
R/C
RADIO CONTROL
MODEL BUILDER
volume 11, number 108
$2.50
JANUARY 1981
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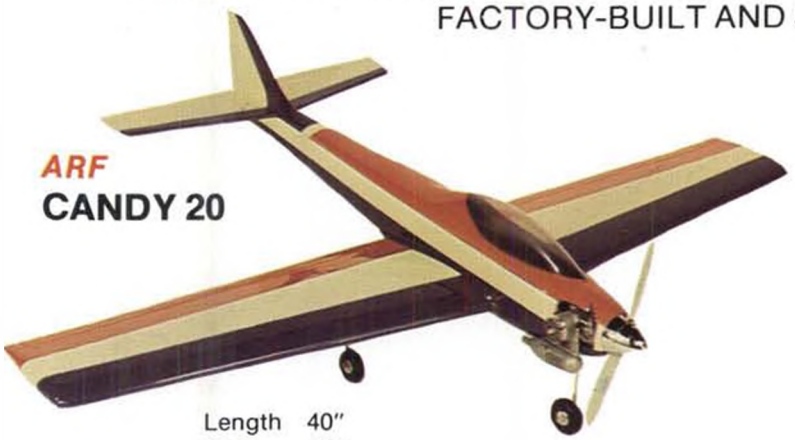
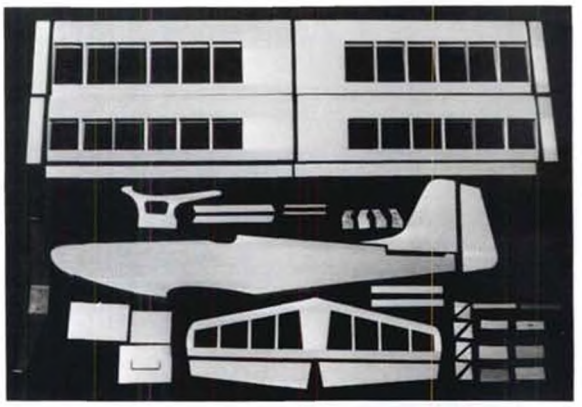


Length 40"
Span 49"
Weight 4 lbs.
Engine .20 size Schnuerle

**$79.95**



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Length 49"
Span 57"
Weight 6-1/2 lbs.
Engine .40

**$109.95**

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Length 51"
Span 58"
Weight 7-1/4 lbs.
Engine .60

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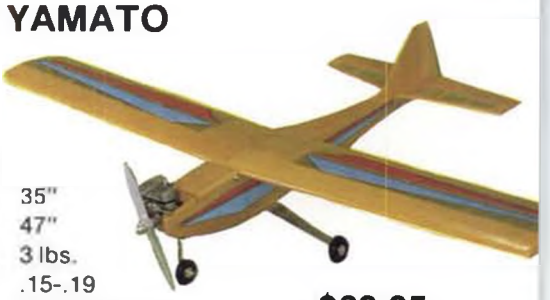

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(Beautifully covered, ready to fly) **$99.95**

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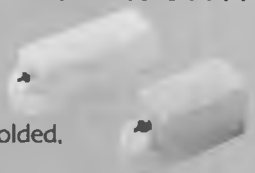

Available in regular and slimline design, these blow molded, thick walled seamless polyethelene tanks, with an easily removed pick-up tube, are the finest. They are suitable for both glow and ignition engine fuels.

Keep your model engine aligned and firmly in place, at the same time keeping vibration levels to a minimum by using our high strength glass filled nylon, or rugged cast aluminum engine mounts. They are available in various sizes to fit most engines.

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# R/C MODEL BUILDER

JANUARY

1981

volume 11, number 108

621 West Nineteenth St., Costa Mesa, California 92627 Phone: (714) 645-8830


## CONTENTS

### FEATURES



### SCALE VIEWS



### CONSTRUCTION



Cover: What you might call a "Sport Scale Mercedes", on a VW chassis, belonging to Ted Pickett, serves as a backdrop for Jean Irwin, Upland, California, who is holding an Air Trails Sportster O.T., built by Terry Conely from a Cal Aero kit. Powered by a Fox .09 side-port, Kraft radio, it is covered with yellow silk and clear doped with Aerogloss. Transparency by Cecil Weatherly III, Hacienda Heights, California.


