

SOS flight judges guide • Aeronca C-1

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FLYING
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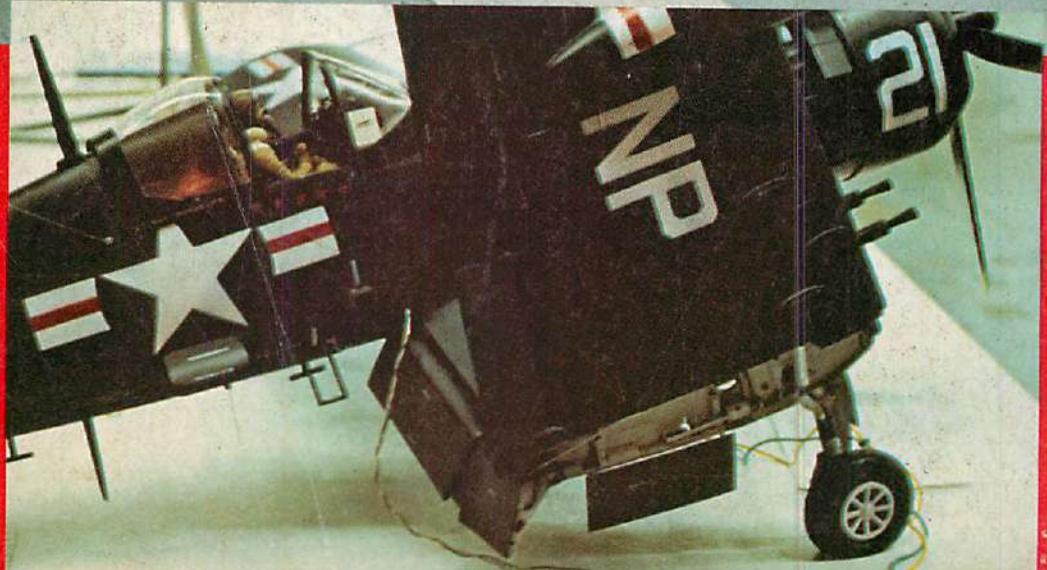
1928-1978
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R/C Boats

Stall-proof Gassie
a FLYING-ACES reprint



WRAM 1978



PHOTOGRAPHY: FRANK TIANO

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dumas
boats

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flying **models**

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1928



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on the cover

Jim Fundak of Rosedale, Long Island, New York took first place honors in Military Post WWI Scale at the 1978 WRAM's Show with this very detailed F4U Corsair. WRAM Show coverage is on page 28 of this issue. Photos by Frank Tiano.

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Buried under Business

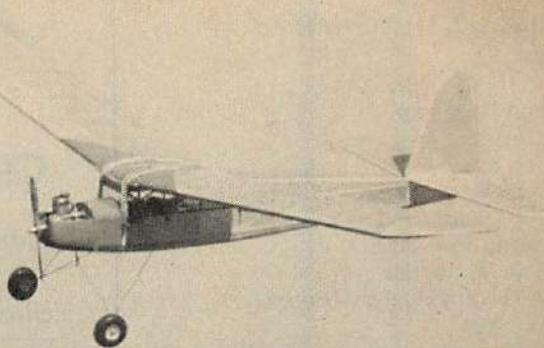
Parliament can have it's Procedure. We're all for orderly business gatherings, but if ever there was a stifling influence on the aeronautically minded it is the monthly model club meeting gone overboard on rules and regulations. It's all important, every club has it's share of grass to cut, ruts to fill and affairs to be decided. A shame though, almost always the matters at hand consume the evening without much emphasis on the real reason for being together, the care and feeding of cantankerous aerial contrivances.

Maybe the thing to do is to get back to the basics of flight. A little hand-launch gathering at the corner field in the summer's evening hours before the meeting. We kind of hardly ever missed a Wednesday's meeting years ago with the old "Prop Spinners" club. 12" span was the limit, and gliders howled upwards before every meeting for years. I think when that site was gobbled up by a building the club dwindled slowly in enthusiasm.

You know you really could condense the club business a bit if it was more fun to fly into the twilight. And break again when all is done for a pizza. You'll find that what you've just done is to put some of the spirit back into the sport. It's more fun to fly and eat and sling the stories than to argue over who can get the club shirts flocked for 10¢ less. ☺

FLYING MODELS

Fiftieth Anniversary
Old-Timer Fly-In



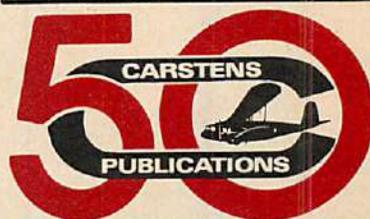
May 7, 1978

Come and help us celebrate!

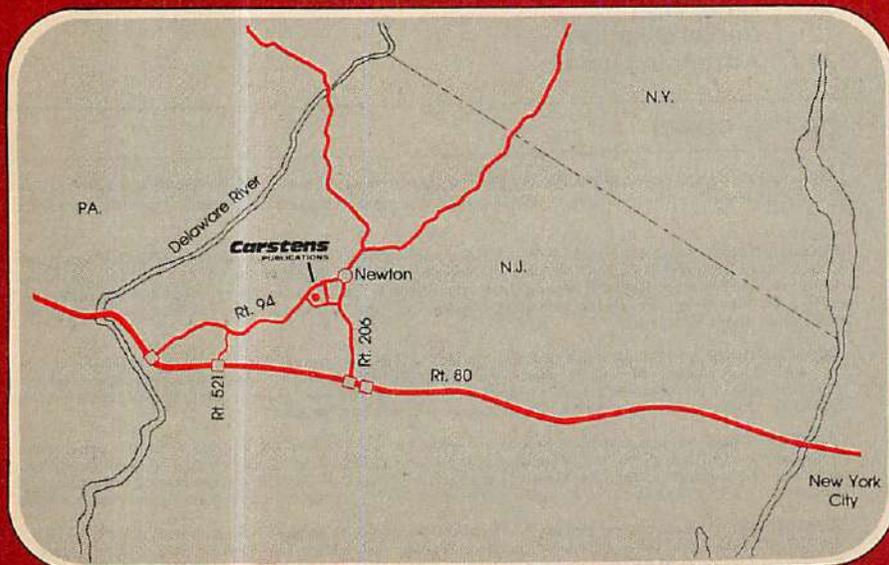
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020 Electric F/F rules:

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.

Air Mail

readers' forum

Electric seaplanes

I see in the *Air Mail* column in the April 1978 FLYING MODELS that Robert Mark has tried electric seaplanes. A couple of years ago I designed and flew a small flying boat for the Boeing Hawks show at the Pacific Science Center out of a small pond. I hand launched it and did water landings. Since it is powered by an Astro Flite 020 I haven't tried to ROW (don't know of any Cox .20 seaplanes that ROW either), but it does handle nicely on the water. It weighs 18 oz. with two channels, 33" span, 172 square inches of wing. It climbs out nicely and flies about five minutes.

The Ranger 42 with an Astro Flite 05 normally comes out at 36 oz.—those floats must have been heavy to bring the weight up to 50 oz. It flies okay at 36 oz., but the Electra Fli does much better with the 05, in fact, with light floats, I think it would ROW, perhaps Robert should try it. Normal weight for the Electra Fli with an 05 is 32-34 oz. two channel and it should be okay up to 42 oz., so even 10 oz. floats would work.

I also have flown a lot of Astro 05 gliders, my present flying planes include an Astro High (original) 28 oz., 72" wing, 450 sq. in.; an Electric Drifter, 34 oz., 72" wing, 550 sq. in.; and an Olympic II, 46 oz., 100" wing, 920 sq. in. They all fly quite well, typical altitudes are 500-700 feet on one charge and seven minutes in still air. My favorite is the Olympic II as it's very majestic in the air. I tied for first with it in the *Model Builder* all-electric contest in January. It is stock except for the fuse which is $3/32$ -inch balsa sheet with $1/64$ " ply doubler back to the trailing edge. Total structure weight is 22 oz. Most stock Olympics here weigh about 40-42 oz. without the electric power, so I saved a lot of weight in that fuselage.

MITCH POLING
Seattle, Wash.

Reliant in Finland

I have been a subscriber to FLYING MODELS for some years now and thought I'd share my newest project with you. This Stinson Reliant is my first aileron equipped ship and

my second proportional R/C ship. The photo was taken at Jami (an old glider and sailplane pilot training center) during Easter of 1977. The intention was to make the maiden flight but due to the rather strong winds and my more experienced fellow club members scepticism in the Stinson's flying abilities we postponed it. Some weeks later she was uneventfully airborne. Recently I flew her alone and a fellow flier arrived and talked me into flying her inverted. I turned her on her back and she hit the ground. She's flying again today. Thanks for a great magazine.

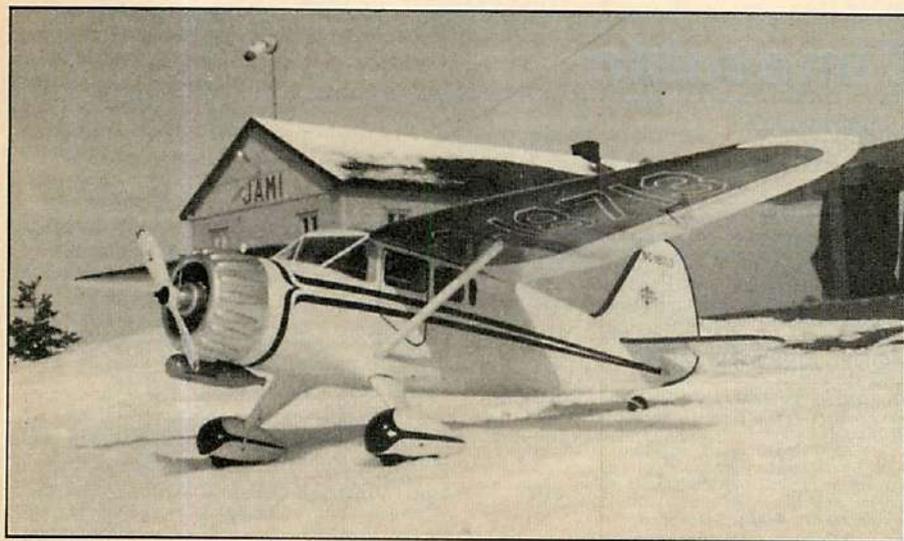
ERIK BJORKELL
Tanpere, Finland

Judging the judging

I have just read Frank Tiano's article in the March issue, "Judging the Judging." I agree with most of what you say, but would like to qualify my statements. I am *not* a scale flier—I fly pattern these days and a good bit of your criticism could be applied to the judging of pattern as well. I like to think that most of the people involved in this fantastic sport/hobby of ours can use their heads intelligently, but I only see glimpses of this occasionally. First of all, a contest is supposed to be run for the contestants, so that they who pay their hard earned entry fee can enjoy a day of competition and comradery. One way to help toward this end is more consistent judging by the book.

Static judging: This, if done properly by the book, is only partially subjective. There are definite criteria by which the model is judged. I think all scale judges should be competent builders, not necessarily scale builders, but able to follow the entrant's documentation and tell whether or not the model follows the subject's outline and color scheme. We probably should have a national judges' organization, USPJA, or similar, which would standardize judging procedures and hopefully, techniques.

Flight judging: I have judged scale flying, a not too unpleasant task but think some knowledge of the full scale subject's capabilities would help here. My biggest gripe



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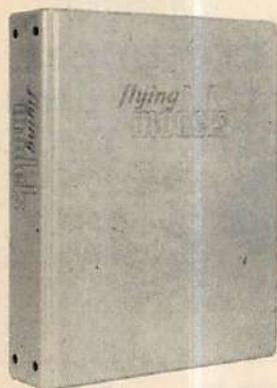
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for all flight judges is that they be seated at least 6-feet apart, not shoulder to shoulder. I don't think that bonus points should be given for flight options such as retracts, flaps, bomb or tank drops, etc. I do feel that points should be subtracted if the scale subject has these options and the model has them and they don't work, or if the model doesn't have them at all.

Most modern jet fighters can do axial rolls but you won't see them from most of the WWI or WWII types. The fact that they raise the nose slightly only compensates for that loss of airspeed during the maneuver, causing the nose to drop.

The biggest problem is how do you keep average Joe Blow scale judge from being highly impressed by the "Biggies" who come to his contest, or how do you overlook all that precision detail on that sport scale bird? I have often said that I would like the judges to be able to see only the aircraft as it performs its schedule of maneuvers and not the pilot moving the sticks. Judges must be trained for the job and your article forms a good basis for this training.

DICK BASSANO
Bethpage, N.Y.

Looking for rubber

I would greatly appreciate any help you could give me regarding a source or sources where I could order, by mail, basic components for building rubber-powered flying model airplanes of the stick type and semi-scales. I'm referring to strand rubber by the foot, a good grade of Japanese tissue, rough shaped balsa props, wheels, nose buttons and flattened and drilled thrust bearings. I would like to interest a group of youngsters in the pleasures of flying models.

EDWARD OLESAK
Alpena, Mich.

Contact Vintage Aero, 1 The Glen, Tenafly, NJ 07670; Peck Polymers, P.O. Box 2498-FM, LaMesa, CA 92041, and Aircraft Model Products, P.O. Box 318, Scituate, Mass. 02066 and Old Times Models, P.O. Box 18002, Milwaukee, WI 53218—Ed.

February cover

Those Taubes are gorgeous! That's how a flying machine should look, proper and birdlike. I'm almost done with my Etrich Taube from FM. In answer to your question—yes, more Taube plans would be

great. As for power, how about a Jetex or Ducted fan? (Only kidding!) Seriously, I'd like to show up at the next contest with a Peanut Scale Taube, preferably one of the cleaner versions and having a non-Rube Goldberg undercarriage. A dual article having built-up or all sheet versions of a 1911 Deperdussin peanut. Keep up the handiwork, there are too many ARF, glass-foam no talent-required planes out there.

TOM ELLIOT
Culver City, Calif.

More FLYING ACES

I go along with the letters in the April 1978 FLYING MODELS that ask you to continue to reprint portions of FLYING ACES as a regular feature. I especially enjoyed seeing the pictures of Bill Gough and Carl Goldberg on page 49. They are both still active after being in this hobby for many years.

CHARLIE SOTICH
Chicago, Ill.

How about some Phineas Pinkham stories in your FLYING ACES section?

JIM MORRIS
Ashland, Ore.

I'm glad to see you reprinting some of the old FLYING ACES material. One of your readers suggested reprinting plans for the Moth. Let me second that suggestion. That ship drew more mail than all the others combined. Also in reprints—the series Trail Blazers by Henry Struck in 1938 and 39. A great aviation history series. For the "quick-ee" builder, how about any of the Garami all-sheet jobs and stuff like the Christmas Stick and the Snoony Silhouette? Let's see some of those old rubber scale ships as well as the "gassies" and maybe even a Pinkham or two. Regards from a 40 year reader.

JOHN B. MARTIN, JR.
Miami, Fl.

I would like to express my appreciation for your reprints of construction articles from FLYING ACES magazine. They have caused great interest in me for models of that era. Would you please print a construction article on a scale model from that period? Your first four reprints dealt with sport models and I'd be interested in seeing how they treated scale efforts.

CORUM CHAN
Daly City, Calif.

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.

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. Mullfers required for all engines over .15. Contact: Graig Knight, 11 Broadview Dr., Sault Ste. Marie, Ontario, Canada. 705/949-6893.

RHINEBECK, NEW YORK—June 24, 25. Second Annual Rhinebeck Classics Meet hosted by the Mid-Hudson R/C Society at the Old Rhinebeck Aerodrome. For F/C ships modeled after airplanes of the Classic era 1919-1937. This year the rules call for the airframe and markings to be accurate. Events will include AMA Scale, AMA sport scale, Barnstorming and time trials. Contact: Vance Sutton, 21 Greenvale Farms Rd., Poughkeepsie, NY 12603.

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.

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.

R/C BOAT CONTESTS

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.

CHESAPEAKE, VIRGINIA—May 6. IMPBA Record Trials, all classes hosted by the Old Dominion MBA at Indian River Lake. Contact: Randy Williams, Rt. 1, Box 234, Camden, North Carolina 27921. 919/336-2259.

HAMMOND, LOUISIANA—May 6, 7. IMPBA Record Trials hosted by the Southern Gentleman Racing Association at Miller-S Pond. Contact: Louis Durand, Jr., 4400 Ithaca St., Metairie, LA 70002. 504/887-4986.

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 Trials hosted by the Gold Coast Racing Team at Lake Palmetto. Contact: Don Pinckert, 3265 Franklin Ave., Miami, FL-33903. 305/446-5358.

WHEELING, ILLINOIS—May 7. IMPBA Heat Racing hosted by the Racing Dolphins at Potawatomi Pond. Contact: Mert Mishnick, 914 Robert Dr., Mt. Prospect, IL 60056. 312/437-2094.

FREMONT, CALIFORNIA—May 13-14. NAMBA District 9 points, Heat Racing: Sat. Hydro, Sun., Mono hosted by the Sacramento Model Boat Association at Kaiser Pitt AHF. Contact: Fred Standa, 4881 Kipling Dr., Carmichael, CA 95608. 916/465-1904.

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

BATAVIA, ILLINOIS—May 13, 14. NAMBA Heat Racing Deep Vee hosted by the Bulkheads at Batavia Boat Club on the Fox River. Contact: Orvin Erikson, 201 Locust, Aurora, IL 80506. 312/879-8139.

CALGARY, ALBERTA, CANADA—May 13, 14. NAMBA District 16 points, Enduro, A, B heat racing, OB, Scale hosted by the Buoy Busters of Calgary at Lake Carburn. Contact: Douglas Sick, 1616-11th Ave., N.W. Calgary, Alberta, Canada T2N 1G9. 403/289-7578.

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

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 Presse, 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.

FARMERS BRANCH, TEXAS—May 27-28. Heat Racing, Deep Vee hosted by the Dallas R/C MBC at Lake Nitro. This is the 3rd Annual Muscular Dystrophy Charity Race. Largest race in Southwest last year. Trophies in all classes including High Point. Contact: Jim Hopkins, 3473 Pine Tree Circle, Dallas, TX 75234. 214/243-0271.

EDMONTON, ALBERTA, CANADA—June 3, 4. NAMBA District 16 points enduro, heat racing, Deep Vee, Scale hosted by the Edmonton MBRA at Edcon Pond. Contact: Paul Omerzu, 15710-89th Ave., Edmonton, Alberta, Canada. 403/489-3494.

YONKERS, NEW YORK—June 3, 4. NAMBA Dist. 1 points, Heat Racing hosted by the Empire Racing Association at Tibbets Brook Lake. Contact: Fred W. Coleman, 23 Park Circle, White Plains, NY 10603. 914/428-5686.

INDIANAPOLIS, INDIANA—June 3, 4. IMPBA. Indy Unlimited hosted by the Indy Model Boat Club at Dandy T Lake, 3307 Dandy Trail. Contact: Jim Alexander, 2607 E. 57th St., Indianapolis, IN 46220. 317/255-7410.

CLEVELAND, OHIO—June 10, 11. IMPBA Multi-Racing for Monos and Hydros hosted by the Cleveland MBC at Clare-Mar Lakes. Contact: Mike Bokulich, 916 Columbia Dr., Amherst, OH 44001. 216/988-2345.

BRISTOL, PENNSYLVANIA—June 10, 11. IMPBA Oval racing, hydros only hosted by the Del Val MPBA at Magnolia Lake in Silver Lake Park. Contact: Nick Monti, 402 Swarthmore Ave. #A, Ridley Park, PA 19078. 215/487-0246.

EL MONTE, CALIFORNIA—June 10, 11. NAMBA Dist. 9 points, heat racing hosted by the Prop Nuts at Legg Lake. Contact: Leonard Feedback, 7906 Spinel Ave., Cucamonga, CA 91730. 714/987-2863.

PORTLAND, OREGON—June 10, 11. NAMBA Enduro, Scale, Deep Vee 40. A Outboard hosted by the Rose City MYC at Lake Force. Contact: Dave Blacksten, 880 NW 6th Ave., Canby, OR 97013. 503/266-4186.

LUBBOCK, TEXAS—June 10-11. NAMBA Dist. 7 points, Enduro, Heat Racing hosted by the West Texas Water Wizards at South Park Inn. Contact: Bob Baker, 1915-43rd Lubbock, TX 79412. 806/744-8136.

HARTFORD, CONNECTICUT—June 17-18. NAMBA Deep Vee racing Classic hosted by the Greater Hartford MBC and Leticia Corporation at the Connecticut River, junction 191 & 86, Contact: Robert E. Triggs, Jr., 3 Riverside Dr., Vernon, CT 06066. 203/871-0134.

TOLEDO, OHIO—June 18. IMPBA Unlimited race hosted by Propwash Unlimited at Lake Moon. Contact: Ron Haddad, 717 Chestnut St., Toledo, OH 43604. 419/243-4352.

FLINT, MICHIGAN—June 23. IMPBA Record Trials hosted by WMRBA at Thread Lake. Contact: Lou Totovich, 17641 Rowe, Detroit, MI 48205. 313/526-6909.

BELLE ISLÉ, DETROIT, MICHIGAN—June 24. IMPBA Hydro Only Multi Race—Mini Gold Cup hosted by WMPBA at Blue Heron Lagoon. Stay over one day and see the full-size Unlimited boats run on the Detroit River. Contact: Lou Totovich, 17641 Rowe, Detroit, MI 48205. 313/526-6909.

TACOMA, WASHINGTON—June 24, 25. NAMBA Dist. 8 points, heat racing, Deep Vee hosted by the Puget Sound MBC at Lake Waughop. Contact: Jerry Dunlap, 6702 Mt. Tacoma Dr., S.W., Tacoma, WA 98499.

DATELINES

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

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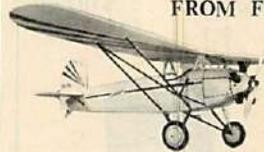
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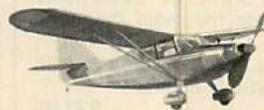
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Flying Report

news and comment

Circus Circus' Bill Bennett lucky recipient of Walt Billett Trophy

Bill Bennett, of Las Vegas' famed Circus Hotel, was the lucky recipient of the infamous Walt Billett Loving Cup, awarded at the annual business meeting of the Hobby Industry Association of America, Inc., in Houston, Texas.

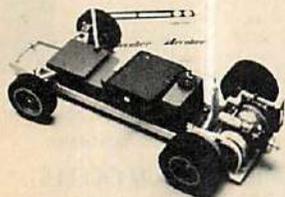
Bennett, a long time devotee of radio controlled model aviation, has been instrumental in furthering the cause of model aviation during the past few years with sponsorship of the Las Vegas Tournament of Champions cosponsored by *Model Airplane News*. The four-foot high cup is difficult to transport and winning recipients are rumored to return it to their offices securely strapped to a first class airplane seat.

control model aviation, has been instrumental in furthering the cause of model aviation during the past few years with sponsorship of the Las Vegas Tournament of Champions cosponsored by *Model Airplane News*. The four-foot high cup is difficult to transport and winning recipients are rumored to return it to their offices securely strapped to a first class airplane seat.

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The 1977 recipient of the infamous award was Roy Gelber, Model Rectifier Corporation, who was obviously relieved that he had found someone worthy of receiving the trophy. The Walt Billett Loving Cup was originally dreamed up by the late Walt Billett to suitably honor those who have contributed to the advancement of model aviation. The names of all previous recipients are inscribed on the cup, which reads like a Who's Who of Model Aviation. Among past winners are many high ranking naval aviation officers who for years were instrumental in promoting AMA activities on their various bases. Others are persons who actively promoted model aviation in some manner. Among recipients was FLYING MODELS own Hal Carstens.

For many years the Cup was presented by the Flying Eight Ballers, an industry group who promoted AMA. More recently the activity has been carried on by the Model Aviation Section of the Hobby Industry Association of America, Inc. Started as a fun thing, the Walt Billett Cup has come to be

the model airplane industry's own unique way of honoring those of its own who have in some unselfish way benefited the growth and advancement of the world's greatest hobby.

Johnny Clemens Honored by Industry

Johnny Clemens, Dallas hobby retailer but better known as FLYING MODELS readers as president of the Academy of Model Aeronautics, was presented with the Meritorious Award of Honor of the Hobby Industry Association of America, Inc., at its annual banquet at Houston, Texas, before a crowd of 500. The award is the highest honor bestowed by HIAA on its members. A second Award was presented to another Dallas resident; Bobbye Hall of Hallmark Models, also a Dallas retailer. Bobbye was the first woman ever to be elected to the HIAA Board of Directors.

Making the awards for HIAA was Sol Kramer, Life Like Products, who was at one time connected with Burd Models.

Product notes



MONTROSE HOBBY MANUFACTURING, 2613 Honolulu Ave., Montrose, CA 91020, has recently introduced the "An-

swer", a 72" span sailplane with 495 square inches of wing, that was designed for performance and fast, easy construction. The

kit will go from box to flying field in one week of evenings. All work is done flat on your work surface. The kit, priced at \$29.95 features machine cut fuselage sides, rudder and fin and includes a full hardware package with pushrods, horns, clevises, threaded wire, rolled plans and instructions. Available from your local hobby shop or direct from the manufacturer.



WINGS ENGINEERING, 19 Sea Beach Dr., Stamford, CT 06902, has introduced a

unique Speedometer/Tachometer for use with engine powered models. Called Sonotrack[®] (patent pending) this new precision instrument is the only one on the market that gives both m.p.h. and r.p.m. readouts. The compact, hand-held Sonotrack utilizes the Doppler principle to accurately measure the speed of passing craft. A direct-reading dial calibrated from 0 to 200 m.p.h. quickly gives you the correct speed. Now you can evaluate and adjust your engine right in the field without time traps, strings or other special set-ups. Sonotrack's tachometer can accurately measure your engine's speed up to 30,000 r.p.m. This wide range allows you to get a reading on anything from a gentle tick-over to a screaming brute. Operated remotely, it is reliable, even at a distance, making it safe. It also operates well under high interference levels, where many other tachometers fail. Priced at \$69.95, Sonotrack can give you that competitive advantage. It works equally well on full sized cars, boats, and planes. For complete specs, write Wings, at the above address.

BROOKSTONE COMPANY, Peterborough, NH 03458, is offering metal parts drawers that add needed storage space. If you need extra space to stow hobby equipment, this pair of metal parts drawers can be installed quickly and easily beneath workbenches, kitchen counters, or shelves. Drawers pull out on slides and can be removed for taking to the job. With enamel finish, these 10 $\frac{3}{4}$ " x 5" x 2 $\frac{3}{4}$ " molded steel drawers attach to a one-piece mounting plate.

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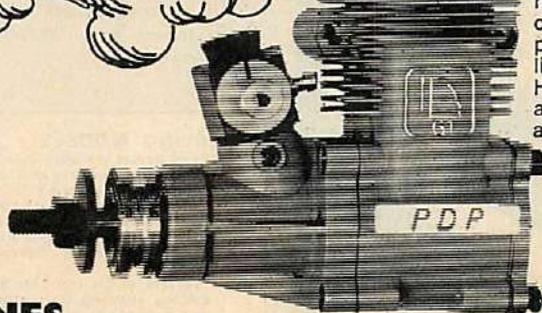


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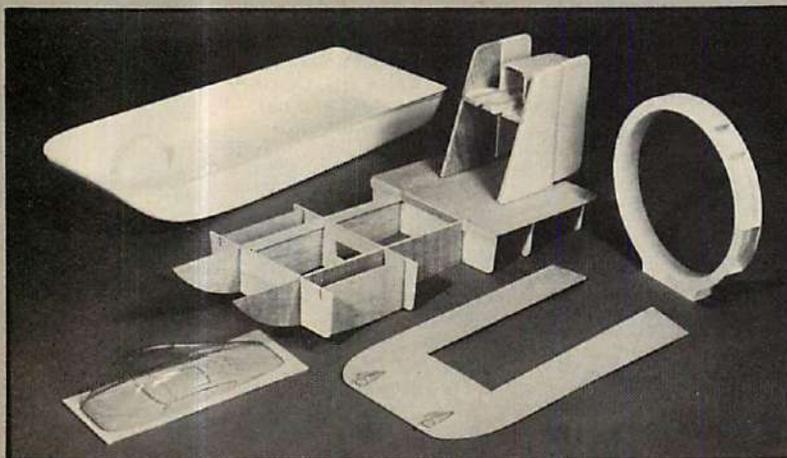
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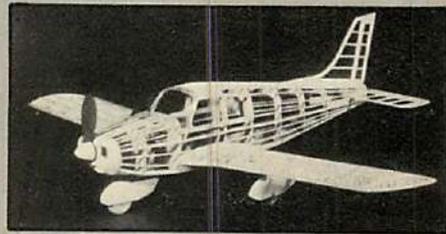
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P-61 Black Widow



Kit E-15

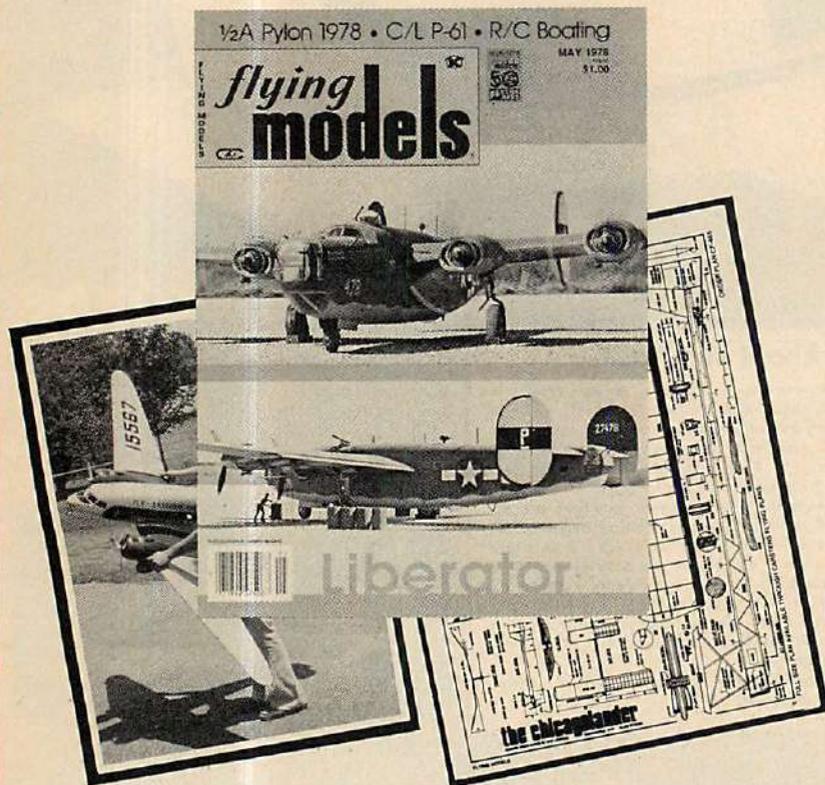
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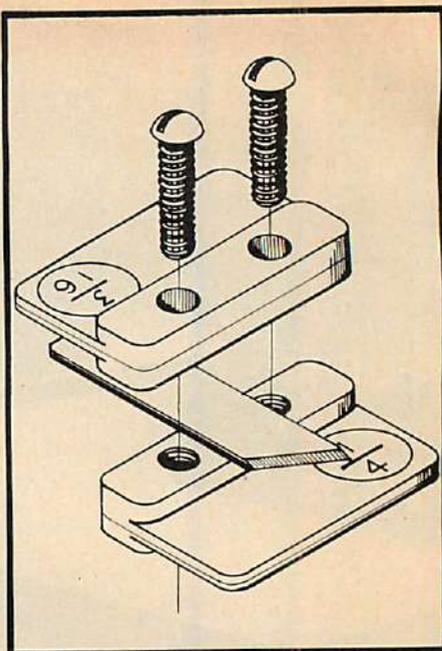
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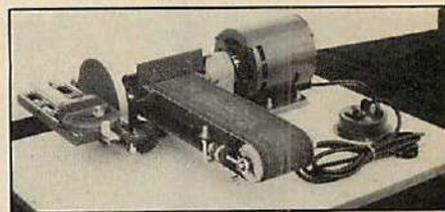
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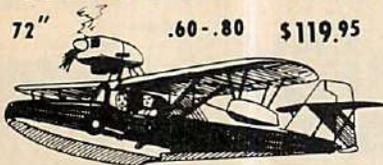
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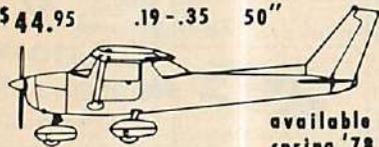
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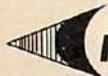
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priced at \$37.00 and features a 4" x 36" belt. A 6" disc sander accessory with a cast table and mitre gauge is available for an additional \$17.45. The combination belt/disc sander features robust cast construction and is backed with a ten year full-service guarantee. In addition to the sander, a 1/2 HP (or larger) motor and a switch are required, both of which are available at a reasonable price from AMT.

AMT has been offering moderately priced power tools since 1928 and is able to do so by eliminating much of the expensive features. Instead of adjusting the table angle with a fancy vernier dial, you use a bolt and a wing nut. Rather than a lot of costly chrome, their machines are adorned with grey paint. The machine is no less functional and is priced within the reach of most modelers.

If the sander is permanently mounted on a workbench, it is driven by a belt and pulley arrangement with the motor mounted under the bench. Since my bench space is rather limited, I chose to mount the sander, motor and switch on a board as shown in the photo. A formica surfaced sink cutout, which is available for little or no cost from most local kitchen cabinet shops, was utilized for this purpose. Using the 1 HP, 1750 RPM motor available from AMT (\$29.90 if purchased with the tool), I installed a 1/2" thick plywood pad under the motor since the shaft centerline on the sander is 3 1/2" while the centerline on the motor shaft is 3". A 5/8" x 1/2" flexible coupling (available for approximately \$2.00 from any local hardware store) is used to connect the motor to the sander. A line cord, switch, and switch housing (\$5.95 from AMT) completes the installation. A simple sheet metal coupling guard was fab-

ricated from an old piece of aluminum siding. Coupling the motor directly to the tool as illustrated requires the direction of rotation to be reversed. This is easily accomplished by reversing two leads, as indicated under the motor cover plate.

I found one minor criticism, that being the difficulty in adjusting the wing nut, which controls the angle of the platen table, since it is located directly behind the sanding disc. This is a minor inconvenience since it is not a frequently changed adjustment.

The usefulness of the sander was proven during the construction of a Dallaire Sports-ster kit I am reviewing for FLYING MODELS. The leading edges and tips of the wings, as well as the nose blocks, were shaped, the rudder and elevator leading edges beveled and a considerable amount of general sanding, which would have taken hours, was accomplished in minutes with this machine.

It would be advisable to use a fine grit belt and develop a light touch while becoming familiar with this sander since it removes balsa fast, and it's quite difficult to replace wood removed in error. I practiced on an old wing from a wreck and several pieces of scrap to develop the correct feel before using it on the Dallaire.

As with any power tool, the operator is advised to wear safety glasses or a face shield, refrain from wearing loose clothing, neckties, etc. and if sanding balsa or other light woods in confined quarters, provide suitable ventilation or wear a dust mask.

In summary, I found the AMT belt/disc sander to be a reasonably priced, rugged power tool with many labor-saving applications around the home workshop—FRED KOVAL.

The Rockaway Valley R/C Club and FLYING MODELS magazine invite you to attend their Stand-Off Scale, Sportsman Multi-wing and Novice Pattern Contest.

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tips from the staff

Tip Skids

G.A.: Is there any way to keep wingtips from getting scuffed up on landings?

ANSWER: EK Products offers a molded tip skid which you can build into your wingtip. Or, just bend a small "U" shaped piece of wire. It can serve double duty as a tie-down point when a wind comes up. It is often advisable to secure unattended aircraft on breezy days and a clip on weighted object can make use of the tip skid.

Snuffer Tube

F.L.: What is a snuffer tube? What does it do?

ANSWER: A Snuffer Tube is simply a length of tubing, usually about 1/4" dia., positioned across the fuselage of a Free-Flight model. Usually is it open at both ends. A fuse is inserted into it and the lit end is positioned perhaps 3/4" from the tubing. This allows the fuse to burn for a determined length after which it releases the line to the tail surfaces, allowing the stabilizer to hinge upward, stalling the model out of a thermal. The Snuffer Tube does just what it says, it snuffs out the already used fuse, reducing the stray chance of it starting a fire.

Vented Cowlings

P.L.: How tightly cowl should an engine be? Should it have cowl vents?

ANSWER: Not too tight in most cases, and it should have cowl flaps or vents, enough in the way of air slots back along the firewall region to pass off heated air. Larger full scale aircraft have cowl flaps, the position desired being set by the pilot in flight. We at least need an air exit. In some cases baffles around the engine may help you. Full scale practice is to locate sheet aluminum baffles close to the cylinder head fins, forcing the incoming air to circulate all around and through the individual fins.

Joining Glider Wing Panels

H.A.: It seems to be common practice to join glider wing panels with wire and tubing within the wing roots. How strong is this and what should I know about the technique?

ANSWER: Glider wings by nature are long in span and need to be built as individual panels for several reasons. Ease of transportation for one, for storing in limited space and sometimes to allow more perfect streamlining, as when the wing root is molded and filleted into the fuselage itself. Usually two main wires are employed, around 3/16" in diameter for 100" sized soarers. Piano wire would be my own choice as the softer grades of steel sometimes seen bend too easily for my money. I have ended up playing "blacksmith on an anvil" too many times out in the field. While such wires are easily straightened with a hammer, I see no reason not to go with hardened steel in the first place.

The tubing is another matter. The wire should slip into it easily but snugly, and the tubing should be well involved into the wing root structure. It should extend two rib

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bays and a speck beyond as a minimum, with ends plugged to prevent the wire from simply sliding through, getting lost toward a wingtip. You might want to vary the lengths a bit, say one forward wire extending out 6" either side of the wing center, the rearward wire a bit shorter, perhaps 5" on each side. The important thing is to lock the tubing into plywood ribs, with the wire extending through the tubing until supported by the outer rib. Otherwise, pressures on the wire might just break an arrow shaft type tube apart for want of well placed support.

Three Bladed Props

S.A.: I would like to hand carve a three-bladed prop. Is there any good way to join the three blades at the center? It is for a rubber powered sport aircraft and I have not found any commercially manufactured props that would do the job.

