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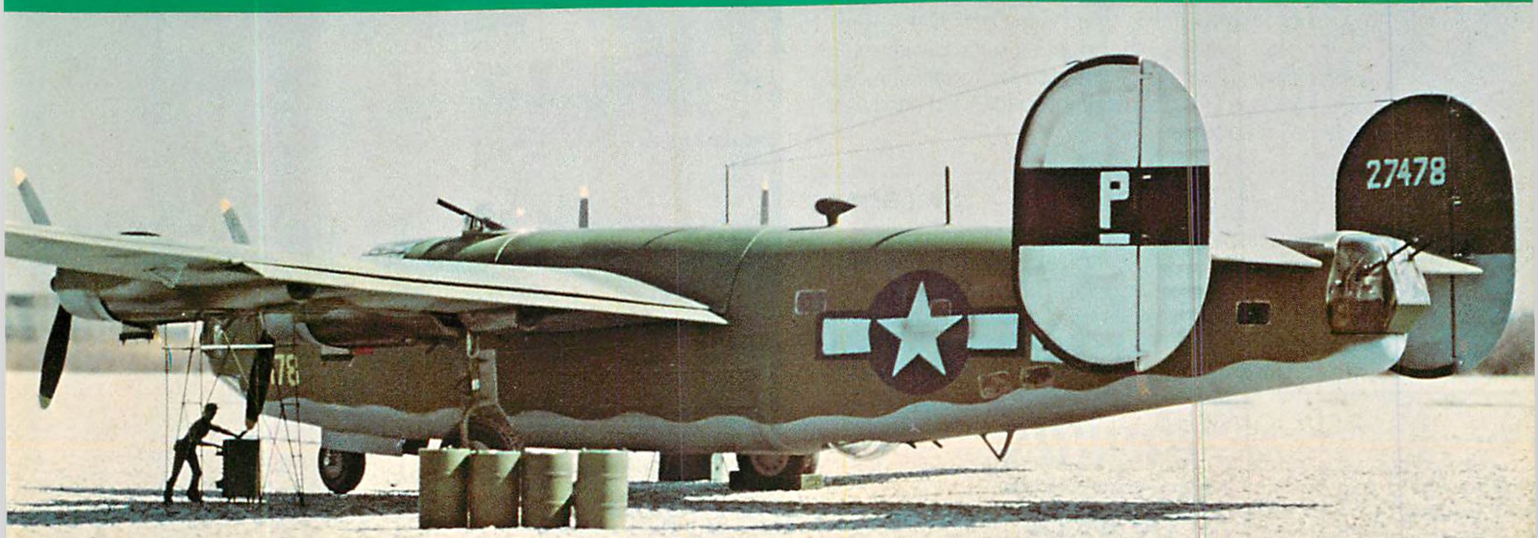


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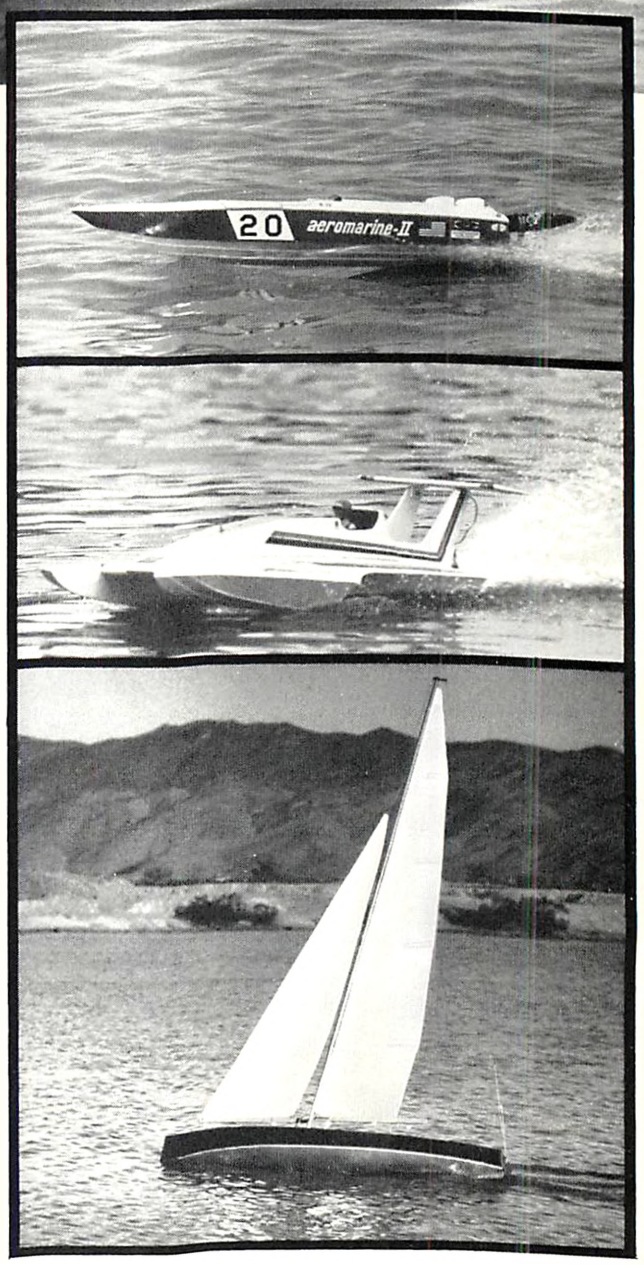


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## Unthought Input

No doubt you belong to a club. You can almost hardly survive as a modeler unless you are reasonably close to others of your kind, there is almost no conversing with your neighbors next door, they don't understand aeronautical contrivances at all, so for some social contact with others of the same mental affliction we as modelers tend to coagulate in groups. Clubs. A place to gather every couple of weeks for an exchange of ideas. Model clubs tend to survive for decades, 30 and 40 years is not uncommon, so it must be a good idea.

Good ideas however are not necessarily perfect. Club gatherings have some slight problems and the unthoughtout input of ideas into someone else's well planned proposal is one of them. You've seen it happen, a really inspired set of event rules for a coming fun fly, then every guy in the room injects an off the top of the head modification into the format that kind of averages things out into a dull morass of more of the same you always flew. It gets to be a little like the chef cooking up a splendid feed with all the relatives walking past and dumping in paprika to vinegar without even understanding the idea in the pot. A plea here for a little more planned thought on things, perhaps first the proposal, a committee to refine it, then a copy to each member for perusal. The idea may have been the result of much mental planning and instant comments from the other members at the meeting are probably going to dilute the concept down.

Climb to whatever height you need and



flying models
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may 1978/vol. 81, no. V/490

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## on the cover

Henry Minnig of Old Bridge, New Jersey, built this impressive, realistic looking B-24-H Liberator. The ship took second in Military Stand-Off Scale in last years WRAM's show and third in the same category at last years Toledo show. Photos by Mark Minnig.

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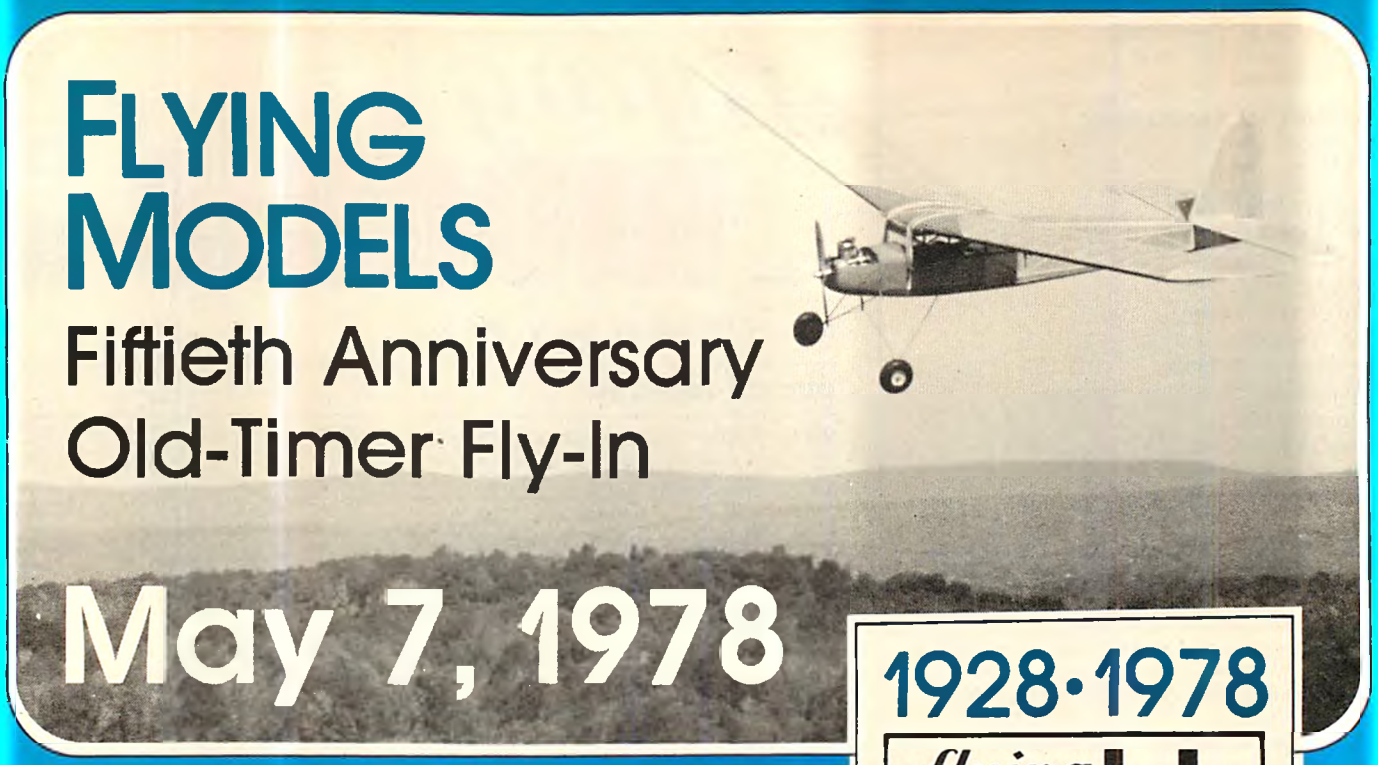
# FLYING MODELS

## Fiftieth Anniversary Old-Timer Fly-In



# May 7, 1978

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Events include:
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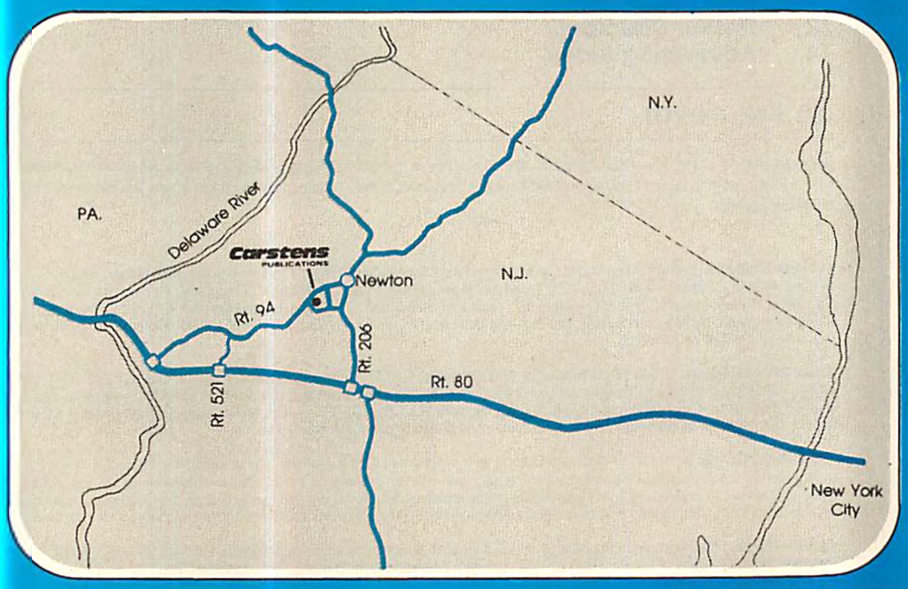


### 020 Electric F/F rules:

1. Any OT ship is eligible.
2. Must have 020 electric motor. (Astro Flite or equal)
3. CD will provide a 2-minute charge from complete dead condition.
4. There will be 6 attempts out of which the first 3 official flights count.
5. Any flight more than 25 seconds is considered an attempt.
6. Total top endurance in seconds wins.

fly till bone dry. Dead stick. You call the moment and the timer starts the clock. Land in 120 seconds, stopped on the spot. A point off for every second over or under, a point off for every foot short or long. Simple to judge, any ship can fly it and all you need is a watch and a tape. It's a good event, it can be flown as the final moments of an aerobatic routine, but listen to the harangue from the floor: "Why can't I just idle my engine?" "Can we use a little throttle?" "I can't stop rolling with my engine idling, okay to measure where wheels first touch?" "Can we glide one minute?" Somehow the inspiration is smothered. Sounds now more like a routine landing. Too bad!

Rom

# Air Mail

**readers' forum**

## Judging the Judging

Frank Tiano's article, "Judging the Judging", in your March 1978 issue, is an excellent appraisal of the current status of judging found at many Sport Scale contests. Although I have not had the pleasure of meeting Mr. Tiano, I have witnessed many of the situations he cites in the article. As a result of some of my own experiences at contests I came to the conclusion that the interest in the event has long outgrown its rules.

Mr. Tiano states that "A big problem seems to be the way the rules are interpreted by different judges". He also states "maybe the rulebook is due for a rewriting to eliminate some of the gray areas". I couldn't agree more. Last Summer I expressed similar sentiments to the District IV Scale Contest Board member, Bob Karlsson. I offered my help in drafting a Judges Guide to improve the uniformity of interpretation of the existing Sport Scale rules. Bob responded by giving me a choice of drafting either a static judging or flight judging guide. I chose the latter since it was in the flight judging that I had encountered the majority of problems. The result is Draft #2 of a R/C Sport Scale Flight Judges Guide. A companion static judging guide is currently underway in another group headed by Bob Karlsson.

I think very few contestants would disagree that the current rules leave a lot to be desired and can be interpreted in many ways. The Flight Judges Guide is largely my own interpretation of how the flight portion of the Sport Scale event should be judged. Others may have differing opinions. For this reason I am currently soliciting comments


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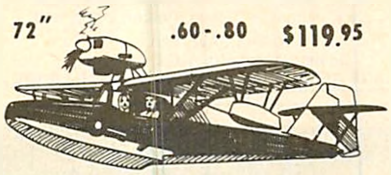

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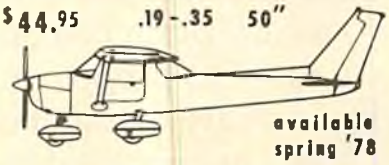

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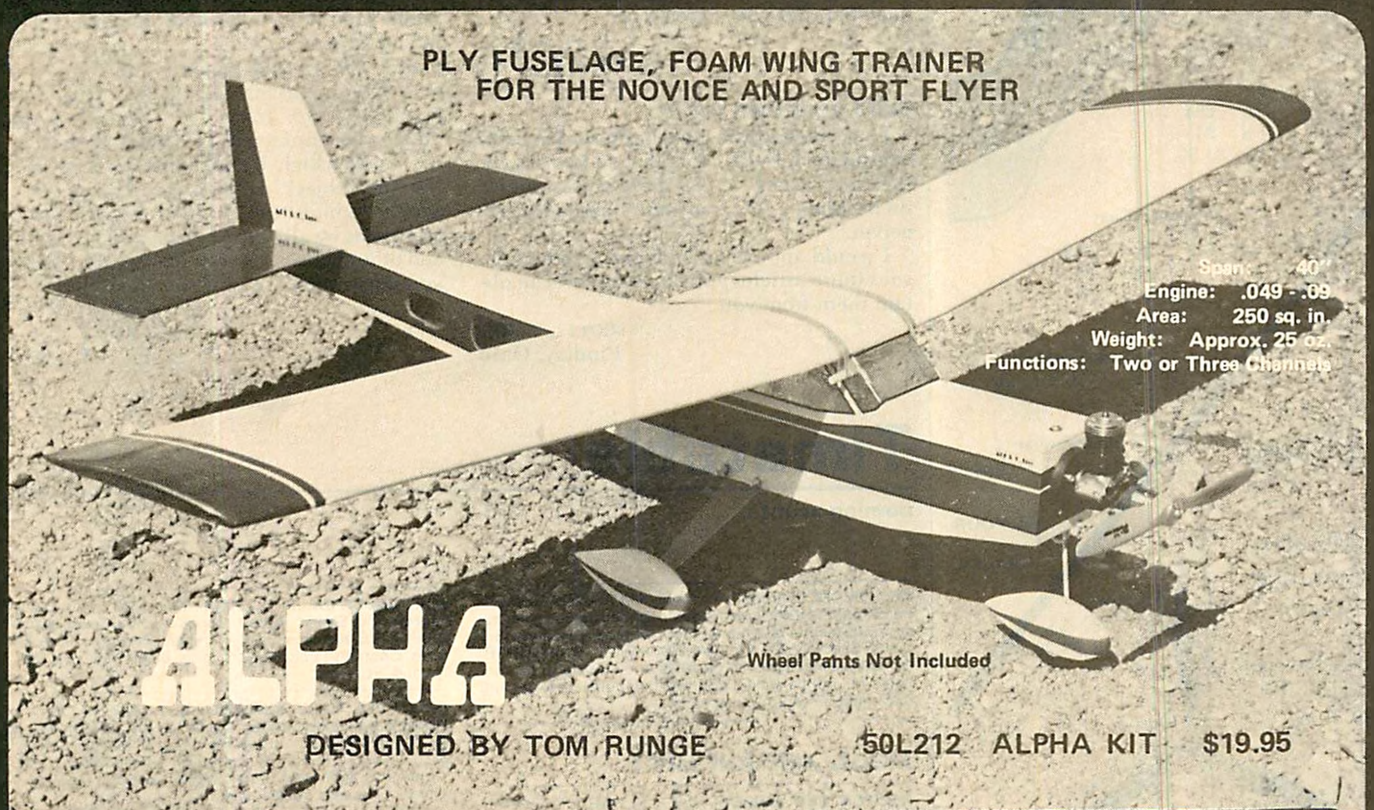


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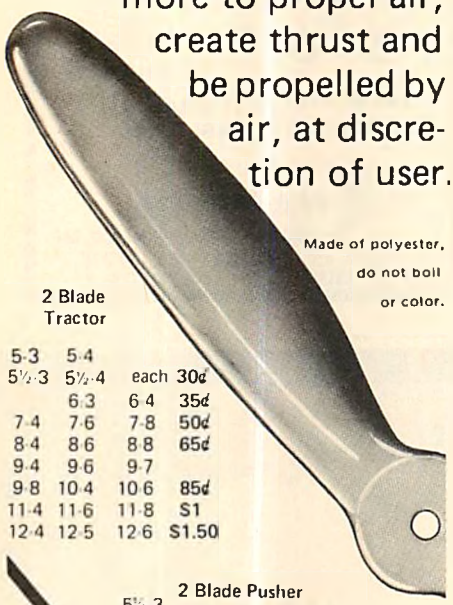

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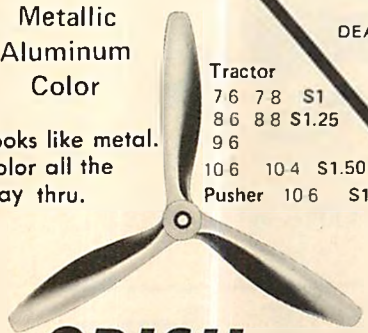

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from other flyers in order to come up with a guide which will satisfy a majority of contestants. It is likely that the help of the recently formed National Association of Scale Aeromodelers will be sought to achieve the necesssary exposure before proposing a final draft of the guide for adoption into the AMA rulebook.

I thank you for the timely publication of Mr. Tiano's article.

JOHN D. PRESTON AMA CD #6343
7012 Elvira Ct.
Falls Church, VA 22042

*In the next issue of* FLYING MODELS *we will present the drafts of both the static and flight judging guides along with the addresses of people to whom you should direct your comments—Ed.*

### Flying Aces

I have very much enjoyed your recent issues of FLYING MODELS, particularly for the inclusion of the FLYING ACES reprints. They really take me back and recall my early efforts in model building.

I'm primarily interested in reconstructing some of the old planes, and in particular I would like to see a reprint of a Pete Bowers design which appeared in the September 1940 issue of Flying Aces—the "Rebel". Hope you plan to include this one in a future issue.

Keep up the great work—I look forward to each months issue.

FRED HERBERT
Marysville, Calif.

I really like your recent practice of reprinting the old FLYING ACES articles. Put me down for a subscription. How about running the Whisper, a small catapult glider sometime? It was a great one.

DAVID L. RAMSEY
Denver, Colo.

### Build your own radio

I have recently become interested in radio control models. I am told that, in two of your previous issues (1977), there were articles on building a R/C transmitter and a R/C receiver.

I would appreciate knowing in which issues these articles appeared and if I can obtain them from you.

SCOTT L. CURRY
Findlay, Ohio

I wonder if you can give me the address of Royal Electronics, the company mentioned in the November '77 article by Mike Dorffler entitled "Build Yourself a Two Channel Transmitter".

Also, can you tell me where I might obtain a December '77 issue of your magazine. It does not appear to be available anymore.

CHARLES T. GOETZ
Shelburne, Vermont

*The article "Build a Micro receiver" appeared in the August 1977* FLYING MODELS *and "Build yourself a 2-channel transmitter" appeared in two parts in the November 1977 and December 1977 issues. The address of Royal Electronics Corporation is 3535 South Irving St., Englewood, CO 80110. All three of these issues are available from Carstens Publications, P.O. Box 700, Newton, NJ 07860 for $1.00 each—Ed.*

### Rubber power

In the hopes that you will not consider the following as presumptuous or the like, I would like to make a small appeal for some help if I can. I have over the last year revived a lot of interest in *rubber-powered* flying models which I practiced quite avidly during the late 1930s and early 1940s. I have been most impressed with your magazine and have recently requested a three-year subscription.

Being away from the situation for thirty years has, of course, presented some difficulties to me—especially in present-day nomenclatures, abbreviations, model classes, and other state-of-the-art subjects. My rubber powered bible has always been, and still is, Charles H. Grant's book "Model Airplane Design and Theory of Flight".

I would appreciate any suggestions your readers might have as to information which includes good articles on rubber-powered model design and construction, prop designing and carving, thoughts on flight adjustments, etc. Just any thoughts would greatly be appreciated. Is there a present day book which I might procure that gets into the subject like Grants did thirty years ago? (or almost so). Most of my modelling associates locally are too wrapped up in R/C and other phases, to be of much help. Thank you very much for your time and effort.

ROBERT C. WEBB
1055 Cherry Lane
Peru, Ind. 46970

# Timetable

**coming events**

**CLUB SECRETARIES:** Items for the FM Timetable are welcome. Submit items typed, double spaced and with necessary information plus contact for complete data and entry blank. Specify AMA, FAI, NAMBA, IMPBA, AMYA, ROAR, etc. Include information on rules and classes to be run. Items will not be picked up from club bulletins to be run, they must be sent to this column.

## MODEL AIRPLANE MEETS

**NEWTON, NEW JERSEY**—May 7. FLYING MODELS Fiftieth Anniversary Old Timer Fly-In sponsored by FLYING MODELS magazine. Events will include R/C assist Old-Timer A, B, C, and Antique classes and 020 electric Free-Flight. Site: Carstens Publications office field. See advertisement in FLYING MODELS for complete directions. Contact: Bob Hoeckele, FLYING MODELS, P.O. Box 700, Newton, NJ 07860. AMA Sanctioned.

**FORT LAUDERDALE, FLORIDA**—March 19. Novice, Advanced and Expert Pattern sponsored by the Broward County R/C Association at Markham Park, Rt. 84. AMA rules. Contact: James R. Scroggins, 6245 Flagler St., Hollywood, FL 33023.

**SAULT STE. MARIE, ONTARIO**—May 27-28. The Annual Upper Great Lakes Meet sponsored by the Sault Modelers R/C Club for A, B, C Pattern and Stand-Off Scale at Sinclair Model Airport. Mufflers required for all engines over .15. Contact: Graig Knight, 11 Broadview Dr., Sault Ste. Marie, Ontario, Canada. 705/949-6893.

**JAMESBURG, NEW JERSEY**—June 4. FLYING MODELS magazine and the Rockaway Valley R/C Club co-host a Stand-Off Scale, Sportsman Multi-wing and Novice Pattern contest at Thompson Park Model Airport. All events will use the 1977 AMA rule book. Trophies to 5 places in each event. Contact: Duke Hoeckele, 9 Manchester Way, Pine Brook, NJ 07860. 201/227-3197

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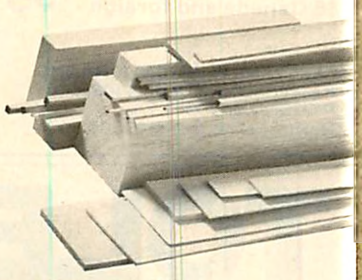

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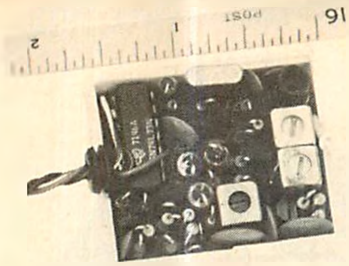

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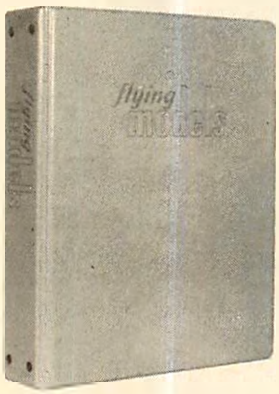

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**FORTLAUDERDALE, FLORIDA**—May 28. Sport Scale meet sponsored by the Broward County R/C Association at Markham Park Rt. 84. AMA rules. Contact: James R. Scroggins, 6245 Flagler St., Hollywood, FL 33023.

## R/C BOAT CONTESTS

**TACOMA, WASHINGTON**—April 2. NAMBA Heat Racing, B Deep Vee, 40-60 hydro and A outboard hosted by the Puget Sound Model Boat Club at Lake Waughop. Contact: Jerry Dunlap, 6702 Mt. Tacoma Dr., S.W., Tacoma, WA 98499. 206/584-7131.

**SPOKANE, WASHINGTON**—April 8-9. NAMBA Heat Racing, Deep Vee, Sat. Mono and Vee, Sun., Hydro and Vee hosted by the Lilac City Model Boat Club at Riverfront Park. Contact: Jack Peters, 1633 E. Powan, Spokane, WA 99207. 509/489-7755.

**SPOKANE, WASHINGTON**—April 11-12. NAMBA Heat Racing, Deep Vee, Sat. mono and Vee, Sun., Hydro and Vee hosted by the Lilac City Model Boat Club at Riverfront Park. Contact: Jack Peters, 1633 E. Powan, Spokane, WA 99207. 509/489-7755.

**BRISTOL, PENNSYLVANIA**— April 16. IMPBA Time Trials for 1/16 straightaway and 1/3 mile oval hosted by the DelVal MPBA at Magnolia Lake in Silver Lake Park. Contact: Nick Monti, 402 Swarthmore Ave., #A, Ridley Park, PA 19078. 215/487-0246.

**BRISTOL, PENNSYLVANIA**—April 22-23. IMPBA Deep-Vee Enduro team run (40 minutes) hosted by the Del Val MPBA at Magnolia Lake in Silver Lake Park. Pre-registration required at least 5 days before race. Same frequency for both boats (either 2-.40's or 2-.60's). Contact: Nick Monti, 402 Swarthmore Ave. #A, Ridley Park, PA 19078. 215/487-0246.

**EL MONTE, CALIFORNIA**—April 29-30. NAMBA Heat Racing hosted by the Cavitators at Legg Lake.

**LA GRANGE, ILLINOIS**—April 30. IMPBA Deep Vee Race hosted by the Minute Breakers at Lake Ida in the Sundown Meadows Forest Preserve. Two classes—up to .40 and over .40. Le Mans start, M-course, no mandatory pit stop, 10-minute heats. Noise limit: under 96 db at 50 feet on water. Contact: Harry L. Byrne, 10 Pheasant Ct., Woodridge, IL 60515. 312/963-5519.

**OKLAHOMA CITY, OKLAHOMA**—May 6-7. NAMBA District 7 points, Heat Racing-Deep Vee C, A Outboard hosted by the Boaters of Oklahoma at Ghost Lake. Contact: Jerry Kimball, 6700 W. 27th, Bethany, OK 73008. 405/787-1602.

**LONGVIEW, WASHINGTON**—May 6-7. NAMBA District 8 points, Heat Racing, Deep Vee hosted by the Longview R/C Boaters at Lake Sacajawea. Contact: David A. Austin, 2340-36th, Longview, WA 98632. 206/577-1644.

**MIAMI, FLORIDA**—May 7. IMPBA 1/16 Record Trialshosted by the Gold Coast Racing Team at Lake Palmetto. Contact: Don Pinckert, 3265 Franklin Ave., Miami, FL 33903. 305/446-5358.

**FREMONT, CALIFORNIA**—May 13-14. NAMBA District 9 points, Heat Racing; Sat. Hydro, Sun., Mono hosted by the Sacramento Model Boat Association at Kaiser Pit AHF. Contact: Fred Standa, 4881 Kipling Dr., Carmichael, CA 95608. 916/485-1904.

**FLINT, MICHIGAN**—May 20-21. IMPBA Record Trials (running on May 20 is restricted to boats which have run within 10% of the class record) hosted by the Wolverine Miniature Race Boat Assn. at Thread Lake. Contact: Lou Totovich, 17641 Rowe, Detroit, MI 48205. 313/526-6909.

**COUNTRYSIDE, ILLINOIS**—May 21. IMPBA Record Trials hosted by the Minute Breakers, Inc. at Lake Ida. Contact: Gary Preusse, 17 W. 323 Sixteenth St., Oakbrook Terrace, Villa Park, IL 60181, 312/279-2451.

**CENTRAL POINT, OREGON**—May 27-28. NAMBA District 8 points Heat Racing hosted by the Southern Oregon Power Boaters at Exposition Pond. Contact: Victor R. Drew, 1678 Corona, Medford, OR 97501. 503/773-5661.

**SEASIDE, CALIFORNIA**—May 27-28-29. NAMBA District 9 Championships Heat Racing hosted by the Gold Coast Model Boaters at Roberts Lake. Contact: H. Power, Jr., 2031 Marsala Cr., Monterey, CA 93940. 408/373-5811.

**HAGERSTOWN, MARYLAND**—May 13-14. NAMBA Deep Vee races hosted by the R/C Model Boaters of Baltimore at Greenbriar State Park. Contact: Arlie Cooper, Rt. 9 Box 129, Hagerstown, MD 21740. 301/797-0096.

## DATELINES

**NAPLES, FLORIDA**—July 10-16. NAMBA Nationals hosted by the Transom Twisters. Contact: Sid Broughton, 813-5th Ave., Naples, FL 33940.

**FLINT, MICHIGAN**—August 7-12. IMPBA Internats.


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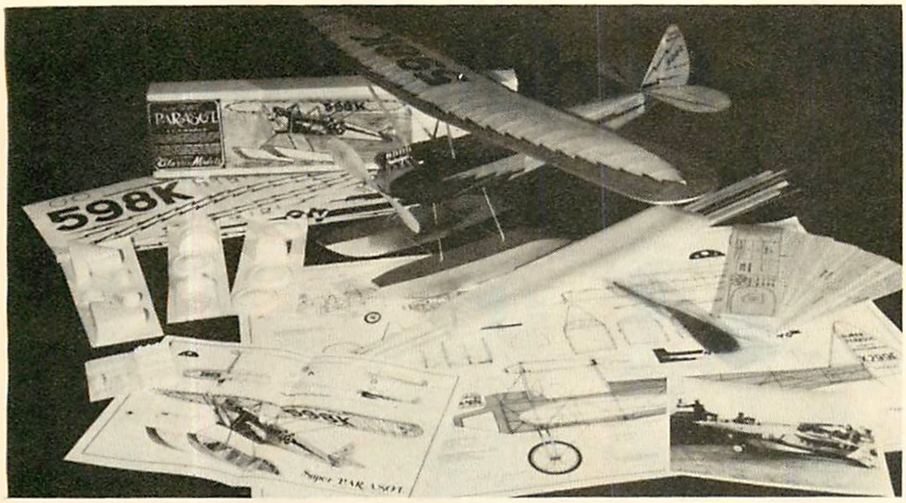
WEAK SIGNALS TOLEDO, OHIO

# Flying Report

**news and comment**




**GENE THOMAS CLASSIC MODELS,** *P.O. Box 681, Melville, NY 11746* is now releasing complete kits of aircraft in their line. In the past, a documentation book, plan and molded parts were available, but now complete kits are being presented. The Baby Bullet goes for $16.95; 1911 Cessna, $16.95; Super Parasol, $18.95, Church Midwing, $18.95 and the Alexander Bullet for $34.95.

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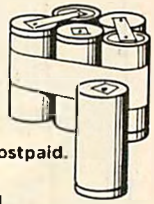

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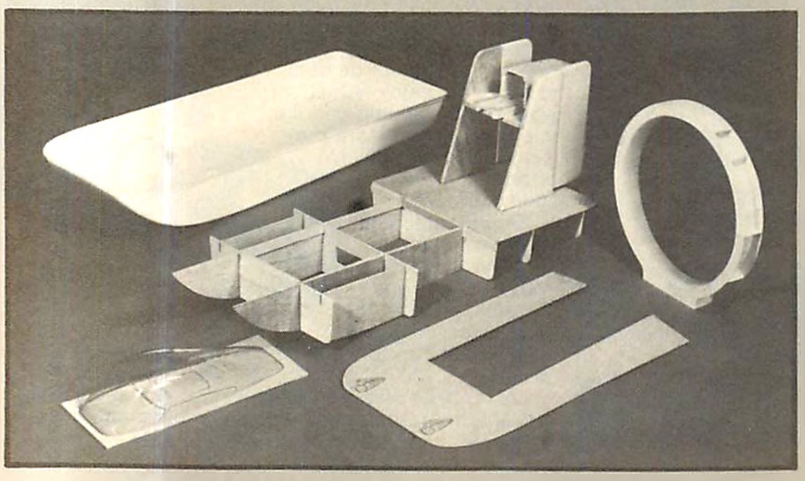

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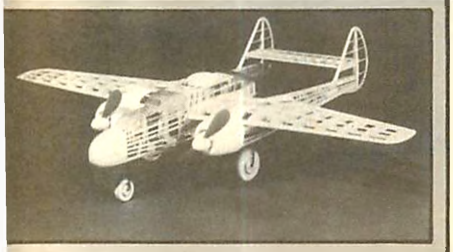
## Piper Cherokee



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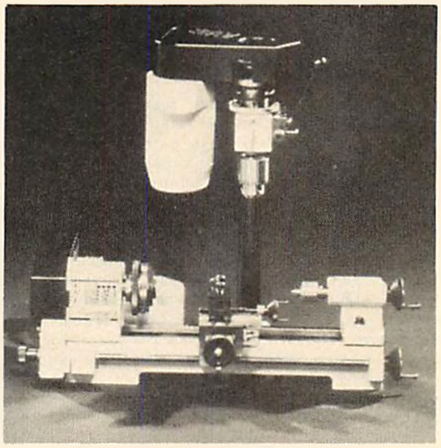

**EMCOLUX CORP.**, *2050 Fairwood Ave., Columbus, OH 43207*, is offering the Unimat 3, a universal miniature machine system for metal, wood, and plastics. Simple enough for the beginner but with the wide range of precision operations demanded by the professional. As a lathe the Unimat 3 can perform longitudinal turning and facing, taper turning, thread cutting, center drilling, polishing, and grinding. The Unimat 3 is built like the big industry lathes with a T-ribbed lathe bed of high grade cast iron for rigidity, professionally designed ground V-guideways for the slide and tailstock, high precision headstock, main spindle held in two self-adjusting precision bearings and cross and top slide with dovetail guide for highly accurate adjustment. With the vertical milling and drilling attachment, the Unimat 3 becomes a universal machine tool with drilling and milling capabilities at any angle up to 90° for gear milling, slot milling and fly cutting. The Unimat 3 is also a compact wood workshop performing circular sawing, jig and fret sawing, combing, grooving, coving, grinding, polishing, wood turning, and disc sanding. The flexible shaft enables drilling, sanding, and polishing to be performed in inaccessible places away from the machine.