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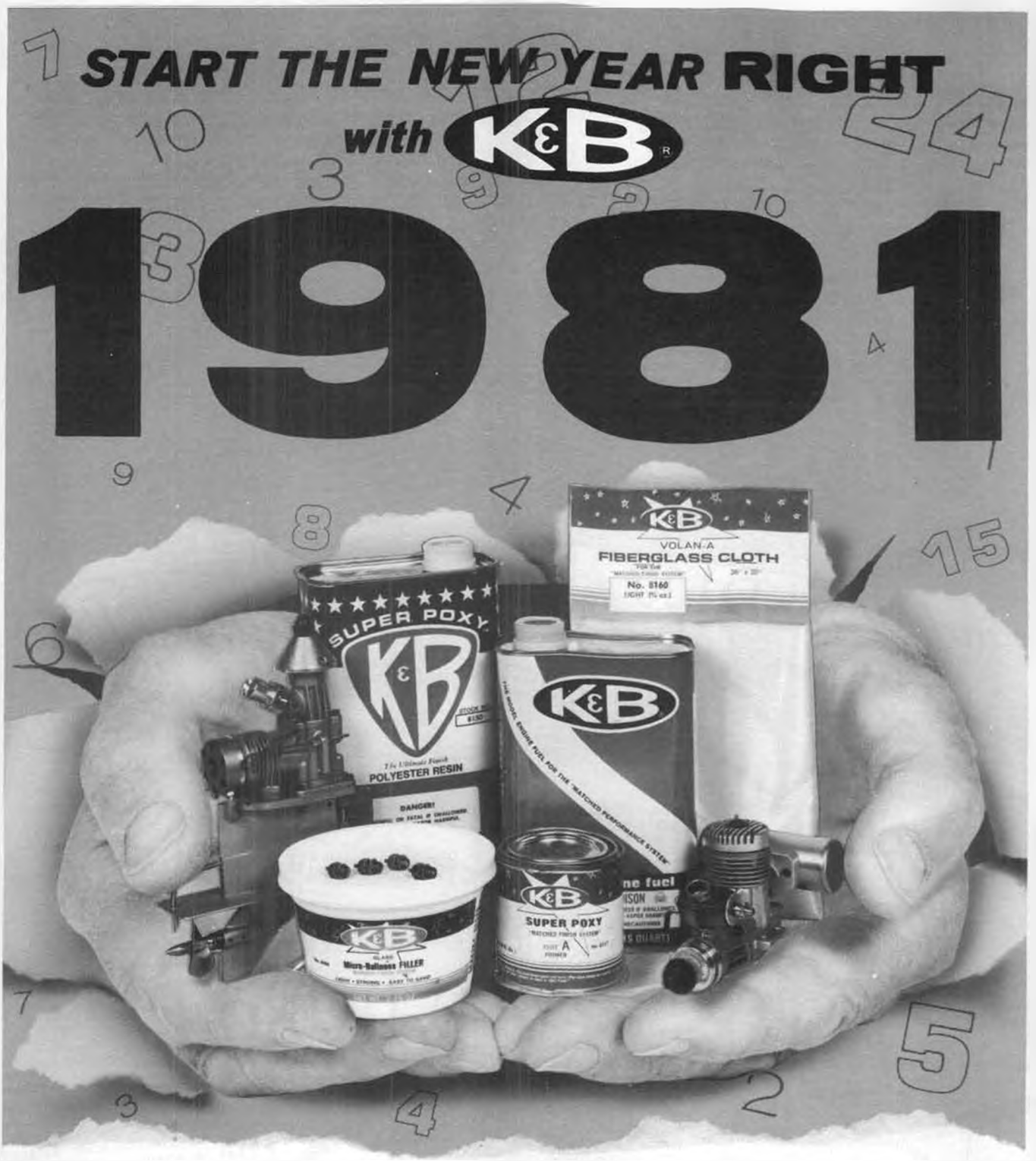


Don't all your modeling efforts deserve the best treatment you can give them? After hours and hours of careful and patient construction of your model, it deserves the best covering and finish, the best engine designed for its size, the best plug for better firing, and the most efficient and powerful fuel for its particular type of flying. K & B has the products to meet these demands: **the K & B "Matched Finish System,"** includes K & B fiberglass cloth and micro-balloons filler; K & B Super Poxy resin, primer and paint; **the K & B "Matched Performance System,"** includes sixteen K & B model airplane engines, four K & B marine engines, and four glow plugs in long reach and short reach; plus K & B fuel with a choice of seven different blends. All are proven products made by K & B, the name synonymous with quality and the leader in its field for over thirty-four years.

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Epoxy Fiberglass Fuselage — I-Beam Spar — Effective Spoilers — Fully Turbulated Semi-symmetrical Airfoil

| | |
|---|---|
| Wing Span | 99" |
| Wing Area | 963 in.2 |
| Flying Weight (w/o Ballast) | 41 oz. |
| Wing Loading | 6¼ oz./ft.2 |
| Airfoil | SS1051 |

Designed by Tom Williams

CAT 109 $99.95

## GOLDEN EAGLE

THE GOLDEN EAGLE IS A STATE-OF-THE-ART DESIGN. A STANDARD CLASS SAILPLANE WHICH WILL THERMAL WITH THE BEST OF THEM, YET WILL PENETRATE THE WIND EVEN WITHOUT BALLAST. THE GOLDEN EAGLE MAY PROVE TO BE THE BEST KIT FOR THE COMBINED FAI SPEED-DISTANCE DURATION TASKS.

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- ALL HARDWARE
- CONTROL RODS

CAT. 104 $149.95

| | |
|---|---|
| Wing Span | 149 in. |
| Wing Area | 1643 in.2 |
| Flying Weight | .5 lbs. to 11 lbs. |
| Lifting Surface | 1931 in.2 |
| Airfoil | FB1151 |
| Wing Loading | 7.0 to 15.4 oz./ft.2 |
| Surface Loading | 6.0 to 13.1 oz./ft.2 |
| L/D (measured) | 21.3:1 |
| L/D with spoilers deployed | 1:1 |

Designed by Tom Williams

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| | |
|---|---|
| Wing Span | 99.8 in. |
| Wing Area | 903 sq. in. |
| Lifting Surface | 1042 sq. in |
| Wing Loading* | 6.38 oz./ft2 |
| Flying Weight* | 40 oz. |
| Airfoil | FB1151 |

*without ballast. Up to 4 lbs. ballast may be added.

Designed by Tom Williams

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- ALL HARDWARE INCLUDED

Spoiler Kit Included

2 METER CLASS COMPETITION SAILPLANE

# Drifter II

Designed by Tom Williams

CAT. 108 $22.95

*6 FOOT WING*

| | |
|---|---|
| Wing Span | 71½" |
| Wing Area | 573 sq. in. |
| Weight Without Radio | 9 oz. |
| Typical Flying Weight | 18 oz. |
| Wing Loading | 4.5 oz/ft2 |
| Airfoil | FB1151 |

*OPTIONAL 2 METER WING**

| | |
|---|---|
| Wing Span | 78¾" |
| Wing Area | 625 sq. in. |
| Weight Without Radio | 10 oz. |
| Typical Flying Weight | 19 oz. |
| Wing Loading | 4.3 oz/ft2 |
| Airfoil | FB1151 |

*material for 2 meter modification listed but not included.

