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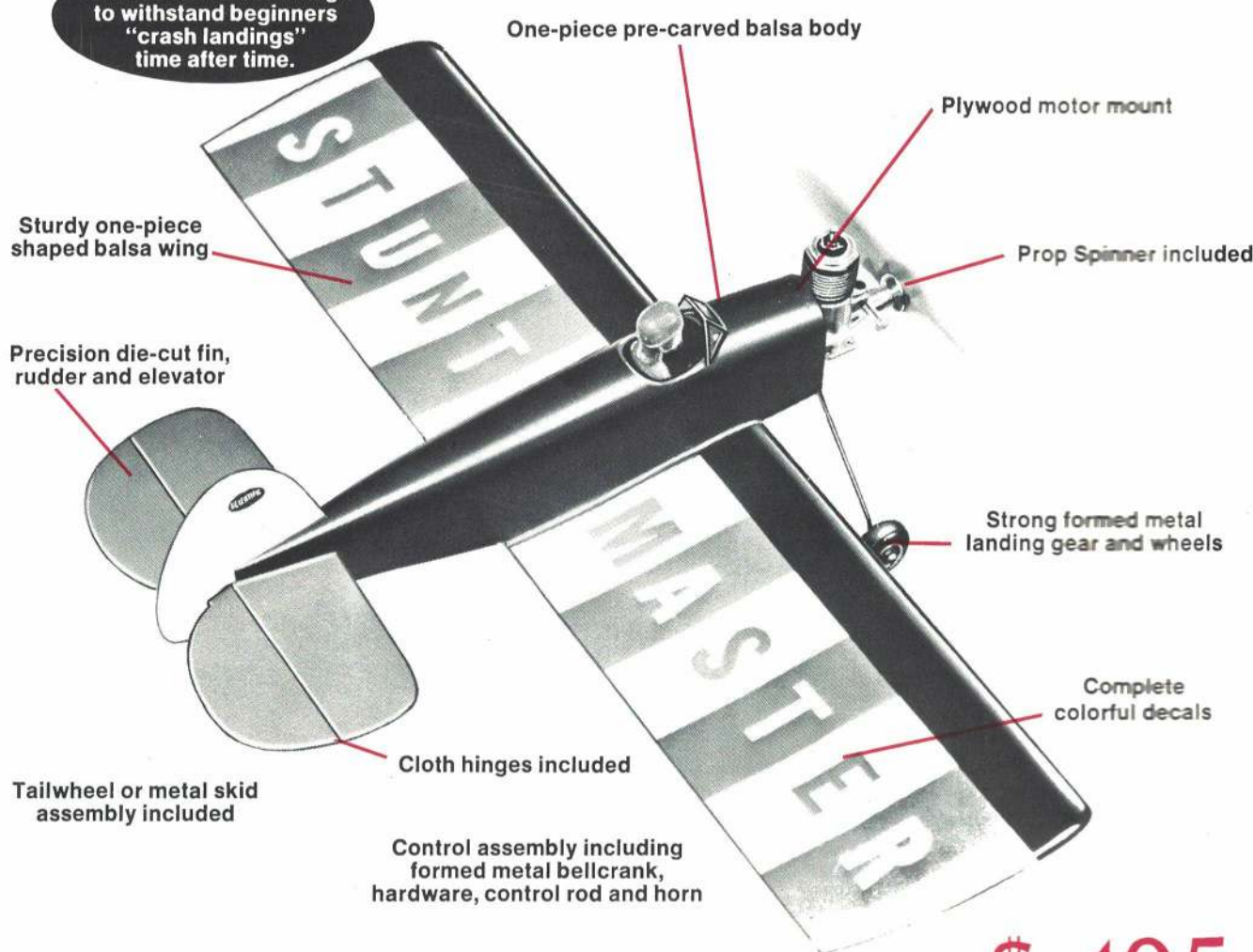


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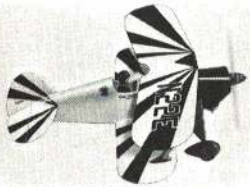
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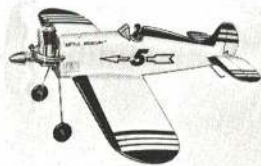


Flying Models

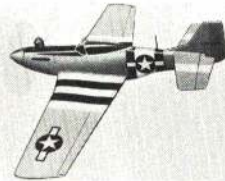
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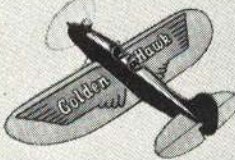
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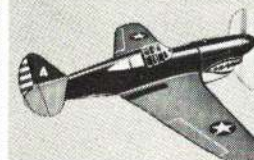
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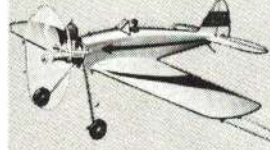
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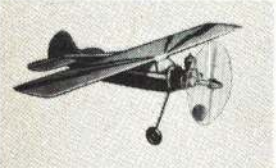
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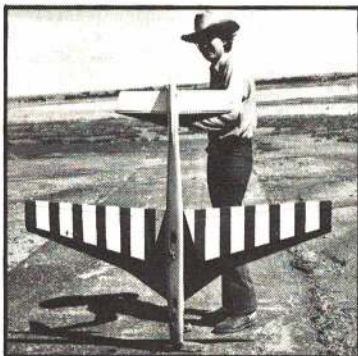
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Bob Lopshire's drawing for the 1972 Academy of Model Aeronautics National Model Airplane Championships held at the U.S. Navy's Glenview NAS, and Art Director Kelly Matthews' photo of a flying witch for Halloween.

There's a Warlock on page 42.



Bob Beckman and Ed Sweeney



The Nats is People in Action. See page 20.

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10¢ PER FT.

getting started in R/C

JIM McNERNEY

Modern radio control equipment, besides being a marvel of performance and precision, is fairly rugged. There are certain practical limits as to how much abuse can be withstood. Those things which can cause damage to the equipment include: shock (crash), vibration, moisture, wide ambient temperature changes, manhandling and overload. The majority of the effects of these adverse conditions can be minimized or negated by proper installation of equipment. The rest is a matter of common sense and reasonable care.

The manufacturers have provided some vibration isolation in the basic radio. Rubber grommets installed in servos and some receivers provide isolation mounting. Individual power cells are potted within the battery pack to reduce vibration sensitivity. However, many electronic components, mounted vertically on the circuit boards, are susceptible to some vibration modes. Everything solid has some resonant frequency, that is, a frequency at which maximum energy is transferred into the body.

For example, you have heard or seen the story about the opera singer's voice being able to shatter a glass. The theory is that the singer's pitch is at exactly the resonant frequency of the glass allowing maximum transfer of energy into the glass and ultimately—*crash!* If the glass had been packed in three inches of loose foam, the opera tenor could have gotten a hernia and the glass would have survived. The foam breaks up the sound waves, allowing only a small portion to pass through.

Now think about that rear rotor forty turning up at twenty-three thousand. And there are all those little goodies—resistors, capacitors, transistors, IF cans, etc.—attached to the receiver which is firmly strapped down to the fuselage. The fuselage acts like a funnel to direct all the sound energy of the engine directly to the receiver. The result? You guessed it. I have seen the insides of a receiver literally shattered by vibration!

While on the subject of vibration—a word about flutter. Flutter is aerodynamically induced vibration. Suppose there is a little play in the aileron linkage. You put the bird into a high speed dive; the ailerons, in turbulent flow, start to buffet. The faster you go, the worse the buffet. If you hit the resonant frequency of the ailerons, you will lose them. If you hit the resonant frequency of the wing—*splat!* Even if you do not hit resonance, the flutter is fed back through the linkage to the servo. This is a quick and easy way to ruin servo gears. They can fret just enough to hang up the next time you try a slow roll. Moral: linkage should be free moving but with no play. This goes for hinges, too.

Back to vibration isolation. Packing the glass we talked about in foam isolated or de-coupled the glass from the singer's mouth (sound source). So this is the solution. Isolate the radio from the sound source. The grommets on the

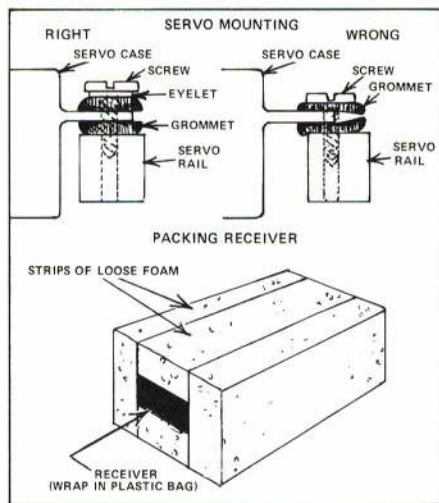
servo will do the job provided that (a) you do not cinch down on the mounting screws until all the give is gone from the grommets and (b) the servo is not touching any other component or structure at any point (except the pushrod). The receiver can be isolated by wrapping with ½ to 1 inch of loose foam. Some people wrap the receiver in loose foam, then wind about six yards of masking tape tightly around the outside, compressing the foam to the consistency of concrete. That's a no-no.

Batteries need vibration isolation, too. Although many are potted with silicone compounds, they are encased in hard plastic that transmits vibration. Under the right conditions, vibration can cause internal breakdown of the individual cells. The best solution here is again the use of soft foam. While you are at it, cover both the receiver and battery with a polyethelene bag before or after surrounding with foam. If you put the polyethelene outside the foam, make sure you don't compress the foam material. The polyethelene prevents moisture intrusion which can not only damage the components themselves, but, in the case of fuel, will attack the plastic cases.

What about crash protection? Those things you do for vibration isolation also provide some crash protection. Additional protection can be gained by adding a layer of dense foam or G-pad outside the light foam. Don't use these dense foams by themselves. Don't use double side foam tape to secure components. Use servo mounting trays recommended by the manufacturer, whenever possible. If you cannot use servo trays, be sure to use sleeves or eyelets inside the mounting grommets so that when you tighten the mounting screw, the sleeve takes the load—not the grommet. Component placement is important too. CG requirements or control rod position forces some limitation on component location.

Consider the typical installation with the battery forward, then the receiver, then the servos. In a crash, the receiver, normally the most delicate component, is sandwiched between the batteries and the servos. The receiver normally loses such a confrontation.

There's not much you can do about temperature, but there are some considerations. Don't lubricate the servo mechanics unless specifically recommended by the manufacturer. In cold weather the lubricants stiffen and the servos become sluggish. Some of the older equipment utilizing germanium transistors is subject to thermal runaway. That is, in hot weather, the transistors heat up uncontrollably and eventually fail. In the case of some output transistors they will, under certain circumstances, explode. Temperatures on concrete or asphalt in the summertime can easily exceed 110°F. The temperature inside a dark colored fuselage can also be very high. The use of a light colored cover or a tent canopy over your model in the summertime is recommended.





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LOOK WHAT A MODELER SAYS!

"Enclosed is a photo of a model of your SKYLANE 62 which I have just completed. I enjoyed building this plane, it is the first model that I have built in 25 years. Several months ago I observed a group of men flying some R/C models and this rekindled my interest in model planes. Having never built an R/C model, I was dubious which model to build. After some investigation I settled on your kit and I was not disappointed. It was so different from anything that I had built previously and I must say that it went together very easily. The plans were complete, left nothing to guess work. I followed the plans exactly with the exception of the motor and I installed a slightly larger motor, a Max OS 40. I am very pleased with the results. I felt I should write and let you know how much I appreciate this kit and I hope to be able to build all of your planes eventually. Again thanks for such a fine kit."

Arnold B. Johnson
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Modeler Mail

Californian who cares

Lt. Richard Jacobs wrote from Fort Leavenworth, Kansas ("Modeler Mail" October 1972 AAM) detailing some of the problems modelers there are experiencing in their efforts to pursue our very fine hobby. I would like to buy them a one year subscription to *American Aircraft Modeler* to be sent to "The Aircraft Modelers," c/o Lt. Jacobs.

C.A. VanPerre Jr., San Jose, Calif.

Your subscription has been entered and American Aircraft Modeler would like to match your generous contribution so the men at Fort Leavenworth will soon be receiving two copies of AAM each month. Your humanitarian effort will certainly be appreciated and admired by all modelers in all walks of life.

—Editor

More on lighter than air ships

I have been following your "Modeler Mail" letters about airships with some interest. I have been interested in building model airships for three or four years since I found an article in *AAM* for the RC Los Angeles. I felt rather disheartened when it wouldn't fly, but I continued to work on it and am still doing so.

In the meantime, I have built a small free flight rigid dirigible, three ft. in length, 1.5 cu. ft. volume. The gas is held in by a polyethylene plastic bag sealed by a soldering iron. The plastic is available as a drop cloth in any hardware store. The bag is fitted inside the balsa wood frame after being carefully fitted to avoid snapping the frame in case of over-inflation.

The bag alone can be used for a model blimp. Without the rigid frame, weight is not such a big problem and the difference can be put to use however the modeler wishes.

Remote control airships are not an impossibility. I've seen a flying model of the Hindenburg with rudder-only control and the possibility for up and down, but for economic reasons. It was powered by two electric motors that drove it at a speed of 3 m.p.h.

The U.S. Navy used a remote control blimp 17 ft. long for recruiting purposes. A photograph of it is in *The Complete Book of Model Aircraft, Spacecraft and Rockets* written by Louis H. Hertz.

Dirigibles 15 ft. or smaller are really

only good for indoor use. Unless radio controlled and sufficiently powered to fight against the wind, a thermal will take it away and you will never see it again (at least not in one piece).

Remote control gear suitable for airships is available. In the August, 1969 issue of *AAM* you published an article entitled "RC Mini Scale," in which you stated that the gear weighed 3/4 oz., a weight that I use as ballast on my blimp. RC impossible? Hardly.

I would like to correct a mistake that Dennis Lenehan made in his letter in the September issue. Real airships used a material called Gold Beaters Skin, not Goat Beaters. It is the inside of an ox's intestine and was named that because goldsmiths used it to cover gold when they beat it into thin leaves. It was used primarily in German airships like the Graf Zeppelin and Hindenburg. Americans found new fibers and treatments to use instead of Gold Beaters Skin because of its cost.

Helium may seem expensive, but its cost can be brought down by buying a tank and having it refilled when you run out. Small cans of helium are available, two 20 oz. cans for \$3.00. This size is nice for experiments or temporary trials in lighter than air.

Tony Avak, El Segundo, Calif.

Practical, flyable airship

In your September issue you published a letter from Dennis J. Lenehan remarking as to the impracticality of a lighter than air ship. I too have been interested in these long forgotten monsters of days gone by. As a result, I have done some research on these craft and believe that the following formula proves that they will fly and are quite practical:

$$\left[\frac{\pi R^2 \times L}{1728} \right] 1.2 \text{ divided by } 16, \text{ where}$$

the following are true. Diameter equals 26.0 in.; length equals 104.0 in.; 1728 equals the number of cu. in. in one cu. ft. The division by 16 and multiplication by 1.2 must not be simplified in any way. It must be used.

The numbers are derived by the following: Sixteen cu. ft. of gas will lift 1.2 lb. of material at atmospheric pressure. With this formula, you will wind up with 55,189.64 cu. in. or 31.938449 cu. ft. Division by 16 gives an answer of 1.996125 and upon multiplication by 1.2, the total lift will be 2.3 lb.

A 40 cu. ft. bottle of helium (don't use Hydrogen as it has very bad habits of exploding) will cost about \$16. The

NEW! KDH ADJUSTABLE GLIDER TOW HOOK \$1.95



2 1/4" long. Aluminum drilled block with smooth threaded hook.

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YOU'VE BEEN PAYING FOR THEM. Not only that, but these may very well be the best wheels you can buy for a model airplane. They are lightweight, they use a neutral-bounce neoprene rubber, and have a tread design that makes 'em look better than most others. I know that our offering them at these prices may have you thinking that they're some kind of junk, but all I can say is it'll only cost you \$1.00 to \$1.55 to find out if all this is true.

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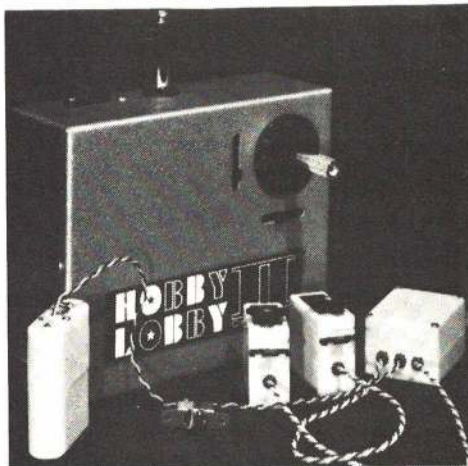
Please order quickly because even though this offer is being made during what is a somewhat slack time for radio sales, it is quite possible that demand could outrun supply at this extremely low price.

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HOBBY LOBBY 2 is a complete two channel ready-to-fly digital proportional system with excellent range for demanding uses such as RC gliders, and has the ruggedness and reliability that make it a

great beginner's outfit in planes like the Falcon 56, Tri-Squire, Lanier Aztec and Cessna.

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bags for containing the gas are old weather balloons and will give, with experimentation, two hours of flight. Motive power is furnished by two Bonner transmitter servo motors run on 12 volts, and flown in a gymnasium. The radio used was a World Engines GG. With a new sub-miniature rig, the weight of the radio will decrease.

A word of caution: Build it so that when the machine is finished, it weighs about two oz. The reason for this being that when your battery packs get low on the motors and if they quit in the air, you don't have to shoot the beast down or wait for three hours for it to sink (that is where the experimentation came from).

The figures given for the diameter and length come pretty close to one-in. scale for the Hindenburg! They ain't perfect, but the sight of a dirigible in the air is well worth the sacrifice in scale deviation.

Robert Jones, Everett, Wash.

P.S. The formula was derived by the head cryogenic engineer for Scott Paper Co., so it is correct.

Cardboard wing saves the day
A few evenings ago I was flying my Midwest Tri-Squire when a friend turned on his transmitter for a ground check and very neatly put my plane into a wire fence which completely shattered the wing. I remembered reading "Denny-

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mite" by Tom Abberger (November 1971 AAM) where he described the construction of a corrugated airplane. I decided to try his method of construction to build a new wing for my Tri-Squire.

Well, it took me about six hours to cut some ribs and to finish the wing which I built in two halves for the 2½" total dihedral required. I coated the raw cardboard with three coats of clear dope and used filament tape spanwise to insure a strong center joint. Right after the last coat of dope dried, I strapped on the wing and went out into my backyard for a test flight. Very much to my surprise, the plane flew beautifully. My thanks to AAM and to Tom Abberger for a very useful construction article. I am a newcomer to RC and have learned a lot in the past year or so.

Dick Swartwout, Penn Laird, Va.

Reader poll on rocketry

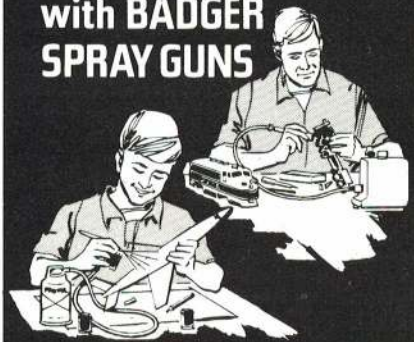
We are writing this letter in hopes that we may convince you to consider our request that AAM publish a monthly article about model rocketry. We are certain that if you were to publish such a feature, many people would be pleased.

Tony Poteet, Mark Longwith, Cleveland, Tenn.

Your request is under consideration at AAM. How many other readers would like rocketry regularly?

—Editor

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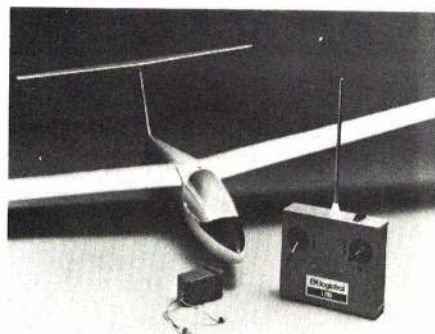
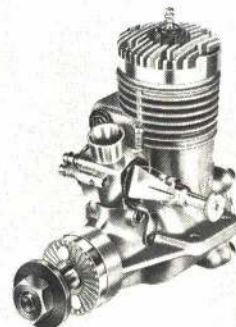
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New Products Check List



Jerobee/Dodge body. Class A stock car Challenger 1/12-scale body is now available separately or as a complete engine-body-chassis unit. Available in red, black, yellow, or orange with clear windshield, full decals, \$5.95. Complete car with RC, \$119.95; without radio, \$39.95. Jerobee Industries, Inc., York Center, Redmond, Wash. 98052

Tatone/Donut Wheels. From Flight Line, 2 1/2 dia. wheels (shown) are made of low-bounce neoprene rubber. With snap-on nickel-plated hub caps, bushings, acorn nuts; nothing extra needed. Durable long-lived equipment. 2 1/2" set, \$2.99, other sizes from 2 to 3". Spare hardware parts also available. Tatone Products, 1209 Geneva Ave., San Francisco, Calif. 94112

EK-logictrol/New L'il Red Brick system. For simplified installation of two- or three-channel systems, 1972 LRB system is hard to beat. Precision control sticks with adjustable tension, airborne weight of only eight oz. with two servos, low 25 MA current drain, 1% control accuracy. \$119.95 for two-channel installation. For additional information, write EK-logictrol, 3233 W. Euless Blvd., Hurst, Texas 76053

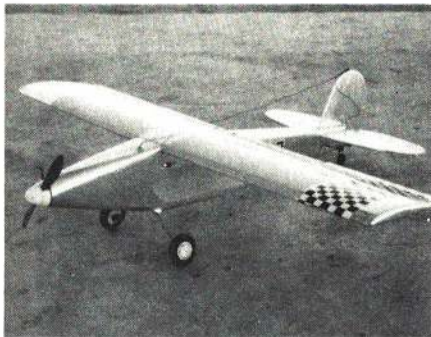
Sonic-Tronics/Electric fuel pump. Mk II pump can be driven by anything from a 1 1/2 volt starting battery up to the 12-volt supply in your car. Pump has two-way controlled action, fills or empties tank at touch of rocker switch. Centrifugal pump, high-impact case of fuelproof plastic, heavy-duty motor with low current drain. \$11.95. Sonic-Tronics Inc., 8017 Craig St., Philadelphia, Pa. 19136

Sterling Models/New beginners' series kits. Shown are *Shoestring* and *P47 Thunderbolt*, two recent additions to Sterling's "S" Series CL kits. Fly them on 049 power, kits come complete with hardware (less lines and handles) motor mount, scale decals, gear and wheels. Easy to build, planes use only six to nine die-cut parts. 21" span. Also available, colorful low-wing *Cherokee*. \$2.95 each. Sterling Models, Belfield and Wister St., Philadelphia, Pa. 19144

Exposition Press/Amelia Earhart—The Myth and the Reality. One of the most technical, detailed, and non-sensationalist books on Earhart, most notable because author Dick Strippel has resisted temptation to add to the "Amelia was captured" theory. This is a book which describes in detail not only her life but such hard-to-find data as a listing of the electronics equipment aboard her *Electra*, weights, power ratings, fuel consumption, etc. One is left with the feeling that author Strippel did outstanding research to justify his thesis. Hardbound, \$6. Exposition Press, Inc., 50 Jerico Turnpike, Jerico, N.Y. 11753

Veco/19 RC engine. Front rotor with hemispheric head machined from aluminum stock with machined crankcase, ball-bearing construction. Fit between head and crankcase is so accurate that no gasket is needed. About \$30. K&B Manufacturing, 12152 Woodruff Ave., Downey, Calif. 90241

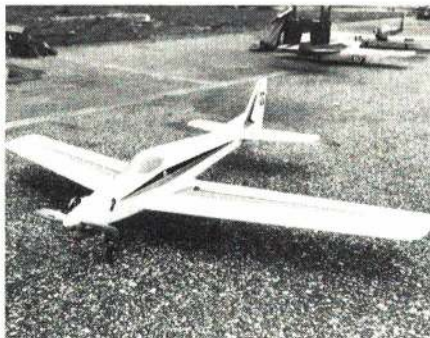
Fly-Line Models/J3 Cub. 1/4A RC or free-flight, 1938 *Cub* uses true 15/16" to 1' scale throughout, including scale wing rib spacing. Built-up wing and fuselage, sheet tail, total weight without radio is only 10 oz. Dummy engine and prop detail, all parts pre-cut, labeled and packaged. Well-written instructions and detailed plans. Plans only, \$3. Full kit, \$14.95. Herb Clukey, Fly-Line Models, 10543 Ashby Pl., Fairfax, Va. 22030



Cox/Two-stage Saturn rockets. New line features high-impact plastic kits of 33½" Saturn V and 21" Saturn 1B. 1/125-scale with NASA decals and re-entry parachute. Saturn V, about \$8, -1B, \$5. Write Cox, 1505 E. Warner Ave., Santa Ana, Calif. 92705

Sig/Mustang 450. Sig balsa and plastic molded cheek cowling and fuselage top, foam core wings with balsa sheeting skin, this scale racer has turned in an impressive list of honors during 1972, both in appearance, performance, and handling ease. Special instructions included for application of high-gloss fiber-glass-resin finish. \$29.95. Sig Mfg. Co., 401 S. Front St., Montezuma, Iowa 50171

Fiber Foam Products/1/4 Midget Racer. Inspired by Lindberg's *Spirit of St. Louis*, 1/4 Midget has 306 sq. in. wing area, foam core wing, top quality balsa throughout. Flying weight only 2½ lb. \$29.95. With veneer-covered wing, \$39.95. Additional info, write Fiber Foam Products, 6370 E. 22nd St., Tucson, Ariz. 85710



Long Island Hobbycrafters/Phoenix-5. Big 60-powered RC Pattern aircraft has 62" swept-back, fiberglass body and bellypan, glaskin wing and stab, pre-shaped ailerons and rudder, pre-bent landing gear. Flying weight, 6½ to 7 lb. \$89.98. Can be fitted with Rom-Air retracts, not included. Long Island Hobbycrafters, Inc., 7600 Shorefront Parkway, Arverne, N.Y. 11692

Du-Bro/RC helicopter. Four-channel 46½" dia. rotor, 38" overall length, kit has been extensively engineered for ease of assembly and flying. All parts machined for accurate, smooth fit. Flying weight, four lb., flight duration, about eight minutes. Flying instructions included. Approx. \$125. Du-Bro Products Inc., 480 Bonner Rd., Wauconda, Ill. 60084

JCM Specialties/Retract wells. Provides a professional-looking undersurface for your wing. Simply rough out wheel-well area and fit unit in place. Vacuum-formed well is made of high-impact styrene in 2½, 2¾, 3, and 3¼" sizes with 5" strut section. 98 cents a pair. JCM Specialties, Box 181, Medinah, Ill. 60157

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Kraft-Hayes/Sponge wheels. In both standard and slim-line design (shown), wheels are lightweight, true-running and fit standard axles without drilling. Exceptionally good looking. From 2¼ to 2¾" dia. \$2.69 to \$3.19/pr. Kraft-Hayes Products Inc., 450 W. California Ave., Vista, Calif. 92083

Bachmann/Scale model catalog. Beautiful full-color catalog illustrates complete scale line from Bachmann, people who have been fabricating plastics in some form or another since 1833. For railroaders, a complete line of N and HO-scale equipment, ready-built plastic "mini-planes," nature crafts, plus complete Fujimi scale model line. Write Bachmann, 1400 E. Erie Ave., Philadelphia, Pa. 19124

Hobby Capitol U.S.A./Scale-Like Wheels. A permanent pneumatic, unbreakable wheel in a diamond tread, regular bounce or a smooth, low-bounce style. Inner hub is removable for brake installation. Sizes are 2¼ in. to 3 in. Prices range from \$1.40 pr. to \$2.00 pr. Hobby Capitol U.S.A., 903 Church St., Nashville, Tenn. 37203



PART I

AUSTRALIAN SILVERTONE RADIO FLIES
JAPANESE/GERMAN WANKEL ENGINE-POWERED
AMERICAN HELICOPTER.

FRED MARKS

The Silvertone MK VII, used in the Du-Bro Whirlybird is a four-channel digital proportional set manufactured in Australia by Silvertone. The system is imported and distributed by Strato Model Products (Route 6, Blakely, Penn. 18447).

The system is also available on five or six channels. We obtained a second transmitter on loan to demonstrate use of the buddy system. The test set was a four-channel unit, while the second transmitter was a five-channel unit. Either four, five or six units may be operated as a buddy system; however, only four channels of a six-channel receiver would be active, and so on.

Included in the system is the transmitter, receiver, battery pack, four servos, buddy cord and an external, transformer-isolated, dual-output charger. The dimensional and statistical characteristics of the system are tabulated for easy reference. Also included with the test set was an in-line failsafe unit for use on any one channel, normally throttle. The system is available on 27 MHz and will soon be available on 72 MHz.

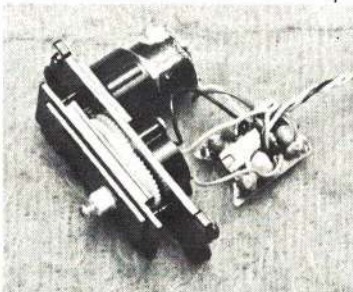
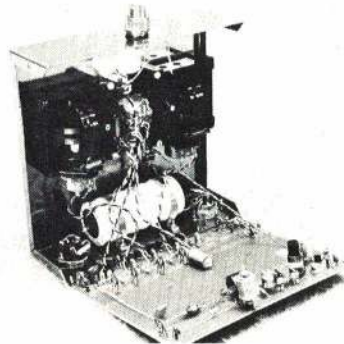
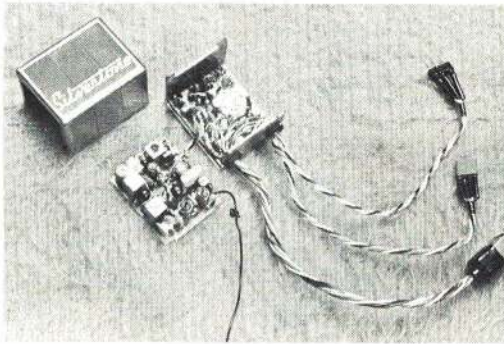
The transmitter and receiver are housed in copper-tone anodized aluminum cases. The transmitter uses a pair of Orbit stick assemblies for primary control. The fifth channel is controlled by a small lever at the upper left edge of the case. Recessed female sockets are provided at the bottom for charging and for the buddy cord.

Electronically, the repetition rate is controlled at approximately 60 frames per second via a free running multivibrator. This is followed by the typical half shot multivibrators which provide the series (four for our four-channel set) of control pulses. The differentiated, gated control pulse outputs operate on a three transistor modulator. The pulse train is routed to a "click" type control switch which permits selection between the instructor output of student transmitter. The modulation signal is routed to the RF section, which utilizes inductive oscillator tuning. The output network is inductive-capacitive (LC) with tuning achieved via a rather large piston-trimmer capacitor.

A small part of the output RF is coupled to a demodulator and used to drive the RF output indicator meter. During battery charge, with the transmitter off, this same meter indicates battery charging. A buddy-box arrangement is provided which permits control in either of the following modes: a) RF emitted by the instructor's transmitter and controlled by either the instructor or the student or b) RF emitted by the student's transmitter and controlled by either the student or the instructor. This permits the student to fly the instructor's aircraft with his own transmitter with the instructor all set to save it from destruction or for the student to fly his own aircraft with the instructor available to save the student's aircraft.

The preceding discussion is provided to show how a buddy system works. The MK VII instructions indicate quite clearly the procedures which should be followed in flying with a buddy-box. It

(Continued on page 68)

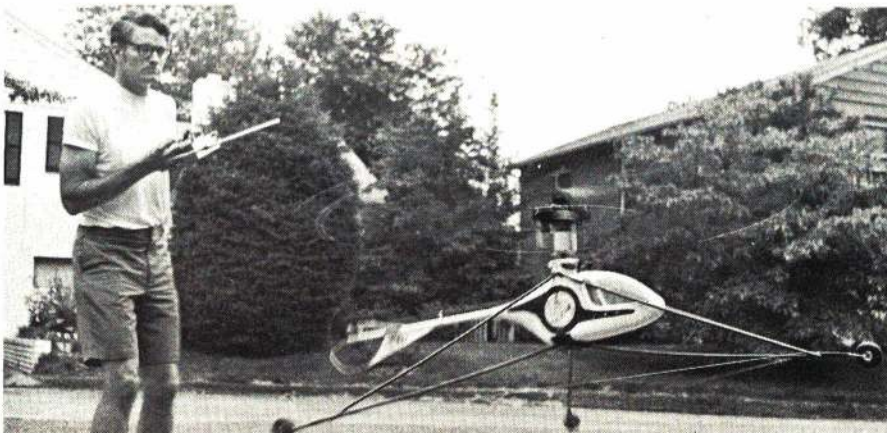


Top: Complete system shown above with optional fail safe device (dark object between receiver and servo at right). Note location of buddy switch.

Above left: This is the receiver test flown and analyzed, since we have reviewed an IC decoder in place of the SCS decoder. Nice gold-plated polarized connectors are used.

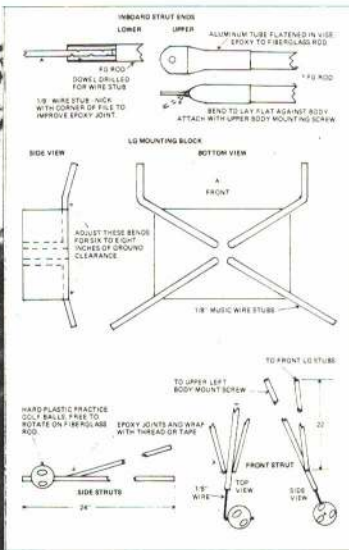
Above right: Orbit stick assemblies used here. High quality 9.6V Japanese DECAS power the transmitter. Left: Our system came with IC amplifier in the D&R mechanism but production units will use Orbit PS-6 mechanics.

Below: Ed Sweeney on a practice flight with the Ross-powered version. Moments later it crashed—but as usual, without harm.





PART II
THAT "GOOFY THING" DAVE GREY DESIGNED,
DU-BRO'S WHIRLYBIRD 505. BUILDING AND FLYING
THIS MODEL WAS PURE FUN AND CHALLENGE
BOB BECKMAN AND ED SWEENEY



Building the Du-Bro Whirlybird was sheer delight, for two reasons: First, it was a new experience in modeling. Helicopters are about the last "frontier" left in RC modeling, and it is fascinating to dig into the details of their construction and operation. Second, it's difficult to see how one could improve on the kit itself. It's not an ARF, and several enjoyable hours can be spent building it. The quality of the many metal, wood and plastic parts is excellent; the instructions are complete and easy to follow.

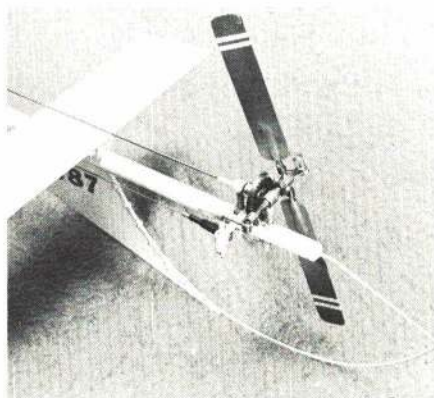
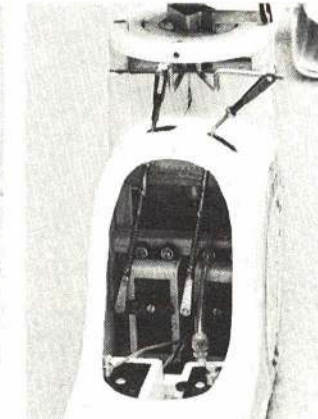
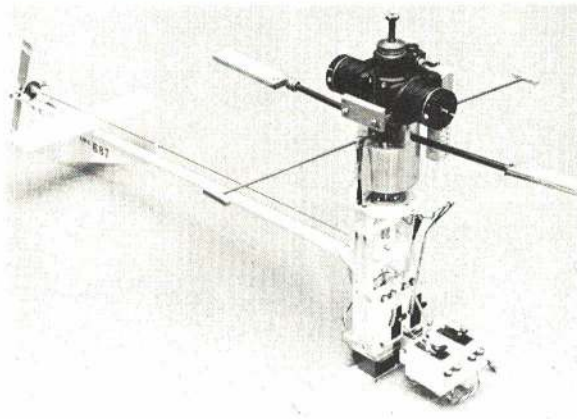
One note of caution: If you don't know how to solder, learn before you start constructing the Whirlybird. Most of the mechanical assemblies depend on solder joints; neat, effective soldering is a must. And keep in mind that this is soldering for mechanical strength, not electrical connection. Sta-Brite low temperature silver solder is recommended.

Construction of the chopper is so well covered in the instruction book that only two comments are needed here. The holes for the mounting screws at the lower end of the cyclic pitch servos should be drilled before installing the mounts for the throttle and tail rotor servos. And it is recommended that the horizontal stabilizer be omitted. Experience, confirmed by Du-Bro, indicates that the bird is more stable in windy conditions without the stab.

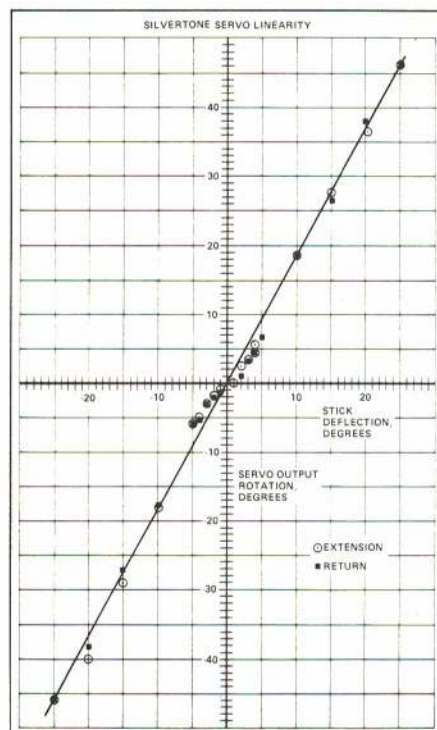
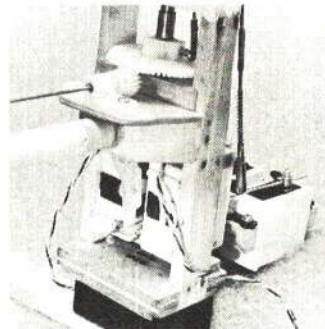
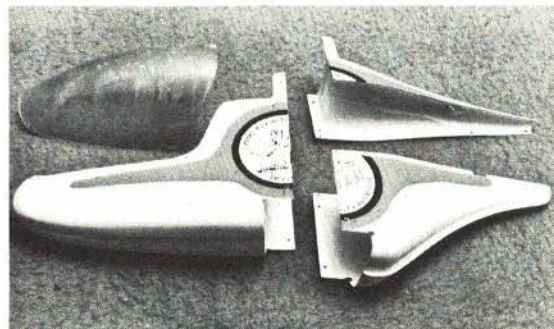
Early in the construction of the Whirlybird the decision was made to try the OS Wankel rotary piston engine. This engine seemed to be a natural for this application, even though its nominal displacement is less than the 0.40 called for.

Mounting the engine requires fabrication of a new mounting plate. A piece of 1/8" aluminum sheet is turned to the outside diameter of the Wankel's mounting ring, the same diameter as the fuel tank on the Whirlybird. The new

(Continued on page 75)



Top: Author with our bird at the time of early testing with tripod gear. Note ideal shape and fit of the O.S. Wankel engine. Spinner for starting only but cooling fan needed. Above Left: Complete frame with Ross engine installed. Short bar of lead on this side of engine balances carburetor and exhaust stacks. All parts are quite serviceable. Above Right: Canopy removed to view inside. Snug body keeps the exhaust mess out fairly well. Incidentally, weight is not critical if you have plenty of available power. Left: Tail rotor operates at nearly zero pitch being used only for rudder function, not anti torque. Since photo was taken, we learned stabilizer should be omitted. Bottom Left: Six piece plastic body is easily assembled and long lasting. Bottom Right: Tail boom is tapering fiberglass rod and main frame is spruce. Sturdy and light.