ANSWER: About the best method I can think of is to laminate the prop blades. This is often done on full scale wooden props. You can easily overlap various laminations in such a way that all three blades are securely fitted around the one common prop shaft hole. Laminations also aid you in carving down the prop. The various laminations are spread slightly, fanned out as a deck of cards might be and cemented in that relative position. This starts to give you an airfoiled blade shape with the least possible amount of wood carving and the lamination glue lines serve as a visible guide as to where additional trimming and sanding is required. It is a bit of work to hand carve any kind of prop, so with this in mind you may

want to make two, keeping at least one new and undamaged one as a display prop. Do remember to balance the prop, at higher rpm's an unbalanced prop will give you a lot of vibration.

Fuel Tank Leaks

S.W.: What can be done to lessen the chance of the fuel in the tank leaking into the radio system?

ANSWER: Leaks can occur, from a variety of reasons. The line may pull loose, tubing may split, a tank could develop a crack or puncture, vibration, chaffing etc. Fuel is always near a radio system for balancing requirements. What to do?

You can design around the problem if you try, it will at least improve your chances. If you can, place your electronics aft of the tank, and behind a second firewall. The tank, when possible should be in a fuel-proof compartment of its own. This is seldom possible as the mass of radio and fuel almost always have to crowd each other in the forward sections of the fuselage. Do try however to split the compartment with a ply floor, radio beneath and perhaps shielded in plastic baggies. You should build in a self draining route for spills of fuel which would drain the fuel away quickly without it reaching the radio. Perhaps four lengths of soda straws built into the corners of the fuel compartment. Fuel would be out on the ground rather than trying to float your receiver off.

Servos too should be kept as clean as possible. Balsa dust, mud, sand, exhaust residue and ham sandwich crumbs don't do a thing for their performance in a clutch.

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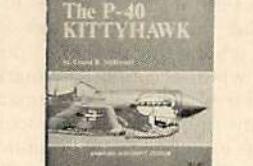
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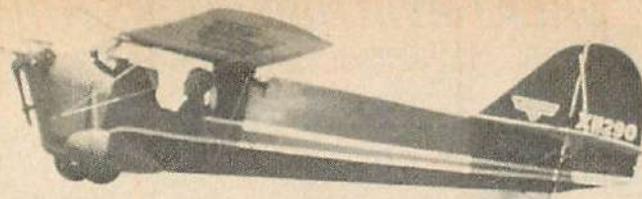
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Stand-Off Scale Aeronca C-1

PHOTOGRAPHY: BOB HOECKELE

A Stand-Off R/C oldie that captures an age. An easy aircraft to build and mild mannered in flight with a .19 for power/**Al Wolsky**

The "Golden years of aviation" are usually referred to as the decade of the '30's. During that period aircraft were designed in which the designers had high hopes, but when placed on the market they did not sell well. Many such companies and their designs dropped from the scene leaving only an example or two around. Dope and fabric with wooden spars was the thing. Usually the planes were slow and under-

powered by today's standards. One such type of lightplane as presented here, of which one was built, was the Aeronca C-1 Scout.

In 1929 the Aeronca Aircraft Co. was formed and went into production with the C-2 which was designed by Jean Roche. It was an immediate success even though the country was in the midst of the depression. It's two cylinder engine burned two gallons



of gas per hour. Cost was \$1495. 164 C-2's were built between 1929 and 1931. In early 1931 the company felt there was a market for a faster more highly maneuverable C-2 type plane for air racing and air show aerobatics. The C-2 airframe was changed by reducing the wingspan from the 36 foot C-2 wing to 29' 4". Fuselage was beefed up by using heavier steel tubing and a slightly larger engine was installed. Advertised as the C-1 Scout, the first plane serial number X-1129 was completed in March, 1931 and test flown. Performance was beyond expectations. The price was to be a low \$1245. The company general manager would put the lit-

#9856 Historical Aviation Album No. 10 by Paul Matt is an excellent book. This is available from Carstens Publications, P.O. Box 700, Newton, N.J. 07860. Price is \$5.25.

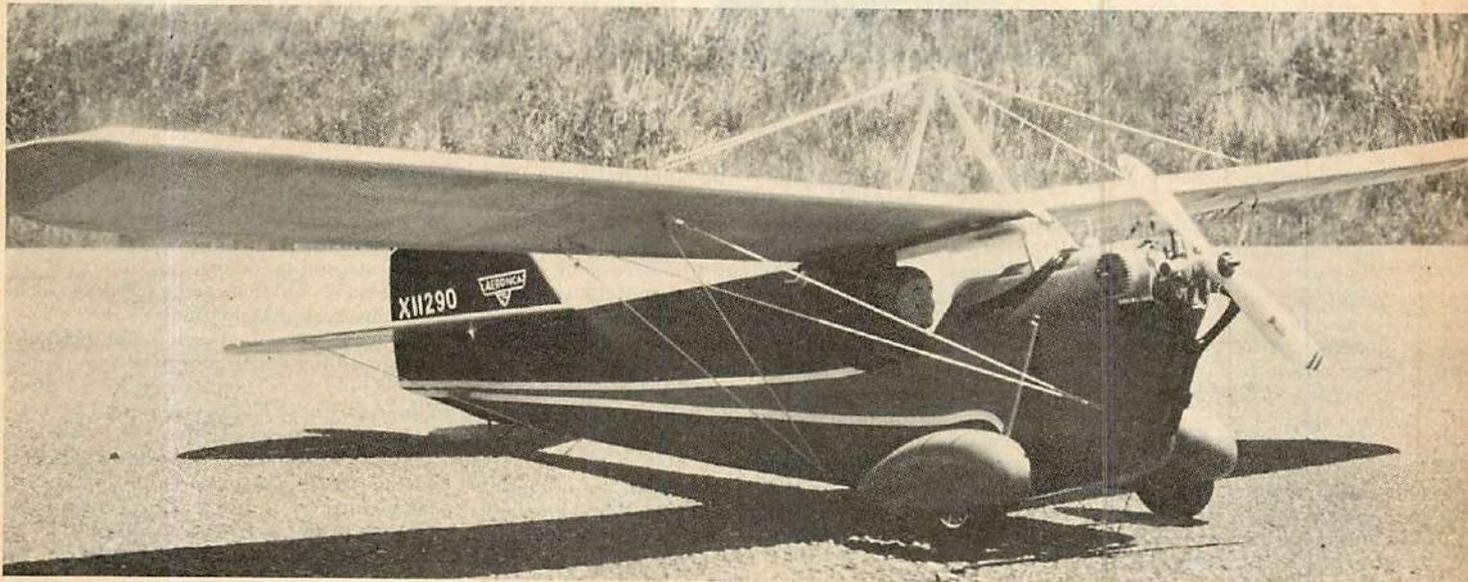
The model is scaled 2" to 1', a Stand-Off Scale design.

Fuselage Structure

The fuselage has a basic triangular shape from the cockpit back and can be built in your hand. No top view is needed since the length of bottom cross-pieces are given on the plan side view. Start with two 1/8" x 6" balsa sheets of equal strength and cut two sides from the side view. The sheet will be

and glue in the cross-pieces.

Bend the gear from 3/32" dia. wire and bind to the floor with heavy cord. Place the fuselage in location and coat with epoxy. Glue 3/32" sheet doublers on the inside of the nose back to F-4 to strengthen this area. Also triangular pieces at the firewall. Cut the two 1/8" ply wing and stab mounts and install. Drill out the holes in the wing mount to locate two 1/4" dia. dowels which in turn are cemented into F-4 to support the wing mount. Bind the forward hook in place, then cut and fit the tank floor. A 4 oz. tank will fit this area. Soak a piece of 1/16" sheet and bend this into a half circle shape and position between the two



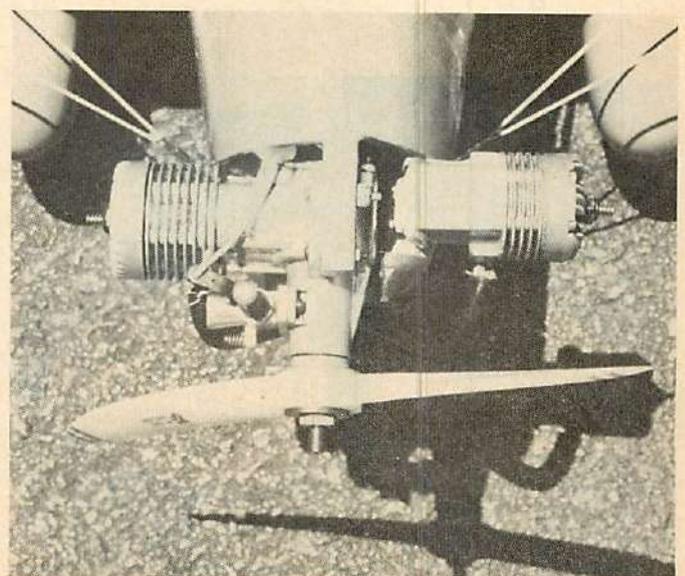
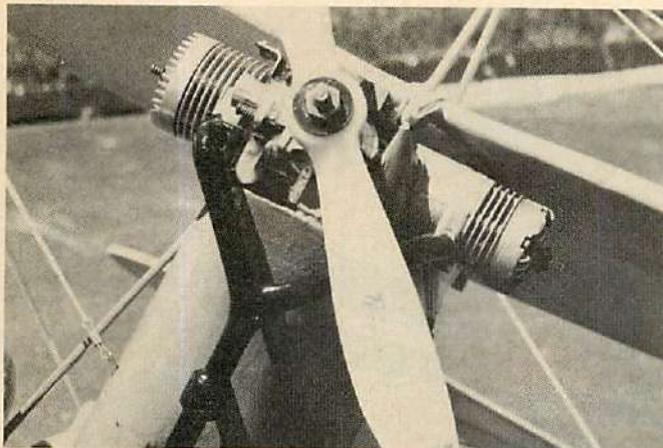
tle ship through what seemed to be many reckless stunts during various airshow demonstrations. On September 12, 1931 during his usual antics he went into a rear vertical bank and the plane slipped and slammed into the ground. The pilot was killed and the aircraft destroyed. After this accident the company lost interest in the little plane and it was never put into production.

For a complete history of the Aeronca,

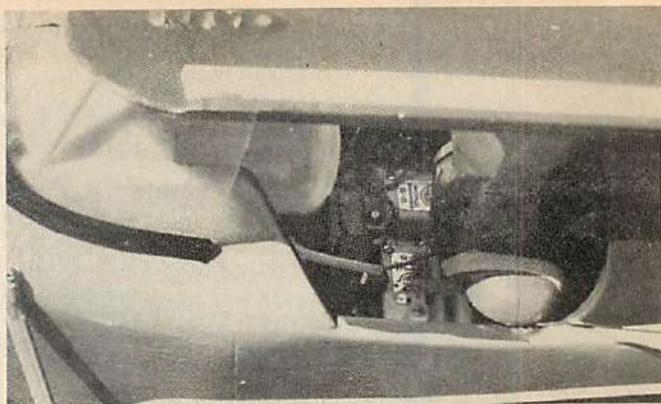
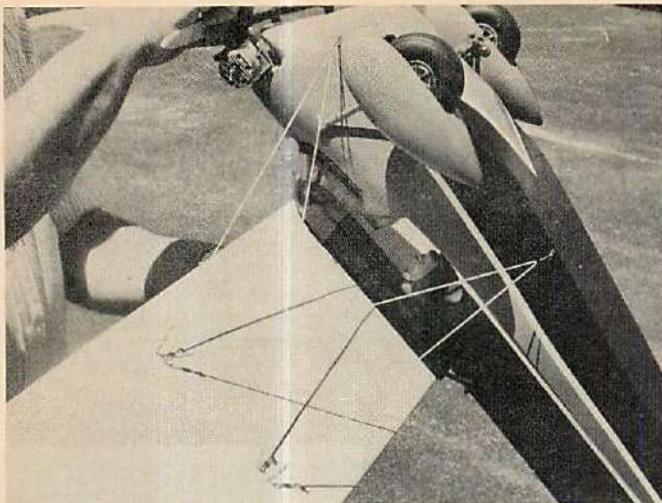
slightly short at the bottom so use the pieces cut from the rear to add on where necessary. Slightly shave the inside top of both sides back to the tail and glue these together. Cut the firewall, gear mount and other formers from materials as called for. Glue the 3/16" sq. stiffeners to the inner surfaces as shown. Next, with a razor slightly score both sides so they can be pulled in to the firewall and former F-2. Epoxy firewall and F-2 in place

F-4's and over the tank. This gives the appearance of the real tank which was located in this area.

Cut out the motor mount and brace with 3/8" hardwood and epoxy to firewall, then glue a soft nose block in position, butted up against the mount. Small blocks are cemented on either side. When the glue sets shape the nose, referring to the pictures for curvature. The lower block could be re-



Three views of this Golden Era airplane opposite page and top. All the shots were taken at the FLYING MODELS field at our office. Two views of the nose (above and right) show the engine and dummy cylinder head.



The wire bracing (left) is strictly for show and does not structurally support the wing. The shot above shows the radio installed in the cockpit. How would you like to be a pilot with a World Engines rig in your chest?

moved and hollowed out to lighten if desired.

At this point it might be wise to install servo mounts. Temporarily install the servos along with the two Nyrods (which I recommend) as it will be less trouble than after the bottom is sheeted. Once installed leave the length extra long at the back for connection later. Sheet the bottom with $\frac{1}{8}$ " stock, grain crosswise. Glue the two F-5 fairings onto each side.

I would like to mention now about covering the fuselage. Whatever material you use is only cemented to the very top and bottom of each side. If this is done carefully the finished result will appear as though the fuselage is a built up framework since the covering will not be touching the sheet construction underneath.

The Tail Surfaces

All the tail surfaces are built up of $\frac{1}{4}$ " sq. balsa and sheet material and should present no problem during their construction.

Wing Construction

Cut all the ribs as noted, tips and trailing edges. The two $\frac{1}{4}$ " x $\frac{3}{8}$ " hardwood spars are cut at their center so with one half on the bench the other half is angled up 4" (total dihedral) at a point 28 $\frac{3}{4}$ " out from the center

joint. Cut the $\frac{1}{4}$ " ply dihedral brace and epoxy this in place at the center. This should be done with accuracy on your building board. When the epoxy sets measure from the center 27 $\frac{3}{4}$ " and trim excess off. These ends represent the location of the W-4 ribs. Now pin the $\frac{1}{16}$ " x 1" lower trailing edge to the plan and glue all ribs in place. Follow with the balsa top spar, leading edge and top trailing edge, then add the tips and sheet the top front, center and bottom of the wing.

Finish Details

Sand all the wood smooth, rounding off edges, removing dried glue. When finished, cover the model with your favorite material. I used Silron. All frameworks were clear doped before covering and the raised grain was sanded down. Covering was applied wet, then given four coats of clear dope, sanding lightly between each. Color is up to you. I chose a dark green fuselage, fin and rudder, with license numbers on the wing. Stabilizer, wing and elevator are Cub yellow. The nose, fuselage strips and wheel-pants are a light green. Wheel-pants are held in place by a metal plate soldered to the gear wire. Two holes in this plate accept small wood screws which in turn screw into a $\frac{1}{8}$ " ply insert in the back of each pant. Windshield is held on with a super glue.

The scale exhaust dresses up the model and is for display only. An old Fox .19 cylinder was used to give the appearance of a two cylinder scale engine.

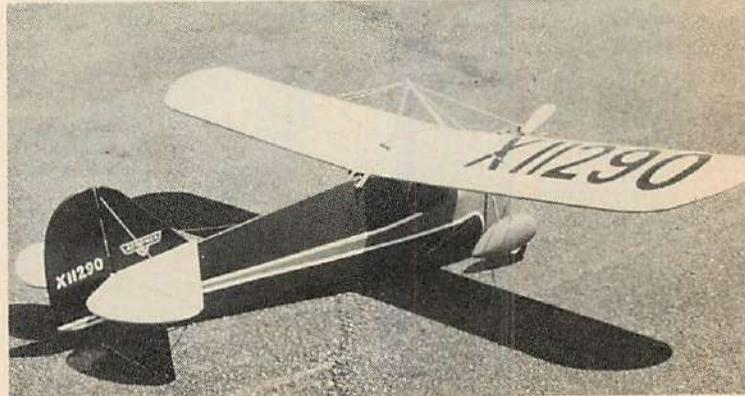
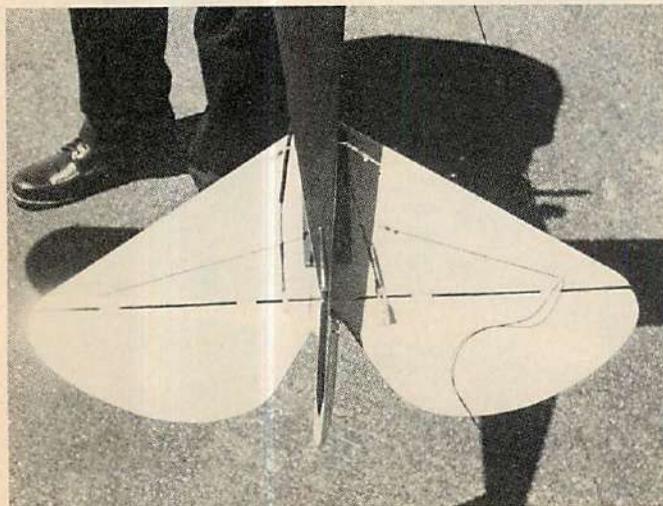
The streamline wires are simulated by using elastic cord that can be purchased at a yarn store. Use straight pins bent into an eye hook shape. They are pushed into locations shown and held with a drop of super glue into the hole. Small control line clips are used at the cord ends. The two gear struts are for show and made removable.

Epoxy the stabilizer in position after removing covering material in the area it will make contact with the stabilizer mount. At this time install your servos and finish your Nyrod installation and motor control.

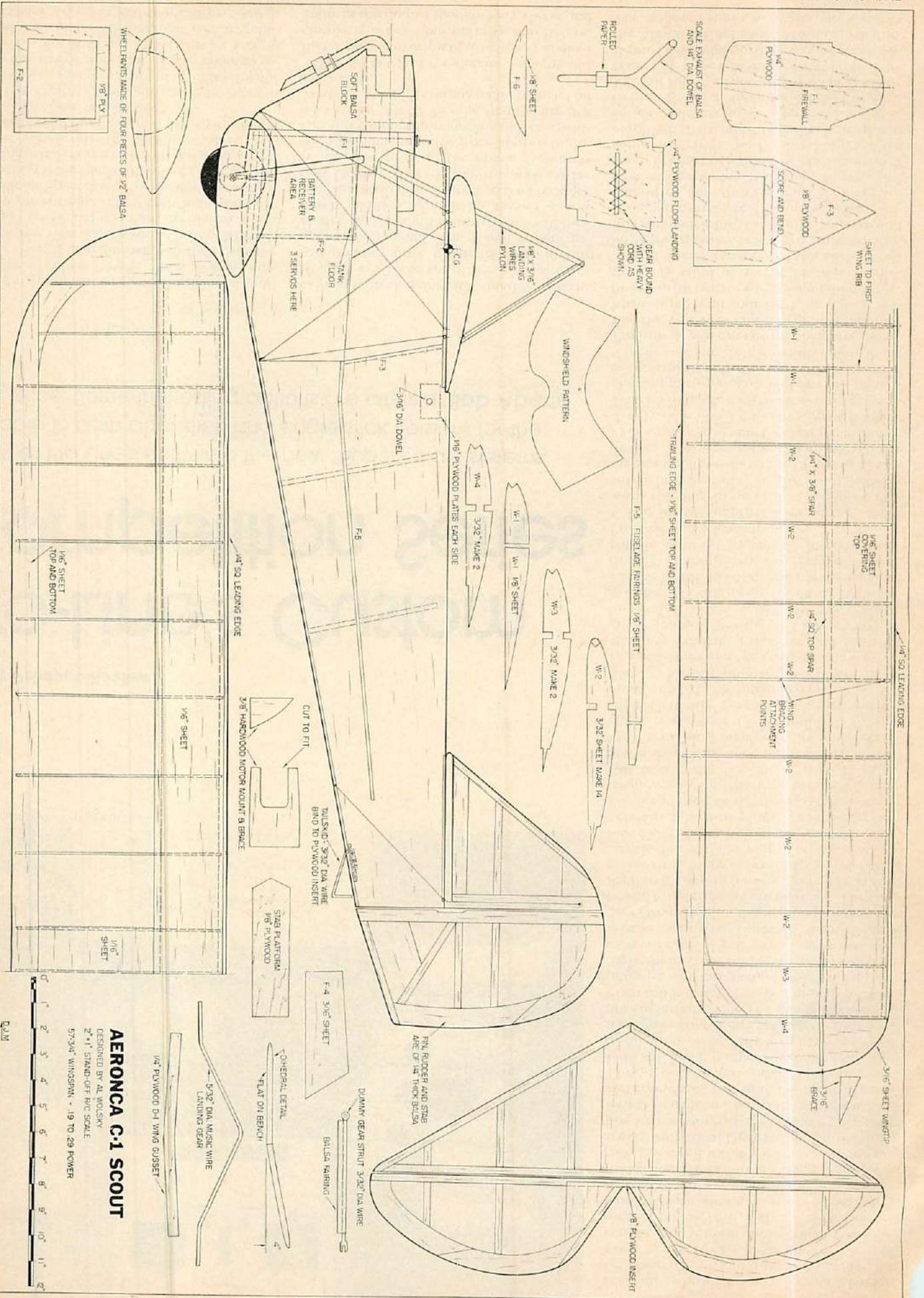
Flying Notes

I suggest an engine in the .19 to .29 power range. Make certain the completed model balances at the point shown on the plan. Notice if the wing has taken on a warp. If so steam it out twisting the warp in the opposite way over a steam source.

My C-1 Scout has been flown actively with a Fox .19 and I have had no problems with this design. Here's wishing you many hours of carefree relaxed flying. It's a little known Aeronca prototype from out of the past. Fly it safely. E



The tail feathers (left) are simple and straightforward like the rest of this airplane, again the rigging is strictly for show. Interesting lines on this rear view could help make it a winner in Stand-Off Scale for you.



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PHOTOGRAPHY: BOB ABERLE

An FM Product Review:

Pro-Line's Custom Competition Series

A look at Pro Line's entry into the new "Super" class systems. Available in both dual stick and single stick versions for the same price. Some interesting options are offered/**Bob Aberle**

In keeping with my promise of covering all the so called "Super" radio systems during 1978, this month we will look over the new Pro Line Electronics, Custom Competition Seven radio system. As stated in our two previous reviews (Kraft Signature and Millcott Specialist), the heart of these new systems is the transmitter. Let's start with an administrative run down on the general system, followed by the airborne system components and finally an indepth review of the new Pro Line transmitter.

The Custom Competition radio system includes a seven channel transmitter (for our review a dual stick unit), seven channel receiver, four selected PLS-1 servos, a complete set of nickel-cadmium rechargeable batteries (receiver and transmitter), switch

harness with charging jack, standard battery charger, complete set of servo trays, extra servo output arms, frequency flags and an operations manual. The above system includes as a standard feature a slow roll button. In addition, a buddy box trainer system can be installed (if desired) as a no cost option. On that basis you might as well ask for it. The list price of the above system is \$723.70. This same list price applies to the Custom Competition single stick transmitter version. All 72-75 mhz frequencies are available as well as the six meter band (at no extra cost).

Now to get into the details. I might add that I have never owned or really looked closely at a Pro Line radio system before. Some of the items I thought very clever and

innovative during my review I found later to be standard on Pro Line equipment for many years. It says a lot for Pro Line, of course, but present and former Pro Line owners please bear with me. The Custom Competition seven channel receiver is housed in a black anodized aluminum case measuring 2 1/4 inch long x 1 3/4 inch wide x 3/4 inch thick and weighing 2.5 ounces (on my scale). Individual Deans (three pin) connectors are used for each channel and the power input. That means that a total of eight cables and connectors exit from the receiver case. This produces a fairly large bundle of wires, but I still feel it is more convenient for radio installations, especially in tight places. With the Deans connectors you can do your own pin soldering which is a real convenience. Each cable connection is stamped in white lettering with the channel function. Surprisingly there is no frequency marker on the receiver case. If you owned more than one receiver you would actually have to open the case and look at the stamped value of the crystal to determine the frequency. The case itself snaps open exposing a very neat layout consisting of two printed circuit (P/C) boards (R-F and decoder). The decoder P/C board contains all the outgoing cable connections. It, in turn, plugs into the larger R-F P/C board. You could change your receiver frequency by substituting a completely new R-F board. But you might want to think twice about this since the board itself lists for \$66.49. Most notable in the receiver circuitry is the four I.F.'s employed by Pro Line. Certainly the mark of a high quality receiver. C.M.O.S. integrated circuits in the decoder result in relatively low power drain. In fact I measured the receiver idle current at 14 ma. Published receiver specifications are as follows: sensitivity 1.0 microvolt or less for full control, selectivity -3 db down at less than 3.5 khz, image rejection -10 db (on 72 mhz band), spurious and harmonic rejection -50 db minimum. The receiver is compatible with all previously manufactured Pro Line radio systems.

The servos supplied with our test radio were the Pro Line PLS-1. Although this servo looks similar to the Kraft KPS-14 mechanics, it is in fact a Pro Line proprietary design. If you placed a KPS-14 next to the PLS-1 you would note the difference immediately. The PLS-1 measures 1 1/2 inch high x 1 1/2 inch long x 3/4 inch thick (less output arm and mounting flanges). Weight is 1.4 ounces each. Cable length (three wire) is a generous 8 inches. If you didn't already know it, *all* Pro Line servos operate on a negative pulse. Should you ever attempt to use another brand servo with your Pro Line it must also be set up for negative pulse operation. Static thrust is rated at 1.4 in.lbs. (maximum). Transit time is a snappy 0.44 seconds for full 90 degree rotation. I can't precisely measure this parameter, but it certainly looks fast and responsive on my test set up (which greatly magnifies any shortcomings in a servo). Centering accuracy is claimed to 1/2%. The servo is constructed in the usual manner. I couldn't identify the I.C. used in the servo amplifier. It is more than likely a special series made exclusively for Pro Line. It is definitely not a Signetics NE-544 or Exar I.C. All the Pro Line servos employ a new type pot wiper assembly developed by Bruno Giezendanner (this was mentioned in the March 1978 FLYING MODELS, page 9). The wiper features a single point contact

which is always centered on the resistance element. Servo output is strictly rotary on the PLS-1. Pro Line offers several other servo options if you are interested. One has linear rack outputs plus rotary (PLS-11), another is a high power unit (PLS-15) and a retract servo (180 degree rotation) is also offered. All of the Pro Line servos list individually for \$46.75, so it is strictly your choice at the time you make your purchase. All the servos come with a single direction rotation. If you need a servo of opposite rotation you must return the servo to the factory. More on servo direction later on.

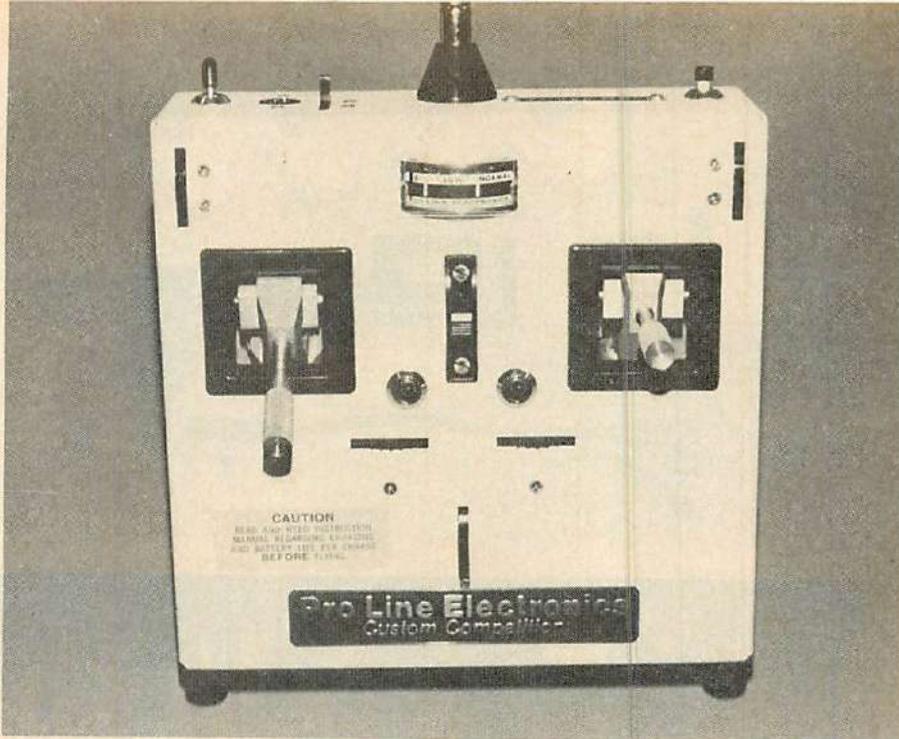
The airborne battery pack (supplied with our system) was designated PL-550. It measures 27¹/₁₆ inch long x 2 inch wide x 1 inch thick and weighs 5.2 ounces. These particular cells are the high rate G.E. sub-types which are so popular in R/C today. An alternate square pack is available using A-A size cells (weight 4 ounces even) and a smaller 225 mah pack weighing 2.8 ounces. All of these battery packs list for the same price (\$21.95) so again it is strictly your choice. Pro Line continues to employ diode protection across the individual battery cells in their airborne battery packs. These diodes will provide a current path in the event of a broken wire or an open cell. The Pro Line receivers will operate on three cells (three of the four). Unfortunately Pro Line does not employ diode protection on their transmitter battery packs. An open cell in the transmitter could just as easily cause complete loss of control. I can't imagine why it was done in one pack and not the other. A switch harness is provided with the system which includes a charging jack.

Battery charging is handled by a dual output charger (Model PL-S-C) which has L.E.D. indicators. Charge rate is approximately 50 ma. (C/10) for both receiver and transmitter, so a 14 to 16 hour charge period is normally required. As an option Pro Line sells a special dual output automatic fast charger (Model PL-F-C). List price is \$49.95. You could, however, stipulate this special charger with your system purchase for an additional \$30.00 cost. I haven't actually tried one of these fast chargers, but the specs sound very interesting. It supposedly will bring fully discharged cells to 80% of full charge in less than 1 1/2 hours (350 ma. current rate). The charger then switches automatically to the regular charge rate (50 ma. current) to finish off the charge. You could, of course, safely fly after the 1 1/2 hour fast charge period. A switch lets you select between the fast automatic and regular charge rates. You can also run the charger off 115 VAC house current or 12 volts D.C. (from your car or field kit battery). It sounds great! Possibly I will be able to do a special detailed review on this charger in the future.

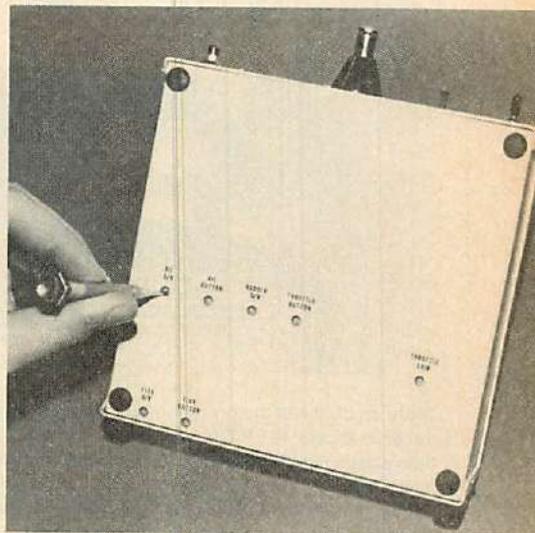
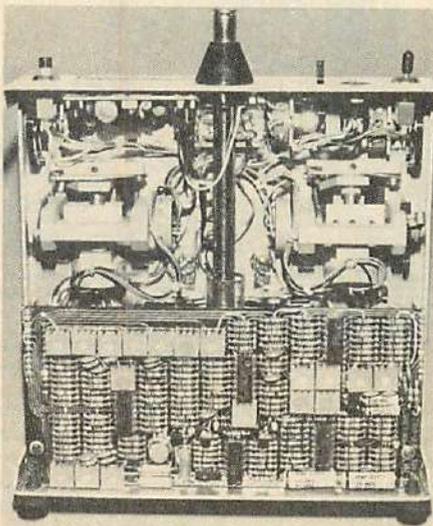
Total airborne weight of the Custom Competition seven channel system was 13.8 ounces including, four PLS-1 servos and the 550 mah battery pack. Total current drain at idle (no controls being operated) was approximately 50 ma. With two servos in motion this came up to a 300 ma. average current level. I would guess approximately 2 to 2 1/2 hours of available flight time from a full charge (with all four servos connected).

Now we'll get down to that all new Pro Line Custom Competition Seven transmitter. The case itself measures 6 5/8 inch wide x 6 1/2 inch high x 2 inch deep (less sticks). It is the usual aluminum finished in a white

FLYING MODELS



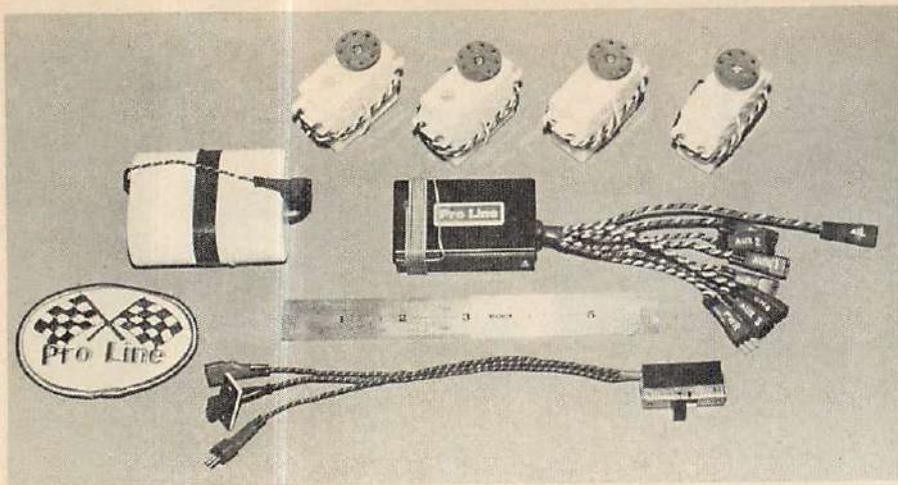
Pro Line's new 7-channel transmitter is the heart of the system. This particular transmitter came with only a roll button which is located in top right corner of the case. Spin and throttle buttons could be added at \$20 additional cost each. **Below:** Inside Custom Competition 7-channel transmitter. A large quantity of discrete parts can be seen. Small squares are actually trim pots for internal adjustments. **Right below:** Seven adjustments available at the rear of the transmitter case. Remainder are on inside of the case. R-F P/C board is located just above the control stick. Antenna retracts into plastic cup.



vinyl covering which has been the hallmark of Pro Line equipment for years. Weight is 2 lbs. 7 ounces complete. The 40 inch whip antenna can be stored almost completely inside the case. Current drain is around 120 ma. (total). Power output on my equipment measured somewhere between 650 and 700 mw (very high!). Only an R-F output meter is employed. This transmitter does not have any type of built in expanded scale voltmeter or L.E.D. low voltage indicator. Likewise it can not check your receiver voltage through an umbilical cable. Pro Line does offer an external meter for this purpose (model PL-B-T) which lists for \$25.80. The R-F P/C board can be unplugged and removed. Each R-F board lists for \$42.30. When you add the receiver R-F board cost of

\$66.49 (mentioned previously) you end up with a total cost of \$108.79 to change frequencies (on a plug in basis). Actually Pro Line will change the frequency of your existing pair of R-F boards (by substituting new crystals and re-tuning) for a \$20.00 fee (on the same band, of course). The transmitter batteries are made by Sanyo. Eight cells are employed using two separate 4.8 volt packs connected in series for 9.6 volts. Mode II to Mode I conversion can be made easily in a matter of minutes by the flyer by changing the position of the throttle stick ratchet device and reversing two servo plug connections.

