http://aerofred.com/index.php>

Hip Pocket Aeronautics Gallery Free Plans.

http://www.hippocketaeronautics.com/hpa_plans/index.php

Contributors:

Scanning by Hlsat.

Editing by Hlsat.

Thanks Elijah from Greece.

flying models

including
FLYING
ACES
est.
1928



november 1980/vol. 83, no. 11/520

aircraft features

- 9 **1980 Controline World Championships**/Bob Hunt
An inside look at C/L's biggest show held this year in Poland
- 13 **On Engines . . .**/Henry Nelson
Henry continues the report on the racing aspects of the World Champs
- 17 **Lincoln Beachey**/Al Wolsky
A semi-scale rendition of a famous barnstorming monoplane
- 22 **Goldberg's P6E Hawk**/Rich Uravitch
An FM Product Review: Balsa, foam and ABS plastic makes for easy building
- 25 **Orange Crate**/Dennis Adamisin
This high aspect ratio Stunter features adjustable controls
- 28 **Steve Wittman's Big X**/Doc Mathews
A rubber-powered version of a homebuilt favorite
- 33 **MRC's Ready-to-Fly to Aircraft**/Bob Aberle
An FM Product Review: They really are
- 37 **Flyin' Things For Fledglings**/Earl VanGorder
FM's beginners column
- 39 **With Model Builders**/Ed Whalley
News and views from all over

r/c model boating

- 42 **Bishop Marine's Phantom Outboard**/Andy Seay
A Dry Dock Review: A hot new outboard outtrigger
- 46 **Prop Stopper**/Don Bilsky
An RCMB How To: Keep your prop on when your nut's off
- 47 **Put more steam in the K&B outboard**
An RCMB How To: Some easy mod's for more go-power on the stern
- 49 **Crash & Burn Protection**/Don Bilsky
An RCMB How To: Eliminate the leaks for safer boating

departments

- | | |
|--|--|
| <p>6 Air Mail
6 Time Table
6 Flying Report
8 FM Clinic</p> | <p>50 Classified Ads
Letter Rip!
Dealer Directory
Ad Index</p> |
|--|--|

on the cover

One of the most colorful and famous planes in history is the P6E Hawk. This month's cover subject is the Carl Goldberg kit of this renowned biplane, built by Rich Uravitch. The pilot in this ship is painted to resemble the author. Kodachrome by Rich Uravitch.

FLYING MODELS (ISSN 0015-4849) is published monthly by Carstens Publications, Inc., Box 700, Newton, New Jersey 07860. Harold H. Carstens, President; Marie L. Merkle, Vice President; Phyllis M. Carstens, Secretary-Treasurer. Application to mail at controlled circulation rates is pending at Sparta, Illinois 62286 and Newton, New Jersey 07860. Copyright © 1980 by Carstens Publications, Inc. Printed in the United States of America.

POSTMASTER: Send address changes to FLYING MODELS, P.O. Box 700, Newton, New Jersey 07860.

SUBSCRIPTIONS: U.S.A. and possessions: \$10.00 per year, \$18.00 for two years, \$25.00 for three years. Single copies \$1.25. Postage outside U.S.A. \$1.50 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.

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. FLYING MODELS assumes no responsibility for unsolicited material. Payment is made upon publication. The contents of this magazine must not be reproduced without written permission from the publisher.

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

Harold H. Carstens
publisher

Robert Hoeckele
managing editor

Bob Hunt
associate editor
Robert Aberle
contributing editor R/C
Donald Bilsky
contributing editor R/C boats
Edward Whalley
contributing editor news
Wayne M. Daniels
advertising production manager
Judy D. Lovas
office manager and bookkeeper

Circulation manager: Linda Jones

Circulation: Jeanne Siple, Carol Heitman,
Tina Boettcher

Advertising production: Janet Bodemann,
Miriam Lee, David Case, Deborah Koch

Reader and plan service: Catherine Streeter

Dealer service: Judith E. Koester

Computer services: Theresa Price

Bookkeeping and mail: Joann McMickle,
Robin Burke

Digital Edition: Hlsat

Sharing and goodbye

One of the things that makes friendship is the ability to share, and sharing doesn't always refer to material things. It also means experiencing new ideas, feelings, and events together. That's why, after my five years here at FLYING MODELS, I feel a bond of friendship every time I meet you, FM's readers, at shows, contests, or local flying fields. A magazine is more than just a pile of paper with ink on it; it's a living thing that has to relate to the interests of its readers and act as a sounding board for their thoughts and ideas. Your shared thoughts and ideas over the past five years have served not only to make FM a better and more successful magazine; they have also made me feel as though I'm talking to friends every month rather than just readers.

The time has come for this reporter to move on to a different facet of the hobby industry. It's hard to say goodbye to friends, but knowing that FLYING MODELS will be in the capable hands of Bob Hunt and the rest of the Carstens crew makes it a bit easier. "Thank you" to everyone who has helped make this always-hecky job easier. That includes authors, advisors (both sought and unsought), advertisers, and flying buddies. It's been a wonderful five years—BOB HOECKELE.

Air Mail

readers' forum

Where's Wylam

In your August 1980 issue of FLYING MODELS there is an article on the Beech Staggerwing written by Gene Sellers in which he refers to a book entitled "The Best of Wylam, Book I." Would it be possible for you to tell me where I can purchase this book?

GERALD E. KUHN
Miami, Florida

The Best Of Wylam, Book I is available through Model Airplane News magazine, 837 Post Rd., Darien, CT 06820—Ed.

Beavertail balancing

I received your set of plans for "Old Beavertail" that were published in the May 1980 issue of FLYING MODELS and I have a question. There is no C.G. noted on the plans and so I assume that the C.G. is located between $\frac{1}{4}$ and $\frac{1}{2}$ of the wing chord as usual. Am I correct in this assumption? The ship is going together very easily and I anticipate no other problems. Keep up the good work as I enjoy your magazine very much.

GEORGE SHAFFER
Lemoncove, California

You're right it's not there. Yes, a good starting place for balance on this ship is approximately $\frac{1}{4}$ of the chord. This may give you a slightly nose heavy model for the first flight. Better this way than to try and fly a tail heavy ship the first time out. Remove weight until the desired sensitivity is achieved—Ed.

Hannan's Hangar speaks

I simply had to express my appreciation for Bob Hoeckele's "Appreciation" editorial in the Sep. 1980 issue of FM. The message is loud and clear.

BILL HANNAN
Escondido, California

Ballerina plans

After several moves and the packing and unpacking they entailed. I don't know how many times I ran across an issue of the October 1959 FLYING MODELS No. 309. I bought it when I was living in Challis, Idaho, some twenty years ago.

There were four models featured in that issue. I am building one now and will start one of the others when I'm finished with the first.

The model that I need help with is Charles Lickliter's "Ballerina". The plans in the magazine are a little incomplete. Is there any way that I can possibly obtain a set of the plans to this model?

KEN SLANE
Woods Cross, Utah

Try writing to Mr. Lickliter at 5237 Honey Comb Lane, Indianapolis, Indiana—Ed.

Flying Report

news and comment

The plane needs a name

As the story goes, sometime ago it was voted to name the F-16, The "Falcon". The name never became official because of what appears to be weak reasons: There is a French Falcon executive transport and the Air Force Academy mascot is a Falcon.

All this is pre-empted by the fact that there was once a very famous Curtiss Falcon in the U.S. Army Air Corps. It even carried the U.S. Mail at one time.

All other new military aircraft are named, such as . . . F-15 Eagle, F-18 Hornet, A-10 Thunderbolt II, F-14 Tomcat, etc. Many F-16's are flying but have no name!

I hereby propose that all publications refer to the airplane as the F-16 "Falcon". If this is not done, the airplane will be called by many other names, resulting in a "fowled" up situation. This is not the first time that a military airplane has been unofficially named. What is a better one-two punch than the "Falcon" and the "Eagle"—ROBERT MORRISON, Repla-Tech International.

Hall of Famers named

The National Free Flight Society has announced the recipients of the Free Flight Hall of Fame Award for 1980. These noted individuals have in many ways contributed to the development and continuity of free flight model airplane activities throughout the U.S.A. and the world. The Society is proud to recognize their achievements.

Louis Garami (deceased), innovator of many model building techniques and designer of many small models.

Ben Shereshaw, developer of the famous Bantam engine and designer of many esthetically pleasing model airplanes.

Henry Cole, a rubber model proponent who created designs that performed exceptionally and helped set the standard for others to follow.

James Cahill, a world renowned rubber model designer/builder. 1938 Wakefield winner with his famous Cloudhopper design.

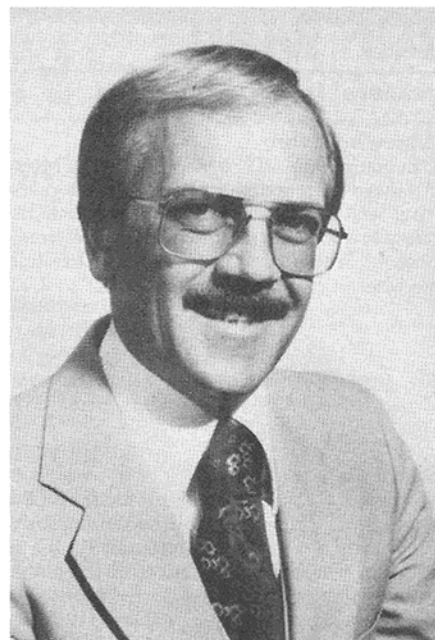
Wallace Simmers, provided hand-launch and rubber model designs that are still popular today. A manufacturer of model kits/supplies to all phases of modeling.

Top Flight addition

Top Flight Models, Inc. announces that G. Scott Christensen has joined their staff in the new position of Vice President of Manufacturing. He joins President Sid Axelrod and Vice President Bob Nichols on the Top Flight executive staff.

Christensen's duties will include the streamlining of production capabilities, new products, quality control and personnel supervision. He will also be involved in new model design and development for the Chicago based firm. Christensen has been involved in model manufacturing in the hobby field for 12 years and has been involved in all phases of modeling from hand-launched gliders to radio control.

The Minnesota native has engineering experience in model aircraft and airframe design as well as kit design. He has served as a design engineer for the consumer power tool industry and holds a patent for power tool attachment design. Christensen, a graduate of California State at Fullerton, brings to his



position 30 years of active involvement in the hobby. He has had numerous articles published on aircraft design and construction. In the early seventies he was co-founder of the League of Silent Flight and holds the distinction of being cardholder no. 1.

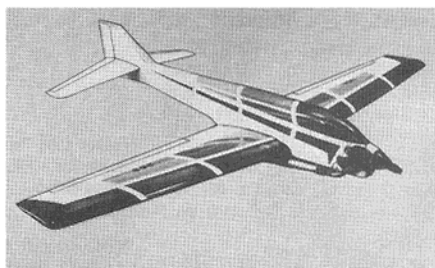


MIDWEST PRODUCTS, CO., 400 S. Indiana St., Hobart, IN 46342, has released their new kit, the Pattern Master. It is a simplified pattern trainer, designed for use with .40 size engines. Features include machined parts, clean die-cutting, molded canopy, aluminum engine mount, steerable nose gear, plastic hinges, Cam-Loc fasteners for the wing, control linkages, full size plans and instruction manual. The wing has a span of 60" and an area of 720 square inches. A four channel radio system is required. For more information write to the address above.

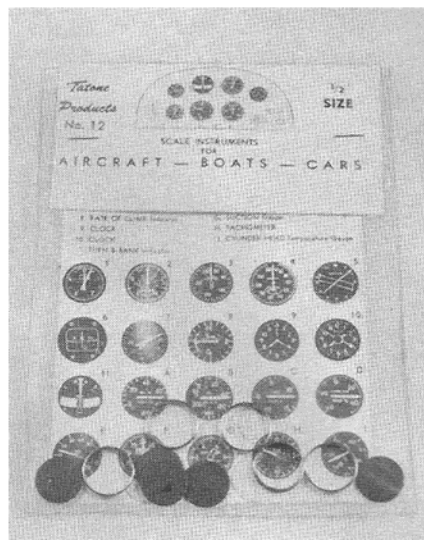


FLYLINE MODELS, INC., 2820 Dorr Ave. (B-11), Fairfax, VA 22031, introduces their kit of the nostalgic Quaker Flash in half scale for .020 power. This classic old timer has a 34½" wingspan and is designed for single command R/C operation or for Free

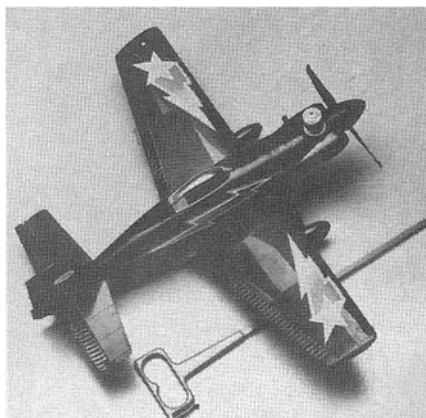
Flight. Herb Clukey is the designer of this excellent schoolyard flyer. The kit contains rolled plans, decals and printed wood. The retail price is \$15.95. For more information write to the address above.



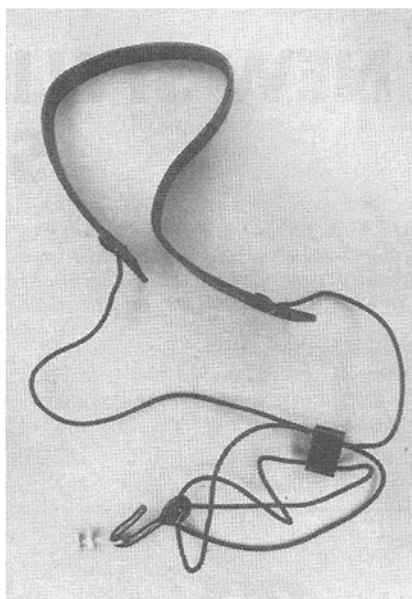
W-K HOBBIES, 19 N. Main St., Centerville, OH 45459, has released their kit of the Tiporare pattern ship. The kit features a molded fiberglass fuselage that is joined and double taped in the mold for guaranteed straight alignment. Also featured in the kit are precision cut foam wing and stab cores, plywood firewall and wing mounts a full-size template sheet and a fully illustrated and detailed instruction book that carefully explains every aspect of the construction. The Tiporare spans 65" with 720 square inches of wing area and is designed for use with a .60-.65 size engine. The retail price of this kit is \$84.95 for the standard kit and \$134.00 for the deluxe kit. Write to the above address for more information.



TATONE PRODUCTS CORP, 1209 Geneva Ave., San Francisco, CA 94112, is again marketing their line of scale instrument kits. The new instrument kits have been improved and three new sizes have been added to the line. These new sizes are designed for the 1/4 Scale models that are becoming so popular. Each kit contains five machined metal instrument cases that are polished and plated, precision fitting lens and backing plates and a selection of twenty typical instruments along with instructions. These kits are available at your hobby shop or direct from Tatone. For more information write to the address above.

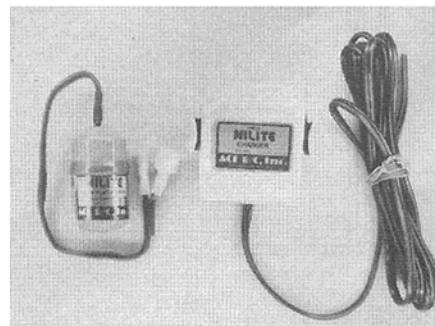


THE TESTOR CORPORATION, 620 Buckbee St., Rockford, IL 61101, introduces a new starting system for their line of ready to fly/run models. The new Zip Starting System consists of a 13" long x 1/4" wide stick that is inserted through the nose of a Testor plane or an opening in the frame of a Testor car. Teeth on the Zip Stick engage a gear connected to the crankshaft. The stick is then pulled back through the slot, turning the engine over five times. This procedure is repeated until the engine starts. The key to this system is in the clutch design. When the stick is inserted and pushed through the slot, the clutch disengages the gear and the Zip Stick slides smoothly into place. The clutch then engages, the Zip Stick catches the starting gear and the system is ready to work. Should the engine start with the stick in place, the clutch allows the starting gear to spin freely on the crankshaft thus preventing engine stall-out. Using this system, the modeler does not have to touch the propeller in any way. Fingers and hands are not involved with moving parts. Testor plans to market five planes and seven cars with the Zip Starters. All new, enclosed boxes and new stock numbers will reflect the changeover. For more information, write to the above address.



ACE R/C, INC., Box 511, Higginsville, MO 64037, introduces their new Neckstrap for R/C transmitters. The strap is adjustable in length and features quality construction throughout. The strap attaches to the trans-

mitter with a spade bolt. The retail price of the Neckstrap is \$4.98. Write to the above address for more information.



ACE R/C, INC., Box 511, Higginsville, MO 64037, introduces their Nilite Ni-CD Glow Plug Igniter and Nilite Charger. The Igniter is a small, light-weight unit to attach to your glow plug for starting. The source of power is a 1.2 AH 1.2V nickle cadmium cell which has more than enough capacity for any normal flying session. The Nilite Charger is designed to be used with the Igniter. It delivers 1.2V at 120 MA, or an overnight charge rate for the Igniter. No connector is furnished. The Igniter retails for \$9.95 and the charger for \$5.95. A combination package is offered for \$14.95 with the wiring done for you. For more information write to the above address.

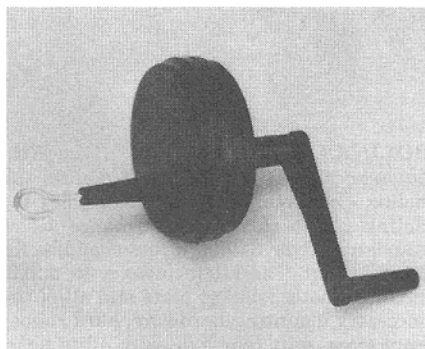
REPLA-TECH INTERNATIONAL, 48500 McKenzie Highway, Vida, OR 97488, offers the scale builder or airplane enthusiast a variety of services. They are known mainly for their line of Scale Drawings. Featured among these drawings is the work of Robert C. Morrison, covering the latest military and civil aircraft, ships and military vehicles. These are prepared on either a 17"x22" or 24"x35" format. Scale drawings of raceplanes of the National Air Race era are prepared by Robert S. Hirsch. One of the most well known aircraft draftsmen in the business, Bjorn Karlstrom, has also prepared scale drawings for Repla-Tech. World War I and II aircraft scale drawings published by Model and Allied Publications LTD. are also offered. Repla-Tech provides up-to-the-minute scale drawings on all new aerobatic airplanes. Their publication, "Aerobatic Airplanes" is currently in its second printing. R/C flying model plans are a new service being offered by this company. Write to the above address for a complete catalog and price list on the many services available.

REPLA-TECH INTERNATIONAL, INC., 48500 McKenzie Highway, Vida, OR 97488, introduces Repla-Foto packets. Repla-Tech has a varied assortment of photographs that may be of value to the model builder or photo collector for obtaining the details of a given airplane. All black-and-white prints are semi-gloss and standard size 3"x5". Each print sells for 25¢. All color prints are glossy and standard size 3"x5". Each color print sells for 75¢. Each packet contains prints of a specific airplane unless otherwise noted in the catalog. Prints may be purchased by the packet only. With purchases in increments of \$10.00 you may select \$1.00 worth of additional prints free of charge. For more information and a catalog of print packets available, write to the address above.

NORTHEAST AERODYNAMICS, 568 Main St., Haverhill, MA 01830, introduces the Bel-Air .40 sport biplane. It is a larger than usual scale-like ship that was designed for "barnstorming" type flying. Features of the design include a 45.5" wing span with an area of 675", bolt-on wings, plug-in cabane wires, all balsa wing and fuselage construction, slotted fuselage sides for exact bulkhead placement, easy-to-read plans and instructions, simple wing construction, semi-symmetrical airfoil with jig holes for easy and accurate building and all machine cut parts. The Bel-Air .40 is designed for four channel operation and .40 size motors. The retail price is \$69.95. For more information write to the address above.

HOBBY HIDEAWAY, RR 2, Box 19, Delavan, IL 61734. Now your young child can build models two-gether with you! From the desire of a son to be able to build a model all his own and a Dad who wanted his boy to be interested in model building and flying, these kits came into being. They are an ideal introduction of the new model builder to the joys of model creativity. All models are machine cut to shape from selected wood and feature positive alignment of parts. All needed hardware is included, but some additional items such as glue, sandpaper, and hammer are not supplied. An instruction sheet containing both printed instructions and sketches assure the ease of assembly. There are no power requirements other than a child's fingers or the breeze, a pollution free, non-hazardous power source. The model may be built and a color finish applied in any way the young builder chooses — felt markers, paint, or ball point pen. Upon completion, each model is sturdy and will be useful in developing additional learning experiences.

SIG MANUFACTURING CO., Montezuma, IA 50171, has released a 1/4 Scale Engine Kit to dress up the appearance of their big Piper Cub. The kit is suitable for any model of a plane that featured an exposed 65 h.p. Continental or Lycoming engine. The engine kit consists of four matched, vacu-formed moldings for duplicating the full-scale engine's cylinders, exhaust pipes and top shroud. The moldings are made from ABS plastic which is easy to cut out, glue and paint. Sig-Ment glue, dope thinner, MEK or cyanoacrylate adhesive are recommended for the assembly of the parts. Dope, Epoxy or enamel can be used for painting. For further information, write to the address above.



GAYLORD PLASTICS, INC., 1643 19th St., Santa Monica, CA 90404, presents their 6:1 Winder for light rubber powered models. The 6:1 Winder is injection molded of High Impact Styrene for toughness. It weighs less than one ounce and has the capability of

winding eight strands of 1/8" rubber 18" long to over 600 turns. The price of the 6:1 Winder is \$3.95 postpaid from the address listed above.



STERLING MODELS, INC., Philadelphia, PA 19134, announces their new KID series of rubber powered models that are engineered for the beginning modeler. Included in the series are the Aeronca Champion, Sonic Turtle and Luscomb Sedan. The kits are complete except for glue and paints and feature die-cut balsa parts, prop and wheels, rubber motor, color tissue, clear celluloid for windows, all necessary hardware and colorful decals. The packaging notes, "reading skill required" which is important as these kits also feature a separate sheet of instructions explaining balancing, trimming, flight instructions and launching techniques. Write to the above address for more information.

AMERICA'S HOBBY CENTER, INC., 146 West 22nd St., New York, NY 10011, has released their new catalog for model cars. This catalog contains all the latest equipment available, with the factory numbers and descriptions of pictures. It has been alphabetized by factory name so that the race car enthusiast can readily locate parts and prices. The cost of the catalog is \$1.50 and it is available at the above address.



BOLINK/CHAMPION, 420 Hosea Rd., Lawrenceville, GA 30245, introduces the Bolink Conversion Kit to update your old Bolink car to current performance series standards. Over \$40.00 of merchandise for \$35.00 retail. The kit includes a 40 m.p.h. modified motor, shaker plate and all of the necessary mounting hardware, hard rubber front tires, split rear axle with oilite bearings, high speed gear change (spur and pinion) and easy to follow instructions. For more information write to the address given above.

FM Clinic

readers' questions staff tips readers' tips

Contributions to *FM Clinic/readers' tips* should be sent to FLYING MODELS, P.O. Box 700, Newton, NJ 07860. \$1.25 per column inch (\$5.00 minimum) will be paid upon publication.

Staff tip Foam sanding blocks

Because a rigid sanding block can dig into the surface of a large, curved, sheeted area, I've been using foam blocks to eliminate this problem for some time now. The foam is of the type found in model airplane wing cores, and the scrap pieces or "cradles" from a kit type core are an excellent source of foam blocks. This type of foam is known as expanded polystyrene and can be found in larger quantities at lumber yards and packing houses. It is used primarily as insulation. Most of the blocks that I make up are approximately 1" thick, although thinner blocks are desirable for working on extremely curved areas. To glue the sandpaper to the foam block, use a cement that will not attack and melt the foam. I've been using 3M's #77 Spray Adhesive and water-based contact glues with good results. In a pinch, epoxy will do, but it cuts down on the ability of the block to bend around curves. Start out by making a block the size of a new piece of sandpaper, and then cut it into smaller blocks as you need them. In use the foam blocks will allow a full-contact sanding of curved surfaces. I've been using these blocks for sanding the sheeting on foam cored wings, long balsa blocks on the fuselage, and for wet sanding of the final clear coat of finish prior to rubbing. Cut into very small pieces, these blocks can be used for detail sanding in tight areas. An added plus is that the soft edges will not leave dents or dings in adjacent areas if they are inadvertently hit while you are sanding—BOB HUNT.

Hanging up to dry

D.L.: I find myself trying to dope ailerons, rudders and loose surfaces without a place to park them until dry. Any suggestions?

ANSWER: Many modelers have solved problems such as this by sticking small straight pins into the edges of the structure, the pin serving as a handle of sorts for holding. It can then be hung from an overhead rack or line by nipping the pin's head with a small alligator clip or such device.

Diamond leading edges

G.P.: Why are leading edges often of 1/4" square set on edge?

ANSWER: To achieve a rounded leading edge with the least trimming, and the greatest mass of wood remaining for impact strength. A few strokes of a razor plane will blend it into the airfoil section. As an additional bonus, the usual 1/16" leading edge sheeting is able to butt-join against it with the least degree of beveling. And the notched fit of the wing ribs helps align the ribs themselves to the height of the leading edge.



PHOTOGRAPHY: BOB HUNT AND DAVE ELIAS

1980 Controline World Champs

An inside look at Controline's biggest show. Poland was the host country/**Bob Hunt**

Czestochowa, Poland, was the host city of the 1980 Controline World Championships held on the dates of July 12th through the 18th. This was my second venture into the world of international modeling as both a competitor and reporter. I have mixed emotions as I am writing this, for there are actually two separate stories connected with this affair. One of course is the competition itself. The conflict between the competitors within their individual events was in the highest of sporting standards and I am pleased to report that, in this regard, the contest was an overwhelming success. The other story to be told is not as bright. It is one of misunderstanding and disorganization. It would be easy to overlook the problems connected with the running of such a large and multi-facted undertaking and to just say the "they did the best they could," but they did not. The governing body of international modeling is the Federation Aeronautique Internationale and this organization is responsible for, among other things, the site selection for World Championships. They must consider the proposals submitted by various countries and choose the most desirable one. Among the factors that must be

considered before choosing a location is the ability of that country's national aero club to handle the various tasks required in organizing a contest of this magnitude. Housing, feeding, transporting, and informing a group of 300-500 people who, for the most part, don't speak a common language are only some of the responsibilities, and they don't even begin to encompass the problems of running the contest itself. Herein lies the undoing of the 1980 gathering.

The flying site itself was located on the stadium grounds a short distance from the downtown area of Czestochowa. As far as flying sites go, this one was a model of perfection. The speed and Team Race circles were built sometime before the contest and I think they had seen some use in competition prior to our arrival. Surrounding these circles were a number of permanent cubicles for use as work areas. Each country was assigned its own cubicle for use throughout the contest. These pit areas were spacious and well designed, with a workbench in each and adequate seating. The circles themselves were fenced around for spectator protection and had bleacher seating around one side. The Combat circles were laid out in the grass

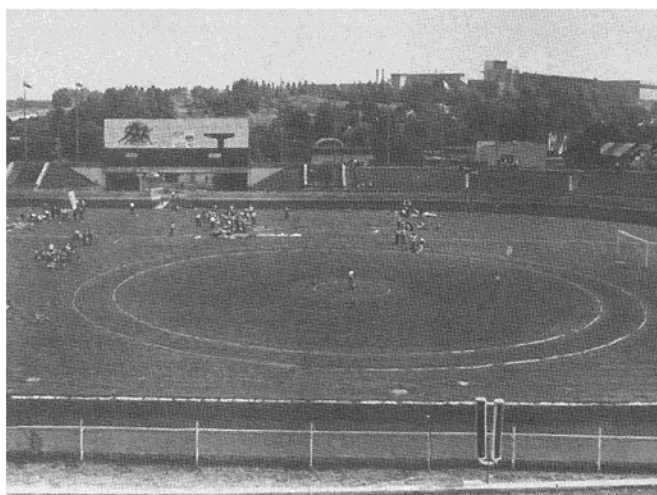
infield of the stadium, and aside from some strange wind conditions (caused by obstructions near the circles) were very satisfactory. The spectators were treated to an excellent view of the Combat circle by virtue of the stadium seating. A brand new circle was constructed for the Stunt event. Again the only problem was the presence of the same strange wind conditions. The individual events were spaced so that a spectator could take in the whole show without walking a great distance. Crowd control was no problem either as the Polish people proved to be extremely courteous.

So, what's the problem, you ask. There was adequate lodging, good and plentiful food and a superb contest site. Well to the observer everything looks good, but just ask one of the competitors about the practice or training facilities. They were essentially non-existent! Oh, we were assigned two official training areas: a half concrete, half high grass area directly adjacent to a large apartment complex; and an all-dirt hard pack surrounded by trees.

The grass area would have been almost tolerable if the contest management had only provided the proper facilities for the



The Stunt circle was constructed just prior to the competition. This photo was taken from the top of the adjacent stadium. The Team Race circle is shown here during a qualifying heat (*below*). Note the wire fence. 1980 World Champion in Controline Stunt, Les McDonald (*opposite page*).



The grass infield of the stadium provided excellent facilities for the Combat event. This area was later used for the awards ceremony and the closing air show. Charlie Lieber starts his Speed ship while Bob Spahr holds (*below*). Note the spectator seating on the perimeter.



competitors and for the interested spectators. But problems arose when the children of the apartment occupants came to play at our "Official Training Site." Oh yes, the area was posted with signs but they were foolishly only in English! The Berea tar pits site would also have been usable if the weather had cooperated. Due to the heavy rains (a daily occurrence) the dirt-hard-pack turned into an unflyable mud-pack. Our first reaction to the practice situation was to try and use the official contest site at the stadium. When we pulled up to the closed gate and saw the Militia guards we started to get the picture. No practice on the contest site was allowed throughout the meet. A complaint was lodged with the organizers to try and get a guard for the one useable practice site, but none was assigned. Now if you are not a competitor, all this talk about the lack of training facilities may seem unimportant, but to a contest flyer who is used to flying several flights a day and who needs time to re-trim and adjust his equipment to local weather conditions after traveling half way around the world, it is most important. Nuff said.

The World Championships saw the return of the Eastern Block countries to competition

after their withdrawal for political reasons in 1978. It's a shame that politics has to invade the world of sports and I could go on about that but I've put my soapbox away for this month.

The big news for the United States was the Gold Medal placing in the Stunt event by Les McDonald, and the team victory that was cinched by the Bronze Medal performance of Bill Werewage coupled with Wynn Paul's fine tenth place finish. The author finished with a Silver Medal to give the U.S. a one-two-three finish in the Stunt event. This was the second time in the event's history that this has been done; the first time was in 1976 in Holland.

Les McDonald flew the same model that won for him in 1976. The Stiletto 660 is still a work of art and is now being powered by a Stan Powell custom built K&B .40. Bill Werewage has returned to his Jet styled USA-1 design, that won him two consecutive World Championships in 1970 and 72. The retiring champion (me!) flew a new version of the Genesis design. Wynn Paul, in his first appearance at a World Championships, flew his own design, Pampawagon. The stunt event is run over a four day period; the first

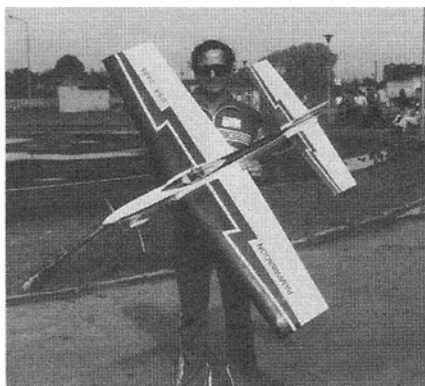
three days are the qualifying rounds. There are two rounds for qualifying flown over a three day period. The first round is flown the entire first day and half of the second day. The second round begins around mid-day on the second day and runs through the third day. The highest scoring flight of the two is added to your highest finals flight for a total score. Many of the competitors feel that the qualifying round score should not count and that the two finals flights should be added together. The problem cited is the possibility of an early draw in the qualifying rounds producing too low of a score if the judging "balloons" on the next days flyers. This could put a contending flyer mathematically out of the running.

In Team Racing the United States almost had another gold as Walt Perkins and J.E. Albritton just missed with their bid. Henry Nelson, our "On Engines" columnist, was also competing in Team Race and has the full story on the event elsewhere in this issue.

In a first ever U.S. placing in the Combat event, Washington state's own Phil Granderson fought to a Bronze medal award. Steve Hill was Phil's pit man and though the FAI doesn't consider the Combat event a team



Bob Hunt starts the engine in his Genesis .40 while Bill Werewage holds. Note the muddy condition of the area. Practice facilities in general were of very poor quality. J.E. Albritton and Walt Perkins flew to a well earned silver medal placing in the Team Race event (**below**). Henry Nelson has the whole story of the Team Race event in his column, elsewhere in this issue.



Lexington Kentucky's own Wynn Paul flew in his first World Championships. His score in the Stunt event was the deciding factor in the U.S. Team victory. Wynn placed a fine tenth. Phil Granderson and his pit man, Steve Hill (**below**). Phil is the first United States team member to win a medal in the Combat event at a World Championships. A fine effort.



Les McDonald shows good form as he signals for the start of his pattern during one of the final rounds of the Aerobatic event. Les was the 1976 World Champion too. He's a formidable competitor. The U.S. Stunt Team is shown here going through technical inspection of their models (**below**). Bill Werewage is about to place his U.S.A.-1 design on the weighing scales.



sport, the work between these two was awe-inspiring. George Cleveland from New Orleans flew to a fine ninth place tie, with Paul Curtis of Florida running out our Combat teams work with a 40th place finish.

The picture in the speed event was not rosy at all. Everyone that I talked to complained of a power loss from their normal runs at home. They never did solve the problem completely but still managed to put up reasonable runs. Although none of the speed team placed in Medal territory, it is to their credit that they never stopped trying. Our highest finisher in the speed event was Californian Bob Spahr, who turned 260.492 k.p.h. for seventh. New Jersey's Charlie Lieber had a best run of 257.326 k.p.h. for tenth. Luke Roy stepped into a team slot when the ailing Chuck Schutte could not attend, and posted a 255.138 k.p.h. for twelfth place.