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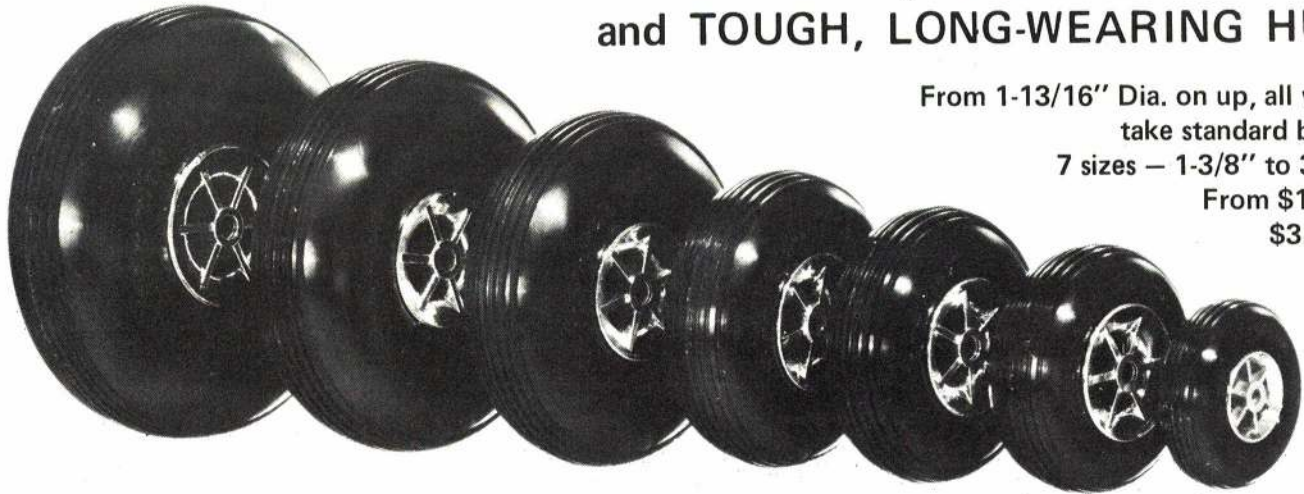
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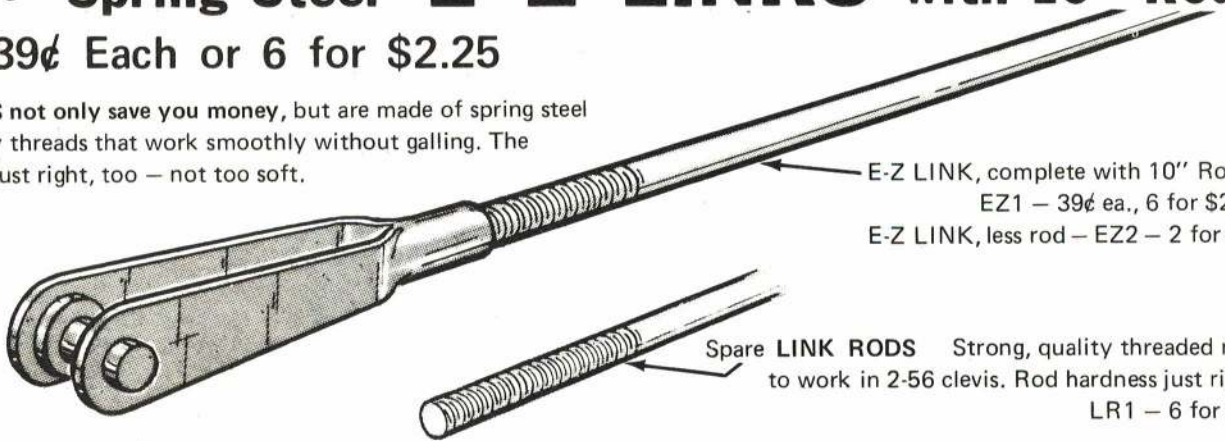
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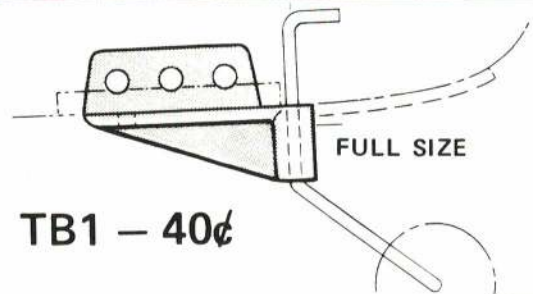
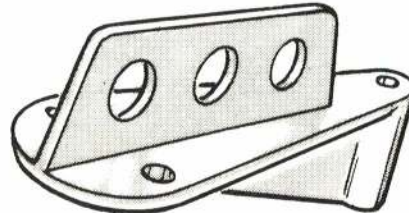
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'72 NATIONAL CHAMPIONSHIPS

President's Memo



AMA President John Clemens presented Outstanding Service Award Plaques to the Navy Nats Project Officer, Lt. Cdr. Al Geimer (right) and his assistant, Lt. Cdr. Bob Needham.

This was SALUTE and THANKS YEAR to the NAVY, the 25th ANNIVERSARY of cooperation between the NAVY and AMA in providing a national level of competition in the field of model aviation.

It certainly looked like the modelers had caught the spirit, because just over 2,000 contestants and mechanics showed up! "Camper-and-Tent City" looked exactly that: a city. And most of these were whole families. If no spectators at all had shown up, the contestants alone would have made a good sized crowd, but the spectators DID show up. In fact, somewhere between 20,000 and 30,000 showed up on the final day just to see the AIR SHOW (held this year at a remote part of the field), and ALL MODEL AIRPLANES and the championship trophy awards. It was quite a success.

While mentioning the air show and the thousands who attended, I MUST COMPLIMENT those thousands for their orderliness and cooperation. I mention this because we

Continued on page 23



Top Flite Models and Dave Platt (L) have made a gift of Dave's famous Dauntless to the Pensacola Naval Air Museum. Accepting for the museum during a Nats ceremony was Bob Blaikie (ctr.), Capt. Paul Merchant (R), NAS Glenview C.O., was another of the participants.



The last Navy Nats Airlift? Carrying many officials, press reps, thousands of pounds of Nats gear, this was the final '72 Nats departure for Texas and California.

Thanks, AMA!

The general theme of the 1972 Nats was "Thanks, Navy!" This was in appreciation of 25 great years of Navy hosting of AMA's big annual event. It would not, however, have been a very good ending to the Navy program if the 1972 event had been unsuccessful. In order to say thanks in proper fashion, therefore, it was important that the '72 Nats be a great one.

It was, despite tremendous increases in AMA's physical and financial workload. In hosting this Nats, the Navy was unable to offer anywhere near the usual support of past events. The Navy did a lot, but it largely depended upon AMA to provide the people and money.

On the money end, it looks like we about broke even. Contestants and sponsors alike absorbed substantial increases in expenses. On the physical end, a near-miracle effort on the part of about 150 AMA workers made the '72 Nats an operating success. Not only were more contestants involved than before, but with generally fewer competition problems and complaints.

To those workers who made this possible the message from a grateful Nats management is: "Thanks, AMA—you made our thanks to the Navy a greater success than anyone had a right to expect."

Sincerely,
John Worth
AMA Executive Director



Behind the Scenes...

The Incredible 1972 Nats! It survived one crisis after another. It was cancelled once (by the Navy), almost cancelled again (by AMA), then struggled through a series of near-panic situations involving personnel, supplies, equipment and other problems.

But it turned out to be a great Nats—not only bigger than last year's big meet but also a generally happy one. Over 2000 participants were registered: over 1400 contestants and more than 600 mechanics. Except for a day and a half the weather was great. Following several days of boiling hot temperatures immediately prior to the Nats, the weather suddenly cooled off with a day of rain, and this was followed by milder temperatures which held through the rest of Nats week.

But when the rains came on the first full day of Nats competition, the outlook seemed dim. Nats officials had just completed a weekend of backbreaking preparations (erecting two miles of snow fence for crowd control, marking circles and event areas on the runways, hauling and putting up tents, tables, chairs, and other Nats gear). This was followed by Nats registration, test flying, Indoor competition, and qualifications for RC Pylon Racing.

Then came the start of the full schedule on Nats Wednesday. Flying began but so did the raindrops—gently at first but building slowly. Up until noon the events managed despite the wet air, but by mid-afternoon many had quit as the rain got steadily heavier.

But most flyers persisted despite very cold and drenching conditions. Radio Control judges and Free Flight timers could hardly see, scoreboards smeared and blurred, models splashed when they hit the ground. Even so some Free Flighters scored "max" flights despite the terrible conditions.

The next day was windy in the morning as an aftermath of the rain, but there wasn't much waiting around for calmer weather. Unfortunately, the most weather sensitive event was scheduled during the wind—Free Flight Scale took a beating as flight after flight ended up in wreckage.

Otherwise, however, the Nats went booming along. RC Pattern flying operated with great efficiency to get in six rounds of qualifying despite the loss of time the day before. It was much the same in other events. Free Flight, using the 'time a flight, fly a flight' scheme for the first time at a Nats, operated very smoothly. Many flyers said that it was better than previous years even with the lack of 60 or more timers that the Navy had usually supplied.

Control Line had another sort of crisis. First the Nats CL Manager of many years, Pete Peters, was not able to attend the Nats. So the load fell on CL Director Gosta Johnson's shoulders. Then Gosta got called home on an emergency, and Control Line events were suddenly without an overall leader.

The Nats Executive Committee went into a huddle and picked Combat Director Murry Frank for the bigger job. He came through in fine fashion and so another Nats crisis was overcome. Once again it was a case of people managing to 'make do' in situations that happened despite the best laid plans.



Rolling out the barrels for fence anchorage are AMA volunteers. Never before have AMA'ers been responsible for this kind of detail, but they did the job and ran the meet, too.

More than 2,000 Delta Darts were given away, built and flown during the '72 Nats. Nancy Penrod and Bernie Drummond are shown attaching wings and stabs with electric glue guns—to speed the flow of anxious youngsters. Jigs were a big aid in doing the job.



Continued on page 22



Big crowd at Sunday Model Air Show was orderly despite lack of a barrier. One of many exhibition flights was made by Josh Titus, shown here with RC Ansaldo SVA5.



Hangar confab at RC transmitter processing: Pylon Director Glen Spickler, left; overall RC Manager Kemp Bunting, right.



Al Algood was one of those who manned the spectrum analysers loaned by the Hewlett-Packard Company for frequency monitoring. Thanks to H-P and also to Midwest Model Products and McGee Displays, Inc., of Nashville, Tenn. Midwest provided fuel for FAI FF and RC Pylon events, and McGee supplied special transmitter processing decals.



Above: Could it be that commentator/modeler Paul Harvey said a funnier one than Johnny Clemens? Shown (L-R): Paul Harvey, Capt. Paul Merchant, Jack Ruth, Johnny Clemens, Earl Witt.

Left: AMA had some mighty attractive help for cleanup operations. Alice Fruit wields the broom as Carol Risko works the trash bag.

BEHIND THE SCENES...

Continued from page 21

When, for example, the Navy had earlier indicated that military personnel would not be available to help AMA officials run the Nats, it had not been expected that the lack would be so complete. It was soon learned, however, that use of naval station personnel would be charged for, and therefore the cost of operating the Nats could go sky-high.

AMA officials, therefore, decided to go it alone, doing double and triple duty. They realized the necessity of showing that the Nats could be run with absolute minimum support in order to fan the faint sparks of hope that a minimum cost Nats might induce the Navy to keep the Nats going, although they previously had announced that this 25th year of Navy hosting would be the last.

Between the regular Nats officials working overtime and the help of many Chicago area AMA volunteers, the Nats went on successfully by substituting about 50 new AMA workers in place of over 150 Navy personnel in former years. These, plus the usual number of AMA officials, resulted in the Nats operating with about half the number of workers of past years—an 'above and beyond the line of duty' effort on the part of many.

This is not to say that the Navy was missing. Far from it. They provided equipment, housing, meals, basic garbage pickup, first aid, transportation, public affairs and other support. Two officers, Lt. Commanders Al Geimer and Bob Needham, together served in multiple capacities that had involved a dozen officers of past Nats. They solved many problems requiring AMA-Navy liaison, including the location, transportation, borrowing and procurement (paid for by AMA) of many items of meet needs, such as fencing, rope, electric power generators, signs, furniture, and lots more.

They also provided public relations support in place of the usual station effort to promote the Nats. They helped distribute Nats posters, promoted the Nats on TV and radio, even came up with a Miss Model Aviation after that usual Nats project had been dropped due to lack of time. They helped greatly to hold the Nats cost down by scrounging rather than buying or renting. When walkie-talkies were desperately needed for field communications, for example, they were able to borrow them from the Chicago Police Department. Likewise, they were able to borrow 12,000 feet of snow fencing. Commander Geimer even loaned two of his personal fans for the Nats headquarters operations, as well as his own bikes to Nats officials.

With these and other contributions the Navy did a lot despite severe restrictions. This, together with AMA absorbing a lot of cost items which had previously been provided by the Navy (such as rental of field sanitation facilities, airfield cleanup after the Nats, gas for vehicles, and pay for Navy truck drivers) made it possible for the 1972 Nats to be held.

It was reported earlier in the year that the Navy had cancelled participation in the '72 Nats due to budget reductions. This happened in March, but AMA got a reversal for one more year on the basis that the Navy would not have to foot the bill as in the past. At the time it looked like the cost to AMA might be

Continued on page 39



PRESIDENT'S MEMO

Continued from page 20

ran up against a unique problem that the spectators helped mightily in solving.

We found, suddenly, that there was not time with our volunteer help to establish the safety barricades or fences around the runway areas to be used for the multitude of flying demonstrations. An imaginary safety line was established with a few barrels as markers. Starting early with the public address system, as the crowd arrived, I pointed out to the folks the dangers of moving any closer than the imaginary line marked by the barrels. I pointed out that INTELLIGENT AMERICAN LADIES AND GENTLEMEN would know how to conduct themselves under these circumstances and would not only stay at the proper distance, but would also aid us in pointing out to the less polite and less wise that they should stay back also. The fact that this huge gathering did just as asked, with no fences or ropes, is a TREMENDOUS TRIBUTE to how AMERICANS can and will act when they stop and think—and are given a logical reason for acting. They even helped pick up litter in the area. As I told this fine assemblage of folks on the PA system, it sure made me proud to be an American!

While watching the crowd enjoy the air show, I also had a chance to watch the expressions of satisfaction and pride on the faces of our TWO MOST HONORED NAVY GUESTS. They also realized that we were witnessing a fine AMERICAN SPORTING ACTIVITY being enjoyed by a FINE AMERICAN CROWD being hosted aboard their U.S. NAVAL AIR STATION. These two gentlemen who added prestige to the giving of our top NATIONAL AWARDS were our hosts, the commanding officer of Glenview Naval Air Station, Captain Paul Merchant, and the Deputy Chief of Staff of Naval Air Reserve Training, Captain Richard Altmann.

Taking an interesting look at the other end of the week of Nats activity, I walked down to the main gate of N.A.S. Glenview just before it was opened to our AMA contestants. Cars, trailers and campers filled the parking lot outside the gate as well as the access road as far as the eye could see. At about 8 am the gate was opened, and, so help me, it looked like the chariot race scenes from Ben Hur! Everyone placed some sort of premium on being first at the registration desks. This is amusing because, honestly, there is no advantage in first, second or even twenty-fifth. But the vehicles poured through the gate like water through a hose, and I shot movies of it all. Since I am just nut enough to find something amusing in nearly everything, I shot the film with a special camera that takes only one frame every half second. When shown on the screen at normal 18 frames per second, everything is "hurried-up." The result looks like the NATS was being held at the Indianapolis 500 instead of the dignified Glenview Naval Air Station. I wish all of you could see this film. But please slow down next year!

It made me proud that all the contestants coming through the gate smiled and waved when they realized that the president of AMA was there to greet them. AMA'ers are an awfully nice bunch of people!

John E. Clemens
AMA President

NATS ENTRIES

	Jr.	Sr.	Open	Total
No. of Entrants	240	268	955	1463
No. of Mechanics				630
Entries by Event				
Indoor	Jr.	Sr.	Open	Total
Scale	6	14	30	50
H.L. Glider	32	38	65	135
Paper Stick	17	13	34	64
Cabin	3	11	16	30
Stick	8	11	30	49
Control Line				
Scale Racing	36	34	97	167
Rat Racing	12	28	77	117
B Proto Speed	6	10	22	38
1/2A Profile Proto	55			55
1/2A Proto Speed	8	19	38	65
FAI Speed	8	7	17	32
1/2A Speed	20	15	28	63
A Speed	14	11	31	56
B Speed	6	11	31	48
C Speed	9	6	31	46
Jet Speed	1	5	33	39
Aerobatics	11	28	77	116
Combat	19	61	135	215
FAI Team Race		1	16	17
Scale	12	10	22	44
Navy Carrier I	4	5	28	37
Navy Carrier II	3	11	39	53
Profile Carrier	10	33	54	97
Radio Control				
C Pattern Expert		8	84	92
C Pattern Novice	3	7	40	50
B Pattern		4	22	46
A Pattern	6	11	43	60
AMA Scale		2	35	37
Pylon Formula I	2	8	89	99
Pylon FAI		3	51	54
Free Flight				
1/2A Gas	69	75	171	315
A Gas	53	56	168	277
B Gas	14	22	105	141
C Gas	10	19	104	133
FAI Power	6	18	53	77
Wakefield Rubber	9	5	43	57
Unlimited Rubber	31	16	67	114
Coupe d'Hiver	12	10	70	92
Nordic Glider	41	34	100	175
H.L. Glider	96	81	148	325
Rocket Power	10	19	49	78
Scale Rubber	3	5	27	35
Scale Gas	3	6	34	43

PERPETUAL TROPHIES & SPECIAL AWARDS

MULVIHILL (high time regardless of age, Unlimited Rubber): Philip Klintworth, Troy, Mich.

TULSA GLUE DOBBERS (high time regardless of age, Outdoor HL Glider): Paul Kosmala, Cheektowaga, N.Y.

STOUT INDOOR (high time regardless of age, Indoor Cabin): Bucky Servaites, Dayton, Ohio.

TESTOR's (best model finish, regardless of age): Ed Ellis, Dearborn, Mich.

STOUT COMMERCIAL (high time regardless of age, Indoor Stick): Clarence Mather, San Diego, Calif.

DICK BLACK (high time regardless of age, Coupe d'Hiver): George Perryman, Smyrna, Ga.

STERLING MODELS (most Scale static score of any category, qualifying by official flight): Claude McCullough, Montezuma, Iowa.

DANNY BARTLEY (Control Line Category Champion): Glenn Lee, Batavia, Ill.

JIM WALKER (winner of Junior-Senior-Open flyoff, CL stunt): Dennis Adamisin, Taylor, Mich.

NATIONAL CHAMPIONS

GRAND CHAMPION

Brian Webster, Manchester, Tenn.

JUNIOR

Kenneth Bauer, Orange, Calif.

SENIOR

Brian Webster, Manchester, Tenn.

OPEN

Bucky Servaites, Dayton, Ohio

RADIO CONTROL CATEGORY

Larry Leonard, Canoga Pk., Calif.

SCALE CATEGORY

Frederick Stark, Florissant, Mo.

INDOOR CATEGORY

James Richmond, Davidson, N.C.

FREE FLIGHT CATEGORY

Robert Watson, Morton Grove, Ill.

CONTROL LINE CATEGORY

Glenn Lee, Batavia, Ill.

AMA CLUB TEAM

Chicago Aeronuts (Mark Kummerow, Keith Gordey, Charles Markos, Charles Sotich, Robert Watson)

NATS TEAM

Dixie Whiz Kids (Mary Lou Brown, Charles Schubert, Brian Webster, Dennis McGraw, Brian Pardue)

1972 NATS SPONSORS

Some of the basic meet expenses and approximately 600 competition awards were provided through the contributions of the following:

Ace R/C, Inc., Aero Sports/Nitrotane, AI's Hobby Shop, Ambroid Company, Inc., American Aircraft Modeler, Aristo-Craft, Competition Models, Inc., Dremel Manufacturing Co., Dumas Products.

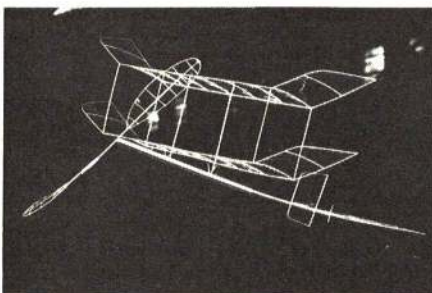
E.K. Products, Inc., Fagel Bros., Flying Models Magazine, Fox Motors, Carl Goldberg Models, Inc., Grish Brothers, Paul K. Guillow, Inc., Heath Company, Hobby Industry Assn. of Delaware Valley, International Balsa Corp., Jasco, Jetco Models, K&B Manufacturing Corp., Kraft Systems, Inc.

L.M. Cox Manufacturing Co., Inc., Midwest Model Supply, Midwest Products, Mini-Flite Co., The Model Builder Magazine, Model Materials Co., Model Rectifier Corporation, Montgomery Signs, Northfield-Ross Engines, Pactra Industries, Inc., Pettit-Hobbyoxy, Progress Manufacturing Co.

R/C Modeler Magazine, Russell, Marsh & Kennedy, Inc., Warren Shea, Sig Manufacturing Co., Inc., Stanton Hobby Shop, Inc., Sterling Models, Inc., Sullivan Products, Inc., Tatone Products, The Testor Corporation, Top Flite Models, Inc., Williams Brothers, World Engines, Inc.

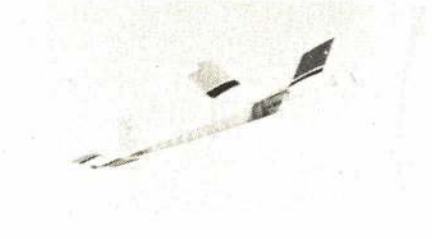


An outstanding example of traditional stick-and-tissue construction, this rubber-powered Vought OS2U Kingfisher, built by Michael Kuehne, flew in the Indoor Navy Scale event.



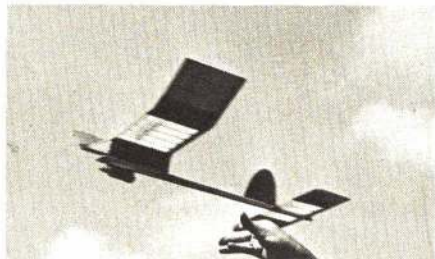
Unusual microfilm biplane model by Clarence Mather.

Susan Weisenbach's rubber job heading aloft.



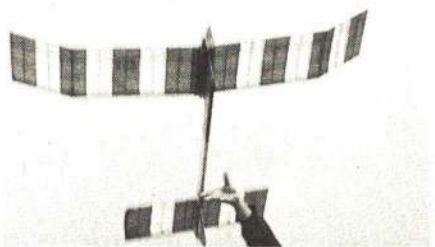
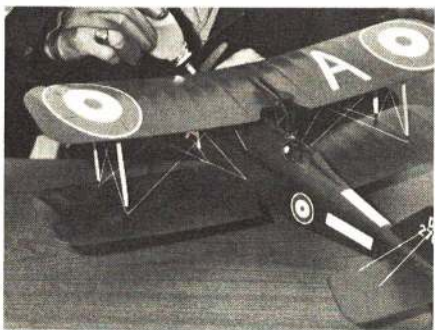
Team Cailliau makes a pit stop. Lawrence took second with his simply constructed Pennyplane.

Pat Wood, 15, begins a flight with his scaled version of a Pilatus Porter from AAM plans. He also flew this model in outdoor Scale.



Charles Wiese's Rocket-Power event entry powered by Jetex 150.

Diesel-powered, scale SE-5A by Francis Kastory.



Three seconds after this photo was snapped, the screaming Supertigre 23 pulled the rain soaked wings off of George Versaw's Star-duster 600.

Winning Outdoor Flying Scale, Waco YKS-6 by Harold (Bill) Warner features opening doors, complete interior—even maps in the map pockets.



Indoor: It is no surprise to see Richmond, Mather, Sotich, Servaites and Rohrbaugh on the winners list, but two new names have appeared: Larry Cailliau and Dennis Jaecks. Dennis, a convert from RC, won the increasingly popular Pennyplane event in 1971 and won again this year with an even better time of 12 min. 25 sec., phenomenal for this severely restricted event. He later placed fourth in the Microfilm Stick event. Larry, returning to modeling after an eight year time-out for college, marriage, and the early years of a career as a TWA pilot, placed second in Pennyplane and Hand-Launch Glider, and first in Paper Stick, breaking Jim Richmond's long-standing record by more than a minute.

There is a man at the Nats Indoor events every year whose absence would spell disaster, yet his name never appears on the list of winners or the officials roster. He is "Major" Brown, custodian of the armory. He lowers the lamp when a rubber-powered model becomes snared by one, and jostles the hand-launch gliders loose when they alight on the rafters.

In one corner of the armory a free-balloon duration contest between Bill Bigge and John Thornhill was taking place. Helium-filled balloons were weighted with clay until they would rise slowly. Then after a few minutes enough helium seeped out to cause the balloon to descend. Hitting the ceiling disqualified the flight.

Fulton Hungerford, whose tiny Ford Trimotor stole the show at the 71 Nats, did a repeat performance this time with his Boeing 80-A1 trimotor. All three motors are rubber-powered, the props of the wing-mounted motors being driven through flexible shafts by rubber motors contained within the wing.

Al Rohrbaugh entered the only microfilm stick model built to the 300 sq. in. wing area limit. The 51 in. Nordic-like wing was pulled by a huge 27-in. prop which cruised at only 32 rpm. A disastrous collision with a lamp support prevented the model from exhibiting its true potential.

The Nats Hangar had its usual miscellany—rows of workbenches used for storing and working on models, and sleeping on or under; models under construction, few of which were completed by the end of the week; a committee of six assembling a stick-and-tissue scale model from a kit; people selling and swapping everything from old model mags to new engines; the scale cage and the model shop; hordes scanning the results posted on the bulletin boards. This year a new feature was added in the person of Bezin flying his rubber-powered helicopters all over the place, talking a blue streak, surrounded by an ever-changing mob of kids, and selling completed stick-and-tissue copters for two or three bucks, scarcely two alike. Why? To clear out his basement to make room for building more copters!

On Wednesday, the first day of the outdoor competition, the weather started off bad and got worse as the day wore on. The wind was strong, and it



Peanut Scale models are limited to a 13-in. wingspan and fly about a minute. Richard Whitten, editor of "Star Skippers" newsletter for Juniors, built this Pietenpol Air-Camper from a Peck-Polymers kit.



Launching his hand-built glider is James H. Harris.

A familiar sight at the Model Airplane Championships for seven years is the sister team of Cheryl (left) and Susan Weisenbach. Susan, 20, was the 1966 Nats Grand Champion which earned her a trip to the Naval Flight Academy at Pensacola, Florida, and a college scholarship provided by the Academy of Model Aeronautics. Cheryl, 18, specializes in FF scale models of WW I biplanes.



Neil Miller and husband Carl patch their Puss Moth rubber-powered free flight. The Millers are veterans of Nationals competition since 1954.

Terry (left) and Mike Kuehne have flown in model events for over ten years, specializing in FF gas events. Shown setting a timer for a two-min. flight.



The Linstrums, Mindy and Jennie, display their Pennyplanes. Popular with both tenderfoots and oldtimers, event drew 48 entries.

National Free Flight Society Executive Director Hardy Brodersen adjusts his Rossi 15 to around 24,000 rpm, pegging the light-beam tachometer built into his goodie-box which also contains an electric starter. A fast climber.



was between a drizzle and a real rain all afternoon. Max flights didn't come easy. By 2 p.m., when the rain started in earnest, only four max flights had been posted on the Open A/2 glider scoreboard, many of the contestants hoping for better weather which never came. Peter Allnutt, flying his rather soggy and tired-looking Adagio No. 6 won the Towline Glider event for the third time in four years.

Weather that bad couldn't get any way but better. And it got a little better each day—Saturday and Sunday had some of the best weather ever seen at a Glenview Nats.

Bruce Mathews, flying a replica of the Loening M4 with which Tom Stark won the Open Outdoor Flying Scale Gas event three times, came as close to tears as a young man would like to admit when, on the third of his allowed four attempts, his flight was 1/2-sec. short of the required 20 sec. He made it on his last attempt, however, and won in the Junior-Senior age group.

Harold (Bill) Warner included fishing, test flying, model building, and the Nats in a month-long Volks-van tour. While he was test flying in Iowa, the longest and best flight of his Peanut Scale ended with a dunk in the settling pond of a sewage disposal plant, and it hasn't flown the same since. Harold got even with the world by winning the Outdoor Scale Gas-Powered event with a Waco YKS-6 cabin biplane having doors and a complete interior.

Unlimited Rubber Powered: With the historic Mulvihill trophy as bait, the Unlimited Rubber marathon brought out the usual assemblage of top-notch rubber modelers. By noon it was clear that it would be a battle between Phil Klintworth and George Perryman, who has come within shooting distance of the Mulvihill a dozen times. Klintworth was following behind Perryman by about two flights when on its eleventh flight the stabilizer on Perryman's model was knocked out of alignment and the model destroyed itself. Klintworth flew his eleventh successfully to qualify for having his name engraved beside those of the other aeromodeling greats, and it is good that it ended then for his winding arm was tiring. George consoled himself by winning the Coupe D'Hiver event on the following day.

Toronto's Andy deMello established an early lead in Class A Gas flying his Cox 15-powered Half Nog to four maxes. Red Johnson, from Southern California only got a 3-1/2 sec. engine run on his fifth flight—his pen bladder fuel tank burst in flight. Hercules Farand, however, posted five maxes +96 sec. to win. Greg Forth, posted a creditable four maxes +70 sec. to win in Senior.

The unofficial Old-Timer events drew a nostalgic array of Zippers, Bombshells, Brooklyn Dodgers, Playboys, Korda Wakefields, Gollywocks, and even a pair of twin pushers. The gentle drone of spark-ignition engines and the smell of gasoline and castor oil brought back memories of the Genesis of Free-Flight Gas in the mid-thirties when models flew more like "real" air-



planes instead of the rocket-boosted gliders they have evolved into.

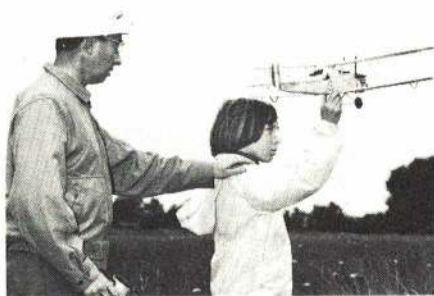
FAI Power: Harold Eggleston of Toronto put up his five three-min. maxes, blew his fourth flight by dethermalizing early, and disgustedly left for home, not realizing that despite the seemingly ideal weather, no others would better his mark. With 55-min. of the day's flying remaining, Danny Lock roared up to begin the nearly impossible job of putting up his five flights. But he did just that, including one "attempt" when his engine flamed out upon launching and dived into the concrete, requiring a quick prop change and re-fueling. With only a minute remaining, he put up his fifth flight to complete the string of maxes and near maxes which earned him the second-place trophy.

Saturday was perfect hand-launch glider weather, with moderate drift straight along the runway. By early afternoon, Dick Mathis had posted four consecutive two-min. maxes, plus a flight of 1:39. Bucky Servaites, in a position to beat Mathis, went up into a cloud of other HLGs and Coupes in what seemed like good air, but was down in 40 sec. Later Paul Kosmala, flying an aft-rudder design by Bill Patton, and Dana McKinzie made their fifth maxes, hit holes on their sixth flights, and emerged first and second only six sec. apart. Mathis's third place was denied him because of a protest about his taking more than the allotted three-min. to launch his glider, although dozens of others did also—perhaps the price of being a well-known figure by virtue of previous successes.

Mark Kummerow was sure that his third flight in Senior C-Gas, a three-min. max, had put him into first place, but with less than an hour of the contest remaining and his model packed away, he discovered that his last flight had not been recorded. But after a long search, his timer was found and his max properly recorded. Mark's second flight dethermalized into the grass only 200 ft. from where he had launched it.

Rocket Power: With a surprisingly large turnout for an event which is so difficult to fly, the Rocket-Power event proved that the contest isn't over until everyone has finished flying, for first place changed hands often. Dave Chancey put up a mediocre 61-sec. flight followed by two three-min. maxes. Charlie Sotich maxed, crashed on his second flight, then made a 70-sec. flight followed by a max using his 1967 Nats winning model. Later Martin Richardson maxed on his third flight, which put him on top, only to be beaten by William Jenkins who also maxed on his third. Jenkins's win ended a week of bad luck which included crashing his 1/2 A Gas Model into a parked car, and having his hand-launched glider mashed by another HLG while it was in the trunk of his car.

Meanwhile, Charlie Wiese won in the Senior age class with a score that would have been good enough for second place in the Open age class, while Robert Lyons won in Junior, flying an all-balsa model he and his father had designed.



Lee Taylor instructs his son, Bradley, 11, on the important techniques needed to launch his DeHavilland 4, WW I British bomber.



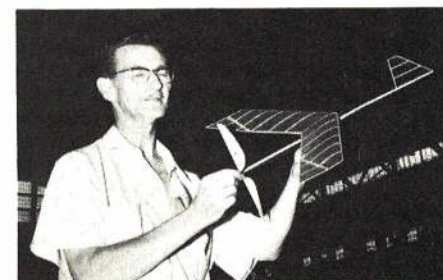
Charles Puckett attempts to fire up his 020-powered Cargo model during Wednesday's downpour. The game is to carry maximum weight for 40 sec. with only a 20-sec. engine run.

Jack Pfeifer test flies the Nig Nog for Class B Free Flight.



With rain pelting the model, Edward W. Mate, Jr., seven-years-old, launches tissue-covered Nordic for his dad, Edward Sr.

A top contender in Scale Free Flight, Ed Fort launches his Rearwind Speedster. Powered by a Cox 049 glow plug engine, the airplane is an exact scale model of a popular light plane that "barnstormed" in the 1935-37 era.



Bill Gough's novel pusher whatever-it-is flew well, stable and efficient. Pennyplane rules promote unusual solutions.

Nan Taibi holds a wind streamer for husband Sal. Here Sal is getting his Payload Free Flight model ready.



Despite more recent successes in modeling, Sal Taibi gets big jollies out of flying his Forster 29-powered Pacer, designed in the late thirties. Sal even drove an old-timer car to the Nats from Los Angeles: a Chevy with 335,000 on the odom. He's trying for half a million.

Flying his B-Gas Starduster in the Wednesday afternoon rain, George Versaw had his hot Supertigre 23 flame out just after launching. The model came to a dead stop ten ft. off the ground, the engine caught and the model made a second vertical takeoff. But, his troubles weren't over yet, for seconds later, with the model going straight up at a tremendous speed, the two halves of the water-soaked wings parted company.

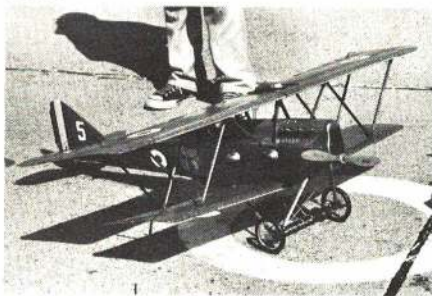


Bob Smith's T-2A designed by Tom Atkins. Bob will kit this ship. Notice the drooped aileron. Ship has coupled ailerons/flaps. Works very well.

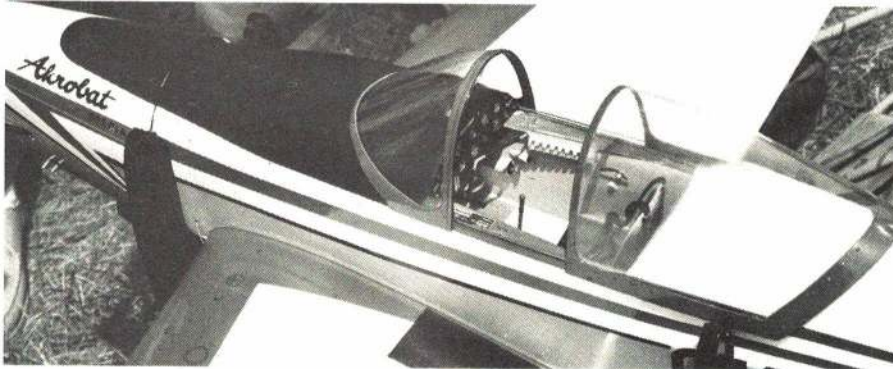


Ralph Jackson beside his Weindecker Eagle. Retracts to be added for next meet. All plastic real plane very suitable for modeling in scale. No rivets or joint lines.

Josh Titus' magnificent and fine flying Ansaldo. It drops pilot by parachute and a bomb.



Don Botteron's "paint brush" special, Akrobat, painted with a brush believe it or not.



Claude McCullough's very nice Shinn. Notice the detailing.



RC at the '72 Nats was many things for many people. For some it was joy—making the finals in Class C or Formula I or FAI Pylon and for many more others failing to do the same. Winners are always happy; losers, some bitter, some expect it, some shrug it off, wait till next year! But the name of the game, in no matter what kind of competition, is winning! All strive for victory—some more than others—and tremendous preparation is in evidence everywhere!

Preparation achieves, but what about Lady Luck? It struck down almost randomly: **Jim Whitley** and **Jim Kirkland** due to an unfortunate frequency mix-up; **Whit Stockwell** and **John Agee** plus two others due to mid-air collisions; **Bob Smith** with the fastest qualifying time in Formula I racing dropped out of the finals due to equipment problems; **Telford** and **Violet** with the fastest FAI racing qualifying times were also struck down in the finals by engine and other problems.

Misfortune is very unforgiving as there is not much room these days for error; one missed pylon heat or pattern flight can change the whole picture. Some were able to rise above misfortune: **Whitley** finished second in C Pattern with a ship he had never before flown, borrowed from **Ed Keck**; **Jim Kirkland** with an airplane borrowed from **Rhett Miller** also never flown before by Jim; **John Agee** rose from the ashes of a mid-air and made the Class C finals with a borrowed airplane test flown in the rain!

RC at the '72 Nats was flown in conditions ranging from absolutely miserable hot and humid weather, to cool and very wet, to perfectly beautiful, sunny and calm. Something for everybody. I had never flown competition in the rain before, but I sure did this year. Two flights in the driving rain. It sure is hard to see that airplane with the rain beating in your face! Equipment operation was fantastic, until a drop of water got in the wrong place—just ask **George Hill**! "Fair weather" George was surviving okay, until his ship did an uncommanded 90° turn, whereupon George shook the water out of his transmitter and continued with "come back here you...!"

Have you ever flown in a strong crosswind? Well, always expect it in Chicago at Glenview. Crosswind is S.O.P. and he who has not practiced under these conditions won't do so well. Evidence of experience under these conditions was present in the high finishers in Class C Pattern. The old rudder really gets a workout under crosswind conditions!

Classes A and B were flown for a half day only (to the chagrin of the A and B fliers) under ideal conditions. Time was available for only three flights each—very unfortunate since Class C fliers had six qualifying flights plus six more to each of the top 20 qualifiers. Classes A and B were won by two youngsters whom I had the opportunity to judge. Young **Steve Brooke**, son of twice International Champion **Ralph**



Charley Kenney wipes oil from The Pathfinder.

An uncomplicated Ryan M-1 mailplane ready to start.



The "Doc" Brookes family. Young 12-year-old Steve won Class A with some very impressive flying of his Kaos. Powered by HP 60 and controlled by Pro-Line. Steve has been flying RC two years and won his first contest a year ago.