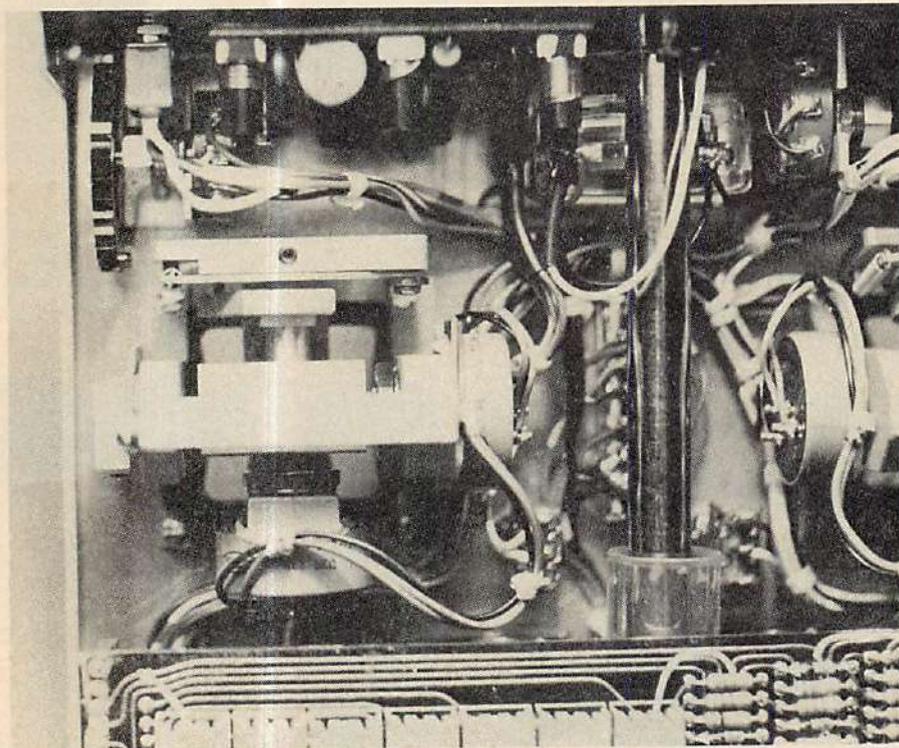
The control sticks are of an all metal, open gimbal variety of very high quality. To my knowledge the spring tension and stick



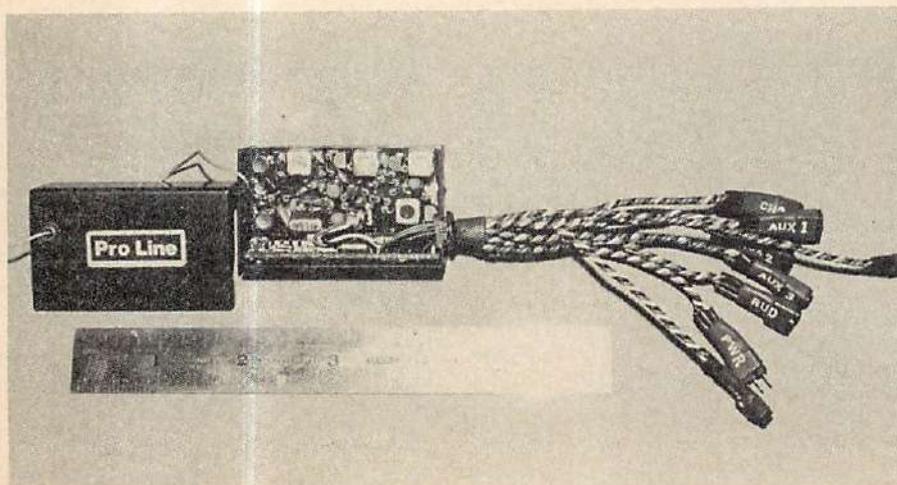
length can not be adjusted. However, I was personally satisfied with the feel of the sticks on my transmitter and wouldn't have changed them anyhow. I'm going to register my complaint once again concerning the open stick assemblies. There is no way of preventing dust and dirt from entering the transmitter case with these type control sticks. One good prop wash at the local flying field could do a real job on those precision stick bearings and other components for that matter. I'd still like to see a flexible, protective boot covering this opening. Hopefully an enterprising manufacturer will offer such an item in the near future. All primary flight control trims are made with thumb wheels which rotate a full 270 degrees. A full excursion of a thumb wheel produces almost 25 degrees of control surface movement (most trims usually only cover 12 to 15 degrees). With the thumb wheel, however, you do lose your trim reference point. It would be easy for someone to "play" with your transmitter while it was in the impound area at a contest. You would never know after a visual inspection of your transmitter. I still like a simple lever better since I can tell at a glance the true position of my trim. The trims are not exactly crossed. Elevator trim is at the top left corner of the case which is cross trim (for Mode II flyers) since the opposite hand works the trim. Aileron trim is just below and to the right of the power switch which means that you have to remove your hand from the aileron control stick to make a trim adjustment. Rudder trim is to the lower left of the power switch and finally throttle trim is at the top right hand corner of the case.

Standard with the custom Competition series is dual rate elevator and aileron. These rates are selected by two toggle switches located on either side of the main power switch. In the high rate position you can obtain full servo travel of approximately +/- 40 degrees. A gain control located inside the transmitter case (must remove the cover) will give roughly a 10 degree adjustment of the full control excursion. In the low rate position, you can reduce control movement down to 50% of total throw with an adjustment (pot) accessible from the (outside) rear case cover. At full reduction (in servo travel) you still move the transmitter control stick through it's full travel. This means you get a more precise control feeling, more or less like a vernier (fine tune) control. These dual rate controls are strictly linear in response. Pro Line does not employ non-linear or exponential rate control. As an option, you can also have dual rate rudder installed (at the time of purchase) for an additional \$20.00 fee. The switch for this (not on our test unit) would be located directly above the left hand control stick. For each dual rate function the reduction in control motion is adjustable, by screwdriver, from the rear of the transmitter case.

As standard, a roll button is provided, which when depressed will give a pre-determined, fixed aileron deflection. This button is located on the top right corner of the case. An adjustable pot on the rear of the case will allow the positioning of the aileron surface at any point through it's complete travel (in other words you can select anywhere from full right to full left aileron). The instant you depress the roll button, the control stick function is electrically disconnected to prevent possible servo overtravel. Two additional options are offered at \$20.00



Close up of one of the precision open gimbal control stick assemblies as viewed from the inside of the transmitter case. R-F/P/C board is located just above the control stick installation. Antenna retracts into a little plastic cup. **Photo at top:** The typical airborne pack. PLS-1 servos seen here and a PL-550 battery pack. The weight as you see it is 13.8 ounces. **Photo beneath:** The Pro Line receiver. Note the large bundle of individual cables. Each is neatly marked with the exact channel function. Ch-2 and Ch-4 are reversed when changing over from Mode II to Mode I. All in all a well engineered product.



each. One is a spin button which controls pre-set elevator positions and the other is a throttle button which can give momentary high or low throttle for certain maneuvers. Both of these program buttons function similarly to the roll button previously described. Although it is an extra cost item in this case I would recommend that you purchase both of these options. You just don't have a "Super" radio unless you have the full control capability.

In addition to the four primary controls you also receive a retract channel (operated by a switch) and two auxiliary channels operated by small levers. All of these three channels have control travel adjustments which can be made by removing the rear transmitter case cover. This is still a convenience in my opinion. On most other transmitters the auxiliary channels are strictly not adjustable.

You will be able to fully reverse your throttle channel using an adjustment on the rear of the case. This unfortunately is the only reversible channel in the entire transmitter. I'm a little disappointed in this omission. I personally like the ability to reverse a servo at a flip of a switch. On the other hand many flyers are now pointing out problems associated with servo reversal which has caused model crashes. This is mostly carelessness I feel but at any rate this Pro Line transmitter does not offer the feature of servo reversal on the aileron, elevator or rudder channels.

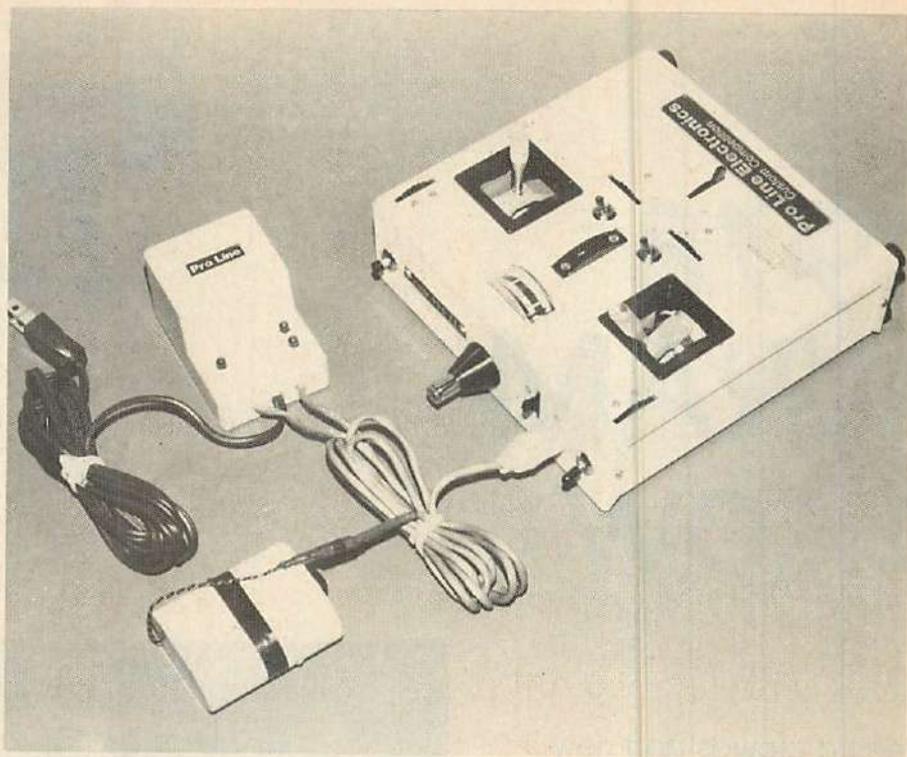
Of special interest to some is the inclusion of a set of Lustre/Cal metalized decals containing the nomenclature for the basic control functions. I only wish Pro Line would go a step further and include such titles as *Elev. Trim, Elev. Dual Rate*, etc. The use of these decals certainly can help a new "Super" system pilot learn to use to all his new buttons and gadgets, and in this case some thumb wheels too!

The Pro Line operating manual was not the most comprehensive I have seen in recent years. In fact I gather it was intended more for previous models rather than this new Custom Competition series. Only a couple of brief addendum pages are supplied to help you understand all the new control functions. Possibly I have only an interim manual. On the plus side, an FCC license form and a set of regulations are provided with the system. A complete set of system schematic diagrams can be purchased for \$5.00. Standard warranty covers a period of 90 days from date of purchase.

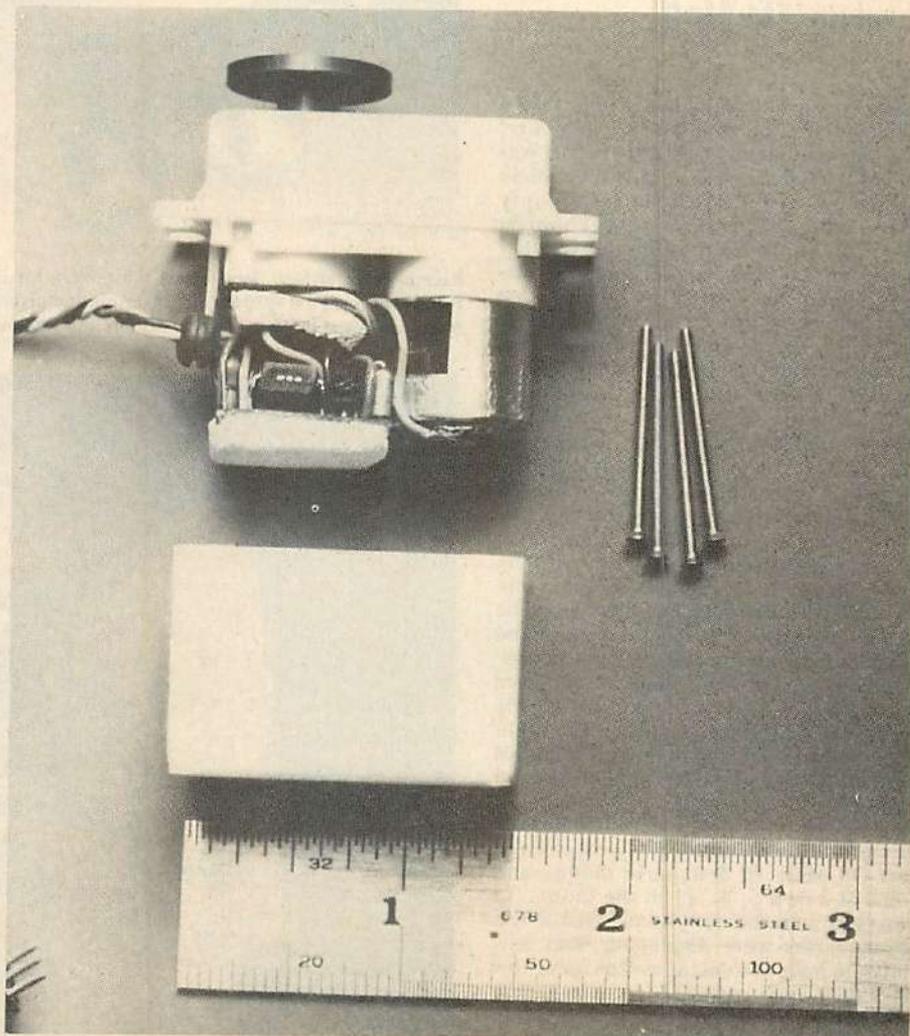
In summary I again was very impressed with this new Pro Line Custom Competition series radio system. Some of my readers will possibly get tired of my summation each month because I seem to say the same thing about each system. All of the new "Super" radio systems are truly great! Each has its own individual features, advantages and in some cases disadvantages. It is only my intention to give you an overview description so that you can make up your mind as to what is best to suit your own personal hobby needs. One thing for sure the new Pro Line organization still builds radios to the same high standards as before.

Pro Line has a rather detailed catalog which covers their full line of R/C equipment including a new marine R/C system and an assortment of accessory items. I suggest you write to Mr. Jerry Bonzo, Pro Line's Sales Manager, at 10632 North 21st Ave., Suite 11, Phoenix, Arizona 85029. ☐

FLYING MODELS



Typical battery charging hook-up. The current charge is the usual C/10 50 ma. rate for 14 to 16 hours. A special automatic fast charger is also available as a system option for \$30.00 additional. See text. **Photo below:** A look inside the PLS-1 servo. About 1.4 ounces in weight. It's well made, easy to repair.



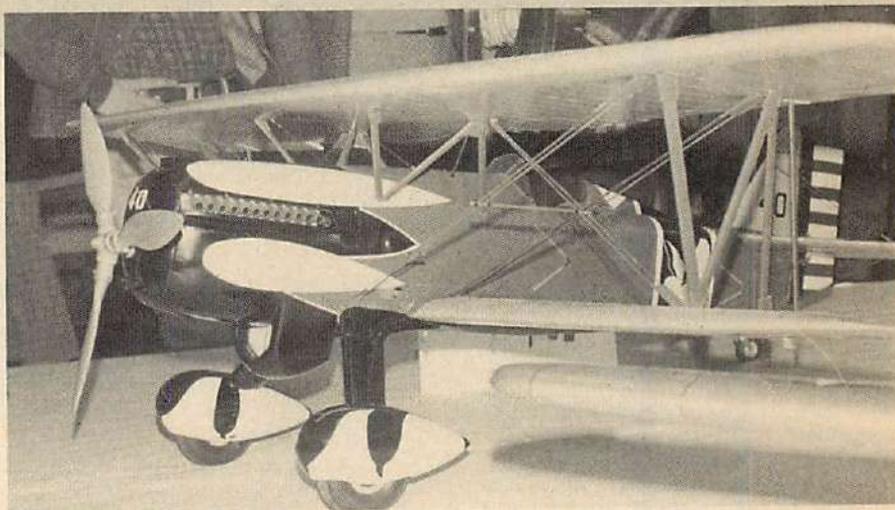
1978 WRAM Show

Record crowds and new products tell the story of this great New York show that signals the end of winter/**FM Staff**

Despite an unusually bad winter in the northeast the Westchester (County) Radio Aero Modelers (WRAM's) Club was still able to hold it's big annual R/C hobby trade show at the Westchester County Center, White Plains, New York (February 25 and 26, 1978). Fortunately the weather cooperated for that weekend and it was record attendance as usual. So much so that it was difficult at times to move around from booth to booth. Most hobby manufacturers were represented at this show. Many, in fact, travel all the way from the West Coast to visit this, "the best show in the east". The WRAM's clubmembers were helping out everywhere. Their active participation makes this show a success and they are to be commended for a job well done.

This year we saw the R/C hobby take off in two distinctly different directions. Many new mammoth scale models (and some non-scale too) were displayed in the static judging areas. Most of these models were scratch built giants that left everyone in awe. We might add that some were built up from many of the new giant model kits that hit the market during the past year. On the other side there was considerable interest shown in $\frac{1}{2}$ A and .09 powered R/C models. House of Balsa had a large display of $\frac{1}{2}$ A Stand-Off Scale models. MRC-Webra had their new .10 size engine. World Engines showed their OS Max .10 Schneurle engine and hinted at a new S. T. .11 in the future. To keep pace with the new aircraft trends R/C manufacturers were displaying both new miniature radio systems as well as some new heavy duty, high powered servos to handle the surfaces on those extra large models.

In addition, many new innovative ideas



PHOTOGRAPHY: FM STAFF

George Rose of New Jersey took the honors for Best in Show with his beautiful P-6-E Hawk shown flying (above) at the 1978 Nats in California and on display at the 1978 WRAM's Show. Phil Kraft of Kraft Radio fame won the McEntee Award this year (below). It was presented by Howard McEntee's wife.





CASS ENGINEERING, Box 420, Rutherford, NJ 07070 had "Stormin' Norman" Casella showing their new Skybolt intended for Stand-off Scale or Biplane events. It uses Pulsar wings.



EDSON ENTERPRISES, 17 Speer Place, Nutley, NJ 07110 had Paul Tremarco and his dad showing their new super heat sealing iron for plastic coverings. Lots of other uses too.



MASTER KIT, 6 Fox Road, Plainville, CT 06062. had Frank Massa offering their new Hiperbiplane SOS all-balsa kit as well as Peppermint Pattie a .15 high performance aircraft.



PHOENIX INDUSTRIES, INC., 60 Engineers Drive, Hicksville, NY 11801, makers of the Paper Cub cardboard trainer were showing this aileron trainer that is being developed now.



AEROTREND PRODUCTS, 44 W. Prospect St., New Haven, CT 06515, was showing (besides their fine fiberglass field case) a new wood box that does the job compactly and easily on the field.



EASTCRAFT SPECIALTY PRODUCTS, INC., P.O. Box 25, Irwin, PA 15642, had the hit of the show with their Lectra Starter, an on-board electric starter for glow engines. Great for 1/4 scale.

showed up. For example: a built-in electric starter for model aircraft, several new types and sizes of ducted fan power units and an assortment of power reduction units which enable an engine to swing a large diameter prop for those giants we just talked about.

The WRAM's Show didn't concentrate just on R/C model aircraft. Many exhibits involved R/C cars, boating and in a category all by itself, the current state of the art in R/C helicopters.

As in previous years FLYING MODELS had its staff members covering the WRAM's Show in depth. Throughout both days every manufacturer was visited, photographed and, of course, interviewed. The Carstens Publication booth was manned by FLYING MODELS, Managing Editor, Bob Hoeckele and Contributing Editor, Jim Boyd. Detail reports were filed by Contributing Editor, Bob Aberle who spent most of his time reviewing the R/C equipment and systems manufacturers. Bob Crane, LSF 168, concentrated on the R/C Soaring area (both aircraft and equipment) and Frank Tiano covered all the various kit manufacturers (and there were many!). Their individual commentaries now follow:

Radio Control Systems and Equipment

Just about all of our current R/C equipment manufacturers were present at the 1978 WRAM's Show. The several who couldn't make it were still digging out from the big snows of '78.

Kraft Systems showed off their new KPS-18 micro servo which weighs only 0.582 ounces. Although very small it has resolution comparable to the larger Kraft

servos. Unfortunately, the high price tag (\$59.95) may make some modelers think twice. Of course their biggest application will be in .049 powered aircraft (or smaller) where two channel control still prevails, requiring only two servos. Kraft also showed off their expanded line of Sport Series radio systems. They now have a two and six channel system to go along with the four channel set introduced last year. Check the low prices on these systems.

One of the most interesting pieces of equipment to come on the market in the past year or so is the new Millcott Specialist series. Although a new company they have a top quality system with features not found on any other set. Millcott also offers a neat little three channel system which contains a built-in electronic mixer control. The mixer will enable a "V" tail model to be flown without the need for all that complicated control surface linkage. A great system for the glider pilot and also the sport flyer. List price is \$275.00 for the three channel set.

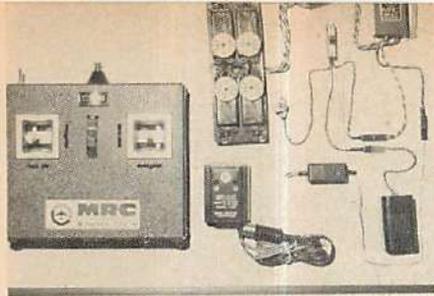
Many R/C manufacturers are now offering some type of "super" or custom radio system. The Kraft Signature series led the way in this category several years ago. As of this year, Pro Line now offers a Custom Competition Seven series, Futaba has a new Contest Seven radio, EK Products showed their Championship series, the Millcott Specialist Eight, Royal Electronics had their extremely sophisticated, Omega system which they are only offering in kit form and RS Systems also displayed a new transmitter with extra control features. If you haven't already figured it out it is the transmitter that actually makes the new "super" radio system. These new custom transmitters have

features such as reversible servo travel, dual rates, non-linear rates, roll and spin buttons, built-in electronic control mixers, plug-in frequency modules, battery monitoring systems and flight timers to name a few. Each custom unit has its own advantages and disadvantages. Since these systems share one thing in common, they are all expensive, it would be wise for the modeler to look them over very carefully before making the final decision to buy. There is no question in my mind that these custom radio systems offer many conveniences which can be real time savers. If you are any kind of pilot at all, these new radios should make you even better. Don't simply walk away when you first look at the price tag.

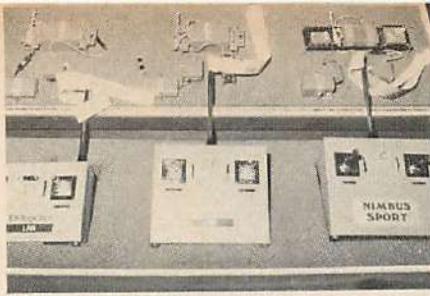
Litco Systems has been offering airborne flight packs for several years now. If you own a complete R/C system and want another flight pack for a second model this is an inexpensive way to go. Litco has now upgraded all of their servo amplifiers with the popular Signetics NE-544 integrated circuit. All of their prices looked quite attractive.

Sid Gates of Royal Electronics displayed their new Chevron servo. This servo uses again the NE-544 integrated circuit along with a series of outboard transistors. You will have a choice of a 10 ohm or 6 ohm motor for that extra power needed on the new larger aircraft models and for R/C boats as well. It is also claimed that this servo can be easily adapted to 180 degree travel. Sorry I didn't get anymore details on this at the time.

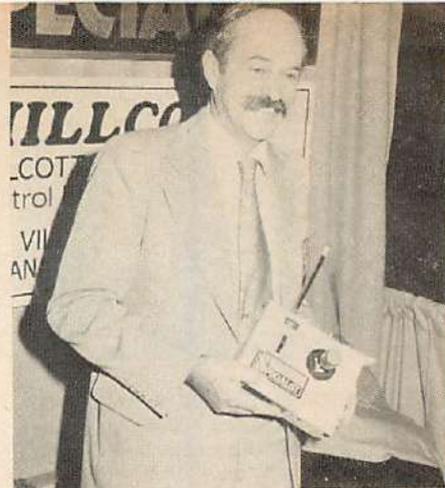
Charlie's R/C is a new entry into the R/C kit field. This line is based on the well proven Cannon Electronics equipment, but strictly in kit form. There is an entire assort-



MODEL RECTIFIER CORP., 2500 Woodbridge Ave., Edison, NJ 08817 was showing their fine quality 775. A 5-channel radio with die cast metal open gimbal sticks for competition.



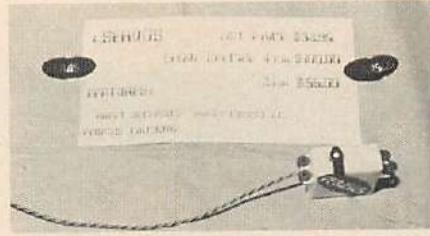
EK LOGICTROL PRODUCTS, INC., 3322 Stovall Street Irving, TX 75061 has a full line of economy radios shown here. The Nimbus radio was covered in depth in the February 1978 issue of FM.



MILLCOTT CORP., 1420 Village Way, Unit E, Santa Ana, CA 92705 had Hugh Milligan proudly displaying his new Specialist 8 single stick transmitter. Read about it in May '78 FM.



STERLING MODELS, 3620 G Street, Philadelphia, PA 19134, had Betty Boyle holding their new Stinger .40 airboat. Behind her are their new P-61 Black Widow and Piper Cherokee.



PEGASUS ELECTRONICS, 12180 Nebel Street, Rockville, MD 20852, is offering servos using either Kraft KPS 14 or 15 mechanics and the Kraft integrated circuit for \$32.95.



FUTABA INDUSTRIES, 630 Carob St., Compton, CA 90220 was well represented by Lewis Polk of Polk's Modelcraft Hobbies. Here Lewis is holding the new FP-7G radio. Retail list \$579.95.



ROYAL ELECTRONICS, 3535 S. Irving St., Englewood, CO 80110 had Sid gates displaying his full line of assembled and kit form R/C systems and components. Two channel system was in FM.



KRAFT SYSTEMS, 450 West California Ave., Vista CA 92083 has Phil Kraft presiding over his fine array of R/C systems. New micro KPS-18 servo weighs only .582 ounces for \$59.95.

ment of system kits, airborne flight pack kits and individual servo kits. Their sub-mini servo kit using the Dunham D-5 'micro mechanics lists for only \$24.50.

Mr. Frank Ritota of Model Rectifier Corp. was very enthusiastic about their new MRC-Mabuchi electric power unit which is intended for model aircraft, boats and cars. This is a full system including the electric motor, rechargeable battery pack and a special electronic sensor unit which shuts down the motor when a certain level of discharge is reached. This all sounds very innovative and should add a new dimension to electric powered R/C models.

Most notably absent from this years show was the various pieces of special battery test equipment. Several years ago this was a big item of attraction. I honestly believe most R/C modelers now have enough of an understanding of their rechargeable nickel-cadmium batteries to be able to cope with most problems. If not there is usually at least one fellow in each club or at each flying site that can offer assistance. In other words we have finally made some progress in this very controversial area.

As you can tell from my few comments,

this was somewhat of a quiet year as far as R/C equipment progress is concerned. The big emphasis this year seems to have been in the R/C accessory field and in new model construction kits — BOB ABERLE, Contributing Editor.

Soaring

Although only one major sailplane manufacturer, "Craft-Air" was present at the show, the 1978 WRAMS show was very interesting. Craft-Air is adding two new kits to their fine line of sailplanes and accessories. The "Butterfly II" by Bill Carter, is a training airplane for would be R/C flyers with aged reflexes and faint hearts. Wing span is 99 inches utilizing the Craft-Air "Windrifter" flat bottom airfoil. Wing area is 960 square inches; flying weight 50 ounces; recommended engine size is .09 to .19; radio - three channel; wing loading 7½ oz./sq. ft. The Butterfly II besides being a gentle trainer also has a sporting side to her nature. The rate of climb is said to approach 600 ft./min. and rough calculations indicate that the top speed should exceed 50 m.p.h. According to Tom Williams of Craft-Air, the Viking is a very versatile sailplane. Wing

span is three meters (118 in.); wing area 1200 sq. in.; wing loading 6½ oz./sq. ft. The Viking comes equipped with two sets of wings. The Viking Mark I has the same airfoil that is used on the Windrifter and Sailaire. The Viking Mark II has a semi-symmetrical airfoil which has launching and thermalling characteristics similar to the Windrifter.

The men of Soaring Products, Don Clark, Walt Good, and Ben Givens are widely known in the R/C soaring world. The "Thermic Sniffler" is a small three-ounce device which rides in your R/C glider and transmits instantaneous rate-of-climb audio information to your ear via a monitor receiver at your side. The "Thermic Sniffler" uses the variation of the air pressure with altitude to detect a climb or dive of your model. It's really the same as the electronic variometer in full scale sailplanes. The Sniffler contains a sensitive thermistor flow meter, a tone generator and a radio transmitter housed in a tough plastic air chamber. The receiver/monitor is a new Midland brand modified to the Sniffler's use.

Ted Strader of Special Edition Plans is offering two gliders which may be of interest



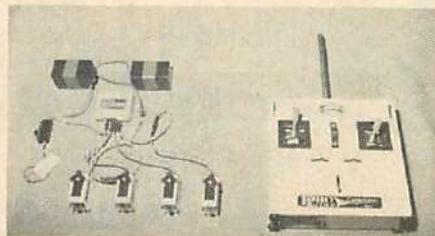
WORLD ENGINES, INC., 8960 Rossash Ave., Cincinnati, OH 45236, was well represented by the US top pattern flyer Dave Brown and Mr. Jack Pfohl show the Expert series radio.



FLYLINE MODELS, INC., 2820 Dorr Ave., Fairfax, VA 22030 had Herb Clukey and Hurst Bowers with their two latest. The Great Lakes will be ready this summer, the Howard DGA is ready now.



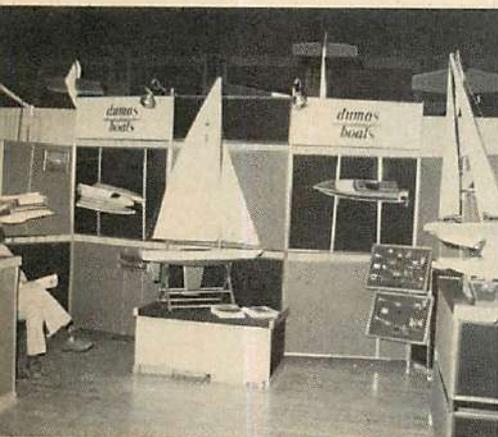
CHARLIES R/C, P.O. Box 192, Van Nuys, CA 91408, had "Charlie" herself showing her line of R/C kits. A typical 4-channel kit with CE-4 servos lists for \$174.95. Not bad-the price that is.



LITCO SYSTEMS, INC., P.O. Box 90, East Hanover, NJ 07936, offers a complete series of airborne flight packs and components for use with just about every known transmitter. Units or kits.



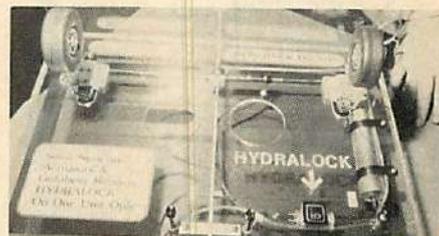
PETTIT PAINT COMPANY, 25 Pine Street, Rockaway, NJ 07866 had the ever popular Bev Smith giving out helpful advice throughout the show about the full line of Hobbypoxy products.



DUMAS PRODUCTS, INC., 901 East 17th Street, Tucson, AZ 85719 was at the show with their very impressive display of every kind of model boat and accessory. The Model Boat People.



GENE THOMAS CLASSIC MODELS, P.O. Box 681, Melville, NY 11746 was showing his new Alexander Bullet peanut scale and 1½" scale kits that includes 3-views and glossy prints.



IDEA DEVELOPMENT, INC., P.O. Box 7399, Newark, DE 19711 introduced Hydra Lock which is inserted into a standard pneumatic retract system and slows it down and keeps it locked in position.

to our lunchtime flying buddies, in that they can be in the air in a matter of minutes. The "Gypsy" spans 60 inches and has a wing area of 364 sq. in. The Gypsy was originally published in 1963 in "Flying Models" and is being revised for 1978. The revisions include a new spruce spar and full span webbing for added strength. Three channels are recommended, rudder, elevator and throttle (power pod). The glider may also be hi-started or winch launched. The Gypsy is not a competition sailplane but rather a fun sailplane. The "Gulliver" is the "just a little bit different" sport glider for care-free fun. The kit features a gull wing design spanning 48 inches with 205 sq. in. of wing area. One or two channel control may be used.

M.E.N.—Model Engineering of Norwalk is offering their fine hi-start surgical tubing. M.E.N. rubber is given a special treatment to reduce surface scratches. The 5/16 inch O.D. x 1 1/16 inch wall rubber is packaged two pieces maximum in a 100 foot length per box. M.E.N.'s towline parachute is a red and white, twelve gore chute designed for thru-tow service on the heaviest model sailplane. To retrieve and store your hi-start M.E.N. offers a hi-start reel. The reel capacity is 800

feet of line and 100 feet of heavy duty rubber. The semi-balanced design and size allows wind up and unwind to proceed as fast as you can walk.

Economy Plus has some interesting products for sailplanes. One product "Ser-Velcro", is an industrial grade super-holding Velcro tape which is not available in retail stores. Len Ellentuch, informed me at the show that the Velcro system is stronger than the servo tape currently on the market. Reports indicate that holding strength is 7-10 lbs. per sq. in. for Ser-Velcro, which also comes with a peel-off adhesive backing. "Curathane" is an aircraft finish formulated for maximum durability on models. Curathane is actually used on jet, turbo and propeller aircraft, and is impervious to 100% nitro.

Bill Mueller of Hi-Flight Model Products has just introduced the Hi-Flight 12 launch system, a new concept in commercially produced winches for the launching of R/C sailplanes. The Hi-Flight 12 is powered by a conventional 12 volt automotive battery and is unique in that a single foot control allows the flyer to choose slow (6 volt), medium (9 volt) or high (12 volt) winch speed. An isola-

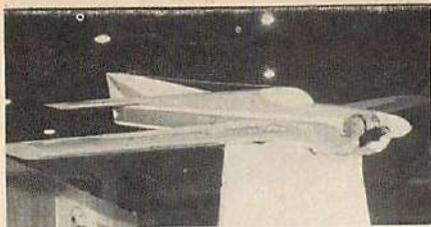
tion switch is provided to eliminate high speed, if the flyer desires. The Hi-Flight 12 consists of a rugged welded steel frame which is acid dipped and sprayed with two coats of catalyzed polyurethane; a completely rebuilt 12 volt motor; a finely machined drum with a two inch core; and all the electronics necessary for its operation including the finished three speed foot control and roller bearing turn-around. The winch system measures 9"x9"x15" and weighs only 40 lbs. less battery. Also offered by Hi-Flight are LSF and NSS heat transfer emblems for shirts. The LSF is an attractive four color emblem with iron on level numbers. The NSS is a two color emblem.

Strobe-flight is not an ordinary blinking light system but a strobe effect. This system is available in preassembled or kit form. Great for night flying with your sailplane.

Sailplane Accessory Co. offers a new spoiler system for R/C sailplanes which does not use magnets or rubber bands for spoiler closure. The system is a positive push-pull system actuated by a slotted triangular bell-crank which connects to a 180 degree bell-crank which is in turn moved by a servo in the fuselage. The spoiler system can flex



CHAMPION MODEL AEROPLANE CO., P.O. Box 45, Keyport, NJ 07735, had FM author Dick Sarpolus with the Anderson Kingfisher, a 4-channel amphibian with retract landing gear for land.



KARODEN HOBBY PRODUCTS of New Jersey was showing their new model of Dennis Donahue's fine pattern ship "El Tigre". The new model kit features a fiberglass fuselage.



VORTAC MANUFACTURING CO., P.O. Box 469, Oak Lawn, IL 60453, had a happy Cousin Don showing his new bomb and drop tank release mechanism which is assembled for \$4.98.



RALVIN INDUSTRIES of New Jersey had "Uncle Ralph" Paladino very seriously offering his fine J-Bipe which features connected upper and lower ailerons for fantastic response.



EXECUTIVE DESIGN CORPORATION had Al Wolter, co-owner with his brother Tony, showing the Executive, a new intermediate trainer. The ships this company has are clean and classy.



MIDWEST PRODUCTS COMPANY, 400 South Indiana St., Hobart, IN 46342 was showing smilin' Frank Garcher and his new 1/2A ducted fan design and a 1/2A Heinkle for it to power.



REV MODEL PRODUCTS, 430 Key St., Unit D, Addison, IL 60101, had Bob Vojslavek holding their Cassutt .40 size sport scale, pylon ship. Kit features foam wings with balsa sheet covering.



FOX MANUFACTURING COMPANY, 5305 Towson, Fort Smith, AR 72901, was represented by Duke himself showing his new large wheels and twin .60 engine which should retail for \$275.

both forward and backward or if a rough landing is made come apart, without damage to the mechanisms. Also available are triangular belleranks for flying stabs and wing supports which are made from spring steel and provide very good vertical position of the wings—BOB CRANE, *LSF 186*

Kits and goodies

For most of us here on the East Coast, the WRAM show really couldn't come at a better time since it does wonders for putting the building and flying spirit back into our dreary bodies after a long winter of not flying. Walking up and down the many aisles the first time Saturday morning sets ones heart beating and makes it difficult to decide which booth to stop at first. What I have done here is compile a brief report on the many items of interest, especially new products, available at the time of this writing. Some of the products will be the subject of future FM Product Reviews so stay tuned to this mag if you're seeking further information.

First we'll take a look at the new kits, some of which will be available now, others by mid-Summer. One of the prettiest ships on

display was the new House of Balsa P-51 Mustang designed for .35-.40 engines. The ship may be built either as the Candy Man racer of Reno fame or a WW II fighter. For those of you familiar with the 1/2A kits offered by the House of Balsa, the .40 version should be a pleasant surprise since it features the same type of construction with the plastic turtle deck. Price is \$54.95 from hobby shops. House of Balsa, 2814 E. 56th Way, Long Beach, Cal. 90805. Royal Products Corp., 790 W. Tennessee, Denver, Colorado 80223 displayed their new ME-109D for .60 engines. Although the paint scheme on the model left a little to be desired as far as realism, the ship looks like it has good moments and should prove to be a fine flyer. Price is \$94.95 and the ship has a 67" wing span and 697 sq. inches of area. Cass Engineering unveiled their new Steen Skybolt biplane for stand off scale and pattern events. This ship uses the same wings and moments as the famous Pulsar and should prove to be a winner. The kit features a fiberglass fuselage and foam wings. For more information see your dealer or write to Cass Engineering, Box 420, Rutherford, NJ 07070.

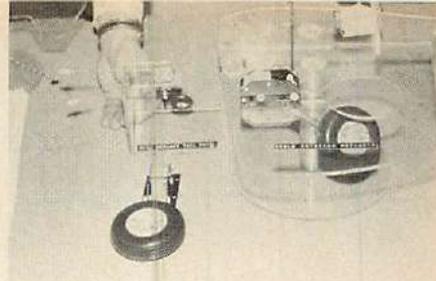
Don Foster of Gee Bee Products was showing the new Dreamer .40 powered biplane that was first featured in *FLYING MODELS* back in June 1972. This high performance biplane weighs in at 4 1/2-5 lbs. and is of all balsa construction. It's intended for 4 channel operation and will retail for \$42.50. This kit is being sold direct from Gee Bee Products, P.O. Box 18, E. Longmeadow, Ma. 01028. Ted Strader and his pretty wife Vada came down from Schenectady N.Y. to show their new Yeoman trainer. This little .15 powered cutie features all balsa, interlock construction for durability. Available from Special Edition Plans, P.O. Box 2555, Schenectady, N.Y. 12309. Sterling Models always has something new in the works and this year was no exception from the looks of their booth. A P-61 Black Widow and a Piper Cherokee both with 37 1/2" wingspans are now available for rubber, .020 or electric power. Sig Manufacturing Co. had their new Kavalier aileron trainer on hand that features built in washout in the wings while being built on a flat surface. The kit is intended for .29-.35 engines and retails for \$39.95. The Kavalier features typical Sig quality and should be available by mid-



MODEL RECTIFIER CORP., 2500 Woodbridge Ave., Edison, NJ 08817 had Frank Ritota holding their new Webra .90 which features a mixture device controllable with an extra servo.



