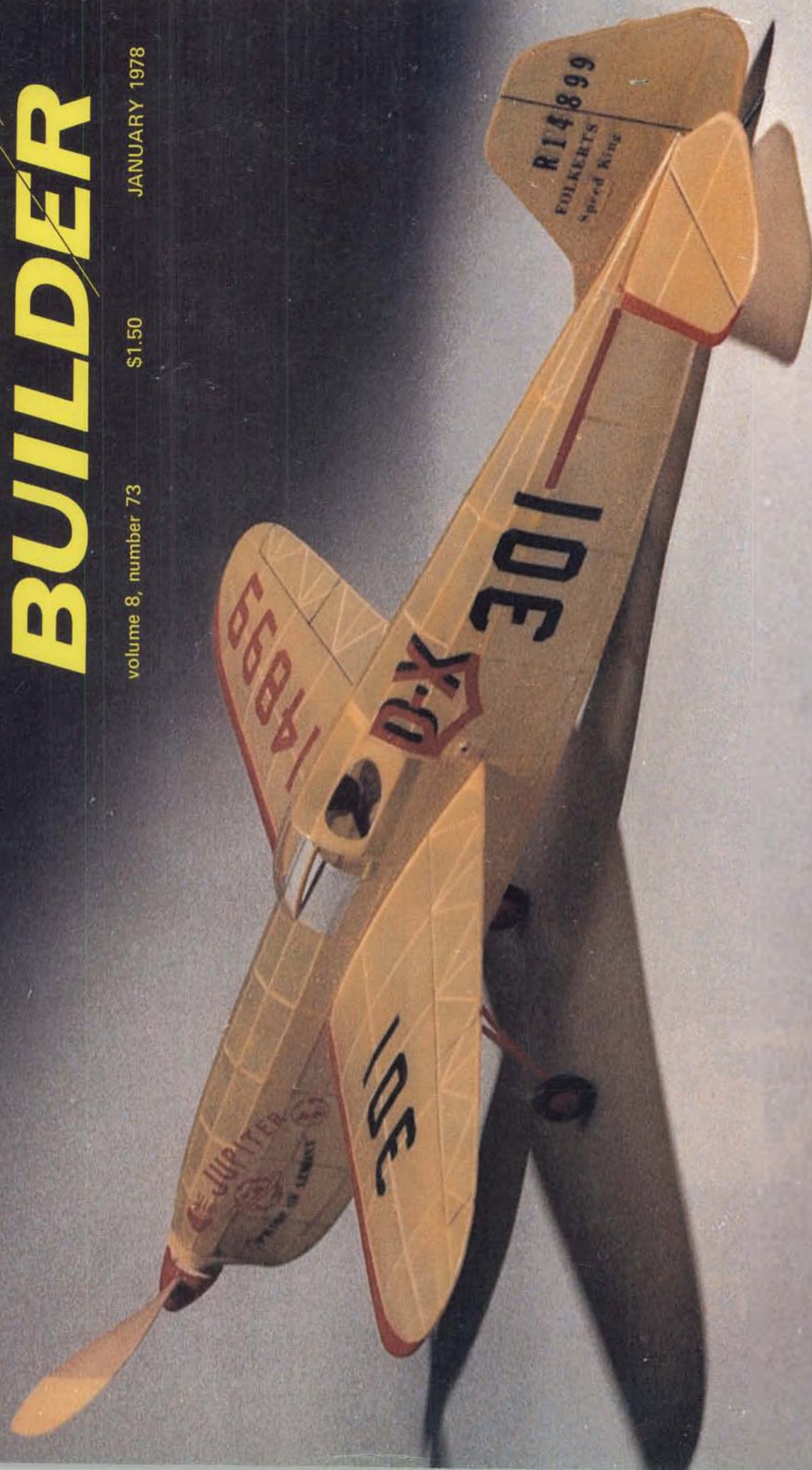


# MODEL BUILDER

volume 8, number 73

\$1.50

JANUARY 1978





# Enjoyable moments in sports

## MRC-Tamiya's Electric R/C Porsche Kit A driving success story everywhere it goes ...and it goes everywhere

R/C modelers are using the MRC-Tamiya Porsche Turbo RSR to take part in a whole new world of radio control driving enjoyment. They're recreating the excitement of an Indy 500, the precision timing of rally races, the burst of excitement associated with a drag race and the sheer satisfaction of running a challenging obstacle course. And what's making this all possible is this solidly designed, magnificently engineered MRC-Tamiya Porsche Turbo radio control car. It's a bold combination of MRC electronic technology and Tamiya's studious attention to precision engineering and realistic details.

Not a finicky toy, but a solidly built vehicle, it's one of those rare kits that while simple enough to assemble provides performance the radio control hobbyist can relate to and appreciate.

**PUT SOME OBSTACLES IN YOUR WAY . . .** set up your own mini pylons and let this MRC-Tamiya Porsche's true proportional steering, semi-pneumatic tires and differential gear help you take tight turns like a cat . . . literally run rings around the competition. So precise is its control and turning radius that you can build an entire obstacle course in little more than a one meter wide area.



**INDOOR CONTROL . . .** change gear ratios . . . you can set them anywhere from 4.6/1 to 19.4/1 . . . and start having fun in the house. Here the clean, quiet electric motor gives you the control you need around tight corners. Setting speed and gear ratios you can match the space you have indoors no matter how limited or convoluted. There are two forward and two reverse speeds to choose from . . . meaning you can put it in reverse and back into self-made parking spots with ease.



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**THE BIG RACE . . .** get outside and create your own Indy 500. Make the course as big as you like and as tough as you can this baby can take it. It'll navigate turns with ease as the differential gears keep you in command control. The rubber tires grip any surface and hug the corners. Shock absorbing front end and rugged ABS plastic body will keep you away from pit stops. And you'll learn for the first time the capability of the powerful electric motor.

**TIMED FOR A RALLY . . .** pre-set the speed you need. Now set out and match the clock around the course you select. Timing is important and the Porsche will get you there just on time. Create your own rules. Let the proto-typical rear suspension take your road or driveway course in stride.

**IT'S A DRAG . . .** lay some tape. Beat the stopwatch or drag. Watch the MRC-Tamiya Porsche peel out and stop on a dime. Set the gears for the space you have and the speed you need. This car's versatility is astounding. It'll do "tricks" no other R/C car can match.



This GT racer can dish it out and take it. Delrin gears keep you on the move day in and day out. And depending on the use you choose you can run it with dry cells or set it up for rechargeable nickel cadmium batteries. Make no mistake about it there are only two Porsche Turbo RSR's available that offer this kind of flexibility and enjoyment . . . and the other one costs thousands of dollars. And they both look the same. MRC-Tamiya's version is a great replica from rear air foil to headlights and racing mirrors, the attention to authenticity is stunning.

We suggest you drive over to your hobby dealer and drive away with an MRC-Tamiya Porsche R/C kit, you'll find a lot of friends already on the road. All of them enjoying their own memorable moments in sports.



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Dave Brown

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*Dave Brown*

Dave used a World Engine's retract servo and a 2" white Goldberg "Snap-on" spinner. Both Salkowski and Oddino used S & O retract servos with Goldberg mechanics.

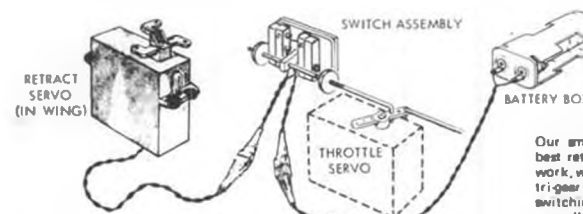
1st Place Winner Dave Brown with Phoenix 7. Won the '77 Nationals in R/C Pattern.



3rd BILL SALKOWSKI with his Curare



5th JIM ODDINO with his Curare



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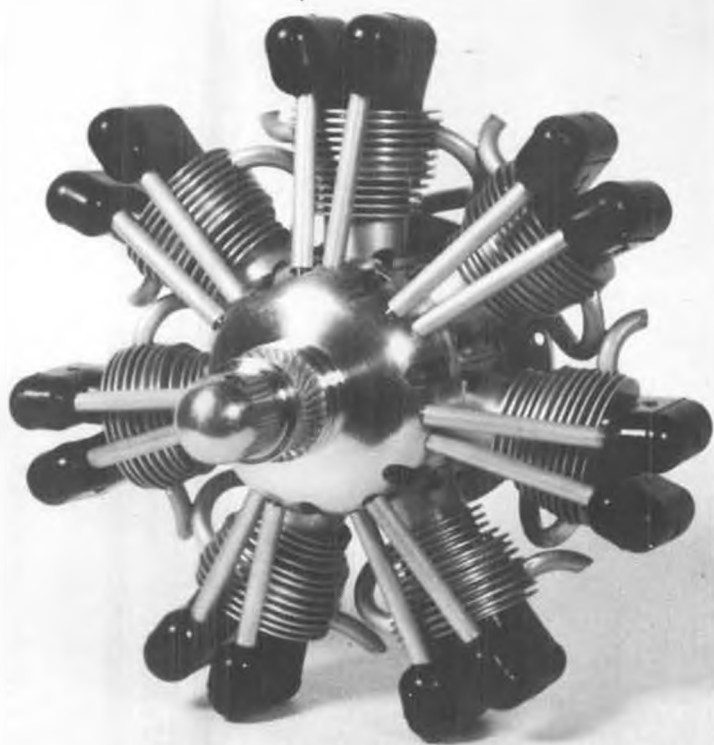
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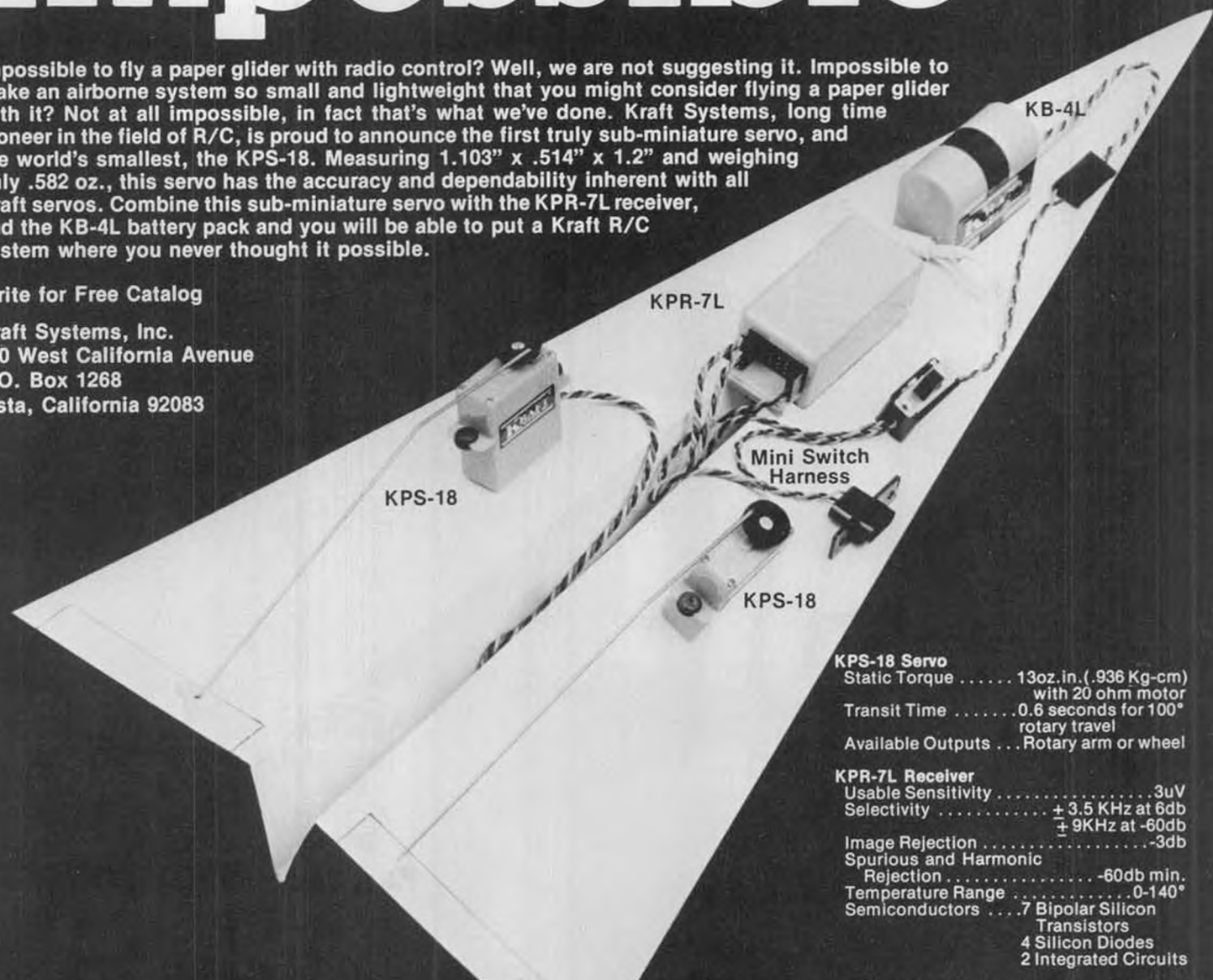


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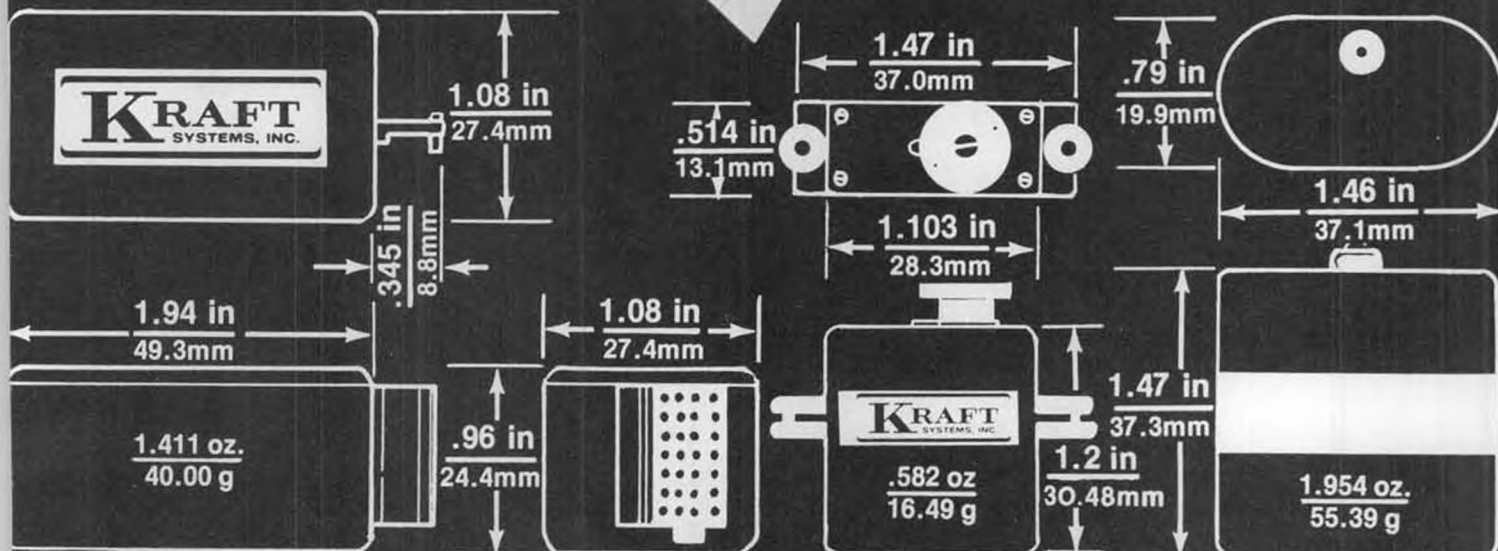


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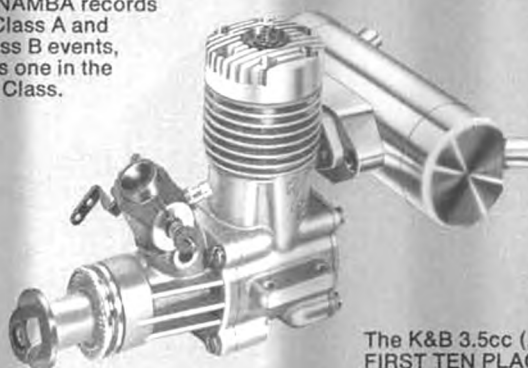
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Photo by Wynn Paul

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Gallon	Clear	...	\$10.95
Gallon	Color	...	\$11.95
Gallon	Thinner	...	\$ 6.95

### SUGGESTIONS FROM THE SIG FACTORY FLIERS ABOUT FINISHING WITH SIG DOPES

To prevent warps and excessive pull down of planked areas, Sig Supercoat Color Dope and Lite-Coat Clear are made with a low shrink base. They should be used on open framework covering only after the required amount of covering shrinkage has been obtained with one or more coats of Supercoat Clear Dope, which is in a shrinking type base. Use Lite-Coat as the only clear dope on rubber powered and other small models. Solid sheet balsa or sheet balsa covered models, whether covered with paper, silk, or not, can use Lite-Coat as the only clear dope. (From this point we will refer to clear dope, which can be either regular or Lite-Coat, depending on whether you need shrinkage or no shrinkage.) Covering all exposed wood with silk, silkspan or similar material is recommended to strengthen the wood and prevent splitting and cracking. The covering makes an ideal base for a finish.

To prepare a balsa framework, either open or planked, for covering, apply two coats of clear dope to the wood surfaces. Sand lightly after each coat is dry to remove any raised grain or fuzz. The bottom of the wing is a good place to start covering. Cut a piece of material about 1" larger than half of the wing with the grain running lengthwise. Dip in water and apply. Work around the edges, pulling out all of the wrinkles and stretching it smooth. Brush around the outside edge with clear dope. It will soak through the covering and adhere to the dope already on the structure. After drying, trim off the edges with a sharp, double-edged razor blade. Go over any edges that have not adhered with more dope. The top half is done in the same fashion except that the covering should be brought down over the edge and lapped over the material on the bottom of the leading edge and over the back of the trailing edge. Other parts of the model are covered in similar fashion. Brush on two or more coats of clear dope to fill the grain and/or obtain desired shrinkage.

For a prize winning finish, Sig Sanding Sealer may be used to

fill the grain further and provide a base for color dope. Sand between coats with 220 to 360 Tri-M-Ite Finishing Paper. Remove as much as possible of the sealer in the sanding process, but be careful not to cut into the covering material. Two coats of Sealer are generally enough. Apply a coat of clear before color doping. It is possible to use all clear dope as a base for color without using Sanding Sealer. Clear can also be sanded between coats.

Supercoat Color Dope should be thinned with 10% or more Supercoat Thinner for brushing. This helps prevent brush marks and gives smoother coats. Flow on wet coats and avoid rebrushing back over an area already painted. For spraying, thin dope about 50 - 50. Add more thinner if the dope does not go on evenly.

Sig Retarder can be used in place of part of the Supercoat Thinner when the humidity and/or temperature is high. The Retarder slows down drying action and prevents "Blushing" or turning white. It also helps in spray mixes when "orange-peel" surfaces result from the dope drying in the air on the way to the part.

Painting the entire model white is recommended for a good color base, particularly when white is part of the color scheme. Color coats can be sanded with 360 Tri-M-Ite or 400 or finer wet paper. When using masking tape for trimming, seal the edge with a coat of clear dope to prevent the color dope from bleeding under the edge. Don't leave the masking tape on any longer than necessary. The longer it is on, the harder it sticks. Complete the job with several sprayed coats of clear over the color scheme. This seals the colors and adds gloss. For a smooth, realistic finish the final coat may be rubbed down with Sig Rubbing Compound. After applying the decals, protect them and the finish with wax. For best results, it is not a good idea to try to mix different brands of paint. Use SIG products from the start.



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# MODEL BUILDER

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volume 8, number 73

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Cover: Winner of MODEL BUILDER'S 1977 Parcel Post Proxy Peanut Grand Peanut award, a Kraft KP-3 radio control system, was Kurt Enkenhus, Silver Spring, Maryland, who built this superb model of the Folkerts SK-3 "Speed King". It set a P.P.P.P. endurance record of 2 minutes, 3 seconds, in a gym with 30 foot ceiling. Construction article begins on page 48. Kodacolor negative by Kurt Enkenhus.



## from Bill Northrop's workbench ...

### WELCOME ABOARD

We are pleased to announce the addition of Dick Tichenor to the **Model Builder** staff. Dick, as assistant to the editor, will be involved in a wide variety of duties related to the monthly production of our magazine.

Dick brings to us a background of some twenty years with various model publications as a photographer, writer and model designer. His model building interests started in the early 1930's and have covered almost every category of modeling. His first R/C aircraft was built in 1950, and after the crashes, repairs and fly-aways attendant with the primitive tube type control equipment, the radio found a more practical home in a stern paddle-wheel tow boat that he designed and built.

Dick has a particular interest in models of new and unorthodox designs. His latest design is a R/C stand-off scale Cessna Citation I, powered by a pair of ducted fan units. The jet can be added to his list of designs such as pushers, insects, etc.

Along with his modeling activities, Dick was employed in the aerospace industry for some 35 years, working in engineering, program management, marketing and subcontracting. Some of the programs on which he worked included Space Shuttle, Apollo, F-111, F-104, B-70, F-8U-1, B-36, F-9, F-4, P-38, P-47, Stinson 105 and SR-10.



MB's editor, with Hans and Hanno Prettner, soon after the award ceremonies at the 1977 Las Vegas Tournament of Champions, where Hanno was winner for the 4th time in a row, earning a beautiful trophy, and this year, a check for \$13,000. He is truly the best in the world.

We are happy to have Dick aboard, and feel that his experience and knowledge will contribute to the future growth of our publication.

### ALESSON AND A HINT

The following is taken from the November 1977 "Crab Rag", newsletter for Maryland's Chesapeake Bay Radio Control Club, Inc. (love those hot steamed crabs!). It's the "Tip of the Month", by Tom Obringer, and consists of a very important lesson that everyone should learn, and also a very handy hint for anyone using glow engine power.

*"I think some of the first tips I received when I started to build my first R/C plane*



Dick Tichenor, having his last cigarette before joining the non-smoking staff of **MODEL BUILDER** Magazine.

*were to be sure to fuel proof the fuel compartment and to wrap the batteries and receiver in plastic. I've been building and trying to fly for about four years now. In all that time, I've used epoxy to fuel proof and have always wrapped my batteries and receiver in plastic. I've heard of others having problems with fuel leakage into the plane, but it always happened to 'the other guy'. Well, the other evening it finally happened to me!*

*"I filled the tank as usual and proceeded to take off and enjoy a normal flight. Part way through the flight, the engine quit and I had to land dead-stick. I connected the fuel pump and found that the tank was empty. Then I made my first mistake; I refilled the tank. Even though I felt something was wrong with the previous flight, I still proceeded to fly instead of checking for the fuel tank problem. Again, as with the first flight, the engine quit after about a quarter of a tank.*

*"The lesson is right here. Model airplanes, in their own way, call tell you when something's wrong! The catch is that you have to recognize their method of communication. Think back on some of your 'surprise' problems. How many times have you realized that your model gave you a warning that something wasn't right, before it actually happened ... and at the time, you ignored it!*

*"This time, after landing, I decided to investigate the source of the problem. Upon removing the wing, I could see the evidence of the problem; the bottom of the fuselage was covered with fuel. The foam rubber used to support the fuel tank, batteries, and receiver were completely fuel-soaked. It was a real mess.*

*Continued on page 110*



# OVER THE COUNTER



Ace R/C's first 1978 kit is the Alpha, a 2 or 3-channel ship for .049 to .09 engines.

● In case you hadn't noticed, or have been trying to ignore the fact, 1978 is upon us. Ace R/C, never one to ignore anything in the small airplane field, has released its first 1978 kit, the ALPHA.

The Alpha is a sporty looking tri-cycle gear high-winger for .049 to .09 engines. It has a span of 40 inches, an area of 250 square inches, and a flying weight of approximately 25 ounces. Two or three channels can be used.

Lite plywood fuselage construction and a double-sparred foam wing add up to fast and easy construction with maximum strength and flyability. The flat-bottom high wing provides stable flight, with slow speed and slow glide

characteristics.

Alpha is an ideal small size trainer and sport airplane, economically priced at only \$19.95.

If you like to keep track of how things go in our hobby, we'll give you something to watch out for. Notice how long it is before you start seeing ALPHA's at your field. It won't be long, or at least no longer than the first good flying weather for you unfortunates in the Northlands. Tell Ace we were "fustest with the mostest" when you ask for more info or order your \$1.00 (refunded first order) catalog. Ace R/C, Inc., Box 511, Higginsville, MO 64037.

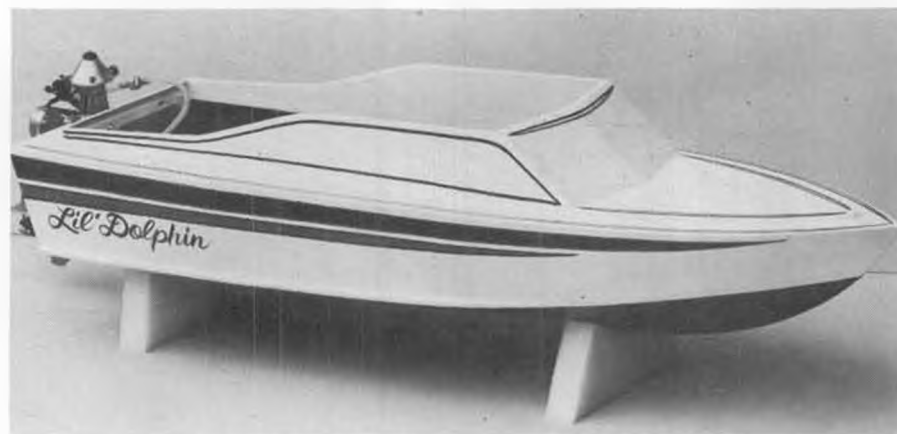
\* \* \*

It is not quite a year old, and won't



The Specialist Eight, by Millcott Corp.

be until Toledo time, but in the one flying season that has passed since its introduction, the Specialist Eight, by Millcott Corp., has firmly established itself amongst competition flyers, the most discriminating of all. This system has a number of interesting pluses, including such standard features as three maneuver buttons, dual rate, and a control panel for adjusting all flight



The "Lil' Dolphin", designed and produced by Steve Muck for the K&B 3.5 Outboard, or inboards up to 3.5 cc.



Vintage Aero's 1977-78 catalog.



Heat sink for the OS 25 FSR and engine mount for the OS 60 Four-Cycle glow engine.



Winner of the 1/12 Scale Electric Class D, 6-cell outdoor event at the 1977 ROAR Nats, available, complete with radio, from JoMac.



The OS 45 Marine RV, from World Engines.



Super-Tigre Schnerle 60 will be available from World Engines.



controls.

According to the manufacturer, this is the only radio available with an optional electronic mixer in the transmitter. Mixing action takes place at your switched command, and can be used not only for the normal Vee-tail or rudder/elevator mixing, but can also be factory-adjusted for uni-directional intermix of two servos. This method permits coupled ailerons and rudder, for example, with normal rudder operation, although it would be engaged when ailerons are used. It is possible to couple elevator and flaps, or even throttle, collective pitch,

and tail rotor in a helicopter. By special order, the three functions can be set up to interact electronically.

The Specialist Eight comes with an interconnect cable that can be connected from the transmitter to the receiver charge receptacle. You can thus read receiver battery voltage on the transmitter's expanded scale voltmeter. By turning on the receiver switch, you can then operate all controls, check your retract gear, open the throttle, set the trims, etc., all without actually putting a signal on the air.

The normal type of dual-rate controls, which readjusts the ratio of ele-

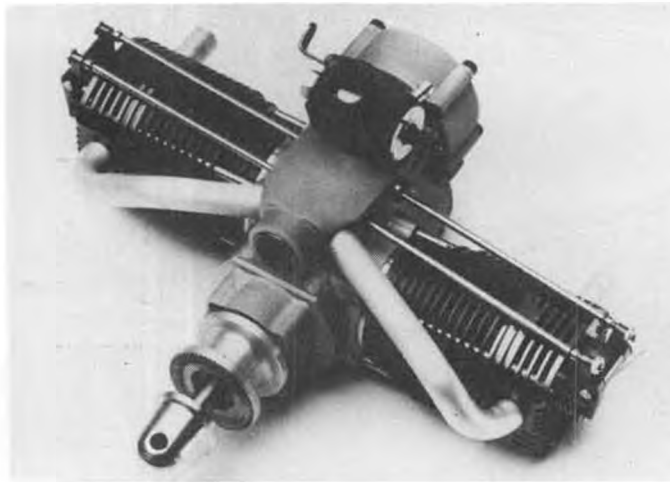
vator and aileron stick-to-servo travel at the flip of switches, is also available. But, to carry it one step further, your Specialist can be ordered with its Exponential Rate as an extra, no-charge option. With Exponential, the user can have a non-linear distribution between stick and servo. Tailored to your individual airplane and preference, the aircraft's reaction time becomes less sensitive around neutral, yet, unlike dual rate, still has full servo travel available at full stick throw.

Proper control placement; servo re-

*Continued on page 100*

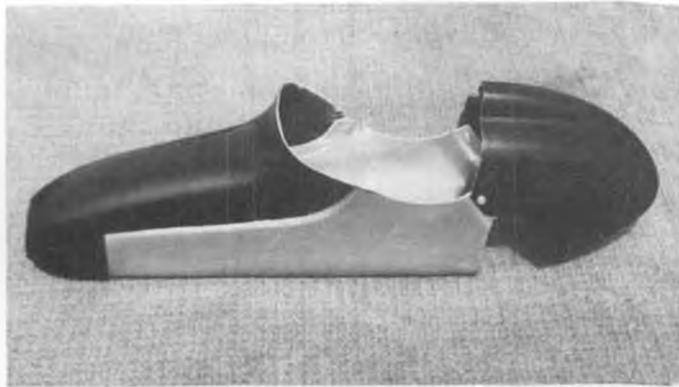


Craft-Air's plastic bodied Bull Pup and molded polyethylene field box. See page 30 for full review on the Pup.



The DAMO FS-218, from Sweden.





Fiberglass parts for 1/8 scale sprint car, from Auto Research, Inc.



Completed Auto Research 1/8 scale sprint car.



The model on the right, if you happened to notice, is the Parlor Mite, by Micro-X.



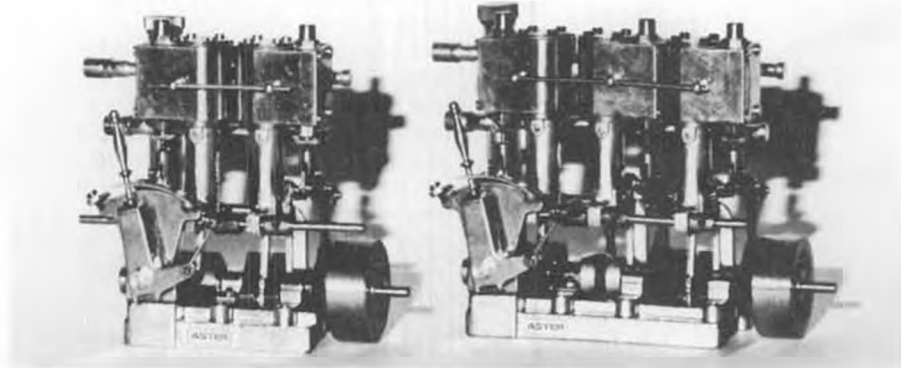
Rubber powered T-shirt, from Che Hobbies.



Versatile glue from Wilhold is excellent canopy and hinge glue.



Extruded cockpit coaming and strut fairings from Fourmost Racing Products.



Small two and three-cylinder steam engines, from Polk's Model-Craft Hobbies.



New large rocket engine from Centuri.



PHOTOS BY DAVE GIERKE & GEORGE BAYNES

# Formula 1 → **STINGER** ← Formula 1

By GEORGE BAYNES . . . Aside from being a proven winner, this ship has the additional feature of being entirely independent of manufactured foam or fiberglass structures. A good hobby shop has all you need.

• The Stinger was designed with thoughts of having a Formula 1 racer that performed well and also looked different from the rest, both on the ground and in the air. On both counts, I believe I have succeeded.

I have been racing with Stingers for three seasons now, but 1977 was its best year. At seven U.P.R.C. races run during 1977, Stingers racked up a score of one first place, six second places, and one third place; failing to place at only one race. Dave Kelly

took the U.P.R.C. Season Points Championship with his Stinger, and I won the High Point Canadian Perpetual Trophy at the Canadian Nationals with mine.

I had previously built and raced three of Joe Foster's "Sharks", which appeared in M.A.N., mainly because of its distinctive appearance. The Shark handled well in a race, but the grass runways we fly from in this area (United Pylon Racing Circuit, Western New York and Southern

Ontario) are too rough for torsion bar type wire landing gear. When I happened to see the three-views and pictures of the full size Stinger, it seemed like the answer to my landing gear problem, and it had a semi-elliptical wing for a distinctive appearance.

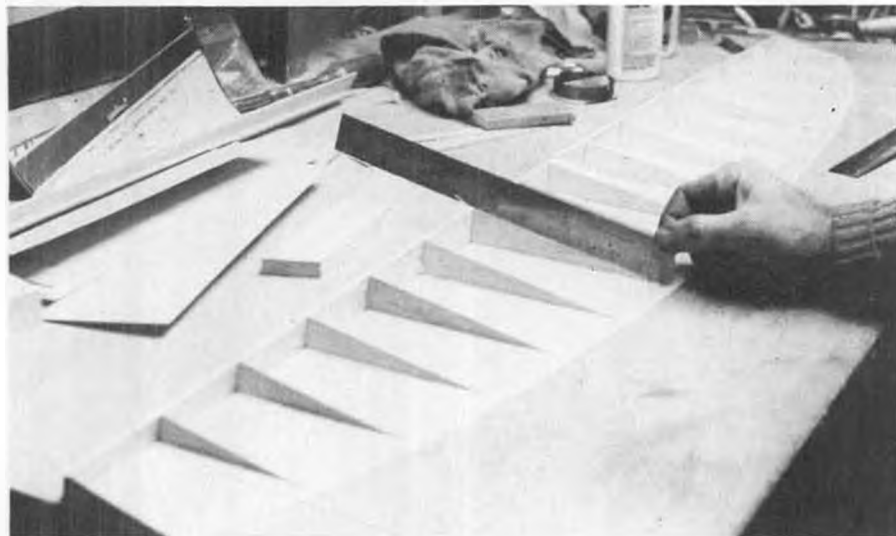
Being a shoulder wing plane, the tempered aluminum landing gear would be solidly mounted in the fuselage, and solid it is. I have bent the landing gear almost double a couple of times, in disgustingly sloppy landings, with never a trace of stress cracks, or any other damage to the fuselage.

Takeoffs from grass or asphalt are a cinch, no rudder, a slight amount of up elevator, and it's off in six feet or less.

Landing after a race is where the Stinger really shines. The ailerons are just as effective at landing speed as at full speed, and having a long flat glide path, it can be held a foot or so off the ground for 200 feet or more, until speed drains off, resulting in a very nice two-wheel landing with no tendency to nose over.

## CONSTRUCTION

It is assumed that anyone tackling a Formula 1 model has enough building and flying experience under his belt to have his own favorite



Wing structure is simple and rugged. After placing bottom sheet and main spar, ribs are easily shaped into triangles from sheet stock. Forward portion is a 1 x 3 solid balsa plank.



Dave Kelly and his Stinger at the 1977 Canadian Nationals.



Designer George Baynes with his Stinger at the 1977 Canadian Nats, where he won the High Point Canadian Perpetual Trophy.

building methods. Therefore, this discourse will be quite basic. Individual preference will determine adhesives used, radio installation, cowl mounting, finishing methods, and the like.

#### WING

The Stinger wing is built very much like the Shark wing in Joe Foster's excellent construction article. The main changes are the leading edge outline, aileron placement, and the sheeting being 3/32 rather than 1/16.

Butt glue two 4 x 24 inch pieces of medium hard 3/32 sheet for each wing skin. After drying, cut the two bottom skins to the outline shown on the plan and taper the last 3/4 inch down about 1/64 at the trailing edge. Mark the rib locations on the outside. Pin or weight the two bottom skins on a hinged building board set at the dihedral shown on the plan.

Cut the spar from 1/8 hard, straight-grained balsa and glue and

pin it in position, using a small triangle to make sure it is flush with the edge of the sheeting and at a 90 degree angle.

When the spar has set, the ribs are made thusly: at each rib station, a square-cut piece of 3/32 sheet of sufficient dimensions is placed in the rib position, butted firmly against the spar. With a ballpoint pen, mark it at the top of the spar and the taper line 3/4 inch ahead of the trailing edge. Using a straight edge, draw a line connecting the two marks, cut along this line, and there is your rib. Glue it in place and go on to the next. The center rib is cut from 1/4 inch balsa.

After all the ribs are in place and the glue is dry, the top skins are applied. They are cut 1/8 inch over-size along the trailing edge, and are sanded to match the bottom skins later. You will need plenty of weights spread over this while the glue is drying, as the top surface is curved.

The trailing edge is best glued with epoxy, as a water-based glue could cause warping.

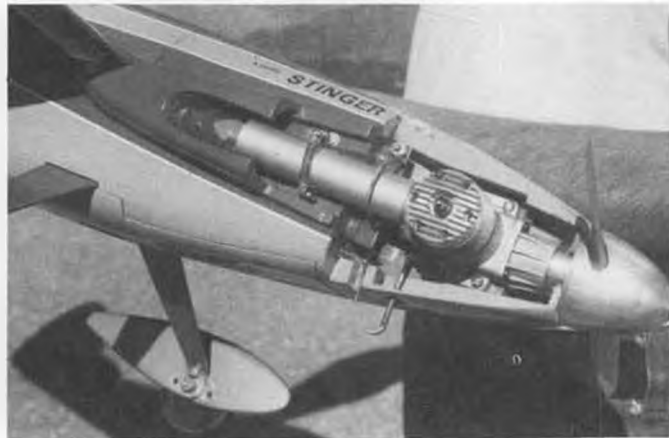
After drying overnight, the wing can be removed from the building board, and the top wing skins trimmed at the trailing edge to match the bottom skins.

The leading edges are cut from 1 x 3 inch medium-soft balsa to the outline shown. After notching the rear surfaces for the plywood dihedral brace, they are glued to the front of the spars, level with the bottom of the wing. Cut the wing tips from 3/8 inch balsa, and install. Epoxy the 1/8 plywood dihedral brace in place, fill the rest of the notch with 1/8 inch balsa, and add the 1/8 sheet filler which brings the center portion of the leading edge up to the spar height.

With a balsa plane and sanding block, shape the leading edges to the airfoil shown on the side view and work the wing tips down to blend

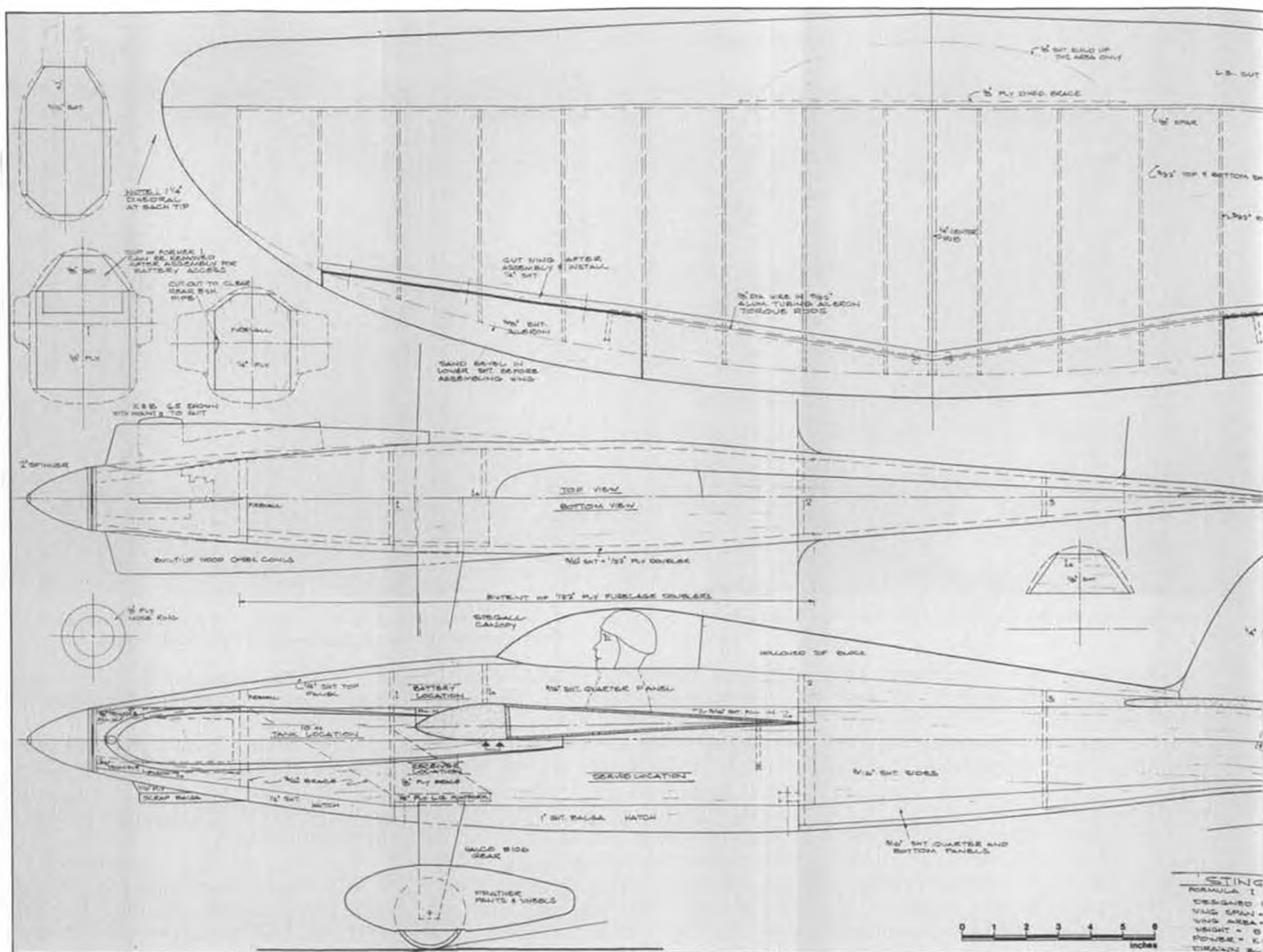


Side-port K&B installation in Kelley's Stinger. It says, "Davies go for it prop," on blade closest to camera.



Clean installation of K&B rear exhaust 40 in George Baynes' ship. Note lever for hand operation of cut-off.





## FULL SIZE PLANS AVAILABLE — SEE PAGE 112

with the rest of the wing. At this point, the whole wing should be sanded smooth using a sanding block with medium paper.

Using the aileron outline on the bottom wing skins, draw a line along the aileron leading edge to the center

of the wing as shown on the plan. Draw another line 1/4 inch ahead of this and repeat both lines and aileron outlines on the top surfaces.

The ailerons and the remaining in-board trailing edges are cut separately from the wing structure and set

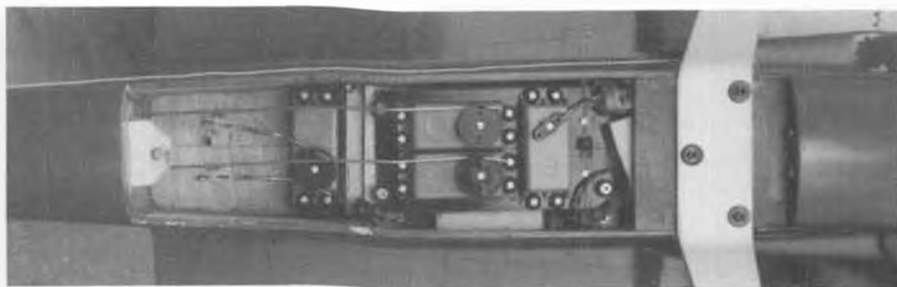
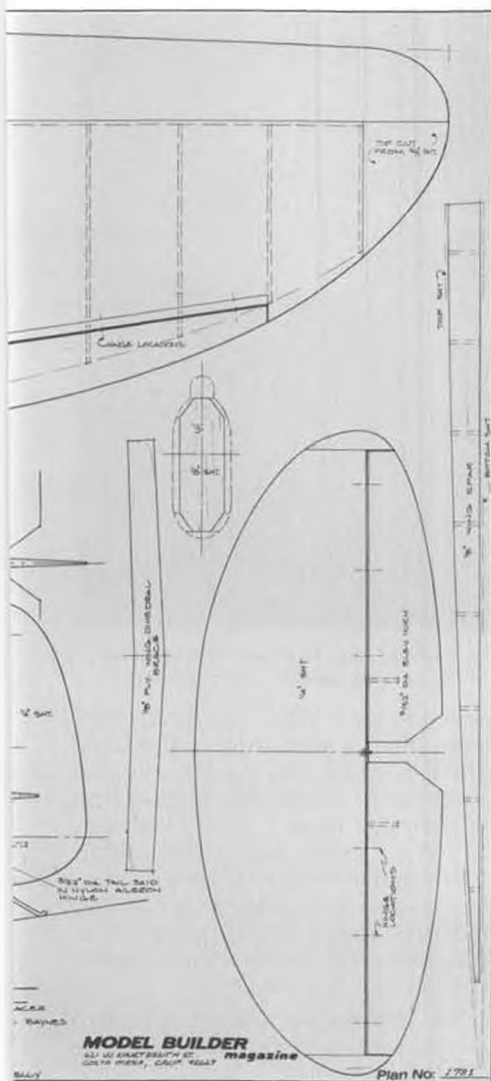
aside. The remaining 1/4 inch strip is cut away and replaced with a 1/4 x 3/8 inch hard balsa rear spar. When in place, the rear spar must be shaped to match the top and bottom wing surfaces. Be very careful not to round off the rear corners.



Dave Kelly with the U.P.R.C. Season High Point Trophy.



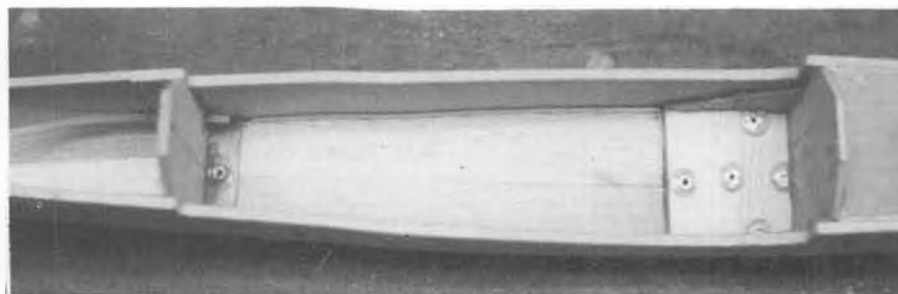
Kelly twiddles the needle while Baynes checks the RPM's with the Heath tachometer. Where are your ear protectors, George?



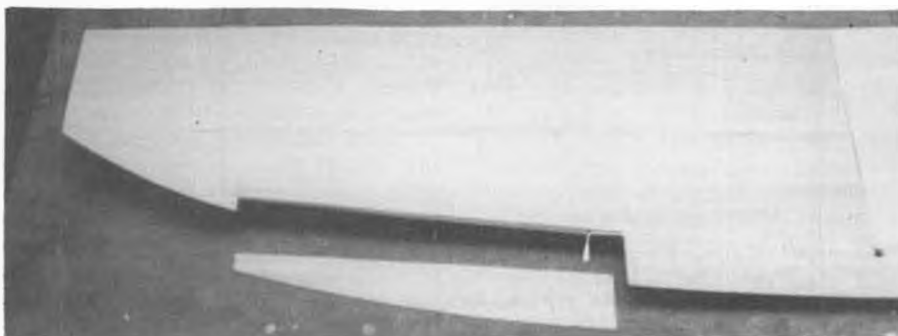
Kraft radio installation in Kelly's Stinger.



EK radio installation in Baynes' Stinger.



Top view of fuselage in radio compartment area. Wing is permanently attached, so radio access is through bottom hatch. Note blind nuts for landing gear and hatch attachment.



Partially completed wing, with aileron ready for attachment. Entire model may be built from materials obtainable at a good hobby shop . . . no foam or molded fiberglass.

Install the 1/8 inch aileron torque rods in 5/32 tubing, and epoxy them in position. Use a straight edge on the bottom wing surface to be sure all is true and straight.

Ailerons can be made from 3/8 inch medium balsa, or you can remove 1/4 inch from the leading edge of the built up pieces previously removed, replace with 1/4 inch sheet, fill in the ends, and sand to shape.

Now is the easiest time to fiberglass the wing, before it is built into the fuselage. I like to use 3/4 oz. cloth and K&B finishing resin.

#### FUSELAGE

Make right and left fuselage sides from 3/16 x 4 inch sheet. Cut to the outline shown on the plan. Contact cement the 1/32 plywood doublers in position and mark a full length center line and the former locations on the inside of each side. The 1/4 inch balsa fuel tank compartment triplers and 1/8 inch plywood landing gear mount braces are now contact cemented in place.

Before cutting out the formers and firewall, mark them with both hori-

zontal and vertical center lines to facilitate alignment.

The fuselage is best assembled inverted in a fuselage jig. Align the former and firewall center lines drawn on the sides, and get everything square and true, especially the firewall. Any side or down-thrust is definitely not required. Slow-drying epoxy is best for installing the firewall and formers. Before installing the firewall, mark and drill for motor mount bolts, and install blind nuts. Also drill fuel line holes and engine shutoff cable hole.

When the epoxy has set-up, and with the fuselage still inverted in the

jig, the elevator and rudder control cable tubing can be installed. Make sure both ends are firmly secured and properly aligned.

Now the 3/16 bottom sheeting and the 1/4 inch plywood landing gear mount can be glued in place. The radio compartment and fuel tank compartment hatches can be fitted and mounted next. Remove the fuselage from the jig and plane and sand the belly into shape.

The wing is now installed. The flat-bottom airfoil makes the incidence alignment easy. The leading

*Continued on page 86*



The realistic appearance of large scale models comes through in this photo by John Preston. Extensively modified "Mr. Mulligan" Nosen kit by Kirby Crawford, NVRC, is powered by 1.6 cu. in. chain saw engine converted by Kirby. White pine replaces balsa in fuselage construction.

## 'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

### PREVIEW OF A PROPOSAL

The following discussion was sent to us by Horace Cain, Buffalo Grove, Illinois, and summarizes a more detailed proposal which he intends to submit to the R/C Contest Board sometime prior to the September 1, 1978 deadline for 1980-81 rules proposals.

We assume this material may also be published in other magazines, as our copy obviously came from a duplicator, but we feel the content is of sufficient interest to warrant over-exposure. Anything that can stir up more interest in competition, particularly in the lower skill levels of pattern, deserves all the attention it can get.

"Have you ever noticed that after

most R/C pattern contests, there seems to be only one contestant who is satisfied with the overall management and judging, etc., and thinks it was a good meet? This is normally the first-place winner.

"All gripes, complaints, and other ill-will can be eliminated by giving each contestant his own class. Of course, there is no competition but everyone is happy, or are they?

"If the lack of competition turns you off, why is there so much talk about adding another class and/or restricting certain equipment. Simply because we all know that we must encourage participation, yet we want to FEEL competitive in any contest. Regardless of how much fun it is to fly in a contest, we still possess that inner

desire to excel. When we lack either the desire to work harder or the basic skills required to do the job, the first thought is to divide the competition and therefore have a better chance to win. Who cares about the added administrative burdens placed on contest management, added cost to the sponsors, added workload on host clubs, and all other similar problems? . . . Who cares? . . . I DO!!

"The present four classes of pattern are quite adequate for our sport. They need not be changed, but one minor revision would make them better accomplish their design task, and allow contest management more flexibility in the application of the classes.

"The four classes of R/C Pattern should provide a pyramid of proficiency. At the top of this pyramid are the gifted few . . . the Masters . . . those who set the pace, determine and prove equipment and techniques, and set the fashions. Just below them are the Experts . . . those who also possess a high degree of proficiency and use



These happy Texas HOT MACs really put fun in their Fun Fly. See text for some details of interesting events.





Hanno Prettner has won the Circus Circus Tournament of Champs for 4th consecutive year. He teams up with father, Hans.



Tournament of Champions winners (l to r): Gunter Hoppe, 4th; Wolfgang Matt, 2nd; Hanno Prettner, 1st; Dave Brown, 3rd; and Ivan Kristensen, 5th.

the latest fashions in equipment. Below the experts are a large group called Advanced, because they have risen above the novice stage through hard work and a competitive attitude. They are improving their skills and are using modern equipment and techniques.

"Below this Advance group lies the base of the pyramid, and the foundation of pattern, the Novice class. It is the Novice flyer who is the new blood that must flow in the life-stream of this sport, and most important, he supports the industry. Any

good sport flyer with an airplane capable of looping and rolling maneuvers should be able to enter a Novice contest and feel competitive, even while competing against pilots with more advanced equipment.

"In the course of competition, Master and Expert pilots fairly well decide their choice of equipment and stay with it. Advanced flyers still experiment and still need some motivation to continue on course. Generally, they get motivated when a previous Novice moves up and either beats or places close to the older Advanced

contestant. Now he starts working again. It is the Novice pilot who must be baited, then hooked and kept on the line.

"Novice fliers fly lots of sport, mingle with other club members, try new equipment, and generally support the sponsors who make contests feasible. The Master may decide what the manufacturer will make, but it is the Novice who keeps the production lines moving and creates the volume production that the manufacturer requires.

"Novice Pattern must (1) attract



Stacey Mitchell, of Newton, South Australia, is hanging in there with Leo O'Reilly's 1/5 scale "Circe" R/C sailplane. The Circe has a 3.5 meter (138 inch) wingspan.



Bill Bennett awarded top honors to Bob Nelitz in the Tournament's Scale division. Bob's world champion DH Chipmunk was tops again.



Prettner uses a variety of controls, such as these spoilers, to perform some of the Tournament's unique maneuvers.



There is a lot more gadgetry on the bottom side of Prettner's Curare. The unusual spoilers are shown extended.

those sport fliers who have not yet been motivated to the use of the latest pattern fads, (2) allow the Sunday flier's sport aerobatic machine to be competitive while not restricting any other equipment, and (3) motivate the more serious competitive flier to rapidly advance to a higher class.

"The solution presented here is only to define the thesis of the 'BONUS POINTS PLAN.' Hopefully, the proposal that will be presented for the 1980-81 AMA rulebook will be much more elaborate and TESTED.

"A Bonus Points Plan would give a Novice pilot a percentage of his flight score based on the equipment he

uses. ONLY BONUSSES . . . NO PENALTIES . . . would be used. For example: Fixed landing gear, plus 10%; engine less than .45 cu. in., plus 5%; wing chord line over 1 inch above thrust line, plus 10%; conventional muffler less than 6 inches long, plus 5%; flat bottom wing, plus 20%; no ailerons or other controls on wing, plus 20%. Maximum bonus points will not exceed 45%.

"If Joe Flywright pilots his 'Kaos 40' in the local 'AA' pattern contest, he could pick up 20% bonus points. Jack Hotrock, with his 'Super Master-Magoomus' will still most probably win, as he only needs to beat Joe by

one or two points in each maneuver. The main thing is that the scoreboard will reflect a much closer total score. Now Joe feels good and is thinking about building one of those 'Super Master-Magoomi' and show that Jack a thing or two. Jack is thinking about moving on into Advanced and getting away from those 'Sunday Fliers'. The host club got another entry fee, a sponsor will probably sell another kit, Pattern has another convert, and Novice Pattern has served its purpose.