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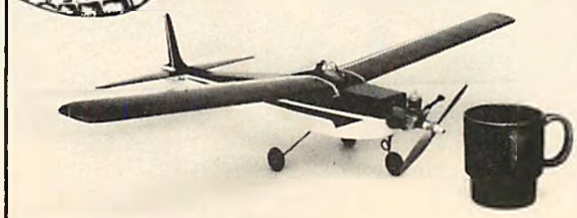

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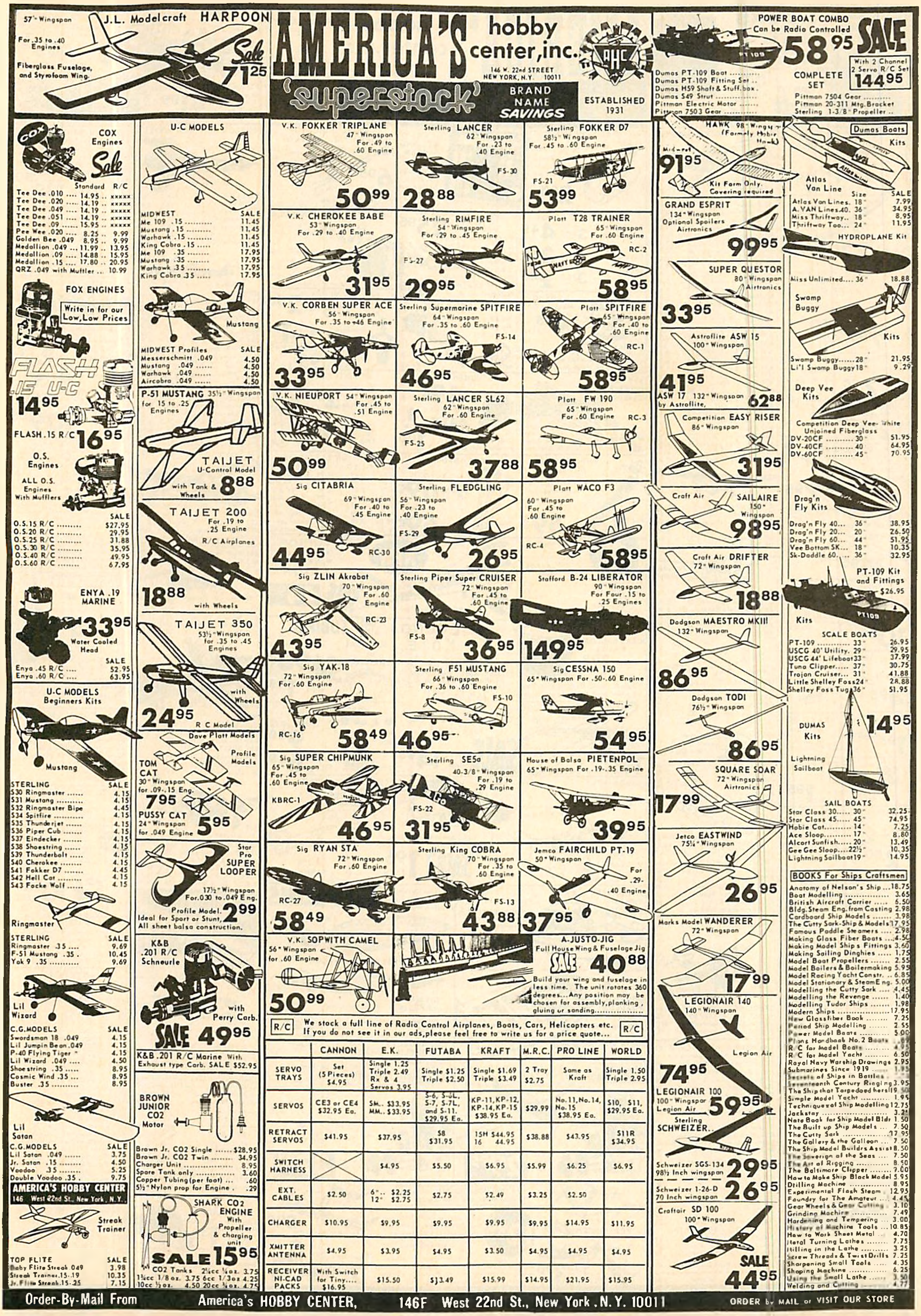
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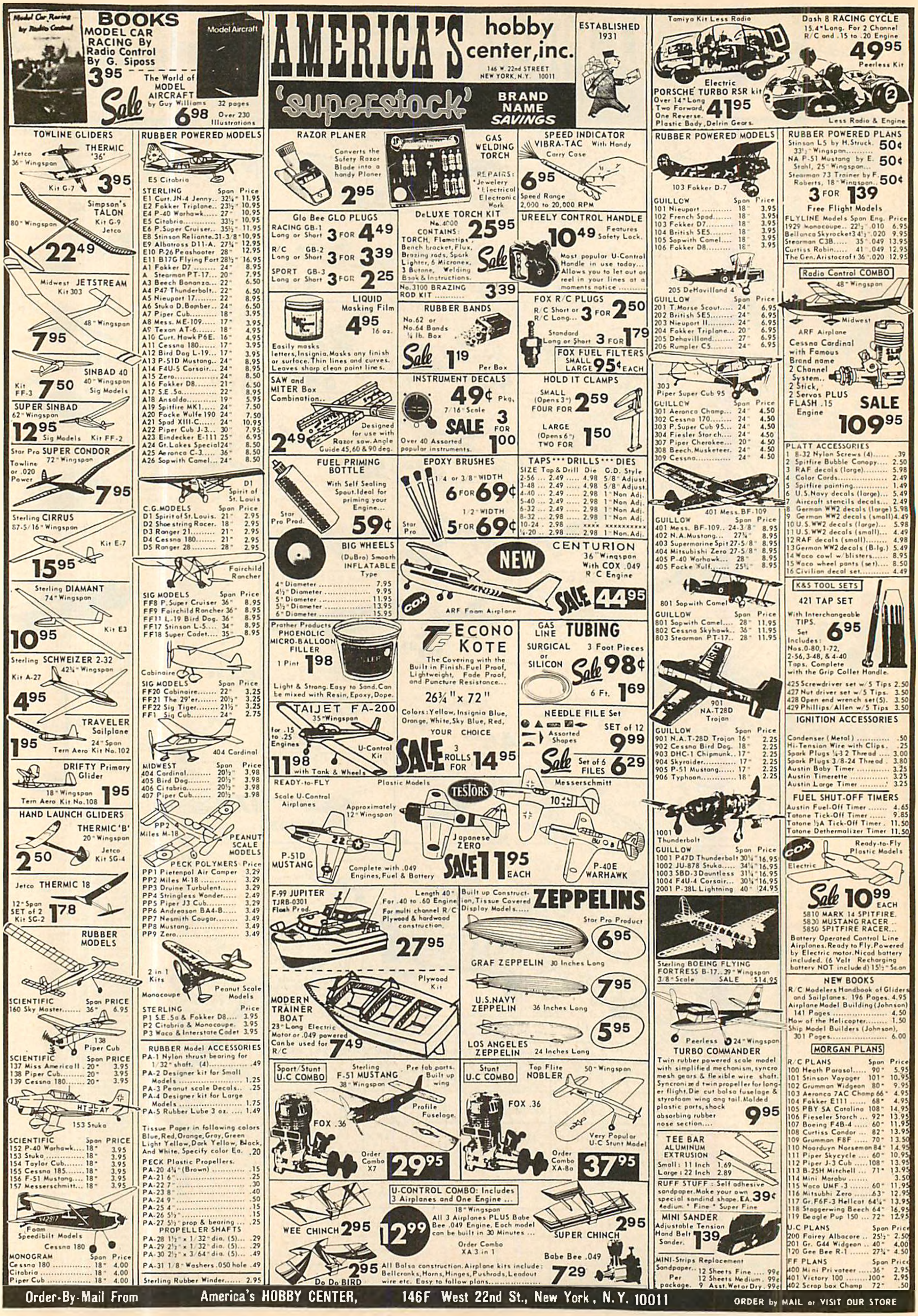

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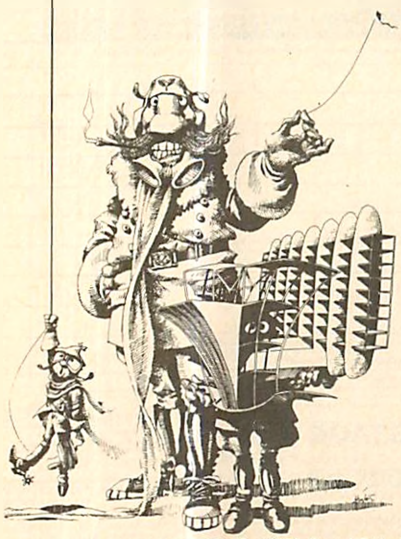
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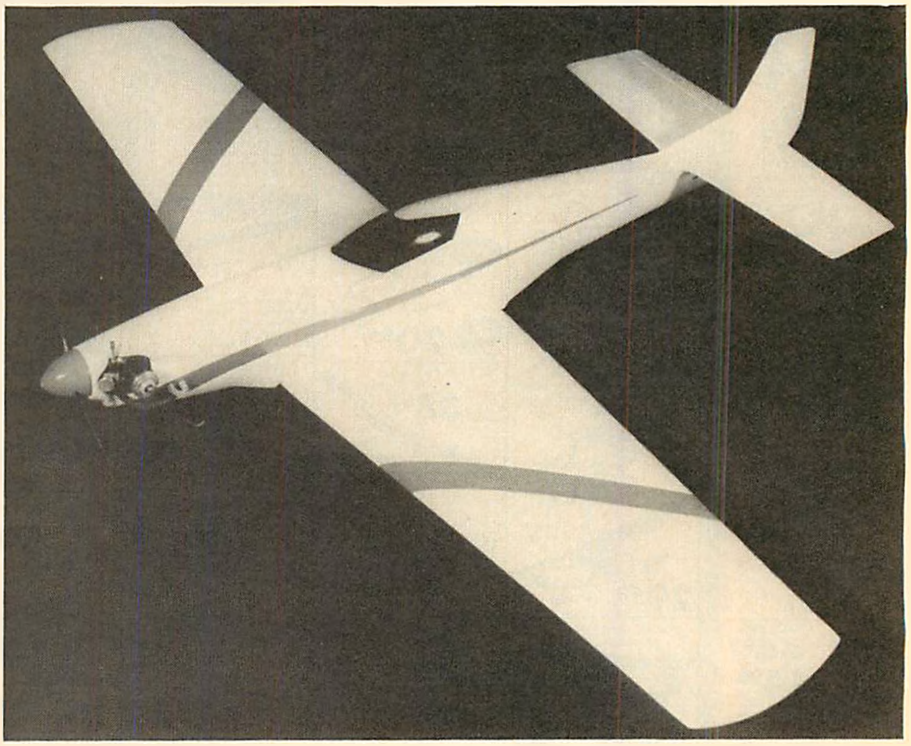


### Miss Cheap Thrills

J & M Glascraft Co. of 30820 *Mayflower, Roseville, Michigan 48066* (Area Code 313-773-7069) is now offering a ½A R/C pylon racer kit styled after the P-51 and specifically known as "Miss Cheap Thrills". This kit meets the new AMA 1978-1979 ½A R/C pylon racing rules in every respect (including minimum fuselage height and width and the ⅞ inch minimum wing thickness at the root chord). The kit or actually semi-kit lists for $30.00 including shipping via UPS from Michigan. It is not available through local dealers at this time.

The semi-kit includes a hand made epoxy glass fuselage with the firewall already installed. The firewall itself accepts the Kraft-Hayes .049 radial enging mount which is not included in the kit. Recommended engine is the popular Cox TD .049/.051 (which is mounted on its side). The fuselage is roughly 25 inches long and weighs only *3.0 ounces* as received, including a small semi-scale P-51 lower air scoop (which also serves as a landing skid). It is completely finished ready for the final assembly and paint job. Also included in the kit is a set of precision cut foam wing cores and a rolled set of full size plans (with excellent detail). As the builder you must still purchase the 1/16 inch balsa for the wing skins and the ⅛ inch balsa for the horizontal and vertical tail feathers.

Wing span is 34 inches. Wing area is 212 sq. in. Weight can be easily brought in at the 20 ounce pylon racing rules minimum. At 20 ounces, the wing loading would be 13.6 oz./sq. ft. The wing is removable and is held in place by a forward dowel and a single 4-40 nylon bolt at the trailing edge. Only two channels of radio equipment is required (aileron and elevator being the recommended controls). The aileron servo is mounted in the lower center section of the wing. There is plenty of room for most average size radio systems. The radio compartment above the wing (between the leading and trailing edge of the wing) measures 7½ inch long x 2¾ inch high x 2 inch wide. In addition, there is enough room (3 inch long x 1 inch high x 1½ inch wide) under the Sullivan SS-2 fuel tank to install a 450 MAH battery pack (similar to the Kraft KB-4M). Standard size servos, such as the popular D & R Bantam mechanics, will fit easily. The new micro size servos are not necessary for this application.

A test model of the "Miss Cheap Thrills" was built and flown by Long Island modeler, Mr. Dan Mass (a member of the L.I.R.C.S.). Dan's model is shown in the accompanying photograph. This will obviously be a very competitive plane in the upcoming 1978-79 ½A pylon racing seasons. Best of all it can be built in just several nights of work.

Interested modelers should contact J & M Glascraft's designer, Mr. John Fotiu, for further details. John, by the way, is also offering a very competitive quarter midget version of the P-51 with a semi-kit price tag of $36.00. Ask for a complete brochure — *Bob Aberle.*

# FM Clinic

**tips from the staff**

### Wind-Blown Field Dirt

*F.D.: How can I keep field dirt and wind-blown sand out of my engines?*

ANSWER: A muffler helps, but some fields are on the gritty side. Why not keep a few of those polyethelene dry cleaning type bags near your field kit. One is all you'll need for the day, the opening is wide enough to take the whole forward end of your aircraft, prop and all. It'll catch fuel drippings, guard against rain too.

### Stronger Wingtips

*G.A.: How can you end up with a strong elliptical wingtip when the sheet pieces forming it require different grain directions?*

ANSWER: Most such wingtips are formed of about three sheet pieces, with the grain running the best way possible on each. This is still not ideal, but why not cut six pieces, of thinner sheet? You can then vary grain direction for sort of a balsa version of plywood and overlap the splices in different directions. Sands and trims down better too, maybe a little more thickness to match the airfoil.

### Canards and Flying Wings

*A.B.: Normal aircraft set-ups are confusing enough for me, but how is a canard or a flying wing type model balanced and controlled?*

ANSWER: Canards are not new to aviation, the Wright brothers started that way. Just take a normal glider, place the wing on with the airfoil facing the other way, remove the fin from the tail and glue it onto the wing instead. Change the balance and you've got a crude form of a canard, it will glide backwards, though it will need refinements and area changes before performance becomes comparable.

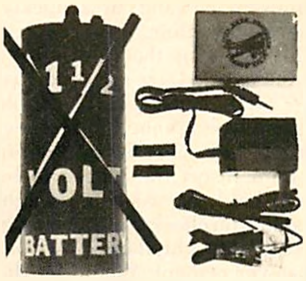
As for the flying wing types, often you will find the design to have a swept wing. Think of the flying wing as a conventional aircraft. The sweep of the wing does the work of a fuselage, the tail surfaces are the wingtips. It will respond to rudder in the same manner (though tip drag from the rudder can cause yaw) and raising or lowering tip elevons will give you both an aileron and elevator type reaction.

The fastest way to understand what is what and the potential of each is to spend an hour or two building up sheet balsa gliders of canard and flying wing configurations. The thin sheet can be finger warped to simulate aileron and rudder movement as well as reaction to flaps, elevons, and whatever else you can dream up. Fun for a cold and snowy night. Might put you onto a hot new project for the coming season.

### Splicing Strips

*W.A.: What is a good way of splicing strips of balsa or spruce when lengths greater than 36" are necessary?*

ANSWER: Don't overlook the availability of 48" stock. Some hobby shops can supply it. In any event, sooner or later you will have to splice a few pieces, it's not difficult at all. Make a long diagonal cut on each piece and epoxy together. I like 5-minute epoxy for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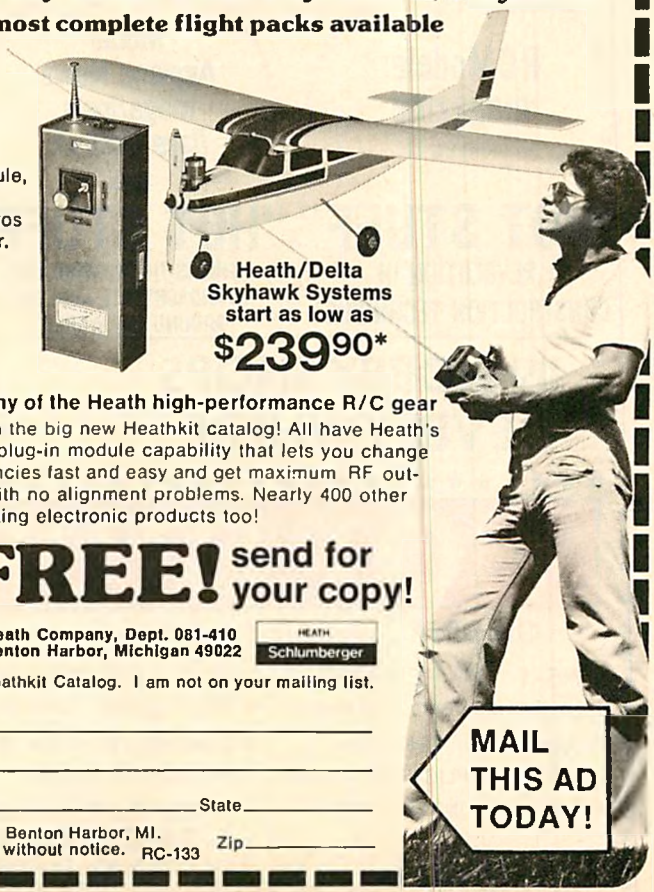

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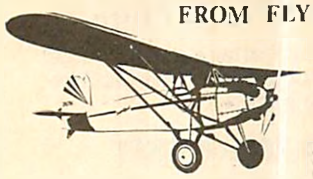

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this as it is strong enough and cures quickly. You may also use other glues of your choice. What I would suggest is that you build a little jig to hold the wood size required, that is a channel ¼" wide, or whatever. A couple of pieces of scrap wood pinned to ¼" sheet might do the job. Lay some Saran Wrap in the groove, then insert the pieces to be spliced. It will hold the wood in straight alignment and let you check the splice diagonals. Trim for a perfect fit, then apply your epoxy or whatever cement. When dry the Saran Wrap will peel off easily and you should have a straight and true length of spar stock. Sighting down the length will catch any mis-aligned splice joints.

### Test Flight

*L.P.: The first test flight of a new aircraft is always a nervous moment, but do you have any suggestions for improving the chances of a Scale type model?*

ANSWER: It depends a great deal on the type of aircraft it is. In general, the model must be free of unwanted warps, controls must function freely, the center of gravity must be right, and an experienced R/C flyer should make the first attempt, if it is an R/C design. Beyond all that, the engine and radio should be in reliable order, and range checked to be sure. If the tail surfaces appear to be on the small side, a not unusual situation when modeling some full scale aircraft, you might try an enlarged sheet fin and rudder to slip over the scale surfaces for the first test flight or two. It is easy to make such a thin sheet extension, possibly with a hollow slot to slip over the existing surfaces. Later, as you get the feel of the model, the area can be trimmed down gradually, or the whole slip-on extra area can be removed with the plucking of a pin. Do add a speck more nose weight to compensate for the extra tail area. If the tail moment is three times as long as the nose moment you will need three grams of weight in the nose to balance one gram on the tail. Keep that in mind.

### Pushrod Roller Bearings

*A.T.: Can you suggest a simple lightweight bearing that could support thin pushrods (travelling through a slender wing)?*

ANSWER: Yes, you might try a series of "U" shaped wires, as like a bent around straight pin. Impale the two ends into the framework, retaining with a speck of epoxy. If you turn every other one sideways, it will lock the slender pushrod in nicely. As a further refinement on the idea, cut short ¼" long lengths (or whatever length necessary) of plastic spaghetti tubing insulation and slide over the wire ends before cementing the ends into the structure. Your pushrod will now roll of a dozen or more bearings, very little friction and no metal to metal contact, even if you elect to use music wire as the pushrod.

Whenever you are dealing with any kind of pushrod fairleads please bear in mind there is a little side motion or up-down movement of the pushrod in the vicinity of the rudder horn or any other type bellcrank. If you restrict the movement too much you will force the pushrod to bend accordingly and friction will become extreme. Any unnecessary friction robs the servos and your battery pack of available power to move the surface against air loads imposed by maneuvers being performed.

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I guess ½A R/C Pylon racing got its start back in the early 1970's. The very first set of rules on the subject was published in the May 1971 R/C Modeler (pages 30 and 31). Credit for the original concept should go to both Owen Kampen and Don Dewey. The basic idea was to promote midget R/C Pylon racing using small bore (½A) engines. If you look back over these original rules you will notice that the type of model configuration was greatly limited. The wing was restricted to a constant chord (rectangular) planform along with a specified minimum airfoil thickness (⅞ inch). In fact the first ½A Pylon racers basically evolved around the standard Ace foam wing panels which are still popular to this day. The models also had a weight minimum and a fuselage cross-sectional area minimum. As originally set forth, the idea was to have essentially a "one plane" design event (much like the Quickie-500 racer of today). The competitive element therefore was basically the flying skill of the individual pilot. Small size models also meant a smaller investment in material/equipment and in building time. It all made good sense.

Several designs appeared almost immediately in the model press to provide a starting point for ½A R/C Pylon racing. Designs such as Owen Kampen's Upstart (May 1971 R/C Modeler) and Roman Bukolt's Cassutt/Bonzo racers (August 1971 R/C Modeler) were quite popular at the time. Unfortunately as happens so often in racing type events, the better pilots wanted faster speeds. Competition picked up rapidly. Lighter weight radio systems started appearing on the market in the early 70's. These radios, of course, were perfect for ½A Pylon racing with the 20 ounce minimum weight rule. As time went along the original R/C Modeler rules were modified by various factions throughout the country. Everybody had their own idea on the subject. With all the variations on the same theme it made it quite difficult (if not impossible) for a kit manufacturer to go into production. After investing in expensive tooling, a design could be quickly obsoleted by another informal rule change. As a result we never did see a variety of ½A R/C Pylon racer kits on the market.

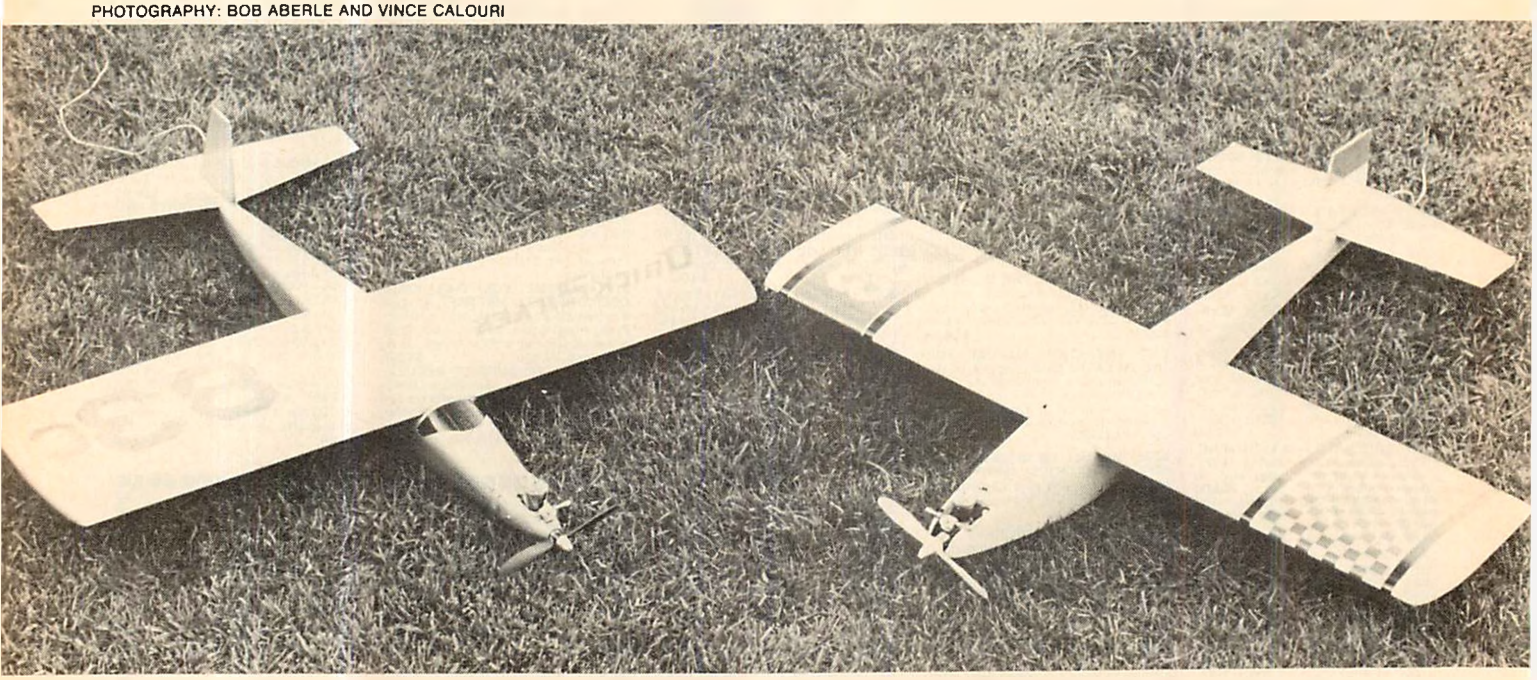
It was obvious that during this period of time (1971-1976) that the state of the art in ½A racing was steadily improving. Speeds were getting considerably faster. One of the better designs published during the period was Vince Caluori's L.I.T. Special which appeared in the August 1974 FLYING MODELS. The Boeing Hawks (Seattle area) R/C Club, of which Vince is a member, had evolved ½A Pylon racing into a very popular local competition. Racing times for a ten lap course were reduced from over 2 minutes down to the 1 minute 30 second mark. Although the basic RCM rules were followed, the Hawks did find ways of improving the performance of the basic Cox TD .049/.051 engine. Loose piston/sleeves, opened venturi, pressure and 70% nitro fuel produced some startling results. A good detailed article on state of the art ½A Pylon racing was authored by Vince Caluori in the February 1977 issue of FLYING MODELS, titled, "Faster—Faster—Faster". It is "must" reading for the serious ½A Pylon flyer.

In the Spring of 1976 I saw an announcement in Model Aviation (Competition Newsletter Section) calling for new contest rule proposals for the 1978-1979 flying seasons. That's right, you have to start about two years in advance. It sounded like a lot of work. In fact, it actually was a lot of work. I drafted up a set of rules based primarily on the Boeing Hawks experience along with inputs from my local club members and some of my own. My basic theme was to allow for some originality in airplane design, yet at the same time limit engine performance improvements which would in turn cut down on speeds, a little, and allow more general participation in the

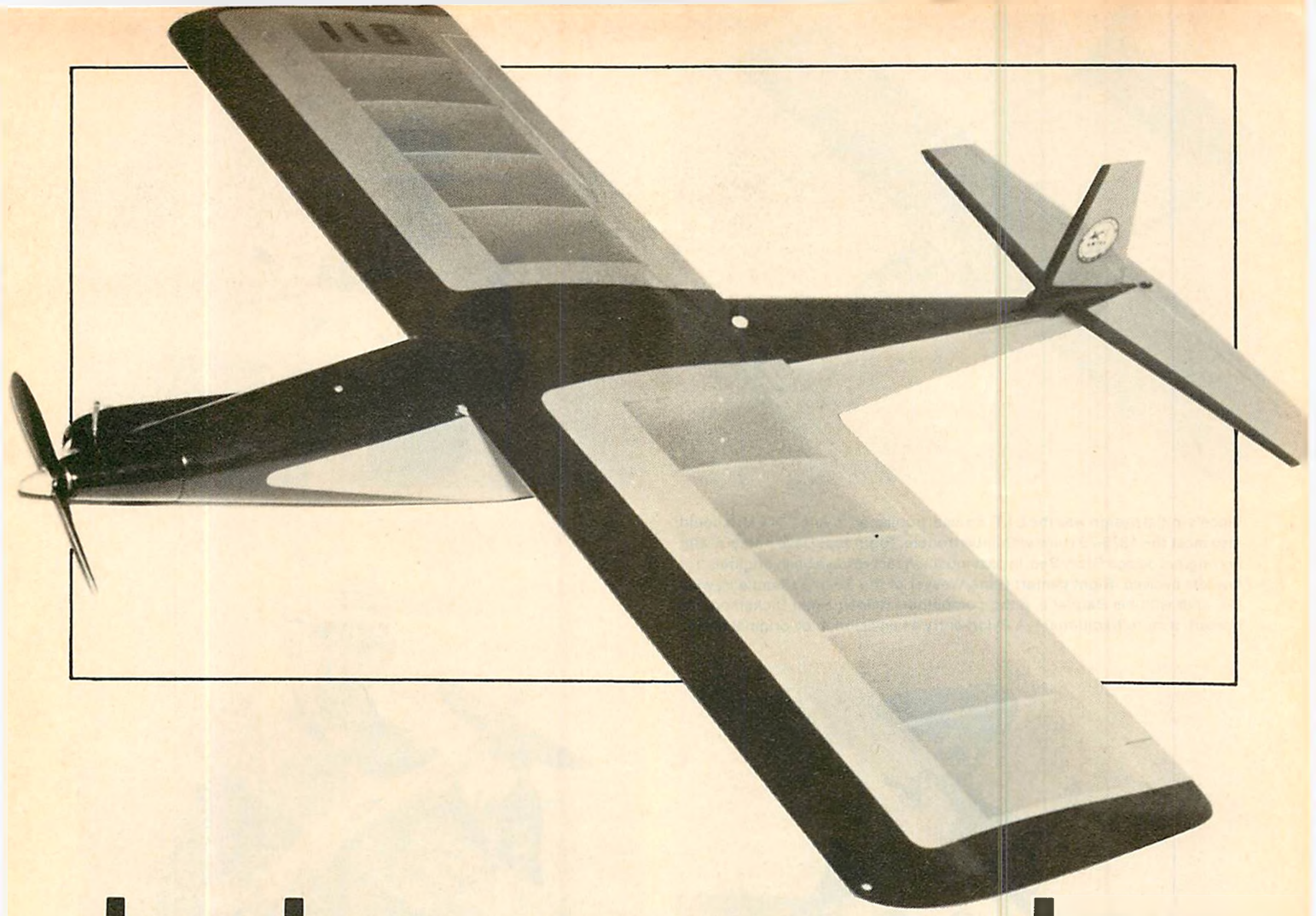
# Pilots—

½A Pylon racing now has official AMA rules status. Here is a detailed look and analysis of the new 1978-1979 rules and how they came into being by the man who helped propose them/**Bob Aberle**

PHOTOGRAPHY: BOB ABERLE AND VINCE CALOURI



Vince Calouri's well known Quicksilver ship paired with its forerunner, the Grey Ghost (with checkerboard wing trim). That represents only about one year's progress. It's the little things that make a difference, at high speeds the air is a thick soup and drag points take their toll. **Photo facing page**: Current standard of excellence can be portrayed with this Quicksilver built by Larry Davidson, active in eastern racing meets.



# start your engines

event. I didn't want it to become another Formula I or Quarter Midget event.

My original rule draft was mailed off to the AMA Contest Board (each member individually) on July 27, 1976. Proposal due date was supposed to be no later than September 1, 1976. I sent copies literally all over the place to give the rules some extra attention. My resulting postage bill was out of sight. Several of the Pylon racing magazine columnists published my rules (namely Dave Lane of Model Aviation and Fred Reese of RCM). Only one of the eleven Contest Board members (Mr. George Hill) ever wrote me on the subject which I found a little disappointing. Ultimately my rules (identified as Proposal RC-78-14) were printed in Model Aviation, Competition Newsletter Section, December 1976, pages 68 and 69 for comments. Suprisingly only *three* modelers responded with cross proposals. One flyer, a Mr. Paul Yee, from Madison, Wisconsin, added a set of amendments which would have produced a very conservative racing event. His intention was to keep it as a one plane event with casual speeds so that any type of flyer could compete. Certainly a good motive, I'm sure. On the other side Mack Moffat of Sun Valley, California (who now writes a ½A column for RCM) and Bill Simpson of Palos Verdes Peninsula, California wanted an all out competition with practically no restrictions whatsoever. I felt that my own position was somewhat between Paul and Mack. The exact text of their individual cross proposals were published in the May 1977 Model Aviation (pages 80-82).

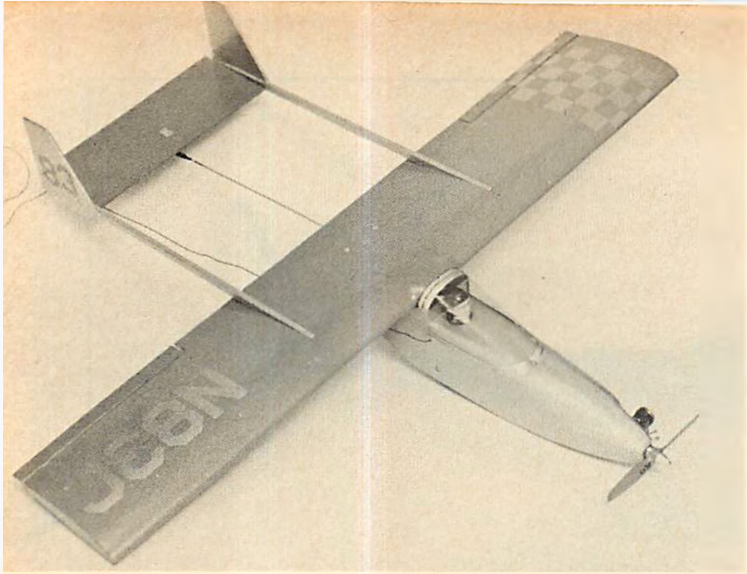
Before the final R/C Contest Board vote a new rule proposal questionnaire was printed in the September 1977 Model Aviation (page 73). You could have commented on these various proposals at that time and, of course, influenced the final voting. Unfortunately not many flyers did answer this questionnaire from what I can gather.

The recent January and February issues of Model Aviation gave the final R/C Contest Board voting results for the ½A Pylon racing event. The final wording will appear shortly (we hope) in the new 1978-79 AMA Contest Rule Book. The actual rules, I must admit, won't make any of us very happy. I'm sure Paul, Mack and Bill are not particularly happy and I know I'm not. I get the impression that the Contest Board was not fully appraised of the rules and cross proposals as presented.

By the time you read this article the new printed rules will have been distributed. Rather than take additional space here I'd like to go over some of the important areas and note the problems that might arise. Please keep in mind that some of the exact wording may be a little different in the final text of the rules (I'm working from an advance copy).

*Engines-* The new rules make it quite clear that only a stock engine may be used. In fact, as written, it would be doubtful that Bob Davis' diesel head conversion could be legally employed on the Cox TD .04'/.051 engines. The biggest disappointment is that the popular Kirn/Kraft special fine thread needle valve assembly is no longer permitted. This valve made TD operation a pleasure for the modeler. Likewise, the venturi opening must not be changed. It can't be opened up to the 5/32 inch diameter dimension (as recommended by Cox). Of course you still will be able to swap piston/sleeve assemblies in an attempt to get a reasonably loose fit. I can't see any rule preventing this since it could not ever be monitored properly by contest officials.

*Fuel Pressure-* In the same regard, "No pressurization of the fuel system except for atmospheric pressure shall be allowed". This means that neither a Kirn Kraft back plate pressure tap nor the Cox standard pressure tap may be employed to pressurize the fuel system. Similarly, a pen bladder or pacifier type pressure tank may



Vince's initial design was the L.I.T. Special published in Aug. '74 FM. It could also meet the 1978-79 rules with little trouble. **Right top:** Dave Katagiri with his original design Glory Bee. In past most ½A racers have been originals, for few kits evolved. **Right center:** Gene Weaver of the Boeing (Seattle Hawks) R/C club with his Batplane, a top competitor. **Below:** Brian Dickerson, his Upstart, a more traditional ½A Pylon entry as envisioned by original event.

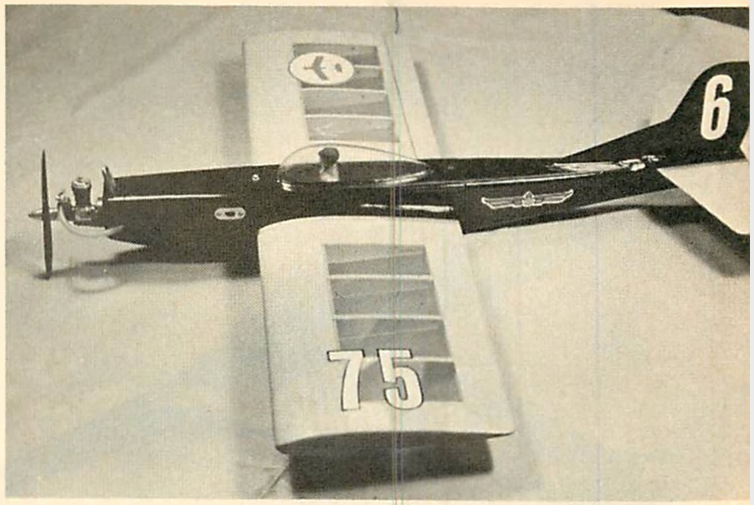
not be used. In the long run this will prove a great mistake. Pressure in combination with an opened venturi and a loose piston/sleeve did make for considerably higher rpm. A better compromise would have been to permit only a standard venturi opening but allow pressure and a Kim Kraft needle valve assembly. Fuel nitro content also would have had an effect on rpm (more on this in the next paragraph). The result would have been a steadier running engine (with pressure) which would have made racing more comfortable for the average flyer.

*Fuel-* The fuel will now be limited to 50% nitro content *maximum.* In combination with the previous engine comments this would have minimized the increase in rpm's *even* while using pressure, *provided that the venturi opening was not altered.* 50% nitro fuel can be obtained by the modeler commercially without any difficulty (for example George Aldrich fuel distributed by Carl Goldberg Inc). Above 50% nitro content you tend to blow out Cox glow heads quite rapidly. With the cost of these heads now up to $1.75, this could have been expensive in the long run. The 50% nitro fuel limitation was certainly the best compromise.

*Fuel Cut-Off-* I had expressly wanted cut-off by radio control, prohibiting the fixed fuel pick up tube which requires that the plane be rolled inverted and held there until the fuel runs out of the tube. The new rule now states, "Allow cut-off by fixed tank pick up and roll to inverted". With speeds upwards of 80 mph, a ½A Pylon racer can fly just about out of sight while waiting for the fuel to run out of the vent (or pick up) tube. A sagging engine (which happens often due to dirt in the fuel system or an improperly set needle valve) makes it almost impossible to hold the plane inverted. Under those conditions it is difficult just trying to stay in the air. It can therefore create a safety problem at a crowded contest. The fixed fuel pick up in my opinion is a big mistake. I personally now use a third servo to activate a Fournost Racing Products fuel cut-off device. Think safety!

*Aircraft Requirements-* In general the model need not any longer resemble a full scale racing plane (not that many did in recent years). Canopies, cockpits, pilots heads and even landing gears are no longer necessary. Wing area is still a 200 sq. in. minimum. Any planform is now permissible (with the exception of delta wings or flying wings). The airfoil thickness at the root chord must be at least ⅞ inch, as before. However, in keeping with the fact that the wing can now have varied planforms (tapered at the tips for example) you will be allowed a proportionately thinner airfoil section at the wing tip. The ratio of thickness to chord being the same throughout. My intention here was to permit a reasonable airfoil thickness at the wing tips. A ⅞ inch thick airfoil at a 3 inch wing tip would have been ridiculous. Unfortunately, I made a bad error in this part of my rule wording. As pointed out to me by Paul Yee, an elliptical shaped wing planform can result in literally a paper thin airfoil section at the wing tip. In addition, an elliptical shape could give a contest director fits since it is so difficult to calculate the area accurately in a short period of time. Had I to do it over again I would have restricted the use of elliptical planforms, at least within the measured 200 sq. in. wing area minimum. My apologies!

Minimum model weight will still remain at 20 ounces. Making the weight less would only mean that the modeler with the lightest radio equipment had the best advantage. A lighter model could also mean one that is not structurally sound. You don't want an 80 mph racer breaking up in the air over or near a crowd of spectators. Fuselage cross sectional area is still going to be a problem. The original rules called for a minimum cross sectional area of 8.5 sq. in. at the widest point. Our 1978-79 rules will now say something like this: "The fuselage including canopy and cowling, but excluding




This is Bob Aberle's Nothin' Special (an FM design) with a "V" tail removed and conventional tail feathers substituted. Bob explores all possibilities. **At left:** Bob again in the field, original "V" tail seen on Nothin' Special. It was featured in May, 1975 FM issue. It will meet new rules as shown but a cowled engine would reduce drag. **Below:** Chuck Silver and his original ship Disaster. He would need a canopy to meet a 4" minimum fuselage height rule.

fillets, shall have a minimum height of 4 inches and a minimum width of 2 inches. These dimensions need not occur at the same fuselage cross-section, but they must occur in that length of the fuselage bounded by the wing root chord. Profile canopies and cheek cowls are expressly prohibited." Many of us were hoping for a chance to design a more streamlined fuselage. The new rules makes this impossible.

*Conduct of the Race-* In the actual running of the ten lap race you may at your option hand launch your own model. For safety sake, having a helper do the launching seemed a more practical idea. You will only have 90 seconds now to start your engine. With the new ½A electric engine starters now on the market this should not be any real problem. If a pylon is cut by a contestant it simply is not counted. Pylon callers will now be permitted under the new rules. The race course itself will be the three pylon course developed by the Boeing Hawks Club and used, for the most part, throughout the country already. The basic triangular shape (described by the three pylons) has two 300 feet sides and one 60 feet side.

That just about covers the major points in the new ½A R/C Pylon racing rules. Despite some of the drawbacks it is still a starting point. The event now has official status and hopefully will be raced at the 1978 AMA Nationals. With standard rules you can now at least compare flying speeds throughout the country with some degree of consistency. If you have any comments *now* concerning these new rules I suggest you contact the R/C Contest Board member for your own AMA District. Their addresses can be found on page 74 of the February 1978 issue of Model Aviation. New or revised rule proposals will be accepted up to September 1, 1978 for the 1980-81 flying seasons. Standard rule change proposal forms can be obtained from the AMA Headquarters.

What can we expect in a typical ½A Pylon racer for 1978? Well as it stands now I would think the elliptical wing planform would be about the best approach unless it was specifically excluded from the test of the final rules. The resulting thinner airfoil at the wings tips would have an advantage over a straight taper wing planform. The engine should be cowled and preferably on its side with the cowling fairing back towards the wing leading edge. The cross sectional fuselage area rule is going to prompt almost a standard size fuselage. The 4 inch minimum height being the biggest design problem. The fuel tank vent could be faced forward inside the engine cowl allowing the airstream flow to produce a slight pressure effect. Although this might be disallowed as well. Certainly it would be wise to fee-up the piston/sleeve fit for a few extra rpm's and a little smoother running with the 50% nitro fuel. Since there is no real way of monitoring the piston/sleeve tolerances you might as well do it. Horizontal stabilizer and vertical fin areas should be calculated using tail volume coefficient formulas instead of simply guessing at a fixed percentage of the wing area. I might also like to try a laminar flow airfoil similar to the one used by Lee Helsel of Sacramento, California, in winning the recent ½A Internats Pylon Race (San Francisco, Calif., December 10, 11, 1977, I believe). Lee used a ⅞ inch minimum thick airfoil but moved the maximum camber point back to 45% from the leading edge. His best time was 1:14 for the ten lap course. I might add that he was using a borrowed Vince Caluori modified Cox TD .049 on pressure and 65% nitro fuel. With the new rules I would think times around 1:20 may be possible, but not much faster (famous last words!).

We would be very much interested in publishing some new ½A Pylon racing designs, based on these new rules. Why not send some photos and sketches to me for a starter (c/o Carstens Publications, P.O. Box 700, Newton, New Jersey 07860). Until then, pilots you have 90 seconds——*start your engines.*

# Sliver

PHOTOGRAPHY: DICK SARPOLUS

This one is not so exotic that you can't build it. This thin-lined bird will soar on the slighest lift/ **Dick Sarpolus**

This sailplane offers good performance, modern styling, and easy construction, based on some well proven design features. I hadn't built a sailplane in quite a while and had some new techniques I wanted to try as well as a desire to go back to a proven wing with a long, long history. The airfoil - and the wing - go way back to Frank Zaic's Thermic 100 of the 1940's. The airfoil is the well known NACA 6409, with or without the flat bottom modification. This basic wing also offers several choices in the airfoils and sizes it can easily be built to.

I first encountered this wing as one of my early sailplane ventures with friend Joe Roslyn; the Thermic 100 wing was combined with a Taurus tail assembly for the Themus, a successful sailplane in 1969 which is still winning trophies today. Frank Zaic later modified the wing, going to a straight tapered tip panel in place of the original "Wolf" outline. It was sold commercially by Frank and also incorporated into several successful kit sail planes. He later modified the undercambered 6409 airfoil into a flat bottomed section and again offered it commercially in several sizes, from 100" up to 130".

My intent to build this wing with the undercambered airfoil was to have a model which would be well suited to calm air or light breeze conditions. The flat bottomed wing version could be used for windier weather, being faster and better penetrating. The wing's multiple spar and closely spaced rib layout offers easy construction - no planking or capstrips required - and still performs well. The chosen layout uses 34" span constant chord center panels and 21" span tapered tip panels for a 110" span, 906 square inch area. The two main panels construction easily mates with two wire joiners through the fuselage for a clean assembly.

This plane is my first with a vee tail, and selection of this feature led to the slender fuselage design. The vee tail is appealing for several reasons - less construction time, less drag, novel appearance, less vulnerable to crash damage. The control linkage chosen was Du Bro's new setup, with the mixer linkage mounted on one servo and linked to a second servo, directly behind the first one. With the two servos now mounted in line, it was obvious that a very slender fuselage could be built, using a flat pack battery and a flat receiver. The fuselage was laid out to be

Dick, if you don't get the photos right now the dumb sky is going to open up and drop two feet of snow on your head tomorrow. Quite a winter in the east for testing anything. It's a beautiful easy floater.

barely wide enough to accept the DuBro linkage; the servos, battery, and receiver easily fit.