CUSTOM MODEL PRODUCTS, 27 Fulton Street, Brockton, MA 02401, had Jean Smith holding their new Genie trainer kit. The ship was only offered in finished form previously.



ROBART MANUFACTURING CO., P.O. Box 122, Wheaton, IL 60187, was showing their newest product in their line, conventional and rotating retract systems for larger models.



SIG MANUFACTURING CO., Montezuma, Iowa 50171, had Maxy Hester and the gang showing their newest kit, the Kavalier aileron trainer that features built-in washout in the wings.



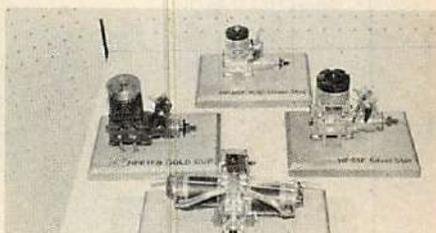
TOP FLITE MODELS INCORPORATED, 2635 S. Wabash, Chicago, IL 60616, had Smilin' Sid Axelrod showing their entire line including the Freshman Trainer. A sturdy ship to learn on.



AEROMOBIS DESIGN, Box 325, New York, NY 10009, had Cathy and John Heisch showing the ZOZ 25, a 55" ship for .29-.36 power that features fold and glue construction with foam.



R/C KITS MANUFACTURING, 353 Briar Ave., North Canton, OH 44720, had Bob Campbell showing his new T-38 which is stand-off scale and is intended for .60 engines. A big one.



MIDWEST MODEL SUPPLY CO., 6929 W. 59th St., Chicago, IL 60638 presented their Damo 4-cycle twin along with an assortment of other engines. The black one is the HP Gold Cup series .61.

Summer. Sig also unveiled their new Kiwi sport pattern model scheduled for release sometime this fall at \$37.95. Aside from an excellent line of adhesives and the famous Z pliers, John Smith, of Custom Model Products was only known for his beautiful wife Jean. Well now CMP has something new to crow about, this being the Geni sport trainer. The Geni is an attempt to provide the modeler with a truly aerobatic sport trainer that is easy to build and rugged as well. This kit is unusually complete and can be built in a very short time. For more information drop a line to Custom Model Products 27 Fulton St., Brockton, Ma. 02401. Another show stopper was the T-38 Talon now being offered by RC kits, 353 Briar Ave. N. Canton Ohio 44720. This .60 powered stand off scale model was done up in a Thunderbird color scheme and was one of the prettiest aircraft at the WRAM show. Construction is balsa and foam and the kit includes all building materials such as wing sheeting, etc. The ship will require either a pumped engine or a Robart fuel pump as the tank is mounted in the rear of the fuselage. Flight performance is supposed to be outstanding at 8-8½ lbs. Retail price is \$89.95.

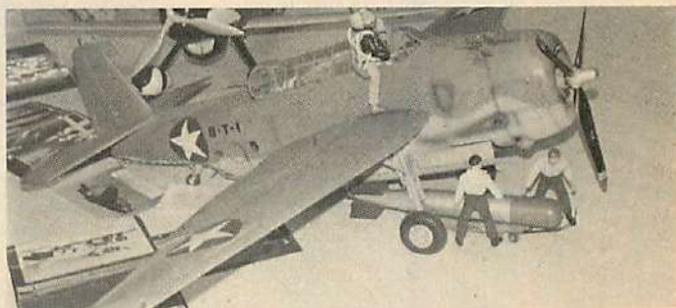
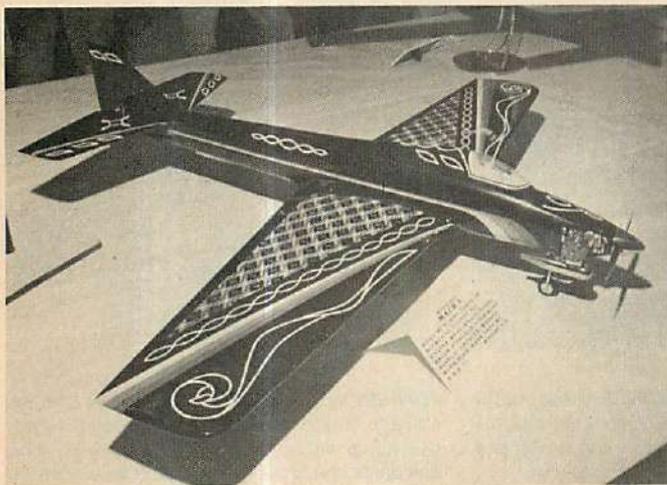
Champion Model Aeroplane Co., PO box 45, Keyport, N.J. 07735 announced the rekitting of the old Mini Flite line of balsa models. The most exciting plane in their booth was the Kingfisher amphibian that features retracting gear for water use. This kit will retail for \$119.95 and be suitable for standoff scale competition. This fantastic ship weighs in at 7½ lbs and packs 750 sq. inches of wing area in a 72" span. Another new company, Executive Design Corp., Box 530, Wheatley Hgts., N.Y. 11798, displayed a line of sport and scale kits for .40 to .60 sized engines. The ship that drew the most attention in their booth was the Executive, a .40 powered sport ship featuring a high gloss black paint job. Also shown was their soon to be released Aero Commander 112, an accurate scale model of the sleek private airplane. The price for the Executive is \$59.95 while the Aero Commander's price will be released at a later date. One of the most novel and interesting designs shown at the WRAM show was the ZOZ-35 from Aeromobis Design, Box 325, New York, N.Y. 10009. This \$29.95 kit features foam core construction for rugged, easy construction. The ZOZ-35 will accommodate .29-.40 sized

engines and is intended for the sport flyer. At this time orders are being handled direct from the manufacturer if \$4.00 is added for shipping and tax. Last but not least, Denny Donohue finally formed a kit company and is offering his very successful "El Tigre" pattern ship in kit form. Karoden Hobby Products, PO box 434 Bergenfield, NJ 07621 is the name of the company and offers a new type of masking tape and other hobby related items as well. The El Tigre features a gel-coated fuselage with factory installed firewall, wing dowel bulkhead and rudder post. Foam cores from Bob Hunt are also included in the kit along with a fiberglass belly pan and detailed plans. Price for this highly competitive airplane is only \$79.95 available from your dealer.

Engine wise, the newest offerings at the WRAM show came from Midwest Model Supply, Fox, HB Engines and YS Engines. Nelson handles the line of HP engines from Austria and was showing their newly redesigned series of Schneurle ported powerplants. The most interesting item in the booth was the new Damo twin which has 1.10 cu. inches of displacement and should be ideal for those large scale models. Price



Frank Costello of Dover, N.J. took first in Sport with this Antic (above). Duane Neefe took first in Pattern with his beautiful black Mach 1 (below). The TBF at right belongs to Jerry Puleo of E. Rockaway, N.Y. who took second in Military Scale with it. Dan DeLuca of Elmwood Park, N.J. won second in Pattern with his Purple Passion and a great MonoKote job.



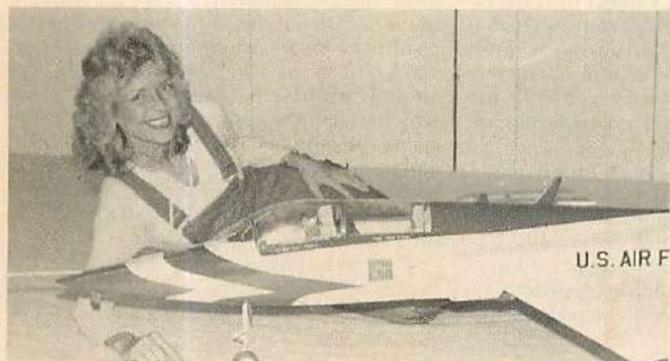
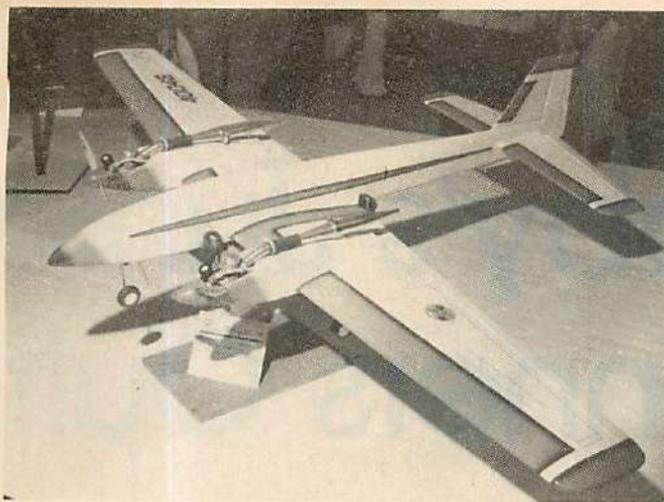
of this piece of craftsmanship will be in the neighborhood of \$650. The new HP Gold Cup .61 was also displayed and should be a winner in the pattern field when fitted with its available tuned pipe. Bavarian Precision Products, PO box 6, New Canaan, Conn. 06840 displayed their fine line of HB engines for both aircraft and marine use. These engines feature excellent workmanship as well as good looks and are competitively priced with other quality engines on the market today. Reading Hobby Supply, RD#3 box 583 AB, Reading, Pa. 19606 showed a complete line of YS internally pumped engines featuring Schneurle porting. These engines are supposed to get those heavy scale models in the air with little effort or power a pattern ship with speed to spare. For more info contact John Camilli at Reading Hobby Supply. Duke Fox unveiled his new 1.2 cu. inch twin featuring dual carbs and Schneurle porting due for release late this Summer. The twin will swing a 15" prop at 11-12 thousand and develops a reported 2½ horsepower. We'll keep you posted on this one.

Other items of interest to me were the new flight boxes offered by Master Kit, manufac-

turer of the Hiperbiplane and Stinger biplanes. This new box is intended for the competition flyer and separates into two parts. Another fine wood box is offered by Aerotrend Products, also intended for the serious flyer. Royal Products Corp. now has a new covering material called Thermalon. This paintable covering is supposed to be lighter than most plastic types and may be applied at 300 degrees of heat. Vortac Mfg. Co. has a new bomb or drop tank release mechanism available for \$4.95 that looked really neat. I've been telling people that the scale modeler has needed this item for a long time and it's finally here. Soon to come are exploding (harmless) bombs from the same company. For further info contact Vortac at PO box 469, Oaklawn, Ill. 60453. Economy Plus, makers of Stuk and related adhesives have introduced a new form of paint called Curathane. This is a two part paint that has all the features of epoxy plus extreme durability and high gloss. Also available from Economy Plus is a new type of Velcro not available in retail stores that will mount servos as well or better than tape and will not loosen with vibration. I tried a piece and it really does work. Cyt-4 Industries has a

product called Form-a-balance that can be mixed with epoxy to form a weight exactly where you need it. Also available from the same company are a wing wedge used for holding up your wing while connecting servo cables or retract hoses, and a glow plug igniter called "Hot Box" that may be recharged 1000 times to give many years of reliable starting power for flooded plugs. A new total that caught my eye is being offered by Edson Enterprises. This is a new type of sealing iron for covering materials that has a removable tip that may be transformed into a soldering gun in seconds. Another nice gadget is the Fornicator offered by Idea Development Inc., PO box 7399, Newark, Delaware 19711. This is a home usable, low cost vacuum former that really works. The unit retails for only \$27.00 and should be a definite help to the scale or scratch builder.

In closing let me say that the WRAM's did a splendid job and everyone enjoyed themselves immensely. Throughout the coming months I will try to bring you a bit more up to date on some of these items in our product review section — FRANK TIANO, Contributing Editor.



Betty Shulman, wife of Don, daughter-in-law of Lee is trying to get some extra points for her husband's scratch-built T-38 in Stand-Off (above). The JU87B Stuka (above middle) won first in Stand-Off Scale, it belongs to Mike Cavuto of Plattsburgh, N.Y. Dick Sarpolus' Magnum Twin (top) features two K&B 6.5 engines with tuned pipes. If this one won't do vertical maneuvers, nothing will. Look for this design in FLYING MODELS.

1978 WRAM Show Winners

World War I

- | | | |
|----------------|---------------|------------------|
| 1. Len Stolk | Avro 504K | Leonia, N.J. |
| 2. Mark Minnig | Fokker EV | Old Bridge, N.J. |
| 3. Bud Roane | Sopwith Camel | Keyport, N.J. |

Post WW I (Military)

- | | | |
|----------------|-------------|-------------------|
| 1. Jim Fundak | F4U Corsair | Rosedale, N.Y. |
| 2. Jerry Puleo | TBF | E. Rockaway, N.Y. |
| 3. Bill Fuori | FW 190 | Commack, N.Y. |

Post WW I (Non-military)

- | | | |
|-------------------|--------------|-----------------|
| 1. George Bussman | Gypsy Moth | W. Seneca, N.Y. |
| 2. Henry Haffke | Howard "Ike" | Vineland, N.J. |
| 3. L. Carpenter | | Lehighton, Pa. |

Sport Aircraft

- | | | |
|-------------------|-------------------|--------------------|
| 1. Frank Costello | Antic | Dover, N.J. |
| 2. Fred Strauss | Focke Achgelis 61 | Washington, N.J. |
| 3. A. Carrera | Fanliner | North Bergen, N.J. |

Pattern Aircraft

- | | | |
|------------------|----------------|--------------------|
| 1. Duane Neefe | Mach I | Elimford, N.Y. |
| 2. Dan DeLuca | Purple Passion | Elmwood Park, N.J. |
| 3. Dick Sarpolus | Magnum Twin | Shrewsbury, N.J. |

Gliders

- | | | |
|-------------------|-------------|------------------|
| 1. Art Pelletier | Aquila | Barrington, N.H. |
| 2. Larry Otto | Gran Esprit | E. Hampton, N.Y. |
| 3. Joe Abbondanza | Original | Fort Lee, N.J. |

Helicopter

- | | | |
|---------------------|------------|--------------------|
| 1. Bob Haden | Jet Ranger | Jeannette, Pa. |
| 2. Kerry Stener | Enstrom | Bath, Pa. |
| 3. John Simone, Jr. | Jet Ranger | Mission Diego, Ca. |

Boats (scale)

- | | | |
|-----------------|-----------------|-------------------|
| 1. John Steffen | Schooner Eloise | Whitestone, N.Y. |
| 2. Bud Lederer | Sub U-505 | Woodcliff, N.J. |
| 3. Mario Peano | Michelle | No. Haledon, N.J. |

Boats (racing)

- | | | |
|----------------------------|---------------|------------------|
| 1. Doc Corpus | Benihana OSR | Staten Is., N.Y. |
| 2. Bob Turs | Isis Deep Vee | Westwood, N.J. |
| 3. Kathy and Vern Randolph | Little Mixer | Merrick, N.Y. |

Juniors (any category)

- | | | |
|--------------------------|---------------|--------------------|
| 1. Gary Singer (14) | Nieuport 17 | Armonk, N.Y. |
| 2. Nick Ziroli, Jr. (14) | G. L. Trainer | Smithtown, N.Y. |
| 3. Brian Yerich (16) | Deep Star | Millburn, N.J. |
| 4. Mark Greenburg (15) | Travelair | Scarsdale, N.Y. |
| 5. Larry Otto (15) | Miniplane | E. Hampton, N.Y. |
| 6. M. Moss (15) | 1933 Fleet | White Plains, N.Y. |

Pylon (Formula I)

- | | | |
|----------------|-----------------|-------------------|
| 1. Paul Zink | Little Toni | Jamaica, N.Y. |
| 2. Pete Reed | Pole Cat | Plainville, Conn. |
| 3. Bob Wallace | DeNight Special | Avon, Conn. |

Cars

- | | | |
|------------------|-----------|---------------------|
| 1. Nick Galligan | Chapperal | N. Babylon, N.Y. |
| 2. B. Kaczmarek | Maserati | Staten Island, N.Y. |
| 3. Chubby Caviso | McLaren | Ronkonkoma, N.Y. |

Stand-Off Scale

- | | | |
|-------------------|----------------|-------------------|
| 1. Mike Cavuto | Stuka JU87B | Plattsburgh, N.Y. |
| 2. Frank Tiano | Hawker Tempest | Kingston, N.Y. |
| 3. Mark Weinstein | P-38 | Island Park, N.Y. |

Sport Biplane

- | | | |
|------------------|------------|------------------|
| 1. Jim Gratson | Pitts | Cortland, Oh. |
| 2. Hugo Visconti | Tiger Moth | Whitestone, N.Y. |
| 3. Rich Uravitch | Waco | Panamoka, N.Y. |

Old Timers

- | | | |
|---------------|-----------------|---------------|
| 1. Dave Paine | Miss America | L.I. N.Y. |
| 2. Larry Fair | Albatross | Cardiff, N.J. |
| 3. Joe Beshar | Brooklyn Dodger | Oradell, N.J. |



Hobby Lobby's Junior Beginners Outfit

The subject of this FM Product Review is a complete beginner's package from Hobby Lobby International Inc., Rte 3, Franklin Pike Circle, Brentwood, Tennessee 37027. The package includes a Jr. Telemaster kit, Fox .15 R/C engine, Hobby Lobby six channel radio and two rolls of Superkote covering material. Except for the Fox engine, these items are marketed exclusively by Hobby Lobby. At the time this review was started, the special package price was a very reasonable \$277.00. These items have all proved to be of high quality and perform very well together. And best of all, this combination is ideally suited to someone who is just starting out in radio control airplanes.

The Jr. Telemaster is a trainer designed to take the novice from first flight through competence in four channel flying. It is equally suitable to three channel operation (no ailerons). This is one trainer that really does the job well. As you might imagine, there are some kits which are marketed as

trainers but don't fly so well at all. How can a beginner make a choice based on advertising claims alone? This is risky and, whenever possible, he should seek the advice of an experienced flyer (and read lots of product reviews).

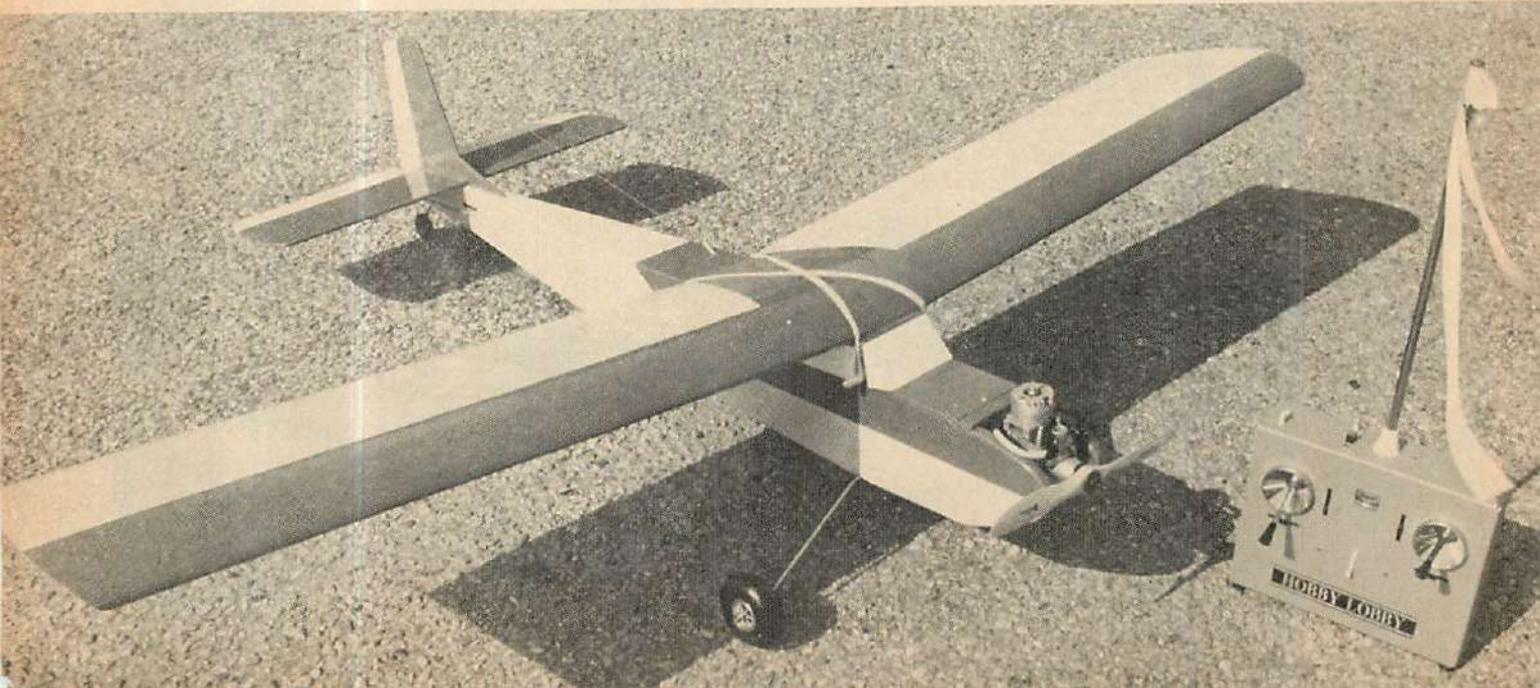
Unfortunately there are varying opinions as to what makes a good trainer, and each instructor may make a different recommendation based on his experience. In fact, one could fill a book on the subject of trainers alone, and that would still not settle all of the controversy. So to put this review into perspective, I'll tell you a little about my feelings on trainers. Later on you will understand why I like the Jr. Telemaster so much.

The following discussion is grossly oversimplified. There appear to be two major categories of trainer: 1) super stable so that it almost flies by itself, and 2) reasonably stable so that it requires attention but is forgiving of errors. I find that the first type tend to be sluggish and very hard to manage in the

wind, but the second type are more responsive and more tolerant of windy conditions. If you live in a windy area, you aren't going to learn how to fly by waiting around on the ground. Also, to some extent, excessive stability robs the student of valuable learning experience. So for most beginners I will recommend a ship in the second category providing it has no bad habits.

What all of this is leading up to is that I think the Jr. Telemaster is an ideal type-2 trainer. With or without ailerons it responds positively to the controls and goes where you point it even in moderate winds. The controls are effective down to the stall point, which is gentle and occurs at a very low speed. It is moderate in size for economy and ease of transportation, yet has plenty of room for radio equipment. Also, it is strong without being heavy or difficult to build. So let's see how it goes together.

The box is deceptively small for a ship that builds up to a 50" span and 409 square inch wing area. The wood is all clear and



Telemaster

Hobby Lobby answers the question of how to get started in R/C with a total approach aimed at the novice. A package of things that work well/**Ron Farkas**

straight, and all the pieces were of suitable density for their respective applications. Only the 1/16" fuselage top and bottom sheeting was a little too soft by my standards. The hardware includes machine screws, blind nuts, aileron torque rods, horns, landing gear, tailwheel gear, and a Bridi BHE-19 fiber-filled engine mount. The plans are clear and easy to understand, especially because of the simplicity of the design. The instructions are brief but anything that may be vague can be figured out from the plan. There is a bill of materials which is worth checking before you begin. The only piece that I could not account for was the capstrip material which I easily cut from some stock in my scrap pile.

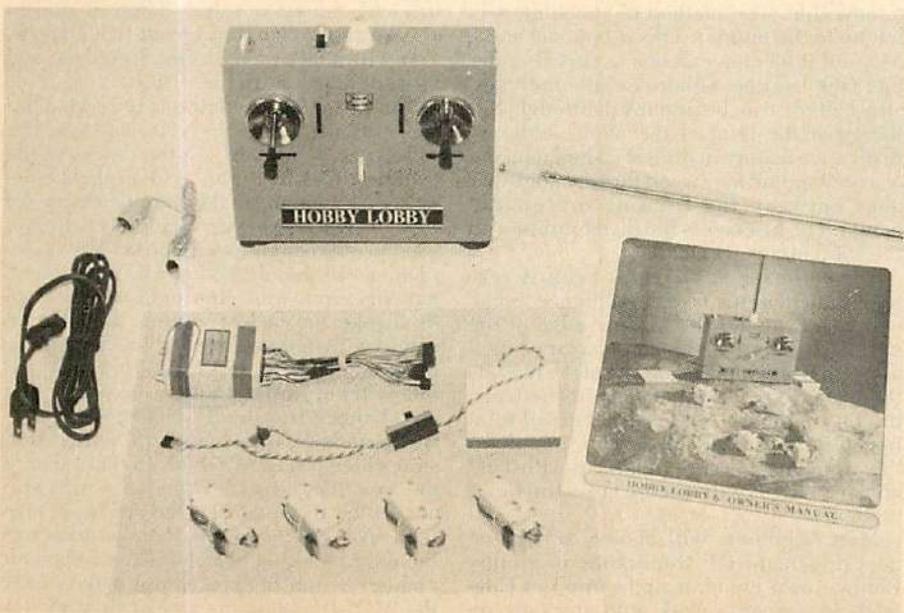
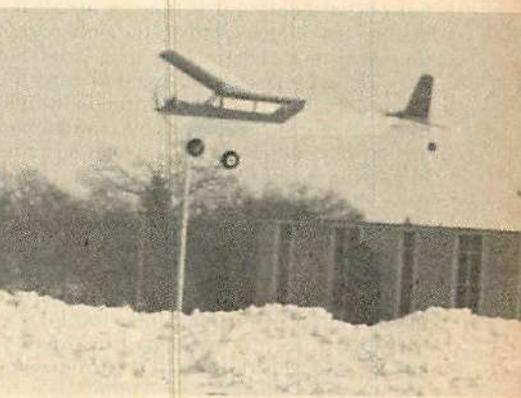
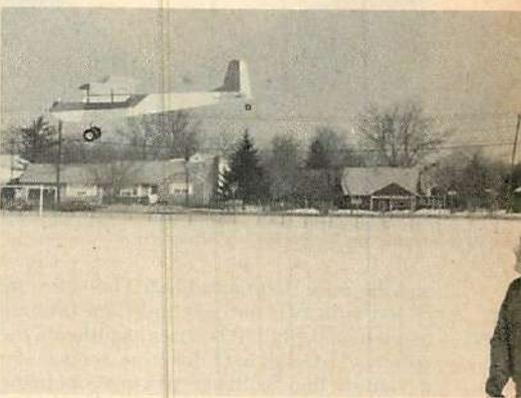
Assembly goes very quickly, especially because the parts fit perfectly. The flat-bottomed wing is built in two pieces on any straight board. The bottom sheeting, capstrips, leading edge and spar are glued together over the plan. The bandsawed ribs are glued down followed by the top spar,

trailing edge, top sheeting and capstrips. The wing panels can then be removed from the board and aileron torque rods fitted. The instructions are sketchy in this area. Hardwood tapered stock is pre-notched to take the torque rods and all you have to do is glue this assembly to the trailing edge of the wing (without getting glue in the guide tube, of course). I always add a little scrap material in the trailing edge of the wing to give the aileron hinges something to bite into. The tips are glued on and carved, and the wings are ready to join. A center rib of tapered stock is used to ensure that the dihedral is built in. The instructions specify the application of glass cloth to strengthen the center section. I think this material should be included so the builder is not inclined to omit this important step. The completed wing is very strong and resistant to twisting.

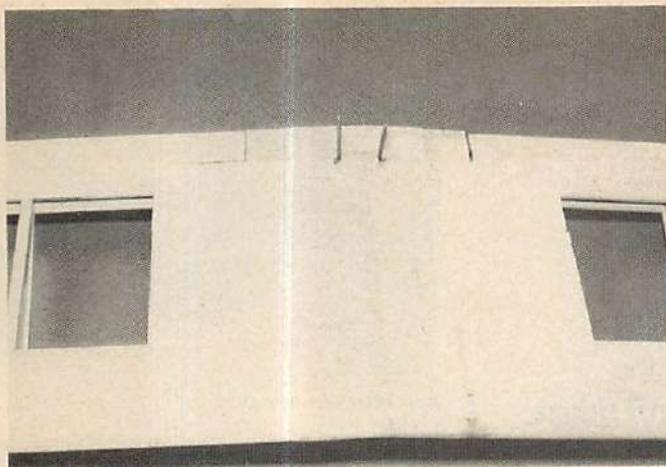
The fuselage is also strong and simple to build. Each side is made of an upper and lower portion which are first glued together,



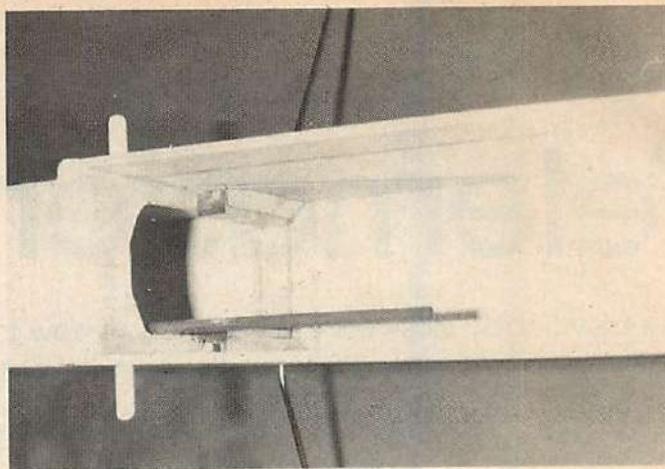
PHOTOGRAPHY: BOB ABERLE



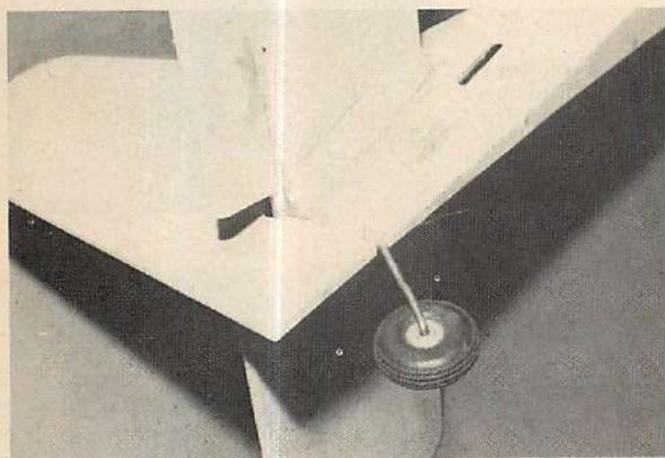
The complete Hobby Lobby six-channel system with four servos and nickel-cads. A.C. cord plugs into wall outlet and bottom of trans. Charging can be done only with both units connected (left). This series of shots (above top to bottom) shows the first launch of the Jr. Telemaster. Author cranks engine while temperature is below freezing. Hank Stumpf is the helper. No zooming tendency.



The bottom of wing (above) showing aileron torque rods. Servo cutout is not made yet. Do not omit glass cloth on the center section. The underside of the tail (below) shows the triangle stock that adds to gluing area. Tailwheel bracket is a nylon aileron torque rod bearing glassed in.



View inside cabin (above) shows the authors landing gear modification. Fuselage doubler and triangle stock add strength where loads are greatest. Uncovered airframe (below). It's boxy but lean and trim. Very sturdy construction. The landing gear has wide spread for ground stability.



and the nose doubler added. The sides are joined with two formers and then brought together at the tail. It is wise to sandwich the tailwheel bracket in at this time or else later it is almost impossible to cut a neat slot in the joint between the aft fuselage sides. After attachment of the firewall and plywood bottoms nose sheeting it is time to install the landing gear blocks. This is the only part of this airplane's construction that I did not like. The wire gear is designed to cross the fuselage bottom and get captured in upright blocks inside the fuselage. This is a standard torsion bar setup. While the bottom cross block is grooved for the two thicknesses of wire, the uprights should each be grooved for one thickness and the groove offset. However, all three blocks had the wide groove so I added a $\frac{1}{8}$ " square hardwood strip to the uprights to close it up. This might have been an oversight when the kit was packaged since the plans and instructions clearly describe the offset required when installing the blocks. The landing gear retaining straps were longer than the width of the bottom block so the mounting screws would not be caught by the hardwood. I added a hardwood cross brace at the back of the block to receive the screws. Also, I did not feel that these blocks would stay put in the event of a hard landing, so before installing them I added a shallow doubler of $\frac{1}{32}$ " plywood to the fuselage sides and after in-

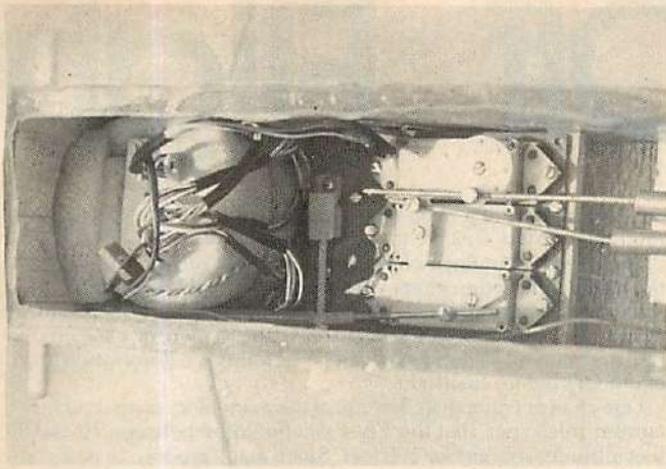
stalling the blocks I boxed them in with some triangle stock. I believe that straightening the wire gear is preferable to repairing the blocks. After fitting pushrods, the fuselage top and bottom are closed in with cross grain sheet. I took the advice in the instructions and made the nose hatch removeable. The method of attaching it is left up to the builder. This is optional and I only did it for convenience in checking the fuel tank later on. Otherwise, the fuel tank and battery can be removed through the former at the front of the wing saddle. A really nice feature of this kit is the inclusion of a pre-tapered hardwood thrust wedge that goes between the firewall and engine mount. The fuselage is finished by gluing on the soft balsa cowl cheeks.

The entire tail is $\frac{3}{16}$ " sheet balsa. A very important feature is the incidence block which goes under the leading edge of the stabilizer. This gives about $\frac{1}{8}$ " positive incidence and is claimed to be one of the reasons the plane flies so well. The joints between the fin, stabilizer and fuselage are all reinforced with triangle stock. This completes the airframe. It is very rugged to withstand abuse, and it will accept any finishing method.

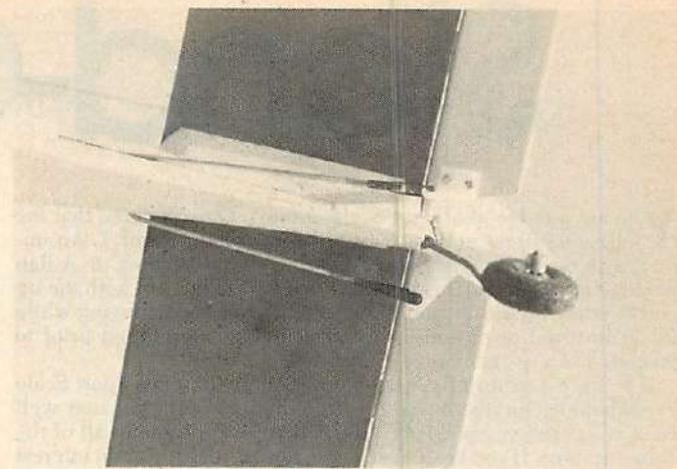
Most beginners will choose an iron-on covering material. Superkote is Hobby Lobby's own brand, manufactured in England. It is easy to work with and only re-

quires a low level of heat. It is pliable during the covering process and remains that way to give very good puncture resistance. It shrinks so well that just about any wrinkle can be removed. Also, it sticks very well to wood and to itself when you make lapped joints or add trim pieces. Superkote comes in a wide variety of colors. Some are unusual, like the brown and cream that I chose. You will really enjoy using Superkote and be very happy with the results.

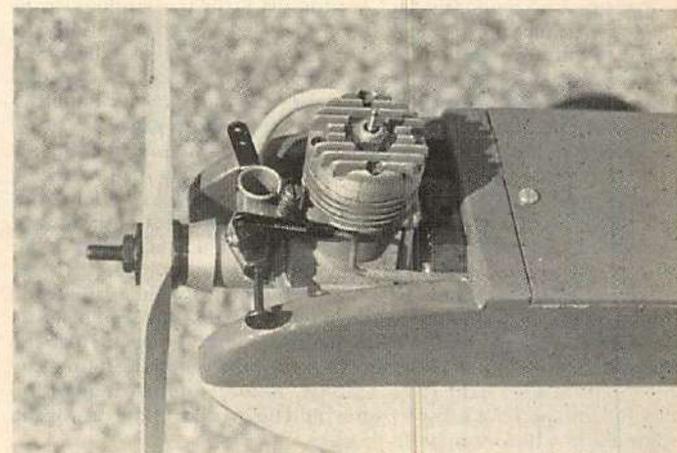
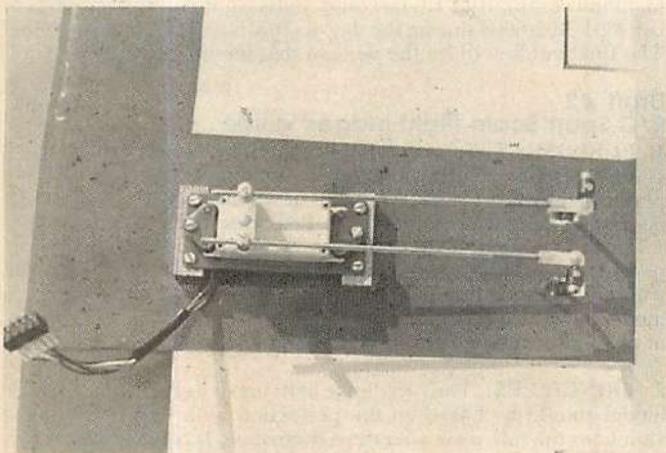
The Fox .15 R/C engine is somewhat unconventional but entirely satisfactory. The difference is primarily in the design of the throttle. The beginner will probably not notice or care about the uniqueness of the Fox design. However, modelers who are used to other engines will, most likely, complain about the method of idle adjustment. Actually, mine idles fine and I have not had to change the factory setting. The engine comes with detailed instructions for making these adjustments and I would urge you to follow them explicitly if you have to make any changes. It is significant to note that this is the plain bearing schneurle ported version which is now standard .15 R/C motor in the Fox line (a ball bearing version is also available). Its power seemed above average for a sport engine of this size, but it retains the easy handling characteristics of a sport engine. Its robust crankcase is a loose fit in the BHE-19 mount (and won't fit a .15 size



The radio installation (above) shows that everything fits just right. The servos are mounted in the optional side-by-side tray with integral switch mount. The aileron servo is mounted in the wing opening and held in an optional tray screwed to the hardwood rails (below).