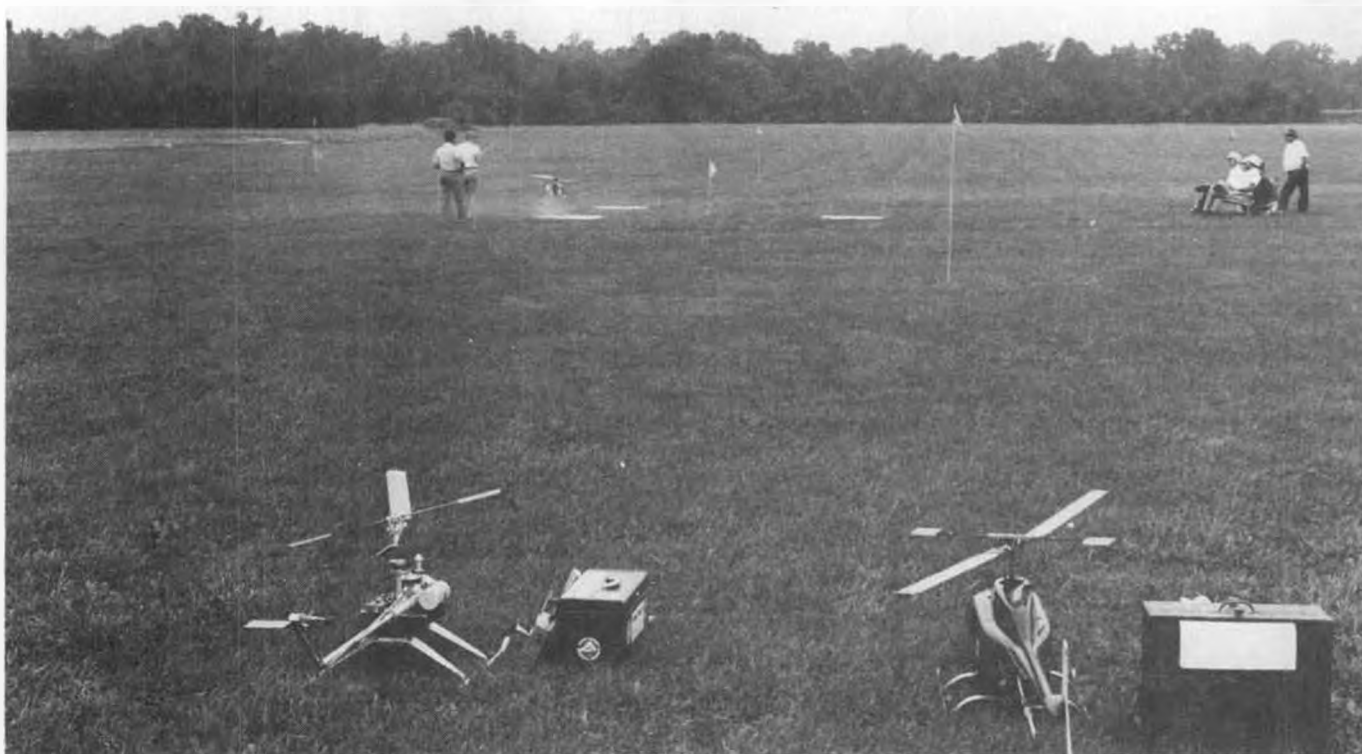
"In no way will this plan create a class of 'Trainer Pattern'. Good pilots with good equipment will continue to win . . . and advance . . . yet, especially on local levels, better sport fliers will be much more inclined to enter their Sunday-Flying Super Kaos, Mach 1, etc., and try their luck. Any old fisherman knows that many a fish is hooked when just playing around with the bait. R/C fliers can easily be hooked on pattern when they get a taste of it. Bonus Points rules in Novice pattern is the tasty bait.

"Pattern Fliers, think about it on the basis of the good of the sport. Let us not bureaucrat this area of our favorite activity with additional classes; let us not burden our hosts and sponsors with unnecessary expense and work; let us not resort to negative rules that limit and/or discriminate against individual initiative; but do let us revise in a positive manner those rules that should be as modern as our equipment. Do let us use the present classes as they should be: Novice . . . to bring



West Coast 1977 QM winners (l to r): Dale Yaney, 1st; Nick Nichols, 2nd; Ron Russel, 3rd; Eloy Marez, 4th; Bob Root, 5th. All flew "Li'l Cobra", kitted by R/C Etc.

*Continued on page 105*



Tom Knerr flying his Revolution helicopter to a 1st Place win in Intermediate at the 2nd Annual East Coast R/C Helicopter Championships. Choppers on the ready line belong to Faye Peoples and Charlie Sjobeck. This and other Champs photos by BiBi Phillips.

# CHOPPER CHATTER

By JOHN TUCKER



PHOTOS BY AUTHOR UNLESS NOTED

## SECOND ANNUAL EAST COAST R/C HELICOPTER CHAMPIONSHIPS . . . by HORACE HAGEN

• The 2nd annual East Coast R/C Helicopter Championships took place on August 14, 1977. The contest site was a beautiful 35 acre grass field located in Thompson Park, Lincroft, New Jersey.

At dawn of the contest day, the weather looked threatening. There was a solid cloud cover, but it had not rained for several hours. However, it was not to last. During the first round of competition, the rains did come. Contestant Wally Rodriguez got caught by a downpour in the middle of his flight, but continued until he finished all the maneuvers. It was a valiant effort, and so was the effort of judges Larry Davidoski, Mike Pilla, and Dick Robbins, who endured the same downpour. We did complete the full round of competition by continuing to fly in between showers.

The total entry this year was 25 contestants. We had 16 entries in the Novice class, 6 in the Intermediate class, and 3 in the Expert class. Last year we had 14, 1, and 4 entries in the Novice, Intermediate, and Expert

classes respectively. It appears that quite a few pilots have graduated to the Intermediate class.

The contest was again well supported by the hobby industry. The single largest donation was a Revolution helicopter kit, and it was awarded for first place in the Expert class. Every contestant, except for the first through fifth place trophy winners, received a

souvenir plaque.

Quite a variety of helicopters was flown. We had 7 Jet Rangers, 5 Revolutions, 4 Heli-Babys, 3 Alouette II's, 2 Sharks, a Hughes 500 with Alouette mechanics, a Hughes 500 with Jet Ranger mechanics, and 2 Scratch-builts. Most of the helicopters were powered by Schnuerle ported engines.

I would like to thank the members of



Pilot's briefing by CD Horace Hagen (facing camera, left of center) at the 2nd Annual East Coast R/C Helicopter Championships. Proposed AMA rules were used. See more in text.





Gene Rock's scratch-built helicopter, foreground, is a machinist's delight. Chopper was flown, but not entered, at the East Coast Championships.

the Monmouth Model Airplane Club who came out to help run the contest, and the Monmouth County Park System for letting us hold the contest in Thompson Park. With a little bit of luck, maybe next year's contest will see some good weather, for a change.

The contest winners are tabulated below:

#### AMA NOVICE CLASS

1st	Charlie Sjoberg
2nd	Don Chichester
3rd	Joe Mazza
4th	Frank Alicandro
5th	Lenny Labella

#### AMA INTERMEDIATE CLASS

1st	Tom Knerr
2nd	Wally Rodriguez
3rd	Les Stone
4th	Al Lobaito
5th	Ron Palmer

#### AMA EXPERT CLASS

1st	Ernie Huber
2nd	Faye Peoples
3rd	Ralph Dalusio

• • •

#### ALOUETTE II UPDATE

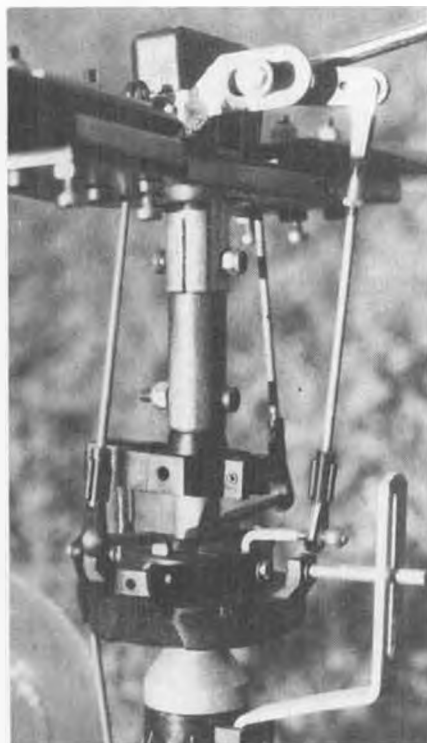
It never ceases to amaze me how well the Kavan Alouette II helicopter adapts itself to the demands of its pilot, and how easily it can accept small modifications without drastic changes in its performance. One such modification, which I have not previously mentioned, is the lengthening of the main rotor shaft approximately 30 mm to provide additional clearance between the main rotor stabilizer paddles and the plastic canopy and/or scale engine. The first production flights soon revealed that in certain "hard-over" stick positions, the stabilizer paddles struck either the canopy top and dinged it pretty badly, or made contact with the scale jet engine, which is mounted just above the tail boom assembly. In both cases, the

damage was minor and non-critical, however, it was irritating when it happened, and there was always the risk of a resulting crash.

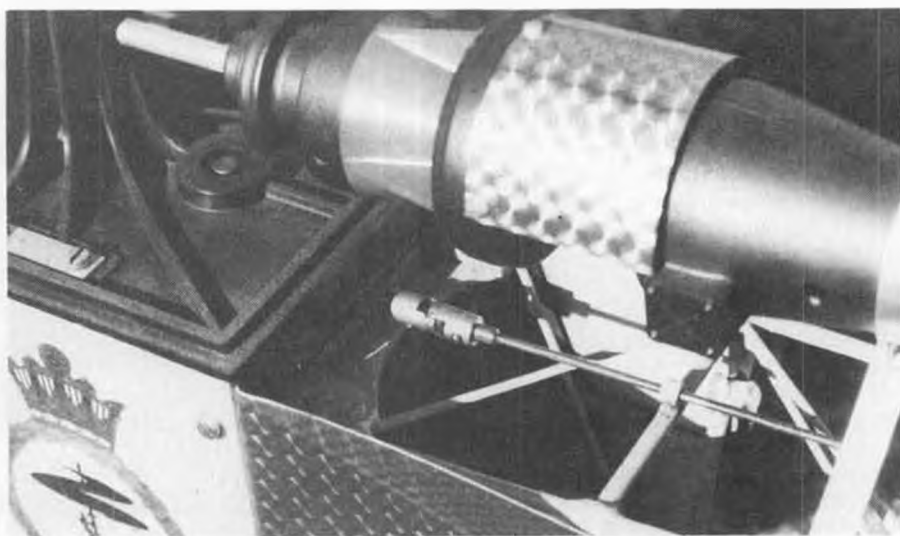
Recognizing the problem, Kavan mailed out a modification kit to all owners. The mod consisted of a small steel plate which is cemented to the top of the stabilizer see-saw, thus limiting the movement of the paddle system to where it could not strike the canopy. Unfortunately, this also limited the ability to perform abrupt maneuvers upon demand, and the little choppers' responses were much slower. Wanting both performance and smoothness, I machined out a 30 mm extension from mild steel, that could be installed between the top end of the main rotor shaft and the main rotor hub, thus giving an additional inch of clearance above the canopy.

Of course, the push-rods had to be lengthened the same amount to make it all line-up. Now I could remove the steel plate mod and regain the control movement which had been lost.

The first trial flight was a revelation in that, not only did it maneuver beautifully, but it also exhibited an exceptional degree of stability which it did not have originally. This "extra benefit" undoubtedly comes from increasing the pendular effectiveness, by suspending the body a greater distance from the rotor hub. To further simplify the installation, Franz Kavan machined a new, longer shaft to replace the original one, thus eliminating the extension adapter. I haven't yet installed the new shaft, but plan to do so this next weekend, and will keep you posted on developments. I wouldn't be surprised if Kavan made it available on special order, or as an optional accessory. In the meantime, the photos in this article will show a comparison between the two shafts, and also the installation of the adapter unit on my Alouette. You might also



Kavan Alouette II rotor head modifications. Read text for detailed explanation.



Friction is reduced by using this universal joint between the transmission and the tail rotor drive shaft on the Alouette II.



Alouette II belly pan now has pads for strapping on landing gear struts.

notice that I have cut two small "slits" in the main rotor hub where it bolts to the main shaft. This was done during the modification, to permit a more rigid attachment instead of the "loose" connection, by a clamping action.

Another very unique idea from Kavan is the installation of a tiny brass universal joint between the Alouette transmission box and the tail rotor drive shaft. As you may already know, the tail boom assembly has a slight upward sweep in relation to the transmission box. This results in a slight bend in the tail rotor shaft, with attendant friction and loss of torque. By installing the universal joint, the entire tail rotor drive system is almost completely free of friction, and has reduced the tail-boom "dance" considerably. Dozens of flights have produced no problems of any nature. This too, is being considered as an accessory for the Alouette. While you're waiting, you might experiment by substituting a small steel spring instead of the universal joint . . . it works well, but it's not as good a system as the universal. Again, the photos will show the details of the installation.

#### NEW PRODUCTS

Now on the shelves at your dealer, or available from Kavan, is the new Alouette belly-pan. This new pan seems to be slightly stronger and more flexible, but the main feature is the removal of the landing gear lugs (which have the habit of breaking off on a hard landing), and the substitution of heavy, reinforced pads to which the landing gear struts are mounted with steel straps. For more

details, see the photos in this issue and also the Oct. '76 issue of **MB**.

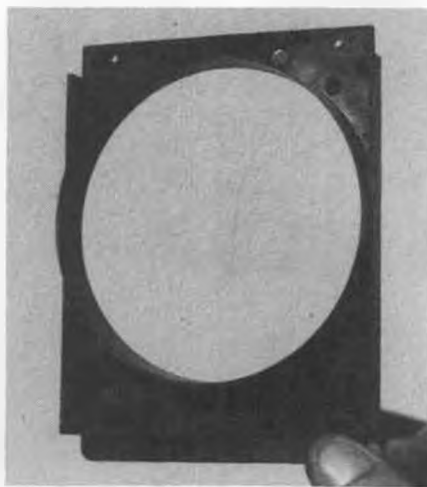
Another much needed change is the Alouette cooling fan shroud. The original shroud was molded from thin plastic material and usually shattered on the first landing unless it was installed with extreme care. If I remember correctly, our first Alouette modification was to fabricate a heavy-duty fiberglass shroud (Oct. '76 **MB** photo), which solved the problem completely. A new shroud is now in production and will be available shortly from Kavan, and features the same heavy-duty construction and rigid structure as indicated in the photos.

#### MORE ON CONTROL RESPONSE

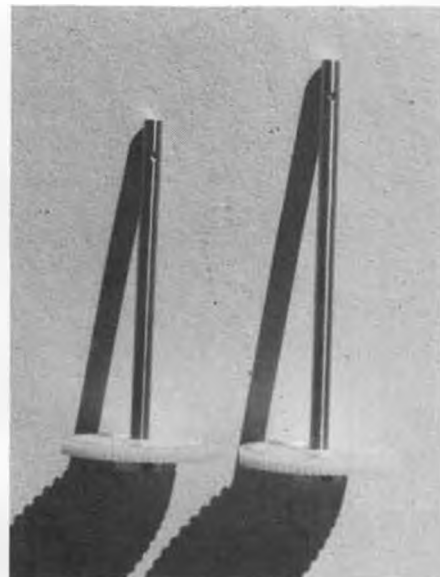
One last item before we close the shop for the day. It concerns the control inputs to the main rotor blades to achieve certain desired results. A few months back, we talked about changing the control response on R/C model helicopters in general, and another article dealt with a super-stable system for the Jet Ranger. This month, I'm going to include a photo which should give you a few ideas for the Alouette chopper. Specifically, I'm referring to the "Bell System" push rod which runs from the swash-plate to the mixing lever on the main rotor head. This particular cyclic control input creates a powerful force on the main rotor disc, and as built from the stock kit, might be a little too much for the novice. As the photo shows, this control input (movement) can be reduced by shortening the length of the arm which is attached to the inner race of the swash-plate. The closer you can move (or relocate) the ball-link connection toward the swash-plate, the less control action will result. We would suggest that the ball can be installed right on the swash-plate itself, instead of having it on the arm.

Be sure to remove the arm if you do it this way.

On the other hand, I feel that it



Heavy-duty injection molded cooling fan shroud replaces flimsy vacuum formed unit.



Special main rotor shaft for Alouette II is longer than standard shaft at left in photo.

might be better to compromise this distance with something about half-way between the original position and the swash-plate. This may be accomplished by removing the arm, cutting it shorter, and reinstalling the ball at the new position. Of course, you will have to turn down the arm or file it to accept the ball securely. The photo shows more than one ball installed so that you may experiment with the best location for your own techniques and proficiency. If you can silver-solder well, you might decide to solder a length of music wire to a very short arm, and "stack" a series of balls along its length for a really good selection of positions. Or, in the alternative, a long machine screw (M2mm or 2-56) could be installed and a single ball held in place at the desired position with a small nut on either side of the ball.

At the other end of the push rod (on the main rotor head mixing lever), the proper "hole" selection will also change the control input. In this case, the inside hole will provide strong reactions, while the outside hole will tame it down somewhat.

By experimenting with these ideas, and choosing the best connection points, you can end up with a machine that flies like a pussycat, or like a tiger . . . take your pick.

#### FINAL APPROACH

This month, we've concentrated on the Alouette, and next month, we plan to show you a much better and easier way of mounting the collective pitch lifting mechanism on your Jet Ranger. The idea comes from a German model builder who just thought it was a better way of doing it . . . and he was right! Also in the mill, are some ideas for modifying the Graupner 212 to the "Bell" stabilization system . . . three different ways. Until then, BCNU. ●



The happy first twelve place winners at the 1977 Rough River Quarter Midget Championships.



Bill Weesner (left), first place winner at Rough River, his own kit Toni, and caller Dan Kane.

# PYLON

**"GO FAST AND  
Turn Left!"**

By JIM GAGER

PHOTOS BY AUTHOR UNLESS NOTED

• I know, I know. There you are with your new Prather Q-M "Little Toni" kit, just waiting for the review we promised, to see if we ran into any building problems, before you start on yours. Well, we're about 80% finished, lacking only the motor mount and painting. It seems like a sure thing that the article will be ready for the next issue, so we'll promise it for then and keep our fingers crossed. WHERE GOEST THOU, Q-M?

We pose the question because it appears we're rapidly moving away from the original intent of this event; i.e., recently, in many widely geographic areas of the country, we've seen the approved (by whom?) use of tuned pipes, the dropping of an enforced idle rule, and even a case of running whatever nitro fuel you felt you could get

away with. We personally could care less what rules we fly under, but it's nice when you can be sure that whatever contest you go to you'll be familiar with the rules and be running competitive equipment (the reason we fly under AMA rules).

With the increase in speeds and concurrent drop in lap times these changes are causing, it looks like we're going to have to clean our airplanes up a bit more to stay competitive, ala Form I. That means fully cowl the engine, adding wheel pants, skinny wheels, smoothly faired landing gear attachment, and a super-smooth finish on the entire aircraft.



"Senior Citizen" Bob Reuther, was 2nd at the QM Champs, Rough River.



Third Placer Greg Doe accepts silver tray from trophy presenter Shorty Holsclaw.



QM's famous B/S team, Denis Beilick (left) and Lynn Stevens.

Too much work, you say. Well, don't do it, then. But, your competition is doing it and it's sure to add a couple of miles-per-hour to his speed. Can you afford to give him the edge?

Along the same line . . . having a good prop working FOR you, instead of AGAINST you, is becoming increasingly important. And having spent countless hours working up props, we know what a royal pain it is, and have been looking for a way to make it easier. We think we've found that way, at least for ourselves. Like all good things, it costs a little more, but we think it's worth it. We'll turn the next portion of this column over to George Zink, writing in the MARA Newsletter:

## PROP REWORK

"Reworking props is now a fact of life in QM racing (also legal, beginning Jan. 1, 1978. wcn). From all I hear, most QM racers are excited at the prospects of doing their own thing with the props, and they have been getting some pretty fair results from their own rework.

"We have gone into props on a pretty fair level of effort in order to improve the breed, and without going into the ideas and engineering behind the end product, we present here our procedure for coming up with a competitive blade.

1. True the hub.
2. Machine the back of the blade for the following results:
  - a. Repitch the blade to a specific





Attractive van with pylon racing mural at Rough River, belongs to Dave Latsha, LeMoyne, Pa. The four No. 7n's are his, the other two to Ron Bressier, Linglestown, Pa.

- pitch and distribution to wash out the tip and hub surfaces.
- b. Match the pitch distribution on both blades.
- c. Thin the blade.
- d. Decrease the blade chord.
- e. Sharpen the trailing edge.
- f. Weight balancing by removing material from the whole length of the blade for dynamic purposes.

3. Sanding the back of the blade for finish and fine balance.

4. Remove the existing finish from the front of the blade with 0 or 00 steel wool, and balance.

5. Reshape the airfoil at the tips with 100 grit sandpaper and balance. Stop and inspect frequently and work in stages. The purpose of balancing with each step is to make more certain the work is balanced on both blades.

6. Fine sand with 320 or 400 grit paper and polish with 000 steel wool.

7. Dip blades, one at a time, in laquer-type sanding sealer.

8. Polish with 000 or 0000 steel wool and repeat dipping once again.

9. Polish and balance.

10. Wax with a hard paste wax, I use Blue Coral.

11. Hand-rub for glass type finish.

"If you were to go through each of these steps with several props, you would find that comparatively little time

is taken from steps 3 to 11. The bulk of the work is all in the first 2 steps. If you would do these two steps by hand and recheck frequently, you could be spending many hours making props and I'm sure you can think of many other ways you would rather be spending that time.

"That's why we are offering our machining services to you and help with steps 1 and 2. Here's the deal.

"You send me the props to be modified. We prefer Rev-Up 7x6 or 7x6N because these result in sharp trailing edges without removing the material needed for strength. I'll machine the props you send through step 2 and return them to you. Your cost is \$1.00 per prop and the cost of postage both ways. Please include the name of the aircraft and the engine you are using.

"Right now, we are working with a 55 series prop, and it seems to work for a fairly wide variety of QM aircraft and engine combinations, but we will be experimenting with other props in the future and we will send out what we know to be best for your particular combination.

"Our fixture is capable of machining props up to a 9 inch diameter, so that Formula 1 props may also be machined. Our experience with these Form 1 props is much more limited, but we can machine a prop to your specifications for pitch distribution. There can be no guarantee that the blade will clean up or stay together even during static testing. If you want to work with us, call or write: George Zink, 80-28 222 St., Jamaica, NY 11427."

There you have it. We tried some of the Rev-Ups George recommended, and also had him do some Top Flite 7x5 and 7x4-1/2 wide blade Super-M Power Props. With a little work to get the elliptical tip shape we wanted, and very little balancing, the props work just fine . . . you'll still have to play with them to achieve the rpm's you need but, believe me, they'll save you a lot of work.

Just a cautioning note: Props are dangerous enough before you rework them, so if you redo or have someone else redo a prop for you, treat it as you would a loaded gun.

Be sure you send the props to



"Profile of a Racer" in this month's text, Whit Stockwell, at the 1977 Riverside Nationals.

## George . . . not me! PROFILE OF A RACER: WHIT STOCKWELL

We're sure that if you've been in this racing game for any period of time, you've seen or heard of Whit. If you've had the opportunity to fly against him, you'll have found out just how tough and fierce a competitor he can be.

Nineteen years in modeling may not seem like a terribly long time . . . unless the modeler is 23 years old. That's Whit Stockwell's record; and he has the pictures to bear it out.

The Encino, California, racer went through the usual modeling stages before settling on R/C when he was 12. First came the rubber-powered models, launched from a hill at a nearby park by Whit and his father, Bob (an integral part of the racing team known as 'Stockwell and Father' or 'Stockwell and Son', depending on who's telling the story). Then came the gliders, launched at the Sepulveda Basin Model Airport in the San Fernando Valley.

It was at the Basin that Whit and Bob saw their first R/C planes. A year

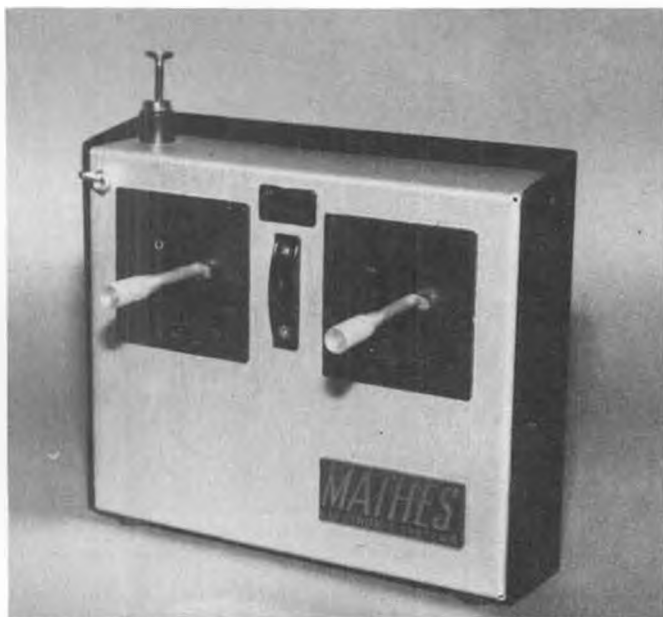
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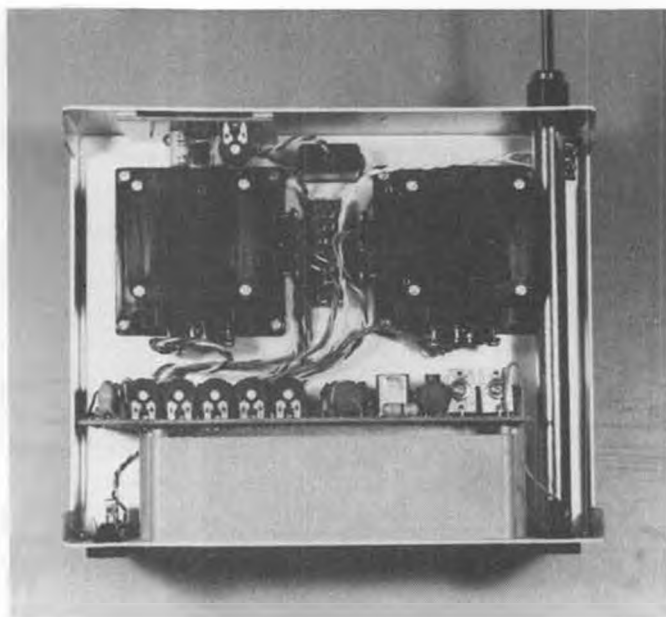
Could Paul Zink's QM be a Weesner "Little Toni" with high aspect ratio wings?



Bob Block flew a J&M Glascraft "Miss Paranoia" at Rough River. Placed 7th.



Mathes Electronic Systems' 5-channel radio has attractive brushed aluminum and black-grained vinyl transmitter case.



Transmitter components are neatly arranged in a smaller-than-usual case. If reliability is based on simplicity, this is it!

## PRODUCTS\$ IN USE\$

### MATHES ELECTRONIC SYSTEMS 5-CHANNEL RADIO, by ELOY MAREZ

• For the newcomers in our hobby, I started to research just how long Don Mathes has been associated with the design and manufacture of radio control systems. He needs no introduction to old-timers and us "medium timers", and I found it interesting to go back and see just where I could first find reference to him in the model press. As it turned out, the publications I was looking in got more yellow and more brittle as I went back in time. And I had to stop when I could no longer decipher the hieroglyphics on the stone

tablets in the back room. I did establish pretty definitely that Don's start in R/C came at about the same time as the development of the printing press.

Don Mathes and Doug Spreng brought out the grand-daddy of digital systems back in the early 60's, the "Digicon". Later, Don helped establish a company called "Micro-Avionics", whose radios are still seen on the local flying fields. Micro-Avionics, before it became a part of Orbit, put out what, in my opinion, was one of the best looking

transmitters ever, in a highly polished green anodized case. To keep things in balance, they also put out what I consider the ugliest, the '68 and '69 wood-grain vinyl-covered Micros. That company merged with Orbit Electronics in '69 or '70; Don went along. He later spent a short spell with MRC, didn't seem to like New Jersey too well, and came back to the West Coast.

Don's present location is an obscure little burg in Arizona, so obscure that they have to take out ads asking "Where the hell is Lake Havasu City?" Well, it is somewhere in the great state of Arizona, better known for such cities as Phoenix, Tucson, and Eloy! And Don's present company, Mathes Electronics Systems, is manufacturing a modern, state-of-the-art, five-channel R/C system.

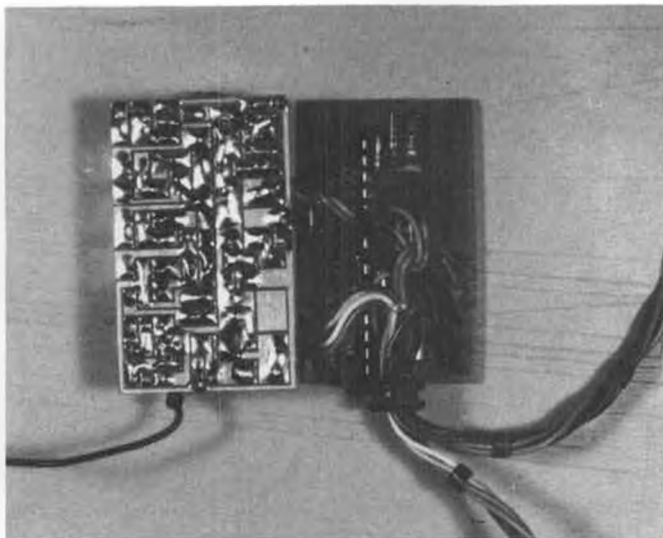
#### TRANSMITTER

At first glance, the transmitter looks quite different from what we are used to seeing. Instead of the one-piece front, top, and bottom that wrap around a one-piece back and sides, the former is inset in the latter for a shadowbox effect. The difference is largely visual, as the transmitter does not feel greatly different in your hands, and in fact, because of the small size, feels quite comfortable. It measures 6-1/2 inches wide, 5-1/2 inches high, and a narrow 1-5/8 inches thick. Placement of the sticks is about optimum for my hands, which I would classify as of average size. The transmitter weight is 24-1/2 ounces.

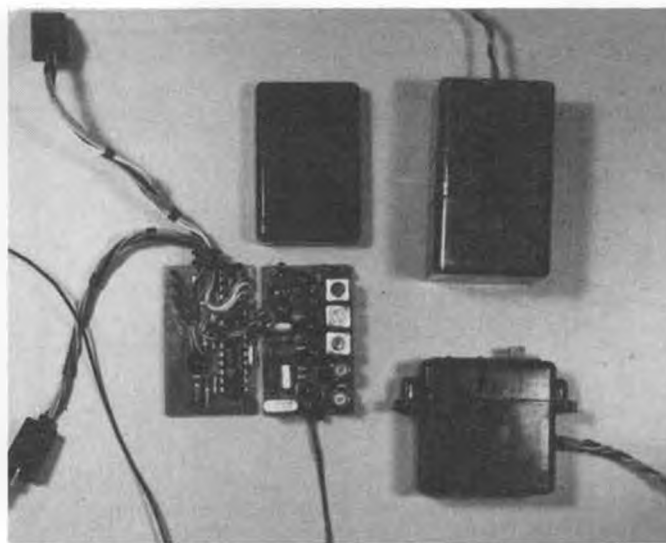
The transmitter is encased in a very attractive brushed aluminum front, and black, close-grain vinyl back case. The edges of the back piece have been finished smooth;



Our Mathes radio system was extensively flight-tested in this Enya 40X powered Safari.



The compact receiver utilizes two PC boards of equal size.



Airborne components (clockwise from top); receiver case, battery pack, servo, and receiver components.

and along with the inside, have been treated in what appears to be black anodizing. The Dunham open gimbals and other external fittings, all in black plastic, complement the brushed finish extremely well.

The fifth channel, normally to be used for retracts, is operated by a switch mounted on one of the upper corners, depending on mode.

So much for the outside, let's get down to the meat of the matter. The Dunham gimbals are of the open/enclosed variety i.e., the pot wiper assembly is directly driven by the stick, without going through any pivot or bale. But the whole gimbal is enclosed, thereby not leaving the transmitter insides open to the elements. The integral mechanical trims are part of the gimbals, and are located under and to the inside of the sticks, as is common practice.

The electronics are all on one printed circuit board, with the exception of a transmitter battery condition circuit, which will be described later. This main PC board is located on top of the base-mounted plastic battery case which holds the eight 500 MAH nickel

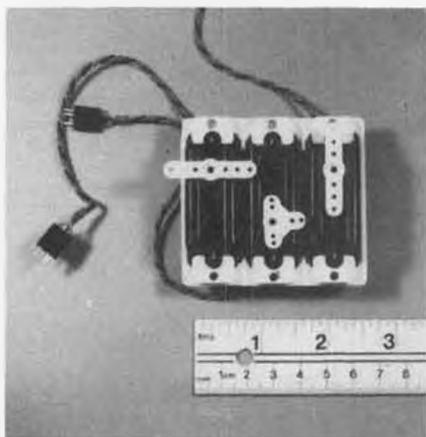
cadmium cells that power the transmitter. The usual switching and charging arrangements are used. The only deviation from standard practice is the use of a left side, sub-mounted, non-removable antenna. It retracts almost completely into the case and does not create a problem during transporting.

The antenna location might be a factor to be considered if you fly with your index fingers hooked over the top edge of the transmitter, such as I do. Don't ask why, except that it feels comfortable. And if it is comfortable, it is right. But in this manner, your finger can touch the antenna, causing detuning and obviously some loss of signal. During the considerable flying that I have done with this system, I have caught myself touching the antenna, with no ill effects at the receiving end. I'm retraining myself though; this could cause a problem on a long low approach or as you go round Number One pylon during a race.

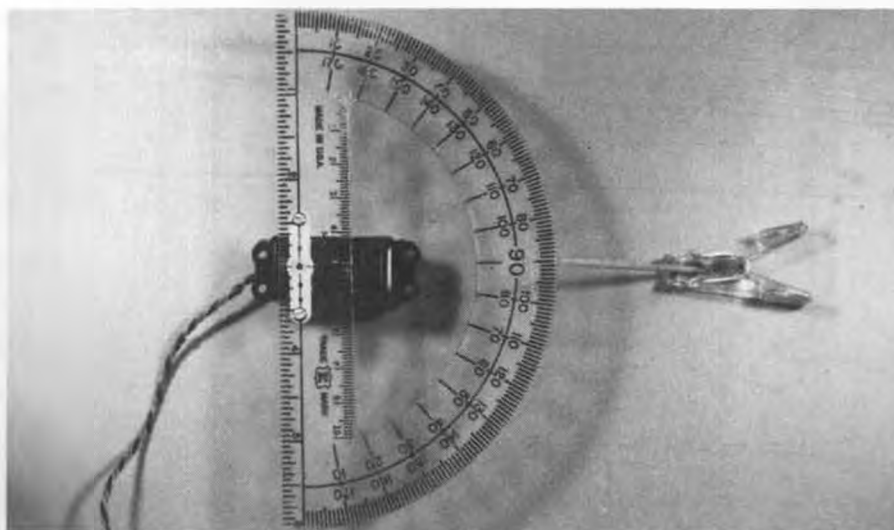
Circuitwise, the transmitter does not present any surprises. The usual crystal oscillator and buffer/doubler are found, driving the final, which in this case, is three 2N5770's in parallel. The encoder is also standard; no IC's. It is obvious Don is not doing his experimenting on us, the flyers, and is using only time-proven circuitry, updated only by the use of the newest components.

The one departure from the norm is the use of a red LED driven by a battery condition circuit to show when the transmitter is "ON" and when it needs charging. This LED is submounted in a plastic well, located in the position usually occupied by the normal meter. In use, throwing the switch to "ON" causes the LED to glow, which is easily seen down in its recess even on a sunlit day. When the battery reaches the critical 1.1 volt per cell level, the LED starts to blink, indicating a need to recharge. The instructions are to the

*Continued on page 72*



Three servos in mounting tray . . . a small, easily installed package.



Model Builder uses this arrangement to check servo performance. Very simple and effective.





Fred Emmert shows his well-built Riser Rider. Hit a car at the Fresno Annual.



Bruce McAviney applies modern technique for starting the ignition converted engine in his GHQ Sportster. Fine aircraft for R/C.



# PLUG SPARKS

By JOHN POND

• Well, SAM 21 and SAM 26 did the Pond Commemorative up brown this year! All due credit for running an excellent meet should go to John LeSeur, Contest Director (SAM 26), Tom Bristol, Assistant Contest Director (SAM 21), and the Tri-Valley R/C Modelers. A beautifully run meet to say the least!

For those not familiar with the Pond Commemorative, this came about as an idea of Red Barrows, of San Diego. Red's idea was to have an old-timer contest where the old man would have absolutely nothing to do. The idea here was to have Pond possibly win with no excuses of administrative work interfering with his flying (it hasn't helped much, haw!).

With help from Al Hellman and John LeSeur, the initial meet got off



The girls get into the fun. Neva Nicholau and Miriam Schmidt with Nicholau's Super Buc.

like a rocket, with excellent attendance, considering the newness of radio controlled old-time free flight on the West Coast. Trophies and prizes were promoted by Red Barrows, while the PR work was done by Al Hellman. Of course, Tom Bristol and John LeSeur did their usual outstanding work. Only one fly in the ointment, they called the meet the "Pond Memorial." The columnist is still getting calls asking when he died, hence, the contest being re-named Commemorative.

Lessons learned from the first two meets were: (1) too many events on one day, (2) with any sort of bad weather, there would not be enough time for flying and, (3) one day was not enough to attend to all the many functions of a contest.

This year, a two day affair was staged, with the Commemorative Banquet being held on Saturday night. This year's banquet was no exception, as it proved to be very popular. For those who had not pre-registered or reserved a table, things were a little tight, as over 100 had already signed up.

The banquet featured Dr. John Nicolaides, formerly of Notre Dame,



Ted Kafer, Sam 21 newsletter editor, enjoys some help from Prexy Don Bekins. Ship is JASCO Flamingo.



Bob Sliff's fleet of Playboys won Class A, B, and C at the Pond Commemorative, Santa Maria, California.



Fawncy cowl on an unidentified Sailplane, seen at the Fresno Annual.



The better half of the Bernhardt family, Marge, with brand new rebuilt Trenton Terror. Fresno Annual.

and now head of the Aeronautical Department at Cal Poly. His talk on the development of RPV vehicles and other aeronautical oddities (such as his "Flying Mattress"), was the hit of the night. For a change, the women, who are generally bored to tears at these functions, found the good doctor most entertaining and amusing with his humor and dry wit. Slides and films on parafoils were shown, depicting John LeSeur taking an active part as the RPV pilot. Matter of fact, John has gotten such a reputation as a RPV pilot, he is seriously considering the sale of his excellent hobby shop in Santa Maria. Wanna buy a hobby shop? (Nicolaides was the "star" on a recent showing of "60 Minutes", demonstrating his parafoil. wcn)

Originally scheduled in December for the first contest, the Commemorative has been steadily moved forward a month each year. The first year featured frost in the morning. The second, in November, was still chilly, with very scattered lift. The third, staged in October, proved to be good, but suffered from early morning fog. In most cases, the fog did not lift until 10:00, which was followed almost immediately by the wind. By 2:00 each day, all flying was generally suspended. Seems as though there is something wrong with each month for flying! Regardless, John LeSeur announced that next year's Pond Commemorative would be held on October 14 and 15. So paste that one in your hat!

What can you say about the flying when the results show Bob Sliff placing in every event (five) over the two-day stint of flying. To show that he wasn't fooling last year, Sliff won every event on Saturday. His fleet of scaled Playboys won Class A, B, and C. To show it was no fluke, he was actually "maxing" in the afternoon

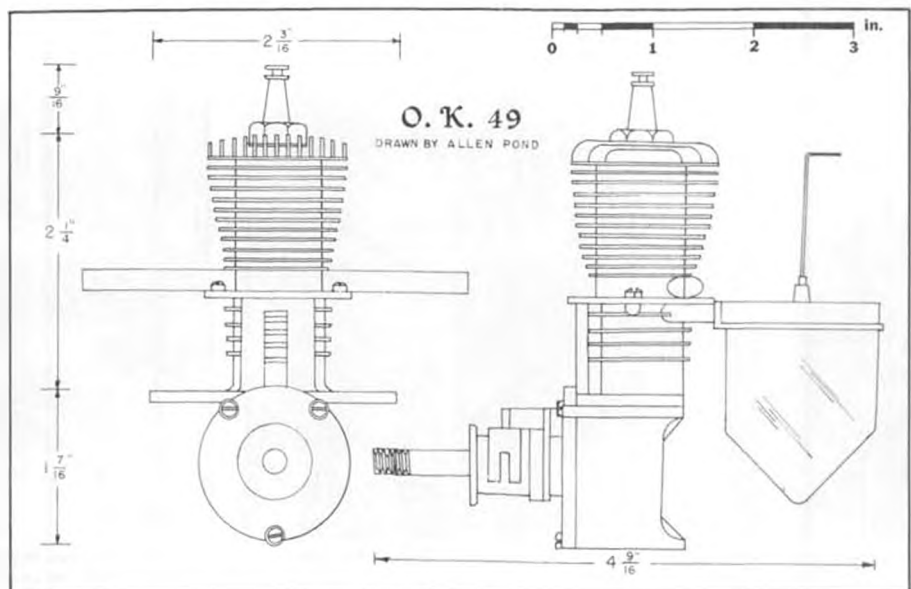
wind. The next day, he took two fourths, in Texaco and .020 Events, both fuel allotment type of contests. Needless to say, Bob won the Sweepstakes trophy by a wide margin over runner-up SAM 21 Prexy, Don Bekins.

A considerable amount of excite-

ment was generated on Sunday as the columnist's model, and quite a few others, were constantly playing hide-and-seek in the scattered clouds. At one point, the writer never saw the model for two minutes, having to rely on the timer and others for flight directions. Well, you

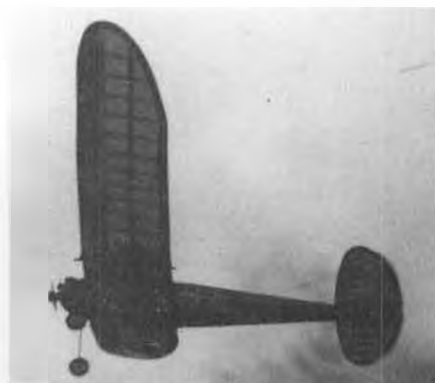


Bob Sliff was such a heavy winner at the Pond Commemorative that he needed a van for all the trophies. "Daddy Warbucks" himself presents the perpetual.





The Florida Turkey Flyers (l to r): Terry Rimert (Playboy), Howard Hemminger (Bombshell), Bryton Barron (Playboy), and Frank Carney (Playboy). Nice looking flying field.



Helmer Johnson's Playboy floats in after a flight in Houston, Texas.



Mimi Gerard holds John Pond's latest electric powered 1936 Turner Special. Sanwa 3-channel.



Bob (EK Products) Elliott's Powerhouse reaches for the sky in Houston, Texas. This and above photo of Johnson's Playboy sent to us by Owen Morris, NASA Space Center, Houston.

know, as you get older, people talk softer, your arms get shorter, etc., etc.

The new proposed club, SAM 49, spearheaded by Otto Bernhardt and Al Hellman, claimed the majority of the prizes, led by Bob Sliff, taking six of the fifteen trophies, and leaving the balance of the hardware for SAM 21, SAM 27, and SAM 26. Worst part about it all is that SAM 49 is not yet formally organized!

To wrap up a real fine time by all, the old man was requested to award the trophies. This gave the columnist an excellent opportunity to thoroughly express thanks to every-

one for a great meet. No question about it, next year's Commemorative will be bigger and bigger!

#### ENGINE OF THE MONTH

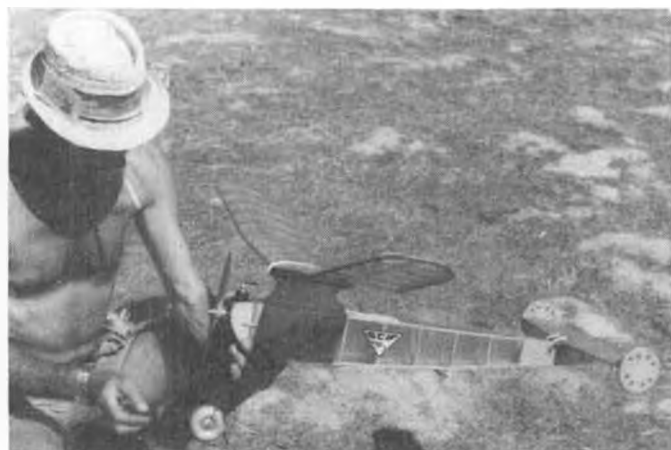
A lot of old-time modelers never realized that there was such an engine as the OK 49. This motor, due to its slightly lower power output, was responsible for a considerable number of designs in the five foot wingspan size appearing in the 1941 model magazines.

To back up a little, the gas engine craze was in full swing by 1939, and there was plenty of competition for the market from Brown, Super Cy-

clone, and Ohlsson. A definite overhaul was in order for the present line of OK engines, and Charles Brebeck proved his ingenuity as a machine man.

In 1940, Brebeck came out with a new look on his engines, while keeping most of the basic parts unchanged. He announced an OK Deluxe (.616 cu. in. displacement), OK Standard (.604 cu. in.), the OK Special (also .604), and the OK 49 (.493 displacement). There was a price for every pocketbook, with the Deluxe starting at \$19.50 (strangely

*Continued on page 75*



Another Flying Aces design built by Phil McCary. Remember the "Stall-Proof Gassie"?



Keep your eye in the sky, even for slow-flying old-timers. This Dal-laire belonging to Hal Cullens, Yuba City, punched hole in hood.





PHOTOS BY AUTHOR

# J.C. YATES "MADMAN" in .020 R/C

By FLOYD CARTER . . . Control Line, Radio Control, and Old Timer, all rolled into one! Most famous of the early post-war C/L Stunters was this design by "J.C." Yates . . . both a legend in their time.

• The peacetime economy of 1946 brought a sudden increase in the availability of consumer goods, after a decade of economic depression, which was followed by another four years of severe rationing and wartime priorities. Many small companies found their government contracts ended, so they were eager to switch their production lines from military hardware to candy bars, washing machines, and model supplies. Engines, balsa wood, and other materials once again appeared on the shelves of hobby shops. Former modelers found their way back into the hobby, along with countless others whose aviation interests were triggered by the recent air warfare.

Control line flying had been introduced only shortly before the war, and little development had since taken place. Without much of a background for guidance, modelers invented, developed and refined the control line stunt pattern while striving to design the optimum stunt machine. Planes of all shapes and sizes appeared at flying fields and in kits, only to become obsolete and outclassed within a very short time.

Along with the mainstream of design philosophy which gradually took shape, my own models of the time imitated the large "barn door" designs powered by the magnificent new Orwick 64 engines. Size and lots of wing area were considered necessary to carry the heavy engine and its ignition system.

In the midst of this trend, one can imagine the skepticism that greeted the Madman. Here was a very handsome model which resembled, but did not imitate, the sleek fighter planes

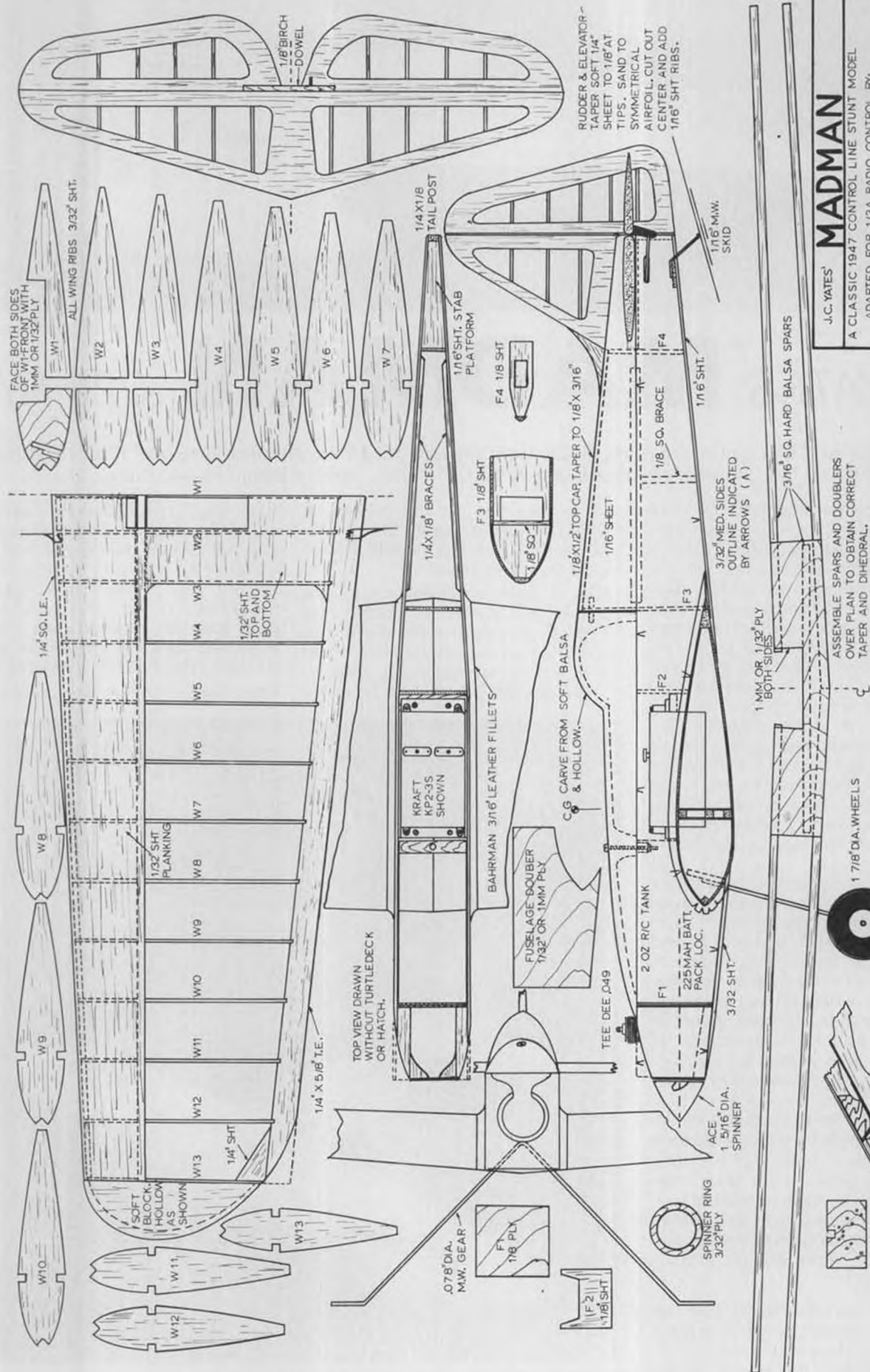
of the time. On the other hand, it seemed almost too small to be competitive with the big, lightly-loaded planes that were popular.

The designer of this new model was a young man named J.C. Yates. And he quietly began to show the rest of us what a winning combination could do. When the smoke finally cleared, he had earned 37 trophies to prove

that the Madman was indeed a capable machine. This performance was not lost on the competition. The Madman kit was soon introduced and became the standard stunt machine for serious contest flying. It wasn't long after this that glo plug engines were introduced. These permitted smaller, lighter planes with wing flaps. The Orwick engine faded from the



Miss Allison Carter shows off the classic lines of the "Madman". While the .049 TD is tiny in comparison with the original Orwick, the 1/2A model has adequate power.



# MADMAN

J.C. YATES' **MADMAN**  
A CLASSIC 1947 CONTROL LINE STUNT MODEL  
ADAPTED FOR 1/2A RADIO CONTROL BY:  
FLOYD E. CARTER

Plan No. 1782

DRAWN & INKED: F.E.C. MAR '77  
SPAN: 38 1/2" (82% OF ORIGINAL)  
POWER: .049-.051 RADIO: 2 CHANNELS

MODEL BUILDER magazine  
USE INSTRUCTIONS WITH CARE

ASSEMBLE SPARS AND DOUBLERS  
OVER PLAN TO OBTAIN CORRECT  
TAPER AND DIHEDRAL.

1 7/8" DIA. WHEELS

FUSELAGE ASSY.  
SHOWING COWL  
BLOCKS

LG. MOUNT  
3/32" PLY

SPINNER RING  
3/32" PLY

ACE 1 5/16" DIA.  
SPINNER

225 MAH BATT.  
PACK LOC.

2 OZ RIC TANK

TEE DEE .049

FUSELAGE DOUBLER  
1/32" OR 1MM PLY

BAHRMAN 3/16" LEATHER FILLETS

KRAFT KP2-3S  
SHOWN

TOP VIEW DRAWN  
WITHOUT TURTLEDECK  
OR HATCH.

1/4" X 5/8" T.E.

1/32" SHT  
PLANKING

1/4" SQ. L.E.

FACE BOTH SIDES  
OF W1-FRONT WITH  
1MM OR 1/32" PLY

ALL WING RIBS 3/32" SHT.

1/8" BIRCH  
DOWEL

RUDDER & ELEVATOR  
TAPER SOFT 1/4"  
SHEET TO 1/8" AT  
TIPS. SAND TO  
SYMMETRICAL  
AIRFOIL. CUT OUT  
CENTER AND ADD  
1/16" SHT RIBS.

1/16" M.W.  
SKID

1/8" SQ. BRACE

1/16" SHT.

3/32" MED. SIDES  
OUTLINE INDICATED  
BY ARROWS (A)

1/8" X 1/2" TOP CAR TAPER TO 1/8" X 3/16"

1/16" SHEET

1/4" X 1/8" BRACES

1/16" SHT. STAB  
PLATFORM

1/4" X 1/8" TAIL POST

F4 1/8 SHT

F3 1/8 SHT

1/8" SQ.

C.G. CARVE FROM SOFT BALSA  
& HOLLOW.

F2

F3

1MM OR 1/32" PLY  
BOTH SIDES

3/16" SQ. HARD BALSA SPARS

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The original "Madman", built by J.C. Yates. Wheel pants were later discarded. Note the heavy ignition wire to the spark plug.

stunt scene, and the Madman became another casualty of progress.

During his practice sessions with the Madman, J.C. (yes, that is his full, given name) developed what became known as the "Yates Takeoff". With full up elevator at takeoff, the Madman could roll a few inches and then half-loop to inverted flight. Modern control line combat machines will do this, but J.C. was the first to do it (but not in contests). That kind of flying was possible because of the brute power of that big Orwick, which would swing a 12-6 prop without any thought of slowing down, regardless of the attitude of the airplane. That kind of flying also earned J.C. the nickname "Madman Yates", which was coined by Johnny Davis in the model press.

After his Nats win in 1948, J.C. retired from control line stunt competition. He is now an R/C enthusiast and regularly flies at his home field in Southern California. J.C. still has a Madman or two that he takes out occasionally to brush up on his U/C pattern technique. Except for the wires attached to the wing, it could easily pass muster side by side with modern R/C models on the flight line. Such is

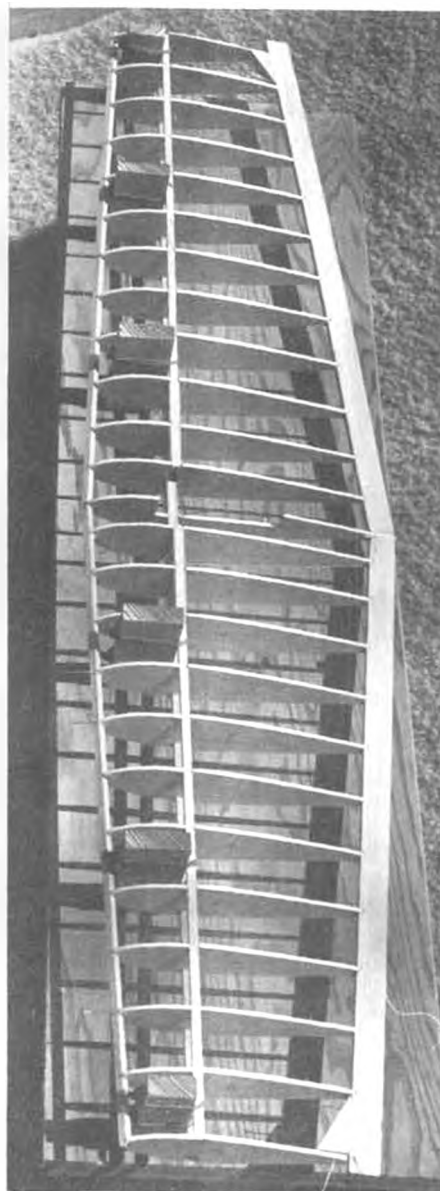


The control line lead-out wires are fake (but scale!). Antenna wire is clue to R/C.