RADIO CONTROL

C PATTERN QUALIFYING—EXPERT

Jr.-Sr.-Op.	Points
1. Ron Chidgey	463
2. Jim Whitley	454
3. Norm Page	452
4. Lew Penrod	448
5. Phil Kraft	441
6. Tony Bonetti	438
7. Jim Martin	431
8. Steve Helms	430
9. Joe Bridi	429
10. Steve Buck	428
11. Jim Kirkland	426
12. Ralph Brooke	424
13. Don Coleman	422
14. Ted White	421
15. Dave Brown	417
16. Ed Hotelling	416
17. Larry Leonard	405
18. Don Lowe	401
19. Martin Barry	400
20. John Agee	396

C PATTERN FINALS—EXPERT

Jr.-Sr.-Op.	Points
1. Ron Chidgey	855
2. Jim Whitley	845
3. Don Coleman	840
4. Norm Page	831
5. Jim Kirkland	822
6. Phil Kraft	816
7. Jim Martin	814
8. Lew Penrod	813
9. Steve Helms	809
10. Tony Bonetti	808
11. Steve Buck	807
12. Ralph Brooke	806
13. Ted White	806
14. Dave Brown	804
15. Joe Bridi	786
16. Don Lowe	782
17. Larry Leonard	775
18. Martin Barry	763
19. Ed Hotelling	762
20. John Agee	758

C PATTERN—NOVICE

Jr.-Sr.-Op.	Points
1. Ed Hotelling	416
2. Rhett Miller	378
3. Kim Johnson	371
4. Don Sobbe	357
5. Ernie Weiss	355

Best C/N-E Junior
Rhett Miller
Best C/N-E Senior
Steve Ellison

B PATTERN

Jr.-Sr.-Op.	Points
1. Ellis Newkirk	370
2. Mark Smith	344
3. Jack Poppenhager	334
4. Leland Peterson	312
5. Joseph Hildreth	304

Best Senior
Ellis Newkirk

A PATTERN

Jr.-Sr.-Op.	Points
1. Steve Brooke	391
2. Robert Platteter	365
3. Donald Guttridge	364
4. Reuben Tyson	358
5. Gary Anderson	356

Best Junior
Steve Brooke
Best Senior
Robert Platteter

PYLON FORMULA I

Jr.-Sr.-Op.	Points
1. Cliff Weirick	20
2. Larry Leonard	18
3. Harold Coleson	18
4. D. C. May	17
5. Terry Prather	16
6. Kent Nogy	16
7. Doug Spreng	13
8. Tom Baker	13
9. Ed Hotelling	13
10. Telford/Violett	13
11. Dan McCan	12
12. Charles Funderbunk	12
13. Harold deBolt	10
14. Chuck Smith	8
15. Richard Brickert	7
16. Jeff Bertken	2
17. Bob Reuther	2
18. Mike Barna	-
19. Bob Smith	-
20. Jerry Wagner	-

Best Junior
Bruce Richmond
Best Senior
Richard Brickert

PYLON FAI

Jr.-Sr.-Op.	Points
1. Gary Korpi	19
2. Terry Prather	18
3. Chuck Smith	16
4. Pete Reed	16
5. Bob Upton	16
6. Tom Baker	15
7. Harold deBolt	15
8. Ron Schorr	12
9. Telford/Violett	11
10. Larry Leonard	11
11. Maurice Phillips	10
12. Robert Root	10
13. Bob Smith	9
14. Bob Reuther	8
15. Richard Davis	8
16. Jeff Bertken	6
17. Harold Coleson	5
18. Whit Stockwell	4
19. Jack Stafford	2
20. Basil Derrough	2

Best Senior
Whit Stockwell

SCALE

RADIO CONTROL

Jr.-Sr.-Op.	Points
1. Bud Nosen	16208
Douglas A-1H Skyraider	
2. Walt Moucha	15612
Fly Baby	
3. Edward Ellis	15298
Ryan M-1	
4. Don Botteron	14605
Ziin Akrobat	
5. Ralph Jackson	14145
Windecker Eagle	

Best Flight Achievement
Tom Cook
Best Senior
Bill Hiller



A very rainy day during pattern prelims. Flying in the rain ain't much fun, but fly we did. Ed and Louise Izzo do their thing.



Jimmy Grier gets his "kicks" out of a Norm Page Mach 1 these days. Jimmy is always a tough competitor.

Young Rhett Miller, only 14-years-old, came within a whisker of qualifying for Class C top 20! A Kirkland-designed Intruder.



Jim Bonanno's replica of the WW II German Stuka JU-87 diver bomber.

Bill Bertrand surprised everyone with a new ship—a Handley Page bomber. It was a handful to fly!



Brooke, took Class A Pattern in impressive fashion. This youngster has been flying RC for only two years and flew in his first meet just one year ago. The boy's technique, presentation and execution of maneuvers was far beyond his tender years. Also Ellis Newkirk from Nashville, winner of Class B, had all the style and skill of many oldsters. You can certainly expect a lot from these boys as they move into the advanced classes! Let's also mention 14-year-old Rhett Miller from Tallahassee, Florida. This boy placed second in Class C Novice and almost made the finals in Class C. He has been flying competition for only two years with two wins and a second in Class A, two wins in Class B, and two wins in Class C/D. Except for engine problems in two qualifying flights, Rhett would have been flying in the top 20 Class C finals at the Nats!

What is a Nats without "Goldie" Goldclank doing his thing in Pattern and Pylon? This guy won't admit it and rarely shows it, but he is really a very good flier. Goldie's thing is not winning but having a good time in his own fashion and entertaining the crowd with his original (and unrecognizable?) maneuvers. Fun and laughter is Goldie's reward—too bad more of us can't be satisfied with that!

Horror of horrors, a Nats without Bill Bertrand's perennial monster scale Fokker D-7? Bill showed up this year with a four-engine (count 'em) scale Handley Page biplane bomber, and it flew—precariously. Why must it be that Scale is fraught with near-disaster in flying most of these fabulous creations? I strongly contend that we are placing too much emphasis on scale and not enough on flying. It takes one to two years to build a competitive scale ship and five seconds to wipe it out! This happened to several at this Nats. I don't have a final count, but many were damaged or lost including two beautiful Ray STs by young Bill and Jim Hiller—months of work down the drain!

Stand-off Scale, here we come! Rarely have I witnessed a good scale-like flight in RC Scale and I didn't see one this year. An interesting sidelight in Scale: Fred Stark placed only 19th in RC Scale with a cute McDonald Doodlebug, but he was Scale category champion with firsts in Indoor Rubber Scale, Outdoor Rubber Scale, Navy Rubber Scale, second in Outdoor Gas Scale and 19th in RC Scale—now there is what I would call a Scale enthusiast!

What about design and trends? Most Pattern ships seen at the Nats were fast and sleek, complete with super engines and retracts. Phil Kraft tried to turn back the clock with his famous Kwik-Fli III and placed sixth. The fast aircraft definitely had an advantage in the windy weather conditions that prevailed during the prelims. However, slower ships such as Steve Brooke's Kaos looked very good in the calm air Sunday morning.

All Class C finalists had retracts as well as "honking" engines. Probably the fastest was Jim Martin's Banshee pro-



pelled by an H.P. (Hot Pants) 60. Would you believe a mile-high top hat? (Well, almost.)

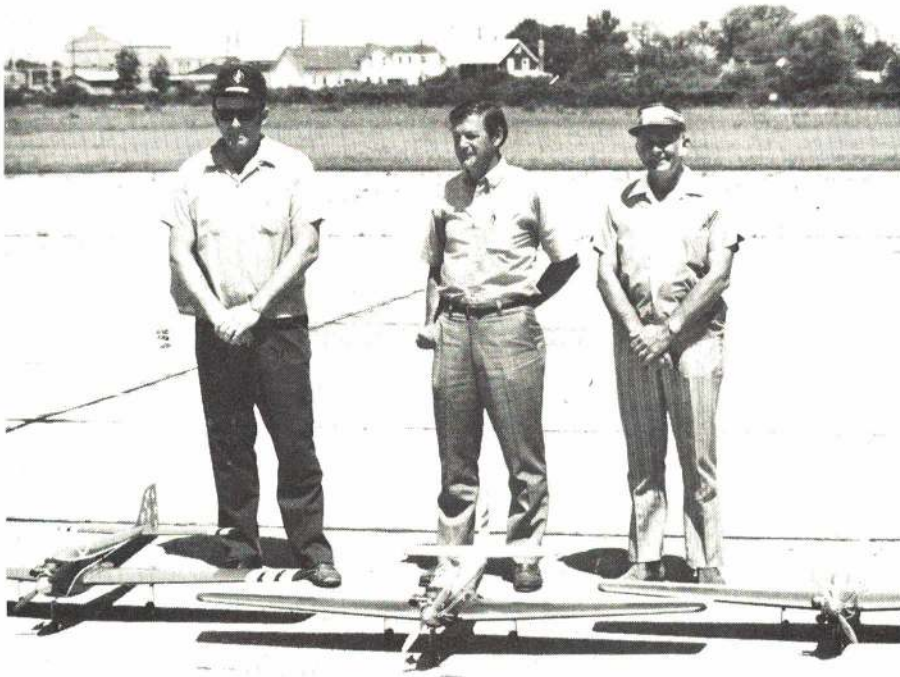
A very interesting flap/aileron arrangement was used by both **Bob Smith** and **Ed Hotelling** on their Pattern ships. Bob says the flaps cut landing speeds in half! Bob flew a beautiful T-2A which he plans to add to his kit line. Du-Bro showed a very interesting muffler which was used by several contestants. It is a compact device made of perforated flat plates stacked together with spacers; it will soon hit the market.

Fred Hartshorn flew a unique ship—very long fuselage, highly tapered wings and coupled flying stab and flaps! Now that was different! It was complete with retracts, 550 sq. in. and a Webra Blackhead—fast!

Pylon was dominated by the new K&B Schneurle engine. "Over the Hill" **Cliff Weirick** showed them in Formula I with all firsts. Many of the California troops dropped out in the finals for one reason or another—mostly equipment or damaged aircraft. A downwind takeoff was the nemesis of several. A near-disaster occurred when **Bob Reuther's** Minnow pranged into the crowd with equipment failure and New England's "Tiny" **Rich** escaped with a bad cut, bruises and shock. Tiny's buddy, **Jerry Wagner**, a potential winner due to a tremendous qualifying time, thereupon withdrew from the contest. **Bob Stockwell** did a great job calling the races. His expert patter added much to the activity.

Helicopters are here! Informal competition and demos in the evenings brought out many originals and kit designs. The most impressive (to me) was still the Schluter chopper flown by **Horace Hagen**. AAM's **Ed Sweeney** showed up with a very interesting variation on the Du-Bro Whirlybird soon to be an AAM feature. Windy conditions are still a strong deterrent to helicopter operation and proved to be the downfall of several, but progress has been remarkable!

How does one sum up the '72 RC Nats? *Memorable*—the last (supposedly) Navy-sponsored Nats. *Frustrating*—same management errors here and there, I'm sure aided and abetted by lack of Navy help. *Scary*—the speeds of Formula I and FAI Pylon are almost out of hand. *Satisfying*—a demonstration of aircraft, design and performance, undreamed of when I first entered the hobby/sport. So into history we file the 1972 RC Nats.



The big winners in Class C: **Jim Whitley** (2nd), **Ron Chidgey** (1st for the second time) and **Don Coleman** (3rd). Note that Jim was flying Ed Keck's ship as a backup when his own was splattered due to radio interference.

Leon Shulman flew Top Flite kit P-51 Mustang in pattern until a glitch destroyed this fine ship, retracts and all.

The most unique pattern ship there—**Fred Hartshorn's Thunderball**. Coupled flying stab and flaps, 12 to 9% wing, wing taper 13 to 4 in. tip, 550 sq. in., 7½ lb., Rom-Air retracts. Really moved with a Webra Blackhead.

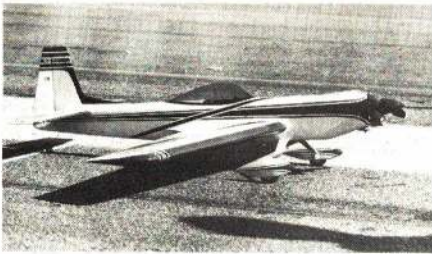


Scale winner in flight. **Bud Nosen's** highly detailed and colorful A-1 Skyraider which later crashed by control system failure.



Mike Mueller and his Mach 1 from Chicago. Also very close to qualifying for top 20 in Class C.





Beautifully finished in red and white trim is Lew McFarland's Akromaster. Lew finished fourth in the Open Stunt category with this fine scale-like plane.



Dick Sawicki's Fairey Spearfish is extremely stable as it is seen here in the low speed run. This fine flying plane earned Dick a fourth place in Open Navy Carrier.



Scale Racer by James Hojnaski has all the latest improvements used on many of this year's racers—foam wings, metal engine mounting plates, titanium gear, and Kosmic engine.

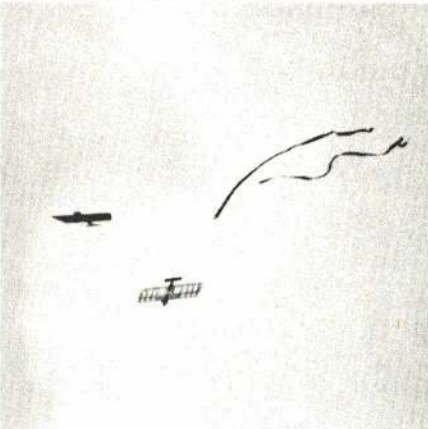


This beautiful F4 Phantom by John Valasek was the only jet-powered entry in the CL Scale events. It weighed 6½ lbs. and was equipped with a Dyna-Jet. It is from AAM plans.

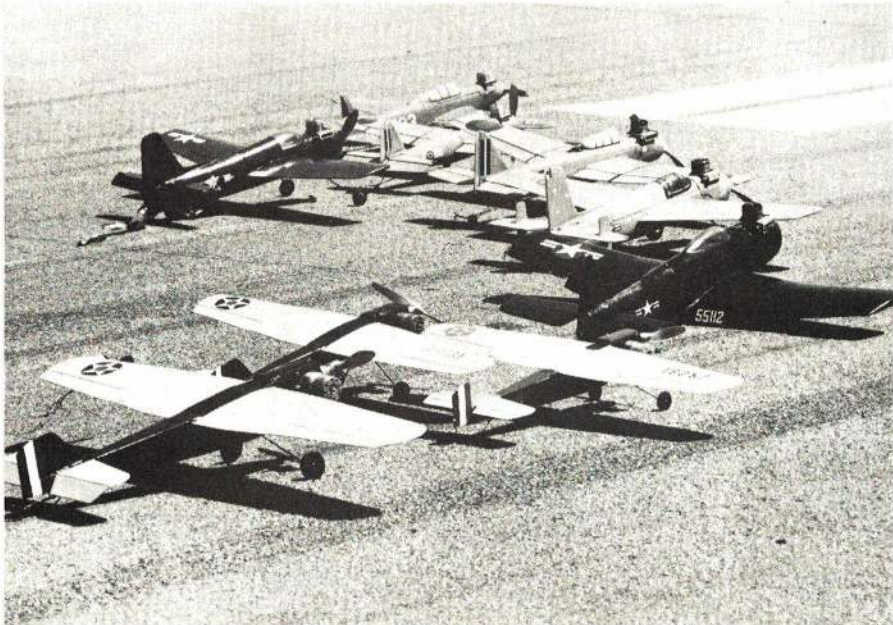


It's a Flap Jack; Navy's experimental Sea Skimmer was the basis for this novel Profile Carrier plane flown by Bob Hayward.

There's no doubt about this one, it's a clean cut—one of the many seen in the final round of the Open Combat matches.



Small League of Nations is seen in this line-up of Class I and II Carrier planes. Planes are Mauler, Martin MO-1, Guardians, Fairey Spearfish (English) and The Latecoere (French). Also seen, but not pictured, were several Japanese planes.



The 41st Nationals Competition of the Academy of Model Aeronautics was hosted for the 25th time by the U.S. Navy at Glenview N.A.S., Illinois, during the week of July 24 to July 30, 1972. For those of you who could not attend we'll try and present the highlights of this year's competition.

Before getting into the competition highlights, I'd like to cover briefly what makes a Nationals competition. We might ask the question: Is the NATS a true Nationals competition? I think not. Our Nationals competition is more like an annual convention of model fliers. It is that once a year opportunity for the inexperienced to come in contact with the champs. It's a time when clubs or areas of the country come together to fight it out in friendly competitive rivalry, and of course it's a time when last year's champions try to retain their crowns for another year. It's also a time for talking about the good old days and renewing modeling acquaintances.

Modelers come from just about every state in the United States, Canada and Mexico—with cars, station wagons, campers and trailers all loaded with modeling equipment. Housing arrangements are somewhat unique; those with campers of course live in them, many stay in Navy barracks, while still others bring tents to form what the modelers refer to as "Tent City."

To put on this yearly extravaganza there are several hundred people working behind the scenes to make each meet a success. Many are members of the competitors' families and many are just modelers who gave up flying in the competition to work. That help was required more this year than in the past because of the Navy's reduced manpower roll.

Our many "thanks" to all who gave up some of their flying time to work.

Rat and Scale Racing participants saw two spectacular performances, one by the Boss Rat Team and the other by a club known as the Cow Town Circle Burners.

The Boss Rat Team has been trying for seven years to capture the Open Rat Race crown, and finally succeeded this year. Not only did they take the Open Class, but also succeeded in winning in the Senior category.

Bill Keller piloted his HP-powered ship to a 5:10.4 win in Open which was 14 sec. faster than last year's time, while Bernie Varnau captured the Senior Class for the Boss team. (*With a name like that I couldn't help but root for them.*) It should be noted that Bill Keller's win in Open was made under extremely bad weather conditions. Not only was it rather cold, but it rained heavily almost all day long. Perhaps this helped keep his engine cool for the great time turned in.

The Cow Town Circle Burners of the Irving-Dallas, Texas area put in a most impressive performance in Scale Racing by flying to victory in all three classes.

Mark McEndree, Junior Class; Dennis Williams, Senior Class; while Kerry Turner took the Open Class. The best time posted was 6:54.3 by Turner



Contestants in the Goodyear Race event line up for technical examination before entering the competition.



Waiting in line seems to be part of the game. Navy Carrier ships are lined up for processing the night before flying the event.



The Dixie Whiz Kids, left to right, Dennis McGraw, Brian Webster, Mary Lou Brown, Charlie Schubert, and Brian Pardue, all champions in their own right, combined their talents again this year to walk off with the National Team Championship.



Tuning the engine of his carrier plane is Jim McEndree. The plane was piloted by his son, Mark.



This V-tailed French Fouga Magister sporting a Belgian paint scheme was another of the scale-like Stunters that brought Dennis Adamisin a first place win in the Senior Stunt category. Similar version of the model is in this issue of AAM.



Tanks away—Hawker Hurricane MK-2-G by Lynn Sidabras was the only CL Scale plane to demonstrate airborne operational features other than flaps and throttle control. His efforts garnered a third place win in the Open Class.



Gusty winds and rain couldn't dampen the spirits of 1/2A Proto racers (left to right) Peter Bauer (9) and Tommy Wozny (6). With temperatures dropping into the 60s and the onslaught of rain, the boys and their planes remained warm and dry under their home-made shelter.

in Open—some 25 sec. better than last year's mark. However, the best improvement in time was turned in by McEndree in his first Nat's entry, beating last year's time by posting an 8:13.9, 1:10.3 better than the 1971 winner. All Scale Racing winners used the Rossi 15 engine and the same basic plane.

In the hardware department many planes sported metal engine mounting plates, reported to reduce vibration and act as a heat sink for better engine cooling, thus better engine performance. Several inverted engine mountings were seen as well. Foam wings are also becoming popular in this fast growing event.

Dave Ankenman (Toronto, Canada) had the most novel engine-plane combination in Scale Racing. Dave had his Ole-Tiger Scale Racer outfitted with an ST 15 rear rotor engine and a tuned pipe. Dave had high hopes of turning some fabulous times but pit stop problems and weather prevented him from giving a winning performance.

Speed was plagued with weather problems—starting out on the first day of competition with rain, going to a cloudy and cool day on the second, and too hot and dry on the last two days. Just when most thought they had that magical needle valve setting, the conditions changed and so far fewer good times were posted than were expected.

No radical changes or improvements were noticed in the engines or equipment; the larger classes were again dominated by Rossi and Supertigre while the TDo49 was prevalent in the 1/2A events. It might be noted that the Juniors turnout in Proto Profile was the largest in many years, primarily due to Dale Kirn's "Torky," a well-constructed and good flying kit that can be mastered by the youngsters. The Jet event also had an exceptionally large turnout with considerable success attained by all in getting in full flights. Weather kept records from being established in many categories of Speed, however, several good performances were turned in.

The Bartley/Garner/Huff Team (High Point, N.C.) succeeded in establishing a record in the Open B Proto event with 156.59 mph.

Dennis McGraw, a Junior from Memphis, Tenn., put in a record performance in Jet Speed setting a 166.87 mph mark, and then backed it up with a 167.37 mph flight.

Glenn Lee (Batavia, Ill.) not only captured the Open C Speed Class with a 186.84 mph to beat out the Bartley/Garner/Huff Team by .58 mph in this event, but also captured the overall CL Championship award by accumulating 714.43 points. Glenn flew a finely made plane equipped with an OPS 60 and tuned pipe for his C Class win.

The Dixie Whiz Kids Do It Again—Dennis McGraw; Brian Webster, Manchester, Tenn.; Mary Lou Brown, Staten Island, N.Y.; Charlie Schubert, Greensboro, N.C.; and Brian Pardue, High Point, N.C. make up the Whiz Kids Team, and put in a spectacular performance by winning the National Team Championship for the second year in a



row. Flying in some 40 or more events the kids racked up an impressive 2919.98 points.

Over 200 contestants participated in this year's Combat Bash with 135 in Open, 65 in Senior and about 20 in the Junior class. When I say "Combat Bash" I mean just that, because there were more planes driven into the ground or involved in mid-air collisions than I have seen in the past three years. In two matches the Combat boys gave the Free Fighters competition—combat ships in each match broke loose and put in maxes. Both planes went up and out of sight. Howard Rush was one of those making a max; his plane was recovered from the N.A.S.'s golf course. I never did learn who flew the second Combat free flyer or whether it was found.

Combat flying this year was most spectacular. There seemed to be as much controversy on the ground as there was combat in the air. Contestants were at odds with the judges on many calls on how many cuts were made or who had the kill. One such protest ended in the awarding of duplicate trophies for fourth place in Open Combat to Bob Baldus (Dayton, Ohio) and Ron Esman (Houston, Texas).

There was also a display of sportsmanship between two buddies, J. Sima and W. Keidel in the semi-final fly-offs for fifth place in the Senior category. Sima and Keidel were matched against each other. This would have been alright except for the fact that they only had one plane between them. Sima forfeited the match to allow Keidel to fly in the next round. As it turned out Keidel lost to B. Miller (Des Moines, Iowa) for the fifth place honors.

Texas Does It In Combat—All three category winners in Combat hailed from Houston or Dallas. Mike Wheeler from Dallas took the Open event by posting ten sec. better air time than John Hollfelder (Castro Valley, Cal.). Mike flew a "Spoiler" equipped with an ST 35BB engine, a pacifier, 9-6 Power prop and used 40% nitro fuel. Russ Green, from Dallas, Texas took the Senior category with his "Sneaker" equipped with an ST 35BB, pacifier and an 8-8 Tornado prop. Engines used by both these winners had been reworked by Phil Bascel. J. Plake of Houston was the winner in the Junior Class.

In the Navy Carrier event we were pleasantly surprised by the small League of Nations displayed in the various planes. The ever-dominant Guardian of the past few years seems to be giving way to a new variety of planes, all of which proved to be good flying ships. In addition to the ever-present Guardian the following planes were seen: Martin MO-1 by Don Gerber, Mauler by Robert Sawicki, NSB Kate (Japanese) by Tony Naccarato Jr., Naka Jima Myrt (Japanese) by Roland Baltes, Judy (Japanese) by Terry Herron, Latecoere (France) and Fairey Spearfish (England) both by Dick Sawicki. All these planes flew very well with several of them reaching the winners' circle. If you are looking for a Carrier ship that's a little

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Glenn Lee, the tall quiet man of the speed circles, made quite a roar this year capturing the Individual CL Championship. Glenn displays his OPS 60 powered Speed ship which won him a first in C Speed with 186.84 mph.



It's a family effort. Paula, Peter and Matthew Bauer all entered the Junior Scale category with their Volksplanes. Paula beat her brothers by placing fourth.



Cow Town Circle Burners from Ft. Worth, Texas, make a clean sweep of top honors in Scale Racing. Left to right are Kerry Turner, Open; Mark McEndree, Junior; and Dennis Williams, Senior.



Upside down or right side up, it's a good flyer. Pictured here is Al Rabe's scale-like Seafury Stunter during inverted portion of flight pattern. Al flew the Seafury to a first place win in the Open Stunt Class.



Retrieving a rat by Sherwood Buckstaff are his pitman, Ron Esman (right), and Carl Layman.



Displaying one of his many planes, William Allen shows the finer points of combat to Miss Model Aviation, Linda Pillion.



Jim Finley shows off his Nats winning Guardian with Terry Herron (right), winner in the Senior Class I event, and Greg Hissem.



Holding hands in victory, Mike Wheeler and girl friend show great pleasure over Mike's first place win in the Open Combat Class.

PYLON



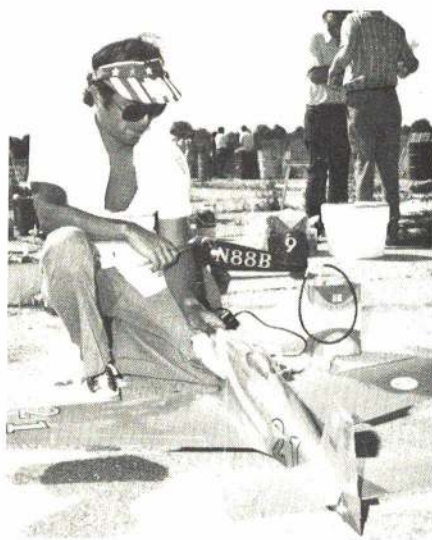
The FAI winners, Garry Korpi and partner Luke Roy (1st), Charley Smith (3rd), and Terry Prather (2nd) are all going to England for the Cranfield Internats—great U.S.A. representation. Telford/Violett, Larry Leonard, Doug Spreng, Whit Stockwell, F.N. Maire, and Jeff Bertken are also going.

Leader of the "coming up the other side of the hill gang," Cliff Weirick won in Formula I, firsts in all heats for this former AMA President.



Dan McCan puts the finishing touches on a propeller before qualification flights.

Who says all the chess action takes place in Iceland? Although an unlikely and sometimes nerve-racking location for a game of chess, old friends Douglas Spreng and Morris Atun found a place to relax during pylon racing.



Manuel Davilla of Mexico City replaces a propeller broken on take-off. He has been flying model airplanes for three years, and this is his first Nats and first Formula I competition.

Though Bob Smith had his troubles at the Nats this year, the end of September will see him married to this lovely gal holding his Miss DARA, Kathy McCan. He won't be fretting much then over all those cuts he took in FAI or the busted wing on take-off in his first Formula I heat—and he did establish a new world's record, 1:27.4 in qualifying!



D.C. May and Harold Coleson on line ready to go. Came in 3rd and 4th and called for each other.

Really bad luck struck Bob Reuther when his radio failed, crashing model into ready area and injuring Tiny Rich, fortunately not seriously.



Three high points in Pylon Racing at the 1972 Nationals stand out: (1) Johnny Brodbeck and the K&B Schneurle were the fastest with the mostest; (2) Cliff Telford and Bob Violett dramatically improved the speed potential of FAI Pylon; (3) A serious accident, that could have been much worse, put a damper on the whole affair.

Consider the K&B story first. They posted the four top Formula I qualifying times: Bob Smith set a new record time of 1:27.5, followed by Larry Leonard with 1:30.1, Kent Nagy with 1:31.5, and Chuck Smith tied with Telford/Violett at 1:32.7. The slowest qualifying time was 1:40.0, a little slower than we had predicted (I didn't think anyone slower than 1:36 would make the finals). In the finals, eight out of the top ten finishers did it with the Schneurles, including the first four out of the top five: Terry Prather was fifth with a Tigre, and Telford/Violett were tenth.

There were no R.A.F. engines available for the Nats, and now it appears they will not be competing prior to next season. Jack Frye brought one of his test engines which Whit Stockwell flew for him after the Formula I finals were over; while the engine appears to have great promise, it is also clear that more refinement is needed. None of the H.P.s made the finals, and only four Super-tigres did.

On the other hand, there was ample evidence in FAI Pylon that the Tigre is equal or superior to the '71 K&Bs (almost no one tried to run a Schneurle in FAI, for good reason). The Korpi/Roy team, with a '71 K&B modified with Luke Roy's special head, took four firsts out of five heats, and were second to Whit Stockwell's Aldrich Supertigre in the only heat where he got off the ground all day. Since that 1:59.4 for second place was the best time Korpi posted in the finals, though he had a 1:51.8 in the qualifying runs, it would appear that the engines are competitive.

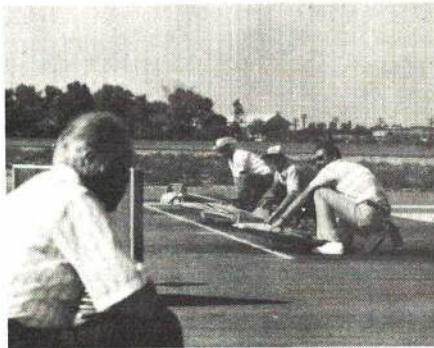
More striking evidence of the competitive status of the Tigre in FAI was the spectacular showing of the Telford/Violett team in the qualifying runs, where after failing to get off on their first attempt, they posted a 1:45 for eleven laps, and a 1:44.4 in the finals for ten laps. Some of their speed can certainly be attributed to their highly original design which places the two wheels side by side in the belly of the fuselage, leaving a completely clean wing and absolute minimum wheel drag, with anhedral in the stab to give ground-handling stability (about a half inch clearance on each tip). It was the ground-handling stability that cost them the contest, since they were faster than anyone else by a wide margin. All they really had to do was get in the air five times and cruise around the course. But, as in qualifying, they failed to get in the air once, and twice were beaten when their extremely sensitive needle valve setting was off the mark. In the end, K&B not only had the first four places in Formula I, but one, three and five in FAI.

The accident that marred the Formula I races happily turned out to be less serious than it at first appeared to be. The control tent and ready area were only 150 ft. from the No. 3 pylon—absolute minimal legal distance. Never again should it be less than 300 ft. Bob Reuther had completed the first heat of the day and was coming around No. 3 rather wide at the end of his precautionary eleventh lap when his radio went ape and he got two bumps and then full down elevator. The plane smashed directly into the ready area, hitting Tony Rich, who is Jerry Wagner's caller, on the left wrist and side. Tiny was in shock for a few minutes, an ambulance quickly got him over to X-ray, and within half an hour he was back watching the races, with a bone fracture in the wrist. But it was so close that we can only shudder at what might have happened. There is no point in saying that it could have been prevented by slowing them down: it was *not* pilot error, and a plane going 10 m.p.h. slower would have done exactly the same thing. I am reporting it in detail as I want the facts known without distortion or hand-wringing over the dangers of Pylon Racing.

Because of the accident, Jerry Wagner withdrew from the remainder of the competition. I was tremendously impressed with his airplane, his general competence, and his sportsmanship. His blue mid-wing Cosmic Wind was one of the very finest Formula I ships to qualify. All balsa, including the cheek cowl and a built-up stab and fin, it weighed 4¾ lb. all completed, and Jerry had to add some lead to make it legal. Jerry's 1:33.0 was sixth best qualifying time, and I think there's no doubt he would have placed high in the finals. I think he's about the best bet I've seen to win the Nats next year, given any decent breaks at all.

My own association with Pylon Racing only goes back to 1967, when I saw Joe Foster beat Cliff Weirick in a fly-off for first that ended with Cliff's dramatic dive from several hundred feet up (his victory roll) that splattered his Midget Mustang totally in an area that could be covered by a dinner napkin. But before that, he was the winner of the first Nats Pylon Races ever. And now, six or seven years later, after several near misses, this former AMA president, this leader of the Over-the-Hill-Gang; has done it again: and he earned it with five perfect races, in one race beating Terry Prather and Larry Leonard (who ended up fifth and second, respectively), beating Harold Coleson in another (he came out a sparkling third), and D.C. May and Danny McCann in still another (D.C. was fourth, in the end, and Danny had carburetor trouble that knocked him down to eleventh). Cliff's time was only the fourth best of the finals (1:34.9, with Leonard's 1:33.5, Prather's 1:34.0, and Nagy's 1:34.7 ahead of him), but he was as fast as he had to be whenever it was necessary: and just as he did at Las Vegas, he came through on the big ones. I have never seen a more exciting race

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Carl Goldberg watches at the starting line as they're about to be released. His new retracts very popular for use in FAI birds.

Irwin Funderburk with Stengall Minnow.



Cliff Telford and Bob Violett's Tigre picked the day of the Nats finals to go over the hill. The prototype plane was built amid mild protests about the landing gear system on the Bob Cat. However, it does meet the rules and will beat 1:30 with a bit more flying.

Morris Atun holds model aloft to confirm needle setting.



The Formula I winners with starter Jerry Christensen and race controller and tabulator Jean Christensen, the left and right hands of C.D. Glen Spickler. In front between Jean and Jerry are Cliff Weirick (1st) and Jerry Leonard (2nd). Cliff is holding his Stafford Minnow, Larry his P.B. Products' Miss DARA. Behind them are, left to right, Harold Coleson (3rd) and D.C. May (4th), both with their Stegall Minnows, and Terry Prather (5th) with Stafford Minnow. All except Terry had K&B '72 Torpedoes; Terry had his reliable Super-tigre.

Charley Smith, one of the leaders of the Southern California NMPRA District and 3rd in FAI, with C.D. Glen Spickler and former NMPRA President Pete Reed who, like many other top fliers, couldn't put it all together for the '72 Nats.



You have to believe this is the man, Johnny Brodbeck, Jr., who really won the Nats 1972 Pylon event with K&B Schneurle engines. This picture shows Johnny with the two rubber ducks he awarded Cliff Weirick (Formula I 1st) and Garry Korpi (FAI 1st) along with unlimited beer.

Larry Leonard (2nd in Formula I) sets needle; caller Bob Bleadon holds.



GRAND NATIONAL CHAMPION



BRIAN WEBSTER

If it wasn't for the friends he has made in modeling, Brian Webster wouldn't have been the 1972 Grand National Champion (as well as the Senior age class National Champion). In fact he likely wouldn't have entered the Nats at all or kept with model aircraft for all the period of time since his father, Lee Webster, introduced him to this hobby-sport at the age of three (!) had it not been for the most pleasant associations he has developed. In an interview with an AMA staffer Brian said, "You come to the Nats more to see your friends than you do to fly."

But fly Brian did, and very well indeed as attested by his champion-of-champions award. He not only bettered his own 15-18 age peers but the older and younger flyers as well. Brian is 18 years old.

Unlike the National Category Champions which require expertise in only one basic type of model (outdoor Free Flight, Indoor, Radio Control, Scale and Control Line), a successful aspirant for the Individual National Championships (Junior, Senior, Open and Grand) must bridge the categories. Of the nine events maximum to be considered for scoring, only two each are permitted in FF Gas power, FF non-Gas power (including Indoor) and Control Line. The remaining three can come from any of the categories.

Brian Webster chose his championship events very carefully. A prime consideration of course, was to fly the models he could expect to do well with based upon pre-Nats performance. But another factor, which he said is equally important, has to do with how points are computed according to official AMA rules.

Two years ago it was standard practice to lean heavily on outdoor FF events because everyone who "maxed out" would receive 100 points irrespective of how much flyoff time was added onto the score of the winner. Then came the new and current procedure which includes flyoffs and which awards 100 points only to the winner; and as Brian indicates, championship contenders stayed away in droves from such events as Unlimited Rub-

ber where the winner could be expected to be determined from the total of many flyoffs.

A look at Brian's events shows that he adhered fully to this concept: FF non-Gas power—Indoor Scale and Nordic Glider; FF Gas power—B FF Gas and FAI Power; Control Line—A Speed, B Speed, C Speed, FAI Speed, and B Proto Speed. As the results indicate, he was the winner or a high placer in many of these events, and even where his name is not shown as being within the first five places, he still received a good number of points for having a high (though not winning) score relative to the winner's.

Brian has just graduated from high school where he was strong in math and the sciences, and he expects to enter college this fall. Primary interests beyond modeling are in full scale airplanes and car rework. Currently he prides himself with a custom VW which has fiberglass fenders and a Corvair engine.

Most of Brian's models are his own design but incorporate the best features of winning designs by others. He rates foremost the need for consistency among the airplanes he flies rather than ultimate performance.

Two times previously, in 1970 and 1971, Brian has been Senior National Champion. This year he put it all together for the third straight year for Senior plus the top prize, the Grand National Championships. He has twice been King Orange International Contest Champion, and he has held the national record for FF FAI Power.

JUNIOR NATIONAL CHAMPION



KENNETH BAUER

Kenneth Bauer, the 1972 Junior National Champion, was influenced to begin modeling at age eight by his dad. He is now 13 and will

be in the eighth grade this fall. Optional school activities that suit his interests are science and the band; he plays trombone.

Ken's primary field is Free Flight modeling in which he has had expert tutorage and advice from not only his father but also such "name" modelers as Bob White, Jim Quinn, Bob Gibbs and Sal Taibi. That's good company to be in—which Ken recognizes and for which he is most appreciative. And during the Nats, Ken remarked that Rick Wisniewski had been very helpful at the Control Line circles.

Help is a two-way street as far as the Junior Champ is concerned. A prime example of this, brought out in our interview, occurred on the night before he left his California home for the Nats. There he was, at 8 pm,

helping a neighbor boy at his first try to learn how to fly Control Line!

Since young Bauer's experience is mostly with Free Flight models, it is not strange that his championship entries leaned heavily in that direction: Indoor HL Glider, Unlimited Rubber, Coupe d'Hiver Rubber, 1/2A FF Gas and A FF Gas. His Control Line entries, built especially for the Nats, were 1/2A Speed, 1/2A Profile Proto, FAI Speed, and Stunt. This was Ken's third National Contest.

Many original design models were among Ken's entries. A notable exception was the Starduster 350 which he flew in 1/2A and A FF Gas merely by swapping engines. He pulled another swap, using the same prop assembly for Unlimited Rubber and Coupe d'Hiver.

Why does Ken like modeling? "It's fun to do," he said, "and it also keeps you busy."

OPEN NATIONAL CHAMPION



BUCKY SERVAITES

The three-year reign of Bucky Servaites as Grand National Champion was ended in 1972, but it is believed that he has set a new mark for the consecutive number of years being Open National Champion—four. Bucky has been Open Nats Champ continuously since 1969!

Bucky builds and flies models primarily for the relaxation it gives him, he says. Even

with his work as a bridge engineer for the State of Ohio Highway Department, he makes the opportunity for having this kind of relaxation take place. Come lunch time he closes his office door, takes the phone off the hook, gets out the sticks, glue, board, etc., and "has at it for 45 minutes or so...to forget the trials and tribulations of the day."

One of Bucky's strategies in Nats flying is to make good use of his exuberent energy at the beginning of the contest by flying many events early and then tapering off as the week (and he) wears on. This works well for him since he especially likes and is proficient at all kinds of Indoor flying, scheduled at the beginning.

In using reasoning virtually identical with Brian Webster's in choosing his nine events—those with little flyoff potential—Bucky's selections were: FF non-Gas power—Indoor HL Glider, Indoor Scale, Indoor Cabin, Outdoor FF Scale and Coupe d'Hiver Rubber; FF Gas power—A FF Gas and B FF Gas; Control Line—1/2A Speed and 1/2A Proto Speed. A snag

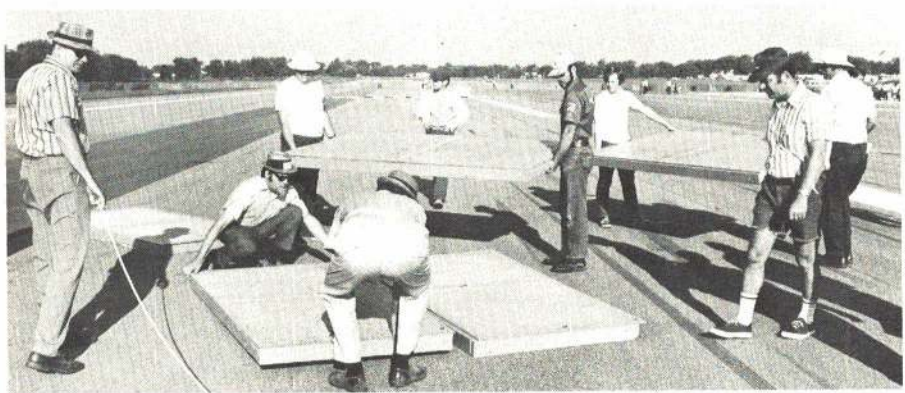
which may well have played an important role in Bucky's not being Grand Champion this year was that his planning did not take into account the need to turn in his outdoor FF Scale model on time (for static judging); the deadline occurred while he was flying Indoor Rubber in downtown Chicago, and thus he received a zero.

About half the models Bucky flew were of his own design, the other half by others. The 1/2A Speed and Proto designs were his own, although he indicates they are modifications of Warren Kurth designs. For Indoor Stick and Cabin he goes for published Joe Bilgri designs except for his own props which incorporate current thinking regarding area distribution to induce "flare" (variable pitch).

Bucky was 31 years old at the time of the Nats but celebrated his 32nd birthday a few days later. He has been in modeling for about 23 years. Interest in model aircraft structures led to his majoring in structure design and analysis at the University of Dayton where he earned a degree in civil engineering.



BEHIND THE SCENES



AMA officials snap color coded flags to signal model pilots that their planes have cleared the pylon during an RC Formula 1 Pylon race.

Part of the frequency monitoring was handled by John Swanson.



With this year's emphasis on AMA members doing the work, many of the competitors pitched in. Here we see them setting up the Navy Carrier decks.