The photo above shows the underside of the tail and the control pushrods. The horns that are provided have plenty of adjusting holes. The Fox .15 installed (below). Throttle arm points up. The linkage on left, the engine is very accessible for tuning and clearing.



mount) so center it carefully before drilling the mounting holes. I later added a Fox closed front muffler for this engine and it was a good compromise of silencing and power loss.

Now let's talk about the Hobby Lobby six channel radio. This set is made to Hobby Lobby specifications by a nationally famous manufacturer, E.K. Logictrol. A three channel Hobby Lobby system appeared in a FLYING MODELS product review (Nov 1976) and other E.K. Logictrol sets were reviewed in Oct 1975, Aug 1976 and Feb 1978. The Hobby Lobby six channel transmitter is a dual stick configuration with proportional levers for both auxiliary channels. Four servos are supplied, and the set has full rechargeable ni-cad batteries. Servo trays are an available option. Hobby Lobby is quite proud of their receiver design which incorporates four of the servo amplifiers in the receiver case, instead of in each servo as done by other radio manufacturers. To house the additional electronics, the receiver case is a little large by today's standards. The servos, on the other hand, are very small and light but still suitable for the largest airplanes in common use. Total airborne weight with four servos is 11.5 ounces. Installation was a snap in the Jr. Telemaster but the receiver might be a tight fit in some of the smallest planes around. The really great feature of this electronics

design is that spare flight control servos are a ridiculously low \$14 each. Therefore you can have a complete set of servos in your backup ship for a very low additional cost. Servos for either of the auxiliary channels are conventional with the amplifiers inside (\$31 each). There are probably several other pros and cons to this configuration but, for the beginner, reliability is all that really counts. The radio performed flawlessly during this review. There were no problems or glitches of any kind in spite of the fact that most of the flight testing was done in below freezing temperatures.

It seems that I can only get together with the cameraman on weekdays during lunch break. This usually affords time for two or three flights and about twenty photos. The field was covered with snow that had a crusty surface. The ship was ready to fly at a weight of three pounds two ounces for a wing loading of 17.7 ounces per square foot. This is about right for a plane of this type. With the sun softening the snow it was decided that the first flight begin with a hand launch. My helper took a few steps and just let go. The Jr. Telemaster flew straight out and only required a bit of up trim on the transmitter. In spite of gusty winds the penetration was good and the ship flew smoothly at full throttle. At low throttle settings it was so stable that very little correction was necessary to maintain a constant

heading. In fact, the first landing was practically at my feet.

For the next flight I replaced the wheels with skis. This time the Jr. Telemaster skimmed across the snow and lifted off after about forty feet. The weight and drag of the skis hardly made any difference in the flight characteristics, and the Fox .15 still pulled it along at a good pace. The rest of the flight was spent doing touch-and-goes for the cameraman. That was the photosession end.

On another day I disconnected the aileron servo and plugged the rudder servo into the aileron channel. The ship flew just as well on three channels using only rudder, elevator and throttle control. I personally think that ailerons give you more control when it's windy though. Since that time it has been flown by several flyers of varying experience levels and all agree that it is a delightful little trainer. It does all the things a trainer should do to build up the proficiency of the student, and it is also a fine sport ship after the pilot is beyond the beginner stage.

So there you have it, an economical package of things that work well. If you are just starting out in radio control you can be confident in choosing any of the items from this review. And, for you instructors out there, the next time you are asked to recommend a kit to a beginner, remember the Hobby Lobby Jr. Telemaster.

Stand-Off Flight

You are a judge at a Sport Scale contest. Do you agree that the following flight options should be awarded a zero? 1. An immelman turn which is begun on a downwind heading. 2. A flap demonstration in which, although you saw the flaps in both the up and the down position, you didn't actually see them moving while being lowered or raised. 3. A taxi maneuver performed prior to takeoff. 4. An overshoot (as in FAI Scale 3.8 (n)).

If you are a pattern flyer, who occasionally enters a Sport Scale event held in conjunction with pattern flying events, you may well have answered yes and have awarded zeros for some or all of the above options. If you are a scale enthusiast, with little or no interest in pattern flying, you should rightly have answered no and judged the above options in an appropriate manner. At Sport Scale events I have attended, judges have awarded zeros for the options in 1 and 2 and the CD has prevented a contestant from performing options 3 and 4. In short, the interpretation of the current Sport Scale rules may be anything but uniform.

Perhaps a reason for this non-uniformity is the tremendous surge in popularity of Sport Scale in the last few years with essentially no change to the original but rather sketchy rules. I use the word sketchy, not as a criticism of the authors of the rules, but because nobody has seen fit to set forth for sport scale judges a guide such as has been in existence for several years for pattern judges.

I am not alone in believing that we, the scale flyers, need to get our act together and develop a judges guide. There have been several articles recently in various model magazines which have criticized the quality of sport scale judges. The latest of these was Frank Tiano's article "Judging the Judging" which appeared in the March 1978 issue of this magazine and was accompanied by an excellent cartoon by Steven Campbell which now has a place of honor over my workbench. I agree with Frank that we need to make a concerted effort to improve the quality of our judging and to meet that goal, I am asking FM readers to review the following draft of an R/C Sport Scale Flight Judges Guide. Before you tear it apart (or take up golf) perhaps a few words would be in order about how it got started and where it may be headed.

Back in May 1977 a column that I write in the DCRC newsletter started some correspondence with our District IV scale contest board member, Bob Karlsson. To cut a long story short, Bob asked me to have a try at drafting a set of guidelines for judging the flight maneuvers of the Sport Scale event. At the time this didn't seem like much of a chore since most of the maneuvers are already described in detail elsewhere in the rulebook. Bob and I thought that since the guidelines would merely augment the existing rules and not change them, if it was finished in time, it could be published in the 1978/79 rulebook. Although the first handwritten draft was finished during September it quickly became obvious that we could not get the necessary review and comments in time to make the 1978/79 rulebook. As it turns out, this is just as well since now we can cease worrying about whether the addition of a judging guide to the existing rules is a rules-change or not. If we receive enough positive comments to the draft, the final revision can be submitted to AMA as a rules-change proposal for ballot in the usual manner and publication (if accepted) in the 1980/81 rulebook.

The draft published below is mostly one man's thoughts on how the flight presentation should be performed and judged. Astute readers will note that language has been borrowed from the AMA Pattern Judges Guide and a couple of paragraphs came from the International Aerobatic Club manual (with their permission). Comments to a first draft, made by several Washington D.C. area flyers and by Bob Karlsson, have been incorporated into this draft. It remains however, the viewpoint of a few and we are grateful to FM for this opportunity to solicit comments from the readership so that a final version can reflect the opinion of a large number of Sport Scale flyers.

In the section on Optional Flight Maneuvers, to save writing, we have merely referenced the section in the 1976/77 rulebook where satisfactory descriptions already exist. The current rules permit a contestant to choose options from AMA or FAI pattern or scale rules. As a result of this choice the contestant is faced with the dilemma of choosing between as many as three different descriptions of the same maneuver. In the draft guide, where more than

one description of a maneuver already exists in the rulebook, the reference listed first is the preferred description. As food for thought, we are in favor of dropping from the rules all reference to the maneuvers in the other event categories (AMA or FAI Pattern or scale) and listing a single description of each maneuver in the judges guide. A contestant would still have the option of choosing an unlisted maneuver (lomcevak?) if he can supply a description to the event CD before his flight.

One change is suggested to one of the mandatory maneuvers. The current rules state that the Fly-Past should be between 10 and 20 feet altitude, straight for 100 feet. Since many models, in particular those of WW2 fighter aircraft, will travel 100 feet in less than one second it is suggested that the Fly-Past should be judged over a distance of at least 100 yards. Your comments on this suggestion will be appreciated.

Please read the following R/C Sport Scale Flight Judges Guide carefully and if you have constructive comments or criticism write to, John Preston, 7012 Elvira Court, Falls Church, Virginia 22042 or call (301) 492-6604 during the day or (703) 532-2417 in the evening. The final guide will be the version that the majority prefer.

Draft #2 R/C Sport Scale flight judges' guide

1. **PURPOSE:** To furnish for both contestants and judges uniform Guidelines for executing and judging maneuvers capable of being performed by full-scale aircraft, ten of which are performed for the contestant's flight presentation in R/C Sport Scale competition.

For the competitor this guide will help him learn what is expected from his flight presentation. For the judges it should provide a uniform method for rating the flying performance of the entrant's model during the five mandatory flight maneuvers and the majority of optional maneuvers from which he must select five (5).

2. **PRINCIPLES:** The principles of flying or judging a Sport Scale model should be based on the perfection with which the model simulates the full-scale aircraft performance. It is recognized however, that while the contestant is able to go to some length to research the flying characteristics and capability of his own model, the same cannot be done by the judges. They may be faced with many models of full scale aircraft with which they are not familiar. It should be obvious, however, to all concerned, into what basic category the model can be placed, i.e. maneuverable fighter or sedate transport. Judges should be selected for their knowledge of the flying capabilities of different categories of full scale aircraft. They should assess the perfection of the flying maneuvers of the model accordingly.

The judging criteria for perfection can be divided into Precision, Presentation, and Realism of the maneuvers.

2.1 **Precision:** When the contestant announces a maneuver the judge should form a mental picture of the flight path to be followed by the model. The size of the maneuver will be dependent on the type of aircraft modeled and will be discussed under realism. Judging begins at the time the contestant announces, usually with the words "beginning now" and continues until the contestant announces completion, usually with the words "maneuver complete." Only during the judging period is the precision of the announced maneuver to be assessed. With a few exceptions the maneuver should begin and end with the model in straight and level flight. Course corrections, not called for in the description of the individual maneuver, but which are obvious to correct deviations in the path of the model after beginning the maneuver, shall be a cause for the deduction points due to lack of precision. Smooth and unobtrusive corrections during a maneuver to counter wind drift should not be a cause for loss of points if they are executed in a manner typical of the prototype.

A contestant should note that in order for a judge to obtain a reference for the maneuver being executed, the start and finish of any aerial maneuver must be level flight. There are a few exceptions to this rule, such as take-off and landing, overshoot, touch and go, etc., in which the model may be in an ascending or descending attitude at the start or finish of the maneuver. The wings however,

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should be level at the start and finish of all maneuvers.

2.2 Presentation: To achieve perfection, all flight maneuvers should be presented in a manner such that they can be easily judged. The optimum location of the maneuver relative to the judges will vary according to the type of maneuver executed. For example, maneuvers with horizontal symmetry (Cuban, Eight, Loop, Roll), should have their mid-point or center immediately in front of the judges. Some maneuvers, however, are best performed offset to the right or left of the judges to present a plain view of the model as it performs for example a stall turn or a wingover. It goes without saying that the competitor should locate himself near the judges so that they all obtain similar views of the flight presentation.

In addition to presenting the maneuvers for maximum visibility, the longitudinal distance from the judges should not be excessive. Generally the competitor should strive to center a flight maneuver at a horizontal distance of no greater than 300 feet from himself. Judges should downgrade a competitor who they suspect is trying to cover up poor flying ability by a performance at an excessive distance. The actual distance at which a contestant chooses to perform his maneuvers should take into account the altitude of the model at its highest point in the maneuver. A contestant should avoid high altitudes close to the transmitter that force the judges to look up at more than a 45° angle. Aside from discomfort endured by a judge who is forced to look in a vertical or near-vertical direction, the perfection of the maneuver cannot be properly assessed from such an angle. No bonus points will be awarded for a low altitude presentation, but points will almost certainly be deducted for excessively high presentations. Competitors should bear in mind that the judges spend many hours on the flight line and a painful neck caused by looking at overhead maneuvers will almost automatically result in downgrading.

Another point that competitors should bear in mind is to avoid crossing the sun during a maneuver if at all possible. Even a zero score is completely justified if, in the judge's opinion, the maneuver could have been placed elsewhere.

2.3 Realism: Awarding points for realism in flight maneuvers is probably the most difficult and controversial aspect of judging scale models. The presentation of a realistic flight by the competitor should be given some attention prior to the contest. Most important is to only perform flight maneuvers which were capable of being performed by the full scale aircraft. For example, 3 axial rolls performed by a model of a B-29 may be spectacular, but should receive an automatic zero for being outside the capability of the aircraft. To eliminate discord on the flightline it is recommended that prior to flight any maneuvers or scale operation not listed in the rulebook should be cleared by the Contest Director. The contestant should be prepared to explain any such maneuver or option and, if necessary, produce documentation that such an option was indeed within the capabilities of the aircraft.

The size of aerobatic maneuvers performed by a contestant should reflect the capabilities of the aircraft modeled. For example, it would be expected that a loop performed by a J-3 Cub would be smaller in diameter than one performed by a P-51 Mustang if both models are built to the same scale. The speed at which such maneuvers are performed should also reflect the capabilities of the full scale aircraft. Consideration should also be given to throttle position during aerobatics. In the majority of full scale aircraft power must be reduced at the point of maximum altitude in a vertically oriented maneuver before entering the descent portion of the maneuver. Performance of such maneuvers by a model at a constant full throttle, which should be obvious from the absence of change in engine noise, could be grounds for a reduction in score.

The size of a maneuver will also be influenced by the physical size of the model. Models scaled at 1 inch = 1 foot would be expected to perform aerobatic maneuvers much smaller in overall size than a similar model scaled at say 3 inches = 1 foot. Consideration should be given in all aerobatic maneuvers to the "g" forces that would be exerted on the full scale counterpart. Exceedingly small or tight maneuvers with unnecessarily high rates of roll, pitch or yaw do not simulate the performance of the majority of full scale

aircraft and should be downgraded accordingly.

Finally, the contestant should acknowledge that the smoothness or gracefulness of his presentation will have a large impact on its realism. Sudden jerks and attendant changes in heading of the model should be avoided. These would represent high "g" forces well in excess of full scale tolerances and judges are justified in downgrading for this. Similarly the transition from ground to air and vice versa during take off and landing should be smooth. The judge should consider himself to be a passenger in the model and assess these maneuvers in terms of the affect they would produce on his well being. Many of the so-called "average" landings by RC models would result in collapsed landing gear in full scaled aircraft or, at the very least, severe bodily discomfort to any passengers.

3. ACCURATE AND CONSISTENT JUDGING: The most important aspect of consistent judging is for each judge to establish his standards and maintain them throughout the meet. It is recommended that the contest director or chief judge should hold a meeting prior to the day of the contest to discuss with all the judges the rules for the event. It is also advisable to make the judging standards as uniform as possible by having a noncompetitor perform a practice flight which all judges will score simultaneously and privately. After the flight, the defects in each maneuver should be discussed and an agreement should be reached on the severity of the defects and the appropriate number of points that should have been deducted. After this is done, and the contest is started, the individual judges should strive to maintain a uniform standard of judging for all contestants.

As stated in the rules, a competitor who flies over a controlled spectator area may receive a zero score for that flight. Such spectator areas should be clearly defined by the Contest Director in a briefing prior to the start of the flying portion of the contest. It is also recommended that a "foul line" should be established which can be the edge of the active runway nearest to the flyer extended to infinity in either direction. Any flying over this foul line should be grounds for a zero score in the maneuver in which it occurs. The judges should all agree on such an occurrence and if a separate person is used as the flight timer it is recommended that he be assigned the task of determining when a model crosses the foul line or passes over a controlled spectator area. Unanimity in awarding zeros for such unsafe flying practices should always be reached. Nothing can cause more unrest among contestants than a zero and a seven score for the same maneuver. The responsibility for disqualification of a contestant who persists in flying in an unsafe manner should be assigned to the judges by the Contest Director.

4. JUDGING INDIVIDUAL SCALE OPERATIONS AND FLIGHT MANEUVERS: In addition to the four mandatory flight maneuvers a competitor must perform, five options which may be any scale operation or maneuver which was typical of the prototype. Many of these are already described in the rulebook under AMA or FAI RC Pattern or RC Scale Rules. In addition to those listed a competitor may perform any other operation or maneuver in accordance with AMA RC Scale rule 9.3 (s) or FAI Scale rule 3.8 (p). In such a case it is recommended that a short description of the maneuver or operation be submitted to the judges for their information prior to flight. As in the case of all optional maneuvers the judges may require proof that such a maneuver was within the capabilities of the prototype.

A judge should not wait until a maneuver is completed before trying to assign a grade based on overall impression. Judges should assume that a contestant is going to perform a perfect maneuver and therefore start with a grade of 10. As the maneuver is executed, any faults which are observed should be the cause of a lesser number of points. Full marks should only be given when a maneuver is ideally positioned and no faults are observed. This is *not* a common occurrence.

In downgrading the score for an individual maneuver, or a scale operation a judge should consider the number of defects, the severity of the defects, and the number of times any one defect occurs. For example, a single change in heading during takeoff would be considered one defect, while two or three distinct turns would be

Stand-Off Scale Flight

considered two or three defects. In a case where more than 10 defects are observed it is not possible to downgrade one point per defect or we might have several negative scores. While a minor defect may result in the loss of less than a full point, a major defect could be the cause for the loss of 4 points. The score given for a single maneuver should always be a whole number. Fractions of a whole number should always be rounded to the lower number. Unless a maneuver is missed or is totally unrecognizable, a zero score should not be given.

4.1 Description of Scale Operations:

4.1.1 MULTI ENGINES. To obtain maximum points the engines should be of equal displacement unless the engines of the prototype differ in size. In this case the model engines should differ in a similar proportion. Extreme variation from scale engine sizes should be heavily penalized. Proof of scale engine sizes shall lie with the contestant. For maximum points all engines must be running at takeoff and continue throughout the flight with throttle operation being demonstrated at least during the approach and landing. An engine failure during flight should be judged according to the contestant's ability to continue flight taking into account the engine layout of the aircraft. For example, continued flight on one engine of a B-25 requires a degree of skill in handling the asymmetric thrust and should be rewarded. However, one engine operation of a Cessna O-2 is relatively simple if there is sufficient reserve power in the remaining engine. There should be no requirement to perform additional fly-pasts to exhibit multi-engine operations unless the competitor wishes to demonstrate differential throttle operation and which may be claimed as a separate option.

Errors: Engine or engines stop during flight. Models cannot maintain flight with one or more engines stopped. Throttle operation not demonstrated in the approach and landing.

4.1.2 RETRACT AND EXTEND GEAR. Retraction should commence during the takeoff maneuver when the model establishes a positive rate of climb. Gear extension should be initiated during the downwind leg of the traffic pattern. The speed of gear operation and its action should approximate that of the prototype. For example, "snap action" gear should be downgraded, but the model should not be expected to duplicate the cycle time of the prototype. Similarly, if on the prototype the gear folded inwards (towards the aircraft centerline) points would be deducted if on the model the gear folded outwards. In Sport Scale competition however, it should not be expected that a model should duplicate a complicated gear cycling operation. Models of aircraft with retractable tail wheels should be downgraded if the tailwheel of the model does not retract. If the judges cannot observe the gear retraction sequence due to the attitude of the model at takeoff, they may request that the gear be cycled during a fly past.

Errors: One or more gear leg fails to retract or extend, (includes tailwinds if these were retractable on prototype); Gear sequence is less than two seconds; Gear action is grossly different from prototype; Gear extends or partially extends during high positive "g" maneuvers.

4.1.3 FLAP OPERATION. If the prototype used flaps for takeoff, the model shall also. Flaps should be used during maneuvering if this was a feature of the prototype i.e. during a dive bombing run by a JU 87. Flaps must be used for landing. For maximum points flaps used for takeoff should be raised during the climbout and for landing they should be lowered on the final crosswind leg of the traffic pattern. Flaps should also be used during a touch and go or overshoot, and points should be deducted from both the flap option and the maneuver if the contestant fails to use them. There should be no loss in points if the judges fail to observe the flaps in motion during flight. If, however, they are small in size and difficult to observe in a lowered position, the judges may request that they be lowered in a taxi maneuver prior to takeoff or that they remain lowered in a taxi maneuver after landing. For maximum points the flap action should resemble the prototype i.e. split flap, Fowler flaps, etc. Only if it is agreed by the judges that the wind strength is too great to justify flaps during takeoff and landing should a fly past be required to demonstrate flap operation.

Errors: Failure to operate flaps when required; flap operation is grossly different from prototype; model exhibits violent trim change during flap operation.

4.1.4 BOMB DROP. Bombs should be carried in the same manner

as the prototype. For bombs carried internally, bomb bay doors should open, bombs should drop and doors should close for maximum score. If bombs are carried externally they should be securely attached with no noticeable oscillation in the slipstream. For maximum score the model should perform a bomb run in the manner of the prototype which should begin and end in level flight. No extra points should be awarded for explosive bombs. With the exception of napalm types, bombs should not tumble end over end after release.

Errors: Bombs are not carried in the manner of the prototype. Bomb doors are grossly different in operation from prototype. Bomb(s) drop immediately upon opening of doors. Bomb drop not preceded by a bomb run. Finned bombs tumble erratically after release. Externally mounted bomb(s) wobble(s) in slipstream during flight.

4.1.5 TORPEDO DROP. For maximum points a torpedo drop should be performed as a part of a torpedo run at a low altitude. Actual altitude of the model at release would depend on its scale, but it should be low enough to enable the torpedo to strike the ground in a relatively flat attitude. Release should be performed with the model in a level attitude and may be followed by a rapid climb which may include a turn. The actual procedure to be followed should be announced to the judges prior to performing the operation.

Errors: Model is too high at release; Release is not preceded by a straight run; After release model performs unannounced maneuvers.

4.1.6 TANK DROP. A jettisonable fuel tank should be carried in the manner of the prototype. The drop should be performed with the model in level flight in clear view of the judges.

Errors: Tank not securely attached to model has visible oscillation in slipstream prior to release; Tank does not fall clearly away from model at release; Model not in level flight at release.

4.1.7 PARACHUTE DROP. A parachute drop or ejection may be performed in the manner of the prototype. Cargo should be dropped via doors, hatch, bomb bay or from wing mounts. A man or men should be dropped via doors, hatch or by inverting the aircraft. A single seat aircraft shall not drop its pilot. A braking parachute may be deployed on landing if this was a feature of the prototype.

Errors: Parachute does not open; Parachute does not fall clear of aircraft; braking parachute rotates after deployment and tangles rigging lines.

4.1.8 OTHER OPTIONAL DEMONSTRATION. A contestant may elect to perform a scale operation of his own choice that was typical of the prototype. Any such operation should be cleared by the Contest Director and explained to the judges before flight.

4.2 Description of Mandatory Flight Maneuvers

4.2.1 UNASSISTED ROG. The model should remain still or near still on the runway with the engine running after release by a helper or after a taxi maneuver. Takeoff should be into the wind and should begin with a straight ground run followed by a gentle liftoff with a climb angle consistent with that of the prototype. Takeoff is completed when the model contestant calls the maneuver complete.

Errors: Model is held by pilot or helper after advancing throttle to takeoff power; Model swings on takeoff run (a slight swing should not be the cause of loss of points on light aircraft types with conventional gear if it is corrected); Model becomes airborne too soon; Takeoff run is too long; Model jumps off ground; Model climbs too steeply; Model drops a wing badly during takeoff (should not be confused with aileron correction for crosswind.)

4.2.2 FIGURE EIGHT. On a downwind heading directly over the centerline of the runway, the model shall enter a horizontal figure 8 from level flight at the instant it passes in front of the judges. The major axis of the figure is perpendicular to the runway and the first turn is always away from the judges. The figure shall be performed at a constant altitude and is completed with the model in level flight on the same heading as the entry (i.e. downwind).

Errors: Entry not made from centerline of runway and opposite judges; Rates of turn not constant in any half circle; Model does not maintain constant altitude; Model does not complete second full circle at same crossover point as finish of first half circle (axis not straight and perpendicular to runway); Finish not on same heading as entry; Finish not over center of runway and opposite judges.

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Model does not begin and end figure in level flight. Note: Due to perspective the second circle of the figure eight may appear smaller in diameter and at a lower altitude than the first circle. This illusion will be greater as the size and altitude of the figure increases.

4.2.3 FLY-PAST. The model should fly straight over the center line of the runway, either up or downwind for a minimum distance of 100 yards at an altitude between 10 and 20 feet. The mid point of the maneuver should be opposite the judges. The contestant may elect to fly fast or slow whichever he feels demonstrates his subject the best. Unsafe flying, i.e. high speed and low altitude close to judges, whether deemed intentional or unintentional, may result in a zero score for the maneuver.

Errors: Straight and level flight at constant altitude not maintained throughout the maneuver (Note: Allowance should be made for slower types of light aircraft which should be permitted slight corrections for gusty wind conditions). Flight path not over center-line or runway: Altitude not between 10 and 20 feet: Maneuver is offset to the right or left of the judges.

4.2.4 LANDING: The landing maneuver begins when the model commences to flare at the end of the traffic pattern. This is usually when the model is at an altitude of about 10 feet. There shall be no requirement to touch down in a marked circle but for maximum points the model should land approximately opposite the judges. An aircraft with conventional gear may make a three point landing, or may touch the main wheels first and gently lower the tailwheel as the speed decreases. An aircraft with tricycle gear should land on the main wheels first and gently lower the nosewheel during the rollout.

Errors: Model does not flare or does not flare smoothly (gallops in pitch axis): Model bounces at touchdown: Model noticeably drops a wing during landing: Model touches a wingtip on the runway: Model noses over during rollout (noseovers should not be scored zero if the flare and touchdown were satisfactory). Tricycle gear model does not touch main wheels first: Model runs erratically after touchdown: Model collapses a gear leg on landing: If a model runs uncontrollably over the foul line after touchdown a zero landing score should result.

4.2.5 REALISM IN FLIGHT. Judging for realism shall begin when the contestant announces his first maneuver and ends with the announcement of flight completion. Approximately half the realism score should be awarded for scalelike speed. The model should also be judged for its attitude in flight, smoothness of control in yaw pitch and roll axes, the use of throttle in maneuvers, and the way the contestant flies the model between maneuvers. The model should not show signs of instability which may be characterized by erratic flight path. Any model of an aircraft with retractable landing gear which flies with its wheels down shall be downgraded for realism.

Errors: Model does not fly at scalelike speed: Attitude in flight is unrealistic: Model does not fly smoothly: Engine(s) not throttled back in maneuvers which would normally require less than full power: Contestant makes random and erratic maneuvers between options: Model of retractable gear aircraft flown with wheels down.

4.3 Description of Optional Maneuvers: The following list of maneuvers should be used, together with the Scale Operations in the previous section, to select the five options for the flight demonstration. Only maneuvers which are not described in detail elsewhere in the rulebook are described in this section. For those not described here, reference is made to the section of the rulebook where the description may be found. Where a maneuver is described in more than one other section of the rulebook, i.e. in both AMA Pattern and AMA Scale Rules, both references are given with the first reference being the one preferred for Sport Scale. A contestant may, however, elect to perform a maneuver according to the description given by other than the first reference if he so chooses, providing this is stated on the judging sheet.

4.3.1 PROTO TAXI. If competitor elects to use taxi as an option it should be listed on the judging sheet as the first option (after fly past), but it should be performed prior to the takeoff as described in AMA RC Scale 9.1 (a), (b) or (c).

4.3.2 STRAIGHT FLIGHT OUT. AMA Pattern Judges Guide; FAI Scale 9.3 (i).

4.3.3 PROCEDURE TURN. AMA Pattern Judges Guide; FAI Scale 3.7.3; AMA RC Scale 9.3 (j).

4.3.4 STRAIGHT FLIGHT BACK. AMA Pattern Judges Guide;

AMA RC Scale 9.3 (k).

4.3.5 INSIDE LOOP(S). FAI Scale 3.8 (g); FAI Pattern 13.8 (three described, but contestant may perform less than three).

4.3.6 OUTSIDE LOOP(S). FAI Pattern 13.6 (three described, but contestant may perform less than three). The contestant may also perform an outside loop as follows: Starting in level flight, the model noses down to perform a smooth round outside loop, which is completed when the model regains its starting altitude and exists in level flight on the same heading as the entry. The throttle should be closed at the beginning of the maneuver and should be opened after completion of the first half of the loop when the model is inverted and is closest to the ground.

Errors: Maneuver does not begin and end in level flight; Exit altitude is not the same as entry altitude; Model does not begin and end on the same heading; Loop is not round; Wings do not remain level during maneuver; Throttle not closed during first half of loop.

4.3.7 IMMELMAN TURN. Single. FAI Scale 3.8 (f); AMA Pattern Judges Guide. Double. FAI Pattern 13.4.

4.3.8 STALL TURN. FAI Scale 3.8 (e); AMA Pattern Judges Guide.

4.3.9 WINGCOVER. Model starts in level flight then noses up to a near vertical altitude at which time it is flown through a 180° arc using rudder to end up in a near vertical dive. Throttle should be closed at this point and the model pulls out of the dive at the same altitude as the entry and on a parallel path, but on a 180° opposite heading.

Errors: Model not level at start; Model rolls left or right during pull up; Model tucks under a wing during 180° turn; Return path not parallel to entry; Throttle not closed during dive; Recovery not at same altitude as entry; Model does not fly straight and level to complete maneuver.

4.3.10 SPLIT S. FAI Scale 3.8 (h).

4.3.11 ROLL. FAI Scale 3.8 (k); FAI Pattern 13.11.

4.3.12 HESITATION ROLLS. AMA Pattern Judges Guide (2 point); FAI Pattern 13.7 (4 point); FAI Pattern 13.9 (8 point).

4.3.13 SLOW ROLL. FAI Pattern 13.5.

4.3.14 SNAP ROLL. Inside. Model begins in level flight and as the nose is pulled up to the point where the wing will stall, rudder is applied to roll the model in the desired direction. The nose of the model should break the line of flight in a direction towards the pilot's cockpit, indicating that a stall has occurred. While most models will rotate faster in a snap roll than in an aileron induced roll, speed should not be a factor in judging. The roll should stop precisely when the model is again upright and the maneuver should be completed with straight and level flight. Snap rolls may be performed vertically or on a 45° climbing or diving flight path, but such maneuvers should always begin and end in straight and level flight.

Errors: Model does not begin in straight and level flight; Wing does not stall during roll; Roll is not terminated precisely after 360° rotation; Model does not finish maneuver in straight and level flight on same heading as entry.

4.4.15 SNAP ROLL - OUTSIDE. Same as inside snap roll, except as the break occurs the nose of the model moves away from the direction of the pilot's cockpit.

4.3.16 SPIN. FAI Scale 3.8 (j); FAI Pattern 13.14 (3 turns).

4.3.17 CUBAN EIGHT. FAI Scale 3.8 (i); FAI Pattern 13.3.

4.3.18 RUNNING EIGHT. FAI Pattern 13.13.

4.3.19 TOUCH AND GO. AMA Pattern Judges Guide; FAI Scale 3.8 (m).

4.3.20 OVERSHOOT. FAI Scale 3.8 (n).

4.3.21 SIDE SLIP. FAI Scale 3.8 (o).

4.3.22 FLIGHT IN TRIANGULAR CIRCUIT. FAI Scale 3.8 (q).

4.3.23 FLIGHT IN RECTANGULAR CIRCUIT. FAI Scale 3.8 (r). NOTE: Maneuvers #22 & 23 for non-aerobatic aircraft only.

4.3.24 FLIGHT IN STRAIGHT LINE WITH ONE ENGINE THROTTLED. FAI Scale 3.8 (t). Note: This maneuver is for multi-engine models only.

4.3.25 TRAFFIC PATTERN APPROACH. FAI Scale 3.7.11; FAI Pattern 13.15.

4.3.25 ANY OTHER FLIGHT MANEUVER. The contestant may perform any flight maneuver within the capabilities of the prototype. This should be cleared with the C.D. prior to flight and a short description of the maneuver may be requested for use by the judges.

FLYING ACES

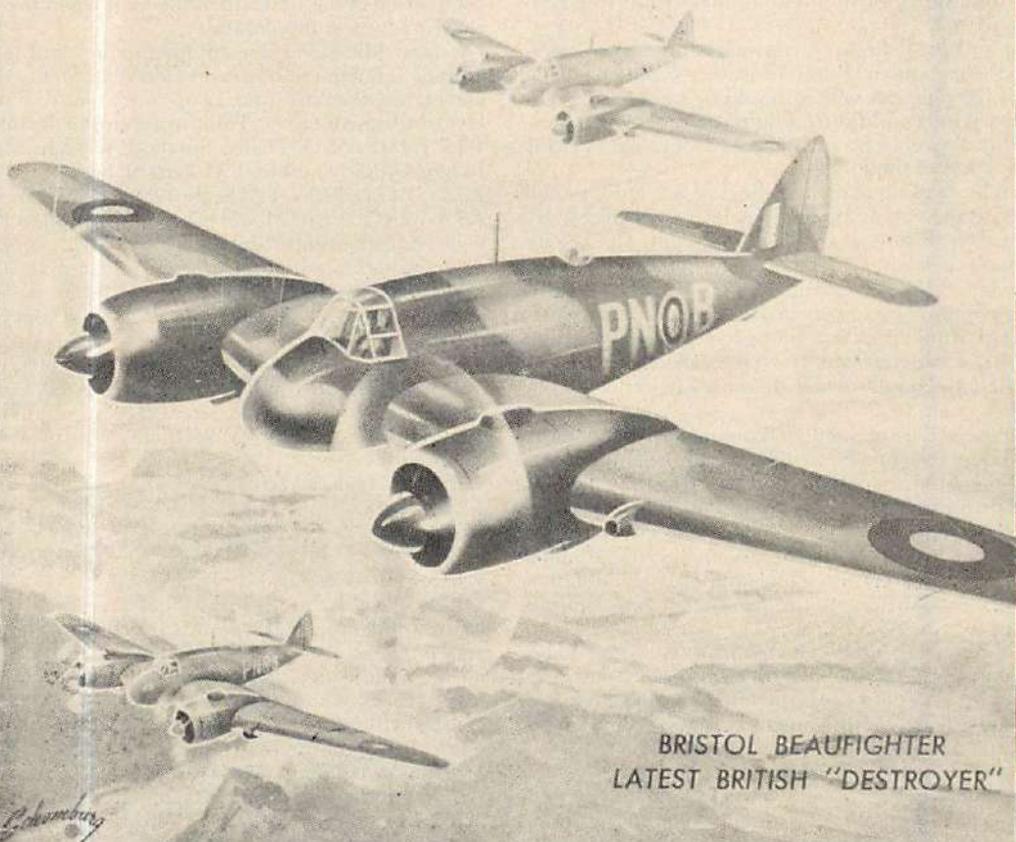
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by JOHN E. HOYT



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At first glance this month's FLYING ACES reprint ship looks a lot like all the other pylon jobs of the era, but this one had a difference. It incorporated leading edge wing slots. The author, Robert Hayos, goes to some length in the article to explain the advantages of the system as it applies to model aircraft and it makes some interesting reading. The slot design itself is really quite simple and in these days of Hot Stuff should be even easier than it was in 1941. The ship has a 40-inch wingspan and 225 square inches of wing area.

Also included from the same issue is the *With the Model Builders* page. If that name sounds vaguely familiar, it's because that column name still survives today at *With Model Builders* by Ed Whalley in every issue of FLYING MODELS. We hope that you enjoy seeing these photos of folks from the early days, many of whom are still around, building and flying.

To help us celebrate our Fiftieth Anniversary we've had special red, white and blue 3" x 3 3/4" patches made up of the logo that appears to the left of this column. For your patch, just send \$1.50 to FLYING MODELS, 50th Anniversary Patch, P.O. Box 700, Newton, NJ 07860. We also have FLYING MODELS decal sheets available which include various sizes of FM logos as well as the 50th logo. These are not ready yet but will be soon.

Our Fiftieth Anniversary Old-Timer Fly-In will be taking place just about as you're reading this—hope you're there.

With the Model Builders



Medals representing preliminary awards are shown being given to winners of the "Flight Command" model plane contest held at the Lowe's Paradise Theatre in The Bronx, N. Y. Here, Jerry DeRosa, theatre manager, and Jesse Davidson, Model Editor of FLYING ACES, and contest judge, make presentations. Left to right: Danny Feldlaufer, DeRosa, Herbert Topper, Davidson, and Walter Dambrogio.



Competitors of the "Flight Command" finals, as well as contestants from other boroughs in the greater New York area, were given a dinner in the aviation terrace at LaGuardia airport, after which three winners were selected. Left to right: Lt. Comdr. Richard Lambert, 2nd Winner Vic Codella, Lt. Comdr. Mark McChesney, 1st Winner Jeanette Eastman, Lt. Robert Power, and 3rd Winner George C. Searing.



Ten-year-old Billy Crowell, of Los Angeles, Calif., and his Super Cyclone-powered Comet Sailplane with which he won first prize in a Pasadena meet for contestants under fourteen years of age. He was awarded the FLYING ACES Trophy when his seven-foot gas craft turned in a high time of better than two minutes.



Leonard Sorby, of Brookline, Mass., holds his prize-winning Piper Cub model which took the "Flight Command" first award in the Junior Aviation League contest. The trophy is an Atom engine on a detachable mount.



There's going to be an influx of sky babies this Spring season, and from these early preview shots it looks like it's going to be a howl-

ing success, too. On the left, Martin Powell poses with his latest creation. Center photo shows Basil Giesson with his new Atom job.

And above, we have Herman Kastner who holds his box-car like fuselage, wings attached, to demonstrate streamlining is unimportant.

Here's a trim looking craft that is good in performance, with an added feature that assures your efforts of being worthwhile.

by Robert Hayos

Drawings by Jack Greenglass



Wing slots aid in maintaining lateral stability in steepest of climbs.

STALL-PROOF GASSY

IT WASN'T long after the end of the first World War when the England Handley Page Aeroplane Company developed a device that startled the aviation world. They had equipped one of their huge planes with an airfoil-shaped vane which ran along the leading edge of the wing and a few inches in front of it. This was the first "wing slot" ever used on a flying machine. The men who designed it realized that a device to prevent stalling was absolutely necessary, and the slot was the answer to those demands. As a plane neared the stalling speed, the angle of attack was of course increased. The wind hitting the wing at a steep angle was deflected off and the airfoil soon lost its lift.