At the end of the competition, the organizers had scheduled an airshow that took place directly over the stadium. Low level aerobatics were performed by a Polish Air Force jet and by a privately owned Zlin Akrobat. A demonstration flight was flown down inside the stadium by a full scale helicopter that left us all twitching somewhat. The Awards Ceremony followed the demonstration with all of the competitors lined up on the field behind their respective flags. It was an inspiring sight and it left us once again with a good feeling inside for contests of this type.

The last official event was the Banquet

Farewell Party and it was here that the competitors let-down after an intense week of flying. A good time was had by all and old friends renewed their vows to meet in two years time to do battle once again.

A report of this event would not be complete without mentioning the work done by our Team Manager, Assistant Manager and supporters. Don Jehlik took on the post of Manager this year. Don has a long history of involvement in world competition. He was a member of the winning Team Race duo along with Herb Stockton. More recently he has served on World Championship Team Race Jurys. The post of manager is one of hard work for very little thanks. So from all of us on the Team, Don, thanks and well done. The same goes out to Bill Lee, the assistant manager. Bill was in charge of the logistics for the team, no small matter when you consider the fact that 29 people had to fly from different cities throughout the U.S. and then travel by van through East Germany and Poland. Providing the lodging and feeding this troupe was a monumental task. Ya did good Bill. A very special thanks goes to David Elias from the members of the stunt team. Dave had originally come along as a supporter but when he saw the aerobatic contingent he knew it was here he was needed. He became our "official" Stunt Team Manager, taking care of the many details that came up and helping us to keep our minds on the job at hand. We can't tell you enough how much you helped, Dave.

World competition is still where it's at. ☺

Results of the 1980 Controline World Championships Individual results

F2A Speed

- | | |
|--------------|--------|
| 1 P Constant | France |
| 2 P Fontana | Italy |
| 3 G Hicc | Italy |

F2B Aerobatics

- | | |
|--------------|--------|
| 1 L McDonald | U.S.A. |
| 2 R Hunt | U.S.A. |
| 3 W Werewage | U.S.A. |

F2C Team Race

- | | |
|---------------------------|----------------|
| 1 H Geschwender/J Mau | Denmark |
| 2 J E Albritton/W Perkins | U.S.A. |
| 2 S Smith/C Brown | United Kingdom |

F2D Combat

- | | |
|----------------|----------|
| 1 O Doroszenko | U.S.S.R. |
| 2 B Gysbertsen | Holland |
| 3 P Granderson | U.S.A. |

Team results

F2A Speed

- | |
|----------|
| 1 France |
| 2 Italy |
| 3 U.S.A. |

F2B Aerobatics

- | |
|----------|
| 1 U.S.A. |
| 2 Japan |
| 3 Italy |

F2C Team Race

- | |
|------------------|
| 1 United Kingdom |
| 2 Denmark |
| 3 Hungary |

F2D Combat

- | |
|------------|
| 1 U.S.S.R. |
| 2 Holland |
| 3 Italy |



The United States Race Team. From left: Walt Perkins, J.E. Albritton, Jed Kusik, John McCollum, Henry Nelson and Doctor Laird Jackson. Behind them is the Team Race juries tower. Note the digital readout clocks. For the first time in World Championship history, China fielded a model airplane team (**below**). Their first effort was one of very high standards in both flying and equipment. They placed well in all events.



The United States Combat Team. From left: Paul Curtiss, Steve Hill, George Cleveland, Jim Ong and Phil Granderson. R. Baeter from Holland is shown here holding his lightweight stunter (**below**). The United States seems to be the trend setter in the Stunt event. The United States Stunt Team is shown here with their planes (**bottom**). From left: Bill Werewage, Bob Hunt, Wynn Paul and kneeling is Les McDonald. A winning crew.



On Engines . . .

Columnist and international C/L Team Race competitor, Henry Nelson, relates the story of that racing event at the C/L World Champs in Poland to us. He's got some interesting comments.



This photo sequence clearly shows the plane flown by the pilot from the United Kingdom hitting the lines of Walt Perkins' plane during his pit stop. This incident prevented a possible win for the U.S.

I can't say it was the worst ever World Championships—I haven't seen them all. I hope I'm never subjected to worse. The story goes like this.

A few hours after last month's column was deposited in the mailbox Doc, my wife Kathy, and myself were on our way to Frankfurt via a plane change in London. The stupidity was ready to begin. As usual, I had all my tools and engines in my toolbox which I keep as carry-on luggage. This always impresses airport security as their x-ray machine sees a big blank. Usually I have to open all the little boxes to show that I have the minimum of guns, bombs, etc.

This time my right to be carrying tools was questioned. The geniuses at the machine deemed me "confused" when I couldn't immediately provide documentation concerning said tools, but I'm not totally stupid. I flashed my AMA license at them and won immediate release. They didn't even open the lid of the toolbox.

After the usual non-restful flight we arrived at Frankfurt which, this being my third time there, was looking like an old friend. Our Fiesta automobile was quickly acquired and not so quickly stuffed with luggage, airplane boxes, and three people. After a short drive we were at the East German border.

The crossing took two hours for no reason other than inefficiency. Fortunately we didn't have to open all the luggage.

We were trying for a 10 or 11 o'clock arrival in Wroclaw, Poland, where we'd join up with most of the rest of the team. A real snag appeared when we found the eastern border crossing closed for construction and we had to drive about an hour and a half north to another crossing. Later we found out that it was illegal for foreigners to take that road, but we didn't know any better. The Polish border crossing only took about an hour and with the Doc driving we were off to Wroclaw. Oops, what's this waving red light ahead? 109 k's in a 100 zone? Honest ossifer we're just poor dumb Americans.

It seems the boys in blue (gray actually) wanted 1000 zlotys for Doc's indisgression. Since we hadn't yet exchanged any money we didn't have any Z's. Finally, disgusted, they let us drive off. They didn't want Doc and they didn't want to leave their hunting ground to accompany us to the nearest all night bank. At a proper 100 k, after dodging a monster lake in the road (I haven't mentioned the rain) we arrived at the Grand Hotel in Wroclaw at 3am.

To our mazement we were met by assistant team manager Bill Lee who we had expected would by now be fast asleep. The team caravan of five VW buses had pulled in not long before us as they had also been delayed by the closed border crossing but had been ordered to drive back half way across East Germany to stay on a "legal" transit route. In the rain the Fiesta of Perkins, Albritton and Knoppi had hydroplaned through that puddle I had just avoided, mowed down 100 feet of shrubs and rolled over in the ditch. All three escaped uninjured but the thought occurred that maybe they've used up all their good luck just staying alive. That thought turned out to be too right.

Back at the sidewalk in front of the hotel as we listened to Bill, we were accosted by various 3AM types who want to change money, want western cigarettes, and as Kathy was sorting the luggage while we park the car, tried to walk off with Doc's suitcase. A quick

screech puts an end to the attempt, but what a welcome to Poland.

Oh yes, while trying to locate a phantom parking lot, we met up again with the cops. This time I didn't signal for a left turn and they swooped down. We tried to explain that if they want our passports they'll have to come back with us to the hotel. Thoroughly disgusted they drive off.

The next day, after a short night's sleep we stayed behind with Perkins and Albritton while they track down a replacement car. Then in the afternoon we shove off for Czechochowa. They follow in their Polski Fiat with instructions to keep it shiny side up.

The rain of the night before reappears but the road is a crowded 2 lane. And what a crowd. In the US I don't expect to see many horse drawn carts. In Poland the horse still seems to be a popular power source. On the roads and in the fields one or two horsepower implements are the rule. Throughout our stay in Poland the clop, clop, clop of the horse drawn wagon was a common sound.

Finally we arrived in Czechochowa and located the dorms. They weren't too bad as dorms go so there was hope that the worst of the trip was over.

We had arrived early (Wed.) so we'd be acclimated and have things sorted out by the official arrival on Sat. Still the weather conspired against us as on Thursday the wind was really tossing around the trees. We checked out the practice sites and it appeared that T/R had the best situation with two circles in an almost too small parking lot.

The next day was barely acceptable so we put some of the fleet together to see what would run. As we had feared the only steady runner was our Perkins Shadow airplane. Our other planes—a spring's worth of work—still have fuel systems that aren't really right.

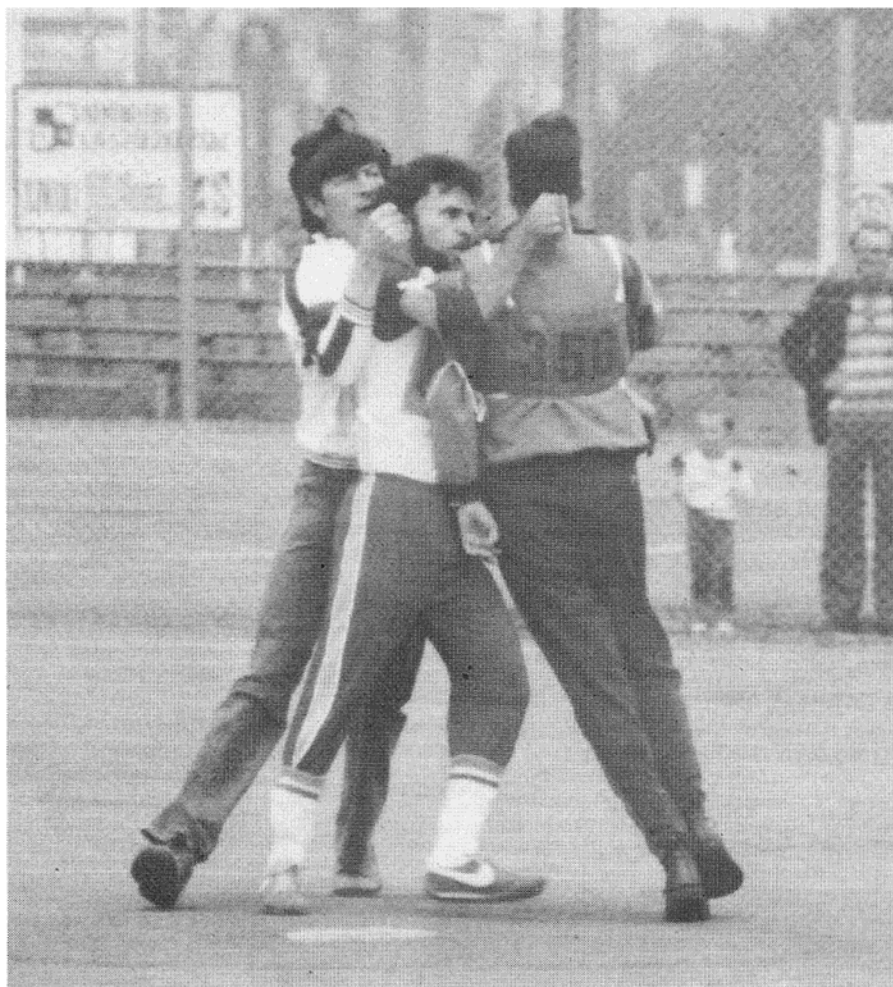
Further disaster struck when we found that a recent flirtation with synthetic oil had, while keeping the piston clean without damage, allowed the crankpins on a couple of engines to get chewed up. Back to the old time religion of castor oil lubrication.

Friday through Sunday were occupied by, at various times, picking a propeller for the number one plane and picking a number two airplane and engine which might result in a minimum of embarrassment if we had to use it.

Perkins/Albritton were performing as at home with 10 lap times in the low 19 sec. range (118m.p.h.). We were in the mid 20's and Kusik/McCollum were in the low 20's but having troubles with getting a steady run.

We were all troubled by the practice site. Just as when trying to fly in the school parking lot there was no crowd control. Flocks of kids wanted to see the action up close. They were well behaved, but still kids. It didn't help that we had no way of communicating other than gestures or shouts to gain their attention. I simply can't understand why the organizers couldn't arrange some sort of crowd control at this and the other test sites. I kept thinking that this was supposed to be a World Championships but there we were chasing kids off the wires like at a Sunday fun fly.

On the other hand there was no shortage of police around the dorms or at the official site. Continuous patrolling kept cars from parking on the street close to the dorms. At the official site, Doc and I had our car pulled over by a uniformed drone and some plainclothes type



Three-up action in a Team Race semi-final race. J.E. Albritton, in center is said by many to be the best Team Race pilot in the world for his height. J.E. and Walt flew to a silver medal placing this year.

with a camera. After a check of passports and a brief conversation between the plainclothes type and the cop we were waved on our way. What was going on? Why not check Perkins and Albritton who had pulled over behind us? Just because you're paranoid doesn't mean "they" aren't out to get you.

On Monday we were scheduled for official processing. This is a fairly simple measuring of wing/stab and fuselage dimensions plus the critical measurement of fuel system volume. We knew that the time allotted for each team was inadequate and figured that by the time they got to us they'd be running really late. Wrong again. The tank measuring experts solved the time problem by doing a totally inadequate job.

In T/R the 7cc maximum fuel volume includes all fuel in the system including any in prime tubes or refuelling valves. The widespread use of multifunction refuelling/shutoff valves can make the measuring a pretty tedious operation to ensure all volumes are filled. In a hurry? Not to worry - ignore the valve and primers. Systems we knew were just under 7cc were checked to be 6-6½cc.

Now you ask, why worry? The answer is that, assuming the competitor has honestly built a legal system, the contest organizers are verifying that with their equipment you have a legal system. What was worrying us is that at a spot check during the contest a "real" measurement might find the fuel sys-

tem to be oversize. In any event this didn't happen but this was a WC not a Sunday fun fly (have I said that before?).

Tuesday and the first round. Predicted lousy weather arrived and left in the night so we got to fly in the normal cool, cloudy weather. We were to fly late in the afternoon but the other two US teams were in the morning.

The first good time was in the first heat, a 3:36 by the Hungarians Balogh/Dorant with a really attractive Nelson powered plane. But as the heats continued, 3:40 was not again broken.

At 10:15 it was McCollum/Kusik's turn. Even after switching to one of Perkins' fuel tanks they were still having problems. Unfortunately, the problems continued and they overheated and spent a ghastly amount of time on the ground trying to restart. Their 4:33 was definitely not in the game plan.

As the morning went on times remained over 3:40 until Perkins/Albritton tore off a masterful 3:33 in fast, heavy traffic that kept J.E. working for the whole race. There was no doubt the US had a real first-place contender.

After the 2 hour lunch break, the current World Champions, Rob and Bert Metkemeijer showed that they haven't been sleeping the past 2 years as, in favorable traffic, they smoked off a record 3:29 that was to stand as fastest of the contest.

At 3:15 Doc and I entered the circle and did

everything we could to record a "safe" time. We did just that and finished at 3:53 which, as the day ended, we were surprised to see in 9th place. We knew we'd have to improve if we wanted to stay in the top 9 for the semifinals, but were satisfied that if Kusik/McCollum could improve their time, the US team had a sure team trophy.

Again that night it rained heavily giving hope that the daily rain was on a nighttime schedule. The next morning was indeed not raining. First up for the US was Albritton/Perkins with the Austrians Nitsche-Kunnecker and Swedes Larsson/Anderson. The Austrians with their Mk100 Nelson engine had recorded sub 3:40 times earlier in the season and figured to do well here after being D.Q.'d in the first heat for losing their wheel.

Again, they were unlucky as Larsson, after his first refuelling made a helicopter style flight through and above the center of the circle. In avoiding a tangle Nitsche had to shut off while J.E. made like a combat pilot. Both were awarded reflights.

McCollum/Kusik still couldn't get it together as midway through the first tank their engine started to overheat. Jed and I decided to tough it through rather than come in early for a reset. Once again, disasterously, the hot engine wouldn't restart and the US team's chances vanished.

At the noon break the rains arrived and we knew our chances of improving our 3:53 were slim. We put on Laystraight wires which are a 3 strand twisted wire also used by the FAI combat fliers. Because they're multistrand they don't stick in rain as do solid wires but are larger in crosssection. A quick test verified that our reasonable speed had vanished.

Originally we were scheduled for a 2 up race but now had the Austrian's reflight added and they were likewise suffering from the rain. We ran a more aggressive race this time, beating both opposing teams but the time was a dismal 4:07. In fact no one who flew in the rain improved his time sufficiently to get into the semifinals. Unfortunately that morning 2 teams had bumped us into 11th place and out of the semis.

Thursday, again without rain, and we were all hoping Walt and JE would be the new champs. They were first up and won their semifinal heat with a 3:41 - slow enough to worry about. Next heat was a real foul up as first, the Italian couldn't manage the heavy traffic and crashed. Then Rob Metkemeijer restarted and released his plane just ahead of Geschwendtner's landing airplane, causing crossed lines and in the mixup in the center Bert crashed.

The Italian protested that he deserved a reflight and an hour passed before the protest was denied.

Round 2 began with Perkins in with Heaton/Ross (England) and the Italians which became a 2 up when the Italians protested the denial of their protest by not starting. In spite of the 2 up, Perkins didn't improve and Heaton/Ross were short of range and needed a third pit. No explanation was offered for the Italian action except their number 2 airplane must be a real dog. I doubt that anyone would sit out with a potential winner.

We were all sweating out the next 2 heats as 4 of the 6 remaining teams had the potential to beat the Gator's 3:41. Only the British team of Smith/Brown managed it with a 3:40 as the Metkemeijers with their reserve model overheated slightly and had just

enough restart problems for a 3:44. The Hungarians ran out of fuel on lap 98½ and the pilot inexplicably failed to tow it around to the finish line. The Danes, Mau/Geschwendtner slipped into third spot with a 3:42.6.

So the stage was set for what was to be the worst WC final in memory. At the start, everyone was away cleanly and in the first tank JE was able to get over Smith twice and Geschwendtner 3 times, but at the first pit stop disaster struck.

JE was bringing his airplane into the middle pit position and Smith was only feet behind gliding for the front pit. Walt caught his plane and the wires were instantly snagged by the British plane.

Walt's plane was pulled into the circle but Colin Brown was able to retrieve their plane. However, he and team manager Jim Woodside determined that there must be a reflight

and did not attempt to continue. Meanwhile the Danes pitted and continued the race. The crowd around the circle stood in stunned silence. What was going to happen?

Unfortunately, the T/R jury of Per Hasling, Dave Rudd and Fred Meijer didn't know either. They let Geschwendtner/Mau continue flying while they talked things over and they eventually finished the 200 laps.

Finally after much delay, and avoiding such inconvenient details as the rule book, they made the incredible judgment that a final couldn't be reflown and declared the Danes the winners. When it was pointed out that the rule book clearly required either or both the British and Americans a reflight Per Hasling—by coincidence(?) a Dane—declared that they had made their ruling period!

Don't go away, it gets worse. Both the US and British team managers filed written pro-



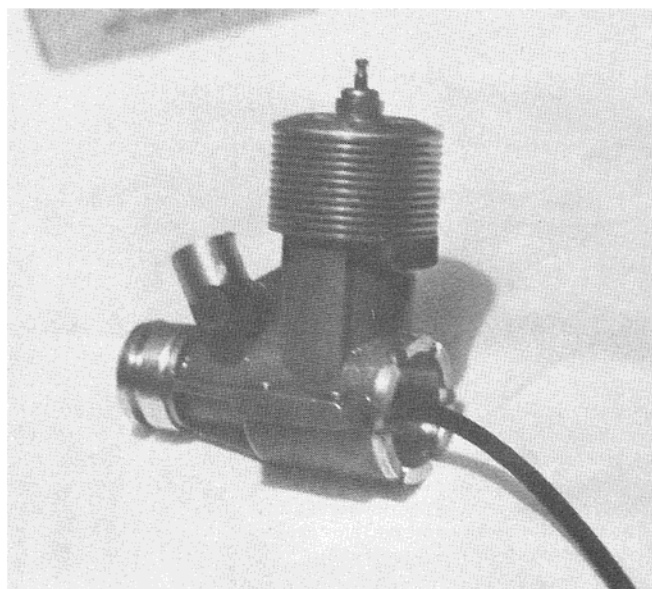
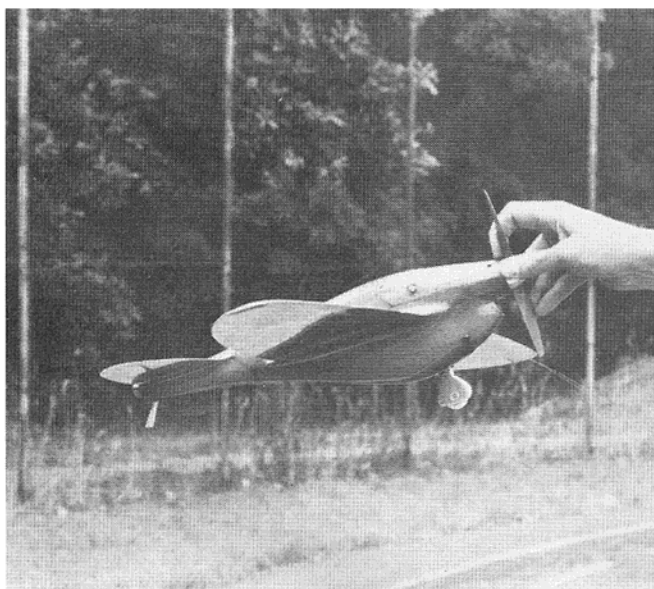
Vilmos Dorant from Hungary is shown here holding his fifth placing model. This model recorded the third fastest heat time. Henry feels that this plane was the fastest at the Championships.



J.E. Albritton ready and waiting for the start of the Team Race final. J.E. is also an outstanding Stunt, Combat, Speed and Goodyear pilot. Vilmos Dorant's Team Race plane (below). Note the elliptical planform of the wing and the fully faired single wheel. Hungary is strong in T.R.



Walt Perkins warms up for the final in Team Race. Walt owns Shadow Racing Products Co. in Florida and travels to Maryland to practice with his team mate, J.E. Albritton. One of two types of Soviet Combat engines seen (below). Both are light weight and compact. Second type had split rear exhaust.



tests to the FAI protest jury. Incredibly, the jury accepted (!) the protest but the contest organizers said it was too late to rerun the race as it might interfere with the closing ceremonies. This is just like the National Baseball League umpires being overruled by the park grounds crew.

As far as Perkins/Albritton and Smith/Brown are concerned, the issue is dead. No further ruling can give them a victory. However, formal protests are filed with the FAI which, if accepted at the CIAM meeting in December will have the effect of declaring the final no contest and will take the title from the Danes.

The closing banquet was Thursday night and everyone packed up and departed for home the next day. We were an exception as we headed south to visit friends in Czechoslovakia and from there further south to Pecs (pronounced paych) Hungary. I'll spend some of the next month's column on that. I'll just


say that we were able to leave the hassles and lousy weather behind. The last week of the trip was much more enjoyable.

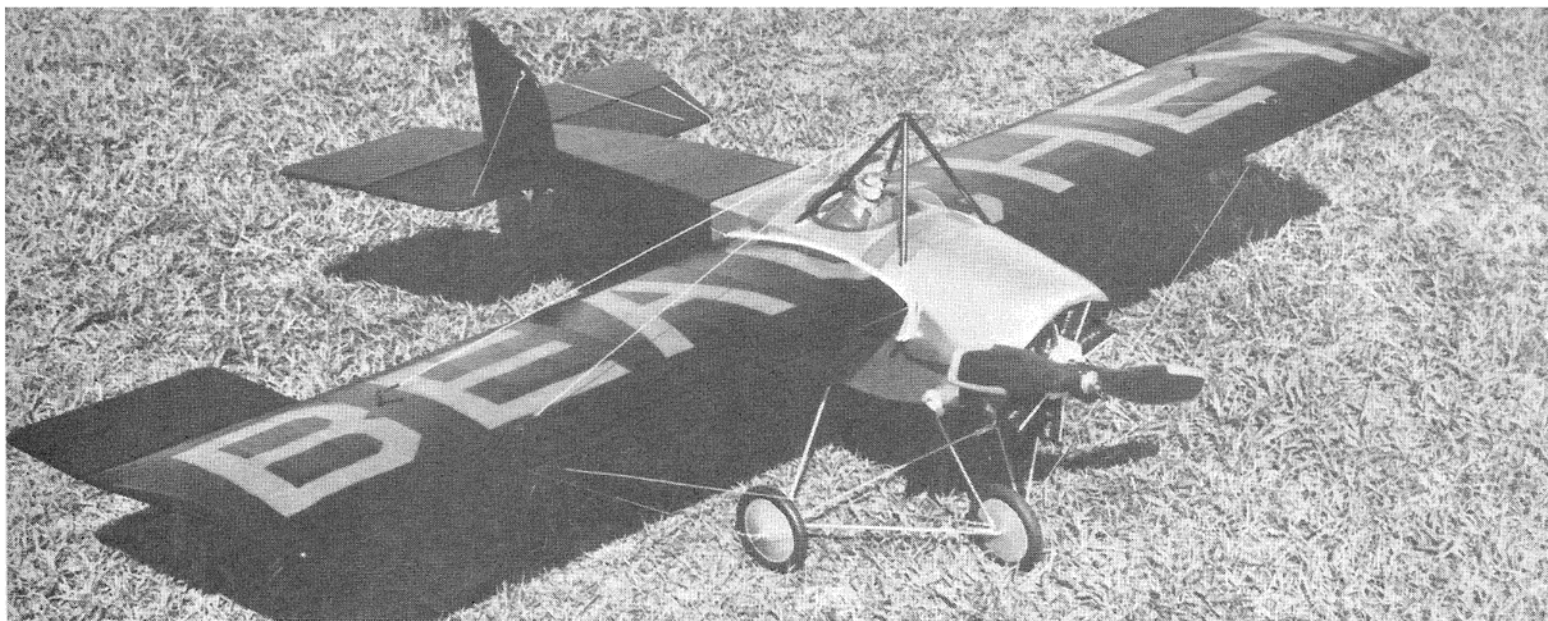
Because I've expended my word budget for this month, I'll reserve details and pictures of the engine scene for future columns. There were no real surprises from my predictions in last month's issue. The FMV engine was very fast in the Metkemeijer hands, less so in Visser's (3:45.5 best). The Cipolla engine, even in the factory teams' hands had a best time of 3:48.2. The 9th place time of Fisher/Straniak (3:50.4) was another non-production Cipolla which (also at Pecs) showed mediocre performance if conditions didn't allow a lot of whipping.

Geschwnedtnr/Mau surprised even me as their Bugl-Geschwendtner crankcase was filled with Nelson 15D-AAC parts that they had obtained 2 years ago at the last WC. It seems that the engine business has gone badly for them as they are unable to find

competent affordable employees and worse yet cannot locate a vendor to properly chrome plate cylinders. The result was the Nelson-B-G which would have been more powerful if they had used one of my present piston/sleeve sets instead of the older one. Since this spring they have been refusing new orders for the B-G and present plans are to continue engine work only for their own use.

Each Soviet team had built its own engines and as I predicted their efforts are showing signs of weakness due to lack of outside competition. Clearly the Soviet dominance of the early '70s is past. They did have some interesting equipment and I'll show pictures in the future.

Also, when I returned and opened the mail, I found a number of letters responding to my August column. Answers to these and future letters will be part of future columns so if in doubt about something - write. 

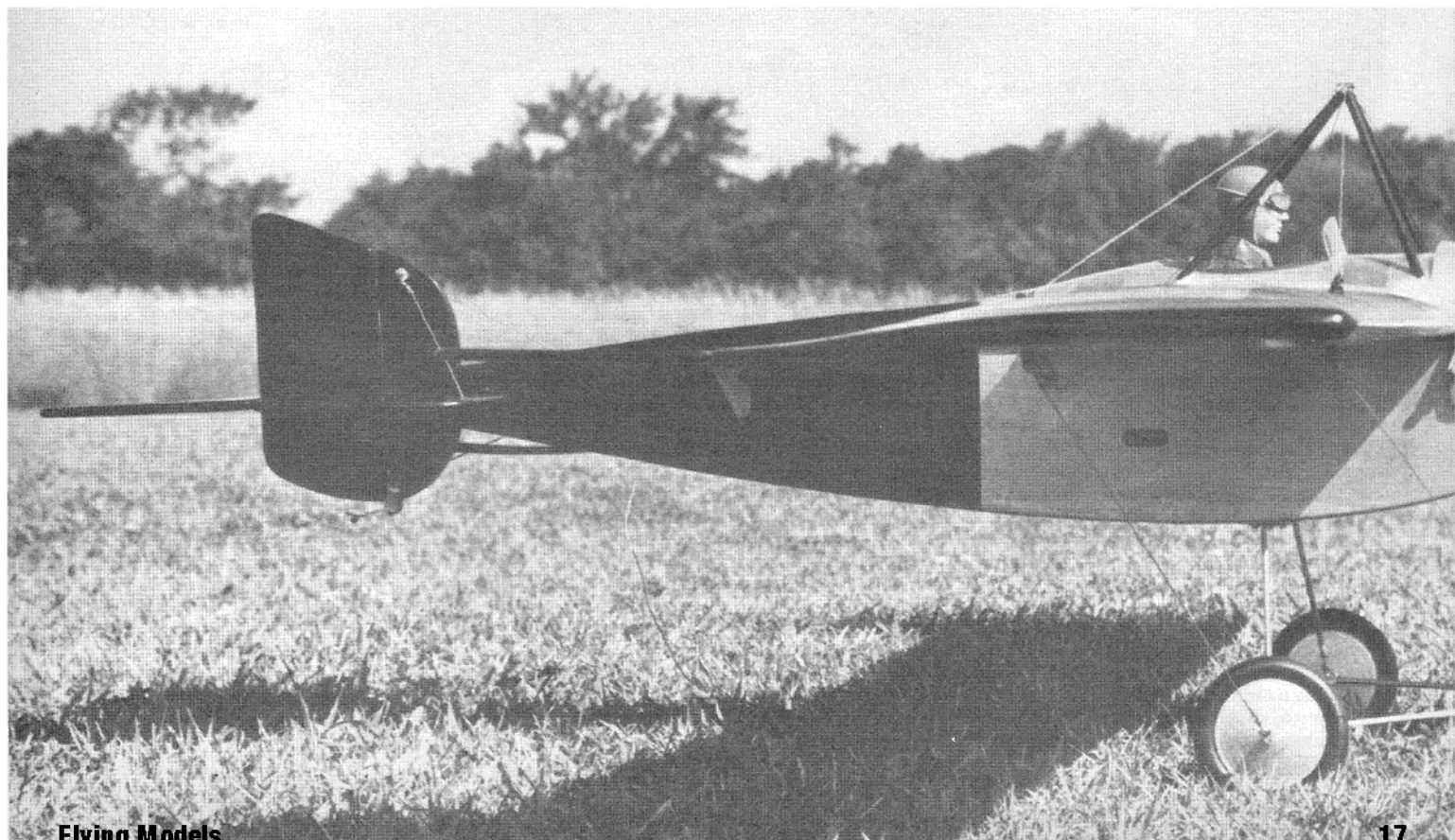


An R/C Stand-Off Scale

Visions of early barnstorming will haunt you when you fly this SOS .35 ship/**Al Wolsky**

Lincoln Beachey

The Beachey Monoplane can probably be called one of this country's first homebuilt aircraft. At the time of its construction there were few people in the country with experience in the building of airplanes. It is amazing what a beautiful little ship they ended up with considering it was a departure from the pusher types that were flying. No copy of the plans were kept after the death of Lincoln Beachey so working from known dimensions supplied by a



Mr. Hud Weeks and using photographic data from the H.P. Christoferson collection, the late Willis L. Nye developed a fine 3-view which was published in the spring of 1964 in the American Aviation Historical Society Journal. Willis was well known for his excellent aircraft drafting which appeared in model and aircraft magazines throughout his life.

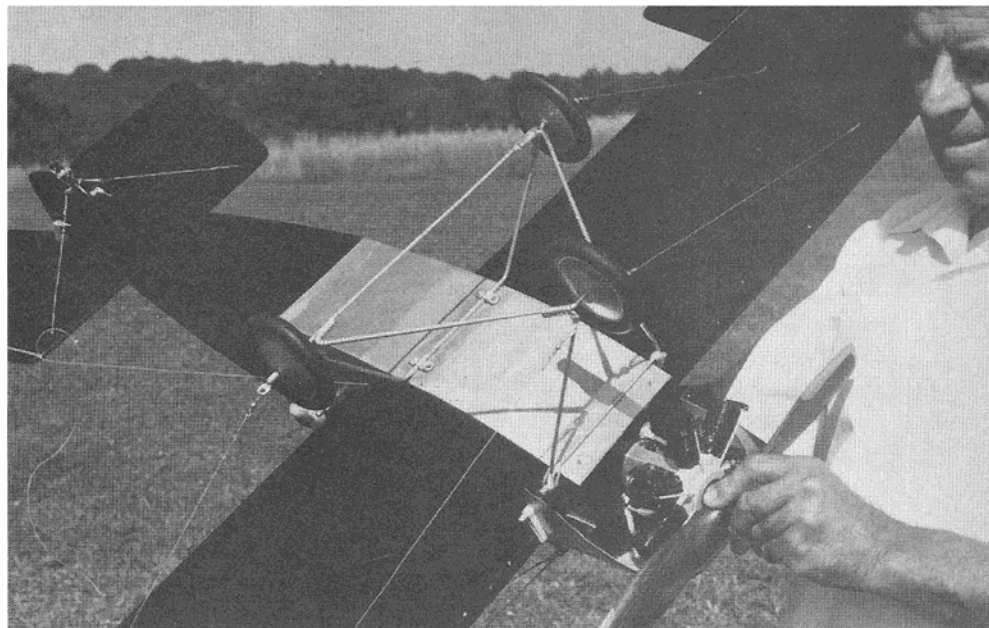
The model is approximately 1/8 scale. Specifications of the real plane were: Wing Span, 26 feet; length, 18 feet; weight, 735 lbs. loaded.

I have enjoyed doing this Beachey model as it is a part of our early aviation history in this country. If you do build it I wish you success, and if you don't, reading the history of Beachey will have enlightened you to our early aviation.