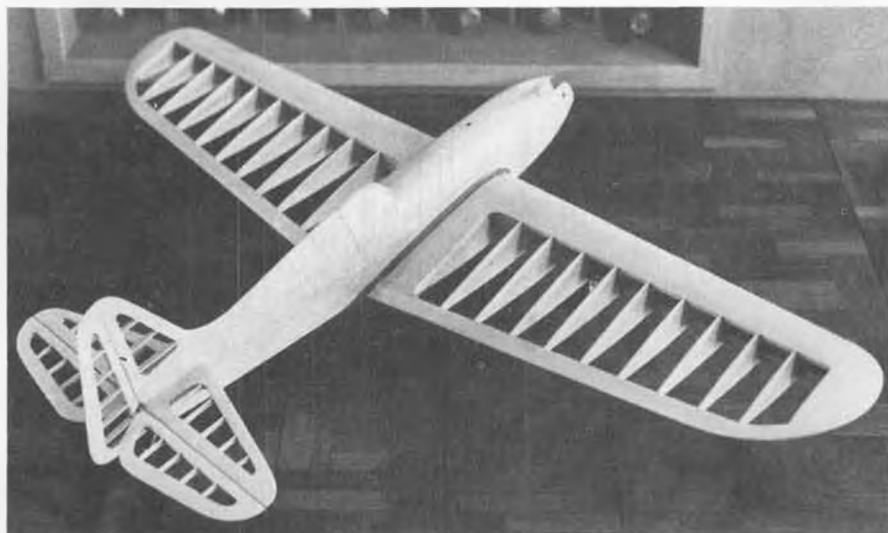
the nature of a classic design. It never seems to look dated or out of place.

To get the Madman down to 1/2A size, it was necessary to reduce the plans only 18%. The same basic method of construction is retained, but the fuselage had to be widened a bit to make room for the 2-channel radio (The original model had a straight taper from the firewall to the tail post.). If you use one of the small radios now

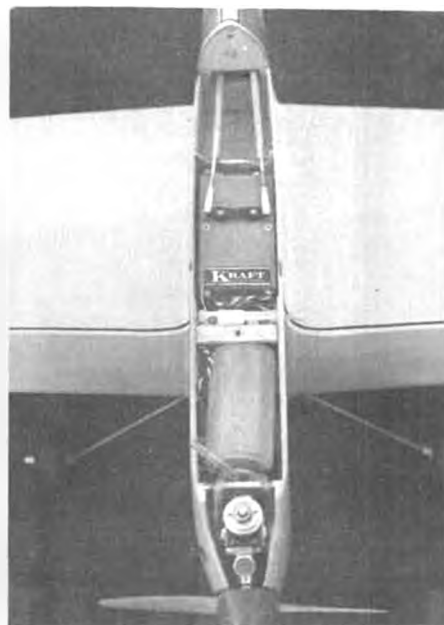
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This simple wing-jig is worth the effort to assure building a straight wing.



The 1/2A R/C "Madman" ready for covering. Conventional structure is very clean. Note leather pattern-maker's fillet between wing and fuselage.



Equipment installation arrangement. Battery pack is below 2 oz. fuel tank.





# PRODUCTS\$ IN USE\$

CRAFT-AIR'S R/C BUHL "BULL PUP", by PHIL BERNHARDT

• Craft-Air has made quite a name for itself over the past few years, by offering kits for some of the best competition R/C gliders you can buy. Go to any glider contest and there will always be a handful of Windrifiers on hand. Always striving for better performance, Craft-Air's latest kit is the great big super-thermalling . . . hey, wait a minute! This one's *gas powered!*

That's right. Craft-Air's newest kit is a 42-inch span, stand-off scale model of the Buhl "Bull Pup", for .09 to .15 size engines. In case you've never heard of it, the Bull Pup, built by Buhl Aircraft of Marysville, Michigan, is a 1931 ultra-light that was aimed at the deflated pocketbooks caused by the Depression. It never really did catch on, and was in production for only one year, so that today, only eleven or so are active. The Bull Pup has always been one of my favorite vintage aircraft, with its potbellied

fuselage and unusual mid-wing configuration, so it wasn't hard to accept the offer to do a review on the kit.

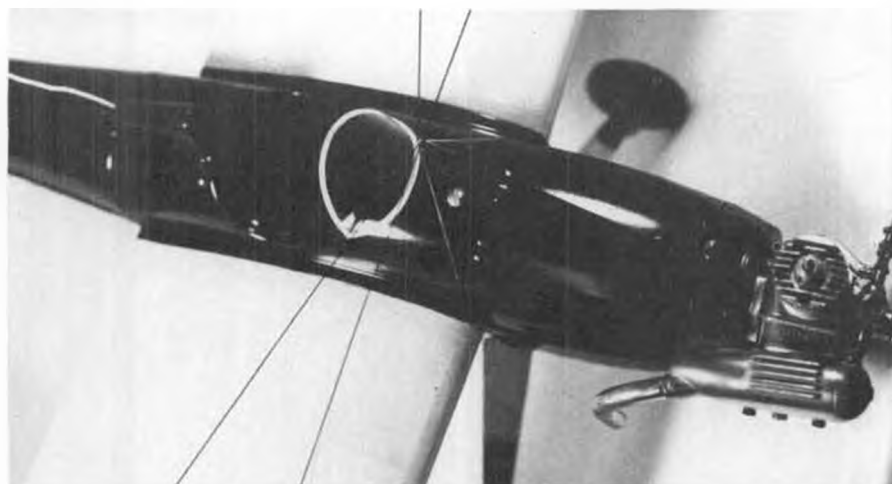
The full-size Bull Pup was one of the first lightplanes to use a metal monocoque fuselage. To get the same appearance, the Craft-Air kit uses two vacuum-molded ASA plastic fuselage shells, supported by a simple internal wooden structure. The shells even have little bumps molded in to simulate rivets. Needless to say, this type of construction is a heck of a lot easier and quicker than building, let's say, a balsa fuselage, because all of the nice compound curves of the Bull Pup's fuselage are already done for you.

The kit incorporates all of Craft-Air's usual high quality. The wing ribs and spar webs are all pre-cut and sanded, and the fuselage formers are die-cut from plywood. The building instructions are printed at the top of

the plan sheet; there is no separate instruction sheet to get lost or chewed up by the dog, or whatever. The instructions are very complete, even to the point of specifying the proper type of glue to use for each step. The choice of glues is not really all that critical, except when something is to be glued to the plastic fuselage shells. A butyrate-based cement (I used Ambroid) *must* be used for this, as nothing else will stick to the plastic. The kit includes all of the hinges, horns, and other small hardware needed to build the model. Black elastic thread for the simulated rigging is included, even a nylon tailwheel. The landing gear is pre-bent from hard aluminum sheet and comes in two halves, which can be removed from the fuselage if necessary. The landing gear is the only major deviation from scale on the whole model. The full-size airplane used a type of tripod arrangement for each wheel. This kind of set-up would make the model look better, but wouldn't be nearly as rugged as the gear supplied in the kit.

The Bull Pup's construction is so simple that little needs to be said about it here. The wing uses conventional open-bay construction (no sheeting except at the center section) and features top and bottom spruce spars with shear webs in between, just like most modern R/C gliders. In order to save weight, the tail surfaces are built from balsa sticks instead of the more typical solid balsa sheet. The horizontal stabilizer is a little unusual in that the elevators are not full-span, but end a couple inches short of the tips. This is to decrease the elevators' effectiveness, as the prototype models, with full-span elevators, were quite touchy in pitch.

All that's needed to build the fuselage is to glue a few plywood formers and a spruce-and-plywood crutch into the plastic shells, and then the two shells are glued together. It sounds



Top of fuselage, from headrest forward, is attached to wing. Single bolt, below tri-pod strut, holds assembly onto fuselage, keyed with dowel. "Flying wires" are elastic thread.

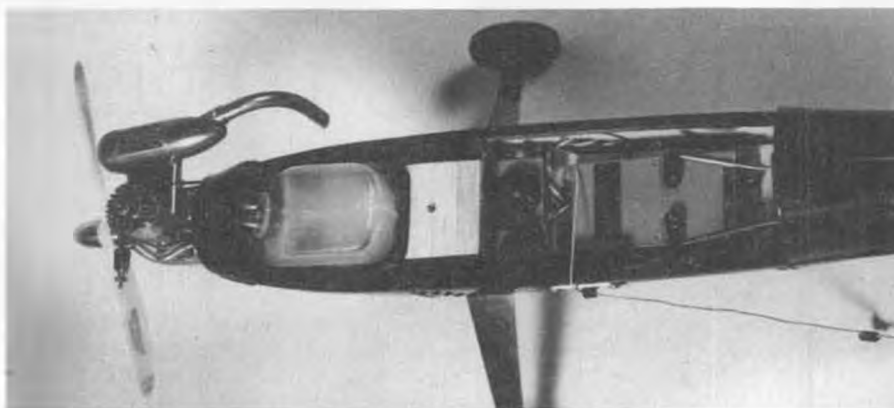
simple, and it is. Be extra careful, however, when installing the crutch; the wing and stabilizer both rest on top of it, so make sure it doesn't get twisted when gluing it in place. I suggest tack-gluing two balsa sticks vertically to the nose and tail of the crutch; this way, any twisting that might creep in while gluing the crutch into the fuselage can be easily seen by sighting along the two sticks.

The airplane itself is not very big, but there is enough room in that deep fuselage for just about any currently made radio. My Kraft "brick" and KPS-11 servo fit in there nicely, and with lots of empty space under them, where the receiver of the more typical individual servo system might go. The brick and servo wouldn't fit the rather closely spaced spruce servo mounting rails in the kit, so I made a plywood mounting tray that is supported on both ends by the F3 and F4 fuselage formers. That big old KPS-11 servo pushes the brick to the very back of the radio compartment, which is the absolute worst place from a CG standpoint. In order to offset the weight of the heavy radio, I decided to use a lightweight battery pack . . . No dice . . . The airplane wouldn't even start to balance with a 250 MAH pack, and just barely makes it with a 500. All this adds up to a pretty heavy radio for this little ship, and the fact that it still delivers excellent performance is a credit to its design.

The most colorful Bull Pup I know of is based at Santa Paula, California, and belongs to Clete Roberts, the well-known TV newscaster. His airplane is done up in the blue-and-yellow colors of the primary trainers of early WW II, and since I've never had a model with this color scheme I decided to copy it. The wings and tail surfaces were covered with Monokote, then trimmed with both Monokote and Trim Monokote. I had originally intended to paint the fuselage with K&B Superpoxy, because I've always had good



Only obvious deviation from scale is the sheet aluminum landing gear struts, replacing the 3-strut scale gear which would be rather tender for every-day sport flying.



Loaded down with a Kraft brick plus a KPS-11 servo and 500 MAH battery pack, the Pup still flew well. Most radio installations would be smaller and lighter.

results with it, but right there in the instructions, in capital letters, it said "EPOXY PAINT IS NOT RECOMMENDED." It turns out that something in the paint has an effect on the ASA plastic, making it brittle. Pactra's new polyurethane paint looked like a good alternative, and in any other case it would have been okay, but I needed a particular shade of blue and the Pactra paint was either too light or too dark. To make a long story short, I ended up using R&S Products' "Perfect Paint". This stuff is every bit as fuelproof as epoxy paint, and seems to

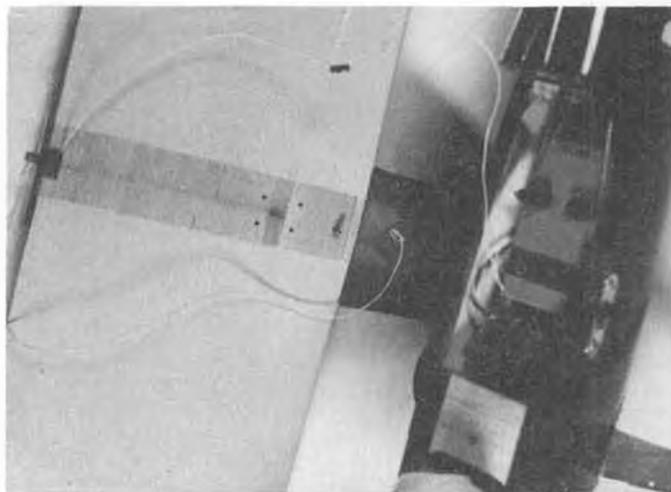
be completely compatible with the ASA plastic. The only gripe I have is that it's so hard to find; none of the local hobby shops had it (they told me they couldn't get it either). I finally tracked the paint down at a not-so-local hobby shop and had to drive into the next county to get it.

The building instructions end with a list of things to check before making the first flight. One of those items is "balance as shown on the plans". The only problem here is that the balance point is not shown . . . not on the plan

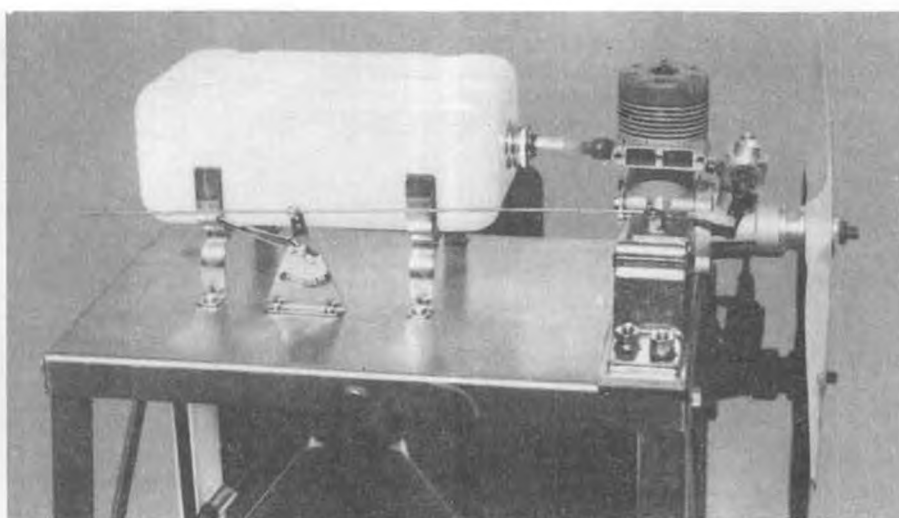
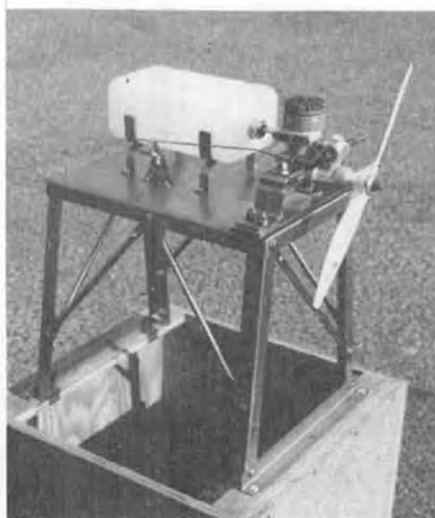
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An OS 10 R/C engine is more than adequate power for the Pup, even with the heavy radio load as used in the test.



Fuselage is molded in two half-shells, of tough ASA plastic. Be sure to avoid certain paints, as specified, that can make the plastic brittle.



# PRODUCTS IN USE

## MRC/IM ENGINE TEST BENCH STAND, by ELOY MAREZ

• Have you ever noticed how many of the answers on "Advice to the Engine Owner" in the model press wind up saying: "Sounds like you haven't run it enough to be familiar with it", or, "Maybe it isn't quite yet broken in?"

Well, to do any of these things, you've got to bolt your engine down someplace, feed it some fire and fuel, and run it according to its manufacturer's instructions. We all have our pet way of doing this. It may be one of the wooden or cast metal stands available, which don't look quite safe for the .60's and even some of the .40's. It may be a piece of wood with a "U" cut out of one end. Or it may even be your one and only airplane, which some guys will use as an engine test stand. No doubt this sort of thing will go on as long as there are modelers, but for those of you who care to do it right, Model Rectifier Corporation has the answer. Actually, MRC, importer, and IM Products, manufacturer, have

the answer, in their Engine Test Bench Stand.

This one has it all, starting with the construction material itself, which is all heavy (.080 inch thick) steel angle and formed sheet. Heavy enough to take the stresses for which the stand is intended, and heavy enough to provide some of the pounds necessary to anchor down all those horses. All the material, including nuts and bolts, is finished in a corrosion-resistant finish to withstand rust and the ill effects of too much nitro.

The engine-holding clamps themselves, adjustable in spacing for model engines from .09 on up to the one-plus cubic inch biggies, are formed from .177 inch steel, and have a cross-hatch pattern stamped onto the areas between which the engine mounting lugs are held. This gives them more 'bite' than would smooth surfaces. There is a third piece, with a formed overhang, that prevents the engine from going forward and out of the

mount in the event the bolts are not properly tightened and/or come loose. This is a good safety feature, and one we were glad to see.

A tank and throttle are part of the assembly. The former has a capacity of 1000cc (33-plus ounces), so you don't have to fool with filling a smaller one all the time. It is held in place on formed, foam padded clips, to which I added some rubber bands in case the slipstream gets a bit much for it. The throttle is another handy feature, having a friction device that you can adjust to keep things running at the desired speed.

Since the throttle-to-carburetor arm distance will vary from engine to engine, I looked for an easy way to vary the length of the linkage. The solution was easy; requiring only the installation of a Du-Bro E-Z connector at the throttle. By simply loosening a set-screw, the length of the wire going to the carburetor arm can be adjusted as required.

Assembly is fast and simple. The only tools required are two 10mm box or open-end wrenches, or in the absence of these, a couple of good metric Crescent wrenches will do the job. The instructions are short, but complete. I have only one suggestion: Lock-Tite. Over a period of time, this

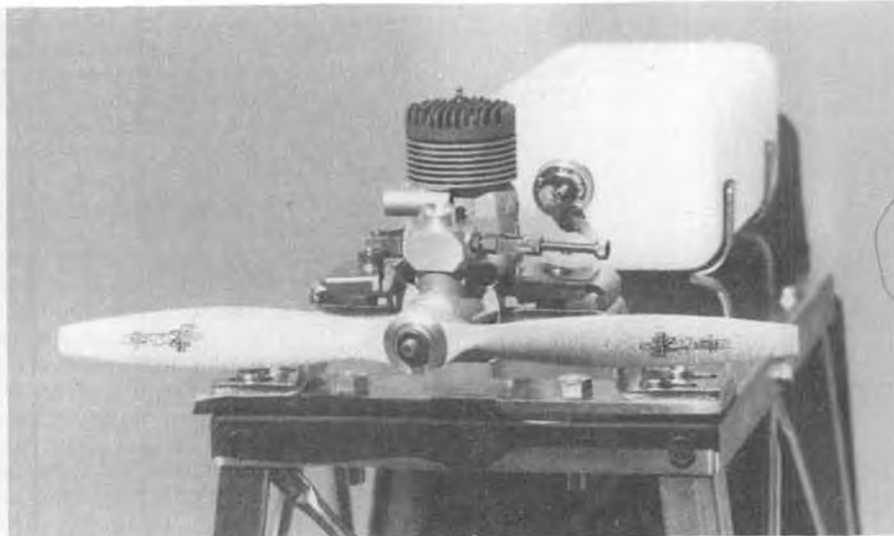


Adjustable, but sturdy mounts, will take a wide variety of engines which are firmly clamped into place for running.



A simple plywood plate mount, with notch for engine, adapts stand for even the smallest glow and diesel buzzers. Make this yourself.





To prevent the engine from sucking in surface dirt, and to avoid kneeling for grandfathers and other types of "old men", we suggest this storage box/stand seen in photo at left, and sketched below. To the right, the author's Black Head Webra with Zinger prop, ready for a long run-in.

stand will get quite a bit of stress and vibration, and you know how fast an engine will tear itself away from the mounts once the first screw gets loose. The same thing can be expected to happen to this type of assembly. Lock-Tite on all the bolts, at the point where the nut makes tight contact, will prevent future loosening.

It is possible to assemble the legs so as to be out-of-square with the top. To prevent this, snug down all the bolts, and then sight down along the front and rear edges, towards the angle mounting piece along the bottom. Adjust the latter 'til it appears perfectly lined up with the top, tighten all bolts, and it's done.

The fittings on the top are put on in much the same manner, except that you will need 5 and 7mm wrenches, and a medium sized screwdriver. Don't forget that some of these screws are permanent, and can use Lock-Tite, while others are not, and should not.

Since I also run and fly the smaller engines, I resorted to the "piece of wood with a 'U' cut out of one end" as adaptors to hold them. As shown in the photos, a Cox .049 with tank is mounted on a piece of plywood, which in turn is held in the Test Stand as though it were engine lugs. The whole idea was to keep from having two engine test set-ups.

Now that we have it all together, we are ready to go run an engine, right? WRONG! As it is, the Test Stand is much too low to the ground to set someplace other than on perfectly clean concrete, and fire up. To do so will stir up all kinds of unwanted engine-eating debris that will wind up inside your \$100 beauty or get thrown into your face at the prop. Though it isn't specifically stated, this stand must be designed for mounting on top of something else, as three holes are provided in each horizontal base piece.

And unless you are fortunate enough to have a soundproof ventilated room in which to do your engine running, or are far enough from the neighbors to permanently mount it above ground someplace, you are faced with the problem of transporting it to wherever you can do your engine running.

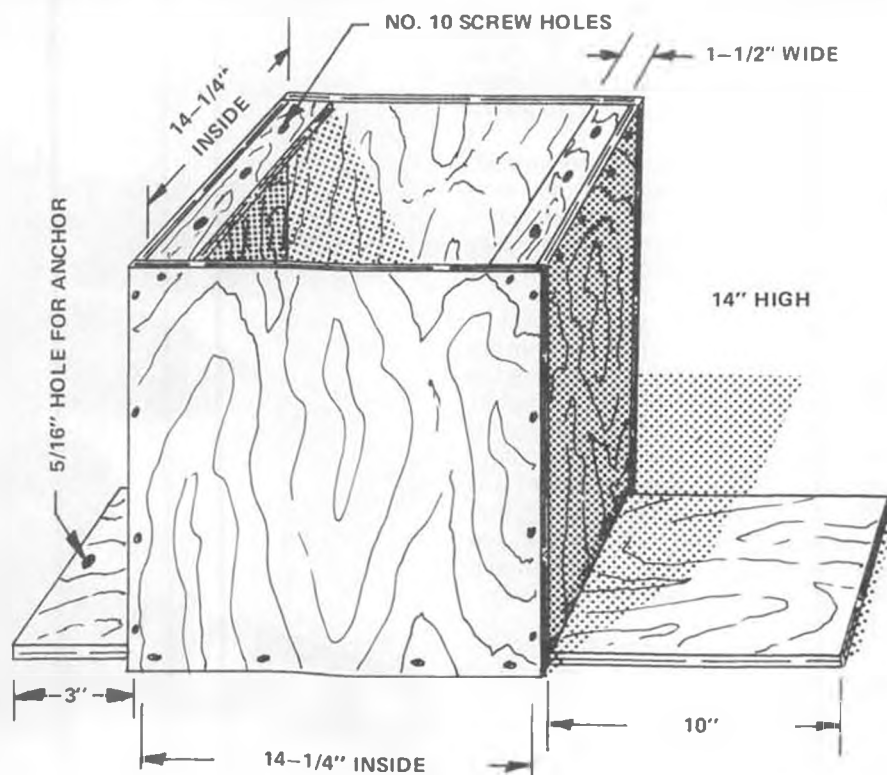
After kicking this around, I decided that simply putting it on a base was not the answer, as then it would be high and awkward to transport. Therefore, I settled on a combination carrier and base, which stores the Test Stand on its way to the running area, and supports it above ground once there.

It is a simple box built of 5/8 plywood, glue, and screws. The only critical dimensions are the height, and

the opening in the top for inserting the stand. The stand is longer than it is wide, and will fit into an 11 by 14 inch opening. Therefore, I started with a box with 14-1/4 inch square inside dimensions, and added 1-1/2 inch cross pieces at the front and rear. The Engine Stand will sit on these cross pieces, and is attached to them with No. 10 machine screws. Upon being removed, and rotated 90 degrees, the stand will drop down into the box.

The height of this stand is 14 inches; I would recommend a minimum of ten as enough for a total height to clear all but the dustiest terrain. Higher than that is better if you have slow starting engines and don't care to bend over too much.

*Continued on page 81*





## MODEL ROCKETRY

By DOUGLAS PRATT

• (Caution. The following article has been written by a man suffering from a serious addiction to rocketry. He has also been known to indulge in heavy doses of Star Wars, followed by old Ernie Kovacs television shows. Extreme skepticism is advised.)

In case you're wondering, that's so the Food and Drug Administration can't claim that I cause cancer in monthly doses.

Greetings across your horn-rimmed spectacles. This month we offer news from the peculiar world of rocketry, and two (count 'em) plans from Terry Lee, Southern gentleman and deadly competitor.

The first of said plans is the Sprint D-5 egglofter, which holds the current Pigeon (D engine) USA single Eggloft record. The record flight of 621 meters was made at NARAM-18, August 3, 1976, using a D6.1-6 engine manufactured by AVI. Note that the model was launched from a tower, meaning that no launch lugs are necessary. If you don't have a tower, the "POP" launch lug from Competition Model Rockets is just as good.

Main airframe is Estes BT-20; Centuri ST-7 is the same size, and CMR sells a tube that has a slight structural superiority (because it's stronger). Fins are from the Estes Sprint kit, made from 3/32 balsa. Thin ply is also excellent;

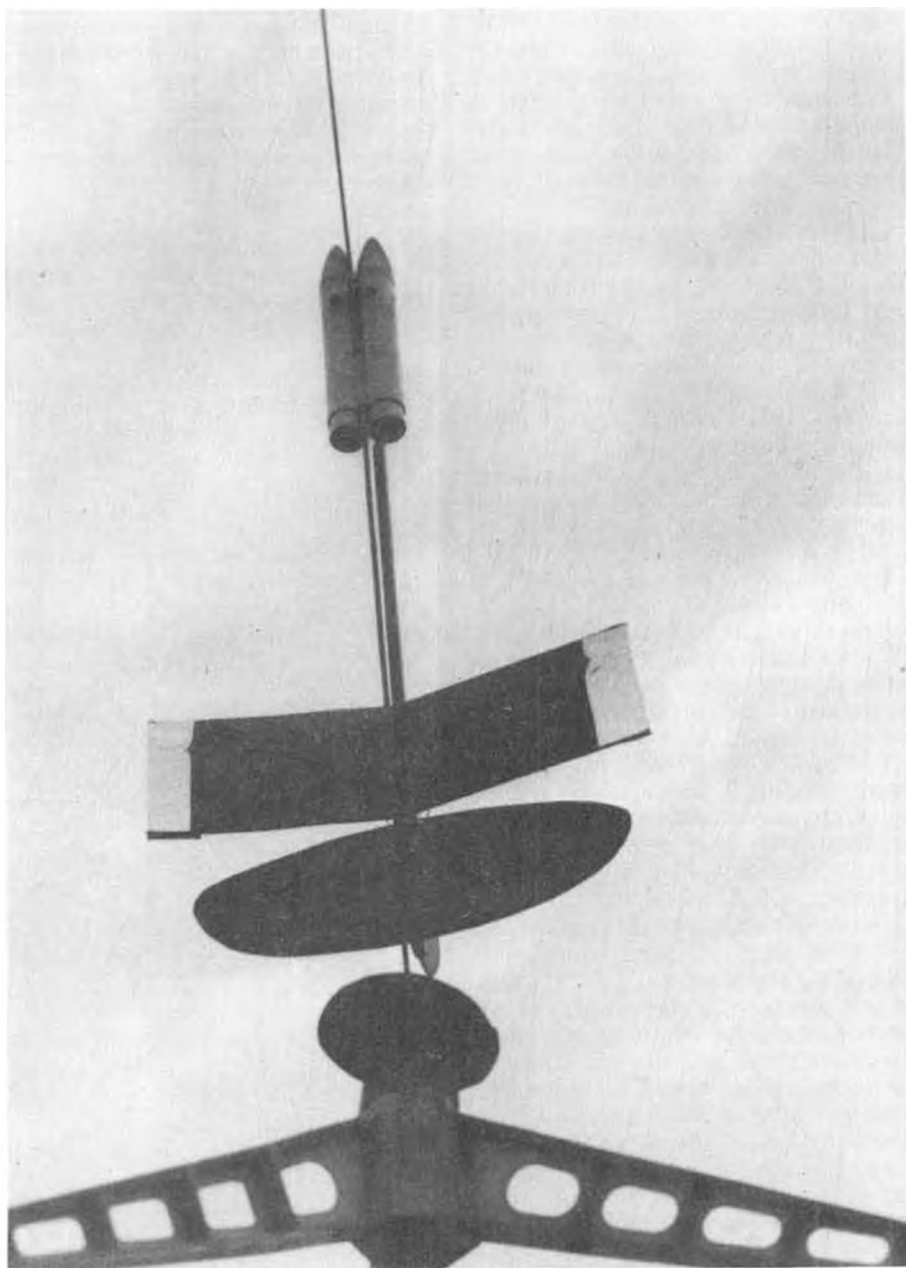
you can taper the stuff to a razor-sharp airfoil, and it'll even stay that way. Note that the fins are set one body diameter ahead of the tail end of the tube. Believe it or not, this helps.

Good Ol' CMR Egg Capsule (registered trademark) is employed to hide the egg. CMR Capsules come with a lanyard that is threaded through the base and knotted, to provide a place for the shock cord and parachute attachment. The interior recovery tackle is an important consideration in the avoidance of messy recoveries, and so deserves careful attention. Two alternate systems are, in my experience, the best. The first is to tie a strong line around the engine block before you glue it in, and attach shock cord, recovery device, et al, to this. This hookup eliminates the blasted shock cord mount that one usually glues to the inside surface of the tube, which

can catch and hold a parachute so strongly that the engine will pop out the back. Method No. 2 involves tying a tiny knot in one end of a length of strong thread and gluing it along the fin-body joint of one of the fins. Once covered with a fillet or two of five-minute epoxy, this forms an extremely strong mounting point for the recovery gear, with the blessed advantage that the inside of the tube is clear of any and all hindrances to chute ejection.

The advantage over Method No. 1 is that the heat of the seventeenth ejection charge won't burn through a string on the outside of the model.

Our second record-setter, courtesy of the Southern-Fried Mr. Lee, is the Shotgun Rebel, so-called "because of its double-barrelled pod." Apparently, Terry got the idea during a local "revenooer" hunt. Terry, never one to

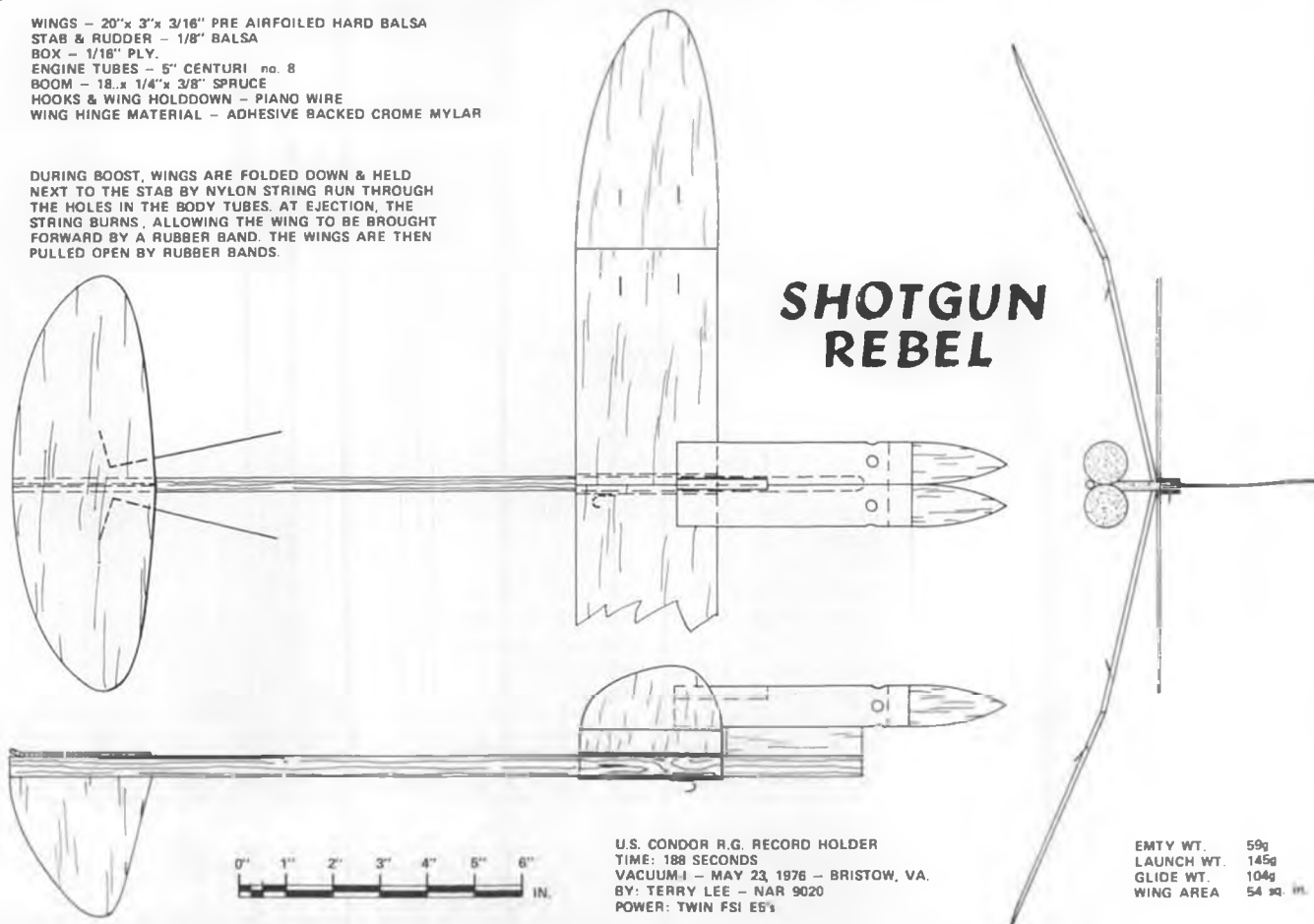


The "Shotgun Rebel" with wing slid back against the stab and outer panels folded, all ready for rocket launch. After 5-second power boost, ejection charge releases wing for glide phase.

WINGS - 20"x 3"x 3/16" PRE AIRFOILED HARD Balsa  
 STAB & RUDDER - 1/8" Balsa  
 BOX - 1/16" PLY.  
 ENGINE TUBES - 5" CENTURI no. 8  
 BOOM - 18"x 1/4"x 3/8" SPRUCE  
 HOOKS & WING HOLDDOWN - PIANO WIRE  
 WING HINGE MATERIAL - ADHESIVE BACKED CROME MYLAR

DURING BOOST, WINGS ARE FOLDED DOWN & HELD NEXT TO THE STAB BY NYLON STRING RUN THROUGH THE HOLES IN THE BODY TUBES. AT EJECTION, THE STRING BURNS, ALLOWING THE WING TO BE BROUGHT FORWARD BY A RUBBER BAND. THE WINGS ARE THEN PULLED OPEN BY RUBBER BANDS.

## SHOTGUN REBEL



U.S. CONDOIR R.G. RECORD HOLDER  
 TIME: 188 SECONDS  
 VACUUM-I - MAY 23, 1976 - BRISTOW, VA.  
 BY: TERRY LEE - NAR 9020  
 POWER: TWIN FSI E5's

EMPTY WT. 59g  
 LAUNCH WT. 145g  
 GLIDE WT. 104g  
 WING AREA 54 sq. in.

waste a newton-second, flew and lost four of these little gems with twin FSI E5-2 engines before getting one back (good old Return Rule!) and filing for his record. The Shotgun Rebel is a good example of the Flip-Flap-Klunk-Sproing school of glider design; it is technically known as a Sliding Flop-Wing (no kidding). The wings hinge back during boost to reduce the chance of shredding, and the entire wing surface slides along the square boom on a plywood box built around the boom. At launch (see pic) the wings are back against the stab, and the outer panels are restrained by the wire hold-downs attached to the stab. The wing assembly is held in position with a loop of nylon string, which feeds through those holes in front of the engines. The E5's thrust for five seconds, and this bird has a reputation for a good, straight boost. At ejection, the ejection charges burn through the nylon thread, the wing slides forward against a stop, the panels hinge outward, and Nature takes its course.

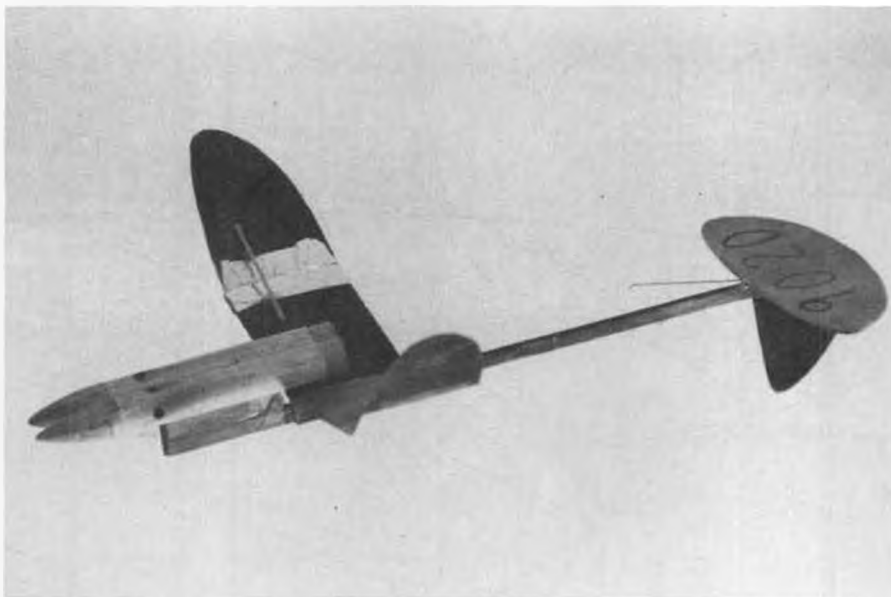
The glider is based around a Thermic B kit. Terry suggests using loops of piano wire to attach the bands to the wing panels. Adhesive mylar is dandy for the wing hinges, and Super Monokote works well, too. Terry notes that the FSI E5 engines have been officially re-rated as D engines, which opens up the possibility of a triple-

barrel Shotgun (shudder!).

Terry sends word that MARS XII was postponed for lack of insurance. I spoke to this point last issue, and here is more sad evidence. MARS, held for the last twelve years at the same site, has, of course, never had an accident, yet the site owners insist on insurance. Sure looks good, doesn't it, when you lose an insurance policy for no good reason? We will now have a moment

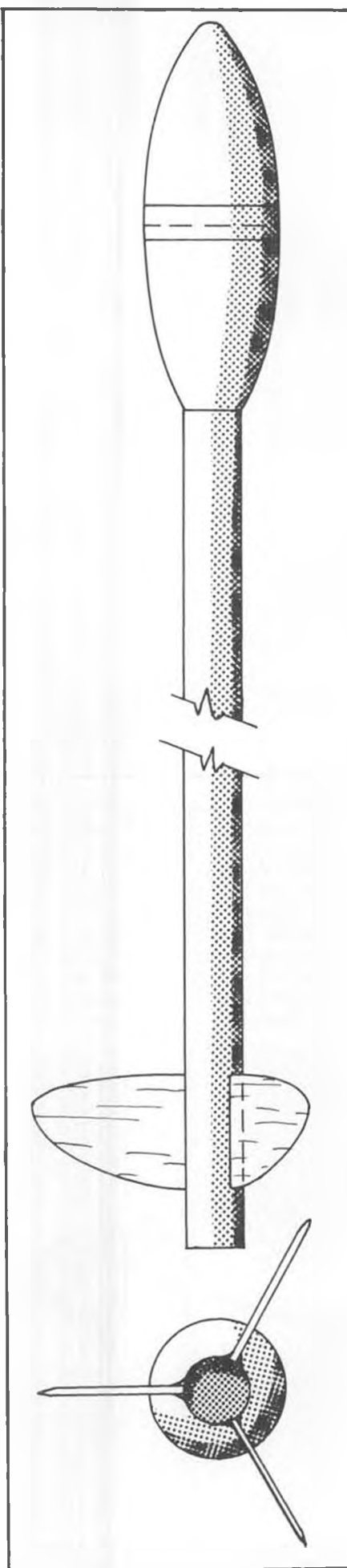
of silence for sputtering and fuming.

The latest issue of the Model Rocketeer, which is back in the capable (understatement) hands of G. Harry Stine, reports that insurance will soon be available to sections, and that there is a good chance that next year's AMA policy can include a NAR rider. Pray for us all. It cost us \$200 to insure NARAM-19, which contributed handily to the meet going into the red.



With wing panels unfolded and in glide position, the Shotgun Rebel looks more like a glider, though somewhat lumpy. Best official flight is 3 minutes, 8 seconds . . . so it does work.





Oh, yeah. Addresses of manufacturers mentioned in Terry's plans are:  
Centuri Engineering, P.O. Box 1988, Phoenix, AZ 85001.

Competition Model Rockets, Box 7022, Alexandria, VA 22307.

Estes Industries, Penrose, CO 81240.

Flight Systems, Inc., 9300 E. 68, Raytown, MO 64133.

AVI Astroport, Mineral Point, WI 53565.

Not really a manufacturer, but send money to them anyway: NAR HQ, Box 725, New Providence, NJ 07974.

Lessee, what else is new? Centuri's new catalog is out, mailed wrapped in a copy of the "Rocket Times." The centerspread is Star Wars pix with appropriate captions (Han Solo at the controls of the Millennium Falcon: "Where is that safety key?"). Also highlighted is their new Club Assortment Programs, calculated to save mucho dinero for educational groups who need a kit for each student and want to buy in bulk. In the RT tradition, there are plugs for NAR activities, and even a reiteration of the NAR discount on **Model Builder** subscriptions (thanks, guys). Of note is the slicked-up-and-expanded Centuri Aerospace Team, with pictures of some of the members in compromising positions (Alan Williams weighing-in a contest model, for example). And over to one side there are a couple of pictures and a description of the Cruise Missile. You wouldn't be thinking of releasing a kit of that little beauty, would you, guys? Wouldn't a series of air-to-air scale birds a la your Fighter Fleet be lovely? Hint, hint?

Estes, lord and master of most of the market, is pounding out some Star

**SPRINT D-5 . . National Record Holder Pigeon Eggloft . . 621 meters, NARAM-18, August 3, 1976, Allentown College, Center Valley, Pa.**

Power: AVI D6.1-6.75 Tower Launched

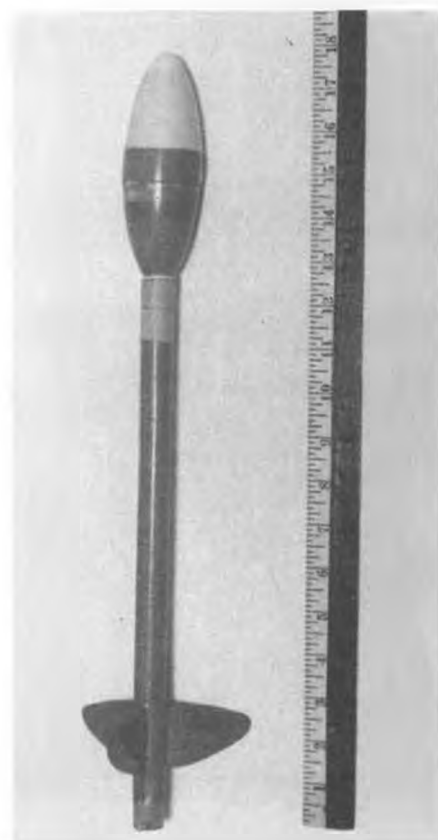
Parts: 12" BT-20 Estes, three 3/32" sprint fins Estes No. 32224, Egg Capsule CMR ENC-77 with RB-74 shoulder.

Set fins one caliber ahead of rear of body tube.

Add fillets of 5-minute epoxy.

Empty Wt: (No engine or egg) - 27.5 gr.

Launch Wt: 125.7 gr.



The Sprint D-5 pigeon eggloft, by Terry Lee. See text for more construction information.

Wars products. The only one I have definite word on is a Starter Kit, to be out for Christmas giving. There are rumblings of scale X-Wing and Tie Fighter kits. Hot damn. I guess this is what comes of the fact that Dane Boles, Estes VP, was christened "R2-D12" at NARAM. Chirp, tweet.

In the future, I'll be running something interesting. In view of the proliferation of microcomputers in the U.S., it seems about high time that someone worked out ways of using computers to do things with model rockets. The work has been done, mostly by spacemodelers who had access to college computers during their ivy-covered sojourns. I was one of them, and I'm searching for the FORTRAN programs that I had worked out for things like estimating altitude, optimizing design, and calculating center of pressure. Some rather classical work was done by Charlie Andres at Cornell, and I'm trying to get copies of that too. The next step is to convert the FORTRAN into BASIC, which is by far the most widely-used microcomputer language. This shouldn't take too long, since I just bought a microcomputer (subtle brag). So start making friends with someone who owns a micro, and if you have or hear of any model-related computer work, please let me know. For now, I have to get back to my usual activities, which include slitting shock cords and flattening out Braille.



A stock 2T-1A Trainer with low pressure tires and wheels. Most Great Lakes were powered by one of three versions of the American Cirrus engine, 90 to 100 hp. Exhausts on this airplane were flexible tubing, bent and flattened at the ends. Photo from John Underwood collection.

# Great Lakes Trainer 2T-1A

By PETER WESTBURG

## PART TWO

- The Great Lakes Trainer shown in the plans was originally purchased by Cedric Galloway in 1934 (see his C.G.



Right side view of above ship. Great Lakes was compact aircraft, with no wasted space in the fuselage. Handgrip under tail was a formed cup around the longeron. Underwood photo.



NC818K at the 1932 National Air Races. Racing mods included long windshield, covered front cockpit, and wheel pants. Many companies located on the Delaware-Maryland-Virginia peninsula used Del-Mar-Va name. Wonder where this one was located?

UNDERWOOD PHOTO





*Enterprises ad in the last issue. wcn*); he put 150 hours on it and earned his Limited Commercial license before selling it to Clem Wittenbeck, April 25, 1936. While owned by Galloway, NC-856K was finished in cream and international orange, but Wittenbeck finished it in black and white and flew it in many airshows, doing inverted passes over the field and outside loops.

Space does not permit listing all the achievements of the Trainer. In August of 1929, Tex Rankin flew a Great Lakes with an extra fuel tank in the front cockpit, 1350 miles nonstop from Vancouver, Canada, to Agua Caliente, Mexico, on 75 gallons of gas (\$22.50 worth in those days) in 13 hours and 7 minutes. In the same airplane, he established a record of 19 consecutive outside loops. Several other records were set or broken in 1929 and during the following two years, but the clutching hand of the Great Depression caught GLAC up in its grip, and though the price of the airplane was cut several times to a low of \$2985 in 1931, the market for the marvelous little biplane disappeared. The company finally succumbed in 1936 after manufacturing approximately 450 units. Some of the Trainers are still around, having been lovingly restored by aerobuffs; but even more remarkably, there is a factory in Wichita, Kansas, devoted to keeping the memory of the airplane alive. The new Great Lakes Trainer is now powered by the ubiquitous Lycoming opposed engine. The price? Approximately ten times the original cost! ●



UNDERWOOD PHOTO

Great Lakes designer, Charlie Meyers, with inverted Cirrus powered 2T-1E. Placed 3rd in 1930 Cirrus Derby. Stock single seaters had no upper wing center section cut-out at trailing edge.



NICK KARSTENS PHOTO

"Cowboy aviator" Roman Warren entering front cockpit. Cowling between pits was hinged for easier access. Photo taken at Riverside Airport, near what is now Flabob Airport, California.



UNDERWOOD PHOTO

This GLT was equipped with navigation lights. NC848K was 110th aircraft built. Note the Szekely powered Buhl "Bull Pup" in the background. Also note the jodhpurs and boots-clad figure under the GLT's nose. This was the typical "daring young aviator" togs of the day.



Phil Kraft and a helper bring a wingtip of the Fournier into position. Note shaded portion of canopy.



Fournier powered glider belonging to Phil Kraft. Note single main wheel and stabilizing wheel and strut near fold in wing.

# R/C SOARING

by Dr. LARRY FOGEL.

PHOTOS BY AUTHOR

• Hopefully, we learn from our mistakes . . . and sometimes even from those of others. Let me confess. I was about to launch my Raven off the cliff at Torrey Pines. . . You know, that fine thermal flying wing designed by Dave Jones, of Los Angeles.

Long ago I learned the good habit of moving the control stick before

launch . . . just to make sure that everything's turned on and operating. I did just that, and it was. So I threw the craft out in level flight . . . only to realize that I had no control.

Then it dawned on me. I had changed the airborne pack from violet-and-white to brown-and-white. With the transmitter so close to the receiver, you have apparent positive control, but a few feet out you have . . . nothing.

I quickly shouted for any brown-and-white transmitter, but none was available. I watched helplessly as the sailplane porpoised in fitful loops, due to the last "up" instruction it had received at the launch. That was a lucky break. Most of the time, the Raven was flying near to level flight. As the attitude became severe, it would flip or sharply drop its nose, then quickly pull out. The rudder was in neutral and so the plane performed this dance while the wind pressed it back toward me. Soon it was overhead and de-

scending. It impacted the ground in level attitude . . . and *without a scratch*. What luck! I should have gone to Vegas instead of the cliff. From now on I label each bird with the frequency it contains. Do you?

Let me reflect on other things that might avoid trouble for the newcomer to our sport. It's well to use an expanded scale voltmeter to check the charge level of your airborne pack before you fly. If you don't have one available, at least watch for any sluggish control response or a change of trim which might testify to your need for recharge (or replacement of those dry cells).

If you find that you're flying with increasing trim away from neutral, you might also check your hinges. They could be slipping out a bit. This can introduce a significant bias in the control surface, and thus the need for trim compensation.

You may experience jitter in the servos when operating near neutral



Jay Horowitz and Larry Fogel (in shirt) soar in desert thermals near Palm Springs, from hi-start launch. Sure looks like hard work!



View of left wing of Fournier from rear cockpit, at 3,000 feet. Sure hope that pin is locked!



Instrument panel of Fournier powered glider, for the benefit of scale nuts.



The inboard releasable tow hook, by Rocket City Industries.



The author's Raven, 300 feet over the Pacific, at Torrey Pines.



Lloyd Standley and his Beaver, built from Pilot kit.



Can you imagine a mouse controlling a beaver? The cockpit of Standley's glider.



The Beaver performs some aerobatics for spectators in a boat off Torrey Pines, California.

position. That may be a sign of dirty pots or excessive wear in the receiver or transmitter . . . a condition worth checking, *now*. It's also worth checking your controls to make sure you don't have a significant "double-neutral." Let the control stick center from one direction and note the position of the control surface. Then do the same from the opposite direction.

If the two final positions of the control surface differ, you have a double neutral . . . and precision flying becomes difficult. The greater the difference between the neutrals, the greater the difficulty. What to do? Check for sticky friction or slop in your control system. Move the control surface and see if the servo arm moves accordingly . . . and without play. Check that the hole in the servo arm (for the clevis or control wire) is not of excessive diameter. Lastly, have a serviceman check the cleanliness of the pot inside your servo. Here a little cleanup can go a long way.

Another new contest idea, this one due to Ed Hoppe. Last Sunday, 24 pilots met at Mira Mesa to try a Sailplane Bomb Drop Contest. The CD provided numbered bombs to each contestant, these being soft paper sacks filled with flour, with a beer can lid ring for affixing the bomb to your sailplane. You were scored on duration (up to seven minutes) and your ability to drop the bomb within the

usual landing circles.

There were many Rube Goldberg bomb-drop arrangements. Some pilots simply tried holding the bomb on the towhook before the winch ring, then making a smooth slideoff at altitude. I dreamed up a simple idea of tying a thin thread through the bomb ring, which then goes forward through an eyelet and back to the winch ring. In this way, as the winch ring slips off, it pulls the bomb further onto the towhook until the thread breaks. I had neither the time nor the courage to try this idea.

Some dropped their bombs from high altitude, while others preferred to drop it during their final approach. There were a number of obstacles to dropping the bomb from a low altitude: a high wire fence, nearby tennis courts, and a baseball backstop. That made the final approach interesting, to say the least. Alex Mladeneo took first place, with Don Edberg coming in second. Everyone had a good time.

Recently, the Horowitz and Fogel families went to Palm Springs for a weekend. Out near Borrego Springs we found a small dry wash in the desert. What could be more appropriate for the hi-start and some flying? Soon the planes were way up there among a few wispy clouds and scattered turbulence. We stretched out on the sand and flew for an extended

*Continued on page 82*



Flour bombing release set-up on Bob Peck's Windfree. Uses extra servo.



Flour bomb after impact with ground. Number tag identifies bomber for scoring.





Older Atlas Van Lines boat used wing to advantage in Unlimited competition.

# R/C POWER BOATS

By BOB PREUSSE

• The 100 mph barrier is not the far-fetched idea it was five years ago. Combine the sleek outrigger designs of today with the new high performance engines from K&B, Super Tigre, and OPS, and you have a mean machine capable of 70 mph. Next, you apply speed secrets from a John Ackerman workshop, and you have a boat capable of speeds in the high 80's. A safe bet is that the 100 mph barrier is only 3 or 4 years away. (Only time will tell.)

As speeds increase, environmental conditions, such as wind, chop, humidity, temperature, and barometric pressure, have a magnified effect on the running attitude of a hull design and engine performance. Small changes in any of these factors can have a big effect on a boat's performance. Could a properly designed wing using sound airfoil principles improve a hull design so that it could withstand higher speeds? Maybe allowing for a condition such as wind can be used as an advantage. We

know various amounts of wind and chop can help all hulls; however, maybe we do not maximize their use. The top-name unlimited hydros, like Pay 'n Pak, Atlas Van Lines, U-95, Miss U.S., and Sunny Jim, have all used wings to their advantage.



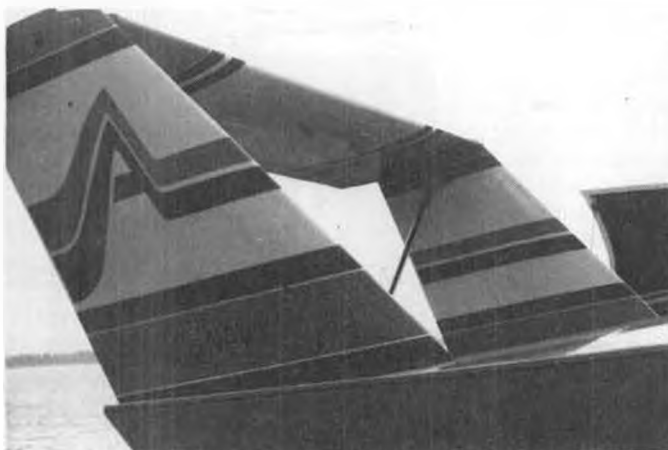
The author's Pay 'n Pak has adjustable wing. Du-Bro kwik links facilitate fine changes.

Bill Muncey's new Atlas Van Lines runs very smooth in all kinds of water conditions.

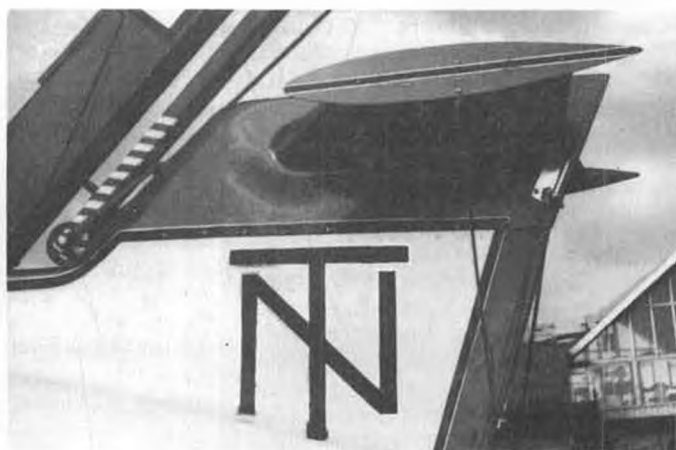
I have seen several model boaters use wings with varying degrees of success. Some, like John Bridge and Skip Horstman, have used operating wings powered by a third servo. This is great for changing conditions, or during heat racing where the wing is adjusted in the turns, the beginning of the straightaway, and the end of the straightaway. It's kind of like shifting gears through the course. Other boaters have used a fixed wing to give tail lift, which helps the boat stay on the water. Dumas Models' Atlas Van Lines and Pay 'n Pak kits have a fixed wing like the prototypes, which can be made adjustable.