Taking the contestants' scores and compiling them for future use was the job of Frank Nautais.



The official counters and starter were, from left to right, Howard Nupen, Jim Buckmann (Chicago area Vice President of NMPRA), Loretta and Ken Hall, Horace Cook and Jerry Christensen.

The lamp support cables collected indoor models like a flypaper strip collects flies. "Major" Brown lowered the lamps to the floor, and most were recovered.

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in the neighborhood of \$15,000 more than previous years.

This was regarded by AMA officers as a tough cost situation but one that could be met by a combination of fee increases and service reductions. It was generally felt that a limited loss situation could be tolerated in order to prevent cancellation of the Nats program in 1972. So, with some gulps and finger-crossing, the Nats planning went ahead. It was already late in the year, but a special effort would be made to catch up.

Then came another crisis in May. A request for clarification of AMA's financial obligation indicated that the cost could go up another \$10,000 above the basic \$15,000 that planning was based on. The threat of Nats cancellation, this time by AMA, was again in the air.

But some quick AMA HQ action on the phone came up with the answer. Discussion with the Navy revealed the problem to be an apparent need to fly aircraft away from the station during the Nats, the cost of which would have to be borne by AMA. By brainstorming the problem the solution came to light: relocation of Control Line events and the Sunday air show so as to permit station aircraft to remain in their normal squadron locations.

Agreement by the commanding officer, followed by a meeting at the Pentagon, confirmed the solution. The crisis was averted; the Nats was back on. But valuable time had been lost. There was barely time to get word to all Nats officials concerning details of travel and lodging. There was some confusion and some juggling of Nats workers due to the late word, but these problems were largely solved by a week before Nats time when AMA

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Wouldn't be a Nats without the hundreds of workbenches in the hangar, which were assembled and put in place by AMA air-lift gang.

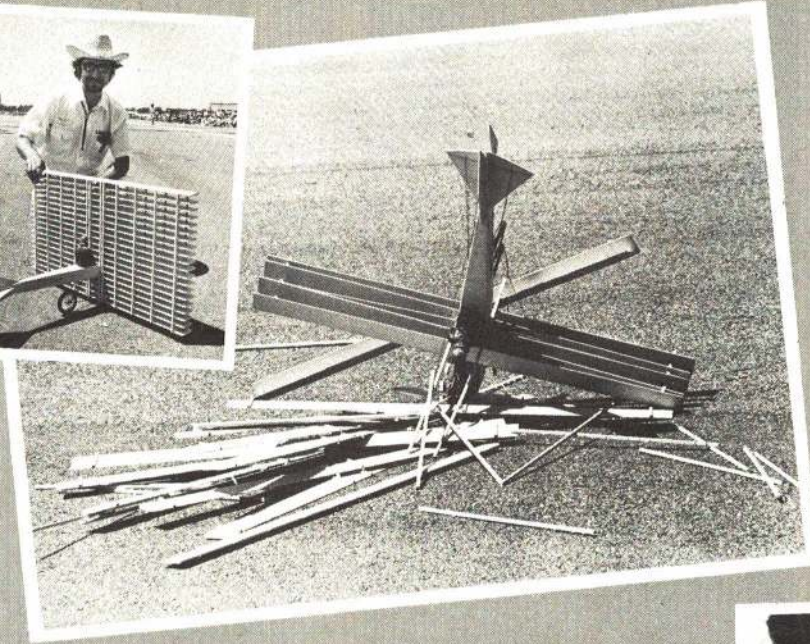
Jerry Davet's RC scale model was judged by Keith Ward, Bill Kneep and Johnnie Cashburn. They are just three of the several score of judges.

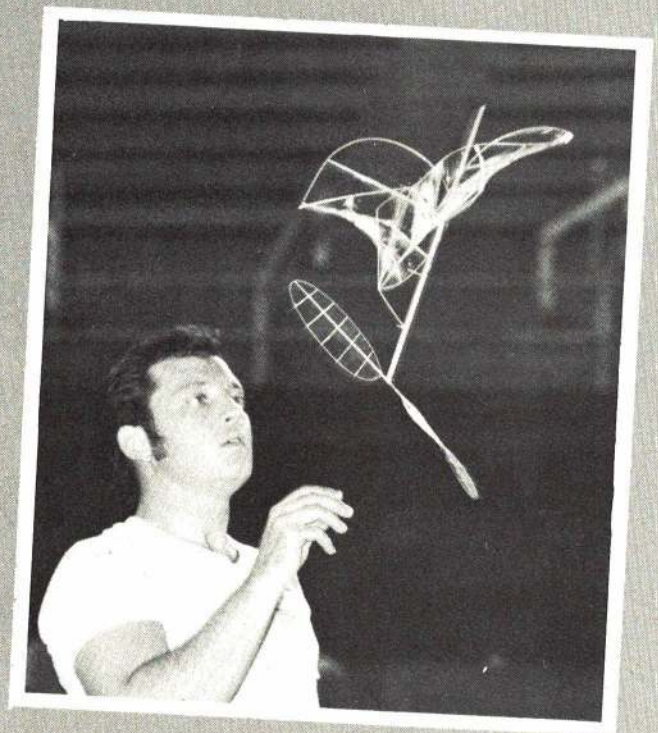


It took five hours to grade more than 50 indoor rubber-powered flying scale models in three classes.



ANONYMOUS





JIM WILMOT

The Warlock was one of the classic mistakes of all time. The usual procedure of thought and design was somewhat reversed in the creation of this machine. Far more thought and theory was expended after the first version was flown to discover why this aircraft could perform so flawlessly.

In late fall 1970, I was out flying my past National's Pattern ship and was feeling rather unsatisfied with it. Something was lacking. After a relatively dismal flight, I was stricken to the core when Lloyd Nicholson (our local big-time contest flier) offered to let me try his latest design for the weekend. (Why, I'll never know!)

Sometime later, we descended into the murky depths of his basement, a light was flipped on, and there amidst the balsa shavings and dope fumes squatted the strangest, most bizarre creation I had ever seen. If you can mentally combine the outlines of a Bomark

missile, the character of a broomstick, and the grotesque charm of an Ugly Stick, I think you will get the idea.

Upon closer examination, even stranger particulars came to my attention: flying stab, delta-outline wing, formerless fuselage, and a "King" airfoil. From this angular airframe would evolve the precise machines of a new era!

The next weekend was exclusively spent in trimming, practice and evaluation, and I slowly came to the conclusion that somewhere deep inside the essence of this craft was the answer I had been seeking. Suggestions were then typed up, and a set of modified drawings plotted out, all of which were returned with the cybernetic bird in the hopes of improving the breed. However, Lloyd had already started work along a different line, so I took it upon myself to create and modify from memory, as I had given away the only copy of my drawings. Luckily, measurements were

still clinging to the deep recesses of my mind; work progressed swiftly. Within two days the final draft was ready.

As the din of frenzied creation subsided, I dumbly stared at the result resting on the tangerine felt surface of the pool table. Something which had bothered me fixed itself into words: "Egad! The resemblance has been lost!" The essence of its predecessor had been warped by the addition of tandem gear, a swept wing, top decking, stall strips, canopy, altered movements, new airfoils, increased areas, redrawn contours and a swept fin. Through the process of imagination and a bad memory, a totally different aircraft had been arrived at.

At last the fateful day of its maiden flight arrived. The Enya 6011 was cranked to life, and this behemoth taxied out to the center of the runway. Power was brought back to full idle, and a control check was made. A powerful realization slammed through the barriers



JUST IN TIME FOR HALLOWEEN!

Warlock

of my subconscious: This monstrosity can't possibly be capable of controlled flight. It's too radical. . . too many new ideas at once. . . maybe I should forget about it. Every eye on the field is on me, I can't chicken out now. Somehow the throttle was shoved to the extreme, the Warlock screamed down the runway. Instinctively I pulled back on the stick, and the red, white and blue blur started to rotate. . .that's enough, now ease up. . .it's still going up! Put it into a bank. . .it's *still* going up! Loosen up now, just horse it on around, I thought to myself as more trim was stuffed into the box. . .here she comes!

During that immediate low full-power fly-by I came to experience a feeling of total exhilaration, of freedom and absolute precise control. I also realized that this craft was slightly under-powered and I would have to come down soon. This was one decision I wished to delay until I discovered how

the flying stab worked (I kept remembering the sight of countless past wrecks caused by improperly balanced flying stabs), and what the stalling speed was.

At the moment, altitude was no problem. Power was reduced to full idle, and back stick was fed in slowly until it became apparent that stalls were nearly impossible. With this knowledge, a final approach was set up, and a truly fantastic landing was accomplished due to the unique outrigger arrangement.

Further flights were cancelled until one of the newly introduced Supertigre Bluehead G60s was purchased, installed, and broken in. I had decided to run the Tigre rich for the first flight and was aghast when it died on me at 200 ft. altitude. I had only one landing under my belt, and panic set in immediately. I was not used to the feel of my handiwork. Instinctively, I pulled the craft into a split-S to keep my speed up, and

set up an approach for a *hot* landing. At about ten ft. altitude, I realized the Warlock was traveling at about 105 mph, downwind, and with a dead engine. As it screamed past me at eye level, I was uneasy but reassured by the two miles of runway. Sometime later, it dawned on me that my pride and joy was disappearing into the sunset with the same altitude and speed it had when it had passed by me. I let go of the back stick, and saw the plane come in contact with the strip, go careening back into the air, back down again, up again, and then settle down out of sight below the horizon. After a dismal four-mile walk to and from the site—only one outrigger was seriously damaged—I was told never to run a G-Tigre rich after it is broken in.

With an application of five-minute epoxy, I was back in business. The engine was leaned out, and the rest is history.



COMPLETELY ORIGINAL RC PATTERN PLANE
FROM MILE-HIGH DENVER IS A WINNER IN COMPETITION
AND WITH THE SPECTATORS.

Throughout the contest season, the Warlock never failed to place high in the standings. This can be attributed to three factors. First, the Warlock has the capability to awe the judges and intimidate competitors. Due to its unusual appearance and unique design aspects, an immense psychological advantage was created in my favor. In this day of immaculate maneuvers, something is needed to make a flier stand above the others. In some cases, just the name of the contestant alone is good for an extra one or two points for each maneuver. Another way to influence the judges is to literally astound them by hauling out a truly unique aircraft which flies with utter perfection.

Second, when these intangible aspects have been peeled away, the most vital factor remains: *consistency*. In this design, all the components melded together into a flawless, dependable piece of machinery. Fate guided my decision toward selecting the Supertigre Blue-head as my main contest engine. Throughout the '71 contest season, I never experienced an engine malfunction—no aborted flights, dead-sticks, overheatings, load-ups on taxi, or even a broken prop! Also, I was fortunate because I never had to quit in the middle of a contest due to radio failure (Royal Classic 70 system). And the Warlock has its own dependable features: it has the uncanny ability to maintain precise contest trim, access to most vital areas is direct and simple, every component is incorporated simply and logically.

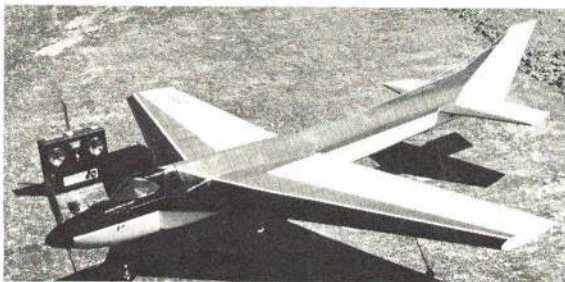
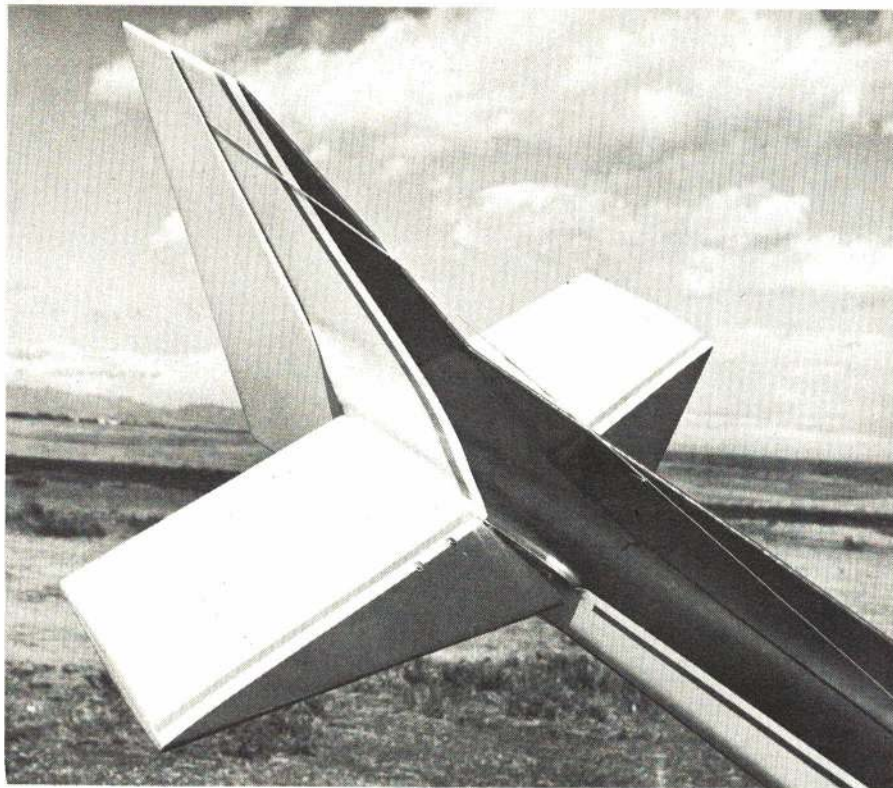
I was terribly perplexed about *why* the Warlock was so successful. After the fact, I did some research to find out where I went right! After some 83 pages of theory, I noted that through mistakes, curiosity, and pure luck, the Warlock design matches up almost item for item with the hypothetical aerobatic ideal. Through the conglomeration of rule-of-thumb and a fatalistic attitude, I've proven the age-old maxim of "what looks right flies right."

Construction

To all expert builders: If you expect to create a flyable, precise machine, you must carefully read these construction notes. Several unique practices are employed. The Warlock is not a Sport aircraft, nor even a C-Novice ship. It was designed to be exclusively built and flown by experts.

The wing should be built first. Notice that this particular wing cannot be built on an Adjusto-Jig due to its severe taper and sweep. Due to the need for precision, however, some jig has to be used. Notice that there are 1/4" holes in the rib templates through which 36" long 1/4" steel rods are inserted. One wing panel is completely assembled up to the stall strips on these rods at a time; later, both are joined together (with no dihedral) by inserting 1/4" hardwood dowels through the first three ribs on each side. Sheeting is applied around the center section and the optional stall strips, the formed leading edges are glued on, and the whole center section is then fiberglassed.

(Continued on page 69)

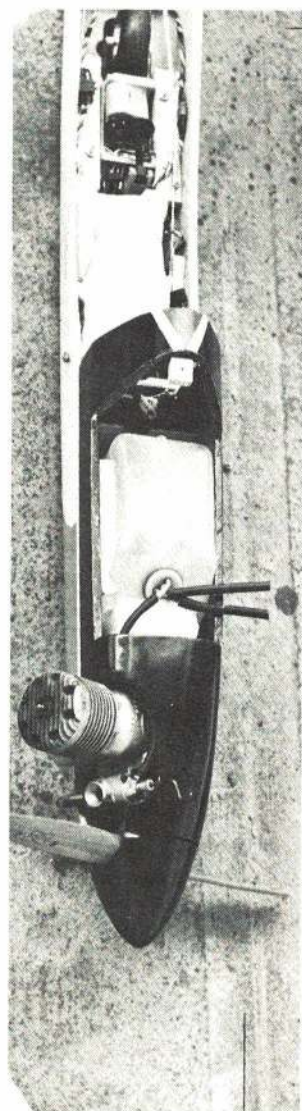


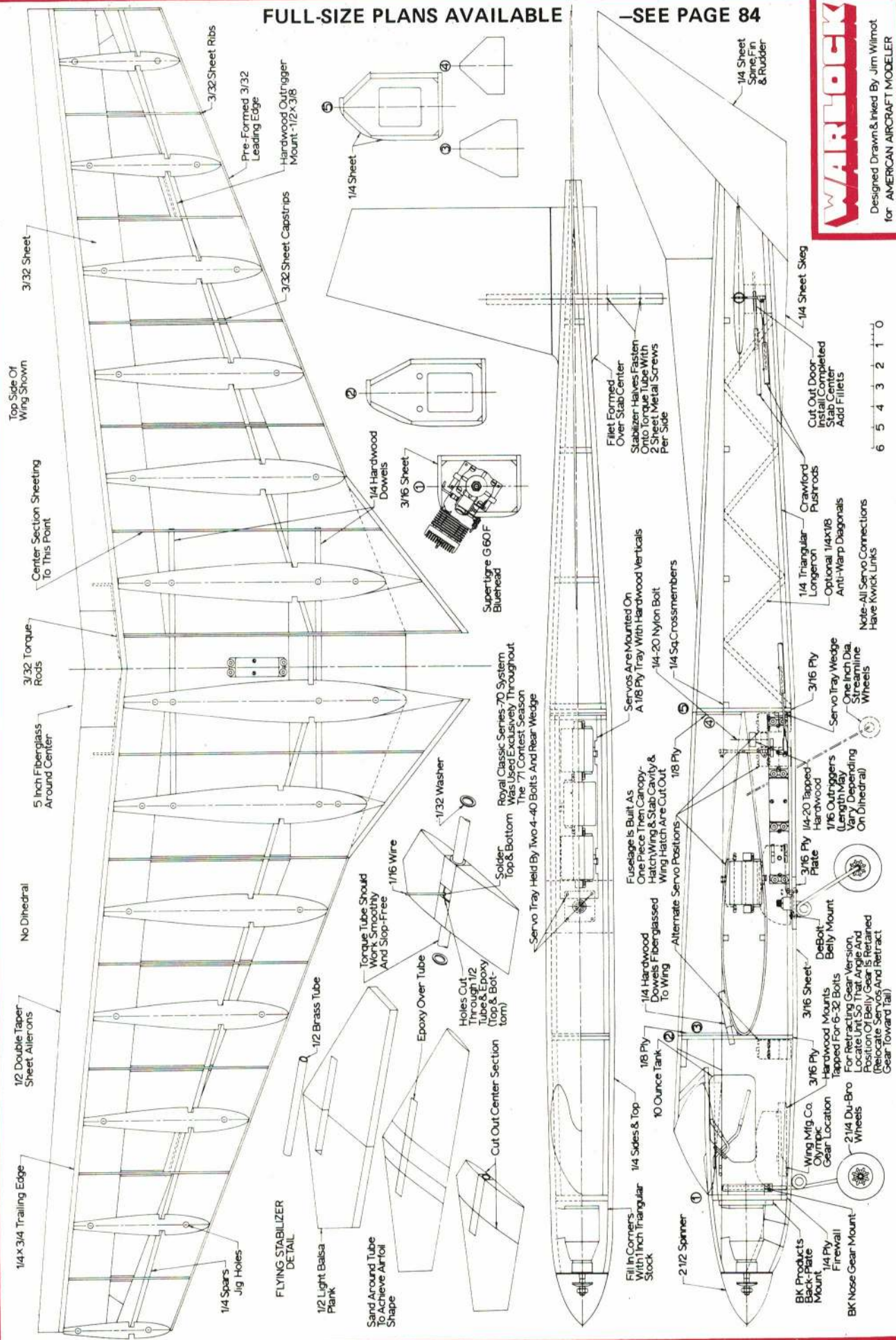
Top: All-flying stabs are becoming popular these days, Warlock was the first Pattern design to use it successfully. Smoother maneuvers and easy transport are its advantages.

Above: Guidance for Warlock is Royal Classic 70, retracts by Wing Mfg. Plane is relatively simple all-balsa design.

Right: There's plenty of room in the thin fuselage but servo locations may be a bit unique and widespread. Twelve-ounce tank carried up front with nose gear retract.

Below: How about Jim's flying site? It is just below Denver's recreation reservoir/lake. Model-size runways here, too.





1/4 x 3/4 Trailing Edge

1/2 Double Taper Sheet Ailerons

No Dihedral

5 Inch Fiberglass Around Center

3/32 Torque Rods

Center Section Sheeting To This Point

3/32 Sheet

3/32 Sheet Capstrips

Pre-Formed 3/32 Leading Edge

Handwood Outrigger Mount - 1/2 x 3/8

3/32 Sheet Ribs

1/4 Spars Jig Holes

FLYING STABILIZER DETAIL

1/2 Light Balsa Plank

Sand Around Tube To Achieve Airtol Shape

1/2 Brass Tube

Torque Tube Should Wrap Slightly And Stop Free

Epoxy Over Tube

1/16 Wire

-1/32 Washer

Solder Top & Bottom

Royal Classic Series 70 System Was Used Exclusively Throughout The '71 Contest Season

Servo Tray Held By Two 4-40 Bolts And Rear Wedge

1/4 Hardwood Dowels

3/16 Sheet

Supertigre G 60F Bluehead

1/4 Sheet

1/4 Sheet

1/4 Sheet Skag

1/4 Sheet Spine, Fin & Rudder

1/4 Sheet Skag

Cut Out Door Install Completed Stab Center Add Fillets

Fillet Formed Over Stab Center Stabilizer Halves Fasten Onto Torque Tube With 2 Sheet Metal Screws Per Side

1/4 Triangular Longeron Optional 1/4x1/8 Anti-Warp Diagonals

1/4 Triangular Longeron

Optional 1/4x1/8 Anti-Warp Diagonals

Note-All Servo Connections Have Kwick Links

3/16 Ply

3/16 Ply Wedge One Inch Dia Streamline Wheels

Servos Are Mounted On A 1/8 Ply Tray With Hardwood Verticals 1/4-20 Nylon Bolt 1/4 Sq Crossmembers

Fuselage Is Built As One Piece Then Canopy Hatch, Wing & Stab Cavity & Wing Hatch Are Cut Out

1/8 Ply

1/4-20 Tapped Hardwood 1/16 Outriggers (Length May Vary Depending On Dihedral)

3/16 Ply Plate

1/4-20 Tapped Hardwood

3/16 Ply

DeBolt Belly Mount

For Retracting Gear Version, Position Of Belly Gear Retracted (Relocate Servos And Retract Gear Forward Tail)

Wing Mfg Co Olympic Gear Location

2 1/4 Du-Bro Wheels

BK Products Back-Plate Mount

1/4 Ply Firewall

BK Nose Gear Mount

10 Ounce Tank

1/8 Ply

1/4 Sides & Top

2-1/2 Spinner

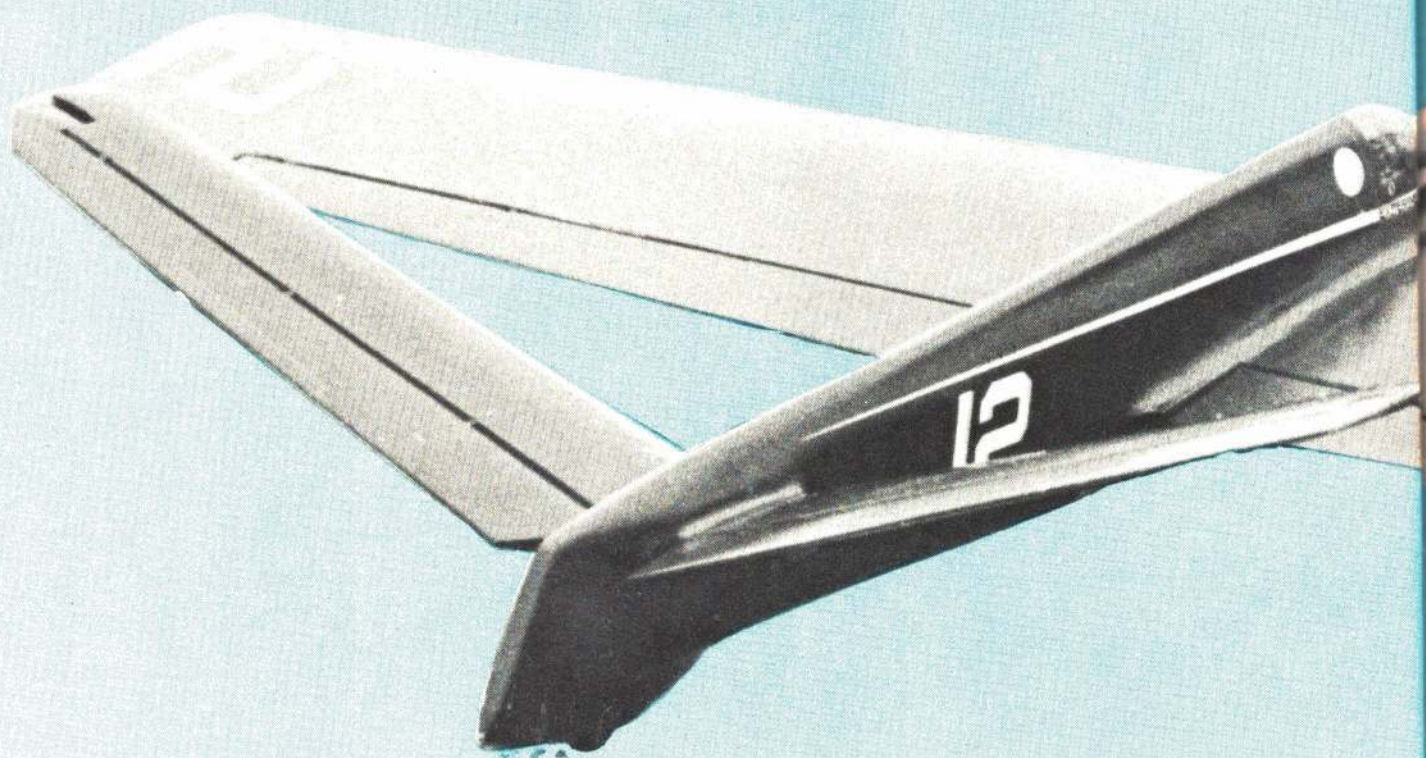
Fill In Corners With 1/4 Inch Triangular Stock

1/4 Hardwood Dowels Fiberglassed To Wing

Alternate Servo Positions



SWEET PEA



DENNIS ADAMISIN

The Sweet Pea is my newest hat in the stunt design ring. It is a notch different than most stunt ships. The V-tail not only opens a whole new series of designs but seems to improve the plane's flying ability. This airplane is the first "full stunter" I have built with a V-tail, though it is actually the third development model in my V-tail series. Number four is on the board right now, and by the time you read this it will probably have been flown and evaluated. I do not believe in building the same airplane every year.

In 1965 my brother flew his first original design at the Nationals. That year marked the last time anyone in our family flew a kit design. Since then we have designed our own airplanes.

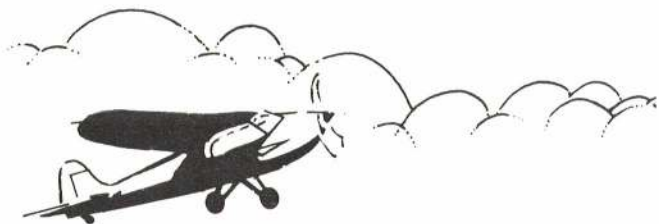
The Sweet Pea represents the present cog in our design machine. Since 1965, an impressive array of shapes has come off our drawing board with approximately half the designs actually built. The shapes have included jets, pure original, semi-scale and novelties. Variation in the design has been more than superficial; we have experimented with wing configurations, airfoils, stab and flap configurations, moment arms, wing and stab positions in relationship to the thrustline, size of the overall airplane, wing loadings, power loadings, tail-draggers, trike gears, tandem gears with

*(Text continued on page 86)
(Plans on page 48)*



Dennis Adamisin with his V-tailed stunter Sweet Pea. An original design fashioned after the Sky Baby series, it has built-up wing with sheeting, OS-35 engine and 10-6 rev-up prop.





MODEL AIRCRAFT OPERATING STANDARDS

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION



1. PURPOSE

This advisory circular outlines safety standards for operators of model aircraft, and encourages voluntary compliance with these standards.

2. BACKGROUND

Attention has been drawn to the increase in model aircraft operations, and the need for added caution in the case of free-flight and radio-controlled types to avoid creating a noise nuisance or a potential hazard to full-scale aircraft and persons and property on the surface.

3. OPERATING STANDARDS

Modelers, generally, are concerned about safety and do exercise good judgment when flying model aircraft. However, in the interest of avoiding undue criticism from affected communities and airspace users, compliance with the following standards is encouraged by operators of radio-controlled and free-flight models.

- a. Exercise vigilance for full-scale aircraft (get other people to help if possible) so as not to create a collision hazard.
- b. Select an operating site at a sufficient distance from populated areas to avoid creating a noise problem or a potential hazard.
- c. Do not fly higher than 400 feet above the surface.
- d. Do not operate closer than three miles from the boundary of an airport unless permitted to do so by the appropriate air traffic control facility in the case of an airport for which a control zone has been designated, or by the airport manager in the case of other airports.
- e. Do not hesitate to ask for assistance in complying with these guidelines at the airport traffic control tower, or air route traffic control center nearest the site of the proposed operations.

William M. Flener

William M. Flener
Director, Air Traffic Service



Planked Hulls Make The Big Difference



DRAGON International Racing Class.
31" long. Complete with fittings. \$31.00

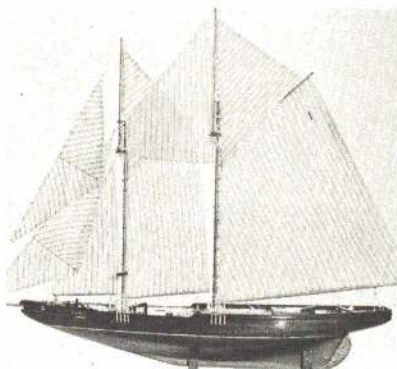
**"Pirate"
Racing Yacht**

Approx. 24½" long, 33" overall height. Mast 27" high. Excellent quality wood construction kit including keel plate, ribs, and planking. Detailed instructions and plans.

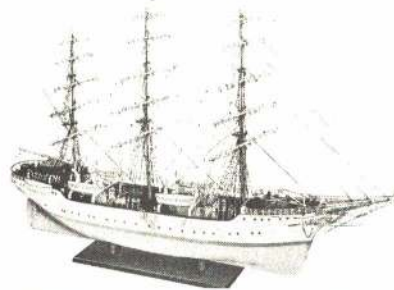
Complete with sails metal keel, and fittings. \$13.00



LILLA DAN. 26¾" long, 4¾" wide, 19¼" high. Complete with fittings. \$42.00



BLUENOSE. 35" long, 27" high. Beam 5½" with all fittings — \$52.00 \$49.00

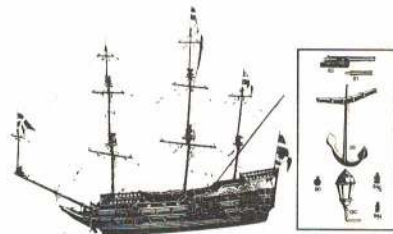


DANMARK \$77.00
complete with fittings

This training ship of the Danish Merchant Navy is a real beauty. Kit has wooden planked construction, and is complete with turned brass fittings. Scale 1:75 Length 35½", 23½" high, beam 5½".



JYLLAND Frigate. 39¾" long, 24¾" high. Complete with fittings. \$67.00



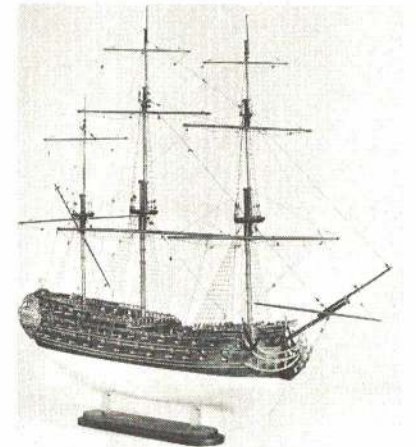
WARSHIP WASA, original built in 1628. Sunk on maiden voyage. Located and lifted in 1960, now a museum piece. Beautiful model—23" long, 23" high. All wood kit with fine, precision brass fittings. Complete kit. \$44.00



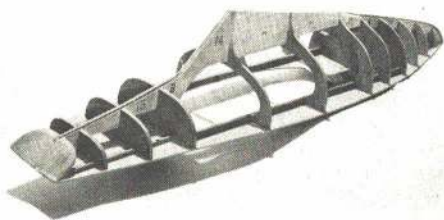
ZWARTE ZEE tugboat. 30¾" long, 11½" high, 5" beam. With fittings. \$55.00



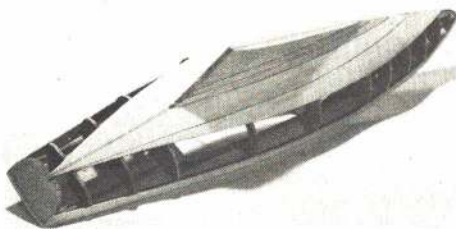
VIKING SHIP Exciting, authentic reproduction, scaled down to 26" by 6½" Complete Kit. . . . \$17.00



NORWEGIAN LION, a warship of 1765 era complete set of fittings includes 70 turned brass cannon. Challenging, rewarding kit to build. \$101.00



STEP 1. The ribbed hull of a typical Billing Boat[®] kit. No short cuts; you become the skilled modeler!



STEP 2. Planking is being laid in place. A simple challenge for any careful model builder.

**NEXT STEP:
Pick Your Kit
& Get Started**

and Billing Boats[®] Has Them!

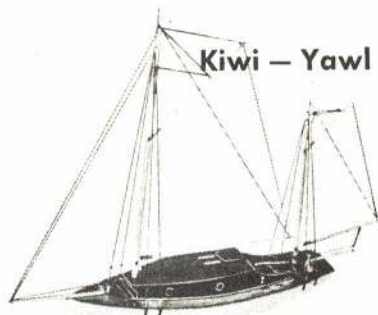
(DENMARK'S FINEST MODELS)



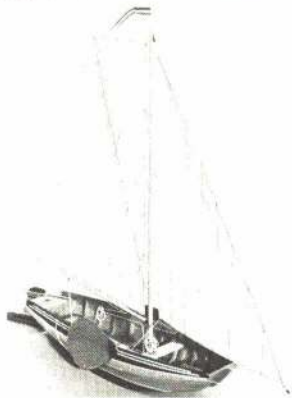
CUTTY SARK is scaled 1:75. Builds to a 44" show piece. Planked hull construction. A real modelers' challenge. Turned Brass Fittings. Complete kit. **\$96.00**



"Samson" Sea-going Tug. Unusually fine quality wood kit, with keel plate, ribs and planking. Excellent detailing includes rubber bumper on bow. Approximately 23 1/2" long. Complete with metal fittings. **\$22.00**



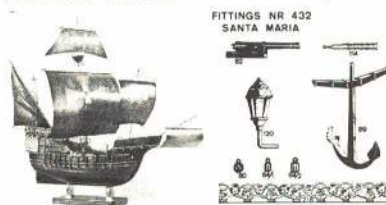
Excellent quality construction kit. 22 1/2" long by 19 1/2" high. Includes ribs, planking, Brass fittings, cloth for sails. Complete kit.—**\$14.00**



"SCHOUW" or Scow. Netherlands Canal freight barge. Easy to build this satisfying kit. Makes a 26" model with planked hull const., cloth sails, all fittings. Complete kit. **\$16.00**



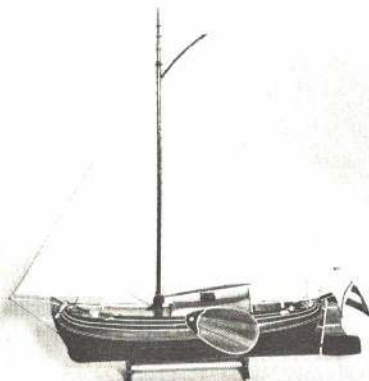
"STATENJACHT" was what the Dutch called original Royal Yacht. Planked hull const. with hardwoods. Builds to 36" long by 8 1/4" wide and 33" high. Complete with fittings. **\$61.00**



SANTA MARIA. 21 3/4" long, 17 3/4" high, 5" beam. With fittings. **\$26.00**



North Sea Cutter 21" long, 16" high. Complete with fittings. **\$33.00**



SPERWER — Model of Dutch Canal Boat, in scale of 1:15. Length 23 1/2", Width 9", height 32". Kit comes complete with sails and decorative side paddle. Complete with fittings of brass — **\$34.00.**

All Billing Boats scaled from originals. Planked hull construction with hardwoods. Turned Brass Fittings. Authentic Replicas.

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See Your Hobby Dealer... Dozens of beautiful models; some advertised in recent issues of this magazine. If dealer does not stock, send check or money order for direct, prompt shipment. California orders must add 5% sales tax. Satisfaction guaranteed.

FRANK SCOTT

The night is All Hallows' Eve, and ghostly figures scamper through the darkness to the lighted doorways where they demand their yearly tribute of sweets. There are, however, others who may call this night Lammas, and from overhead we hear the rustling of wind-blown garments as we glimpse a witch in flight on her way to the Witches' Sabbath.

Spooky indeed, but alas impossible. Magic is a flimsy substitute for aerodynamics, and so we have had to overcome the ancient broom's shortcomings with more modern power and balsa.

If you would like to duplicate our enchanting miss, pull yourself up to your workbench for a spell and clear off a spot big enough to glue together the soft 1/8" sheet balsa cape. Better first place a piece of plastic wrapping on the workbench unless you intend to fly the whole table.

Any wood model cement or white glue will suffice for the cape. Due to the unusual nature of this model, however, we strongly recommend using an epoxy-type glue for all other gluing to insure adequate strength.

The nose block can be either a solid block or laminated from any sheet wood to make a block 1 1/4" thick. When the glue has dried on the block, carefully square the front end with saw or sandpaper and drill lengthwise for the 3/8" dia. tail boom. Epoxy the 1/8" plywood firewall in place; when cured finish shaping the nose block and sand smooth.

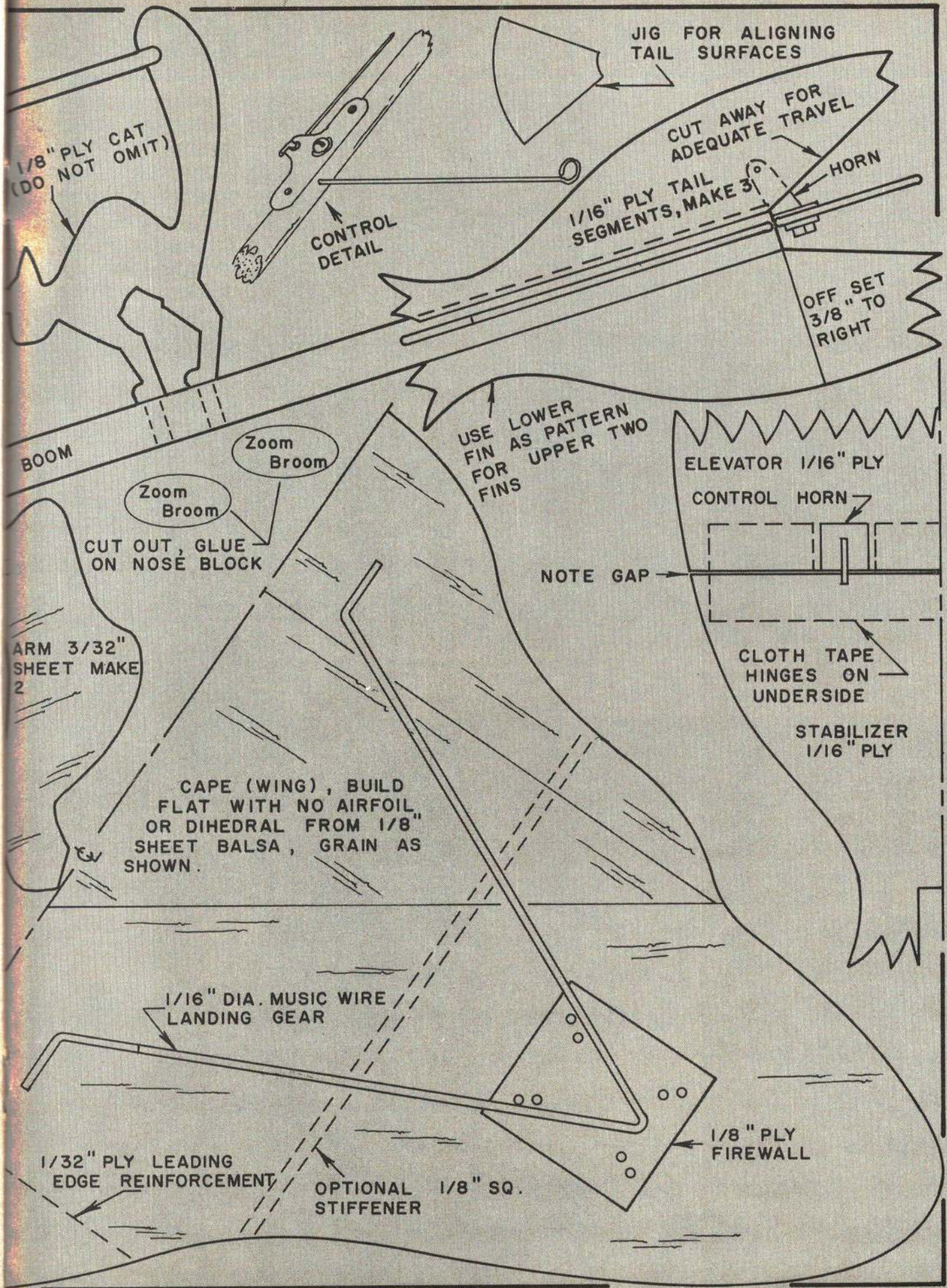
The broom handle is a 14" length of 3/8" dia. dowel slotted to receive the horizontal stabilizer and drilled to accept (in order, nose to tail) the line guide, bellcrank screw, and both the

(Continued on page 57)

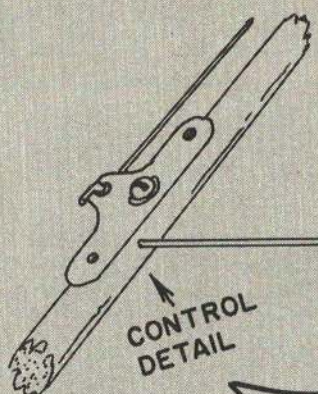


WOOD
FOR THE
TENDERFOOT

Witch craft



1/8" PLY CAT
(DO NOT OMIT)



CONTROL
DETAIL

JIG FOR ALIGNING
TAIL SURFACES

CUT AWAY FOR
ADEQUATE TRAVEL

1/16" PLY TAIL
SEGMENTS, MAKE 3

HORN

OFF SET
3/8" TO
RIGHT

BOOM

Zoom
Broom

Zoom
Broom

CUT OUT, GLUE
ON NOSE BLOCK

USE LOWER
FIN AS PATTERN
FOR UPPER TWO

ELEVATOR 1/16" PLY

CONTROL HORN

NOTE GAP

ARM 3/32"
SHEET MAKE
2

CLOTH TAPE
HINGES ON
UNDERSIDE

STABILIZER
1/16" PLY

CAPE (WING), BUILD
FLAT WITH NO AIRFOIL,
OR DIHEDRAL FROM 1/8"
SHEET Balsa, GRAIN AS
SHOWN.