The airplane

In the year 1910 the Wright Brothers sold to the U.S. Government the first military airplane. Thereafter, experimenters sought to develop better aircraft to either sell to the government, or to individuals. The same year, 1910, fairs and exhibitions all across the country sought the services of aviators to simply prove to the crowd that man could fly. From this period a rare breed of men developed. Traveling the country by train with their plane, a mechanic, and spare parts these daredevils would perform before thousands of people. One such flyer was Lincoln Beachey.

Lincoln Beachey at the age of 17 set out to earn his living as a balloonist, having served a brief apprenticeship in the operation of balloons. For 5 years he earned a good living along with fame. In 1910 he became an aviator and was off to a new career. By early 1911 he was giving airplane flying exhibitions and was paid as much as \$5,000 for a single performance. He was born showman with nerves of steel combined with an ac-

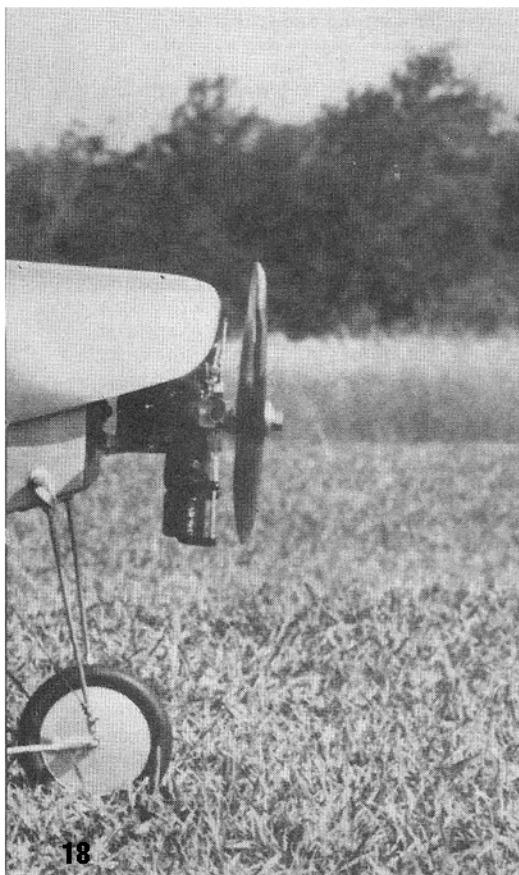


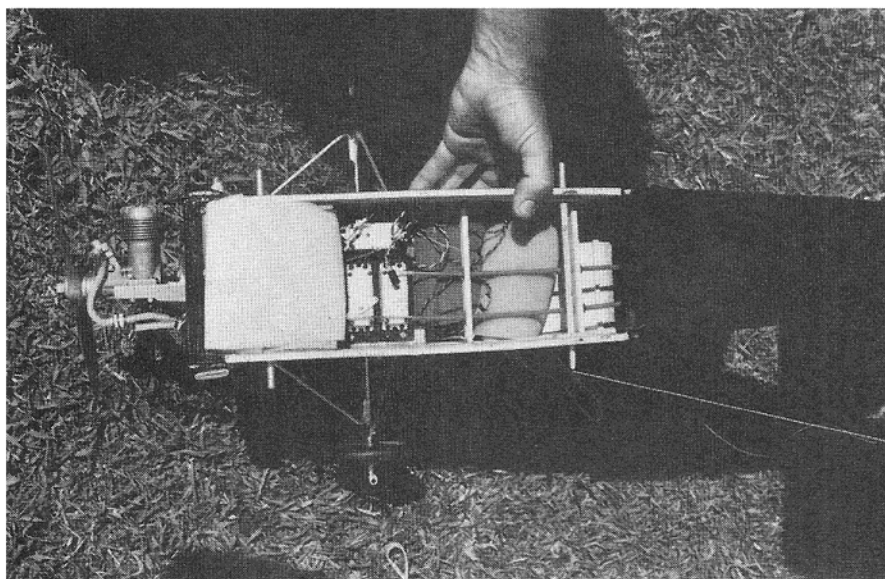
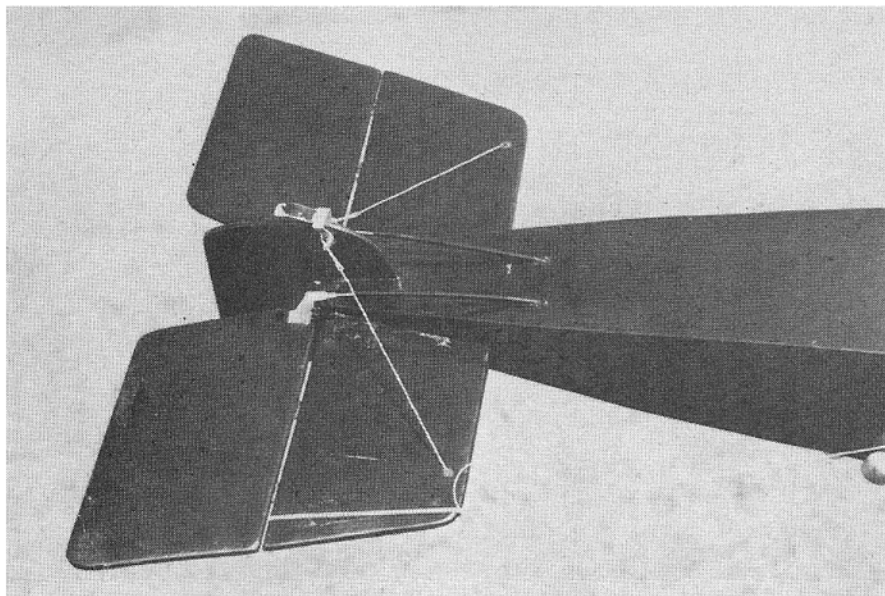
robats sense of balance. He was a star who was in constant demand. After 2 years he was being copied by many imitators hoping to cash in on the growing interest in flying. Many did not possess Beachey's abilities and paid with their lives.

By March 1913 Lincoln Beachey decided he had enough and announced his retirement from flying. He went on a nationwide vaudeville tour. While in New York word reached him that a Frenchman, Adolphe Peguod, had performed a loop, something Beachey had never done. Here was a challenge and a good reason to get back to performing in the air. The loop by Peguod had been done in a Bleriot. Beachey had a conference with his friend Glenn Curtiss at Hammondsport, N.Y., and it was decided to have Curtiss construct a new biplane for him powered by a Curtiss OX engine, capable of a loop. By October 1913 it was ready. After testing, it was shipped to the Curtiss winter quarters at San Diego. It was here that Beachey learned within a few weeks to perform loops at low altitude where the customers could get a good view. He performed over San Diego on Thanksgiving Day 1913, did three loops and earned \$4,000. He was on his way again. During early 1914 he traveled demonstrating loops, spirals, and 8,000 foot dives. In April he decided that he would need a lighter airplane. Also about this time he heard that the Frenchman Peguod was con-

sidering a tour of the U.S. Since Beachey's Curtiss was a heavy machine compared to the Bleriot, he had his brother Hillery, who was also into aviation, Warren Eaton who was a builder of airplanes with 5 years experience, and Art Mix his mechanic, build a smaller Curtiss type design powered by an 80 h.p. Gnome rotary. Tested during May of 1914 in Chicago, it was called the "Little Looper", it proved to have exceptional flying qualities. He set out on a nationwide tour flying almost daily exhibitions.

Since racing drivers such as Barney Oldfield and others were exceeding over 100 m.p.h. Beachey's thoughts were of a faster airplane, he was a showman and wanted to go faster and give the crowd a thrill. So in the fall of 1914 he put his crew to work again on a new design. This time it would be a Tractor Monoplane, as small an airplane as possible. Finished sometime in January or early February 1915 it was a beauty compared to his Curtiss type "Little Looper". It had a wing span of 26 feet, weighed 585 lbs. and was powered by a 7 Cylinder Gnome. In tests it was fast and a thing of beauty in the air. About this time Beachey was approaching his Tenth Anniversary as an aviator, and his hometown of San Francisco was getting ready to celebrate its recovery from the 1909 devastating earthquake and the opening of the International Exposition, a Worlds Fair type of event, with displays from 41 nations





The radio compartment is well designed and spacious. The Enya .35 can be seen here. Al chose to use dowels for the wing hold down as there was no solid bolt anchor available. The tail feathers with their flying wires attached (**top**). Note the placement of the Nyrod pushrods, skid and control horns. Al removes the wing and cowling for access to the radio compartment (**below**).



and 43 states. Beachey was asked by the exposition committee to do exhibition flying for the fair spectators. On Feb. 21, 1915, he opened the fair with a flight in the "Little Looper", thereafter he flew regular daily flights. Some time early in March the fair officials asked Beachey to use his new monoplane in his flights, since a medal was being struck in his honor. Between March 3rd and 13th he made several flights in the new monoplane, these were at a location on the beach south of San Francisco. On the afternoon of March 14th Beachey took off on what was to be his last flight. He climbed to 500 or 6000 feet and coming back over Alcatraz he started a series of loops. After his last loop he climbed back to 3,500 feet and, pushing the nose over, he went into his famous vertical dive for 1,000 feet with power on. He pushed it over still further into a 45 degree inverted flight, so the crowd could read "Beachey" on the top of the wing. The ship reached a terrific speed and lost altitude very fast. At about 1000 feet he prepared to recover to normal altitude, his excessive speed in the clean monoplane must have shaken him, for he whipped the stick back abruptly to gain level flight. At about 500 feet there was a loud sound as both wings folded up, the ship fell into the bay. Lincoln Beachey was killed instantly. An investigation into the crash reported that he misjudged his speed because his body and face were protected by the enclosed fuselage and windshield, in all previous vertical drops he had used a Curtiss pusher type biplane where he was exposed to the full force of air pressure which aided him in judging his speed. It was estimated his speed was close to 240 m.p.h. in the dive. An autopsy revealed that he died from drowning. So ended the career of what was this country's greatest early aviators.

Building the model

I will not go into a lengthy account on the construction, only presenting what will be of help in areas that need explaining. The model is not difficult to construct but requires patience since pieces must be cut accurately for a strong and true model.

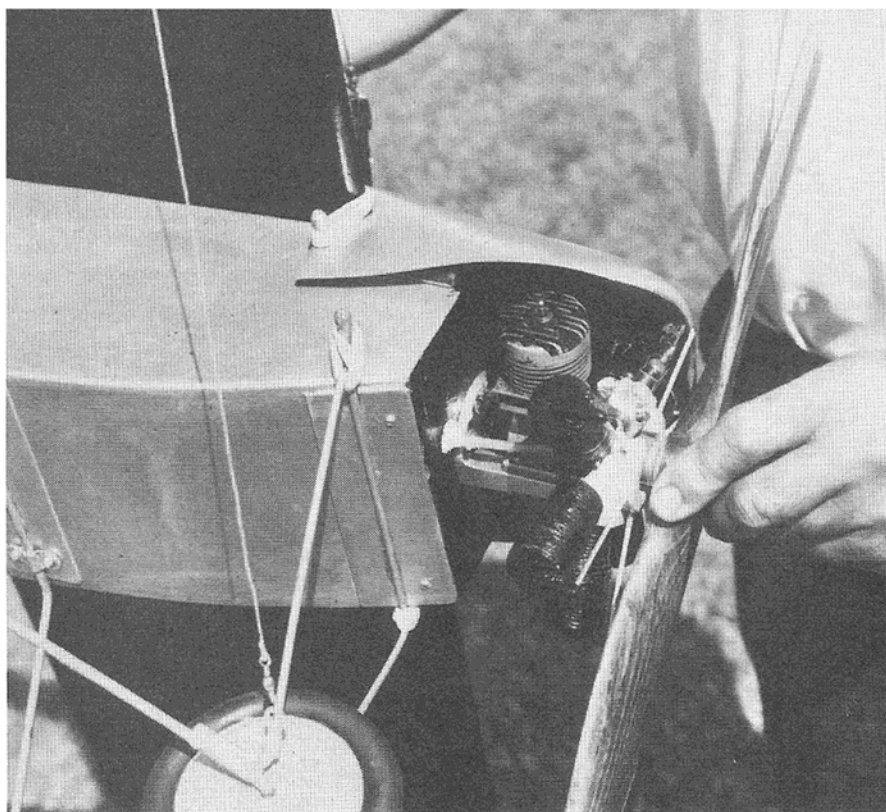
Wing

Construct the $\frac{3}{8}$ " x $\frac{1}{4}$ " lower spar with the ply center braces. The spar has 1-inch dihedral. When dry pin in place over wing plan, pin in place lower $\frac{3}{32}$ x 1 inch sheet trailing edge. Add all full ribs, $\frac{3}{8}$ " square leading edge. Next glue in place the top trailing edge, now add all the false ribs. The tips are simply $\frac{3}{8}$ " x $\frac{1}{2}$ " blocks glued in place. When dry, trace the bottom of the rib underchamber on the block. Do the same at the top of the block using top of rib airfoil. Carve to shape and sand blending into leading and trailing edge. Add $\frac{1}{4}$ " square top hardwood spar, fit piece from last rib to tip. Oil plan turn over and construct other half of wing. When complete, sheet center section top and bottom.

Fuselage

Material is $\frac{1}{4}$ " square hardwood longerons and cross pieces. The sides are filled in with $\frac{1}{4}$ " ply from the firewall back 5 inches, also use it in the areas that the gear mounts to. Do not be concerned about using the plywood as the model tends to be slightly tail heavy without it, might as well add strength to the nose section rather than the use of lead weight to get the model to balance out later. The fuselage top front section is removable and is part of the wing assembly. When the wing is complete, tack glue it to the fuse-





A close-up of the engine compartment shows the attachment of the dummy engine to the front of the Enya .35. This dummy engine is removed for flying. The rugged landing gear is held in place with rubber bands. The name is painted on top of the wing so spectators can read it during a loop (**bottom**).

lage in its proper location, check for squareness to fuselage center line. Next, glue in place on the wing the formers that form the top of the fuselage and plank with $\frac{1}{8}$ " balsa. Sand to shape and cut out the cockpit. The landing wire pylon is made of $\frac{1}{4}$ " diameter dowels. The wing is held to fuselage by rubber bands to the dowels that are shown in top view. The fin, rudder, stabilizer and elevator all are made of $\frac{1}{4}$ " sheet and $\frac{1}{4}$ " balsa.

Landing gear

The gear is made of $\frac{5}{32}$ " and $\frac{1}{8}$ " dia. wire.

Bend all parts accurately bind with copper wire and solder well. The gear is non steerable and is held to the fuselage with clips and screws at the rear. At the front rubber bands are looped around the front leg to the dowel.

Finishing


The model is covered with Silron and finished with Sig dopes. Iron-coverings could be used but make certain that it holds to the rib underchamber.

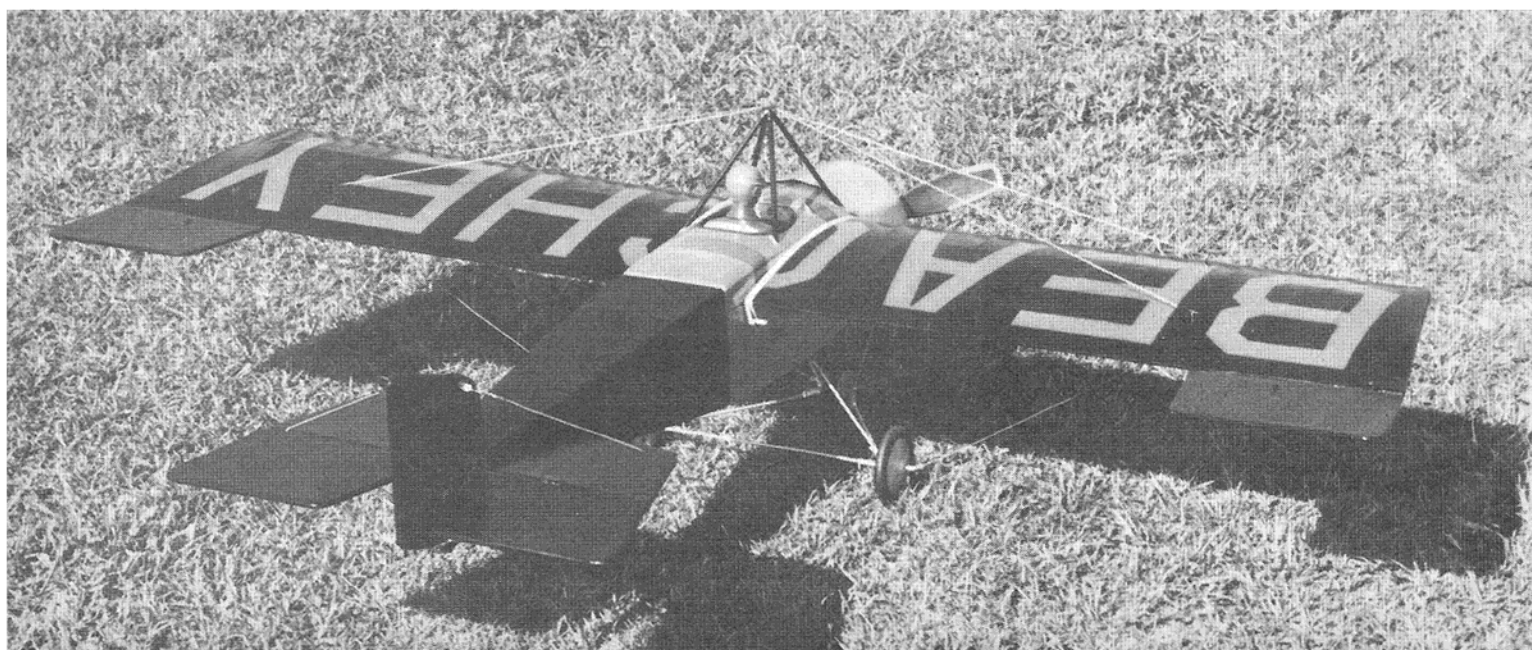
The cowling is made from the bottom section of a gallon plastic bottle-bleach etc.

Mine came from a cola syrup bottle which had a perfect radius at its bottom. Cut away what is not needed to fit. It is held in position by a screw at top, the sides slip over the wing dowels, with wing rubber bands in place the dowel is secure. The dummy Gnome rotary was made as follows: The cylinders are pieces of a broom handle shaped and wrapped with heavy cord. These are epoxied to the crankcase which is made of a 1-inch thick piece of pine. The valve push rods are pieces of $\frac{3}{32}$ " wire. The cylinders are black, the crankcase is gray. Mounted in place hiding the glow engine and used only for appearance, it looks real from 10 feet. The color of the model follows the color of the full sized plane. The wing, tail surfaces and fuselage aft of the cockpit are black. The fuselage at the cockpit section forward is aluminum. The BEACHEY letters are on the top surface of the wing only and are hand painted with fire red dope, mix orange and red together. The letters are 8-inches in height. The stroke of all letters is 1 and $\frac{1}{4}$ inches. The width of all letters is 6 and $\frac{1}{8}$ inches except the C which is 9 and $\frac{3}{4}$ inches and extends over the fuselage onto the other wing. The letters are spaced 1 and $\frac{3}{4}$ inches from each other.

Flying

Make certain the model is not tail heavy. If it is, add weight until it balances at the point indicated, a wheel weight from car wheels are useful for this. The landing gear should be mounted so that the model will track straight.

One very important fact that I should mention and that is that the ailerons seem sluggish. I learned this early in the testing of the model. I have been using the rudder for turns, using the ailerons only it tends to react too slowly into and coming out of turns. It could be that their size is rather small for the wing span. However other than this it flies well. You should keep this in mind when making that all important first flight. Also the ailerons should be trimmed so that at neutral their trailing edge is up $\frac{3}{8}$ to $\frac{1}{2}$ inch, giving the appearance of a wash out condition, this seems to help, especially on landing. The model is very stable and I have hand launched it many times, holding the transmitter in my left hand. Wishing you the best of luck if you build the Beachey. 





PHOTOGRAPHY: RICH URAVITCH

Carl Goldberg's P-6E Hawk

A blend of balsa, foam and plastic makes this kit of a 1930's classic biplane a rugged and easy-to-build R/C project for .19 to .35 size engines and four channel radios/**Rich Uravitch**

"In days of old,
when knights were bold
and rules could be abused,
they'd grab a brush, a can of paint
and some colorful machines produced"

ANONYMOUS

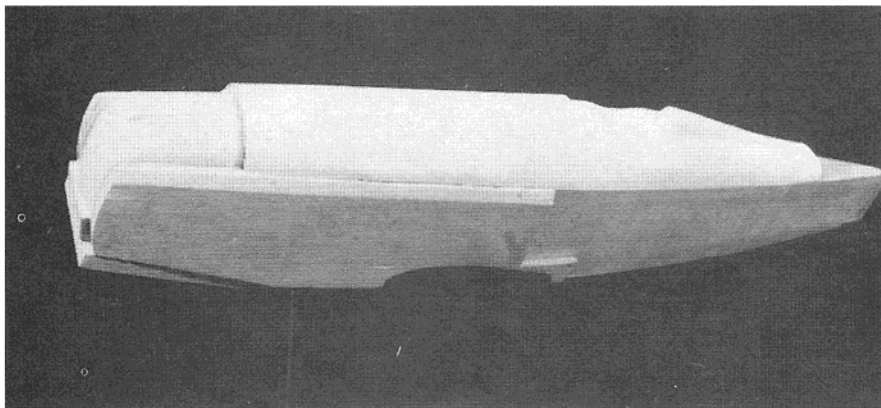
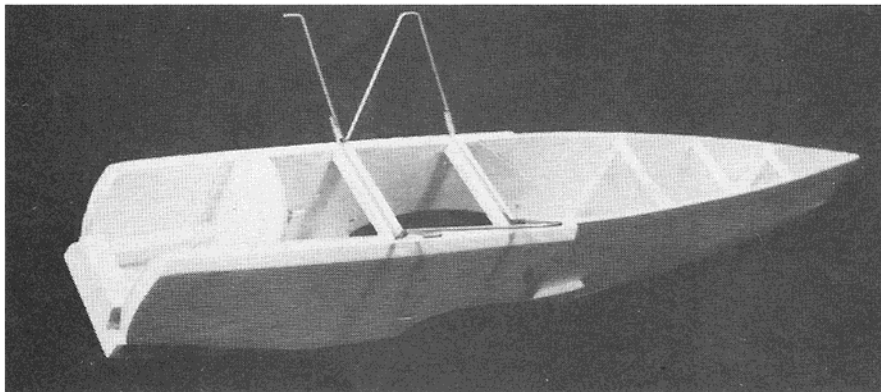
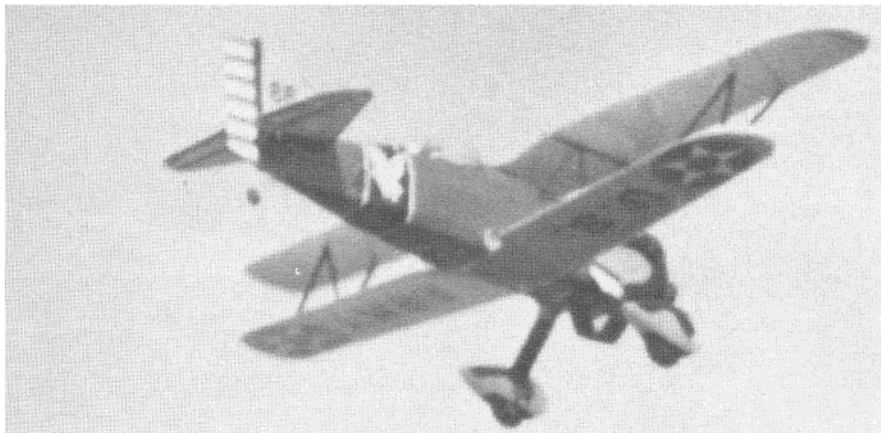
Back in the days when no one really thought much about camouflage, and esprit de corp manifested itself in the form of flashy paint work and coloring on military airplanes, people were treated to the sight of colorful, personalized flying machines. The

glint of the sun off yellow wings; the business like rumble of the 24 cylinder engines at idle, even the pursuit planes pilot's ever-present white silk scarf . . . all part of the bygone era. The last modicum of unique markings on military airplanes seems to have slipped into the past . . . the striking schemes of the Naval A-7's, F-4's and F-14's have all given way to subdued, low visibility finishes . . . mundanity in varying shades of gray!

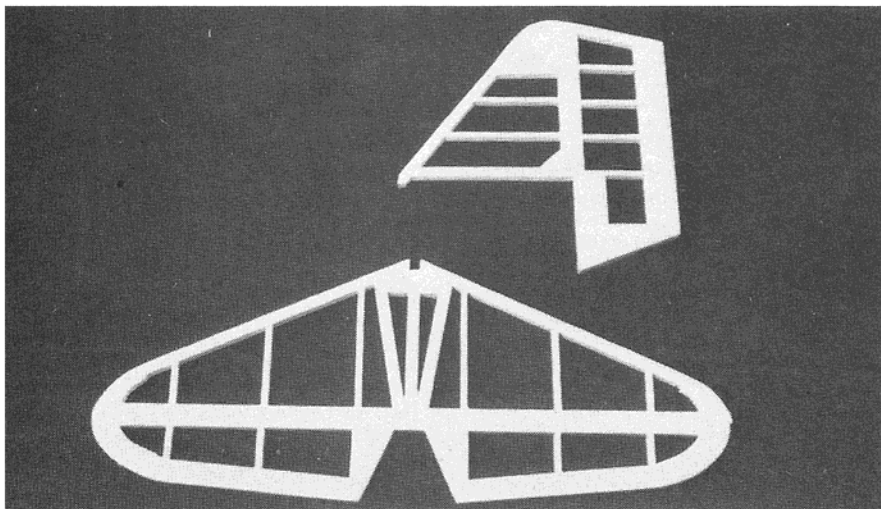
If one single airplane ever represented everything flamboyant about an era, the Curtiss P-6E Hawk would certainly be near the top of the list . . . bedecked in a beautiful paint scheme (at least those from Selfridge

Field, Michigan), wheel pants, smooth cowling, every line seemingly drawn from an esthetic viewpoint first, design second and a biplane to boot! In the words of Von Klugner . . . "So, what could be bad?"

The Carl Goldberg kit of the Hawk represents a fairly quick building, moderately sized replica which can be built and flown successfully by modelers having some previous experience. The kit contents include four (4) molded foam wing panels, a nice array of die-cut balsa and ply parts, a sheet of vacuum formed plastic parts including the wheel pants and cowl, a colorful decal sheet (film type, not mylar) and an excellent set of full



The sheet balsa fuselage construction with ABS plastic top deck and cowling is shown here. Note the cabane strut installation (**above**). Simple frame and rib construction of the tail (**below**).



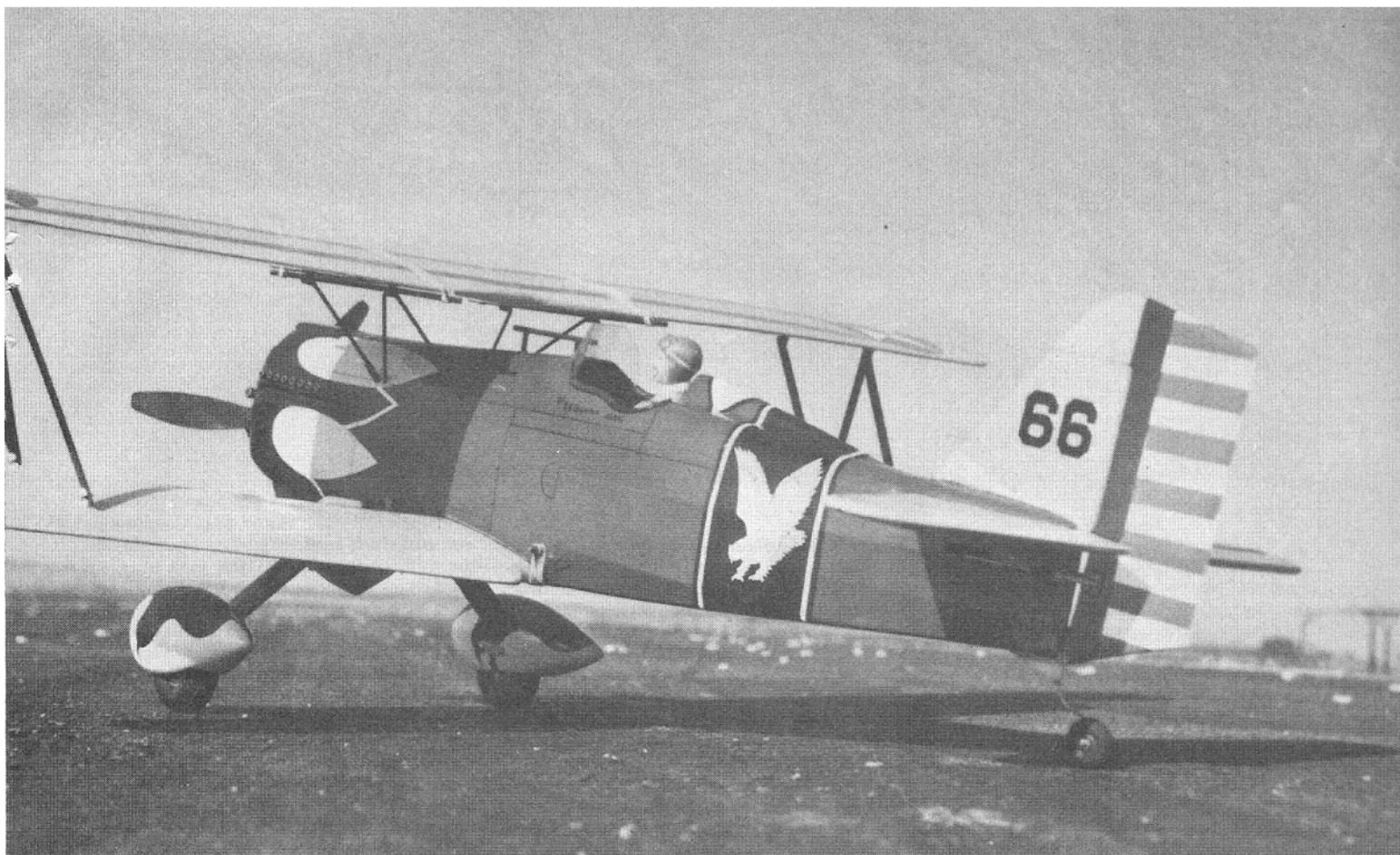
size plans to be used in conjunction with the well illustrated construction manual.

Actual building was begun with the empennage which is of built-up spar and rib construction. This provides a strong, light weight structure with the added advantage of appearing more scale-like when covered. No difficulties will be encountered here. The fuselage builds rather quickly, but some minor changes should be incorporated. When bonding the ply doubler, use epoxy rather than the recommended contact cement. When the 3/16 balsa triplers (yes, Virginia, *triplers*) are added, pulling the fuselage sides in to match the firewall becomes somewhat akin to infidelity . . . almost impossible without separation.

In retrospect, I found the triple laminated forward fuselage a bit overbuilt, since it adds unnecessary weight. To reduce some of this weight, I cut lightening holes in the fuselage from front to rear on both sides.

The first thing that strikes you upon assembling the airplane for the first time is that it is "dense". My particular model came out at exactly the box listed weight of 3 3/4 lbs. It still strikes me as feeling a bit heavy for its size.

After all of the actual building and pre-fitting had been completed, the entire airframe (wood parts only) was finally sanded and given one coat of Balsarite and the fuselage covered with Silkspun Coverite. Since this material requires high heat for application, it was only carried up to the mating edge of the pre-formed plastic upper section. Minor imperfections and seams were filled with a micro balloons/resin mix followed by



two coats of clear dope over the covering only. While the fuselage was drying (24 hours), the tail group and wings were covered with yellow Solarfilm (excellent for use on molded foam wings due to low heat requirement). The fuselage was then given two sprayed coats of Olive Drab Pactra Formula U, masked and the black and white nose trim hand painted. An excellent set of painting templates is included in the kit to simplify this normally complicated task. At this point, the airplane really started looking pretty.

The decals were applied next and really dressed up the model. I was forced to make up new markings for the rudder from trim mylar since the kit decals didn't bond real well and flaked off after drying. This however, is typical of virtually any water transfer decal when you attempt to make it stick to mylar covering material. After the inked panel lines were applied, the O.D. areas were sealed with one coat of satin clear polyurethane while the black and white colors were overcoated with high gloss clear.

The radio installation presents no problems as there is sufficient room in the fuselage for any current standard sized servos. A 450 mah pack was located in the nose, immediately below the 6 oz. fuel tank. Since I was using only three channels, no aileron servo was required. When installing the radio, make every effort to place everything as far forward as possible to minimize additional ballast requirements.

I used a reliable O.S. .25 fitted with a Dubro Mini muffler which allows the exhaust to exit just below the scale right

hand exhaust bank. The airplane was balanced according to the revised diagram included in the kit, and I found that an additional 1½ ozs. of ballast was required in the nose to get the correct balance point. Now it was off to the field.

The first flights were accomplished on an absolutely perfect afternoon . . . just enough wind to slow you down on landing and help the climb on take off. The O.S. was fitted with an 8x6 prop (the only one in my flight box), fired up, and adjusted to provide the high and low ranges I wanted. Putting the Hawk on the runway, I crossed my fingers, advanced the throttle and instinctively, fed in a bit of right rudder. The little bird rolled about five feet, lifted its tail and tracked arrow straight for another twenty feet and lifted off. The climb angle seemed a little steep for the amount of elevator input I had fed in, so I neutralized the stick and proceeded to trim. The climb persisted, and I finally fed in all the down trim available and still had to fly with some forward stick. Easing back on the throttle, the climb decreased somewhat indicating the need for a bit more down thrust on the engine. Rudder trim was not required, and the airplane was flown around a bit to detect any other trim requirements. When looped, the Hawk had a tendency to "snap" out at the top, indicating a tail heavy condition. Straight and level flight appeared "tail low" rather than "on the step." I landed the airplane, shimmed the rear of the engine with two (2) washers under each aft mount bolt, added an additional 1½ ozs. of ballast to the nose, neutralized the elevator trim and pressed on.