*machined parts *top quality wood *I beam spar *fuselage reinforced with plywood & triangle stock longerons *plans for power pod *and with all of the extra goodies, including . . . control rods . . . horns . . . clevises . . . hinges . . . tow hook . . . servo mounting material . . . absolutely nothing else needed except glue, covering, and radio.

*May very well be the easiest to fly R/C Model ever designed.*

Designed to win! (not only light air thermal events, but FAI)

# VIKING

Designed by Tom Williams

| | |
|---|---|
| Wing Span | 3 meters (118 in.) |
| Wing Area | 1200 in.2 |
| Flying Weight | Mark I, 52 oz. |
| | Mark II, 54 oz. |
| Wing Loading | Mark I 6¼ oz./ft.2 |
| | Mark II 6½ oz./ft.2 |
| | w/Ballast 17 oz./ft.2 |
| Mark I Airfoil | FB1151 |
| Mark II Airfoil | SS1201 |

| | |
|---|---|
| CAT. 106 MKI (PLY FUSE) | $79.95 |
| CAT. 107 MKII (PLY FUSE) | $79.95 |
| CAT. 106FG MKI (FG FUSE) | $119.95 |
| CAT. 107 FG MKII (FG FUSE) | $119.95 |

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*106 and 107 have the new ply reinforced fuselage 106 FG and 107 FG feature the epoxy glass fuselage*

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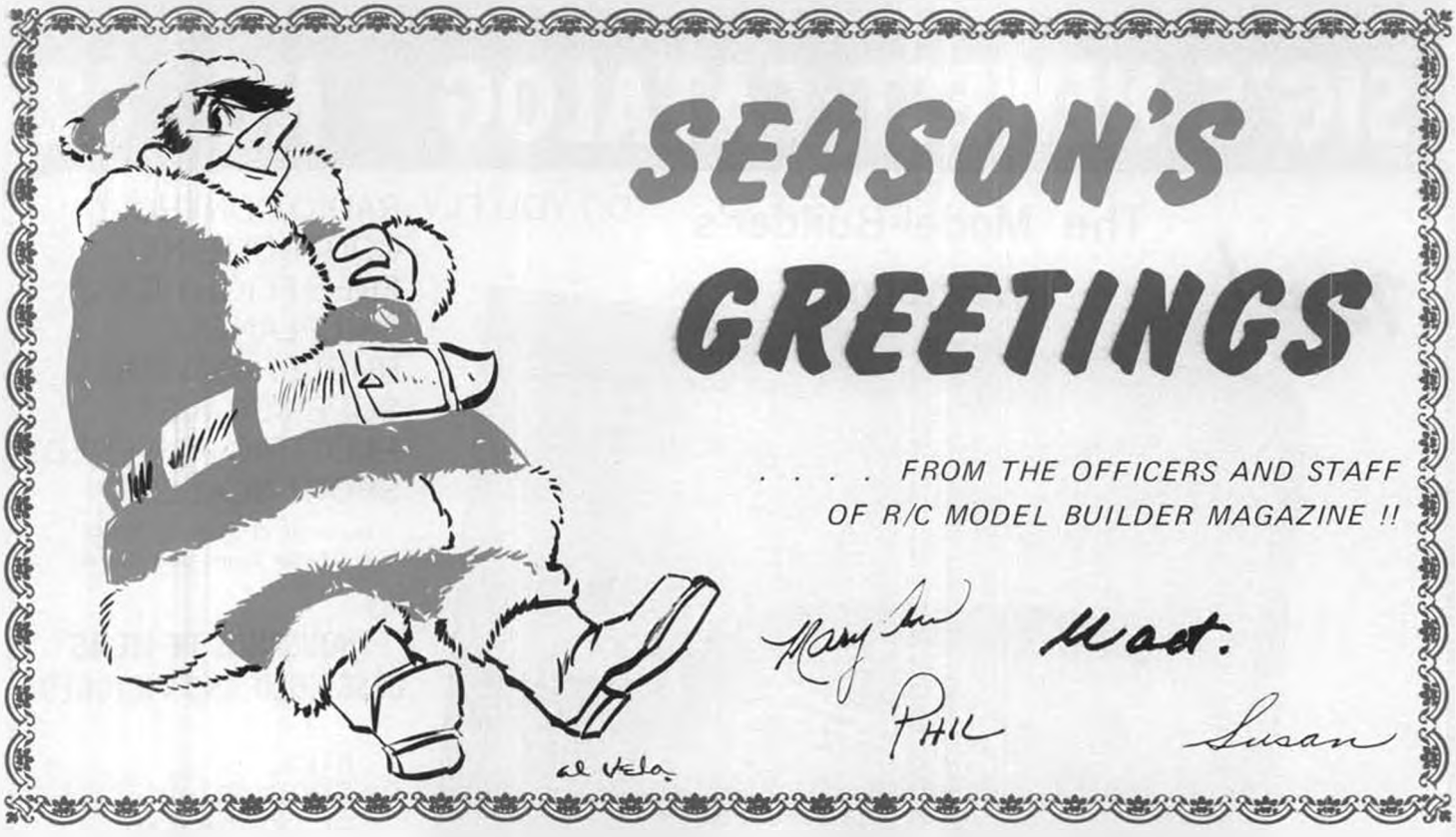



FLASH!!! Hanno Prettner repeats as winner of Tournament of Champions at Las Vegas for 6th time, wins $20,000 First Prize. Dave Brown 2nd, $10,000; Wolfgang Matt 3rd, $7,500; Gunter Hoppe 4th, $5,000; Jeff Tracy 5th, $4,000.