1/16" DIA. MUSIC WIRE
LANDING GEAR

1/32" PLY LEADING
EDGE REINFORCEMENT

OPTIONAL 1/8" SQ.
STIFFENER

1/8" PLY
FIREWALL



SIG PRODUCTS CREATE TOP QUALITY SC



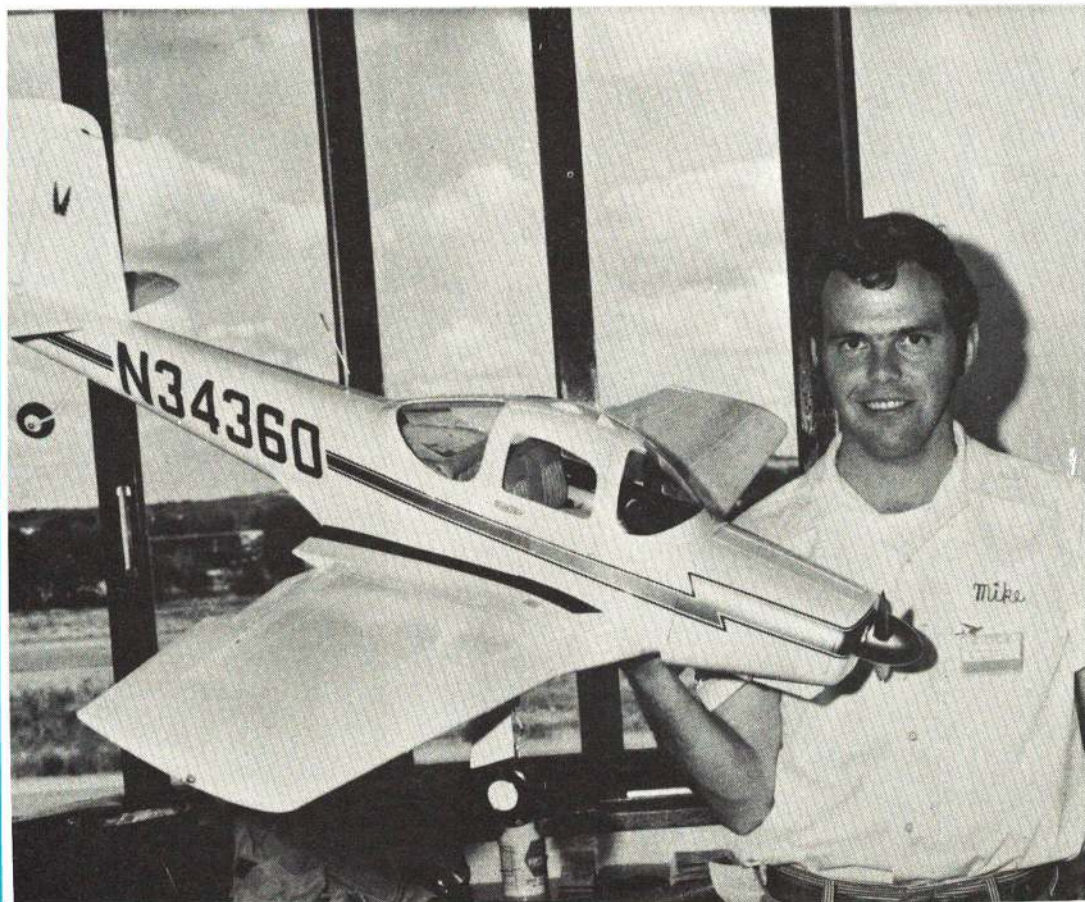
Maxey Hester's Ryan STA is one of the best known models in the world, having placed 2nd in England at the 1970 World meet, won 1st at the 1971 Nationals and recently captured 3rd in Toulouse at the 1972

World Championships, leading the U.S. RC Scale team to victory. It was the prototype for the popular Sig Ryan kit and is an outstanding performer in the air. A Logictrol Pro Series radio is used for control.

The demanding assign
tic appearance of full
quires the best. All
were built from Sig
silk, surfaces prepar
ished with Sig Super
plication of Sig Lite
competition with Sig
these standards of th



The Shinn 2150 built by Claude McCarty was picked as the best scale model of the 1972 the judges at Glenview NAS in Chicago a Sterling award. It is completely riveted than 5,000 1/32" head aluminum rivets



MEYERS 145 CONTROL LINE SCALE

Mike Stott designed his Meyers 145 from measurements and photos taken of the big ship on display at the Antique Airplane Association Fly-In. It is complete in every detail, down to the ignition key in the instrument panel and packages of gum and cigarettes on the cabin rear deck. Ross Twin powered, Rom-Air units retract the gear and the flaps also operate. Mike placed 4th at the World Championships in France during August, highest placing member of the U. S. CL Scale team.

SCALE MODELS

Assignment of reproducing the authentic full-size aircraft in miniature re-All three of these realistic beauties g balsa and glues, covered with Sig ared with Sig Sanding Sealer, fin-ercoat Dope topped off with an ap-te-Coat Clear Dope and flown in Sig Fuel. See your Sig dealer for the modeling world.



McCullough was from Sig) and has a vacuum-formed ABS plastic covering on the tail to simulate the crimped aluminum used on the full scale airplane. The model is stable and easy to handle in the air with Logictrol equipment. 1972 Nationals by go and given the eted with more ivets (available




KIT FF-21

The '29er

Rubber-Powered Scale-Like Flying Model



KIT FEATURES:

- * Complete Building and Flying Instructions
- * Detailed Plans with Isometric Construction Views
- * Formed Plastic Propeller
- * SIG Contest Rubber Strip for Maximum Turns and High Flight Performance
- * Die Cut SIG Balsa Parts

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DESIGNED BY PAUL McILRATH

Sig's Classic Series kits give you three important features that assure you of successful flights:

- (1) A proven flyable design
- (2) A reliable way to make flight adjustments
- (3) Complete flying instructions

Second in the Sig Classic Series, the '29er captures the familiar parasol look of several famous aircraft in an attractive blend of lines and function. A particularly stable model because of the high wing position, the difficulties usually found in this type of mounting have been eliminated by a simple, effective construction procedure. Designer Paul McIlrath has written a comprehensive 8 page booklet covering all phases of assembly. The trimming and testing sections are an education in the basis of model flying. The '29er takes it's place beside the Cabinair as a top notch sport rubber-powered kit.

SPAN: 20½"
LENGTH: 16"
WEIGHT: Approx. 1 Oz.

\$1.95

**Realistic Appearance
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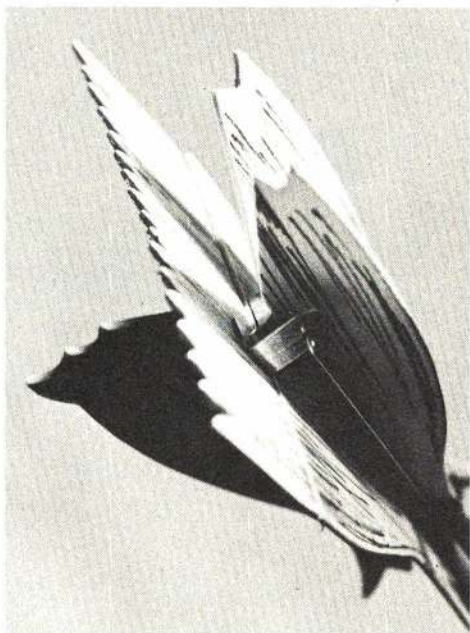
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.045 MUSIC WIRE LINE GUIDE
USE .045 WIRE FOR PUSH ROD





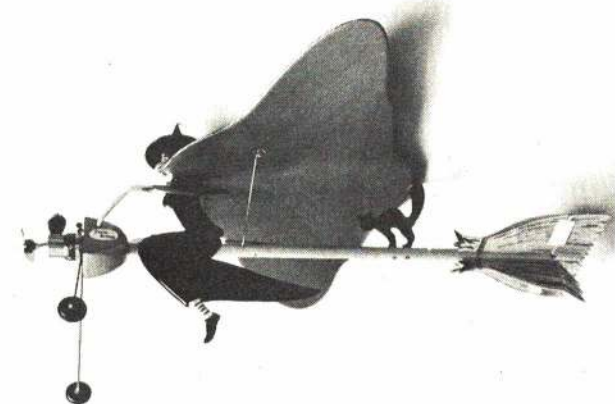
Above left: The tail straws. With a bit of up-broom it will fly like magic. Dowel broom handle was carefully notched for the stabilizer and rudders.

Above right: Note the use of wire leadout guide. Don't guide the flying wires by the wing, you'll bank the model inward too much and not have enough line tension.

Left: Cape is lots of wing area. Model flies fairly slowly so choose calm weather for safety of the Witch.

Materials

- 1 - 1/8 x 3 x 36 balsa
- 1 - 1/4 x 3 x 18 hard balsa
- 1 - 3/32 balsa scrap sheet
- 1 - 3/8 dia. birch dowel
- 1 - 1/8 plywood
- 1 - 1/16 plywood
- 1 - 1/32 plywood
- .045, 1/16" dia. music wire
- Pair 1" dia. wheels
- 1/2 A bellcrank and horn
- 1/8" dia. aluminum tube
- No. 2 sheet metal screws
- Glue
- Fuelproof dope: clear, red and black



WITCH CRAFT

(Continued from page 52)

cat's feet. With the stabilizer slot cut and holes drilled, this boom may be glued into the nose block.

Our bewitching aviatrix is cut from the hardest piece of 1/4" balsa available. After she has been shaped and sanded, saw her in two to allow for the broomstick. Wrap rough sandpaper around the broomstick, rough side out, and slide the witch halves back and forth in order to relieve them for a good fit with the boom. When you're satisfied with this fit, the witch may be epoxied to the broom handle.

The cape, which sustains our craft as a wing, needs only to be cut to shape and the edges sanded round. The wing is attached to the body with the 1/8" plywood "T" which passes through the witch's body, and reinforced by the 1/32" plywood plate at the under side of the leading edge. At the trailing edge, the wing is secured in place with the 1/8" plywood "Familiar" cat. The attachment of the cat is facilitated by the pegs left on the bottom of his feet which are glued into holes in the broomstick.

The 1/16" plywood fins are a bit

stiff for broom bristles, but being plywood, they are strong and help balance the machine. Of course balsa may be substituted, but then ballast may be required. Note that the horizontal stabilizer is made in one piece, is substantially larger than the other fins, and passes through the fuselage slot. The other fins are simply glued onto the broomstick. The lower vertical fin also serves as a rudder with its trailing edge bent 3/8" to the outside of the circle.

Incidentally, the rudder offset is the only line-tensioning device needed. The position of the line guide makes any wing tip weight or engine offset unnecessary.

In keeping with our modernization of the ancient vehicle, handlebars are provided for improved rider comfort. These are bent from 1/8" aluminum tube, and the witch's 3/32" sheet balsa arms are epoxied in place.

So much for the airframe. To give this project real color, it's time to decorate. A felt tip pen can be used to handily sketch in broom bristles and bindings and, after achieving some confidence with the broom, the witch's face. Give the entire model two coats of clear fuelproof dope, lightly sanding be-

tween coats. No fashion discerning witch would be caught in a drab cape, so a bright red lining is appropriate. The top of her cape, dress, hat and shoes are black. Stockings are the traditional red and white stripe. The engine pod can be any color that turns you on. The remainder—face, hands and broom—are clear finished.

Bend landing gear wire to shape and attach wheels. The landing gear is sandwiched between the firewall and engine when the engine is mounted with No. 2 sheet metal screws.

Mount the bellcrank and hook up pushrod. Finish the control system with the line guide, bent from .045 wire, epoxied in place.

Now for the final inspection. Check the model's balance and add ballast as necessary. If built according to plans, balance ought to be right with a Cox Pee Wee .020. Check for control freedom, warps, and anything which may put a hex on your witch.

At the flying field, try your flying sorceress on short lines (15 ft., for example). Fill the tank with the appropriate elixer, mutter the usual incantations, and with a bit of up broom it should fly like magic!

Where the Action is

Free Flight

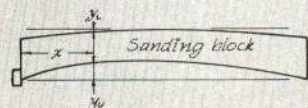
BOB MEUSER SPORT

Boeing Scholarship Contest: Marty Thompson of the Oakland Cloud Dusters did it again. He won the Boeing Bash, and a \$1500 check that goes with it. He took six first places (Half-A Gas, A/2 Towline Glider, Unlimited Rubber, Cargo, Outdoor Handlaunch Glider, and Easy-Bee) plus two second places (Control-Line Speed, and Helicopter). Quite a cross-section. We presented a three-view of his winning Forty-Plus Cargo model (December 1971 AAM, p. 35). It carried 20 oz. of three flights.

Meanwhile Back at Charlie: Last month we started on a complete uncut, unexpurgated expose of Charlie Sotich's Draw-Dip Nordic. Now comes the good part: the wing construction.

Airfoil Data
Dimensions are in inches

X	0	.1	.25	.5	.75	1	1.25	1.5	2
Y _u	.025	.165	.280	.415	.510	.590	.650	.695	.760
Y _l	.390				.220				.100
X	2.5	3	3.5	4	4.5	5	6	7	8
Y _u	.790	.800	.785	.755	.705	.640	.470	.255	0
Y _l	.025		0		.025	.100	.220	.390	



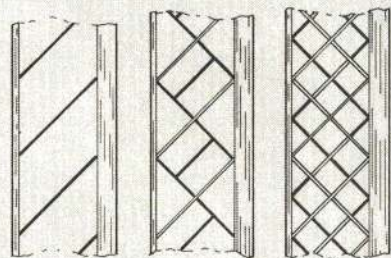
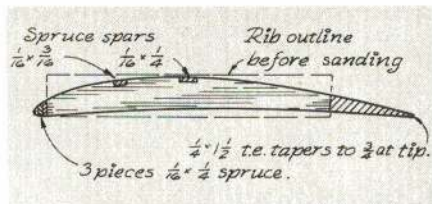
Karbo-grit sanding sheet, top and bottom



First of all, you will have to make a special sanding block, shaped to give a 10% thick logarithmic spiral on the convex side, and a circular arc on the concave side. (The coordinates are shown in the table.) The surfaces are covered with sandpaper or, better still, with "lifetime sandpaper," consisting of grits of tungsten carbide bonded to a thin sheet of steel called Craftsman Karbo-Grit Sanding Sheet which is sold at Sears Roebuck stores.

Charlie's method of constructing the wing appears to be similar to the one presented by Italy's Paolo Soave in Frank Zaic's 1969-1971 *Model Aeronautic Yearbook*. But it is different in important ways. You had best follow the recipe by the numbers, or you will void your guarantee.

- 1) Laminate the leading edge by forming and gluing the strips directly over the plans. Taper the trailing edge stock from 1/4 x 1 1/2 to a width of 3/4 at the tip.
- 2) Pin the LE and TE in place on the plans, and prop up the front edge of the TE to the proper angle.
- 3) Cut strips of sheet balsa to a width of 13/32 in. This is the rib stock.
- 4) Cut the full-ribs to length, and glue in place.



First, the full ribs, then the half ribs, and finally the quarter ribs. (Parts being added are shown bold.)

5) Cut the half-ribs to length, and glue in place. Then the quarter-ribs. Add the straight-across ribs near the wing roots. (When all the ribs are in place, the tops form a flat surface.)

6) (Here comes the sneaky part.) Remove the wing from the plan and set it on a flat surface top side down. Sand in the undercamber using the convex surface of the sanding block.

7) Turn the wing top side up, and align the trailing edge with the edge of the flat working surface. Sand in the upper surface camber using the concave side of the sanding block. Keep the leading edge guide on the sanding block in contact with the leading edge. Continue sanding until the sanding block bottoms out at the LE, and until the ribs are flush with the TE stock.

8) Sand the leading edge to shape.

9) Plane the top surface spars to a taper. Pin the spars over the rib joints, and mark the ribs for notching. Remove the spars, notch the ribs and glue the spars in place.

10) Brush water-thinned white glue over all the joints.

Charlie Sotich gives his Draw-Dip Nordic those masterful touches that make winners.



11) Coat the entire framework with clear Hobbykote.

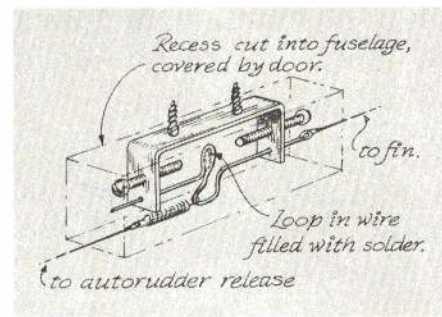
12) Mount the aluminum tubes which receive the wing-joiner wire with Sig Epoxy.

13) Cover the wings with MonoKote.

Stabilizer and rudder construction is similar, but since they are so small they can be sanded freehand. Stab section is flat-bottomed, 7% thick.



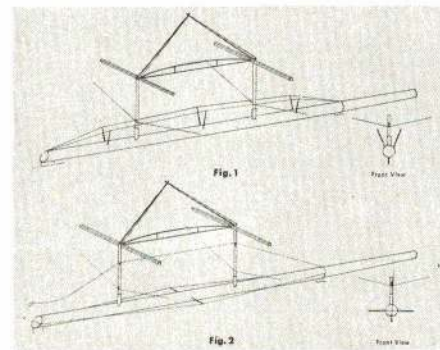
Thoughtfully designed pay load model by Marty Thompson has one-bladed prop, four-point gear, and dropped wing tips.

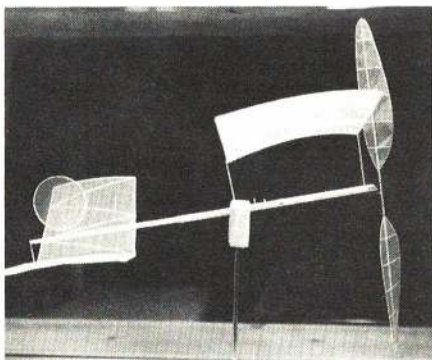


Indoor Plumbing Is In: There are two kinds of people in the world: those who prefer screw adjustments, and those who prefer glued-in-place shims. Charlie Sotich is one who prefers screw adjustments for Nordic rudder. The usual arrangement is a U-shaped bracket with a pair of tapped holes epoxied to the top of the tailboom. The rudder flops between the ends of a pair of screws inserted in the tapped holes. Charlie gets the whole thing inside the fuselage pod rather neatly, as the sketch shows. While the model is being towed, the formed wire is held against the front screw, and the rudder is approximately straight-ahead. When the towline is released, the formed wire is pulled to the rear against the other screw, permitting the rudder to flip to the glide position.

BUD TENNY INDOOR

More Fuselage Bracing: The October 1972 issue explained the advantages of bracing motor sticks, and showed the two most popular bracing methods currently in use. This month, Fig. 1 shows another method of stick bracing, which has been used by experienced fliers for years. Because it is somewhat more demanding in craftsmanship and precise wire tension and alignment, it is not recommended for beginners.





An unusual Pennyplane model by Dick Hardcastle is patterned after ideas from John Kukon and Doug McLean. Funny looking circle rudder sits atop fuselage while large stabilizer is pyloned below fuselage.

The posts are installed in pairs, with the posts passing through the motor stick and ending flush with the bottom of the stick in the center next to the motor. It is necessary to install the wires under tension, with the same tension in each wire. Field adjustment of the wires is not recommended unless building jigs are available to assure that the motor stick is straight and the wire tension correct.

One-gram FAI models need a fairly large piece of rubber and an extra-long fuselage must be used to permit enough turns for long flights. As a result, the motor sticks get extra stress from both torsional forces and rubber tension. The slightest mishandling of a tightly wound motor can deflect the stick to the side and cause it to collapse. For that reason, this correspondent designed the bracing shown in Fig. 2. The basic stick bending loads are taken by the removable top wire which derives extra leverage by being hooked on the wing posts. Side loads are taken by a tightly-strung wire which is permanently installed between the thrust bearing and rear hook. The wire passes over each end of a post which goes through the middle of the motor stick. For those who sometimes find their motor stick bowed to one side after being glued, this wire can be installed to hold the motor stick straight. As with the similar one-wire bracing explained in last month's issue, this system allows separate adjustment of left and downthrust, plus adjustment of the wire tension to permit the motor stick to bend slightly during the power burst. This combination of thrust adjustments and bending motor stick gives unusual latitude in adjusting the power pattern—quite important for highly powered FAI models.

BOB HATSCHEK GADETS AND EQUIPMENT

From a Loser's Viewpoint: This is being written the day after arriving in Long Island after the 1600-mi. drive from Caddo Mills, Texas, and the U.S. 1973 Team Selections Finals. Placing well down the list of Nordic fliers, this gadgeteer fell far short of making the team. Since almost a hundred of the nation's top free fliers also failed to make the team, there's no cause for feeling shame, just a bit of disappointment—until next time.

It was a tough meet. The competition was tough. And the weather was tough. Winds ranged up to about 30 mph for the three days of official flying, and it wasn't even approaching calm at the 6:30 a.m. start of flying. It was hot, too, with temperatures in the 90s on most days, which made it particularly tough on the Wakefield fliers, who left a lot of broken rubber on the field. None of this is meant as an excuse. Rather it's a statement of the obstacles successfully overcome by the eventual winners. Win, lose or draw at next year's World Championships, they'll be a great U.S. team.

Who are they? In FAI power, the three team members are Henry Spence (Arlington, Texas), Frank Wolff (Massapequa, N.Y.), and Tom McLaughlin (Pensacola, Fla.); in Wakefield they are Bob White (Monrovia, Calif.), Frank Parmenter (Houston, Texas), and Jon Davis (Albuquerque, N. Mex.); and in Nordic

A/2 they are Hugh Langevin (Minneapolis, Minn.), Paul Crowley (Detroit, Mich.) and Vince Croghan (Baltimore, Md.).

The strong winds made model retrieval considerably more difficult than usual despite the fairly open Texas countryside. One of the most widely used retrieving aids was the trail bike, which is fairly effective and certainly fun. But it can also be dangerous. At least two motorbike retrievers ran into trouble—one in a hole on what appeared to be a smooth field, and the other into a couple of feet of water in what appeared to be nothing but lush grass. Neither was seriously injured, though one was taken to a hospital for a check-up when he appeared to be suffering from at least a mild concussion. So don't retrieve alone on a motorbike! It's a job for two—one to watch the model and one to watch where the bike is going. The same is true, of course, for retrieving with a car—you need a full-time driver and a full-time spotter.

One of the best-equipped and best-organized retrieving systems was the one used by the Brooklyn Sky Scrapers. With eight members flying (two in Power, two in Nordic Glider, and four in Wakefield), the Sky Scraper retrievers were a busy bunch. And after 15 rounds in the high winds they hadn't lost a single model permanently (some did take a few hours to find and return).

The principal piece of equipment they used was Frank Pualin's "optical tracking station." (See April 1972 AAM.) This consists of a pair of binoculars mounted on a camera tripod along with a telescopic rifle sight and a good compass. It was used in conjunction with an enlarged U.S. Coast and Geodetic Survey map of the area. As each Sky Scraper model either landed or went out of sight in the distance (yes, even with binoculars), its magnetic compass bearing was noted and plotted on a plastic overlay on the map. This sight line was then cross-hatched to indicate the estimated distance. Two members manned this fixed station and, with the aid of an additional pair of binoculars, they managed to keep track of as many as three airplanes in the air simultaneously.

This base station, identified as "Sky Scraper Upwind," was constantly in touch by Citizen's Band radio with "Sky Scraper Downwind," the retriever command post about a mile from the launching site. The one member at this station, also equipped with binoculars, directed the retrieving crew, each of whom also had a lightweight Citizen's Band radio. The individual retrievers brought the models back to the downwind station, where they were picked up by car (several at a time) by the fliers.

For the really long flights, and some went several miles, the Sky Scrapers had the ultimate in retrieving equipment—a Cessna 170. This was generally used after the day's competition was over, but it was a simple matter to fly over the model launching point and fly the compass heading plotted on the map. Not only did the airborne Sky Scrapers take care of their own, they also spotted a number of models belonging to other contestants, later sending ground parties to the locations marked on the map. One afternoon, they picked up eight strays this way and returned them.

There was one retrieve that was only partly successful, however. Sky Scraper Carrol Allen's Wakefields are covered with black tissue on the bottom surfaces so they show up strongly against the sky. After one very long flight, the model apparently flipped over on its back so it wasn't visible from the air. So Carrol took a compass and marched across the countryside on the recorded heading until he found the model. But by this time it had been chewed to pieces by an old horse pastured in the field where it landed. You just can't win 'em all!

BOB STALICK GLIDER, RUBBER AND POWER

FAI Team Selected: Caddo Mills, Texas was the place and the U.S.A. FAI team selection finals was the event. Starting at 6:30 a.m. July 1 and ending at 2 p.m. July 3, this was the big step on the road to represent the country in Austria next year at the FAI Internationals. The weather was hot and windy



Earl Thompson led through 14 rounds at FAI finals, then dropped out with disastrous last flight. Note handle on his electric starter.

Don McGhee hides behind wing of his Cryin' Time FAI power ship. Highly warp resistant structures used.



and models were drifting downwind into the cottonfields, trees and town, but it was a great spectacle and a gathering of some of the top fliers in the country. Support equipment and personnel in these conditions is almost mandatory. Citizen's Band radios, walkie-talkies, motorcycles and thermal detectors were in use throughout the contest, but those with the experience and the good models placed high, whether the support equipment they used was extensive or not. As a result, a strong representative team was selected, with experienced Internats contestants and newcomers placing in each event.

In Power the trendy thing to have was a high aspect ratio elliptical tipped wing covered with sheet balsa and MonoKote or Solarfilm and using a thin, flat-bottomed air-

Fuse is lit, rubber's wound, and Willard Smitz is ready to launch at Caddo Mills FAI FF Finals.



foil. The fuselage was long, with a low to medium height pylon and rear fin. Rossi engines were definitely the standard power plant, usually mounted on a pan. Seelig timers operating auto-stabs and rudders. Stabilizers were smaller and smaller—in the 20% range on a few models. Flapped wings were seen only on the models flown by Ann Gieskieng and by Tom Koster, who came over from Denmark to compete.

High thrustline models were flown by only two contestants: Don Wensel with a Lightning Rod and John Rak with a Soarhead 84. Doug Joyce was competitive with the most unusual model on the field, his canard pusher, The Lightning. Unfortunately, many models were seriously bent by crashes into the runway or ground, presumably by bad launches and/or inability to handle the sometimes gusty wind conditions. The typical variable incidence power model must be grooved exactly in the launch or else it will flatten out in the climb and go roaring off on a cross-country flight that gains much speed but little else. With a good launch, such as Power winner Henry Spence had for each of his flights, a max is practically guaranteed because the height obtained in the ten sec. of engine run is phenomenal.

Even with the sometimes finicky habits, the auto-stab is here to stay and the flapper appears to be lurking just around the corner. Thinner, more symmetrical airfoils can be used with auto-stab, which boosts the climb speed at little sacrifice in glide performance.

A number of Midwest and Eastern area modelers flew versions of Bob Siffleet's Centaur design. This model, although similar in planform to the standard layout, is a stable and forgiving design that is of sound, basic construction with few frills. Its auto-stab mechanism was one of the simplest and most foolproof on the field.

There will be many articles and reports to read and hear on these finals. Modelers serious about the FAI program should learn all they can from them, then begin planning to participate in the 1975 program, which will begin next spring. In the FAI Power event, the above comments should give you some idea as to what the top fliers are using, but don't dismay, it may help to have fancy and expensive equipment, but many made it to the finals flying old Supertigre-powered models equipped with a Tatone Timer, DT fuse and no auto-surfaces. As in all free-flight events, any model equipped with any engine looks just as good in a thermal as any other. So, don't procrastinate. Spring and the '75 qualifying trials are just around the corner.

GUEST AUTHOR: CLARENCE MATHER SCALE

Flying Scale at Taft: The recent United States Free Flight Championships held at Taft, California, included Flying Scale events. It is good to know that some airplane chasers recognize Flying Scale as a bonafide free-flight event! Being an official event, points earned in Flying Scale counted toward championships. It was revealing to watch one prominent contest flier struggling to break 30 sec. with a Piper Cub.

There was a good number of entries although several southern California Scale enthusiasts did not compete. The weather was

Drifting backward is Stinson Seaplane by Bill Pardoe.



Remember the Aeronca K? Here's one on floats by Pardoe. These birds take off quite gracefully.

hot and breezy but not bad if you flew early. Jack McCracken, NAR Flightmasters president, proved that he has organizational ability equal to his superior scale building talent. Carl Hatrack, Scale event director, had serious car trouble enroute to Taft. Jack got word of this and sprang into action. Very soon tables, score sheets, and flight cards were set and Jack had a watch in each hand timing flights!

During the contest I discovered a new way to wreck scale models. Two of my models, a PT-19 and a Stormovik, were in a cardboard box with the top closed but not tied. The box was setting on a cot in a tent that had three sides open. A tremendous dust devil came along engulfing the tent and blasting everyone near with dust and debris. After it passed I suddenly noticed, with great alarm, that the model box was no longer on the cot—in fact it was nowhere in sight! Frantically I looked for the box and models. Soon the models were found upon the ground about 100 ft. from the tent. They were battered and torn but not nearly as much as anticipated. Later Fudo Takagi found the box a good quarter mile from the tent! This is the 13th year that the Stormovik has been flying so something had to happen to it!

It is often difficult to obtain a consistent circling flight pattern with rubber-powered scale models. Outdoors a wandering flight usually can be tolerated but indoors the model crunches into hard walls or bangs around chairs and bleachers. The causes of some of the circling problems are easy to understand. A tightly wound rubber motor generates several times the torque of a partially wound one. Thus the torque on the model, the propeller thrust, the model's speed, the propeller's air blast, and the model's flight attitude all change considerably during a fully wound flight. If a model depends only upon offset rudder or only upon angled thrust, the size of the circle and even its direction will probably change during the flight. Each design and often each particular model has uniqueness but I'll describe the trim adjustments that work well for me.

Most of my scale models are flown indoors in a small recreation center about 40 ft. wide, so there is not much room for a wandering flight! Most models are flown to the left. The rudder is offset about 1/32" from true straight. This is for models that as Peanut Scale weigh about 1/3 oz. and proportionally more in larger sizes. The ultralights will need more rudder offset and heavier models less.

To allow for change, the tail assembly is rather lightly spot-glued when first assembled. Thus it can be easily cut free for trim changes. The propeller is angled several degrees down and to the left. Many models will spiral dive when flown in small circles unless some wing "wash-in" is used. Looking at the model from the rear the left trailing edge should be down about 1/16". It usually is not necessary for the whole TE to be down that much, but the outer portion should be. This can be accomplished by building the wing that way or it sometimes can be warped in by steam. Also a small down elevator can be cemented to the underside of the trailing edge of the wing. Of course twisting up the right wing has about the same effect.

If the circle begins the proper size but enlarges as the motor unwinds, try more rudder

and less thrust offset. If spiral dives persist, even with wash-in, shim up the trailing edge of the stabilizer. Some models require considerable tinkering with the various adjustments before they will respond properly. The thrill of seeing a neat scale model roll across the floor then chandelle up into a smooth circling climb makes it all worthwhile!

Control Line

BILL BOSS SPORT AND SCALE

Show of Shows: Modelers take note! Here's a contest that you will not want to miss. Bob Lopshire, AMA's Director of Public Relations, has just announced a contest that should outdo any contest or modeling show that you have ever seen or participated in. The contest-show is to take place at the Museum of Philadelphia Civic Center and will run from March 23 to April 19, 1974. The contest will be dedicated to modeling craftsmen featuring models of RC planes, cars, boats and CL planes, with approximately 200 prizes or trophies to be awarded.

The contest will be static in nature, and at this writing about 20 award categories have been established, many of which will have awards for all four types of entries. Some examples of the award categories being offered are: Largest Plane, Smallest Plane, Sport, Best Finish, Helicopter, Pre WWI, WWI, WWII, Post WWII Scale, Overall Best of Scale, Antique Ship to 1900, and so on. There are many other event categories assuring coverage of all facets of modeling in the four basic types of models featured. As time goes by, more information will be published on all aspects of the contest.

The contest, which is to be bi-annual, came about as a result of the recent public acceptance of the John Wanamaker, Philadelphia show and the personal observations by the Curator of the Philadelphia Museum. The Museum will present aeromodeling as an art form, and plans to spend the time and money necessary to accomplish that goal. They have 25,000 sq. ft. of floor space for display and hope to have it filled with models.

In order to make the contest-show more appealing to modelers, every attempt is being made to have major prizes for the winners. One example of a great prize being negotiated is a trip to Amsterdam and a visit to the Fokker Aircraft factory for the best model of a KLM-Fokker aircraft. Auto manufacturers and dealers as well as boat manufacturers and dealers are being contacted in the hopes of their providing major awards for the auto and marine categories. All in all, this contest-show promises to be one of the greatest, with the name of the game being "Get Your Hobby Before The Public."

Now that we've told you all about it, you have only 17 months left to design and build your entry. Now is the time to start. Watch the "Where The Action Is" columns as well as AMA's publications in the coming months for more details about this greatest of contest-shows.

Sanding Blocks: Need an odd shaped sanding block? One that can be used to get a nice even sanding job on a leading edge? Roman Bogatschow solved the problem by making sanding blocks out of scraps of polystyrene foam. Start with a foam block of sufficient size, about 3 x 4", and shape one side of the block similar to the shape of the wood to be sanded. Cut a piece of sandpaper to proper size and with a small amount of glue, cement the sandpaper to the hollow in the foam. When the glue is dry, sand away. By using this method you can make sanding blocks of any size and shape that will fit almost all of the curved or flat surfaces of your model.

Scale Markings: Many scale modelers (especially the beginners) enter a Scale contest with great enthusiasm and anticipation of piling up a good score, only to be disappointed when the judge gives him his final tally. The contestant finds that he did pretty well in the workmanship department, but was



Good coloring and markings with several working features on Bill O'Connors Wildcat. Fox 59 for power. Anyone want to retract those gears?

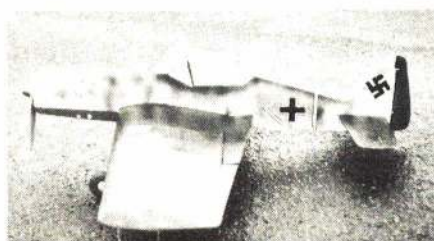
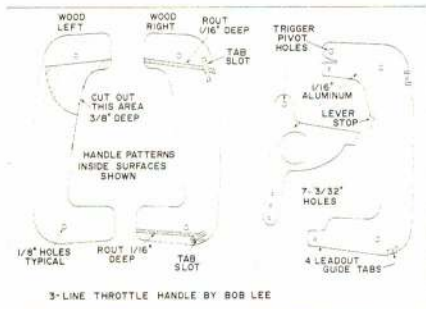
low in the fidelity to scale portion of his score. Several reasons could account for the low score, the most common of which is with color and markings and perhaps some of the detail work.

Remember that your model has to be a specific aircraft. That means that it must be painted, and marked in the same manner as the full-sized prototype. To substantiate this, you should be able to present photos (color if possible) and a good set of three-view drawings, as well as any other information that will

help the judges in giving you every point you deserve. Don't forget: It's your responsibility to prove that what you have done to your model is correct.

Detailing of the plane is important. Make sure that hatches, rivet patterns, antennas, guns, etc. are all in the proper location and size. In your first attempts at scale it might be better to concentrate on a few details and be very accurate about their placement and size, and do an extremely good job on them rather than put on a lot of detail and an overall poor job.

One last thought: Scale builders are not made over night, it takes time, patience and work. Even the best had to start small.



Converted Midwest P-51 comes out a FW 190 for Danny Blum (no relation to writer).

Veco 35 powers profile carrier Sea Fire for Mark Fechner. It has a combat Twister wing.



This is not a critical factor, since the grip portion can simply be made to fit the hand. The 1/16" thick aluminum trigger is 3-3/8" long. From center of pivot hole to center of innermost 3/32" hole is 2-3/8". The other two 3/32" holes are located at 5/16" centers. The trigger at the widest part is 2-1/4".

Lay-out handle plate and trigger on 1/16" plate and cut with coping or jig saw. Drill holes and bend tabs down, including trigger lever stop. Next cut wood handles from 3/8" stock. Cut tab notches and leadout line slots. Bolt handles and plate together, sand to smooth contours and disassemble. Bolt trigger to center plate, reassemble handle with leadouts extending 4", and dope finish.

Refer to the May 1972 AAM for method of constructing an inexpensive, but effective, three-line throttle bellcrank. Above handle will work with this crank or a Robert's crank.

Stunt Wings: Requests have been made for suppliers of foam wing cores suitable for UC Stunt. Here's two: Controlline Specialities, 3 Roger Court, Woodcliff, N.J.; Foam Flite, 628 West Sixth St., Mankato, Minn.

Line Tension Problems: More questions on this and a model's inability to pull out of a loop. Would require a book to define them all. Most problems pertained to 1/2A and Sport.

The following is a list of suspicions. Line tension: (1) no outboard tip weight; (2) no

HOWARD RUSH COMBAT

Honkin' Engines: Lots of people hop up engines for hire these days. I propose a contest to see who's best. Hopper-uppers are invited to send me their engines for evaluation, after which they will be returned. Engines will be judged for ease of starting (hot and cold), consistency of running in maneuvers, and level-flight speed on a Combat plane. Results will appear in this column. Write to Rush, c/o AAM for details.

What?: There's an alternative to going deaf from engine noise. Sonic Ear Valves are ear plugs that attenuate loud noises, but don't cut out quieter sounds. Designed for folks



Wild combat flight between Gary Frost (l) and Bob Burch (r) ended in a mid-air collision with both getting a kill. Gary's plane tells the story. His string has been cut, and Bob's kill zone is wrapped around Gary's engine. Writing on wing of Burch's remains says "Don't forget to fill the tank."



who shoot guns, they can be found in sporting goods stores for about five dollars per pair. Of course, you could use a muffler.

How Fast?: To get speed in mph, divide 1800 by time in seconds for seven laps on 60 ft. lines or for eight laps on 52 1/2 ft. lines.