How does a wing work? We can thank Mr. Bernoulli for that principle; as the air velocity increases, the pressure decreases; and as the velocity decreases, the pressure increases. Thus, the movements of air flowing

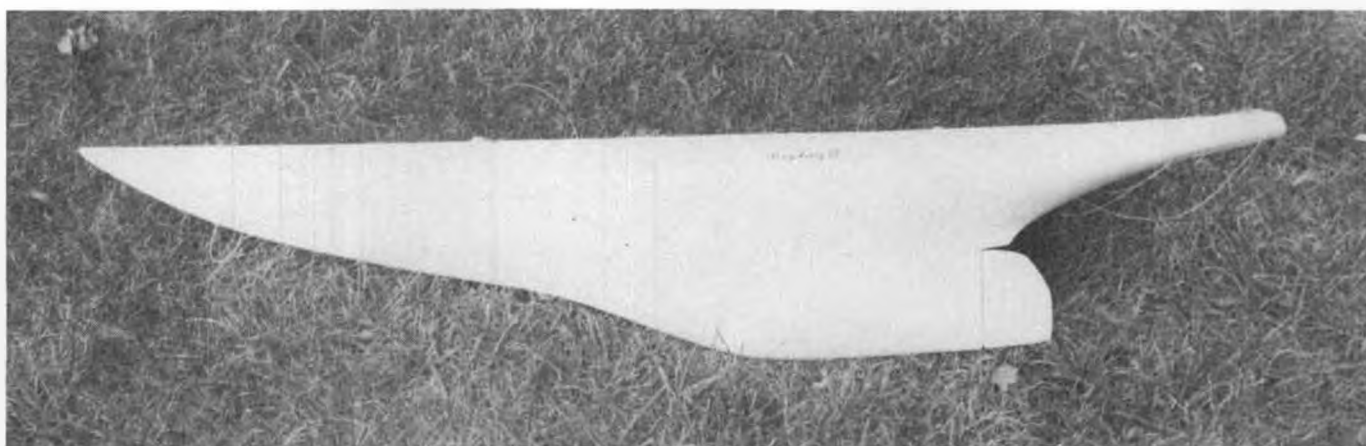
*Continued on page 88*



Bill Muncey's new Atlas Van Lines uses latest aerodynamic concepts.



Miss North Tool's wing is mounted on center fin, is an abbreviated design with wing tips.



Profile of 58 inch long East Coast 12-meter, now called Heritage 12-meter. This is Crump & Associates hull.

# STRICTLY SAIL

By ROD CARR

• Probably the question that I am most often faced with is, in essence, "Which boat should I buy?" If the questioner is already associated with an existing club, he is really asking for inside information on what is the latest 50/800 or hot new 36/600 that will win him some trophies. But more often, the query is posed by a potential skipper who has learned about model yachting, wants to sail some sort of a boat, and may not have yet considered the joys of racing. My answer is invariably to choose an established one-design class boat. Given that you do not live in an area which is continually lashed with gale force winds, I'd go one step further and specify an East Coast 12-Meter. The reason is straightforward. The EC/12 is a scale model with too little ballast and too much sail for its stability. As a result, the skipper is immediately signed up to do some heavy learn-

ing about just what forces control a model yacht. The EC/12 is not an easy boat to sail as the wind goes over 12-13 knots. The sailplan eagerly overpowers the rudder, and control of the boat passes from simple steering to active trimming of sails in order to balance the boat on the chosen course.

Why give a beginner a boat that is tough? Simple . . . if he starts in one of those lightweight, spade-rudder racing boats, he'll never develop the understanding required to make any sailboat perform at top efficiency. This is an established fact. Look at all the EC/12 skippers who have spread out into other classes and done well, and yet the EC/12 class is not invaded and swept away by a rank newcomer.

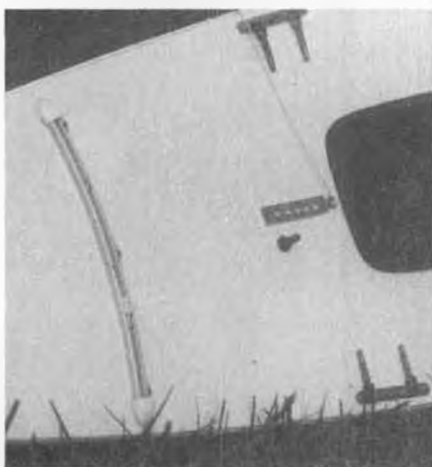
Such a barrier provides a good deal of protection to the novice skipper. By the time he has sailed for a couple of years, he is just that much ahead of people entering the class behind him. No new design is going to come along and put all his prac-

tice to naught. Every hour of experience with the boat makes him an hour craftier than the next fellow down the totem pole.

There are a few folks who compete in the class infrequently and do well. Rich Matt comes to mind as a good example. But Rich has done his homework, and he knows the importance of good sail shape and constant trimming. He applies his knowledge to any boat he sails, and no matter what the class, is always in the top finishers.

The East Coast 12 was born on the drawing board of Charlie Morgan. While designing an America's Cup boat for the 1967 defense, a towing tank model of a big 12 never built was put into the hands of Buddy Black, of Tampa, Florida. By 1970, EC/12's had become an established class within the new American Model Yachting Association. The class secretary at the time was this writer. While some evolutionary changes occurred in the hull form, by 1977, all manufacturers of the boat were adhering to a well controlled shape and sheer line. Skipper skill was, and still is, the controlling factor in vessel performance, with little difference, if any, seen between the new and old hulls. Also, in 1977, the boat's name was changed to HERITAGE 12-Meter, but I'm having

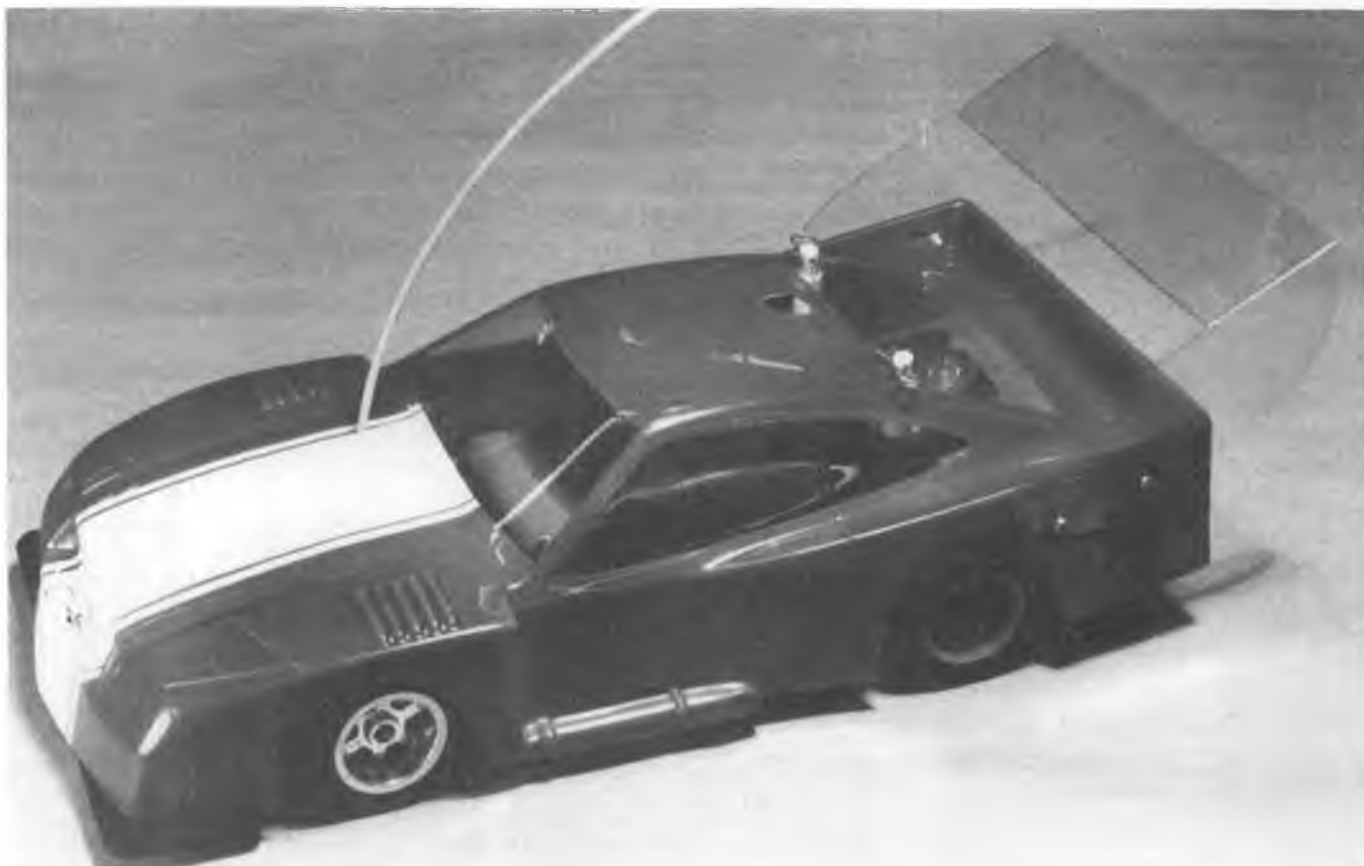
*Continued on page 98*



Jib traveler, 1/16 aluminum mast step, and waterproof R/C switch on the foredeck.



Author's EC . . . er . . . Heritage/12, "Foxy Lady III" had already won a club regatta on her first time out!!



Class A MRP car cloaked in a Cobra GT body. Wing is optional, and is a roll-your-own number.

PHOTOS BY AUTHOR

# BUILDING A 1/12 SCALE R/C CAR

## PART ONE

By DAN RUTHERFORD . . . The fascination of 1/12 scale R/C car racing has taken hold of our far-from-docile C/L Combat veteran. Dan passes on some of the tricks he has learned, which will improve performance.

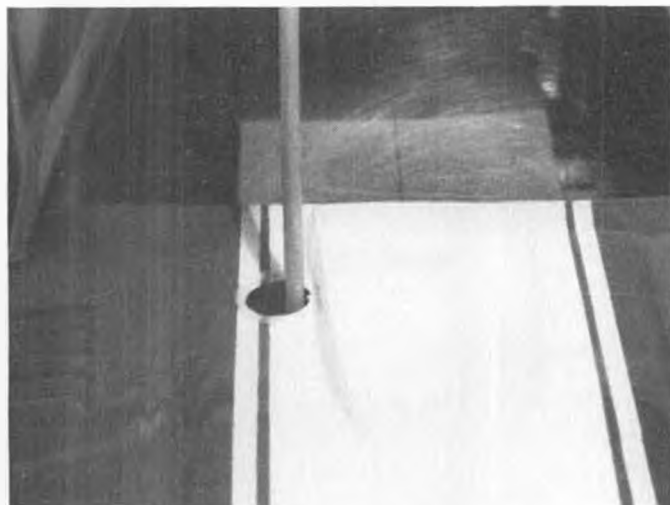
• As a newcomer to R/C car racing, I have been both an observer and a competitor. As my accomplishments as a competitor are so far not even worth discussing, we won't get it into that part of the story this time around. But in observing what happens at many R/C car races, even the ROAR

Nationals, I see the need for an article that describes in detail how one of the pros sets up his 1/12th car for get-serious competition.

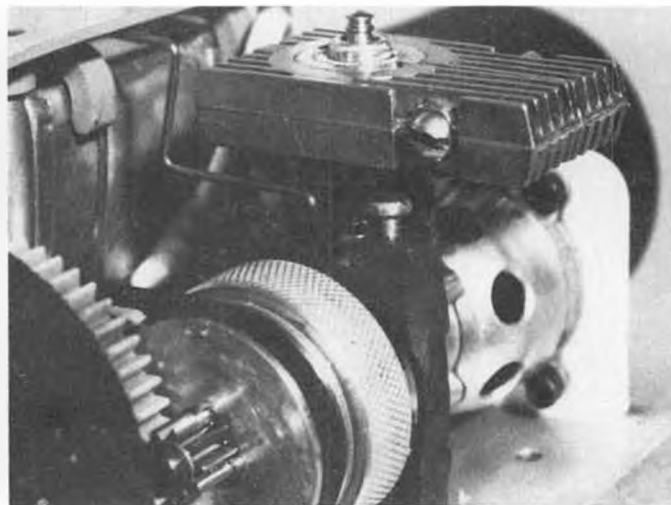
A surprise to many of you will be the fact that no secrets will be revealed in this article. The stock, production cars offered by JoMac with their Jero-

bee and MRP lines are competitive right out of the box. What will be revealed in this article are a bunch of little detail set-up tricks that either aid handling, add to reliability, or in some other way help insure that you will finish every time you light off the line.

To write this article from my own



Hood area of Cobra GT body. Note large hole for antenna, a real time-saver during frantic pit stops.



Close-up shows No. 4 sheet metal scaw used as a throttle stop. Gears are 9-tooth pinion and 56-tooth main, a good all-around ratio.



limited R/C car experiences would be to blow a lot of smoke in your direction. So one day I showed up at JoMac with tape machine, camera, tripod, note pad and my Class A and B MRP cars. Didn't take very long to locate Bob Welch, who is not only a very good R/C car racer with *lots* of experience, but is also the designer of the MRP 1/8th and 1/12th scale R/C cars.

Bob agreed to help with this article by letting me in on exactly how he sets up his personal race cars, and we proceeded to almost completely disrupt MRP production for the day, plus putting the entire JoMac organization back about 40 person-hours.

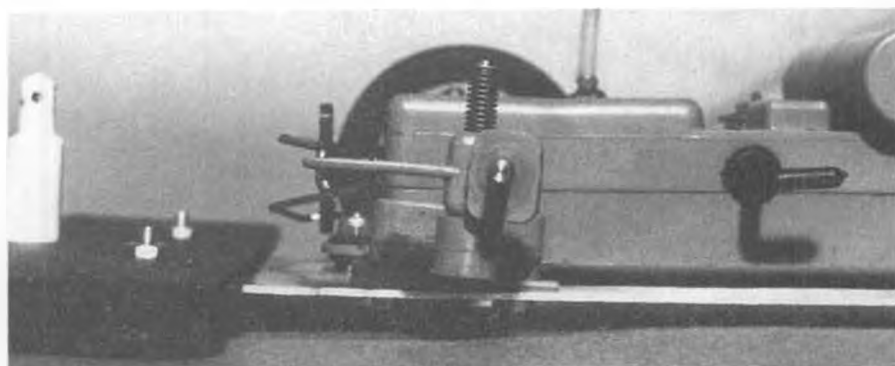
Although Bob and I discussed set-up of MRP cars, many of the things in this article also apply to Jerobee and other 1/12th scale cars. We could have used Jerobee units just as well, but my A and B cars are both MRP, so the choice was logical enough, don't you see?

Just like the girls down the street, it's what's up front that counts, so let's start there. For this area, where the guard rail is always a sheet-metal number that does not catch cars by the bumper, the bumper is left stock. On a track using a guard rail that can trap the bumper, it is bent up slightly at each forward, outside corner. *Everybody* smacks the rail at one time or another in a race. If the bumper gets trapped, you've got a real problem, but if it skips over the offending portion of the rail, you're still running, having lost just a little bit of time from your mistake.

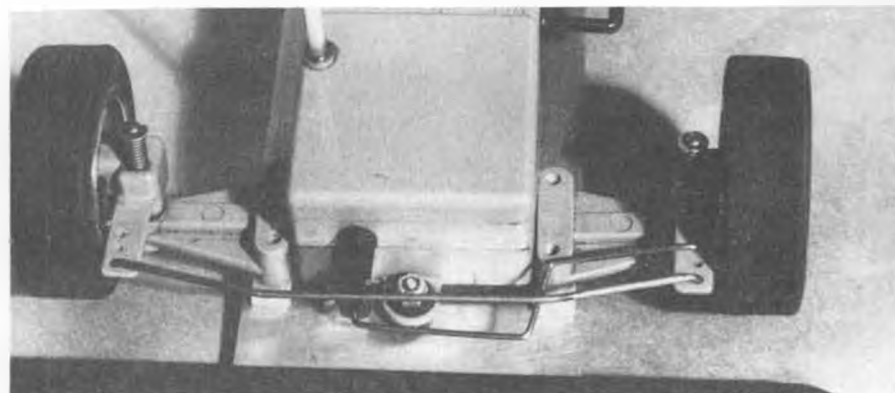
The bumper takes a lot of abuse, so Bob mounts his with two 4-40 socket-head bolts in place of the stock pan-head screws. The front body mount posts also get their share of punishment, and here, a No. 6 sheet metal screw, 1/2 inch long, is used in place of the No. 4 screws. This is especially important when using a body like the MRP Cobra Mustang, which uses a single body mount post up front.

When a Can-Am body is used, the two body mount posts are located at the bumper attach points. In this case, forget the socket head bolts and use the No. 6 sheet metal screws to do double duty in holding the bumper to the chassis and the body mount posts to the bumper.

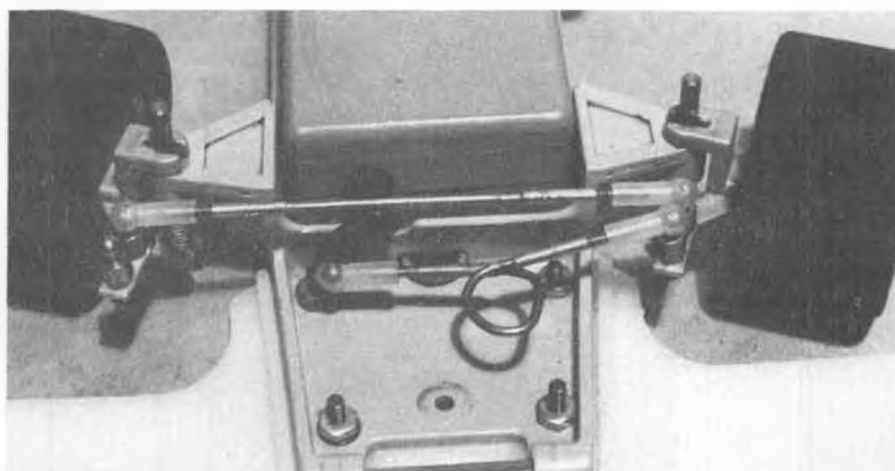
Last thing to do to the bumper is to file a notch in the exact center of it (be sure the bumper itself is centered on the chassis) at the forward-most point. This allows easy checking for any tweak in the chassis. Just stick a narrow-blade screwdriver in the notch and lift the front of the car up slightly. If the car is sitting on a *flat* surface, any tweak will be easy to see, as one of the tires will come off the board before the other. Bob and I are both



The kingpin has been raked back 5 degrees with the installation of Sterling thrust wedges. These give you exact measurement of rake. This really helps straight-line stability.



Front end of MRP car. Tie rod has extra bends to absorb road shock, protecting servo. Toe-in doesn't show in photo. Blue Line Hot Stuff around antenna tube base.



Jerobee electric R/C car front end, with Du-Bro ball links for steering linkage. Note shock-absorbing loop to protect servo. Wire also annealed to make it softer. Foam wheels OK on electrics.

aware of the fact that there are other more exotic ways of checking for tweak, but when you have 90 seconds until the start of your practice or heat race, this method works just fine.

The basic aluminum plate chassis is not cut or modified in any way. Minor tweaks in the plate are either twisted out or compensated for by varying the spring hardness/softness at each front wheel. Rarely a plate will be tweaked badly in a real terrible smack. In this case it is trashed, as it is almost impossible to permanently remove a bad wrinkle. Better to replace this piece than fight an evil handling car that cannot be tamed.

Although many racers use ball links (made by DuBro) and assorted nylon

clevises in their starting linkage, Bob uses the stock wire pieces supplied with the car. He does bend the tie-rod in the center, however. The rod is bent forward, which increases toe-in on these cars. In fact, you should always have some, never run with the wheels straight ahead. In addition to increasing toe-in, putting a bend in the tie-rod gives any excess side load applied to either wheel some place to go besides into the servo gear train or spindles.

Bob didn't mention it, but I have found that after a whole bunch of running, the link between the steering servo and the left spindle will have flexed itself enough times to finally

*Continued on page 83*



Phil Granderson, Jive Combat Team's main man, uses carbon fiber reinforced tail boom.



Jed Kusik's smile is result of narrowly winning 3rd spot on U.S. FAI TR Team for 1978.



Kill string from Dick Stubblefield's ship is all over Fox engine on Bob Burch's bird, '77 Nats.

## Control line

By "DIRTY DAN" RUTHERFORD  
PHOTOS BY AUTHOR UNLESS NOTED

• With this, the first column to appear in '78, and the promise (threat) of a few more thousand Dirty Words being sent your way in the months to come, it seems highly appropriate to start out on a positive note. So. . .

### NATIONAL CONTROL LINE SOCIETY

There has been lots of talk about forming a National Control Line Society, but very little has been done in the way of actually doing something. Talk is cheap and all of that. But George Mattei is not one to just talk. . . he is a guy who likes to do it, not just talk about it.

For your information here is a letter I just received from George.

"During the past year, a lot of people have called for the forming of a group to be known as the National Control Line Society. Many of the leaders of the special interest groups have expressed their support for a national association to unite all control line fliers into a combined group for the advancement of all control line fliers, special interest group members or not.

"'Dirty' Dan Rutherford gave some excellent reasons in his last column in *Model Builder* magazine. 'Doc' Jackson has been calling for a national group for

some time now, and has stated so in the *C/L Speed and Racing Gazette*. A meeting was called for at the '77 Nats this year, and to this date, nothing more has been said about it.

"The time has now come for someone to step forward and start the ball rolling towards the forming of such an organization. Each special interest group is being asked to select one of its members to represent their interests, and to forward the name and address of such member to me. I will then inform each member and a National Control Line Society will be a reality and not some more talk.

"A speedy selection and response to this letter by each special interest group is of the utmost importance; with speed, a national group can be formed and working early in 1978. Let us not neglect this opportunity to put an end to all the talk, and show the modeling world that control line fliers can unite into an organization to benefit all.

"Your immediate reply is awaited, George T. Mattei."

How about that? Sounds really good to me, and I hope that George will get the necessary backing from not only the special interest groups, but individual fliers as well. If you would like to contact George directly in regard to the NCLS, write to: George T. Mattei, 105 Franklin Road, Hamden, Connecticut 06517. If you have ideas for the NCLS, George will no doubt be glad to hear of them. Offers of help with NCLS would be super. And any donations to keep things moving. . . I mean for the right amount of money, we could probably not only help with NCLS, but make you a STAR in the world of toy airplanes!



Jim Houston, San Antonio, Texas, was bombardier on B-26, ser. 1388 in WW II. Model has retracts, flaps, OS Max .30's.



Living legend of combat circles, Howard Rush. He designed Nemesis II, a long time winner.

The forming of the NCLS is not something to be taken lightly, whether you are a go-for-it competition freak or a good ol' Sport Flier. The S.F. or G.S.F. (Glorified Sport Flier) can benefit from the additional promotion given to his favorite brand of flying in that more people will be involved in C/L flying, and his voice will be heard, through the NCLS, by the people in the AMA who determine AMA policy. Say "big deal" if you like, but surely you realize that the AMA keeps its ears open to only four groups of fliers. The R/C competition and Sport Fliers comprise the majority of AMA members, so these two groups grab the attention of the AMA. And rightfully so, of course. The F/F and C/L competition types are the other two groups the AMA listens to. Some will disagree with that, but when we look at hard numbers, the F/F and C/L competitors pull a lot of weight for their size. In my opinion, the people left out in the cold are the F/F and C/L Sport Fliers who simply enjoy flying their models and could care less about competition events, or at the most, would be interested in trying their hand at a low-key event of some kind, using the off-the-wall Sport Flying equipment.

You Sport Fliers out there may have been reading my rantings about abolishing the present Jr./Sr./Open age (skill?) classification system. Going to a Novice/Amateur/Expert system would definitely make it easier for you to enter competitive modeling. If you agree, who are you, as a group, going to tell about it? Nobody, because as of yet, you aren't even a group, you are a bunch of modelers riding along on the shirt-tails of the competition-oriented modelers, most of whom could care less about Sport Flying in the first place.

Even if you are not at all interested in competition flying, many of the AMA policies have both direct and indirect effects on you, and until there is a large group pushing your viewpoints, you probably won't be heard from.

All of you Sport Fliers carrying an AMA membership, just for the insurance protection, are aware of the fact that your membership fee gives you insurance carrying a \$250.00 deductible clause, aren't you? That's right. Do \$275.00 worth of damage with your normally very safe C/L plane, and the AMA's insurance company pays \$25.00, you pay \$250.00.

See, already I've given you something to complain about. It's obvious that operators of low-risk C/L planes are subsidizing the modelers flying R/C planes. In the past few months, there have been several very serious accidents involving R/C planes, and all are bound to be big-buck settlements.

Support NCLS and quite possibly you can help to change things. If you choose to hang by yourself . . . well, please do.

For the C.F. (Competition Freak) or G.C.F. (Glorified Competition Freak), the advantages to being a part of the NCLS are obvious and already a part of their thinking. So I probably don't have to go on a big sales pitch to these people, many of whom are already members of one or more of the existing special interest groups.

**WHAT DOES THE AMA DO FOR ME?**

That is a question all AMA members have probably asked themselves, at one time or another. The AMA likes to think it has several good answers to the question, and I personally have to agree with more than one of the

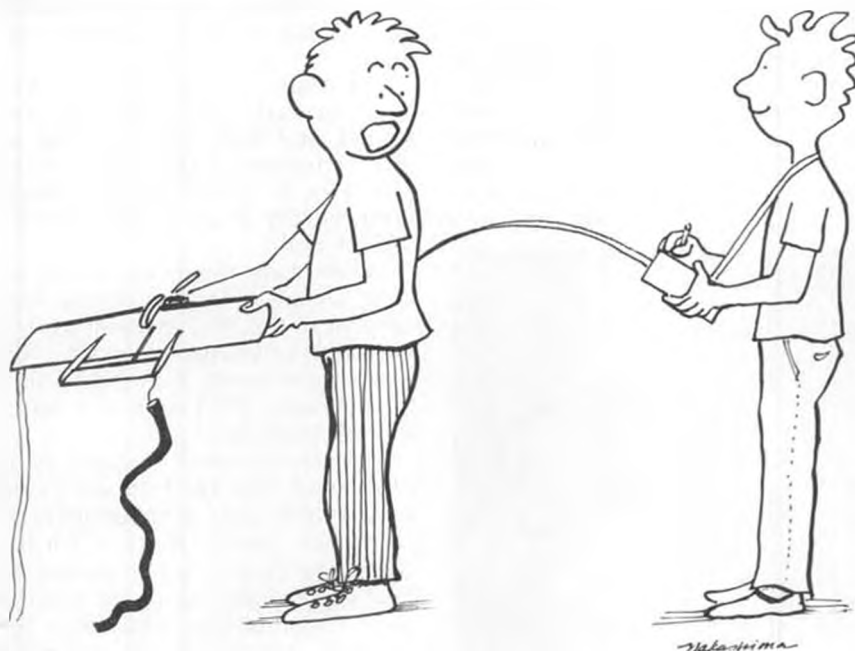


Les Pardue's '77 Nats team racer was only simple, "no gimmicks" racer at March AFB.

answers. But all of the interest in, and forming of, special interest groups, and now the NCLS, would seem to me to indicate the AMA is doing too much of the wrong thing, too little of the right thing, incapable of dealing with and catering to the many interests represented within the AMA.

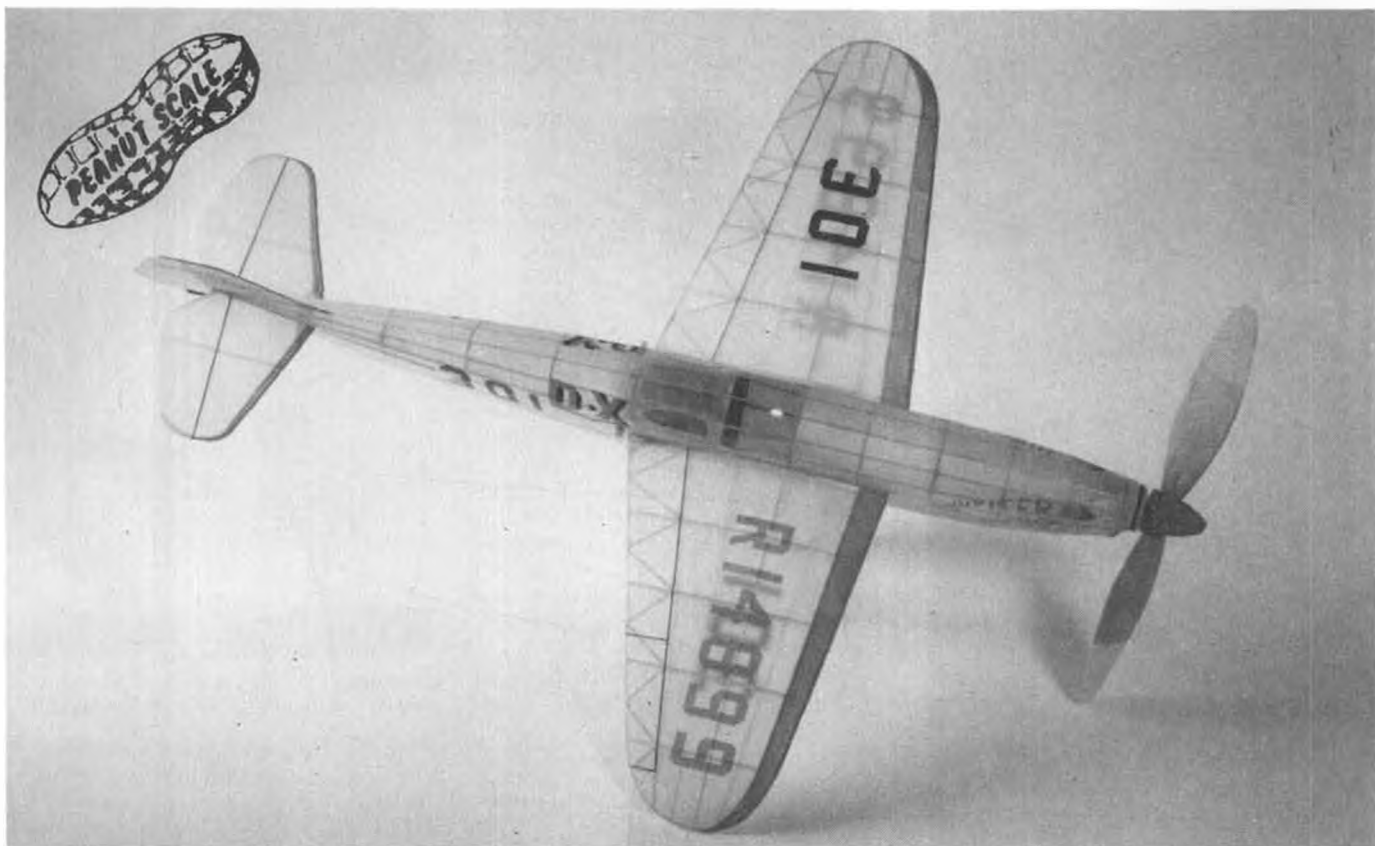
Now, I know for a fact that the butt of many criticisms, known as "The AMA", is interested. And for proof of that, just look at the minutes of Executive meetings, the tremendous amount of correspondence generated by John Worth, Johnny Clemens and the rest of the AMA officials. So we will assume

*Continued on page 89*



"Touche my foot! If you do that again, I'll sic 'Dirty Dan' and his cucumbers on ya!"





# FOLKERTS SK-3

By KURT ENKENHUS . . . Overall winner of MODEL BUILDER's 1977 Parcel Post Proxy Peanut contest, this has to be one of the best Peanut Scale models ever designed. Plans show "heavy" and "light" versions.

● Cleveland, Ohio, 1937 . . . the Thompson Trophy. With rumors of war already casting shadows over the Golden Age of aviation, they gathered here for a showdown to see who was the fastest in the world. While they all worshipped speed, a glance at the bulging cowls confirmed that most of them put their faith in brute force . . . eight hundred horsepower or more of radial engine. One man, Clayton Folkerts, an aeronautical genius, preferred to court

the Goddess of Flight. His SK-3 Speed King, the "Pride of Lemont", boasted only a 400 horsepower Menasco Super Buccaneer, but the slim, in-line 6 was so smoothly housed that it was the sleekest racer there.

The start . . . and the SK-3 trails next to last! Then the Goddess smiled, and Rudy Kling, passing one after another of the eight aircraft ahead of him, flashed to a photo-finish victory at an average speed of 256.91 mph.

What made this plane so remarkable? Details of the fascinating development of the SK-3, as well as Bjorn Karlstrom's three-views on which my plans were based, may be found in the February, 1973 issue of *American Aircraft Modeller*.

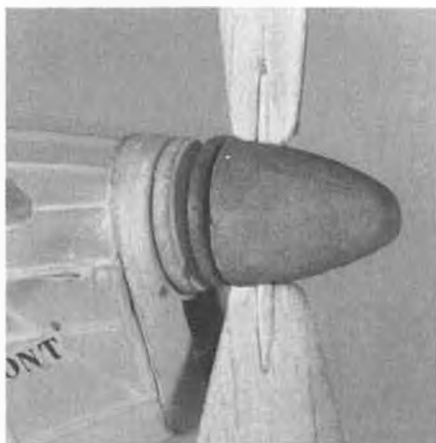
The aerodynamic features which enshrined the SK-3 in air racing history also give it superlative performance potential as a 13 inch wingspan Peanut scale model. The low aspect ratio wings of generous area, long fuselage, and clean lines result in a model of light wing loading, low drag, and excellent flight stability which packs plenty of rubber winds. My enthusiasm grew

when preliminary calculations suggested that two minute flights should be obtainable if the total weight could be kept to 2 pennies.

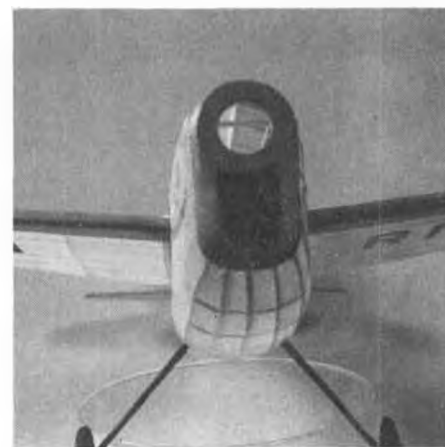
Before discussing the construction methods which permitted this weight goal to be attained, let's spend a little time analyzing the performance of an indoor rubber-powered model airplane.

## MODEL PERFORMANCE ANALYSIS... DESIGNING FOR PERFORMANCE

It's clear that the rubber motor



Thrust line adjusted by rotating nose button in block. Marks help locate best setting.



Super-light version has no bulkheads. Please don't squeeze da fuselage! Plans show both.



Biggest surprise to all the proxy fliers at the contest flyoff was the exceptionally slow flight speed of the Folkerts. The extremely light weight and slow RPM of the large, high pitched prop were obvious clues to its performance capability.

must supply the energy consumed in indoor cruising flight. The propulsive energy supplied is equal to the specific energy of the motor,  $e_r$ , in foot-pounds per pound of rubber, times the weight in pounds of rubber used,  $W_r$ , times the propeller efficiency,  $P_{eff}$ . The rate at which a model of drag  $D$  pounds flying at a speed  $V$  feet per second consumes energy, is  $DV$  foot pounds per second. The time it will fly before using up the available energy is therefore

$$t = \frac{e_r W_r P_{eff}}{DV} \text{ seconds.}$$

This formula is correct even when the model climbs and descends again, because the additional energy consumed in climbing against the force of gravity is regained during the descent. It tells us that to obtain long flights, we need lots of energetic rubber and a high propeller efficiency, coupled with low drag and flight speed. As we shall see, the drag is directly proportional to the weight of the model, and the flight speed increases as the square root of the weight, so building a light model is an essential prerequisite to high performance. Let's proceed with the SK-3 design calculations!

The drag is equal to the total weight of the model,  $W$ , divided by the lift-to-drag ratio,  $L/D$ :

$$D = \frac{W}{(L/D)}$$

By gliding the model (This test was done with the outdoor model, which was built first.  $L/D$  does not depend on model weight, but only on the configuration.) when balanced but without the propeller, the lift-to-drag ratio was found to be  $L/D = 3.5$ . In such a test,  $L/D$  is equal to the ratio of the horizontal distance flown to the vertical descent. From

some calculations and past experience, I believed I could keep the total weight to 2 pennies, or, since there are about 143 pennies in a pound, to  $W = .014$  pounds. The drag is therefore

$$D = .014/3.5 = .004 \text{ pounds.}$$

The flight speed is given by the aerodynamic formula

$$V = \sqrt{\frac{2W}{\rho .0023 A C_L}}$$

in which  $A$  is the wing area = 0.25 square feet for the SK-3, and  $C_L$  is the airplane lift coefficient. I estimated that, for the particular value of wing aspect ratio of the SK-3,  $C_L = 0.6$  when trimmed near stall. We can now find the flight speed:

$$V = \sqrt{\frac{2 \times .014}{.0023 \times .25 \times .6}} = 9.0 \text{ feet per second, or } 6.1 \text{ mph} \dots \text{ a fast walk.}$$

The propeller efficiency can be calculated from the following formula, which is based on data from full scale tests:

$$P_{eff} = \frac{0.85}{1 + \frac{6 \times 2.5}{2 \times 3.5 \times 2.3}}$$

$$P_{eff} = \frac{1 + C_L A}{2 (L/D) A_{prop}}$$

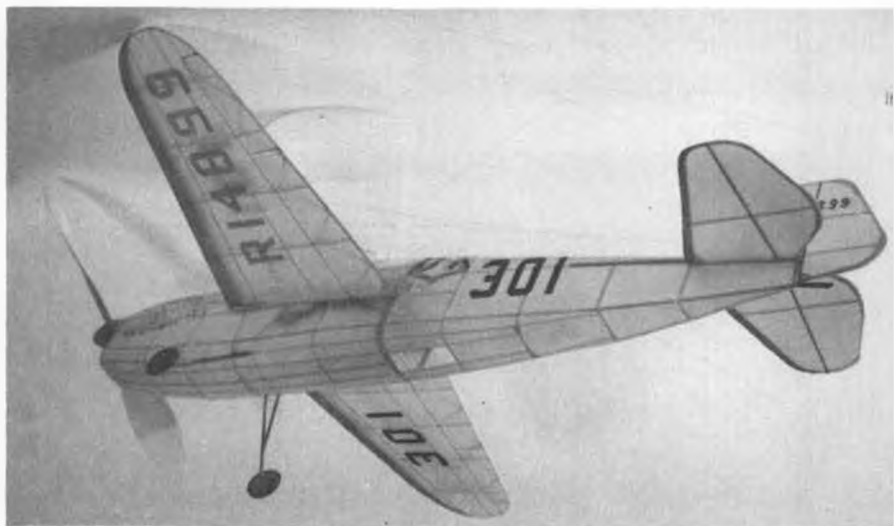
where  $A_{prop}$  is the area of a circle with the diameter of the propeller. Since the formula, in fact, indicates that propeller efficiency goes up with increasing propeller size, I picked a 6.5 inch (0.54 foot) propeller for the SK-3, for which  $A_{prop} = 0.23$  square feet. We now find the propeller efficiency to be

$$P_{eff} = \frac{.85}{1 + \frac{6 \times 2.5}{2 \times 3.5 \times 2.3}} = 0.78.$$

Next, I determined the specific energy,  $e_r$ , of the rubber I had in mind through experiments using a homemade torque meter. The average of three tests gave

$e_r = 2160$  foot-pounds per pound. A reason for doing several tests in succession is that the rubber tends to fatigue, and a single test gives too optimistic a value.

The final design problem was to



Underside photo reveals access opening for hooking up rubber, which is attached to dowel just aft of wing's trailing edge. Running motor to rear of fuselage would have caused balance prob.





determine the size, number of strands, and length of the rubber motor required. A key question is how thick the motor must be to provide enough torque to produce climb early in the flight, without exceeding that needed for cruising flight later. The required torque,  $T$ , in foot-pounds, is

$$T = \frac{PD}{2\pi}$$

where  $P$  is the propeller pitch in feet and  $D$  is the drag in pounds. For a 6-1/2 inch diameter propeller, the largest reasonable pitch, and the value  $l$  selected, was 13 inches (1.08 feet). The required torque is then

$$T = \frac{1.08 \times .004}{2 \times 3.14} = .00069 \text{ foot-pounds}$$

Using my torque meter to wind some sample motors, I found that 4 strands of .050 rubber gave an average torque of .0011 foot-pounds, nearly twice too much. Four strands of the next smaller size (.040) gave .0006 as an average value, but twice as much when nearly fully wound, which was just what I was looking for . . . I hoped! Flight trials are the final verdict. The most rubber I felt could be used was a 15 inch long motor weighing 0.35 pennies, or  $W_r = .00245$  pounds, with the motor peg located just behind the wing trailing edge in order not to have to add any weight to the nose to maintain balance. When added to the structural weight of 1.60 pennies, this brought the flying weight to 1.95 pennies, or  $W = .0136$  pounds. This is slightly less than the 2 pennies weight assumed previously in calculating drag and flight velocity; the corrected values are  $D = .0039$  pounds and  $V = 8.9$  feet per second.

The predicted endurance from the first formula is now found to be  $t = 2160 \times .00245 \times .78 = 119$  seconds

$$.0039 \times 8.9$$

or 1 minute 59 seconds. A best flight of 2 minutes, 3 seconds was obtained by my proxy flyer, Walt Mooney, in the contest.

To complete the analysis, a calculation has to be made to see if the motor can provide the required number of propeller revolutions. The distance flown is:

$s = Vt = 8.9 \times 119 = 1059$  feet, or 5 laps of a 67 foot diameter circle. The number of motor turns required is therefore

$N = s/P = 1059/1.08 = 981$ , or 62 winds with the usual 16:1 ratio winder. The motor used could take more than this, leaving a little more torque left near the end of the flight, which was desirable.

Let me emphasize that the present model does not represent an optimum design. It can be shown from



The 1977 Grand Peanut Folkerts SK-3 among some of its competitors during static judging. It rated third in scale behind the two Jungmanns of Krekovich and Strange, Mooney plans.

the formula for endurance that maximum flight time is obtained when the rubber weight is twice that of the structure. However, 92% of the maximum is obtained when the two are equal. For the SK-3 model, the "motor efficiency", as I call it, is only 42%. By using a gearbox to match the high torque of the rubber to the relatively low torque needed for cruising flight, much longer flight times are possible. However, such a model is heavier, flies faster (but, due to the large increase in  $W_r$ , longer) and, unless exceptionally

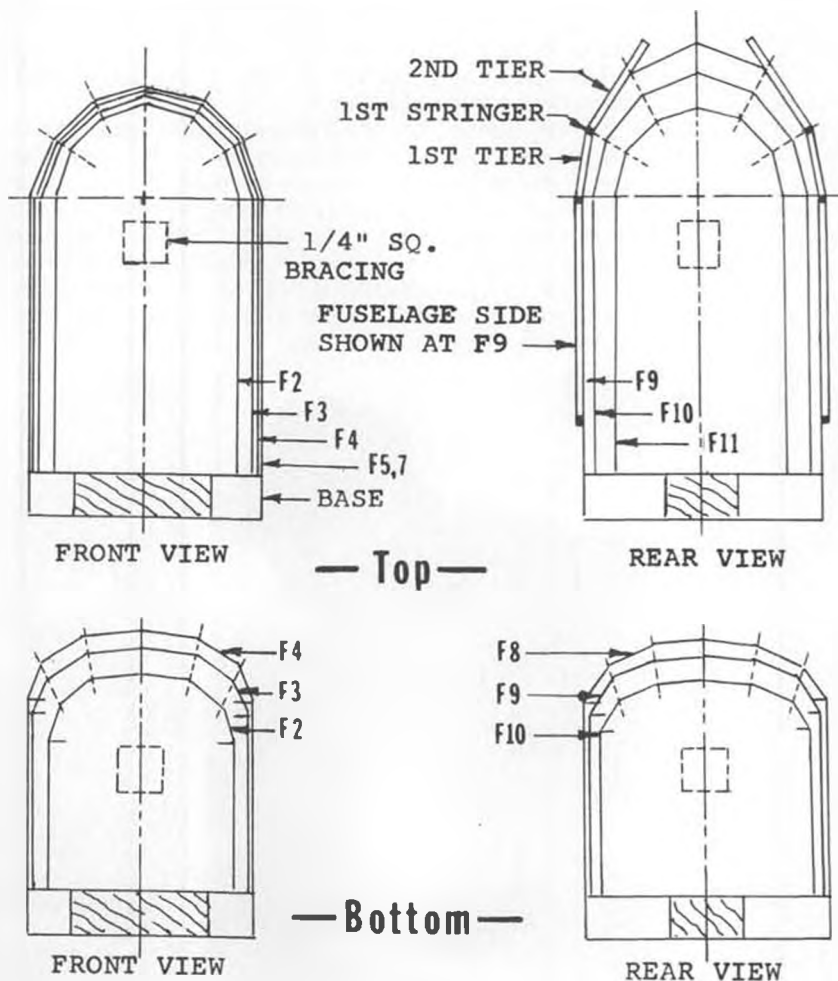
stable, is likely to hit the wall long before the "race" is over, just like some Indianapolis machinery we have read about.

#### CONSTRUCTION

We have seen that there are many factors which promote high model airplane performance, but certainly one of the most important is keeping weight down.

How light is light? The ultimate is the indoor microfilm model, which can fly up to nearly an hour. In Peanut Scale, we can borrow the

*Continued on page 92*



These dummy formers are used in construction of the super-light "eggshell" fuselage, as described in the text. A full size reproduction of these is included with the full size plans package.



Bill Stroman preps his CO<sub>2</sub> Stinson Reliant.



Joe Bailey and his Skyfarer. All photos taken at Flightmasters' Annual, Mile Square Park.



Bill Warner and pigeon-tailed Bleriot, powered by Telco CO<sub>2</sub>.

## FREE FLIGHT SCALE

By FERNANDO RAMOS

• The Flightmasters held their 28th Annual Scale contest at Mile Square Park. As usual, the static judging was done the evening before in the multipurpose room of Trident Jr. High School, in Anaheim. There were 60 F/F scale models entered in the various events; such as rubber, peanut, CO<sub>2</sub>, and electric. Unfortunately, there was only one entry in gas. The quality of the models keeps getting better and better, and the overall competition in static is getting real tough. As to be expected, the most entries were in the rubber events, with almost an equal distribution between rubber and peanut. The next most numerous event was CO<sub>2</sub>, followed by electric. As for gas, it was very disappointing to see only one model in my favorite scale

event. I wish I could say that it was mine, but it wasn't.

We had a whole battery of qualified judges who have done this chore over the years. While the judging was taking place, there were films and slides presented to us by Bill Noonan and Bill Hannan, which entertained the contestants. This whole process started at 7:30 p.m. and ended at 11 p.m.

The flying promptly began at 8 a.m. on Sunday morning. The day started out with an overcast sky, but cleared up, with no winds to hamper the flying. The several hundred spectators were well entertained with the exceptional flying of all of the various models. It is amazing how the state of the art has improved to the point

where almost any design will fly and fly well. Take the Davis DA-2 (home-built design), as an example. There were two of these entered; one by Clarence Mather, and the other by Jack Leuken. Clarence's DA-2 had a flight of nearly eight minutes, while Jack's put in a high time of 1 minute 58 seconds! If you are not familiar with the Davis, it is a low wing, V-tailed design, with a very low aspect ratio. A few years ago, no one would even look at this subject for a model. I might add that Ken Hannan had a Farman Moustique which turned in a high time of 4 minutes, 41 seconds. It hasn't been so long ago that a high time with a Peanut was in the 30 second bracket.

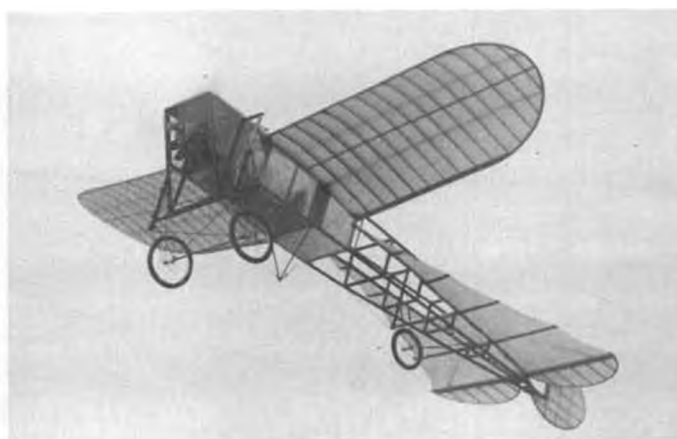
Rubber scale has seen tremendous



Just so we'll know what a real, eastern style, free flight scale CD looks like, Dick Benjamin, Rehoboth, Mass., sends us these photos of Bob Thompson during the recent Fall meet of the Connecticut Flying Aces.



Stroman's rubber powered Taube passes overhead.



Bill Warner's CO<sub>2</sub> powered Bleriot in flight.

growth in spite of the rules which presently govern it. Seems as though many scale clubs use their own rules rather than following the AMA rule book. There is more diversity in design than ever before, and it appears that the average size for a rubber scale model is around 24-30 inches in span. One notable exception to this over the last couple of years has been the designs of Bill Noonan. Bill has competed in rubber scale with jumbo size models. These have had a wealth of detail and fly extremely well. This year, Bill built a jumbo DeHavilland Hawk Moth. Many of you may have seen this model at the Nats or in the pages of **MB**. I personally feel that this could start a new trend in rubber models, which I will explain a bit later. (Fernando didn't know, at the time he wrote this, that the Hawk Moth would appear in December **MB** wcn)

Bill Warner had a Compte (Swiss design, I believe) that was a most spectacular flyer, which brought him into second place. Third went to Mike Mulligan and his Wittman Tailwind. Mike had this model at the Nats, where he finished in the money in rubber scale. This stubby-winged and wide-bodied homebuilt is quite an exceptional model for rubber power. I



Bill Noonan's jumbo sized Fokker glides by.

certainly prefer it over the Cougar, even though the Cougar is a near copy of the Tailwind.

Electric, in my opinion, is still not what I would call the "perfect" source of power for a scale model. Bill Warner seems to be the only one who can consistently make almost all his electric powered models perform as they should. I know a lot of people will argue with me, but again, it is my opinion. Batteries are still the weak link. They are heavy, and have to be treated with kid gloves during charging, and certainly, they are not cheap! One positive thing about electric powered models is that they can make

the most realistic takeoffs. One inconsistency that I have observed is that some electric powered models, when adjusted to R.O.G., will take-off beautifully, but then not have enough juice to keep them airborne for the required 20 second minimum flight time. Bill Warner's tri-motored Airspeed Ferry would do just that. Yet, with a hand launch, it would perform quite nicely. Bill won the electric with this most interesting biplane design. Second place went to Bill Stroman and his unusual Valkyrie. Tony Naccaratto took 3rd, flying a McDonnell M5.

Competition in CO<sub>2</sub> was fierce this year. The flights of nearly every model in this event were about as realistic as you could make them. The R.O.G.'s, the flight patterns, and landings were just a pleasure to watch. There seemed to be an even spread between Brown and Telco engines, with each performing equally well. Bill Hannan was flying a Farman Moustique, which won him first place at the Nats. At our Annual it was no exception. Bill's exquisite Farman flew as flawlessly as it looked. Right behind Bill was Warner's pidgeon-tailed Bleriot. This model was powered with a Telco.

*Continued on page 97*

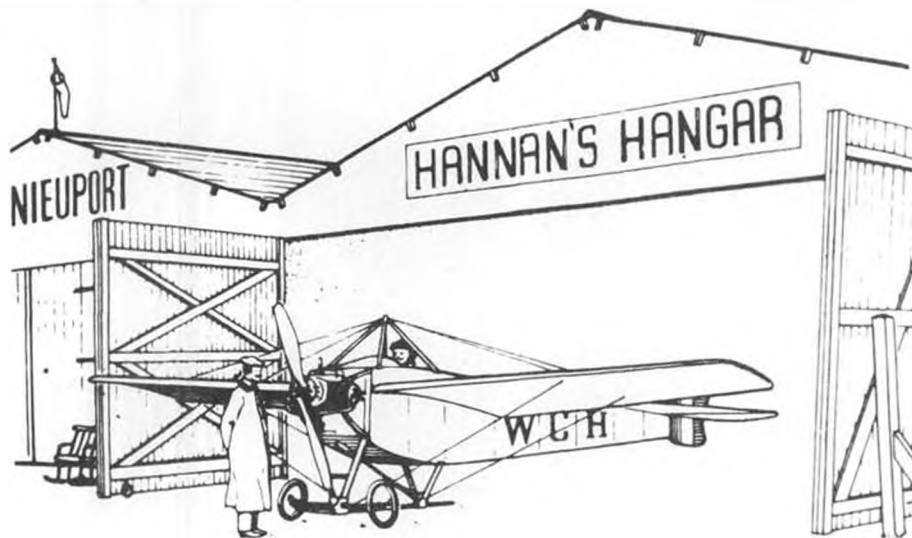


Bill Warner, with his 3 electric motored Airspeed AS 4, talks things over with static judge George James.



Joe Bressi and son winding his P-40, which is an excellent flier.





"To have more, desire less . . ."

• We're not sure how our lead-in line can be applied to model builders, but we found it thought-provoking anyhow. It was spotted on the marquee of the Rayne Water Softener Company.  
STAR WARS

Every so often we feel compelled to don our critic's costume, usually for an aviation-oriented film. This time, the connection may not be so direct, but we think our audience may be interested. Already reckoned to be the greatest money-grosser of all time, the flick continues to attract long waiting lines of patrons. Curiously, the appeal of this film seems to transcend age boundaries, whereas many science fiction offerings have appealed only to a limited age group.

It is difficult to peg "Star Wars" into any particular comparison nitch. Certainly it is reminiscent of the old Buck Rogers and Flash Gordon epics, yet in some ways, it resembles neither. Even though the basic story line might appear simple, the presentation is almost unbelievably complex. The good guys win and the bad guys lose all right, but in the most

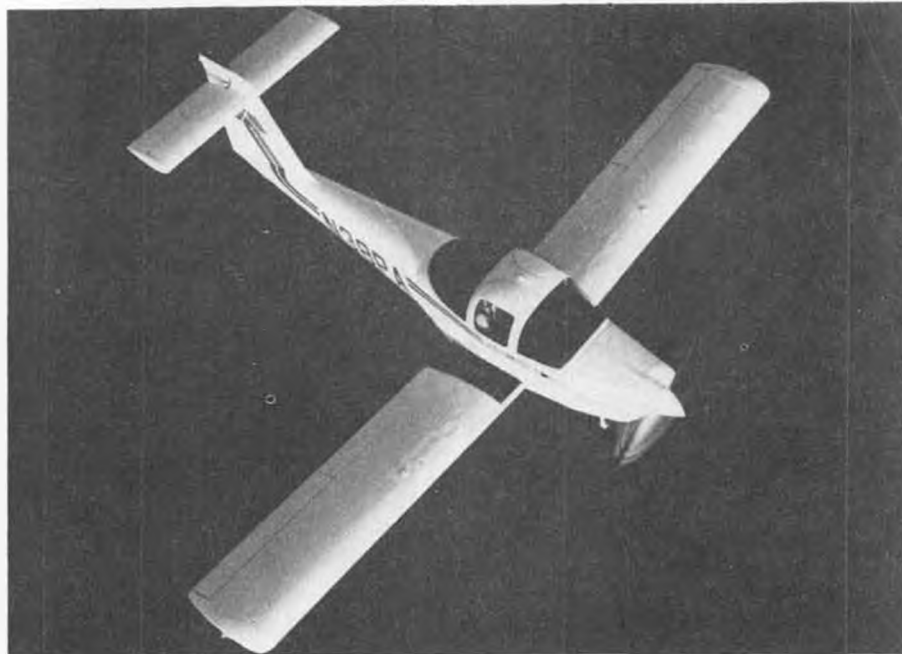
bizarre manner imaginable! Some of the special effects are so powerful as to be distracting. Anyone with any mechanical aptitude is bound to

be trying to figure out how the feats are accomplished, and may find the plot only incidental . . . which is probably why many viewers attend more than once!

Not surprisingly, quite a few model builders were involved in the production, and for a pleasant change, they receive suitable credits for their efforts. All manner of miniatures were employed, along with radio-controlled devices. In fact, the electro-mechanical stars steal the scenes from the humans, in our opinion. The actors/actresses seem almost foils for the robots, instead of vice versa.

The message is strictly entertainment, with a pleasing absence of shock-for-shock's sake language. There is violence, to be sure, but somehow the director/writer, George Lucas, makes it seem justified. The mix of humans, "un-humans", robots ('droids) and spacecraft result in the first really fresh concept to appear in years.