## from Bill Northrop's workbench . . .

### WHERE DA PILOT?

As a modeler who has long advocated a pilot in the cockpit of any scale model when it takes off in flight; R/C, free flight, or control line, it suddenly dawned on us that an explanation is owed to our readers.

The photo in last month's "Workbench" column showed our Gipsy Moth with empty cockpits as it began an official flight at the 1965 Nats. Although not required in those days, according to the rules, we still saw to it that "someone" was at the controls of our aircraft during flight. And when we checked our Moth in at registration for the '65 Nats, there was a pilot . . . from a modified dragster character, with buckteeth and bloodshot eyeballs, but a pilot nevertheless. However, he didn't get past registration! On the AMA scales, which we're sure were more accurate than our spring-type kitchen scales at home, the Moth weighed 15 pounds, 1-1/2 ounces. The only removable item we could find on the whole aircraft which would get the total weight under the 15-pound limit, was the 1-3/4 ounce pilot. Naturally, he had to go . . . and there you have it!

### THINGS TO DO

This section of our column covers modeling activities other than actual competition; those which do not appear in the national AMA contest schedule as published monthly in *Model Aviation*. Obviously it only includes items sent in to us by someone representing the sponsoring organization.

* * *

The Central New York Model Aircraft Association will hold its 5th Annual Symposium on Saturday, February 7, 1981. It will take place in a new facility first used last year, the Art and Home Center at the New York State Fairgrounds. Schedule of happenings includes continuous movies, swap shop (for both dealers and individuals), informal and educational booths by area clubs, competitive static display, flying demonstrations (weather permitting), and programs on various aspects of modeling presented by such well-known modelers as Dave Brown, Art Schroeder, John Grigg, and Ed Izzo. For further info, contact Walt Throne, 2104 W. Genesee St., Syracuse, NY 13219. Phone (315) 468-6544 or (315) 488-8935.

* * *

The B.A.R.F.S. (pardon), Butler Area Radio Flying Society of Butler, Pennsylvania, are again holding their annual R/C Auction on Sunday, February 15, 1981 at the Butler County Community College Convocation Center, Butler, Pennsylvania. This affair has grown in popularity each year, and attracts modelers from Ohio, Pennsylvania, and West Virginia. If you have any further questions, contact Harry Seth, 205 Metzger Ave., Butler, PA 16001.

### JIMMIE ALLEN FOLLOW-UP

One sure way to get reader mail in our office is to goof up on a photo caption. Although Walt House, author of our recent two-part story about the famous pre-WW-II fictional air-adventurer, supplied us with complete photo caption material, an error still occurred. We used one of the better Jimmie Allen Story photos for our inside cover for the F/F-C/L section of the November issue, however the caption info got mixed up and both the aircraft and the classically dressed pilot were not properly identified.

First, the pilot was Mr. Dudley M. Steele, who was Chief of the Richfield Aviation Department during the late 1920s and 1930s. The aircraft is a Stearman C-3B, not a 4E as listed in the caption. One interesting letter about Steele came from retired airline pilot Robert Buck, Moretown, Vermont, who knew him well while operating out of Los Angeles, California. Buck says he got started in flying through modeling, starting with an Ideal Bleriot kit in 1929, followed by ROG's, twin pushers, etc., before getting into the big ones . . . ending up with Boeing 747's.

Another letter came from Ken Wilson, Evansville, Indiana, who happens to be historian for the SRA (Stearman Restorers Association, Inc.). Ken is a regular **RCMB** reader, and quite obviously, noted the Stearman caption error.

Well, we're sorry about the goof-up, but getting such nice letters almost made it worthwhile.

### ABOUT THAT RYAN

We also received a couple of letters about another mis-caption. This was the Ryan NR-1 on the inside cover of our October '80 issue, page 49. One letter, from a modeling acquaintance back

*Continued on page 104*

# OVER THE COUNTER

*All material published in "Over the Counter" is quoted or paraphrased from press releases furnished by the manufacturers and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by R/CMB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by R/CMB.*

• Top Flite is starting up a new series of trainer aircraft for beginning R/C modelers, and the first entry in this "Trainaire" series is the Schoolmaster II, a structurally redesigned but same-size version of the old Top Flite Schoolmaster designed by Ken Willard. It's an .049-.09 ship with a span of 39 in., wing area of 292 sq. in., length of 32-1/2 in., and weight of 19 to 26 oz. depending on the engine and R/C gear installed. Two channels is enough if using an .049, but a third channel (for throttle) is advisable if using an .09 or .10. The radio compartment in the fuselage is big enough to easily accept any three-channel system on the market today.

Construction-wise the Schoolmaster II kit features machine-shaped wing leading edges, a D-box wing (as compared to the fully sheeted wing on the old original Schoolmaster), all die-cut balsa parts, one-piece fuselage sides with guidelines for the internal framework printed on them, complete hardware, and detailed full-size plans . . . a very complete package, ideal for the novice builder.

The Schoolmaster II should be at your local hobby shop by now or can be ordered direct from Top Flite Models, 1901 N. Narragansett Ave., Chicago, IL 60639.


The whole family of electric R/C car chargers from Leisure Electronics.

* * *

Latest items to come from Steve Muck's R/C Model Boats are water-cooled exhaust throttles to fit K&B and OPS marine racing engines. The throttles come in 12 degree and 20 degree angle models, to fit most hydroplane and monoplane boats respectively, and are available for the OPS .40, .60 and .65, and the K&B 3.5, 6.5, and 7.5 engines.