The vee tail surface area is 216 square inches, 24% of the wing area, generously sized for stability. The movable control portions are large to insure adequate control response. Full moving surfaces were not used to simplify the installation. The vee tail assembly is simply mounted to the fuselage with two nylon bolts.

The fuselage itself, now slender due to the inline servo mounting, was further reduced in bulk by going to a pod-and-boom layout. Although a tapered fiberglass or aluminum tubing boom would be ideal, these items are not readily available to a scratch builder. A small rectangular cross-section, with ¼" x ½" spruce top and bottom pieces and ⅛" balsa sides, results in a reasonably light and strong, quickly built boom construction. Perhaps 1/32" plywood could be used as the boom side planking for even more strength.

Our first test flights showed this combination of features had resulted in a really good flying sailplane. It climbs out on the hi-start straight as an arrow and is very stable yet maneuverable. It doesn't feature spoilers, flaps, towhook release, etc., but does offer simple construction and good performance.

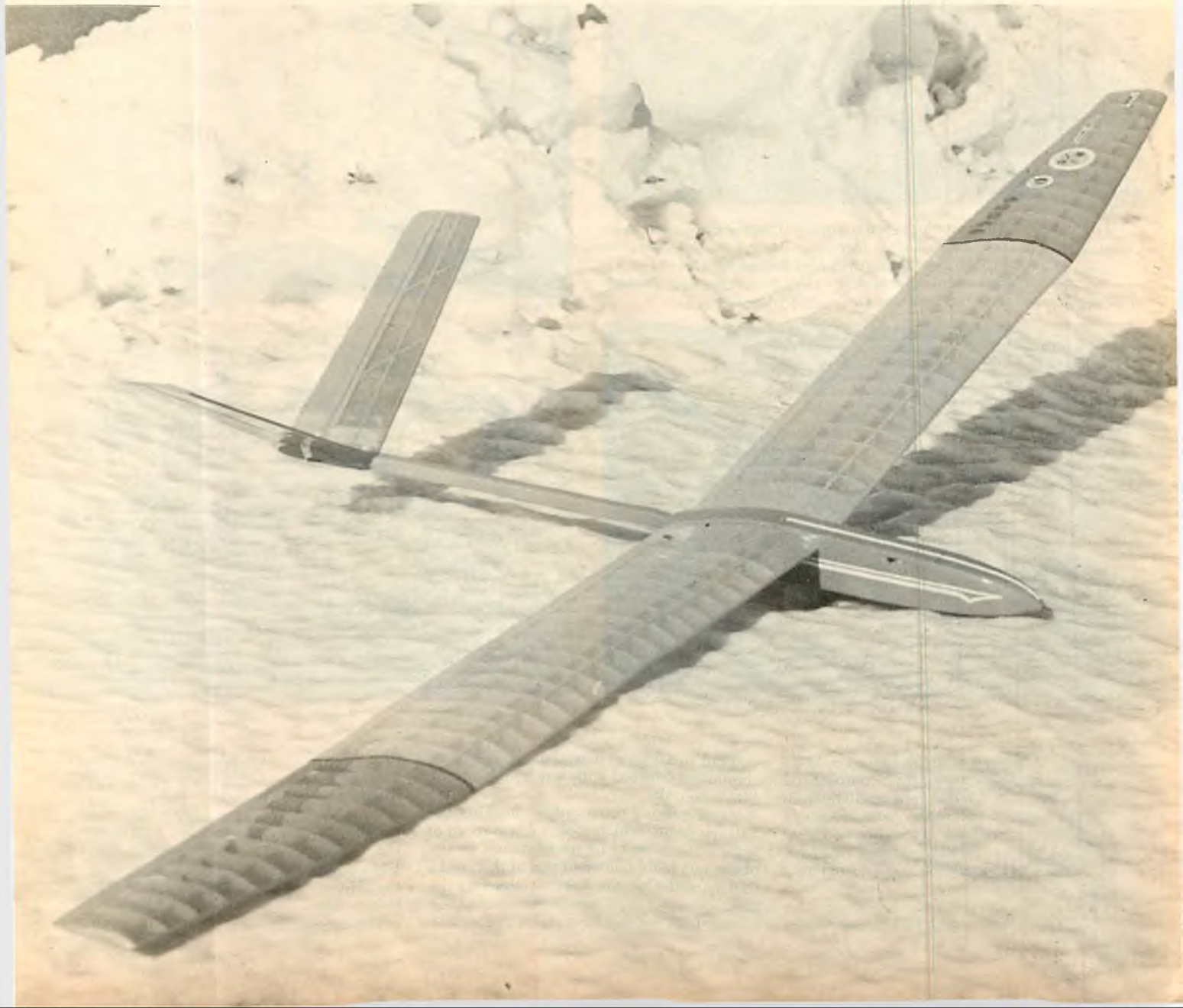
Before getting into the construction, you may be able to save some labor by obtaining a wing kit from Frank Zaic, if he still has them available. I suggest you inquire at P.O. Box 135, Northridge, California, 91328, for his G-99, G-110, or G-130 wing kits.

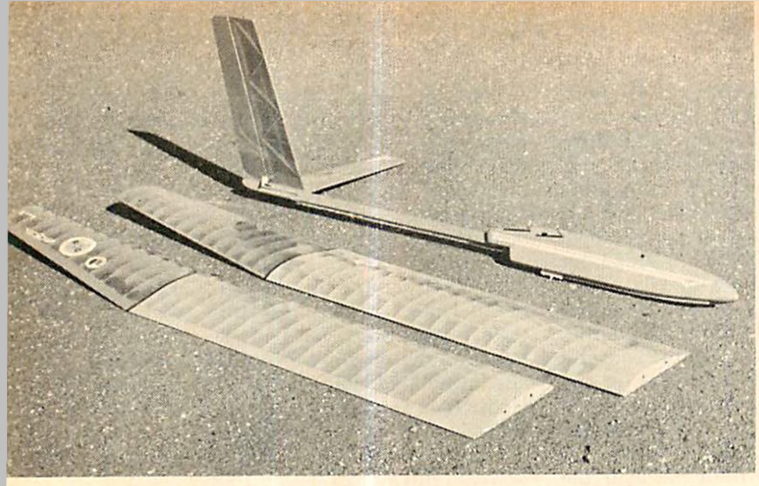
Starting with the wing, there is no denying that there are a lot of ribs to be cut out. Most of these are the same, for the constant chord center panels. A band saw or jig saw will make things easier by stack cutting the ribs, also the six 1/16" plywood center section ribs. Stick with it - it's worth it. With the ribs cut, the panels can be built flat over the plans if you choose the flat bottomed airfoil section. For the undercambered section, the spars must be spaced up off the building board. At the polyhedral break, the extended spars of the tip panel overlap the spars of the center panel for easy reinforcement. Use epoxy here. At the center joint, use 3/16" dia. wire wing joiners to line up the brass tubes before epoxying them to the plywood center ribs.

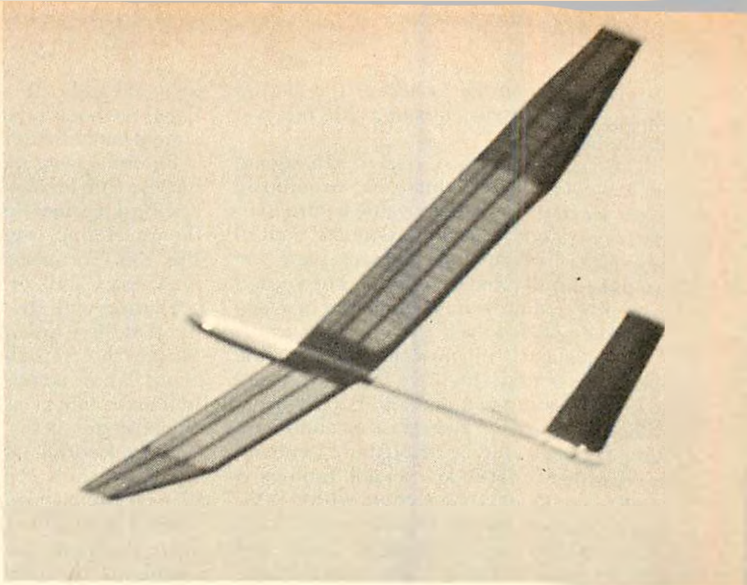
You may wish to add one or two ¼" square spruce spars on the top surface of the wing for extra strength. I did add one such spar on the prototype and have repeatedly looped the model with no problems. The spruce spars are very strong and still flexible; the center wire joiners also flex for more safety.

Going to the tail surfaces, the simple built-up structure with the top spar and tapered control surfaces results in a diamond style lifting airfoil. The center-section is flattened on the bottom for fuselage mounting and reinforced with epoxy and fiberglass cloth. It is removable, mounted with two #10 nylon bolts into the fuselage.

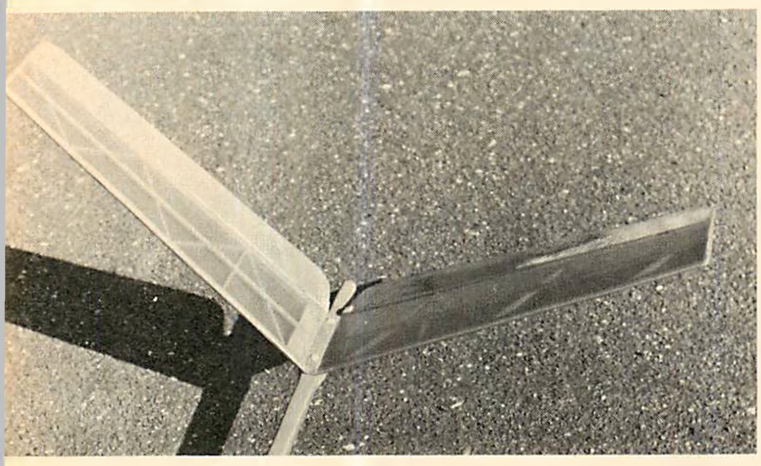
The main fuselage section is made from ⅛" balsa side pieces with 1/16" plywood doublers; this fairly heavy construction is designed to take considerable abuse. Brass tubes are epoxied in place to accept the wing joining wires; the wing panels are held in place with a heavy rubber band between screw eyes in the panels. The tail boom is built up of ⅛" balsa side planking over the ¼" x ½" spruce top and bottom pieces. The nylon tube linkage runs back through the boom, exiting on each side to the control

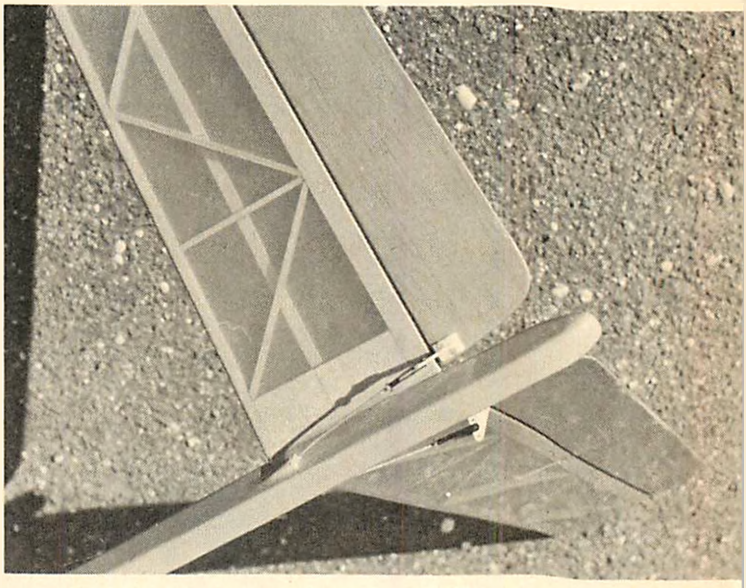




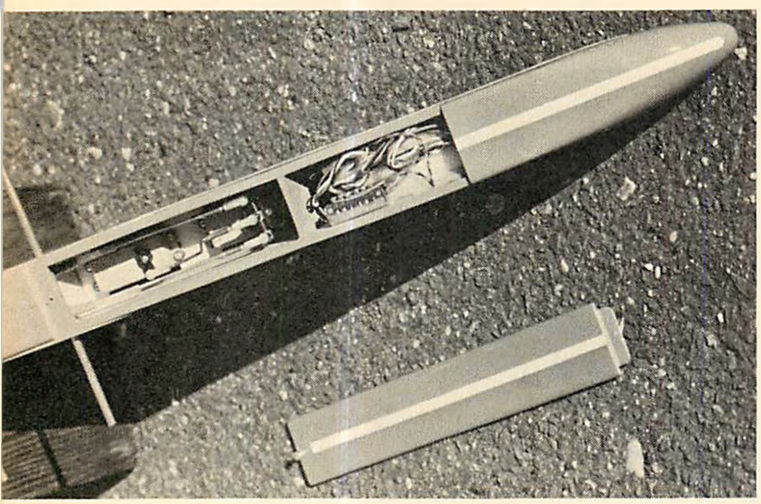


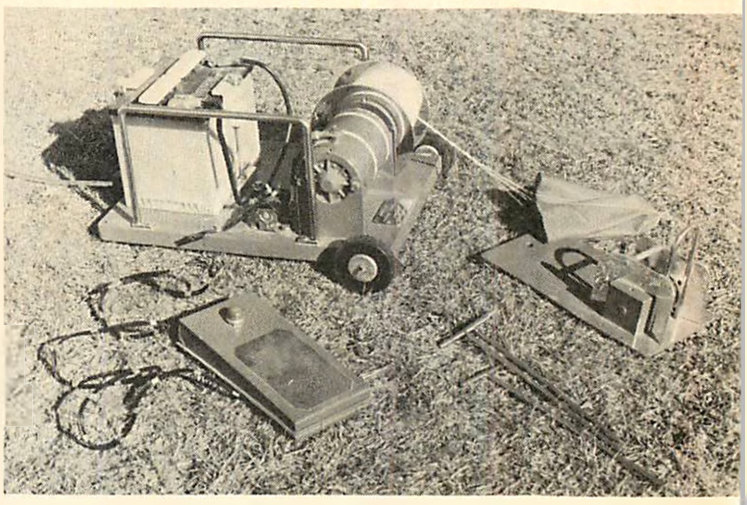
Translucent gleam of the ironed-on film gives you an idea of the structure. A thin fuselage, equipment in tandem arrangement. Light, thermals in winter air. **At right:** Temperature 22 degrees, thermals all over. It flies superbly.





The "V" tail, easily built, nice in that it is graceful, high above ground on the landing roll. Popular on full scale soarers for this reason. Linkage can be seen on photo to **right**. Two horns are required. **Bottom right** photo captures the winch mechanism, foot tredle etc. Or use a hi-start line deal. **Beneath:** The nose, no room lost for a thin cross-section. It balances well.





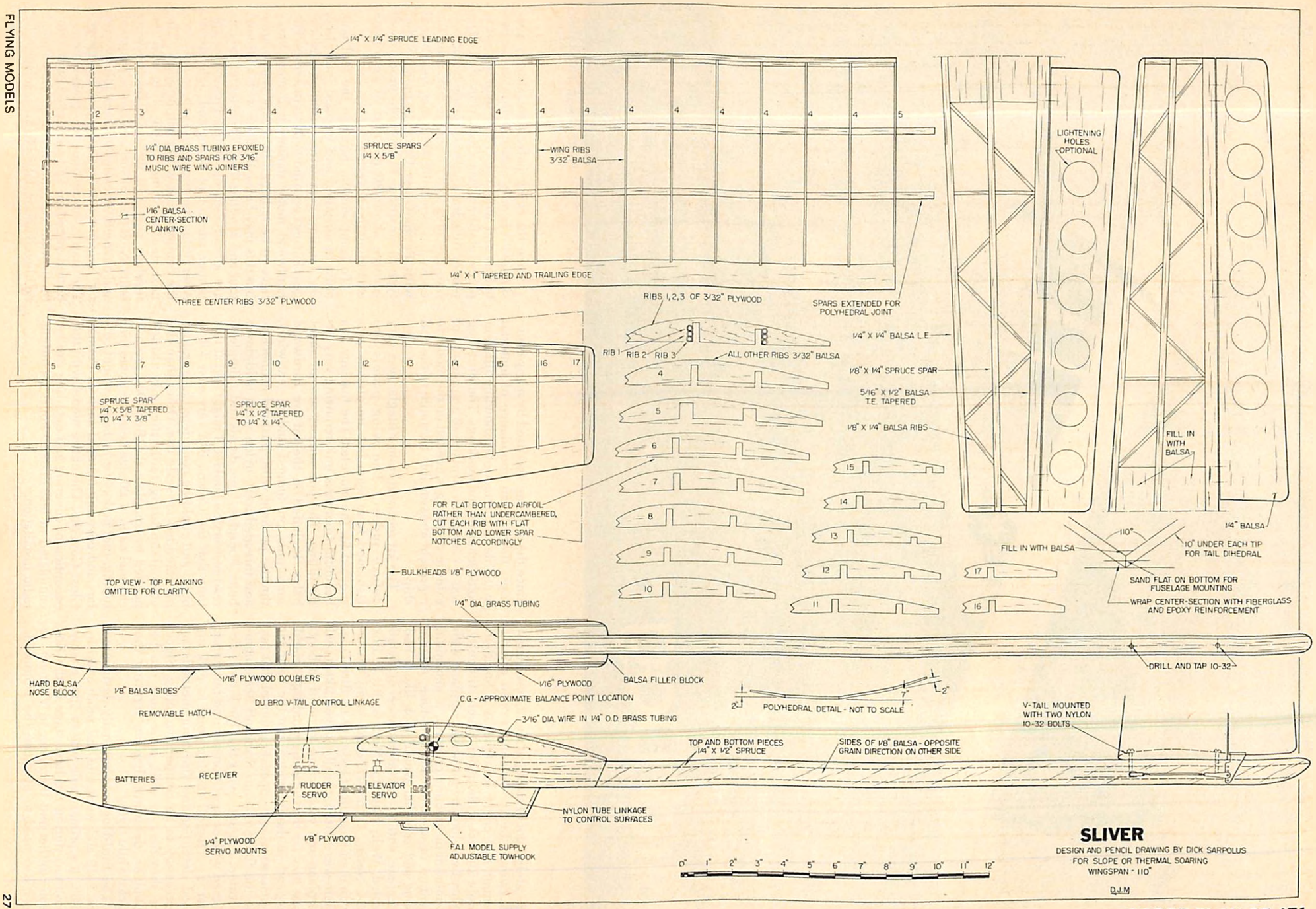
surfaces. Although other linkages could be used, the DuBro setup appears compact and easily workable. A nylon tube could be built into the boom to accept the radio receiver's antenna. The towhook is mounted on a ⅛" plywood bottom section epoxied in place. The nose block should be shaped from hard balsa or even pine.

For finishing, the fuselage should be painted with any usual technique. Wings and tail surfaces, as usual on any sailplane, should be covered with any of the plastic film materials.

My test flying consisted of checking the balance point, which took a few ounces of lead in the nose to locate as shown on the plans, two hand launched test glides, and a shot up on the hi-start. For first launches, the towhook was placed forward for safety, then moved back for the best climb angle. The fifth flight, on a 20 degree cold, clear day off a weak hi-start, resulted in a five minute plus flight! We were pleased.

What's in a name? I usually come up with something catchy like "The new glider with the vee tail", and this time am indebted to FM's editor, Don McGovern, for suggesting the "Sliver", a name whith I like and feel suits this design.

Happy soaring!



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An FM Product Review:

# Fliteglas' Bird Dog

This trainer will also double as a Stand-Off Scale ship/**Frank Tiano**

PHOTOGRAPHY: FRANK TIANO

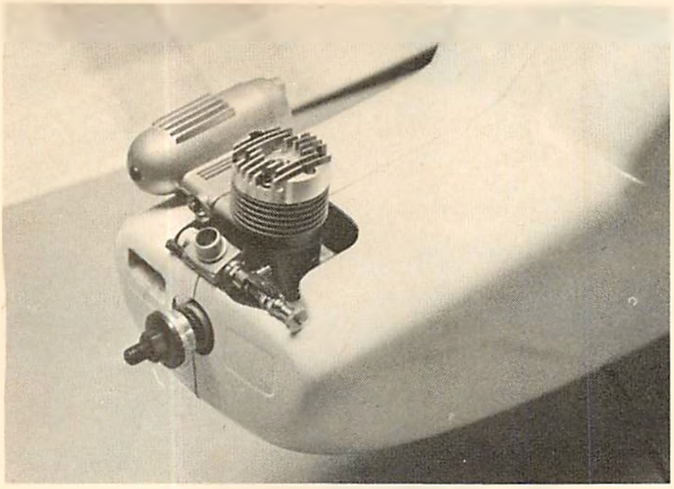
Lately I got to thinking about how nice it would be if someone would offer a trainer that could be done as a Stand-off Scale subject without too much difficulty. What I was looking for was an airplane with a minimum amount of parts, a maximum amount of work already pre-done, a large wing and one that would look like a real airplane without an abundance of detail added. Well, Fliteglas Models, RR 1, Box 324, Neoga, IL 62447, came to my rescue with their beautiful Cessna O-IE Bird-Dog. Here was a kit that really looked like a real airplane and was a snap to build to boot. Just how far the detailing would go would depend on the individual but the basic kit produces an eye appeasling model that can be the first step into Stand-off Scale competition. I'm not saying that the kit was designed with competition in mind but rather that it's a logical starting point to pick up good detailing and finishing methods so neccessary to be competitive today. Since the ship flies so well, more time can be spent on detailing than on fighting the sticks while flying.

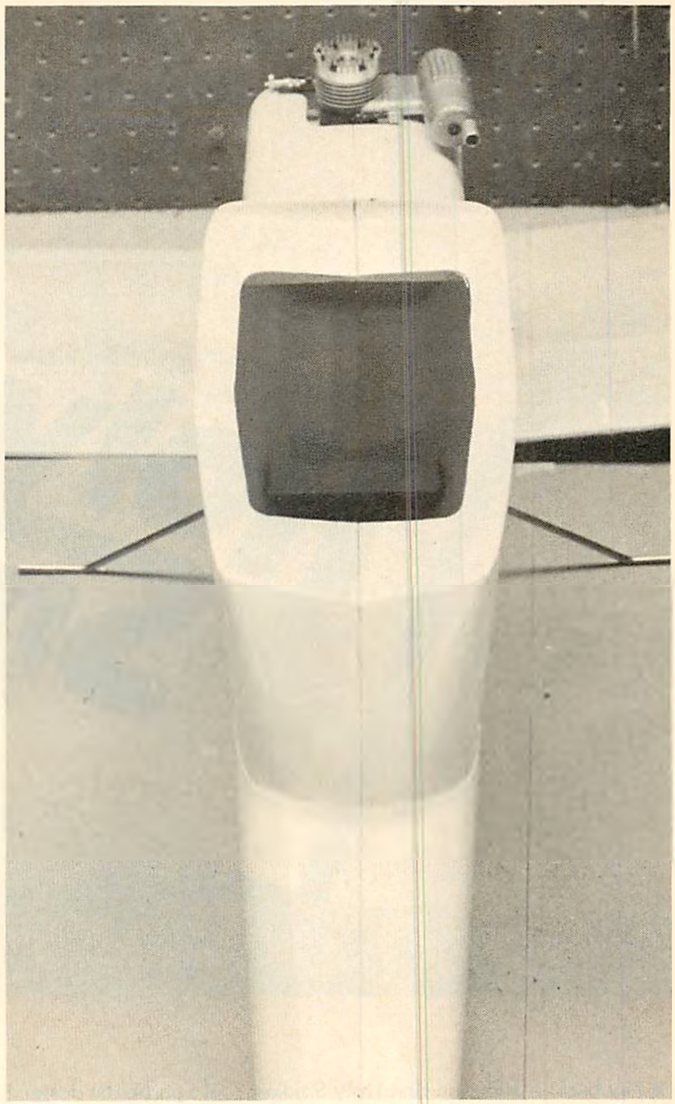
The Bird-Dog was originally designated the L-19 and went into full production in 1956. It's primary role was to spot enemy positions during the later stage of the Korean conflict and then later in Vietnam. It was also used to evacuate the wounded. Since the airplane was used by many countries, there is an abundance of material available to the modeler showing different color schemes and markings. The Bird-Dog was a very clean airplane so a minimum of exterior detailing is needed on the model to represent a reasonable facsimile of the real ship.

The kit received from Fliteglas was very deluxe indeed. The wing panels are fashioned from foam but are already presheeted for the modeler. The fuselage is a beautiful fiberglass unit requiring very little filling. The tail surfaces are all sheet balsa. Included in the kit are hardwood servo rails, pre-formed landing gear wires, throttle pushrod wire, pushrod connectors and threaded rods, nylon wing hold-down bolts, fiberglass tape, decals and a simple to read instruction booklet. I might add at this time that the Cessna is a very easy kit to build and could be considered as a trainer not intended for scale use. Other than the normal building tools the only things needed to complete the Bird-Dog are a 3 channel radio, a .20 sized engine, some fuel tubing, fuel tank (4 oz.) wheels, wheel collars and covering material such as Perma-Gloss Coverite. The entire model with the exception of covering and detailing can be completed in less than 10 hours including radio installation.

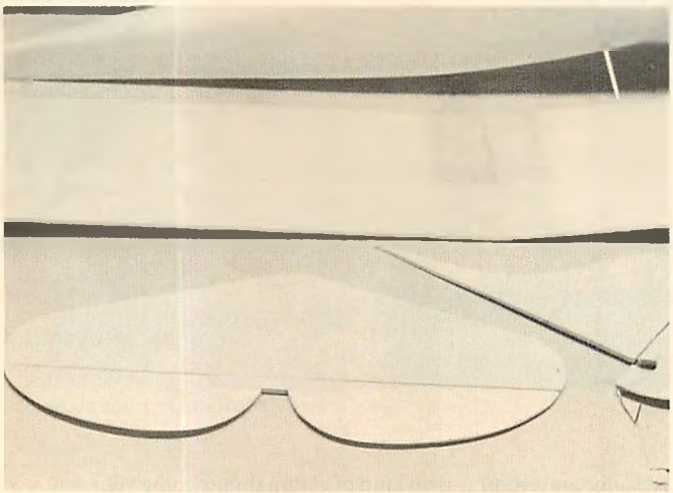
Since the wing halves are already preskinned it is only necessary to join the two halves and wrap the center with a 4" wide piece of fiberglass cloth provided. The proper dihedral angle is already factory cut into the cores so it's a simple task. After the epoxy has dried the wing may be covered with Perma-Gloss Coverite or any other type of covering. That whole process will involve about 20 minutes of your time excluding the covering.

To complete the fuselage the fuel tank must be installed and wedged into place, the landing gear wires installed and the gear fairings epoxied to the wire struts. The hardwood motor mounts will most likely have to be enlarged to accept your engine but this may be easily done with a Dremel tool and sanding disc. The engine mounts are already set up at the factory for the proper amount of down and right thrust. After fitting the engine, be sure to fuelproof the compartment with resin or epoxy. The next step is to line up the wing with the fuselage and drill the holes for the wing bolts. Next the tail surfaces can be prepared and covered. The elevators are joined with a 4" long piece of 3/16" plywood and epoxy. The stab is made from two pieces merely butted together and cemented with Hot Stuff. After covering the units they should be hinged and installed to the fuselage. The





The engine shown in the authors Bird Dog is an OS .20 **(above)**. The fuse **(right)** is one-piece fiberglass with a white gel-coat finish and the firewall is installed at the factory. The wings are foam, pre-covered with balsa while the tail surfaces are sheet balsa. Wing struts are included in the kit.



fin is made by cementing three pre-cut pieces together. After covering the fin and rudder they may be hinged and epoxied to the fuselage. Triangular fillets are then cemented to the top of the stab, against the fin, to keep everything strong and in alignment. The instruction booklet calls for wing struts to be fashioned from 1/4 x 1/2" balsa pieces sanded to a streamlined shape. I decided to use some pre-formed aluminum pieces found in the hobby shop instead because of their greater strength. As it turned out later, the struts are for looks only and are not needed for flying.

Once again I used the Ace 3 channel radio and found plenty of room inside the Cessna's fuselage for installation. The radio switch was mounted on the side of the fuselage but a more inconspicuous location can be used. The battery pack was mounted as far forward as possible and 3 oz. of weight had to be added to the nose for the ship to balance properly. The balance point is two inches back from the leading edge of the wing. To avoid overcontrolling this plane, be sure to set up the rudder at a maximum 1/4" throw in either direction. The elevator may be permitted to move in 1/2" measurements, up and down.

Before attempting a takeoff with the Bird-Dog, make sure that the wheels are towed in somewhat to aid tracking. With the wheels set in this manner, there should be no problems and the ship will leave the ground in about 60 feet at half throttle. Very little right rudder is needed to make a straight take-off. The elevator will be trimmed a bit in the up position to insure straight flight. This is a design necessity, not an error. With the proper amount of surface deflections, the Bird-Dog will handle very nicely and remain easy to control. It will not return to level flight if the sticks are released in time of trouble but a touch of up elevator should straighten things out. The ship has no bad habits as far as I could tell. I was surprised that I could make it stall but the stall was very gentle and always off to the right a bit. Once flying speed was regained the ship handled well. The stall only occurred in dead calm conditions and at very low flying speeds. The total weight of the ship approached 4 lbs. and this may have been a reason. With any head wind at all I doubt if anyone could force the ship to stall at all. Landings are very easy to execute since the Cessna has a very predictable sink rate. In a power off situation the length of the glide will amaze you. Many times we have flown it until the fuel supply was exhausted and we're able to return to the field when many other ships would have landed out in the weeds. After a few prangs the model proved to be quite rugged and we have yet to sustain any damage even in the hands of a beginner.

The Bird-Dog should weigh between three and four pounds for good performance. Depending on what engine you use a little ballast will always be necessary, but less will be needed with a .20 equipped with a muffler. Someone will probably try to fly the Cessna with a .15 but I don't recommend it unless it's a very powerful engine. This ship has a 52" wing and 442 sq. inches of area and needs a 9 or 10 inch prop for proper performance.

All in all I liked this model quite a bit. It's kind of nice to see a trainer that resembles a real airplane. Best of all it flies like a real trainer. The price may seem a bit high at $79.95 but when you realize that the ship is almost completely built for you and features a fiberglass, gel-coated fuselage, it certainly seems well worth the price. I must apologize for not providing any flight shots but on the days I flew the Bird-Dog, I couldn't find anyone else to go along. Be it as it may, it does fly well and at this time I am in the process of making a set of skis for the ship so I can enjoy flying during the winter months. If you want a trainer that looks like something, not like all the rest, try a Bird-Dog. The amount of compliments you receive from your buddies will prove that you made a right decision.

For class A, B, or FAI Free Flight, this ship by **Joe Slovacek** is really a . . .

# Holy Smoker

PHOTOGRAPHY: JOE SLOVACEK

Way back in 1960 the first Holy Smoker was dusting off the clouds strictly as an FAI power Free-Flight. It had been powered with all the super diesel engines of that day. Remember the Oliver Tiger (2.5cc factory mod.)? Then came the Super Tigre, and you know the rest, the new sound.

I can't say that the Holy Smoker was any better or any worse than what any FAI Free-Flight ship was supposed to be. It won a few and lost a few, but one good thing I remember about the Smoker. It always seemed to keep it's cool, even when the "downers" were picking on it. Always easy to trim and forgiving of that bad launch.

With the fast changing aspect ratios and nasty weather reports I figured this bird had finally smoked itself to death - so in about 1968 I retired it with a drooping stab. So that's the way it was, until last year. A visiting Free-Flight friend was unrolling and messing up my plan box when he suddenly stood up. He rolled his eyes back and yelled "Yea! This is it, at last I've found it, I've got it, give me the plans, I've got to build it!" Just that quickly we changed the airfoil from a Lippish to an 8% Benedek B8353b/mod., put the rudder behind the stab, stuck a nitro mill on the nose and classed it a combination A/B or FAI power Free-Flight. We now had an old proven design with all the new and accepted trends in modern F/F know-how. The name is still the same - Holy Smoker, but it now eats bigger and fluffier clouds.

For the record, or whatever, I believe that most modelers have an interest in knowing if a particular design has won any contests or whether or not it is competitive enough to survive today's hangar talk. Of course every competitive American Free-Flighter knows - that even with all of today's super-hot designs, cutting nice groovy paths in the sky, no one design can ever win them all. Hope we all accept that. How many times have you kind of gotten things going your way at a contest - and some turkey hollers out - "Anything looks good in a thermal." Of course that's true, even a cornstalk looks terrific floating in a riser, but we must remember where there's an upper there's a downer nearby.

Gene Simpson gets the launch duty here, caught in the moment of ramming the bird into the blue. The model really departs, not for the faint of heart.

Regardless of how the air went, here's the thermal activities for the Holy Smoker for the 1977 contest season:

1. Cliff Cloud Climbers Contest (Dallas) - 1st in A
2. Fort Worth/Houston Club Challenge - 1st ABC (combined)
3. Houston AA Contest - 1st ½A - 3rd ABC (combined)
4. Houston AA Contest - 1st ½A - 3rd ABC (combined)
5. Plainsmen Regional Championships - 3rd ½A

Deciding what to build is usually a tough decision for most model builders to make. Especially when the wife is keeping an eagle eye on the balsa stock and you've promised to build "just one more". Nevertheless if you do decide to get on with the Holy Smoker, let me give you a word of advice, heed, warning, or whatever you want to call it. It's conceivable that at your next contest the only friends you may be stuck with at the day's end - are nothing but a bunch of buzzards. Got an M-1?

## The A/B Version

With the "A" version weighing in at 18-20 ounces (.15) and the "B" machine at about

22 ounces (with Sp. K&B .21) you must use some clout in the method of construction. Needless to say that 424 squares (projected area) at this light wing loading should stay put for a max or two.

Now comes the question. How can we knock off about 6 or 7 ounces from the FAI version? It's simple. We leave out half the ribs, don't plank the fuselage and cover the ship with super fine Japanese tissue. Surely you know I'm kidding, so let's think about this.

First off, the wood selection is of the upmost importance. You don't have to use pulp wood - but do use good light 6-8 ounce "C" grain contest balsa. The fuselage is the main key in reducing the weight. The plans read ⅛" sheet siding (FAI only) for the fuselage. Go 1/16" sheet here, using ¼" sq. runners. The doublers in the nose area can also be 1/16" sheet instead of ⅛". The wing pylon is of the built-up type which is light and strong - so let it be. The type motor mount is also a big weight factor (you can save 1½ to 2 ounces here). The pan type is alright for the FAI version, but a plain flat back plate mount (⅛" or 3/16" aluminum) is very light and strong. Build the wing straight-away, using no spruce. Complete with MonoKote covering the wing weights 5-5½ ounces.

The built-up rudder is of course very light and the stab should *not* be planked with oak. A light tail swings better.

We do know, that for one reason or another some modelers can just build super light airplanes. It's always the same answer when we ask "how they do it". "I select my wood very carefully." So again, let me stress - watch the lumber!

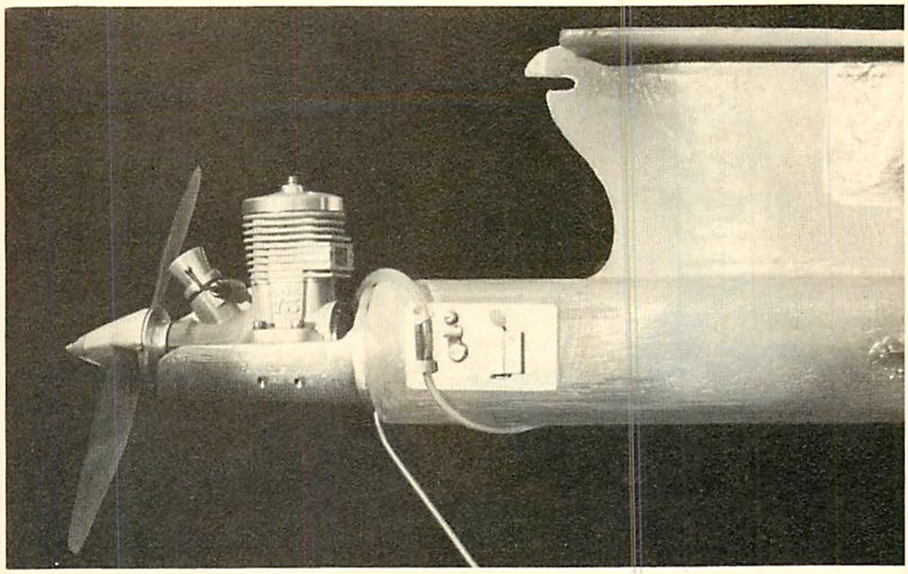
Now let's ask "What if my A or B job weighs more than 22 ounces?" A legal FAI ship must weigh in at 26½ ounces powered with a .15 (2.5cc) motor. Just look at anything less than FAI weight as sweet heavenly revenge.

## The FAI Version

We could talk about this version until we're blue in the face, but more than likely the fellow who digs FAI F/F is going to do his own thing, regardless of what we say here. The serious FAI flyer is usually not a young kid (maybe second childhood) and secondly - probably very capable of designing his own bomb. Still, just in case you've stuck your last one in the ground and are taking a second look at the Holy Smoker, you'll surely notice this - *no auto surfaces!* That's right, I did away with them for the same reason that so many seasoned builders never use them. Just another gimmick to foul up! If you've ever used the auto stuff we both know that's not exactly all fact, but it is a fact that the Smoker rides the groove without all that push-push-pull-pull-click-click. Just simply tilt the stab for a right glide circle and slap in a little left thrust into the engine. This should be simple enough for the modeler who would like to have a crack at the big boys. Could be that while all the other guys are adjusting, tugging, cussing and fiddling around with all that rigging - your Smoker with its lop-sided stab is circling up about in a beautiful thermal.

To be perfectly frank - regardless of what this article says, I still think auto-rudder is great. But like I say, the Smoker really doesn't seem to need it, so who's an FAI die-hard?

I don't know why, but many modelers feel



A 2.5 cc Rossi coupled with an aluminum back plate motor mount gets the job done quite well in Class A using a 7-3½ or 3 fiberglass prop. For Class B he prefers the Schneurle ported K&B .21. A back plate motor mount using a 8-3-¾" wood prop. Just a touch more down thrust. Don't use soft wood for wing! **Photo beneath:** Bob Issacks of the Houston Free-Flight Club kisses the wing of his ½A version of the aircraft, a lucky fellow who finds a tremendous downdraft after a minute and 45 second over run. Maybe double bad luck cancells itself out sometimes. A competitive Free-Flight design, rugged and very able.

Author Joe should look a little happier after retrieving a third max, but who can be all smiles after stopping a screaming .15 with his forefinger? Ouch! **Beneath:** Six unscratched Smokers and happy soles at end of a day of super flying. Dennie Cadwell, Joe Slovacek and Ed Cadwell. It's contest proven.

that they've got to change at least one thing on every plane they build. We can't keep you from doing it your way - so if you happen to make the wrong change and plant a balsa tree, we'll help you water it. America needs more balsa wood.

## Trimming and Flying

How many arguments have you heard regarding that famous question "What would you do?" Many old timers are reluctant to give any advice in the adjustment department, for the simple reason of not wanting to be blamed for the crash. Of course there's a lesson to be learned here - but what if your Holy Smoker does do a big hairy loop, barely misses the ground, zooms up and stalls twice, hooray, you're lucky, saved by a short DT fuse. So now comes the question - what would you do? I'll try to tell you . . .

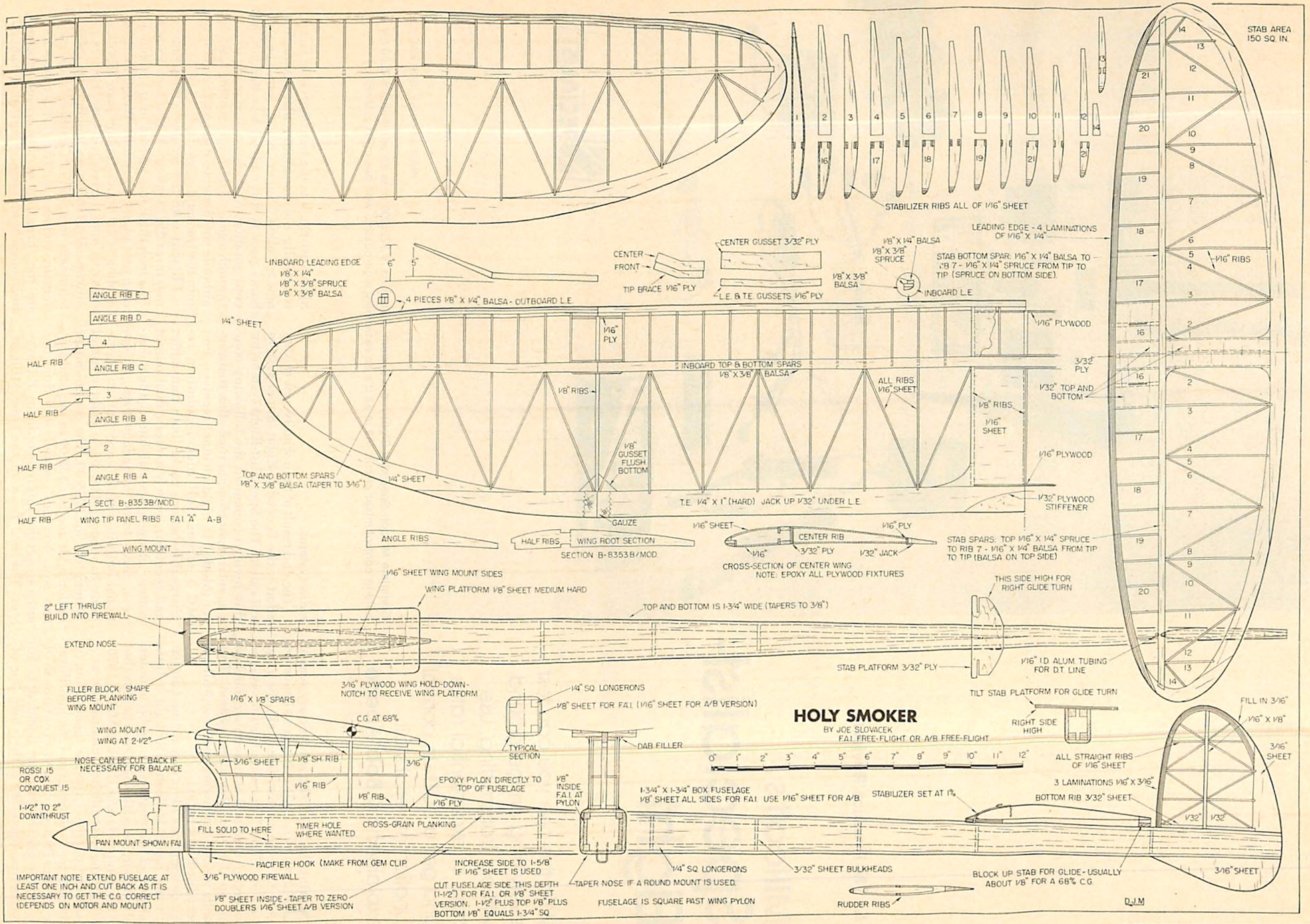
First pick up the ship, jiggle it in your hand, eyeball down the fuselage. Flip over the prop, check the timer arm, look over the wing for warps, knock around the stab to see if it's secure, kick a few weeds out of the way and calmly say "Yeah, well there's a couple of things that may help it."