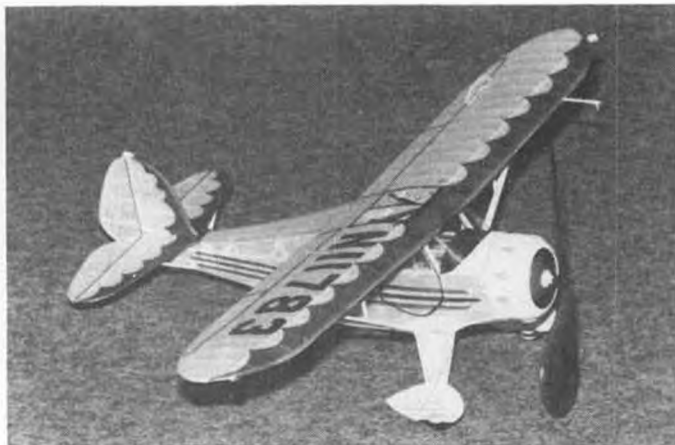
*Continued on page 94*



Piper Aircraft Corporation has announced its new Tomahawk for 1978. Its design features should be a turn-on for scale enthusiasts.



Lonnie Cope launches his Renault Farman racer at the '77 Nats. It flew in rubber powered speed event. Photo by Chris Clemens.



Scratch-built Monocoupe 90-A, a tribute to the late Earl Johnson. Photo submitted by Phil Cox, Calumet Aircraft Modelers.



PHOTOS BY AUTHOR

# CO<sub>2</sub> MOSKITO

By JACK HEADLEY . . . Reminiscent of the pert little Springfield Waco biplane, designed around the K&B .020 "Infant", this tiny sheet balsa biplane has surprising performance with any one of the current CO<sub>2</sub> engines.

• This little model was designed on a Thursday, refined on Friday, built on Saturday . . . but not flown on Sunday, as the local store had run out of CO<sub>2</sub> cylinders and I had to roam all over town for some and it was actually a week Tuesday before the first flights took place but it was worth the wait. Phew!

In fact, the first flights were a little scary, as I didn't have the correct down-thrust figured out and the model kept wanting to return to base via the top of my head, hence the "Moskito" name. Once trimmed (a lot of down-thrust and a tweak of left rudder), the model flew magnificently, if I say so myself, with a splendid spiral climb, and a fairish glide (what do you expect

with so small a wing area). There's probably even more performance in the model, as I've been running the motor at a medium throttle setting, rather than all-out.

Construction is reasonably straightforward . . . the main concern is to make sure that the final assembly is done correctly, no one likes to see an asymmetric biplane! Read on for details of the building procedure.

As we previously mentioned, the model doesn't take long to build, and if you use one of the new glues, it can be constructed very quickly.

Begin with the wings; by cutting out four wing panels, two upper and two lower, plus eight wing ribs. Use softish wood for these wing panels, some-

thing that will conform to the airfoil shape easily. Pin the ribs down to the building board, and cement the panels into place. Be sure, on the top wing, to recess the root ribs a little, to provide space for the wing pylon when the panels are glued together. While the wings are setting up, cut out the tailplane and fin, and cement these together now, making sure that the fin is truly vertical.

The next item is the fuselage frames, in particular Frame 3, which is laminated from two pieces of 1/16 sheet, with the U/C wire squashed between the two laminates. So we start by making the undercarriage, and the two pieces of Frame 3, then epoxy them

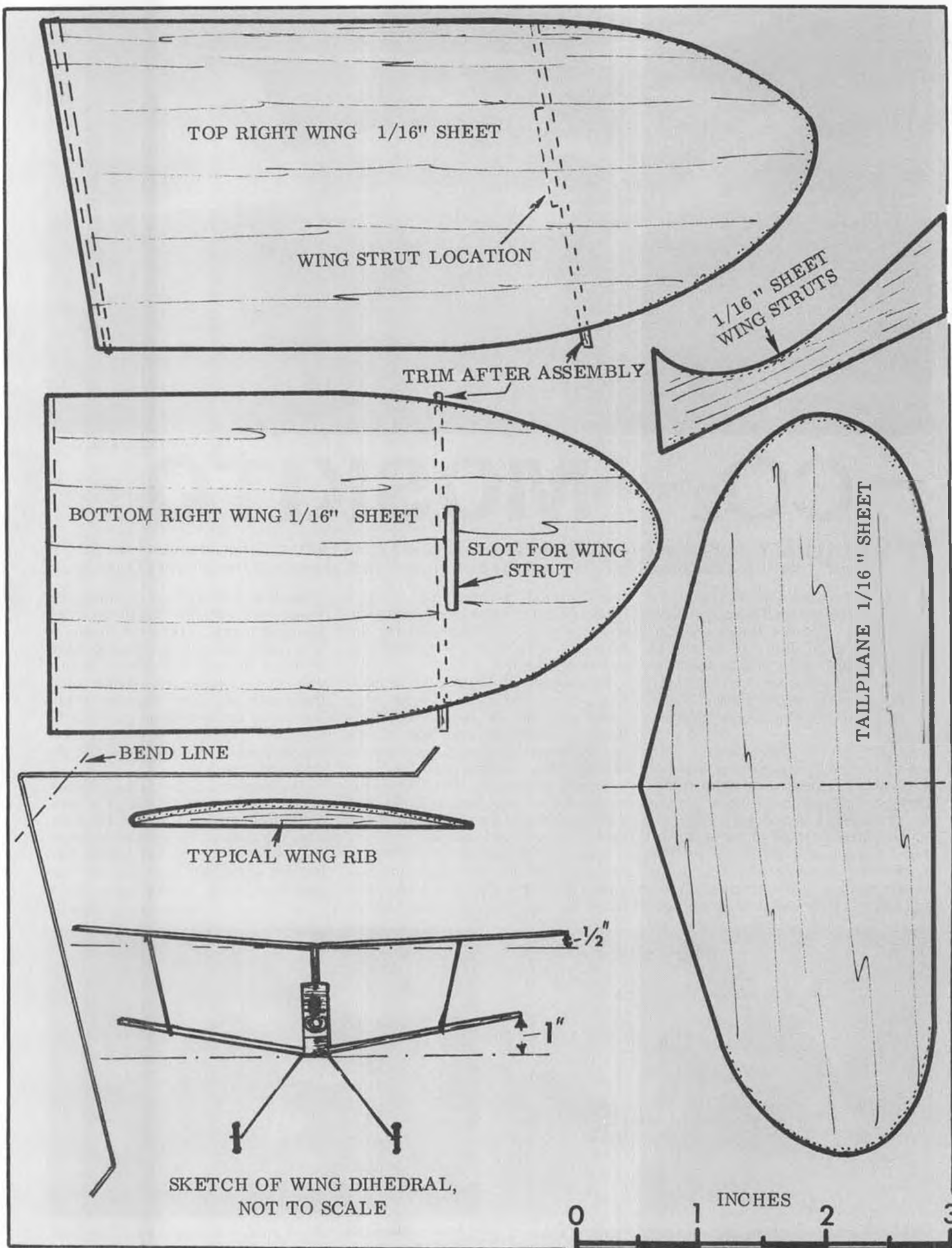
*Continued on page 87*



Not exactly a thermal-catching machine, but it's still a good idea to include your name and phone number. Performance will surprise you.



Moskito and launch platform. Platform to launch author, not plane! Marking pen trim easy to apply, adds very little weight. Cute ship.





WEIGHT 1 1/2 OZ.

LEAVE CABIN OPEN FOR TANK

FINISH

CLEAR DOPE ALL OVER,  
SAND, AND DECORATE  
WITH MARKER PENS

WING STRUTS NOT SHOWN FOR CLARITY

SLOT FOR PYLON

TELCO ENGINE AND TANK

1/16" FIN

1/32" SHEET TOP

1/16" SIDES

1/32" SHEET  
BOTTOM

NO SIDE THRUST

c/g

PLANS ARE FULL SIZE

**-moskito-**

3/4" PLASTIC  
WHEELS

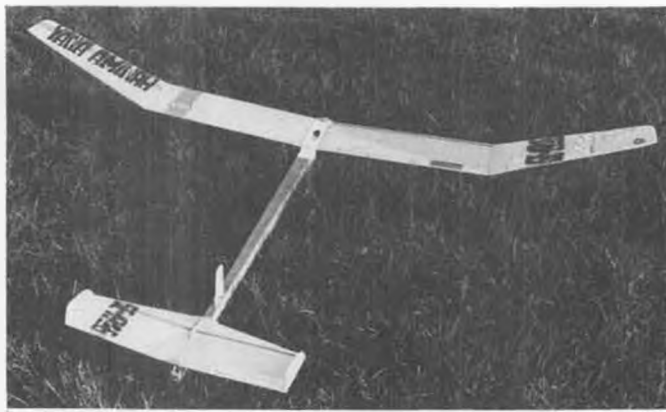
1/16" SHEET

1/16" SHEET

1/16" PLY

G-ASSS

its a



Lars Olofsson, 1975 World FAI Power Champion, sent these photos of his newest ship, "Yana Aminah" (?), featuring the worlds shortest nose moment! Dihedralled stab, triple fins, 6% flat bottomed airfoil, exhaust through pylon top. Climbs like a rocket, glides like a rock, says Lars.

# FREE FLIGHT

By BOB STALICK

## FOUR YEARS AGO THIS MONTH

Could it be that long? Could *what* be that long? Well, in January of 1974, this column was first written by yours truly. What has happened in that time in the wide world of free flight? Try these on for size:

The 7 second FAI Power engine run has become reality.

Category II outdoor sites have become the norm, along with the 3 minute AMA max, and the 9 second engine run.

V.T.O. has gone the way of R.O.G.

The last vestiges of Pirelli rubber have gone the way of the dodo bird, except for the private stocks of the privileged few.

The long awaited intermediate event has appeared to encourage people to fly sport rubber. It's called P-30.

The regular hassle over scale rules continues . . . Peanut Scale is now a flying event with very little to do with scale.

Category III rules are being proposed to allow use of fields not large enough for Cat. II.

There are others, but these come to mind. So, looking into the old crystal ball can give some clues as to what we can expect during the next 4 years. Here are the predictions:

Category I will only be flown at Taft. If another site is located for Cat. I, the SoCal fliers will petition AMA for a Cat. 1-plus category to use at Taft. It will feature 10 minute maxes and 20 second V.T.O. only.

Category IV will be proposed and will feature 1 minute maxes, 20 meter towlines, 4 second engine runs, and 5 gram Coupe motors.

Peanut Scale rules will be changed again to emphasize the scale factor. Models will not need to fly at all.

FAI Power will go to 5 second engine runs in order to compensate for the development of the .15 size

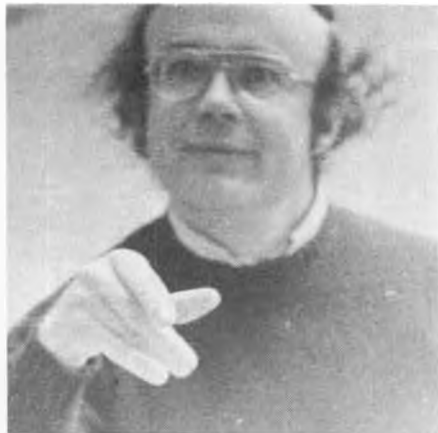
engine.

The annual 100 gram vs. 80 gram Coupe debate will finally settle out with 90 gram Coupe being the norm . . . thereby satisfying no one.

No FAI Finals will be held in the U.S., because no one wants to host the event.

Schneurle port engines will be banned by the EPA as being too dangerous.

Gas rationing will reduce all con-



Would you let this guy time your last flyoff flight? More on page 64.

tests to club meets.

Rise in postal rates will eliminate postal meets.

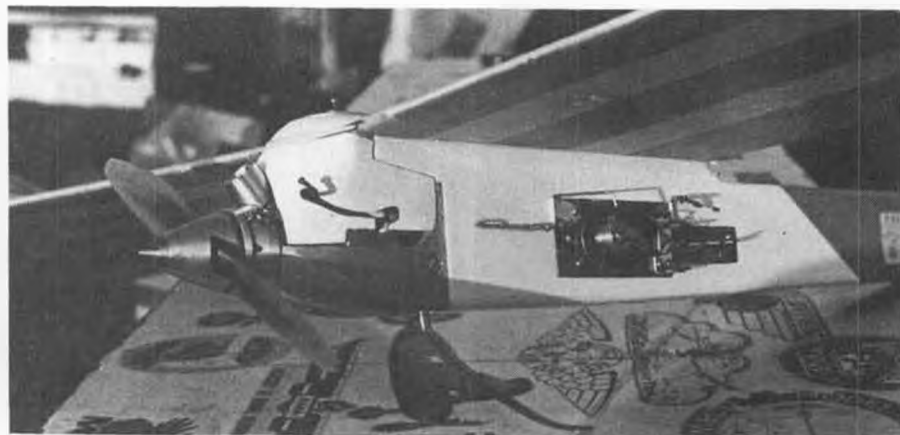
Led by consumer advocate groups, someone will sue AMA over the quality of the membership decals.

The AMA Nationals will be held in Mexico due to lack of U.S. sites. So, there they are . . . some predictions for the next 4 years. I'm sure that this is not an all-inclusive list and that you could add your own pet items to the bunch. It'll be interesting (not necessarily fun) to come back in 4 years to see if any have come true.

THREE-VIEW OF THE MONTH. . .

Super Turkey Unlimited,  
by Jim Quinn

I find it personally very interesting to note the increase in interest in the Unlimited Rubber event. With the unavailability of Pirelli and the general dissatisfaction with the currently available rubber, there is a resurgence in this event which belies the claims that rubber powered flying is on the way out. In our N.W. meets, the events which seem to be growing in number are the rubber events . . . nosing out the popular



Underside view of Olofsson's ship shows fiberglass cowling, Monks timer, and very low "pylon". Wing panels plug into sides of fuselage.

towline glider events. Jim Quinn's model is an excellent state-of-the-art ship. It is a relatively simple rolled tube fuselage model with simple wing and tail structure. Obviously influenced by the highly successful Bob White designed ships, it deserves attention as a ship to build. DARNED GOOD AIRFOIL ... C.S. (Christian Swartzbach) 6356

Christian Swartzbach is perhaps most well-known for his development of the Swartzbach propeller, but here is the airfoil he has developed for use in the Wakefield event. As mentioned last month in this column, the Wakefield Symposium held in the Scandanavian countries 3 years ago, mentioned 3 airfoil sections as being recommended for use in the Wakefield model. This is one of them. Next month we will carry the coordinates and sketch for the final choice. If you are into rubber powered models, the C.S. 6356 looks like a good one.

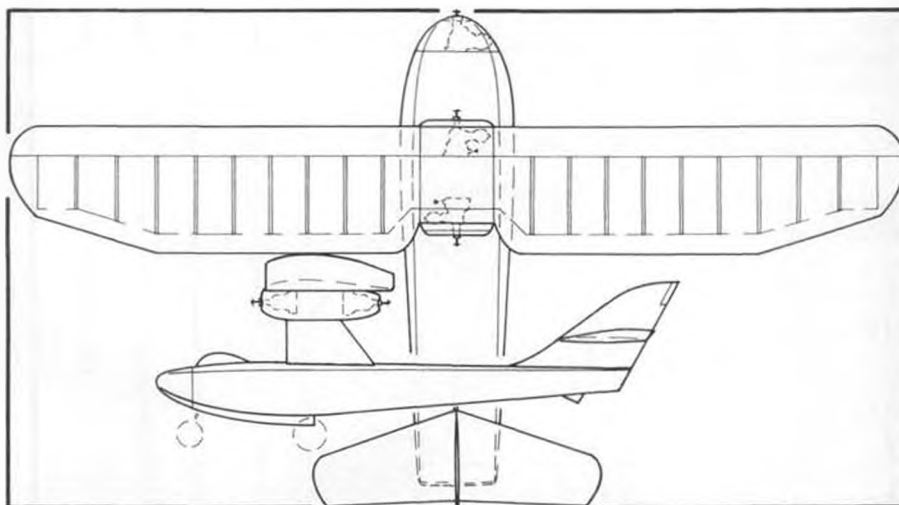
#### MYSTERY MODEL FOR JANUARY

The Civy Boy Mystery Model brought a deluge of mail from all of the folks out there in free flight land. This one may elicit one letter. If you are the one, drop it to Bill Northrop and claim your prize ... a one year subscription to my favorite magazine (**Model Builder**).

Some interesting features of this month's design. It's multi-engined. Not just one or two engines, but three. All of them are roughly categorized as 1/2A engines. On top of that, it's a seaplane. It's also a free flight model. Did anyone ever build it? Well, at least one was built, if pictures of the model are any indication. Did it ever fly? Good question. Can you answer it?

#### THOSE MAGNIFICENT ALUMINUM COVERED RUSSIAN FAI POWER WINGS ... A close-up

Several model magazines, including this one, have covered the 1977 FAI F.F. World Championships held in Denmark. All have mentioned, or provided photos of the Russian FAI Power models and their aluminum sheet covered wings. At the N.W. Semi-Finals, both Charlie and Keith Martin described to me how these wings were made. Charlie also



JANUARY'S MYSTERY MODEL

had a sample of the sheet aluminum, taken from the wing of the damaged model.

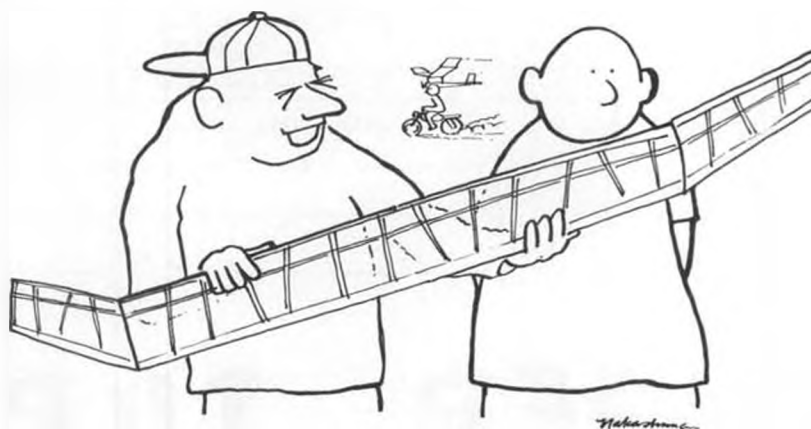
This information is provided to you third hand, but is generally accurate, according to my sources.

Essentially the process is simple, once you have the necessary supplies, which includes sheets of very hard 1 mil aluminum .050 balsa wing skin, aluminum tube leading edge, and lots of weights.

The aluminum sheet is cut to span and chord size (see sketch) and epoxied under pressure to the .050 balsa. Allowances for the nose radius are made, and the top and bottom

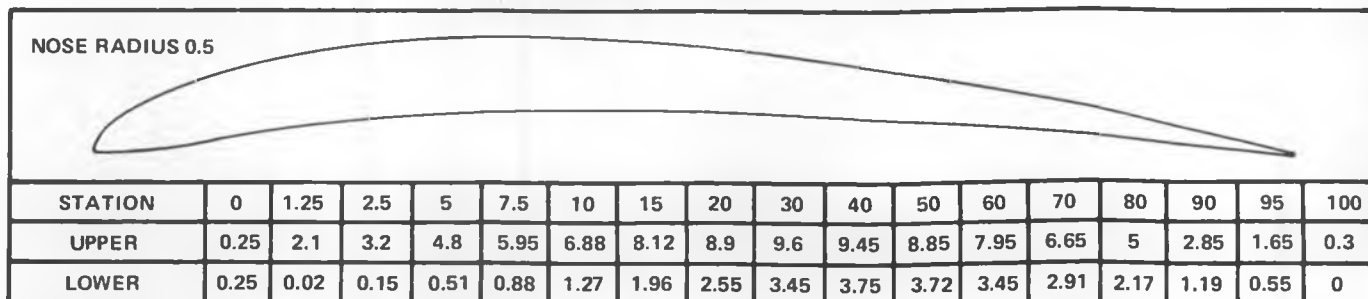
balsa sheeting is epoxied to the same piece of aluminum. The framework of ribs and spars is laid up onto the bottom piece of balsa/aluminum, the aluminum tube leading edge is epoxied onto the front of the framework, and the aluminum sheet/balsa sandwich is wrapped around this structure and securely epoxied into place. The aluminum/balsa sheets join at the trailing edge and are finished at this point.

The Russians used this form of construction for the inner panels of their wings, with the outer panels being the more conventional sheet balsa type of structure. Although the

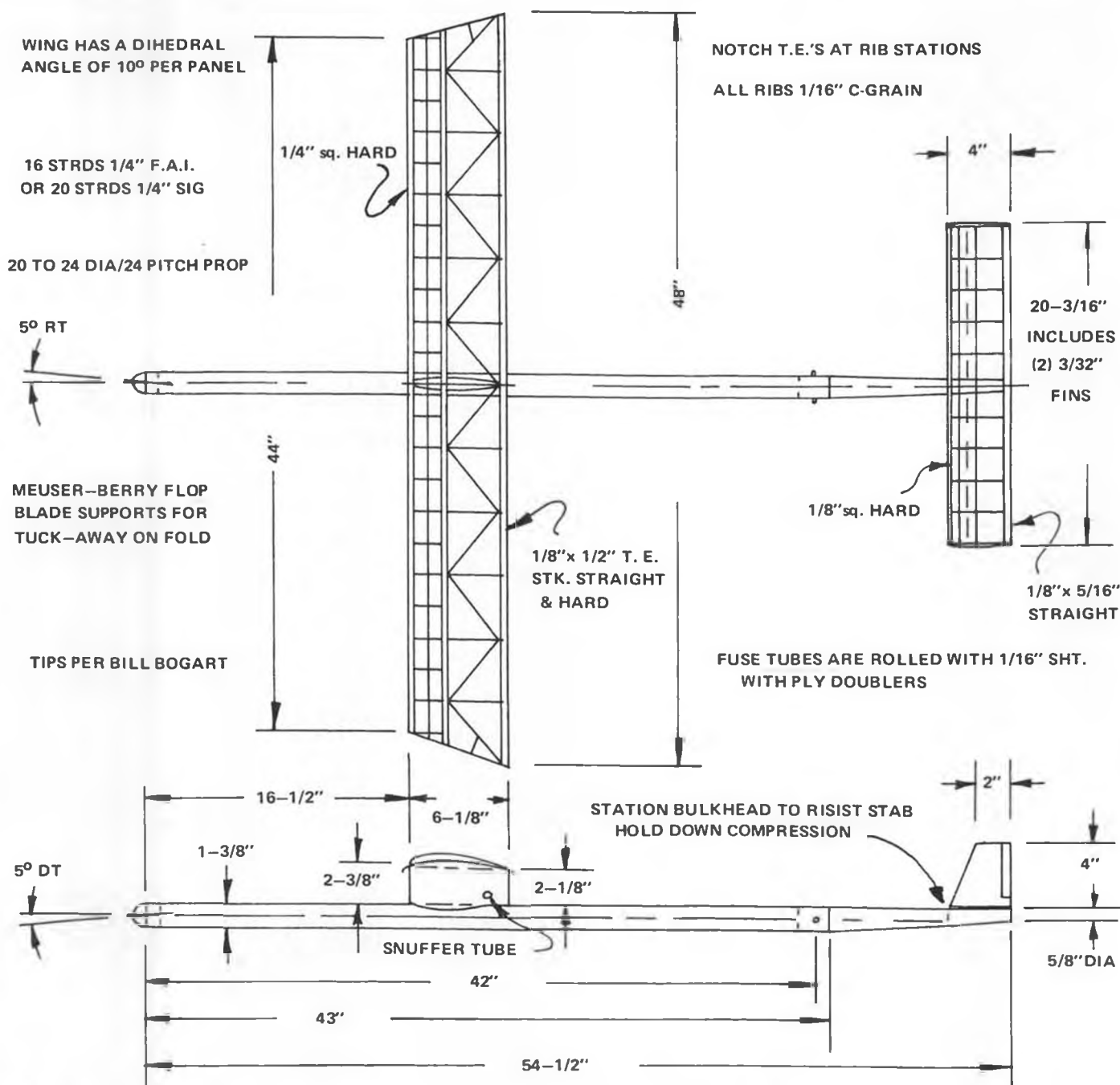


"I was feeling a little rough the morning I made this wing."

#### DARNED GOOD AIRFOIL - CS 6356

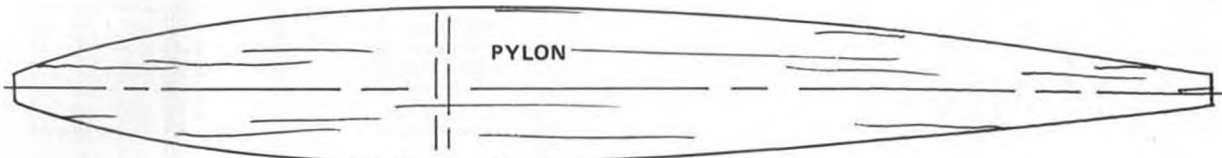
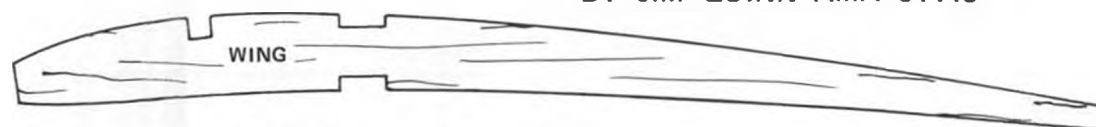






# "SUPER TURKEY"

BY JIM QUINN AMA 51443



purpose of such an involved process is not entirely clear, it would seem that this is an innovative attempt to deal with the problem of minute changes in wing warp, which plague the high speed FAI Power models with their knife edge trim. The only caution is that you shouldn't try to d.t. such a model onto power lines!

An interesting and creative step forward in the design and execution of model airplanes.

#### FLEX TUBE MOUNTS FOR A-2 GLIDERS

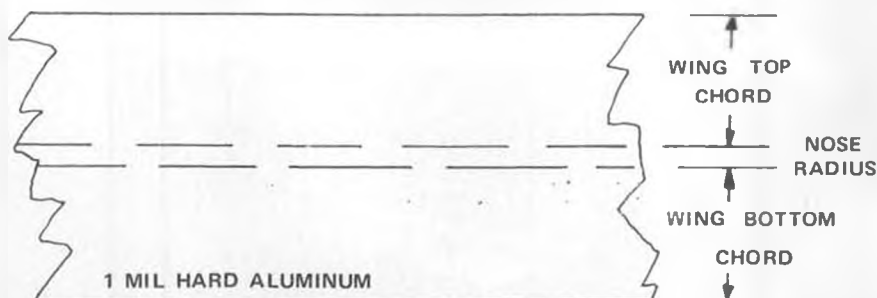
Bob Isaacson and Jim Walters agree that the ability of an A/2 wing to spread the stress evenly from root to tip is a likely condition to successful zoom launches when using circle tow. The East Europeans, notably the Russians, are able to get by with using relatively light wings on their ships and still make high climbing zoom launches. There are ways of making evenly stressed wings, but for most of us, the methods may be unfamiliar or beyond our equipment's ability to help us do it. So, we tolerate heavy wings in order to provide enough structure to keep the wing from breaking, and continue to use the well-known brass joiner tubes and music wire. We also continue to break our wings just where the brass tubing ends. Making tubeless wings appears to be an answer. The next question is, then, how to accurately drill the holes in the plywood wing root ribs and more to the point, how to keep the holes from enlarging during the life of the wing.

I believe that I have a possible solution to the problem. It's simple to the point of incredibility. Here's how:

1. Drill the plywood ribs as usual (oversize).

2. Cut small pieces of brass tube (approximately 3/16 inch) to fit ... one for each rib hole.

#### ALUMINUM SHEET COVERED WINGS — RUSSIAN STYLE



- ① LAYOUT WIDTH OF ALUMINUM TO EQUAL DOUBLE CHORD PLUS NOSE RADIUS. SPAN TO MAIN PANEL ONLY.



- ② EPOXY .050 Balsa SHEET UNDER PRESSURE TO THE TOP & BOTTOM CHORD AREA OF THE ALUMINUM.



- ③ EPOXY RIBS & SPARS ONTO BOTTOM OF BALSA-ALUMINUM "SANDWICH" EPOXY IN ALUMINUM TUBE LEADING EDGE & WRAP TOP OF ALUMINUM -BALSA SANDWICH OVER RIBS & SPARS. EPOXY IN PLACE. WEIGHT STRUCTURE TO INSURE ADHESION.

3. Slide pieces of brass tube over the wing mount wires.

4. Slide wing mount wires, with brass tube, into the plywood wing ribs mounted in the wing.

5. With micro balloons and Hot Stuff, adhere the small lengths of brass tube to each plywood rib.

6. Remove the wing wires and completely surround each of the small brass tubes with micro balloons and Hot Stuff.

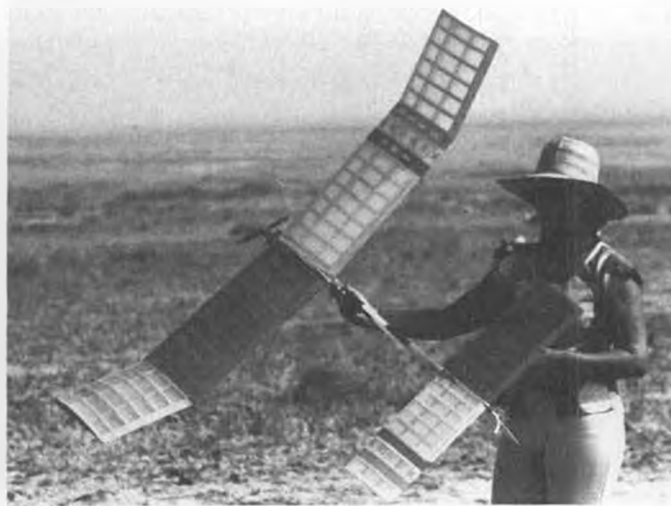
What you now have is a wing which will flex to the extent that the wing wires will allow it, evenly stressed structure which doesn't have a defined end point, and wing wire holes which won't wear out and can be constructed by the average A/2 builder.

Worth a try? Maybe there are some other ways, but this one has worked for me.

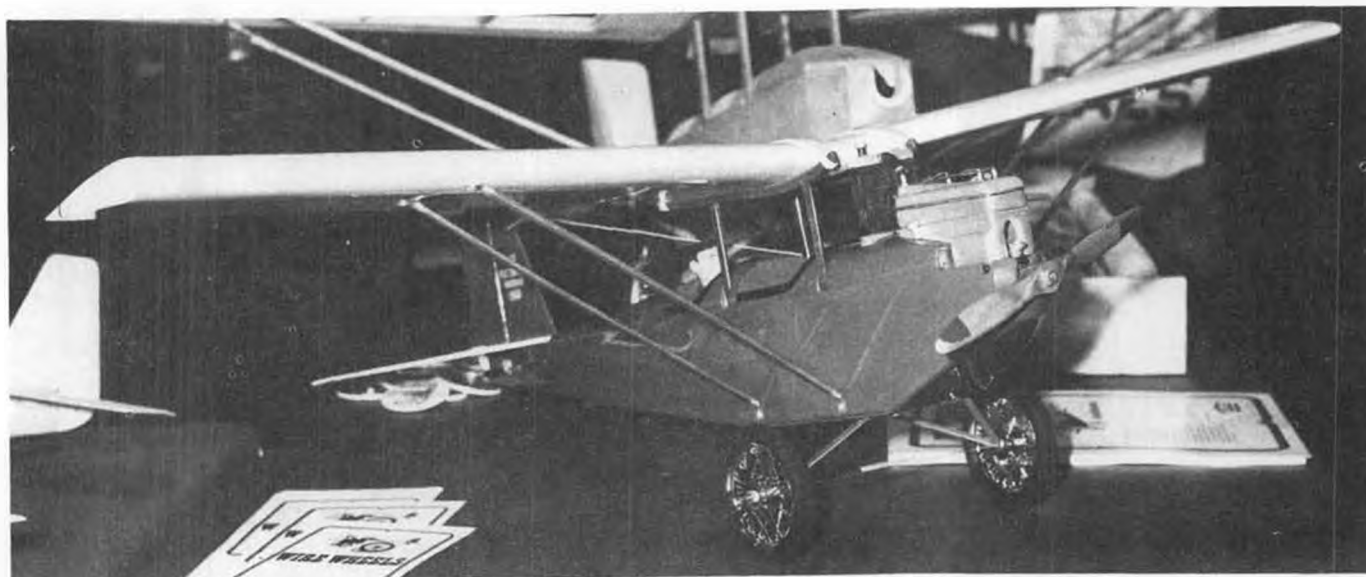
*Continued on page 91*



Charlie Sotich with his Wakefield, at the '77 Nats. His models never seem to age, they just get older (Don't we all!!) Shafer photo.



Mrs. Virgil Coker holds "Coker's Cooker" A Gas model. Shoulder wing has 650 sq. in. area. Update of classic design. Shafer photo.



Half-A Pietenpol from House of Balsa can be anything from a trainer to a stand-off scale winner; builder's choice.

# The 1/2-A SCENE

By LARRY RENGER

• This column will be the first published after a significant personal event for the author. I have left Cox and now work for a medical appliance company. In my new job, I manage a group which engineers various heart catheters, or widgets which help eliminate the need for open heart surgery, in some cases.

The above event has a couple of effects, first, please send any letters, etc., to me, care of this magazine, not at Cox. Second, I should be able to develop a more objective view of the 1/2A Scene. I have tried to be objective in the past, but nobody's perfect! BEGINNERS WORKBENCH

This month, let's discuss propellers. The propeller is a type of wing. It "flies" in a peculiar twisted airstream,

so it is twisted to match. There are important factors to consider in the choice of a propeller.

**Power available:** This is what the engine puts out, wishful thinking won't give you any more than what you have.

**Aircraft size, drag, and weight:** This is what you want your engine to pull, and you also have to consider what kind of performance you want.

**Performance:** This is the type of flying you intend to do. Straight up for U/C Stunt or Free Flight, top speed for a speed job, in between for pylon racing or combat, slow and steady for U/C or R/C trainers.

Once you have nailed down the plane, engine, and desired performance, the problem is how to select

the ideal prop. Here are the variables and their effects.

**Diameter:** The amount of air driven by the prop is related to the area of the prop disc, that is  $A = \frac{d^2}{4}$ . Larger

areas yield more efficient coupling of power to the air. Small differences in diameter mean large difference in power required.

**Pitch:** Pitch tells you how many inches forward you'll go for each turn of the engine. Power required is related "linearly" to pitch.

**Blade width, airfoil, tip configuration:** As in a well-designed wing, the exact form of a prop affects the efficiency. Blade width has the most noticeable effect of this group.

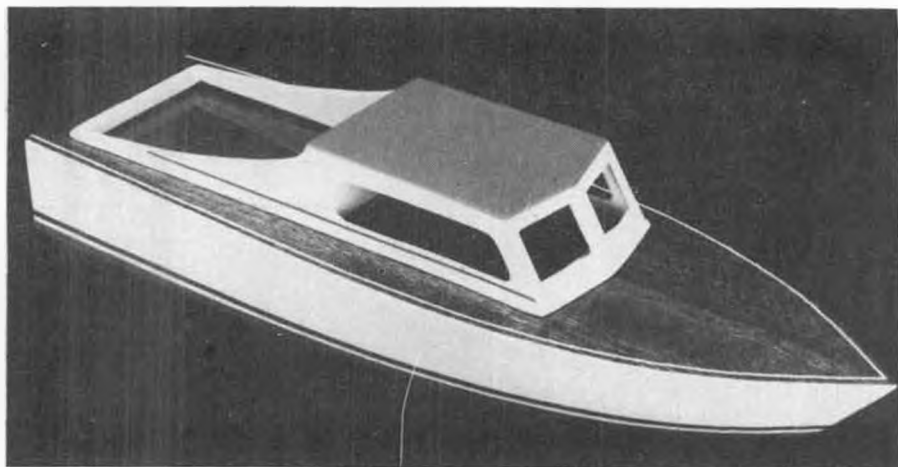
**Prop blade flex:** This is so deep and complex a subject that it is neatly avoided by the flat statement that the more rigid a prop is, the better it is.

Confused? Hang in there, it isn't all that bad, because we are only choosing a prop, not designing one. Also the selection is limited and the application allows a pretty broad tolerance to error.

First, read the kit recommendations, if any, and also the engine manufacturers recommendations. Next, I will stick my neck out and provide this chart as a very rough guide. Numbers are "diameter x pitch".

These just represent the starting point. I have found that I usually try several propellers, including a few which shouldn't work, before I find one which I like the best for a given airplane, engine, and style of flying.

For example, I have a 1/2A Miss Norway with two different engines I use on different occasions. One engine has a Tee Dee crankshaft, QRC piston, cylinder, muffler, and drilled Medallion carburetor; the other is a



The Dumas 1/2A Cabin Cruiser can be neat fun with throttle and rudder on R/C, or just plain free running . . . or tethered.





This attractive Citabria, by Jerry Farr, Abilene, Texas, for 1/2A R/C, has a 200 sq. in. wing, and weighs 18 oz. An excellent example of imagination and ingenuity producing a winner.

hopped up, hi-nitro, bored venturi Tee Dee with no muffler. For the first engine, I like a narrow blade 6 x 2 made from an old Tornado 7 x 2, full-blade, wood prop. On the hi-nitro engine, I run a 5 x 3, because I like the sound and the level flight speed as opposed to climbing ability. The airplane is the same, but engine and intended style of flying have both changed, so the "correct" prop is different.

All you really can do is to experiment, starting from what the chart shows, and see what works best. That's what I do myself! In speed and pylon racing events, be sure to use a stopwatch on a timed course; your ear will lie to you when it comes to



Chris Lella wowed 'em in New York by flying this 1/2A Sunspot C/L stunter on the ice rink at Rockefeller Center.

speed judgements.

For the more advanced flier, I have a maintenance tip: If you have an old Tee Dee or Medallion engine, and it has good compression but is erratic

on the needle valve setting, here is a possible culprit. The nylon carburetor body around the crankcase "grows" with time. Eventually, you get an air leak under the carburetor. If you are using the crankshaft pressure tap, the problem is worse. I know two solutions. First, you can replace the nylon part, or second, you can remove it, then seal it to the case with a very thin and carefully-applied dose of epoxy into the shaft opening, or up into the venturi. Re-drill the crankshaft pressure tap, if that's being used.

Next, there is another newsletter which appeals to the 1/2A U/C flyer. This one is called CL-RPM and is pub-

*Continued on page 96*

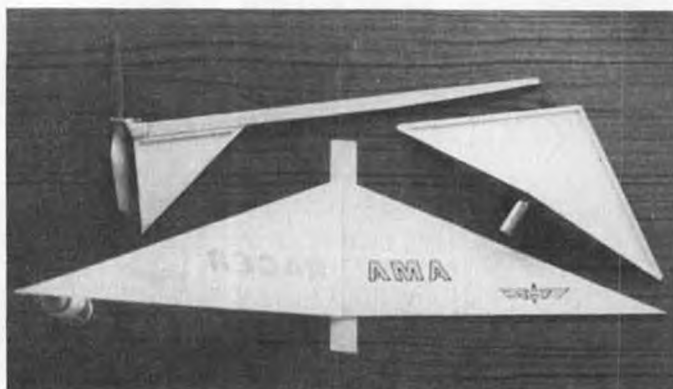
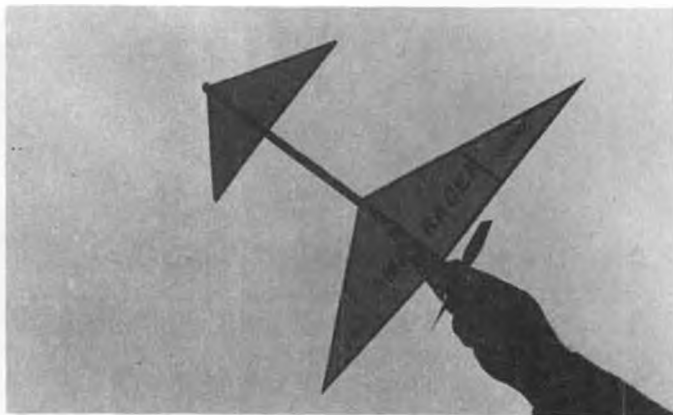
ENGINE	U/C	COMBAT	TRAINER	FF	R/C	AEROBAT	RACING
Reed Valve	5 x 3	5 x 3	6 x 3	COMP.	SCALE	TRAINER	DNA
1 port	6 x 3			DNA	6 x 3	6 x 3	DNA
Reed Valve	5 x 3	5 x 3	6 x 3	DNA	7 x 2	6 x 3	DNA
2 port							
Tee Dee Std.	6 x 3	5 x 3	DNA	5 x 3	7 x 2	6 x 3	5 x 3
	7 x 2	5 x 4		6 x 2	7 x 3½	5 x 3	5 x 4
		5½ x 4		6 x 3		6 x 3	
				7 x 2			
Tee Dee.	6 x 3	5 x 3	DNA	6 x 3	DNA	DNA	5 x 3
Pressure and	7 x 2	5 x 4		7 x 2			5 x 4
Hi Nitro		5½ x 4					
		6 x 3					



Cox Hobbies' new Cessna Centurian. "So close to ready-to-fly you won't believe it." Pre-painted, with engine and control rods in place.



You guessed it! That is really Dave "Whatsistrum" on page 58, launching his Canardart on a flight over Beirut, to survey enemy guns.



At top: Remember to wind rubber backwards, and launch tail first! Bottom: Completed parts, dihedral added, ready for assembly.

# the canard<sup>ART</sup>

PHOTOS BY AUTHOR

By DAVE LINSTRUM . . . In musical circles, it might be called a "variation on a theme", but modelers would just likely say that the darn thing goes "bass backwards"! Call it what you will, it's a fun project.

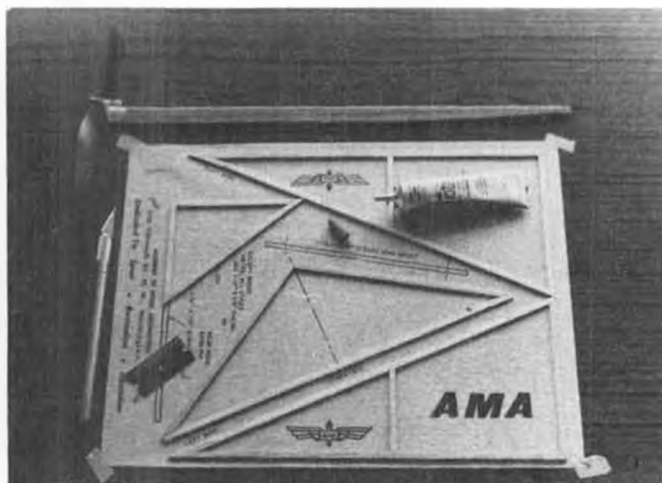
● Back when the author lived in Beirut (we got out fast when the guns started to go off, at the start of the civil war) we had plenty of building time but little to build with. We had brought a few Delta Dart kits along with us, and one of them happened to be the old style Delta Dart, kitted by Sig as the AMA Racer. This was the original design as conceived by Frank

Ehling, who later modified it to what we now know as the AMA Cub. The basic difference is in the area of the flying surfaces . . . the old Dart had a nice, racy sweptback LE on the wing. It is still available as Sig kit FF-4. You can make a Canardart from the material in this kit, or scratch build with balsa, tissue and a North Pacific prop.

The idea behind Canardart was simply to do something a little different, try a tail-first design in a simple format (none of the sophisticated Doug Joyce stuff for us) and build something suited to small sites. Would you believe flying in the street? That's what we did before the snipers came.

The plans reproduced here are full size. If you get a kit, simply tape down the covering onionskin and build on it, noting that the fin goes on the opposite end of the motorstick from the normal model. If you choose to build from the scrap box, make a xerographic copy of the plans (never cut up your precious MB) and tape

*Continued on page 90*



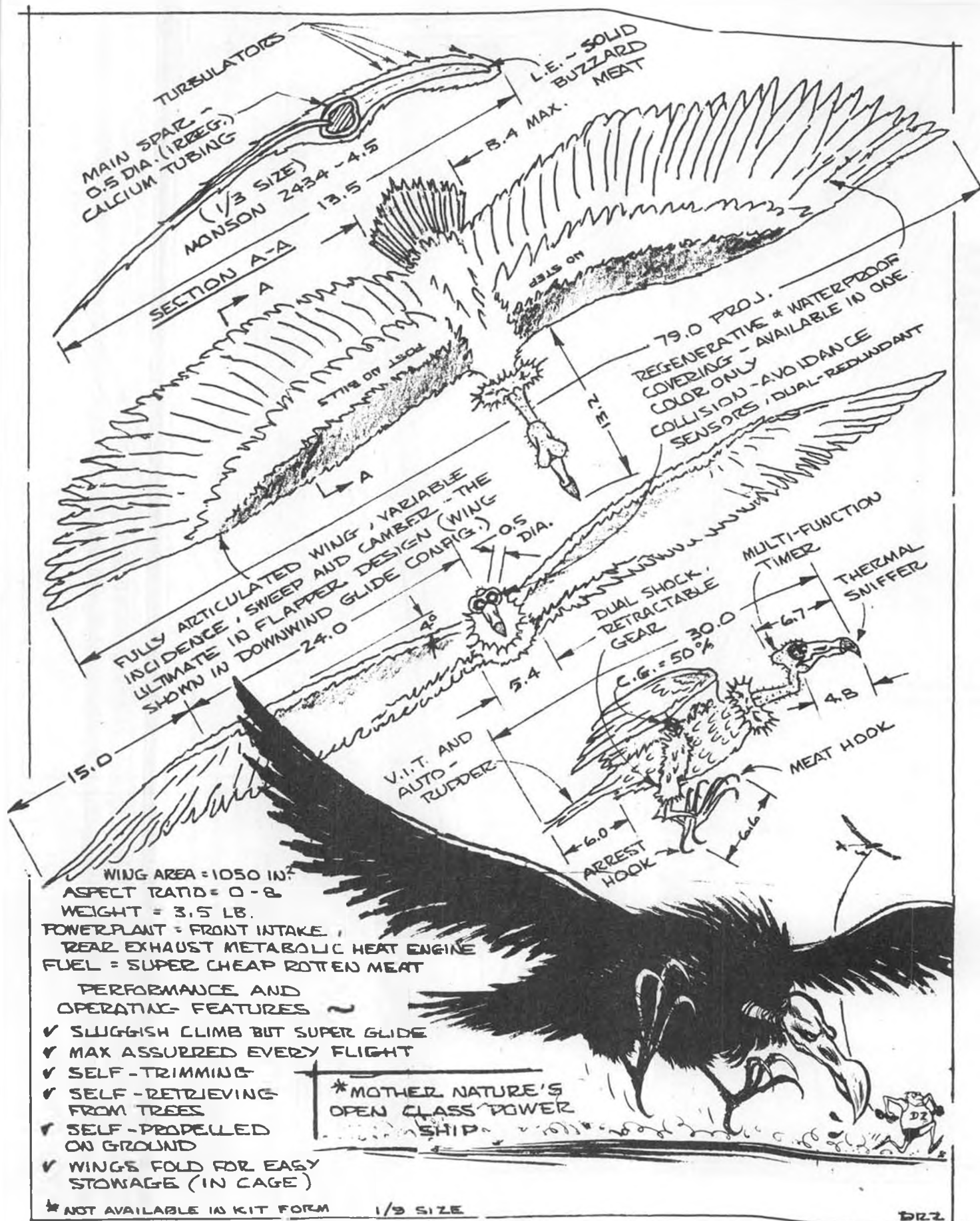
Parts laid out and glued on the AMA Dart plans/covering material. Up to this point, the Dart and Canardart are alike.



Dave Linstrum with his completed Canardart. Now the question is, if some kid brings one to a Delta Dart contest, is he legal?







## ~ "TURKEY BUZZARD" ~

(REGURGICUS VULGARIS)





"THE WEATHER THIS YEAR HAS REALLY BEEN SOMETHING!"

• Thermals are the most important, and least understood, "Tool of the Trade" to free-flight modelers. Not only is it important to know how to detect them in order to assure a good flight during a contest, but it's equally important to be able to detect their absence, so that a test flight doesn't become a long exhausting chase.

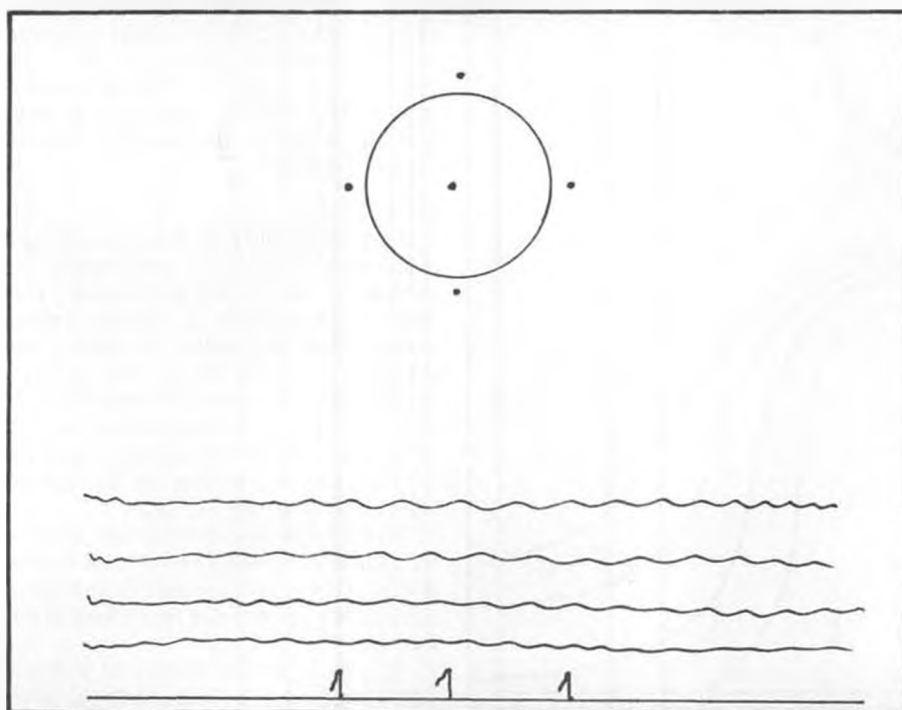
I've read a lot about weather, and thermal generation, but nowhere have I found a simple, dependable method to detect and forecast them; so hopefully this material will fill that bill.

Whenever we deal with anything having to do with the ocean of atmosphere around us, we are talking about meteorology, the science of forecasting the weather. Here, since we are dealing with phenomena of a very small area, and a very small field of action, we are actually dealing with micro-meteorology. Now that we have defined the terms, let's see what factors are involved in thermal generation and forecasting.

The theory I am going to lay out is based upon wind shifts as thermals pass by an area. As we are in the Northern Hemisphere, winds about a low-pressure area . . . which is what a thermal is . . . are deflected to the right, or counterclockwise. It is this physical deflection, detectable and dependable, upon which the following theory is based.

# Thermal DETECTING

By JEAN ANDREWS . . . Having the "ultimate aircraft" for your favorite free flight event won't get you in the winner's circle, unless you know when and where to launch it to catch that "good air". Here's how.



DEAD AIR . . Circulation; light and variable, temperatures stable.

Probably the most important factor in thermal detecting is being alert to small changes in wind direction and velocity, as either of these factors is a symptom of activity in the air around us. Knowledge of the field on which you will be flying will help, of course, but the main thing to remember is that these rules and theories will hold up at even the most unfamiliar field, if the modeler is alert to changes in the atmosphere as the day progresses.

Okay? Here we go. Remember that the wind is deflected to the right, or counterclockwise, around a low pressure area in the Northern hemisphere. All diagrams show five wind-drift indicators set up around the thermal core, and there is no allowance for wind. This is where the practice is going to come in, because in most cases, these wind streamers will be set up far apart, or non-existent, so you, the modeler, will have to use the existing wind indicators, plus your nose, to detect wind shifts.

Surface winds will distort the shape of the thermal, deflecting it down-

wind. The minute we release our airplanes, they also drift with the wind, so it is sometimes best to wait until the main body of the thermal has reached your launch site, even though other airplanes may already be utilizing the lift. Be patient! There's plenty of lift for all to use!

FIGURE I

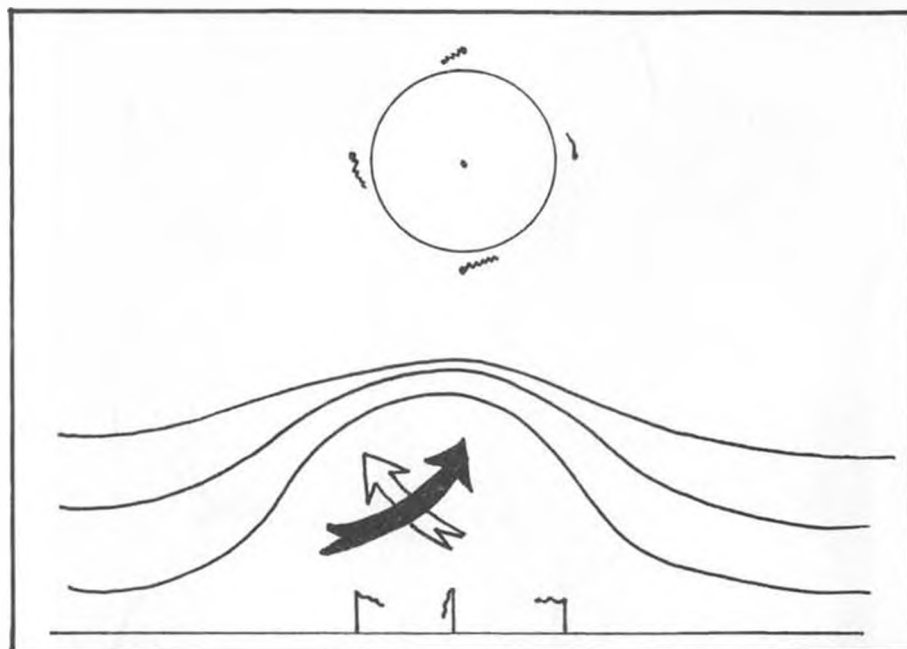
This is the condition before the thermal starts to break loose. Winds are non-existent, or puffy and light, and air temperatures are stable. The air laying in contact with the ground is being heated by contact with the warm surface, though, and temperature-change instruments stationed around the area may show a slight increase in temperature as the condition, warm air under cooler air, becomes more unstable.

FIGURE II

The air which has been heated by contact with the ground until it is warmer than the air laying over it, has started to rise. As it starts to rise, more air flows into the center of the thermal, and since we are in the Northern hemisphere, this flow is deflected counterclockwise. The wind-direction streamers are beginning to show this displacement, although the temperatures still have not shown any appreciable change.

FIGURE III

This is the stage at which thermals should be used. The bubble of air is ascending rapidly, and the circulation is firmly established. A marginally-stable airplane will be able to ride



BIRTH . . Circulation; counter-clockwise circulation begins. Temperatures are still stable or slightly variable.

this thermal, because there is not yet too much turbulence associated with the center 'bubble.' Temperatures will show a slight rise now, although it will be slow and unstable. Models which are trimmed to circle to the right will ascend just as smoothly as those gliding to the left, and at this stage, the machines circling to the right will have a slight advantage because they will center themselves in the core of the thermal, while those circling to the left will flirt with the

fringes of the thermal rather than drifting into the middle of it.

FIGURE IV

The mature stage of the thermal is the most visible stage, because dust-devils will occasionally form in the core. As the bubble of air ascends, more air rushes in to fill this area, and this air will show a distinct rise in temperature. This rise is due to the air's descending and being heated by compression . . . not due to any heating applied by the surface.

A considerable amount of turbulence is now associated with the thermal, and with the boundaries of it. Ships circling to the left will have more of a chance of surviving now, although they may be tipped over into a spin. Models circling to the right will be constantly in the turbulence around the bubble, and may or may not be able to utilize the strong lift now present.