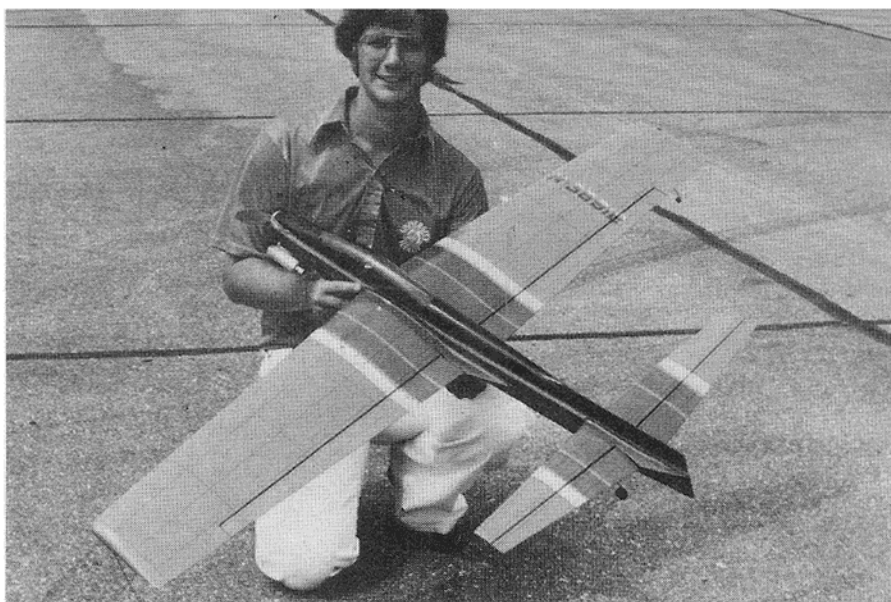
This time the airplane ran on the main gear a bit longer and climbed out at a very realistic angle. The loops became clean and smooth with no directional change at the top. Much better and more positive performance. The airplane was flown four (4) more times that afternoon with each flight appearing better than the last.

Although the kit instructions indicate that the interplane ("N") struts are not required if the foam wings are sufficiently reinforced with tape, I would recommend that the struts be made functional as they provide additional strength and reduce flexing of the wings.

Summing up, the Goldbert P-6E is a fun little airplane which can be built quickly and looks awfully pretty when airborne. The use of three channels limits the roll performance somewhat, and it probably won't get off the average grass field with the wheel pants installed . . . but neither will most airplanes this size. The most important thing to remember is the balance point. A modeler at the field commented that he had "horsed" his Hawk off and it snapped into the ground, no real damage except to his pride . . . cause . . . lack of airspeed and slightly tail heavy. After seeing mine fly and noticing the additional 3 ozs. of nose weight I had added, he commented that he was amazed at the difference that amount of weight made. We have since re-ballasted his and flown it on four channels. The ailerons do make quite a difference, but also require a bit more work. The choice is up to you. Either way, the Hawk will provide many hours of flying fun from smaller fields at a reasonable cost. (C)

Orange Crate

Some new ideas on the subject of Precision Aerobatics are advanced here/**Dennis Adamisin**



A traditional Controlline Aerobatics airplane is probably best described as a bundle of compromises flying in (hopefully) close formation. Most all of the top designs, (and many of the lesser designs), are essentially similar from a functional standpoint and are set apart primarily by styling and execution. While staying within accepted limits will usually insure acceptable performance, it also guarantees that performance will only be, at best, equal to and not greater than the norm. While different is not always better, sameness is never better.

With the above logic (?) in mind, the design of the Orange Crate began. The traditional designs I had been flying had reached a development plateau. These .35 size airplanes had been developed to the point where they were extremely competitive and had excellent contest records. I had won Junior Stunt at the 1969 Nationals and Senior Stunt and the Walker Trophy in 1972; little brother Alan won Senior Stunt in 1973 and 1974; all with airplanes designed in compliance with an evolving design formula. The last two airplanes that I built to these parameters had almost identical performance, I had run out of ideas for improving on the basic formula and felt I was in danger of stagnating, thus the need for change.

After surveying the contemporary .40-.46 designs I concluded bigness was more important from an impression standpoint than from a performance standpoint. People were raving about big airplane performance but in reality the best big airplanes were simply the ones that were straight, light, and equipped with dependable power—hardly a revelation. Among the perceived negatives for the big airplane were higher all up weight, higher fuel consumption, and an observation that seemingly everybody using the big engines had to have a couple of spares on hand to get through a contest.

I decided that the new design should attempt to optimize for high lift, low drag, stability, windy weather performance, dependability and individuality. Also important was weight, ease of maintenance and appearance. High lift of course is necessary for good turning radius. Low drag was sought for improved penetration and climbing performance. Good stability improves tracking, pullouts, consistency and need not come at the expense of turning radius. In sixteen years of competition I just cannot remember

many contests that weren't windy, thus the importance of designing for the wind. Dependability generates confidence and allows for uninterrupted practice sessions. Individuality lets one stand a bit further from the crowd. Weight finish and ease of maintenance pretty well speak for themselves.

The wing received most of the attention during design. The advantages of increasing the aspect ratio versus normal designs are higher lift coefficient for a given angle of attack, lower induced drag (i.e., drag due to lift) and improved load carrying ability due to improved span loading. The blunt airfoil was intended to postpone flow separation and stall and also to provide a "soft" feel around neutral. Proportionally, the flaps are slightly wider than on previous designs. Tapering the control surfaces to their trailing edges reduces drag and increases lift. Fully planked built-up sparless wings are light, strong and durable. Small wing tips are light and easy to construct. The wing span was simple, it had to fit into my car!

Given my goal of increased aspect ratio and the limit on wing span, the wing area turned out to be 558 square inches. The aspect ratio is 6.9 - 1 rather than the more "normal" 4.7 to 5.2 - 1 range. Experience indicated that the finished airplane should weigh 42 - 48 ounces. Experience with the OS Max .35 showed that this engine was well matched to this size and weight airplane. In fact, the engine I used was the same one that I had used in the 56 ounce, 630 square inch Fouga Magister which won Senior and the Walker Cup in 1972. The OS .35 is a fine engine and, particularly after my father "Big Art" Adamisin "blesses" it, will outlast many of the ringed 40's or 46's and outperform quite a few of them too. Note that about all of the stunt 40-46's are 2½-5 ounces heavier than the OS .35 and therefore require a larger, heavier fuel tank and beefier fuselage structure. Thus it is not unreasonable to expect that a 40-46 installation will weigh roughly 4-7 ounces more than the 35 installation. The real clincher is that I had three 35's ready to go and no 40's—quite honestly, I'm cheap.

The fuselage construction differs from the norm because of the built-in fuel tank and the omission of doublers. I realize that everyone has their own horror story about built-in tanks, however, they need not be a risk if, first of all, the pickup tube (and

uniflow tube if used) must be soldered inside the tank wedge. Second, the tank must be cleaned inside and out. Third, the bent tubes must be supported outside the tank and be kept as short as possible. Fourth, all external solder joints must be reinforced with epoxy or silicone sealant. Because the enclosed tank's installation adds so much strength to the forward fuselage, doublers are simply not necessary. In fact, I have not used a fuselage doubler in thirteen years. Besides the obvious weight and time savings, I have never had a stress crack at the wing leading edge line on any fuselage of mine built with this method. My hunch is that the fuselage doublers tend to be too rigid and transmit engine vibrations to their borders, namely the wing/fuse joint. Leaving the doublers out lets the fuselage itself dampen engine vibrations more evenly. Note that the top and bottom of the fuselage sides are straight so that the blocks can be made in one piece. Again, the drill is strong, light, and simple.

The dihedralized stabilizer is mainly a styling cue left over from my previous V-tailed design. The 30 degrees of dihedral per side on the earlier V-tailed designs got the stabilizer out of the wing wake but kept it in the accelerated airstream of the prop. The effectiveness of the stab was improved, enhancing turning and stability. Unfortunately, I kept getting "bad vibes" because of styling. I had several judges tell me that they could not judge an airplane with a "bent stab" because it did not look right. Anyway, reducing the dihedral angle calmed the conformists while maintaining what had become a personal trademark. Ironically, I did have someone say to me in effect, "Gee, this airplane is neat but whatever happened to those nifty bunny rabbits you used to fly?" By the way, the strip aileron horns used on the elevators have been absolutely trouble-free on the ten or so airplanes I've used them on.

The control system features a self-neutralizing 4½-inch bellcrank which my father first used in 1966 and which has been further developed since then. The biggest change was to put the pushrod on the inside of the pivot which causes the front line to be "Up." With this type of a bellcrank, the elevator pushrod must be adjustable so that the elevator neutral is the same as the bellcrank neutral. The only way to set it is to fly it. Until it is set though, it feels something like a misadjusted handle except that, in-

stead of moving the handle, you are simply holding pressure on one line. Another symptom of misadjustment is that the airplane will feel easier to turn one way than the other. Properly adjusted though, it really helps tracking and pullouts.

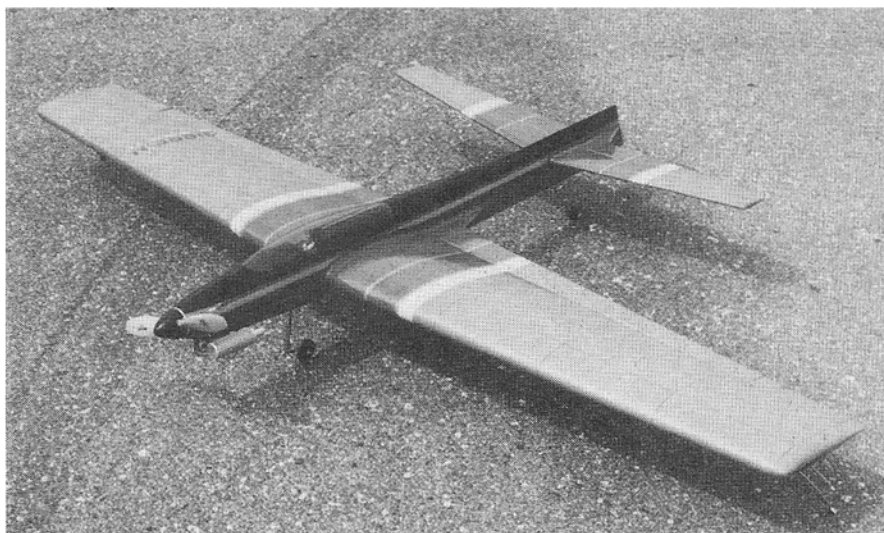
It is a good idea to use the largest pivot possible on the control horns. This gives the pushrods a longer lever arm to work on so pushrod loads are lower, bearings last longer and Kwik-Links become useable once again. Note that each Kwik-Link drives only half of the elevator, further reducing loads and adding a failsafe. The fiberglass arrowshaft rear pushrod does not require fairleads to support and possibly bind it. The strip aileron-type elevator horns allow adjustment of the elevator to flap ratio. Adjustable leadout guides are by now old news to stunt. The pushrod throws and leadout positions shown on the plans are what I ended up with.

The landing gear took some getting used to. What I had intended was to have the lightest, lowest drag landing gear possible. Potentially, the single wheel arrangement should be better than even a retractable system because of the reduced weight and complexity while being almost as clean aerodynamically. The outriggers were originally built into the fuselage at the lower bellcrank floor and angled out similar to a normal gear. These proved to be too soft and the only other possible installation was in the wing tips. They work fine here but get "twanged" everytime the airplane goes into or out of the car. I also don't like the idea of the extra weight at the tips. The best idea is probably to make provisions for outriggers at about the mid-span of each wing. It also may not be a bad idea to go to a conventional wing or fuselage mounted gear with thin wheels and wheelpantz.

Overall styling is pretty simple. The wing is essentially all long, straight lines. The nearly symmetrical shape of the fuselage helps insure that neither inside nor outside maneuvers are visually favored. As mentioned earlier, the dihedralized stab gives the airplane a trademark. Using orange as the base color definitely will insure that this airplane will not be lost in a sea of white and pastels! Having all the paint stripes and AMA numbers running in the same direction gives the judges lots of (too many?) lateral reference lines. The three-color, fogged AMA numbers prove that I do own an airbrush!

I believe that the final package is not unattractive and definitely stands out from the crowd, thus achieving one goal. I have gotten some comments to the effect that maybe the styling is a little too far off the beaten track to please some people. So be it.


The finished weight is 48 ounces, three ounces heavier than it should have been, six ounces heavier than it could have been, but right in line with what I normally build. If there is a stalling point for the wing, I certainly have never approached it. Square corners are crisp and clean especially compared with the currently fashionable 40-46 sized airplane. The squares are further enhanced by the fact that I'm flying on 63 foot lines (66 feet handle to fuselage) and thus the sides of the square loops are longer between the corners. Observers are usually surprised to learn that the airplane weighs as much as it does. It seems that the long wing carries weight well. Given the apparent performance of the wing, I feel there is potential for truly spectacular cornering. Takeoffs and landings took some getting used to but I

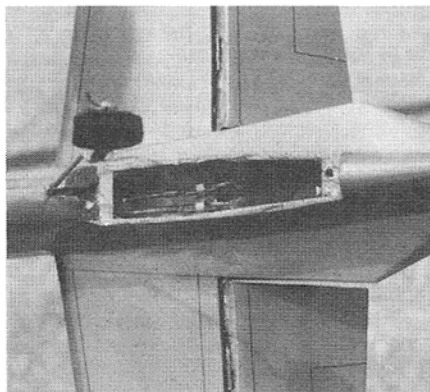


usually can keep it under control now. At one point a flying "buddy" (Bob McDonald) had nicknamed this airplane the "Basketball" based on my takeoffs and arrivals. This is one of the best windy weather airplanes I've ever had, but a little more side area would be nice for yaw stability. In summary, I would not be ashamed to take this airplane to any contest in the world, but the basic design still has untapped potential.

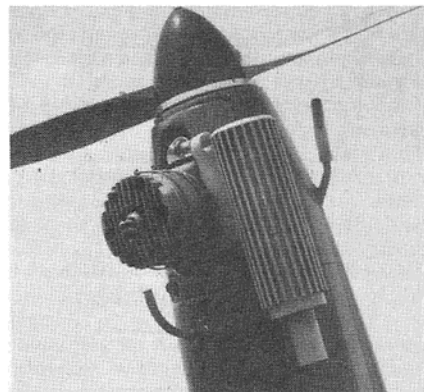
By the time this article is published in FLYING MODELS a couple of next generation developments will have already been flown. The first is a straightforward cleanup of the basic Orange Crate design which includes sweeping the flap hinge line forward one inch, flaps blended into the airfoil, length-

ened moment arms and a thicker stabilizer. The second spinoff features a pair of OS Max .20s. Another derivative still on the drawing board is an elliptical wing version. A shortage of really good balsa sheeting may push me back into a tissue covered wing and maybe a fuselage to match!

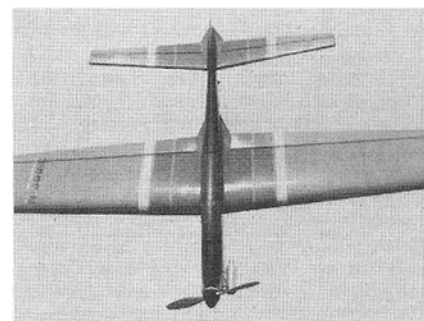
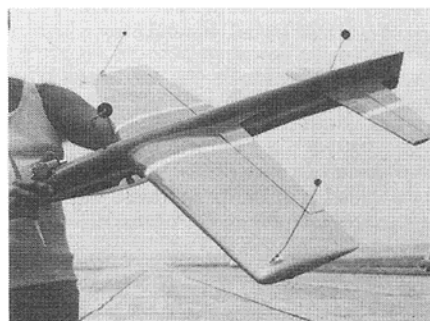
If you are still reading, you may have guessed that I get a kick out of flying stunt. You also have probably observed that I can get to be a bit long winded (a trait inherited from my father). If you have any comments or questions regarding the Orange Crate or stunt or whatever, drop me a line in care of FLYING MODELS. Meanwhile join PAMPA, get practicing and remember that if God flew model airplanes, He would fly Stunt. 

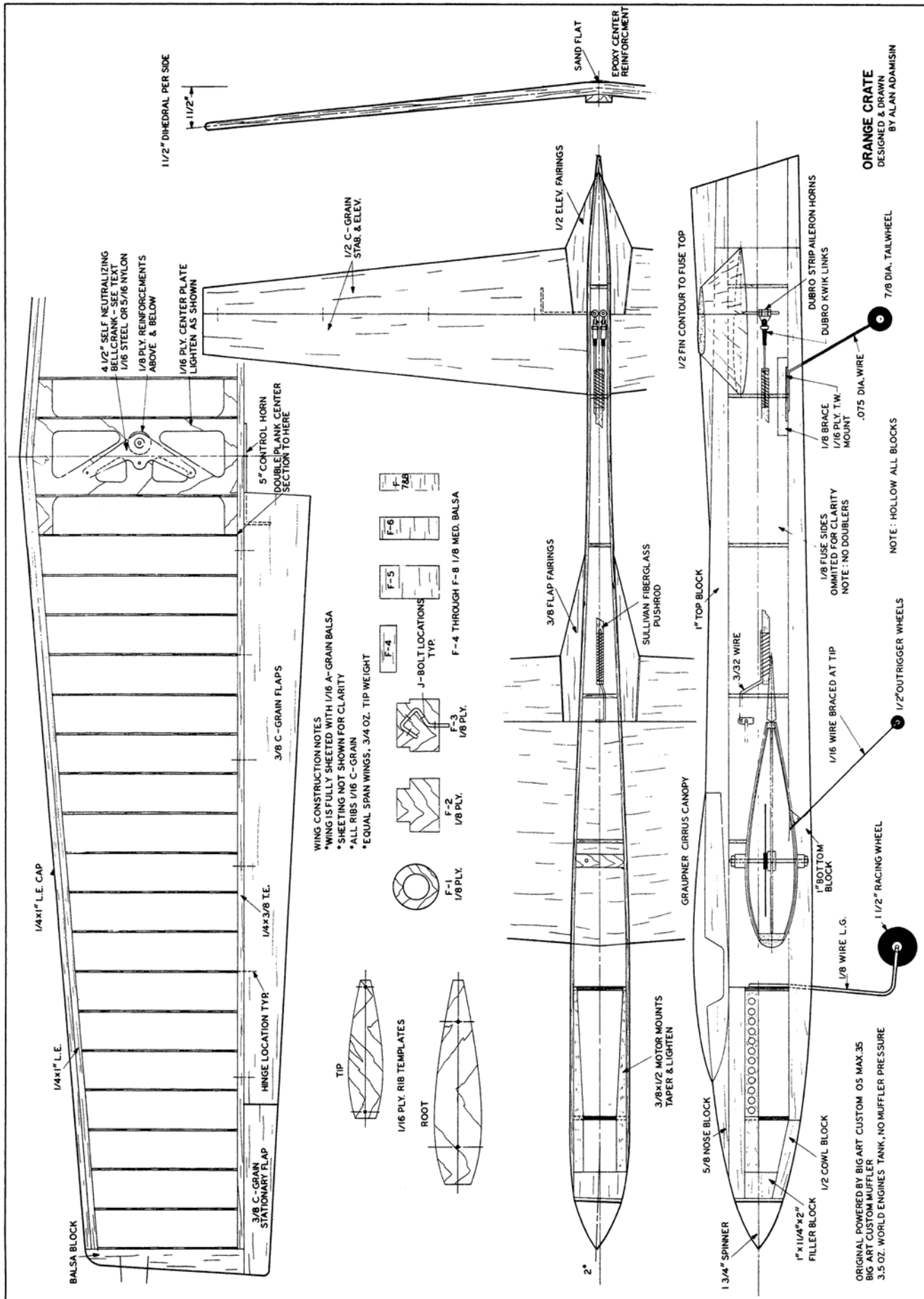


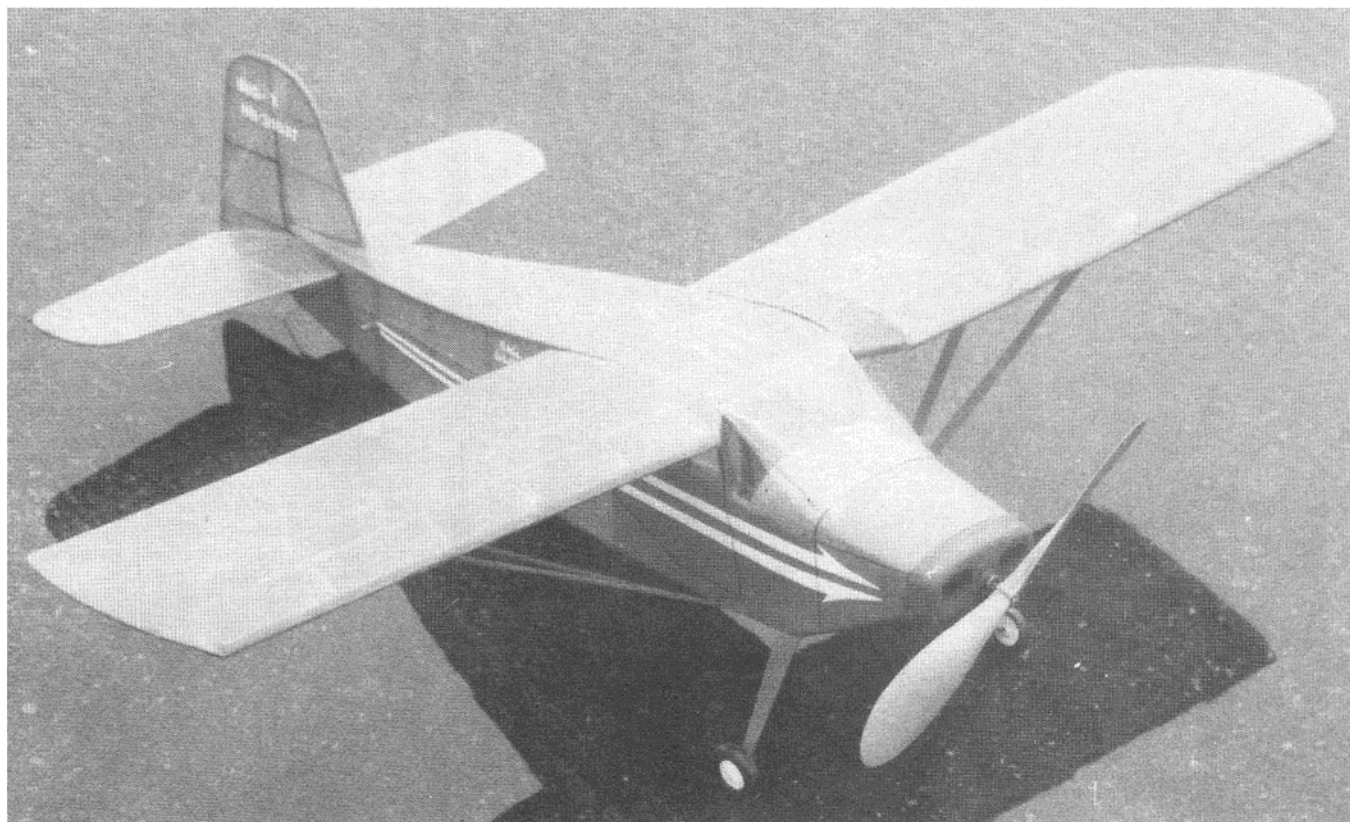
The adjustable controls are accessible through this hatch in the bottom of the fuselage. Note the large elevator fairings. A shot of the bottom shows the landing gear placement (below).



Power is supplied by an OS Max .35 that is custom reworked by Dennis's father, "Big Art." Big Art also supplied the neat muffler. A new look in stunt planforms (below).







PHOTOGRAPHY: DOC MATHEWS

A Rubber Scale

Wittman Big X

To actually discover a living and working prototype for a rare airplane that has always interested you is every scale builders dream. This modeler did it and here is the result/**Doc Mathews**

Steve Wittman is often referred to as the "Dean of the Homebuilders," designer of the highly popular "Tail-Wind," he lives on the edge of the airport used annually for the E.A.A. National Fly-in in Oshkosh, Wisconsin. Wittman's designs range from the Curtiss Challenger-powered "Miss Oshkosh" of 1931 to the contemporary "V-Witt" Volkswagen-powered pylon racer of today. Steve's "Buster" Goodyear racer currently is on display in the Smithsonian Institute as an undisputed bench mark design of the early postwar racing period.

In a racing career that began in 1929 when he flew a borrowed OX-5 powered "Pheasant" H-10 at the Cleveland Air Races, Steve has become a living legend. After 50 years of competition, Wittman finished first in For-

mula V at the revived Cleveland races of 1979. Surely no other motor sport can boast of a competitor with a fifty year participation span: Steve Wittman truly is "America's Senior Motor Racer."

The Big-X design is one of Wittman's more obscure efforts, having been developed for possible production by Fairchild Aircraft, then dropped. In the late 1930's Steve was flying a two place "Buttercup" as a personal transport when he happened to stop in Hagerstown, Maryland. His novel design generated so much interest on the part of the Fairchild management that they entered into a preliminary business agreement with Steve to place the "Buttercup" into production.

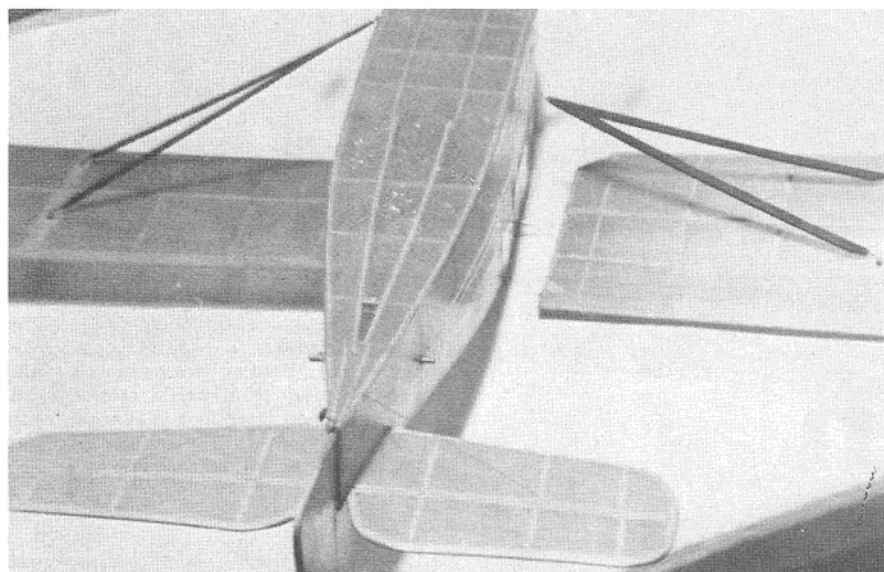
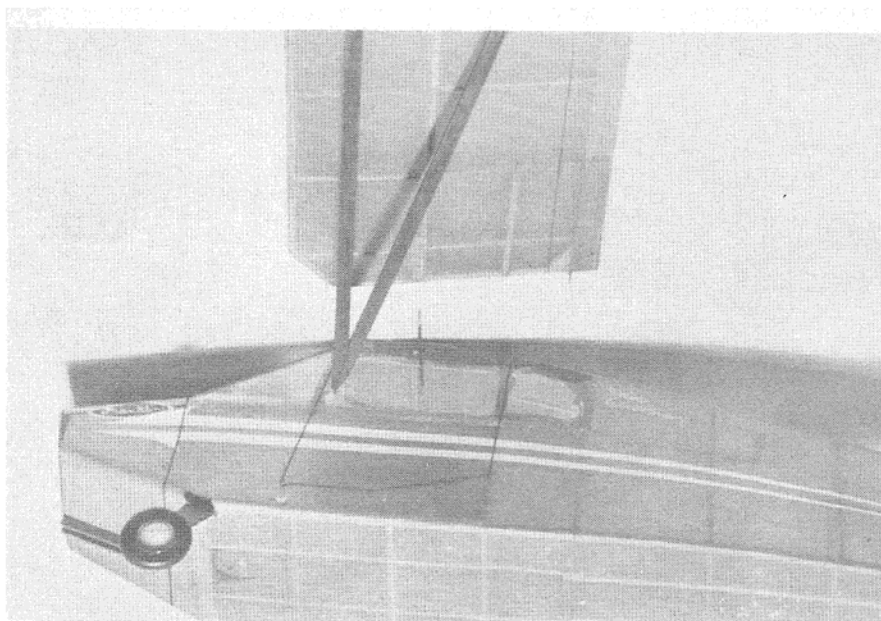
The events of December 7, 1941, ended any

consideration of production of civilian aircraft, and Fairchild became deeply involved in the War Effort with their PT-19 trainer series, the Ranger power plants and aerial cameras. By 1944 it became apparent that wartime production would soon end and Fairchild once again looked at entering the light plane market. They contacted Wittman to re-design the "Buttercup" into a four place aircraft. Work was begun on the "Big-X" in the Spring of 1944, with the first flight made on January 6, 1945.

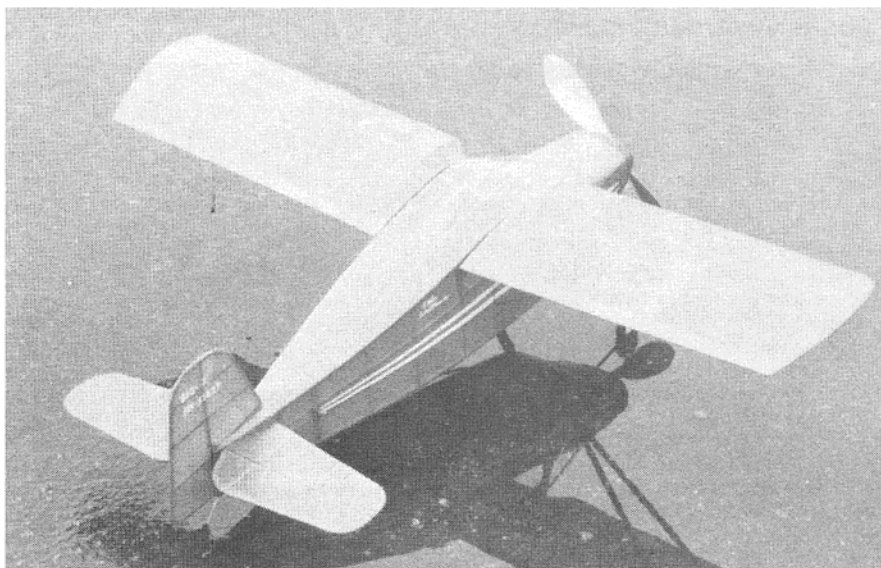
Big corporations have a very deliberate and calculating slowness about decisions sometimes, and nothing much was happening between Wittman and Fairchild when another name appeared on the scene . . . Cessna. The small Wichita firm contacted Steve about his patented landing gear design. They were considering incorporating it into their four-place design (became the 195).

Steven flew the Big-X down to the Kansas prairie, Dwayne Wallace purchased the right to use the spring steel gear, the production rights to the Big-X and the prototype itself. The aircraft was then sold back to Steve for "\$1.00 and other considerations." Cessna of course had no intention of producing the Big-X; they wanted to use the spring leaf gear without a similarly equipped competitor appearing on the market.

Characteristically for Wittman designs, the Big-X does not have elaborate compound curves or fancy elliptical shapes, but rather has a simple planform with careful attention paid to drag reduction and aerodynamics. This attention to detail is no doubt responsible for the aircraft cruising 10 m.p.h. faster than a new Cessna Skyhawk on slightly less power. The gross weight and other figures are amazingly close as well, especially when we consider Wittman's is 25 years older.



The stringer locations can be seen here, as well as the motor peg. Note the scale flying wires on the bottom of the stab. Here we see the wing attachments (top). Note the use of modified Sig nylon hinges as strut fittings. The construction is evident in this photo (below). A plastic propeller is used.



The Big-X and her sister ship the Buttercup were used as crew and equipment haulers for the Buster and Bonzo Goodyear racing team. The racers were flown to the meets with cruising props, while Big-X carried the special racing units as well as parts, tools, and crew. Goodyear Racing, as well as the other racing events, faded away in the 1970's and the Big-X was relegated to storage until purchased and restored by Forrest Lovely of Richfield Minn. It is at this point the story of the model begins.

Modelers who are "into" scale are often walking encyclopedias of subjects they are going to model "someday". Many of the dream projects remain so from a lack of adequate documentation. Frequently a lack of three views, and or, photos cause them to reject full sized prototypes they would otherwise love to model. To discover adequate documentation in some obscure publication, or photos in someone's scrapbook, is every scale modeler's dream. When they gather at contests or club meetings the usual cry is "Anyone got any thing on a _____?"

The Big-X was one of those dream projects filed away in my memory banks as a superb subject for which little documentation could be located. While wandering around the exhibit aircraft at Oshkosh '79, a small, red, four place aircraft came into view. My mental computer cycled a few times and out popped Witman Big-X. Forrest Lovely had parked her next to Wittman's Oldsmobile powered Tailwind. Numerous photos were taken to add to the three view by Cal Smith from Air-Trails 8-51 I'd filed away years before. Right there in Wisconsin's beautiful Fox Valley, I started designing a rubber powered scale of this never before modeled prototype.

The first model was designed, built, and flown in only 3 weeks, as the Fort Worth Plainsman Contest was coming up. At the contest the model received top judging points (perhaps due to its novelty; mixed in with 20 or so more ordinary designs as it was) however, in its less than optimum flight trim it finished third to a pair of "ghost" scale models which each accumulated over 350 seconds for their four flights.

Subsequent to the contest I have redesigned for lightness and am now getting flights consistently in the 50 second range (in dead air) with the second model. Some further experimentation with power and trim might add more duration to the model, but it R.O.G.'s and flies so well I frankly hate to "hype" it more. I have elected to present a construction article in the form of a rugged, relatively simple to construct, easy to trim and fly rubber scale model with excellent competition potential and superb durability for sport flying. Bill Warner refers to this type rubber scale as an "intermediate model." More flyable than the average kit, but more durable and easy to construct than the all out competition machine.

Construction

All wood sizes are standard stock. Try to select light but solid pieces, free of knots and blemishes. The sheet should be light C-grain for the wing ribs, and light A-grain for the nose planking. Primary adhesive through the project is aliphatic resin (Sig-Tite-Bond etc.), Cyanoacrylate (Hot Stuff, Jet, etc.) is used for planking, and 5-minute epoxy holds the wires and tubes.