Universal Slow Combat Rules: Slow Combat is here to stay, so how about a standard rules system so folks can use the same plane for contests in more than one place? Ron McNally, an engineering professor at Purdue and a competitor in both Slow and AMA Combat, proposes a streamlined set of Slow rules. By his system, AMA rules would be followed plus: (1) sleeve bearing engines are required, and (2) airplanes must have at least 350 sq. in. wing area and must be at least 24 in. long, measured from propeller to tail hinge line.

Ron favors plain-bearing engines with pressure fuel systems optional because it's the least expensive way to fly. "Suction fuel draw limitations are unreliable to the point of causing crashes," he claims. Also, experience gained by novices using a pen bladder or baby pacifier in Slow Combat is good training for AMA Combat, where competition dictates the use of a pressurized system.

Ron rejects mandatory landing gear as adding to a plane's cost and complexity at the expense of performance. His area and length rules would rule out all existing competitive AMA Combat planes and would favor Ringmasters, Flite Streaks, and the like.

Rusty Motors: After running an engine with synthetic-oil fuel, squirt some light motor oil in the exhaust port to prevent rust. Synthetics make fine lubricants, but they need help when the engine is not running, particularly in damp weather.

JOHN BLUM CARRIER AND STUNT

Throttle Handles: Much has been said on throttle handles and many types have made the scene. Bob Lee, writing in the San Jose (Calif.) Aero Modelers Newsletter, presents a workable throttle control handle that parallels even the most sophisticated in end result. The most important factor to many modelers is economy of construction.

The sketch doesn't show dimensions, but with a little effort the handle can be made. The grip portion, or overall handle parallels the standard size E-Z Just two-line handle.

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GREAT LAKES TRAINER

KIT C13
SPAN 36"
LENGTH 26½"
.19 TO .35 ENGINES
SCALE: 1¼" EQUALS 1 FT.

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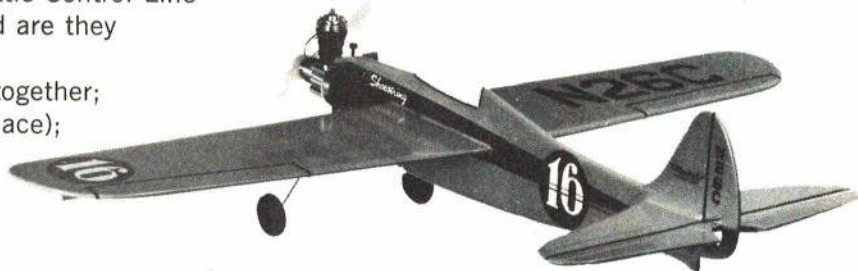
and then... there were ten!

no — not little Indians . . . but 10 nifty little Control Line models that deliver real fun flying . . . and are they easy to build! Only 6 to 9 die-cut parts (depending on the particular kit) to glue together; a motor mount (that's ready to bolt in place); also the complete control system (less



KIT S40 BEGINNERS CHEROKEE

slight modification). A perfect ship to learn to fly on (first time flight instructions on the plan). They're great little flyers and so light you can't hardly hurt them. We've got 10 of them in the line now, 9 at \$2.95 and the Bipe at \$3.50. Tools you need are generally found around the house. So take a look at them at your dealer. You'll love them . . . and so will your pocketbook.



KIT S38 BEGINNERS SHOESTRING

handle and lines); decals, landing gear, wheels, etc.; which makes building a lark and assembly literally in minutes! Use any .049 engine (you might even have around from an abandoned ready-to-fly plastic job, it may require



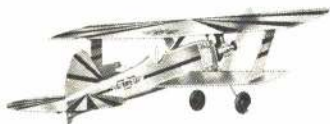
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AVAILABLE
IN CANADA





Eleven-year-old Matthew Bauer uses Enya 15 on his Jr. Flite Streak. He's a most happy fella, nice building job.

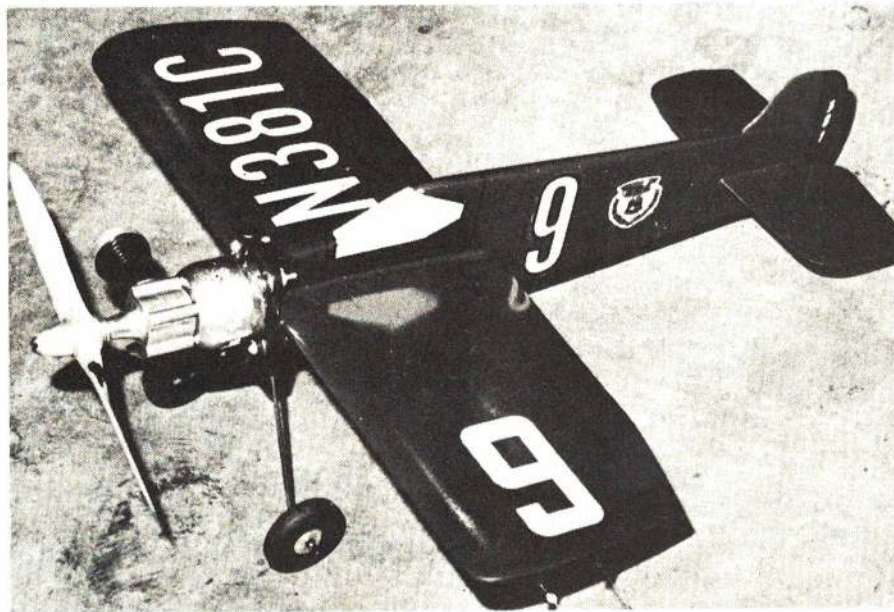
engine offset; (3) UC lines too long; (4) insufficient power; (5) lines too large in diameter and too heavy; (6) model extremely light for wind; (7) model too slow. Inability to loop: (1) model not designed for stunts; (2) model too heavy; (3) nose moment too long; (4) flat bottom wing; (5) tail moment extremely short in comparison to nose length; (6) flexing pushrod; (7) model too fast; (8) lines too long resulting in loss of control; (9) insufficient elevator-elevator area; (10) insufficient wing area. Well, that's a few!

JOHN SMITH SPEED AND RACING

Formula V and Mouse Racers Equals Fun: In recent columns I have been mentioning the newest fad to hit the Control Line scene. In different parts of the country they are called different things. But every one agrees that the small .049-powered scale-like racers have added new blood to racing circles. It seems as if every club newsletter has mention of these little bombs. All state that Juniors who never before were interested in racing are building them. Most of the models are built for the reed valve Cox .049.

In Cleveland where the event was started, the rules state that only this type engine be

A Cassutt III Formula V (.049) built by Bob Sargent. Handles like a team racer.



allowed. Wingspans run from 12 to 14 in., models are 3/4" scale profile, and are flown on 42 ft. lines. 48 to 54 laps per tank (Golden Bee) are common and some pilots have been seen test flying on 52 ft. lines! Any engine modification is allowed as long as over-the-counter parts are used. Fifty lap heat races, three models per heat, and 100 lap finals are run. One pit stop must be made in each race. Designs call for over-sized stabs, about 20 to 25% of wing area, balance on or near LE. Kirn LH props are being seen on some. The reverse torque helps control takeoff. At least one major kit manufacturer is planning to get on the bandwagon with at least three models. If your club is running this event, let's hear from you. With everybody's ideas, maybe a set of national type rules can be written up. Should make a nice after-hours event at the Nats next year.

Like 'em Bigger, Try Slow Rat: Bob Compton (El Paso, Texas) says they're flying Slow Rat in our second largest state—300 sq. in. on the wing, 36" minimum span, Profile, no pressure, hot glove, or fast fills. Add a two-oz. tank, two-wheel gear and a 40 up front. Fly for 140 laps with at least one pit stop. Mix well and you have the fastest growing event in the Texas area. Bob adds that the Juniors are running faster than the Open guys with pit stops averaging around 15 sec. This event ought to keep everybody happy. Something is getting people interested in Speed flying. This year's Nats had 409 entries in Speed with 71 in Junior 1/2A Profile Proto. Hope the trend continues.

Radio Control

BOB STOCKWELL PYLON

NATS Predictions: As of July 13, Bob Smith is ninth in the National Standings on the basis of three races, whereas everyone ahead of him has had five or more races. The simple truth about Bob is that you can't beat him by flying closer to the pylons. If you're closer to the pylons than he is, you have cut. So you have to go faster than he does. In 1971 there were some Supertigres that did in fact go faster than Bob—Terry Prather, Telford/Violett. But this year Bob has as good an engine as anyone, and when his own isn't running, he has Roger Theobald's to put in instead (as at Bakersfield when he turned 1:27.9), or his partner Jeff Bertken's, or one of Larry Leonard's. There is no way he will be in the air with less than the best K&B engine



Bob Smith, one of the men to beat, with a retractless P-51 going about as fast as the retractables.

Glen Spickler, Nats Pylon Director, assigns handicap points at local race.



around. Unless he has terrible luck, like a mid-air collision, I have to predict that he can't be beaten this year except under one condition: that someone comes up with an engine that is better than the best K&B, and flies nearly as well as Bob. Early in the season there was some hope that RAF might be able to do it. As of the date of this writing (July 13), there is doubt whether RAF will even have engines competing at the Nats. They will be good, we believe, when finally released, quite possibly better than K&B, but it now looks as if their year will be 1973. There are some top Supertigres around, some fine Aldrich engines, some Telford engines, some Prather engines. They are capable of beating almost anyone else flying a K&B, except Larry Leonard or Harold Coleson or Cliff Weirick or Garry Korpi on a given heat. But they do not have the torque of the Schneurles, though they have considerably more rpm. It shows in the turns.

I will also predict that the top two or three winners at the Nats will all be on the same frequency, so that they won't have had to fly against each other. Last year it was 72.40 that picked up the first three positions. This year it will be 72.24. I hope I'm wrong.

I can't believe we will be as lucky this year about mid-air collisions as we were in 1971. I predict that the outcome will be in part determined by the luck of avoiding mid-air. At these speeds it's not a matter of skill when you manage to stay clear.

I think we'll see several wings fold in the qualifying trials. The present speeds are increasing the wing stress exponentially.



Active again in a big way in Pylon is Joe Foster with a retractable tricycle-geared P-39 from Francis kit. Attractive model does not have distorted appearance seen on all the P-51s.

Chamber Maid by Bob Root is skillfully caught in flight passing a pylon by Ron Reed.



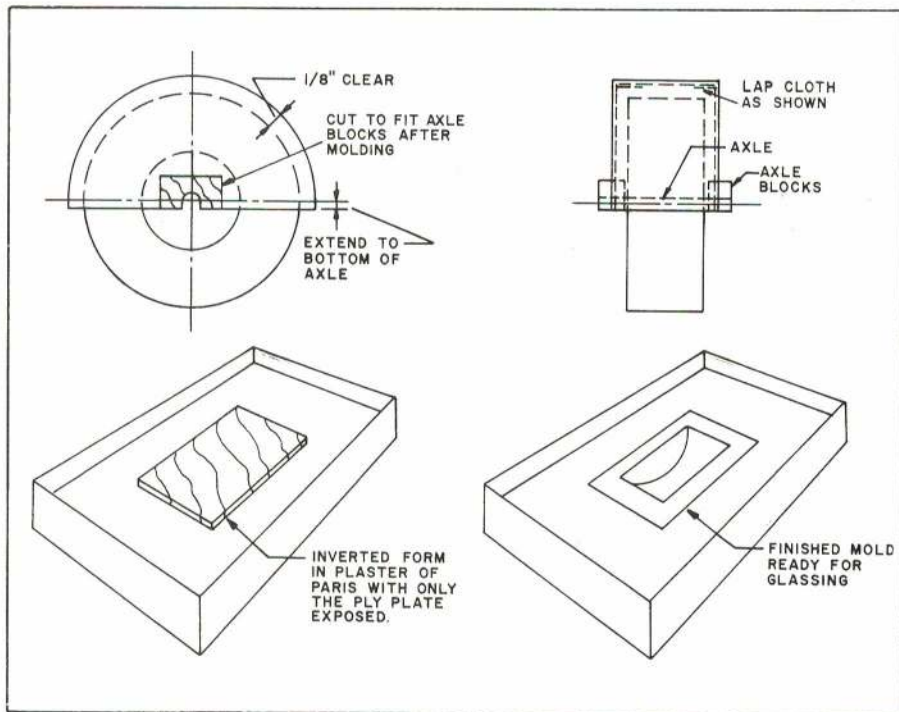
Let's hope my crystal ball is foggy on all but Smith winning. No one could deserve it more. He flies superbly, builds to perfection, and is a modest and sporting competitor.

Editor's Note: To see how close Correspondent Stockwell came to predicting the outcome of Pylon Racing at the Nats, turn to page 36.

CARL MARONEY GLIDERS AND FAI

Molding Wheel Wells with Silicone: Editor Bud Faulkner published his idea for providing added realism to scale sailplanes in the ECSS Journal, "Sailplane." Feeling the basic method could be adaptable to new ideas he requested to share it with other modelers.

Here's a good way to keep dirt out of a fuselage for those who are using wheels. The well should be 1/8" larger in circumference and 1/8" wider in width each side of the wheel. Use a circle template to draw diameter of wheel on balsa form (see detail). Cut form to shape and mount with epoxy to a piece of 1/8" ply making sure of a snug fit with no clearance between the form and the ply. Finish the form with Hobbyoxy or balsa filler and Aero Gloss. Using several coats of Polyurethane applied directly to the sanded form will give good results, but this requires several built-up coats with sanding between them. After the form is complete, it is ready to be covered with silicone. G.E. white silicone was used and is available at hardware stores and marine supply outlets. Cover the form with a generous coat in a well-ventilated area. Silicone should be applied to cover form and plate. Allow to dry overnight. After dry-



Making of fiberglass glider wheel well.

ing and before separating, mix plaster of Paris in a cigar box or any other container and lay the well in this inverted leaving only the 1/8" ply plate exposed.

After plaster cures, remove the well and separate the silicone from the form carefully. With a properly finished form, the separation will be smooth as will the inside of the silicone mold. Set the finished mold back in the plaster form and it's now ready for lay up. Hobbyoxy Formula II works very well if it sets for about 20 min. before applying to the mold. The viscosity is higher than other polyester or epoxy resins without adding fillers to prevent runoff from the vertical surfaces. After mixing Hobbyoxy, the cloth can be cut while the epoxy gets tacky.

Cloth weight is not critical on a project such as this, so use scraps laying around the shop. Also, plain weave ten oz. cloth is good. The bottom of the mold (top of well) should be applied first; cut the cloth so that it sticks

out about 1/4" each end of the well. Next cut the sides so they project the same distance. Sides should lap bottom about 1/8" (see detail). Now lay the cloth aside and coat the entire model with the epoxy. Apply the cloth and check for runoff to prevent build-up of epoxy in bottom of mold. When about 80% cured and while still tacky, trim excess cloth from mold with a sharp razor. When cured, lift mold from plaster and peel away silicone.

To provide wheel support two wheel axle blocks are needed. Slot 1/2 x 1/4" spruce or ply blocks with round file to fit wheel axle. Bevel bottom to fit fuselage closely. Align wheel and spot-gue blocks to fuselage prior to adding well. Notch the sides of the well to fit ply blocks. The well should hug the fuselage closely at the bottom. Spot-gue wheel well in place and apply cloth and resin to secure to fuselage. The entire procedure will take only two evenings. Be sure to work in a well-ventilated area and away from any heat or furnace for safety.

Special Interest

JOHN BURKAM HELICOPTERS

Fuselage Design: All kit helicopters to date have fiberglass fuselages, and the helicopters made from these kits are rather heavy. Non-scale metal helicopters can be built 20 to 30% lighter than scale fiberglass jobs of the same power and size. Few scratch builders of helicopters care to go to the trouble of making a mold and laying up a fiberglass fuselage shell. I predict a trend away from scale helicopters as interest turns more toward performance. Abetting this trend will be the development of a simple, easy-to-build, good-looking metal fuselage which protects the radio and servos from the exhaust fumes.

The fuselage design presented here is a step in that direction. Only the engine, pulleys and belts are outside the box. A large panel on each side is removable for access to the servos and the tail rotor drive. This model uses the same drive components as the original Tubie helicopter except for slightly longer shafts. A K&B 40 engine is used and should give a maximum thrust of about 14 lb. on the five ft. rotor. With an empty weight of six lb. including radio, there is a healthy performance potential, whether it be rate of climb, altitude, speed or load carrying capacity.

There are many ways to make a box. One

of them must be easier than the way I did it—separate pieces for top, sides and bottom. Recommended method: For the straight section, bend from one piece with seam at one of the lower corners where .032 x 3/8 x 3/8 angles are used as internal reinforcement to distribute the landing gear loads. Wrap the tapered section from one piece with the seam on the bottom. The tail boom is a piece of 3/4 x .035 wall 6061T6 aluminum tubing stepped down to 1/2" tubing just before the bend ahead of the tail rotor. Up in front the fan is shrouded to force cooling air to pass through the engine cooling fins. Rotor downwash velocity is only five to eight mph in this area, not enough for cooling even if a heat

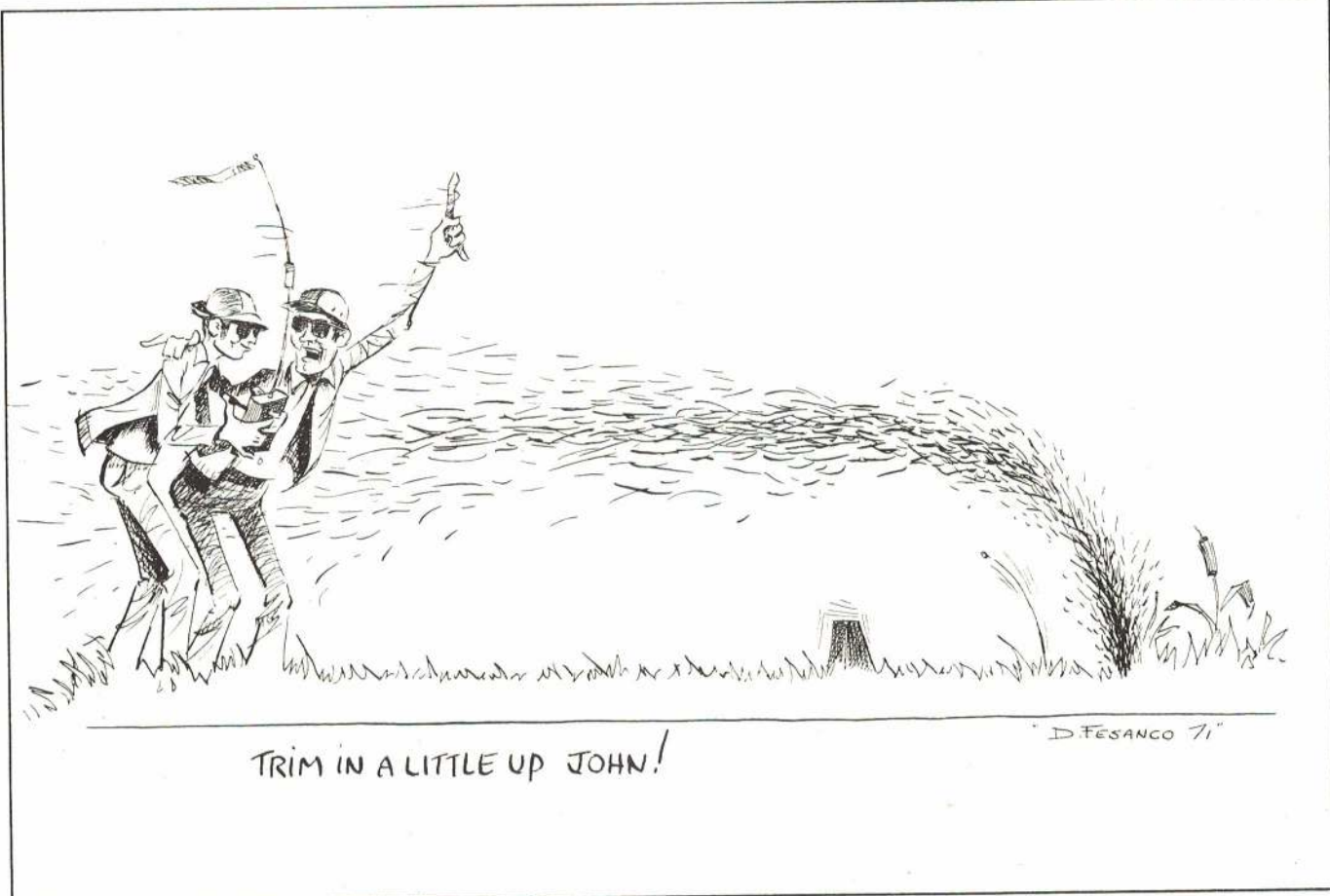
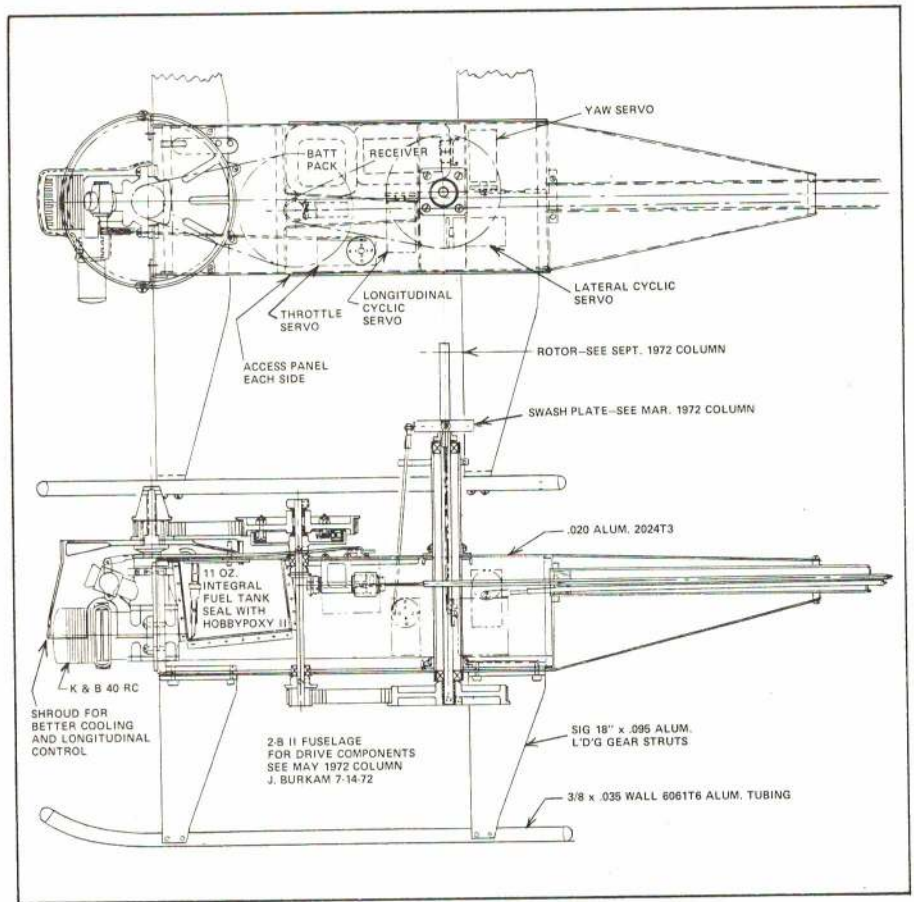
Next-to-latest version of SSP by Gene Rock has more realistic fuselage and tail rotor drive by 3/32 mw torque rod.



sink is used. The shroud also prevents the fan from exerting a varying lift force on the fuselage and upsetting the balance of the model when you least want it. With just a little more effort, even the pulleys and belts could be enclosed on this model.

On the prototype pictured, .020 thick 2024T3 aluminum was used, but the box is so strong that .016 could easily have been used. Soft aluminum from hardware stores may require thicker gage or more reinforcing. Metal Good Div. of Alcan Aluminum Corp., Norcom and Charter Roads, Philadelphia, Pa. 19154, will accept orders of \$25 or more and will deliver in the Philadelphia area. Consult your Yellow Pages for a local source. The pop or blind rivets available in many hardware stores are neat and quick to use. Steel, 3/32 dia. rivets are recommended and seem to work even in rivet guns which are only supposed to take 1/8 or larger rivets.

Wind Tunnel Free Flying: Gene Rock established what may be a world's first when he flew his SSP-4 helicopter in Boeing-Vertol's 20 x 20 ft. wind tunnel with wind on and without benefit of tethering lines. Speeds to 25 knots were flown, and a sling load consisting of a miniature telephone pole was carried during parts of the tests. Ceiling effect was noted one time when the model came too close to the ceiling and sucked itself up. The friction on the blade tips along with the pilot's chopping throttle caused a sharp drop in rotor rpm, but the big Enya 45 engine managed to rev up the rotor in time to prevent damage on landing. At 25 knots, the model wanted to pitch up or down if disturbed from equilibrium conditions—in other words, a slight static pitching divergence. Reduction in collective pitch of the Hiller servo paddles from about 10° to zero collective improved handling qualities at high speeds. With more practice, it should be possible to hold the model within two ft. of a given point. This new technique of testing in a wind tunnel opens up new possibilities of studying stability and control and helicopter-sling load compatibility.



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A fascinating glimpse into the future of space exploration. Approximately \$8.00.

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is best to be quite familiar with the procedures. We plan to discuss this in a future "Where The Action Is" column.

The receiver has a double-tuned front end, the usual 455 kHz IF strip and a stage of output squaring. The detected output is fed back to all IF stages for ACC. The output pulse train is fed to the decoder where the clock and reset pulses are formed by discrete components. Decoding is performed by an SCS for each channel.

The servos feature the use of an IC amplifier by Texas Instruments with discrete, passive components for trimming and damping. These are mounted in D & R Bantam DS2P mechanisms.

Interconnections are via a miniature plug block with separate plugs for fifth channel and power supply. Charging connection is made via the same power harness.

The test system had a separate in-line failsafe device with it which could be used with most any digital system. It simply plugs into any desired receiver output to a servo and the servo, in turn, plugs into the failsafe.

The failsafe functions as follows: It detects the presence of the incoming servo control pulses arriving at 60 times per second; so long as the pulses are present, pulse omission detector (POD) remains deactivated and the control pulse is passed on to the servo. When a pulse is not present, for example during a loss of signal to the receiver, for a period of one second, the POD activates to start a reference pulse generator the output of which now controls the servo. The width of this reference pulse may be set by means of a tiny trim pot on the failsafe board to position the servo at any point in its normal range of travel. If used for "fail-soft," i.e., low throttle, the throttle servo could be run to full cut-off. At any time signal is regained, the servo will return to its original commanded position.

Near the end of our evaluation, a new IC decoder was sent to us by Silver-



1-2-Punch!

Our new low battery drain integrated circuits are working well (1) in the field (2) in the plant. Thorny production and set-up problems have melted. So . . . we are:

1. Adding a fifth channel to the Pylon Midget Single Stick (\$10 more) \$285.00.
2. Producing all Blue Max systems as 6 channel outfits (4 servos) and adding only \$10.00 to the 4 channel price—\$330.00 + \$10.00 = \$340.00 and remember our Blue Max 12 volt set comes with Buddy Box—a deluxe set.

Transmitter Dimensions¹: 6½ wide x 6½ high x 2 deep

Receiver Dimensions: 1¼ wide x 1-1/8 high x 1-5/8 long

Servo Dimensions: 7/8 wide x 1¾ high x 1-1/8 long (Length includes mount lugs, height includes output arms)

Battery Pack Dimension: 1¼ x 1¼ x 2-1/8

Average Servo Thrust: 2.5 lb. at 11/64 in. radius. Torque equals 0.43 in.-lb.

System Linearity: (See plotted resolution curve)

Airborne Weight: Approximately 12 oz. with four servos and without failsafe

Transmitter Power Supply: 9.6V

¹All dimensions in inches.



WORLD ENGINES

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tone and installed in place of the SCS decoder. The decoder utilizes three SN74L73 dual J-K flip-flops for decoding. Performance of the system is essentially the same with the IC decoder; however, reliability should be significantly improved.

Performance of the system was quite satisfactory. Temperature tests at 0°F and 150°F were satisfactory although one servo slowed perceptibly at 0°F. The average torque for the four servos tested was 0.43 in.-lb. This compares with a nominal 0.70 to 0.90 in.-lb. for most systems we have tested. The output thrust of 2.5 lb. at a 1/64 in. radius was quite adequate for the helicopter.

In addition, we were informed by John Foy, president of Strato Model Products, that they would be using Orbit PS-6 servomechanisms. Measurements were made of torque for a set of these servos and an average value of 0.83 in.-lb. was obtained, a considerable improvement over previously measured servos.

WARLOCK

(Continued from page 44)

To cut out the 1/4" dowel holes in each rib, round up a 1/4" dia. brass tube and grind away the inside edge of one end using a conical grinder (Dremel tool). Hone down and polish this edge to a razor-like character, and punch out the required holes.

The formed leading edge is made from a piece of 6 x 36 x 3/32" sheet which has been soaked in steaming hot water for an hour. If possible, find an old tapered wing, and wrap the wet wood around the leading edge and tape it in place until dry. This process may have to be repeated to make the wood hold a tight curve. Then take it off the old wing, trim it, and glue it to the new wing (formed leading edges are needed for both sides).

Our home-brew wing-jig consists of two 1/4" steel rods supported evenly at each end by clamps. Note that the rods go through the wing at an angle. Slide the ribs into position—carefully! First, slide all the ribs into position on the back rod and tape them to the rod so they do not slide around. Then slide the front rod through the remaining holes with a twisting motion (you'll probably need help to keep things in position).

Splice together enough soft 1/2" balsa to form the rough shape of the flying stab (it should be full-span). After all the edges are squared up, imbed the 1/2" brass tube in the stab (see plans). Then flow five-minute epoxy into the gaps on both sides of the tube until the glue is flush with the surface. At this point, rasp and sand the stab to an airfoil shape using the brass tube as the peak of the camber. When satisfied with the shape, run it through a bandsaw along the lines shown on the plans to cut out the center section. Cut out the top and bottom of the center section brass tube to obtain a 1/2" square hole. Slide in the torque tube, and solder the tiller bar in position. Install the center section on the fuselage, and slip on the 1/32" spacers and stabilizer halves. Fasten with sheet metal screws, two on

NEW PILOT ARTF'S



GULL \$39.98

This sharp looking aircraft is designed to fly on elevator, rudder, and motor. It is a relatively large 3 channel airplane, 5 1/2" span. The manufacturer recommends a 20 but would probably fly on a 35 O.K. Nice vacuum formed fuselage, balsa elevator, molded foam wing with solid dihedral brace. Model also includes steerable nosewheel. A little larger than the Pilot Cherokee and Olympia. Worth the additional \$5.00.



MINNOW FORMULA I \$69.98

This model features the same type of vacuum formed fuselage and foam wing construction used in the popular Pilot Cavalier. The wing span 49.6". Length 39.37" (1 meter). Wing area 461 sq. in. Engine 4 cc. in. Weight approximately 5 lbs. This almost ready to fly pylon racer with racing lines, wheel pants, should make active pylon racing possible for the modeler too busy to build. This is particularly important in this rugged event.



PHANTOM \$18.95

The Phantom is an almost ready to fly U/Control model constructed of vacuum ABS plastic and wood. A very striking looking sidewinder. Wing span 25". Length 25". Wing area 192 Sq. in. Recommended engine 15 to 19. Flying weight approximately 1.35 lbs. Here is a chance for some U/Control flyers to enjoy the advantages of an A.R.F. package.



BEAT-X \$13.98

This is a U/Control combat trainer for a 20 engine. Wing span 30". It is a composite wood and vacuum formed aircraft. Even the name is a ringer.



STOL \$14.95
71" SPAN R/C

This glider is the Pilot Thermal's little brother. Foam wings. Vacuum formed fuselage with a plywood pod. Manufacturer recommends an .06 engine. .049 engine would probably work well.

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10G17--Stomper System '72	\$74.95
26,995, 27,045, 27,095, 27,145,	27,195

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Complete weight of each unit and suggested application:

Unit	Weight	Recommended
Baby	2.5 oz.	Pee Wee .020 Up to 48" gliders
Baby Twin	2.7 oz.	Tee Dee .010-.020 Up to 72" gliders
Standard	4.4 oz.	.049 to .10
Stomper	4.8 oz.	Tee Dee .049-.23

ACE MINI FOAM WINGS

These jobs are being used by more and more modelers to come up with their own designs. See recent issue of AAM for P38 and RCM for Mr. Mulligan. Ideal for 1/2A Racing-and other planes of semi-scale or fun types.

Constant chord measures 35" span, 5 1/2" wide, area 192.5. Weighs 3+ ounces.

Taper section is 35" span, center 5 1/2", which tapers to 4"; area 166.25. Just over 2 ounces.

13L166--Ace Mini Foam Taper Wing	\$2.95
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DICK'S DREAM KIT

Highly Recommended for Beginners

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- † Top grade die-cut wood parts
- † For .020 engines
- † Commander Baby or Baby Twin
- * Owen Kampen design

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- † 70" Foam Wing -- Moulded sections
- † Precision Machine cut and sanded wood
- † For .049--Power Pod parts supplied
- † Recommended for Rudder-Only
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- * Owen Kampen design

No. 13L104--Ace High Glider Kit \$14.95



SKAMPY KIT

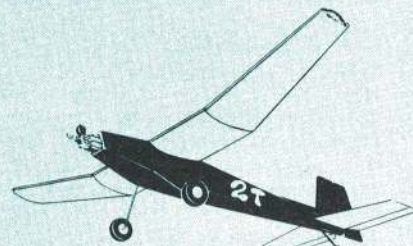
If you have mastered Rudder-Only pulse proportional flying, and are looking for new ventures, the Skampy is for you. Resembles a stand-off Goodyear Scale Racer. Owen Kampen touches in both the design and kit assures the experienced modeller of a satisfactory RO pulse experience. It is NOT recommended for beginners.

Has 30" span wing cut from Ace mini foam tapers. Construction of the fuselage is a bit harder than a box type, but still simple for modellers with experience. Fuselage is 23 1/2", recommended power is Tee Dee .020. Recommended radio installation is Commander Baby Twin. This makes total weight of 12 to 13 oz.

Kit contains taper foam wing set, precision band sawed and sanded top grade balsa and hardwood parts, Bent landing gear, wire for torque rod and plastic bearing, and hinge material is also supplied. Wheels and engine mounting hardware not included.

Full step by step instructions make this a simple job for the experienced RO flyer.

No. 13L103--Skampy Foam Wing Airplane Kit \$6.95



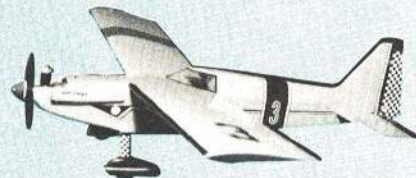
2T KIT By Ron Jacobsen

Uses two sections of the Ace Mini Foam Taper Wings, and one Constant Chord section for a total span of 50 inches, 262 sq. in. Coupled with an .049, the 2T was designed primarily for the two channel Brick type digitals that are on the market, or two servos of any digital system.

Also, when constructed correctly, it performs exceptionally well on Rudder Only using the Commander Standard or Stomper. Motor control can be added to at a later date by using the KR D motor control.

Kit contains three wing panels, all balsa wood completely band sawed and precision sanded, bent landing gear, and miscellaneous parts. Is of the same general high caliber as previous Ace kits. Hardware for hinges and linkage and wheels is left to the buyer.

No. 13L106--2T Foam Wing Airplane Kit 14.75
No. 13L206--Three Foam Wing Sections For 2T 5.00



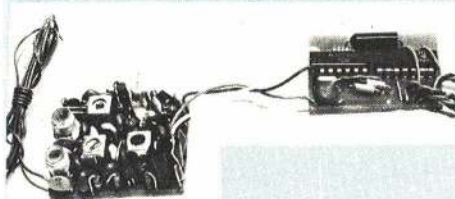
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IC's simplify wiring and set up of 2 channel decoder. Receiver is conventional double tuned front end using discrete components. Complete with detailed step by step instructions.

- No. 12G20—Digital Commander Receiver-Decoder Kit \$27.95
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- No. 12G30—Flight Pak Combo \$69.95
No. 12G30L—As above, but with D & R DS2P Linear Mechanics 71.95

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For complete listing of Transmitter and Combo Pak, Batteries, Packs, Connectors, or components and PC boards—see our Handbook-Catalog. Price is \$1.00 via BULK Third Class. \$1.50 via First Class.

digital commander TRANSMITTER KIT

IC's make the encoder a cinch, and easy conversion later to 4 channel. Built up to a standard of excellence, not down to meet a price. Complete kit with step by step instructions.

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- No. 10G2—Digital Commander Kit Combo \$117.95
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BATTERY & CHARGER OPTIONS

While alkaline energizers may be used for Flite Pak, Nicads are recommended—4.8 volts.

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| 38K33—Nicaid 225 ma Cylindrical cells | 2.00 |
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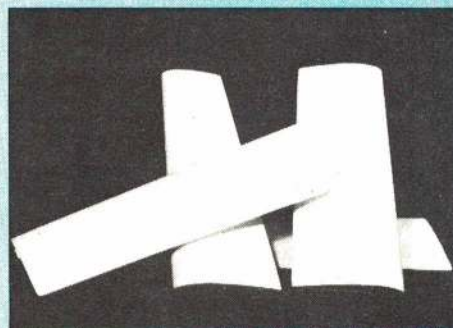
Modified Ace Foam Taper sections are used—again a simplification and an assurance of exact duplication of wings.

Span is 34". Area 350 square inches. Designed for .049 to .15 power. Use with .15 and three channels, .09-.10 for two channel OR with .049 and Rudder Only Pulse! Truly an All Star.

Kit contains 60 precision band sawed and sanded balsa, spruce and ply wood pieces, two sets of Ace taper foam wings, miscellaneous wire parts, and complete step by step building instructions. (Wheels and pilot not supplied.)

- No. 13L200—Ace ALL STAR Deluxe Biplane Kit \$21.95

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Dear Friend:

The photo above is of the Ace Foam Wings. The reason we're bringing this up again is that probably no design of a set of wings has done so much for so many.

Designed by Owen Kampen with small aircraft in mind, they are now being used with modification in biplanes such as the All Star, and triplanes such as the Sopwith by Fred Reese, and 1/2 A midget racers of all types. You name it—chances are someone has built a sort of scale or some type of aircraft using the Ace Mini Foam Wings.

AAM will have plans by John Chapis for a low wing Ryan. RCM will have at least two designs by Fred Reese as well as several others.

We invite you to keep watching the magazines—we believe you ain't seen nothing yet. It is our opinion that no foam wing design has ever had the versatility of these mini jobs by Owen Kampen.

Pulse rudder is growing like mad in all sections of the country. Not only is it for the beginner, but more and more we are finding that the RO systems are being put into small craft by many a full house flyer who wants the "instant" fun that a small ship will provide. Some clubs are even having Pulse R-O contests!

If you haven't investigated the pulse proportional story, by all means send for our latest Ace catalog, as detailed on our coupon. Get in on the fun.

Another interesting rudder only application is the new Questor by Airtronics. A Stomper gives amazing and very satisfying results. It goes off the winch like a shot, and even in calm and dead air will achieve consistent glides. Airtronics plans for the Questor contain suggestions for the Commander R-O installation.

We've been asked whether we will have gift certificates this Christmas. Very definitely. If you are in doubt as to what to give your R/C modelling friend, (circle this and let this be in a conspicuous spot where your wife can see it), we will have gift certificates in any denomination from \$10.00 up. This will allow the recipient to make his own choice from our big and expanding catalog.

Next time we'll have more on the expansion of the Ace Digital Flite Paks. The changeover for the existing receiver-decoder is quite simple and is especially for the people who are using this with transmitters other than the Ace Digital 2 channel.

Digital Commanders are presently available on all 27 and 53 mHz spots.

May you have happy flights and soft landings.



Yours sincerely,
Paul F. Runge
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each side, to the torque tube and finish with resin to prevent warping of the stabilizer.

Round up a piece of 1/2" brass tube and another piece with lesser diameter which will rotate smoothly inside the 1/2" piece yet not flop around. Whenever a cut is made, polish the edges so the torque tube will rotate smoothly.

Note that the slot for the tube in the stabilizer blank is cut completely through the 1/2" balsa. Pin the tube to wax paper and, using a spatula, push epoxy into the gaps to hold the tube in position and make a flush surface.

The one-piece center torque tube is slipped through all three pieces of the completed stabilizer. *Do not* cut it into three pieces (as you did with the larger 1/2" piece). Slip this tube into the center section, and drill a 1/16" hole through both sides for the torque rod. (See diagrams on plans.) Then, insert the torque rod in the torque tube and solder at both ends. *Be careful* to do a *neat* job; the flux has a tendency to flow all over and gum up the tubes. The solder joints must be strong and closely contained in the vicinity of the joint. If solder or flux gets into the tube surfaces, the whole assembly must be taken apart and polished to make it work smoothly again.