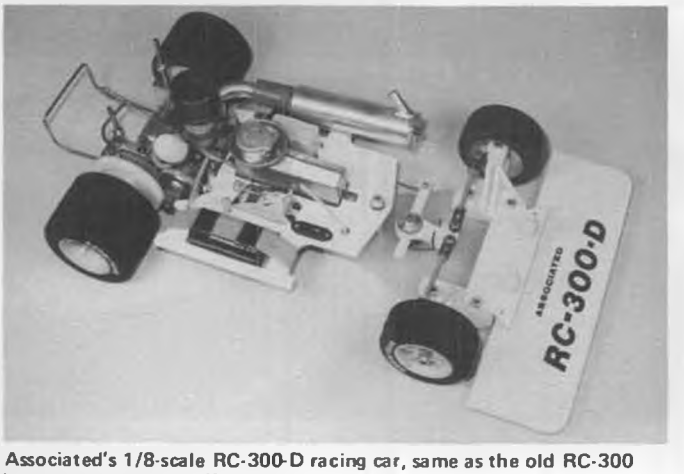
Features include extra large water fittings to provide an adequate flow of cooling water and to make for tighter fitting hose connections. Each barrel is hand lapped into the body and does not make use of O-rings to maintain a seal. Also, the barrels are marked for full open position, making linkage hookup easier during engine installation.

Prices on the exhaust throttles start at $41.95; write to Steve for details. Steve Muck's R/C Boats, 6003 Daven Oaks Dr., Dallas, TX 75248.

Super-hot Black Label 05 racing motor, also from Leisure Electronics.

* * *

What with the steadily increasing popularity of the new breed of "monster" glow engines, i.e. starting at the .60 size and going up to the .90's and beyond, there is a growing demand for a good, solid mount to secure these brutes to your model's firewall. Now Sig Mfg. Co. is answering that need by

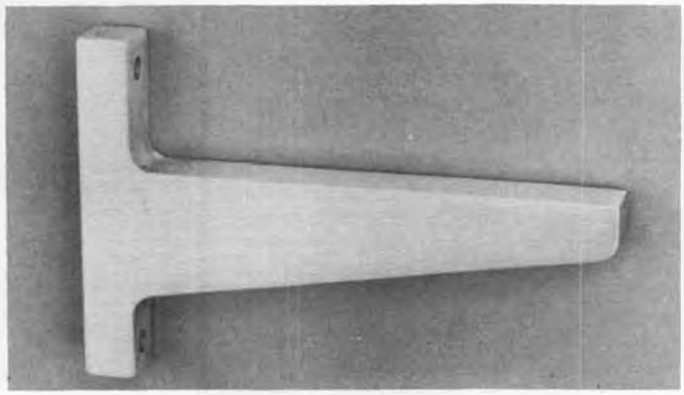



Associated's 1/8-scale RC-300-D racing car, same as the old RC-300 but now sporting a differential.

The Schoolmaster II, first of Top Flite's new "Trainaire" series of kits for beginners to R/C.

The Eastport Pinky, latest in The Laughing Whale's line of wood ship kits.


Viper 21, 3.5cc size hydroplane from Futuraglass Design.



Massive metal motor mounts for massive model motors, new from Sig.

offering its new Extra Heavy-Duty Aluminum Motor Mounts, in addition to the two similar but smaller sizes that have been on the market for some time now. These new big mounts are machined from a hard aluminum alloy to provide a rugged, vibration-dampening installation. A package of two sells for a surprisingly low $2.25, which includes four 6-32 self-tapping screws.

Available at your local hobby emporium or direct from Sig Mfg. Co., Route 1, Box 1, Montezuma, IA 50171.

* * *

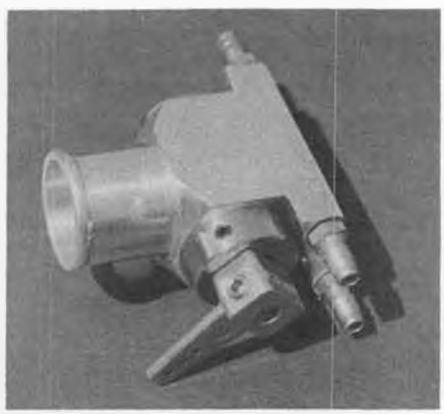
One of the biggest manufacturers of 1/12-scale electric R/C racing cars, Leisure Electronics, has updated its three existing Auto Chargers and has added two completely new ones to more fully satisfy the needs of individual racers. The least expensive model, No. 105, is a resistance charger that now features a built-in equalizer circuit. No. 106 and 107 are house current chargers, 106 being a 4-6 cell AC charger and 107 a 6 cell AC/DC unit. Both now contain fuses to protect the transformer from inadvertent overload and also have built-in equalizer circuits that will top off your car's batteries the night before the Big Race.

No. 108 is Leisure's new adjustable amperage constant-current charger. This one has an adjustable current of 0-4 amps, which gives you the advantage of being able to charge any battery from 250 to 1200 mah rating. Like the others described above, it too has an equalizer circuit to let you top off your batteries overnight.

But the really top-of-the-line charger is the No. 109, designed for the serious racer who wants to get the most performance from his car's ni-cds. It features a large (1/2-inch high) LCD readout that shows up well even in strong sunlight. The meter can read both current and voltage to better than 1% accuracy. This unit contains the same variable rate charging circuit as No. 108

*Continued on page 97*

Sort-of-scale Taube is the latest kit to be released by Balsa USA.