First we might try putting in some down thrust. If that doesn't work try shimming up the leading edge of the stab or cut down the shim in the back. Also maybe adding some weight to the nose might help, or jack up the back of the wing if it looks like too much incidence. Better still, move the C.G. back and add some wash-out in the wing tips. The stab could be tilted a little more by the way. How was the glide turn? If you tighten up the turn that can help the stall. Don't overdo it, easy does it. Try launching downwind next time and use a smaller prop. Put enough rubber bands on your wing or it can cause you some trouble.

Well, that cured the hairy loop, but what do you do if the Smoker goes over the top and sticks up in the mud? Simple, just reverse all the information I just gave you. Remember to clean the engine thoroughly and don't forget to point the nose straight up when you launch it again.

Now let us get to the finer points of trimming. As we all know by now, that when it comes to putting trim in any design in most cases the skin can be put in a number of different places in order to accomplish about the same thing. Boiling it all down and launching straight from the shoulder - do these few simple things and the Holy Smoker will do the rest.

1. Follow the plans, even if they blow out the window.
2. Put some left thrust in the engine (about 2 degrees).
3. Add a little downthrust to the engine (just be sure you have no up), about 1½ or 2 degrees.
4. Tilt the stab (match the dihedral center angle of the wing) from the front of the airplane - the left side of the stab is high.
5. Put about 3/32" wash-in into the right inner panel of the wing (remember that's the trailing edge warped down).
6. Shim the stab until the glide is smooth and flat.
7. Don't forget to check the C.G., dead on at 68%. It should balance 2⅝" off the trailing edge.
8. Have a clean towel handy to wipe things off ready for another flight. I hope those tears you wipe off will be tears of joy. Happy smokin!



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**An FM Product Review:**

# Millcott's Specialist-Eight

With this one you can test everything on the ground without transmitting, use dual or exponential rates and get a built-in control function mixer. It's all explained by **Bob Aberle**

PHOTOGRAPHY: BOB ABERLE

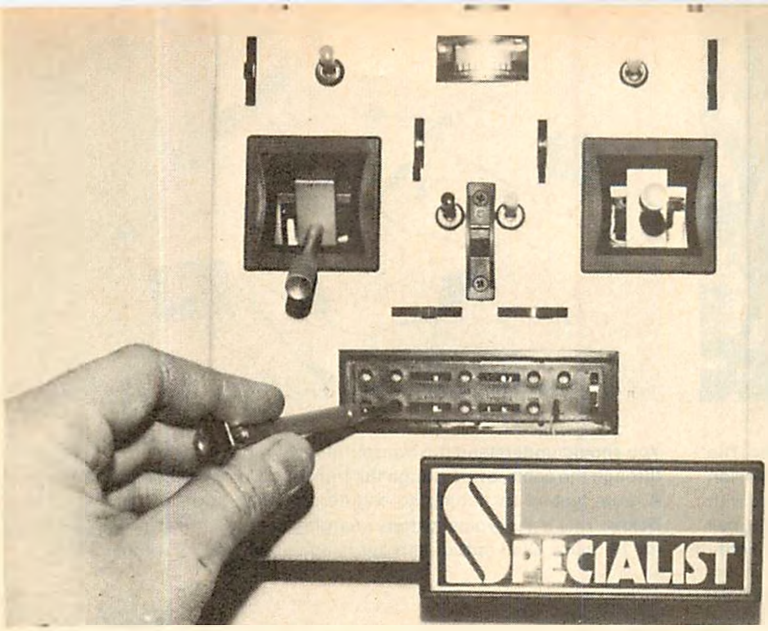
Complete Millcott Specialist-Eight radio system. List price is $725.00 plus an additional $35.00 for a built-in control mixer circuit. All in all it's an extremely high quality, well designed system.

During the 1978 50th anniversary year of FLYING MODELS/FLYING ACES I have set a goal to review most, if not all, the new breed of "Super" or custom radio systems now on the market. Last month we touched base on the Kraft Signature system. This month we are reviewing the new Millcott Specialist-Eight radio.

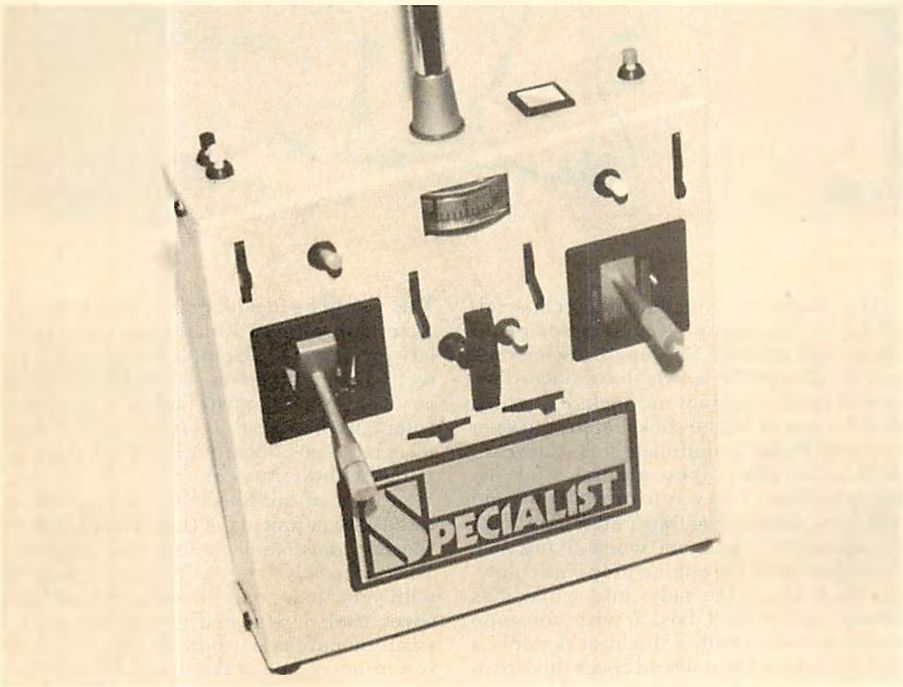
Since some modelers may not be familiar with the name Millcott I thought a little background information would be in order. Millcott purchased the old Orbit facility (but not the company name) back in March 1976. Initially they established themselves as a repair and overhaul service specializing in Orbit, Micro-Avionics, Pro-Line and Royal Electronics R/C systems. As an outgrowth of this repair service Millcott decided to go into the manufacturing of their own line of radio systems.

The end result of their wholly new design effort is the Specialist-Eight (Super system as I call it). The Specialist-Eight system (for this review) contained the following components: eight channel dual-stick transmitter (Mode II), eight channel receiver, four MC-3 servos, full nickel-cadmium rechargeable battery packs (both transmitter and receiver), switch harness, dual output battery charger, special interconnect harness, servo trays, frequency flags, an optional built-in control mixer and an operations handbook. The basic eight channel system lists for $725.00. The control mixer option adds another $35.00 to the total system cost. You can certainly tell from the price aspect that this is no ordinary R/C system. The real heart of the new Millcott Specialist-Eight is the transmitter. In fact it is actually the transmitter that makes the new so called, "Super" R/C system. The airborne pack is still more or less standard in configuration. As such I'm first going to run through a general description of the Millcott airborne components. After that I want to go into the transmitter, in depth.

I'll start with the receiver. Physically it measures 2½ inch long X 1 9/16 inch wide X 13/16 inch thick. It is housed in an aluminum case (not plastic or nylon). Weight with all cabling is 2.5 ounces on my scale. Five cables exit from the receiver case. Each is approximately 3 inches in length. Two cables terminate into I.T.T. Centiloc block style (female) connectors. The I.T.T. connectors are the three pin variety which employ mechanical wire connections (they cannot




Important to note here cover panel (shown removed). Control travel, servo reversal, push button control adjustment and control mixer switch are all conveniently located in this area. Easy access at the field. **Below:** The Millcott Specialist-Eight "Super" transmitter as Bob calls it because of the extra features and gadgets. Color coded for fast identification. Text herewith describes control functions in depth. A quality system that does much to inspire your piloting skills.



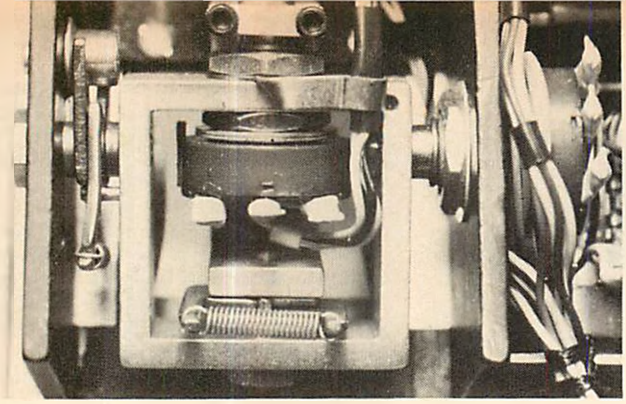

be soldered by the modeler under normal conditions). The majority of the system servos plug into these two block connectors. The exceptions being a separate I.T.T. (female) connector for both the retract and aileron channels. The fifth cable is the power connector which in this case in the standard Deans type. The Deans connector along with a heavier gauge wire is used in the power circuits to prevent a voltage drop. A double tuned front end is employed along with three I.F. stages. Only a single I.C. is used in the receiver circuit, namely a 74L164N (TTL) eight bit shift register. Probably due to the (TTL) I.C., the total receiver current drain is 34 ma. (as I measured it). All components are mounted on a single epoxy/glass printed circuit board which is, in turn, hard mounted to the metal case. Receiver antenna is color coded to the exact 72 mhz frequency for easy identification (great if you fly several R/C systems). Receiver voltage is regulated down to 3.5 volts. As such the receiver can operate with one failed cell (out of the four) provided that the cells shorts and doesn't open. The remaining receiver specifications are as follows: sensitivity 3 uv nominal, selectivity -3db at 1.5 khz, signal/noise ratio 10db minimum and image rejection of 6db.

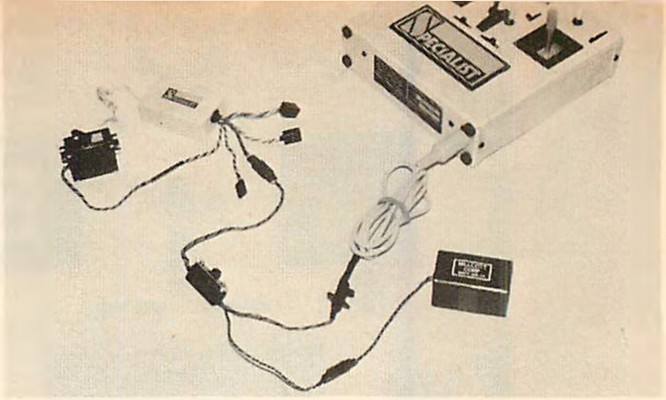
The MC-3 servo supplied with the Specialist-Eight employs the popular D&R Bantam mechanics. It typically measures 1½ inch long X 1½ inch high X ¾ inch thick and in this application weighs 1.3 ounces (each). The Millcott servo amplifier incorporates the Texas Instrument (T.I.) 28604 I.C. Each MC-3 servo is individually tuned (hand selected and adjusted for linear response) which is essential when using the built-in control mixer circuit (more on this later). Transit time is 0.4 seconds (for a full 90 degree rotation) and believe me it is every bit that fast! Output power is 19.5 oz.in. and the idle current is 7 ma. Position accuracy is claimed to be ½% maximum error. On an individual basis the MC-3 servos list for $49.50. Also available is an MC-4 servo set up for retracts (180 degree rotation) and a hi-power MC-5 servo (90 degree rotation in 2.8 seconds) for possible application on large aircraft or model boats. Both the MC-4 and 5 use Carl Goldberg mechanics and list for $55.00. Servos use the I.T.T. Centiloc (male) connectors on the end of 5 inch long, three wire cables.

Battery pack supplied with our system was the square configuration measuring 1¼ inch square X 2¼ inch long. It employs four G.E. 500 mah A-A size nickel-cadmium rechargeable batteries. This pack weighs 4.1 ounces with case and cable. An alternate flat style pack is offered, with the same size batteries, as an option. A special vibration proof 450 mah pack is offered as an option at extra cost. We did not get a chance to look at this particular battery pack. Finally a 225 mah pack is available (along with a charge reducing adapter) where space and weight is a critical factor. A dual output charger is supplied which includes L.E.D. indicators. Charge current for both receiver and transmitter is 50 ma (C/10 rate) requiring the full 16 hour charge period. Millcott does not recommend field type fast charging (the so called 15 minute variety). A switch harness is included with a charging jack that may be mounted on an exterior fuselage surface.

To summarize the airborne components, total weight with four servos and the 500 mah battery would be 12.4 ounces. Total current drain at idle (with four servos) was 62 ma. With two servos (of the four) operated continuously I could get the current drain up to approximately 300 ma. Millcott claims up to 3 hours flight with four servos and a 500 mah battery pack. I personally think it might be a little less than that. Actual flight time, of course, is still strictly dependent on the amount of controls you issue while flying your model. For those interested an extra complete four channel airborne system can be purchased for a list price of $340.00.

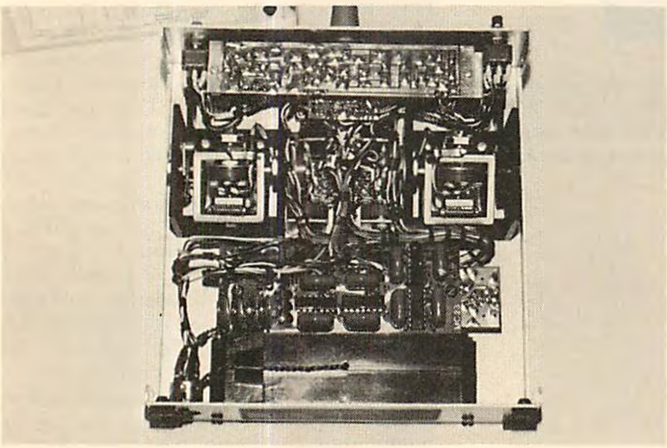
Now let's talk about that new and very sophisticated Millcott Specialist-Eight transmitter. Right from the first glance you know it must be something different with all the extra switches, levers and control buttons distributed around the case. The case itself measures 6⅞ inch high X 6⅝ inch wide X 2 inch thick less switch and control stick protrusions. Case material is the usual aluminum with a vinyl covering which in this case has an off-white color approaching tan. Weight of the complete transmitter is only 2 lbs. 6 oz. making it just about the lightest "Super" transmitter on the market at the present time. It is available on all 72-75 mhz frequencies and six meters as well (without extra charge). You must decide your frequency with some care since Millcott does not employ plug-in frequency modules. A ten section 43 inch whip antenna does not fully collapse into the case. However, it can easily be removed for storage or transportation. Eight 500 mah G.E. nickel-cadmium rechargeable battery cells are employed for a nominal 9.6 volt input. Current drain is 160 ma. which means that the transmitter can

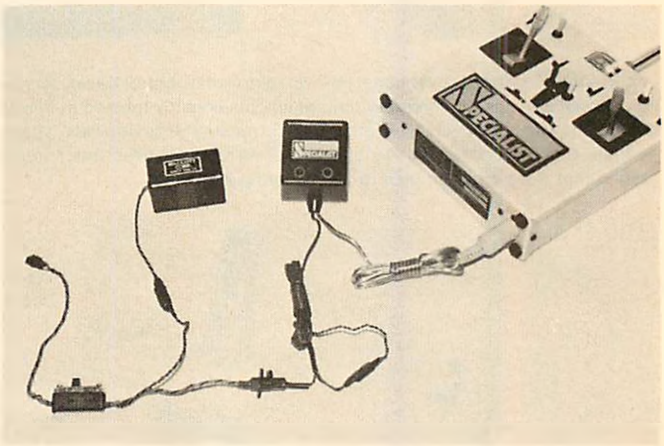




Here you have a close-up of the Millcott Specialist-Eight transmitter. The gimbal control sticks are of the open type. Stick length and spring tension can be adjusted to feel of each flyer. **Below:** Again, transmitter's interior with R-F board at the top. Encoder's below the control sticks and eight cell battery pack appears at the bottom. It's all well balanced, compact, light.

You should understand the transmitter can operate the servo (or all servos) through the cable, even though the transmitter is not sending an R-F signal. A great feature for tuning an engine or setting surfaces prior to a flight. **Below:** This is the typical battery charging set-up. Strictly 50 ma. (C-10) rate for 16 hours. Dual output charger is equipped with L.E.D. indicators.





operate for up to three hours before recharging. R-F output (measured by me) was in excess of 500 mw (one half a watt).

The transmitter has a built-in expanded scale voltmeter (E.S.V.) instead of the more usual R-F output indicator. Unfortunately the meter scale is not calibrated for normal voltage readings. You are simply instructed to fly until the meter goes below half scale (which is probably something around 9.0 to 9.2 volts). In addition, a special cable is provided which connects between the transmitter and receiver charging jack. When this is done the E.S.V. (in the transmitter) now monitors the receiver voltage (4.8 volts nominal). The cable automatically switches the meter scale so that you are still looking for a minimum reading of half scale (in this case something in the order of 4.4 to 4.6 volts). In this receiver voltage check mode only the airborne pack idle current acts as a load (approximately 62 ma.). There is no supplementary load connected. Supposedly the E.S.V. scale factor compensates for this lack of a larger and more realistic load.

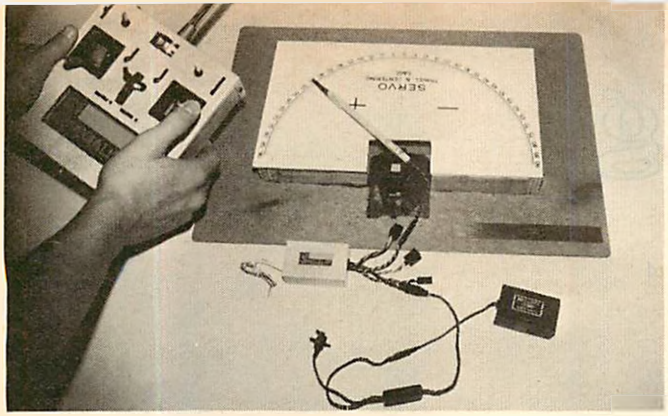
Now for a real bonus. With the special batter check cable still connected between the transmitter and the receiver charging jack, if you turn on the receiver power switch you can operate *all* the radio system controls while the transmitter remains off. So now you could run up your engine and trim out your controls prior to a contest flight without ever emitting any R-F energy from your transmitter. In this special mode only the transmitters encoder operates, not the R-F portion. This is a truly great feature that I'm sure many will now attempt to copy.

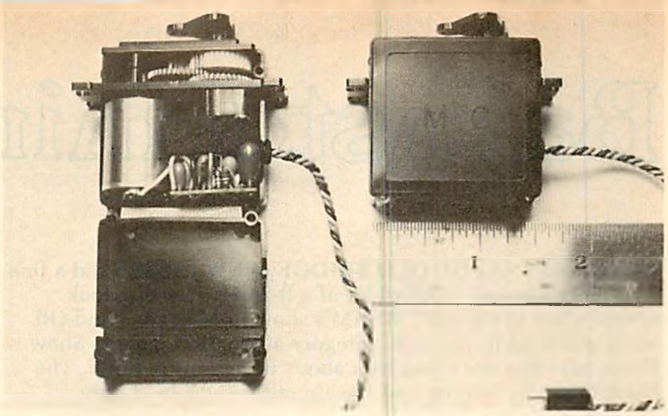
The control sticks on the Millcott Specialist are of proprietary design employing all metal open gimbals. The length of each stick can be adjusted by a twist/loc device. Two sets of tension springs are included which enables you to set the stick feel to your own personal liking. Unfortunately as is the case with most other open gimbal stick assemblies there is no way to prevent dust and dirt from entering the transmitter case. This is especially a problem when flying at a dusty field with the engine/prop wash blowing back across the radio unit while it is sitting in the field box. I wish someone would come up with a shield or possibly a soft rubber boot that would cover this opening yet not interfere with the stick motion. The throttle stick on the Specialist does not have a ratchet device, it is strictly a friction type fit for smoother operation. All four basic flight controls have cross trim. This means that if you are flying mode II with aileron and elevator on the right stick, both trim tabs for these controls can be operated with the left hand so that you don't have to remove your right hand from the control stick. This cross trim feature is becoming more popular with the new "Super" transmitters. A full 15 degrees of trim control is available on each of the four prime flight control channels (elevator, aileron, rudder and throttle).

Four additional or auxiliary controls are available on the Millcott Specialist-Eight. One is a two position switch located on the face of the transmitter, to the left of the meter face. This would most likely be the retract channel. Another is a special three position switch located just to the right of the meter. This would be ideal for operating three separate flap settings. Finally two more auxiliary proportional channels are available (directly below the meter face). All the auxiliary controls and push button controls are color coded so you can keep track of their respective positions until you get more familiar with the system.

In back of the Specialist name plate located on the front of the transmitter is a set of special adjustment controls and switches. You can easily remove this cover or plate with your finger nail (if you have one). The cover itself is attached to the case with a small monofilament line so that it can't be lost or misplaced at the flying field. Unlike another "Super" transmitter which uses a paper placard to identify the special controls, Millcott actually has the nomenclature molded into the plastic for permanence. A small screwdriver is necessary for both adjusting the trim pots and moving the switch positions as well (since the switches are actually recessed into the panel). Each pot is of the 320 degree variety (doesn't quite rotate a full turn). Four switches provide instant servo reversal on all of the four primary control channels (elevator, aileron, rudder and throttle).

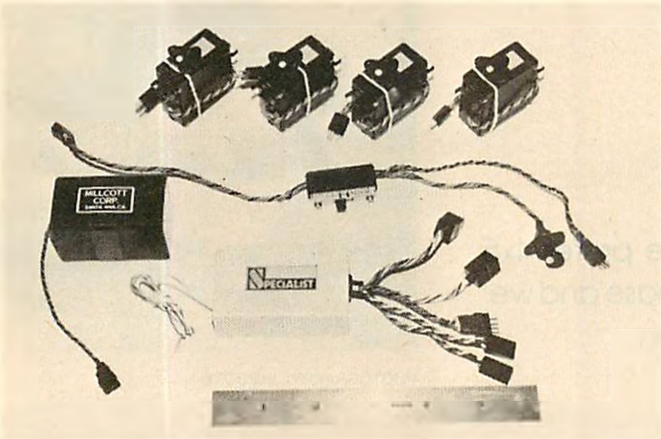
Your first big decision when ordering a Specialist-Eight is whether you want dual rate or exponential rate on the elevator and aileron channels. There is not cost difference, it is strictly your choice. If you option for dual rate your control response will remain linear at all times. Two switches located on the front of the transmitter case (on either side of the main power switch) select

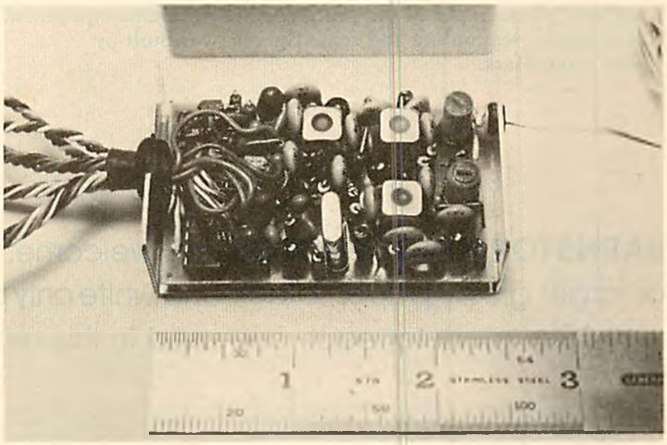




Bob seen here checking linearity of the Millcott MC-3 servo, getting used to the exponential rate control. Note protractor device developed by Jerry Smith out Indiana way. **Beneath:** The complete Millcott airborne flight pack. Weight is a little over 12 ounces as you see it with the 500 mah battery. An extra airborne pack can be purchased for $340.00, keeps two all ready.

D&R Bantam mechanics used by Millcott in their MC-3 servo. Millcott "hand tunes" their servos for near perfect linearity which is essential when using the control mixer function. **Photo below:** Interior Specialist-Eight receiver. The case is aluminum. Three I.F.'s and only one I.C. Note receiver current drain is just 34 ma. The weight of the receiver is approximately 2.5 ounces.





either a high or low control rate. In the high position you can adjust the amount of total servo travel (at the extreme throw position). In the low mode you can adjust the servo throw up to 50% less travel (roughly 20 degrees instead of the usual 45 degrees full throw). While flying in the low mode, full displacement of the control stick will only move the servo output arm ½ of its normal travel. It therefore acts as a vernier control which is especially helpful on fast, maneuverable aircraft (boats, as well). The other option provides both linear control and a new special exponential rate (non-linear) control. With this option, if the rate switch was in the high mode you would receive normal linear control and even be able to reduce the travel down to 50% of normal (with a pot adjustment remember, not a switch). Then if you switch to the low mode you would now be on a special non-linear or exponential rate control. In this mode something like ½ control stick travel would only rotate the servo through ⅓ of its travel. The remaining ½ of control stick movement (to its extreme position) would actually move the servo the remaining ⅔ of its normal travel. Thus a somewhat *soft* neutral or desensitized neutral is obtained. This is the way our review system was set up and I feel it is the preferable option in the long run over the simple dual rate approach.

In addition to the two mode operation on the aileron and elevator channels the Specialist-Eight also offers three push button switches for pre-programmed control of the elevator (for spin maneuvers), ailerons (for slow rolls) and throttle (momentary high or low speed). Unlike some of the other "Super" transmitters, when you depress a push button control on the Specialist it automatically disengages the stick control (for the same channel function). If you hit the roll push button the aileron stick control is disconnected. On some systems you would get an additive control travel which could possibly take the servo past its travel limit. This is an excellent feature!

As if that wasn't enough Millcott offers as an option a built-in control mixer. If ordered the standard mixer will combine the aileron and elevator functions for use with a "V" tail aircraft (as an example). To engage the mixer you simply flip a switch on the front adjustment panel. Thus the two servos could be connected directly to the "V" tail without the need for any special mechanical control mixer. Dual rate or exponential rate function as normal even when the mixer is in use. For special applications a uni-directional mixer can be made available from the factory. This is used where two separate controls are to be mixed while one still must function independently. An example of this is the use of coupled aileron/rudder on a large scale model for true coordinated turns. In this case ailerons will effect rudder but the rudder can still be operated by itself for ground steering. This is even a further option involving the mixing of three control functions for special applications. With the mixing control it is imperative that the servos operate in a linear fashion. This is why Millcott fine tunes their MC-3 servos. A non-linear servo operating in a flaperon application could cause one flap to dip more than the other thereby giving a roll effect to the model. Because of this fact also, Millcott will only sell complete systems or extra airborne packs. They will not sell a transmitter separately for use with another system that might not have true linear servo response.

A dual stick Mode I system is also available with all the features just described (this is especially for Eloy Marez of Model Builder). Additionally a new single stick version is available with a list price of $750.00 plus $35.00 for the optional control mixer and another $35.00 if you would like a top, self centering auxiliary rudder control.

Millcott offers a Specialist-Six system which has some, but not all of the Eight's features. This six channel system lists for $615.00. A smaller three channel system is available with a built-in mixer control specifically designed for R/C glider flying with an attractive list price of $275.00. Standard factory warrantee coverage on all systems is six months. Batteries are warranteed for a full one year.

Millcott has a very fine, detailed operations manual which covers all the new control features and options quite well. If you write to Hugh Milligan at Millcott (1420 Village Way, Unit E, Santa Ana, California 92705) he will send you one of these manuals, a price list and an idea as to where your closest dealer might be located. The Specialist-Eight system is about as close to the optimum as I have seen to date in R/C. I wish space permitted some of my detailed comments on the quality and performance of this sytem. If you get to Toledo (1978) take a good look at the Specialist-Eight.

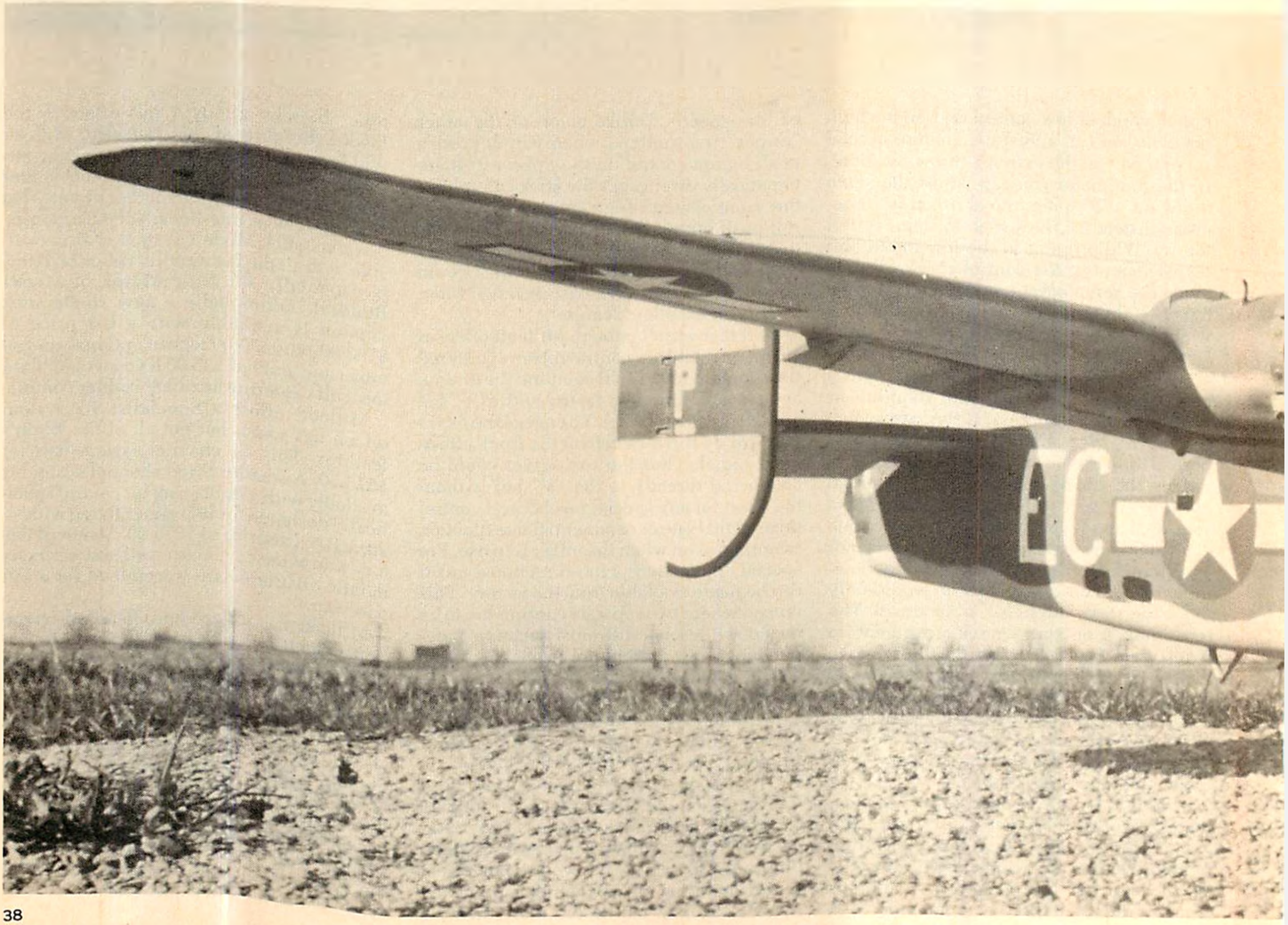
# Barnstorming

**HENRY MINNIG OF OLD BRIDGE, NEW JERSEY** did a fine job of modifying this Jack Stafford kit of a B-24-H. The ship took second place at the 1977 WRAM's show in Military Stand-Off Scale and third in the same category at the 1977 Toledo Show. Henry says that the plane took about 10 months to build. The finish is acrylic lacquer and the aircraft weighs in at only 14 pounds. Power for the big ship is supplied by four Veco .19's. Rhom retracts take care of the landings and the plane also features operating flaps and bombay doors.

The ship is modeled after a plane in the 392nd Bomb Group that was with the 8th Air Force in England during World War II and stationed at Welding, England. While Henry had her at the WRAM's show in 1977 he accidently met the radio man who had flown on the ship. He supplied Henry with additional photographs of the prototype. The diorama equipment, including the scaffolding and scale figures, was built by Henry's son Mark.

PHOTOGRAPHY: JIM BOYD

**BARNSTORMING PHOTOS** are welcome. We prefer 4x5 or larger glossy paper, black and white only please and we pay $5 or more for each one used in this section.



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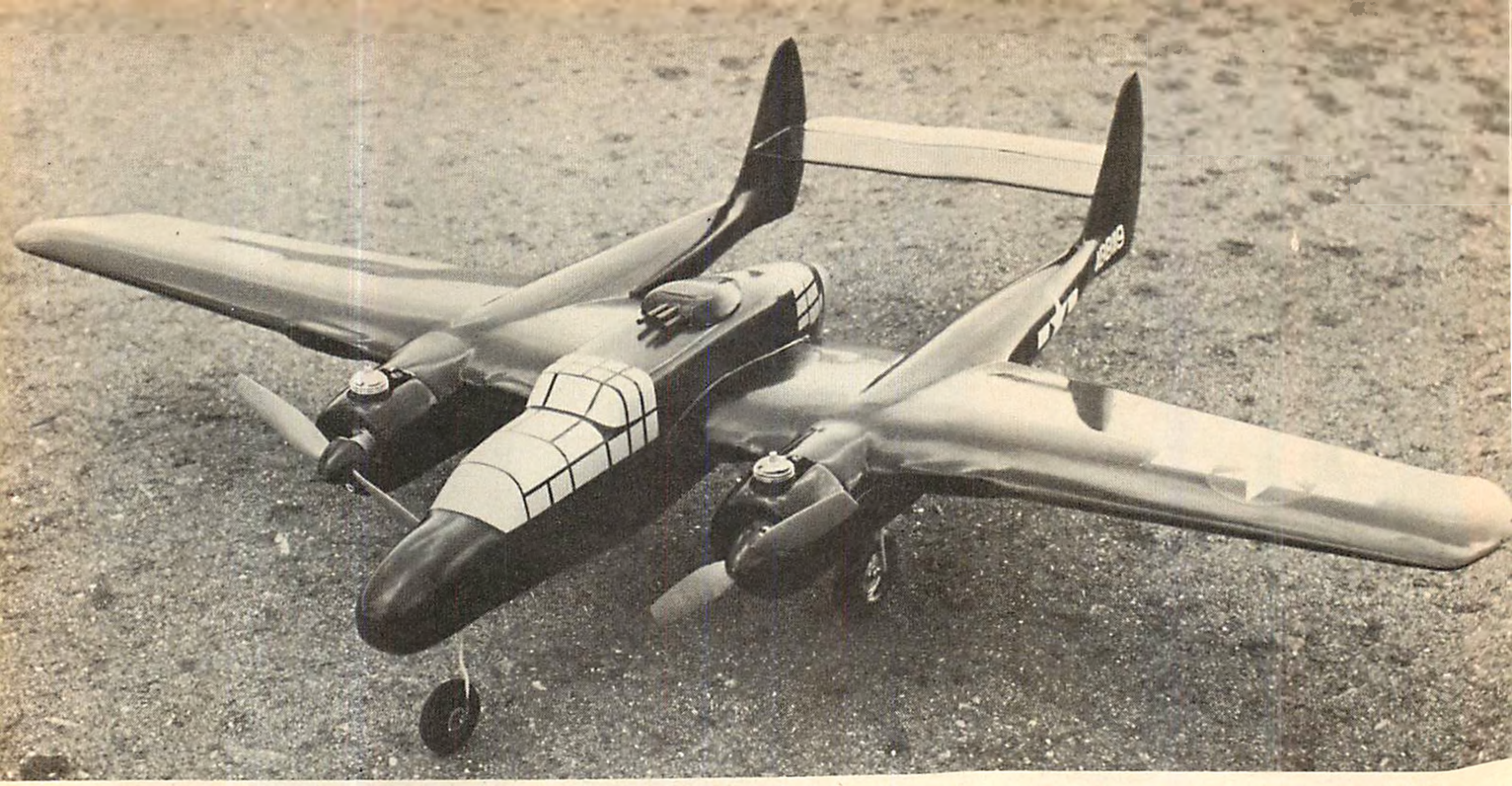


# A little P-61 Black Widow

A not too difficult to build twin .049 powered Controline design. A wild sound at the end of the lines/**Mike Beaulieu**

The P-61 Black Widow was designed purposely for the role of night fighter against enemy bomber formations. This WW-II fifteen ten fighter in later versions packed a powerful sting in it's eight 50 calibre machine guns which were sufficient to really disintegrate opponents. Before taking on it's duties of night fighting, the Black Widow was engaged in chasing and destroying the V-1 Buzz Bombs. After the Allies started their drive towards the German heartland, the P-61 was primarily used for daylight operations. The duties were now the destruction of railyards and such military targets.

I recall a friend of mine who was stationed in England during the war years telling about one night that was totally dark and the Germans had come over for a nightly terror raid. He said that the enemy aircraft was about overhead when he heard another aircraft approaching the area. Suddenly there was a stream of tracers which appeared out of the nightime sky. At the receiving end of the tracers there came a tremendous explosion, the German bomber just blew apart sending debis in all directions.

When the P-61 first reached England they were all "A" models, painted in olive drab. The familiar totally black color scheme came about as the result of the British not having enough olive drab one day to paint a P-61 after maintenance. The American pilot who had gone to pick up the plane had discovered that it was not finished. He suggested to the British, that since they had enough gloss black, why not paint it black? From that day on the P-61 became known as the Black Widow.

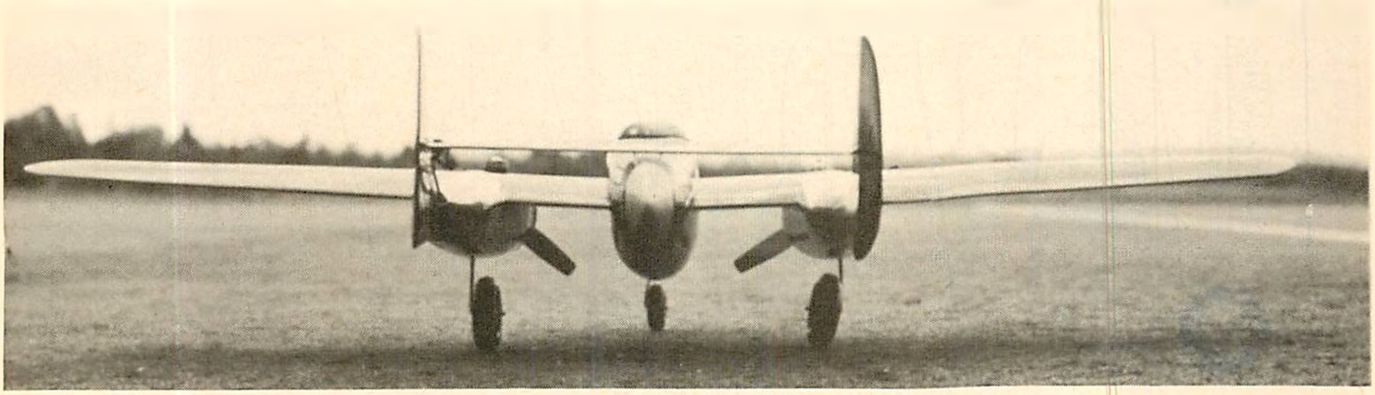
I have always had a feeling for this aircraft and wanted a model of it for my own. Auther, a friend and fellow modeler was always coming to the field with some new project. When he showed up one day with a ½A twin-engined HS 129, it was time to counter with one of my own design. This was enough to stir me to action.