The 1/32" spacers are made from scrap 1/2" brass tube. Be sure not to get any resin into the tubes or sheet metal screw holes when you resin the stabilizer halves. Do not finish the halves while they are fastened to the center section—finish them separately.

Glue the Nos. 2 and 4 bulkheads to the fuselage sides, then pull in the nose and tail ends. Add the triangulars, spacers, and bottom and top sheeting. Piece in the canopy area, and block in the engine compartment with one in. triangular pieces. (I usually install an old

engine with spinner to properly shape the front end and to be certain access room is left for the engine. Next, with rough sandpaper, rough out the shape of your plane. When that job is done, cut out the canopy hatch, wing hatch, wing cavity and stabilizer slot. Glue in the formers for the wing hatch and set aside. Position the wing on the fuselage, fiberglass the front hold-down dowels in place, and rig up the trailing edge bolt(s). Then glue the top wing hatch to the top of the wing, and sand it down to blend in with the rest of the fuselage. Install the center section of the flying stab with its access hatch cut out, and epoxy on the fin and fuselage spine.

For the fixed-gear version, use an old Debolt belly mount bolted to a piece of 3/16" plywood and lock it so it will not swivel. The retract-gear version requires more thought, and the Positract nose gear units are recommended for both the front and belly gear. The nose unit is shown in phantom line on the plans—it retracts to the rear. The belly gear goes in the same position as the fixed gear with the same amount of sweep in the strut (it is necessary to adjust the micro-switching of the retract mechanism to obtain this sweep). The retractable belly gear is not shown on the plans. I am certain there is a better

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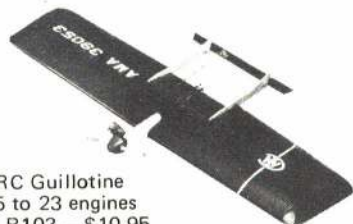
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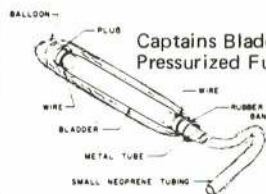


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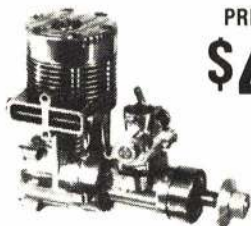
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method to retract it than the one I used (retracting towards the tail necessitated locating the throttle servo under the gas tank!). It would probably make more sense to retract the gear forward and take the sweep out of the strut. This, however, would decrease the cushioning effect and detract from the overall appearance of the gear. Use your own judgement.

Fiberglass both sides of the firewall (front and back) to provide a sturdy, vibration-resistant base for the engine. Also fiberglass any landing gear mounts—retractable or fixed.

If the Positrac system is used for the belly gear, remove all the nose gear steering parts and tighten the side set screws to keep the strut from turning. Be sure to keep the nose-gear throw to a minimum since to maneuver little throw is needed.

The severe sweep in the hinge line complicates the making of the rudder horn. Round up a 4-40 bolt, 1 1/2" long, and bolt it through the rudder near the hinge line. Thread an aileron tiller onto the bolt, and connect it to the pushrod Kwik Link.

The canopy area is pieced together (or make it out of a solid block), cut from the fuselage, and painted. Cut an old clear canopy for the windscreen, and epoxy it in place.

It is probably unnecessary to tell experts how to set up a Pattern ship, but here are some notes on the landing gear system, CG, and control surface throws.

First, the landing gear. Much thought was put into this system. If you

change it, do not expect things to work perfectly. Less-than-perfect landings are nearly impossible if the outriggers and undercarriage are located according to the plan. For example, as the craft is set up on final, the power is reduced to full low and brought in fairly fast with a slight amount of back stick. This rocks the plane back on its heels causing the outriggers to touch ground first. These appendages are set up with a small amount of "spring" to put pressure on the nose gear when taxiing. When the weight is off the outriggers, they spring below the main gear and absorb most of the impact with the ground. As speed dies off, the belly gear comes into play and due to its sweep, further cushions the landing. By the time the nose gear comes into contact with the ground, it is set down so gently that a bounce is out of the question. The only thing to watch out for is the nose-gear throw. Because the belly gear is in direct line with the nose, very little throw is needed to redirect its path. Slop, therefore, must be kept out of the linkage at all costs.

Second, the flying stab has a few tricks to it. You will need about twice the throw you would expect: about 1/2" in both directions (sometimes as much as 5/8"). In the air the craft is not super-sensitive, but gives a smooth, gentle and precise feel which is just what today's pattern calls for. Also, a flying stab eliminates worrying about wing incidence. The stabilizer will always align itself with the wing to achieve level flight.

Last, but not least, is the CG. Due to the long nose moment, this craft cannot be tail-heavy. Even with all the flying stab equipment back there, I still had to add weight to the tail. Generally, the CG should be about 8 1/4 in. from the

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trailing edge of the wing, just outside the fuselage. From this point, gradually add tail weight until the plane enters easily into a spin. Once this is achieved, *go no farther.*

Don't try to fool yourself into thinking you can fly the Warlock if your skills are less than perfect. This is one heck of a lot of airplane, and it does not tolerate the slightest mistake. It has the capability of making a great pilot look magnificent with a minimum of practice, but I shudder to think of the result which will inevitably occur if inexperienced hands get on the box!

So, good luck. I hope I never have to compete against another Warlock!

BLUE RIBBON REVIEW— PART II

(Continued from page 17)

mounting plate is then attached to the rotor head assembly with counter-sunk 4-40 machine screws. Three 8-32 machine screws hold the Wankel mounting ring to the plate. The engine is located on the plate with the throttle in line with the rotor blades. Final balancing of the rotor assembly is accomplished by placing small pieces of solder in the end of the rotor blade.

Several tanks of fuel were run through the engine before attempting tethered flight. With the chopper firmly anchored (bricks on the landing skid), this engine break in time also afforded an opportunity to check and observe the action of the controls. Final trim-

ming of the flybar linkage was made by observing the disc of the flybar in motion and adjusting for a level condition with all controls in neutral.

Initial flight attempts were made with the two-line tether system described in the instructions. The model weighed just under four lb. dry, and ten oz. of additional weight was attached to the landing gear. The first "flights" were made in Bob Beckman's backyard heliport, using a sheet of plywood as a landing pad. Two things became immediately obvious: There was enough lift from the Wankel; there wasn't enough tail rotor control. A quick trip to the shop to adjust the tail rotor linkage, and we were back to the now greasy plywood.

Several days and many penguin-type flights later we were beginning to wonder. The model obviously got light as power was applied, but it also started jittering and swinging around as soon as it started to lift. Even the most charitable of spectators couldn't say that the model was flying. At times it did seem that we had some control over the bird's gyrations, but for the most part it was just banging back and forth between tethers. We were beginning to question whether the engine had the power to turn the rotor fast enough to provide the necessary control.

At this point we got a break. Dave Gray was in town to help with the AMA demonstrations at TRANSCO '72, and he gave our bird a test flight. After removing the weights and checking over

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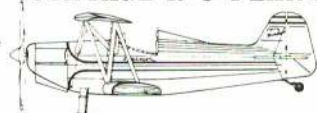
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the engine installation, Dave was ready to go. As he didn't feel that Bob's backyard heliport was big enough, we all trooped out into the street in front of the house. The tank was filled, the engine started, and Dave took the bird up. Just like that!

All doubts about the capability of the model were removed. Our difficulty had really been the capability of the pilot. Dave made several flights that evening (we wound up under the street light at the corner) with both the Wankel-powered version and one of his own 40-powered birds. We reached the conclusions that: 1) the Wankel will fly the Whirlybird nicely when it is putting out peak power, but none of the margin of power is available that is so important to helicopter flying; 2) the marginal power situation further complicates the already difficult task of learning to fly a new way. That the power is marginal is not surprising, since the Wankel is a nominal 30. What is pleasantly surprising is that this rotary piston engine produces enough power to fly the Whirlybird smoothly, *once you know what you're doing.*

Dave had another valuable hint regarding the landing gear. Up to this point we had been using the skid gear that came with the kit. This is quite adequate and looks very scale-like, but as Dave pointed out, its narrow tread is what allows the chopper to jitter and bounce around just before it becomes airborne. One of Dave's models was fitted with wide stance, tricycle, training gear. The advantages are: 1) as the throttle is advanced, the model remains stable until adequate control forces have been developed by the main and tail rotors; 2) the wide stance of the gear will help to avoid tipping over and breaking rotor blades; 3) the tether system is not needed. Once the pilot's capability has been developed, the skid-type gear can be used.

Several versions of the training gear have been made, and the final version is shown in the drawings. Construction is simple, but a few words on evolution are in order. The first gear made was fabricated from 1/4" dowels with rubber balls on the ends. Looked great, but the rubber balls wouldn't slide so it was hard to move the model around, the dowels were both springy and weak so on a hard landing they either broke or bounced the model over and banged up the rotor. Ping-pong balls were tried in place of the rubber balls, but they were too fragile. Small rubber-tired wheels looked good for a while, but going sideways they would dig in and flip the bird just like the original balls. The final combination of fiberglass rods and plastic practice golf balls seems ideal.

By this time we really had the bit in our teeth on this business of helicopter flying and we wanted to master it. The Wankel was temporarily retired, and we looked around for something with enough power to make our tyro attempts a little easier. The Ross twin looked like the answer. Here we had a setup where the counter-balance has a piston in it to contribute to the power available. Mounting the Ross was simply

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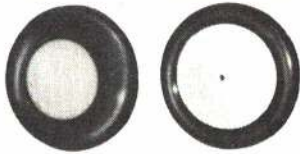
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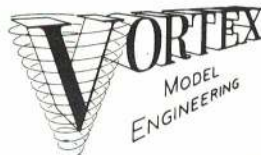
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a matter of making another mounting plate and rigging a balance weight opposite the exhausts.

Flying the Whirlybird with the Ross has been a pleasure. The engine is easy to start, smooth and quiet running, with more than enough power to do the job. The first takeoff resulted in the bird climbing to a six ft. altitude before we realized what was happening. That we got it back down undamaged proved that we were making some progress in learning to handle this new type of RC flight. Since then we have progressed to short duration hovering flights and, more important, learned that we can fly the Whirlybird in moderate wind.

The Du-Bro Whirlybird has proven itself to be a fascinating and successful introduction to RC helicopters. Its greatest value may be as a trainer in preparation for flying other types of choppers. But we have to repeat the oft-stated fact that it takes a lot of time to learn to fly a model helicopter. After about four gallons of fuel we're still a long way from being accomplished RC helicopter pilots. But we'll get there!

Additional comments by the Editor: Many modelers have given up on their Du-Bro 505's and claimed that they are not flyable. This is just not so. They fly well and are a true helicopter even with the torque reaction drive. Think of this as a coaxial helicopter. The Du-Bro is the easiest helicopter to fly, too. I have become a pretty good fixed-wing RC pilot, but I felt like a rank beginner in RC with my first three gallons of fuel through the Whirlybird. It takes about four gallons to achieve smooth hovering.

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Comments by other would-be Du-Bro 505 pilots indicate much misunderstanding of helicopter characteristics. For example, the Du-Bro is not top-heavy just because the engine is on top. Consider where the lift is coming from and realize that all the weight is below the lift. The chopper may seem top-heavy because of marginal control and

stability when the rotors slow down or are unpowered when chopping the throttle. Because this model has a low rotor speed, that speed is critical.

Helicopters when within one rotor diameter distance from the ground are flying on a very slippery bubble of air. All control inputs are concentrated on keeping on top of that bubble. When the model is up to five ft., it is riding on a more stable column of air, not just a

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bubble. Also, the Du-Bro is a rigid rotor design and must be in full free flight off the ground (by at least an inch) before any control inputs are meaningful. Inputs on the ground have no relation to the direction of flight or movement of the model. So, bring the rotors up to speed, then lift off quickly but slightly before expecting controls to take effect.

As mentioned by Bob Beckman in the above text, we switched from the Wankel engine to the Ross to try the model with additional power. I made this conversion after achieving significant power increases. Unfortunately, Bob did not get to fly it with the improved Wankel operation.

The engine loves lots of nitro and K&B 500 seems to be its best fuel. A Fox short idle-bar plug improves rpm by nearly 800 rpm over the original O.S. Wankel plug. The engine overheats and then sags fairly soon after running up to full speed on the helicopter, as there is almost no cooling in this application. Simple aluminum cooling fan of eight blades, 4 1/2 in. dia. mounted just under the flying prop, provides the necessary engine cooling air. Use an 11-4 prop to fly the helicopter.

You just can't beat having extra power and the Ross is the way to overpower the Du-Bro 505. However, by using a high pitch prop (11-7 1/2), more energy is put into the main rotor via torque at liftoff speed. More torque means more rotor rpm and thus both more control and more stability.

The tripod landing gear is quite easy to make either with fiberglass rods into a base block or with bent wires into the original landing gear mounts. We'll sketch the elaborate tripod gear, you can simplify it to suit yourself. Please, build one for your model, it makes learning to fly more successful and possible.

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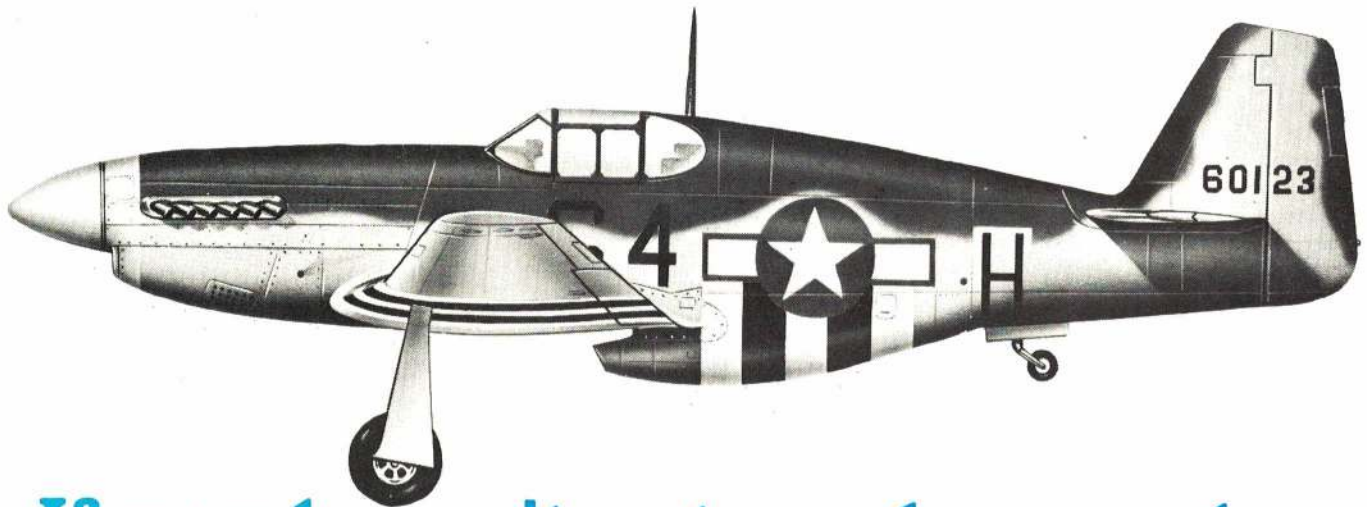


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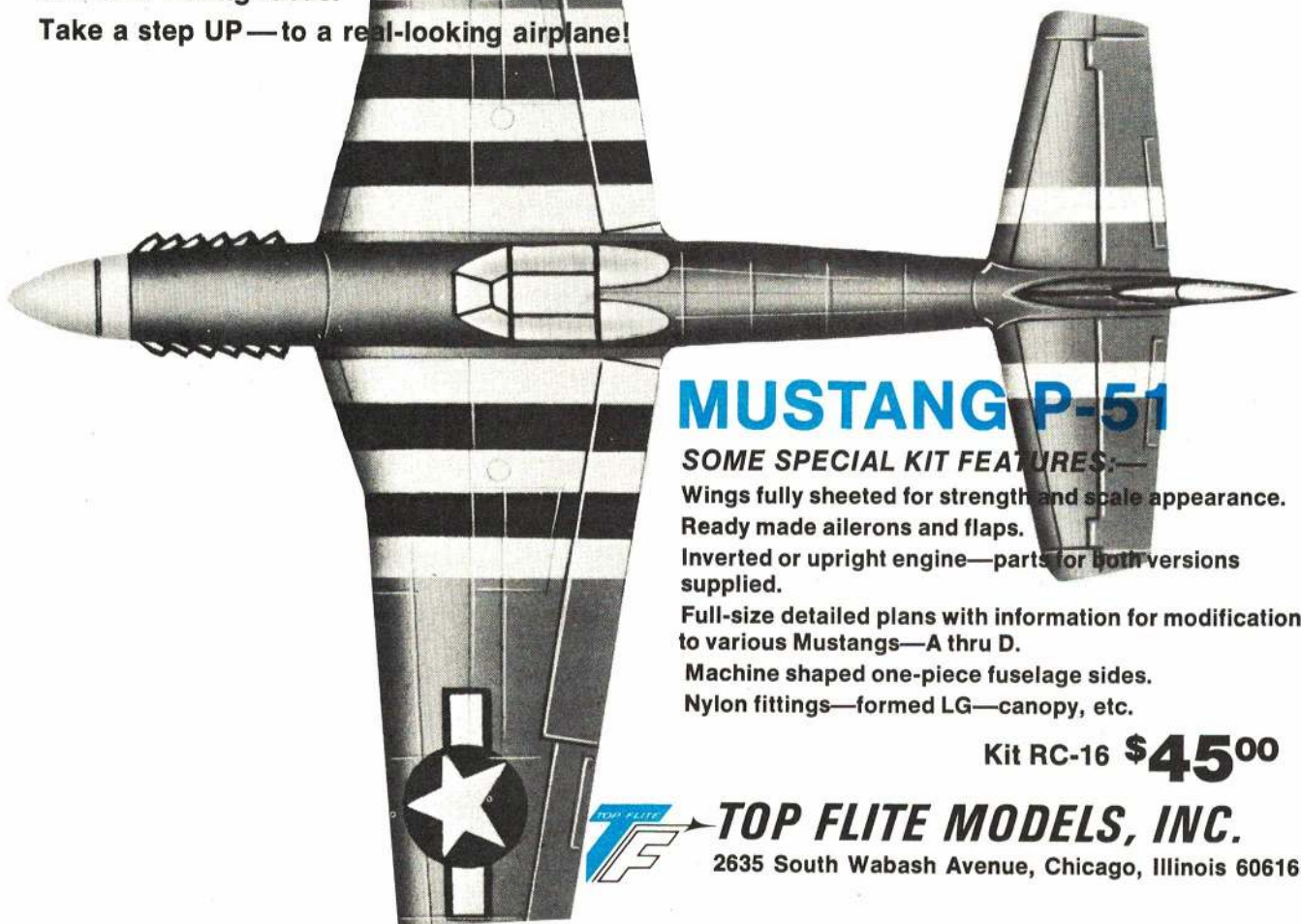
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CONTROL LINE (Continued from page 35)

different and want to get some color back into your local Carrier contest, you might investigate the use of these planes.

Jim Finley (Wichita, Kansas), as a result of his win in the Open Class, was the most happy individual I have seen in a long time. Jim has been trying for years to capture the Open crown, but for one reason or another it has eluded him until now. Jim was the third or fourth contestant to get airborne in this competition and put his Guardian through its paces to post an impressive 588.19 score. As it turned out, the score held throughout the day giving Jim the Open win. Jim's Guardian was equipped with a Rossi 60, Bill Johnson fuel metering system and used a Herron blend fuel.

Robert Sawicki (Wyandotte, Mich.), eleven years old, also put on a great show at the Carrier circles by taking first place in the Junior classes for I and II events. Robert posted a 507.78 in Class II, but exceeded this score in Class I to establish a new Class I record at 515.15 points. Robert's win this year makes it the fourth consecutive year that he has dominated the Junior Carrier Class I and II events.

Terry Herron (Wichita, Kansas) flew his Japanese Judy to a first place win in Class I with a 518.05. I might point out that by winning this year, Terry has successfully defended his Senior crown won in 1971.

In the Open classes the names of Ray Willman (Normandy, Mo.) and Dick Sawicki (Westland, Mich.) are like household names. Both men can be counted upon to be in the winners' circle at the Nats—it's only a matter of which place. Last year in the Class I event Sawicki took the first place slot while Willman placed second. Approximately seven points separated them in 1971. This year, however, Willman took the first place slot flying his Guardian for a 556.10 score to beat Sawicki who finished in the second place slot with his French Latecoere, less than three points behind Willman. What will it be next year, gentlemen?

To round out the report on Carrier event winners it should be noted that Senior John Gerber (Wyomissing, Pa.), flying a Martin MO-1, took the Senior Class II event with a 499.24 score.

Control Line Scale was not as impressive this year as it has been in the past couple of years. I believe this was because our top-notch scale modelers were in France representing the U.S.A. at the World Championships, and many new faces were seen at the Scale circles. This probably accounted for a lower level of workmanship and fewer operational features than is normally seen in this event, all of which was evident in the scoring. The highest score was 460 points in the Open Class where there are usually several scores over the 500 mark.

Seniors Cathy Burnstine and Rick Ouweleen had the only multi-engine planes entered. Cathy ran into trouble



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with her previous Nats winning B-26 when an engine failed during flight causing the plane to come in on the lines destroying her chances for another win this year. Ouweleen managed to nurse his underpowered and tail-heavy P-61 around the circles for five laps to qualify for a second place in the Senior category.

The only plane having operating features other than the normal throttle control and flaps configuration was the 1 $\frac{3}{4}$ " scale Hawker Hurricane MK-2-G by Lynn Sidabras which dropped fuel tanks after making his qualifying flight.

Dr. Charles Kirkland (Chicago, Ill.) entered one of the most talked about planes in this year's meet. Everyone waited for the moment when Kirkland brought out his 1904 Philips Multiplane for a qualifying flight. The question everyone wanted answered was "Would it fly?"

Before answering that question let me give you a few details about the plane. It was built to a 2":1' scale giving the plane a 36" wingspan, and was powered with a Fox 59 (almost as old as the plane). For those of you that don't know what a Multiplane looks like, just imagine an open Venetian blind with a small fuselage attached to the bottom of the blind.

Now back to the flight line. Kirkland got set on the circle, started his engine, set the needle valve, and went out to the center of the circle. He called for the release of the plane. It moved out and around the circle picking up speed.



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THIS MONTH'S PLANS

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When the plane had run about one third the way around the circle a little up elevator was applied and the plane was airborne, but not for long. It did what many of us thought it would—a small loop and back down to the ground to collapse in a heap much like an open Venetian blind would when dropped to the floor. I can't imagine what could be done for an encore that would top this performance. It should be noted that during my discussion with Dr. Kirkland about his plane he had indicated that this particular plane has never been done for CL before. Now I know why.

Ernie Violet (College Park, Md.) was a lot more successful in the Open Class than Dr. Kirkland by flying his finely-detailed Boeing Kaydett N2S5 to a first place win. Ernie's plane was powered with a K&B 45 and was equipped with throttle control.

John Glab (Chicago, Ill.) defended his Senior crown for the third year in a row by flying a well-executed eight lb. SE5A which was powered by an ST 60 and equipped with throttle control.

Darrin Matthews (Greensburg, Kansas), a newcomer to the Scale circles, captured the Junior Class with a well-done Volksplane.

Dan Frey (Wawatose, Wisc.), also a newcomer to the Scale circles, was part of a club effort by the Circle Airs YMCA to garner wins in all categories of the Scale event. While Andy Arhelger and Lynn Sidabras of the Club made it by taking places in the Junior and Open Classes respectively, Dan did not fair so well. Dan was flying a 12 lb. Martin Mauler which took much coaxing to get it airborne. When he finally did get into the air on his final attempt, he wound up missing a place in Senior by about a half lap of flying. It was a great club effort. I'm sure that they learned a lot, and that they will be back in force again next year for another go at it.

Semi-Scale Stunters Come of Age—It seems that the Stunt fliers have hit upon the magical combination of good flying characteristics and scale appearance as all three first place winners at this year's National Stunt competition flew semi-scale type planes to the winners' circle.

Al Rabe (Irving, Texas), a pioneer of the true semi-scale stunter several Nats ago, finally hit the right combination with his excellently built and executed

Seafury stunter to capture first place honors in the Open Class. Al's Seafury weighed in at 73 oz., some 20 oz. more than most Stunt fliers feel is a good flying weight for this event. The effect of the extra weight was well balanced by the use of an ST 60 providing the necessary power for a smooth clean pattern. Al also used a movable rudder on the ship to prevent yaw during maneuvers, and a shock absorbing landing gear for good takeoff and landing characteristics.

Dennis Adamisin (Taylor, Mich.) was the winner in the Senior Class flying a semi-scale Fouga Magister. Dennis's plane weighed in at the more conventional weight of 54 oz., was powered by

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a Max 35 and featured a semi-matte paint finish.

Mark Bauer (Norridge, Ill.) flew an original take-off on the Eindecker to take the first place slot in the Junior category on this his third try at Nats Stunt competition. Mark's plane was powered by an ST 40, weighed in at 50 oz., and featured adjustable wing tip weight and a movable rudder for better flying characteristics in the turns.

The competition in all three categories was very tight as shown by the final results. In the Open Class Rabe won over Gieske by two points. Adamisin in the Senior Class bested Jackson by only .75 points, while Bauer beat Peterson by four points in the Junior event.

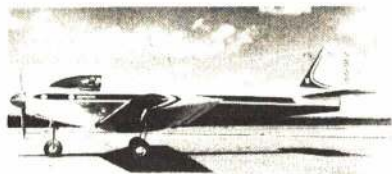
A great bit of flying by all. It might be noted that in addition to the three first place winners flying semi-scale planes, Bill Rutherford (Dallas, Texas) flew a well executed P-51 for a third place in the Open Class, while Lew McFarland (Lexington, Ky.) flew his Akromaster to the fourth place position. Yes, this was the year for the semi-scale stunts.

At the time of this writing the Jim Walker fly-off to determine the overall Nat's Stunt Champion had taken place, but the trophy had not been awarded. Senior Dennis Adamisin put in a good flight topping Al Rabe's performance by about two points. However, the question of whether or not appearance points should be counted in the overall scoring was raised. If appearance points were to be counted, the score would have been in favor of Rabe as he had about six more points in appearance than Adamisin. It might also be pointed out that with the K factor system of judging used in this year's competition, only a half point difference in a judge's mark on one maneuver could have made the difference between a win and a loss.

I don't know how headquarters is going to resolve the problem, but I do know that from talking to some previous Jim Walker winners that appearance points were not counted. The win was made on flying only. If this precedent were applied to this year's flyoffs, Dennis Adamisin would be the Jim Walker Trophy Winner.

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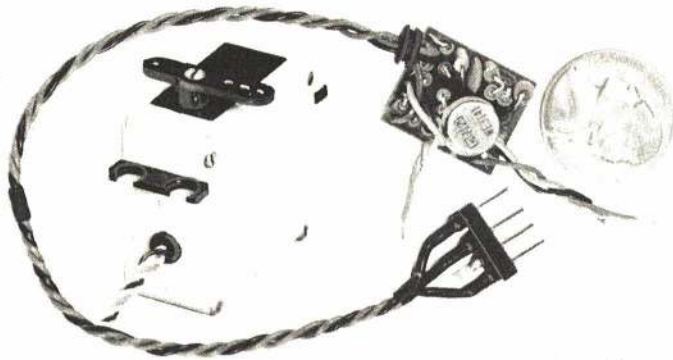
SWEET PEA

(Continued from page 47)

tip skids, twin rudders, single rudders and, in the case of this craft, no rudder.

After all these different designs we have reached a conclusion: Keeping the basic designs similar, the number of good flying aircraft but different-looking designs is endless. Building the exact same airplane every year because you are afraid to change is silly. All it does is put you in a rut which gets deeper each year. Even if you are successful in competition, there is eventually and inevitably a time when you will be beaten. Anyone who builds the same plane year after year without innovating or experimenting is not going to have experience with different designs, and therefore will not know in which direction he is going. Also, no

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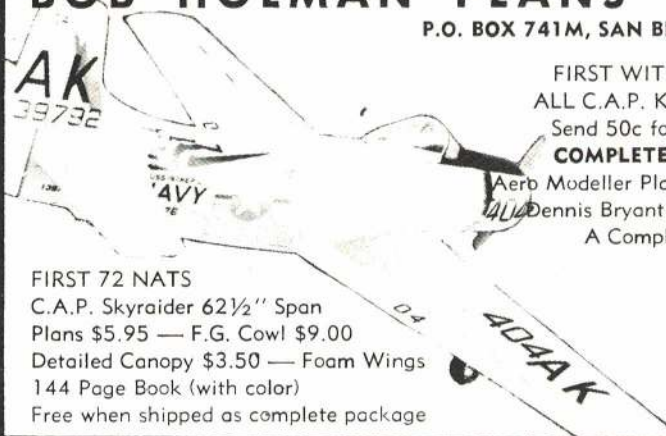
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two airplanes—no matter how similar—have ever flown exactly the same; they may all fly well but are just a little different. A slight difference in relativity, turn radius, line tension and engines can mean a different flying plane.

With regard to the appearance points controversy, there seems to be growing sentiment for dropping appearance points from the AMA Pattern. Proponents of this idea claim dropping appearance points will increase interest in Stunt because competitors wouldn't have to spend as much time building. These people also claim Stunt is primarily a flying event and appearance points shouldn't play any part in the final outcome.

I consider both these views irrational and unfounded. Many modelers in different parts of the country, including my own, have dropped appearance points at local contests in an effort to improve participation. They have found that in the long run only Stunt fliers participate anyway. All stunt planes are time consuming to construct. If you want to be competitive in this event, you have to build one; if you don't have the desire or ambition to do this, you can forget about competing.

I partially agree with those who contend that Stunt is a flying event. The existence or nonexistence of appearance points is not going to make it easier to spend long, grinding hours practicing. A major difficulty is the way some judges score. In four days of flying at the 1971 Nationals, only one flier, the Senior winner, scored over 500 points (503). It is unrealistic to say that the best fliers in the country cannot fly high 500-point patterns. A flier should be awarded the full value of his maneuver. Too many judges give a great maneuver 29 points and a bad maneuver 22 points. The AMA scoring allows for a 30 point spread from top to bottom—use it! Give credit for a maneuver which deserves it. Doing this would lessen the effect of appearance points and put the emphasis on a consistent quality pattern.

If we drop appearance points, the whole quality of the event is going to drop with them. Except for Scale events, Control Line Stunt is the only AMA event where the quality of the airplane is judged. There are some small U-Control stunters available in ARF. If

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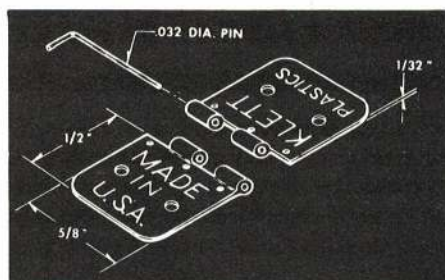
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we drop appearance points then we can drop the builder of the model rules too, just as they have done in RC. When this happens the man with the heavy pocket-book will have the inside track in the race for a good airplane. Even if all this did happen, the man with the prettiest airplane has got a psychological advantage in the judges' eyes before anybody even flies. Funny thing about humans—they are notoriously impressionable animals.

Construction

Sweet Pea's construction is different but not difficult. Necessary materials are a large flat board and some scrap wood suitable for jig blocks, as all major assemblies will be built in a jig.

All balsa, except as noted, should be the lightest available. The strength of this model comes from the structure, not hard wood. In most cases the

strength to weight ratio is higher for a light airplane.

Use sensible gluing techniques. Don't overglue, but don't go the other way either. Make the joints fit; don't depend on glue to fill the cracks. When you use epoxy, remember everything you apply stays.

The wing is a sparless structure and is designed to be planked. If you do not want a sheeted wing, take out every other rib and build a D-tube wing. (If in doubt, consult September 1972 AAM "The Hawker Typhoon.")

Begin by cutting out the rib templates—one root and two tip ribs out of 1/16" plywood. Sandwich 49 rib blanks, 25 outside and 24 inside between the templates. There are three 1/8" ribs on each side of center and one on each tip; all the other ribs are 1/16". Carve the ribs and hollow them to ap-

proximately 3/8" wide. Just before assembly, hollow the first two center ribs and the tip ribs only as much as is needed. Notch ribs in 1/4 x 1/2" leading edge and in 3/8 x 1/2" trailing edge as shown; the leading and trailing edge are notched full length. This is done with a 1/16" and then a 1/8" woodruff key cutter on a drill press. The 1/8" high notch is cut only in the center section where the 1/8" plywood center brace is located. Scrap 1/16 x 1/4" balsa is inserted into the slots to hold the ribs on center while gluing.

Cut the center section crutch out of 1/8 x 6 x 12" plywood and hollow out as shown. Epoxy the bellcrank screw brace into place, and drill the screw hole. Epoxy the leading edge and trailing edge onto the crutch, and allow to harden. When this is hard, you can begin the assembly of the jig. The leading and trailing edges are each blocked up with one-in. blocks. Nail all the blocks in their respective spots, and pin the framework to them. Starting at either end, install the ribs one at a time; cut off as much of the bevel on the leading edge as is necessary. When these are dry, sand the structure, preferably finishing the sanding with a long straight edge. If the wing is upright on the board, install your favorite control system.

Join and sand sheeting off the wing, making sure the joints are on the flat part of the airfoil. If you use four and six in. sheeting, you will have only one major joint on the wing.

The most difficult job is next. Coat the entire sheeting with Hobbyxox Formula II glue. The trick is to leave only as much glue on the sheet as is necessary and scrape off the rest. Try to get the coating to look just a little shinier than dry. Also apply glue to the leading edge, trailing edge and the center and tip ribs. Pin down the sheeting at the trailing edge, smooth the sheet forward and pin the sheet to the leading edge. Deposit weights evenly across the sheet and let harden.

When hardened, pull the wing off

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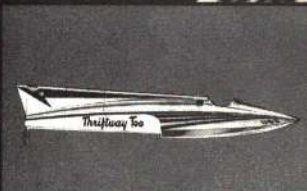
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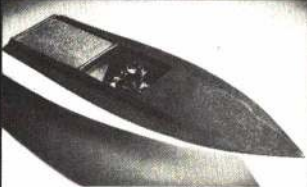


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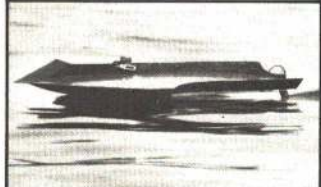
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the board, rebuild the jig, and sand and apply sheeting as before. Completed wing shouldn't weigh over 14 oz. Install flaps and tips.

Cut fuselage sides out of 1/8" medium-soft balsa. Make a template of the airfoil off the wing, and cut out wing hole. Cut out stab hole also. Taper and drill out the motor mounts as shown on plans. Cut out all bulkheads. Glue motor mounts directly to fuselage sides—there are no doublers. This is a tried and true method for avoiding stress cracks at the wing leading edge-fuselage joint. If you insist on doublers, do not use plywood thicker than 1/32". Make them as long as the motor mounts and do not extend them past the leading edge. Be sure to have a left and right side! Epoxy two bulkheads and fuel tank to left fuselage side. Slide the sides onto the wing from each side, and epoxy the bulkheads to the right fuselage side. Glue the next two bulkheads in. Build a jig for the fuselage with the fuselage resting on its top. This will hold the fuselage steady while you align the wing. When the wing is properly aligned, epoxy it in and let it harden.

Cut the stab and elevator out of 1/2" soft sheet. Carve them to an airfoil shape. Be extremely careful to leave 3/4" each side of center of stab uncarved; it greatly facilitates construction. Bevel the center of the stab to create a 50° angle. It is possible to increase the angle to 60° or decrease it to 45° without any real difference in performance. Carve a block one in. wide to fit the inside angle of the stab. Join the stab halves, and block together with epoxy. When hard, sand the bottom of the stab until you have a flat approximately one in. wide.

Elevator horns are made of Du Bro strip aileron linkage. Position the horn wires in the elevator, and open up the bend of the wire until it is vertical to the fuselage and parallel to the wire on the opposite side. The two wires should be no more than 5/8" apart. Epoxy the horn wires and hinge the two elevators onto the stab using at least three hinge points on each side.

The pushrod is a little tricky but, when done, is about the best way to motivate the multiple control horns. Using 1/16" wire, bend the rod as follows: bend a "Z" in the wire approximately 1/4" wide; bend the wire at a right angle opposite the direction of the "Z" so the wire crosses back across its center; bend another right angle bringing the wire back towards the point you started; bend another "Z" to bring the wire back right next to the original leg.

You should end up with a 3/4" rectangular loop with the two open sides angling towards the center. Slide the Du-Bro nylon horns onto the loop with a cut-down ink pen spring between them to help keep them separated. Solder the open ends of the loop to a piece of 3/32" wire for the pushrod proper. Slide the horns onto the wire uprights on the elevators, and lock them into position with the set screw which comes with the horns.

Notice the former under the stab at the bottom of the fuselage and running to the back. Make one of these out of



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3/8" balsa, and pull the back of the fuselage together around it and the tail post. Install the remaining bulkheads. Slide the pushrods-stab assembly into place. After the controls work freely and smoothly, epoxy the stab into place.

The top, front and entire bottom of the fuselage should be carved and hollowed out of blocks. Build up the turtle-deck with sheet balsa and then cap it. Glue the block above the stab to both the fuselage and to the block in the center of the stab. This improves the solidity of the rear fuselage.

Any of the new breed stunt engines run with good power and dependability. I used an OS MAX 35, but several other engines—notably the Testors and Fox 40s—are excellent choices.

Wheel pants are a nice luxury. The tailwheel fairing is borrowed from the full-size Sweet Pea. It looks nice but requires sacrificing the advantage of a long tailwheel. Then, you have to work for good landings. It is made of a 3/8" balsa core, cut out for the wheel. A 1/16" plywood cap on either side of the cut-out faired in with 1/16" balsa finishes the assembly except for sanding to shape.

Cheek cowl is made from one in. scrap balsa carved, hollowed and capped. These add charm and also make it easy to grab hold of the airplane.

Apply your favorite fillets. I carve mine out of balsa or use Epoxylite putty. Finish methods vary. If in doubt about finishing, consult articles written by Don Bambrick and Dave Gierke.

Flying

My model is a little heavy at 51 oz.; shoot for 48 oz. Mine took little trimming and flies extremely well. It doesn't turn as tightly as some of its contemporaries, but it turns cleaner. I flew mine on 65-ft. lines with excellent results. The plane will carry the extra weight, and it also gives you more time to think between corners.

I would enjoy hearing your comments and ideas. Send me a note in care of the editor.

PYLON

(Continued from page 37)

than the one in which he just nosed Terry Prather out at the finish line: They were coming down the back straight ten feet apart, and Cliff got Terry on the finish by little more than the length of the airplane. Cliff's caller Dave Lane did a superb job. Cliff had to win several races starting from second or third position, which is rough, with everyone capable of flying in the 1:30's.

What happened to some of the names you'd expect to find high in the finals? Well, what makes racing fun is just exactly the incredible number of unpredictable things that can go wrong. I remember one year when Cliff Weirick went to the line and flamed out four out of five times because he had insufficient rotor clearance. This year the Hound Dog was out to get the San Fernando Valley contingent, except for Larry Leonard and Kent Nogy, to say nothing of what the Hound Dog did to

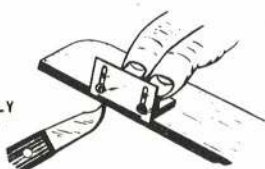
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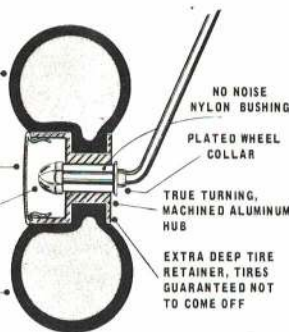


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the Florida, Texas and San Gabriel Valley entries.