The fuselage is constructed in the classic second side over the first technique. Con-

struct a box by assembling the cabin area with one side pinned flat on the board. Use 90 degree triangle to check for absolute squareness in all plains. Allow for thorough glue setting, then remove from board and pull tail post together over top view, adding cross members as you go. Repeat the sequence for the nose.

Install formers A-B-C- & D then plank nose and cabin sides with soft sheet. Bend landing gear wire over drawing, attach it to ply mount with carpet thread and C.A. Epoxy wire through holes and against F, drill a small hole in window sheeting for rear wire. Epoxy $\frac{1}{32}$ " ply doubler to inside of cabin frame.

Cut nose blocks to rough outline and epoxy the stack together, epoxy $\frac{1}{4}$ " bass plug to rear of nose block to match cut out in A, then sand unit to shape while spot glued onto fuselage. Remove and drill $\frac{1}{4}$ " hole for a Peek nylon thrust bearing. Note that the hole is drilled perpendicular to the nose block (down thrust is built in) although a drill press is desirable, a hand drill can be used if a small pilot hole is drilled very carefully then enlarged with increasing sizes of bits.

Construct the empanage over the plan using pins to hold pieces in place (do not place pin into wood). Remove, sand and cover. Install it into the appropriate slots in the fuselage. Add stringers to all four sides of the fuselage, sand to a smooth feather edge at rear, and flair into the side sheet in front. Cover fuselage.

Wings are built for stack sawn ribs developed with a ply or metal master pattern. *Note the $\frac{3}{32}$ " wash out shim in the right panel.* Pin L.E., T.E., and bottom spar over plan (rub with cooking oil and build from the back to create a left panel). Glue ribs into place, add top spars and tips: spars taper into root rib by cracking. Glue $\frac{1}{16}$ " x $\frac{1}{4}$ " strut mount flush with ribs and bottom spars.

The wing struts are cut from $\frac{1}{16}$ " bass sheet and assembled with epoxy over the drawing. Drill $\frac{1}{32}$ " holes for the wire but do not epoxy until the wings are mated to the fuselage. The strut anchors are small segments of Sig Nylon hinges cut down to a single loop, then drilled $\frac{1}{32}$ " through the pin holes for the wire. Although ridiculously simple, these little anchor brackets work amazingly well.

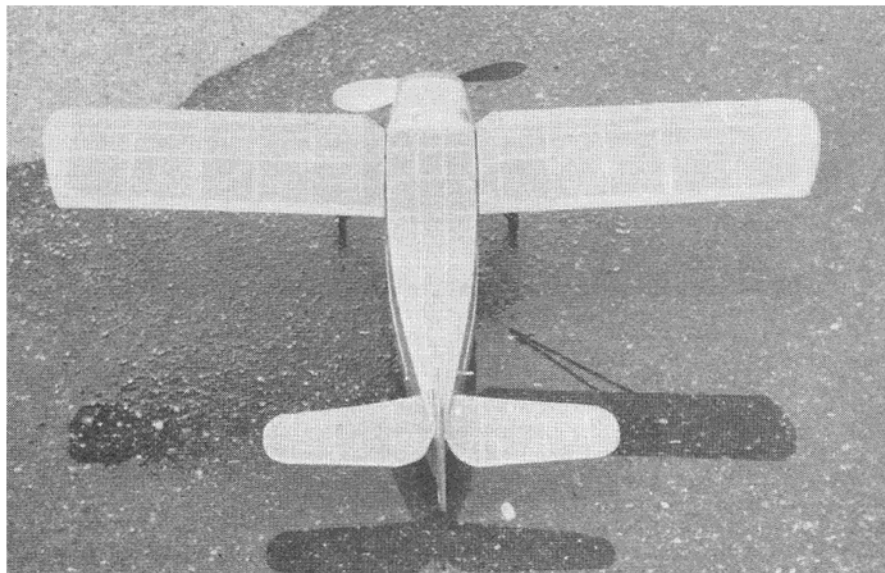
Epoxy $\frac{1}{16}$ " aluminum tube to rear of the bottom spar (note the angle) either wrap with carpet thread, or build up a box around them with scrap balsa and epoxy. The rear wire peg is epoxied against the front edge of the trailing edge. Complete the wing by temporarily positioning it, with struts attached, onto the fuselage side. Sand the root rib for a flush fit, C.A. strut pins into the holes, then epoxy them permanently. Cover completed wing.

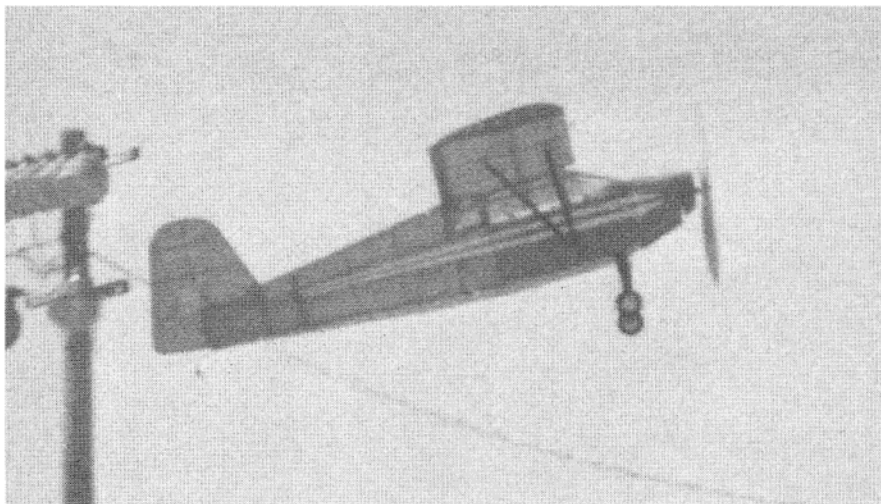
All structures are covered with red Japanese tissue (Peck superlight or equivalent). Use the time honored three coats of clear nitrate on the frame, thinned nitrate to stick the tissue to the frame, and 3 coats of plasticised nitrate to seal the tissue. Note that we do not use butyrate dope, it seemingly never stops shrinking, causing severe warping trouble on a light structure such as this. If you do not have nitrate, be advised it is available in the K&B matched finished system.

The wheel centers were painted with chrome paint for plastics, the letters are white paint used in a drafting pen. The block letters are vinyl items from an office supply.



The full-scale Whittman Big X is shown here. It's construction is almost model-like. Note the small amount of rudder area. Author Mathews has captured the feeling of true scale in this model, without adding the weight common to such detailing (top). This plan-form view shows-off construction (below).





The long landing gear assure prop clearance for those long prototype takeoffs. The Big X climbs out for another long flight (top). The author reports good stability and glide characteristics. Try one soon.



The dark blue components are painted with Floquil purchased at a model railroad supply. The window frame dowls and sills were pre-painted with red Floquil before cementing to place. We also painted the nose block with Floquil. The side trim stripes are cut from vinyl trim tape stuck to a glass pane and cut with a straight edge and razor blade.

Windshield is attached with R.C.54 or C.A. Some trimming of the pattern will be necessary for an exact fit. The landing gear struts are epoxied to the wire but not to the fuselage bottom: this provides a free swinging effect to

reduce damage upon landing. The wheels are held to the wire with 00 railroad brass washers and solder, although a drop of epoxy would also work.

Make up a prop hook from a Peck $\frac{3}{64}$ " unit, install it with the Peck prop and a Sig SH-474 bearing into the nylon thrust bearing and nose block. I use a winding hook on the motor in order to wind with the prop off, however, a loop can easily be bent on the front of the shaft for the winder. Although a winding tube would be useful I don't use one, "live dangerously" is my motto.

Prepare a 15 foot length of Sig Contest $\frac{3}{16}$ " rubber, tying a knot to form a double strand of rubber. Lube with Sig rubber lube or "Armor All"® (a polymer for use on automobiles). Braid the motor by having someone hold one end while you wind in 250 to 275 turns, grab the knotted end while still holding the winder end and place both over your finger. Pull and twist the now 4 strand motor several times to produce a nicely braided look. If the length is too short, unwind some. Conversely, if it is too long to hold the nose block under tension, or bunches up, add turns. A special thanks to Roland Schmidt of Arlington, Texas, for showing me this technique, it really works.

The rubber motor is inserted into the fuselage with the illustrated loading stick. I left the covering off the small section of the bottom immediately below the rear peg to better visualize the loading sticks position and the tubeings passage into it.

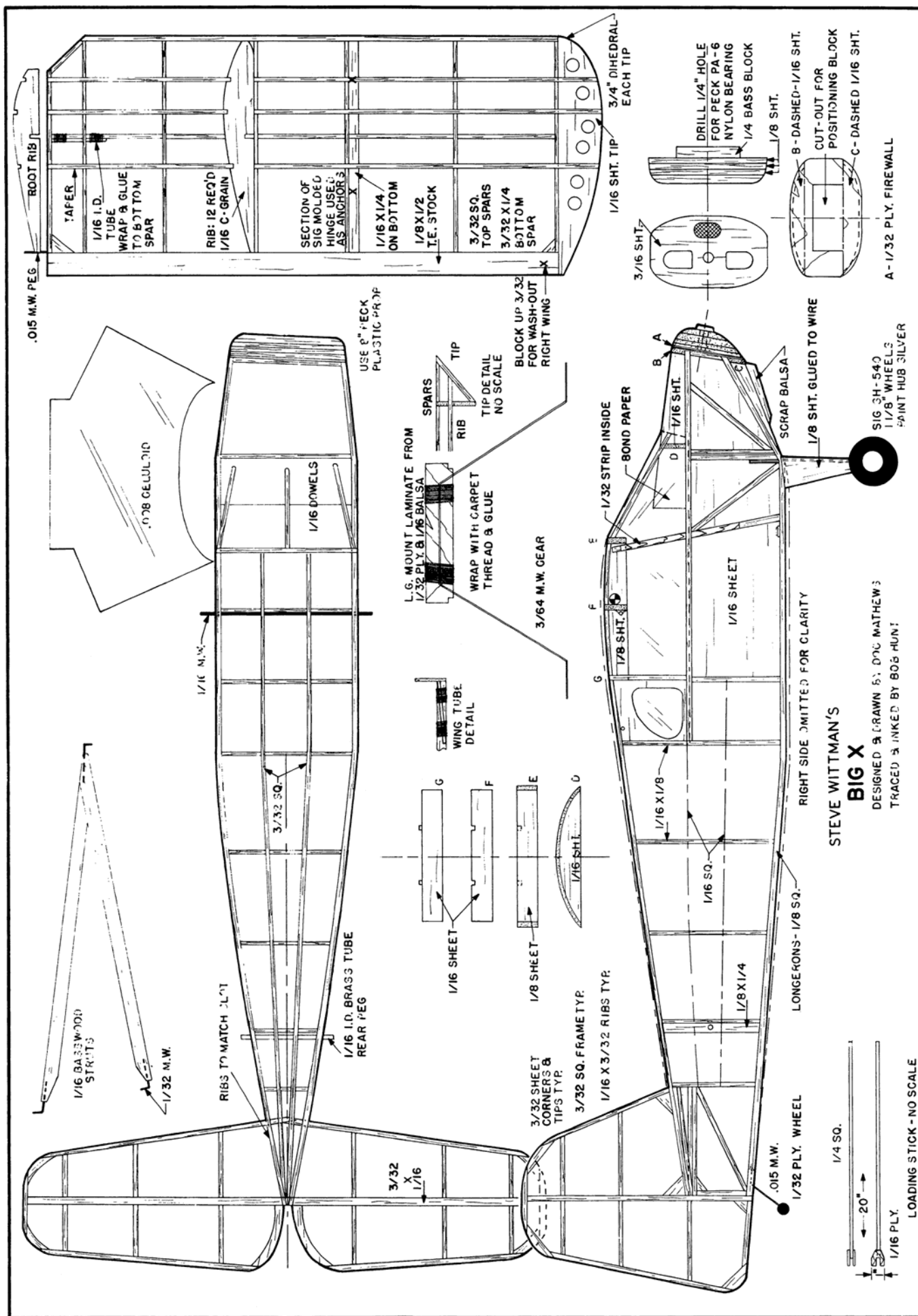
It is helpful and reassuring to know the "maximum turns" available in a given batch of rubber, therefore I make up three motors at a time. One to wind to the "explosion point" and two for use in the model. One should always remember the longevity of a rubber motor is proportionate to its age, use, and condition. As a rule of thumb I go up to maximum winds *only* if I'm forced to, preferring to stay about 15% behind the maximum. Conversely, underwinding is self defeating in that the motor weighs just as much half wound as full. It all goes right back to how dangerously one wishes to live.

Ballast the model to obtain the proper C.G., then hand glide, trying for a flat glide with a gentle right turn. Begin powered flights with about 200 turns, this will give a straight ahead climb with a slight right turn as the motor runs down. As the winds are increased the pattern will tighten to the left with increased torque. Should it turn too steeply, add right thrust with small scraps under the nose block. Add down or up thrust to produce a steep left turning climb which opens up into near straight ahead as the motor runs down, and transitions into a right glide. Essentially adjust the power pattern with thrust settings and the glide with rudder and elevator twist. Although the described trimming technique will not necessarily produce optimum duration, it is a safe one for the less expert rubber flyer.

The Big-X is designed for the rough and tumble of local contests and sport flying. Have you ever noted the "tall grass" so often recommended for test flying frequently grows in fields littered with stones and other hard stuff? For that reason I prefer models more resistant to such abrasive and traumatic encounters, at some sacrifice in performance to be sure. The more expert rubber scale builder could easily substitute $\frac{3}{32}$ for $\frac{1}{8}$ in the fuselage and $\frac{1}{16}$ for $\frac{3}{32}$ for the enphantage.

The resultant weight reductions could easily increase the 50 second durations we are presently getting. Should the builder elect to make these changes we caution him to be sure the model knows how to avoid hitting immovable objects.

After dreaming about a model of the Big-X for 29 years, a pure dumb piece of luck has made it possible. I must say the wait has been worthwhile as the little model has been delightful to develop and present to you the prospective builder. Build one for yourself and satisfy a dream or two. What ever you do, enjoy.



FULL SIZE PLAN AVAILABLE THROUGH CARSTENS FLYING PLANS

ORDER PLAN CF-554



10 year old Jill Aberle poses with the Chipmunk and ME-109. Bob says that this would have been a great shot except for the typical Happaage roads that tend to look like a salt lake bed. The Chipmunk kit as distributed in the U.S. by MRC (below). The list price is \$114.95 for the plane and engine.



MRC's new ready-to-fly aircraft

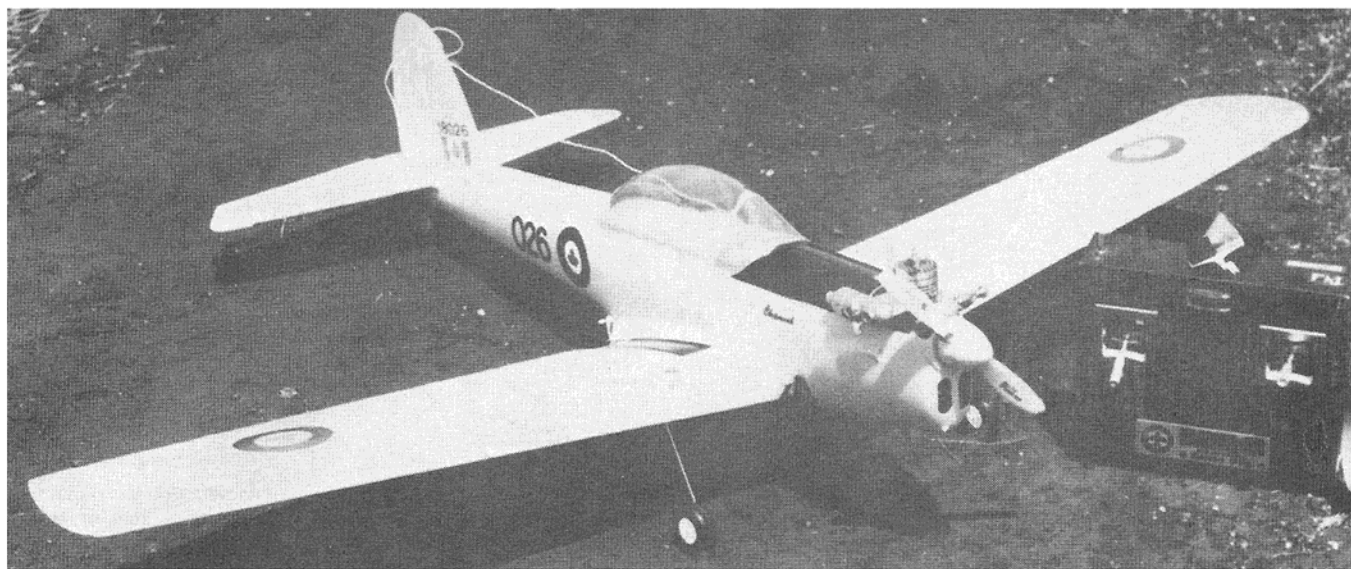
Molded foam construction and a finished paint job makes these new offerings from MRC very attractive/**Bob Aberle**

Most R/C modelers are aware of the fact that Model Rectifier Corp. (MRC) sells a wide variety of hobby products. Years ago MRC was known primarily for their radio control systems and as the U.S. distributor of the Enya line of model engines. In recent years MRC has expanded their product line to include a series of ready-to-fly or almost-ready-to-fly model aircraft. This type of marketing concept now permits MRC to offer the modeler a total package: R/C system, engine and the model itself. As you know my prime responsibility is to review radio control equipment. In the case of MRC I reviewed their most recent line of radio equipment (the Guidance systems 2,000, 3,000 and 4,000) in the January 1980 issue of *FLYING MODELS*. That was roughly a year ago. Last fall I was asked by MRC to participate in the prototype development of their new 1/2 A powered Eagle, R/C trainer. Although the two Eagles I flew were only pre-production "mock-ups", I learned to appreciate quickly the fact that ready made (or almost ready made) models constructed primarily of expanded bead foam can provide an inexpensive and practical entry point into our hobby. The Eagle, by the way, is still in the initial production phase and will be reported on at a later date.

This past spring MRC announced several additions to their foam aircraft line. These new models are manufactured in Japan and distributed in the U.S. by MRC. The principle subject of this review is the new MRC De Havilland Chipmunk. However, at the end of this review I will also comment on a pre-production version of an MRC Messerschmitt ME-109.

The MRC Chipmunk specifications are as follows: wing span- 41.5 inches; wing area- 276 sq. inches; airfoil section is essentially a flat bottom with a slight curvature at the lower leading edge; airfoil thickness is 13.2 percent at the root and 11 percent at the tip with no molded in washout; dihedral angle as supplied is 3.5 degrees on each wing panel; engine displacement- .09 cu. inch; estimated flying weight with a typical three channel radio system is 33.7 ounces (dry-no fuel) which would produce a wing loading of 17.5 oz./sq. ft.

MRC designates the Chipmunk as their catalog number IF-130. List price is \$114.95. Although this may sound a little steep you must consider the fact that the plane comes almost ready to fly with an installed Enya .09



PHOTOGRAPHY: BOB ABERLE

(throttle valve) engine. The entire model is molded from expanded bead foam. Except for the firewall there is virtually no wood structure. The overall finish of all the foam parts is very smooth. The molding technique employed here yields almost a "polished" surface which is hardly representative of the usual foam texture. This smooth surface is then spray painted. To keep up with the scale appearance the Chipmunk is painted a bright yellow. The wing comes completely molded (one piece) with the correct dihedral angle for rudder/elevator control. Plastic trunnion blocks are mounted on the bottom of each wing half to accept the pre-formed landing gear struts. The fuselage comes with the vertical fin attached. MRC provides an Enya .09 TV engine which is already mounted to a glass filled radial mount (similar to the Kraft and Bridi engine mounts). A special 2 3/4 ounce fuel tank comes installed along with the fill and vent lines. Even the 7-4 prop is mounted on the engine with a small, scale appearance, plastic spinner. Rudder and elevators come hinged with the control horns mounted in their correct locations. In addition the kit includes the necessary wire control rods and clevises to connect up the rudder and elevator servos to their respective control surfaces. A universal servo mounting tray is included. So the \$115.00 price tag literally gives you everything you need to fly the model with the exception of the radio system. About the only other exception might be the need for 5 minute epoxy cement.

Now let's talk about the actual assembly process. As you can tell from the kit description there is very little to do before flying. Total assembly time is equivalent to one night of work. The assembly instruction booklet supplied by MRC is excellent. About the only suggestion I might add to the assembly sequence would be to first mount the wing to the fuselage. This requires the installation of two wooden dowels (in pre-drilled holes) to accept the wing hold down rubber bands. Once the wing is in position it is much easier to align and attach the horizontal stabilizer. The stab fits easily into a slot and is secured in place with an application of 5 minute epoxy cement. Remember, you are working with foam, not balsa wood. Regular modeling cements and the so called, "instant glues" will tend to melt the foam. MRC supplies a large sheet of press on decals which add tremendously to the scale appear-

ance of the Chipmunk. The location of these decals are aided by special guide lines that are lightly molded into the various foam surfaces. If you hold the wing, for example, up to the light you will see exactly where the Canadian emblems should go. This is the kind of detail that makes these kits stand out above the rest.

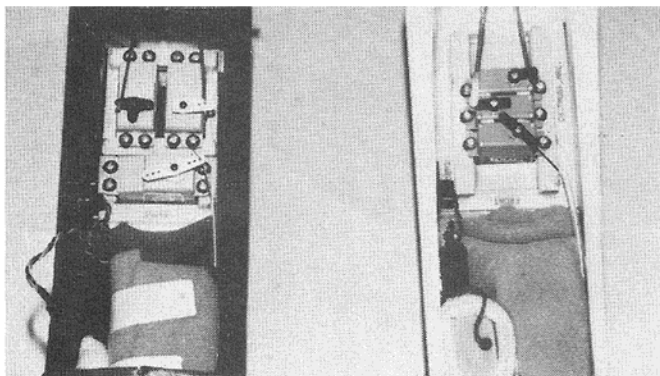
During the preparation of this review it was necessary to remove the engine and mount for photography purposes. I did find that the plywood firewall was not coated with any type of sealer or fuel proofer. I don't honestly believe this omission would cause any real problems since the firewall actually fits into slots molded into the foam fuselage shells. However, based on my experience, I found it advisable to put a light coat of epoxy cement around the firewall area to prevent any residual fuel from penetrating the plywood.

The only item remaining in the assembly procedure is the radio installation. There is plenty of room for any average size radio system. MRC instructions naturally show the installation of their own Guidance System 3000 (three channel) in the Chipmunk. The plywood servo tray can be easily modified (with scrap hardwood and epoxy cement) to fit most servos. In the basic configuration of rudder, elevator and throttle control, all three servos mount on this single tray. In turn, the tray is placed towards the rear portion of the R/C compartment. In the forward area you place the receiver and battery pack (wrapped in foam) side by side. Connecting the control wires from the servos to the control horns (located on the control surfaces) will probably be the most difficult job for the beginner. The instructions are not perfectly clear in this area but the average person should be able to figure it out. A local modeler or a knowledgeable hobby dealer might provide some additional assistance if necessary. MRC, in their usually thorough manner, has even provided the exit holes for the rudder and elevator control wires to pass through the fuselage. The instructions include a guide as to the proper control surface movement. You can adjust the control surface travel or deflection by moving the control wire to several of the different holes provided on the servo output arm. Or you can adjust the throw by selecting a different attach point for the clevis at the control horn (control surface end). In my case the rudder was set to deflect .875 inch maximum and the

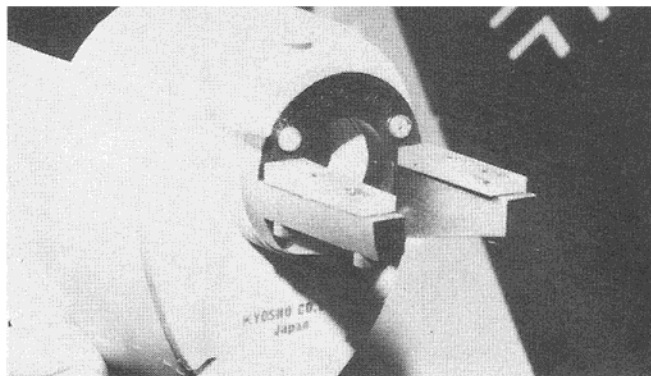
elevator was operated at .375 inch either side of neutral. The throttle control wire supplied was a rather heavy gage piano wire which certainly didn't flex very much. I therefore substituted a length of flexible cable from a Sullivan Gold N' Rod set (which is available at most hobby shops). The flexible cable is easy to install but you still must be very careful with this step. Make sure that the servo output arm can't travel more than the throttle lever on the engine. If it is allowed to do this it could easily stall the servo motor, which, in turn, will greatly increase battery consumption (and could possibly damage the servo as well). Play with the throttle linkage until the full transmitter control stick movement provides complete throttle travel (high speed through low idle) without any binding or over-control. For my evaluation purposes I installed a Kraft airborne pack in the Chipmunk consisting of a KPR-7L receiver, three KPS-18 sub-miniature servos and a 225 MAH battery pack. Weight of my R/C system was only 6.0 ounces total. The average radio system would more likely weigh close to 10.0 ounces (and this model can handle it!).

Prior to flying I did a weight and balance check. My Chipmunk weighed a total of 28.0 ounces. This breaks down into 6.0 ounces for the radio system, 5.0 ounces for the engine/muffler combination and 17.0 ounces for the model structure and associated hardware. Wing loading, at this weight, is 14.5 oz./sq.ft. Balance was perfect! I measured the C.G. at 2.25 inches back from the wing leading edge which is the forward most recommended position (and the better choice for the beginner and novice flyers). The way the plane is designed and the radio positioned (according to instructions) it just about has to balance properly. That fact alone is very important to the beginning pilot.

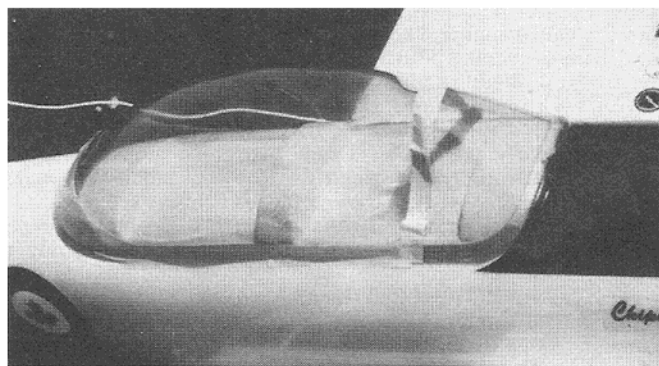
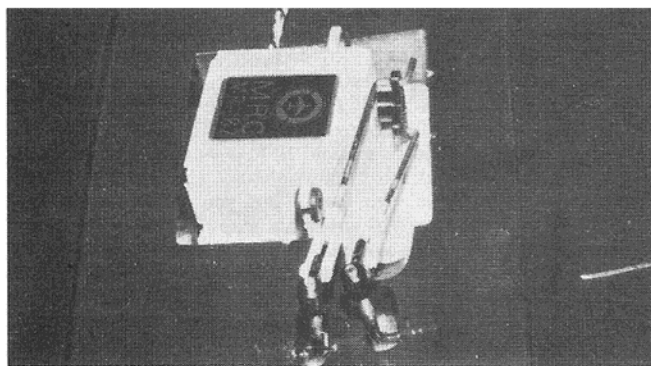
Before discussing the actual flight performance I think I should dwell on the Enya .09 TV engine. The MRC instructions supplied with this kit concerning engine operation are excellent. Every step of the engine starting sequence is explained for the beginner. In the flight preparation section they describe an engine break-in sequence that recommends that four (full tank) runs be made prior to the first flight attempt. Unlike a lot of the other Enya engines, this little one definitely requires a good half hour of break-in time to be able to operate at a reasonable performance level. Although the in-



The ME-109 at left has an MRC-776 FM receiver, 500MAH battery pack and four MR-62 servos. The Chipmunk at right has subminiature Kraft system using a 225 MAH battery and three KPS-18 servos. This MR-62 servo is shown installed as per instructions in the aileron position (**below**).



The Chipmunk is shown here with the cowl removed. Bob found that the plywood firewall had no protective finish. He suggests a coat of epoxy to prevent fuel soakage. This is what happens to the bubble canopy after being left in the rear seat of Bob's car for five hours at 90° (**below**).



structions show hand flipping of the prop with the aid of a "chicken-stick", an electric starter is almost a necessity. At least this was true during the initial stages of operation. The Chipmunk spinner cone screws in place with a clockwise motion. I thought for sure that the electric starter (which operates counter-clockwise) would easily flip the spinner right off the engine. The fact of the matter is that for some reason the spinner always stayed on the engine. The engine came equipped with a standard Enya glow plug (no idle bar). I'm not sure if this was an oversight. Since my "Head Lock" connector wouldn't fit over the Enya glow plug, I replaced it with a Fox idle bar short plug. After the break-in period I was able to achieve an excellent, reliable idle. The fuel tank supplied is manufactured by the I.M. Products Co. of Japan and as stated before has a capacity of 2 3/4 ounces. A truly perfect size for an .09 engine. I wish they had these tanks available for modelers years ago. Because of the generous fuel supply you can expect an 8 to 10 minute engine run from a full tank. One more point: the engine mounting screws. MRC mounts two aluminum plates to the top of the radial engine mount. The engine is, in turn, mounted to these plates. The plates contain tapped holes which accept hardened steel socket head screws. Unfortunately though, no lock washers of any kind are employed. So be careful to check all the hardware (including the muffler mounting screw) to make sure they stay tight and don't get a chance to vibrate loose. I surmise that the two metal plates are actually meant to break-away in the event of a crash, thereby protecting the engine mounting lugs.

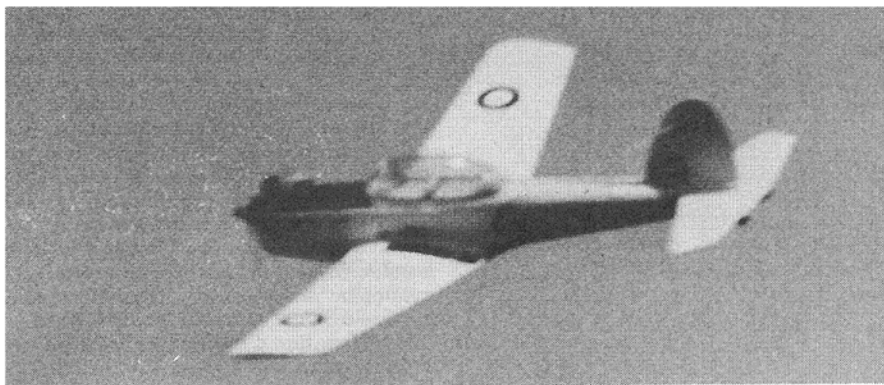
Now for the actual Chipmunk flight per-

formance. The instructions show both hand launching and ground take-off techniques. In the hand launch sequence the instructional photo shows a modeler holding the Chipmunk at the fuselage, *forward* of the wing leading edge. This is apparently the way it is done in Japan. I personally don't recommend this approach. That part of the fuselage gets very slippery from the engine exhaust residue. If you were to lose your grip on the forward fuselage, your hand could easily end up in the prop. On my hand launch flights I hold the model by the fuselage, just *behind* the wing trailing edge. I had a helper launch the model for me and I was also able to launch the model by myself while holding the transmitter in my other hand. Both techniques worked fine (the beginner should always call a helper to launch the model). After making quite a few flights at the 28.0 ounce weight level I decided to add a 4.0 ounce lead weight on the C.G. to increase the models weight to 32.0 ounces. I wanted to simulate the weight of the Chipmunk if it had employed the recommended MRC Guidance system 3000 radio with three MR-62 servos. At the higher weight level it is preferable to have a helper hand launch the model. You need a good amount of forward speed at the higher weight, to guarantee a safe launch. Taking the model off the ground at the 32 ounce weight level was somewhat difficult. At least it was for me because I have only a 10 feet wide blacktop runway to fly off. Since the tail wheel is not steerable the Chipmunk tends to go off the side of the runway quite easily. On a larger paved surface this problem would be minimized.

In the air the Chipmunk flew much like a general trainer or possibly an advanced

trainer. I tried a complete stall at almost idle and found it gentle with no tendency to go into a spin. You can loop it easily from level flight (at the 28 ounce flying weight). Even barrel rolls can be performed using just the rudder and elevator. Because of the low wing configuration and the relatively low dihedral (3.5 degrees) the Chipmunk does tend to "tuck in" or tighten up in turns. It will not recover from a turn on its own. You must bring it out with opposite rudder control. I also noticed that the sink rate is quite high for a model of such relatively light wing loading. The plane does not glide for very long when the engine goes to idle. On dead stick (engine out) landings it comes down in a hurry. Both of these facts lead me to believe that the Chipmunk should not be considered for your very first R/C model. With reference to the MRC line of R/C models I would recommend their .15 powered Trainer Hawk or the new .049 powered Eagle (as soon as it is available) as a good first "subject" for the beginner. After flying one of these trainers the very next model could be the Chipmunk.

For the more advanced flyer, MRC is including an option that comes with this Chipmunk kit. You will find all the necessary hardware for installing "barn door" type ailerons on the wing. The instructions include a recommendation that the wing be cut in half and that the dihedral angle be reduced. Lower dihedral tends to improve the sensitivity of aileron control. A cut out is already molded into the top, center section of the wing to accept the aileron servo. Be prepared for the fact that this aileron installation job will take some time and patience to get working properly. I would also suggest that a plywood dihedral brace be added at the



center section when you rejoin the wing panels.