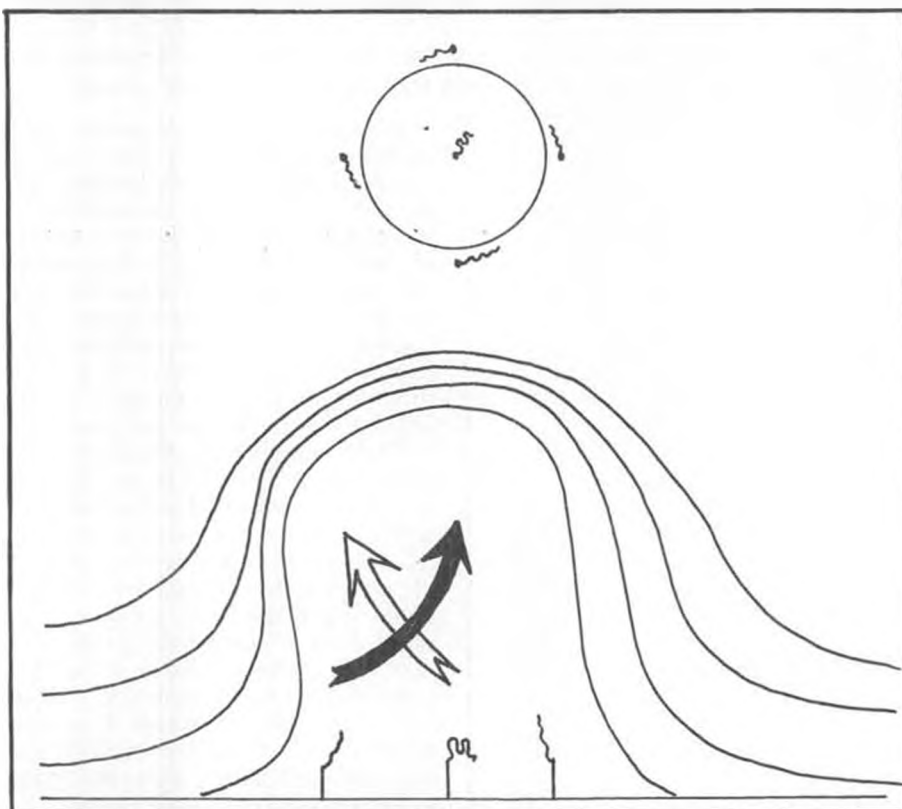
FIGURE V

The lifting 'bubble' has now broken away from the surface, and though the thermal is still strong and usable, it is almost impossible to detect unless some other airplanes, or birds, are already circling in it. The surface winds have dropped off until they are almost stable. Temperatures at the surface still show an increase, because of the continuing flow of air downward and onto the surface.

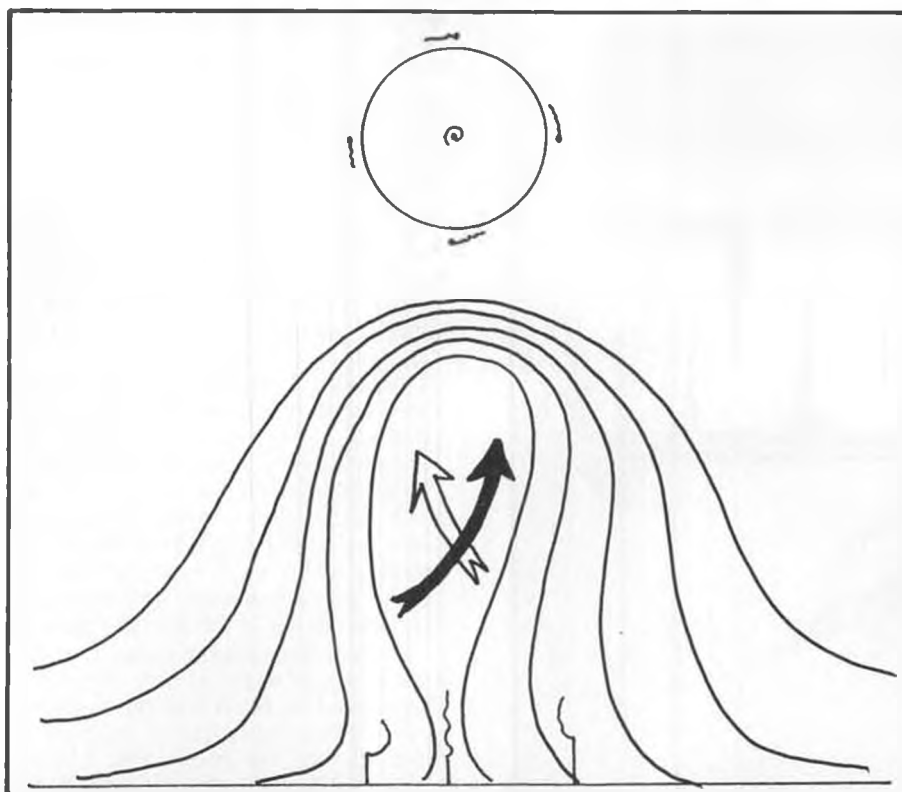
Notice that the circulation around the bubble is still counterclockwise, and that there will still be considerable turbulence around the boundary of the thermal.

So much for the theory of thermal detecting; now for the practical side.

First of all, watch for thermal "Pulses." Thermals tend to go through



DEVELOPING . . Circulation; strongly counter-clockwise; temperatures stable or slight increase as air is drawn into body of thermal.



**MATURITY** . . Circulation; strongly counter-clockwise, with possible dust-devils in core. Temperatures increase.

cycles, with a predictable span of time between them, so watch and time a few pulses. This way you will be ready to launch (rubber motor wound, engine fueled and ready to be cranked, fuses in place, starter fuse where handy, and lighted, etc.) when the thermal cycle is at its most usable stage.

Secondly, watch for anything you can use for wind-direction indicators. Tents, streamers, smoke columns, dust trails from cars and motorcycles, are all good indicators. Be alert to any change in the wind direction or velocity, because this will mean a thermal somewhere in the vicinity. Knowing and understanding the above theory will help you locate it, but familiarity with the individual field will help immeasurably to increase consistency and remove the "luck" factor from your thermal hunting.

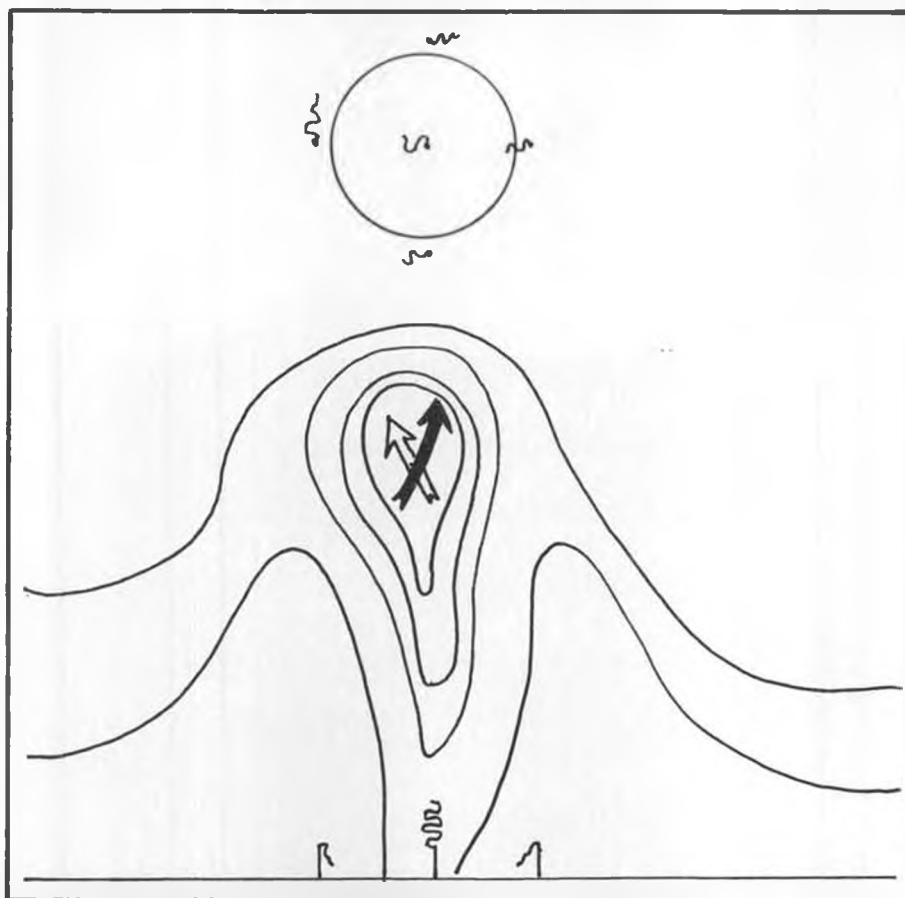
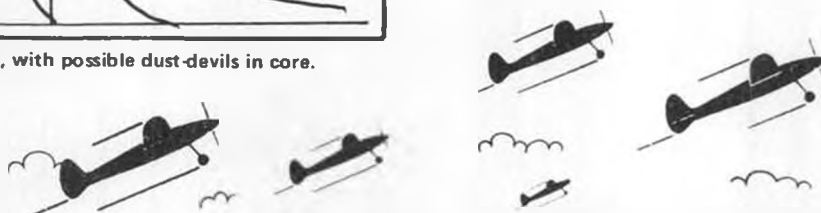
Thirdly, and probably most important of all, **KNOW YOUR AIRPLANE!** Know where it will be when the prop folds, or the engine shuts off, or the tow line unhooks. Fly the machine often enough that you know whether the airplane will handle rough turbulence in the center of a mature thermal, or whether it might be better to wait until another thermal comes along that may be smoother.

Remember also, that there are a lot of outside factors which help in thermal-finding. For instance, I wear a set of sunglasses which only pass twenty percent of the light through

the lenses. These "80-20" lenses are available through most optometrists, and are used mostly for flying, because they don't change any of the colors . . . just darken them. I have found them invaluable when looking into a bright desert sky, because they dampen down the glare and allow me to see columns of dust and pollen, indicating a thermal, which are invisible to the naked eye.

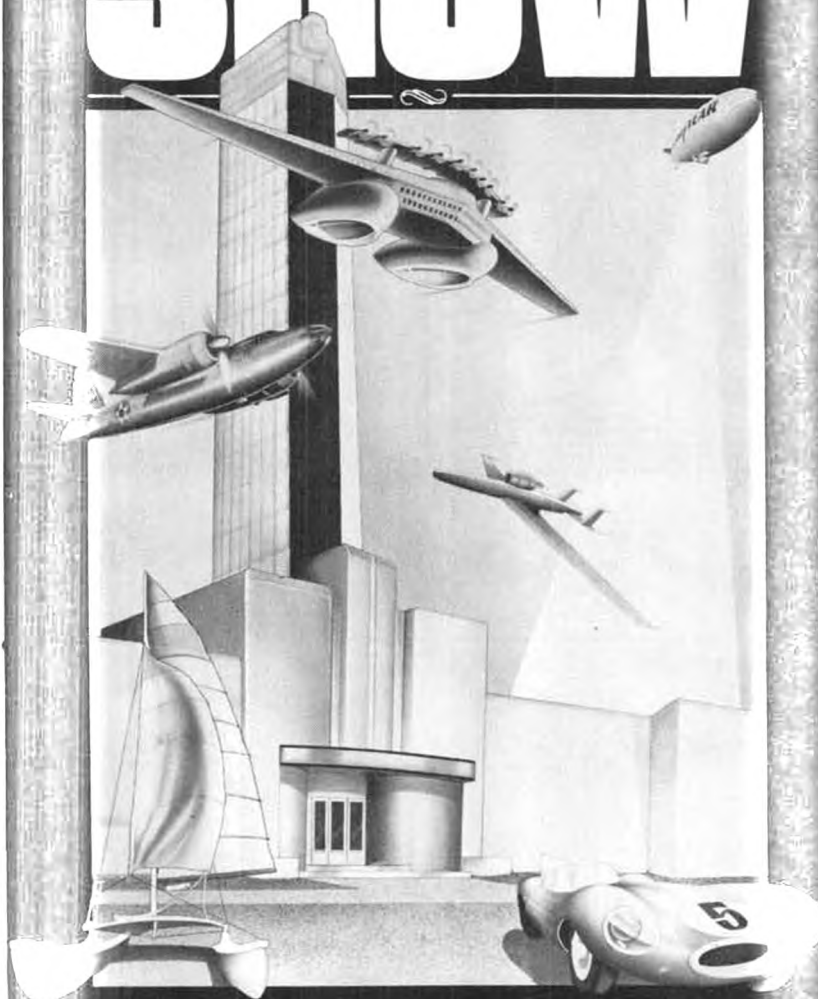
"Fluffies", seeds of cattails blown into the air, are also handy, not just because they will ride the light surface thermals that presage a thermal, but also because they will indicate a wind shift as it begins. For this reason I always have a few extras in my flight box.

That's about it. Practice, practice, practice, is what makes perfect. Watch ALL conditions the next visit to the field. Be aware of the conditions as you observe thermal pulses coming through, so you can launch and fly with more confidence, and **HAPPY HUNTING!**



**BREAKAWAY** . . Circulation; light and variable at the ground, with strong counter-clockwise rotation aloft. Much turbulence around bubble. Temperatures at surface show increase, due to heating by compression as air flows down and into area to fill vacuum left by bubble.

SOUTHWEST *the* MODELERS  
**buzz, roar & splash**  
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 Traffic jams of model cars.

It's the Southwest Modelers Show, and it's  
 all for fun. Come see.

**January 21st & 22nd**

Women's Building State Fair of Texas Dallas

Pylon . . . . . Continued from page 21

later they were ready for competition. The original plan had changed, however . . . Whit was the pilot and Bob the caller.

The AMA Nationals held in Riverside, California, this August, marked the tenth Nats that Whit has attended, and the ninth in which he has participated. It's fitting that this decade of activity started in California . . . at the Los Alamitos Nationals.

Between Los Alamitos and Riverside, Whit has been NMPRA Grand Champion (1969), represented the United States in the world championships (1972), and has won numerous local and regional titles. His trophies have become a major problem for his mother (who exercised her housewifely prerogative some years ago and banished many of them to the garage).

It's no exaggeration to say that R/C has been a way of life for Whit throughout his teens and into his twenties. He has participated in contests throughout the mainland United States, in Hawaii, and in England. On entering college in 1972, he found he had to restrict his flying to pylon, because of lack of practice time for pattern. Last year, 1976, was one of his best racing years . . . he won two of the four contests he entered.

Currently secretary of the NMPRA, Whit will return to the University of California, Berkeley, after the Riverside Nats, to begin graduate work in business administration. He received his bachelor's degree, with a major in architecture, from Berkeley in 1976 (in his freshman year, he received an AMA scholarship). His long-range plans include a career in real estate planning and investment . . . and continued participation in R/C modeling.

We're sorry to see Whit leave racing, even for a short period of time, but the nitro has obviously gotten into his blood, and there's little doubt that he'll be back racing after he's finished his graduate work. Good luck from all racers, Whit.

**QUARTER MIDGET  
 CHAMPIONSHIPS AND THE  
 DOOLITTLE TROPHY RACE**

On September 10 and 11, 1977, a total of 53 Q-M racers came to Rough River State Park, situated in the North-eastern part of Kentucky. I was unable to attend this spectacular race due to that back injury you heard all about last month, so we're publishing the results as sent to us by C.D. Shorty Holsclaw, and photographs taken by Allen Booth, for this column.

From talking with some of the flyers who attended, it sounds like a carbon copy of the previous years' races; beautiful fall weather, friendly hosts, more good food than could possibly





# ANNOUNCING!



## MODEL BUILDER magazine's

### FOURTH ANNUAL INTERNATIONAL

## Parcel Post Proxy Peanut RUBBER SCALE CONTEST!

#### SPECIAL ANNOUNCEMENT

Every peanut model, from near or far, will be proxy flown, indoors, by some of the U.S.A.'s best rubber scale flyers, including Walt Mooney, Bill Hannan, Clarence Mather, Bob Peck, Fernando Ramos, Bill Warner, and many others.

Local modelers will be allowed to enter, but their planes must also be proxy flown, and no verbal or physical help will be allowed from the owner . . . only written instructions to the proxy flier, as allowed for all entries.

*Because of the limited time available to MODEL BUILDER's staff for the purpose of properly conducting and staying on top of a world-wide postal competition, we have obtained the capable services of Chuck Conover, a local modeler and Peanut specialist, who will manage the 1978 contest. The result will be prompt processing of entries, score sheets, tabulation, prize awarding, and model return. We apologize for past delays and confusion, and assure you that it will not happen again!*

**Open to modelers from all parts of the world... any nationality... any age... any sex... come one, come all!**

AWARDS to include TROPHIES and MERCHANDISE . . . ALSO, a KRAFT RADIO SYSTEM to the

## GRAND PEANUT of 1978!

(HIGHEST OVERALL COMBINED STATIC AND FLIGHT SCORE)

Other prizes include such items as; Peanut Scale kits and materials, Astro Flight and VL Products electric motors, Brown Jr. twin and single cylinder CO<sub>2</sub> engines, Uber Skiver knives and sets . . . over 50 trophy and merchandise awards altogether!

**Contest Director: CARL HATRAK**

*Competition will be divided into five (5) classes: Pioneer, World War I, Golden Age, World War II, and Modern. There will also be individual awards such as; most distant entry, best shipping container, entry most damaged in shipping (Don't try hard for that one!), best entry built from Walt Mooney plans, best model by a female, best entry by any modeler under 15 years of age, oldest qualifying contestant, youngest qualifying contestant, best biplane (Big John Award!), best entry built from a Peck-Polymers kit, longest flight, most static points, plus a few surprises.*

**Chief Static Judge: RUSS BARRERA**

*Scoring will be based on the total of each entry's static scale points (100 maximum) and flight points (100 maximum). Static judging will be according to AMA Indoor Rubber Scale rules. Flight points will be the average of the two best flights out of four official flights (10 seconds minimum, 100 seconds maximum). Ties will be broken by highest single score, or a fly-off. Number of attempts to be limited, subject to size of total entry. DO NOT SEND UNTESTED MODELS! A three-man jury will preside over all decisions.*

**SCHEDULE: Register by mail on or before February 1, 1978.**

**Models to be on hand on or before April 1, 1978.**

**Contest to be held approximately April 15 to May 1, 1978.**

**Send in now for your registration form, which includes an entry blank, a complete set of rules, and other particulars. Write to:**

**MODEL BUILDER PROXY PEANUT CONTEST**

**621 West Nineteenth St., Costa Mesa, California 92627 USA**





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**Fox 19CL 23.95**

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The Fox 25 is lighter weight and burns less fuel than 29s or 35s yet has plenty of power to fly models calling for 29s or 35s. Starts easily. Runs reliably priced modestly. A truly fun engine.

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be eaten, and six rounds of fast and furious racing.

Tuned pipes were permitted, and this allowed lap times to drop slightly. To be competitive, you had to be capable of flying the course in the mid to high 1:30's consistently.

### TOP 10 FINISHERS

Name	Points	Best Time
1. Bill Weesner	24	1:34
2. Bob Ruether	22	1:35
3. Greg Doe	22	1:40
4. Bob Nelson	21½	1:34
5. Ronald Bressler	21	1:41
6. Gail Jacobson	21	1:36
7. Bobby Blouch	20	1:38
8. Al Grove	19½	1:39
9. Denis Beilich	19½	1:36
10. Dr. Bill Adams	19	1:45

Flyoffs were used to break ties for second and fifth places, in this contest for the Quarter-Midget Championships. As you can see by the list, Crazy Bill Weesner brought the marbles home to Indiana, as I (ahem) couldn't attend the event.

The 12 fastest fliers qualified for the grudge-type "Doolittle Race". Four heats were run to weed out the men from the boys, and Paul Zink, Lynn Stevens, Gail Jacobson, and Al Grove were to be the finalists in the last of many exciting races. Early in the last race it was soon obvious that everyone was using his best prop for this one. Though Stevens was a bit

erratic while zipping around the course, his superior engine/prop combination allowed him to finish about 10 feet ahead of Jacobson. Final order was Stevens, Jacobson, Grove, and Zink. In winning the race, Stevens also set the lowest time of the meet . . . 1:31.1. Jacobson was close behind with a 1:32.8.

HAPPY NEW YEAR! Hope it doesn't hurt too much. Jim

Mathes . . . . . *Continued from page 23*

point . . . Do not attempt to operate the equipment while the indicator is flashing, as total system failure is inevitable.

The electronics for the battery condition indicator is located on its own PC board, on the upper right side of the case. The LED flashing point is preset, and requires no adjustment or maintenance.

The transmitter current drain is 90 mils. Since this is an unvarying load, we can safely assume an "ON" time of over five hours being available with the 500 MAH battery being used. Bear in mind that this is not system time. Almost all systems have a much higher transmitter operating time capability than that of the airborne system.

RECEIVER

The receiver is extremely small, measuring only 1-1/8 x 1-3/16 x 7/8 inches, and weighing only 1-1/2 ounces, including harness. It is built on two PC boards of equal size, one holding the audio and decoder IC's, and the other, all the RF and IF and related circuitry. The layout is uncluttered and extremely neat, with no crowding of components. The latter all appear to be of high quality, with names like Texas Instrument, Fairchild, and Toko being in evidence.

Circuitwise, again no surprises. A double-tuned front end and half-frequency crystal oscillator are followed by the usual mixer, three stages of IF, and a detector, before going to the audio and decoder sections. Regulated voltage is used at various critical stages. Thus the receiver has the one-cell-out capability so important to getting your bird back on the ground in one piece in the event of a cell going out in the flight pack.

If one cell does fail, it does not noticeably affect range; your only clue will be a slightly less responsive airplane as the servos lose some of their "zip". Therefore, it is a good idea to train yourself to recognize the normal speed of the servos and controls, and to look for any loss of speed during your preflight.

The receiver current drain is 24 milliamps, which compares favorably with most others on the market. Antenna length is the more or less standard 36 inches.

### SERVOS

As in the rest of the system, the don't-fool-with-it-if-it-works approach has been followed in the servos. The proven and popular Dunham D-1 mechanics are used, driven by a single board amplifier designed around the Texas Instruments SN28640 Integrated Circuit.

Actual size of this servo, less mount, is 1-1/2 inches high, 2 inches long, and 3/4 inch wide, including ears, but not the height of the output shaft or the arm. The individual servo weight is 1-1/4 ounces, including arm and its 6-1/2 inch long lead. There are a lot of this type of servo flying around in airplanes as small as 1/2A's, so size and weight can be classified as average.

A smaller servo, using the Dunham D-5 Micro mechanics is available on order, at no increase in system price. This is the same mechanics as used by Cannon, D & R, and Ace R/C, but the motor, amplifier, and in some cases the gear ratio, differ from one brand to another. This smaller servo was not tested at this time.

The throttle connection is made by the use of a clever sliding arm fitting that permits precise adjustment of total pushrod travel. This

# FORMICATOR



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Used with a home oven and a hose type vacuum cleaner, the Formicator will make part after part with ease and speed—from Peanut Scale to giant-size R/C; fairings, cowls, wheel pants, detailed panels, wing tips, etc., etc. The only limitation is your imagination. We've worked on that too . . . the instructions are loaded with information and suggestions. The Formicator will open up a whole new creative world for every modeler. (We even put in some ideas for things wives can make for their craft projects!)

### KIT FEATURES:

No cutting or other purchase required to complete kit, (with the exception of a good quality white glue). All parts are precision cut from select, kiln dried wood and high quality aluminum. Zinc plated, quality hardware. All in fool-proof, easy to assemble, kit form with complete instructions for assembly and usage. Handles 8½" x 17" sheets of plastic.

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### ABS Plastic Sheets for the Formicator— All sheets 8½" x 17"—Packs Only

THICKNESS	PCS. PER PACK	PACK PRICE
.020 (1/50")	30	\$13.00
.030 (1/32")	20	13.00
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.090 (3/32")	6	13.00
Assortment Pack (see below)		13.00

Assortment Pack contains: 6-.020/ 4-.030/ 3-.045 2-.060/ and 1-.090 sheets. Any pack \$12.00 when ordered with the Formicator. ALL ABS is white only. All ABS packs shipped Postpaid in the U.S.—Foreign add \$2.00—For air in U.S. add \$2.00—For air to Foreign, consult your Post for 4 lb. air rate and include with order. International money orders only.



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Newark, Delaware 19702



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makes it possible to get the throttle set for maximum opening, proper idle, and cutoff at low trim.

The servo amplifier standing current is 8 mils, increasing to an average of 130 as the servo is operated with no load, and to 350 under stalled conditions. These are pretty average figures, and since they are constantly varying under flight conditions, it is not possible to calculate exactly how much flight time is available per charge. Just be sure that none of your controls bottom and stall your servos; you should be safe for 1-1/2 hours or so in the average airplane.

A complete set of servo mounting accessories is included, from grommets and screws to single, double, triple, and side mounts. Included also are a goodly assortment of output arms.

### HARNESSING

The receiver comes with two three-section block connectors on the end of four inch cables. One block provides for elevator, engine, and rudder servo connections, the other for the aileron and auxiliary channels. The second block also has pins protruding from it, which mate with the switch harness for power connections. The switch harness differs from many in that it does not have a plug-in connection between

the battery and the switch. The 8-inch lead provided is adequate in length for most installations, and in my opinion, leaving out this connector reduces the number of things that can come unplugged and ruin your fun.

The total harness length from battery to receiver is 15 inches, and a separate charge connector is found on the end of a five-inch lead. A separate 6-inch extension is furnished and will probably be most useful when used in the aileron position.

### CHARGER

A transformer-isolated, dual, wall-mounted charger is provided. It can be used to charge the system batteries individually or simultaneously, and has a separate LED charge indicator for each section. A minimum charge time of 14 hours is recommended, with 24 hours stated as being the maximum safe time. Our tests showed a 47 mil rate for the transmitter and 52 mils for the receiver batteries. These are considered adequate and safe values, and are in following with the minimum and maximum times as stated.

### WARRANTY AND SERVICE

The Mathes system is warranted for a period of 60 days from the date of sale to the original owner. The warranty covers all the defects in

material and workmanship, which makes it pretty well all-inclusive. It does not cover damage from misuse, accident, water or repairs or modifications done outside the Mathes facilities or service agencies.

The instruction manual includes some do's and do not's for when your system needs service. They are all pretty basic and common sense things, but can be considered as a good checklist. All service is being done by Moses R/C Electronics, for which there has been a change of address from the one in the manual. Chuck is now located at 925 N. Main St., Orange, CA 92666; (714) 639-8886.

### ROASTS

I really didn't like it all! But I realize that some of the things I didn't like are petty, and as personal as the colors that I pick for my airplanes, and have no bearing on the operation or reliability of this system.

For example, I am a thumb flyer, and find that the plastic ends on the sticks are sharp and uncomfortable. But before you start saying "Poor Baby", remember what I said earlier, that if it is comfortable, it is right. The reverse is also true, if you are flying around with something distracting you, you are doing it wrong. I eliminated this particular distraction by removing the slip-on plastic

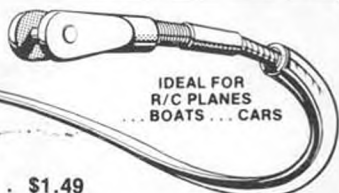
# DON'T LOSE CONTROL... GET HOOKED UP RIGHT!

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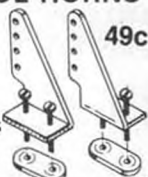
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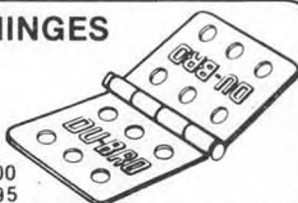


49c

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## DU-BRO PRODUCTS INCORPORATED

480 BONNER ROAD WAUCONDA, ILL. 60084

ends and installing a set of metal ends as used by Millcott Corporation on the "Specialist" transmitter. In addition to what is a more comfortable feel, I gained the adjustable stick feature which can also contribute to comfort and precision in flying.

These stick end pieces are designed for the same diameter rod as is used in the installed gimbal, and will slip right on with no modifications. Length adjustment is made by simply positioning the piece, and locking it in place with a twist of the top as the bottom piece is held. They are available from Millcott (see ad) for \$4.25, postpaid. The only fly in this particular ointment is that they are only available in a gold anodized finish to match the rest of their transmitter. I decided I could give up the "color coordinated" for the other features.

The other thing I didn't like is of an even more inconsequential nature; the X&@&# switch cover on the transmitter. It is of the flip up type, which remains up and gets in my way. Possibly it would bother us Mode One flyers more, but I've never felt the need for such a gadget, and it was also taken off. It removes easily, and is just as easily replaced with a 98¢ Kraft Switch Guard. But if you like the type, the one installed

is well made and is there for you.

My other dislike, more on the order of a suggestion, is a bit more on the valid side. If you lay the transmitter on its back, such as many of us do when starting the engine, you are going to get the back of it all scratched. It needs rubber feet. They've been installed on mine, and are available from Moses R/C Electronics at four for \$1, postpaid.

### FLYING

A considerable amount of flying time has been accumulated on this system. All of it was done on one of Archaeopteryx Airframe's "Safari" RTF birds, powered by one of the new Enya 40X engines. This aircraft being rather high off the ground, and with the antenna running externally back to the top of the stab, the 50 feet minimum ground range as stated in the manual was easily achieved. Other types of installations and other airplanes will doubtlessly differ somewhat. The important thing is to set a standard and to be wary if the range changes.

In flight, we gave it the works. Far and low, antenna pointed directly at it, turned on every transmitter on a different frequency that was at the field. Through it all, control was solid and reliable.

Generally, we feel safe in saying that if you install it and preflight it

properly, you need only concentrate on enjoying the flying.

### GENERAL

The suggested retail price of this system is \$400, on your choice of frequencies in the 27, 53, or 72 MHZ bands. You also have your choice of normal or Micro servos, and 500 or 225 MAH battery pack. A 180 degree Goldberg type retract gear servo is available at \$45. Extra batteries, in either capacity, are \$20, and a complete extra airborne system, tuned to your frequency is \$250. Dollar-wise, this is not a "Cheapie" R/C system. But then, it is not in that class quality-wise, either. Don Mathes has stated that his goal is not high volume production; the systems are virtually individually assembled. The payoff is integrity, performance, and eventual satisfaction.

Airborne system weight is 11-1/4 ounces, including servo mounts, of which 4 ounces is the 500 MAH battery. The use of a 225, 400, or 450 mil battery will result in savings of from one to two ounces. Even with the larger battery, the weight is not excessive and is more or less average. The use of the Micro servos will result in another ounce or so being saved. I have yet to fly servos of that size, but there is bound to be some reduction in available torque. So for average use, and as long as space permits and the one ounce is not critical, I am staying with the normal size servos.

The stick-to-servo travel movement was checked and measured, as I feel this is an important test of general quality that any of us can carry out and interpret. I found an average of 85 degrees servo movement, with only a 6 degree variation from least to most. Trim movement averaged out at 23 degrees, with 8 degrees variation least to most.

Most impressive, I found that in moving one servo from channel-to-channel, there was never over 3 degrees change in center, and two of the channels differed by only one degree. This is indicative of the fact that everybody along the way, including the set-up technician, cared. Setting up radios is dull and boring, nowhere near the challenge that troubleshooting and repairing can be.

To you, it means that you can move servos from one channel to another, such as you would want to do if one developed a questionable condition and you want it in throttle, with only the slightest re-trimming being necessary.

I found the servos to have minimal dead center, with no trace of "nervousness" or overshoot. Power and speed are acceptable for all uses, including Formula One. And while it hasn't yet, as it has been in a test



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plane, this one will soon see service in one of my Quarter Midgets, which is my way of saying without resorting to TV commercial superlatives, that I consider this to be a high quality and reliable system which I am not concerned about flying in an airplane that I built.

My type of flying does not require roll and spin buttons (yeeck!) such as are found on other radios, but if you ever get that "GO FASTER" button circuitry perfected, Don, I want one!●

**Plug Sparks . . Continued from page 26**

enough, if you wanted it inverted, this was \$1.50 extra), followed by the Standard at \$16.50, the Special at \$12.50 and the OK 49 at \$12.50. Almost a carbon copy of the Junior Motors Corp. of scaling prices on their Brown Jr. models B, C, and D!

Three-view drawings show the cleverness of the engineering at Herkimer Tool & Model, as all of the above engines had interchangeable parts. A commonality of this type allowed Brebeck to drop his prices so as to match Super Cyclone, which was then a strictly mail-order engine at a very competitive price.

To really round things out, the Herkimer concern offered a Raceway and Marine engine takeoff on each of

the foregoing engines, in an attempt to capture the car racing and boat trade. With the addition of a fly-wheel, prices jumped about three dollars on each engine.

The OK 49, which was simply a destroyed sixty, featured a three-piece welded crankshaft. The engine was clearly identified by the numbers 49 stamped on the left lug on top. Outside of being a 1/4 inch shorter than the Special, and a 1/2 inch shorter than the Deluxe, it was difficult to quickly spot the difference between the 49 and 60 motors.

It was also about this time that the Herkimer Tool & Model Company launched its intensive campaign of "A Snap to Start", indicating the ease of starting its motors. The columnist owned three in his day and found them fairly tractable. However, with the spark lever slightly advanced, the engines developed a mean streak and left their mark on many an unwary finger.

Although OK engines were generally accepted as pretty fair running engines, they never quite made the big time as did Brown, Super Cyclone, and Ohlsson (incidentally, in that order of succession). OK engines were a very much discussed engine, but one thing was certain, they enjoyed an excellent distributor-

ship and could be found everywhere; even in the Western Auto Stores!

For the technically minded, the OK 49 featured a .900 bore (as did the 60 motors) with a stroke of .775. The OK timer consisted of a steel trunion pin cast into the bracket. It was claimed that by reaming the breaker arm bushing to close tolerances, point flutter was eliminated over full speed range.

Brebeck took out Patent No. 2,179,683 for crankcase and cylinder design, with the cylinder mounting flange forming a separator between the transfer and exhaust ports. With transfer ports located below the flange connection to the crankcase and the exhaust ports above, it was claimed this eliminated (or minimized) the expansion of the crankcase cylinder extension, thereby eliminating leaks between cylinder and crankcase. This allowed the cylinder to be machined from a solid billet of steel, with no gaskets. Pistons (ground and lapped) were machined from solid steel, hardened, ground, and finally lapped. The wrist pins were steel, hollow-drilled, with aluminum pads to prevent scoring. All engines were provided with translucent bakelite type tanks which were impervious to all solvents such as gasoline, ether, benzol, alcohol,



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etc.

OK 49 motors were rated at 1/5 horsepower turning at 6500 rpm. Weight, complete with coil, condenser, and tank was 11-1/4 ounces. Not bad for a complete assembly!

One point worth noting in the OK brochure on starting and running of its engines is the interesting piece of advice which could be applied to engines of today: "Use a good quality propeller weighing 1-1/4 to 1-3/4 ounces for breaking in the engine. After break-in, select a propeller of one to one-and-a-quarter ounce weight that is *carefully balanced*. The use of a propeller light in weight will cause the engine to be difficult to start due to lack of momentum to carry the piston past compression. A light propeller will also cause the engine to vibrate excessively."

30 YEARS AGO I WAS. . .

Looks like this little section of this column may get to be real popular, as fellows enjoy hearing about the other guy and then recounting their own experiences in the "good old days". Here is the latest from Vic Dubery of England, an avid **Model Builder** reader (wouldn't have him any other way!).

Vic cut his aeromodeling teeth (now, there is a well turned phrase!) on Megow kits in 1935, and a lot of

old Flying Aces magazines. He has only one precious Flying Aces copy left (sob!). He has built replicas of the 1936, 1937, 1938, and 1939 Wakefield winners. Entered the United Kingdom Team Eliminations in 1939 with a "streamliner". Eventually he did make the British team in 1954, for proxy flying in the USA (Jerry Kolb, are you still there?).

With this background in mind, Vic never completely gave up modeling, even when in the Mid-Atlantic in 1943. At that time, he was serving with the 811 Squadron, Royal Navy, aboard the carrier HMS Biter, for convoy protection. The aircraft in use then was the Fairey Swordfish (a torpedo carrying plane). Occasionally, when the weather was bad, and particularly at night, every so often, a Swordfish would go splat. The resultant ditching would ruin the undercarriage (landing gear in Americanese). Before being scrapped and heaved over the side, Dubery would lay claim to the "step" in the vee of the leg struts. Underneath the formed dural was a filler . . . you don't have to guess twice . . . balsa-wood! This stuff was unobtainable since 1939!

After laboriously making his own sheet and strip stock from the odd sized block, Vic built peanut-size models while on standby in the

crews room. When off duty, and there was sufficient room in the hangar (when aircraft were out on patrol), Vic would fly his models. That ought to be some sort of a record, 1000 miles from the nearest land!

Hopefully, we'll get some more stuff from Vic on how he was able to come up with other modeling supplies, such as rubber, covering, cement, etc. Sounds like fun!  
**17th ANNUAL STOCKTON O/T**

It hardly seems possible to this writer that seventeen years have gone by so quickly. It only seems like eight or ten years ago, the first old-timer contest was held at Sacramento. Man, is this Annual starting to get a few whiskers on it!

Despite the cries that the columnist is strictly O/T R/C oriented, this is one of the writer's favorite contests. Don't miss these very often! Held on the same days as the Fresno Annual, at the same site, an astonishing 81 entries were noted in the good weather. Quite a few models drifted off in the afternoon breeze, and by the time the count got up to 7 O/T models lost, an airplane was chartered to find the errant ones. Imagine the surprise of the pilot when he found a "downer" of an area wherein there were 12 to 15 models! Talk about making a profit!

(We're only kidding, as there were quite a few modern free flights out there from the joint Fresno Annual.)

Because of the badly overcrowded old-timer contest schedule this year, the Annual North-South Contest was held in conjunction with the Stockton Annual. This gave the meet a little added spice. As usual, the AMPS (although outnumbering the southerners) lost to the SCAMPS and SCIFS by a rather lopsided score of 22 to 14. Maybe if "we" eliminated Sal Taibi and a few of the other boys, the score might even out a bit.

Something new was added to the Stockton Annual this year, with the inclusion of the First Annual Swap Meet. The Fresno Club handled most of the preparations (including the site). Although attendance wasn't that great (Persson was expecting a real heavy turnout in Fresno for a first-time thing), the swap meet turned out to be a good one, with numerous items being traded and sold. Next year should see a much heavier participation, as many of those attending weren't exactly sure how this Swapfest would turn out, let alone being held!

Back to the flying saw Sunday with a real day of thermals all over the place. Class A turned out to be the real dog-eat-dog event, with son Greg nosing out dad, Al Rasmussen, both at 20:00 mark. Jim Persson beat Larry Boyer's good time of 14:21 with 16:04 for third. The competition was alive!

Other winners featured Abe Gallas again winning .020 Replica, Larry Boyer topping the field of 30 Second Antique Models, Jim Adams copping Class B, while Chris Christenson, of Bakersfield, won Class C. In old-time rubber, Bill Langenberg easily outdistanced all others with a 20 minute flight total. Interestingly enough, Charlie Werle pulled a fourth place with one out-of-sight flight with his Schmaedig Twin Pusher. Beginning to see more and more of these old-time pushers. They do fly well!

Full credit for promotion of the meet and the tremendous trophies and merchandise should go to Russ James, of Fresno, for his tremendous PR work. His tireless efforts really paid off and those who skipped this meet have only themselves to blame for missing out on all the loot! See you next year on the last weekend of September.

**WESTERN OLD-TIMER  
F/F R/C ASSN.**

For lack of a better name, this will do until some bright lad thinks of one. But regardless of a name, something like this was bound to happen, with the formation of the So. Cal. Club, the 49ers, making the fifth O/T R/C Club in California.

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A special meeting was called by John Pond, SAM V.P., inviting representatives of SAM 21, 26, 27, 32, and 49 to attend. The primary reason for the meeting was to stress fewer and better contests rather than having every club running off and staging a dozen poorly attended meets.

All clubs were in agreement with this idea, as it did not exclude any small get-togethers any of the individual clubs might care to stage. After considerable discussion, the following months were assigned, with the individual clubs to come up with suitable non-conflicting dates with other O/T F/F activities (whenever possible):

February	SAM 27
March	SAM 30
April	SAM 21 Texaco (Taft)
May	SAM 21 .020 Annual Memorial Day 5 Club Meet
June	SAM 49
July	SAM 27
September	SAM 21
Oct. 14-15	SAM 26 Pond Commemorative
November	SAM 30
December	SAM 49 Texaco (Taft)

All clubs are to notify the Chairman (Pond) as to dates so that they may be properly publicized.

### MEMORIAL DAY O/T R/C ANNUAL

As part of the business being conducted at the Santa Maria meeting, the idea of a three-day Old Time F/F Radio Control meet was brought up by the columnist. As originally suggested by Otto Bernhardt, this date appears to be the best available. Some objections arose as it was felt some old-timer flyers would be unable to attend O/T functions at the U.S. Free Flight Champs and this proposed O/T R/C meet. It was pointed out that the majority of the members of all clubs do not attend the USFFC; hence, there would be no conflict of interests.

Upon the recommendation of the chair, Russ James, of Fresno, was appointed Contest Manager. His

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duties would consist of field procurement (in the Fresno area), arrangement of block motel reservations, publicity, prize arrangements, field facilities, you name it!

No Contest Director was named, but it appears the columnist may inherit it by default, unless an eager volunteer can be found. We'll carry more on this in future columns.

Tentatively, events would shape up something like this, spread over three days: Glow events, Class A, B, and C, Ignition events, Class AB combined and C, Antique, Texaco, and .020. Looks like a full schedule

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### FLORIDA FUN

Terry Rimert reports as a follow-on to the George Perryman episode at the O/T Nats Dinner, that George is almost over the shock of the Mulvihill Trophy award presentation. To keep him in line, Terry has put a bounty on him. Sez this will keep George from getting the big head. To further sweeten the pot, Rimert is giving extra prizes for anyone who beats George. Now that's getting to be rough competition!

Reports on the Jim Kloth Memorial O/T and Turkey Fliers Contest at Pensacola suffered from lack of entries. Same old problem, if you don't advertise, the modelers don't know about your meet! Truly a shame, as Jim Kloth is well worth remembering for all his activities in Florida modeling.

"Anyway," sez Terry, "I had a smashing good time. My Playboy is now doing better loops than it was at Riverside. More spectacular when it crashes!" Between running, busting an Orbitier into an antenna wire, and powdering his .020 Replica Foo, Terry had a great time.

Ron Sharpton, not to be outdone, borrowed Terry's hot fuel after overhauling his ignition system, and proceeded to show Terry how to really

loop a Foo. By the way, as a side note, Bryton Barron went into the hospital for a checkup, and they kept him there. The hospital personnel is still trying to figure out why he is in such good shape. Easy! Fly Old Timers!

Looks like the Jim Kloth Memorial may be renamed the McNeill Benefit, as Jim ran off with half of the loot. Terry sez he pulls models out of his car trunk and puts them up like they have been flown before and completely trimmed out. Everyone knows that's against the rules! Haw! Might even disqualify him!

Other winners were McGloughlan in O/T Pylon, Sharpton and Ralph Jolbert in .020 Replica. The rest McNeill got! To round off a great contest, Caroline Kloth came over to help out with the officiating and to award the prizes. How appropriate an end to a very promising contest!

### MIDWEST ANTICS

Received a most informative letter from Don Jenkins, of Indianapolis, who writes to say the 15th Old Timer Bash at Bong came off on September 11 with everyone having a great time.

Bob Larsh finally lost his 15-year-old Brooklyn Dodger in the usual Bong wind. No results, but Tim Banaszak sez it was a good meet.

Jenkins goes on to say the CIA (Central Indiana Aeromodellers) meet held at Wright Patterson Air Force Base was "blessed" with Bong AFB type winds. As also noted by Harry Murphy, Editor of the CIA Informer, quite a few models bit the dust in the high winds. However, "Murf" sez WP AFB is still large enough for two-minute flights no matter what the wind. Great stuff! Just what was needed in this area . . . a flying field!

Noted was the flyaway by Buck Zehr's Playboy, with a full tank of gas. The model went into the over-cast, still snorting, because of an inactivated timer. The D-T timer must have been set for a minute and a half as the motor ran for 1:48, resulting in the darndest spin you would ever want to see! Model landed about a mile downwind with very little damage. How lucky can you get!

Compare that with Harry Murphy ruining his Demon on a crosswind launch. Another cartwheeling model, John Peck's Playboy, was another "lucky" with John taking bids on his "two piece" wing. (This is a direct quote from Harry Murphy.)

Jenkins' boy, Don Jr., had the boys guessing for quite awhile as to what kind of old-timer he had when first putting his Air Warden on the flight line. As some wags said, it looked like a Buccaneer with a gland condition.

Results, as appearing in the Informer, show Bill Hale winning Class A-B O/T and Bob Larsh copping Class C. In closing off his commentary, Murphy looks for a real renaissance in free flight now that the Central Ohio Free Flight Club has been successful in obtaining the use of Wright-Patterson AFB. Maybe we'll even get a SAM Chapter going!

### EAST COAST

#### OLD TIMER CHAMPIONSHIPS

The SAM 7 "Yankee" newsletter didn't carry very much on their highly successful East Coast O/T Championships held at Wendover AFB. The Champs enjoyed one of the best days ever seen for flying. About the only wind noticeable was some later afternoon shifts. In short, conditions were superb and practically every model had a good flight!

About the only contestant who has not come down to earth yet is Bob Bissett, of Baltimore, who won the Wahl-Brown Jr. custom engine so generously donated by Herb Wahl. Bob worked hard to get it, as the competition was pretty fierce.

To sum up the SAM 7 Newsletter, this year has been excellent for flying, and believe it or not, no contests had rain! Attendance was always over 65 individual entries. Everything was lovely! As the SAM 7



Club puts it: "Flying with SAM 7 is flying for Fun and Enjoyment" Couldn't have put it better myself! DECALS, DECALS!

Not content with his previous offering of re-created old-timer engine decals, Larry Vance, of 5066 Cindy Lane, Las Vegas, Nevada 89102, has now produced several more sheets of assorted old decals.

Old Timer modelers will be particularly pleased to see the old Academy of Model Aeronautics decal with the center circle of NAA. Of course, to properly decorate your model indicating the engine, Larry offers decals of Dooling, Phantom P-30, McCoy, Drone, Bunch, Ohlsson 23, K&B Torpedo, and even for the rubber fans, "T-56 powered!" How about that?

Vance has gone to considerable trouble and investigation to make them exact in size, coloring, and type lettering. For the fastidious modeler, these decals are best quality, will lay flat, will not crack, and with proper application, can be fuel proofed.

The set of decals (now available!) sell for \$7.50 postpaid. Before you back off on the price, this includes 23 varieties on six sheets. Actually, you receive two sheets of each style. Worth noting the price is now a 50% reduction over the first set offered some time back.

You won't be sorry if you order them, as the columnist was more than pleased at the beautiful reproductions. Gettun while they're hot! THE WRAP UP

Almost missed it in the Nats News put out by Les Hard, Editor at Riverside AFB during the Nationals. This could so easily apply to old-timers and in particular old-timer FF radio controlled, that it isn't funny. Try these rules that were the actual regulations governing the operation of full scale aircraft in the early 1920 era.

1. Don't take the machine into the air unless you are satisfied it will fly.

2. Pilots should carry hankies in a handy position to wipe off the goggles.

3. In case the engine fails on take-off, land straight ahead regardless of obstacles.

4. No machine must taxi faster than a man can walk.

5. If you see another machine near you, get out of its way.

6. Do not trust altitude instruments.

7. Pilots will not wear spurs when flying (How about that one!).

8. If an emergency occurs while flying, land as soon as you can. (You're telling me!)

Ridiculous and absurd as some of the old regulations seem to be, the



Ralph DeFalco, RC model airplane enthusiast and his scratch-built, 1"-1", stand off scale P-61 Black Widow.

main point is to be safe whenever you fly. Let's not be stuffing our models into the parked car area! We're having fun; let's keep it that way!!

**Madman . . . . . Continued from page 29**

available, the fuselage can be straightened out as on the original Madman. Other than this, the Madman is an exact reduction and was scaled photographically. Ordinary materials are used throughout, as in the kit version. So you don't have to send away for fiberglass or foam parts in order to get started.

**CONSTRUCTION**

## "Midwest Micro-Cut Balsa... it's the better scratch-builders' balsa."

When Ralph DeFalco of Oak Lawn, Illinois, began work on the model he's always wanted to build, he built with Midwest Micro-Cut Balsa.

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Since the wing is tapered in every possible direction, a wing jig is necessary to insure alignment. A simple temporary jig can be put together as shown in the photo. The spars are assembled over the plan to obtain the proper dihedral and thickness taper.

The spar assembly is then lashed to the upright blocks on the jig, using rubber bands. The ribs and trailing edges are aligned, and the entire wing is glued up at one time. Zap, or equivalent, is good for this, since the adhesive is applied to the outside of each joint without disturbing the alignment. After adding the leading edge, remove the wing from the jig



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and install the planking. Tack glue the wing tip blocks in place. After carving and sanding, they are removed and hollowed.

The tail group on the original Madman was carved from thick balsa sheet and the same procedure is used here, except that the center portions are cut out and sheet balsa ribs are substituted to save weight. After tapering the blanks linearly to 1/8 at the tips, sand to a symmetrical airfoil shape. Then cut out the centers where shown.

The fuselage structure is a simple box, with embellishments added here and there to give it a pleasing shape.

Begin by cutting the fuselage sides from medium 3/32 sheet. Epoxy or contact-cement the ply doublers to the sides and assemble the fuselage upside down on a true surface by using the firewall, F1 and former F3 for alignment. The T-nuts for the engine mount should be installed on the firewall before assembly. The firewall is set so there is no engine offset. Add the braces to the fuselage sides aft of the cockpit area and bring the rear together at the tail post. Next, add former F2, the servo rails and the stabilizer platform. The engine should be trial fit at this time. Glue in the blocks for the cowling and the ply spinner ring, after adjusting the length of the cowling blocks to provide about 1 mm clearance between the spinner backplate and the spinner ring. Save the carving on the cowling until after the wing and fuselage bottom pieces have been added.

The completed wing should be installed after the stabilizer and fin. It is likely that the wing cutouts in the fuselage will not be exactly true, so the stabilizer provides a good reference for alignment of the wing. After the wing is installed, some of the leading edge planking will have to be cut away for installation of the landing gear bulkhead. Sew the gear wire to the bulkhead with carpet thread or copper wire and epoxy this into the slot in Rib No. 1. The ply faces on Rib No. 1 carry the landing gear loads back to the spars. Some additional reinforcing may be added in the form of glass cloth or blocks, if desired. The gear wire is lighter than normal to act as a spring shock absorber.

The radio and pushrods should be added while the fuselage is still open. The 2-channel brick radio is mounted to the hardwood rails that have been epoxied across the fuselage and to former F2. You may choose to install Nyrods, but 3/16 square hard balsa wrapped with tissue and doped would serve, since the pushrods are straight. When the controls have been checked

for clearance and freedom from binding, add the fuselage bottom planking and the built-up turtledeck.

Leather fillets were supplied in the Madman kit. These are again available in hobby shops, and are superior to the usual putty fillets because they are not messy, require no sanding, and will not crack out.

The Tee Dee 049 should be set up for pressure operation. With previous models, I have found that a non-pressure system using a 2 oz. tank is unreliable. In order to clear the cowl, a 90° elbow made from brass tubing should be epoxied to the crankshaft pressure fitting. Note that the TD does not have the pressure line drilled clear through the crankcase. Follow the manufacturer's instructions when drilling the crankcase.

The wing structure is quite strong, and does not depend on silk or silkspan tissue covering for strength. Plastic films may be used, but I chose the classic silkspan and dope finish to be authentic with the period. The wings and tail surfaces are tissue covered and the finish is built up with talc mixed with Aero Gloss clear. The paint scheme matches the original Yates Madman and is overall light blue with dark blue trim and black striping. The AMA numbers on Yates' Madman are gold decals outlined in black. These are no longer available, so I had to settle for the pressure-sensitive type. FLYING

The newcomer to 1/2A ships of this type will require some psychological orientation. Although not faster than larger pattern planes, the apparent speed is greater because of the smaller size. Depth perception is also affected, especially if you regularly fly larger models. These difficulties will disappear after a little practice, but first flights should be high and cautious. The hand launch is the only practical method of taking off, since this model is a tail-dragger with poor directional control on the ground. Needless to say, ground looping is a problem with this configuration. Launch smoothly straight ahead and avoid massive control inputs until altitude and speed are reached.

With a 225 MAH battery pack, my model weighed in at 21 oz. No ballast was required to trim to the CG shown on the plans. Initial flights could carry a slightly more forward CG, for safety. As flight experience is gained, the CG can be moved back until the model is able to snap roll smartly with full rudder and elevator.

For better roll performance, you might consider substitution of strip ailerons for the rudder. However, this is a scale model, in a sense. So ailerons just would not be authentic. My object was to exactly duplicate the classic Madman in the 1/2A for-

mat. What resulted is a fine looking model that is fast, responsive, and great fun to fly.

#### ACKNOWLEDGEMENTS

I would like to thank Mr. J.C. Yates, Mr. Bob Palmer, and Mr. J.A. Miske, for their contributions of historical and documentary information. •

Stand . . . . . Continued from page 33

The base is longer than the size of the box, both front and rear. The front part acts as a leg out front, to keep the whole thing from tipping over when called upon to hold that new 1/4-Scale powerplant. The back leg, shorter, has a hole through which a screwdriver or large nail can be inserted into the ground for added anchorage. Maybe you won't need either one, but it is better to be safe than sorry. One coat of K & B polyester resin overall, effectively fuelproofs the base forever.

We have found this MRC/IM Products Engine Test Stand a worthwhile addition to our support equipment. It allows us to safely and conveniently break-in, test, and otherwise run our engines. If the \$34.95 selling price is considered as too high for your individual budget, it certainly isn't too high for a team or club purchase. In fact, an ideal set-up would be a permanent installation at the club field, with a waterproof box or even a plastic cover to protect it from the weather. (Also a burglar alarm! wcn)

And for those of you in the "with enough power, anything will fly" school of thought, remember that it will probably take a lot of elevator just to get it to rotate. . .

This is an appropriate time and location to publish the Standards and Warnings with respect to using propellers safely and properly. These standards were developed in cooperation with propeller, model engine, and kit manufacturers, and were compiled and published by Top Flite Models. MRC includes a set of these Standards along with its Engine Test Stand Instructions.

#### INSTRUCTIONS AND WARNING SHEET — HOW TO USE PROPELLERS SAFELY & PROPERLY

The failure to read and follow instructions, abuse or misuse, may result in serious personal injury!

1. For correct propeller size and pitch, follow advise of engine manufacture or prop chart available free from dealer or Top Flite.

2. Install prop with curved side facing you. Securely tighten propeller nut; use correct wrench for this purpose.

3. When starting engine, keep spectators away (20 feet or more) and out of path of rotating prop.

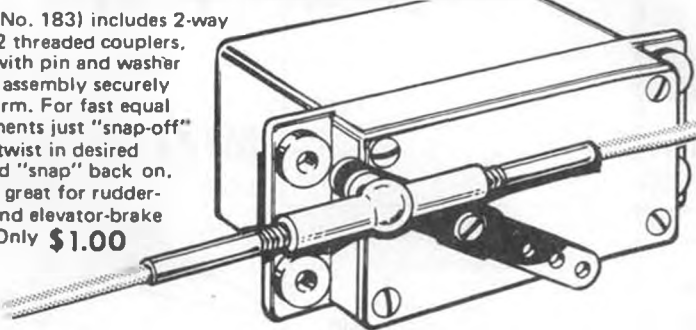
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4. Keep hands away from prop as much as possible; use "chicken stick" device or electric starter; follow instructions supplied with device.

5. Keep face and body away from path of prop as you start and run engine.

6. Make all engine adjustments from behind rotating prop.

7. To stop engine, cut off fuel supply or follow engine manufacturer's directions. DON'T use hands, fingers, or any part of body. DON'T throw anything into a running engine.

8. Discard any props with nicks, scratches, splits or cracks or any sign of wear or damage. Never repair, alter, shave or bend a prop! Normal engine vibration can loosen a prop; inspect and retighten if necessary!

#### ADDITIONAL PRECAUTIONS

A. Use safety glasses when starting or running engine.

B. Don't run engine in area of loose gravel or sand; prop may throw such materials in face or eyes.

C. KEEP AWAY FROM PROP: Loose clothing, shirt sleeves, ties, scarfs or loose objects (pencils, screwdrivers) that may fall out of shirt or jacket pockets into prop.

D. Make certain glow plug clip or connector is secure so that it will not pop off or otherwise get into running prop.

E. If a spinner is used, be certain its edges do not touch the prop blades.

#### ADDITIONAL SPECIAL WARNINGS AND INSTRUCTIONS FOR NYLON PROPELLERS

Nylon props are affected by amount of moisture in the air and will become brittle and break if too dry. Since amount of moisture may vary greatly from time of manufacture, do

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3. After use of prop, remove from engine, wrap in moist cloth, paper towel or rag and store in a watertight plastic bag.

**Bull Pup . . . . . Continued from page 31**

or anywhere else. A quick call to Tom Williams of Craft-Air confirmed it; the balance point was left off the plan by mistake. All of the Bull Pup plans still at the factory have had the balance point added with a rubber stamp, but there is still a number of kits in the hobby shops that were shipped before the mistake was discovered. For those who happen to get one of these, the correct balance point is on the spar.

My model weighs 36 ounces ready to fly, which is four ounces over the maximum weight listed on the plans (no doubt due to the heavy radio). With a wing area of 269 square inches, this translates to a wing loading of slightly over 19 ounces per square foot. Not real light, but then it's not really heavy either. The extra weight doesn't seem to have any bad effects on the airplane's performance, so don't be concerned if your model

comes out a little over the 32 ounce maximum weight shown on the plan. If you don't tell your plane, it'll never know the difference!