Tommy Tusing, the brilliant young competitor from the S.G.V. R/C League, had a mid-air in his qualifying attempt, flying one of the prettiest Miss Dallas's you'll ever see, with a Super-tigre that was going with the best of Telford, Prather or Aldrich. Since only the wing was damaged, he put the wing of his back-up onto his No. 1 fuselage. The result: a disastrous trim problem that caused him to dump it full bore around the No. 3 pylon. Ed Rankin from Ft. Worth had a plug cool off in his Miss DARA and he filtered it through a fence on a downwind landing. Bob Bleadon went off rich as Croesus, the plug cooled off, and he tried to turn it downwind before he had adequate flying speed, and, of course, snapped it in. Bob Smith, still in my opinion the best bet to win any given race entered, had something go crazy in his radio in his first heat, or there was interference in the air and his plane snapped on take-off. (One has to wonder. There were too many of these strange failings, and I think there is no doubt that Smith himself was innocent of fault.) Chuck Smith, who finished a brilliant third in FAI Pylon, was also in great shape to place high in Formula 1 when he landed his Miss DARA into the landing lights just beyond the No. 2 pylon. Jack Fehling, one of the fast Florida group, had a wire come loose on his starting battery when he was on the line for his third attempt. And a lot of guys who are capable of beating 1:40.0 almost

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any day in the week just somehow couldn't put it together: Pete Reed, Joe Martin, Whit Stockwell, Ted White, Charley Gray, Don Singer, Bob Bleadon, Garry Korpi. And maybe twenty others of the sixty-two who failed to qualify could almost as easily have made it as not. It's hard to figure sometimes.

One wonders about the whole qualifying system. Why couldn't we fly heat races all day Monday and Tuesday? At Bakersfield we flew eight complete rounds in two days with 95 entries. With 82 entries, I'll bet we could have done ten rounds and still had Friday afternoon for five complete rounds of the 35 or so FAI entries, and Saturday afternoon for five rounds of the twenty who were at the top of Formula I after the racing Monday and Tuesday. I don't think one freak time should determine your opportunity to fly in the finals, but rather your heat point accumulation after eight or ten rounds. I also don't trust those stop watches, despite the fact that we had the best group of counters, flagmen, starters and desk helpers ever at one contest. There was one instance when three planes finished within ten feet of each other: two of them were timed at 1:37 and 1:38, and both qualified, and the third was timed at 1:43 and failed to qualify. No way!

Please understand that I do not mean this as criticism of any of the workers, most of whom I number, hopefully, among my friends. I mean it as criticism of the system—a bad one that has been thrown out at every other major event except the Nats. And it cannot be claimed that it is retained at the

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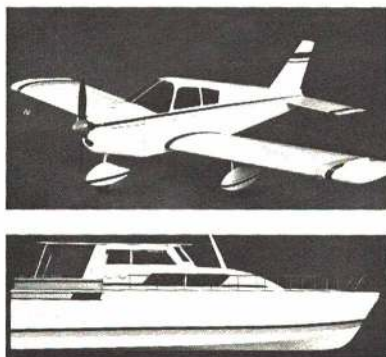
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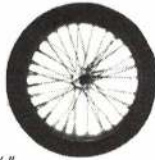


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Nats because of the numbers: there have been other Formula I races as big and bigger, and the addition of the puny FAI entry adds no problem because it could easily be flown off in one afternoon without *any* qualifying. In fact, I no longer have much sympathy for FAI Pylon as an event at all, and would like to try to combine all the racing events (except events like Quarter Midget that are explicitly intended to bring newcomers into racing) into the one clearly defined event we have—Formula I. There are too many loopholes and indeterminacies in the FAI rules—consider the Telford/Violett innovations and some of the monkeyshines that take place with FAI engines. I think the FAI influence has also been extremely damaging to our U.S. Pattern event, where everything comes down to nit-picking details, as well as to racing.

I think a special trophy for outstanding novice performance should be awarded to Kent Nogy. Would you believe that he placed six in Formula I in the fifth race he has ever entered, and of course his first Nats? Another newcomer to the Nats was Mike Barna, whose 1:40.0 was the 20th qualifying time but whose luck ran out in his first heat of the finals with a crash induced by a servo failure.

I believe the most impressive group, geographically, was the Southern contingent: Harold Coleson was 3rd in Formula I, D.C. May 4th, Tommy Baker 8th and Charles Funderbunk 12th. Southern California placed a larger number in the finals, but they entered quite a few more, too. They had Weirick 1st, Leonard 2nd, Prather 5th, Nogy 6th, Spreng 7th, Hotelling 9th, McCan 11th, and the two Smiths and Bertken on down the line. Stockwell was off the qualifying pace by 3/10 of a second, Joe Martin by 4/10, and others like Stafford, Upton, Tusing, and Korpi (N. Cal.) were in close behind them. And speaking of impressive novice performances. I must mention Ed Hotelling, who qualified in both the Formula I and the Pattern events at his first Nats—it was just a year ago that he won the Novice race in Southern California.

We've spoken of engines, now a word about airplanes. In '69, '70, '71 and '72 the winner has been the reliable low-wing Minnow, three times a stock Stafford Minnow and once the Stafford fuselage with a Smith laminar wing. Now that is quite a record! It doesn't prove it is *the* best airplane around. It still hasn't been able to set the times that Smith and Leonard have turned with the Miss DARA, but it's got to be one of the best flying, fastest, best landing and cleanest airplanes in the competition.

Speaking of good-looking airplanes, it was Terry Prather's exceptional white Minnow with orange trim that took the top starting honors. Terry has few rivets, no control surface striping, no gimmicks—just superb finish and workmanship, and excellent scale outline. Another detail: the top six in the handicapping were basic white, some with red trim, some with blue. Somehow judges prefer basic white airplanes. I find that

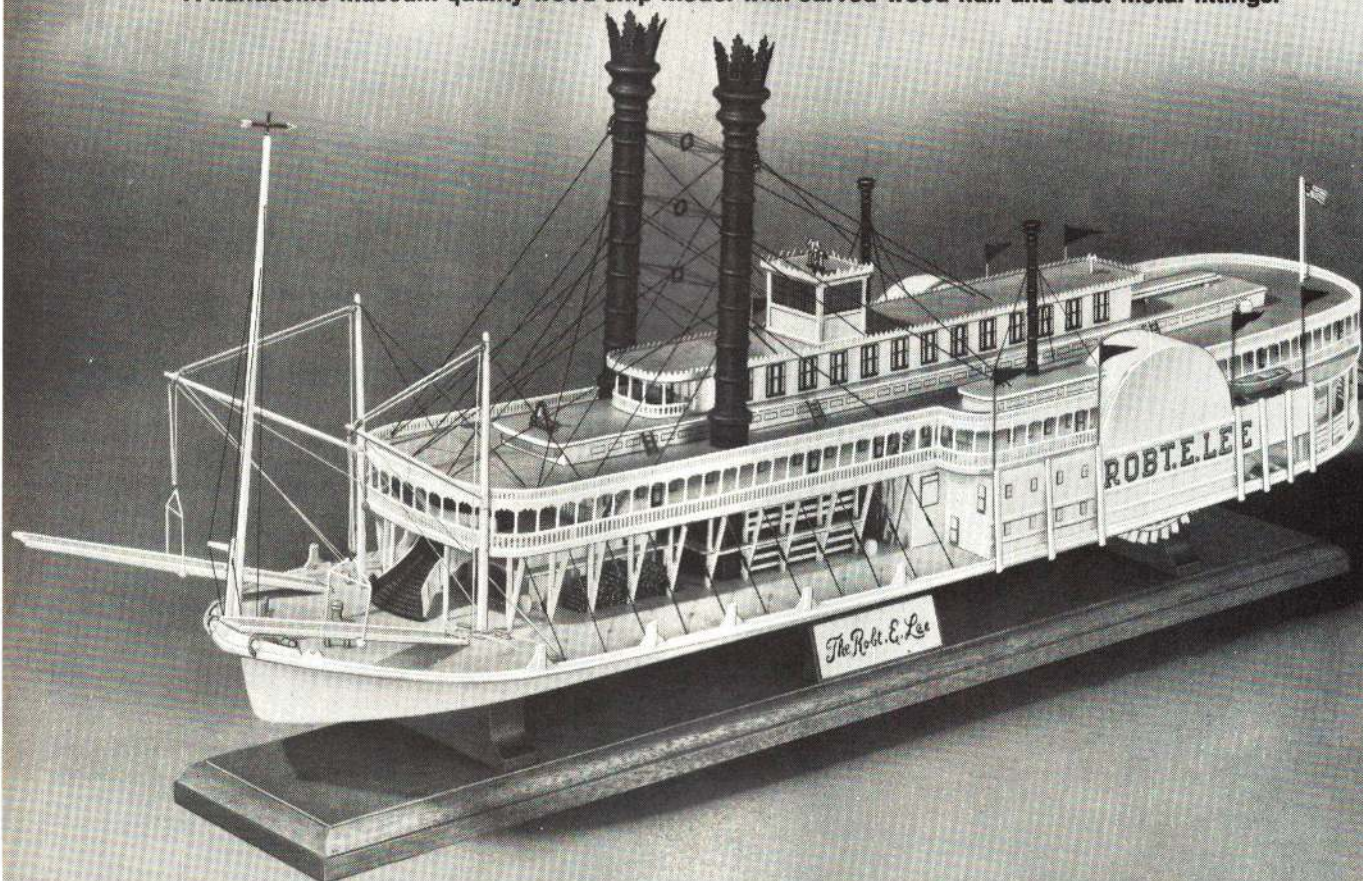
(Continued on page 102)

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Editor:
Carl Wheely

MODEL AVIATION

Official magazine

A.M.A. NEWS



Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

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Spectacular AMA - AAM Nats Coverage Begins Page 20

The regular "AMA News" section may look as if it has been short-changed this month, but it really isn't so. Instead AMA and AAM have teamed up to improve the reporting and graphic presentation of the highlights and official results of the 1972 National Model Airplane Championships.

Beginning on page 20 you'll find the usual AMA authors plus AAM's "Where the Action Is" columnists. In this manner the reader will be able to learn about all aspects of the Nats with improved continuity. It is a team effort designed to pay dividends in increased reading pleasure.



Two-time CL Stunt World Champion Bill Werwage is carried on Teammates' shoulders in celebration of Bill's repeat win. Basic results of the CL World Champs in Finland were reported in the October "AMA News Extra", page 111.

Scale World Championships

U.S. TEAMS 1ST IN RC, 4TH IN CL

Individual U.S. placing in the Second FAI Scale Models World Championships at Toulouse, France, August 2-6 was as follows.

Radio Control: Maxey Hester, Ryan STA Special, 3rd; John Roth, Volksplane, 5th; Bob Wischer, Emeraude, 7th.

Control Line: Mike Stott, Meyers 145, 4th; Mal Meador, Spitfire, 7th; Ralph Burnstine, Douglas A-20, 14th.

Heinz Simon, Germany, was the individual RC Scale World Champion, entering and fly-

ing very impressively a German ME 163 rocket fighter. His procedure was to tow the model to the takeoff point by means of an RC truck, just as was done with the prototype, then take off from a dolly.

Jerzy Ostrowski and Lech Podgorski, both of Poland, were first and second in Control Line Scale, which placed this country in good stead to also be the CL Team World Champion. Ostrowski's aircraft was the twin-engined DH Hornet.

New Dues Structure

The AMA Executive Council, at its July 26, 1972 meeting, approved the following dues structure for 1973 AMA members:

Open class (19 or over as of July 1, 1973)—\$15.00, including subscription to American Aircraft Modeler Magazine.

Junior or Senior classes (not 19 by July 1, 1973)—\$3.00 without American Aircraft Modeler Magazine, \$7.50 with the magazine.

Membership renewal notices will be in the mail during October, must be returned with dues payment by December 15, to avoid missing any magazine issues for 1973.

New memberships may be applied for now—should be received by AMA by December 15 for full 1973 service including magazine subscription, liability insurance, and AMA competition eligibility.

U.S. Wins Indoor WC and RC Pylon Int'l

Pete Andrews, the first man to clock 30 minutes with an Indoor model, has won the 1972 Indoor World Championships with a two-flight total of 71:09. Czechoslovakians took 2nd, 3rd and 4th and also the team prize. U.S.A.'ers Cannizzo and Romak were 5th and 7th to earn 2nd team place.

Bob Violett, piloting the Telford/Violett entry, won the RC Pylon Race International Contest with 32 race points and best meet time of 1:40.5. Philip Greeno, Gt. Britain, was 2nd with 28 points, and Jeff Bertken, U.S., was 3rd 23 points.

The two contests were in England, August 25-28; Indoor was flown at Cardington while the RC Pylon Race was at Cranfield.



CONTEST				
	1	2	3	4
7	8	9		13
14	15		18	19
			24	25
	29	30	31	

CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

SEPT. 30-OCT. 1—E. GRANBY, CONN. (AA) N.C.R.C.C. Annual RC Pattern Meet. Site: E. Granby. G. Sawn CD, 6 Audrey Ln., Enfield, Conn. 06082. Sponsor: Northern Connecticut RC Club.

SEPT. 30-OCT. 1—ELMIRA, N.Y. (A) National RC Soaring Contest. Site: Harris Hill. R. Miller CD, 22 Kings Cir., Corning, N.Y. 14830. Sponsor: The Flying Sparks, Inc.

SEPT. 30-OCT. 1—JAMESTOWN, N.Y. (AA) United Pylon Racing Circuit RC Championships. Site: Hartfield. W. Johnson CD, 153 Hallock St., Jamestown, N.Y. 14701.

SEPT. 30-OCT. 1—MONROE, N.C. (AA) N. Carolina State RC Meet. Site: Monroe. D. Pearce CD, 1005 Ainsworth Ct., Greensboro, N.C. 27410.

OCT. 1—MENTOR, OHIO Quarter Midget World Championships. Site: Tyler Blvd. R. Penko CD, 21151 Westport Ave., Euclid, Ohio 44094. Sponsor: Mentor Area RC Society.

OCT. 1—VALLEY PARK, MO. (A) United States Model Aerobatic CL Championships. Site: Buder Park. T. Niebuhr CD, 1170 S. Florissant Rd., Florissant, Mo. 63031. Sponsor: St. Louis Yellow Jackets.

OCT. 1—LINCOLN PARK, N.J. (A) 14th Annual CL Model Air Show. Site: G.S.C.B. Club Field. K. Purzycki CD, 273 Marcella Rd., Lake Parsippany, N.J. 07054. Sponsor: Garden State Circle Burners Inc.

OCT. 1—LAKEHURST, N.J. (AA) Central Jersey RC Club 1972 Eastern States RC Championships. Site: Lakehurst Naval Air Station. L. Shulman CD, 1114 Raritan Rd., Clark, N.J. 07066. Sponsor: Central Jersey RC Club.

OCT. 1—DAYTON, OHIO (AA) Dayton All 1/2A & A CL Contest. Site: Municipal Flying Field. K. Trostle CD, 6301 Leawood Dr., Dayton, Ohio 45424. Sponsor: Dayton Buzzin' Buzzards.

OCT. 1—ALBANY, ORE. (A) 3rd Annual Silence Please FF Meet (Cat. I). Site: Parker Field. B. Stalick CD, 1120 Shady Ln., Albany, Ore. 97321. Sponsor: Willamette Modelers Club, Inc.

OCT. 1—OKLAHOMA CITY, OKLA. (AA) Controliners Fall CL Rally. Site: 5300 N. Broadway Ext. M. McGee CD, 904 N. Harris, Apt. D, Oklahoma City, Okla. 73107. Sponsor: Oklahoma City Controliners.

OCT. 1—RICHMOND, VA. (AA) Brainbusters Fall FF Meet (Cat. II). Site: Curles Neck Dairy Farm. B. Champine CD, P.O. Box 6213, Newport News, Va. 23606. Sponsor: Brainbusters Model Club.

OCT. 1—MESQUITE, TEX. (A) Golden Triangle Annual A-B Pattern & Scale RC Meet. Site: Samuels Park East. B. O'Steen CD, 1506 Marie Terr., Arlington, Tex. 76010. Sponsor: Golden Triangle RC Club.

OCT. 1—COUNCIL BLUFFS, IOWA (A) Cobras RC Pylon Meet. Site: Cobra Field. P. Edmunds CD, 4729 Easkine, Apt. No. 4, Omaha, Neb. 78100. Sponsor: Cobras Radio Control Club.

OCT. 1—CHAGRIN FALLS, OHIO (A) Third Annual Midwest All-Scale FF Meet. Site: Savage Road. V. Didelot CD, 4410 Lorna Ln., Erie, Penna. 16506. Sponsor: Erie Model Aircraft Assn.

OCT. 1—BALTIMORE, MD. (A) Flite Streaks CL Stunt Contest. Site: Skyview Park.

B. Trent CD, 300 Lambson Ct., Baltimore, Md. 21220. Sponsor: Flite Streaks.

OCT. 7-9—FISKDALE, MASS. (AA) 7th Annual N.E. Hydro Radioplane Championships. Site: Brimfield Dam, J. Ross CD, 19 Sterling Dr., Dover, Mass. 02030. Sponsor: New England RC Modelers, Inc.

OCT. 7-8—DALLAS, TEX. (AAA) Model Aircraft Club of Dallas Fall CL Championships. Site: Hobby Park. M. Wheeler CD, 2400 Lovell Dr., Mesquite, Tex. 75149. Sponsor: Model Aircraft Club of Dallas.

OCT. 7-8—ALBUQUERQUE, N.M. (AA) SWAT 8th Annual FF (Cat. I) Contest. Site: Boys' Academy. J. Bicknell CD, 12329 Princess Jean, N.E., Albuquerque, N.M. 87112. Sponsor: South West Aero Team.

OCT. 7-8—S. EL MONTE, CALIF. (A) San Gabriel Annual RC Pattern Contest. Site: S. El Monte. J. Garabidian CD, 909 N. 3rd St., Montebello, Calif. 90640. Sponsor: San Gabriel Valley RC Club.

OCT. 7-8—VAN NUYS, CALIF. (A) N.A.R. Flightmasters 23rd Annual FF Scale Contest. Site: Van Nuys Basin. J. Kusik CD, 9172 Willhelm Cir., Huntington Bch., Calif. 92646. Sponsor: N.A.R. Flightmasters.

OCT. 7-8—SPOKANE, WASH. (A) Octoberfest Fun-Fly & RC Pattern. Site: Barons Field. C. Martin CD, 2906 N. 5th St., Coeur d'Alene, Idaho 83814. Sponsor: Barons Model Club.

OCT. 7-8—WALLKILL, N.Y. (AA) Sky-Scrapers International FF Challenge. Site: Galeville Army A.F. W. Dunwoody CD, 985 Ft. Salonga Rd., Northport, N.Y. 11768. Sponsor: Sky-Scrapers.

OCT. 8—SOUTHFIELD, MICH. (A) Cloudbusters Annual FF Scale Meet. Site: Southfield. R. Duenz CD, 14645 Stahelin, Detroit, Mich. 48223.

OCT. 8—LINCOLN PARK, N.J. (AA) 14th Annual CL Model Air Show-2nd Half. Site: G.S.C.B. Club Field. J. Miske, Jr. CD, 415 Clifton Blvd., Clifton, N.J. 07013. Sponsor: Garden State Circle Burners, Inc.

OCT. 8—HUNTSVILLE, ALA. (AA) MACH Old Timer and FAI FF Contest. Site: Old Huntsville Airport. L. Baker, Jr. CD, 701 Esslinger, Huntsville, Ala. 35802. Sponsor: Model Airplane Club of Huntsville.

OCT. 8—DETROIT, MICH. (AA) Fall CL Internationals. Site: Rouge Park. J. Lucas CD, 20463 Ardmore, Detroit, Mich. 48235. Sponsor: Strathmoor Model Club.

OCT. 14-15—LAS VEGAS, NEV. (AA) L.V.R.C. Annual RC Meet. Site: Tule Springs Park. R. Mearns CD, 5412 Holmby Ave., Las Vegas, Nev. 89102.

OCT. 14-15—NEW ORLEANS, LA. (AA) 11th Annual Crescent City RC Meet. Site: Club Flying Field. A. Wiltz CD, 3231 47th St., Metairie, La. 70001.

OCT. 15—FORTH WORTH, TEX. (AA) The Fort Worth Planesman Fall Annual FF Meet. Site: To be Determined. W. McCormick CD, 4612 Pleasant, Ft. Worth, Tex. 76115. Sponsor: The Fort Worth Planesman.

OCT. 15—HUNTSVILLE, ALA. (A) RC/RC Soaring Meet. Site: Old Airport. C. Scholefield CD, 2709 Briarwood Dr., Huntsville, Ala. 35801. Sponsor: Rocket City Radio Controlers, Inc.

OCT. 15—FT. LEWIS, WASH. (AA) 3rd Annual FF Power Bash (Cat. I). Site: Harts Lake Prairie. H. Smith CD, 1417 N.W. 191st St., Seattle, Wash. 98177. Sponsor: Boeing Charter Hawks.

OCT. 15—WATERMILL, N.Y. Suffolk Falcon's Annual Water Mill Meet. Site: Watermill. R. Caplan CD, 21 Oneida Ave., Centereach, N.Y. 11720. Sponsor: Suffolk Falcons.

OCT. 15—SALEM, OHIO (A) RC Short Circuits Club RC Soaring Contest. Site: Quaker City Drag Strip. J. Marshall CD, RD No. 5, Lisbon, Ohio 44432. Sponsor: RC Short Circuits Club.

OCT. 15—LUMBERTON, N.C. Fort Bragg Model Club Fun-Fly. Site: Lumberton. L. Quarterman CD, 511 Anson Dr., Fayetteville, N.C. 28301. Sponsor: Fort Bragg Model Airplane Club.

OCT. 15—DURHAM, CONN. (A) Flying Aces Club Fall Meet. Site: Durham Meadows. D. Stott CD, 66 Bankside St., Bridgeport, Conn. 06606. Sponsor: Flying Aces Club.

OCT. 15—NASHVILLE, TENN. (A) Fall 1/4 Midget Rally. Site: Nashville. B. Reuther CD, 216 Vaughns Gap Rd., Nashville, Tenn.

37205. Sponsor: Middle Tennessee RC Society.

OCT. 21-22—MONROE, N.C. (AA) MRCC RC Air Races IV. Site: Monroe RC Club. V. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210. Sponsor: Monroe RC Club.

OCT. 21-22—HOMESTEAD, FLA. (A) AMPS RC 2nd Annual Fly-In. Site: AMPS Field. R. Hendricks CD, 11742 SW 176 Terr., Miami, Fla. 33157. Sponsor: Aero-Modelers of Perrine.

OCT. 21-22—VENTURA, CALIF. (AA) Ventura County Comets RC Pattern Contest. Site: Ventura. R. Lake CD, 1033 Red Oak Pl., Camarillo, Calif. 93010. Sponsor: Ventura County Comets.

OCT. 21-22—ABILENE, TEX. (A) Abilene RC Pattern Fly. Site: Seabee Park-Ft. Phantom Lake. R. Howard CD, 4235 N. First St., Abilene, Tex. 79603. Sponsor: Abilene RC Society.

OCT. 22—BRIDGEWATER, MASS. Fun-Fly. Site: Bridgewater. J. Ennis CD, 165 Grafton St., Brockton, Mass. 02401. Sponsor: South Shore RC Club.

OCT. 28-29—OKLAHOMA CITY, OKLA. Oklahoma Model & Hobby Fair. Site: Oklahoma State Fair Grounds. D. Armor CD, 7308 N. Western, Duncan, Okla. 73116. Sponsor: TORKS.

OCT. 29—FRESNO, CALIF. (A) Fresno Monthly FF Meet (Cat. I). Site: Near Kerman. F. Ginder, Jr. CD, 5740 E. Ashlan, Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

OCT. 29—VALKARIA, FLA. (A) Florida Miniature Pylon RC Races. Site: Valkaria. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789. Sponsor: R.C.A.C.F.

NOV. 4-5—S. EL MONTE, CALIF. (A) S. Calif. RC Air Races. Site: S. El Monte. J. Garabidian CD, 909 N. 3rd St., Montebello, Calif. 90640. Sponsor: San Gabriel Valley RC Club.

NOV. 4-5—RALEIGH, N.C. (A) RCNC Anniversary RC Meet. Site: Raleigh. D. Pearce CD, 1005 Ainsworth Ct., Greensboro, N.C. 27410.

NOV. 4-5—MESQUITE, TEX. (AA) DRC Club Fall RC Ball. Site: Mesquite. L. Hyde CD, 607 Dublin, Richardson, Tex. 75080. Sponsor: Dallas RC Club.

NOV. 12—SACRAMENTO, CALIF. (A) 12th Annual Stockton Old Timers Contest. Site: Weagell Field. R. Douglas CD, 5303 Calderwood Ln., San Jose, Calif. 95118. Sponsor: Oakland Cloud Dusters.

NOV. 18-19—LOS ALAMITOS, CALIF. (AA) All Speed Annual CL Meet. Site: Los Alamitos N.A.S. B. Wisniewski, CD, 4261 Petaluma Ave., Lakewood, Calif. 90713. Sponsor: Speed Flying Anyone.

NOV. 19—EL SINORE, CALIF. (A) "Mini-FAI Champs" Site: Lake Elsinore. M. Keville CD, 5407 Pimenta Ave., Lakewood, Calif. 90712. Sponsor: Thermal Thumbers.

NOV. 19—TAFT, CALIF. (A) SCAMPS Old Ruler & 30 sec. Antique Meet. Site: Taft. G. Wallock CD, 220 LeRoy Ave., Arcadia, Calif. 91006. Sponsor: SCAMPS.

NOV. 24-26—TUCSON, ARIZ. (AA) Winter RC Nationals. Site: Marana Air Park. R. Angus CD, 6640 N. Columbus, Tucson, Ariz. 85718. Sponsor: Tucson RC Club.

NOV. 26—FRESNO, CALIF. (A) Fresno Monthly FF Meet (Cat. I). Site: Near Kerman. F. Ginder, Jr. CD, 5740 E. Ashlan, Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

NOV. 26—VAN NUYS, CALIF. Northrop's 6th Annual "Flying Wing" Contest. Site: Van Nuys Basin. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: Northrop Model Aircrafters.

NOV. 26—SHARPES, FLA. Spaceport RC's RC Scale Meet. Site: Sharpes. G. Jordan CD, P.O. Box 3331, Cocoa, Fla. 32922. Sponsor: Spaceport RC's, Inc.

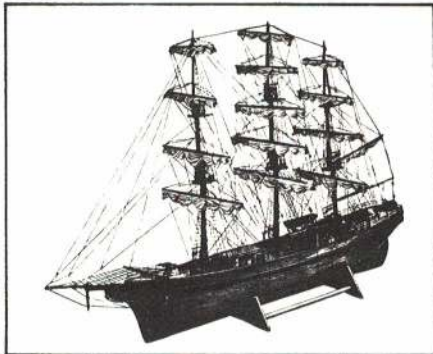
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The most recent complete directory was published in the August AAM, p. 103.

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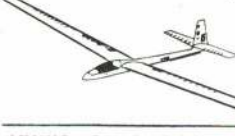
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(Continued from page 98)

particularly annoying since white is the easiest color to apply (especially with SuperPox over the white primer). But Terry's was the best, whether they were on target all the rest of the way down the line or not. Handicap judging is a thankless task; far be it from me to add to their burden. Certainly Bob Violett didn't agree with them when he found his beautiful bronze mid-wing Cosmic Wing, with all the detail of rivets, control surface striping and the like, was in fact seventh rather than second (he was looking at the wrong end of the first row). And apparently it doesn't matter whether your engine is fully cowled or not. Terry Prather's was the only fully cowled engine among the first six; he does it by having an overlarge cowl on the right side which nobody ever notices.

In FAI Pylon, this time Garry Korpi did what he came so close to doing last year: that time he was third, this time he went all the way for an unchallenged first place. His most serious competition had bad cases of the cuts. Bob Smith couldn't find the No. 3 pylon on the FAI course, kept flying it like Formula I, for two zeroes. Chuck Smith had a perfect score four out of five heats, but in his third heat he went to the line to find he had a dead receiver. During the qualifications Whit Stockwell's P-51 died just after release and there it sat in front of Doug Spreng, who turned sharp left to avoid it on takeoff and ended up crashing near the No. 3 pylon while trying to get up flying speed and avoid the officials in the area. Pete Reed's fine consistent performance earned him two firsts, two seconds, and a third to place fourth in the finals. Bob Upton had the same points as Pete Reed but a slightly slower time to take fifth.

As almost always in Pylon Racing, the finals were full of surprises. No one

who watched Telford/Violett qualify in FAI would have predicted anything but first for them. No one would have figured Bob Smith for 19th in Formula I, or that Garry Korpi would fail to qualify. Terry Prather lived pretty much up to expectations, with a solid second in FAI, though he might easily have been higher than fifth in Formula I—he crashed his No. 1 ship on landing during the qualifications, and his back-up has never been as fast even though they appear to be identical. For Whit Stockwell to fail to qualify with the best engine he's ever had was beyond our ability to fathom: we were just snake bit, that's all there is to it. And we weren't alone. It was a strange Nats—unpredictable, surprising, but always fun, good sportsmanship, good fellowship.

BEHIND THE SCENES

(Continued from page 39)

Executive Director John Worth and Nats Manager Ron Morgan arrived at Glenview.

One of the first problems encountered was a lack of any station public affairs office planning concerning advance publicity. It had been assumed that despite the Navy's minimum support situation, the normal public relations effort would be provided, simply to protect the Navy's interests and to obtain maximum publicity from the event. When this was found to be not so, AMA's PR man, Bob Lopshire, was called in several days sooner than was originally planned. He immediately got things rolling to provide an AMA effort to replace the usual Navy support.

With the help of Navy officers Geimer and Needham, the publicity effort quickly produced good newspaper, TV and radio promotion. In fact, the effort also produced good national promotion, due to Nats visits by commentator Paul Harvey and by a CBS network crew headed by newsman Hughes Rudd.

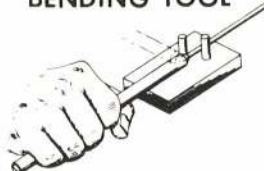
Other problems were solved during that week, including a big one concerning how the

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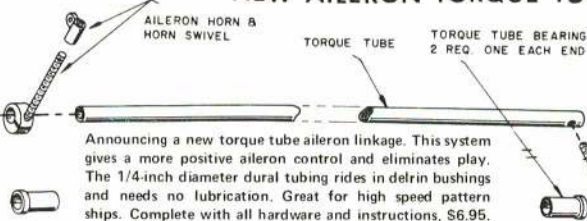


At last... a tool for making the difficult job of bending landing gear stock easy. \$9.95.

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Announcing a Belly Mounted Retract Nose Gear compatible with our system. This new gear is available in addition to the standard firewall mount gear.

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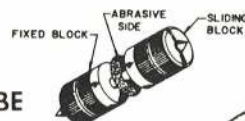
Announcing a new torque tube aileron linkage. This system gives a more positive aileron control and eliminates play. The 1/4-inch diameter dural tubing rides in delrin bushings and needs no lubrication. Great for high speed pattern ships. Complete with all hardware and instructions, \$6.95.

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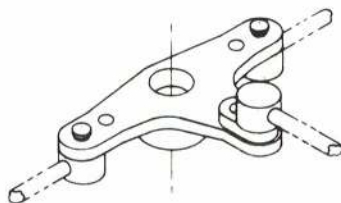
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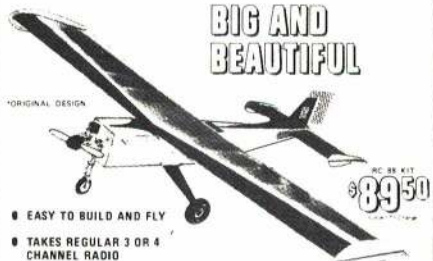
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Control Line circles were to be marked. Because of new paving on the runway the usual painted lines were not permitted. Nor was any form of whitewashing or washable marking. It was felt by Navy interests that any of these would leave a permanent stain, and this would not be acceptable on a runway used for regular full scale operations. It was finally agreed that masking tape would be acceptable since it could be peeled off or would deteriorate by exposure to weather.

Then came another shocker: 1400 yards of masking tape were required! At normal prices the cost would have been unthinkable, but it was finally arranged that AMA could buy the tape at government cost, and this kept the Nats budget within control.

Meanwhile arrangements had been made to borrow two miles of snow fencing from the State Highway Department. Navy help got it transported from Chicago to Glenview, but it was AMA's job to get it put in place on the field. It was obvious that between the fencing and runway marking jobs a major effort would be required on the weekend immediately preceding the Nats.

Then came another last minute requirement that threatened to double the entire workload. The Navy insisted on fencing or roping off all station aircraft for protection against curious spectators. This added at least another mile of effort. But with many surplus barrels and thousands of feet of rope (also bought by AMA) the additional fencing requirement was met.

At this point, on Sunday before the Nats was to start, everything depended upon a massive personnel effort by AMA to get everything ready on the field in time. The job was divided between two basic groups: airlift officials and local volunteers. About seventy AMA officials had arrived by Navy airlift on Saturday. Meanwhile many Chicago area volunteers, organized under the leadership of Bob Vojslavek (Woodbridge, Ill.), arrived to help. In addition, other officials from out of state drove to the Nats and joined the effort.

It all came together that Sunday, and the job continued through the next day. The fencing got up, the runways got marked. At the same time the special Nats phone system got installed as did 2400 feet of tables in the contestants' work hangar, and many portable sanitary toilets—all these contracted for by AMA. In addition, the trailer and tent grounds got laid out, and dozens of trash barrels got distributed.

The Nats hobby shop got built and stocked, a trophy cage also got built. Before Nats week started, the usual huge Scale model display cage had been built. This was a special effort by the Chicago Scalemasters Club: AMA paid for the materials; the club did the work.

AMA also set up a printing plant operation at the Nats to avoid costs which would be charged if Navy facilities were used. An offset press and photocopying machine were borrowed. Throughout the Nats, therefore, all printing was done by AMA including Nats results, contestant instructions, publicity handouts for spectators. This was a brand new and massive effort by AMA handled very well by HQ employee Art LaLonde.

AMA also organized and operated a major transportation network to support the Nats operation. Three small and one larger van were rented, as well as a fleet of a dozen cars for airlift officials who had to chase back and forth constantly on the field. This network was supplemented by many local cars used by

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local area officials. In an operation involving over 150 Nats workers, transportation was a key element to success.

All these and many other factors went into producing an outstandingly successful Nats. Whatever problems were involved behind the scenes, the main goal was to achieve a good contest. This was done, and to most contestants the '72 Nats was much like others before it—the problems and extraordinary efforts were not visible to most flyers.

For this Nats the behind the scenes efforts were more important than usual because they would determine what any future Nats might be like. Had AMA not been able, for example, to do on its own what had been done by the Navy in past years, the likelihood of continuing the Nats on a large scale basis would have been greatly diminished. The 1972 effort proved that AMA can produce the same type of Nats so that our horizons need not be limited to a much lesser version than we have become accustomed to. On the other hand, the cost was tremendous, financially and physically. Whether or not another such major effort should be tackled for next year is currently a big question to be decided by AMA officers.

That question is being resolved at present, from among several choices currently available. One is to go again at Glenview on the same basis as the '72 Nats (Navy sources have indicated a willingness since '72 involved so little Navy effort compared to previous Nats); another is to go to Los Alamitos Naval Air Station in California (involving even less Navy effort since this is no longer an operational airfield for aircraft); another is to go to a private field such as Oshkosh, Wisconsin (where

extra income is available from public admission charges); and a brand new possibility is Wichita, Kansas, based on an offer involving community support from that area. AMA's Executive Council has promised to review all possibilities and announce the date and location of the next Nats before the end of 1972.

While the question of the '73 Nats is being resolved, a few closing memories of the '72 event linger. One is that of Ed Sweeney, editor of American Aircraft Modeler, all alone on Sunday evening of the last day of the Nats dumping barrels and rolling up snow fence. He had volunteered to help and did it, at a time when most everyone else had quit in exhaustion. Similarly, on the day after the Nats, one lone volunteer single-handedly did the final cleanup at the contestant hangar. Ray Collins, of New Orleans, simply grabbed a broom and worked all day on his own. He wanted no favors or compensation—this was his contribution in appreciation for having enjoyed many Nats.

Many others pitched in during Nats week for similar reasons. They emptied garbage cans, swept the hangar floor, set up work tables or took them down, and generally offered their efforts without looking for recognition. Another good example was that of the Nats workers who pitched in even when they learned their airlift flight would be late departing. They worked on Monday morning, after the Nats, taking up the runway markings.

Yet even with these extra efforts—and despite a tremendous final Nats day cleanup by contestants and officials—AMA had to hire a crew to finish the job. It took two more days after the Nats, at a cost of \$600, before we could give the Navy back its air station in

first-class shape. It was well worth it, as we left in good graces and with the Navy's willingness to do it again in '73, but it was a last reminder that a Nats effort on our own does not come easily or cheaply.

It was a tremendous Nats, in many ways perhaps the best in 25 years of Navy hosting—certainly the biggest. Hopefully we will go on to other great Nats, with or without the Navy. In the meantime the '72 effort should make us all grateful for those great years of Navy support—we found out in '72 just how much of a contribution the Navy had been making behind the scenes, and without question it was tremendous. In weariness, therefore, after the experience of 1972, we can say in full appreciation, "Thanks, Navy, for 25 great years of Nats history—regardless of where we go in '73, we're grateful!"

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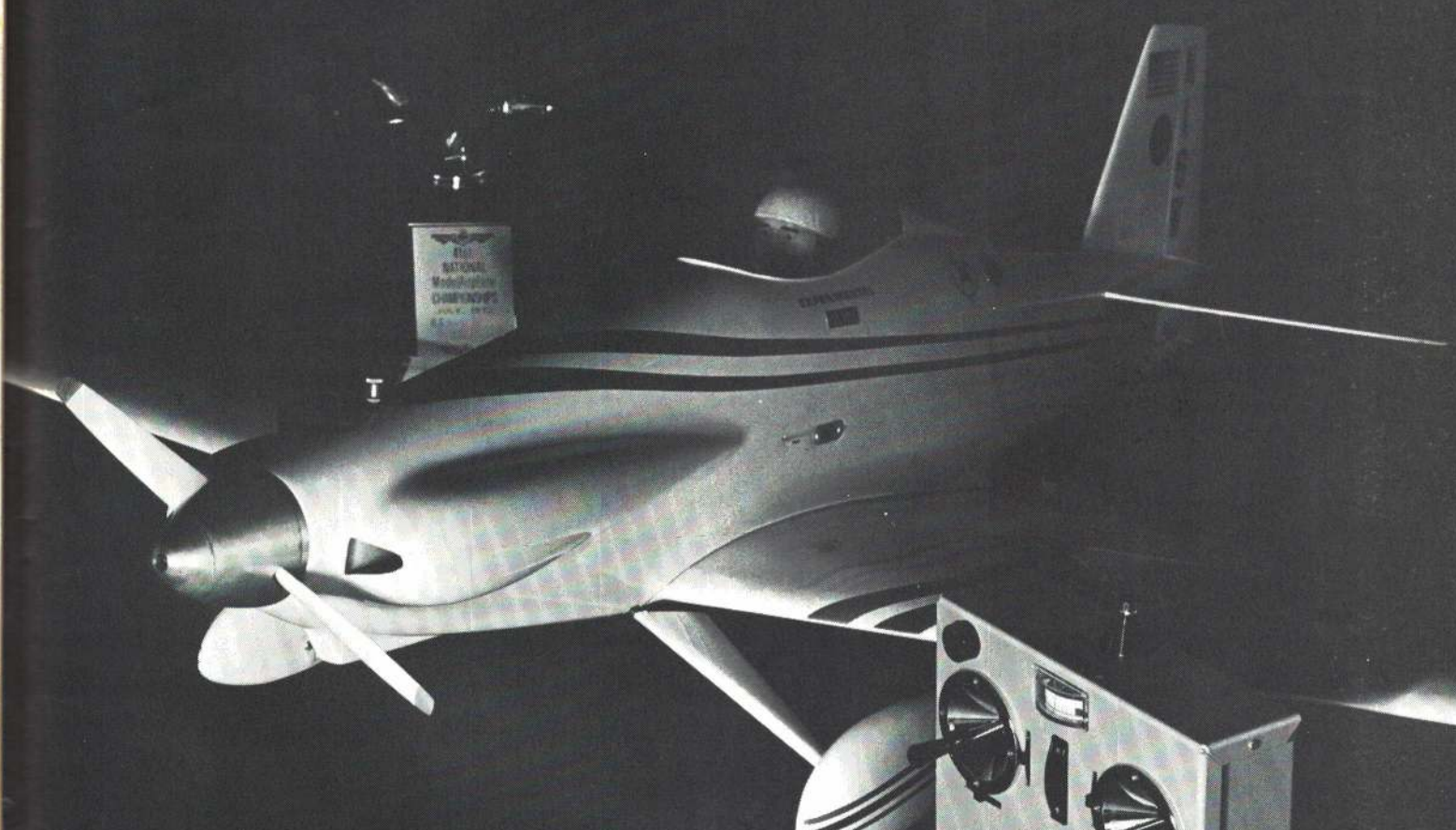
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