I'd like to now go over some of the pro and con comments that surfaced during my evaluation of the MRC Chipmunk. The most important problem noted is that high temperature levels, as encountered in an automobile left out in the hot sun for several hours, will affect some of the model's components. I left the Chipmunk in the rear seat area of my Volkswagen Beetle with the window almost completely shut. The model stayed in the car from 6:30 AM until lunch hour. The temperature at noon time was just under 90 degrees. To my surprise I found the Chipmunk's bubble canopy greatly distorted by the heat. I also noted that the paint on the side of the fuselage had started to blister and that some of the decals became quite loose. MRC had already noted this problem and is placing suitable warning in future kits. On one light the engine stopped quite abruptly. I made a hard, but controlled landing, only to find that fuel intake tube had broken loose from the needle valve body on the Enya .09. I later had this same thing happen to the other Enya .09 in the ME-109. All it takes is a little silver solder to correct (available at most hobby shops). I found the molded plastic cowl reasonably durable. The foam parts do take a beating quite fast. MRC will be making available a series of replacement parts for the Chipmunk. Despite the excellent quality finish, the raw model fuel will eventually penetrate into the foam structure. But this should take awhile before it really becomes a problem. My 15 percent nitro (K & B 500) fuel did not melt any of the foam or the cowl. The landing gear wire supplied with both of my models was practically a "dead soft" ^{3/32}

inch diameter wire. It was not piano wire for sure and as you might expect could easily be bent out of shape (especially on a hard landing!). I certainly recommend that you replace this wire. The hinge material is new to me. It looks like a fibrous type tape which is molded directly into the foam surfaces. Whatever it is I found it to be perfectly safe. It easily passed the safety check we impose at our local flying field. Attaching the molded canopy turned out to be the usual problem for me. The instructions didn't cover this procedure. In my 30 years of modeling I can honestly say that I have screwed up almost every canopy installation job. This case was no exception. I resorted to roughing up the edges of the canopy with sandpaper and applying a coat of Hobbypro Formula II cement at the fuselage junction. The canopy was held in place, until dry, with the aid of a lot of straight pins. It works, but doesn't look very great. Any of you modelers have a better way please tell me! My final comment involves the rubber bands used to attach the wing to the fuselage. In a short time these rubber bands will begin to penetrate the foam structure at both the wing leading and trailing edge areas. I suggest to prevent this that you add some reinforcing tape in these areas. Or you might possibly apply some 5 minute epoxy cement to these surfaces to harden the foam somewhat.

As stated earlier I did have a brief chance to try a pre-production version of the new MRC Messerschmitt ME-109. Construction is much the same as the Chipmunk. It is also roughly the same size. The principle difference is that the ME-109 is intended for four channel operation and comes with ailerons already installed. This kit will list for ap-

proximately \$120.00, including an already installed Enya .09 engine. I install an MRC six meter FM radio system in this ME-109 along with four MR-62 servos. The FM receiver weighs a lot more than the new MRC Guidance system 4000 counterpart. In addition I used a regular 500 MAH capacity nickel-cadmium battery pack. The resulting model weight, in my case, was 37.0 ounces (which is quite heavy for an .09 powered model. At this weight I did find the ME-109's performance a little marginal during hand launching. I might add that the ME-109, unlike the Chipmunk, has a semi-symmetrical airfoil shape which thins out to less than 12 percent thickness at the tips. For the same reasons as the Chipmunk, I couldn't get the ME-109 to take off our narrow paved runway (no steerable tail wheel on this model either). It is possible that the foam density was a little too heavy on my pre-production model, thereby causing the higher weight. It may also prove necessary to use a lighter 225 MAH battery pack. For hand launching I would suggest that you keep the model under 35.0 ounces complete (less fuel). At this writing (July) I did learn that Hank Likes, a member of the Ocean County R/C Modelers (New Jersey) and also AMA Assoc. V.P. for District II, has been flying two prototype MRC ME-109's. From what I gather, Hank has been consistently hand launching both of these models with a weight of 35.0 ounces. This would tend to corroborate my previous comments. Once in the air the ME-109 is highly maneuverable and a generally excellent performer.

In conclusion I can honestly say that the Chipmunk is built to precision, can be assembled in one evening and flies well. But a brand new R/C beginner should acquire a little experience before attempting this plane. The ME-109 shows good promise, especially so if you can keep the weight down by using lighter weight R/C equipment. Both models balanced perfectly without the need for any extra ballast (a big plus!). Because they can be built in one evening I could see an R/C club buying a bunch of these little models for a "one plane/engine" type fun-fly type contest. Nobody could possibly give the excuse that he didn't have time to assemble a Chipmunk or ME-109. As a suggestion how about a club R/C team racing event? Team up two flyers to each Chipmunk. Let one pilot fly the first 5 laps and then pass the transmitter over to the other team member to complete the 10 lap (total) race. Sound crazy! It could be fun!

For those interested in further detailed information and list price schedules, I suggest you write to Mr. Frank Ritota at Model Rectifier Corp., 2500 Woodbridge Ave., Edison, New Jersey 08817.

Editors' note

Since the writing of this product review, Contributing Editor, Bob Aberle, has had a chance to fly a final production version of the MRC/ME-109 model using four channel control (aileron, elevator, rudder and throttle). Total model weight was 35.5 ounces (without fuel). Performance has been excellent! Hand launching at this weight has proven no problem whatsoever. Enya .09 (with muffler) used a 7-4 plastic prop and was tacked at 12,000 r.p.m. (an average speed for this engine). Although a good flyer you should have some low wing, aileron control experience before attempting to fly the ME-109.

Flyin' things for fledglings



More news from the gang/Earl VanGorder

Hah! Caught you reading the column. . . but that's good and furthermore, I'm going to warn you to pay close attention 'cause I've got so many things to tell you that you might miss something if you don't. It's great to have you all aboard again, so let's get right down to business. First of all, we'll dig into the mailbag and I'll fill you in on what

some of the rest of the gang are doing.

Steve Fischer, from Hudson, N.H., had trouble making rolled balsa tubes and dropped a line asking for some help. Well, I explained how I do it - that is, by boiling the balsa sheet in a pan of water, with some household ammonia added, for about 10 minutes. Remove from the boiling water and

wrap tightly around a dowel rod or broomstick and bind with masking tape or tie tightly with pieces of rag. You can let it dry overnight or bake for a short time in a low-heat oven. When dry, it can be trimmed and the seam glued while on the same dowel or broomstick, to make sure it stays perfectly round. Of course, don't forget to wrap some waxed paper, or Saran wrap on the stick first or you'll never be able to get it off. Well, Steve must have tried my method, because, later I got another short "thank you" note from him. He has a sense of humor, too. . . . He said, "Hey, Van, how'd you like to have a little balsa stew."

Also had another letter from Larry Miles of Mission, Kansas. Larry would like to see us devote some space to beginner's U-control and maybe even do some brief kit reviews on what's available here for beginners. Now, gang, Larry's the only one who's made this request, so if more of you are interested . . . drop a line and let me know and we'll sure do something along this line.

Dennis Brown, of Loveland, Ohio, dropped a short note . . . no questions . . . just some nice complimentary remarks and to say he really likes the column. Thanks, Dennis, it's really nice when someone takes the time to recognize another person's efforts. Needless to say, it's also the kind of thing that spurs this old typewriter pounder on to greater efforts!

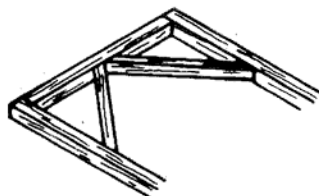
Old friend, Steve Pawlowski, dropped in again with a couple of questions and to say a friendly "hello". Steve really digs the rare birds like ornithopters, autogiros, flying wings, etc.

Last, but certainly not least, was another letter, and photo, from Lou Roberts of Denver. You'll remember, a few issues back, I showed you a photo of the CO₂ design which Lou had created. He called it "Lil Stix." Well, now he's designed a little peanut-size rubber job for fun flying that should be really terrific for less experienced modelers. Lou says it's a design that's easy to build and flies just great. The triangular fuselage is built entirely on the bottom view of the plan. That is, the top is built first and the two bottom sides are added to the top before removing the fuselage from the plan. The end result is a perfectly aligned fuselage. Lou just calls the model the "Sport" and it's kinda neat looking as you can judge for yourself from the photo. Lou also sent along some building tips in drawing form which we'll be sharing with all of you, from time to time.

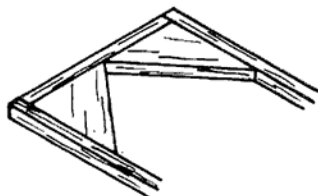
Well, gang, that's just a sampling of what came in the old mailbag this month. . . but I think we'd better keep moving along 'cause there are also some neat products that I want to tell you about.

First, I want to tell you about some great offerings that are available from Buzzer Model Airplane Co. in Howell, N.J. I had a nice letter from Ed Toner, who runs the company, and he included a lot of his plans and even a sample of his printwood. I guess a lot of us are intrigued by the big, old timer "gas-sies" from the 1930s and early '40s. But, heck, how many of us want to tackle one of those monster six to nine foot span jobs? Well, Buzzer has a great answer. Yep, that's right, you can now build miniature replicas of some of the famous old timers scaled down to 18 and 19 inch wingspans and set up for CO₂ engines. Ed sent me the plans and printwood for this reduced version of the famous old Buzzard Bombshell and it's noth-

Build it light

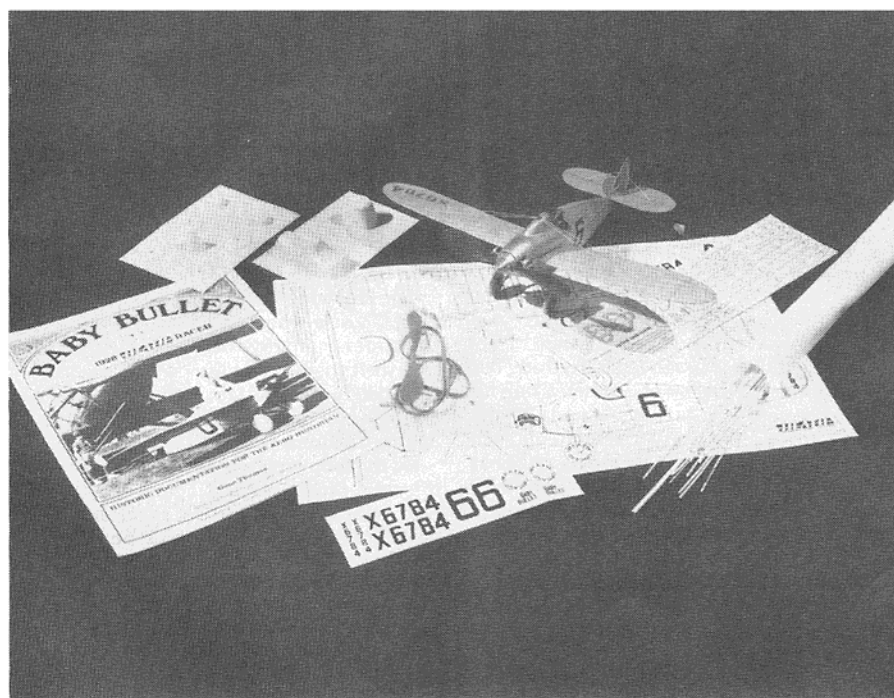
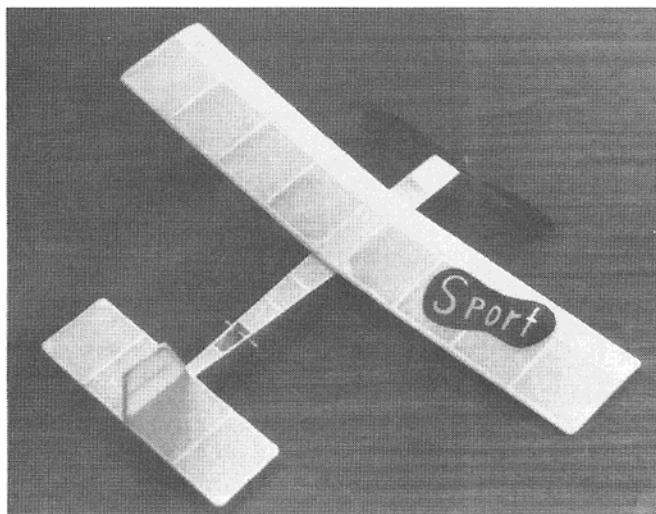


This



Not this

For peanuts sake use stick gussets - they're lighter and just as easy to install



This Classic Models kit of the Heath Baby Bullet is super complete, even to the scale documentation booklet. This Lou Roberts' design is a fine-flying sport peanut (top left). The Co₂ powered, miniature Buzzard Bombshell old-time classic by Buzzer Model Airplane Co. (top right). Lou Roberts of Denver, Colorado, sent in this building tip (opposite page). Light gussets for a lighter ship.

ing short of terrific! Not a difficult building job either. The printwood is very good with clean sharp lines and the selection of balsa is the greatest. And, does it look like the real thing? Well, again, judge for yourself from the photo! He also offers the famous old American Ace and Super Sunduster in this series. I say, "in this series," because Buzzer also offers a number of other items of interest. Incidentally, the aforementioned miniature old times are offered as semi-kits (plans and Printwood only) and sell for \$4.25 each. There's also a series of slightly larger old time replicas to be used with .02 glow engines. There are also peanut scale types in all degrees of difficulty from simple to "Wow!" There are special types unlike anything offered elsewhere. I specifically refer to a rubber powered version of the Concorde Supersonic transport! This is a "sweetheart" and

surprisingly easy to build . . . and, how'd you like to be the first guy on the block with a flying model Concorde? Okay, okay . . . I can see that some of you are already "drooling." How do you find out about all these goodies? Simple. Send a self-addressed stamped envelope to: Buzzer Model Airplane Co., P.O. Box 124, Howell, N.J. 07731. You'll get a neatly printed brochure of all that's available with ordering instructions. You'll also find out about other exciting things happening at Buzzer . . . like . . . Bill Brown is going to build a new Co₂ engine exclusively for Buzzer. It'll be larger (.016 cu. in. displacement) and swing an eight-inch prop at around 4000 r.p.m. for 60 secs. on a tank! Should be great for some of the larger free flight kits. But, don't wait - send in that SASE now.

Golly, I can already see that we're not going to get in all the items I wanted to tell

you about this month. Well, what the heck, we'll do it next month and that'll give you something to look forward to. Right? Hey, remember the little P-40 Flying Tiger, all-paper glider I told you about some time back from Saf-Flite models? I showed you a photo of mine at the time and recommended it for school groups. Well, I know some of you remember 'cause Bob Fudold who runs the company told me he got quite a few orders from some of the gang. Well, the news is that Bob has turned out the second model in the series - a terrific Japanese Zero! It's built in the same way as the P-40 and comes out looking great with a grayish-silver finish and the red "meatballs" on wings and fuselage, gun details, and all the necessary detail and markings. These little kits are \$2.50 each - same as the P-40 - and that includes postage. You can get yours by writing to Saf-Flite Models, P.O. Box 62, Roseville, MI 48066. If you didn't get the P-40 before, you can send a "fiver" now, get both models, and re-fight World War II in the Pacific! Saf-Flite has another nice touch . . . their order form says, "If not satisfied, return model for immediate refund." I guess that tells you that they know they have a good product.

Oh yeah, I wanted to toss in one reminder, too. A while back, I suggested that you more advanced scale builders get the Classic Models catalog. Remember, I told you how complete it was with photos of all the kit parts, plans, and even the finished model? Well, I wanted to show you a photo so you'd know what to expect if you haven't gotten your copy of the catalog yet. Just send a buck to Classic Models, P.O. Box 681, Melville, N.Y. 11747. That "buck" is also deductible from your first order . . . and that \$1.00 credit is printed right on the order blank that comes with the catalog.

Well, gang, as I said earlier, I've got more new goodies to tell you about, but it looks like the time has come to close up the old shop and close the hangar doors for another month. Just to whet your appetite, next month I'm going to tell you about a large-size completely scale model that can be built *even by a beginner* in one day! It flies, too! Sound exciting? I hope so . . . 'cause that should guarantee that you'll be here right on time when we open the hangar doors for next month's session. Until we get together again, keep the letters and photos coming to your old friend here at 10 Brothers Rd. in Wappingers Falls, N.Y. 12590. See ya soon.

With Model Builders

by Ed Whalley

NFFS Nats project launched

The National Free Flight Society has instituted a talent search to staff both a select committee and a nationwide panel to address the overall problem of Free Flight and the Nats. Once the mainstay of Nationals competition, Free Flight has gradually assumed a lesser position in the Nats effort due to the emergence of R/C as the major modeling interest. With the decline in F/F as a primary interest among AMA members and as a result of other factors; e.g., the expanding site demands of an advancing state of the art and the difficulty of meeting these demands on sites suitable for other categories of competition, Nats F/F has degenerated into something of a Fun Fly or a convention Fly-In. The result has been that titles won in F/F categories at the National Championships have proved little beyond the fact that a few good old boys attended. In a series of events in which measured duration is the yardstick of achievement, Nats F/F has ceased to be an important competition. The independently sponsored USFFC's have become the top meet.

Taking advantage of the Academy's formal recognition of special-interest groups, NFFS rightly feels that it is the organization best suited to explore the philosophy of a Free Flight Nationals, to develop methods and resources for its implementation, and to impact on AMA. The Society hopes to present a unified and workable concept to the Executive Council at its fall meeting.

To this end, Hardy Brodersen, Executive Director, has launched the NFFS Nats Project. A select committee is being confirmed by the Society's directors to get the Project off the ground. The ten-member Committee will be backed by a nationwide panel of resource people who will feed information, ideas, and resource data into the Project. Appropriately, the kickoff meeting at which the Committee will be named is set for August 13 at the Nats.

Since this is being written before the fact, we can only report likely appointments to the Committee. However, individuals like Bob Meuser, Jim Scarborough, Homer Smith, Bob Sifleet, Jim McNeil and a host of others with a record both of service and of competitive interest come immediately to mind. The possibilities for the back-up panel are infinite. And while a report for the fall Council meeting is being set as an immediate objective, there is no reason to assume that the work of the Committee or of the back-up panel will not be on-going in nature.

In addition to a re-thinking of Nats FF philosophy, the group will deal with matters of format, site requirements, site rotation, meet and event scheduling, site availability and selection, and all of the problems which

have plagued FF under the current Nats program. It's a tall order.

Any individual or group with anything to offer or anything to say should get in touch with Hardy Brodersen at P.O. Box 1104, Birmingham, MI 48012. It doesn't matter whether you belong to AMA, to NFFS, or whether you even fly Free-Flight. When one segment of the modeling community helps another, everyone benefits. There are a lot of professional and avocational resources out there which, if brought to bear, would find an alternative to the annual dilemma faced by the Nats Executive Committee which seeks to balance FF site requirements with the logistics of a traditional Nats. How about it?

Kansas City program attracts both drop-outs and newcomers

Controline activity in Kansas City nearly disappeared about five or six years ago, but it is currently enjoying a mild revival according to Larry Miles of the Kansas City Control Liners. According to Miles, too much specialization and not enough to attract beginners was the reason. Anyhow, about a half-dozen guys got together last year and began to fly what they had. This was the nucleus of the KCCL. They tried to revive interest by promoting a few contests, but it didn't do much good.

More of the same old stuff wasn't the answer, so this year they tried something different. What the boys came up with was a six-month, round-robin tournament based on one plane flying in five events. Their once-a-month contests have rekindled the interest of known drop-outs and attracted several newcomers. The one-plane, five-event deal makes it tough to be anything but a generalist, and the low-key competition for small but useful prizes has restored the element of fun to the activity. Useful items such as fuel, plugs, props, etc., serve as prizes at the monthly meets; trophies are reserved for the top five hi-pointers at the conclusion of the tournament. The program bears looking into.

The boys kept it simple by limiting engines to plain-bearing .15's or .19's. Tanks were limited to two-ounce size without quick-fill or pressurization. Ships fell into the mold established by available kits: Magician, Ringmaster Jr., Flite Streak Jr., etc. And the five events selected included: Endurance, Speed, Racing, Balloon Bust and Modified Stunt. Rules for these events are likewise simple.

Endurance is flown with one ounce of fuel. Scoring is based on one point per second of air time. No exhaust or venturi restrictors are permitted. Typical times run to between two to four minutes which translates into a range of 120 to 240 points.

Speed is based on one point for each mile per hour achieved. The first eight laps only are timed. Speed points tend to be low. Top speeds are in the 80 m.p.h. range. Racing, on the other hand, is based on laps completed in a ten-minute period. At two points per lap, scores tend to run between 200 and 300 points.

Balloon Bust is scored by multiplying the speed (once gain, for eight timed laps) by the number of balloons burst. The balloons are mounted on weed stalks spaced 60 degrees apart and allowing 120 degrees for takeoff. The arrangement permits five balloons. These are set at heights ranging from six feet for beginners to as low as seasoned flyers dare go. Two balloons snagged at 50 m.p.h.

equals 100 points; four at 65 m.p.h., 260 points.

Modified Stunt is scored by awarding between 10 and 40 points for each of the following: take-off and level flight; wingover (end right side up); a series of three inside loops; two laps inverted; three outside loops; one inside, square loop; two horizontal figure eights; two vertical eights; two overhead eights; and landing.

Typically, the KCCL charges an entry fee of fifty cents per event, and they aren't chintzy about skipping that in the case of a kid who has trouble getting it up. If you live in the KC area and would like to get in on the action, get in touch with Larry at 6595 Foxridge Drive, Apt. 158, Mission, KS 66202. The gang is cookin' up more goodies.

Cars race at MACK International

A series of weekly race meets was held at MACK International out near Great Bend, Kansas. The field is the home base of the Model Association of Central Kansas. Editor Jim Mowrey carried the results in their publication, *Turbulent Tissue*. And if the races weren't reported in *Car and Track*, KCK-TV taped some of the goin's-on for presentation on TV-2. Yep, that's right—race cars!

On June 9th, ten cars were entered. This was both the day that the TV crew showed up and that points started in the feature races. Larry Tournear starred for the locals in the interview, and some good race footage was shot. Bob Arnett won in the feature, with Don Reed, second and Larry third.

The following week, nine cars were pitted. Arnett lost a wheel in one of the races, and the power company turned off the lights before the finish; but things were successfully concluded with Bill Moore taking first, Reed taking second (again) and Tournear (also, again) finishing third.

By the following week, the field was down to seven racers. Arnett again had trouble. And, again, it was Moore, Reed and Tournear. This concluded the series, and the final standings read: Reed, 9 points; Moore, 8; Tournear, 6; and, Arnett, 4. Guess the other entrants didn't make it into the Features. Anyhow, this story proves that guys who fly R/C planes can also race R/C cars—only thing is, they do it at night. Howcum the power company, ALCO, turned off the lights? Can the boys find happiness on the track as well as in the air? Stay tuned-in.

Super Joysticks Race at Mather

Out on the coast, the boys are keeping those old Joysticks going. The Cordova Model Masters ran their third meet of the season on July 12th at Mather AFB. Larry Taylor of the local (Sacramento) Joystick Aces and Kermit Walker of the Tokay R/C'ers (Lodi) got carried away with the whole thing and staged the most thrilling spectacle of the afternoon. Went like this:

Due to an unfortunate distribution of frequencies, all heats were flown as two-up races with three of the four Experts involved never flying against each other. It ended-up with a three-way tie for first in Expert between Taylor, Walker, and Lanny Shorts (Lodi). Heat times had to be used to decide the ties. Shorts, on this basis, clearly ended-up in third place. However, Taylor had the fastest 20-lap time; Walker, the fastest 10. So they decided to settle things via a 20-lap flyoff. This turned out to be a harum-scarum deal with both ships never getting even 100 feet apart and both flyers keeping

them right down on the deck. About a third of the way through, Walker cut the Number One pylon and picked-up a penalty which, for all practical purposes, cost him the race. But the boys were having too much fun to quit.

They kept on racing for about thirty laps with the pressure getting to both flyers. Walker picked-up more cuts but kept on coming with Taylor going flat-out to stay ahead. Coming off Number Three, Taylor was so low that he pancaked into the weeds about half-way down the straight as Walker streaked by like a fighter putting the finishing touches to his foe. Luckily, Taylor didn't even break his prop. The extent of the damage was simply a pulled landing gear. Taylor earned his first; Walker, his second; and in the process, they provided some excitement for everyone on the field.

Joysticking seems to be becoming a monthly event. If this piques your curiosity, check it out with Chuck Beem (Hobby Mart, Rancho Cordova) or Lanny Shorts (Standard Hobbies, Lodi).

Aeronuts OT meet logs 50-odd entries

The 19th Annual Old Timers Contest up at Bong drew an awful lot familiar faces among the fifty-odd entries. Next year will be the big 20 for the Chicago Aeronuts' meet. This year, Bong was tied-up for the whole week end as the OT meet ran back-to-back with an IMAC meet. This was a good deal for those who had to travel any distance. Another good deal was the weather. It usually blows at Bong; but for this one, the winds were mere zephyrs and the lift was light and spotty. CD Otto Curth reports that Gas and Rubber could climb into lift but that HLG saw no maxes. Even with 2:00 maxes, only .02 Replica saw a max-out.

Mitch Post had a good day. He took a first in Class A, plus seconds in B and C. Tony Italiano and George Flemming got into the flyoff in Replica with Tony pulling it out via a coin-flip after each did 240 on top of his 360. Bob Larsh put up his glider long enough to post 102, 85 and 80 to get his 267 total. The next highest single was 54 on a toss by Dana Pond. Italiano also got a third in B which was won by Tom Van Hoose with a 360 maxout. Chuck Sotich took ROG Cabin in the Rubber category, and Willard Smits took Old Time Stick with 359, one second short of 360. Bob Watson got a third in A behind W.A. Zehr, plus a fourth and fifth in other events. Zehr had a fourth and a fifth, too. It was a fun meet with a lotta opportunity to chew the fat.

Rodemsky and U.S. win at West Baden Indoor WC's

The United States Indoor contingent had things pretty much its own way at the West Baden, Ind., Indoor World Champs in June. Not only did the Team take top individual and group honors, but our defending Champ, Jim Richmond, make it into second place in the overall standings. Erv Rodemsky of Danville, California was the top man on the winning team and top overall individual as he clinched the title for the U.S. Erv, a pilot for American Airlines, made the longest flight of the venue when he posted 36:23 on Day One. He backed this up with a 35:36 for a 71:59 total on his sixth and final flight. Pete Andrews posted 66:38; Ray Harlan, 68:02 to bring the Team total to 206:39. Harlan's best effort was 35:49 Andrews', 33:23. Richmond, flying as Defending Champ (not as part of the Team) posted 71:29 to finish a mere 30 sec-

onds behind Rodemsky. Jim's best time was 36:17.

Third place in individual standings went to Rene Butty of the second-place Swiss team. Butty posted 35:26 on his first flight; 35:06, on his sixth. His overall total was 70:40. His team members, Dieter Siebenmann and Andreas Vogel posted 67:19 and 66:44, respectively, for a Team total of 204:43.

The British Team of Laurie Barr, Bernard Hunt and Dave Pymm posted a total of 203:42 for third. Hunt was the top-placing individual with a 69:17 total, and this got him fifth place overall. Edward Ciapala of Poland was fourth with 69:45, and his team finished in fourth place, also, with a 192:29 total. The Netherlands was fifth with a team score of 182:45. Canada was sixth with 177:17.

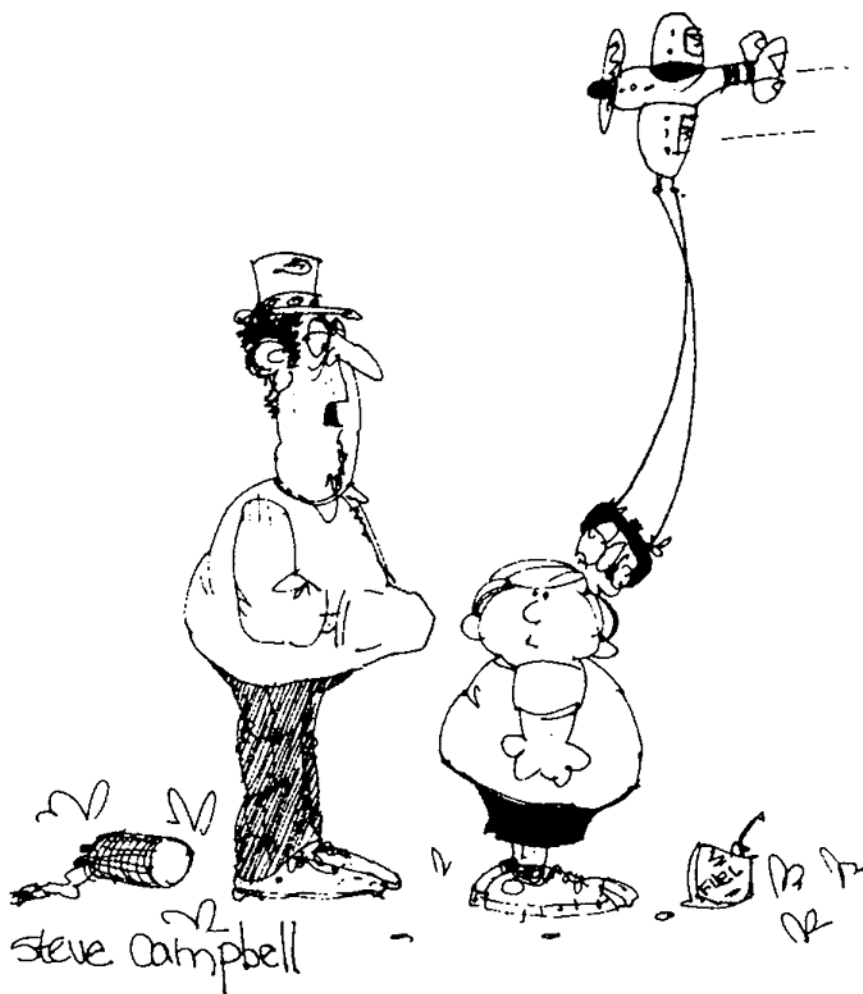
The meet, held at the Northwood Institute in West Baden, drew quite a few spectators and elicited much favorable comment from competitors. Having the entire affair held under one roof—flying, housing, administration, everything—made for a memorable and enjoyable experience. Paul Stroud, Northwood Dean, was awarded a commemorative plaque from AMA for his school's cooperation in the Champs. The award was well deserved; the Institute has become the favorite site of the U.S. Indoor fraternity and now, possibly, of the World.

Oregon's CLAMbash '80 marked by tight flying

Up along the Oregon coast the CLAMS (Control Line Aeromodelers Society) of Astoria and Seaside held their third annual CLAMbash which featured something old and something new and which turned out an unqualified success in every way. They enjoyed the best weather, the best turnout, and the best prizes ever—and they didn't go in the hole doing it. Considering that Mt. St. Helens was trying to blanket the whole Northwest in volcanic ash at the time, this was quite an accomplishment.

The meet offered Combat, Stunt, Sport Racing and a new event, CLAM Scale. This latter is an event with both static and flying points with loose rules to encourage Scale building. Combat saw some pretty good flying with very few air-time matches. Stunt was very tight in Advanced-Expert. Rich Porter took first with 418. Rich Schaper was second with 415, and Don McClave was third with 413—just five points off first place. Scale went to Terry Miller and his "almost" Navion based on an old Sterling kit. His static points were a bit low, but his maneuvers were outstanding.

Combat produced an added thrill when Jim Cameron's Half-A got loose and free-flighted around the site. It finally got up to 400 feet and landed, ultimately, a few blocks away without even breaking the prop. Jim



"Okay kid, head this plane to Cuba!"

immediately became known as "Sky King" or the "Free-Flight King." He still made it into third place, though. Bill Varner was first; Jeff Young, second.

Combat went the single-elim route. Bill Varner once again proved his mettle by taking regular (BC Fast) Combat to become the top pilot at the meet. John Thompson was second; Ken Burdick, third.

The Northwest Sport Race for kitted ships on .35 engines went to Thompson in 9:40. John flew a McCoy .35 Ringmaster as did most of the entrants. Second place went to Bruce Guenzler; third, to Phil Granderson. Phil also got a fourth in 1/2A Combat, by the way. It wasn't his best day.

Jeff Young was the winner in Beginner-Intermediate Stunt. His score was 318. Terry Miller was second; Kev Buzzell, third. Young flew a Nobler with a stock OS .40 swinging a Zinger 10/6. Porter's entry in Adv./Exp. was a 580 sq. in. Ridiculous powered by a TD .049 on 52-foot lines. The combo proved its worth against such designs as full-bore Super Chipmunks, Stiletos, and the like, flying on 65-foot lines and powered by a variety of .35's and .40's.

Incidentally, John Thompson and Mike Hazel of the CLAMS put out the nicest bulletin, Flying Lines, that it's been our pleasure to receive in some time. We hope that they keep sending it. It's big, it's good, and it's got pictures. Write: Flying Lines, 1411 Bryant Avenue, Cottage Grove, Oregon 97424.

Records Tumble at San Jose

You better believe it; come the Fourth of July and the Homecoming Meet at San Jose, and the WAM records fall like autumn leaves. This year's Firecracker Day Meet proved to be no exception. Four records went by the boards this year, three in Speed and one in Endurance. And flying in Stunt looked like a version of Family Feud as the McClellans, Fanchers and Dave Fitzgerald—all of the 049'ers—pulled out all the stops in an unrelenting effort to beat each other—and everyone else. Maybe it's the crowd that brings out the tiger in everyone at San Jose. The whole WAM clan seems to converge on the meet. Whatever it is, it makes for a great contest.

Let's take a look at the records. Joe Pearson, set the new mark in 1/2A Open Endurance. He turned 3 hours, 34 minutes, and 50 seconds. Since this beats the ABC mark set by Al Unger in 1975 (3:02:29.0), it is also an absolute record. It also beats the club record set by the Air Pirates for 1/2A, also back in '75, of 2:09:39.0; so Joe's time establishes a new milestone in Endurance records. Joe's from the Pacific Coast Flying Gryphons.

In Speed, Doug Hinckley of the Concord Model Engineers turned 101.08 MPH in 1/2A Junior for a new record. And the Margaridos, Fred and Joyce, turned 172.68 MPH in A Expert for another record. The third record to tumble was in C Expert. Here, Frank Hunt turned a sizzling 199.92 m.p.h. giving the magic 200 MPH mark a close brush. In setting the new A Expert mark, the M&M's broke a record that had stood for four years. The old C Expert mark had been set in 1969. This year's effort by these people can only be termed outstanding.

Turning to Stunt, we might remark in passing that the McClellan family now fields four competitive flyers; the Fanchers, three; and, the Fitzgeralds, two (on occasion)—all 049'ers. Bill Howe, Jeff Anderson and the Shorts clan are usually out to beat them. It's

a tough way to go.