Steve Muck's new water-cooled exhaust throttles, to fit various OPS and K&B engines.

Custom-made padded wing storage and transport bags, from Slope Associates.

# Pattern × Flying

By DICK HANSON . . . Part 10: The Rolling Eight and Running Eight.

• This month's maneuvers complete the entire program of maneuvers from Novice through Expert.

There are seven "Figure 8" maneuvers in the AMA program and they all have one thing in common: the intersections are very easy to judge. The judge simply holds up a pencil, closes one eye and notes the first intersection by lining up the pencil tip held at arm's length. You, however, have to remember where that first intersection is and hit it each time. The judge clearly has the advantage here, unless you too have a pencil to watch.

Impossible? Not at all.

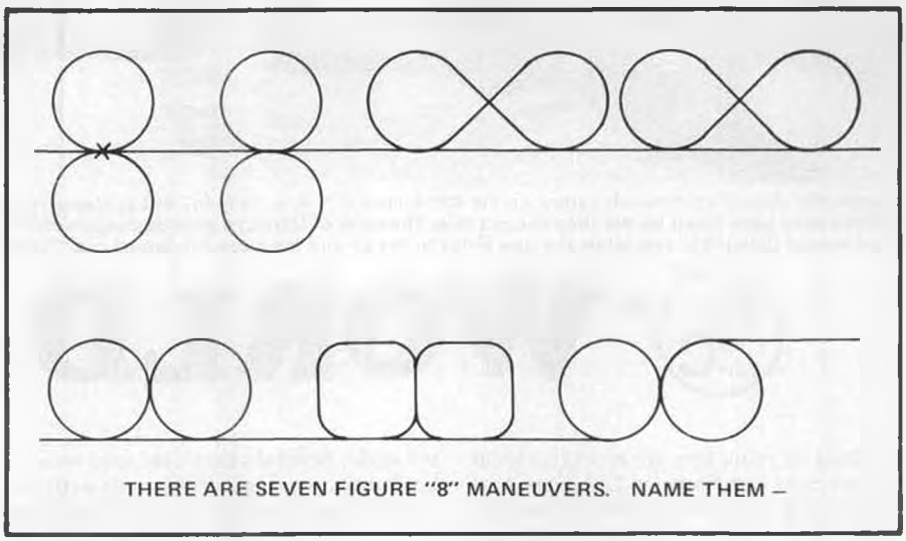
For years some fliers have used tray-mounted transmitters to give additional stability. Further, by using an antenna which can be adjusted to point to the center of the "frame," they can refer to the antenna tip as a reference point. John Tapp from Salt Lake City, Utah, flies using this technique and it really works.

We have been using a hand-held transmitter plus a neck strap for stability; up till now the tray concept hasn't seemed to be of any real advantage. What really sold me was a review with the pattern judges at the last contest, the Las Vegas N.S.R.C.A. Regionals. They showed me where my lowest scores were due to missed intersections on eights and rolling triangle maneuvers. These judges, by the way, did the best job of judging I've ever seen.

We now have a new tray type transmitter which will take some practice in order to get familiar with it, but apparently the advantages are worthwhile. By the way, the exponential controls we mentioned last time are still being used and we should have something solid to report next month. Now, on to the maneuvers.

**THE ROLLING EIGHT**

This maneuver is almost impossible to do without a rapid roll rate. Here's why. You start the maneuver upwind at a fairly high altitude, approx. 150-200 feet, until you determine the size of maneuver desired. Pull up into an inside loop and cut the throttle at the top to prevent a speed buildup as you come around to the bottom of the loop. Now make a fast 180° roll directly at the intersection and, avoiding the urge to pull quickly through the second loop, allow the model to gradually start the second inside loop. As you reach the bottom of the second loop, add full power and continue on to the intersection once more. At this point, make the rollout to level flight. You will probably have to lead each intersection slightly for each roll, so be certain you release elevator pressure when you roll or it will look like a corkscrew.



THERE ARE SEVEN FIGURE "8" MANEUVERS. NAME THEM –

Read through the maneuver again and note that the first roll must occur when the plane is diving and is moving fairly rapidly. The second roll occurs when you are fighting gravity and a headwind. This is when you need a rapid roll rate to give balance to the maneuver. A normal tendency here is to roll too late in an effort to avoid missing the intersection and/or losing the heading.

A heavy model usually has trouble with the rolling eight due to speed loss in the last half. As we've said before, *keep it light.*

**THE RUNNING EIGHT**

The running eight is a downwind maneuver. This makes it very difficult for most fliers to maintain loop sizes and intersections as required. Generally, the best approach is to select an altitude (approx. 150 feet to start with) that allows a smooth transition to low speed, then a nice controlled dive into the outside loop. The use of throttle is recommended to hold the apparent speed constant and compensate for wind drift. Some fliers have found that a very high powered, very light model can be flown at full tilt and thereby cancel wind drift. That's fine, but if you miss at all, it's a disaster. Try the controlled approach first.

The crossover is, again, the bugaboo on this maneuver. Assuming we have a stiff downwind condition, let's go through a typical sequence. But first check your plane as follows: Fly along at full throttle in level flight with the trim set for hands-off flying. Now cut the throttle to an idle and watch carefully for any heading shifts or pitch changes. Some designs simply won't perform this test very well and will change pitch excessively. Try altering thrust angles until the pitch problem is resolved. *Be careful not to interpret a wing warp or rudder trim problem as a side thrust problem.*

I don't know how to tell you the best way to sort this one out. I measure everything and check for equal hinge lines, gaps, soft linkages (pushrods), and lousy servo pots (this one is really sneaky, as the pot will shift as the load on the flying surface is reversed or dramatically changed). Lastly, I alter the side thrust, as it is usually not that critical in this test. Just make certain you have no left thrust.