Although the slot did not prevent this entirely, it did allow the craft to assume a higher angle of attack. The wind striking the slot and being deflected down onto the wing proper forced the plane to keep its flying speed. Because of this, a higher rate of climb could be achieved which resulted in increased performance.

When the author first realized the possibilities of wing slots being used on a model, it became evident that here, too, stalling would be impossible and the climb would be increased appreciably. Also, spiral stability would be enhanced.

Up to this point not much has been said about the ship itself. This little job was designed when the old rules were in existence, which limited the wing area to 225 square inches for Class "A" models. Since then the rules have been changed and the ship has competed against much larger models with favorable results. And although the ship has never actually been entered in competition, it has outflown many craft with much more power and wing area and has earned its salt in all types of weather. The plane has a near vertical climb and exceedingly flat glide. Under power it is extremely fast and inherent stability keeps it going smoothly

without spinning tendencies.

The combination of slots and simple design have been the secret of success of this model. The slot design explained here can be used on your own plane, provided the slots are scaled proportionally to the plane itself.

FUSELAGE AND LANDING GEAR

THE FUSELAGE is made first in the following manner. Begin by laying out the drawings on a large sheet of paper. Shelf or brown wrapping paper serves the purpose nicely. The fuselage sides are pinned to place on the plans, one side being made at a time. The longerons are of medium hard stock, while the cross braces are made of softer material having the same dimensions. Sheet balsa, $\frac{1}{8}$ " thickness is laid between the first upright and diagonal, its grain running vertically.

The wingmount is made of balsa plywood having $\frac{1}{8}$ " sheet balsa running vertically in the center and $\frac{1}{16}$ " sheet on either side running horizontally. Sand the entire mount to a streamline shape. The mount is then glued firmly to a piece of $\frac{1}{16}$ " sheet which previously has been glued across the top longerons. The tray for the wing is made of $\frac{1}{8}$ " sheet. Strips of $\frac{3}{16}$ " square are glued on either side to keep the wing from rocking. Insert a short length of $\frac{1}{16}$ " wire into both the front and rear, just under the tray and cement securely. This will enable the wing to slip off easily upon striking an object. Glue fillets are used to strengthen the mount.

The nose is of the removable type which has been found to be very convenient in the event of motor trouble. The firewall is cut from $\frac{1}{4}$ " stock and made to fit the front of the plane. The motor bearers are cut from pine measuring $\frac{1}{4}$ " by $\frac{1}{2}$ ". The cowling is of $\frac{1}{8}$ " sheet sanded to a streamlined shape. Soft balsa fillets are glued between the mounts and the cowl sides, the width being enough to accom-

modate the motor you intend using.

The landing gear is bent from $\frac{1}{16}$ " steel wire and is glued to the firewall which is notched to receive it. Sheet balsa $\frac{1}{16}$ " thick is glued over it to hold it in place. Any small air wheel may be used as long as its diameter is approximately $2\frac{1}{2}$ ". The tray is next on the production line. This is made from hard balsa and is fastened to the firewall with a piece of wire bent to the shape shown on the plans. It is finally bound to the tray with thread and then glued. Next, the tray is fastened to the firewall with a nut and bolt to keep it in place. Make the battery box in the regular manner with a piece of sheet brass at either end, with the wire connections soldered directly to it. Both the coil and condenser are bound to the tray with rubber bands wrapped tightly around the whole "works."

The nose is fastened to the fuselage with rubber that is in turn brought around two $\frac{1}{4}$ " diameter dowels, going through the fuselage and around the hook which is glued to the cowl sides.

WING AND TAIL SURFACES

ALTHOUGH OF conventional design and construction the wing must be built with care and accuracy. This is due to the fact that a slight warp on any other wing will hardly affect its flight. A warp on this wing will be disastrous, because the slots, contrary to popular belief, are not a cure all.

All ribs are cut from $\frac{1}{16}$ " sheet of medium soft stock. Trace their outlines onto the wood with the use of carbon paper. The two end ribs are slightly shorter than the rest, but are of the same outlines.

The wing spar is made from $\frac{1}{8}$ " by $\frac{1}{2}$ " hard balsa, as is the trailing edge. The latter is sanded to a triangular shape as shown on the airfoil drawing. Pin the trailing edge to the full scale drawings and begin laying the ribs in their corresponding

It's built-in safety factor plus rugged construction assure the builder of many hours of flying fun.

positions. The tips are cut from $\frac{1}{8}$ " soft sheet, glued together. The end ribs are then glued in place as is the leading edge which is shaped from $\frac{3}{16}$ " square stock. Sand the ribs so that they fit flush with the trailing edge. This will eliminate any possible wrinkles, and also improve the final appearance of the ship. The dihedral breaks are reinforced with $\frac{1}{16}$ " hard sheet balsa gussets which are glued on either side of the spar.

The slots are made from $\frac{1}{32}$ " sheet and bent to the required curve over the spout of a steam kettle. Be sure that the slots are not warped lengthwise and that the curve is consistent throughout the length of the slot. Cut the slot supporters from $\frac{1}{16}$ " sheet making them all the same size. These are laid aside for the present. The wing is covered and doped after which the slots are glued in place. At each of the slot stations shown, sand the tissue until the wood is exposed. Then carefully cement the slot supporters in place, allowing them to dry thoroughly before attempting to glue the slot on. The slot itself is made in four sections, a new length being cut from the present wood. Glue the sections to the supporters using small pins to hold them in position until dry.

The tail is made next and is of the twin fin-type. The stabilizer is not actually a lifting surface but will aid in maintaining the type of glide that is accompanied by the use of such an empennage.

The stab is made from $\frac{1}{4}$ " by $\frac{1}{8}$ " strips except for the leading edge which is of $\frac{3}{16}$ " square and also the $\frac{1}{32}$ " sheet with which the indicated sections are covered. Make the rudders from $\frac{1}{8}$ " sheet, the grain running vertically (to prevent splitting in "hot landings") and then sand to the form shown on the top view.

The elevator ribs are $\frac{1}{4}$ " by $\frac{1}{8}$ " laid on end. The ribs taper downward from the spar back. Sandpaper all these parts smooth before attempting to cover with balsa. Pins are used to

hold the sheet in place until the glue dries. Leave about $\frac{1}{8}$ " overlap of wood which when sanded will fit smoothly into the stab proper. The rudders are then glued flush against the end ribs. A small piece of wire may be bent to fit the curves of the bottom of the rudders to act as tail skids.

COVERING AND ASSEMBLY

WHEN THE framework has been completed, sand everything with a fine grade of paper so that all the fuzz is removed. Use plain clear gas model dope for adhesive in applying the tissue.

The fuselage is covered first, the grain of the paper running horizontally to overlap, so that no wood is exposed. The wing is covered in four sections, a new piece being used at each break for the dihedral. Both the stabilizer and wing are covered with the grain running spanwise. The balsa rudders are also covered with tissue, the grain this time going vertically—in the same direction as the grain in the wood.

The front of the nose may also be covered, either with $\frac{1}{32}$ " sheet or with tissue, and then highly doped. This is not recommended as the dripping gas and oil offer a fire hazard. Not much difference will be noted in the performance whether

this section is covered or not. However, if you are willing to risk a slightly charred motor, you may find that your ship will float just a few more feet before landing.

The wing mount is also covered with tissue, the wood being first doped. Do not attempt to cover the whole mount in one section, but rather use small pieces. Use any kind of colored paper you wish for covering the entire of the model.

ADJUSTMENTS AND FLYING

FEW ADJUSTMENTS will be needed. The original model powered with an Atom, has $\frac{3}{16}$ " incidence under the leading edge of the wing. A later model powered with a Bantam required a piece of $\frac{1}{8}$ " square under the trailing edge of the stab, in addition to the $\frac{3}{16}$ " under the wing.

On the first flight not more than twenty-five per cent of your power should be used, if you are using a $\frac{1}{7}$ horsepower motor. The engine should in no event be leaned down on the preliminary flights, as a dying motor is fatal, after the first few seconds of the takeoff. More power can be tried slowly until you have full confidence.

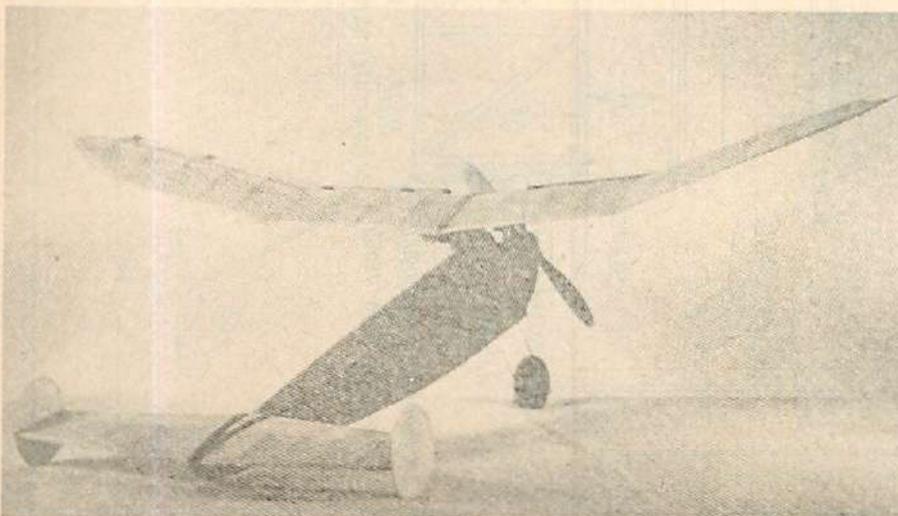
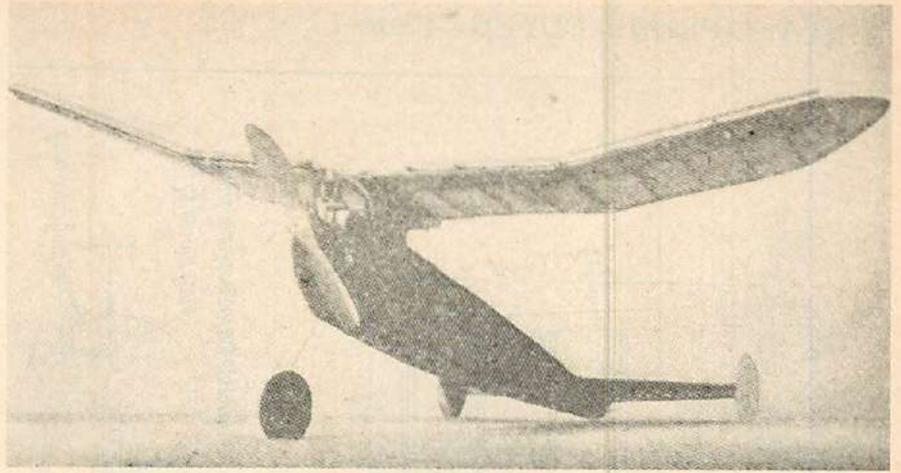
The rest of the adjustments are left to the discretion of the builder, so that we will not be held responsible if you should lose your model on her first thermal.

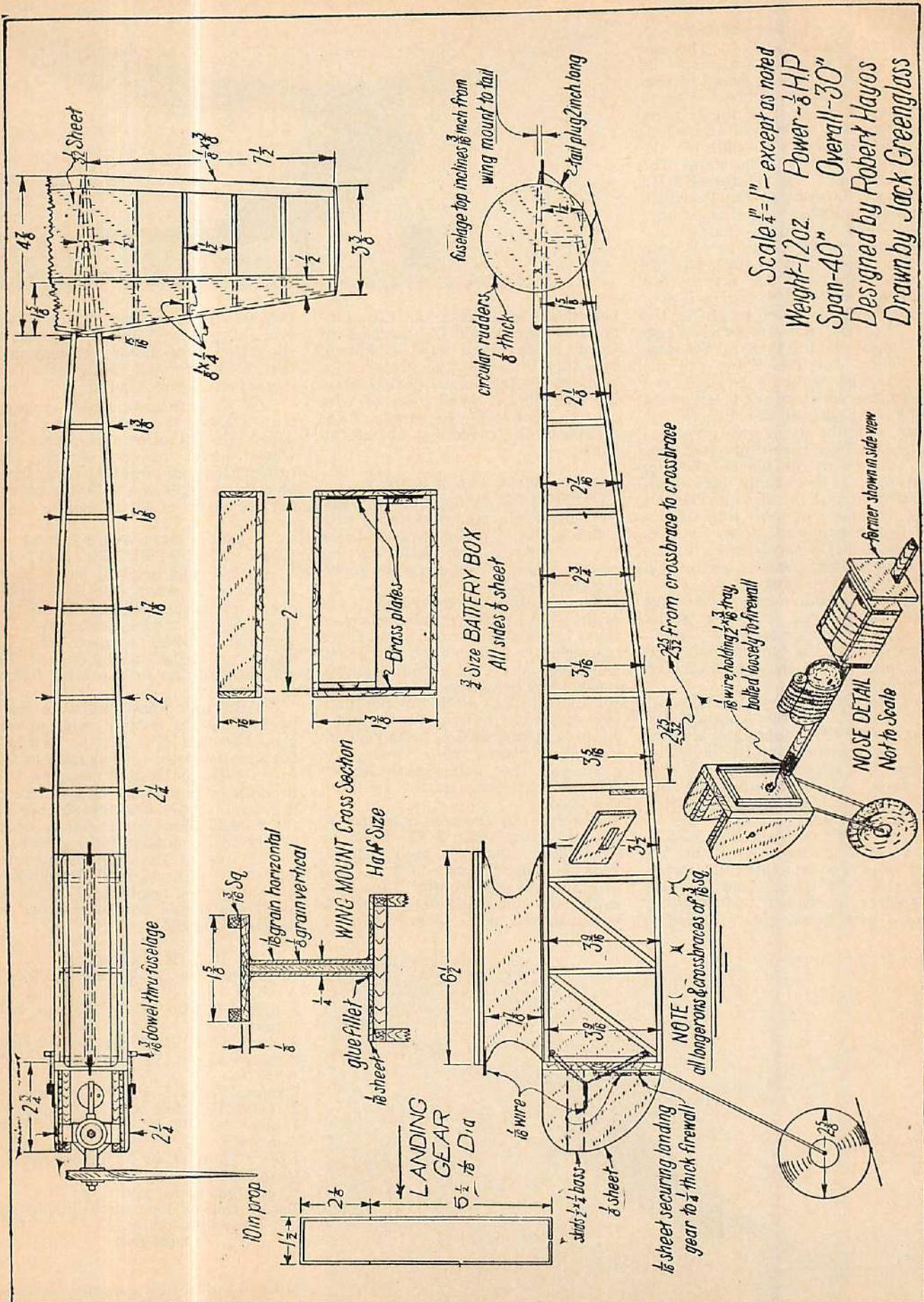
BILL OF MATERIALS

- 14 pieces $\frac{3}{16}$ " sq. by 36" for long-erons, etc.
- 8 pieces $\frac{1}{4}$ " by $\frac{1}{8}$ " by 36" for tail parts
- 4 pieces $\frac{1}{16}$ " by 2" by 36" for ribs
- 2 pieces $\frac{1}{8}$ " by $\frac{1}{2}$ " by 36" for cowl etc.
- 2 sheets $\frac{1}{8}$ " by 3" by 36" for rudders
- 2 feet $\frac{1}{16}$ " steel wire-landing gear
- 1 piece $\frac{1}{4}$ " by $\frac{1}{2}$ " pine for motor mounts
- 1 piece $\frac{1}{4}$ " by 3" by 4" for firewall
- $\frac{1}{2}$ pint clear dope
- $\frac{1}{2}$ pint gas model glue
- Tissue, colored dope, pins, nuts, bolts, and drawing paper.

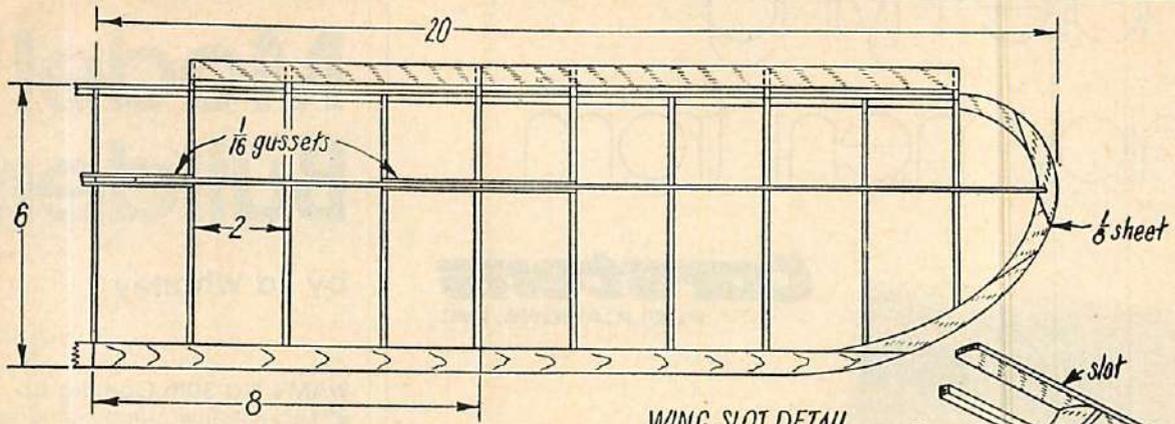
THE END

Twin-finned tail surfaces and polyhedral wings contribute to consistently good performance.



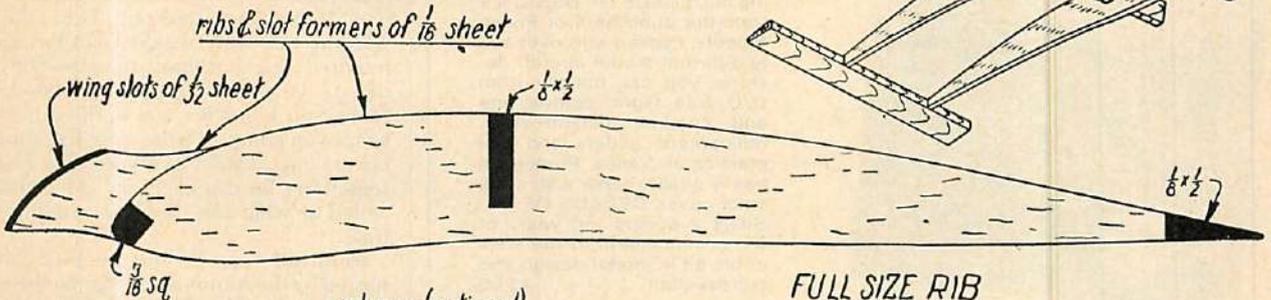
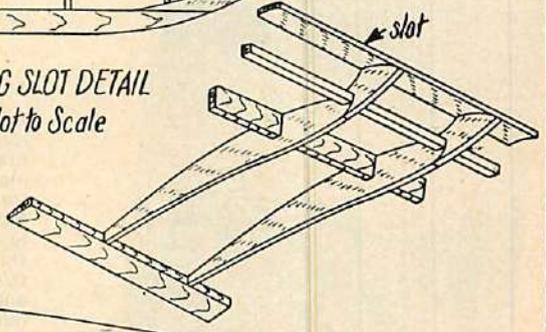


Scale $\frac{1}{4}'' = 1'$ - except as noted
 Weight - 12oz. Power - $\frac{1}{8}$ HP
 Span - 40" Overall - 30"
 Designed by Robert Hayos
 Drawn by Jack Greenglass



WING SCALE $\frac{1}{4}'' = 1''$

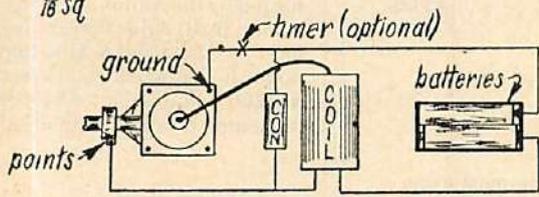
WING SLOT DETAIL
Not to Scale



FULL SIZE RIB

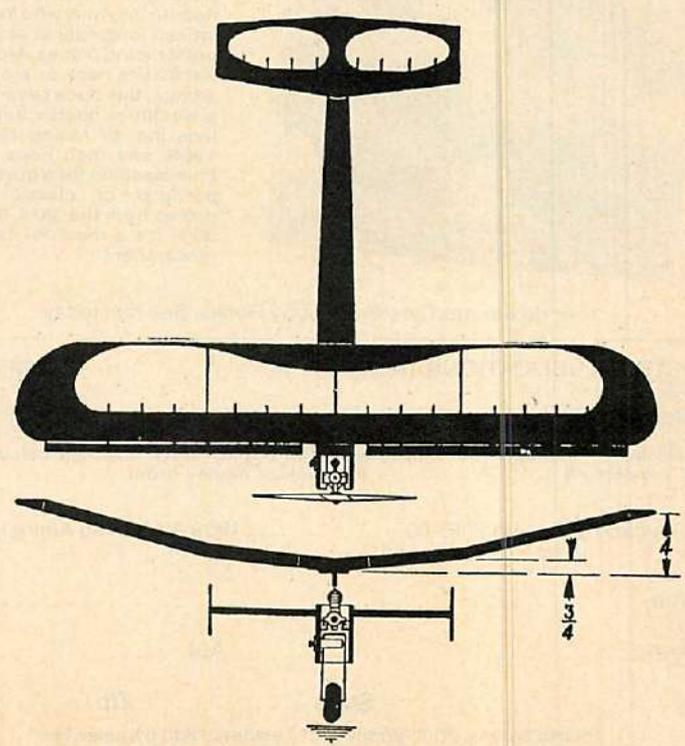
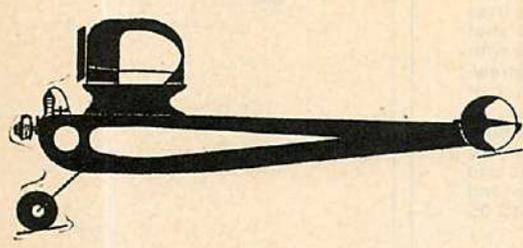
bend to shape

Make 12



IGNITION SYSTEM

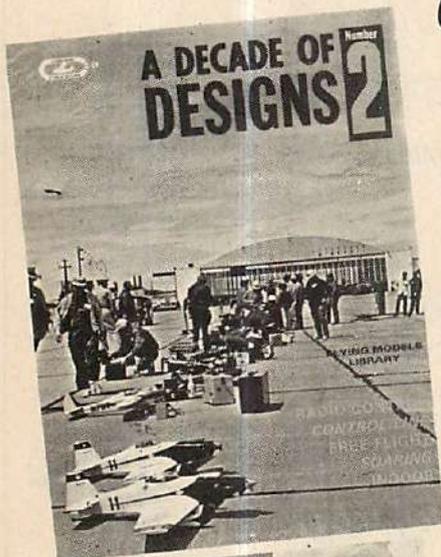
SLOT SUPPORTER



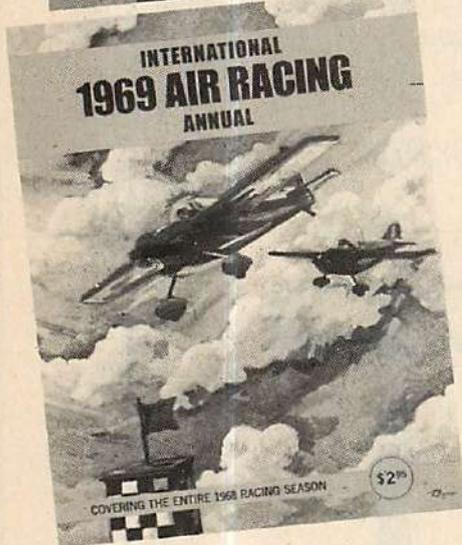
ASSEMBLY DRAWING
Scale $\frac{1}{12}'' = 1''$

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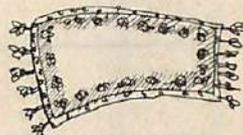
With Model Builders

by Ed Whalley

WAM's Big 30th Coming Up

Got a note from Mom Coad on the heels of the coverage we gave WAM's 29th Parade of Champions—the piece in which we “bet” that Mom would once again be drafted for Executive Secretary by acclamation. Her note started out “O.K., Ed, you won the bet. Here we go again for another hundred years; at least, sometimes it feels like it.” To which we can only respond, “But Mom, you know it's one of the things that keeps you going.” Carmen Basilio, the great boxer, once said “Everyone has to have something he can excel at.” Mom has excelled at what *she* does for a mighty long time.

From all reports, the January Parade, hosted by the Aeromodelers of San Jose, was a good deal. Arlie Preszler reports that the food was good and not too long in coming—no mean feat when you're feedin' in excess of 200 modelers. ASJ's Mike Logan presented his club's officers, introduced the



Steve Campbell

WAM president, and turned the evening over to WAM. Mary Carpenter was elected to another term as President "after doing a great job last year." And Don Hollfelder of the Vacaville Skylarks was voted-in as V.P. As usual, a number of great door prizes were awarded: Terry Imboden got the biggie, a TV; Joanne Price picked up a Thermos Air Pot; our friend, Arlie, got himself a Sig hat and jacket. All of the prizes were donated.

Some of the awards were really special—the NAMBA Sweetheart pins. Only ladies got these, and only ladies who've worked for the Model Boatman can ever get them. The first three went to Mitzi Johnson, Jackie Metelak and Mom Coad, and these three have diamonds, five of them in their centers. Designed by Don Coad, the pins are heart-shaped, red enamel on gold. Mitzi and Jackie earned theirs by working with their NAMBA-president husbands; Mom, by being the First Lady of the Office. Copies, without the diamonds, may be bought through the NAMBA office, but only over the signature of the local District Director. They're meant to have meaning.

The Concord Model Engineers put in a quick bid to host the big 30th Annual coming up. It was accepted unanimously, and a committee got right down to business on the details. Late word is that the site will be the Concord Inn, that trophy presentation will be by past presidents and dignitaries from the industry, and that the big door prize, a 17-inch color TV, has already been bought and paid for. And that isn't all, Sam, you get a choice of two entrees—chicken or roast beef—for a firm price of ten bucks or less. Get your reservation in early. Looks like WAM's going all-out on the next one.

Two Firsts for the FFMAASC

In Southern Cal, the Association banquet attracted a tremendous turnout. Jim Scarborough reports that the place was literally jammed and that the affair had to be among the best ever. The idea was great: cook-'em-yourself steaks and a salad bar—go ahead, drool a little. Surprisingly, an East Coast luminary was on hand for the festivities—the ol' Professor, George Perryman. The Perrymans are combining business with pleasure on a California trip.

One of the "firsts" we alluded to came in the form of the Coast premiere of the new Academy film, "Those Marvelous Miniatures." The 50-minute sound film covers all types of models, and it was well received by the Californios. Jim arranged for the showing. The film's in color, and you can get it for your organization through AMA.

The second "first" was the presentation of a new award, the Award of Excellence. District V.P.'s make this award which goes to clubs with outstanding records. Jim gave this to his own club, the Thunderbugs; but don't holler—they earned it by taking Association team honors two years in a row. And here's what we like about this one: every member of the winning club gets to wear a distinctive patch with a large gold "E" on it.

More on Manhattans

The MIAMA boys from Florida have been plugging the Manhattan Indoor event for many moons. Last year's Nats effort (unofficial) was admittedly poorly attended. But good ideas die hard, and Manhattan interest appears to be building. Anyhow, they've come up with their announcement for the Lake Charles Nats this year: Manhattan will

be run as an unofficial event on the first day of the Nats, Saturday, July 29th, at the Lake Charles Civic Center. It will be run concurrently with Indoor Rubber Scale. And if Bob Clemens, Lou Sutter, Charlie Sotich and Clarence Davis, last year's winners, show up, they'll get the trophies they didn't get last year.

Anyhow, just in case this episode escaped your notice, let's run it by one more time: Bob Clemens, a New Yorker, came first with 6:23.6; Sutter, a Texan, seconded in 4:56.5; and, Sotich, a Chicagoan, logged 2:24.0. (It isn't clear whether Davis logged an official or not.) The average weight of the three top entries ran to about 5 grams and prop diameters ran from under ten to over twelve inches. You can get the event spec's from an earlier issue of FM or by writing Dr. John Martin of MIAMI at 3227 Darwin St., Miami, Florida 33133. The February issue of Hangar Pilot graphically depicts everything you need to know right on the cover.

In the meantime, MIAMA stalwarts are going strong in the blimp hangar with meets featuring Handlaunch, Peanut Scale, Manhattans, and a healthy Delta Dart program for the kids. Heck, these guys fly everything. At a recent venue, Fulton Hungerford (yes, he's the scale-wheel man) took a second in Peanuts with an SE-5 and a first in Scale with a DH Moth. Roman Szymula won in EZ-B, Pennyplane, and Stick (19:28.6). Jim Stewart had a couple of seconds plus a win in Paper Stick. Ernie Clark took Manhattan with a time of 2:31.4. John Martin took Peanuts and a second in Scale with his Cessna AW. And Jill Rose and Chris Norris tied in Dart at 35 seconds.

Control Line Coalition To Pick Ten Best Models

Dr. Laird Jackson who's come up with more than his share of good ideas for Control line flyers has come up with a beaut this time. In fact, it fits right into the "It's-sure-about-time" category. Anyhow, we think it's great, and here's how it goes:

The idea is to get the various Control line groups to get together and sponsor what Doc calls the "Ten Control line Models of the Year Program." It's not a superagency piled upon the organizational structure; it's a simple inter-organizational cooperative. Basically, reps from the different groups, PAMPA, MACA, the Racing and Carrier outfits, will form a committee to select and honor the outstanding designs of the year. The concept is similar to, and based upon, the NFFS deal, "the Ten Best." In practice, designs would be nominated for honors and selected by some kind of vote.

In the interest of getting the bird off the ground this year, Doc has put his money where his mouth is and volunteered to act as Chairman or Coordinator, or whatever. And he's come up with a list of categories for the nominations; these include: FAI Speed, Aerobatics, Team Race and Combat; AMA Speed, Racing, Navy Carrier; and, a Special category. Presumably, the designs will be published, and the designers will get some kind of award.

Doc is inviting input from both concerned organizations and individuals. You can get to him at: 523 Meadowbrook Circle, St. Davids, Penn. 19087.

Top Combat Flyers Named

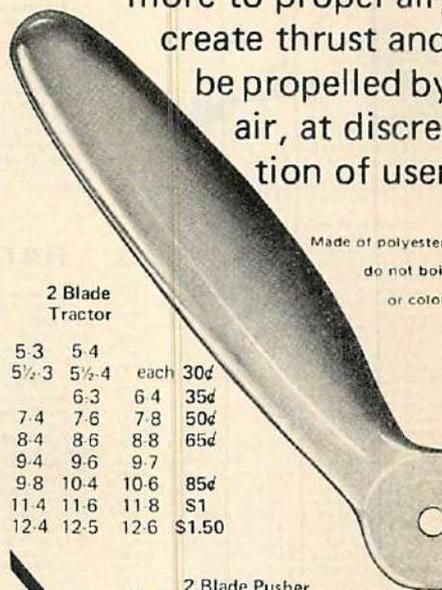
According to the current issue of MACA Newsletter, Dick Stubblefield is a Com-

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bateer to be reckoned with. Dick ranked first in the Top Twenty standings; third in the Fast Combat "Top Ten"; second in the Slow Combat "Top Ten"; and, sixth, in the FAI "Top Ten." His looks like an outstanding record. But there are others who did pretty well, too.

Paul Smith was Number One in Slow Combat, second in the Top Twenty, third in FAI, and tenth in Fast Combat. Rich "von" Lopez topped the Fast listing, and Neal Rose headed the FAI list. George Cleveland was third in Top Twenty, fourth in Slow and eighth in Fast. Mike Guthomson who picked up a third in Slow and a sixth in Fast was fourth in the Top Twenty. Rose was ranked fifth in this overall list and von Lopez, sixth. Rich, by the way, really cleaned-up in the WAM standings last year. The lists are derived from season-long placings in approved meets.

The Newsletter, by the way, is still airing the pros and cons of the Team Selection controversy and the Pitmen Problem. We think this is healthy; and without taking sides, we present different points of view for your consideration. In the matter of the judging, Hank Nelson of Verona, Pa., points out that there has always been a minor crisis attributable to a reluctance of qualified people to take-on judging chores. He suggests that a stipend, something that would pay at least part of the expenses involved, would provide some incentive for individuals to take on organizational and judging duties in the Program. This would permit contenders to disassociate themselves from meet management. The protest, in part, cited the lack of flying experience of some of the judges. Conversely, a number of people see no corollary between flying and judging; and, indeed, suggest a commendable degree of disinterest on the part of such judges.

In the matter of selecting pitmen, Max Means of Rock Cave, West Virginia, raises a couple of valid considerations. Max, by the way, requested the original, if unofficial, vote on methodology. Max's position is that there are two prime considerations involved: 1) fielding a competent Team; and, 2) expanding the U.S.'s base of experience at the WC's level of competition. Max feels that the second objective might be better served by offering the pitman positions to the alternates. He argues that, by and large, they would be pretty good pitmen and that they would gain valuable WC's experience which would stand them in good stead should they gain Teamster status in future Programs. Nelson also supports this view. He feels that the alternates have earned a shot at the positions by supporting the Program and paying their entry fees. And Mack Henry of Franklin, Tenn., comments that if funding falls short of sending a full quota of pitmen, the Teamsters should settle on the one or two whose passage can be paid. In other words, there seems to be a desire for definite, procedural guidelines in the matter. And there seems to be plenty of evidence that pit positions are not only something to be desired but actively sought-after; and that getting them should be a reward for effort within the Program.

Big Goodyear Rules Firmed
An outgrowth of the Southwestern Regionals at Buckeye was the formation of the Southwestern Control Line Association (SWCLA). The move came as a result of talks centering on a unified set of rules for Big

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Goodyear—an event pioneered by the Arizona contingent. Robin Sizemore, Bob Reynolds, Phil Shew, Les Pardue, and Ben and Patty Sasnett were prime movers. California, Arizona, New Mexico and Colorado are the states thus far affected. Upon ratification in these areas, Big Goodyear rules will be the same everywhere. The next step is agreement upon Slow Rat rules in these states.

Briefly, SWCLA Goodyear is an event for commercially available profile kits having side-mounted engines, a full set of flying surfaces, two-wheel landing gear, and enclosed "pilot" positions. Wings have to run to 375 squares or better, and some structural mods are permitted. Ships have to present a realistic and racy appearance and must carry racing numbers. Stock engines up to .36's are required, and tanks can't exceed two ounces. Other spec's: commercial 9/7 props; no hot gloves, shut-offs, internal line connectors; no pit stops required; pull test of 35 pounds; and, 60-foot, stranded lines of .018 diameter.

Event-entry figures from the Southwest indicate that Big Goodyear has been the most popular event for the past two years. The concern for unified Slow Rat rules is probably occasioned by the data which shows two other Rat classes gradually melding into AMA Slow Rat. Apparently, flyers who haven't adopted AMA rules have simply dropped the event. Speed, never a strong event, has declined almost to the vanishing point even with combined classes. The biggest gain was evidenced by Profile Carrier with added interest spilling over into Carrier I and II. Half-A events like Profile Proto and straight Speed have been stable but not particularly well supported. Speed, next year, may be limited to Formula .40 only.

Incidentally, we are indebted to Hangar Talk, the Cholla Choppers' newsletter out of Tucson for this info. Robin Sizemore is doing a commendable job with the paper. Contact him at 12405 E. Arbor Vista, Tucson, Arizona 85715 if you want to subscribe or exchange papers with him. And thanks, Rob!

Dist. XI Sympo a Success

Happily, the Wakefield and Nordic Symposium hosted by Wayne Drake in Troutdale, Oregon, attracted some of the most skillful and communicative exponents of the arts and can only be termed an unqualified success. Participants came from Washington and Oregon, and there were about twenty-five auditors for each segment. John Lendeman was drafted as moderator.

Nordic speakers included Tom Hutchinson, Steve Helmick, Drake, and Gene Jensen. The topics covered ranged from towhook systems and towing techniques through construction and trimming to tactics and competitive practices. Related discussions with a variety of input followed each presentation.

In the Wakefield segment, Bill Gaiser discussed prop-carving techniques as did Ron Davis. Theory and practice were supplemented by examples of various front-ends which were passed around for examination. Stan Fink did his utmost to bring everyone up-to-date on the current rubber offerings in terms of stored power, power release, and motor makeup.

The attendance roster carried familiar names from the Nor'Westers, the Strat-O-

Bats and the Willamette Valley clubs. Norm Beattie came down from Vancouver. All of this points up why the Northwest is coming to the fore in Nordic competition. All who attended agreed that it was a day well spent and that it should be repeated next year. Seattle was suggested as a possible site, and there was evidence of support for a proposed Northwest FF Association. It could be a logical outgrowth.

Incidentally, Tom Cashman and his editorial cohorts are doing a fantastic job with the Monthly Bat Sheet through which we have been keeping abreast of developments. The comprehensive coverage afforded the symposium suggests that the Sheet could well become the sounding board for an NWFFA. Two bucks to Tom at 2521 SW 323rd St., Federal Way, Washington 98003 will bring you 12 issues "no matter how long that may take."

DCRC Moves for Cash Prizes

The DCRC Board of Directors at their January meeting agreed to the idea of cash prizes for the club's June Pattern contest. The idea was adopted at the suggestion of Andy Finizio and was based upon his experience as a Pattern competitor. Finizio, who appeared as a guest of the Board, made a number of suggestions which, he believed, would improve the contest. These included: 1) holding the meet at the Beltsville Ag Center; 2) giving cash awards; 3) making judges practice before the contest to familiarize them with maneuvers; 4) prohibiting club members from competing in order to forestall charges of prejudice and to provide experienced judges; 5) encouraging the entire club to come out and support the meet; and, 6) moving the contest date from Fathers' Day week end to a less-committed date.

Andy must have made quite an impression on the Board. They agreed to support the meet, to allow him to select the date, to ante-up the prize money, and to put him in charge as CD. Nothing succeeds like success.

And talking about success, that's the only term that can be applied to the January Snow-Fly of the Soaring contingent which was CD'd by Walt Good. Walt gave the matter some thought and came up with a task which was designed to equalize skill levels and give beginners a break. He called it Lottery Duration, and here's how it worked:

Walt set three rounds of 5 minutes, max, in which the flyer tried to put together a total of 6:00, 8:00, 10:00 or 12:00—whatever goal he set for himself. After the last flight was logged, a lottery drawing determined the target time for the event—it turned out to be 8:00. The winners were those who had totals closest to that time.