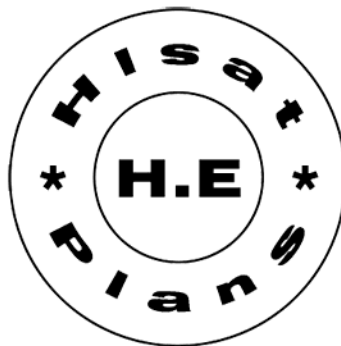
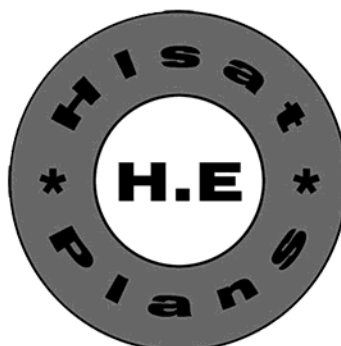
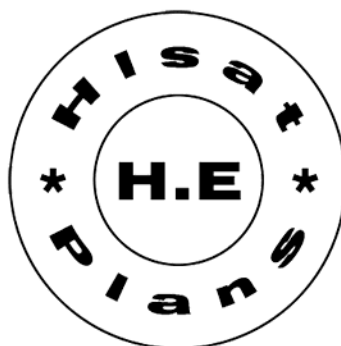
Stunt BC Expert is really the big boys' event; it's more like the finals at the Nats than just another class at a regular meet. It was a complete 049 sweep. Ted Fancher posted 517 to win. Dave Fitzgerald was second with 499. And Gary McClellan was third with 490. Considering the judging at these WAM meets, it is absolutely certain that the scores would stand-up at the Nats. In other classes, Dan McClellan took 1/2A (Adv./Exp.) away from Fitzgerald by a wide margin: 478 to 416. Bill Howe (388) was third. Jim McClellan took 1/2A Beginner with a creditable 407. And Dave Fitzgerald turned the tables on both McClellan and Fancher by taking A (Adv./Exp.) in 483. Gary posted 469; Ted, 409. Jim also pulled a third in BC Beginner; Dan, a second in BC Advanced. Mitch Williams won ABC Novice; Jeff Anderson, BC Beginner. Jeff's 421 score reflected a most creditable performance. Mitch Williams took 1/2A Novice; Bill Kipp, BC Advanced with a solid 413. All of these individuals bear watching; good competition breeds strong competitors.

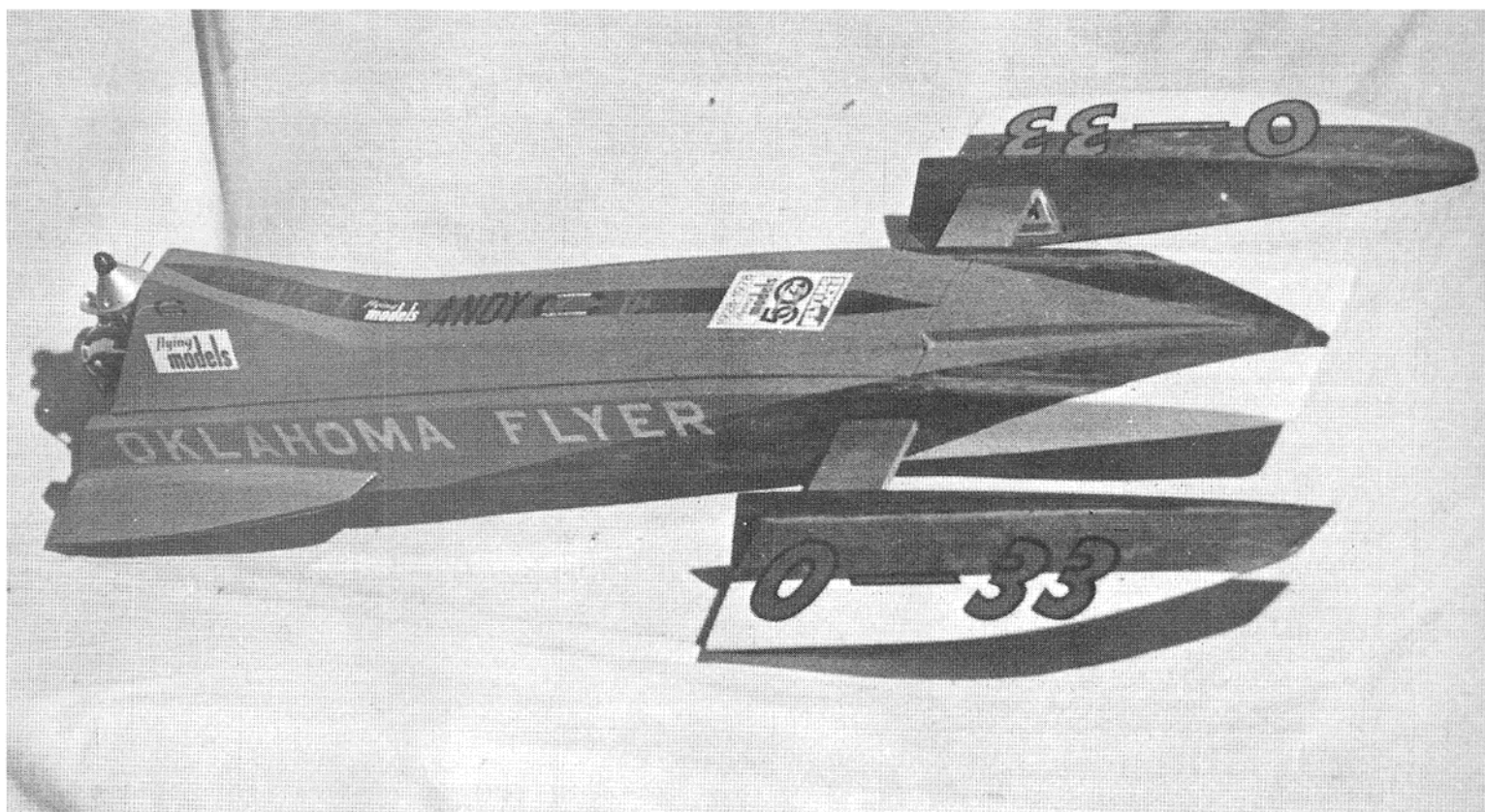
In other flying, Rich von Lopez scored wins in 1/2A Open and BC Fast Expert Combat. Fast Eddie Bridant won in BC Slow and took a second in A Open and a third in BC Fast. Matt Rodrigues took A Open and a second in BC Fast. In Scale, Frank Hampton had a first in 1/2A and seconds in Single-Engine and Multi-Engine. Other winners included: Joe Pearson, Bob Riggio, Stan Patterson and Tom Moore. Patterson also had wins in Carrier as did Don Chandler in Air Race. The Carpenters did well in Economy, and Bob Anderson, the perpetual Hi-Pointer, placed in a number of different events. Vic Garner and Gary Buffon continued to slug it out in Ten Mile with Merle Machen and Bob Boling showing promise on their way up. Garner turned 5:53.4 to take C Expert; Machen, 9:08.2, to take C Advanced. (This to give some idea of the levels of expertise.)

And, last but not least, we turn to the WAM Glider events. Here, young Robert Anderson posted 2:22.5 in Ten-Inch Novice. Bob Frank, in Ten-Inch Expert, only did 2:10.2. And Dave Fitzgerald limbered-up his Stunt arm by chucking his Five-Inch glider to a win with 1:14.5—all great times. These gliders are a good idea, and more meets ought to card them.

Courtesy of U.S. Mail

- We're now getting the Thunder Bay Rc'ers bulletin. More on their flying field—remember they elected to follow a natural growth pattern rather than to go for a big membership—well, they've been handed an eviction notice by the provincial government. The irony is that they're getting more and more new members all the time.
- Bud Nosen is featured in a ten-minute segment dealing with his Quarter Scale biggies. The footage is being aired in the U.S. and Canada on the PM Magazine deals (Westinghouse?). A similar segment on R/C Soaring features activity in Massachusetts. Bud's from Two Harbors, Minn.
- Got a note from Joe's Hobby Collector, 5379 E. Whittier Blvd., Suite 39, East Los Angeles, Calif. 90022, advising us that they have recently acquired quite a few collectibles—notably old kits and Jetex motors. They now have many hard-to-find items as the result of buying the stock of a hobby shop to settle an estate. Write to the address for particulars.





Bishop Marine's

Phantom Outboard

This outrigger hydro is set up specifically for outboard engine use. A change from the tunnel hull approach/**Andy Seay**

Until now, the only kit designed for the model outboard racer that could reasonably handle a hot K&B 3.5 outboard engine, was the El Diablo outrigger, by Precision Boats. The rest of the market was flooded with tunnel hull designs, which are fine as long as your K&B engine is box stock. Otherwise you would find yourself spending more time in the pick-up boat retrieving that speedy little tunnel hull that could not

handle the power of your modified outboard engine.

But that will soon be changed. A new design is about to hit the winner's circle in outboard racing. Bishop Marine Designs, of Woodward, Oklahoma, has just introduced a new and fast outrigger specifically designed for outboard racing and the K&B 3.5 outboard engine. This new design, called the Phantom OB, is easy to build, features ad-

justable front sponsons, and is capable of handling most water and race course conditions.

The kit is very well put together, using high quality machined parts and first rate aircraft plywood. All of the wood parts are numbered for easy identification, and I found the parts to fit perfectly without any modifications and very little sanding. The only criticism I have of the kit is the instruction booklet. It was quite brief, and left some steps in construction unclear. But hopefully, should you decide to build this boat, this article and the booklet should answer most of the questions that arise during construction. Also included was a set of full scale drawings of the

boat which were quite helpful and very professionally done.

Hull construction

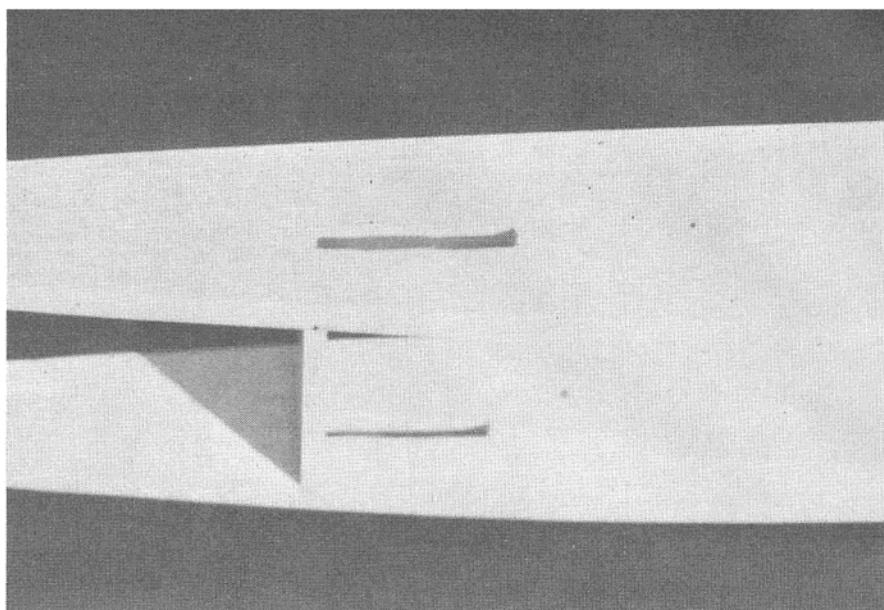
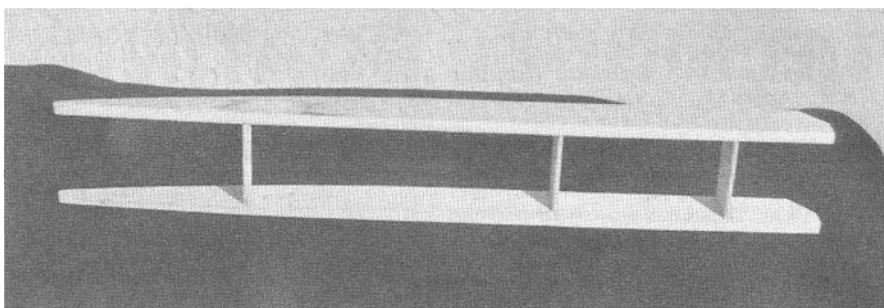
Locate parts #22, #23, and #24 of the motor bearer. Arrange these in sets so you will have a left side and a right side. Laminate part #22 to the inside of part #23 and laminate part #24 to the outside of part #23. Be sure you do not produce two lefts or two rights. Lay the motor bearers on a flat surface and weight them down until dry. Locate bulkheads #11, #4, and #1, using the full scale drawing (side view), locate and draw a vertical line on the inside (part #22) of the motor bearers for each bulkhead. Now, before these can be installed, the sponson boom cut-outs must be made. The instruction booklet was *quite brief* on this step, so try to stay with me and I will do my best to explain how to locate your cut-outs.

Find Part #18 and again refer to the scale drawing (side view) and also drawing #A in this article. You will be working on the part of the motor bearer which is the bottom of the hull. Using part #18 as a guide, draw a horizontal line the completed width of part #18 starting from the vertical line of bulkhead #11. (Drawing #A) Then take one of the aluminum booms and mark an outline of the boom using the horizontal line of part #18 as the lower edge of your boom. You should now have an outline drawn on the motor bearer of your cut-out. Do the same to the other motor bearer and cut the slots out. There is also a picture showing this cut-out in the article. This step is important so the sponsons will be positioned at the right height. The next step is to glue all bulkheads #11, #4, and #1, to one motor bearer. Be sure these are straight and square before they dry. After they are dry, glue the other motor bearer to the bulkheads. Now you have the basic framework of your hull.

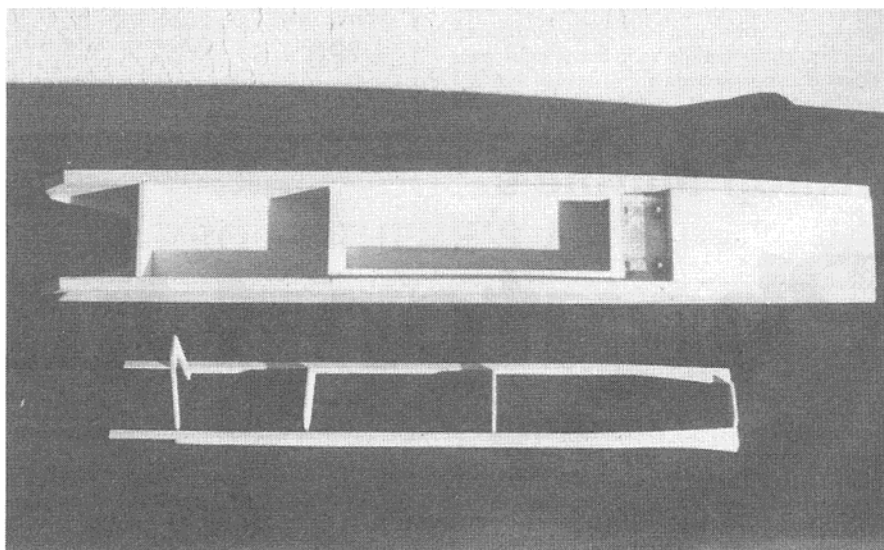
Now locate Part #48, which is the bottom of the hull. Use masking tape and weights, epoxy the bottom to your hull framework. (Note: Be sure you are attaching the bottom to the right side of the hull. Part #48 seems to fit on either side. Tape and weights are very important in this step, so the hull will not develop a warp while drying). After the bottom piece is dry, add the foam nose block. A word of caution: Be sure to use only epoxy glue on the foam pieces, other types of glue will melt the foam. Now add part #46 which is the front nose piece. Sand and shape it to your satisfaction. Using the sanding block, sand the foam level with the top of the hull and epoxy part #20 into place.

Locate parts #14, #50, and #16. These parts will complete the nose section of the hull and will allow the cowl to flow into the design of the boat. I found it to be easier to construct these parts with five minute epoxy, sand and shape, then epoxy them to the hull as one unit. Now locate Part #18 and the four 10/32 hex bolts. The bolts need to be epoxied in place before installing part #18. Great care should be taken when you epoxy the bolts to part #18, so that they will not come loose later. After the bolts are dry, epoxy part #18 to the bottom of the hull next to bulkhead #11. Now install part #9 which is the front barrier of the radio box. Bulkhead #4, which is already installed, is the rear barrier of radio box. Locate two pieces of part #8, and epoxy one to each side of radio box. Now add the hardwood plexiglass lid supports, parts #5 and #3 (two each).

After the hardwood supports are dry,

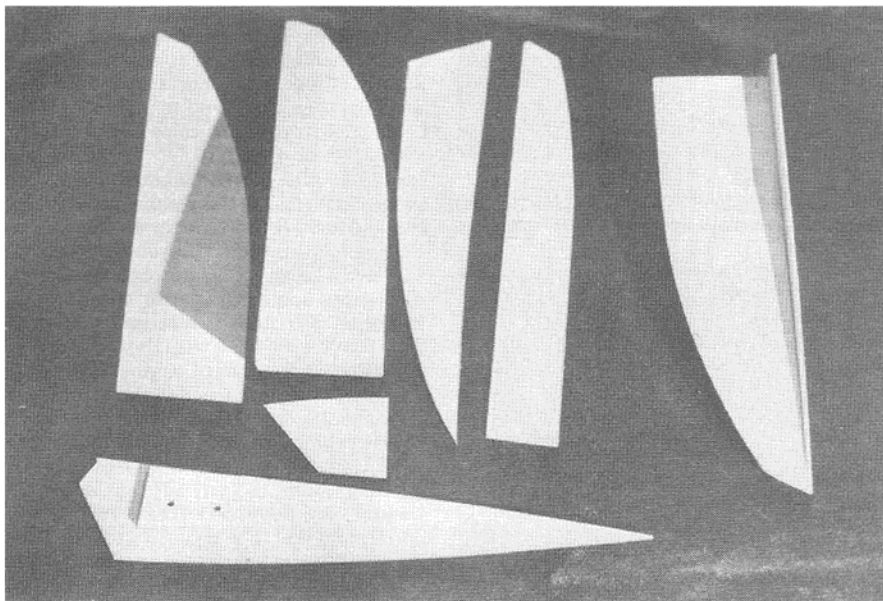
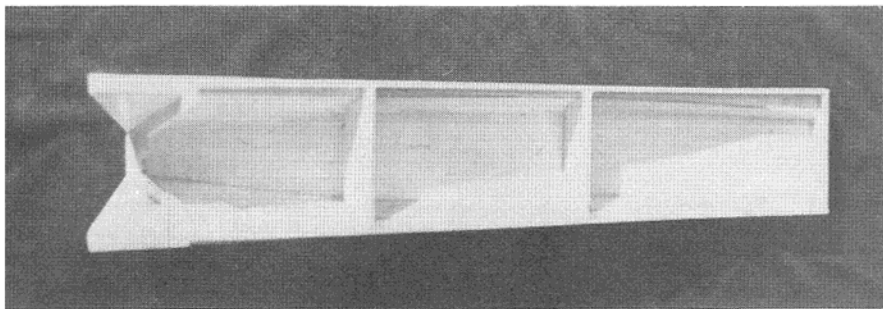


In this photo the sponson boom cutout's can be seen. The basic hull frame with motor bearers attached to bulkheads #11 and #25 is shown here (top). Here hull construction is complete (below). In the foreground is the framework for the cowl. This is made with parts #45, #29, #30, #51 and #25. Note the rugged construction of the side members. A must for a long-lasting competition boat.

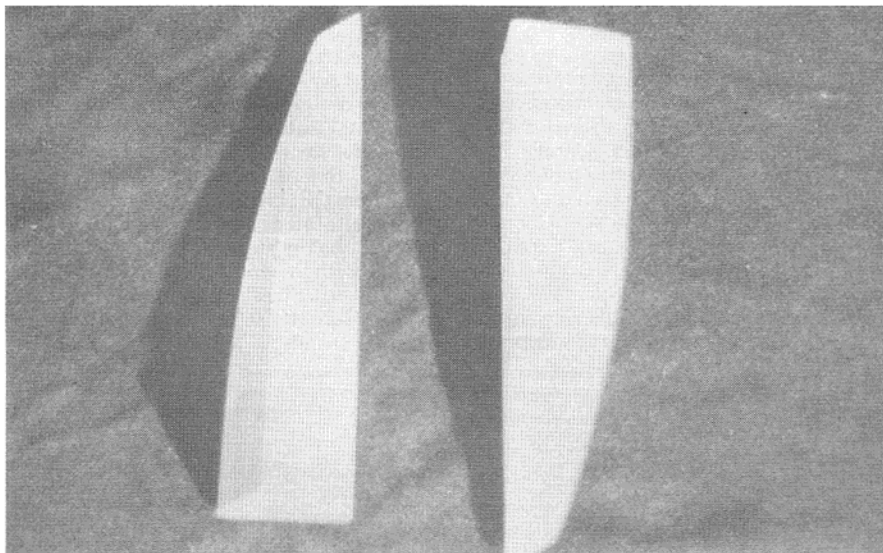


lay out plexiglass lid and drill holes for mounting. Then match holes and drill the hardwood supports. You might leave the paper on the plexiglass while drilling the holes to keep it from splitting. For sealing your lid, saddle tape is suggested in the instructions. Here is another idea; smear a good coat of GE silicone over the hardwood supports. Lay down wax paper, then the plexiglass cover with weights holding it flat.

After the silicone has dried, remove the weights, cover and wax paper. Trim off any excess silicone, smear some grease on the silicone and screw down plexiglass lid. It is now completely sealed from water. This step should be done as one of the last steps before running the boat. This would be a good time to locate and position your servo supports and fuel tank tie downs. After all of the inside hull construction is done, coat a liberal



Shown at the far right is a completed front sponson. On the left are the pieces needed to build a front sponson. Top piece #38, foam body, rear cap #43, splash chime #39 and ride surface #47. Here is the completed cowl (top). Coat the inside with two hour curing epoxy for added strength and to seal the structure from soakage. These are the completed rear sponsons (below).



amount of two hour epoxy throughout the inside of the hull, including radio box.

Cowl construction

If any of you have ever built a wood cowl for a tunnel boat or any other model boat, you know this can be a real pain the neck. But I have got to hand it to Joe Bishop, for this cowl was quite easy to build, and looks real sharp when finished. First step in construction is to

lay two layers of masking tape, or one layer of duct tape, completely around the top inside area of the engine compartment where cowl is to fit. This will leave just the right amount of clearance for the cowl to slip on and off easily.

Locate parts #45, #29, #30, #51, and two parts of #25. Refer to the sheet plans for location of parts. With the use of 5 minute epoxy, build a frame, using the above parts

mentioned, inside the engine compartment. Locate part #28 which is the top of the cowl. Epoxy this part to the top of your framework using tape and clamps to hold it in place. This step is very important, as it will form the actual shape of the cowl and will be the strength in holding that shape. Now epoxy side parts #26 and #27. After the sides are dry, coat the entire inside of the cowl with a liberal amount of two hour epoxy. Using micro-balloons and epoxy, fill and sand cowl to your satisfaction.

Rear sponson construction

Locate the smaller foam bodies from kit and part #31. Making sure that the foam is flush with the bottom and lower rear tip of the inner sponson side, epoxy part #31 to the foam piece. *Be sure* you are making a right and a left sponson, not two lefts, or two rights. Now *follow* this sequence in applying the skin parts and you will have no problems. Locate two sets of parts #35, #32, #33, and #34.

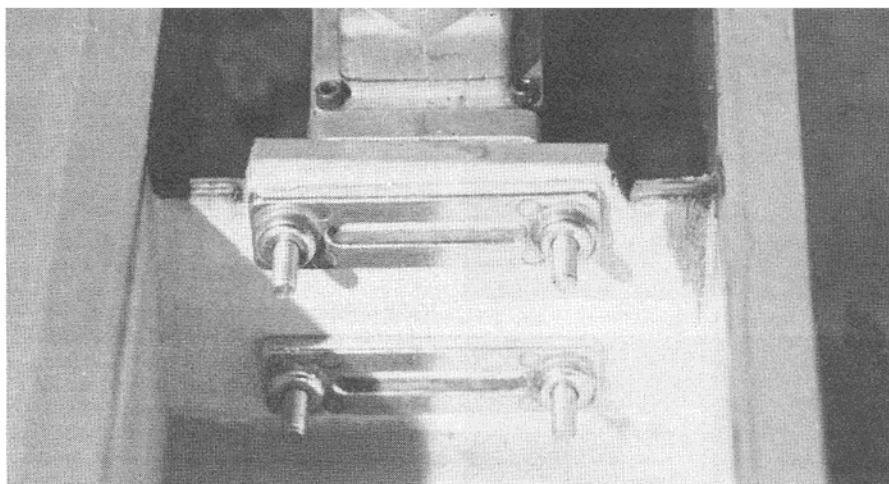
Starting with part #35, which is the rear cap, epoxy it to the rear of the foam piece flush with the outside of part #31. Using a sanding block with fairly rough sand paper, sand the bottom of the foam to match part #35. Now epoxy the ride surface, Part #32, in place. It should be flush with the outside edge of part #31 and leave $\frac{1}{8}$ " of the ride surface extending to the rear past part #35. When this is dry, use a ruler and draw a line from the front tip of the sponson to the rear cap where the sponson top and splash chime meets. Using the sanding block, sand the top of the foam until it is flush with the line.

Epoxy part #34, the sponson top piece, in place. After top piece is dry, take the sanding block and sand the excess foam until it flush with sponson top and ride surface. Now epoxy part #33, the splash chime in place. Some cutting, sanding, and filling will need to be done. Do not round any edges on the bottom of the sponsons or hull, as this will increase drag. When putting the sponsons together, I found five minute epoxy to be the best to use along with tape and clamps to hold the parts in place until dry.

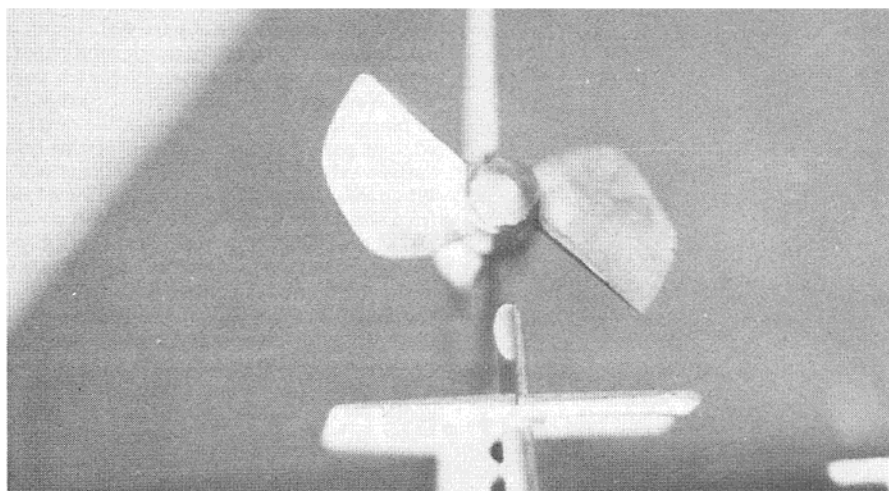
After you have filled and sanded the sponsons to your liking, take the hull and prepare it for mounting rear sponsons. Measure $\frac{5}{8}$ " up from bottom rear of sponson and mark a line at that point on the sponson. Now, noting where the tip of the sponson will hit the hull, measure $\frac{1}{2}$ " up from the bottom of the hull. Mark a line on the hull at this $\frac{1}{2}$ ". Lay the sponson against the side of the hull with the bottom line of the hull hitting the $\frac{5}{8}$ " mark on the sponson and the front tip of the sponson hitting the $\frac{1}{2}$ " mark on the hull. Using the bottom edge of the hull as a guide, draw a line on the sponson. Apply epoxy to the sponson above this line and be sure when you put it on the hull, that it is flat against the hull. After both rear sponsons have been mounted, fill and sand the hull and sponsons.

Front sponson construction

The front sponsons are constructed in the same way as the rear. Be sure to only use epoxy glue on the foam pieces. Instruction book advises extreme caution in shaping the inner foam bodies, as this will greatly affect the performance of the boat. Begin construction by making cut outs on part #40. Draw a line connecting the holes on part #40 and cut this square out. Locate part #42 and *making sure* you are constructing a left and a right sponson, epoxy part #42 to the inner side of



This is a view of the adjustable outboard bracket. Four bolts are used to hold it on. Steve Muck's new outboard prop (below). Andy says that you won't be disappointed with it. Ready to go (bottom).



part #40. Part #42 should cover the cut out in part #40. After inner sides are dry, install and epoxy the two 8/32 blind nuts in place. There are holes in part #42 provided. Now, foam bodies should be notched out to accept part #40. Make sure foam is flush with the bottom and lower rear tip of the inner sponson sides. Put a piece of tape over the back side of the blind nuts and then epoxy part #40 to the foam inner body.

The rest of the skin parts are applied in sequence as the rear sponsons were con-

structed. Part #42, rear caps, are fitted flush to part #40. Shape bottom to match part #43, then epoxy the ride surface, part #47, in place. Again, as on the rear sponsons, leave $\frac{1}{8}$ " of the ride surface extending past the rear of part #43. A line is drawn from the front tip of the sponson to the rear cap where the sponson top and splash chime meet. Sand foam until flush with line, then epoxy top of sponson, part #38, into place. Remove excess foam, to be flush with top and ride surface. Part #39, the splash chime, is now epoxied in

place. Fill and sand sponsons, plus check for rises, depressions, or warps in the sponsons.

Final assembly

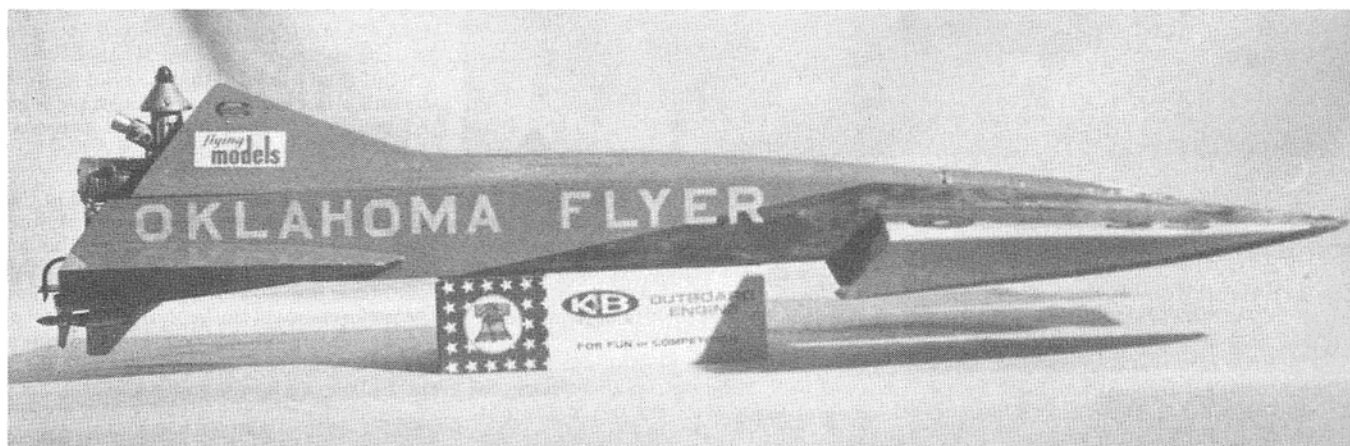
To attach the cowl, BMD sells a spring loaded cowl hinge kit for \$12.95. These are easy to install and works great. When you install your front sponsons, set the left sponson $2\frac{3}{4}$ " outward from hull and set the right sponson at $2\frac{3}{4}$ ". This is only a starting position for you and can be adjusted to your engine and water conditions. A turn fin is supplied with kit and is positioned on the inside of the right sponson. Check the plan sheet for exact location and depth of fin. Paint scheme and color is up to you, but be sure it is fuel proof. For a nice finish, wet sand between coats and apply about 3 to 4 coats of clear over the color and decals.

JG3D-8 or Octura 1445 props are suggested in the instructions. Another good prop which makes the outboards fly is by Steve Muck R/C Boats in Dallas, Texas. Write Steve and tell him you want to order the "outboard prop". The instruction booklet also gives some details on trimming the Phantom OB under different conditions. This boat can be used with the stock or modified K&B 3.5 outboard engine. BMD offers several items you can add to your 3.5 to make it smoke. If you decide to use a pipe, try the KB2R exhaust throttle w/ $1/2$ degree pipe mounting flange, with a KB2U collective venture, all from BMD. If you use a carburetor, try the BMD KB2C racing draw carburetor. Another new item for outboards is the "outboard adjustable bracket" by K&B Manufacture. This item relates to the full scale outboards in being able to jack up or let down your engine. Check page 63 of Flying Models issue of May 1978.

Bishop Marine Designs has all kinds of boat hardware ranging from throttles, venturers, carburetors, exhaust gaskets, socket head cap screws and washers, and even a precut assortment of AAA grade birch plywood. You might also check out other BMD boat kits, such as the outboard trike, a canard design hydro. For you inboard drivers, BMD features the first fully adjustable outrigger hydro called the Phantom CE.

Well, that wraps it up on BMD and the Phantom OB. I really think that if you want to be quite competitive in open outboard with a boat that is easy to build, you can't go wrong with this kit. Call or write Joe Bishop at 918 8th Street, Woodward, OK 73801, (405/254-2021), he will be glad to hear from you.