Now that we're trimmed, let's set up a nice downwind heading and call the maneuver while out far enough to permit cutting the throttle and coasting to the center of the frame. Now tuck under (outside loop) and apply power while taking care to open the loop to prevent the wind drift from making it egg-shaped. As you go over the top to the first intersection, add a little more down again and keep the power up for the last half of the eight. As soon as you are pointed straight down, start the last half fairly quickly, as the combination of wind drift and speed required for the inside loop will usually open the loop excessively.

Practice this sequence using some fixed reference such as a distant tree or your antenna tip (or your foot held up, if you're limber enough).

Next month: Masters class maneuvers.

A sneak pre-view of next month's story on the 4th Annual Q.S.A.A. "Fly-In" at Las Vegas, in October. The Hughes flying boat did not fly then, but may have been flown by the time you see this. The team of Germans were back again with another huge B-17. Did it fly? Did the the stab stay together unlike last year when the spar broke in the air and the plane was wiped out? Tune in next month and find out!

# R/C WORLD

by BILL NORTHROP

• About 12 years ago, we went to a local airport near our home in Delaware and began measuring an Aeronca C-3 which had been somewhat stripped in preparation for a future restoration. Getting deeper into it, we next made contact with John Houser, known at the time to be the best source of information on Aeroncas, who was able to provide us with prints from some faded, water-soaked factory drawings of the C-3.

After completing a set of preliminary 3 in. = 1 ft. drawings (as luck would have it, the factory drawings were also 3 in. = 1 ft.), we began construction of a 9 ft. span (ah yes, quarter scale) model. The wing panels were covered with silk and given two coats of clear. Following Proctor's method, the thin, scale airfoiled tail surfaces were covered with non-warping bamboo paper, and clear doped, followed by black and red Sig dope, sprayed on from aerosol cans (really came out nice).

At this point in time, the project was set aside. Several years later, and now in California, we dug out the parts with the idea of completing the ship, but the bamboo paper had received some punctures, and the silk on the wings had become brittle and crumpled like dry leaves. What with a constant flow of monthly deadlines and very little time in between, we decided to hell with the scale fabric texture and full speed ahead with Monokote. By the way, Monokote can't be ironed onto an aluminum tube rudder outline. Guess the aluminum dissipates the heat too fast. Not to worry.

One more pre-view shot. This beautiful DH-89 by Jerry Shumaker and Andy Osborne, Wichita, Kansas, is powered by two OS 4-cycle .60's, weighs 16 lbs., flies majestically . . and quietly.


The spread between aircraft and model narrows. Gary Ingraham, Roanoke, Va., powers his Mitchell Wing B-10 with a 12 HP McCulloch engine. On the right, Walt Moucha, New York, services the 3 cu. in. Roper in his 1/2-scale Fly Baby. Both seen at Bealeton, Va. Photos by Bob Droege.

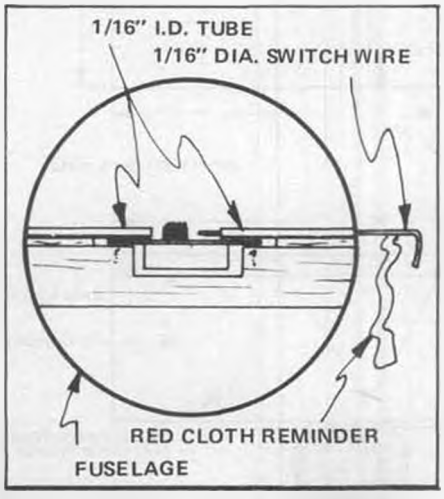
Two scratch-built Pitts by Dave Landvater, Elizabethtown, Pa. The S-1 on left has 2 Quadras in tandem and Eastcraft starter, weighs 30 lbs. The one at left is single Quadra powered. Both seen at DC/RC Scale Meet & Air Show, Flying Circus Aerodrome, Bealeton, Va. Droege photos.

The Hafke trademark, a Gee Bee. This won Best of Show at Bealeton, was also seen at the 1980 Toledo show. It's a Model D, quarter-scale.

Roy Smith, Rockville, Maryland, scratch-built this Aeronca C-3. Power is a Webra .61. Our favorite pre-war lightplane.

Pull and heat the film halfway around and over the tubing and apply Hot Stuff! After the first side is stuck on, the second side will adhere where it overlaps the Monokote glued to the first side.

As nice as it went on, it still didn't look right to see such shiny surfaces on an old, pre-war lightplane, so we pulled the Monokote off.




Simple hidden-switch idea described in text. It's also protected, and can prevent launches without radio turned on.

Another pause of a year or two, and then we tried several iron-on fabrics on the wing panels. Looked great, but the grain of the fabrics went across the roll so that a 4-1/2 foot wing panel couldn't be covered in one piece, and besides, we couldn't get the stuff to pull up tight, no matter how much heat was used. The C-3 went back on the shelf again.

But maybe fate was just making us wait all this time for the phone call we just received from Top Flite's Sid Axelrod.

"Hi, Bill, remember you were the first one to do a write-up on Monokote when we introduced it about 14 years ago?"

"Yeah, Sid, and I also remember some of the crazy nicknames that the original tacky Monokote was called before you came up with Super Monokote. Once the Super M came out, you kinda revolutionized the covering habits of modelers all over the world."

*Continued on page 99*

MRC's Messerschmitt Me-109E, companion model to the Chipmunk which was described in detail in the November "Over the Counter" column. Span is 42-1/2".