## The Wing Construction

The structure begins with the wing. The main spar is cut from 1/8" balsa and it is reinforced by the 1/16" plywood spar. Prepare the leading edges by routing out the air intakes. Insert and glue the vanes in the air intakes, then put it aside and cut out all the ribs from 3/32" balsa. The ribs are now installed as shown on the plan. When this is dry check to see if all the ribs are in proper alignment, along both leading and trailing edges. Sheet in the entire bottom of the wing with 1/16" balsa stock. You should now camber the trailing edge. Install a small Perfect bellcrank onto the plywood bellcrank mount, then attach the ½ ounce weight firmly to the outer wing tip. Make certain that the control rod and leadout wires are properly installed and soldered. Attach the leading edge and sheet the entire top of the wing. Also add the wing tips at this time, then sand the leading edge and wing tips to proper shape.

## The Fuselage

Cut the center fuselage keel to shape and



A Night Fighter! It might be fitting to install a set of flying lights in this nocturnal machine. The closing years of World War II brought forth more sophisticated radar equipped planforms, something to be reckoned with in the dark of night. The montage of photos on these pages capture the essence of it all. Not a hard ship to build, distinctive in appearance. It's a small twin, for two roaring .049's.

mark off where the formers and wing are going to be attached. Cement the 1/4" x 1/2" x 13-3/8" center fuselage keel to the centerline of the bottom of the wing. Slice out all formers for the fuselage from 3/32" balsa, except former A, then add the 1/16" dia. music wire nose gear. Make sure that this assembly is well constructed before gluing it to the fuselage keel. The fuselage is now covered with 1/16" x 1/4" balsa planking. Add a hollowed out nose block and sand all to shape.

The boom keels are cut out of 3/32" hard balsa and cemented to the wing. The stabilizer is added next, glued in place between the two fins. Former K is cut out of 1/4" plywood, in one piece. This former is also the motor mount for your Cox engines. Use a good epoxy glue when mounting it to the boom's keel. Add formers L, N and P to the keels in their respective places.

Construct the main landing gear and attach to 1/8" plywood former M. When this assembly is complete, add to the boom keel. The booms can now be planked with 1/16" x 1/4" balsa. Both booms are now sanded to final shape. Chop out the 3/32" rudders and cement them to the stabilizer with at least 1/4" right offset.

The cowls are formed from laminated blocks, lathed to shape and then hollowed with a Dremel tool. Mount two good Cox .049 engines, driving 5½-4 props. 1" dia. spinners from Ace Mfg. do nicely. Check the aircraft at this point for proper balance. If your P-61 seems to need nose weight, this is a good time to add it to the nose block.

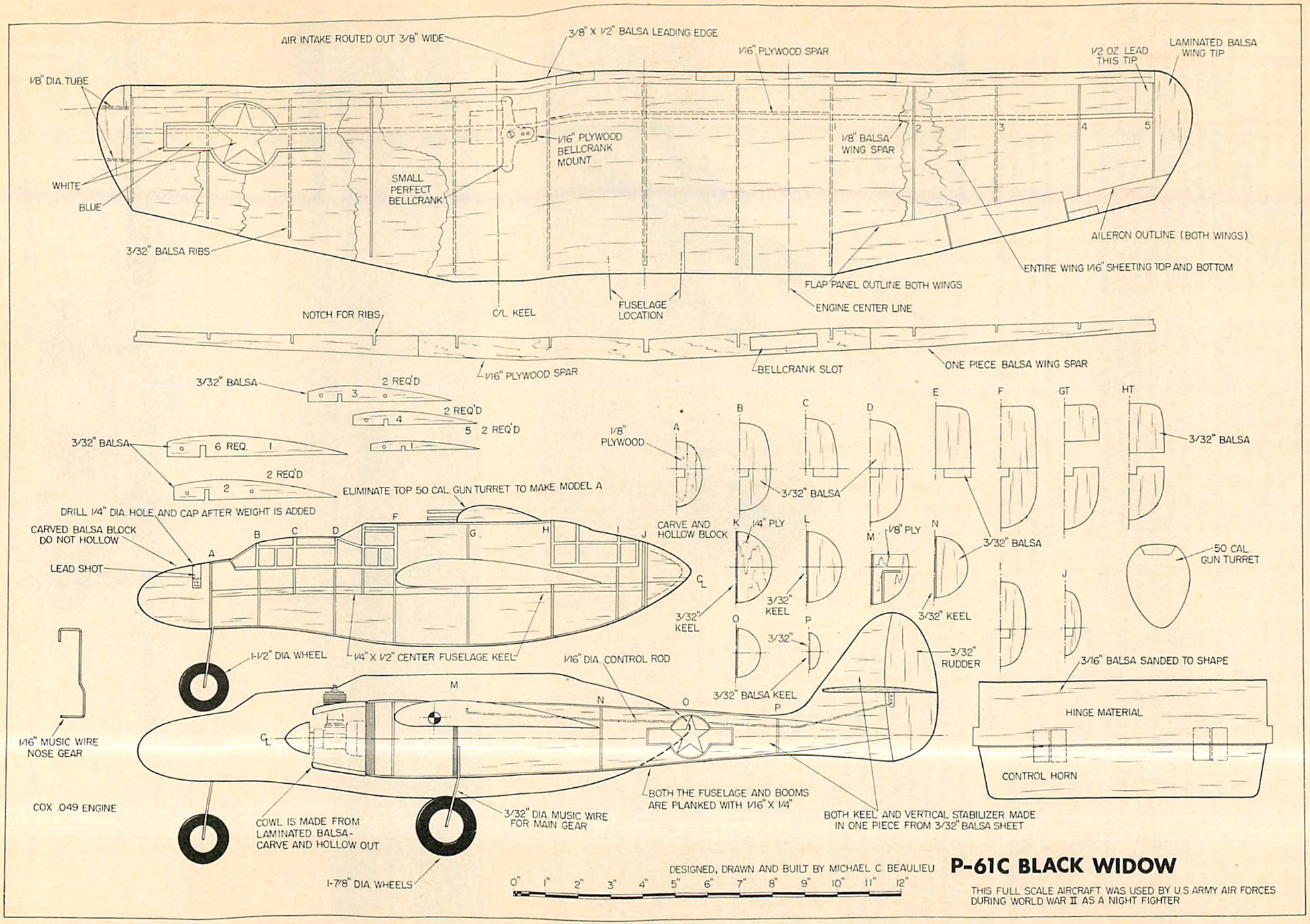
The entire model was coated with two coats of Hobbypoxy white Undercoater, sanded between each coat. I then sprayed on two coats of Perfect Paint #P-09 Glossy Black. This is quite a finish. The aircraft at this point takes on a dramatic look which made me really anxious. I have never had a finish as nice as this from a spray can.

The greenhouse on this model was simulated by masking off the area to be sprayed with Hobbypoxy Silver. The ship was then rubbed out with Dupont Red rubbing compound and then polished with Dupont White polishing compound. I found suitable decals in a Top Flite kit. It might be possible to write and order decal sheet #N-11.

## Flying Notes

Finally the big day arrived. I packed up the flying box and headed for the field. My friend after seeing the P-61 Black Widow had only one comment to make. "Where did you ever get a plastic model of a P-61? Some friend! I used 40 foot lines, .008 dia. wire. This gives you plenty of airspace and it's a comfortable length to fly with.

When firing up your engines, start with the outboard engine first. When both are running, there is a sound as if an entire flight of P-61's are getting ready for a mission over Europe. In flight it is very realistic and a joy hanging out there on the lines. The Black Widow flys in a stable manner, even on one engine. Landings and takeoffs are quite smooth. I hope you'll enjoy your replica as much as I have mine. Fly it carefully, clear of powerlines.

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The Red Ripper, this months FLYING ACES reprint, is a fairly easy ship to build with it's boxy fuselage and straight lines but, from what the author says, it really knows how to perform in the air. Jerry Peeples, the author, describes an official out-of-sight flight of 11 minutes, 15 seconds on a 17 second motor run with a Brown model "D". The design is from the July 1940 issue which also included, in the *News of the Modelers* column, an announcement that the 1940 Nationals was set for the first week in July and would be sponsored by the Chicago Times. In those days the AMA also had set minimum age requirements for getting a gas model license which, it is announced, was lowered to 14 years.

In the last issue of FLYING MODELS, on page 4, there was a full page advertisement announcing the FLYING MODELS Fiftieth Anniversary Old-Timer Fly-In. Unfortunately, due to a printers error, the type that described the events to be run and the rules was omitted. so look for the complete ad in this issue. The contest will include R/C assist Old-Timer A, B, C and Antique as well as a special .020 electric event for F/F. SAM rules (the updated ones) will be used and mufflers are required. A map of the Northwestern New Jersey area is in the ad so you can find us as well as a list of the .020 electric rules.

Due to a number of circumstances over the span of years that linked FLYING ACES and FLYING MODELS we do not have a complete collection of magazines. If any of you have issues of FLYING ACES stashed away in your attic somewhere, and want to clean it out we'd be happy to give them a good, safe home. Contact me, Bob Hoeckele, here at the Carstens Publications office for details. See you May 7.

# *Gas Up This* "Red Ripper"

o o o

## By Jerry T. Peeples

IN A RECENT contest held by the Cleveland Gas Model Guild, the "Red Ripper" turned in an official out-of-sight flight of 11 min., 15 sec., with a 17 sec. motor run after hooking onto a thermal and reaching 2,000 ft. The model is very rugged and is designed to take it. It has a slow, flat glide, a long moment arm, and very stable surfaces.

'Most any 1/5 h.p. engine may be used by merely altering the hole spacing or the thickness of the mounts. The original craft was powered with a Brown model "D."

The ribs for the wing, stabilizer, and rudder are ½ size and may be scaled up to full-size by using a graph of ¼" squares. Other units are 1/3 full scale. Medium hard balsa is used throughout except where specified.

### Fuselage and Wing Mount

CAREFUL selection of about seven pieces of hard ¼" square strips of balsa is the first step in constructing the fuselage. These strips are used for the two body sizes—the main longerons and cross-braces.

After laying out the first side, with a piece of wax paper over the plans to provide a working surface, glue the motor mounts in place at the front of the fuselage. Small tacks or pins are used to hold the sides firmly in place. After one side has dried thoroughly and the ¼" cross-braces have been cemented in place, the other side is made.

When the two sides of the fuselage have been completed, join them at the tail post with an ample amount of cement. When this joint has set, glue the cross-braces in place. These braces, incidentally, are 2" long back to the ninth bulkhead, and the remainder are fashioned as noted on the plans.

After the cement on the fuselage frame has set thoroughly, glue the firewall in place on the front of the body. Drill a hole in the top of the front bulkhead for the high tension wire, and fashion two more in the bottom for the ground and breaker points wires. For the assembly of the motor, the holes may be drilled for the required spacing.

**Swift, easy to build, efficient —that's the "Red Ripper!" With more than 250 flights logged, this six-footer is outstanding for contest work. So if you balsa butchers have been seeking a tourney taker for Summer meets — here's just the craft to fill the bill!**

The mounts are made from ⅜" by ¾" by 7" basswood. The landing gear is of ⅛" piano wire and is attached to the lower section of the firewall with the aid of .025 thick tin brackets bolted through the fire-wall.

In constructing the pylon-type wing mount, first take three pieces of ⅛" flat hard balsa, 2½" by 18¾", and construct a streamlined shape template of cardboard. By scaling up the drawing to actual size with the use of ¼" graph paper, the necessary shape can be obtained. On the template, space the notches as on the plans for the ¼" cross-braces.

When the notches have been spaced properly, take the cross-braces, which are all 3" in length—spacing the three sections as shown in the perspective drawing—and cement them in the notches. When thoroughly dry, cut a ⅛" dowel into 2" pieces and cement in their proper locations so that rubber may be wrapped around them on either end to hold the wing on top of the mount.

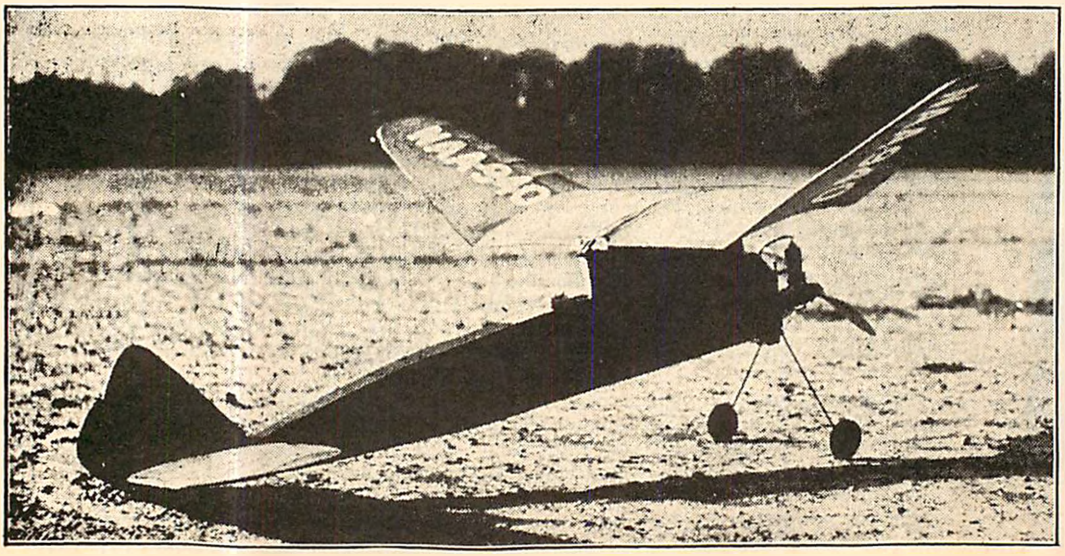
The next step is to form the wing supports, which hold the wing on the pylon mount. These supports are made to the size stated from ⅛" plywood, then cemented to the top of the mount as indicated. This type support assures a non-fluttering wing.

After the mount is completed, cement to the top of the fuselage at the *exact* location shown, thus establishing a perfect center of gravity and proper balance.

The engine may be bolted in next, and before the covering of the fuselage is finished the wiring must be completed.

The battery box makes for an exceedingly simple process of changing penlites. The box consists of a regular Austin Penlite container bolted to a plywood flooring in the front of the fuselage. The wires are run to the outside through 1/16" hole drilled in the motor mounts, then soldered to the positive and negative terminals of the battery container.

The position of the motor affords complete access to all important sections, with the plant getting every advantage of keeping cool on warm summer days by not being cowled.



*Our model's simple but smooth lines are brought out vividly here. You won't have to worry about carving bulkheads, either. For as you can see, the "Red Ripper's" fuselage is box-like. And note that generous wing under-camber? That's what helps our craft to gather altitude so rapidly.*

## BILL OF MATERIALS

*(All wood is hard balsa except where specified otherwise)*

Fuselage:
- Main stringers, ¼" sq. strips
- Cross-braces, ¼" sq. strips
- Firewall, ⅛" birch 3-ply sheet
- Wing-mount bulkheads, ⅛" sheet
- Wing-mount cross-braces, ¼" sq. medium hard strips
- Motor mounts, ⅜" by ¾" basswood strips.
- Machine Screws
- Landing gear, ⅛" music wire

Elevator:
- Ribs, 3/32" sheet
- Spars, ⅛" by 3/16" strips
- Tips, ⅛" by ¼" strips
- Leading edge, 3/16" sq. strip
- Trailing edge, 3/16" by ½" strip

Rudder:
- Leading edge, 3/16" sq. strip
- Trailing edge, ⅛" by 3/16" strip
- Ribs, 3/32" sheet
- Spars, ¼" sq. strips
- Tips, ⅛" by ¼" strips

Wing:
- Spars, ¼" by 1" strips
- Ribs, 3/32" medium hard sheets
- Tips, ¼" sheets
- Leading edge, ¼" sq. strip
- Trailing edge, ¼" by ⅞" strip
- Dihedral supports, ⅛" 3-ply sheets
- Center-section planking, 1/16" sheet

Miscellaneous:
- Wing supports, ⅛" 3-ply sheets
- Wing-mount dowels, ⅛" diameter
- Stabilizer hooks and tail skid, 1/16" piano wire
- Red bamboo tissue
- Nitrate dope, cement, wheels, bushings, bolts, solder, wire, aluminum, pins, etc.

Be absolutely sure that the right amount of down-thrust is used, as specified on the plans, as this is one of the main factors that gives the "Red Ripper" its steep climb without stalling or looping.

### Wing Construction

THE WING is of a simple and effective design, with a very high lift airfoil section. It is built in three panels—the center and two outer. The center section remains flat, while the two outer panels form the dihedral angle. The ribs are made from 3/32" sheet balsa.

Before starting construction of the center section, however, be sure that the working surface of your plan is covered with wax paper, thus preventing cement from ripping off notations and figures which may later prove necessary. That done, support the main spar in position with pins and glue the ribs in place, using an ample amount of cement. And when this frame is dry, cement the leading and trailing edges in their respective locations, trimming to complete an airfoil section.

The outer panels are constructed in the same manner. And after the glue on all sections has set thoroughly, the panels are joined together. Place prop blocks under each wing tip, incidentally, to make sure that when the cement dries there will be the correct amount of dihedral.

The main spar and trailing edges are gusseted with ⅛" plywood at the points where the outer panels butt against the center section. The leading and trailing edges are now sanded to shape. And the center section is planked with 1/16" flat balsa to support the rubber and to keep the paper covering from sagging.

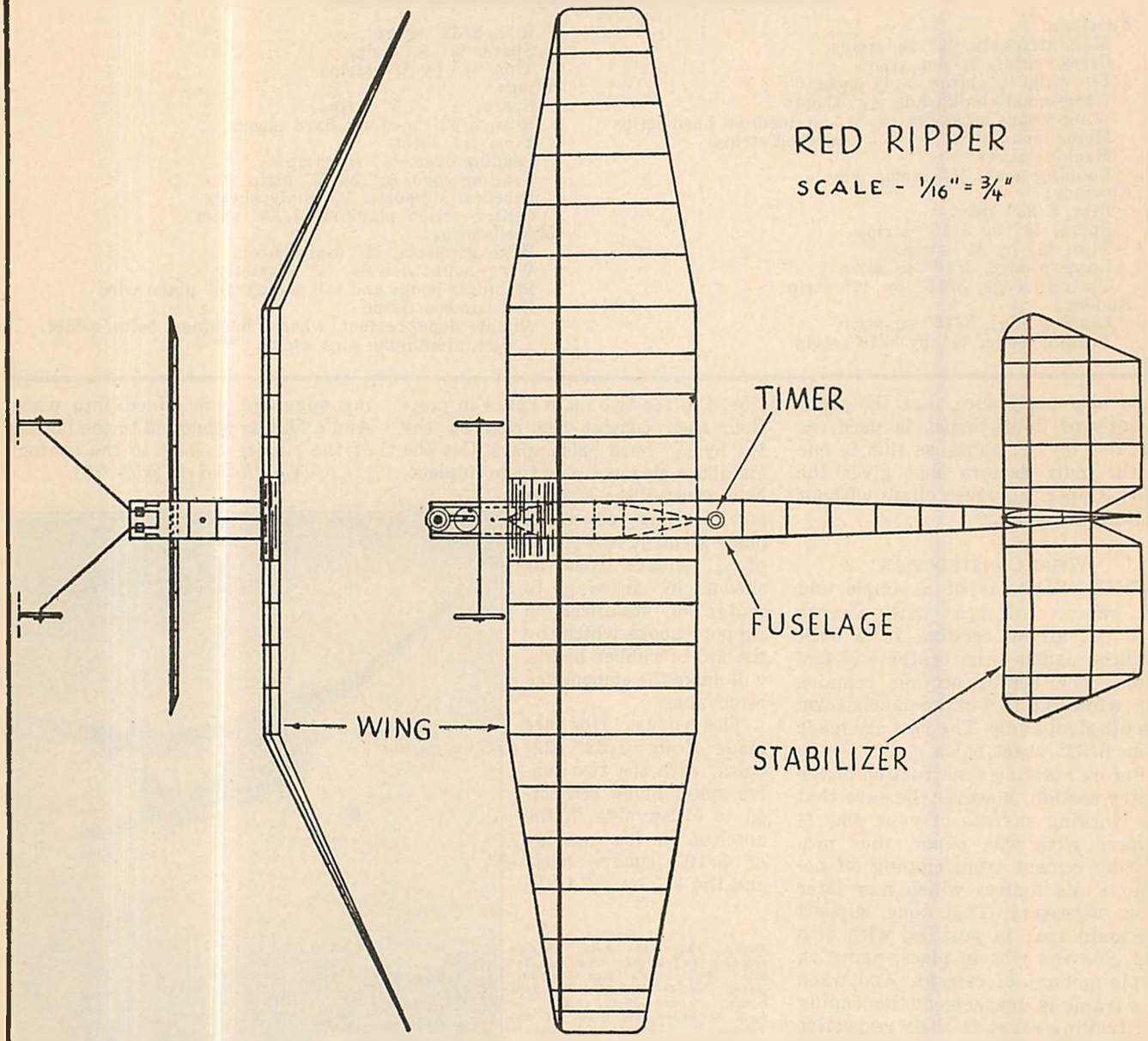
### Tail Surfaces

IN MAKING the stabilizer, cut the ribs to size from 3/32" flat balsa. There are nine main ribs and two tip ribs. Pin the two main spars in position, then cement the ribs on the ⅛" by ¼" hard balsa spars. Cut the stabilizer tips and glue them in place. Now cement the leading and trailing edges in place. Cement two pieces of ¼" square balsa, as shown in drawing to center of stabilizer to support hooks which, by the aid of rubber bands, will make the empennage removable.

The rudder ribs are made from 3/32" flat balsa, with the two center spars being cemented to either side in the notches. The leading edge of 3/16" square balsa and the ¼" by ⅛" trailing edge are now glued into place. And a fillet is cemented to the bottom of the rudder to rest to the contour

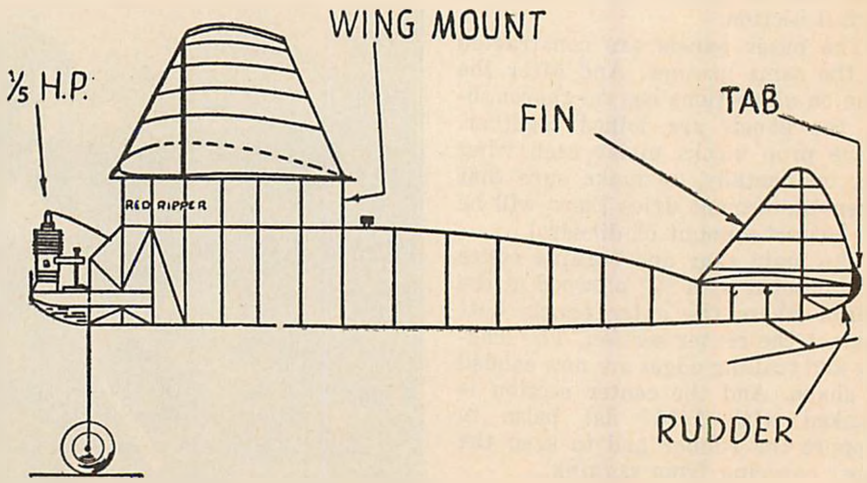
*(Continued on page 79)*

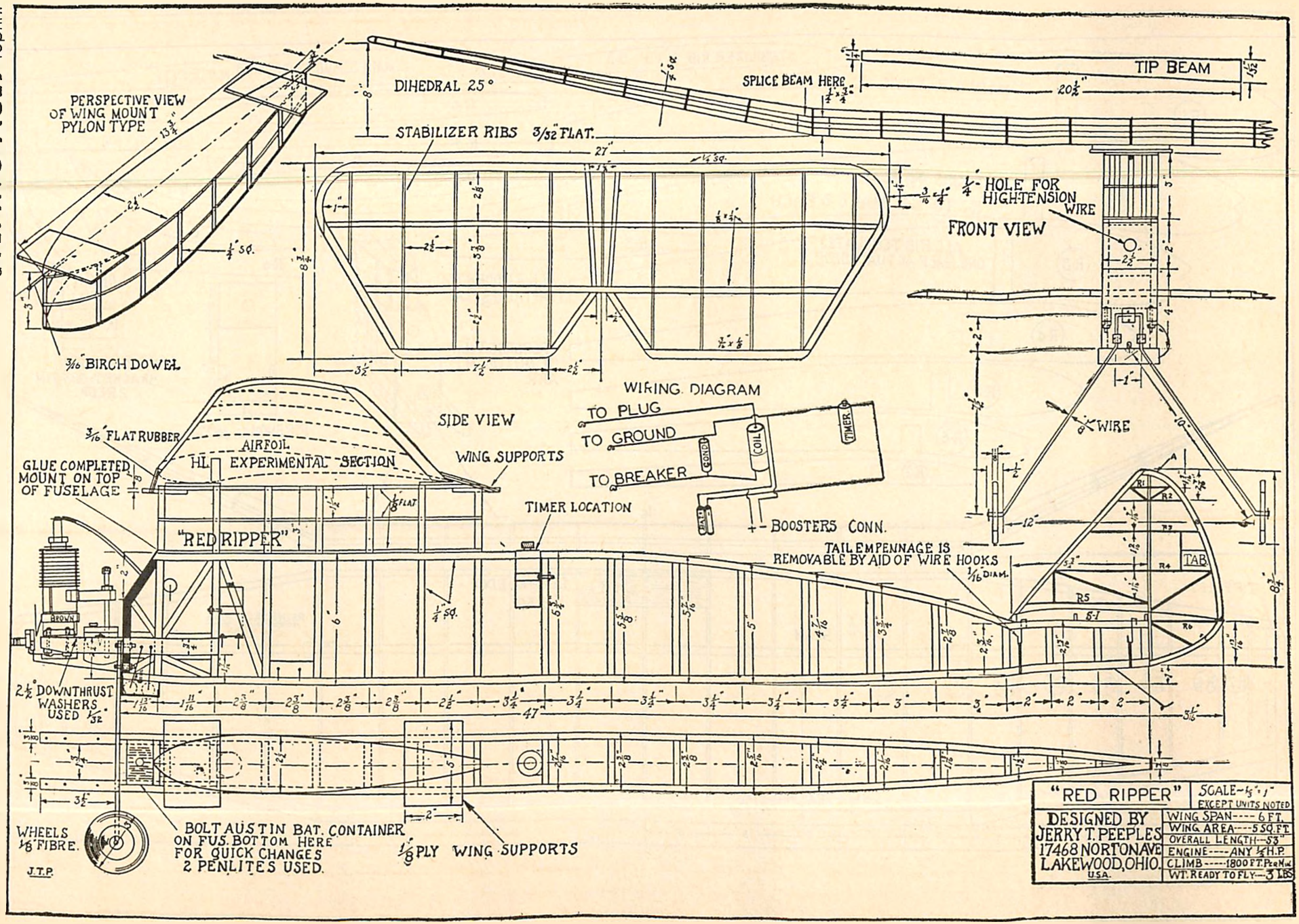
*Right: There she goes! Engine roaring, tail down, nose up. Below: And here's our designer, Jerry Peeples. See that big field behind Jerry? Well, that's the kind of space you need for the "Ripper," because she covers plenty of territory.*

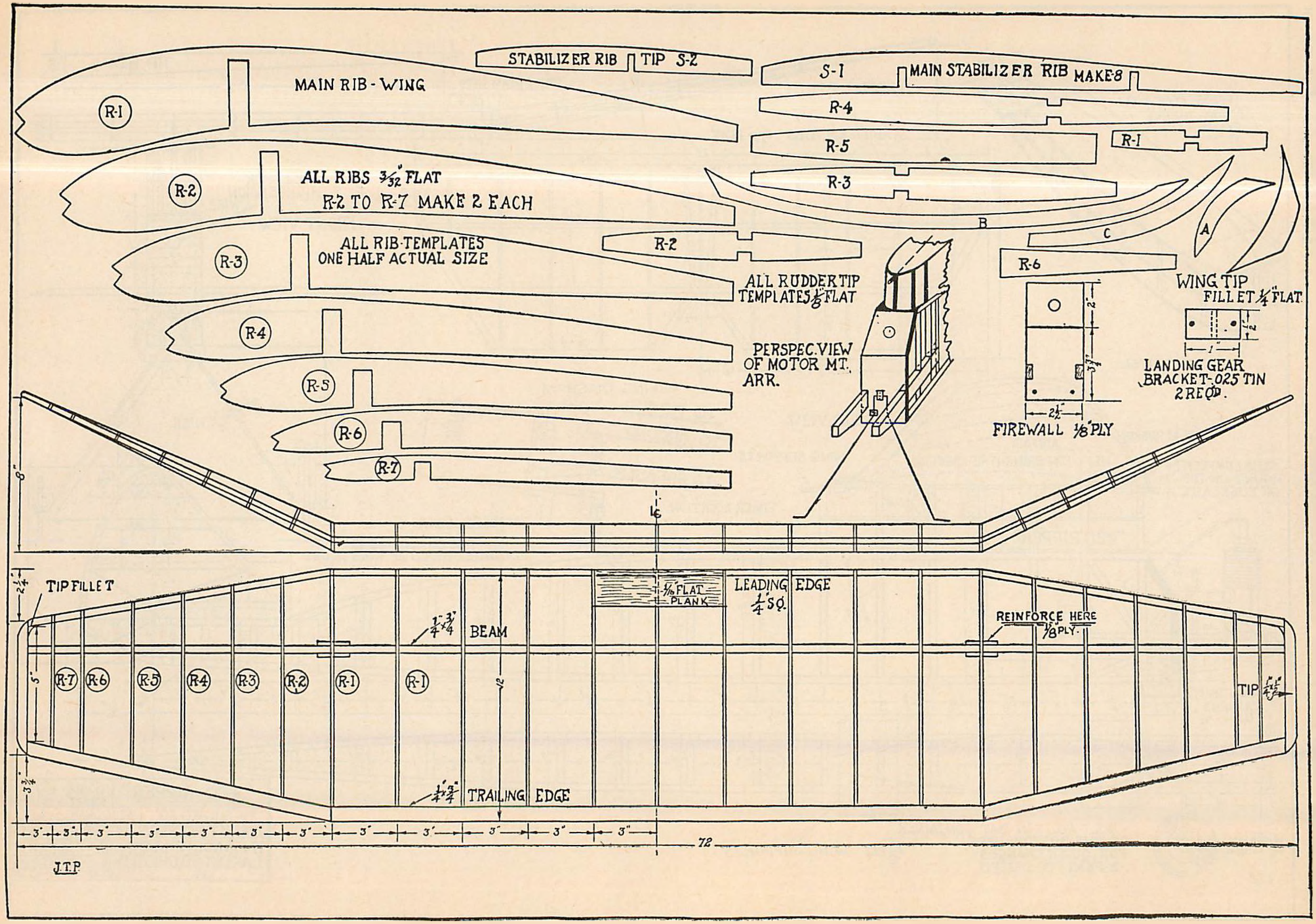



SPECIFICATIONS

| | |
|---|---|
| WING SPAN | 72" |
| WING AREA | 720 sq" |
| MAX. WING CHORD | 12" |
| OVERALL LENGTH | 53" |
| STAB. SPAN | 27" |
| OVERALL HT. | 19" |
| TREAD | 12" |
| WT. READY TO FLY | 3 lbs. |




PERSPECTIVE VIEW OF WING MOUNT PYLON TYPE
3/16" BIRCH DOWEL
DIHEDRAL 25°
SPLICE BEAM HERE
TIP BEAM
STABILIZER RIBS 3/32" FLAT.
FRONT VIEW
1/4" HOLE FOR HIGH-TENSION WIRE
WIRING DIAGRAM
TO PLUG
TO GROUND
TO BREAKER
CONDS
COIL
TIMER
BATT
+ - BOOSTERS CONN.
SIDE VIEW
3/16" FLAT RUBBER
AIRFOIL
HL EXPERIMENTAL SECTION
WING SUPPORTS
GLUE COMPLETED MOUNT ON TOP OF FUSELAGE
"RED RIPPER"
TIMER LOCATION
TAIL EMPENNAGE IS REMOVABLE BY AID OF WIRE HOOKS 1/16 DIAM.
TAB
BROWN
2 1/2" DOWNTHRUST WASHERS USED 1/32"
WHEELS 1/8" FIBRE.
BOLT AUSTIN BAT. CONTAINER ON FUS. BOTTOM HERE FOR QUICK CHANGES 2 PENLITES USED.
1/8" PLY WING SUPPORTS
J.T.P.
"RED RIPPER"
SCALE-1/2"=1" EXCEPT UNITS NOTED
DESIGNED BY JERRY T. PEEPLES 17468 NORTON AVE LAKEWOOD, OHIO. U.S.A.
WING SPAN----6 FT.
WING AREA----5 SQ.FT.
OVERALL LENGTH---53"
ENGINE----ANY 1/2 H.P.
CLIMB-----1800 FT. P. MIN.
WT. READY TO FLY---3 LBS


STABILIZER RIB
TIP S-2
S-1
MAIN STABILIZER RIB MAKE 8
MAIN RIB - WING
R-1
R-2
R-3
R-4
R-5
R-6
R-7
ALL RIBS 3/32" FLAT
R-2 TO R-7 MAKE 2 EACH
ALL RIB TEMPLATES
ONE HALF ACTUAL SIZE
ALL RUDDER TIP
TEMPLATES 1/8" FLAT
PERSPEC. VIEW
OF MOTOR MT.
ARR.
WING TIP
FILLET 1/4" FLAT
LANDING GEAR
BRACKET-.025 TIN
2 REQD.
FIREWALL 1/8" PLY
TIP FILLET
1/8" FLAT
PLANK
LEADING EDGE
1/4" SQ.
BEAM
REINFORCE HERE
1/8" PLY.
TIP
TRAILING EDGE
72
J.T.P

## Gas Up This "Red Ripper"

*(Continued from page 45)*

of the stabilizer rib.

COVERING AND FLYING

MY ORIGINAL model was covered with red bamboo tissue, then doped with two coats of clear nitrate dope. Thickened nitrate dope was used for an adhesive. The firewall was colored black, and the wheels black with red centers. The author believes that red is the best color for long-distant visibility, and would therefore advise its use on the "Red Ripper."

After covering, the paper is sprayed lightly with water and allowed to shrink. Then, two even coats of dope are applied. The framework of the pylon wing mount is also covered with red tissue, sprayed, and doped.

The motor may now be bolted into place. And after connecting the high tension wire and the ground and breaker points, the batteries are attached and a check-up of the ignition system should be made by testing the spark. This may be done by holding the spark plug with your left hand and rotating the propeller with your right, at the same time touching the crankcase with a left finger. If a jolt is felt, the wiring system is working.

A fourteen-inch prop was found to give best results.

Balance and adjust the model so that it will be slightly nose heavy. An angle of incidence may be used by cementing a block under the wing leading edge if the craft appears to be slightly nose heavy, after giving it a test glide. Be sure to use the right amount of down-thrust in the engine.

Wrap rubber around the hooks on the tail empennage and attach that section to the rear of the fuselage, mount the wing with 3/16" flat rubber, and then test-glide the model into the wind. It is not advisable to fly the "Red Ripper" in a small field because of its flat, long glide approaches.

The original craft spiraled to the left under power, and when the motor cut it continued long, lazy spirals to the right. The job stayed in sight much longer than smaller craft, which usually glided faster and at a steeper angle.

Queries for further info concerning the "Red Ripper" may be addressed to the designer in care of FLYING ACES. Also, any comments on the ship's performance will also be welcomed.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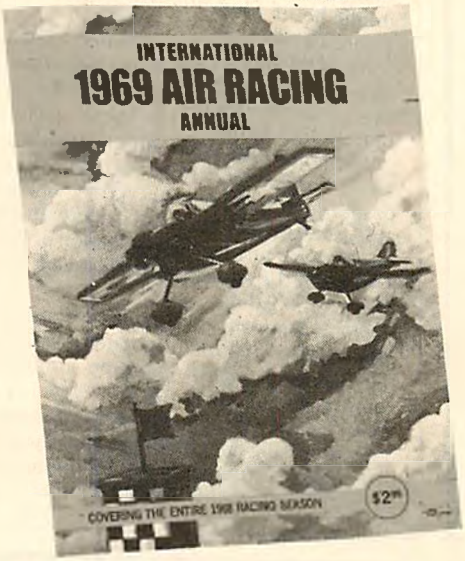


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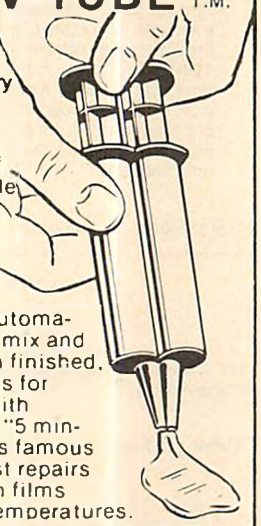

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# With Model Builders

**by Ed Whalley**

### Old-Timer Concepts Revisited

From time to time, we report on the various Old Timer events held 'round the country. We like them because they're generally low-pressure and a lot of fun. Usually, we toss around terms like the "HBP event," "SCIF or .02 Replica," and "Old Ruler." The use of these terms has prompted a number of inquiries from younger (?) flyers who are unfamiliar with them. Some of them are self-explanatory, such as the ".02 Replica" deal, above, which is, obviously a reference to a scaled-down copy of a regular Ol' Timer gassie. Some of the confusion results from using "SCIF" and "Replica" interchangeably—SCIF being the group which popularized the class. We're indebted to Jim Dean for the following which might be of some interest to potential Ol' Timer flyers:

An "Old Ruler" does not necessarily derive from the date of its introduction as a design (although all contest ships of the period had to meet the same design requirements). An "Old Ruler" exhibits the following characteristics: a wing loading of 8 oz. per sq. ft. of wing area; a power loading of at least 80 oz. per cu. in. of engine displacement; and, a fuselage cross-section of at least 1/100th of the square of the fuselage length (the $L^2/100$ rule).

The HBP event or "Bowden Precision" as it is popularly called originated in England but has been used off-and-on around the country and is currently in vogue on the West Coast. (Which explains why we've been reporting on it in WMB) Jim says Bowden ships are subject to the following regs: 1) ships must qualify as Old Timers under SAM rules; 2) the flyer must have been the builder, and all flights must be logged by the same ship; 3) ignition engines only may be used; 4) ROG is required; 5) the idea is to make three flights, each as close to two minutes duration as is possible; 6) the score is determined by the difference between the two-minute target time and the actual duration of the flight (The maximum panelty is two minutes, and this applies also to flights which are artificially terminated); 7) the entrant's score will be the total of his three flights as arrived at above—lowest score wins. Other regulations apply to the conduct of a meet and are somewhat discretionary with CD's. In general, flying is usually by rounds with contestants launching in a sequence determined by a draw; each flyer is allowed three minutes to get his ship away; and, the model must land in a normal manner within sight of the timer on pain of receiving the max penalty.

Other specific info on Old Timers may be had by writing Society of Antique Modelers, 1947 Superior Ave., Whiting, Ind. 46394—at least that's the last address we have on them. And at our last contact, annual dues, including SAM Speaks, were $5.00 per member.

### Kear, Kall and Mangino, Jr. Top Classes at Buckeye's 28th

We're indebted to Ben and Patty Sasnett for an exciting blow-by-blow account of the Controline segment of the twenty-eighth running of the big bash at Buckeye. Lewie Kear, Joe Kall, and John Mangino, Jr., topped all others on the busy tarmac of the Buckeye Airport. Kear took Open; Kall, Senior; and, Mangino, Junior. In addition to the model flying, there was plenty going on.

In what was probably a first for a model meet, a couple of balloonists drove up, unpacked their gear, turned on the burner and floated up over the Speed circle, headed for the desert. A number of contestants flew in, taxied over to the parking area and mingled with the cars and campers. A helicopter set down next to the circles. The Buckeye Airport definitely does not shutdown for the meet. Along with the conventional aircraft coming and going were a number of classic ships based at the field: a B-25 Mitchell, a couple of A-26 Invaders, C-119 Boxcars, a PB4Y-2 Privateer, and others. Contestants found plenty to interest them besides the models.

In what was definitely a first for Arizona, FAI Team Race was held on Sunday under the auspices of the Albuquerque Thun-

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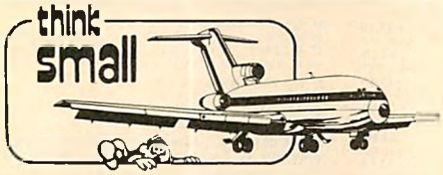



derbirds. Jed Kusick and Larry Jolly, members of the U.S. Team, managed a close win over Ken Mogi and Jim Jolly (Larry's dad). Fred Malone and Phil Shew came third. Kusick/Jolly had a fast time of 4:16 for the 100; 8:57.6 for the 200.

Profile Carrier and ACLA Big Goodyear attracted the most entrants along with Mouse Race. Mangino and Kall scored wins in Mouse. Mike DelPonte, Jr., took Junior honors in Goodyear; his dad, Mike Sr., in Senior-Open. Fast Fred Malone beat-out Bob Hawk and Ted Edwards in Profile. Malone had scores of 228.70 and 234.35. Kall did 3:13 in Mouse; Del Ponte, 9:37.8 in Jr. Goodyear. Mike Sr. had a bit rougher time in Senior-Open. Les Pardue, Jed Kusik and Fred Malone pushed him some in the 140. His winning time of 7:35.8 put him out front. Pardue, Kusik and Malone finished 7:52.7, 7:58.0, and 7:59.6.