Among the Experts, Gus Burgin beat out Walt and John Coleman to win. Among the Sportsmen, it was Reg Mitchell, Barry Drew and Bill Cavanaugh—in that order.

It was a good way to spend a winter's day. It was cold, but clear and sunny, and there was crusted snow on the ground. Ships coming in for a landing greased along on the crust for a hundred feet, and a few which hit footprints did some spectacular cartwheels. Surprisingly, there was some lift around and quite a few ships made maxes.

Some Like 'Em Big

We see more and more evidence of the increasing popularity of really big models.

The current emphasis on quarter-scale replicas and the use of converted chainsaw motors reminds us of a remarkable pre-WW II combo which was produced commercially for a while and then, reportedly, went to war. Both the ship and the motor, the Avion Mercury, were produced not too far from this office—over in Woonsocket, R.I. The story is that Avion production was turned over to the military for target drones. Anyhow, I never learned of the ship or the motor until I came home in '45.

At that time I was instrumental in organizing an area club and met Aram Pothier, the manufacturer. The Avion motor was remarkable in that it featured magnesium castings which made it remarkably light for its size. It also had a functional carburetor which was intended for remote control (R/C). It turned a variety of laminated wood props made by full-scale makers ranging up to two feet in diameter. The design of the motor was reputed to be the work of an MIT student going for his doctorate. About ten years ago, I was able to locate one of the few remaining specimens of this motor for a collector. Unfortunately, the magnesium castings on most of them deteriorated with age—even in storage.

The companion ship for this motor was comparable to today's quarter-scalers—it ran to about ten or twelve feet in span. A lot of spruce went into it, and so did some remarkable examples of aircraft plywood. Covering was cotton nainsook, and the ship had a Stinson-like appearance. Pothier kept an assembled ship in his garage; and on occasion, he'd set his young son astride the cabin, fire-up the motor, adjust the carburetor, and ride the kid around the yard by steering with the tail. The ship weighed fifteen pounds ready-to-go. On one occasion, the ship was "tested" by free-fighting it over some isolated country and chasing it with a Cub.

The family had other distinctions as well. Pothier's father had been not only the governor of the state but the operator of one of the first airports. And among his other accomplishments, the motor manufacturer was also the designer of a man-carrying kite. Reportedly, the kite was tested on my old FF site (now part cemetery, part development). Wonder what became of that?

Just to show that things come full cycle, some of the DCRC guys are building quarter-scale Stinson SR-9's—five of them to be exact. Span will be ten-feet-plus. Chord at the dihedral break in the gull wing is 25 inches with a depth of four inches. The boys are cutting the ribs out of eighth-inch ply, and it takes more than a four-by-eight sheet for a complete set of ribs. (23 per panel) Oh yes, they're converting Homelite Super-2 chainsaw motors!

Potpourri

• Yankees simply tend to be laconic. Along with the pix in his February bulletin, Maine's George MacArthur wrote: "Here are some pictures left from last summer (no snow)." If the whole country hadn't been subjected to what we New Englanders have been through, this could be taken as an inside joke. (My stock is standing so high above the fences that the only thing that keeps 'em in is force of habit.)

• Out on the Coast, the Tokay R/C boys are pushing a Super Joystick Pylon event. Briefly, the rules specify: Super Joystick from stock kit; stock O.S. Max .15 en-

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gine; 15% nitro fuel; 3 or 4 channel R/C (elevator, ailerons and throttle, min.); and, a minimum weight of 2½ pounds. Reportedly, clubs in the Sacramento area started the ball rolling, and other groups are joining-in.

- The MIAMA hangar pilots have come up with a new version of the Peanut rule: 9 inches in overall length (less prop) OR 13 inches in span. If the length doesn't go over 9 inches, the span can be whatever it scales out to be. If the span doesn't exceed 13 inches, the length can be whatever it scales out to. The idea is to make more designs eligible for competition and to get away from stereotypes. Walt Mooney and Bob Clemens have expressed support for the concept, so we look for a covey of "New Rulers" to hit the local tarmac very shortly.
- The "THNIRT" is coming: You remember the SNIRT don't you? (Second NIMAS Indoor Record Trials) Well, the third running has been dubbed the "Thnirt." It's set for June 23-24 at—where else?—the Northwood Institute in West Baden, Indiana. If there's anything that typifies a national "home" or homecoming for Indoor freaks, this is it. It's a natural; don't miss it!

- Groups bidding to host FAI Team Selection meets now have a six-page form to fill out. It assesses various site and weather factors and includes a section for the signatures of all personnel associated with the contest. In reporting the document, Scarborough quipped: "And you thought model building was a fun game!" Things are getting serious.

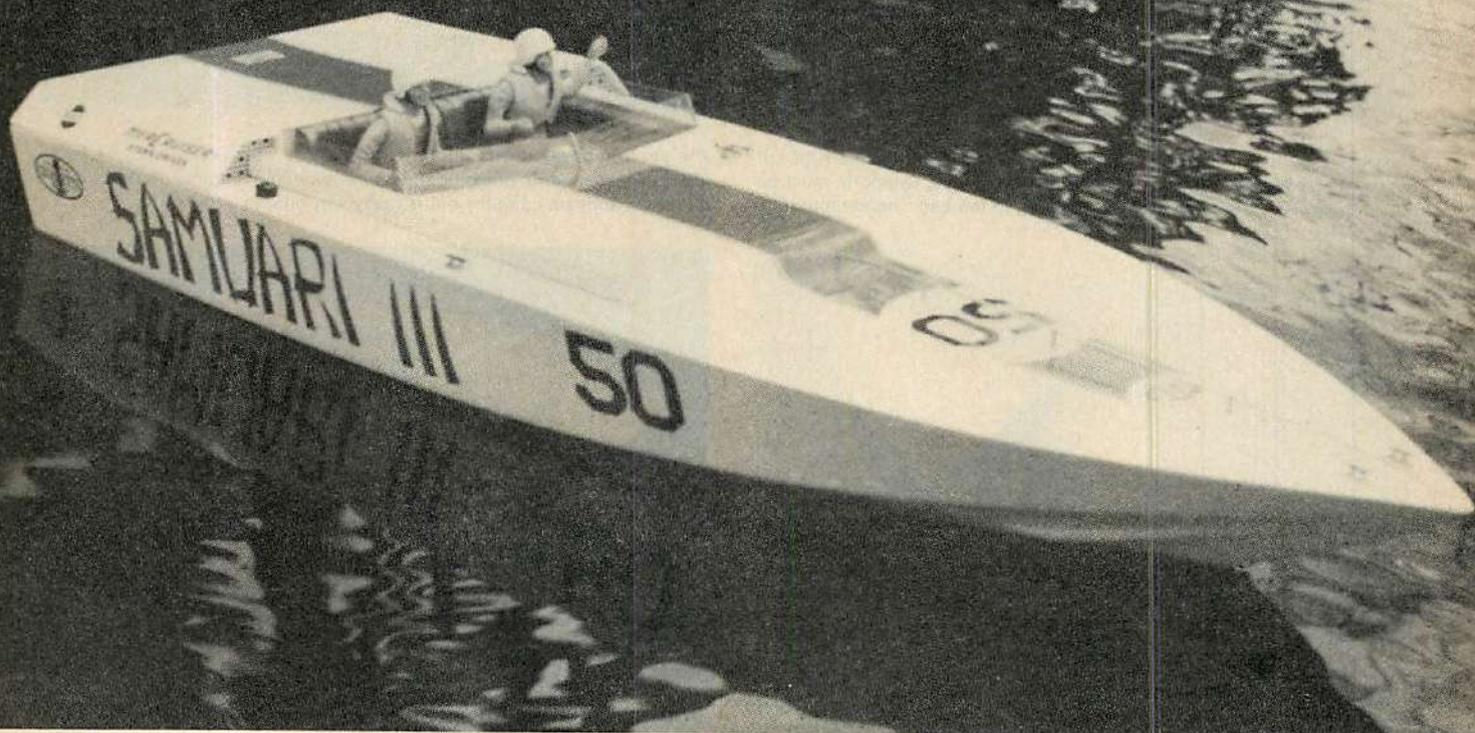
- Patty's Pinkie reports that the boys around Riverside are kicking around the idea of a 500-lap Big Goodyear for Memorial Day weekend. Dale Long says prizes will probably go to both flyer and pitman through third place. (Yes, the Pinkie's still going. The gang wouldn't let them quit!)

- MACA reports that Combat will be sited at a lighted ball field with three or four diamonds at this year's Nats. The field is adjacent to other Controlline event sites. Some night flying, maybe?

- Well, it's been done before. At DeKalb's Muscular Dystrophy meet last September, the final match was flown in pitch dark. Paul Hoffman and Bob Burch were the flyers. They had to depend on line tension and engine noise to determine relative positions. Bruch pulled an outside loop, then sighted down Paul's lines to guess at his position. He made the cut, but it took the judges about thirty seconds to figure out that a kill had been made. With lights, it should be easy.

- The USFFC's will remain a three-day deal. A poll will be taken this year to see how participants feel about extending the time. Junior BC Gas is being dropped; instead, management will offer a Hi-Time Junior Trophy for BCD Gas. Rocket and P-30 are being retained, and P-30 will be split for the benefit of Juniors (trophies to third). And here's another break for Juniors: trophies to third in .02 Replica especially for them. FAI events will be flown by rounds, but a poll will determine event procedure for next year.

- From Salt Lake comes word that the Intermountain Ol' Timer Champs are set for July 22nd and 23rd. And Lin Haslam confirms that his SLAM group have put-in a bid for the SAM Champs. Looks like there'll be plenty of Free-Flight on the salt flats this year. If they get the Champs from SAM, the U.S.A. will be called upon to work the meet.



PHOTOGRAPHY: DOUG FACONI

A modified Dumas DV 40 F for .20 class

The older boats designed with .20's in mind won't work well with the new generation of more powerful engines. Here's one answer—chop a .40 boat/**Doug Faconi**

As engine performance increases steadily, we find that most engine/hull combinations become unreliable for competition. For example, running a new OPS or K&B 3.5 in a hull originally designed with a Veco or Taipan in mind produces a boat that is difficult to trim and impossible to handle. On the other hand, within the past season, Deep Vee racing has become so much more competitive that it had been, that simply installing a 3.5 in a .40 hull produces good handling but only marginal speed.

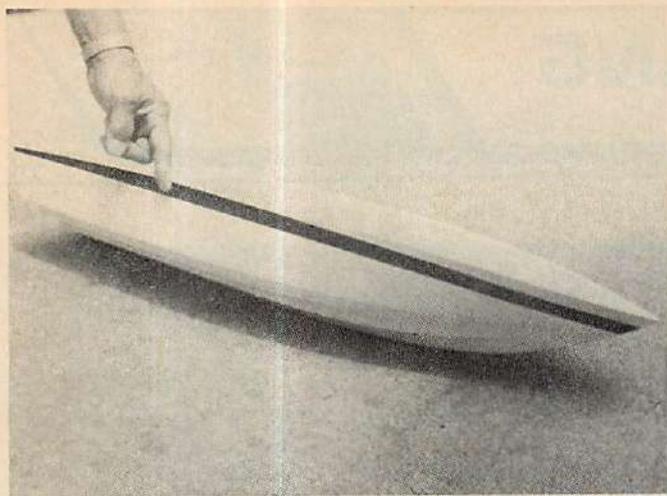
FLYING MODELS

Some manufacturers, realizing this, are doing something to fill the gap. For instance, Dumas will have a new 21 DV available as you read this article. Basically, the new hull, a modified DV 40 is lower and shorter resulting in a stable yet very fast boat. The prototype was developed after I ran a cut down 40F the previous year that did quite well. Don Typond built the modified DV 40 in wood with a K&B .21 that produced even better results. The model described in this article achieves top performance yet retains

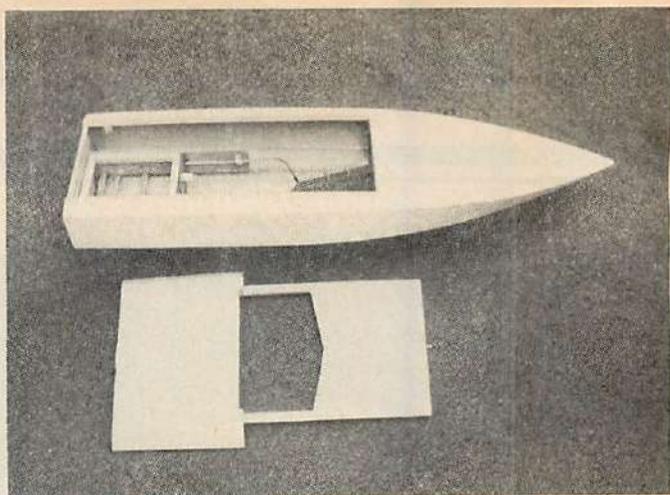
its scale appearance. It was tested at the Gran Prix in New Jersey last September. Unfortunately, the driver was not as quick and reliable as the boat.

Construction

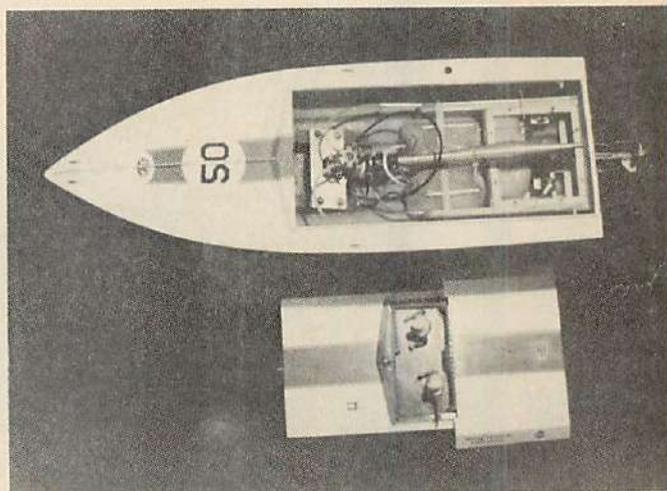
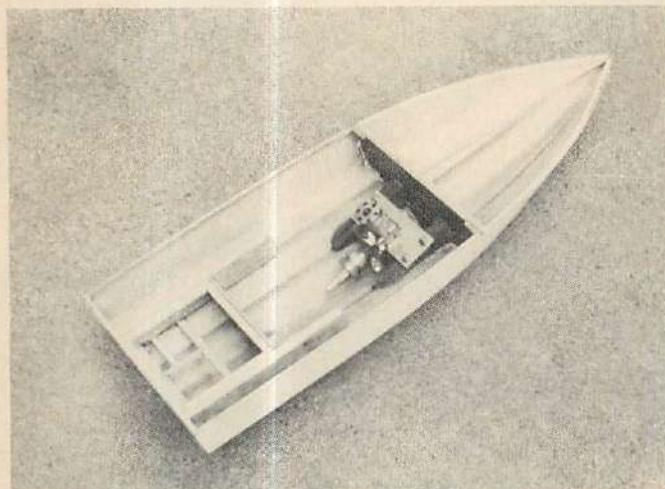
The first step in changing the old Dumas DV 40 F hull to a fine running 20 hull is also the most important step—cutting it down. This also has the effect of shortening the hull slightly. Mark your cut line with black tape on a line starting $\frac{3}{4}$ -inch to $1\frac{1}{4}$ -inch below



The Dumas DV 40 F hull is shown **above** with the tape put on to mark the cut which will be made along the lower edge of the tape. Supports must be added (**below**) for the front and side decking in the basic construction.



The photo (**above**) shows the large hatch area which provides very easy access to the innards of the boat. The installation of engine, hardware and radio box appears complex but is really very simple. A movin' boat.



the point of the hull and running to $\frac{1}{4}$ -inch below the side at the transom. Make sure that the freeboard is within legal dimensions and that it is esthetically okay.

The cut itself can be made with a saber saw using a fine scrolling blade or with a hacksaw. Proceed carefully to avoid cracking or chipping the fiberglass. When the cut is finished rough up the inside edges removing irregularities, then bond $\frac{3}{16}$ -inch x $\frac{3}{8}$ -inch wood strips with resin along the inside of the hull edges. These strips will now

have to be trimmed and sanded level to form a bonding surface for the decking.

Glass in the front bulkhead, radio compartment and deck supports. The deck and hatch on my boat was fabricated from $\frac{1}{16}$ -inch plywood sheet. Most of the construction calls for generous amounts of resin and epoxy but be careful not to put resin over epoxy as it will not dry at all.

The running I used was a Dumas outdrive with a K&B 3.5 engine and a JG F20 prop. The placement of the strut and rudder is

always a question with any boat. Generally the strut should provide a slight degree of thrust to keep the hull level, while the top of the prop should be approximately $\frac{1}{8}$ -inch below the bottom line of the hull. The rudder should be cut off about $\frac{1}{4}$ -inch below the prop and be relatively perpendicular to it. Use trim plates for final adjustments.

This boat is quite capable of dominating .20 class Deep Vee racing, but the competition is so stiff that winning depends more than ever on the driver. Good luck. ☺



A Dry Dock Review:

3-D Models' Ruff Stuff 50

Here's a total view of how to handle one of Tom Daniels' winning Deep Vees/Paul Stakun

A long time ago, (longer than I care to remember), I promised that I'd write a review article on the 3-D "Ruff Stuff" Deep Vee. This boat has been popular in the East Coast off-shore classic races in all NAMBA classes, and rightly so—it's damn fast! I don't mean to knock other boats because it seems that everyone with a couple of years racing experience under their belt is emerging as competitive as the next guy, no matter what boat he's running! It's great to see the competition.

I saw the first boat run at one of the early Hennessey Mini Grand Prix races held at Greenwood Lake, N. J. That's where Deep Vee racing was born! Tom Daniels raced his prototype there for the first time. I noticed that the boat was extremely fast, but because new boats sometimes have growing pains, it had its difficulties. Later, Fred Gimbal got a copy and developed it into one of the most competitive machines that I've seen. That's when I said to myself, "I'd rather switch than fight", so I purchased a Ruff Stuff 50 to do battle in the C class.

At first, the long 50-inch hull looks as if it could be used for an aircraft carrier. My wife said, "Don't you need a trailer for that thing?" Don't fool yourself. When you bolt in a mighty OPS .60, the length seems about right, since anything shorter would have

great difficulty handling the power. As to how the boat handles, I'll get into that later.

The Ruff Stuff can be purchased in two ways, either assembled with engine bearers and deck joined or in kit form. I chose the kit which consisted of the basic hull and deck. The hatch cover is an option and is worth the extra cost because it saves you a lot of building time. In addition, other materials are needed to complete the basic hull construction, namely some 1/4 inch plywood (marine plywood preferably since it has no voids or knots), About 12 feet of 6 inch wide fiberglass tape, 1 quart of polyester resin, a small piece of fiberglass mat, and an Octura 5-55 engine mount.

To start, cut out the 1/4 inch plywood engine bearers and transom doubler using the patterns supplied. The patterns for the engine bearers gives the hole location for attaching the aluminum mount. I found, however, that the angle of these holes with respect to the bottom was not quite right. These holes are angled about 8 degrees and should be more like 12 degrees, therefore I recommend that the front hole be raised about 3/16 inch to get the desired angle.

The instructions that come with the kit are fairly well written, so I won't go into a lot of the details in building the boat that would be redundant. I did not follow the sequence

of construction as specified because I felt there was a better way. The worksheet calls for joining the deck prior to installing the engine bearers, and I think it should be the other way around to make it easier to work on the inside of the hull. I would suggest that you build a sturdy stand to begin with so that the hull can be held securely without a chance of bending it.

It is recommended that the inside of the hull be sanded with 100 grit paper to remove any splinters that stick up from the resin, particularly on the flange where the deck joins the hull. You'll get a better joint if the two pieces have a closer fit.

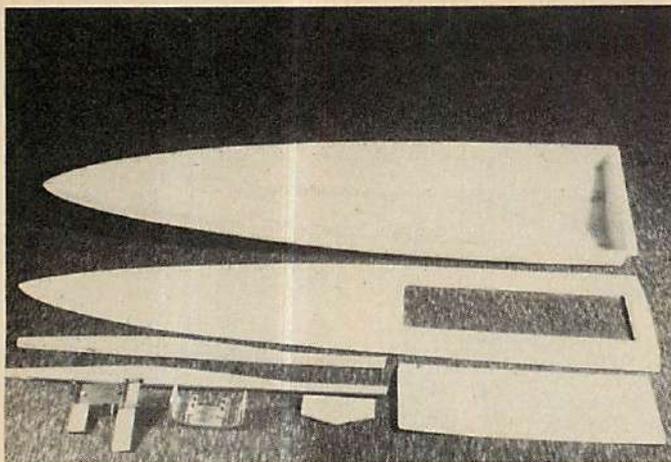
Because the hull is molded from resin and chopped fibers instead of cloth, I feel that additional strength is needed to keep the boat from cracking in service. That's why the 12 feet of glass tape is necessary. When installing the engine bearers, I essentially covered the bottom of the hull with a layer of fiberglass cloth which incidentally, did not add an excessive amount of weight, and made the hull stronger to boot.

Take your engine mount and apply about six layers of masking tape to the surfaces to be bolted against the plywood bearers. This is to compensate for the fiberglass cloth to be added later. Now bolt the mount to the bearers and position this assembly in the hull

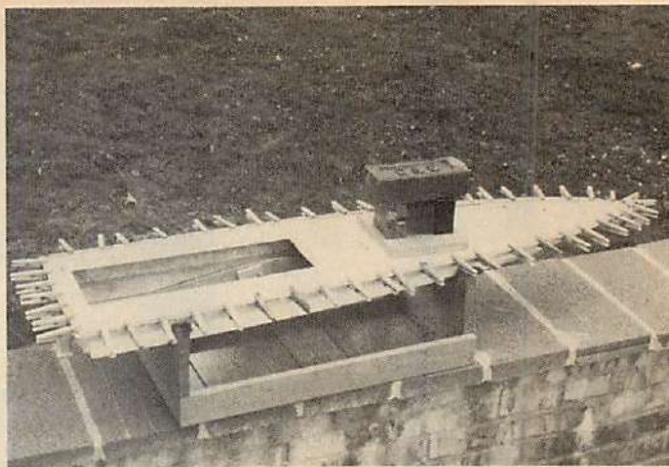


PHOTOGRAPHY: PAUL STAKUN

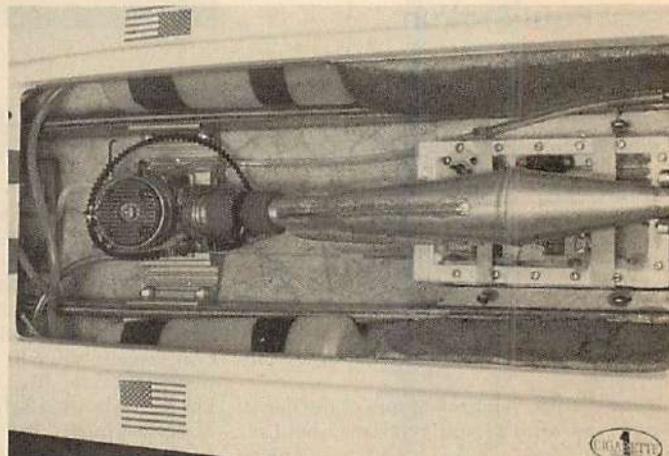
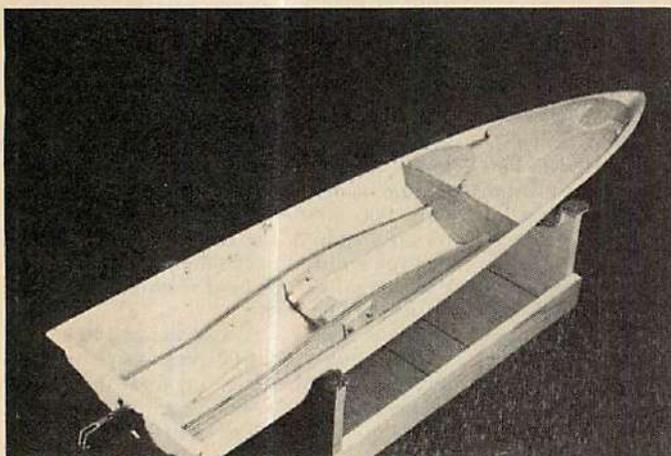




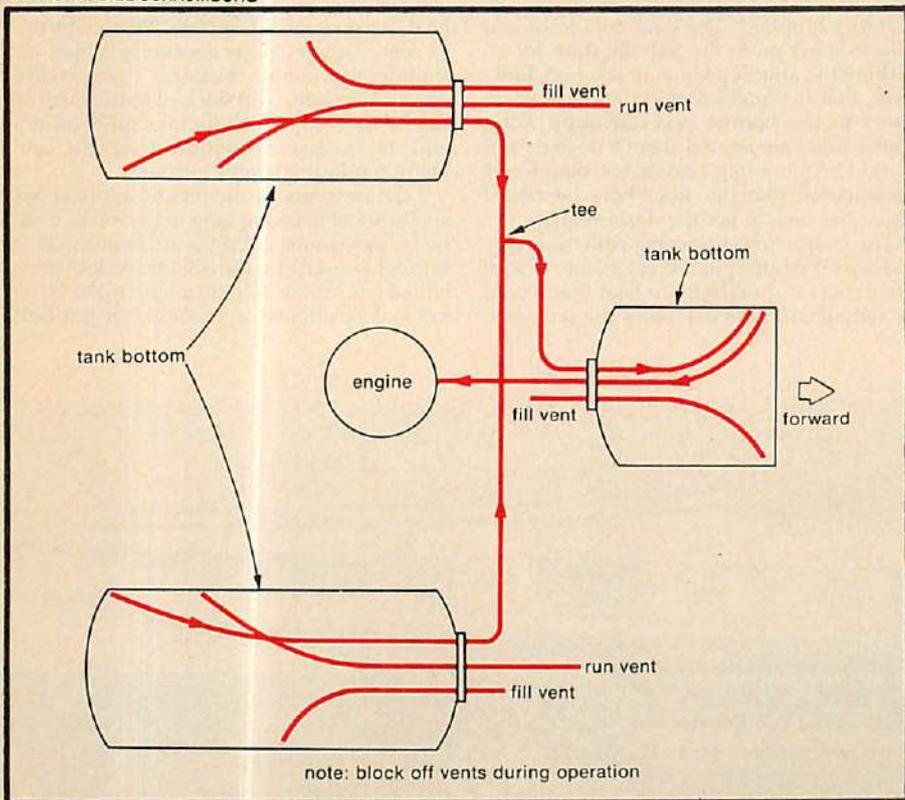
Only the hull and deck come in the kit. Plywood bearers, strudder, engine mount and hatch cover is extra (above). Inside the hull after the engine bearers, engine mount and foam is in place and the hull is ready for the deck to be joined to it. Do not omit the foam, it could save your boat.



You need a lot of clothespins to hold the deck in place. Don't forget the wood strips under the clothespins to keep the deck from scalloping as noted in the plans (above). This inside shot of the Ruff Stuff 50 shows the OPS .60 with fuel tanks and foam flotation behind them. Keep it neat.



ARTWORK: BILL SCHAUMBURG



with the transom doubler. To make work easier, I tack glued the bearers in place with a little resin before applying the fiberglass. (Don't tack glue in the transom doubler)

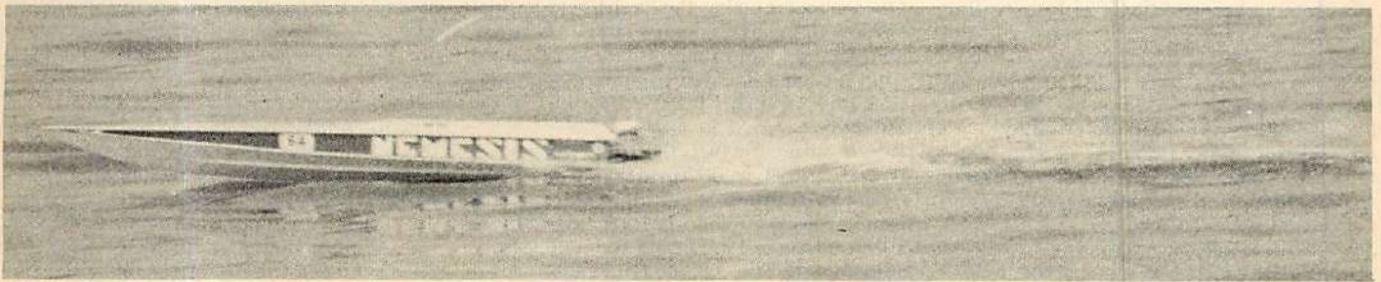
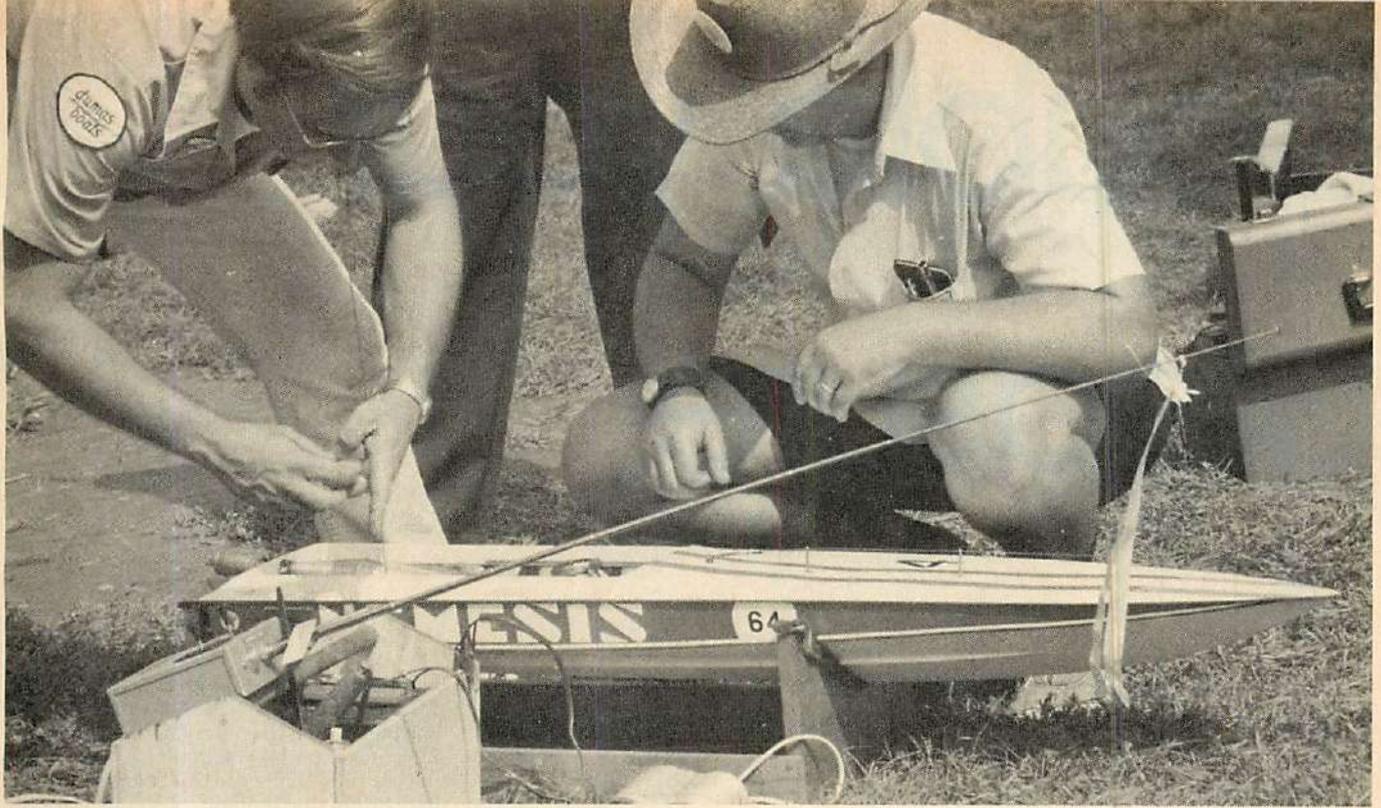
Before I go on, just a word about using epoxy and polyester resins. If you apply epoxy to polyester, there's no problem. But, if you apply polyester to epoxy, *even well-cured epoxy*, it probably won't harden. The best advice is not to mix them. Therefore, use polyester throughout the construction for best results.

Once the bearers are tack glued in place, remove the transom doubler and apply fiberglass tape to the outside of the bearers and fold the material so that the remaining portion of the cloth covers the bottom of the hull. When the resin is well set, trim off the excess cloth.

Using the transom doubler as a pattern, cut out a piece of mat cloth, soak it in resin and sandwich it between the doubler and the transom. Clamp until the resin is set.

Now remove the engine mount and apply fiberglass tape to the inside of the engine bearers covering as much of the bottom as possible. Finally, I chose to add a layer of tape in the center from stem to stern for added strength. Drill out the fiberglass from the bolt holes in the engine bearers, remove the masking tape from the sides of the engine mount and re-install the mount.

As you can see in the photos, I filled the



nose of the boat with foam floatation prior to joining the deck to the hull. I also built a 40 sized hull and poured the foam in after joining the deck. Foaming the boat after joining the deck is preferable since the foam will hold the deck's shape better.

Because the deck of the boat is so long, it is hard to keep it from getting wavy. It's a good idea to glue on a couple of strips of spruce to the underside before you join it to the hull. This will insure a smooth contour.

Follow 3-D's instructions on deck joining *plus* the following: put some masking tape on the edge of the deck and under the flange of the hull so that if any resin gets squeezed out, it won't mess up the gel coat; use fiberglass mat soaked in resin between the flange and you will get a good, strong joint with little if any, voids. After the deck is joined, I mixed up about four ounces of resin and poured it inside the hull so that I could coat the hull/deck joint to insure best bonding. Hold the boat on its side when you pour in the resin and rotate the hull so that all of the joint gets a good coating. Trim off the excess flange leaving about 1/8 inch left.

Install the engine, strudder and drive line hardware. Be sure that the prop shaft depths are 7/8 inch for the .60 powered boat and 3/4 inch for the .40. The best props are the Ocutra 1455 for the .60 and the J-C I-25X for the .40.

You will need *three* (Yes three!) Fuel

tanks for the .60 boat, unless you can find some specially shaped tanks that hold more fuel and will fit under the deck. Two Sullivan C-16s and one RST-12 will do the trick. The main tanks (C-16s) should be located at the C-C under the deck beside the engine. The 12 oz. RST is located forward of the engine and acts as a plenum or collector from the main tanks before fuel is fed to the engine. You'll note in Fig. 1, the wierd plumbing set up. I pirated this from Fred Gimbal and it works, believe it or not. Fred must have stayed up late at night to figure this one out. The main tank vents go to the *bottom* of the tanks and the fill vents are blocked during operation. Amazingly, this system does not require the use of pressure and will give a steady fuel flow throughout the run. Also, note that the tee should be located closer to the port tank because centrifugal force will give uneven fuel flow from each tank. If one tank empties first, it's all over and the engine will quit.

Remove the forward tank and engine leaving the two side tanks in place. Fill the bow with Sig Superfoam to a point halfway between the bow and the deck opening. Then, in each area behind the two main tanks, fill with foam under the deck. Although this last step is not entirely necessary, if the boat swamps, it will remain level in the water instead of the bow pointing up. Trim off any excess foam if you've overdone it.

You can paint the hull in the color of your choice using Hobbypoxy or K&B Superpoxy. As recommended, sand the surfaces to be painted with 400 or 600 wet or day paper. Epoxy paint has a tendency to peel off unless the surface is roughed up.

My finished Ruff Stuff 50 weighed in at 13½ pounds, dry. This is not excessive especially as the water gets rough. I've seen some boats weighing as much as 17 pounds to hold them down, and speeds were still good.

I used the Futaba FP-2E radio to control this monster and the FPS-7 servos are more than adequate to turn it. I find that the boat is very responsive to stick movement even at full throttle. This is unlike many other slugs that I've driven. If the water gets rough and you're going full throttle, this is no place for violent or sudden turns because the boat will spin out. Some people feel that this is a defect in the design of the Ruff Stuff, but when you stop and think that it is capable of 50 m.p.h., any boat is operating on the edge of instability. This is no time for ham-handed steering. The best driving technique is to throttle back on the turns to where the engine is off the pipe, then when the boat is headed squarely down the straight, give it full throttle. The speed of the craft is gratifying, and you may surprise some hydro aficionado by blowing his sponsons in!

Double your pleasure

Did you ever yearn to hear the scream of twin engines in a boat of your own? here's how one man did it/**Don Bilsky**

After competing in the 1977 Indy Unlimited and finishing 68th out of 120 I decided that it was time for a change. I have always liked running K&B .40's and didn't want to change, but it seems to take a .60 or larger boat to compete in an unlimited type race. The .60+ hydroplane can be made larger and more stable without sacrificing speed so I decided to build a twin .40 outrigger and still be able to use my 6.5's for power. This decision was helped by three people; Fred McBroom, who ran the first .40 twin with two shafts in a Hughey boat, Bob Finley, who had an unofficial pass of 89.2 m.p.h. with twin .40's and Don Pinckert, who had the first twin .40 over 80 m.p.h.

Once a boater makes the decision to build a twin he then has to choose a hull. There are many good kits available that twins can be used in, but I decided to build a combination of a Crapshooter, Gator and a little Hughey.

In building my twin the sides were balsa wood with plywood inside and out laminated for strength. The front sponsons are from a Super 60 Crapshooter (fully adjustable) and the rear are from a Gator (also fully adjustable). The sponson brackets are of Hughey design. The motor mount is the new Octura twin 40.