CE



Prop Stopper

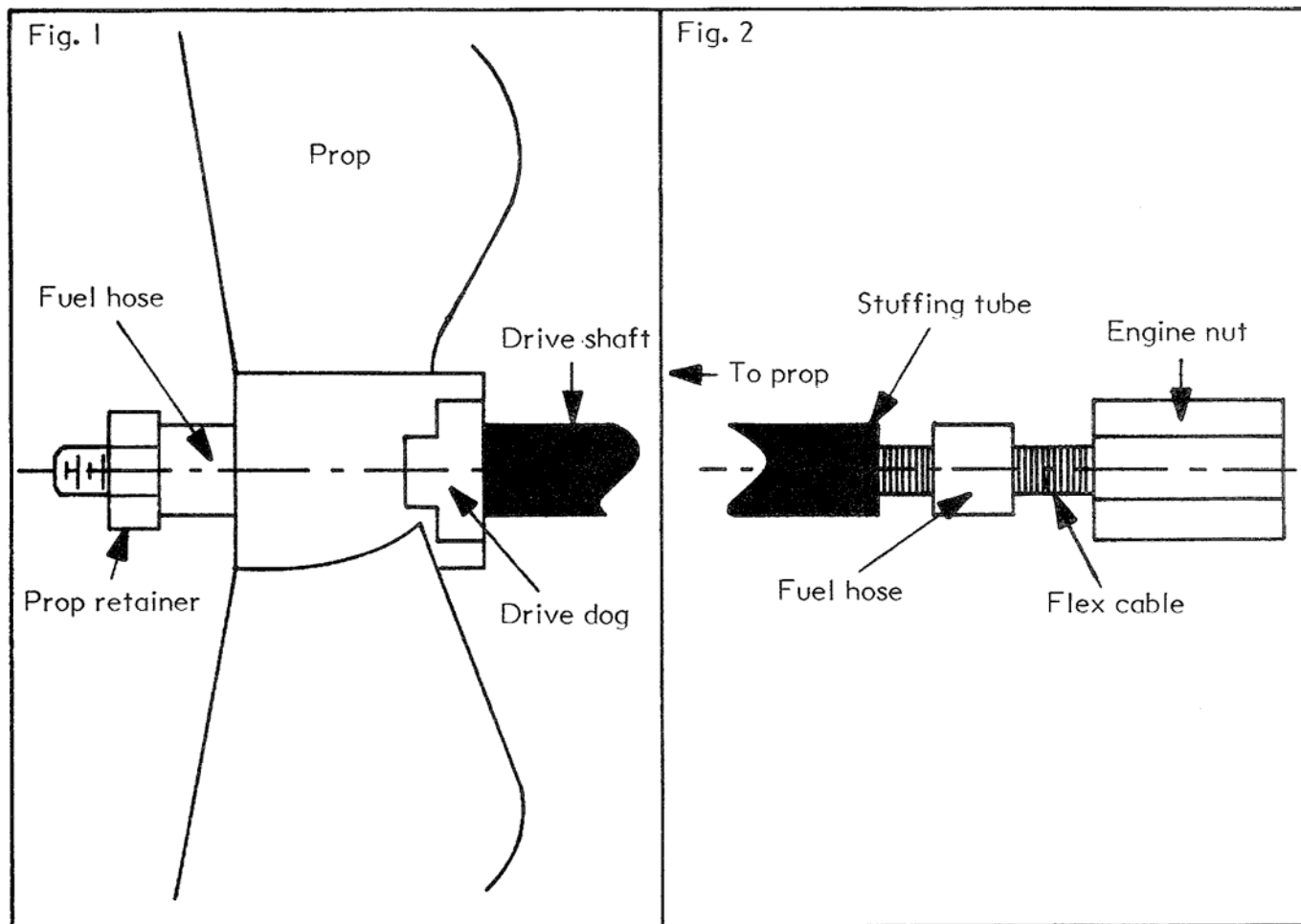
Keep your prop on even if your nut's off **Don Bilsky**

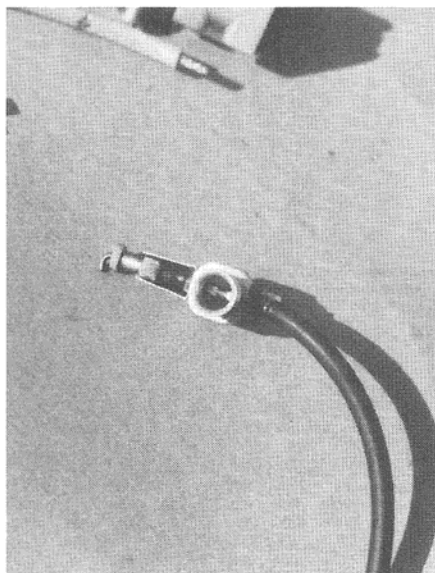
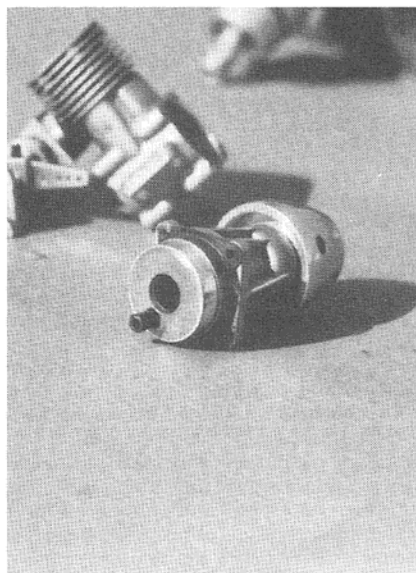
ARTWORK: BOB HUNT

How many times have you been out at the pond, ready to impress your friends or at a big race in the lead only to hear your engine start screaming and your boat settle gently in the water as it comes to a halt. If this has happened then you know what losing a prop sounds like. Not only is it embarrassing, but at \$8-\$9.00 per prop plus all the filing, polishing, and balancing, it's expensive.

Sometimes you lose props regardless of what you do, but one way to help is to cut a $\frac{3}{16}$ " long piece of good fuel tubing and place it between your prop and retainer (Fig. 1). What this does is let the prop disengage itself from the drive-dog if the retainer comes off without letting the prop slip off the shaft. If you have flex cable, where the prop is threaded on, you can put the fuel tubing between the engine nut and the end of your brass stuffing tube. This will help keep you from losing both the prop and shaft (Fig. 2).

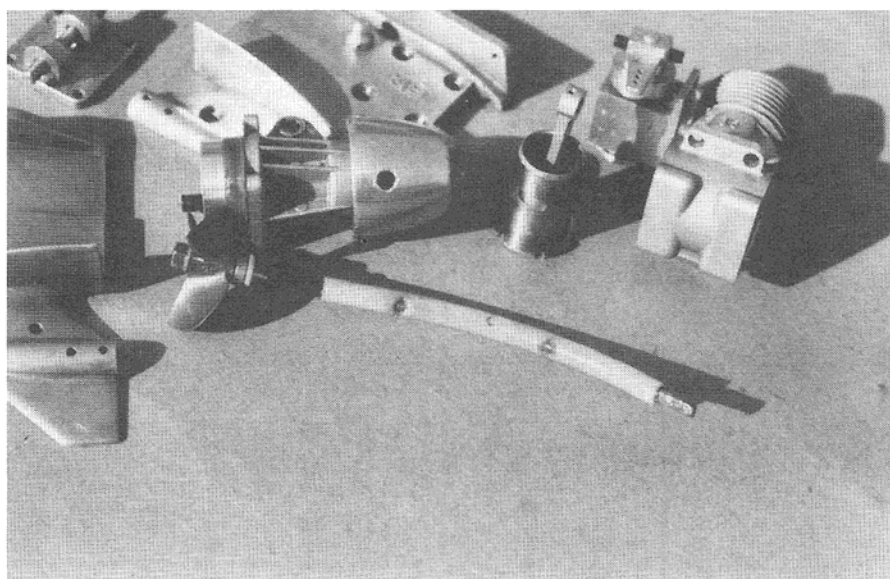
For those of you out there with good ideas just remember, an article doesn't have to be long or filled with a lot of fancy words to get an idea across and help a fellow boater avoid headaches and save money. Please, share your ideas with other boaters. Write an article today. If you tell me what you know, I'll tell you what I know.



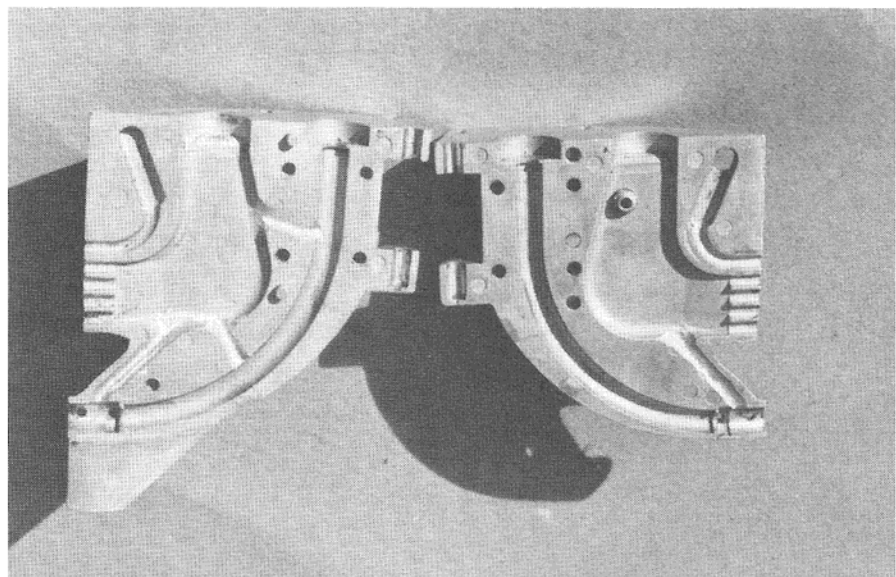


Putting more steam in the K&B 3.5 cc outboard

Some simple steps for more raw speed/**Al Berry**



The holes in the Teflon tube are cut to match the new oil passages in the lower end. This offers better lubing of the shaft. This is the racing crankshaft from McCoy (**top left**). This oversized 9.5 MM venturi features a twin hole spray bar (**top right**). A view of the insides of the case halves shows the new oil passages (**below**). Be extremely careful when cutting the new grooves in the soft aluminum cases.



This article deals with making modifications to a stock K&B 3.5 cc outboard engine. Most of the changes are simply parts replacements but some of the work involves basic metal cutting that can be done by hand with a Dremel or similar tool. The possibility exists that, if you are unfamiliar with doing this type of work, you could ruin either your engine, the lower case halves or both. Do this at your own risk—Ed.

The K&B 3.5 cc outboard is a very popular engine in the box-stock classes. However, there are some of us who can't leave well enough alone and are interested in stepping up to the modified outboard class. Unfortunately, information on the modification of the 3.5 has been difficult to find. Here is one way you can put more go in your outboard.

The first thing you do is replace the stock crankshaft with a McCoy ICB crank. This crankshaft is available from Dick McCoy at C&H Inc., 10767 Monte Vista, Ontario, CA 91761. Order part number MC-2121-1 car crank and send them \$24.95. To install the crank in your outboard, remove the long crank pin from the stock shaft and reuse it in the ICB crank. This is done in order to drive the rear rotor button. The McCoy ICB crank is fully balanced and features a large intake, with a fillit in it for better fuel flow and a return oil groove cut around the stem of the crank. McCoy has a very nice preset intake timing that doesn't have to be changed for cars, boats, and airplanes. We used a car crank so the intake on the front housing could be turned to the right side of the engine, due to the reverse rotation. This allows you to turn the engine case around with the exhaust port facing up. You are then able to install an exhaust throttle and enlarge the venturi. The photos with this article show a homemade exhaust throttle but we have since used the Prather Products 3.5 K&B-20 degree unit and it has worked just as well. These are available from Prather at 1660 Ravenna Ave., Wilmington, CA 90744 for a list price of \$44.94. The installation of the exhaust throttle eliminates most of the problems involved with the stock slide exhaust valve. The next step is the use of a quality box rod made from 7075 T6 aluminum, with

a bushing on each end. You can get rods like this from Richardson Precision Machining (RPM), 5070 Golden Drive, San Jose, CA 95129. Call them at 408/257-7059 for prices and delivery. This should effectively solve the difficulties people have been experiencing with stock rods. We also used a stainless steel wrist pin as an additional safety feature. The wrist pin is available from Associated R/C Racing Products, 1928 E. Edinger, Santa Ana, CA 92705.

The exhaust throttle was set at a 90 degree angle, so the exhaust exited to the rear. Then on went a 9.5mm bore venturi, that has a special twin-hole spray bar. The spray bar is the key to the engine running properly. This venturi and spray bar comes as a unit and will also work very well with the K&B 7.5 engine. You can acquire one of these assemblies for \$24.95 by ordering part number 35-1 from RC/B Products, 1623 Mo. St., Chickasha, OK 73018.

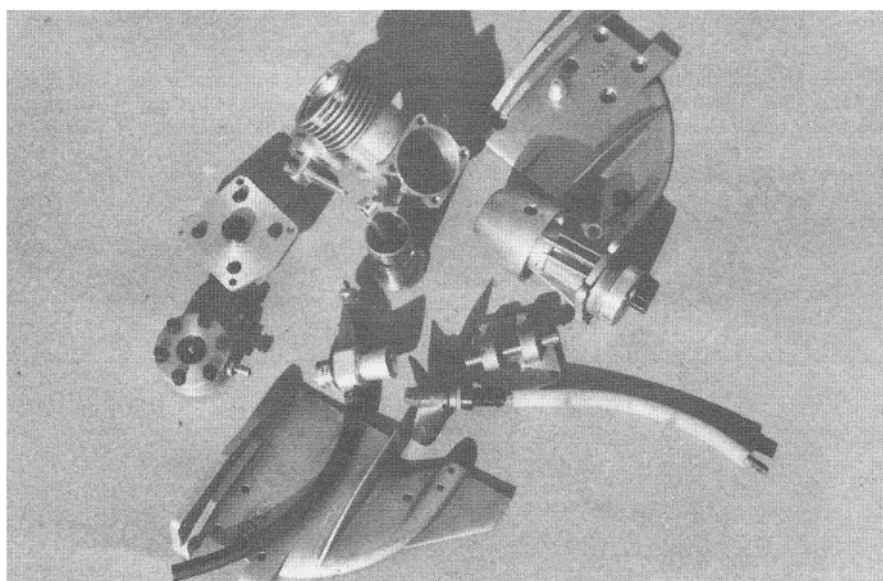
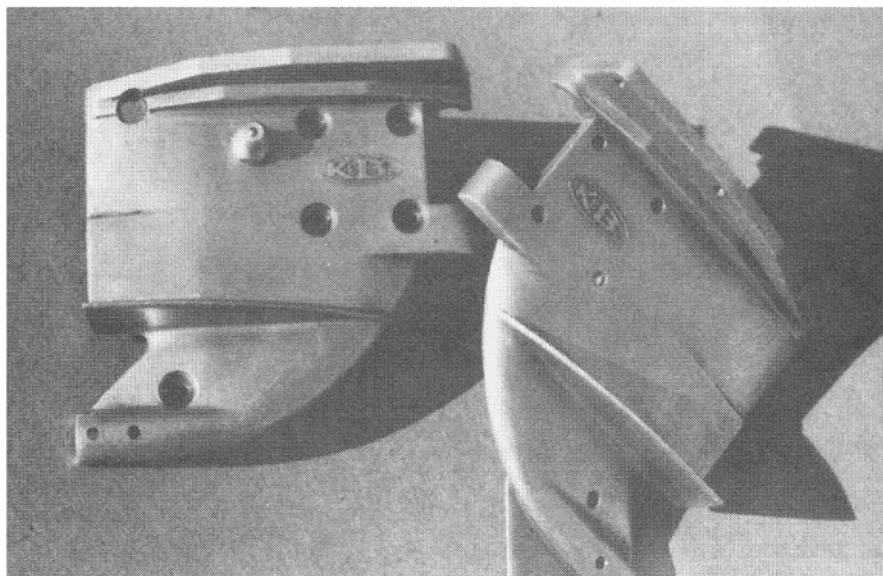
The stock flywheel does the job, I've never heard a bad report on one, but nevertheless, since we were modifying the K&B all the way, we went ahead and built a custom flywheel, (if for nothing else, maybe just looks). All of the aforementioned modifications will put your engine in the high performance bracket, so let's move on to the lower end unit.

It is important that a great deal of care be taken with the lower half. We cleaned the lower case halves and carefully cut grooves in them as shown in the photographs. The oil passage hole to the bearing was also enlarged. This was done with a Dremel tool and a small cutter. *Please use a great deal of caution here. Do not cut through the case halves.* After grooving and cutting make certain that all the aluminum shavings are completely cleaned from all surfaces, grooves, ports, insets and any place else that they might adhere themselves to. Wash the case halves at least twice.

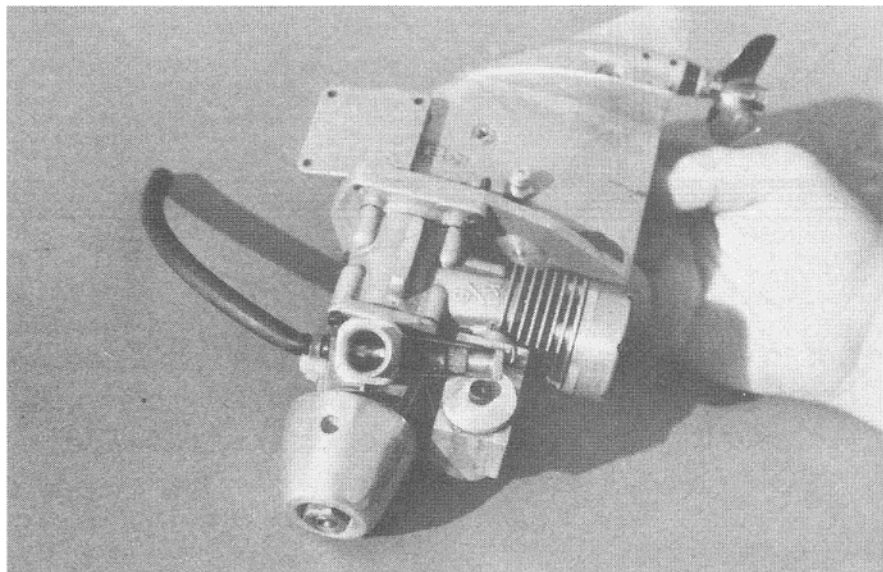
On the right side we drilled and tapped a $\frac{1}{4} \times 28$ hole and installed a grease fitting. We made a round aluminum plug to fit in the old exhaust port hole in the top of the case halves and sealed it in with high grade silicone rubber. We also sealed the old water pick up holes and the old exhaust port outlets with the same silicone.

You may be wondering why we are going to all this trouble on the lower case halves. The reason is that when you turn the engine around (exhaust port up), there is no oil going to the lower bearings in the case halves. In order to supply the necessary lubricant we fill the lower unit with STP® through the grease fitting on the right side. The lower case halves are sealed together with silicone also. This way the only place the STP® can get out is through the bearings themselves. By filling the lower end with STP® after each race, we make sure the bearings are well oiled. As a matter of fact, this is a better oiling system than the stock approach. While you are waiting for your next race, be sure to place a small rag under your engine in the event that some of the oil seeps out of the bearing holes. The lower end will hold enough lubricant to last the race and then some.

These modifications will enable your K&B 3.5 outboard to turn about 2,000 more r.p.m. The exact r.p.m. figures will depend on the kind of prop you are using and at what depth you will be running it. When the job is done properly you will be thrilled at the additional speed and power generated.



This is a photo of the completely finished but disassembled engine. The right case half has been drilled and tapped to accept a grease fitting (top). This facilitates the lubing of the lower end bearings. The completely finished and assembled engine (below). Remember: undertake these modifications at your own risk!



Crash and burn protection

Eliminate seepage for more reliability/**Don Bilsky**

Leaks in your radio compartment can be the "Pits". In a past issue of FM I showed you where one leak can come from, now let's look at another possible trouble spot that can cause a "crash and burn" situation.

The front and rear bulkheads of a built-in radio box in a hydro are the culprits of this leakage spot. These two bulkheads are glued to the bottom of the boat. When the bottom flexes while the boat is running, it can cause

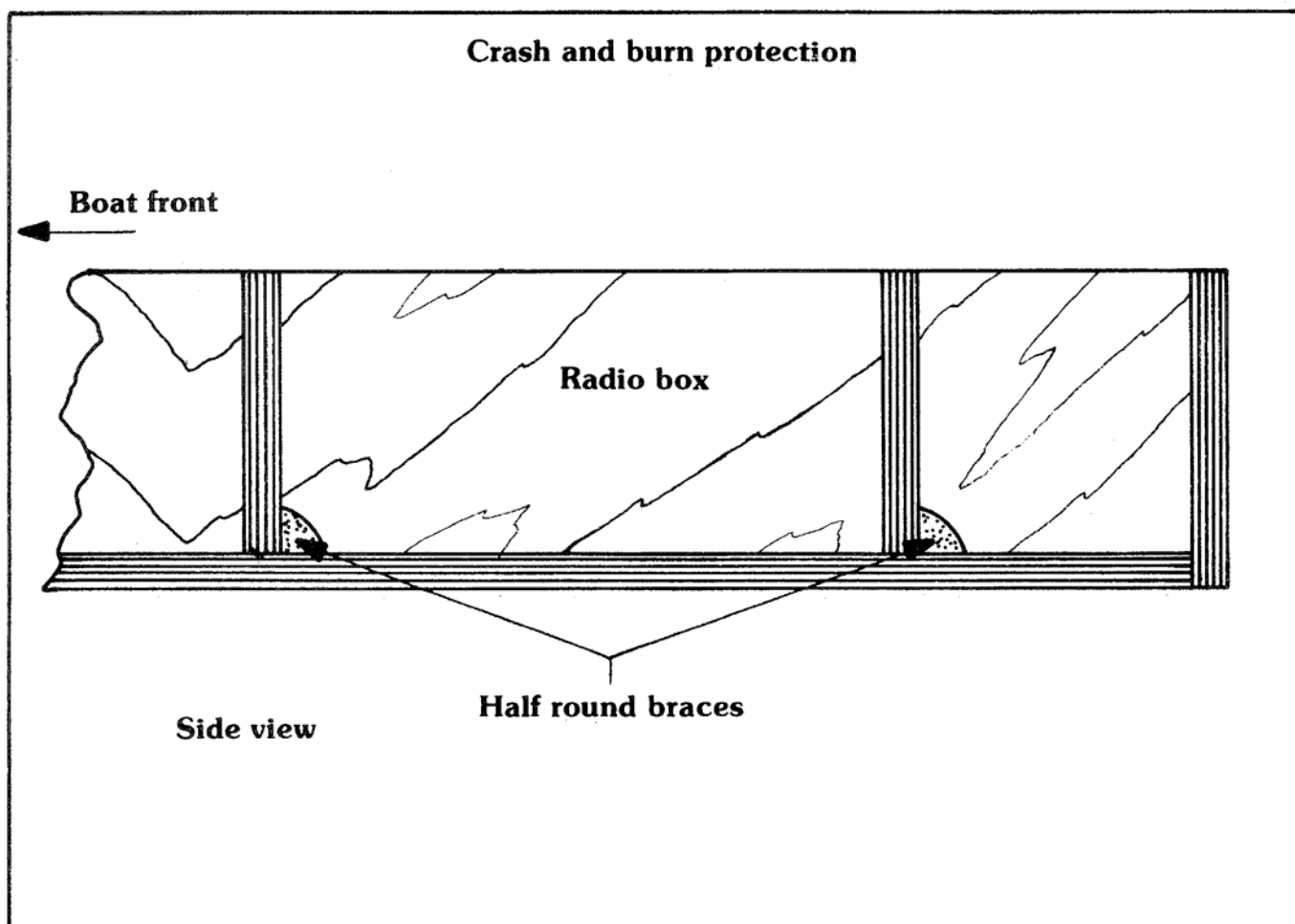
a separation or crack in the glue joint where the bulkhead joins the bottom. Whether it is the front or back bulkhead, it will cause leaks.

The solution to this is easy. If you use a piece of $\frac{1}{4}$ " or $\frac{1}{2}$ " half round, available at any hardware store, and glue this the entire width of the bulkheads at the bottom seam your leaks will stop. I recommend putting the front one on the inside of the radio box

and the rear one on the outside (Fig. 1) or, if you want to go this far, put one on each side, front and back. This adds great strength to the joint and should stop any leaks in this area.

Water in your radio box can definitely put you and possibly your boat out of action. In future articles I'll try to cover some of the other areas that can cause leakage problems.

CC



Letter Rip!

Those of you who have been reading the *R/C Model Boating* section of *FLYING MODELS* for the past five years are no doubt at least mildly aware of this R/C flyer's attempts at becoming a "hot shoe" boat racer. In that respect I failed miserably, but along the way and alongside many ponds from coast-to-coast I've met and made friends with a lot of very nice people. I've seen cut-throat competition that ended with the winning racer using a borrowed engine part (he borrowed it from the guy that he eventually beat). I've seen the world of R/C model boating grow into a real force to be reckoned with in the R/C industry. I saw *FLYING MODELS* snickered at by other magazines in the hobby field when we first started the RCMB section. I heard their tunes change a few years later when they all tried to jump on the model boating bandwagon. Thanks to you, the active model boating people, *FLYING MODELS* has been and is now the premier model boating publication.

I mention all this now because it's time for me to leave. It's been exciting watching model boating's growth these past five years with all of the accompanying pain and happiness. I want to thank all of those folks who introduced me to, and kept me active in, model boating (in spite of shaky knees and balky engines). I especially want to thank all of the fine authors who shared their thoughts and ideas to help make model boating grow and come of age. I'm proud of the role that *FLYING MODELS* played in that growth; I'll miss it and all of you—BOB HOECKELE.

The Great Divide—Why?/a guest editorial by Don Bilsky

In 1861 a great nation was divided by a difference of opinions called the Civil War. Brothers fought brothers with the end result being pain and sorrow for both sides. In 1968 the same thing happened to the IMPBA—a split that has hurt both associations. The split put boating brother against boating brother. Why?

I started in R/C boating in 1974 and, because I am from the Mid-West, joined the IMPBA (International Model Power Boat Association). A while after that I learned that there was another association called NAMBA (North American Model Boat Association). At that time I couldn't understand why there were two associations, but being new and having enough to think about I let the thought pass. In the last couple of years though, I have given it a lot of thought and talked to many people from both organizations. It seems that almost everyone likes something about each associations' rules and would like to see a re-establishment of one main body. There are a few people, and I mean a very few, in NAMBA and IMPBA that, because of some past personal dispute, dislike the other organization and oppose a merger. I wish all general membership could be polled to see how many want both organizations back together again. We've had and will have more times when we need to present a united front for R/C Boating as in the past FCC negotiations.

I would love to hear from the general membership of both NAMBA and IMPBA on how you feel about a merger and combining the rules for the betterment and enjoyment of all model boaters. Please write to Don Bilsky in care of *FLYING MODELS*, P.O. Box 700, Newton, NJ 07860. Let's make our Brotherhood stronger—DON BILSKY.

New club

I recently purchased your magazine for the first time in quite some years and I must say, I was pleasantly surprised to find that it is the same, informative, well thoughtout, well researched, finely written publication I had been used to.

I have just started building models again after some ten years out of the hobby and I immediately turned to your magazine to see how the hobby has progressed. This time I've decided to turn my attention toward the building of scale and competition boats instead of airplanes. My reasoning for this is because in my researching of the hobby this time I became aware of a lack of suitable flying sites in my area. Unfortunately I did not research far enough because I have since become aware of a decided lack of water space in which to run glow fuel boats. As you can see I am in somewhat of a pickle. I have discovered that I want to compete with the racing hulls and I must turn to your magazine for some help.

I am very interested in either joining or starting a model boat club in my area. I'm quite sure that there are others in my area who share in my problem and would be interested in joining a club. I have written to NAMBA International for a copy of their rule book and application for membership and any help they can give me. I have also spoken to the owner of the Campground in which I stay as to the use of one of the three lakes he has for use by the model boaters. He seems to be interested and I'm sure that with enough support and some planning an arrangement can be made by which we can run our boats and hold competitions for our club and other clubs in the state. Of course, if there already is a club in my area I would certainly join it. To this date, I have not heard of one. Anyone interested in starting a club in the Union County area of New Jersey should contact me at the below address. Any help your magazine can give me in this matter will be greatly appreciated.

WILLIAM MASSA
108 East Elm St.
Linden, NJ 07036
201/925-7595

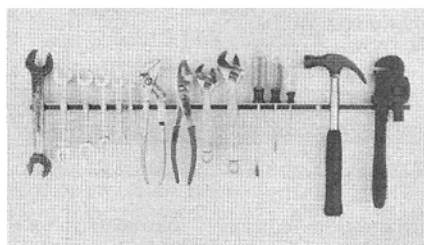
Model uses part of famous carrier in construction

The aircraft carrier U.S.S. Franklin (CV-13), the "ship that wouldn't be sunk," will live on as a bit of history has been preserved by the U.S. Naval Sea Cadet Corps Franklin Division. In an impressive ceremony three former crew members of the Franklin laid the keel for a six-foot operating model of their ship which will be built by the cadets. A unique feature is the use of a metal

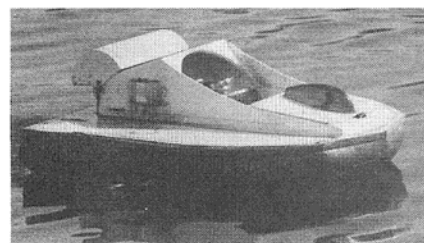
plate from the real ship in the construction of the model. This plate, removed from a machinery compartment before the ship was cut up for scrap, was presented to the Sea Cadet unit by the Franklin Association members present at the affair. These three men also burned their initials into the hull bottom assembly, as did a Pearl Harbor survivor, a member of the U.S.S. Missouri Association, representatives of the Navy and Coast Guard, and the Commanding Officer and a cadet from the division. The model is scheduled to be launched later this summer.

Other highlights of this ceremony included an address by Huntington Town Supervisor Kenneth Butterfield and a film depicting the history of the U.S.S. Franklin, which vividly illustrated the heroic efforts of the crew to save their ship after it was heavily damaged by Japanese bombs on March 19, 1945. The resultant return to New York under her own power has become a legend in the annals of Naval history.

The Sea Cadets, all students of local-area high- and junior-high schools, are constructing the model Franklin (the division's namesake) as part of their training program. The replica will be completely detailed, including the aircraft types on board the real ship during World War II. Several working features will be incorporated into the model, which will be operated by a radio-control system. The Cadets hope to have the model ready for the Huntington Nautical Festival R/C Model Boat Contest to be held in Heckscher Park on September 7, 1980.



DOWLING MINER MAGNETICS CORP., 372-D Bel Marin Keys Blvd., Novato, CA, introduces their Super Power Magnetic Tool Holder for workshops, tool rooms, maintenance departments, and home use is said to hold the heaviest tools and keep work areas organized. Features heavy-duty ferrite permanent magnets, rust-resistant galvanized finish, and choice of lengths: 12", 18", and 32". Price ppd. is \$10.95, \$14.95, and \$21.95 respectively. Write to the above address for more information.



VENTURE AERO-MARINE, 871 Moe Dr., Unit A-2, Akron, OH 44310, has released their XR-1B "Cyclone" R/C Hovercraft kit. The Cyclone has a beam of 30", a length of 40" and a height of 11½". The suggested weight is 7½ pounds. This kit has been designed for 1,2 or 3 channel radio equipment, and to be pow-



Boy, will this shake 'em up at show and tell . . .

ered by a .50 to .60 engine. The kit features machine cut plywood parts, an extensive hardware kit, pre-cut foam floatation, an integrated lift-thrust system (only one engine needed) and a thrust reverser which allows the XR-1B to brake to a stop or back up. For more information write to the above address.

IMPBA Roostertail

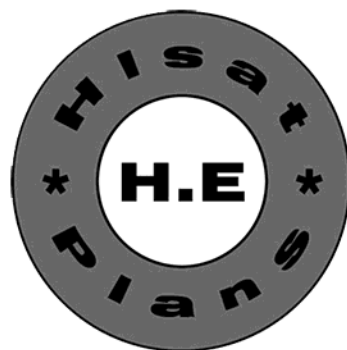
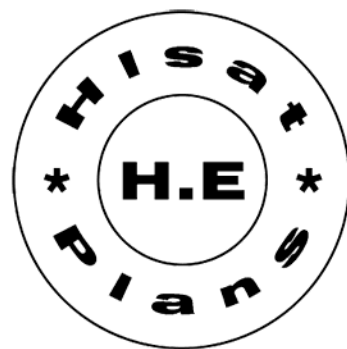
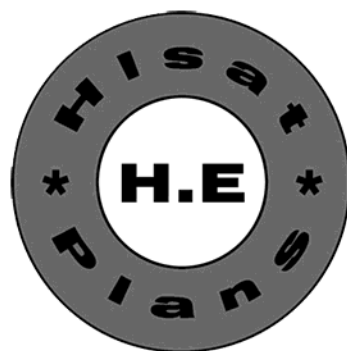
As I write this I am preparing to leave for the 1980 IMPBA Internats at Bartow, Florida. The 9 members from Indy who will attend are looking forward to a great 8 days of racing.

Some information of interest is as follows: There are 133 entrants from 16 states who will run the following: AB Hydro - 26, CD Hydro - 38, E Hydro - 50, and F Hydro - 29. Monos are also well represented: AB at 15, CD at 17, and E at 20 for a total of 195 boats for the 4 heats of heat racing. In addition 103 of these 195 boats have been entered in both the Straight-A-Way and Oval Trophy Trials. In addition to the preceding 45 boats have been entered in the Deep V Classic along with 34 Outboards for the Outboard Race and 23 Scale (60) Hydros will run in the Scale Hydro event. It is interesting to note that

edge. E Hydro has taken over D Hydro in number of entries and also the fact that there are more F boats entered than AB in the Hydro class is interesting.

These facts may indicate a trend to larger boats. (Kit manufacturer's take note.) I have also heard of a couple of twin .90's in the works which will be quite large physically. Watch FLYING MODELS for further information on the Internats and also developments in model boating in general.

You have either received your third 80' Quarterly Report or will receive it in the next few days. In addition to the report you will find your ballot for IMPBA President for 1981-1982. Please consider carefully who you want for this job and return your ballot. Vote, it is important to have the largest possible expression of the memberships desire. Vote as soon as you receive your report so that it will not be forgotten and return your ballot at once for the same reason. Each member who votes will receive a membership list of all IMPBA members free. Good boating to everyone—FRED MCBROOM, President IMPBA.





Airport Xanthi 1



Airport Xanthi 2



Airport Xanthi 3



Airport Xanthi 4



Airport Xanthi 5



Airport Xanthi 6



Airport Xanthi 7



Pilots (Hlsat,Savvas,Kostas)