Malone lived up to his "Fast Freddy" moniker by taking Scale Racing (Goodyear) on Saturday with 3:23.3 in the 80 and 6:30.4 in the 160. He literally busted his britches on this one during a fast pit, and the rip was repaired with a length of copper wire. Kall, Pardue and Kusik followed in that order.

Ben and Patty had their K&B 5.8-powered Slow Rat peaked-out for this one, and they took the event quite handily with 3:26.1, 3:22.1, and 7:34.4 for the 140. Dale Long/Ken Mogi seconded (7:58.5), and DelPonte/Kear thirded (7:58.5).

The California 500 Stunt Club showed up in force and took the first six places—all with scores over 500. Here's the rundown: Jim Armour, 583.5; Bob Whitely, 578.5; Lucky Pyatt, 578.0; Bart Klapinski, 572.5; Mike Be-


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Multi-Wing event (Sportsman Class)
Pattern event (Novice Class)
Stand-Off Scale
All events: 1977 AMA rule book
$5.00 for the first event entered, $2.00 each additional event
Flying starts at 8:30 am
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**CF-364 EAA HEADWIND**. Brilliant stand-off scale R/C for .15 engines. 48" span. by Al Wolsky. FM 4-75 $2.50

**CF-373 LINCOLN SPORT** .020 powered 30" span scale classic for pulse/light R/C or F/F. Hurst G. Bowers. FM 6-75 $2.00

**CF-375 FOCKE WULF 190D-9** Stand-Off Scale R/C. 62" span for .60 engines. Tony Eck. FM 7-75 $6.00

**CF-377 YAK-9** R/C Stand-Off Scale for .60 engines. 61" span. Dan Reiss. FM 8-75 $3.50

**CF-386 GRUMMAN SKYROCKET** Stand-Off Scale R/C twin-engine experimental. 56" span and two .29-.40 engines. Nick Ziroli. FM 10-75 $3.50

**CF-380 BD-6** Stand-Off Scale R/C for .19 to .35 engines. 56" span. Bob Aberle. FM 9-75 $3.50

**CF-389 HEINKEL He-162** Stand-Off Scale R/C with 55" span for Scozzi .40 Twin Ax 1 ducted fan. Nick Ziroli. FM 11-75 $5.00

**CF-391 SOPWITH PUP** Stand-Off Scale R/C WWI biplane with 59" span. .60 engine. Jerry Puleo. FM 12-75 $5.00

**CF-396 DEWOITINE D-510** Stand-Off Scale R/C with 69" span. 40-.60 engine. Alan Spievack. FM 2-76 $3.50

**CF-397 JUNGSTER II** Stand-Off Scale R/C EAA Homebuilt with 50" span. 19-.29 engine. Al Wolsky. FM 2-76 $3.50

**CF-400 HAWKER HURRICANE Mk-I** R/C Scale with 61" span for Ross .61 engine. Tony Eck. FM 3-76 $5.00

**CF-403 P40 "WARHAWK."** R/C Stand-Off Scale. 56" span. .60 engine. Dan Reiss. FM 4-76 $3.00

**CF-406 BOULTON-PAUL DEFIANT** R/C Stand-Off Scale fighter. .60 engine. 60" span. Dan Reiss. FM 5-76 $3.50

**CF-407 BIG "GERE SPORT."** 60 powered 54" span Stand-Off Scale R/C biplane. Dr. J. Makovich. FM 6-76 $3.50

**CF-413 FARMAN 400 MONOPLANE**. .020 powered light R/C or F/F. 38" span. Hurst G. Bowers. FM 8-76 $2.00

**CF-418 MONOCOUPE 90A** Stand-Off Scale R/C classic with 72" span for .45 engine. Frank Dellamura. FM 9-76 $6.00

**CF-425 DEWOITINE D-520** R/C Stand-Off Scale WWII fighter for .60 engine. 62" span. Dan Reiss. FM 12-76 $3.50

**CF-431 GRUMMAN KITTEN G-63** 48" span R/C Stand-Off Scale ship for .40 engines. Bob Aberle. FM 2-77 $3.50

**CF-434 NAKAJIMA KI-84-1a HAYATE** 54" span Stand-Off Scale R/C for .60 engines. C.S. Hines. FM 3/77 $3.50

**CF-441 BERG D. AVIATIK D-I** Austrian WWI SOS R/C Bipe with 40" span for .35 to .40's. Frank Dellamura. FM 6-77 $3.50

**CF-446 FOKKER T-2** Stand-Off Scale R/C with 66-inch wingspan for .40 to .60 engines. Don Martin. FM 7-77 $3.50

**CF-452 DOUGLAS A-1H SKYRAIDER** Stand-Off Scale R/C for .60 engines with a 58" span. Rolled plywood fuse. Dan Reiss. FM 10-77 $3.50

**CF-454 DC-3 SOS** R/C twin for two .45 engines with a 96" wingspan. Tony Lombardo. FM 11-77 $5.00

**CF-462 CP-65 PORTERFIELD COLLEGIATE** SOS R/C ship with a 74" span for .35 to .45 engines. D.B. Mathews. FM 2-78 $5.00

## RADIO CONTROL

**CF-158 BOONDOCK BIRD**. R/C trainer with 52" span for .15-.19 and Hallco gear. McGovern. FM 4-69 $3.00

**CF-2 RAVEN**. 54" RC ship with fat fuselage, holds PREY glider releasable in flight. Single channel RC. .09-.19. By Don McGovern. FM 4-65 $3.00

**CF-4 FAIRFIELDER**. Low wing R/C design. 67" span. .45 R/C. Phil Ostilio. 2 sheets. FM 2-62 $5.00

**CF-5 CITATION**. Multi R/C by John Roth. 63" span. .35-.45. High wing, fast assembly. FM 8-62 $5.00

**CF-7 RIDGE HAWK**. Proportional R/C trainer. Fun ship. 72" span. .19-.35 power. John Tudor. FM 8-63 $5.00

**CF-11 RIDGEHOPPER**. 15-19 high wing. 58" span. Trike gear. R/C single. FM 10-62 $5.00

**CF-12 GENIE**. Single R/C fat fuselage with 59" span. Don McGovern. FM 2-64 $5.00

**CF-21 SKYLINER**. Class III R/C. .45 shoulder wing design. By Marty Meyer. FM 9-65 $5.00

**CF-22 TEMPO**. Class III multi winner. 68" wing. By Phil D'Ostilio. FM 6-65 $3.50

**CF-32 MARK B**. Class 3 multi design R/C. 67" wing. .60 engine. By Paul Foster. FM 4-66 $3.00

**CF-35 TOUCHDOWN**. R/C low wing sport model for small fields. 42" wing. .049. By B. Petersen. FM 4-66 $2.50

**CF-42 LUCKY 2**. Class 2 R/C 60" .15. By Gene Rogers. FM 7-66 $3.00

**CF-48 PATRIOT II**. Low 62" wing class II. .61 mil Bosch airfoil, proportional R/C. Joe Foster. FM 8-66 $3.00

**CF-50 B.I.R.D.S. SPECIAL**. Class III R/C. .60 mil. Uses any standard foam wing. By Dallas Moran. FM 10-65 $3.00

**CF-54 KOBRA II**. Class II RC hi-stab with 60" wing. 29-.35 competition model. Gene Rogers. FM 10-66 $3.00

**CF-72 DEFENDER**. Class II parasol wing. 65" Removable tray for R/C gear. 45. Gene Rogers. FM 4-67 $3.00

**CF-77 PIRATE III**. Twin tail mid-wing. 60" wing. 45 mil. By Nick Ziroli. FM 5-67 $3.00

**CF-100 SKIPPER**. 31" span sport flyer for single channel 1.2A and small R/C. By Vince Micchia. FM 12-67 $2.00

**CF-105 BANTAM KOBRA**. Small proportional R/C with .23 power. By Gene Rogers. FM 1-68 $4.00

**CF-110 X-103**. Sport & experimental for Hallco R/C. 103 gear. Elevators & ailerons. 23. Ziroli. FM 2-68 $3.00

**CF-116 DEVASTATOR**. 66" span multi-contest with Enya .60 R/C. By Gene Rogers. FM 4-68 $3.00

**CF-117 TRIDENT**. All weather R/C trainer for .61. Land, water, skis. Wally Zober. FM 4-68 $3.00

**CF-134 PROFILE MUSTANG**. R/C equipment is buried in foam wing. 45-.56 wing. By Sterling Models. FM 10-68 $3.00

**CF-137 TIGER TWIN**. 62" span trike geared design for two .23s. R/C. By Gene Rogers. FM 10-68 $3.00

**CF-138 JUNKER KLUNKER**. Put a .45 to .60 in this Zober design. Looks German World War I. FM 10-68 $3.00

**CF-151 URCHIN**. Small R/C sport tail dragger for .23 and mini gear. By Gene Rogers. FM 2-69 $2.00

**CF-156 VIXEN ACROBATIC**. 40 span biplane with inverted .23. R/C design by Gene Rogers. FM 4-69 $4.00

**CF-161 SNIPE**. R/C sport flyer. 68" span with 56 engine. By Wally Zober. FM 5-69 $3.00

**CF-165 BOOMERANG**. Big acrobatic Bipe. 58" span. .60-.61. R/C. By Wally Zober. FM 3-67 $4.00

**CF-175 VERT-A-GO**. Rocket assist R/C VTO with 38" span uses .19 engine. By Nick Ziroli. FM 9-69 $3.00

**CF-180 ACCELERATOR**. R/C sport design for land or water. 50" span for .19-.29. By Gene Rogers. FM 12-69 $2.00

**CF-187 SWINGER 2**. R/C stunt with coupled flaps & elevator. foam 63" span wing. 45. Jack Sheeks. FM 3-70 $3.00

**CF-206 RAIDER**. 56" span for .40 and larger. MRC Digital. By Jack Sheeks. FM 3-71 $3.00

**CF-216 DEE-KAY SPECIAL**. Formula II R/C pylon racer. 57" wingspan. Dave Gierke. K&B .40. FM 5-71 $3.50

**CF-220 BRAZEN RAVEN**. 84" multi pattern R/C. Super Tigre .60. 4 sheets. Dave Gierke. FM 5-71 $9.00

**CF-229 RAMPANT**. Toledo R/C Pattern Class Winner. .60 mil, wing retracts in tandem. 62". Jerry Worth. FM 7-71 $7.00

**CF-236 BANSHEE**. R/C design for full AMA or FAI patterns. With Webra .61 and Pro Line gear. By Jim Martin. FM 9-71 $3.50

**CF-237 SHOESTRING**. 57" semi-scale for Fox .35 mil. By Paul Simons. FM 9-71 $3.50

**CF-238 BEHEMOTH**. Giant 14" T Tail craft. Takes .29 to .60. By Humphries. FM 9-71 $3.50

**CF-239 INDY 500**. A maneuvering R/C monster that'll deliver pattern performance. Jack Sheeks' original has .61 Merco and EK Logicrol. FM 10-71 $3.50

**CF-249 INTIMIDATOR**. RC pattern ship for .60. 7-1/2 lbs. By Marty Meyer. FM 1-71 $3.50

**CF-252 D.D.T.** Sport R/C design easy and cheap. 15-.23. Jack Sheeks, Jerry Caldwell. FM 2-72 $2.00

**CF-255 XP-400**. Formula II and FAI Pylon Racer. 56" span. .40. Dave Gierke. FM 3-72 $3.50

**CF-256 SPRINTER**. Sport R/C V tail two channel 42" span for .049 to .15. By Gene Rogers. FM 3-72 $2.00

**CF-261 ASTEROID**. R/C sport .61 span. K&B .40. Dick Johnson. FM 4-71 $3.50

**CF-266 DREAMER**. R/C sport biplane with 38-1/2" upper span. 37-1/2" lower with .40 engine. Don Foster design. FM 6-72 $3.50

**CF-269 FAIMEISTER**. 65" span R/C pattern ship. 61 powered, retract landing gear. Bob Caplan design. FM 7-72 $5.00

**CF-270 ESCAPADE**. R/C tail dragger with Goldberg retracts. .60 engine. Gene Rogers. FM 8-72 $3.50

**CF-272 JOEY**. 64" span R/C. .60 engine. Ply and foam construction. Dick Sarpolus. FM 8-72 $3.50

**CF-289 ME-109**. 1/4 midget pylon racer 39½" span. Super Tigre .15 with Blue Max R/C. Jack Sheeks. FM 2-73 $2.50

**CF-281 SEA VIXEN**. 64" span pattern twin boom for .60 power R/C. Jack Sheeks. FM 11-72 $2.50

**CF-282 TYCHO 400**. Altimeter equipped R/C trainer with Enya .45. Orbit R/C. span 62". McGovern. FM 12-72 $3.50

**CF-293 BLUE FLAME**. Open pylon racer R/C. 54" span. 505 sq. in. Super Tigre .40 ABC. Dave Gierke. FM 4-73 $3.50

**CF-298 MOONROCK**. R/C Pattern Delta with 44" span. 46" length. Enya .45. Lou Cubillos. FM 5-73 $5.00

**CF-299 GULL**. 66" span R/C sport for easy flying. Fox Eagle .60 and MRC 710 radio. Unusual wing. By Dick Johnson. FM 6-73 $3.50

**CF-303 TAILGATER**. R/C pattern ship 63" span. Webra .61. Pro Line radio. Rcm air retracts. D.Ostilio. FM 7-73 3.50

**CF-310 NORTHERN EAGLE**. R/C Pattern. 58" span. .40-.51 mil. Dave Gierke. FM 9-73 $3.50

**CF-345 DESPERADO**. R/C flap equipped .60 powered sailplane with 99" span. For Ross Twin Opposed .60 engine. Gene Rogers. FM 9-74 $5.00

**CF-340 LIT SPECIAL**. 1/4 R/C Pylon Racer for Cox Tee-Dee .049 with 31" wingspan. V.A. Caluori. FM 8-74 $2.00

**CF-367 "NOTHIN' SPECIAL."** 1/4 R/C V-tailed pylon racer with 27" span. Bob Aberle. FM 5-75 $2.50

**CF-383 FLICON** R/C Pattern Trainer using Falcon wing kit. .40 to .46 engines. Vince Caluori. FM 9-75 $3.50

**CF-405 76 SPECIAL**. Quarter Midget R/C trainer with T-tail. .15 engine. 36" span. Bob Aberle. FM 5-76 $3.50

**CF-410 CANNONBALL**. Micro-size R/C pylon racer for .020 engine and Cannon Tiny R/C. 22" span. Bob Aberle. FM 7-76 $2.00

**CF-415 REVISION "A"** Single or two channel R/C trainer. .049 engine. 44" span. Howie Applegate. FM 8-76 $2.50

**CF-417 SUPER WHIPLASH** R/C Sport Pattern ship with 54" span and .40 engine. Dick Sarpolus. FM 9-76 $3.50

**CT-420 SUPER SPAD** R/C sport bipe with 38" span for .19-.30 engines. Gene Weaver. FM 10-76 $3.50

**CF-426 WREN** R/C Sport biplane for .15-.19 engines. 38" span. Norman Rosenstock. FM 12-76 $3.50

**CF-429 INDY RE-TRAINER** Sport R/C with a 50" span for .30 engine. Jack Sheeks. FM 1-77 $2.50

**CF-435 CHECKERS** 64" span R/C Pattern Trainer for .60 engines. Jarold Schmidt. FM 4-77 $3.50

**CF-437 THE BASIC BIPE** 48" span R/C Sport Biplane for .60 engines. Dan Reiss. FM 4-77 $3.50

**CF-438 REISS' ROOSTER** R/C Sport Biplane for .60 engines. Dan Reiss. FM 5-77 $3.50

**CF-442 LIL' EAGLET** .010 Sport R/C with 22" wingspan for mini radios and Cox .010. Bob Aberle. FM 6-77 $2.00

**CF-451 DOUBLE TROUBLE** Pattern Biplane for R/C and .60 engines with a 54" wingspan. Dick Sarpolus. FM 9-77 $3.50

**CF-455 BI-BABY** R/C Sport Biplane for .29 to .40 engines. Jack Sheeks. FM 11-77 $2.50

**CF-456 THE ACE THREE-TEN** 3-channel R/C trainer with a 36" wingspan for .09 and .10 engines. Bob Aberle. 12-77 $2.50

**CF-458 THE CHALLANGER** A twin-boomed .60 powered R/C pattern ship with a 62" wingspan. Bob Godfrey. FM 1-78 $2.50

**CF-459 THE HUNGRY EAGLE** An R/C duration model (looks like a F/F ship) for 40's with a 96" span. Dick Sarpolus. FM 1-78 $3.50

## SAILPLANES

**CF-1 SPOTTER**. A/2 Nordic with 79" two piece wing. By Joe Bilgri. FM 4-65 $3.00

**CF-14 SEAGULL**. Giant 84" wingspread soarer R/C with supplementary .09-.15 power. Don McGovern. FM 8-62 $5.00

**CF-16 THERMAL QUEEN**. Radio control soarer uses Eppler 385 airfoil. 144" span with light wing loading. By Carl Lorber. FM 11-70 $3.00

**CF-20 LIL T**. R/C 74" glider, rudder only with T tail. By Bob Hahn. FM 6-65 $4.00

**CF-34 SCHWEITZER I-26**. R/C 1/6 scale glider with .67 sport canopy. By Dan Lutz. FM 4-66 $4.00

**CF-41 SPECTRE WING**. R/C flying wing. Thermal soarer with power assist. 15-.92. By McGovern. FM 6-66 $2.50

**CF-44 CASTAWAY**. Nordic A/1. 51" span. Low cost competition glider. By Joe Bilgri. FM 7-66 $2.50

**CF-46 SLINGSBY SKYLARK 4**. 119" span, high aspect ratio R/C slope or thermal. Ira Achey. FM 8-66 $4.00

**CF-65 FOAMIN'S BAT WING**. R/C modern foam wing soarer. By Roll McPherson. 72" span $3.00

**CF-69 BONG BOOMER**. FAI R/C glider, one time world record altitude holder. Maynard Hill. 136". FM 2-67 $4.00

**CF-70 THUNDERHEAD**. 54" span towline trainer. By Don McGovern $5.00

**CF-88 SOAR SAM**. A/1 Nordic for NATS, etc. 48" span. By Bill Dunwoody. FM 7-67 $2.00

**CF-92 1931 NORTHRUP PRIMARY TRAINER**. 72" span R/C glider. By Walt Kessler. FM 8-67 $3.00

**CF-99 PEREGRINE**. 89" span A/2 Nordic with fibreglass fishing rod fuselage. By Ken Whiting. FM 10-67 $2.00

**CF-101 RAINBOW**. 100" span R/C power & boom design with power assist. 15 mil. FM 12-67. McGovern $3.50

**CF-102 HYPODERMIC NEEDEL**. A/2 Nordic with 47" span. By D. Mathis. FM 12-67 $3.00

**CF-108 LA MILA**. 66 NATS winner. Hand launched. By Maj. Mel Allen. FM 2-68 $1.25

**CF-112 DANCER** R/C Glider, pod and boom. V-tail soarer for thermals. Carl Lorber. FM 3-68 $4.00

**CF-118 ENILWOT**. A/1 Nordic easy to build with underslung rudder. By Dick Mathis. FM 4-68 $1.25

**CF-120 AMERICAN CROW**. A/2 Nordic. 77" wing. Different approach to competition model. Mathis. FM 5-68 $2.00

**CF-127 NORDIC EXTRA LARGE**. 113" span Pod with fibreglass boom. By Chet Lanzo. FM 7-68 $3.00

**CF-139 MOLLYMAWK**. Superstreamlined 108" R/C thermal soarer. Carl Lorber. FM 10-68 $3.00

**CF-142 PTERODACTYL**. Hand launch lightweight glider. 20" span. By Tom Peadon. FM 11-68 $1.25

**CF-148 TRI-BELLE**. RC glider, slope, thermal, power. 105" span. By Marley Michaelis. FM 1-69 $3.50

**CF-152 TUMBLEWEED**. A/2 Nordic. 74" two piece wing for windy weather. By Dick Mathis. FM 2-69 $2.00

**CF-166 GAGGLER**. R/C soarer 117" span. Pod and boom design. By Carl Lorber. FM 11-69 $3.00

**CF-169 MISKEET**. 149" R/C glider with fibreglass fuselage. By Harley Michaelis. FM 7-69 $3.50

**CF-176 SCARAB A/2**. Nordic Kit with 79" span. Fibreglass fishing rod fuselage. By Dick Mathis. FM 10-69 $2.00

**CF-179 U S KID, ZING, FLASH**. Three hand launched 18" gliders by Bay... Mathis, Peadon. Great fun. FM 7-70 $3.00

**CF-189 INVADER**. 15-.35 powered sailplane 73-1/2" wing. By Gene Rogers. FM 4-70 $3.00

**CF-194 HALF MACH**. 120" span thermal or slope soarer. Optional power. R/C. By Carl Lorber. FM 5-70 $2.50

**CF-201 PRANCER**. 12' R/C thermal or slope soarer with fibreglass fuselage. By Carl Lorber. FM 2-71 $4.50

**CF-205 HYSTERIA 1000**. Class C FF 84" .40 1000 sq. in. wing area. By Mathis. FM 3-71 $7.00

**CF-207 GOB**. A/1 Nordic with Jedelsky type construction. By Mel Allen. FM 4-71 $7.00

**CF-208 SABRE SOAR**. 125" span R/C soarer. Eppler 385 airfoil. By Neil Liptak. FM 4-71 $3.50

**CF-209 ATHENA**. 80" span Nordic A/2. Glass fuse. Open class winner '66 NATS. Roger Simpson. FM 3-67 $2.00

**CF-233 LEAD ZEPPELIN**. Sleek A/2 Nordic free flight. 88" span. Tom Hutchinson. FM 8-71 $2.00

**CF-243 YANKEE SOAR**. 16 ft span makes it easier to find thermals. Neil Liptak's R/C soarer. FM 10-71 $4.50

**CF-244 GAMBIT**. A/2 Nordic. Benedek 7452 airfoil. fibreglass rod fuselage. By Ric Bays. FM 11-71 $2.00

**CF-250 POACHER**. A/2 Nordic FF 77" span. A beautiful soarer. By Don Chancey. FM 1-72 $2.00

**CF-264 THERMAL HOPPER**. 120" span FAI R/C sailplane. British design with rudder, elevator, spoilers/towhook controls. Geoff Dallimer. FM 6-72 $3.50

**CF-275 QUASOAR**. R/C soarer with 146" wingspan. By Neil Liptak. FM 9-72 $6.00

**CF-276 SPIRIT OF FREEDOM**. Graceful 118" radio controlled soarer. Harvey Michaelis. FM 10-72 $3.50

**CF-280 ILLUSION**. 120" span R/C wing soarer for towline, winch, slope. Hal Cover. FM 11-72 $5.00

**CF-292 BANZAI**. Giant 50" span catapult glider by Mike Alwood. Free flight. FM 3-73 $3.50

**CF-306 UNDERDOG**. Handlaunch glider design by Harry Kruse. 19" span. FM 8-73 $1.50

**CF-314 THERMUS**. Catapult glider. 36" span. Bob Adair. FM 11-73 $1.50

**CF 317 LONG ISLANDER**. R/C soarer for slope or thermal. 100" span. Bob Aberle $3.50

**CF-337 WILD BLUE**. 100" span slope & thermal soarer that fits into a suitcase. Don McGovern. FM 7-74 $3.50

**CF-343 FACE SAVER**. Handlaunch Glider for rough wind. 16" span. Larry Kruse. FM 8-74 $2.00

**CF-359 "SPORT PRO"** 110" span R/C soarer with 605 sq. in. area. Harley Michaelis. FM 2-75 $3.50

**CF-369 "BOMMEL"** 114½ R/C soarer with full wing flaps. Peter Keim. FM 5-75 $4.00

**CF-372 THE WEIRD ONE** 119" R/C canard soarer by Dick Sarpolus and Arnie Pederson. FM 6-75 $3.50

**CF-378 OCHROMA PYRAMIDALE** Nordic A/2 with 70" span. Dave Linstrom. FM 8-75 $2.00

**CF-379 EYESORE** 116" R/C flying wing soarer with .19 power pod. Don McGovern. FM 8-75 $7.50

**CF-385 "98.6"** R/C soarer with 98.6" wingspan and a normal disposition. Howie Applegate. FM 10-75 $3.50

**CF-403 BACKLASH** Catapult Glider with 24½" span. Larry Kruse. FM 3-76 $2.00

**CF-408 "DESPERATION."** A/1 Nordic glider. 48" span. Bruce and D.B. Matthews. FM 6-76 $2.00

**CF-424 BOOMER BUM** 78" span Nordic A/2 competition glider. Joe Sloc Slovacek. FM 12-76 $2.50

**CF-412 LARS** Low Aspect Ratio Sailplane R/C. 74" span. Dick Sarpolus. FM 7-76 $3.50

**CF-422 THE HIGHTAILER** 100"-span R/C soaring glider by Howie Applegate. FM 11-76 $3.50

**CF-443 MOJAVE A/2 NORDIC** An A/2 Nordic Free Flighter with an 85" span. Dick Mathis. FM 6-77 $3.50

**CF-448 OGAR A SOS** Polish powered glider for .049 engines with a 72-inch wingspan. Howie Applegate. FM 8-77 $2.50

## R/C SEAPLANES

**CF 6 SCAVENGER**. Amphibious R/C flying boat for .35-.60 engine. 77" wing. Don McGovern. FM 8-62 $5.00

**CF-30 SKIPJACK**. R/C .35 seaplane with one large float, two smaller. 50" span. Paul Hook. FM 1-71 $3.50

**CF-63 PIRANHA**. 74" span seaplane for .56 eng. R/C proportional. FM 12-66. By McGovern $4.00

**CF-75 DORNIER DO-18K1**. .56 span R/C. .19-.29. twin engines in tandem, flying boat. By A. Swanston $7.00

**CF-76 SEA HORSE**. R/C seaplane, twin float amphib. for .45-.67 span. FM 5-67. McGovern $3.00

**CF-86 MAKO MONSTER**. R/C seaplane. .45 mil. Another McGovern original. FM 7-67 $4.00

**CF-94 UNSINKABLES**. Foam floats converts big models to ROW. Gene Rogers. FM 9-67 $2.00

**CF-123 KOOKABURA**. 72" span seaplane for .45 R/C. Willem Arts. FM 6-68 $4.00

**CF-132 GRUMMAN WIGEON**. R/C scale flying boat for .45 twin. Oscar Weingart. FM 9-68 $5.00

**CF-150 MORAY MONSTER**. 72" R/C flying boat with retracting floats for .60. Don McGovern. FM 1-69 $5.00

**CF-168 SCAMPI**. 63" span flying boat for .56 R/C. From Holland. Willem Arts. FM 7-69 $3.50

**CF-171 ENSIGN**. 60" span R/C float plane uses Enya .45. Gene Rogers. FM 8-69 $3.00

**CF-199 SAVOIA MARCHETTI**. Twin hull C/L semi-scale of 1933 flying boat. Make it R/C. Sarpolus & Shubel. FM 9-70 $5.00

**CF-211 EDO FLOATS**. Semi-scale floats for ROW craft. Convert your land plane. By Aarts. FM 3-67 $1.50

**CF-247 LAKE BUCCANEER**. Semi-scale R/C flying boat. 15-19 pusher. By Dave Ramsey. FM 12-71 $3.50

**CF-263 MADGE FLYING BOAT**. 3 channel R/C for .29-.45 mil with 57" span. Brent Reusch. FM 5-72 $4.00

**CF-290 FALCONLER TEAL**. R/C semi-scale amphibian. 71" span. .45-.60 eng. By Don Prentice. FM 3-73 $5.00

**CF-361 SEAWEED**. R/C seaplane with 65" span. .60 engine. Bob Aberle. FM 3-75 $7.00

**CF-393 VIKING** Record setting R/C seaplane for .35-.60 engine. 77" span. Bryce Peterson. FM 1-76 $3.50

**CF-450 THE SEE BEE** 1/4 camera plane for R/C with a 42" wingspan. Dave Katagiri. FM 9-77 $2.50

## R/C BOATS

**CB-1 GLEN-L SPORT FISHERMAN**. 39" R/C boat for electric power. By Jerry Dunlap. FM 7-74 $3.50

**CB-2 EZ-Vee** 32" wood deep vee for .29 to .40 engines. By Jerry Dunlap. FM 9-74 $2.50.

**CB-3 FOAMY**. 19 powered balsa and foam ski boat. William C. Young. FM 11-74 $2.50

**CB-4 "POLYWOG"** extended bow .19 powered R/C run about. Jerry Dunlap. FM 1-75 $2.00

**CB-5 FM AIRBOAT**. 26½" long water-rudder R/C airboat for 15 engine. Jerry Dunlap. FM 4-75 $2.50

**CB-6 QUARTER CRACKERBOX** 24" wood mono for 15 engines. Jerry Dunlap. FM 8-75 $2.00

**CB-7 DEEP VEE DAY CRUISER** 36" wood deep vee R/C racer for OPS .40 engine. Jerry Dunlap. FM 2-76 $2.00

**CB-8 GREY GHOST** 45" long wood competition deep vee for .60 engines. Robert Staal. FM 11-76 $3.50

**CB-9 GREY GHOST 40** A 38" deep vee for .40 engines. Bob and Wally Staal. FM 2-77 $2.50

**CB-10 MISURI A** 26" long Electric scale German one-man tugboat. Gerald Julian. FM 3-77 $3.50

**ORDERING INSTRUCTIONS:** Only C series plans are available including some not listed here. For building instructions refer to issue of FLYING MODELS in which article originally appeared. Issue reference is given with most listings. See back issue ad for complete list of back issues currently available. For issues not available, order from dealers specializing in back dated magazines.

Now most of the plans appearing in FLYING MODELS are available from the publishers of FLYING MODELS. These big full size drawings make it easy to build almost any model airplane.

CARSTENS PUBLICATIONS

**CF-352 FIELD KIT** 2 inter related field boxes to fit compact cars Bob Aberle FM 11-74 $5.00

## OLD TIMER

**445 HALF-SIZED SCRAM** Old Time replica, July 1938 Flying Aces from original 1938 design by Ray Heit Free Flight for .020 engines with a 40-inch wingspan D.B. Mathews FM 7-77 $2.50

**CF-460 SCRAPPY** A reprint of the original 1939 Flying Aces plan suitable for R/C assist Old Timer events FM 1-78 $5.00

**CF-463 RAMBLER** A reprint of the original 1939 Flying Aces plan suitable for Antique category OT competition FM 2-78 $5.00

## CONTROLINE SCALE

**CF-10 FOKKER D-VII** 33" span WWI fighter biplane CL .049-.09 Paul Del Gatto 2 Sheets FM 6-64 $5.00

**CF-23 SPIRIT OF ST. LOUIS** 16" scale UC Lindberg's plane By Paul Palanek FM 12-66 $2.00

**CF-33 SEA VIXON** Royal Navy jet fighter 35 56" wing C/L scale With prop By Jack Sheeks FM 4-66 $2.00

**CF-40 EXTENDED GEE BEE** C/L semi-scale lengthened for better flying 35" sport By B Miller FM 6-66 $2.00

**CF-71 LOCKHEED HUDSON** 41" span twin .19 powered Scale CL World War 2 bomber Paul Palanek FM 4-62 $3.00

**CF-84 CURTISS HAWK 75** CL scale 36 35 French radial engine P-40 Palanek FM 8-62 $3.00

**CF-87 RYAN SC** Semi-scale CL 51" wing, 35 mil By Jack Sheeks FM 7-67 Sleek $2.00

**CF-106 FOCKE-WULF FW-190** 50" span CL profile WW2 fighter 35 45 mil By Jack Sheeks FM 1-68 $2.00

**CF-130 BELL P-39 AIRCOBRA** 56" CL stunt By W Simmons For 35 mil FM 8-68 $3.00

**CF-167 MESSERSCHMIDT ME-109** Near scale 48" span combat CL design for 35 mil Vince Micchia FM 6-69 $3.00

**CF-185 MESSERSCHMIDT ME-109** Semi-scale CL 52" span for 35 engines By Jack Sheeks FM 4-70 $3.00

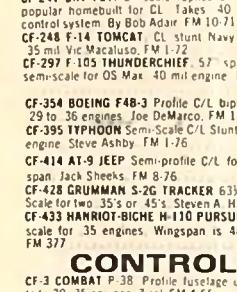
**CF-186 RYAN PT-20** C/L stunt with 55" wing 35 engine Famed 2-place trainer By A DiMezza FM 3-70 $3.00

**CF-195 MUSTANG P-51** Controline stunt for 35 semi-scale By Joe Berry FM 8-70 $2.00

**CF-197 F-86D SABRE JET** C/L stunt 54" span with 35 mil By Bob Lampione FM 6-70 $3.50

**CF-210 MESSERSCHMIDT ME-262** Semi-scale CL 55" span Single inverted & throttled 35 By Vornolt FM 67 $2.00

**CF-212 STUKA JU-87** Famous German WW-2 dive bomber C/L for .40 mil By Jack Sheeks Semi-scale FM 7-70 $3.50




**CF-228 CHANCE VOUGHT F4U CORSAIR** 62" controline scale 59-60 engines 1-1/2" scale By Ira Kulp FM 7-71 $5.00

**CF-241 SKY FLY** 2" scale replica of Anton Cvjetkovic's popular homebuilt for CL takes .40 mil Roberts flight control system By Bob Adair FM 10-71 $3.50

**CF-248 F-14 TOMCAT** CL stunt Navy fighter 56" span 35 mil Vic Macaluso FM 1-72 $3.50

**CF-297 F-105 THUNDERCHIEF** 57" span stunt controline semi-scale for OS Max .40 mil engine Bob Hunt FM 5-73 $3.50

**CF-354 BOEING F4B-3** Profile C/L biplane, 34" span for 29 to 36 engines Joe DeMarco FM 12-74 $2.50

**CF-395 TYPHOON** Semi-Scale C/L Stunter 56" span ST 46 engine Steve Ashby FM 1-76 $3.50

**CF-414 AT-9 JEEP** Semi-profile C/L for twin 30's 56½" span Jack Sheeks FM 8-76 $3.50

**CF-428 GRUMMAN S-2G TRACKER** 63½" span Controline Scale for two .35's or .45's Steven A Hall FM 1-77 $3.50

**CF-433 HARRIOT-BICHE H-110 PURSUIT** Controline sport scale for .35 engines Wingspan is 48" Dick Sarpolus FM 3-77 $3.50

## CONTROLINE

**CF-3 COMBAT** P-38 Profile fuselage u-control craft twin tail, 29-35 engines Zirolli FM 4-65 $2.00

**CF-18 JAGUAR** Controline sport for 29 to 40 A fun ship by Fast Richard FM 12-70 $3.50

**CF-24 SHEIK** Controline stunt, inverted gull wing, twin rudders .35 .53", by Jack Sheeks FM 6-65 $2.00

**CF-28 WHIRLWIND I** Twin engine profile scale CL For two 15 to 19 By A B Swanston FM 6-65 $2.00

**CF-29 RIVETS** Sport profile C/L Goodyear for 15 26" span By Vince Micchia FM 1-71 $2.00

**CF-38 STRAFER** Midwing sport, twin rudder, 40 45 C/L By Don McGovern FM 2-66 $2.00

**CF-43 SUPERSONIC STUNTER** Very clean design swept back 62" wing 35 45 Bernard Ash FM 2-66 CL $3.50

**CF-49 ENYA DEMON** 54" span stunt CL flaps Racy looking for full pattern on 35 Jack Sheeks FM 8-66 $2.00

**CF-58 LADY FINGER** Goodyear racer 41 41 span By Ira Achey, for .09 eng FM 11-66 $2.00

**CF-59 CHIZLER** Slow stunt pattern flyer CL Uses Fox 35 engine with shaft extension 50" span By Dick Mathis FM 11-66 $2.00

**CF-62 TALON** CL stunt with inverted 35 56" span By J Kosiecky FM 12-66 $3.50

**CF-67 SWINGER** Swept wing CL stunt 51" span 35 mil FM 1-67 By Jack Sheeks $2.00

**CF-74 MITSUBISHI ZERO** 40 span profile scale CL for .19 40 combat or sport Nick Zirolli FM 4-67 $2.00

**CF-78 EXCALIBER** CL stunt, 51" span semi-profile for McCoy 40 or similar FM 5-67 Mathis $2.00

**CF-90 STARLIGHT** CL stunt 56" wing for hot 35 By Charles Mackey FM 8-67 $2.00

**CF-95 PIPER CHEROKEE 140** Semi-scale profile Easy By Dick Mathis FM 9-67 $2.00

**CF-98 MAG JET** 44" profile stunt for 29 35 fast building By Vince Micchia FM 10-67 $2.00

**CF-103 FOXEY** Twin boom sport for .049 .051 mil 30" span By Bob Adair FM 12-67 $1.50

**CF-111 NOVI III** 51" span stunt C/L 1st at 67 NATS By Dave Gierke FM 2-68 $3.00

**CF-113 GRUMMAN TIGERCAT F7F-1** CL profile with two 15's By Bob Adair FM 3-68 $2.50

## NEW PLANS

**CF-471 THE SILVER** R/C pod and boom soaring glider with a 110" span for slope or thermal flying Dick Sarpolus FM 5-78 $3.50

**CF-472 HOLY SMOKER** FAI 15 competition F/F 59" wingspan for 15 engines Joe Slovacek FM 5-78 $3.50

**CF-473 P-61 BLACK WIDOW** Twin Controline stand-off scale for .049 engines 34" span Michael Beaulieu FM 5-78 $3.00

**CF-474 RED RIPPER** A reprint of the original 1940 FLYING ACES plan suitable for Old-Timer competition FM 5-78 $5.00

**CF-468 RYSON ST-100 CLOUDSTER** Stand-Off Scale R/C motor sailer for .09 10 engines with a 73½" span Howie Applegate FM 4-78 $3.00

**CF-469 CARE** Stunt controline ship with a 51" span for .35 engines Jack Sheeks FM 4-78 $3.00

**CF-470 EVIL WAYS** Class A-B contest Free Flight ship for .15 to .23 engines with a 60" span Mike Hallum Grady Turner $3.50