I only had three problems with the boat. The first was with the motor mount set-up. It

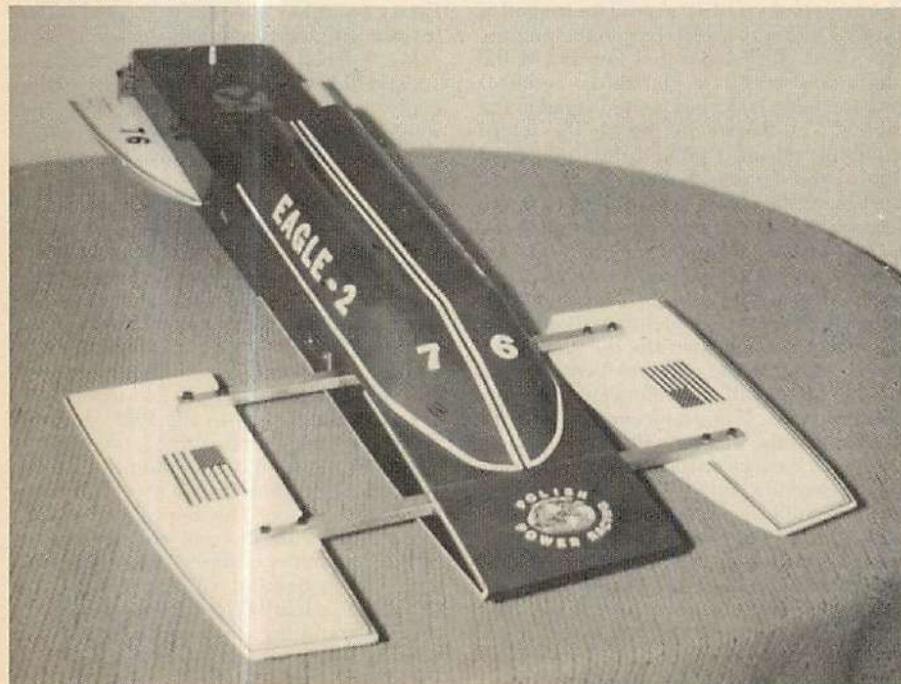
was an excellent idea but it only has $2\frac{1}{16}$ -inch centers. This means that the maximum prop diameter that can be used is $2\frac{1}{16}$ inches and if you don't have any offset in your prop shafts you can't even use that. I had originally thought of using Octura's 1462 props but they are 2.44 inches in diameter so I had to offset both shafts enough to give me 2.44-inch centers and then add a quarter of an inch for clearance between props.

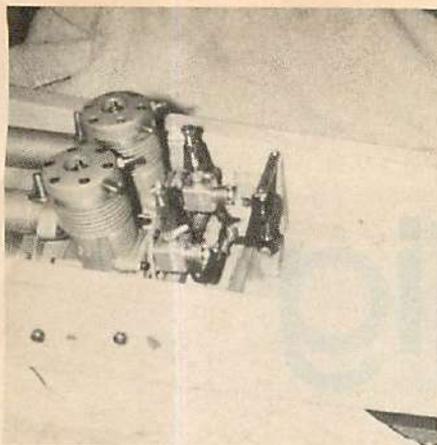
The second problem was in figuring out how to connect the throttle linkages to the servo. I thought of several different ways to tackle this one and also had some suggestions given to me. One of which was to take the needle valves out and isolate them. That was tempting but I decided to use a two-arm pivot with the throttle arms connected and moving from side to side.

The last obstacle to be overcome involved flattening the top ends of two plastic fuel tanks so that they wouldn't be higher than the sides of the boat. If you have ever had this problem you know how frustrating it can be, especially when you're trying to put a flat cover over them. My solution involved putting the part of the tank that you want changed in boiling water until it gets pliable and shape it as soon as you take it out. Hold it in that shape until it cools and it will hold.

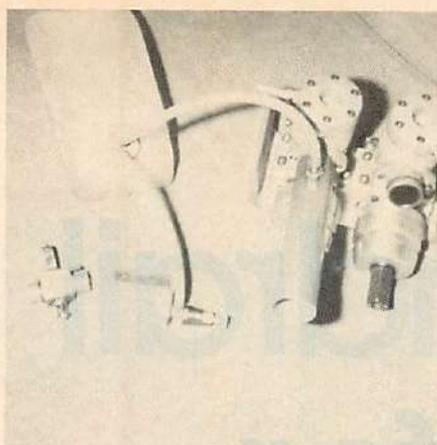
After solving those three problems the next step was to make a cowl for the boat. I started with $\frac{1}{16}$ -inch plywood cut to fit around the engines and over about half the top of the boat. To fasten the front I put another piece of $\frac{1}{16}$ -inch plywood under the front of my cover with a $\frac{1}{4}$ -inch lip at the front of the fuel compartment. To fasten the rear of the cover I used two cabinet fasteners so the cowl can be popped off quickly. Now comes the hard part, making the actual cowl over the engines and pipes. For this I made two $\frac{1}{8}$ -inch ply vertical formers and shaped their tops in the "double barrel" configuration you can see in the photos of the completed boat. I then cut a sheet of $\frac{1}{64}$ -inch plywood to the shape I wanted for the cowl and tacked the sides and center section with five-minute epoxy or Hot Stuff. After this dries, pull down the front of the plywood cowl and tack it down in the round shape. This is where you can have problems if you haven't cut the $\frac{1}{64}$ plywood properly. You

PHOTOGRAPHY: DON BILSKY

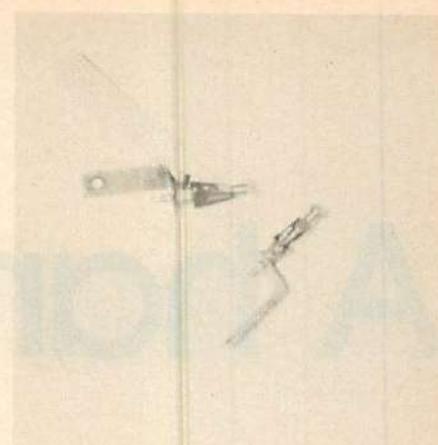




The author's original solution to connecting the throttle arms by using a two arm pivot and the arms connected moving side-to-side.



The final solution was this isolated needle valve system. It saves space and is very simple and efficient. It'll get you some comments.



The photo is of the isolated needle valves themselves. Using this system they can be located up to six inches from the carburetor.

can now use five-minute epoxy and make a smooth fillet all the way around the cowl. If you take your time and use a little ingenuity you shouldn't have too many problems.

This boat was finished with K&B epoxy paint with a clear coat applied at the end over all decals and stripes. The coat of clear gives it an appealing "wet" look. The colors are red, white and blue. There are many boats painted those colors but I am looking for the day when I can run US 1 on my boat (if the IMPBA is still doing it by then).

At the pond

Just prior to the big day when I was ready to turn the 4 to 5 horsepower fire breathing dragon loose (at least that was the picture I had hoped for), I replaced the aluminum flywheels that come on the K&B 6.5's with Octura's steel flywheels. It seems that a heavy flywheel helps keep a higher pitched prop turning when the boat is launched.

My hopes were high and the weather was hot. It was also the day that we had arranged to have a newspaper do a story on R/C boating. When I got to the pond and unloaded the car I spent a half an hour going over all the nuts and bolts to make sure everything was right. I finally built up the nerve and started the engines. If you have never heard a twin run you've missed an experience, the sound almost raises goose bumps on your arms. After the launch, I found that both engines were too rich so it was brought in and leaned out. Another launch showed one engine to be right but one was still too rich. I got the boat in and had to put it up because the newspaper man needed some information and it was getting dark.

The next time out I had three runs that were all too lean, but on the fourth run I got what I came for. The dragon had come alive and was fast and stable. I was not running pressure but would estimate the speed at about 60 m.p.h. with very flat turns.

At the next Indy Time Trials I found that everything had come together. With Octura's 1955 props, which I use for oval racing, it ran 64.66 m.p.h. and with Octura's 2.4 props it ran 79.505 m.p.h. Look out John Bridge!

Epilogue

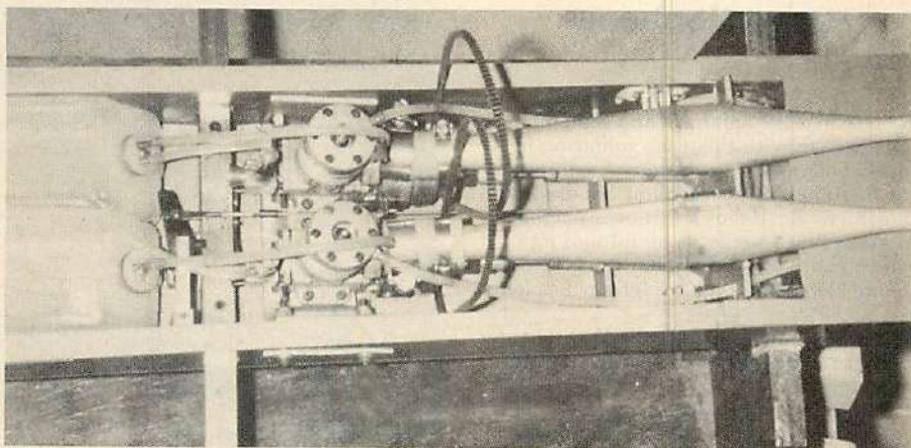
Since building the twin I have made one major change to the boat. I have eliminated the bellcrank throttle set-up as described in

the article and replaced it with the isolated needle valve idea, fed by exhaust pressure and with one pushrod going to both carbs.

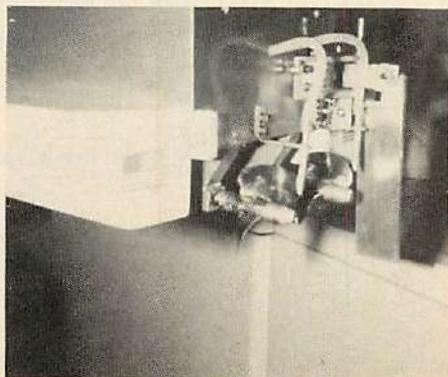
To use isolated needle valves all you have to do is use a complete needle assembly placed in a convenient place around the engine. Then cut off the needle in your carb so that all you have is the spray bar and a place to attach a fuel hose. Run your fuel hose from the tank to the normal place on the isolated needle valve and then run a fuel line from the spray bar on the isolated needle valve to your cut-off needle on the carb.

By doing this I was able to run on pushrod to both throttle arms which were connected together. This procedure is easier than it sounds and if you have ever had a space problem because your needle stuck out too far this will solve it.

Except for changing the throttle set-up, this boat and engine combination has caused me absolutely no problems. If anyone is building a twin and has any questions I would be happy to lend any information I can. You can call me at 317/642-1428. Good luck with your twin. 



Here is the heart of Don Bilsky's twin, (above) the two K&B 6.5cc engines and pipes. The rear sponsons (bottom left) are fully adjustable. The photo at Bottom left shows the oversize Crapshooter front sponsons, oversize Gator rear sponsons, a scratchbuilt hull. Just add a few extra parts and you've got yourself a running twin.



A handrail jig for scale boats

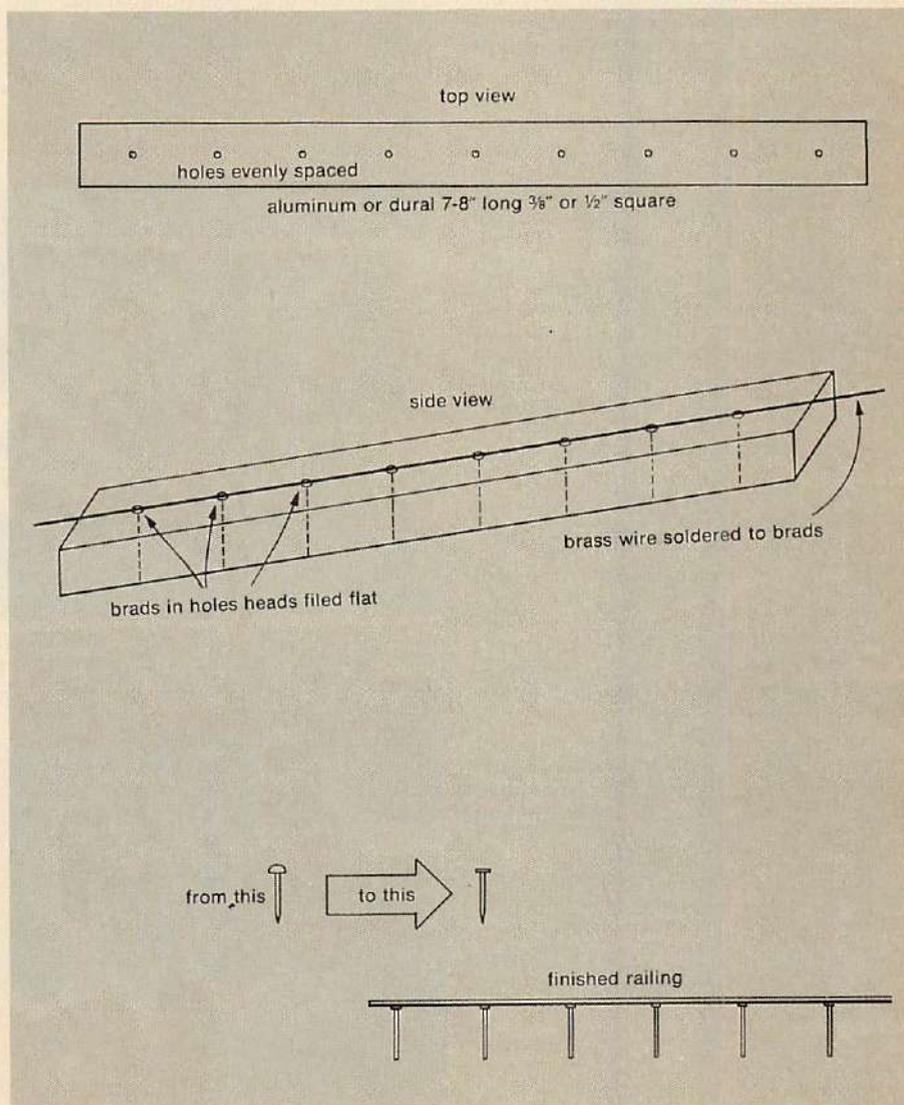
Straight, accurate handrails are always a problem when scratch-building a scale boat. Here's a solution from **Steve Stephanus**.

You can make handrails and stanchions to any size with this easy soldering jig. A nicely built model boat, ship, or sailing craft can be ruined by poor looking handrails and stanchions etc. If they are uneven or crooked in assembly. I made an aluminum jig or it can be made out of dural bar stock $\frac{3}{8}$ " or $\frac{1}{2}$ " square about seven to eight inches long.

1. Scribe a line from end to end exact center of bar. Mark off even spaces and center punch.
2. Drill the holes exact size of the brads (Brass or Copper), clear through the bar.
3. Clamp bar through the bench and put a brad in each hole, file the heads until they are flat.
4. Next, Using a fifty or seventy-five watt iron tin the tops of brads with solder. The brads will not adhere or stick to aluminum.
5. You are now ready for the wire to make the railing. Using straight clean brass wire, clamp each end securely across the flat heads of the brads and sweat solder into place.
6. Let cool before pulling the finished rail from the bar. Clean with alcohol to remove any solder paste. Brushing the finished railing will bring up a nice bright finish.
7. Do this carefully, so as not to get any bends or kinks in the wire.

The results I've achieved thus far are very good and I hope that you have likewise. ☺

ARTWORK: BILL SCHAUMBURG



Letter Rip!



Dayton Model Boat Club

An interest builder

Enclosed is a picture of the Dayton Model Boat Club in Ohio. We are sending you this picture with hopes of your printing it in FLYING MODELS. We are a young club with 26 members. As the picture indicates we have .20 to .60 monos, .20 to .60 hydros and scale hydros. Since FLYING MODELS is well read and circulated here, appearing in it would indicate our club's availability to those interested in joining in the Dayton area. Thanks.

JAMES S. DAVIES, JR.
Kettering, Ohio

R/C Boating praise

The R/C model boating section is a great asset, and a welcome one to your publication. Most of our club members seem to feel they can trust Bob Staat, Bob Finley and the rest of your authors to give honest and unbiased appraisal of the various products on today's market. I hope you keep the section as it's miles ahead of anything offered in any other magazine. You have a fine publication, one that you can really take pride in. Keep it up.

ROGER A. CRUMP
Summerville, S.C.

I would like to compliment Bob Finley on

the fine article on the 3-D Models Phase I in the April issue of FM. It was very informative. Please keep the boaters, whether beginners or experienced, informed through articles such as that one. Thanks.

DENNIS A. KABELA
Geneva, Ill.

Scale race drivers

In the January 1977 issue of FLYING MODELS, Paul Schumacher wrote an article on scale life vests for R/C boats. In it he mentioned the use of 1/12 scale Tamiya figures which are race car types but would work very nicely in boats. I have not been able to locate these figures anywhere, can you help?

GARLANDCHASE
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The Tamiya figures are available through Model Rectifier Corp. 2500 Woodbridge Ave., Edison, NJ 08817 and in Canada through Borgfeldt Toys Ltd., 3440 Pharmacy, Scarborough, Ontario M1W2P8—Ed.

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channel Controilaire reed, in to a model schooner, the America, by Sterling. The boat uses 3 servos for sail control and a fourth for rudder. The servos operate DPDT switches which in turn activate geared down motors. Small drums on the motors take up or let out line to each of the sails. This is similar to the sail operation of Nancy and Bill Shaub's Emma C. Berry. I'll send pictures when I'm finished.

TOM KUBICA
Chicago, Ill.

Miniature Outboard collecting

I am a collector of mini outboards and am interested in adding to my collection. I would appreciate any assistance that your readers can give me in this regard. These outboards were made in the 1950's by K&B, Atwood and several other companies. They are very hard to locate. Thanks.

WAYNE DRISCOLL
Tulsa, Okla.

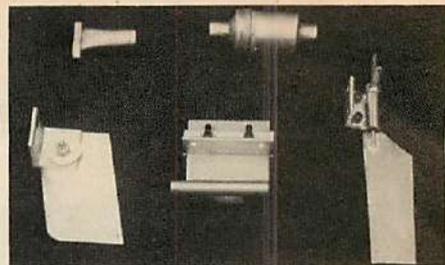
Claim Jumper

In the August 1977 issue of FLYING MODELS Bob Staat wrote an article on JVS's Claim Jumper, but the address of the company was no listed. What is it?

KIETH PIPER
St. John, Ind.

JVS Products is located at 39292 Spanish Bayonet, Box 452, Anza, CA 92306. For \$.25 they will send you a catalog of all their products—Ed.

Product notes



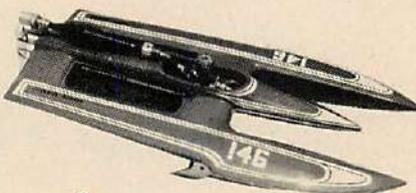
METAL CONCEPTS, INC., P.O. Box 25596, Seattle, WA. 98125 in now offering the serious competition model boater a line of high quality hardware for .40 and .60 size racing models. Among the items available are: a heat treated rudder and shaft from stainless, a strut with mounting featuring needle bearings and aluminum and stainless construction, skid fin and bracket from stainless, exhaust couplers for the OPS .60, OPS .40 and K&B .40, and mufflers for the end of tuned pipes. Special items will be quoted if a sketch is provided. You must be satisfied with the material you receive or a full refund will be provided if the items are returned within 10 days. A complete list of items and prices will be sent upon request.

EKIM, P.O. Box 144, Palmetto, FL 33561, has just introduced a new tunnel hull for the popular new outboard class called the Lil



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Missle. The kit features all-glass construction, almost ready to run. The hulls are available in bright colors and metal flake colors with some two-tone finishes. The suggested list price for the Lil Missle is \$59.95.

DUMAS PRODUCTS INC., 790 S. Park Ave., Tucson, AZ 85719, "The Model Boat People", have come out with two new Electric Drive Kits to power many of their 12" to 22" model boats. Electric Drive Kit # 2330 is for 12" to 16" models and contains a 3 volt D.C. motor, coupling, shaft, shaft tube, propeller and rudder and sells for \$4.50. This kit is perfectly suited to the Dumas 12" Harbor Patrol boat, Cabin Cruiser and Speedboat kits which sell for \$3.85 each. Electric Drive Kit # 2331 is for 16" to 22" models such as the Dumas 18" Cabin Cruiser, Deep Vee 10 and Ske Vee 10. The kit, which sells for \$12.50, contains a 4.8 volt D.C. motor, coupling, shaft, stuffing box, rudder, rudder arm and propeller. A 4.8 or 6 volt battery is required (not included).

DUMAS PRODUCTS, INC., 790 S. Park Ave., Tucson, AZ 85719, has announced the release of a new bronze propeller for .60 size model boats. The new prop, # 3107 is designated "P-102". It is 2 1/8" in diameter and drilled for 3/16" shafts. The new prop makes a total of five bronze props made by Dumas and covers propeller requirements for model boats with engines from .049 thru .60. The cast bronze props, as well as white metal, right and left hand rotation props for electric twin motor boats, and a series of plastic props for electric powered models,



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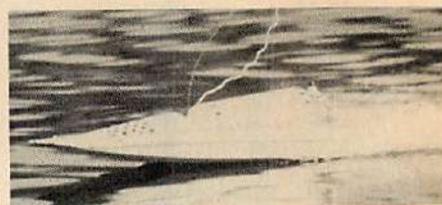


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HYDE ENGINEERING COMPANY,
ROUTE 3, Box 236, Crystal River, FL 32629,
has recently announced the Scat Cat, a finished tunnel hull ready for engine and radio installation. It was designed for the K&B outboard engine and has been tested and run in competition. The Scat Cat won first place in Naples, Florida, in it's first race driven by Jim Hyde, also his first race. It also won at Indianapolis. Herb Stewart of Tampa and Jim Hyde designed and tested the hull which is vacuum-formed of tough ABS material, completely sealed. It is furnished with and engine mounting plate which permits four different engine heights to adjust to different props and water conditions. The hull is finished in white only and is easily painted or trimmed to suit. It is built with radio box and cover and is furnished with the rear cover cowling complete. It weighs 3¼ pounds as furnished and 5¼ pounds ready to run. Complete instructions are included. They will ship it anywhere in the continental U.S. for \$69.95.

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CLUB AFFILIATION

**Puget Sound Model Boat Club
Conducts "Learn to Race Model
Boats" Day**

The Puget Sound Model Boat Club has experienced a doubling of its membership during December and January. We are really excited by all the new members and interest. However, such rapid growth does present challenges to a club. With so many novice model boat racers in need of learning the rudiments of the sport, a special "Learn to Race Model Boats" day was held on Sunday, January 29 in hopes of filling this void of racing knowledge. The P.S.M.B.C.'s regular running site, Lake Waughop at Ft. Steilacoom Park was selected since it provided more than adequate room for such an event. The weatherman cooperated to the fullest by providing a rainless, windless and pleasantly warm afternoon.

Jerry Dunlap, who teaches 5th graders Monday through Friday, was the day's head instructor. Club members with racing experience provided additional comments and hints. Employing that traditional backbone of the educational process, the chalkboard, Jerry drew diagrams on his daughter's portable board to illustrate his presentation. Prior to the first presentation, the participants had time to tune engines and practice running around the buoys.

Topics covered during the first session included: getting started on time, launching techniques, milling procedures, timing your starts and perils encountered in the first turn. Following a question and answer period, the boats were divided into heats based on frequency availability and the participants were given the opportunity to practice the items discussed on the beach. Many of the new model boaters soon discovered that putting theory into practice wasn't all

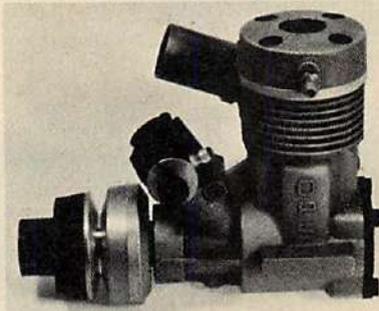
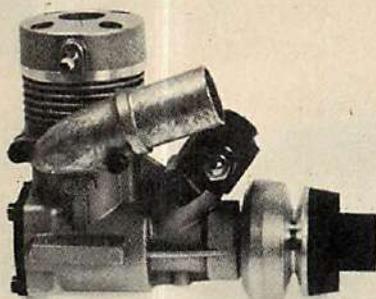
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that easy to do. There were lots of missed buoys in the mill, early and very late starts and cut buoys during the running of the race laps. No results were kept since the purpose of the event wasn't to find a winner, but to prepare our club members to be winners.

After everyone had an opportunity to make some practice starts and race a few laps, all the drivers were again called together and Jerry evaluated what he saw people doing during the practice sessions. This gave immediate feedback to those in need of additional coaching. After this review and critique session, the participants were again divided into practice groups to continue working on making good starts and racing. There were a few collisions during the day's activities. However, all damage was repairable on the beach and boats involved in the accidents were racing again.

The event would have to be labeled a success. A half dozen model boaters without previous race experience received valuable training. And at the end of the day, our club had seven brand new members with the good possibility that another six would be joining very soon. The P.S.M.B.C. strongly believes in helping its members become better model boaters even if it means listening to Jerry.



Ron Erickson Captures 1977 Scale Hydro Championship

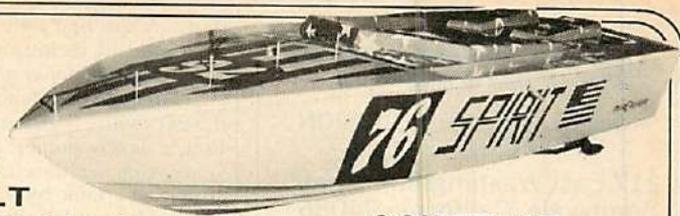
For those who are familiar with who's who in model boating, it would come as no surprise that a confirmed bachelor from Seattle by the name of Ron Erickson emerged with the 1977 Season's Championship for Scale Hydros. After all, this is the same Ron Erickson who showed up at the tether pond at Green Lake during the mid 1950s and began winning regularly with the then popular tetherline hydros. It is the same gentleman who pioneered radio controlled model boating in the Northwest developing numerous world record holding R/C model boats. Ron's achievements in the sport of model boating must rank him among the very best model boaters racers not only in this country but around the world. So for those of us who know Ron, it comes as no surprise at all.

However, most people watching this ac-

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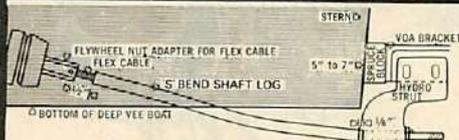


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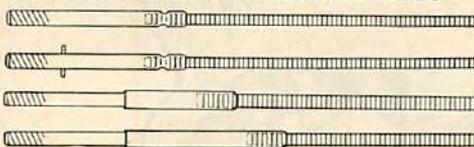


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tivity for the first time have never heard of Ron. After all, racing a model of an unlimited isn't nearly as dangerous as driving the full size version. But Ron's had his brush with danger while participating in this sport. Ron, a nonswimmer, almost drowned ten years ago when the chase boat he was in was struck and sank by another model hydroplane. Only quick action on the part of the other model boater saved Ron's life. And, of course, winning the Mini Gold Cup isn't going to make the sports page of the P.I. or Times. But Ron has managed to gain a limited amount of television coverage when some of the local stations have covered the mini unlimited events. But obviously the name Ron Erickson isn't the household name like Bill Muncey's might be. When he isn't out winning lots of model unlimited races, Ron resides with his mother in the Ballard section of Seattle. Ron, now in his mid forties, is a machinist by vocation and a model boat racer by avocation. A well designed and immaculately prepared model are trademarks of Ron's winning raceboats. When he's not working on his own equipment, he spends much of his spare time making custom marine hardware for other model boaters. Ron is totally unselfish when it comes to sharing his ideas and helping others in the hobby.

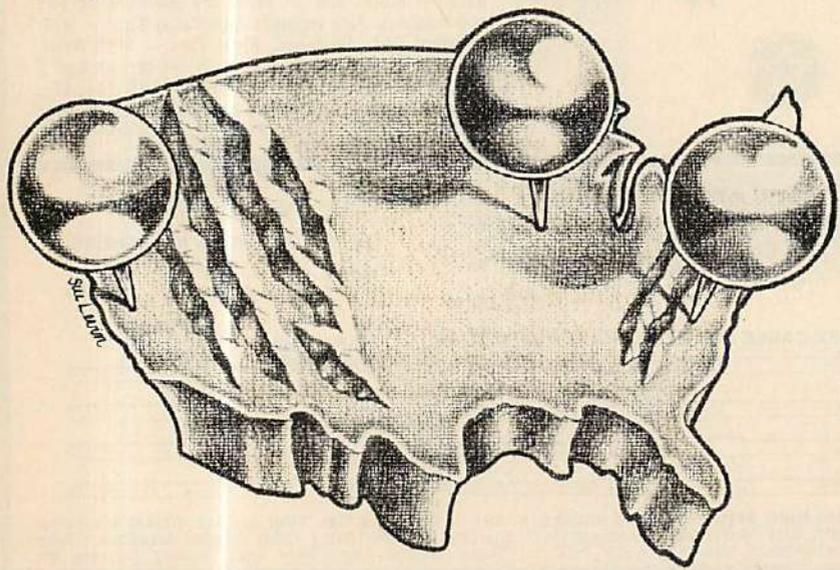
Ron enjoys racing other classes of model boats besides the R/C Unlimiteds. It is interesting to note that while Ron was winning the Season's Championship in Scale Hydro, he suffered through his worst season ever of racing conventional class hydroplanes. For the first time since we've been an organized group, Ron failed to place in the top three of

the competition hydro classes. Ron isn't the type to let an offseason get him down. He has spent the winter preparing for the 1978 racing season in the conventional class as well as continuing to refine and tune his scale hydro. Ron's "Spirit of Dayton Walter" scale hydro holds the world records for its class in both straightaway speed and competition racing. It not only goes fast, it turns well, too. Besides his successful year in Scale Hydro, Ron had excellent success racing his .21 deep vee during the 1977 season. With this boat, he set national records in straightaway speed, oval competition, won the N.A.M.B.A. National Championship in .21 Deep Vee and took the District Championships in its class.

A long standing member in the Seattle Model Yacht Club, Ron can always be depended upon to help fix any of the equipment that is in need of repair. Ron has been responsible for either making or obtaining most of the items accumulated over the years by the S.M.Y.C. Besides his model boating activities, Ron enjoys following the progress of the sports teams from the Seattle area. When the S.M.Y.C. holds a bowling evening, Ron will be out there trying his best to get those strikes. Lucky for the pins that Ron can't figure out some way to install one of his powerful OPS .60 racing engines in the ball and then radio control it down the alley.

1978 will find Ron well prepared to defend his Scale Hydro crown. Look for the white and blue "Spirit" to be among the front runners again this year. While many of the other "hot shoes" are switching over to picklefork designs for 1978, Ron will have a

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slight advantage in having raced his boat last year. While Ron doesn't win every heat, he gives every heat his best shot. There could possibly be a new champion in Scale Hydro for 1978. But whoever it is will have received some stiff competition from our 1977 champion, Ron Erickson.

IMPBA Roostertail

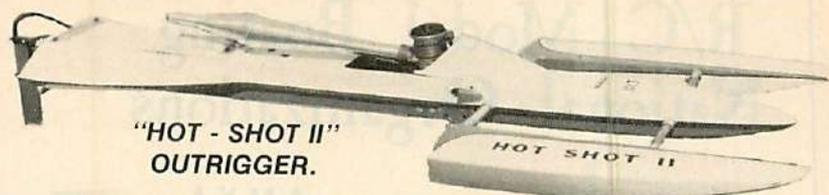
March 10, 1978, and the snow and ice are melting rapidly. A considerable effort has been made to make the 1978 IMPBA rule book available by the Toledo R/C show in April. A good deal of credit is due to Mr. Don Bilsky for all of his help in getting the rule book completed in time. He has been responsible for getting a new printer who also produced the most recent update to our official timing certificates. The timing certificates are the size of a business card and fit handily into your wallet or tool box. Thanks Don!

A number of proposals and changes are going to be discussed and voted on at the Toledo R/C Show. Look for a full report in the IMPBA first quarterly report. Some of the major highlights of the changes will be reported in the next few issues of FLYING MODELS.

It is time to address the 1978 IMPBA election of a new president. All nominations are due in the hands of the secretary no later than 31 July, 1978. Please give this election your serious consideration and place all nominations as soon as possible. I am also informing the IMPBA membership that I am not running for re-election due to some outstanding priority actions which will require my full attention. The position of president and secretary are vitally important to the organization, and require a good deal of attention. It is important in your nomination and selection to choose someone who is dedicated, objective, and has the welfare of all model boaters in mind.

By the time this article is published, the model boating activities will be in full swing. Don't Forget to consult the FM timetable in the front of the magazine for information about boating activities in your local area. If you are interested in starting a model race boat club in your area, send a request for an IMPBA club registration to: Pat Bridge, IMPBA secretary, 24310 Prairie Lane, Warren, Michigan, 48089. For all of you who want to join the IMPBA and receive

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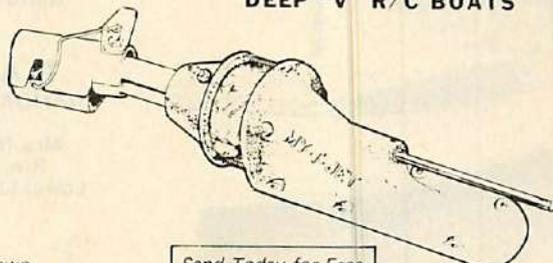
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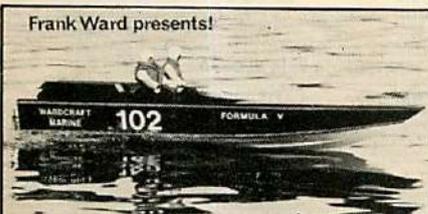
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New!

KIWI

RC SPORT PATTERN FLIER

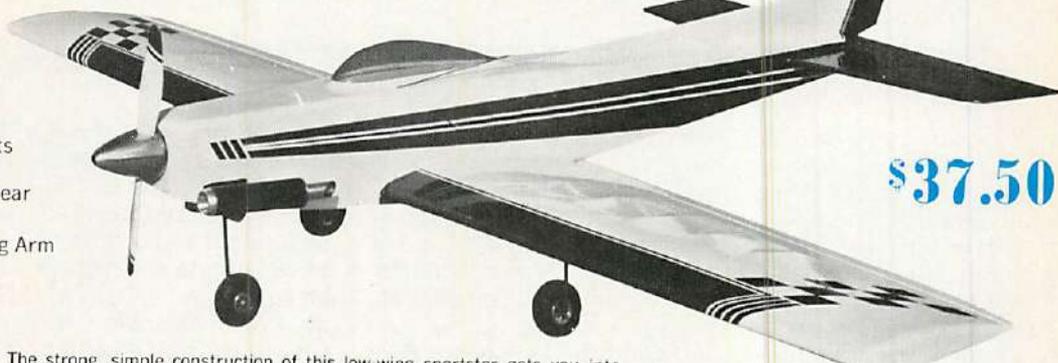


KIT NO. RC-42

Designed by HANK POHLMANN

KIT FEATURES:

- Built-up Wing
- Die-Cut Sig Balsa and Plywood
- Printed Balsa Fuselage Sides- Build Directly on the Wood
- Sheet Balsa Tail Surfaces
- Shaped Balsa, Ply and Hardwood Parts
- Clear Bubble Canopy
- Pre-Bent Torsion Bar Main Landing Gear
- Coil Spring Nose Gear
- Nylon Nose Gear Bearing and Steering Arm
- Aluminum Motor Mounts
- Nylon Strip Hinges
- Nylon Control Horns
- Wire Aileron Torque Rods
- Nylon Wing Bolts
- RC Links and Threaded Rods
- Screws, Blind Nuts
- Full Size Plan
- Illustrated Instruction Book



\$37.50

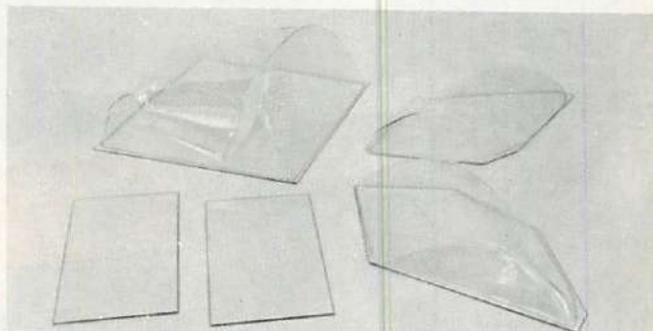
The strong, simple construction of this low-wing sportster gets you into the air fast and keeps you there for many a flying session. Lots of room in the fuselage for easy mounting of almost any kind of RC equipment. The large area control surfaces give sensitive maneuvering response for fast action in fun-fly competition. Or you can reduce the movement and cruise around in a relaxed and easy manner. Check that list of features!

WINGSPAN: 54"
SUGGESTED ENGINES: .35 - .45
SUGGESTED RADIO: 4 CHANNEL

New!

CESSNA 150 CLEAR PLASTIC WINDOW KIT

Featuring:



The Clear Window Kit is optional and is not included in the Cessna 150 kit.

RP-WK-404

WINDOW KIT

\$3.95

Windows must be installed before fuselage sides are joined.

- * Step By Step Instructions
- * One Molded Windshield
- * Two Side Windows
- * Two Molded Rear Windows

ENGINES: .50 to .60
WING SPAN: 65 IN.
WING AREA: 645 SQ. IN.

WEIGHT 7-1/2 LBS.
4 - 5 CHANNEL RADIO



KIT KBRC-4

CESSNA 150 CONTAINS:

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- Molded Plastic Skin Covering for Aileron And Flaps With Realistic Crimping
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- Formed Plastic Fuselage Halves
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- Molded Plastic Engine Cowling
- Molded Wheel Pants
- Precision-Cut Foam Wing Core
- Formed Plastic Wing Tips
- Solid Balsa Internal Fuselage Profile
- Sheet Balsa Tail Surfaces
- Formed Aluminum Main Gear
- Strong Coil-Spring Nose Gear
- Decorative Decal Sheet
- Step-By-Step Instruction Book
- Die-Cut Plywood Parts
- Sig Quality Balsa
- Molded Nylon Control Horns
- Molded Plastic Hinges
- Tuf-Steel RC Links and Rods
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- Nylon Wing Screws
- Blind Nuts And Bolts
- Assorted Small Hardware



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ACCESSORY WINDOWS INSTALLED

Designed by HANK POHLMANN

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- * RESPONSIVE TO CONTROL
- * BUILDS FAST
- * 4 OR 5 CHANNEL RADIO EQUIPMENT

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Some kits use styrene or other types of plastic that are difficult to glue and paint. The ABS plastic parts furnished with the Cessna can be welded together in seconds with butyrate dope thinner, acetone or MEK. A wide variety of finishing materials - Sig Supercat dope, epoxy paints or enamels - can be applied to the ABS plastic used in Sig kits.

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