The Bull Pup is really a fun little ship to fly. The O.S. 10 is plenty of power for it, even though the ads say .09 to .15. With limited control surface deflection, the airplane is docile and would make a great trainer. With full back stick, it just sort of mushes along and refuses to break into a stall, thanks to the flat bottom airfoil and the use of washout to prevent tip stalling. Don't neglect the washout; it's important for safe, slow-speed flight.

Increasing the control surface deflection makes the model surprisingly aerobatic for an airplane that doesn't have ailerons. It will loop, of course, but it will also do some of the best rudder rolls I've seen, and in a spin it winds up like a runaway Maytag! The ground handling is excellent, and there is none of the ground looping tendency that a model with conventional landing gear is supposed to have. In fact, the Bull Pup is more stable on the ground than some of the trike-geared ships I've seen, prob-

ably because of the low center of gravity.

This was a fun project from the start, and I doubt that anyone who builds one of these models will be dissatisfied with the kit or the model's performance. The Bull Pup retails for \$34.95 and is produced by Craft-Air, 7851 Alabama Ave., Canoga Park, CA 91304.

**Soaring . . . . . Continued from page 41**

time in a most relaxed attitude. Trouble is, flying like this fails to convince any spectator that it's a difficult art.

For those of you who take model photography seriously, may I suggest that you look into some equipment now available from Burleigh Brooks Optics, Inc., Hackensack, New Jersey. They offer the Novoflex Auto-Macro Outfit for use with 35mm cameras. Here you can move in on your subject down to eight inches. They also offer a Squeeze-to-Focus Pistol Grip and Close Focusing Bellows, adapted to your camera, with a rifle stock outfit which consists of a metal rifle stock, forward trigger handle, and cable release.

With this equipment, you can go into action as the aircraft maneuvers overhead. It provides accurate sighting and focusing and facilitates tracking through their unique Trigger-Focus feature. You sight through your camera as you hold the lightweight unit with both hands, and shoot from the shoulder. One hand triggers the lens head forward and back for instant focusing from closeup to infinity. The other hand triggers a rapid shutter-release connection to your camera. They offer a choice of 600, 400, or 280mm interchangeable, color-corrected lenses.

Lloyd Standley of the Torrey Pines Gulls enjoys his Beaver (although the pilot in his cockpit looks more like a mouse to me). This plane, produced by Pilot, weighs only 17-1/2 ozs., with 44-inch span in the glider version. This produces a 9 oz. per square foot wing load. Lloyd increases the rudder area to provide more positive control. The craft flies well and provides loads of fun.

Rocket City Industries now offers a releaseable towhook which can be mounted inboard of the fuselage. They suggest cutting a 1/4-inch slot, then mounting this plastic device so there is no protrusion. This is particularly appropriate for scale models. The release lever is inclined 15 degrees forward, and has been tested up to 72 pounds load. A simple servo connection is all that's required. In the lock position, the towhook takes a special long thin winch ring which can be



attached to the usual circular ring. A support servo can be used, or the control wire can be coupled to the spoiler or elevator servos. For example, full spoiler extended or down of the elevator servo could be made to trigger the release. I expect we'll be seeing quite a number of these in the near future.

While talking with Phil Kraft, of Kraft Radio Systems, the other day, he mentioned that we might go for a ride in his Fournier full-scale powered sailplane. I didn't let that remark slide by, and so last Saturday. . .

You unfold the wings, crank up the Volkswagen engine, and leave the ground at very slow speed. We circled at a thousand feet, climbed to 3,000, changed the trim, and cruised down the coastline from Oceanside to Torrey Pines. Turning inland, he cut the engine, and the silence was golden. Very few thermals, so we sank at about 100 feet per minute. He dived to assist engine start-up and we returned to Oceanside for a perfect dead-stick landing. It was fun to watch Phil adjust the final approach with the spoilers.

That flight gave me renewed interest in scale. I've now had sufficient stick time on my 1/4 scale Kestrel 17 to report that it handles easily in spite of its remarkable size (14 foot span) and speed. There is a slight pitch down as the spoilers are actuated, and a pitch up when you drop the flaps. I must remember to drop the wheel before landing and to flare so as to impact with only the eight pounds this bird weighs. The roll-out is brief and beautiful. In flight you can't tell that it's not full scale. For this reason, it takes concentration to judge the range.

I've also learned the great importance of a clean radio installation . . . especially when there are six servos. It's crucial to keep the receiver as far as possible from the servos and extend the antenna away from those "troublemakers." I'm using a 1000 mah battery pack for extra insurance. Can't be too careful about this beautiful bird. ●

#### R/C Auto . . . Continued from page 45

get brittle (work-hardened) and break. I suppose it is only fair to mention that I have only had this happen on a Jerabee electric R/C car that has many, many hours of running on it. Due to their ease of operation, the electrics simply get run to death. You'd have to be a real fanatic to run a gas car as much as an electric car. Still, the steering link is a nickel 'n dime item that I feel ought to be replaced occasionally, just to be on the safe side.

Even though Bob prefers the stock wire linkage, I continue to use ball

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links on my cars. I do this because I am still learning about the handling of these cars and like to experiment with toe-in, toe-out, plus being able to adjust centering easily. With the ball links and/or nylon clevises, each adjustment can be made in controlled and very small amounts, something that the stock wire pieces do not offer.

Bob sets the toe-in on his cars using the infamous eyeball method, and due to his experience, gets away with it. You probably can too, as the MRP chassis plate sides are parallel, providing a reference line to judge toe-in. For those with rulers and a conscience, Bob likes to have 1/16 to 3/32 toe-in on his cars. Whatever works for you is what you should use.

After lots of running, the six-spoke front wheels, even though they are bushed, will wear and get a bit sloppy on the axle. Don't worry about it. Front rubber used is stock stuff, narrow though they may appear to be. A little running time to get mold lines scuffed off, and they are the hot tip. I have seen guys chuck a front wheel/tire assembly in a lathe and scuff the tire down, but it doesn't seem to be worth the trouble.

Running a set of wide foam tires on the front may seem like the way to go, but they only make the car a little unstable on the straights, plus

giving you more front bite than you need or want in the turns. If you're a brodie freak, run foams in front, otherwise stick with stock rubber.

At the '77 ROAR Nationals, when the bite started to come in pretty well, Bob started to notice a bit of straight-line instability creeping into his cars. This was traced to the tripod-mounted JoMac radio shifting slightly on the chassis. As the radio would shift, slight steering inputs would be made. Due to the amount of traction at the Nationals, any steering input showed up where previously this problem had not been noticeable. A temporary fix was to shove paper wedges in between the radio and the inboard ends of the A-arms. This held the radio more securely and eliminated the problem. Since then, Bob has changed the tool used in making the chassis plates and the radio fits snugly (not tightly) between the A-arms. If you have an earlier chassis and run on a good bite track, try this trick. If most of your racing is done on grease-pit tracks, forget it.

One of the great points of discussion in R/C car circles is on the subject of how to go about getting more understeer or less understeer. Notice that we aren't going to talk about understeer or oversteer. A full-sized car with oversteer can be a bit of a

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handful, especially something like a Porsche that is capable of quickly going from understeer to oversteer in a hard corner taken at racing speeds.

In an R/C car, true oversteer is an impossible situation due to the fact that you are not actually in the car where you can feel the back end kick out and then control it by the seat of your pants and an educated right foot.

In both the MRP and Jerobee cars, the degree of understeer can be varied by changing the front spring rates. It would be real nice to be able to tell you which way to go with the MRP chassis to get the degree of understeer you want, but there is some disagreement on this, even within the JoMac/MRP Racing Team. When doing the tape for this article, almost everybody at JoMac got involved, and all seemed to have a slightly different idea on how spring rates, weight transfer, steering under power, steering under braking, chassis tweak, etc.,

worked to produce the desired steering. Trying to hash this out was great fun and made a dynamite tape that is really fun to listen to (Welch and I are planning to play it over the JoMac intercom system some day). However, we didn't come to a concrete conclusion.

But that's OK, as the important thing is to know that changing front spring rates will have a definite effect on the amount of understeer your car has. To soften the spring rates, simply cut a coil or two out of the spring and reinstall it. To harden the springs, just slip a washer or two under the "E" ring and on top of the spring. Do not simply stretch the springs. They'll just get sacked out, putting you right back where you were initially, plus it is difficult to stretch the springs to exactly the stiffness you want. With the washers doing the stiffening, much more consistent results can be obtained. When going out to practice, just take a bunch of new springs and a handful of washers. They're cheap and deserve some attention, if you expect to get the handling you want.

Above, we have talked about changing understeer, but by changing the spring rates, you can also compensate for a slightly tweaked chassis. If the car is turning to the right better than it is to the left, try stiffening or softening the spring at the right front wheel. In the left hand turn, the right front is the outside wheel, so that's the one to play with. Make notes on how the change affected the car, then go a step further (add more washers or cut out more coils) and again note the difference. If you pay attention to what is happening, it

won't be long before you know what works for your car and track surface.

The most important thing to remember, and the bottom line on this bit about changing spring rates, is to be aware of the fact that spring rates do affect handling, and that your car should be set up to match your own driving style to the particular track on which you are running.

Last thing concerning the front end, is caster. In stock condition, the MRP has no caster, the king pin being upright in relation to the chassis plate. It has been found that by raking the king pin back 5- to 10-degrees the car is more stable in a straight line. The added caster does not seem to make any difference in the turns, although it would seem logical that the car would be easier to get pointed straight when exiting a turn.

To get the caster, Bob simply clamps the A-arm assemblies in a vise and twists in the amount of caster he wants. Sounds crude, but he does it this way for a reason. If the caster is put in by shimming with washers between the base of the A-arm and the chassis plate, the chassis plate is pre-loaded. Not only do the mounting screws go through the plate at an angle, but the washers themselves put a pre-load on the chassis. By twisting the A-arm, it still mounts flat to the plate while giving the required caster.

Another solution is to face off the base of the A-arm at the 5- to 10-degree angle on a lathe. What I personally do is to use Sterling Models nylon thrust wedges (stock No. 105). These little wedges are molded in 1, 2 and 3 degrees increments and are normally used for making thrust adjustments on model airplanes. I stack a 2 and 3 degree wedge one on top of the other and underneath the A-arm. An advantage to using these wedges is that the amount of caster is known, making caster changes more meaningful when experimenting. Also, the amount of caster can easily be changed at the track.

Either in cranking caster with the wedges, or facing off the base of the A-arm, lowers the front end of the car a little bit, which supposedly ought to help handling some. On the other side of the coin, both of these methods puts a slight bind on the chassis plate, as the mounting screws still go through the plate at a slight angle. Still, these two methods are much better than shimming with washers and the amount of pre-load is spread out some and probably doesn't affect the chassis enough to worry about. Your choice, just don't use washers for shimming.

Go to more than one R/C car race and you are bound to see somebody have to drop out due to the antenna support tube coming out of the receiver. This is dumb, especially when

the fix is so easy. With the tube shoved into the receiver, put a drop or two of Hot Stuff around the base of the tube. Don't expect this fix to last forever. Check it once in awhile and reglue if necessary.

At the other end of the receiver antenna, let's hope you have an inch or so of antenna sticking out the end of the support tube. If not, I wish you plenty of luck in removing your support tube from the receiver, now that it is glued in with Hot Stuff. If you do have an inch or so of excess antenna, tie a knot in the end of it with the knot tight against the support tube. During a race, you may still have the antenna support tube come loose at the receiver end, but with the knot in the end of the antenna, at least you won't lose the support tube, leaving the bare antenna to be ripped out.

Another very necessary radio component that can come loose is the changeable crystal. A wide rubber band is wrapped around the radio case and slipped over the crystal. If the band is wide enough, a slit can be cut into it, the tail on the crystal being stuck through this slit. This gives a very positive retainer for the crystal, yet crystals are still easy to change.

The JoMac radios are generally powered with dry cells. I regard radio batteries as very important, so I converted my radio to nickel-cadmiums with a unit available from JoMac that comes with batteries, plugs and charger. An overnight charge before going racing guarantees no battery problems. For those still using dry batteries, it is suggested that you keep close track of the batteries and put in new ones when you figure the batteries are about half shot. Don't trash the old batteries; use them when you go out for some one-on-one rat racing around the local concrete jungle. To use old batteries in a race is not only asking for trouble, it's truly false economy.

Another point concerning receiver batteries is to keep everything as clean as possible in the battery box. Clean the ends of the batteries and the contacts in the battery box frequently. It's only common sense preventative maintenance.

The brick radio unit itself is tripod mounted (three-point mounting, two rear, one front) in stock condition and this is not changed, as the tripod mounting allows the chassis to flex pretty much independently of the radio brick. Be sure to use the grommets and do not tighten down the mounting screws enough to compress the grommets noticeably. This allows the radio to be insulated a bit from shock. With the heavy abuse that an R/C car is subjected to, it would seem that the radio should come flying out of the car about the second endo. Not

a Stahl design



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so; the radio will stay in, using the stock mounting system and without over-tightening the mounting screws.

The fuel tank supplied with MRP cars works on a negative pressure principle, more commonly known as uniflo in model airplanes. Internally, the MRP tank has a feed line with its pick-up point located in the center of the tank and right at the bottom. Each vent line goes to the bottom of the tank, the right vent to the right bottom side, the left vent to the left bottom side. In operation, the air venting into the tank to replace the fuel going to the engine has to bubble up through the fuel left in the tank. This creates a slightly negative pressure in the tank, and if the tank is without leaks, will result in really consistent engine runs. This style of tank, when used on a model airplane, does not go lean towards the end of the tank. If anything, it will supply a richer mixture at the end of a tank.

The Class B cars (normally powered with a Cox TD .049) always seem to suffer from leaning out during a race, with a flame-out being the result. So the MRP tank is a lot of help in getting good, consistent runs. The problem



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with the tank comes when it is time to refuel it. With the vents both going to the bottom of the tank, it is necessary to turn the car upside down when refueling. Seems to work OK, but is certainly not very sanitary. The other option in Class B is to fit the tank with a fast-fill plug from Randy's . . . assuming you can even find one of the rare things. Here the problem is that the fast-fill plugs are designed to be used in positive-pressure tanks where the

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pressure itself helps to keep the fast-fill pinched closed. But the MRP tank operates on negative pressure, so keeping the fast-fill closed can be a problem. To fix this, Bob uses a closure spring inside the riser tube for the fast-fill. This is simply a piece of light music wire soldered into the top inside of the riser tube and bent so that one end of it extends over to the fast-fill plug. Light tension of this music wire against the lips of the fast-fill keep things airtight, yet allows fast pits.

In Class A, we have a different problem, as fast-fills are not allowed. The Pylon Jet-Fueler is allowed and most use it. But you still have to turn the car upside down to fuel it.

What I am trying on my Class A car is a Pylon Jet-Fueler on the filler tube and a normal vent (venting from the very top of the tank). This of course eliminates the negative pressure feature of the tank, but the reed-valve motors suck a lot better than the TD's, being very choked-off with the standard venturi size. With good fuel draw, a normally vented tank ought to work OK, yet be a lot easier to fuel.

The tank mounts in the MRP cars work great, but when you get the tank working like you want, be sure to glue it to the tank mounts with silicone glue. This does hold the tank just a little more solidly, but the real reason



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for doing it is that rocks and dirt get in between the tank and the tank mounts. After a lot of racing, this trash may finally wear a hole in the tank. A leaker tank can ruin your whole day; glue it in with silicone.

Due to manufacturing considerations, MRP has to build the tanks with the fuel pickup line exiting the tank at an outboard location. This does seem to work OK, but I prefer to have as short a fuel feed line as possible. So I relocate the pickup line in the center of the tank on the back side. This may or may not be a worthwhile modification. Your choice.

As can be seen from the pics, I have modified the rear body mount to more securely mount the Cobra body. As supplied, the Cobra body mounts with one body pin front and rear. The Tony Bellizi-inspired trick here is to mount two 1 inch body pins to the rear mount platform. This gives the desired tripod mounting for the body, plus the right ride height.

Over the tank and under the rear mount platform are the wire linkages for brake and throttle. As with the steering linkage, Bob uses the stock pieces on his own race cars. I have been tempted to put a Du-Bro quik-link on the linkage to the brake as many others do, but this is not really necessary, and in a minute, I'll tell ya

why.

On the throttle linkage, Bob regards a positive throttle stop as very important. For the Class A car, this can be a No. 4 sheet metal screw in the top of the Cox nose mount for the motor. Check out a pic if it's not clear to you. Notice that the long arm on the throttle ring hits the stop at low throttle. Without a stop, getting a consistent idle can be hit 'n miss what with chassis flex being able to give a higher or lower idle setting without any command from the transmitter. On a TD powered Class B car, the venturi is used as the throttle stop.

The reason Bob doesn't feel the need for an adjustable quik-link on the brake linkage is that he has his transmitter fitted with the optional trim knob for throttle. With the positive throttle stop, throttle trim is not used to adjust idle, however. Instead, the trim is used to fine-tune the amount of brake available at low throttle. The wire linkage is bent to give approximately the right amount of brake and the trim takes care of it from there. Neat trick.

The amount of braking force depends upon the track. Bob dials in as much brake as he can get without breaking the rears loose. The only accurate way of finding out if you have enough or too much brake is to run on the track. In the pits, about all you can do is to be sure that the brake isn't overly tight. Experience helps a bunch here.

Even though the brake strap is a very simple appearing piece, even here there is a little set-up trick. The brake strap should be in contact with the clutch bell only when you want braking. The rest of the time it should ride completely free of the bell to cut down on power-robbing drag. To get this kind of fit, apply maximum brake. Then take a pot of boiling water and pour it over the brake strap. Wait a few seconds and then pour cold water over the strap. The boiling (or near boiling) water makes the strap very pliable and it forms itself to the bell. The cold water then makes the strap take a set in this position. If you've done this properly, the brake strap should release itself from the clutch bell very cleanly and without any unnecessary drag.

*Concluded next month*

**Stinger . . . . . Continued from page 13**

edge must be 1/8 inch lower than the trailing edge. Line up the center of the wing at the trailing edge with the vertical center line on former No. 2, and get the wing tips equidistant from the tail. Five-minute epoxy is sufficient here, as the wing is later built right into the fuselage.



The horizontal stabilizer, with elevator hinged in place and controls connected, is now carefully aligned and glued in place. Next, the fin is installed, making sure it is 90 degrees to the stabilizer and true fore and aft.

Now the top sheeting, the turtle-deck, and the noseblocks can be fitted and glued in place. Cut the cockpit to shape, paint the interior, install instruments and pilot. No cockpit floor is required, the top of the wing is just about right. Trim the canopy to fit and install. The fuselage can now be sanded to fit its final shape.

The cheek cowl can be carved from balsa or molded from fiberglass, depending on individual preference. The cowls run back to the wing, and the epoxylite wing fillet is continued right around the cowls. The fin and stabilizer are also filleted with epoxylite.

It will be necessary to file away a little wood from the fuselage sides in order to fit the landing gear flush against the 1/4 inch plywood mount. With the hatch in place, there should be no gaps.

Two coats of finishing resin, with no cloth, seems sufficient for the fuselages of all the Stingers built to date. A heavy coat of K&B primer, well sanded, makes a good base for your choice of paint.

#### FLYING

The balance point should be no more than 3 inches back of the leading edge with the fuel tank empty. The throws on all control surfaces should be no more than 3/16 inch each way.

Hold about 1/2 up-elevator, and when released, the Stinger will lift off almost immediately with no turning tendency. The rest is up to you. •

**Moskito . . . . . Continued from page 55**

all together, using a vise or something similar to press the wire into the wood.

Cut out the fuselage sides, including the slot for the horizontal, then join together with the aid of Frames 2, 3, and 4. Pinch the sides together at the rear, and glue. When this is dry, install the tail assembly and make sure that it's aligned correctly before finally cementing it into place. Now cut out and attach the wing pylon (Item 5), followed by the upper and lower fuselage sheeting, noting that this is installed with the grain running cross-ways.

This assembly can now be put aside to dry while we get along with the final wing construction. First trim the excess ends of the wing ribs away, then sand all except the wing root edges round. Sand these wing roots to the bevel required by the dihedral

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angle, then cement the wing panels together. Note that the dihedral isn't the same on both wings, it's a 1/2 inch on the upper and 1 inch on the lower. Let these joints dry well.

Make the two wings struts now, and leave these a little too long at this stage, as the final length will be determined on assembly. Make slots for these struts in the lower wing only; at the upper end, the struts lean against the wing rib. Cement the lower wing into place, then test fit the upper wing onto the pylon. If you've left enough space between the root ribs, the pylon should slip easily between them, but if it's no go, then sand a little off the pylon and glue into place.

Test the wing struts for fit, trim them to the final length, then glue . . . but before the glue is set, check the alignment of the top wing, both from the front and side, and make any corrections required.

Frame 1, the 1/16 ply firewall, can now be attached, and this completes the construction work. When all the gluing has dried, sand all over, rounding off the edges of the fuselage a little, then brush on a coat of clear dope, followed by a final sanding. After this, the final decor is up to you, but don't add too much weight by painting excessively. Our prototype was given a further coat of clear dope, then colored with marker pens.

The motor installation, as you will have noticed, isn't shown on the plans, due to space limitations. However, the photos show that the motor is simply tacked onto the front, and doesn't really need much description. My main modification was to discard the two tiny nuts and bolts supplied with the Telco unit, and substitute the biggest self-tapping screws that would fit the mounting holes. The motor was then simply screwed to the 1/16 ply firewall.

The location of the tank unit is shown on the plan, and is a very slight push fit into the cockpit. If required, a small scrap of 1/16 sheet can be glued behind the tank to give a more



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positive location. Run the supply pipe externally down the right side of the fuselage, and let the filler pipe float freely, as the plans indicate.

The beauty of this installation is that the complete system can be easily removed without tearing the model apart.

Test flying is best done in a grassy area, so that the model will have something to bounce off while going through the trimming process. Start with some power flights, as there's not much to be seen from hand glides. With the engine throttled back (on the Telco motor, the crankshaft cam should be set at around 2 to 3 o'clock

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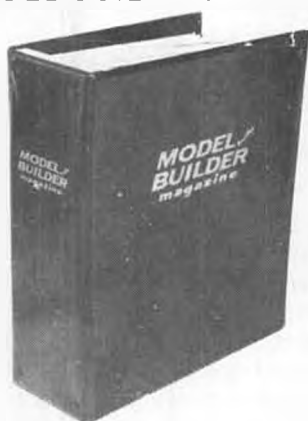


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when viewed from the front), put a gas charge in the tank, tweak the rudder a little to the left, then launch. If the down-thrust is OK, then the model should climb briskly in a sharp left spiral. If it's not OK, then there will probably be a lot of hanging on the prop, ala old-fashioned rubber models. Add down-thrust as required in 1/64 intervals (ply shims behind the motor).

Now for the glide. The main problem here is to prevent a straight glide path, as the model flies quite fast, and because of the size, can easily become very lost.

When both of these trims are achieved, you might try opening up the throttle... but remember, you've only got a finite amount of energy in the tank, so expect more exciting flights, coupled with more rapid visits to the liquor store for more gas! •

### Power Boats . . Continued from page 42

over the curve of the airfoil must move at a faster velocity than the air flowing across the flat bottom of the airfoil, because the air over the top has a greater distance to travel. Applying Bernoulli's principle, the result is lift.

Now, as we increase the angle between the airstream and the leading edge of the wing (increase the angle of attack), we increase the lift. If we apply this to a hydro by placing the wing past the rear running surface, and if we increase the angle of attack, then the lift to the transom will keep the front of the boat down on choppy water. Thus, if we keep increasing the angle of attack we can expect all positive effects. Right? Wrong! As the angle of attack increases, so does the opposing drag force.

With this background in mind, let's consider what factors we can use in designing a good wing for a boat. It is important to understand that a wing will not improve every boat's running characteristics. So don't be discouraged if your early attempts prove unsuccessful. Generally, we are considering high-speed outriggers and other hydros, and possibly 50 mph mono designs.

1. No matter what shape or size airfoil you use, the wing must be adjustable. A fixed wing will just not be useful during changing conditions and trimming the boat.

2. The angle of attack is also critical to the wing's efficiency. As the angle of attack increases, so does the lift factor. However, drag increases at a proportionally faster rate, so you must find a compromise between lift/drag

that will not slow your boat down with too much drag. According to the National Advisory Committee for Aeronautics (NACA), the optimum angle of attack for number 2421 standard airfoil is about 22°. A greater angle would produce a negative effect due to the high degree of drag.

The angle of attack will vary according to airfoil, air speed, etc. I would say 22° could be considered a maximum, and you will probably find a much shallower angle will be effective.

3. All surfaces of the wing and superstructure must be smooth and free of turbulent features. If you feel ambitious and creative, how about a wing with "low-drag boundary-layer control". This principle involves maintaining the air speed of the layer of air on the surfaces of the wing by pulling part of it through small air holes near the leading edge, through chambers, and discharging at the trailing edge. This process should help decrease turbulence.

4. If you use plywood for construction, it is recommended that you laminate several layers to the desired thickness. Be sure to run the grains in opposite directions for strength. The wing and structure must be strong enough to withstand that occasional flip at 70 mph.

5. By keeping the angle of attack low, you can increase the lift by increasing the area of the wing. This will also keep drag down and could produce the results you need.

6. The location of the wing is very important. Positioned on the front deck or fuel tank area in a downward attitude will only deter speed and cause excessive drag. The intent is good if it is designed to keep the boat from blowing-off, and it may accomplish this; but the location is poor. A more effective area is behind the last wetted surface, where it would be adjusted to create lift to the transom. The desired result would be achieved without the drag.

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C/L . . . . . Continued from page 47

our AMA is interested. But it could very well be that our AMA is not capable of dealing effectively with so many special interests within the ranks of the membership. And I'm not so sure but what that isn't simply a statement of fact, rather than a criticism. To make my point, I was going to list a bunch of special interest groups, but just a minute of thought later I had over 20 on the list! It should be obvious that no organization the size of AMA and with the budget the AMA has to work with, can possibly deal with so many groups to each group's satisfaction.

Still, my answer to the question "What does the AMA do for me?" is that it doesn't do enough for me. A selfish answer, of course, but one I will stick with, thank you. No matter what your answer to the question is, I'll bet it won't be too hard to find your District V.P. willing to listen to it.

#### BUILDING SEASON

'Tis the season for building, in addition to Ho-Ho-Ho and Happy New Year. If you are among the C.F.'s and G.C.F.'s, I certainly hope you are up-to-date on the rules to be used in '78 and '79. Sure would be too bad if all of your Slow Combat planes for the next season came up with short noses, this being defined as less than 5 inches from the leading edge of the wing to drive washer of the engine. Or how about that Speed ship you're just finishing? Are you *sure* there will be an event for it next year? Many classes of Speed were dropped, you know.

How about the Carrier plane designed to do your basic Sabre Dance on slow speed? Aren't you going to be surprised when the SeeDee disqualifies your flight because the model was

flying at an angle greater than 60 degrees from horizontal. . . ? And won't it be fun trying to find people to direct Carrier events with such a rule in force?

If you have more money than time, now you can (legally) "buy 'n fly" your way into the winner's circle in Combat. That isn't totally accurate, of course, as winners in Combat are generally the better fliers, not the better buyers. But it sure is welcome relief to many to get rid of the Builder-of-the-Model rule in Combat. Even Jean Paillet voted for this proposal, indication of changing times, the influence of MACA, or both.

One Combat proposal that passed, and I still can't believe this one, is to allow 15-powered models to fly on .012 lines. Do you realize how easily a new Fox Combat Special can cut a set of .012's . . . and how a set of .012's would fare in a jerking contest at the center (as in a line tangle) when up against a set of .018's? If for some reason we would want to let 15's and 36's compete against each other on lines of different diameters, the safer way to do so would be to require the 15-powered model to use .018's and the 36-powered model use .012's or .015's. Just think about it for a minute . . . you'll catch on.

I explained this to Ron McNally, chairman of the CLCB, and his reasoning was that if the rulebook said it was OK to use .012's on 15-powered models, then at least the CD's would be covered by the rulebook instead of just allowing this on their own, placing themselves in a bad situation in case of an accident. Sounds to me as if, in Ron's area at least, there is a CD problem, not a rulebook problem. Now that the rule is in the '78-'79 AMA rulebook, it is assumed that we will have a problem nationwide with fly-aways. A strange solution to a local problem, don't you think?

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Yes, last month I promised to let you in on the performance of the new plugs from GloBee, designed for use in



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the Cox 049/051 engines. Since then, I have used the hemi-head plug for a few flights in a really honkin' TD .049 that is mounted on a Dirty Beaver (1/2A Combat plane). The plug lived through all of the runs and just generally worked great. Unfortunately, I forgot my tach when we went flying, but it was pretty obvious that the engine ran faster on the GloBee plug, as compared to a Cox No. 1702 high compression head. Changing from the Nitrotane 1/2A 70% fuel to a mild brew of 40% verified the claim that this plug needs about 50% fuel to keep the fire lit.

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wanting to use a GloBee plug in a reed-valve engine, the Glo Button Standard, using standard coil material, is suggested.

When talking horsepower, in all of the modeling events, there is only one that rewards pure power without consideration to other factors. That is Speed, of course, and in 1/2A Speed, the plugs are setting records. How's about Open 1/2A at 122 plus?

Although I cannot verify the claim (I forgot my tach, remember?) Harry Roe says that rpm gains of 800 to 1500 are possible by just switching to a Glo Button. You'll have to wait a bit for this, though. The plugs are to be introduced in the spring of '78. Cost? Less than Cox plugs, which makes them very desirable, even if they give the same power as Cox plugs.

### A CONTEST CANCELLED

Every once in awhile, I like to slip in a contest of some kind, just to see if anybody actually reads this stuff. As I write this, we are making plans for the Thanksgiving Day holiday, so it came to mind to throw a contest here in the pages of MB and to give away several turkeys to the winners. But then on second thought, I realized that if MB gave away any of its turkeys, Unca' Bill would just have to go out and hire new staff members to replace those given away . . . (Anyway, who wants a Dirty Turkey?! wcn)

Now that even those at the MB office are after me, I think it is past time to close out for this month. •

### Canardart . . . Continued from page 64

a sheet of tissue (Vintage Aero or Peck Japanese tissue) over them on a soft building board. Glue the wing and tail outlines to the tissue, getting glue in the wood-to-wood joints. Do not glue the motorstick to the tissue as on normal model. Once glue is dry (if you use a cyanoacrylate like Zap, that is instantly . . . but be sure to put plastic wrap under the tissue) you can trim the parts from the covering. We used a No. 11 X-Acto, but that's because we didn't have one of MB's fine Uber Skivers! (Wow . . . talk about a subtle hint! wcn)

Butt-join the wing halves, propping up one tip 3-1/2 inches for dihedral. Crack the stab (forward wing) along centerline and prop up to same dihedral angle . . . see plan detail. Glue the subfin to the motorstick. Cut the top out of the plastic thrust bearing, leaving both sides intact to glue to the motorstick. Turn it upside down and glue on with 0-0 thrust. Now add the two wings to the motorstick, propping up the LE of the front wing (stab) with a scrap of 1/8 square. See detail at front of motorstick on plans. Now add a small rubber hook bent from a

pin; it should hold the motor just above the LE of the front wing (stab). Check to be sure there are no offsets in any surfaces . . . this model is very sensitive to misaligned wings or fin. Torque will give it a natural turn.

Now make up a motor from 1/8 Vintage Aero or Peck rubber . . . it should be a loop about a foot long. There is no point in test gliding, since the model (being primarily an unorthodox sport job) does not have a super glide. Just wind on about a hundred turns for a lower power test, after insuring that the CG is at the right point (1/4 inch in front of rear wing LE). Add clay to nose to get this right.

If the Canardart does nothing erratic, try about 200 turns, going up to about 300 turns max by stretch-winding with a winder. The Sterling 5:1 winder will do. Hook it up to the front of motor while someone holds prop shaft, stretch out 3X and begin to wind, moving in slowly. On the count of 60 (that's 300 turns) pinch the motor near winder hook, back off a few turns and you have a little loop to hook on the rubber hook. Be sure to wind backwards . . . this is a pusher!

If the model stalls, try a bit more clay or a fin trim tab to induce some turn. If it dives, try a bit more incidence under front wing, but do not move the CG back. Avoid trying to turn the model in tight circles. We



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- FRIDAY, APRIL 28 — 1 PM to 9 PM
- SATURDAY, APRIL 29 — 10 AM to 6 PM
- SUNDAY, APRIL 30, — 10 AM to 5 PM

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hope you have as much fun with Canardart as we did in Beirut. We also hope the flying is under much more peaceful circumstances. With that in mind, we leave you with the Arabic farewell "Mas salamah" which means literally: "Go with safety." ●

#### BILL OF MATERIALS:

One Sig AMA Racer kit or the following:

- 1/8 x 3/8 x 13 balsa
- 2 - 1/16 x 1/8 x 36 balsa
- 8 x 10 min. sheet Japanese tissue
- North Pacific prop assembly (from Sleek Streak)
- 2 feet of 1/8 rubber

F/F . . . . . Continued from page 61

#### FAI FINALS SITE. . .

You Got A Place?

As of the writing of this column, the FAI Finals, scheduled for Labor Day weekend, 1978 still has to find a home. The FAI F.F. Committee has developed a set of criteria for site approval. In order to overcome some of the difficulties which have arisen in the past, the committee is accepting bids for sites. These sites will then be evaluated in relation to the developed criteria. The site which most nearly meets the optimum will be selected. So, if you have a site or know of a site, and

if you would like to be involved in operating the FAI F.F. Team selection finals, you can give the entire program a boost by offering your site. This year, the geographical limitation which applied during the last program does not exist, so anywhere in the country is fair game. However, time is short. The deadline for submitting a site bid is January, 1978. If you can do it, do it. Contact Rol Anderson, Chairman, FAI F.F. Committee, 3769 Alexis Rd., Toledo, OH 43623. Give Rol a call at (419) 474-2117.

#### ANOTHER NFFS

#### SYMPOSIUM ANNOUNCEMENT

The National Free Flight Society is soliciting papers for the 1978 Symposium publication. Papers should cover some aspect of the science or art of free flight models. Send an abstract of your proposed paper immediately to: Bob Dodds, Box 436, Rancho Santa Fe, CA 92067.

#### BLUE RIDGE MODELS

#### DOES IT AGAIN

Earle Moorhead, erstwhile past president of the Willamette Modelers Club, Inc., and perennial non-builder of models (The article on the Round TUIT was written with good ol' Earle in mind), has discovered a kit that even he can and will build. The Square Eagle 30 is such a kit. In

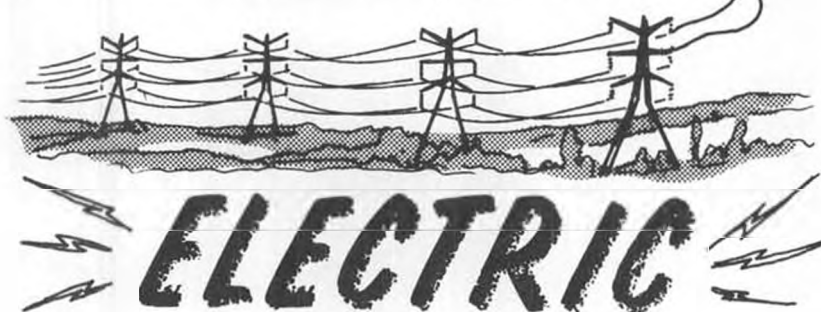
Earle's words, "The damned thing just fell together. It was the best kit I've ever seen." Since Earle's modeling days span Joe Ott and Megow Models, that's quite a compliment. Pictures of the Moorhead-built Square Eagle will appear in next month's installment of **Model Builder** Free Flight. If you want the kit, or any of the other fine models manufactured by Blue Ridge, drop them a line and a self-addressed stamped envelope, and they will forward to you their 3-page brochure. You won't be sorry, as there isn't a bummer in the bunch. All of their kits are done with T.L.C., and literally fall together. After you have built one, you'll wonder how they do it for the price they charge. Address: Blue Ridge Models, P.O. Box 9188, Asheville, NC 28805.

#### OR SO IT SEEMS

This, the 4th anniversary of this column as writ by Bob Stalick, has gone by in no time. It has been an enjoyable and pleasant duty to write this column. It is made more pleasant by those of you who read it and respond to it. I do appreciate your cards and letters (and phone calls). Keep 'em coming. May the next 4 be as good as the last . . . and if the last weren't good to you, may the next 4 be better.

Thermals. . . ●

# MODEL BUILDER



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  3. OLD TIMER REPLICA FREE FLIGHT: For Astro 02 motor only, any old timer, 25 second motor run, 3-minute max, hand launch.
  4. UNLIMITED FREE FLIGHT: Any motor, any plane, 25 second motor run, 3-minute max.
  5. R/C POWERED SAILPLANE: A 2-minute motor run and 6 minute max, with spot landing bonus points.
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F/F Scale ( )	R/C Pattern ( )
F/F O.T. ( )	R/C Scale ( )
F/F Unlim. ( )	Freq. _____

Each event: \$1.00 All events: \$4.00  
All events for whole family: \$5.00  
Send check and registration to Bob Boucher,  
2301 Cheryl Place, Los Angeles, CA 90049

### Folkerts . . . . .Continued from page 51

jargon of race car buffs and think in terms of Stage 1, Stage 2, and Stage 3 "tuning".

A "Stage 1" Peanut can be recognized by its 1/16 or thicker framework, generously doped Japanese tissue covering, plastic prop and wheels. It's usually too heavy to fly long.

A "Stage 2" model might be built from the same plans, but using selected light stripwood with balsa propeller and wheels. Flights of a minute are common.

A "Stage 3" Peanut uses 1/32 or .040 indoor stripwood and condenser paper covering. A few kits are available, such as those sold by Micro-X Products, but they are often scratch-built. Such models can provide the ultimate thrill-flights of two minutes or more. Nor need appearance be sacrificed, because, as I will explain, they can be spray painted with an airbrush to provide just as colorful a finish as their Japanese tissue rivals.

'Nough said . . . Let's build the SK-3!

If you haven't already done so, I strongly advise you to buy and read Fred Hall's book, "Indoor Scale Model Flying", for an expert's ad-

vice on construction.

And, since Peanuts use so little building materials, why not invest in the best quality? The .040 stripwood, .040, .020 and .012 sheet, condenser paper, and Micro Coat called for in the plans are all available from Gerald Skrijanc of Micro-X Products, P.O. Box 1063, Lorain, Ohio 44055. (His catalog is 75¢.) I would recommend his Ultra Cement for gluing balsa, but used thinned white glue for laminating the wing tips and attaching foam parts. The plastic model paints required for the foam wheels, spinner, and pilot, and the Floquil paints and Dio-Sol thinner used to spray paint the tissue, are available at hobby shops.

Let's warm up by building the tail surfaces. They're of conventional construction, but the result is about 2.4 times lighter than what you'd end up with using 1/16 strips and sheetwood.

Optimizing structural design is just as important as using lightweight materials, and the wings, which we turn to next, incorporate many features which maximize strength and stiffness with minimum weight. These features include built-up ribs, laminated tips, and a thin sheet leading edge which is much stiffer than a spar of equal weight. Build

and assemble these parts, then cement in the wing spars in segments between ribs. Finally, add the diagonal trailing edge bracing which greatly inhibits warping, and cement the wing plug-ins to the root ribs.

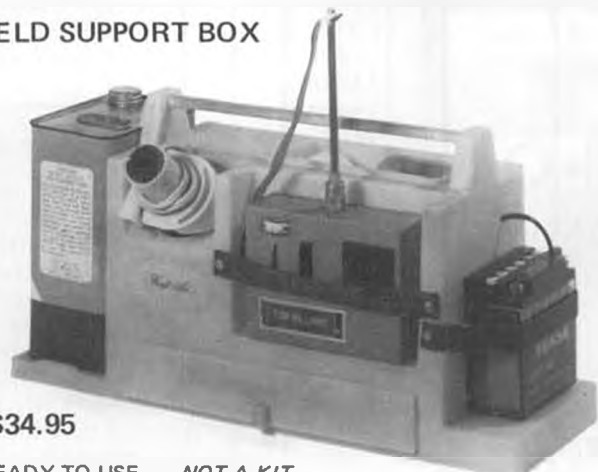
Now for the fuselage. Two construction options are shown on the plans. In the "outdoor" version, the body sides built over the black outline are assembled and completed using the conventional former and stringer method.

The body of the "indoor" version, which was flown in the contest, was essentially "formerless". After gluing the sides together at the tailpost and adding formers F6 and F1B, the structure was mounted on a special form and the top deck completed with a purely stick construction as illustrated in the auxiliary drawing.

It is essential that you first run strips of 1/4 inch wide Saran Wrap over each dummy former and tack them to the bottom of the base, or you'll never be able to remove the beautifully light and true creation you've built! Hold the form over heat to shrink the Saran Wrap strips so they won't slip off during building. And cut the strips at the base to facilitate removal of the partially completed fuselage, pulling out any strips that stick afterwards. Now cement in the

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internal and bottom fuselage cross-pieces.

Build the bottom deck on a separate form, remove, and cement in place. Almost finished . . . and not much more difficult than conventional construction, except that the whole darned thing is pretty delicate before it's completed!

If you wish to include the pilot, don't forget to build, paint, and install him before cementing the stringers and sheeting over the cockpit area between F8 and F9. Cigarette wrap is about right for the side windows, which are attached with thin dope. Hold over the stove to get them tight. If you don't have a vacuum-former to make the canopy, you can heat shrink the mylar over a balsa form . . . as I did.

"Turn" the wheels and spinner by holding sandpaper against the rough-cut foam as it rotates while cemented on a dowel shaft in your Moto-Tool. Hollow out the spinner with the Moto-Tool and slot it so it will be removable to expose the propeller winding hook. Use Hot Stuff to cement the prop shaft to the hub after binding with thread, and also to cement the landing gear in place (but not until the fuselage has been covered and spray painted). Cut out, soak, and bake the propeller blades

on the prop form, then sand to a very thin airfoil shape, less than 1/32 in thickness. Mount the blades on the propeller hub at the proper angle, using triangular templates temporarily cemented near the tips as a guide.

Now that the framework is all done, plug the wings into the wing mount slots and check that both have exactly the right angle of attack as indicated by the construction note on the plans. If not, fix up the wing plug-ins until they do.

Sand the structure very gently where needed, and brush on two coats of thinned dope where the tissue will be attached. I employ thinned dope to fasten the condenser paper, then use a perfume atomizer filled with water to spray tighten. Condenser paper will not warp the structure the way Japanese tissue does, so don't be afraid to get it fairly moist. However, to cover the tail surfaces, first shrink condenser paper onto a balsa frame, then lay the freshly doped framework on the paper and let dry thoroughly before trimming. If you plan to fly outdoors, brush the covering with Micro Coat to prevent sagging tissue on humid days.

Now for some suggestions on finishing, or "Why a condenser paper covered model needn't look

like a ghost ship." Buy a good airbrush. I am using a Paasche with the H-3 tip. Go to your local supplier of bottled gas, wave the airbrush hose, and tell him you want a 20 lb. refillable cylinder of CO<sub>2</sub>, a regulator with a 0-60 psi gauge, and an adaptor to fit your hose. He'll probably tell you he wants about \$80, but it's worth it. Mix yellow Floquil with up to 50% Dio-Sol thinner, and with 30 psi set on the regulator, spray as fine a mist as you can get on the condenser paper. If the mist is as fine as it should be, you will have to apply several coats, but stop as soon as a translucent yellow-cream color is obtained. To paint wood or foam yellow-cream, mix some white paint with the yellow, using Floquil on wood, plastic model paints on foam. The red wing and stabilizer leading edges are most easily brushed on after marking the boundary, with a red felt-tipped pen.

Use a black felt pen for the control-surface outlines and panel separations. Consult the three-views for the location of the latter if you wish to include them.

The lettering and decals were made as follows. Spray pre-shrunk sheets of condenser paper red and black for the larger lettering; trace the outlines on bond paper and sand-

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with the condenser paper between  
this and another sheet of bond, and  
cut out with a sharp blade. I used  
black rub-on letters for the smaller  
printing, since I couldn't obtain red  
letters. Use a very fine brush to  
paint the comet, planets, etc., on pre-  
pared yellow condenser paper, with  
the pattern underneath to guide you.  
Now attach everything to the model  
with thinned dope. The plans explain  
how to make the louvers and pitot-  
static tube, if you wish to add these  
touches.

FLYING

With a doll-like idiot who hasn't

even soloed, in the cockpit, I  
wouldn't put too much reliance on  
the test pilot. Balance the model  
where indicated, wind just a few  
turns in the motor, rotate the thrust  
button about 45° for right and down  
thrust, and check the vertical tail for  
2° right turn setting. Try a few  
"glides" with the prop just ticking  
over and add clay to the nose or tail  
until it's correct. Maiden flights are  
best made outdoors on a dry, wind-  
less dawn or sunset . . . grass is a  
lot more forgiving than the gym wall.  
With more power, adjust the thrust  
button by rotating it until you get

right circles of 60 foot diameter;  
mark this setting. If your model is  
heavier than mine, you'll need  
thicker rubber. (Micro-X has a wide  
increment of sizes.) Your 1937  
Thompson Trophy winner is now  
ready to take on today's compe-  
tition!

Hannan . . . . . Continued from page 54

Obi-Wan Kenobi, played by Alec  
Guinness, bears a remarkable re-  
semblance to Richard Miller, of  
hang-glider fame, and delivers the  
most polished performance. We  
were glad to see that Carrie Fisher  
(daughter of Debbie Reynolds and  
Eddie Fisher) had washed her pre-  
vious role out of her hair, in her  
portrayal of Princess Leia. She seems  
to have inherited her mother's voice  
and her father's features. Luke Sky-  
walker (Mark Hamill) is properly  
"All-American Boy" throughout, in  
the best comic book tradition. But it  
is C3PO (See-Threepio) and R2D2  
(Artoo-Detoo) that keeps things mov-  
ing in the good humor department,  
with their Mutt and Jeff antics.

Model builders will be intrigued  
with the various space vehicles,  
which resemble old Nash Ramblers,  
more than the ultra-jazzy machines  
usually found in sci-fi movies. The  
weapons are equally unlikely, pre-  
senting the paradoxical combination  
of ancient and modern. How about  
a sword which emits a limited-  
length laser beam? Or spaceship  
guns with World War Two style  
Pom-Pom action? On paper, it  
sounds very corny . . . but it isn't on  
the screen! Rather, it is so out-  
rageously incongruous as to seem  
perfectly logical.

In summary, we suggest you attend  
and prepare to be entertained. To  
paraphrase a line from the film, "Let  
the FARCE be with you!"

NEW MODEL MAG

New model publications appear  
about as regularly as lower prices.  
Thus, we were delighted when  
Georges Chaulet sent us a copy of a  
new aviation magazine from Spain.  
Although our linguistic capabilities  
are limited, we greatly enjoyed the  
many photos and illustrations. From  
what we can deduce, the magazine  
will deal with several facets of air-  
craft, including models, hang-gliders,  
and man-carrying sailplanes. The  
quality of the paper is first-rate, and  
the abundance of advertisements  
suggest a strong financial base. En-  
gine collectors might well be turned-  
on by adverts for the Spanish LLAM  
powerplants; ball-bearing units avail-  
able in both diesel and glo varia-  
tions. In fact, all this fine new  
publication would appear to lack is a  
Spanish Peanut! Further information

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could probably be obtained from: AEROSPLAI, Periodísticas con el No 1416, Aragon, 331-1°, Barcelona 9, Spain.

#### SPOKED WHEEL KITS

Peck-Polymers has announced availability of the "Hunt" spoked wheel kits. Featured are detailed instructions, formed plastic wheel components, a jiggling base, hub bearings, and lacing thread. Offered in various sizes, the wheels are intended for use on small flying scale models. Complete price and size list may be obtained by sending a stamped, addressed envelope to Peck-Polymers (see advert in this mag for address).

#### UFO's AGAIN

In earlier Hangars, we mentioned the flying saucer ports located in France and Canada, each claiming to be the first of its kind. Now Japan has filed claim to that honor! According to the October AVIATION NEWS, the UFO facility is located close to Mount Fuji, and cost over a million dollars to build. In addition to a four-foot thick landing pad made of asbestos-impregnated reinforced concrete (which ought to be able to withstand even a crash), the spaceport features a sort of temple, complete with helmet-clad buddha figures. Funds for the unique project were donated by a Japanese super-market czar.

#### MANPOWER UPDATE

Thanks to Russ Hiatte, of Taft, California, and Ron Moulton, of England, we have some additional facts. The prize has, of course, been officially granted to former model builder Paul MacCready and his crew. In addition to the heroic pilot, Bryan Allen, Dr. Peter Lissaman and another model builder, Vern Oldershaw, made important contributions.

Happily, others who have man-powered machines underway have not been forgotten. Lee DuBow, of Palomar Airport, has put up a trophy for the first manpowered craft to reach 100 feet of altitude. And back in England, prizes remain for the first 3-minute flight by a competitor from the United Kingdom, and another for flights around a slalom course by a Commonwealth flier.

Additionally, Henry Kremer has pointed another ten thousand pounds for the first entrant, other than from the United States, to complete the original figure-8 course.

Many photos and specifications of the MacCready machine have been published, but we have yet to see a 3-view. As soon as one appears, a scale model of it would seem to be in a position to blow the lid off all existing records. At last, a full-size "ghost" ship!

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#### TIME FLIES

Recently, TIME magazine published a gallery of its front cover pictures . . . some 2,810 of them, spanning the period of 1923 through 1976. People associated with aviation fared quite well in representation. Some even appeared more than once. With only a casual scanning, we discovered the following pilots, designers and others who influenced the progress of flight in one way or another:

Anthony H.G. Fokker, Glenn H. Curtiss, Henry Ford, Giuseppe Bellanca, Capt. Rene Fonck, Charles Lindbergh, Richard E. Byrd, Orville Wright, Hugo Eckener, Harry Gugenheim, Winston Churchill, General Italo Balbo, Juan Trippe, Frederick Rentschler (Pratt & Whitney engines), Bill Bridgeman, Gen. Hoyt Vandenberg, James H. Kindelberger, Igor Sikorsky, Lt. Col. Paul Stapp, Roscoe Turner, Jean Harlow (Hell's Angels, remember?), Donald W. Douglas, Glenn L. Martin, Hermann Goering, Will Rogers, Air Marshall Barratt, Vice Marshall Playfair, Rueben Fleet, "Hap" Arnold, Sir Arthur Tedder, James H. Doolittle, Leroy Randle Grumman, Gen. Curtiss LeMay, Danny Kaye, Howard Hughes, Capt. Charles Yeager, Arthur Godfrey, and Major General Tunner.

UP AND DOWN

AMA Prexy Johnny Clemens sez: "They use small wind-tunnel models to check out ideas, then scale them up to full size. After that works, model builders miniaturize 'em again!"

#### HAIRY PEANUT?

The most popular chimpanzee in the San Diego Zoo is named KAKO-WET . . . phonetic for "cacahouete" . . . the French word for Peanut!

#### JAPANESE GAS

We promised additional reports on the NITTAN brand Japanese CO<sub>2</sub> cartridges. These capsules are of welded design, which eliminates the leakage of other types. The result is more uniform pressure, ideal for application to model CO<sub>2</sub> engines. Our initial tests were so encouraging that we decided to give them the "acid test" (pun intended, as CO<sub>2</sub> is also known in some quarters as carbonic acid), by using them under contest conditions during the California Nationals. Results were beyond expectation, and we were able to count upon uniform "fills" every time, for our Brown Junior engines.

The cartridges are being distributed through sporting goods stores, but if you are unable to locate them in your area, you might contact Takehide Sumi, Vice President, NITTAN (U.S.A.), Inc., 4901 Morena

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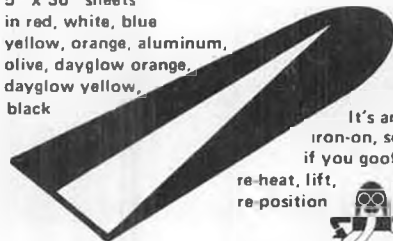
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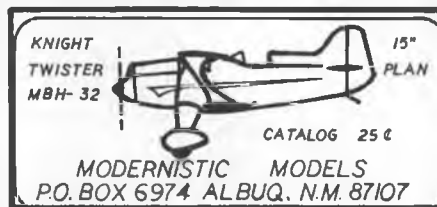
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you been flying models all your life?" Answer: "Not yet!"

**Half-A ..... Continued from page 63**

lished by Russ Sandusky, at 1122 Plaza Cir., Jappa, MD 21085. Dues are \$6 each January, payable to CL-RPM.

Two problems hit me last month. Here they are ... the causes and their solutions. First, I had a QRC which would not rev up. It ran OK rich, but died off when I tried to get full power. The problem turned out to be a bent con rod caused by use of an electric starter when the engine was flooded. The clue was that the metal rim around the reed valve area was scored. The rod had to be hitting it, which meant some distortion had happened. I disposed of both piston/rod and crankshaft.

Second problem was an engine which would run perfectly, no matter how I held the model, but died in a fast roll. The cause was that the fuel hose between tank top and "clunk" had slipped so that the clunk hit the rear of the tank.

### MODELS FOR THE MONTH

First, Chris Lella, of 120 Pelham Road, New Rochelle, NY 10805, sent in photos of his 1/2A C/L stunter, "The Sunspot." Chris uses a Tee Dee .049, 6 x 3 prop with Uniflo tank, no pressure. Weight at 200 sq. in. is 9.8 ounces. Bob Hunt describes the finish on this model as being perfect, and he really knows! Chris used the Sunspot for a big model demo at the

Rockefeller Center in New York. He flew right on the ice rink!

Second model is by Jerry Farr, 2802 Robertson, Abilene, TX 79606. He built this incredible Citabria for 1/2A R/C. The model uses a Cox RTF (No. 290) reed valve engine and weighs in at 18 oz., for a 200 sq. in. wing. The only clue that this is a model is the elevator horn, which is barely visible in the shadow!

Third, Dumas has bailed completely out of the airplane line, but Jay Brandon, the President hasn't forgotten us. Here is a really cute cabin cruiser for Medallion .049 R/C power and two channels of radio. Could be free run or tethered too, if you wanted.

Fourth model is as close to a ready-to-fly as you can get in an R/C model. The Cox Cessna Centurion comes molded, pre-painted, and with engine, pushrods, control horns, and nose landing gear in place. About 30 minutes are required to PUSH the radio into position and attach the rods to the servos, apply the full-color, authentic stickers, slip the wing dowels in place, rubber band the wing on, and push the rear landing gear into its sockets. I have flown four different copies of this model, they all fly alike; smooth and docile, but with good wind penetration and climb. The trike landing gears are well placed, so landings and even ROG's are easy. The wing has a semi-symmetrical airfoil. Trim doesn't change much when the engine quits. The model has been tested in purposeful crashes to check out its structure ... it is very rugged.

Fifth and final model is House of Balsa's 1/2A "Pete", the little brother to their big stand-off-scale Pietenpol Air Camper. This photo was shot in 1974 at the MAC Show. Don Dombrowski set the design aside for a few years until he had some other models completed and kitted for his 1/2A line-

Blvd., Suite 307, San Diego, CA 92117.

### CONCORDSKI?

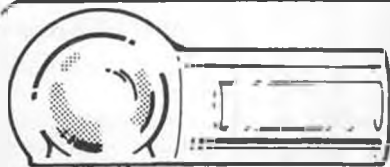
The Soviet Union's TU 144 supersonic transport was scheduled to enter regular passenger service on November 1st. It had been delivering mail and cargo on a regular basis since December, 1975. Original intentions were to place the machines in service during 1971, but various troubles forced delays. Wonder if they'll let them land in New York?

### CONGRATULATIONS, PIPER!

In an age when most factory-produced lightplanes are uniformly dull "spam cans", it is indeed refreshing to see something new and exciting appear. We refer to the "Tomahawk", recently announced by the Piper Aircraft Corporation. One glance at our featured photograph will show how different it is, with "radical" features usually found only on homebuilt or foreign aircraft. Wouldn't this make a fine subject for an R/C model?

### HOW'S THAT AGAIN?

From the Poway Pilots Newsletter, edited by Lee Rose: Question: "Have



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up. Now that 1/2A scale R/C is catching on, the 1/2A Pete is in the line and on the shelves. Power has to be a Tee Dee .049 or 051, as the model is too large for reed-valve engines. You could use a Black Widow or Testor's 8000 for Free Flight Scale with this kit.