**CF-464 MISS COSMIC WIND** R/C Stand-off Scale with a 58-inch wing for .60's Dan Reiss FM 3-78 $3.50

**CF-465 CHICAGOLANDER** Class A Power Free Flight for .15 engines with a 52-inch span Dave Linstrum FM 3-78 $3.00

**CF-466 DRAFTEE** A reprint of the original 1941 Flying Aces plan suitable for Old-timer competition FM 3-78 $5.00

**CF-467 WING INCIDENCE INDICATOR** An easy to build tool for better flight results Jerry Smith FM 1-78 $2.50

**CF-119 BOOMER** Twin boom stunt profile for .35 mil By Vince Micchia FM 3-68 $2.00

**CF-121 FREEDOM 45** CL stunt with 45" span Foam cored wing .45 mil sheet covered Jack Sheeks FM 5-68 $2.50

**CF-129 NOVETTE** Swept 48" wing sleek stunt CL design, profile, OS Max .35 Norm Dion FM 7-68 $3.00

**CF-134 SPITFIRE STUNTER** Semi-scale CL 49-1/2" span .35 engine By Jack Sheeks FM 9-68 $2.00

**CF-140 COYOTE** Long lean CL stunt for .35 40 54" span By Dick Mathis FM 10-68 $3.00

**CF-141 FURY** Stunt C/L Fox .35 engine, trike gear, full span flaps 54" span By Don Bambrick FM 2-67 $3.00

**CF-144 WINDER** CL combat, 42" span, high speed, for .35 By Terry Prather FM 11-68 $1.50

**CF-147 FORMULA S** 55" span CL stunt 2nd at Olathe NATS By J Kosiecky FM 12-68 $3.00

**CF-149 TORINO** 53" span CL stunt with .35 mil Modern By Jack Sheeks FM 1-69 $2.50

**CF-153 SCOTTSMAN** 54" span C/L stunt swept wing design with full flaps for .35 Jack Sheeks FM 2-69 $2.00

**CF-160 KING COBRA** C/L .35 slow combat with 48" span Vince Micchia Maneuverable FM 5-69 $2.00

**CF-162 PEGASUS** C/L stunt 630 sq in 57" span McCoy .40 eng By Bob Howard FM 11-69 $3.00

**CF-164 KNIGHT** T tailed CL stunt 52" span .35 mil By Jack Sheeks FM 6-69 $2.50

**CF-172 HI-LO** 51" CL stunt trainer Fast building for beginners Uses .35 mil By Paul Palanek FM 9-69 $2.00

**CF-177 KAWASACKI** C/L Controline combat profile for .35 By Vince Micchia $2.50

**CF-181 TEAR-A-LONG** Combat CL, small and compact, for Cox .15 By Fast Richard FM 12-69 $2.00

**CF-192 NOVI IV** 55" span controline stunt for .35 mil FM 5-70 By Dave Gierke $3.00

**CF-203 OLD GLORY** Stunt controline 53" span 35 40 By Jack Sheeks FM 2-71 $2.00

**CF-213 MYSTERE II** C/L stunt with 55" span, 29-40 mil Sensitive By Jim Van Loo FM 10-70 $3.50

**CF-219 MANGLER** 29-40 controline all wood sport profile 36" span Fast Richard FM 5-71 $2.00

**CF-225 VULCAN** CL stunt Optional foam or built-up wing 56" span Fox 35 By Bob Lampione FM 6-71 $3.50

**CF-231 MAGISTER** CL profile trainer of French training ship Fox 35 powered FM 8-71 By Jack Sheeks $2.00

**CF-246 STUNT MACHINE** 2nd Place 71 NATS in a sleek 35 pattern CL Gene Schatler FM 12-71 $3.50

**CF-257 DOUGLAS SKYRAIDER** Semi-scale stunt C/L for .35 By Don Typond FM 3-72 $3.50

**CF-258 IRON BUTTERFLY** FAI combat C/L with 33" span By Fast Richard FM 3-72 $2.00

**CF-259 UNITED** Stunt CL for .35 53" span Bob Lampione FM 3-72 $3.50

**CF-167 BE WITCHED** Twin boom stunt controline 51" span for McCoy .40 Jack Sheeks FM 7-72 $2.50

**CF-262 TIGER MIRAGE** FAI C/L team racer for .15 diesel 33" span Dave Kelly FM 5-72 $3.00

**CF-265 WARHAWK STUNT** C/L stunt ship for .35 40 mil with 56" span By Bill Simons FM 6-72 $3.50

**CF-277 FLY BABY** Semi-scale controline stunt ship 57" span .40 McCoy powered Jack Sheeks FM 10-72 $2.50

**CF-283 PINTO** 1/2A stunt CL for Cox Tee-Dee .049 with 34½" span Dick Mathis FM 12-72 $2.50

**CF-291 MONGOOSE** Slow combat CL 40" span .35 mil By Fast Richard FM 3-73 $2.50

**CF-295 CITABRIA** Profile stunt for .29 to .40 mil Dick Mathis FM 4-73 $2.50

**CF-301 PLUM CRAZY CASSUTT** Goodyear Team Racer 26" wingspan powered by K&B .15 or other By Matt Smith FM 8-73 $2.00

**CF-302 VOLUNTEER** 53" stunt controline McCoy .40 Jim Lynch FM 2-73 $3.50

**CF-307 HURRICANE** Stunt controline with 39" wing and Fox .35 engine Jack Sheeks FM 8-73 $2.50

**CF-309 EXCALIBUR II** CL profile stunt ship for .40 mil 51½" span Dick Mathis FM 9-73 $3.50

**CF-312 U-2 STUNTER** C L U-2 Spy plane stunt ship for O S Max 35 50 span Joe Adamusko FM 10-73 $3.50

**CF-315 SPIDER** Slow combat controline 42" wingspan uses Fox .36 Lou Woolard and Mike Tallman FM 11-73 $2.50

**CF-316 MISS DARA** C L stunt with 49" span for Fox .36 engine Dennis Duvall FM 12-73 $2.50

**CF-322 GENESIS** Stunt Controline winner with 52" span for .15 engines by Bob Hunt FM 2-74 $3.50

**CF-327 P-26 STUNTER** Stunt controline by Jack Sheeks for .35 to .60 61" wingspan FM 3-74 $2.50

**CF-329 TALON STUNTER** C/L Stunt 1-38 with 52" span for O S MAX .35 Stunt engine Dave Reiss FM 4-74 $3.50

**CF-332 HEINKEL HE-219** Profile twin controline for two .15 engines 38" span Joe DeMarco FM 5-74 $2.50

**CF-335 ERCOUPE** Profile C L for .19 to .40 engines 53" span Dick Mathis FM 6-74 $2.50

**CF-338 SUNSHINE** C/L Stunter for .35 engines Andy Lee FM 7-74 $2.50

**CF-342 CLIPPER** C/L Slow Combat, 5 35½" span for .35 engine Wm Wiley FM 8-74 $2.50

**CF-344 BISHOP** Stunt C/L for .35 to .46 engines 56" span Jack Sheeks FM 9-74 $2.50

**CF-347 MACCHI 202** C/L Stunter ST 46 58" span Dennis Duvall FM 10-74 $2.50

**CF-355 METAPHOR I** Stunt C L for .15 engine with 47" span Bill Bradford FM 1-75 $2.50

**CF-358 P-51B STUNTER** C L mustang for stunting with 60" span and .60 engine Jim Vornholt FM 2-75 $3.50

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**CF-398 BEARCAT & ZERO** Two Profile C/L with 29" span for .09-.15 power Joe DeMarco FM 3-76 $2.50

**CF-404 SQUIRREL** C/L Stunter, 53" span 35 40 engine Jack Sheeks FM 4-76 $2.50

**CF-409 "METAPHOR II"** C/L stunter with 52" span and .35 engine Bill Bradford FM 6-76 $2.50

**CF-411 TRAGER** C/L Navy Profile Carrier 32" span, 15 engine Russ Brown FM 7-76 $2.50

**CF-421 THE TORCH** 54" span C/L stunter for .35 engine Dick Sarpolus FM 10-76 $3.50

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**CF-444 THE WILD GOOSE** Canard controline stunter with a 48" wingspan for .35 engines Dick Sarpolus FM 7-77 $3.50

**CF-447 GENESIS 46 MK III** Controline stunter, 60" span for .46 engines Winner of 1976 Nats R.W. Hunt FM 8-77 $3.50

## FREE FLIGHT GAS

**CF-15 RAVEN** 1/2A competition H .049-.051 48" parasol wing By Fast Richard FM 11-70 $2.50

**CF-19 TIME MACHINE** Free flight 1/2A .049 to .051 with 49" span By Don Chancey FM 12-70 $2.50

**CF-25 WARRIOR** 74" span sport design for 15 engine $2.50

**CF-26 GNAT** Free flight $1.00

**CF-31 SKYSTREAK** Free flight for .29 35 but adapts to .23 to .40 FM 1-71 $3.50

**CF-39 CENTURION** FAI 65 NATS winner FF 15 Record 34:45" duration By R Simpson FM 6-66 $2.00

**CF-45 ROCK-IT-A-GO-GO** Jelex powered contest ship by P Crowley FM 7-66 $1.50

**CF-47 CARAVAN** 24" span 1/2A free flight, easy build By Joe Bilgri FM 8-66 $2.50

**CF-56 DROP OUT** X 15 style Jelex powered By Don McGovern FM 10-66 $1.50

**CF-60 HEAT SEEKER** Mk III rocket FF 28" span Jelex power By Ken Whiting FM 11-66 $1.50

**CF-61 TRIGGER** 1/2A contest FF High thrust line for Cox .049-.051 By Dick Mathis FM 12-66 $2.00

**CF-80 PANDEMONIUM** 1/2A FF with 48" span Neat design by Fast Richard $2.00

**CF-82 WILD GOOSE** FF contest 1/2A engine 36" span unusual airfoil By Bill Cowee FM 6-67 $2.00

**CF-107 TEXAS EAGLE** 77" span FF contest Hi-thrust for K&B .40 By Dick Mathis FM 1-68 $3.00

**CF-115 SOLITAIRE** 1/2A contest FF for FAI with 44" span By George Murphy FM 3-69 $1.50

**CF-125 LIL SPOILER** 1/4A FF contest design with 32" span .020 engine By Bob Adair FM $1.50

**CF-128 HYBIRD** 60" span FF contest class A with .15 or class B with .23 Bob Adair FM 7-68 $3.00

**CF-131 FIRE FLY** Sport flyer for Jetex 50 Helical jet engine Rocket design Reid Simpson FM 8-68 $1.50

**CF-133 JALAPENA** FF contest 48" span hi-thrust for FAI .049 By Dick Mathis FM 8-68 $2.00

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**CF-196 MIGHTY MOUSE** 1/2A FF payload 34" span for former PAA event Uses .020 Dave Linstrum FM 8-70 $2.00

**CF-218 TORNADO** 48" span 1/2A free flight competition Tee Dee .049 Reid Simpson FM 5-71 $2.00

**CF-221 LIMEY 1.2A POWER** High climbing FF contest design to British formula .049 Dave Linstrum FM 9-70 $2.00

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**CF-325 STAR SEEKER** Class A-B contest free-flight for .19 .23 engines 52" wingspan Mike Hallum FM 3-74 $3.50

**CF-330 JUBILEE** Competition F/F with Old-Timer looks 74" span 29 23 engines Dick Mathis FM 4-74 $2.50

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**CF-381 PARFAI** F/F FAI Power 15 engine 61" span Chuck Markos FM 9-75 $3.50

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**CF-427 deHAVILLAND DH-6** 18" span $CO_2$ scale Free Flight W.R Stroman FM 1-77 $2.00

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**CF-457 FANTASY** $CO_2$ sport free flight with a 21½" wingspan Larry Kruse 12-77 $2.00

## RUBBER

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**CF-155 ISLANDER** 55" span unlimited rubber for FF competition By Bob Adair FM 3-69 $2.00

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**CF-193 LITTLE LIM** Coupe D'Hiver unlimited rubber uses old Wake motor Dave Linstrum FM 5-70 $2.00

**CF-202 BUCKER JUNGMEISTER** 22" wingspan rubber scale biplane John Blankenship FM 2-71 $3.00

**CF-217 SPERRY MESSENGER** 20" span rubber semi-scale biplane John Blankenship FM 5-71 $2.00

**CF-260 CHANCE VOUGHT KINGFISHER** 18" span rubber scale FM 4-72 $2.00

**CF-274 LUCKY PIERRE** 37" span rubber powered Coupe D'Hiver By Don Typond FM 9-72 $2.00

**CF-296 FOCKE-WULF 190 U-9** 17½" span rubber flying scale By Preston Bruning FM 5-73 $1.50

**CF-300 TWIN FIN** Unlimited rubber design for 16 strands 6mm rubber 47½" span By Bob White FM 6-73 $2.00

**CF-304 WHIPPET** 36" sport rubber design by veteran Ted Strader FM 7-73 $2.00

**CF-320 BEAU COUPE** 48" span Coupe D'Hiver rubber By Bob White FM 1-74 $2.00

**CF-336 deHAVILLAND 80A "PUSS MOTH"** Rubber scale design by Ray Booth 24" wingspan FM 6-74 $2.00

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**CF-360 AVRO 511 "ARROWSCOUT"** 14" span rubber F F George Meyer FM 2-75 $2.50

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**CF-399 SCORCHER** Competition Jelex 50 F/F with 30" span Stan Chilton FM 3-76 $2.00

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**CF-436 JUNGSTER II** 20" span Rubber Scale biplane George W. Meyer FM 4-77 $2.00

**CF-440 THE BANDIDO** Rubber power d sport free flight 18" span Larry Kruse FM 5-77 $2.00

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8th Annual

# Model and Craft Show

# April 22-23

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**The giant MACS Hobby Contest**, open to all hobbyists, will present more than 200 awards for outstanding models and crafts. Hundreds of entries will be on display throughout the show.

**Show hours** during this giant two-day-only show are Saturday, April 22, 10 a.m. to 8 p.m.; and Sunday, April 23, 11 a.m. to 6 p.m. Special dealer-only hours are scheduled Sunday, 9-11 a.m.

Long Beach Convention Center on beautiful Long Beach, CA Harbor
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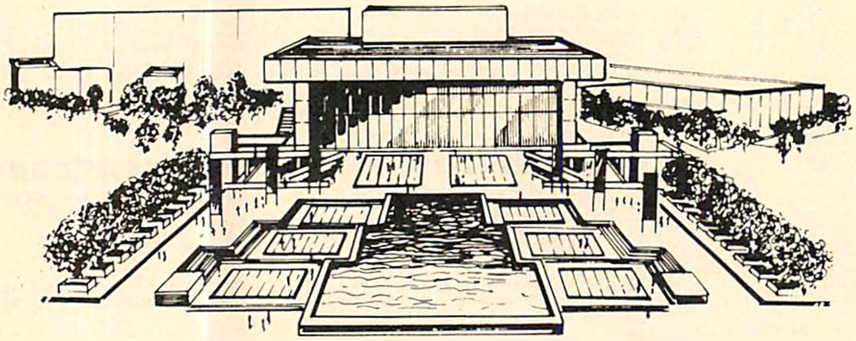

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litz, 523.0; and, Kirk Mullinix, 521.0. Robin Sizemore with 494 topped the non-500 Clubbers, and Mark Herzog turned in the best Junior effort with 393.5.

Noal Hess came down from Salt Lake for Scale with a gleaming Northrup Gamma, but he creamed the ship in the flying. Larry Stevens took the event with an FW Ta-154 and a score of 177. Hess was second with 132. Roland Baltes (the Carrier man) was third with an SBD Dauntless in 122.

Other winners included: Les Pardue, Fast Rat; Baltes, Carrier Class I; and, Ron Duly, Carrier Class II. Balte's best effort was 334.85; Duly's 357.38. A highlight of the meet was the formation flying of World War II Scale ships by Larry Stephens, Marv Martinez and Baltes. This demo is becoming a fixture at Buckeye. It's always a crowd-pleaser. Another show-stopper, albeit unscheduled, was the spectacular flare-up of Patty's Big Goodyear which burst into flames during a pit stop. Fast work put it out.

Speed drew a light entry, and the speeds posted were not particularly noteworthy. The biggest field signed-up for ACLA Slow Proto, an event for .40 engines and Slow-Rat-type ships, limited to one-ounce tanks and timed from a standing start over a one-mile course. Dale Long won handily in 112.95 mph. Ben Sasnett was second; Jed Kusik, third. Neal Tracy took ½A and ½A Proto; Lewie Kear, Formula .40 (134.48 mph). Kusik flew alone for a token win in A.

With FF and RC Glider also being flown, motel rooms were at a premium in Buckeye; but the Cowpuncher Road House did a thriving business after flying hours. Buckeye has only two motels. If you plan to make this one, make your reservations early; otherwise, you'll find yourself commuting from Gila Bend thirty miles away.

### Wynn Paul Takes King Orange

Stunt fans will be pleased to note that Wynn Paul took Expert at the King Orange in Jacksonville. His Pampawagon IV came in at a somewhat heavy 57 oz., spanned 58 inches, ran to 670 squares, and was powered by an ST .46 with Merco muffler. Most of the competition weighed-in at 47 oz. or less. Wynn won handily, however, with a posted 524 which bested Tom Dixon (487) and Randy Smith (464). All of the above, by the way, used foam wings. According to Joe Mead who judged along with Doug Starwalt, this year's turnout was the biggest in years.

Dean Brock topped the Advanced boys with his Nobler on Fox .35 in 439. He was followed by Bob Harpe and Gene Martipe. Brock weighed-in at 42 oz. and used a built-up wing; the others, foam.

In the Novice class, Jerrold Martin took Senior-Open; Wayne Willis, Junior. Judges in these classes were Ed Brock and Lloyd Gregory. MKIMI Martin and Sandra Parmenter handled the scores and boosted morale. Consensus: Pampa classes are the best way to go; they'll be used at the Rebel Rally in May.

### PRO Details Told

Last month we gave some coverage to Bee Williams' efforts to get the Pylon Racing Officials (PRO) organization off the ground. This month, we can give you more of the details. Basically, the purpose of the organization is to keep Pylon alive in the Northeast by providing a viable alternative to the hit-or-miss efforts of local clubs. Here's how:

Experienced lap counters, flagmen, recorders, and others who've worked at meets have been invited to join PRO. These people pay an initiation fee of two bucks to generate some initial working capital. They must meet with other officials when requested and work a minimum of two meets per year. As PRO's, they get a chance to do their thing and improve their skills. They receive a monthly newsletter and an insignia which makes them readily identifiable as pros. They also get a chance to buy some things at discount and a share of PRO profits at the end of the season.

A list of pro officials will be given to CD's in such places as Ballston Spa, N.Y., Somers, N.Y., Hadley, Mass., and throughout Connecticut and nearby Rhode Island. CD's will use these lists to recruit the officials they need for meets which they run. Pros will be alerted to upcoming meets through the newsletter and may volunteer their services to the directors. Entry fees at all PRO-officiated meets will include two bucks for the PRO service.

PRO affiliation of a meet will insure CD's of enough help to run a good meet, competently handled. It will guarantee working officials of enough help's being on hand to obviate their working without a break during a long contest. And it will provide an incentive for people to officiate; and hopefully, to further a genuinely exciting sporting event. PRO has developed guidelines to successful meets listing needed personnel and their duties—right from the CD down to the announcer. They're selling a service, and it seems like a good one.

Interested—either as a potential PRO or as a CD or promoter? Contact Bernice Williams at 347 Southwick Rd., Westfield, Mass. 01085 for more details. With appropriate advertising this idea could attract new sponsors from among the service organizations such as Kiwanis, Lions, etc. Help spread the word.

### What's Happening in Combat?

Well, among other things, the idea of a National Combat Champs is going over like a barrel on the edge of Niagara Falls. With the affair definitely set for Cincinnati this year, there is already a bid in from Omaha for next year. Phil Cartier and the hosting Queen City UC Club will soon have the details all sorted out. Cincinnati affords three grassed circles with concrete center pads plus a couple of completely paved circles. Omaha has its eye on Offutt AFB, Sig sponsorship, and a whole bagful of other goodies.

There's been a certain amount of flak attendant upon this year's Team Selection Finals, and a protest has been filed with the FAI Chairman. The protest focuses on the officiating of CD Ron Malcom and the selection of teamster Gary Frost, MACA prexy. George Cleveland, himself a team member, is responsible for the protest which was signed by eight other finalists Specifically, the protest objects to the masking tape used on streamers and certain aspects of the judging which placed Frost on the team. Malcom, as the prime official, reports that the protest, plus answers, have all been sent up the line for resolution. Other officials concerned include Tom Smith, Mike Steidley and Joan Lowe. We'll keep you posted.

Another facet of Team business is the matter of pitmen. Official transportation allowances extend only to pilots, and MACA


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Use a MUFFLER

A helpful hint from your FM Staff.

has initiated steps to raise money for the passage of pitmen: benefit meets, a dues increase, portions of entry fees earmarked for the fund, etc. At last reports, MACA had raised about $100 for the pilots and $350 for the pitmen. Efforts, of course, will continue. Now, however, the problem of who will select the pitmen has been broached. When the idea of a fund was put forward, everyone assumed that its purpose would be to pay for the pitmen who'd worked the Finals with the teamsters. In other words, letting the team members choose their own pitmen. Max Mearns, however, has requested a policy determination and has suggested that the three alternates be tapped for pit duty." If any of the top six drop out," he says, "we would then be able to fall back on the (procedure of) allowing team members' choice starting with the number one man and continuing as needed." Max has, in fact, unilaterally called for a vote by the 21 finalists as a sort of non-binding referendum.

While I will be the first to admit that the matter is none of my business, it would seem to me that the choice of a helper is an inately personal matter; and in the interest of having each teamster do his best, the selection should be left up to him. He should be allowed the greatest latitude possible and not be limited to alternative choices, none of whom he may be comfortable with. It isn't done during the program, and I can see no reason why a teamster should have it inflicted on him at the WC's. Would it really be in the Team's interest? We'll see what the finalists think.

Speaking of the Team, it is highly likely that members will be offered some unique props especially tailored to their needs. A number of flyers have commented that the Rossi would probably do better with a prop that had less pitch at the tips, say, 3½ in. instead of 4. Well, Al Kelly of Kelly Products, P.O. Box 38, Western Springs, Ill., is running through a batch of fibreglass props based on the Tornado 7X4 with the desired decrease in pitch. His Kelly-green props have already established themselves in the Midwest, and he's promised his first batch of FAI props to the top four Finalists.

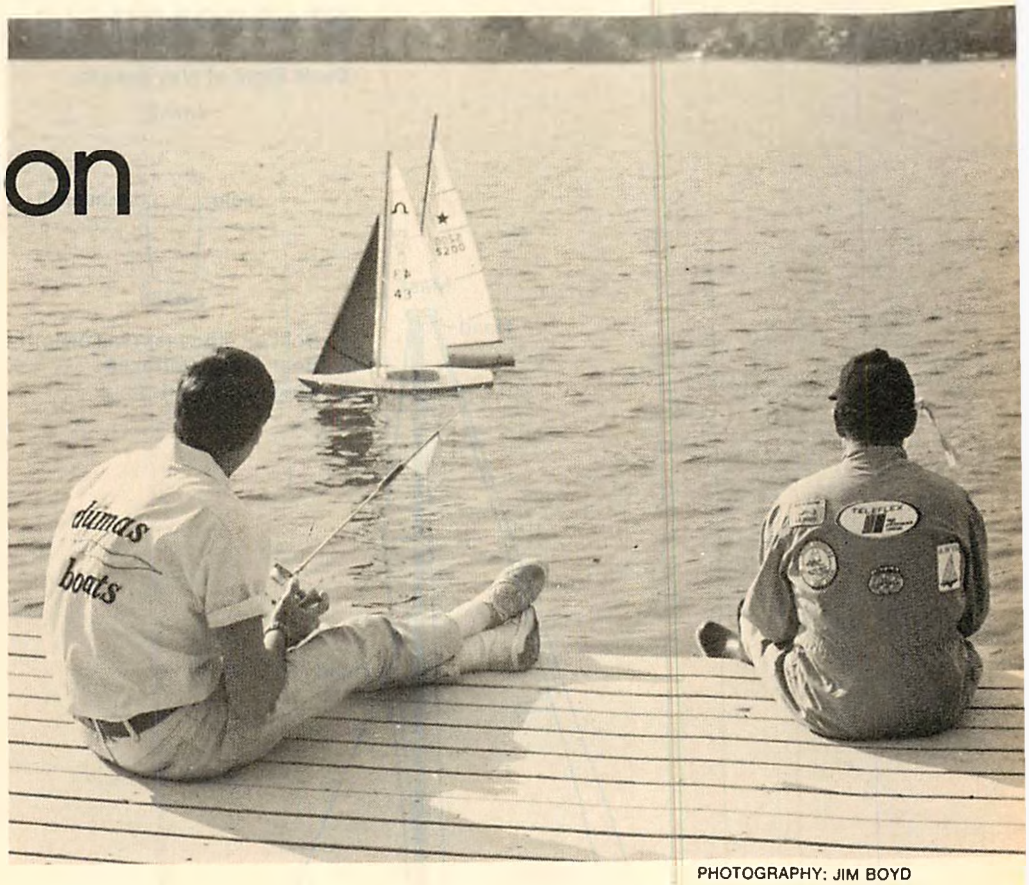
### Items In the Mail and News

• '78 NATS will be held once again in Lake Charles, Louisiana, and are set for the first week in August. Several locations in Ohio were considered as were Lakehurst, N.J. and other possible East Coast sites. Free-Flight room was the big problem everywhere, and Lake Charles afforded the most acceptable alternative. Other considerations included flying hours, camping facilities, housing, and general atmosphere. Logistical considerations and community acceptance count heavily.

• COMING WC's as approved by the FAI in Paris include: Controline Speed, Team Race, Stunt, Combat and Scale (including RC Scale) set for Aug. 4 through 10 at Woodvale, England (near Liverpool). Model Rockets were okayed for Bulgaria with September as a possible date. R/C Aerobatics okayed for So. Africa with a date in September. And Free-Flight was okayed for Yugoslavia in May or June with the site being one used previously. Belgium made a firm offer for the Controline Champs in 1980, and it was approved; Scale goes to Ottawa, Can.

# An introduction to R/C sailing

If you've been thinking about getting into a quieter way of racing, here are the basics/**Walter Pilcer**




PHOTOGRAPHY: JIM BOYD

Through the efforts of the AMYA (American Model Yachting Association) and many individuals too numerous to mention, radio control sailing has been gaining in popularity at a fantastic rate. The ease of construction of the new kits available and the relatively small investment needed to get into R/C sailing has been a major factor in its growth but probably the one biggest factor is the peacefulness of sitting on a lake or river shore and watching your boat sail effortlessly across the water. Or, if racing is your bag, you can find some of the keenest competition in sports today. And for you skeptics who sail big boats and are saying, "Who is this guy trying to kid," all I can say to you is "Try it and find out for yourself." I've been sailing big boats for 26 years and, believe me, it's nice to finish a day of good hard racing and not be bleeding to death and a basket case.

For those of you who are already members of the R/C sailing fraternity, the fundamentals which are so important to having a good sailing boat are second nature. For you folk who are just starting or contemplating starting, I am going to mention a few things which I think will be helpful to you no matter what boat you are building or decide to build.

My first (of many) R/C sailboats was an Etchells 22, designed as a full-size boat by E. W. "Skip" Etchells and manufactured in kit form by Dumas Products of Tucson, Arizona. The boat is an all-round yacht. She is a wonderful trainer, fun sailor, and good racing machine when sailed against other Etchells. The Dumas kit is fiberglass (hull and deck) and absolutely complete except for a radio, sail control unit and ballast for the keel. All the hardware needed to rig the boat is included; such as, turnbuckels, stays, cleats, sheets, sails and more. Extremely well written and detailed instructions are included in the kit and if followed carefully make building a snap.

Some of the things you want to watch when building your boat are as follows:

Be absolutely sure you have completed all the work on the inside of the hull before you put the deck on. Because of the small hatch opening in the decks of most boats, once the hull and deck are joined it is very difficult, if not impossible, to work inside.

When gluing the hull and deck together, you must take extreme care to make sure you don't put a twist in the hull. This can be accomplished by building a jig to support the hull or by finding a flat and true surface and then letting the glue set with the hull upside down and taped to the surface. I flush all my decks with the side of the hull. This makes a very nice appearance and eliminates work which is unnecessary.

When you are drilling the holes to mount the keel and rudder, take extreme care to make sure you have everything centered, lined up and perpendicular to the hull. I never drill my keel or rudder until my deck is on and I have made sure there is no twist in the hull. I would suggest you install the keel first and then line the rudder up to the keel. Also, do not install the weight in the keel until you have everything straight and drilled. Number 9 birdshot which can be bought at any good sporting store selling firearms is a very common form of ballast. The other ballast but harder to work with is plumber's lead. The second is preferred to shot because it will give you a lower center of gravity which helps the stability of the boat.

The other thing you might find helpful is the rigging of the mast. I have found that on the larger boats, 50/800 and up, there is (in my opinion) a tendency to overbuild and over-rig the mast. The heavier the mast and the more rigging you have on it, the more you are going to increase your tip weight. This directly affects the heeling moment of your boat and its performance. My masts are lighter than most but because of the way I rig them I have no trouble keeping them straight.

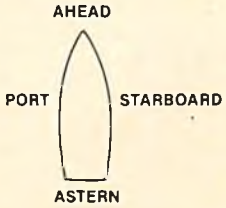
Most kits come with the mast wood included but I like to select my own and I

# BASIC SAILING

## GLOSSARY

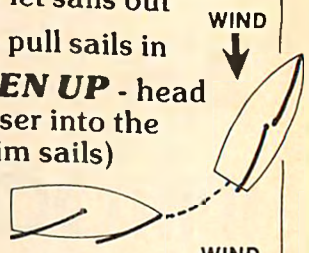
***PORT*** - left
***STARBOARD*** - right

**Basic Right of Way goes to:**

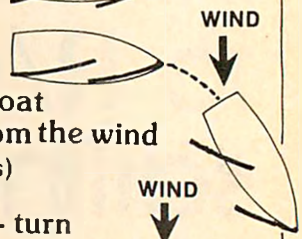



1. Boat on stbd tack (sail on left)
2. Boat being overtaken
3. Boat to leeward

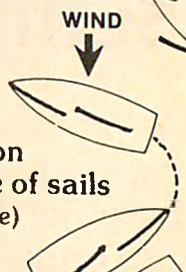
***EASE*** - let sails out
***TRIM*** - pull sails in
***HARDEN UP*** - head boat closer into the wind (trim sails)



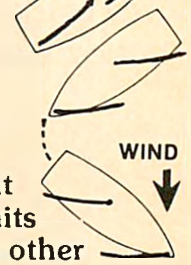

***BEAR OFF*** - head boat away from the wind (ease sails)




**TACK** - turn boat into, through and put the wind on the other side of sails (leave sails alone)



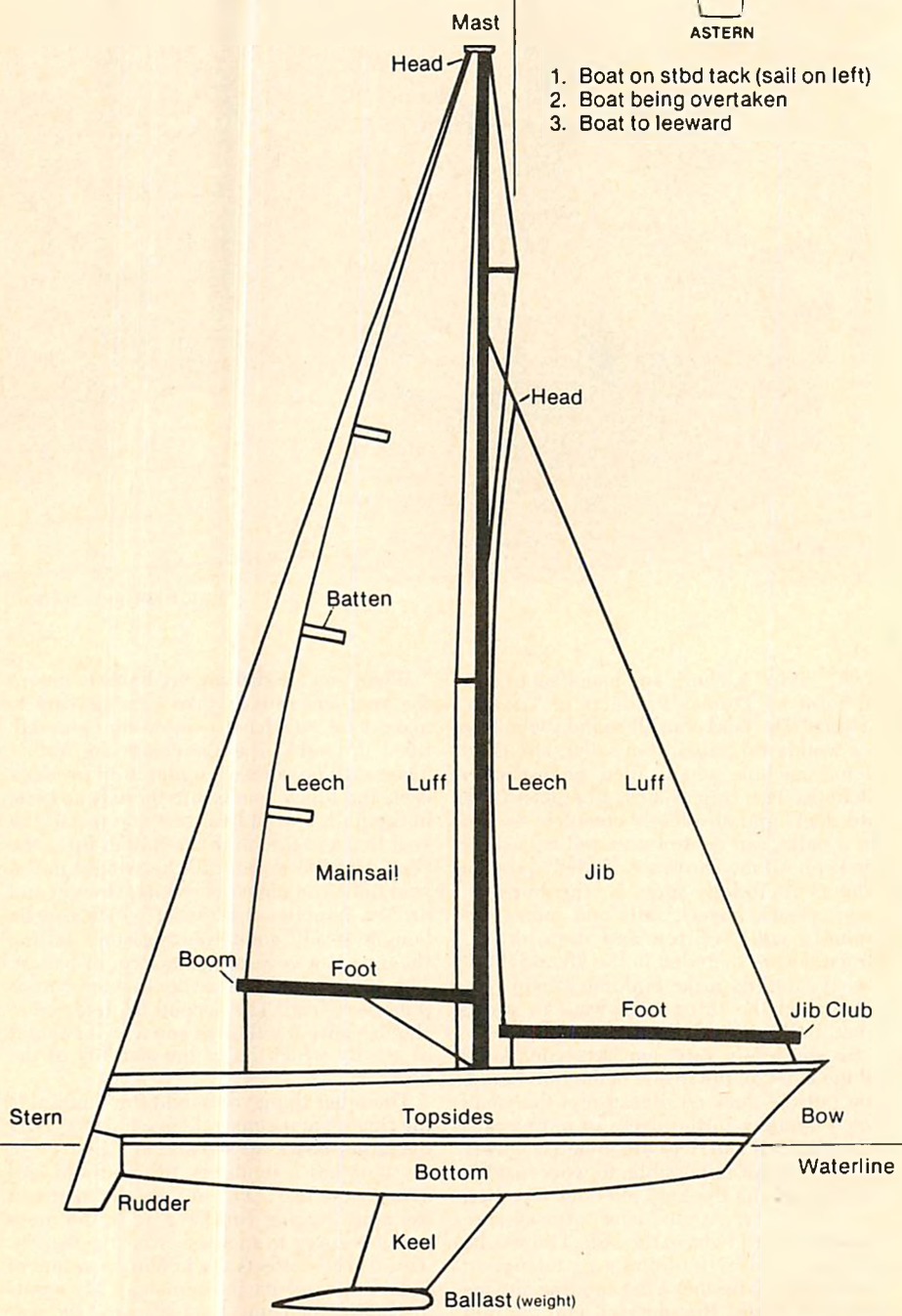

**JIBE** - turn boat away from the wind until the sails swish across the boat and the wind hits them from the other side (leave sails alone)




***WING AND WING*** - sailing directly away from the wind with the mainsail on one side and the jib on the opposite side

***RUNNING RIGGING*** - movable lines that control sails, called "Sheets" - jib sheet main sheet

***STANDING RIGGING*** - fixed lines that support mast called "stays" or "shrouds"

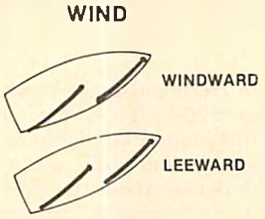



Drawings courtesy Dumas Products

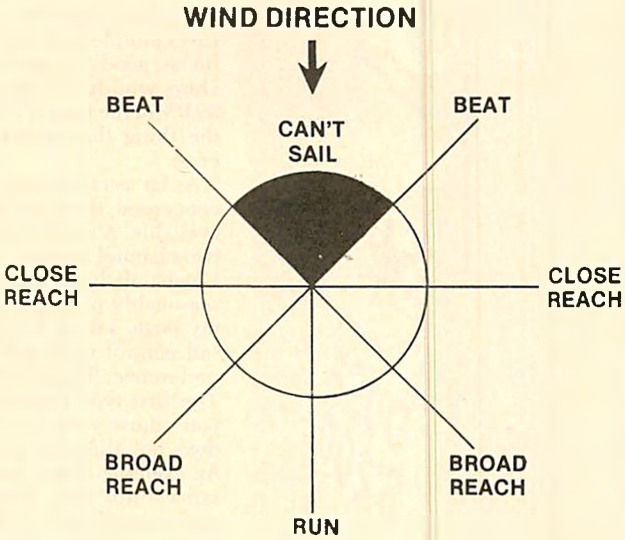
Drawings courtesy Dumas Products

***WINDWARD*** - toward the direction from which the wind is blowing

***LEEWARD*** - away from the direction from which the wind is blowing



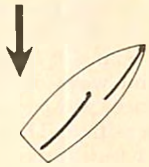

***DRAFT*** - the distance from the boats waterline to the bottom of its lowest point, ***OR*** the depth of the water needed to float the boat!




# BASIC SAILING PRIMER - *POINTS OF SAIL*

## 1. BEATING TO WINDWARD (sailing into the wind)

WIND DIRECTION



on port tack (sails on right)
close hauled (sails in tight)

on starboard tack (sails on left)
close hauled (sails in tight)

## 2. CLOSE REACH (sailing across the wind)

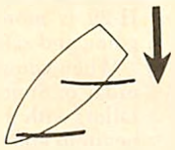
WIND DIRECTION

on starboard reach (sails on left)
sheets eased (sails out 25%)

on port reach (sails on right)
sheets eased (sails out 25%)

## 3. BROAD REACH (sailing away from the wind)

WIND DIRECTION

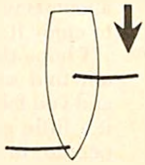


on starboard broad reach
(sails on left)
sheets eased (sails out 50%)

on port broad reach (sails on right)
sheets eased (sails out 50%)

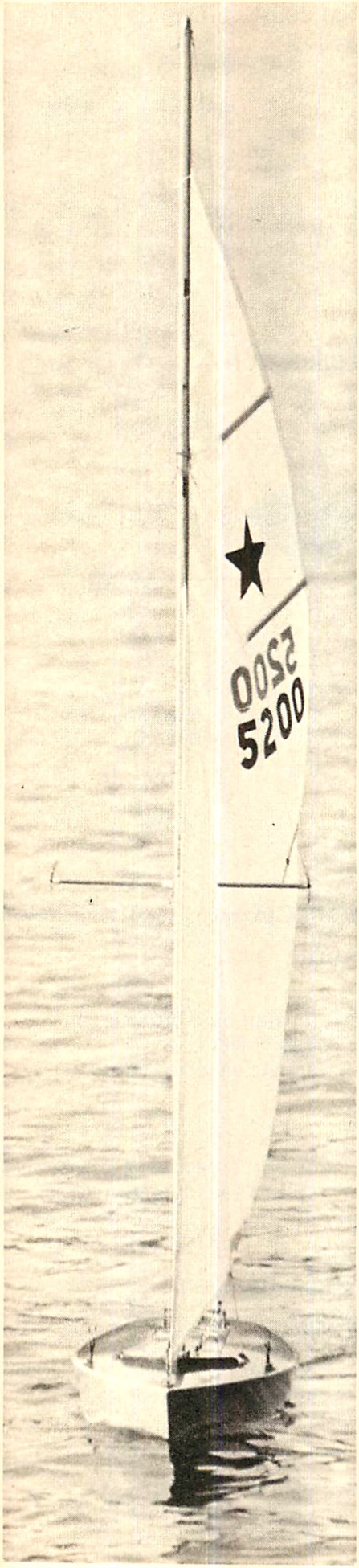
## 4. RUN (sailing before the wind)

WIND DIRECTION



on starboard run (mainsail on left)
sheets out (sails out 100%)

on port run (mainsail on right)
sheets out (sails out 100%)




select it very carefully. I either use Sitka spruce or number one pine. Care should be taken to find a piece which is dry (not full of sap), with a very close and straight grain. Do not use a piece of wood which has been quarter-cut, as you will not get the strength needed if you build a light mast.

I could go on and on about building a model sailboat, but that is not the purpose here. If you follow your directions carefully and bear some of the points I have mentioned in mind, you will find your building experience most rewarding and uncomplicated. Don't be fooled or turned off by those boats you see with all the fancy gimmicks and gadgets. They look very pretty and complicated and, in most cases, are. Seven out of ten times boats built as the designer originally suggested (in most cases simple and down to earth) are every bit as good, if not better, than "machine shop wonders". Remember one thing, 99.9% of the time it's the guy or gal steering the thing that makes the winning difference.

As far as radios and sail controls units are concerned, there are several excellent ones available. A sailboat generally only needs a two-channel system. Cox Sanwa, MRC and Futaba all have good sets which are very reasonably priced. I use the Cox Sanwa in my boats set up for two channels. I think sail control units are a matter of personal preference. There are two types available. The first type is an off-on unit which lets you adjust your sails to any position but does not allow for a very fine adjustment. An example of this unit is the Dumas H-29 sail control unit. The second type is the proportional unit as manufactured by Sail Engineering (see FLYING MODELS September 1976 and May 1977) and Probar. These units differ from the first type due to their ability to respond to any setting desired with positive control and no over or under ride. The proportional unit has its advantages for the sailor who knows how to use it. It is also considerably more expensive than the first type mentioned. For the beginning and average sailor, the Dumas H-29 is more than adequate to get him going and sailing at an affordable price.

When you get down to the pond on a Saturday or Sunday and you see 10 or 15 other sailors with their boats and friends, you can begin to appreciate the fraternity you have gotten into. As mentioned in the beginning of this article, the AMYA has done a wonderful job in getting other people such as yourselves interested and involved in R/C sailboating. If you don't know of a club in your area, write them and they will tell you who to contact and where it is. If you find there isn't a club, I have a suggestion. Take your boat down to the water and once you're there start counting the people gathering around you and wanting to try it. You'll wonder if you'll ever get a chance to sail your own boat. And that's what it's all about. Having fun and getting other people to enjoy it with you.

I hope those of you who are just starting out find some of these comments helpful and you folk who have been thinking about it a little closer to getting involved. Many people, in many words, have tried to convey the feeling of freedom you experience in sailing. There are really no words, no pictures, no stories that can take precedent over getting involved and doing it and finding out for yourself.

**A Dry Dock Review:**

# Hyde Engineering's

# Scat

When Herb and Ricki Stewart of Rt. 2, Box 220-5, Thonotosassa, Florida 33592, first started talking to me about an ABS plastic tunnel hull I was a bit skeptical. Herb demonstrates the strength of this hull by pounding on it with a metal hammer, or throwing it at a tree or wall. This .100 in.-thick plastic racer is completely joined deck to hull with radio box molded in and cover installed. The transom mounting pad with metal drilled and tapped engine plate, ready to accept your K&B outboard, is also installed.

This is the fastest way to get into the outboard class I know of. You can honestly start on the hull on race day and be in the water in three hours. The only work you must do is put your fuel tank together, put a gasket around the radio box cover, install your radio and push rods plus power plant.

As the boat was supplied to me there were no instructions or templates. Herb and I have put together what I feel is a good set of instructions. These are now supplied with the boat kit. You must realize this hull has a number of positive advantages over other tunnels. One, it comes "almost ready to race" (ARR), structually stronger than any other hull. It is a perfect trainer for the new boater. If you hit the shore or a rock, the material will not shatter like glass or break like wood. World record setter, it's not — 38 to 40 m.p.h. it is. That's competitive, and if you work on reliability and finishing the race, you can and will win a lot of hardware with it. Those of you wanting to buy your way to records, forget that. This a fun boat that can and will get you a tremendously fun class of model boating.