A final word . . . all you Free Flyers out there (all ten of you?), if you want coverage of your specialty, you have to get in touch and send photos! I have published all the F.F pics I have, so get with it and submit!●

**F/F Scale . . . Continued from page 53**

Third place went to my venerable ABC Robin. This particular model has been a real pleasure from the very beginning, and has done very well for me in contests over the years. It is powered with one of the early Brown's (serial No. 112), and has always been very reliable. In fact, I like the early design much better than the more recent one. The older versions look more like an engine than do the new ones.

As for gas scale, I wish I had the answer to the lack of participation in this event. Apparently, there are just too many modelers who do not want to fuss with the hassle of fuel, batteries, dirty airplanes, etc. It could even be that flying fields do not permit this type of operation. What ever the reasons, gas is certainly on the decline. Even at this year's Nats, the overall gas entries were low, with some electric and CO<sub>2</sub> taking up the slack. I hope something can be done to reverse the trend.

All in all, I would say that the Flightmasters 28th Scale Annual was another successful contest, with numerous F/F scale flying beauties . . . and through all of this, the overall tempo was one of absolute FUN!

I would like to expand on a couple of items I mentioned earlier. With many rubber flyers advocating new rule changes, striving for some equality between scale and flying,

large models could be the answer. Let me explain what I mean. I've had several conversations with Clarence Mather regarding rubber scale rules. He favors dropping the 100 second max to around 80 seconds or even lower. Why? With a lower maximum time required, the models can be more realistic and more diversified in design. We presently see essentially the same type of models, often sparsely detailed, in favor of attaining the 100 second mark. With a lower maximum time I would think that the models would or could have more detail and still be able to put in respectable times. As an example of this, Bill Noonan's Hawk Moth had a fantastic scale score and deservedly so. It had tremendous detail within its 44 inch wingspan. When it came time to fly, it put up consistent flights of between 40 and 45 seconds. The sight of this large scale model in the air is truly spectacular! I'm sure that Bill could have put in more winds and increased the flight times if he had to, but the combination of his scale points and the amount of time he was getting, was more than enough to win the event.

The models, of course, would not have to be large, but it would help in order to adequately carry more detail. I wouldn't want to specify what the size should be for a rubber scale model, but merely point out possibilities. Hopefully, we will have F/F Scale as an International event, and if wind is a factor, without question, the larger models should fair better.

As long as I have brought up the subject of International Scale competition, as mentioned earlier, something has to be done about stimulating F/F gas scale. This would be the other event, along with rubber, in which we would be competing. We would definitely want the best representation from this country, but if hardly anyone is actively engaged in F/F gas scale, we cannot expect to do very well in this particular event.

Many of you could probably care less about International competition. I

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care, and I'll tell you why. Simply stated, competition causes an advancement of the art. The way anyone can really improve is to try some competition. Going out and sport flying is great fun, but one's techniques can improve immeasurably by watching what the competition is doing. Also, getting a cross-section of foreign builders and seeing how they do things can't help but improve the art of F/F Scale.

One prime example of what I'm talking about is Peanut scale. Peanuts at one time were considered sensational flyers if they could attain flights over 30 seconds or so. Steadily the times kept on creeping up. There are probably more contests for Peanuts over recent years, both indoor and outdoor, than for any other form of scale, including R/C. Now the times are nearly out of sight, and consistently so. This didn't just happen. Competition has brought about the change. It also brought out a diversity in the type of aircraft modeled. So please, don't snub your nose at the idea of International competition, because in the long run, we will all benefit from what is learned at these special events!

In the past, I have mentioned some of the interesting finishing techniques that are used by George James. He is a real aficionado of the Dr. Martin dyes, and he does some rather fascinating things with these water-soluble dyes. Here is a new twist to his covering methods. In preparation for the dyes, George covers his models in white Japanese tissue, using thinned-out white glue for the application (very important to use white glue for applying the tissue). Then the covering is water-shrunk in the usual

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manner, however, George uses an airbrush for spraying the water. His next step is to make a very dilute white glue solution, using about 5 or 6 parts water to 1 part white glue. He airbrushes this solution over the entire model. This acts like a sizing and leaves the surface very smooth. Over sheeted areas, you can lightly sand it and apply another coat, followed by more sanding. This will leave a smooth, pore-filled surface. After the "sizing" has dried, Dr. Martin dyes are applied, again using the airbrush.

Various colors can be mixed together to get any shade or color you want. As everything used prior to the dyes were water-soluble, the dyes, as applied, are very uniform in texture. If dope had been used to put on the tissue, this would not have happened. After the dyeing has been applied and dried, a single coat of thinned nitrate dope is brushed on. No more dope is required, because the thinned-out white glue takes care of filling the pores of the tissue.

Now, for another interesting twist. George has found out that bleach removes the dye from the tissue completely. At our last club meeting, he brought his multi-engined Dornier push-pull model. It was finished in a very neat camouflage pattern typical of the aircraft of the Third Reich.

Instead of using the typical India ink treatment for outlining the ailerons, flaps, fin and rudder, etc., he filled a Rapidograph type pen with a commercial bleach such as Purex or Chlorox. He then ruled with this pen the different separations, leaving a neat white line. The white portion of the German crosses was done essentially the same way, except he used a brush dipped with bleach. If you have a steady hand, all registration numbers and letters can be done this way, using a fine brush. In fact, you can outline the letters and numerals with the bleach-filled pen, using a straight-edge, then come back with a small brush and bleach and remove the remainder of the color.

This method of finishing a rubber scale model gives them a very interesting and distinctive look, and best of all, the weight increase will be insignificant! I'm sure that many of you can think of other innovative changes to George's techniques. If so, please pass them along so that we may all profit from your discoveries! My address is 19361 Mesa Drive, Villa Park, CA 92667.



Sailing . . . . . Continued from page 43

trouble remembering to incorporate that in my discussion.

The class has maintained strong control over auxiliary functions. Only sheets, and jib twitchers are allowed as running rigging. The idea is to make skipper skill, not pocket-book, the difference between winning and losing. This tight control has been the result of a class technical committee. The Tech committee keeps abreast of new developments and advises the Class Secretary of their effect on the one-design philosophy within the class. They also do a good job of sounding out skippers throughout the country to find out what kinds of planned evolution might make the boat a better one to sail. An example of this was the decision to ask the class to vote on a reduction in mainsail roach from 3 to 2.25 inches. The appearance of the boat was improved, as the new main looks more scale-like (and let's face it, there is a large component of esthetic enjoyment in model yachting). Also, heavy weather performance was improved by reducing sail area way aft on the mains'l where it did the most to promote a wild weather helm. Overall performance was just about unchanged. I took an absolutely new boat out into our local fleet wearing the only "small" main. With weather from 0 knots to some wild 18 knot gusts, the new main came through and the boat wound up winning the event. The reduction in area certainly did nothing to devalue downwind performance.

Building a 12 can vary from the ready-to-run variety, to nothing more than a bare hull and a copy of the class specifications. Most of the presently manufactured boats can be obtained with the deck already attached to the hull. This does eliminate a rather tedious evening of measuring to be sure that the sheer beam tolerances are met, but makes gear installation a little bit tougher. The pictures accompanying this column are of my new boat. FOXY LADY III is a Crump and Associates hull, (see ad in December '77 MB). It came with the deck on, all blocks in, and the rudder installed. I adapted the mast off of the TRACER to the 72 inch length required by the EC/12 specs. It took me exactly one day to mount all the gear, pour the lead and test float the boat. That is hardly to be called "building" in my book.

While most of the winning boats are using wooden masts, I have opted for the aluminum one from Reynolds Mfg., in Orlando.



This boat was built the right way. I assembled all the gear that was to go in it; winch, batteries, R/C gear mounting boards, the rig, and so on. The whole package was weighed inside the hull/deck. That weight was subtracted from 24.5 pounds and yielded the amount of lead ballast that could be poured into the keel. **POURED LEAD KEELS**

The writer and **Model Builder** magazine disclaim any responsibility for any problems which may occur if this process is tried as a result of reading these instructions. It is **DANGEROUS**, and requires careful attention to detail. We are absolutely not responsible for any difficulties, injuries or damage which may be caused by pouring molten lead into a model yacht.

The proper weight of lead is melted in a crucible of some sort. I have found a stainless steel, seamless bucket to be a good choice. If the melting is done indoors, provide adequate ventilation, since zinc fumes may be emitted from the lead, and that can stop you from further modeling . . . to say nothing of further living. While the lead is melting, mount the hull, with the keel dam in place, inside some sort of a container, on a slight bow down slope. Weight the hull and surround it with water. Do not let any of the keel which is to be filled with lead touch the bottom of the container. There must be free circulation of the water to remove the heat from the lead and preserve the integrity of the fiberglass and resin hull. I usually put a masonite lid over the hull, with a 3 inch hole centered over the keel cavity. Spend plenty of time leveling the hull and blocking it securely. **MOST IMPORTANT . . . THE KEEL CAVITY MUST BE ABSOLUTELY DRY. NOT ONE DROP OF WATER IS ALLOWED IN THE KEEL.** The reason is that the hot lead will convert any water in the hull into superheated steam. As the steam expands it will blow the molten lead back out of the boat all over your body!!!! Be sure that you have an assistant check the bottom of the keel cavity immediately before you pour the lead.

With cold water, and good circulation around the hull, I've seen this job done to hulls with lacquered bottom paint and not even one blister forms. Be very careful!!! Get rid of all children, dogs, and wives before you start. If you use old tire-balancing weights as a source of lead, they are going to (1), smoke like crazy while the oil burns off and (2), be about 25% short on weight after you skim the metal clips off the top of the lead melt.

Let me finish my comments by



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saying that this kind of a job can result in your untimely demise if you take a jaunty attitude. Don't risk your eyes or skin. Wear some old clothes, and make sure you wear a good set of goggles or safety glasses. While you are engaged, send the family and the dog out to a movie (or a cat fight). If you can use a plumber's rig for melting the lead outside, so much the better. They are available, with propane cylinders, at a very reasonable cost, from tool rental outlets.

A well handled 12 will sail just fine with lead shot poured in for ballast. The molten-lead trick is not really necessary, unless you have your heart set on the national championship or the Mini-America's Cup. I'm going to assume that if you have set that as your goal, you'll do the job carefully enough to insure your survival to sail the event with two eyes and all your fingers. . .

I've seen 12's sailed with every conceivable kind of internal equipment. The R/C gear is usually two-channel, but the class rules do allow both a jib trim function and a jib-twitcher, in addition to the two sheets and the rudder. Any other kind of running rigging is absolutely illegal. I'll stay on record on behalf of the absolute minimum two-channel arrangement. I see a lot of


people sailing with jib trim, and since they don't really understand what it is doing, they spend as much time hurting themselves as helping. Beginners are best left to learn how to sail the boat. Extra functions detract from developing the concentration necessary to sail well. In this one-design class, there is no gadget that will make you significantly faster than everybody else. This is really true if you are sailing against the likes of Ron Stephanz, Buddy Black, Bob Harris, or any of the dozen or so top skippers to be found in the class.

#### TIPS ON SAILING AN EAST COAST 12

Sailing to weather . . . This is where fortunes are made or lost. A good start in this class is worth 40% of the total for winning. Making it to the weather mark first will put you in control of about 60%. Anybody who gets by you after that will have to get through your dirty air and that is extremely difficult. Most changes of position after that first beat occur at the marks. Beating with a 12 is a game of conservation of momentum. Keep the boat moving at all times, and resist the pinching that the hull is capable of. The boat will point a good 10 degrees higher than the direction at which she is making her best speed to windward ( $V_{mg}$ ).


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Being a displacement hull, the 12 pushes a lot of water out of the way when she goes forward. It takes energy to do this. As long as the sails are pulling well, the boat will move. When you tack, the power from the sails is lost. As a result, the boat slows down as it swings through the wind. The power does not come on again until the sails have filled on the new tack. The twisting of the hull in the water as it turns causes a greater loss of energy than if the boat was just allowed to coast straight ahead. The result is a tremendous loss of speed every time you tack. The moral of the story is to keep tacking to a minimum. Don't put the helm over every time you think you've been headed. It comes out better in the long run to keep the boat speed up, and only tack when the shifts are fairly long lasting, and of a decent size. This kind of tactic will in general see EC/12 fleets going to weather on one side of the course or the other. Skippers who try to short tack up the middle usually drop back with each tack.

On the beats as well as other legs, avoid luffing matches. The speed you lose when you luff a nearby competitor is just the speed that the rest of the boats behind you are keeping

as they catch up with you. Good skippers usually only resort to luffing strategies when approaching the finish line, or in the period just before the gun goes off at the start.

When sailing the reaching legs, do everything you can to get and keep clear air. Reduce your heel angle, and the size of your wake, by slackening your sheets. The boat will be going faster, but the smaller wake and the lack of heel will seem to you to be indicative of a slowing down. T'aint true, though. Convert all the energy into forward thrust and you'll scoot out ahead of all rest. Remember that old dictum, "WHEN IN DOUBT, LET'EM OUT!!"

Remember to send in your 1978 AMYA dues to Bob Cryslar, 2709 S. Federal Highway, Delray Beach, Florida 33444. And I'll answer inquiries if they are accompanied by a stamped, self-addressed envelope in care of **MODEL BUILDER**, or directly to: ROD CARR, 7608 Gresham St., Springfield, VA 22151. ●



**Counter . . . . . Continued from page 8**

versing switches; metal open gimbals; .002% crystal tolerance; vibration proof batteries; dual or single stick; all these and more features are built-in with the Specialist Eight. If you have any plans at all for a new radio for '78, we strongly recommend that you obtain all the literature available from Millcott, either at one of the coming trade shows, or direct from 1420 Village Way, Unit E, Santa Ana, CA 92705.

Cal Aero-Model, 7142 Bluesails Dr., Huntington Beach, CA 92647, has informed us that production of the 1938 Powerhouse and 1939 Air Trails Sporster has ended, and only about 100 kits of each are, or will be available.

Both of these "Series 50" Old Timer R/C kits are designed for .09 to .15 power and three-channel radios. They feature pre-cut parts, formed landing gear and partial hardware. The Powerhouse sells for \$31.50, the Sporster for \$33.50.

Don't forget, this may be your last chance to get a kit for one of these reduced-size old-time favorites.

With the exception of the ones who just started last Saturday, all small model enthusiasts are well familiar with the service and supplies that have been available from Vintage Aero in Tenaflly, NJ. They still are, but that company has now gone to wholesale only; to dealer, distributors and O.E.M., and all of its products are available at the retail level only at your local hobby shop, or by direct mail from Aircraft Model Products, Box 318, Scituate, MA 02066.

A retail catalog has just been published by A.M.P., and is available via First Class Mail for only \$1.00. Your buck will also bring you a full size Peanut Plan; ours was an extremely well done Curtiss "Swift" Pursuit. Listed are all the Vintage Aero products, as well as everything from Peck-Polymers, R/N Models, Classic Models, Sig, Hi-Flier, VL Products, Williams Bros., Telco, and a host of others.

Accessories, such as Japanese tissue, imported rubber, props, Peanut balsa, plans, and much more are listed. If the little ones are your way to fly, you shouldn't be without this one-source catalog. A price list is also available for a S.A.S.E., tell A.M.P. you read about it first in **MB**.

Micro-X Products, manufacturer of a large and rather diversified line of model products, has just what you

want for that young modeler at your house . . . or for that old modeler who is unfortunate enough to live where the winters are long and cold. They are called "Parlor Mites", a box-full of indoor flying fun. The materials are all of first class indoor quality, and include everything necessary to build and fly your choice of several different models. Included also, is a four-page instruction booklet written for the beginner, explaining the mysteries of wash-in, incidence, pitch, etc.

The fine points of winding the rubber motor of one of these little flyers is being illustrated by one of Micro-X's "Parlor Mates", Sherry. These quickly built small aircraft can be flown in the average living room, and have been known to reach flight times of over five minutes in rooms with 25 foot ceilings.

Information on the 'Mites; not the 'Mate (sorry!) can be obtained from Micro-X, Box 1063, Lorain, OH 44055.

\* \* \*

To the aspiring modeler, happiness must appear to be having all of the many goodies that he sees at the field and shop. To the long-time modeler who has accumulated a large amount of this paraphernalia, happiness has to be *something to carry it in!*

Whatever group you fit, Craft-Air has come to your rescue with a quality field support box that seems to have the good features of most boxes seen in use, plus some of its own. It is not a kit, doesn't have to be painted, is fuel proof, and is claimed not to break . . . either itself or you, as the price is only \$29.95.

The Craft-Air field box is molded from polyethelene, in bright, easy-to-see yellow. It has a base of 7-1/4 x 22-1/8 inches, and is 11-1/2 inches high. The empty weight is only 2 lbs., 11 oz. It has a 12-1/2 x 6-3/4 x 2 inch drawer in the bottom, a 4 x 7 x 4 inch well at the top, a well for the starter, and a ledge for the 12-volt battery, transmitter, and a gallon fuel can. Also there is enough panel space to allow for mounting your power panel or other support item of your choice.

Now you have no excuse for not having it all together, and all you need is your bird in the other hand and someone to tell you which way the wind is coming from. Try your dealer first. If he doesn't have 'em, write Craft-Air, 7851 Alabama Ave., Canoga Park, CA 91304.

\* \* \*

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Same thing applies to nickel-cadmiums. Who wants fat ones? Robin-



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aire, the Florida outfit that has discovered the way to thin them down, will soon have a smaller one, of 180 MAH capacity. This one measures 1-15/16 square by 13/32 thick, weighs 2 ounces, and is recommended for 1/2A's, Quarter Midgets, and any other low-drain, low-time flying. They will be available with Kraft or Futaba connectors, or without, so you may install the proper type for your R/C equipment.

In an earlier mention, we gave Robinaire a wrong ZIP code, which apparently put it east of Florida somewhere out in the Bermuda Triangle. The correct ZIP to use when you ask for information on this new pack, or

the skinny 450 MAH pack, is 33432. Rest of the address is: Box K, Boca Raton, FL. Tell them MB sent you to the proper address this time.

\* \* \*

The winner of the 1/12th Scale Electric Class D, 6-cell outdoor event at the 1977 ROAR Nationals is now available, completely assembled and ready to run, with radio, from JoMac Products, Inc. Using the time-proven MRP chassis, a painted and trimmed Cobra II Lexan body, and the new No. 406 JoMac Mach 3 Electronic Speed Control Radio Control System, this speedster is loaded with many other desirable features.

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A 12-volt quick charger is supplied, as are fast-charge GE batteries. The receiver works directly off the motor battery to save weight. Two cells may be disconnected for slower indoor operation. The transmitter is a full 1000 MW; the system uses plug-in crystals for maximum channel utilization.

The actual speed is 29 MPH, using a dyno-tested 05 motor. A gear ratio of 16/52 is used, driving 2-1/8 x 1-1/2 inch wide foam-rubber rear tires. Total weight is 38.5 ounces.

The price is a tentative \$240; check your local R/C car dealer, or inquire direct from JoMac Products Inc., 12702 NE 124th St., Kirkland, WA 98033.

\* \* \*

Contrary to popular belief in some quarters, there are lakes and ponds in Texas; enough so that Steve Muck has not had to give up R/C boating since his move from California. In fact, his

interest and manufacturing have both increased. The latest from his new Dallas base is the "Li'l Dolphin", a new three-way kit for the beginner. It can be powered by either a K&B 3.5 CC Outboard, inboards up to 3.5 CC, or electrics of comparable power. The "Li'l Dolphin" kit comes complete with pre-cut bulkheads, deck shears, cabin sides, and radio box. Included also is birch plywood sheeting and a plexiglass radio box lid, screws, and turn fin. Instructions include step-by-step photos and building hints.

The length is 28-1/2 inches, and any two-channel R/C system will handle the steering chores. For inboard installations, a hardware kit using all stainless steel hardware and including a cable stern-drive system and an adjustable strut is available. Also included are a motor mount, cable engine coupling, cable assembly, rudder, arm, stuffing box, and teflon liner.

Sorry, we don't have prices, but they can be obtained at your favorite boat dealer, or direct from Steve Muck's R/C Boats, 6003 Daven Oaks Dr., Dallas, TX 75248.

\* \* \*

Have you ever tried to grow decals? Larry Vance, 5066 Cindy Way, Las Vegas, NV 89102, must have the secret! At least he has been successful in making his Old Timer decal set grow, with new additions, and better prices. The original set, as reported in "Over the Counter" for May '77, has been expanded to include decals for Dooling, McCoy, Champion, Ohlsson 23, and other products . . . 23 varieties in all, on 6 sheets (2 sheets of each style) for only \$7.50. This is about a

50% reduction in cost since the initial release, and in this day of rising costs, we think this is commendable. Order yours from Larry at the above address; don't forget to mention MB.

\* \* \*

This seems like our month to bring you good looking twin objects! Neither the last nor the least is the DAMO FS-218, an opposed twin-cylinder, four-cycle, pushrod operated overhead valve, aircooled, glow engine now available only from its distributor in Sweden.

This new beauty displaces 1.10 cu. in., at a weight of 19 ounces, and is claimed to swing props of from 12 x 6 to 18 x 6 inches, at RPM's from 11,000 maximum to 1,200 at idle. The calculated power is stated to be 1.25 HP. Constructed primarily of aluminum and hardened steel, bronze is also used for the valve guides and seats, and the pistons are of cast iron. The engine is well equipped for long life, with the extensive use of bearings. Four ball bearings are used for crankshaft support, two needle bearings for the camshaft, and even the connecting rods have needle bearings at both ends. The carburetor is either a modified Perry or an OS.

Interestingly enough, this engine does not use castor or any other lubricant. It runs on straight methanol, with up to 10% nitro. Because of the extensive use of bearings, and with the use of proper tolerances, the manufacturer claims that the lubricating qualities of the methanol are adequate. Oil at no more than 5% is recommended only for tightly cowled installations, or whenever a high-nitro fuel is to be used.

Priced at \$495, the Damo FS-218 is currently available only from Marketing Consulting Corporation AB, P.O. Box 241 11, S-750 24 Uppsala, Sweden. Write to them for their information pamphlet, and be sure to mention MB.

\* \* \*

Is one picture worth a thousand words? Hope so, cause all we have on these new O.S. and Super-Tigre engines, available or soon to be available from World Engines, are the pictures; little information.

The O.S. 45 Marine R/V features a Dykes ring and comes complete with marine head, flywheel and U/joint. The Super-Tigre is a Schneurle .60, which will be available as a rear or side-exhaust engine.

Other new goodies from the same folks include a special mount for the O.S. .60 Four-Cycle engine, and a heat mount for the O.S. 25 FSR.

Interesting looking items from manufacturers of many other well-known and quality products, but you'll have to get the rest of the



thousand words direct from World Engines, 8960 Rossash Ave., Cincinnati, OH 45236. Tell them MB sent you.

\* \* \*

Ready for something new in R/C cars? How about an 1/8th scale Sprint Car? An exact-scale fiberglass and aluminum body for Don Edwards' Sprint Car is now available from Auto Research, Inc., 1418 S. Central Park Ave., Anaheim, CA 92802.

The nose and tail pieces are molded fiberglass, and the main body is formed aluminum, similar to the full size car construction. The body parts sells for \$37.50, plus postage. California residents don't forget the 6%. Note that this is for the body parts only, and that the chassis or any of the running gear or detail pieces are *not* included.

\* \* \*

I recently received a modern form of keel-hauling for saying that I didn't really care for the name of a certain airplane. Well, there are very probably complete classes of modelers out there who won't care for the name of this one: R/C-56. But as Dirty Dan points out: "Hey gang, even if it is primarily intended for some other type of model . . . if it does a good job for you, use it. Keep an open mind."

Actually, R/C-56 is not intended for radio control models only, and its name was probably conceived back in some laboratory. It was originally introduced to us a super-sticky for an unusual gluing job; that of joining the very dissimilar materials of which canopies and fuselages are made. It does this well; creating a firm, flexible bond that withstands shock and vibration.

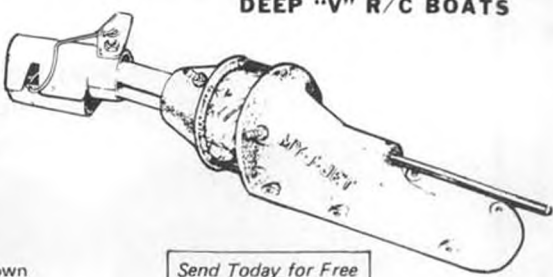
Lately, I have discovered other uses for this adhesive. Nylon and plastic exit guides, and wing tip skids, such as those available from Goldberg models, always had a way of getting loose or lost for me because the adhesive did not "take" well. R/C-56 now cures that for me. A drop on the

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threaded end of a nylon clevis where it mates with the wire rod, very effectively holds it from coming loose. There must be many more plastic-to-something-else gluing jobs that this glue will handle better than others we are now using.

It is non-toxic, goes a long way, and comes in handy 4-ounce bottles with applicator spout. Look for it down at the hobby shop. For further literature and data, write to Wilhold Glues, Inc., 8707 Millergrove Dr., Santa Fe Springs, CA 90670.

\* \* \*

Fourmost Racing Products can't boast of the largest product line in the hobby. But it can boast that all of its products are exclusive, high quality, and certainly make life easier and more pleasant for modelers. It has just announced two new products, neither of which has appeared before in just this form.

One is Cockpit Coaming, extruded from flexible black vinyl material, pre-shaped to fit around corners. Just the thing for that new one or two-holer you are building, or even that old one you've been flying around. It comes in



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two sizes, 3/32 and 3/16 inch, two feet of either size for \$1.95.

Second item is a slip-on Strut Fairing, also of extruded vinyl, in two sizes, 3/32 and 1/8 inch. This should also serve well to dress up those scale and semi-scale birds. The Strut Fairing is packaged in two 23-inch lengths, at \$2.25 for each size.

Look in your hobby shop first. If not there yet, write to Fourmost Racing Products, 4040 24th Ave., Forest Grove, OR 97116.

Engines for the big ones, rockets, that is, are now available from Centuri. It has just announced new "Super-C" single-stage and booster engines, designed to boost big model rockets higher and straighter. They are said to be especially effective with Centuri's Super Kits, and its Space 1999 Eagle Transporter.

The "Super-C's" are a development of the popular "C" engine, and provide a higher initial thrust "spike" at liftoff, to stabilize the larger rockets early in their flight path. The CR-3S single-stage engine may be used with most rockets which already fly well with a standard C6-3, while the C5-OS is recommended for most staged rockets.

"Super-C's" are priced slightly

higher than normal "C" engines; come packed three-to-a-box, complete with igniters.

For further information, contact Centuri Engineering, Box 1988, Phoenix, AZ 85001.

Is something lacking in your rubber powered flying lately? Maybe what you need is our Cindy and her "Rubber Power" T-Shirt from "Che Hobbies", to put some more winds in your motor.

Well, too bad, Cindy is not available. But the T-Shirts are, for yourself and your own pit-person, as are a multitude of other hard-to-get items designed exclusively for the competition free-flight, both rubber and power.

Wood, covering materials, glues, engines and accessories, rubber, winders, reels, kits, etc. If it is free flight, chances are that you will find it all from this one source, which also promises one-day shipping service.

The shirts are available in small, medium and large, in your choice of orange or yellow. The price is \$5.00, plus \$1.00 for postage . . . plus 6% if you live in California. The prices for the rest of the goodies are too numerous to list. You'll get a catalog with your T-Shirt, or send a SASE for

your copy to: "Che Hobbies", 10900 Eastwood Ave., Lennox, CA 90304. Tell them Cindy sent you!

It's a MIRACLE! Sounds kinda like Prather Products has gone into the laundry detergent business, but that is not so. Its Miracle Micro-Balloons filler is called that because it does everything you can possibly ask from a filler. It is smooth, sands easily, comes in a convenient easy-pour container, and is snow-white in color. Mixed with your favorite polyester or epoxy resin, epoxy glue, or even old-fashioned so-called 'model airplane glue', micro-balloons will adhere well to all common construction materials. Applied with forethought and discretion, the mixture will not add appreciably to the gross weight of your model. Miracle Micro-Balloons are available only in a 42 gram (1.5 ounce) container at \$1.98.

Another new release from what most of us erroneously think of as a racing products manufacturer, is of most use to the sailplane crowd. It is Double-Back Tape Squares, in one-inch pieces, using a strong 3M adhesive. They are reported as great for holding servos, receivers and batteries in gliders, or for holding any hardware in your airplane or field box. Tape Squares come ten to the package for 98¢.

And while the following is not about a new Prather Product, it is news, and you never read it anywhere else before. As any one who ever used one will verify, once you have used a Prather Drill-Tap Jig to mount an engine, you will never do it any other way . . . not if you are interested in perfectly located and tapped holes that allow you to mount your engine securely, and where you want it, without having to resort to elongated holes. The real news is that the Jig designed for use with the K&B 15 is also of the proper spacing for the newer Rossi and Cox 15's . . . And like all the higher RPM racing engines, these will perform better if mounted securely.

A last bit of news, not good, is that Prather Products has temporarily discontinued production of Pylon Racing Props, due to scarcity of the high-quality wood necessary for their manufacture. More news from them, and from MB, on that subject as soon as the problem is overcome.

Can't wait for news about the props or any of its other fine products? Check with Terry at Prather Products, 1660 Ravenna Ave., Wilmington, CA 90744.

Engines for Marine Steamers, in small sizes, are now available from Polk's Model-Craft Hobbies. They are

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It's WRAM's SHOW time again and 1977 is shaping up to be the largest Show ever . . . 3 full floors of the Westchester County Center with well over 100 manufacturer's booths, thousands of square feet for models and a whole third floor for the Swap Shop.

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### Special Swap Shop Note

Over the past few years, the Swap Shop has been inundated with built-up models making it extremely difficult to fairly display them all. To provide maximum exposure of each built-up model on display in the Swap Shop, 1977 Swap Shop Registration for complete models and airframes will be limited to one per registrant.

Make sure you make your plans now . . . 1977 will be the biggest and best WRAM's SHOW ever!



**Show hours are 10 AM to 6 PM on both days. It's a weekend you can't afford to miss . . . see you there.**

For further information, write Larry DiRubbo, 167 Lindsey Ave., Buchanan, N.Y. 10511.

available in two- or three-cylinder versions, and are made with cylinders cast from zinc alloy with brass liners. Both models are equipped with gears, which allow two speeds forward and two reverse. For R/C applications, the gear mechanism can be handled by any normal servo.

The dimensions for the two-cylinder are; 4.1 inches long, 3.5 inches high, and 2.4 inches wide. The three-cylinder differs only in length, being 5.1 inches long.

Completely equipped with boilers and burners, the two-lunger is priced at \$219.95; the three at \$299.95.

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**Remotely . . . Continued from page 16**

in new interests; Advanced . . . an upper level for the more skilled; Expert . . . the real training ground for tomorrow's Master; and Master . . . the pros who have demonstrated their right to be there.

"Say . . . have you seen the new kid in the club fly that ole' Falcon 56? . . . Anyway, it is simple!!!"

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Obviously, we're interested in your

reactions, particularly in our capacity as chairman of the R/C Contest Board. Please let us know what you think of the ideas presented. Remember, this will be a proposal for the 1980-81 rulebook.

### MORE ON BEEG SCALE!

The current rise in popularity of large scale models (having flown our 1/4-scale Gipsy Moth in the 1961, 1965, and 1966, Nats makes us feel

like a pioneer!) is so strong that it seems inevitable for the Contest Board to be faced with establishing some kind of AMA-legal maximums on size, weight, and power.

Canadian modelers are talking about a single limiting factor of weight, 35 pounds . . . no limits on size or horsepower (or displacement). Next year's Las Vegas extravaganza will call for close-to-scale models of aircraft that have competed in aero-

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Each member or family automatically receives a subscription to the society publication SAILPLANE, starting with the dues and first issue published after payment of dues and continuing thereafter through the membership year.

Dues are payable prior to December 31st of each year for the ensuing year.

In the event a member joins during the dues year, he shall submit dues as follows: between Dec. 1 and June 30, full annual fee; between July 1 and Nov. 30, one-half the annual fee. Members joining during December of a year shall also be members of ensuing year.

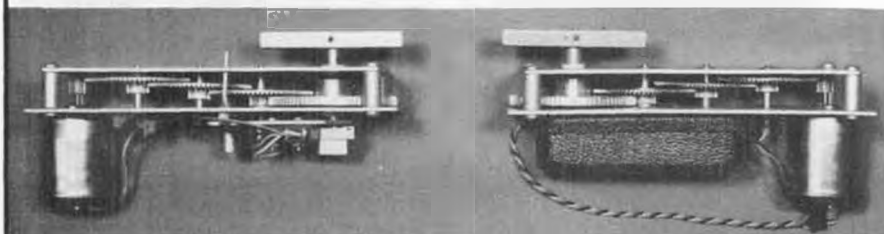
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batics. The *minimum* size limits are 800 sq. in. monoplanes or 1000 sq. in. biplanes. Weight limit is 10 kilos, or 22 pounds, with no maximum limits on overall size or engine power.

It would seem that our concern for super-powered big engines is a little premature. Most everyone who is examining the possibilities or is in the process of building a scale biggy, is looking for engines capable of turning big props with plenty of torque, at low RPM's, which is a healthy attitude. It could be that the very nature of the requirements for large scale models will self-prevent any desire for high-revving monster engines.

All of this leads us to the following letter, from John Preston, Falls Church, Virginia.

"I read with interest your comments in the November '77 MB regarding Mammoth Classic Scale. I would like to offer you my thoughts and in return, try and solicit some information on how to run a 1/4-scale class in a future contest.

"I was the assistant CD at an all-scale contest held by DCRC at Bealton, Virginia in September. I have volunteered to CD a repeat of this event on September 23 and 24, 1978, and would like to include an event for 1/4-scalers. As a result of the presence of a Nosen Mr. Mulligan at our 1977 contest, there is a surge of interest in large models in the Washington, D.C. area. This model, which was built by Kirby Crawford, of NVRC, was too large to compete under Sport Scale rules, but we used it for judges' warmup flights and in a model airshow which preceded a full-scale airshow on the second day of the contest. The enclosed photograph does nothing to show you its realism in flight, which scores an A+ in all departments, including sound. Powered by a 1.6 cu. inch ignition chainsaw powerplant, it tips the scales at 23 pounds. Hardly the MCS model that Le Gray and you had in mind!

"For our contest in 1978, I would like to add a class for 1/4-scalers which would permit the Paul Bunyon engines, but like you, I would get weak at the knees if we had to also include 2 cu. inch Schneurle-ported glo engines. What I had in mind was to permit any model which is +5% of 1/4 scale and use Sport Scale judging rules, but raise the weight limit to 25 pounds and the displacement for ignition engines to 2 cu. inches. A 60 glo engine powered big one could enter either 1/4-scale or Sport Scale if it met the 15 pound weight requirement that currently exists. The emphasis in flight judging will be in realism. Particularly in realistic speed.

"If you see fit to print this letter, I would like to ask any of your readers who may have thoughts on 1/4-scale



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rules to please contact me with any suggestions they may have.

"For your information, Kirby's Mr. Mulligan was constructed from a modified Nosen kit. In the entire fuselage, balsa was replaced by white pine. Engine vibration required a Lexan windshield, and steel engine cowling attachment brackets. Kirby cannibalized an \$80 chainsaw for the motor, and did his own machine work on a Taig micro-lathe to modify it for aircraft use. Covering is Permagloss Coverite, and radio is a Kraft KP5C with KPS-15 servos. No ignition shielding is used, other than an aluminum plate fitted over the entire firewall.

"My own 1/4-scale Tiger Moth, which will be constructed to the MCS concept, is still sitting on the drawing board waiting for me to quit photographing other peoples' airplanes and writing to editors of magazines!"

Sincerely,  
John D. Preston  
7012 Elvira Court  
Falls Church, VA 22042

If you do write to John, please clue us in with a xerox copy. We are interested in gathering data on this subject, and will make the better portions of it available to our readers. Of course, it goes without saying, that another copy should go to the Scale Contest Board Chairman, Claude

McCullough, c/o Sig Mfg. Co., Montezuma, IA 50171.

## HOTMAC POKER

The Waco, Texas Heart of Texas Miniature Aircraft Club (H.O.T. M.A.C.) successfully concluded its Tenth Annual Fun Fly contest back in August of 1977. Though this report is a little late, due to space problems, the ideas for fun-fly events don't become dated, so we're bringing them to you now. Jim Smith, a HOTMAC member from Waco, describes them for you.

"The format of the Summer Fun Fly has contributed to the popularity of this contest. The events flown are designed to appeal to both the experienced and the novice flyer. A luck factor is introduced, which in effect, weighs the end result of point tabulation. The three events flown are: Short Field Takeoff, Limbo, and Pokerhand Spotlanding.

"The Short Field Takeoff event is scored by erecting a 6 foot high paper mache ribbon. The runway is marked off in one-foot increments to 100 feet. Point scoring is tabulated for each foot distance from the barrier. A minimum of 1,000 points is allowed when the plane clears the barrier. A greater number of points is allowed for a successful takeoff for each foot closer to the barrier. The same 6 foot barrier is used for the optional Limbo event. The flyer may elect, at his discretion,

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to fly under the Limbo line. If he is successful in flying under the line he is given 500 bonus points. Should he not be successful in his attempt, 500 points are deducted from his short field takeoff point total.

"The landing area is marked off into five spaces and titled Ace, King, Queen, Jack and Ten. The contestant has five landing attempts to land in an area that would give him the best pokerhand. Should he land on the runway, and miss any of the five designated card areas, he is allowed to draw a card from a deck of ordinary playing cards. Point scoring is allowed, not only for each card,

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but also for various pokerhand combinations such as straights, flushes, and etc.

"The points accrued by each individual contestant are converted to checks for Contest Dollars. This 'Money' is used to bid on merchandise prizes in a Country Store type auction.

"The Auction is actually the high point of the Contest. Fierce competition develops in the bidding, and it is not unusual to see a half-dozen props sell for \$2,000.00. The Contest is limited only by the imagination of the sponsoring club. The requirements for working personnel are minimal and the amount of fun to be had is tremendous."

### WHISKEY WITH A GLITCH

Typically, newspapers don't consider anything to be news, unless it's bad news. Fortunately for our hobby, there hasn't been anything bad enough to print lately . . . thud, thud (knocking on wood, but it happens to be a soft piece of 1/4 by 3 contest balsa). On the other hand, the CB'ers

are still catching hell from the press. It's a little difficult for us to side with the newspaper's victim in this case, as a certain element of the Garbage Band has had telling and senseless effect on many a radio controlled model.

The latest Associated Press story comes out of Washington, and we quote from a local newspaper clipping:

"The Federal Communications Commission has cracked down on the alleged leader of the CB 'Whiskey Club', which the FCC said promotes nationwide use of unauthorized citizens band radio equipment, channels and call signs.

"The commission served notice on Jesse D. Runyan of El Dorado, Kan., to show why his CB license should not be revoked and why his license as an amateur radio operator should not be canceled.

"Runyan was given 30 days to respond to the order and ask for a hearing if he desires.

"The FCC said 'it appears that Runyan was founder, member and leader' of the

Whiskey Club, sometimes called the 'W Club,' composed of CB operators who illegally use the single sideband mode of transmission.

"These CB operators are organized into state Whiskey Clubs which employ a system of operator identification numbers consisting of the letter 'W', preceded by a number representing the particular state's order of admission to the union and followed by the individual member's personal number," the FCC order said.

"For instance, it said, members of the Kansas Whiskey Club use identifications with a '34W' prefix, adding that Runyan apparently uses the identifier of '34W1.'

"In addition, the FCC said, the Whiskey Clubs operate radio transmitting equipment on frequencies above those assigned to CBers by the FCC, apparently using equipment not approved for CB use.

"It further appears that rosters of Whiskey organizations identify operators by first name, city and Whiskey number instead of commission call signs," the complaint said.

"Thus, it appears that this number assignment scheme enables members to identify each other over the air, while avoiding detection by the commission by concealing their identity and station location from the commission."

"The complaint against Runyan was a major step in a campaign by the FCC against illegal CBers, mainly those who operate high-powered illegal equipment, which interferes with television and other communications."

Lack of this kind of bad press continues to put licensed radio control operators on the good side of the FCC. Let's hope we continue to stay there.

While we're on that general subject, reference is made to the January 1978 issue of our competitor, "Model Aviation", the supposedly member-only AMA magazine which is also available for over-the-counter sales in hobby shops.

A report on the Frequency Committee's efforts begins on page 57. Of particular interest, is a discussion on R/C frequency monitoring, which be-

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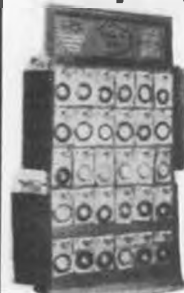
gins on page 58 and continues on page 62. Anyone who has the skills and equipment required to carry out monitoring of the "Guard Band" frequencies (ranging from 31.995 to 42.005), which are being examined by the Frequency Committee, could be doing all radio controllers a great favor. Discovering if the frequencies listed are truly "dead areas" could lead to special effort by the Committee in requesting that the FCC assign them for radio control use.



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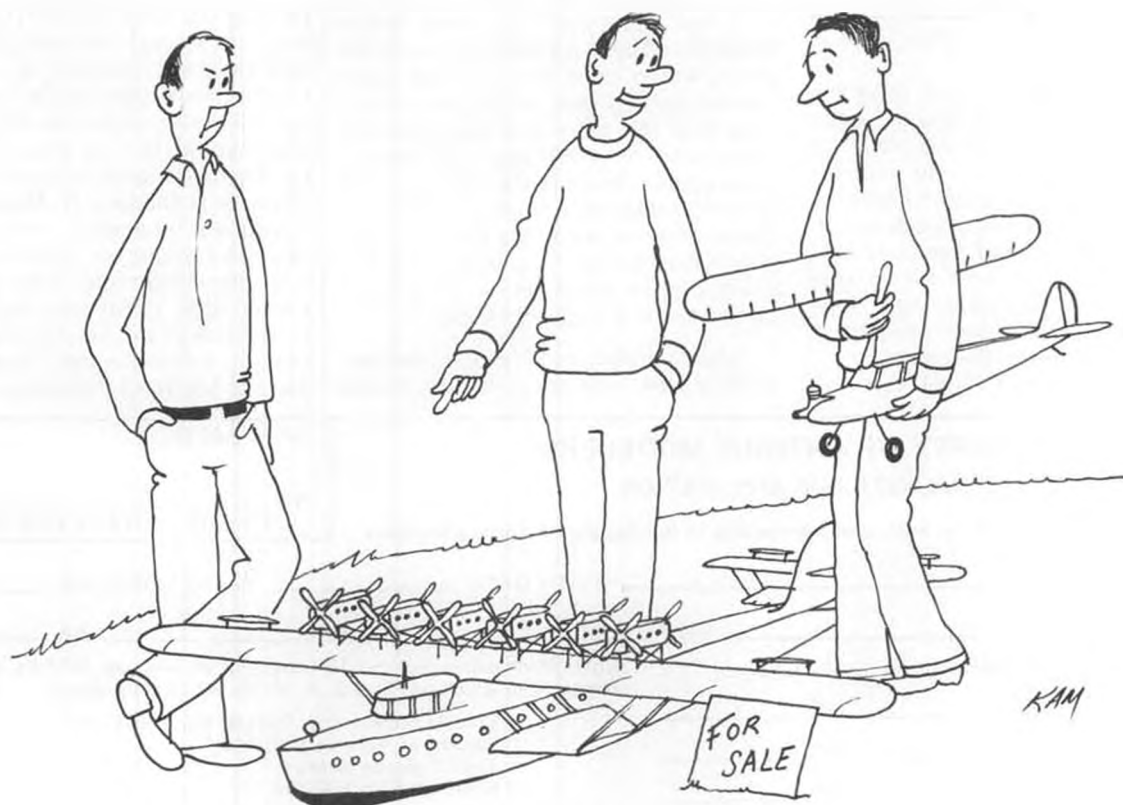


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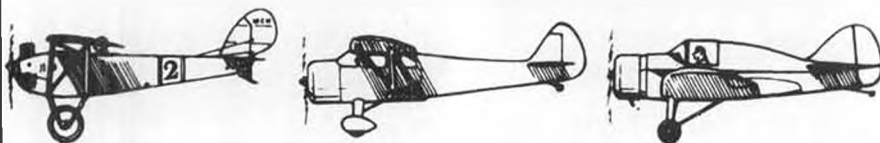


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Workbench . . . Continued from page 6

batteries, and receiver, and filled the fuselage with cornstarch to soak up as much fuel as possible. At this point, my biggest concern was with the receiver and batteries. I removed them from their foam and plastic jackets. Close examination revealed only slight traces of fuel, which could be removed with a little wiping. The plastic jackets had done their job well. I then turned to the job of removing the fuel from the plane."  
COMES THE HANDY HINT. . .

"I had been told by some fellow modelers about a product on the market which would draw out fuel from fuel-soaked balsa. I decided to give it a try. I went to the store and purchased a spray-can of K-2R spot remover. I sprayed the interior of the fuselage and, as per instructions, I let it sit for two hours. I then removed the K-2R residue, which had turned to a white powder, using a paint brush and a small hose connected to a vacuum cleaner.

"Upon careful examination of the fuel-soaked area, I could not find any traces

of fuel! In fact, the area treated with K-2R seemed to be not only cleaned, but appeared to be bleached. The K-2R seems to have the ability to draw the fuel out of the balsa. This experience has convinced me that the use of epoxy and plastic bags to enclose the receiver and batteries is well worth the trouble. It has also proven the benefit of a pre-flight check. If I would have pre-flighted the plane, I may have found the small cut in the fuel line which allowed the fuel to get into the fuselage area.

"K-2R comes in spray can and tube forms. I would recommend the spray can because of its ability to get to areas which could be hard to reach by hand."

## MODEL SHIPYARD

Our search for someone to head up a feature column on the interesting hobby of static and operational model ships continues. The building of model ships had obviously been with us much longer than model airplanes, however, the majority of ship models have, in the past, been of the static type; ornamenting desks, tables, and mantelpieces. In the last century, free-running sail and power boats have become more popular, and in the past 10 years, model ships have become a noticeably "visible" hobby, as clean and silent sail and electric powered radio controlled scale model boats cruise around public parks, lakes, harbors, and man-made lagoons.

We have run several columns on scale ships under the "Model Shipyard" title, and each time it has appeared, we have received enthusiastic reaction through the mail, phone calls, and personal contact. So again, we call your attention to the fact that we are still interested in finding someone who would like to prepare monthly or alternate month columns on model ships for publication in **Model Builder**. If you are interested, or know someone who might be, drop us a line.

In the meantime, here's an interesting little tidbit gleaned from the newsletter of the Ship Modelers Association, located in the Orange County area of Southern California. No credit

## SOCIETY OF ANTIQUE MODELERS MEMBERSHIP APPLICATION

I hereby make application for individual membership in the Society of Antique Modelers.

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In making this application for membership to the Society of Antique Modelers, I agree to abide by the rules set by the Society and realize that the goals of S. A. M. and the Old Timers movement are to encourage participation above competition and is dedicated to the preservation and reproduction of vintage model aircraft.

Signed \_\_\_\_\_

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ONCE AGAIN...

For the 7th year in a row, we take

this opportunity to wish our readers a happy and prosperous New Year. There have been times, particularly in the first few years of our existence, when it was questionable that we would make it to the next January issue. However, through the support of you who subscribe or buy the magazine over the counter, the support of hobby shop owners who have promoted its sales, and most of all, the support of members of the industry, who have pumped life-giving cash flow through its account books in exchange for display advertising space, we're still here and going strong. And for this we offer our sincere thanks to all of you.

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The Chance Vought Corsair had a service life spanning two wars, performing every conceivable mission possible for a military flying machine. The Corsair had a 15 year life span of battle victories unequalled in the annals of aviation history. Vought ceased production of the F4U-1 Model on Feb. 2, 1945 with the delivery of the 4,996th airplane. In air-to-air combat the Corsair had destroyed 2,140 enemy aircraft with the loss of 189.

The Corsair's distinctive whistling war cry, caused by the wing root inlets for engine air, earned it the nickname "whistling death" among the Japanese.

The Corsair's most unique feature was the bent (gull) wing which was necessitated by the most powerful engine ever installed in a piston engined fighter, coupled with one of the largest props in the world. Thus the inverted gull-wing permitted the short, sturdy landing gear required for carrier operations.

The first combat unit to receive the Corsair was VMF-124 and the first 12 machines arrived at Henderson Field on Guadalcanal on Feb. 12, 1943. On Feb. 13, VMF-124 demonstrated their superiority over the Wildcat by escorting PB4Y-1 Liberators all the way to Bougainville. The following day they saw combat for the first time, and the inexperienced Corsair pilots were badly mauled by some 50 Zeros. Two Corsairs, two Liberators, two P-40s and four P-38s were lost in this "Saint Valentine's Day Massacre", but the Corsairs soon gained superiority over the Japanese which was never lost. VMF-124 was subsequently credited with 68 kills against a loss of four aircraft and three pilots. Within six months, all Pacific-based Marine Fighter Squadrons had been re-equipped with the Corsair and the list of aces and the airplanes legend began to grow.

## About The Kit:

Designed expressly for 2 channel R/C with plenty of room for just about any R/C up to 4 channel miniature units. Maintaining top quality and simple construction, (even the inverted gull wing), all Balsa and Plywood parts are accurately die cut. Hardware Package including R/C Hardware, full-size step-by-step Plans and a flat finish Decal sheet for Major Gregory "Pappy" Boyington's Lulubelle as it appeared after the Oct. 17, 1943 raid on Kahili Airfield, Solomons. Recommended engine sizes for maximum performance .09 or .10. Minimal performance achieved with stock .049 or .051 Tee Dee. Diesel conversion of Tee Dee Engines is suggested.



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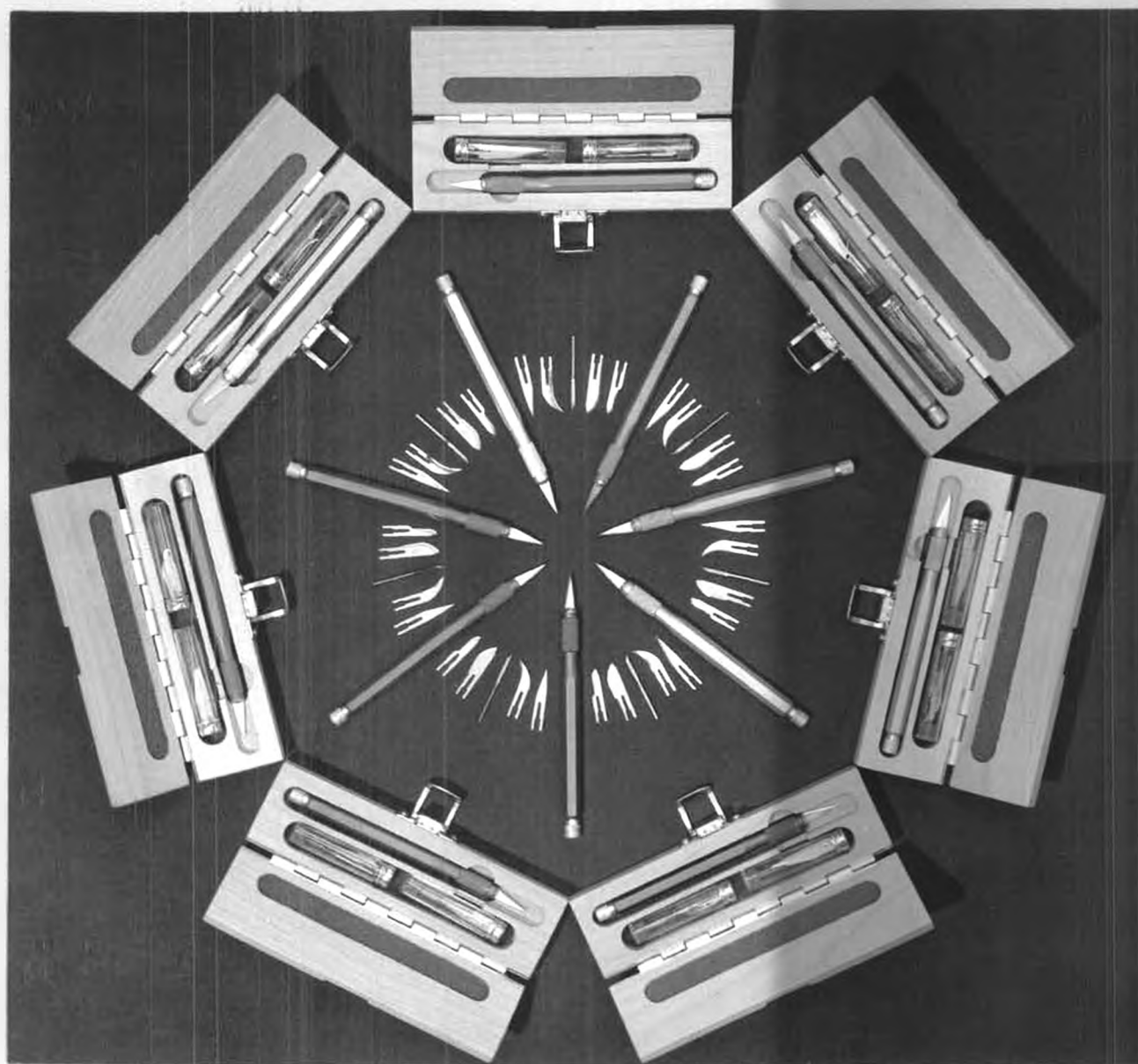
surprisingly similar to most non-scale designs of this size. And now with the interest in Stand-Off Scale sailplanes rising, as seen at the August '77 LSF Tournaments, you'll be seeing a lot of Cadets on the field. With its unique combination of performance and nostalgic heritage, the Cadet UT-1 will be the only Stand-Off that really stands out.



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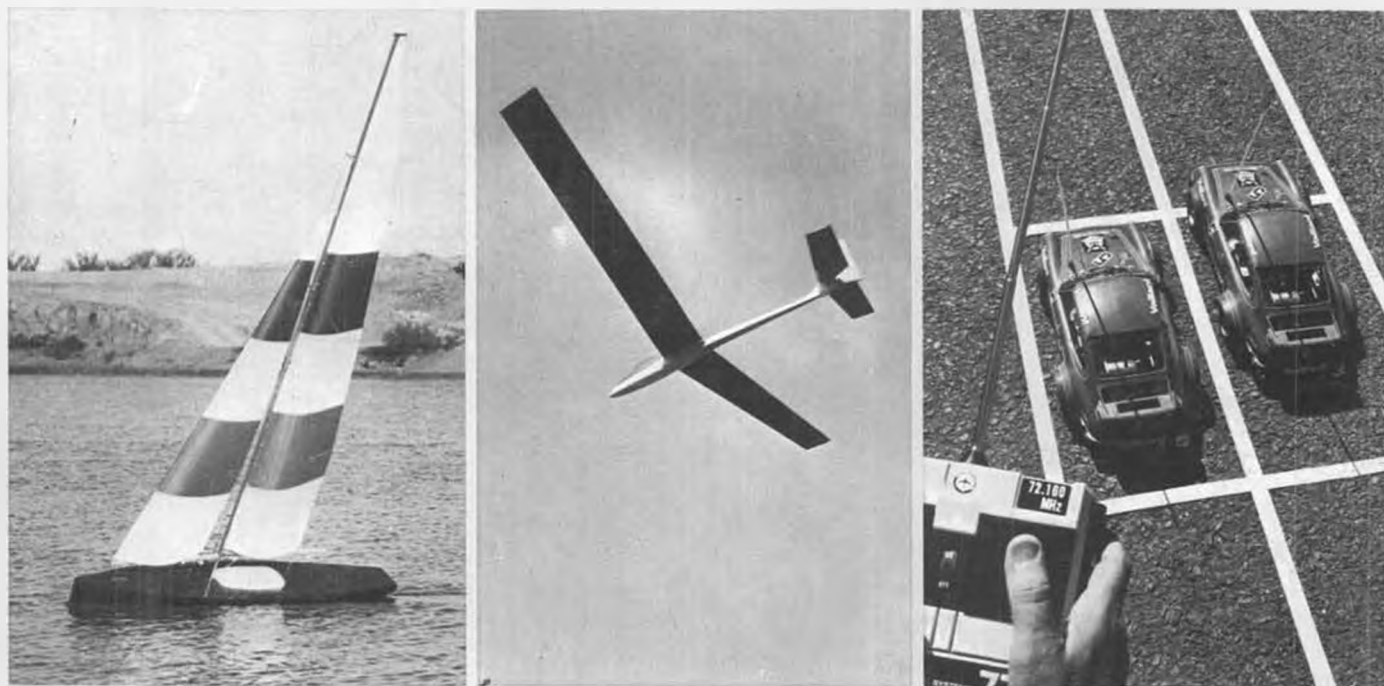
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