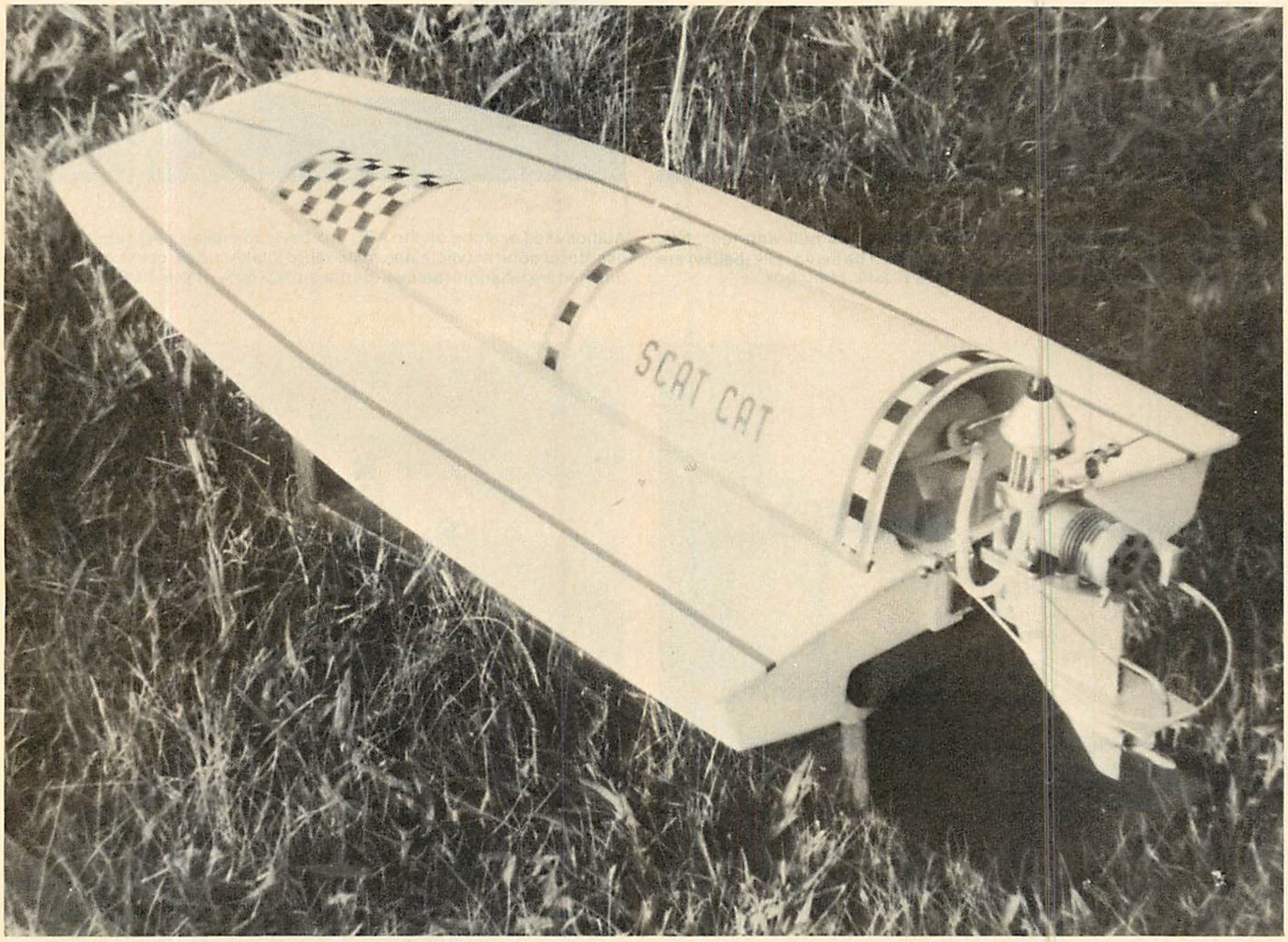
In outboarding, the fledgling boater doesn't need experience setting up end play in hardware, building stuffing boxes, rigging struts, or finding the correct rudder location, etc. By installing your K&B outboard engine you have just done all of the above. K&B has continued to improve their 3.5 cc outboard, and as of this evaluation the stock unit should give many hours of pleasant boating.

At $69.95 for the Skat Kat you don't need to buy radio box, glue, hardware, sealer and paint. You must have a material for "wicking" the servo rails and switch mount in the radio compartment. This can be made by getting a small bottle of acetone from your hobby dealer or drug store and making a syruppy paste by putting the excess ABS plastic in it. Mix until it is thick like honey. You could use a product called DuPont Plastic Cement or a good quality plastic cement that is needed in building plastic

# Kat

Designed by Herb Stewart, this all ABS plastic tunnel hull will get the outboard begginer into the water fast with a strong and durable hull/**Bob Finley**

PHOTOGRAPHY: BOB FINLEY



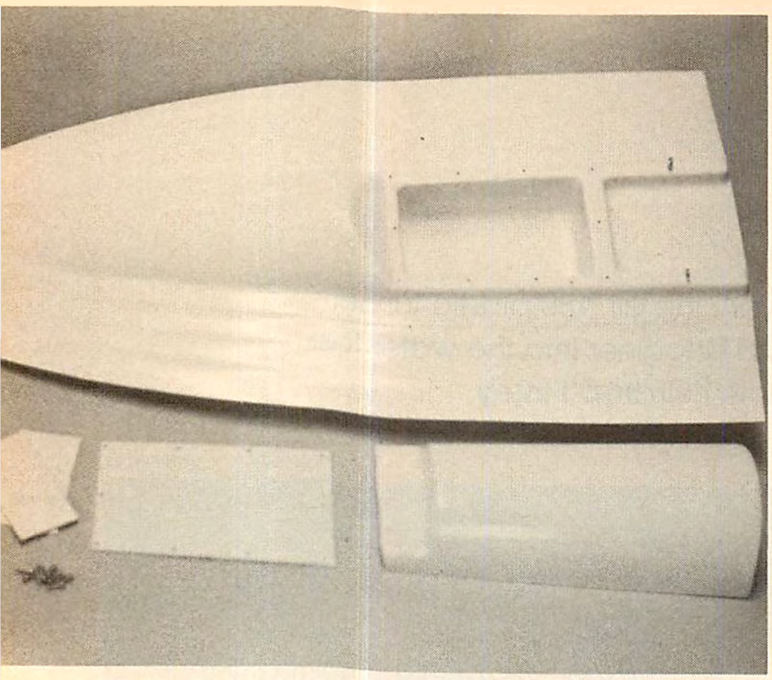

models. A little goes a long way, and be careful as these products dissolve the plastic. If you have time, familiarize yourself with this technique of cementing plastic parts together. By applying a small amount with a tiny paint brush or toothpick to the joint of the two pieces to be "wicked" together, the material will dissolve, run together and become fused as one solid unit. Of course the tighter the fit, the stronger the bond will be.

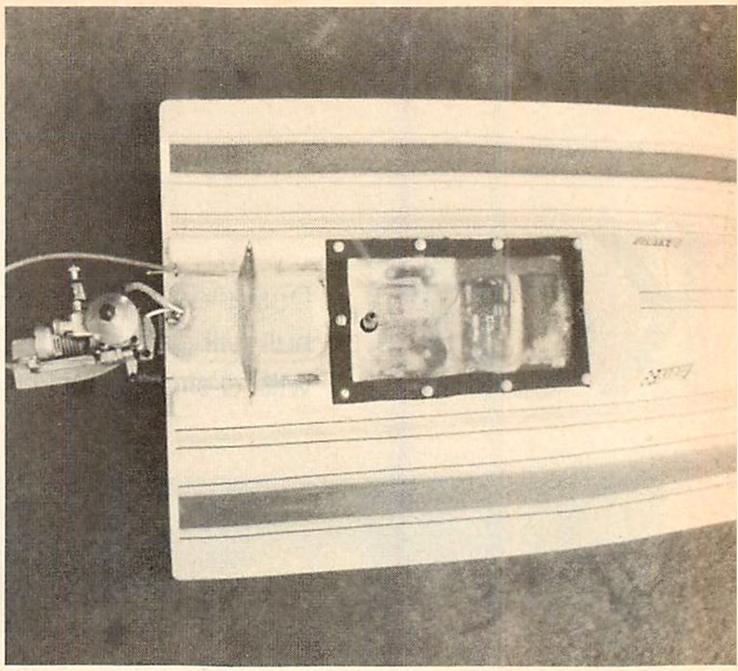
Once the radio compartment is completely finished you can install the on/off switch and push rods for throttle control and steering. I used the Sullivan Gold-N-Rods (GRC-6) for the exhaust throttle control and the left over pieces are then used as guides for the on/off switch and steering rod. Drill a hole to fit tighter around the Gold-N-Rod, then wick the tube to the hull. Care should be taken to insure a straight throw from the servo arm and reduce lost motion or binding.

I prefer Du-Bro threaded ball link sockets which a good friend Dale Haley put me on to. Kwik Links will work equally as well but have more slop in them. The steering rod should be at least a .072" diameter rod; I even like .090". A piece of fuel tubing over the Gold-N-Rod will snug around the rods exiting the radio compartment, and if greased with vasoline or motor oil will make a good and inexpensive water-tight seal.

For a radio box cover gasket, Gary Pruesse has convinced me Ace R/C Inc. #ST1614 Vinyl Sealing Tape is the greatest. It is 1/16" x 1/4" and compresses excellently. Do not overtighten the cover and create scallops which could cause a leak.

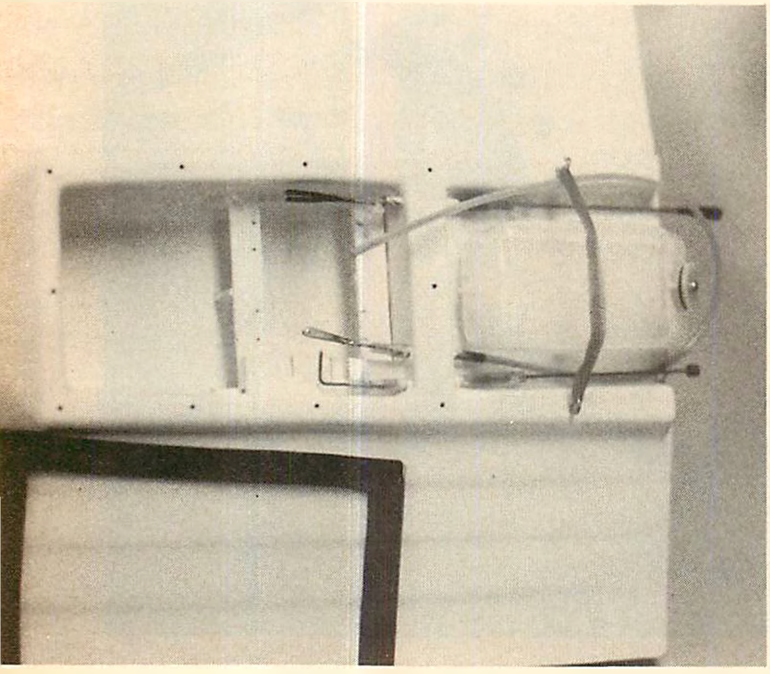
Running the Skat Kat is simple because Herb has eliminated one problem others have not. The Sullivan SS-8 tank is just below the venturi height and only two inches away so the draw problem experienced by other designs is no factor here. The metal engine mounting plate provided has two positions available. I suggest you use the highest of the two positions. Surface prop the engine and use a JG 20 prop. If you then have a hop, the stick on lead can be added for trimming — put it on the under side of the tunnel just under the nose. Try shimming the engine before add-

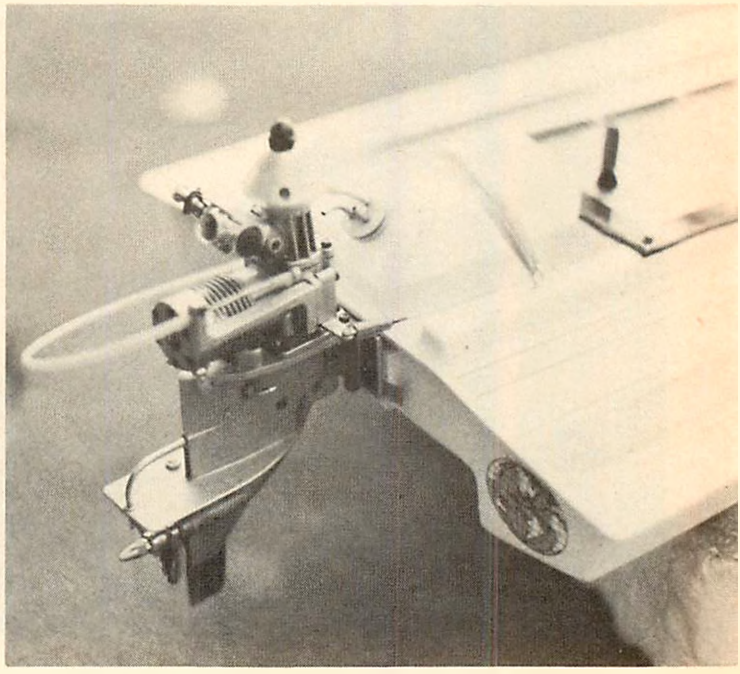




The Skat Kat out of the box has .100" ABS plastic joined hull with radio box cover, screws, fin and servo rail material (**above**). The servo rails (**below**) are shown wicked into place in the molded ABS plastic radio box.

Author used acetone on the ABS box cover to make a paste adhesive. He use storm door acrylic clear material to make a box cover (**above**). The finished installation (**below**). Surface prop 50% of the JG/G-20 blade.





ing weight. You may want to turn the swivel and the mounting plate upside down to get the prop deeper, then the stock zink K&B prop will do a great job, if positioned deep enough. Please sharpen and balance the props. If you shim the engine to plow the nose, take the washers out. The boat should rest on the last five inches of the hull. For more turning capability a trim fin can be installed at, or just behind the center of gravity. This will aid in preventing spin outs and should be on the inside of the right sponson.

Herb sanded the corners of this hull with 100 grit paper, then "Bondo-ed" the edges and wet sanded for a sharp corner but didn't see any great improvement. I didn't do it.

Skat Kat can be painted with epoxy, lacquer, enamel or dope (if put on in thin coats). Sand the area to be painted first with 600 grit paper and wipe clean before applying paint. Monokote, or equivalent can also be applied, plus the many vinyl trim tapes and numbers or decals. This will improve the asthetic value of this stand-off-scale appearing tunnel hull. A Williams Bros. scale driver also looks great in the driver's compartment.

It's worth noting the Skat Kat tunnel won the first Florida outboard as well as the first outboard race in Indianapolis. The hull can be ordered through Herb at H&R Custom Model Boats. He plans a line of full scale unlimited hydros plus Allison and Rolls Royce Merlin dummy engines. There is even a complete ABS plastic radio box available. Drop him a line.

I feel the true builder/competitor would not like the hull for many reasons but, for a beginner, a boater who wants to get in the class quick, club racer, or fun boater, this is the hull. Once trimmed out, and a good sound reliable engine and prop are installed, it's a trouble free unit as long as you want it. You may have to throw it away because it will be around forever. You may train your entire neighborhood on it before you and it gives up.

# Outboard hints and tips

As an ex-full-size outboard racer, the author has some good ideas that apply to model outboards/**Andy Seay**

PHOTOGRAPHY: ANDY SEAY

With the K & B 3.5 outboard becoming more popular, and more people entering the outboard class of model boats, the need is increasing for more ideas on how to make the boat and engine in this class more competative.

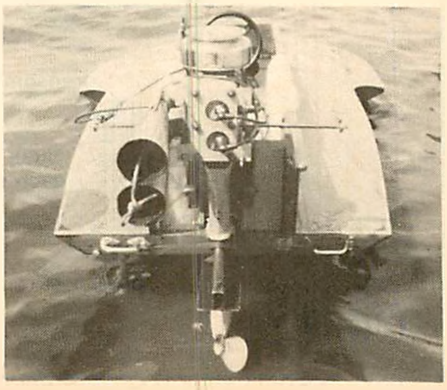
Most of the outboard models tend to favor the tunnel hull design, and are replicas of the full scale tunnel hulls. However, there are some modelers who prefer to put their outboards on deep vees, monos and hydros, such as the Hughey. These are the modelers to whom I direct this article, for I feel that I have a few ideas that might help them. I was involved in full scale racing for seven years and found that some of the techniques we used to make our hydros faster can also be applied to models.

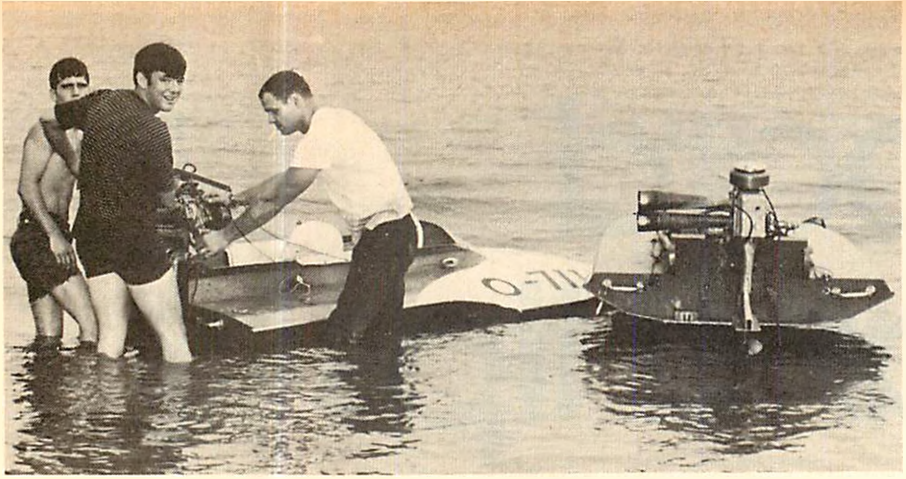
In full scale racing, pitting is done at the waters edge with the boats set on stands. Two types of hulls are used; the hydro which is similar to the Hughey, and the Runabout which is similar to the Mono. Most drivers race two boats, but there are a few who come to a race with four or five and compete in all eight classes.

The race course is set on a quarter mile to one mile oval using three buoy turns and the direction around the course is counterclockwise. There are two heats per class and three laps per heat. To start a heat a two minute gun is fired and the drivers start their engines and get on the race course. As the end of two minutes a one minute gun is fired and simultaneously a one minute clock at the judges stand is started. The clock can be seen by the drivers who try to cross the starting line at full throttle just as the clock hits zero.

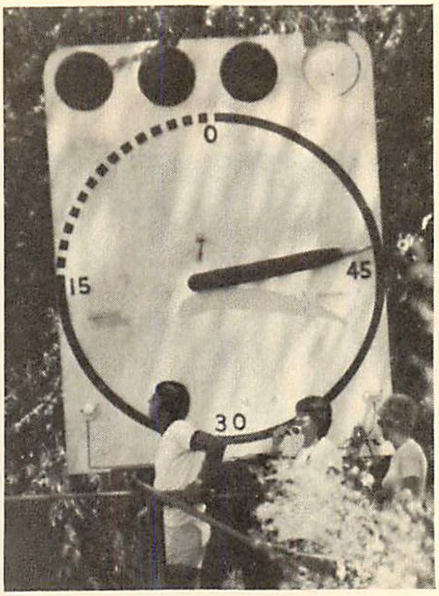
In Oklahoma we ran eight classes: four hydroplane and four runabout. They consist of B-1 class with a 22 cu. in. Evinrude (Hydro - 70 m.p.h. and Runabout - 68 m.p.h.). B class with a 20 cu. in. Mercury

A "B" engine (**below**) on a full-size hydro. This one's a hydroplane, a D hydro (**above**) is the biggest of outboard stock boats. This particular on was National and Oklahoma champion.





An example of how pitting is done with the proto types (**above**), that's a runabout on the right and a hydro on the left. A runabout with a B-1 engine below. This is the clock (**right**) as seen by the drivers as they approach the starting line. There is 45 seconds left



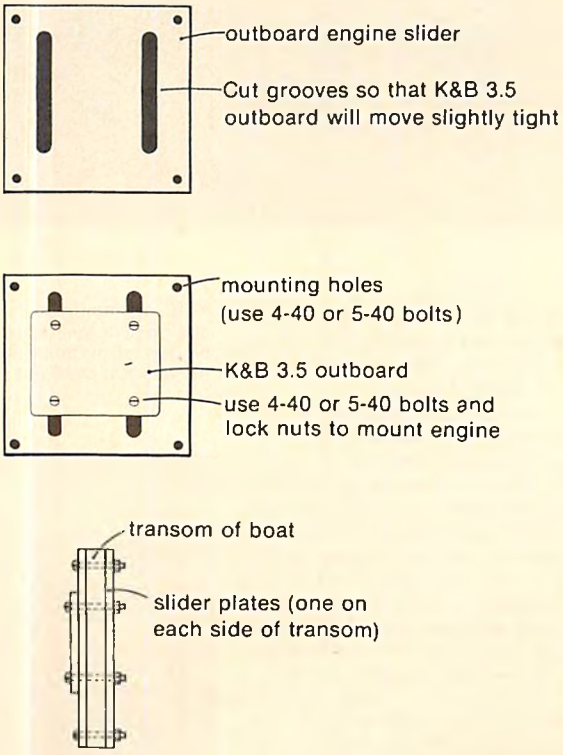




Fig. 1

(Hydro - 75 m.p.h. and Runabout 70 m.p.h.). C class with a 30 cu. in. Mercury (Hydro - 85 m.p.h. and Runabout 75 m.p.h.). D class with 40 cu. in. Mercury (Hydro - 100 m.p.h. and Runabout 80 m.p.h.). The boats are small, ranging from 10'2" to 11'8", and weighing from 95 to 130 pounds bare weight. The engines use a 1:1 gear ratio or a 16:21 gear ratio and are stock. The rules allow some changes such as tuned exhaust pipes.

Now, back to the K & B outboard. As I understand the rules that are being proposed, the basic engine will probably be required to remain stock all the way due to the lower unit. K & B has come out with a unit called the "Auto-Trim" which you will want if you are a serious competitor. We used the same principle as "Auto-Trim" on our full scale hydros, using a thrust socket which allowed us to change the thrust angle of the prop. This can help some boats run faster through the turns.

Another idea for the outboard which would stay within stock regulations would be a device on the transom of the boat that would allow you to adjust the engine lower or higher. We used to jack up or lower our engines to control prop depth as conditions of a lake required. This can increase acceleration and help the engine reach its full potential. It will also help you adjust to different race courses. See Fig. 1 in this article.

I recommend ⅛" aluminum; and use lock nuts on the bolts holding the engine. A safety wire might be advisable from boat to engine.

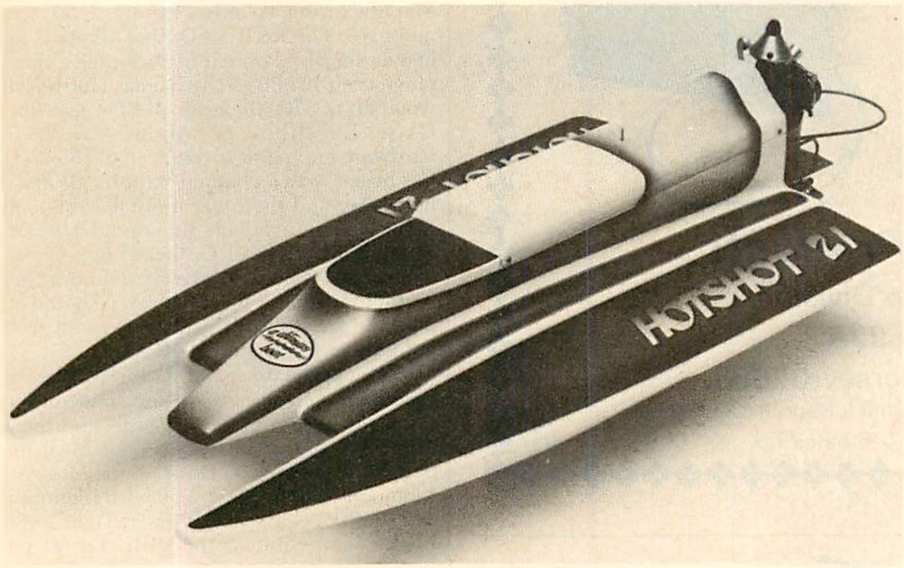
Another suggestion. Don't get stuck on one prop. I know that due to the limited space between prop shaft and cavitation plate not just any prop can be used, but a change could be beneficial. We found that changing props was an effective way to adjust to varying lake conditions such as rough, smooth, clean, or muddy water, and the length of the course should also be considered in prop selection. Not all props from the factory are balanced . . . make sure yours is or it can make pieces out of the lower unit.

If you decide to use a Hughey design, put a small cowl on the front. If the nose rides too high this can sometimes be remedied by making the cowl longer. Sand some of the length down if the nose is riding too low. The cowl will also work on the Mono hulls. Another idea is the turn fin position. We found that the further out on the sponson the turn fin is, the more the boat will slide through a turn. Be sure to distribute the weight of the radio when you install it. The outboard allows plenty of room in the radio box for this.

I hope these suggestions help some of the new model outboarders, and maybe some of the rest of you. If you are thinking of buying an outboard but haven't done so as yet, you have plenty to choose from including a new model called the "Trike" by Bishop Marine Designs. I understand the prototype ran quite well and can handle a lot of speed and wind without flipping. Also you might try getting the large Hughey Hydro and building a tunnel into the bottom. This will make it basically a true 4 point Hydro. The large Hughey is just as long and wide as the successful Lil' Lightening tunnel hull.

Whatever hull you buy be sure to make only slight adjustments when testing. Radical adjustments can prove fatal in full scale and destructive in models. Have fun and good luck!

# Letter Rip!




**DUMAS PRODUCTS, INC.**, *790 S. Park Ave., Tucson, AZ 85719* has introduced a longer, wider, pickle fork version of the famous Hot Shot which came out last year. The new Hot Shot 21, in easy to build fiberglass, is designed for the K & B 3.5 outboard and has demonstrated great speed and handling characteristics in pre-production testing. Length is 27" and bean is 14". Retail price is $67.95. The Hot Shot 21 is a very realistic model of current, full size "clamp on" tunnel hull race boats.

### R/C Outboards - The new class in town

What is the quickest, easiest and least expensive way to get into model boating? I think the answer has to be the new outboard class. In August of 1976, K&B Manufacturing presented the model boating enthusiasts with a whole new way to go model boat racing or just messing around. Mating their highly successful .21 cubic inch powerhead to a specially designed model marine lower unit, the folks at K&B Manufacturing brought out the first truly competitive model racing outboard for R/C model boating. There had been other model outboards prior to the K&B. However, none of them matched the power of the K&B .21.

What are the advantages of the model outboard for the beginner? Let us examine why the outboard offers the easiest entry into R/C model boating at this time. One of the biggest problems confronting the beginner to model boating is the installation of the model marine engine and running hardware. Motor mounts, engine bearers, stuffing boxes, driveshafts, flywheels, universals, prop struts, rudders, thrust bearings, drive dogs, set screws and alignment problems are part of the components confronting the novice model boater as he/she attempts to get the power from the engine to the prop. The model outboard eliminates all of those bothersome items from the "must be done before boat goes in water" routine. The outboard has all those items built into the unit. With the drilling of four holes in the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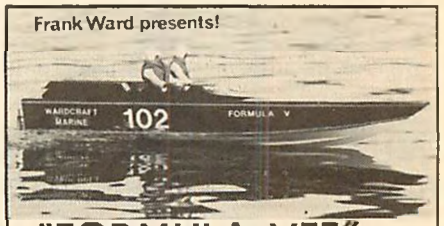
transom of a boat, the K&B .21 outboard is ready for control linkages and fuel line. The outboard unit can be used on a variety of hull types very successfully. The two most popular types of model outboard hulls in the Northwest have been deep vee and tunnel designs. Most hobby shops now carry a number of different hulls that are well suited for the K&B .21. At this time, K&B Manufacturing is only offering a .21 size outboard. The K&B .21 Outboard retails for just under $10. Popular boats for the engine range from $23.00 for the Dumas Hotshot all wood kit to $70.00 for the all fiberglass R/C Glass Excaliber II. About $20.00 in hardware and paint is required to complete the boats. A two channel radio is all that's necessary and there are a number of good radio systems available for around $100.00. Starting the K&B .21 Outboard requires an electric starter and they go for around $35.00 (without the battery). However, it should be possible to get started in this class with good equipment for around $300.

Model outboard racing in the Northwest has taken on a semi-scale appearance. The boats must be tunnel type hulls and there are at least four good designs available to the beginner: the Dumas Hotshot, the Midwest Klampon-Kai, the Steve Much Lil Lightning and the R/C Glass Excaliber II. To be eligible for competition at the District level, the boats must be painted (paint scheme to reflect full scale tunnel boats), display racing number and a scale dummy driver must be in the cockpit. The engine must remain in stock condition. No "hopping-up" is allowed in this class. Even with this stock engine rule, these mini air-trappers can reach speeds of 40 m.p.h. Outboard tunnel racing, mini size, usually takes place in two types of events. The first is enduro racing for a specific period of time, usually five or ten minutes. In the ten-minute event, a required pitstop is often part of the action. The boat and driver accumulating the most laps after a certain amount of time is the winner. Reliability, as well as all-out speed, is important in enduro racing. The other event is heat racing. This event calls for the boats to race around the course for a certain amount of laps, usually five or six. In enduro racing, the starts are normally modified LeMans starts with the engines not running until the starting signal is given. Once the starting signal is given, the engines are started and there is

Frank Ward presents!

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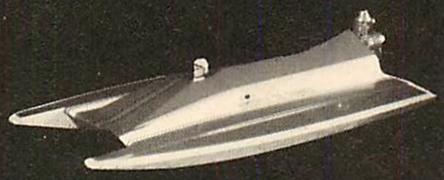

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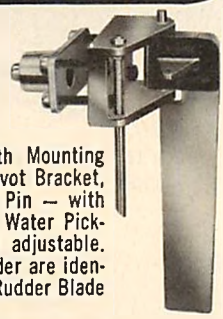

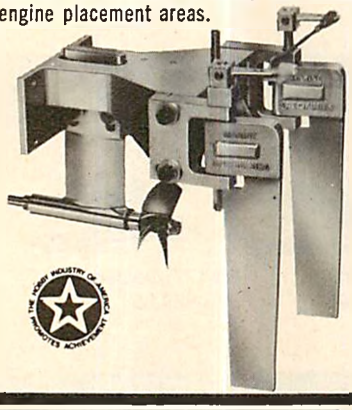

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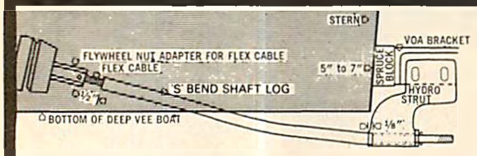


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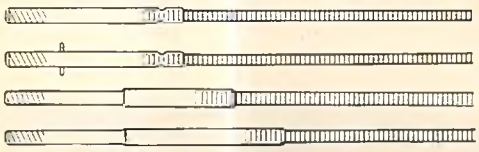

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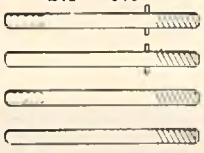

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a mad dash to get the boats in the water. Heat racing uses a clock start format. Here the boats are allowed to start prior to the beginning of the heat. They enter the course during a two minute starting period. At the conclusion of the starting period, there remains thirty seconds of mill time. The boats make a flying start trying to hit the starting line right as the clock signals the start. The current record for a tunnel boat in a .9 mile heat race is 1:57 held by a modeler from the San Francisco area.

Interest seems to be growing in the model tunnel racing class. It is offered as a separate class at many races around the Northwest. The Northwest currently leads the nation in developing a special racing class just for outboard tunnel hulls. There is a good possibility that the class will soon become the most popular form of model boat racing in the Northwest. More information can be obtained about model outboard racing by contacting the District 8 Director, Jerry Dunlap, 6702 Mt. Tacoma Dr. S.W., Tacoma, WA 98499, 206/584-7131.

## Seventh Annual Santa Barbara O/D ACCR

ACCR-American Class Championship Regatta. To the serious R/C sailboat skipper, attending this clambake is as important as the Nationals are to the topnotch R/C fliers—for this is the Nats of R/C boating for each individual class.

This year, the Santa Barbara One Design ACCR was hosted by the Chicago Flotilla and held in that city on August 16 and 17. Even though this was in the middle of the week, some 20 skippers attended and engaged in some very close and exciting racing.

Tuesday started out sunny with the winds in the 15 m.p.h. range; however, by the end of racing in the afternoon, the winds had increased to 20. Then, on Wednesday, even though it was sunny, the winds got up to around 30 m.p.h. These strong winds did point out one thing to all the skippers—it's best to make sure all fittings are snugged up good and everything is in top order—there were 2 or 3 dismastings to show what happens when everything isn't snugged up. This is akin to you power boys having the motor drop out of the hull.

On each day, 7 races of 3 heats each were sailed, so everyone competed in 14 races. When all the tabulations were made, the winner was Chuck Black by a very comfortable margin. After watching him sail, one realizes that here is a skipper who always knows just where his yacht should be, gets it there with a minimum of fuss, no lost time or motions, and makes very few mistakes.

Special thanks went to the host club and to the Regatta Committee of Tom Bermann, Jeff Gros, and Bill Payne and also to the wives of the club members for providing a pondside lunch on both days.

## Third Annual 50/800 ACCR

The bash was over in Chicago for the 36/600 and Santa Barbara class regattas, so now the whole thing was winding up with the 58/800 ACCR held in Indianapolis on the 20 and 21st of August.

There were 28 skippers on hand for this last big sailout of the ACCRs, three of them, to be held in a week's time. The big question was if Chuck Black could take this ACCR and make it a clean sweep of all 3 of them. He was up against some tough competition

in this one, as was the case of the previous two. He was sailing against his brother Buddy, Ray Ozmun with a new yacht of his own design and who came in second to him at the 36/600 ACCR, and others like Rich Matt, Don Prough, and others that seem to have a knack for "putting it all together" in competition. His sailing would have to be error free if he wanted to take this one.

Saturday provided clear and sunny skies and a total of 7 races of 3 heats each were sailed. By day's end, Rich Matt was in first place, Ray Ozmun held down second and Buddy was in 4th. That evening the AMYA Annual Meeting was held with 70 to 80 attending at the Sherwood Inn. This consisted of dinner, business meeting and having a good ole time of it.

Sunday morning everyone wonders if they had too much of a good ole time of it. After checking with one another the conclusion was they hadn't—it was just a dismal overcast morning and pretty cruddy. Not to worry at all, on with the sailing and the regatta, which was done under the aforementioned skies and 8 to 10 m.p.h. winds. Then, in midmorning, the sprinkles started and by around 11:30 turned into a real downpour. This halted the racing for a while but after about an hour it slacked off to allow the racing to continue.

A total of 12 rounds were sailed and after it was all over the victor was Buddy Black. The final score shows how close it was—Buddy edged out Ray Ozmun by ¼ point!

Thanks goes to Ted Brindle, the Regatta OD, all the out-of-town people who helped so much, and finally to the wives who always help so much so the men can play with their toy boats!—ROGER G. BARD.

### IMPBA Roostertail

This month I would like to say a few words about model boating from the spectators viewpoint and what we can do to improve it. How many races have you seen with seven boats starting a race and only one finishing? What can be more disappointing to the spectators or for that matter to us the boaters? We should try to stop getting that last click out of our engines and try to concentrate on reliability and finishing races. After all, what kind of competition is it to be run alone? Finishing races and reliability are shown to be especially important at races like the Indy Unlimited and the Southern Gentlemen Invitational where we have five heats to finish. If you finish all five heats you are almost guaranteed a spot in the top ten places. Perhaps establishing more regattas that consist of five heats are needed so that reliability and finishing becomes more important. Come on guys, lets start finishing more races.

Another disappointment to the spectators are races with only two or three boats, unfortunately the problem relates to the number of boaters who are running an 72 Mhz. As Gene Klisnick wrote in his letter in the March issue of FLYING MODELS, the only problem with 27 Mhz radios are the guys who are installing them and trying to keep them dry. I, like Gene, am also running running on 27 Mhz. I am afraid we have reached the day when the clubs are going to have a


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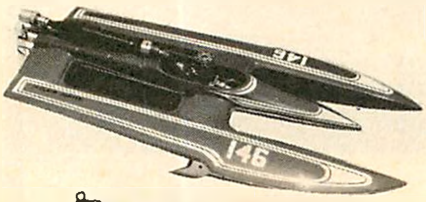


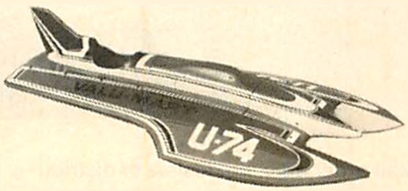


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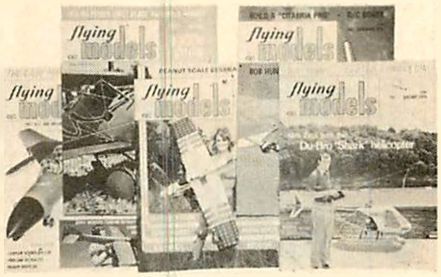

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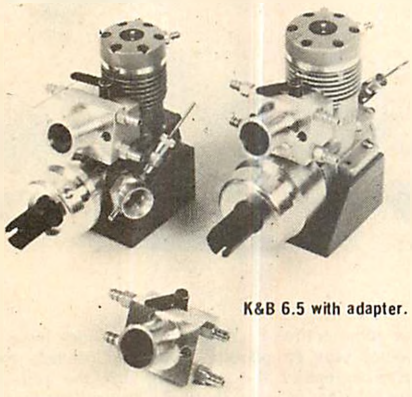

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force pre-registration and limit the number of entries on each frequency. I don't know any other way to solve the problem outside of getting frequencies on a new band to replace those we have on 27 Mhz. Hopefully more boaters will start using 27 Mhz to help resolve our problem of two boat heats.

Recently I have been asked about establishing records for the scale Hydro and Outboard classes. My opinion is opposed to establishing these records. The purpose of the Scale Hydro class is to build replicas of the real Unlimited Hydros. As soon as a set of records is established speed will become the major criteria. In order to achieve greater speeds hull designs will change and the pure scale aspects will go by the wayside. I think this would be against the intention of the class and would help to destroy it. As far as the Outboard class goes, I think it is a class which is appealing to a whole new group of boaters. This class is presently oriented towards sport boaters and is getting a considerable following from the women and some of our younger boaters. The speed of the outboard class is one of the contributing factors. Allowing records for this class will distract from it's appeal to the sport boaters and it will also increase their speeds at a more rapid pace. The final reason for opposing these records is that the hot rod boaters already have ten classes for their records, why do they need two more? Lets help keep these two classes as fun classes.

In the March issue of FLYING MODELS Bob Staat was requesting more sport racing classes especially for the new members. I think that the scale hydros and the outboard classes presently are sport classes and I

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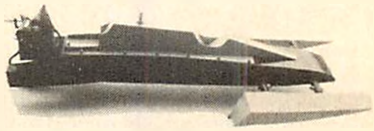

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would like to keep them that way. A sport .60 class is presently being run in Florida. The class consists of conventional style hulls which look like the real hydros but are not necessarily styled after any particular Unlimited hull. This class is not nearly as fast as the .60 outriggers yet offers plenty of excitment.

I have recently been informed about a cheap, effective handle to be used for a launching handle on our hydros. It's a plain, ordinary cabinet handle which can be purchased at any corner hardware store. Don't forget Toledo on April 7, 8, 9. If you've never been there it is a great opportunity to see all of the equipment that is available. It is also a good opportunity to socialize with all your fellow modelers. Check the FM Timetable for the listings of all the upcoming IMPBA races and time trials. Please feel free to contact the district director in your area if you have any questions about joining the IMPBA or model boating in general. A list of their names, address and telephone numbers accompanies this column. There is also a coupon in this issue for joining the IMPBA. If you're not yet a member, join us—LEN SKWIERA, President IMPBA.

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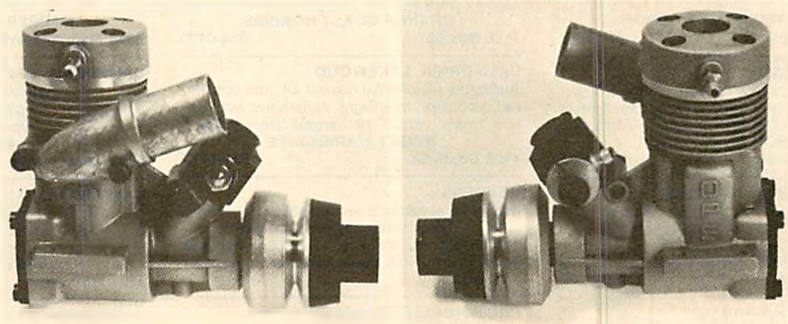

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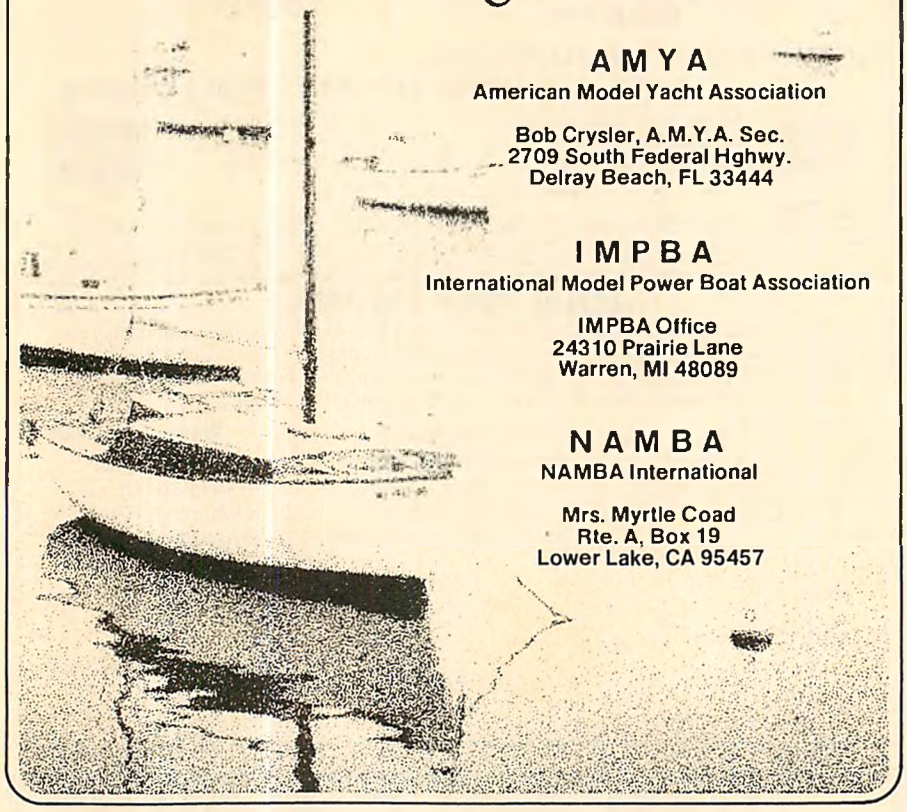

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