# 1 TO 1 SCALE


By BOB UNDERWOOD

• This is an interesting time of the year. The TV season is bogged down in a strike; the four-year political cycle of presidential promises to be unfulfilled takes the place of the missing comedy, and the sparring of three political pugilists makes an Ali fight seem insignificant.

Added to this is the beginning of a new AMA rules cycle. Following the Septe..ber 1st deadline, the Scale Board members have received their copies of rules proposals for the next time around. A rather significant number have appeared, probably indicating the increased level of scale activity in the last two years. While there will, of course, be a complete rundown in *Model Aviation*, a general look might be in order at this time.

One rule receives the award for "The Most Proposals Submitted for Change." A flock of proposals, including this writer's, appeared to change the current figure 8 to the FAI 8. One proposal suggested the dropping of the maneuver altogether and adding another option. Most of the comments heard prior to this point centered around not necessarily dropping it, due to the required flying discipline it helps develop, but certainly to make the 8 a "judgable" maneuver by using the FAI version (minus standing in the middle of the runway, which the FAI has proposed dropping!).

A number of proposals have been submitted to clarify the definition of a Sport Scale model by deleting the statement "Any model resembling a particular heavier-than-air, man-carrying aircraft. . ." and substituting the definition found in the book on page 66. The reasoning developed out of the submission of models of aircraft that may not exist or have never been built.

Not too many proposals concerned size this time, either engine or model. A couple of proposals did, however. For instance, one suggested that four-stroke engines should be allowed a greater displacement. Another suggested a graduated judging distance for models of different wingspans. For instance, 0 to 40 inches — 15 feet; 41 to 65 inches — 20 feet; etc. Another item somewhat related to size was proposals to unify the Giant and Sport Scale static and flying scoring. As an aside to this, it was interesting to note that at the NASA meeting during the Nats, this point was brought up. The question was asked why Giant Scale operated on a 120-point total for flying and static and Sport Scale had 100-point totals. The chairman of the Contest Board, Claude McCullough, present at that time, answered simply that that was the way the event was proposed, nobody submitted a cross-proposal, and no negative comments were received during the complete rules cycle. It is difficult for the Scale Board to act or react when little or no feedback comes to them during the cycle.

Some proposals dealt with options. The move to place more flying maneuvers in the Sport Scale flight was suggested by including the multi-engine option as one of the three allowed mechanical options. Another wished to drop flaps as an option.

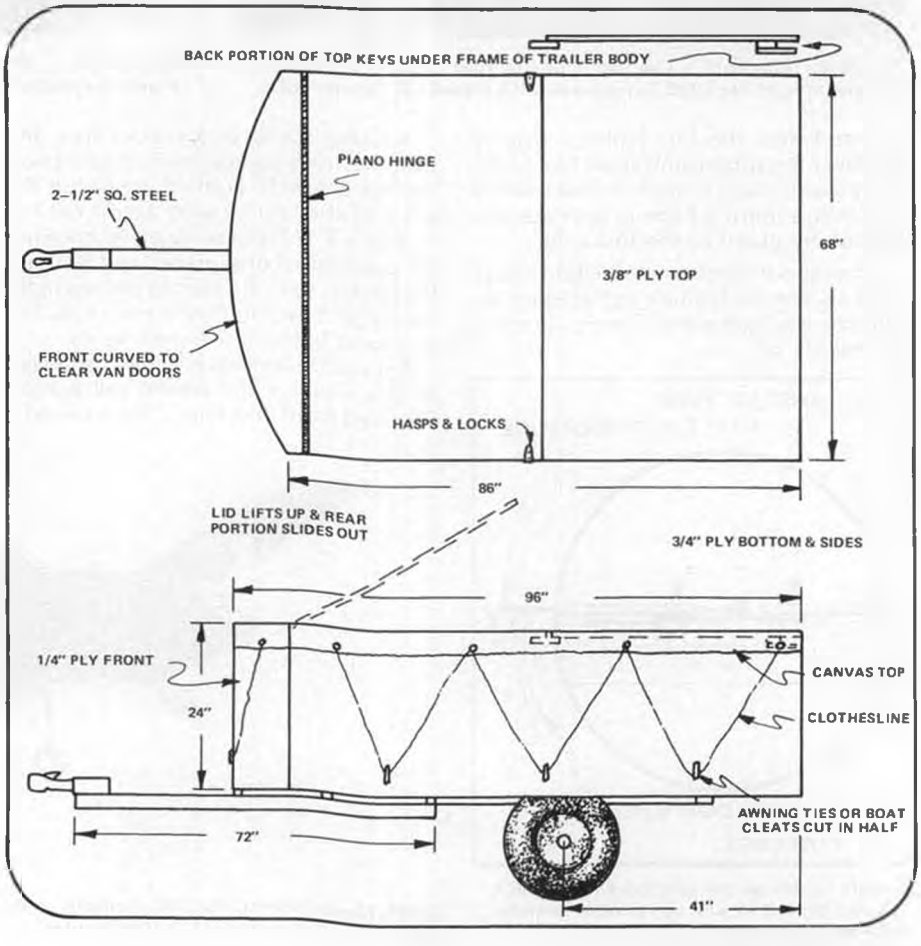
In the general areas, proposals were submitted to drop the Sportsman class of Sport Scale, change the scoring ratio to 40%-60% for static and flying, eliminate the modeler stating what he did not build, require models to taxi out for takeoff, and reduce the touch-and-go to one option. Another individual wants to eliminate the model in the model (the figure required in the cockpit).

You may be interested in the reasoning for a couple of the last proposals. The taxi requirement suggested that it be that way because "real airplanes taxi out for takeoff." While that generally is true, what allowance can be made for aircraft that generally could not and required help due to configuration? (Notably many pre-WW-II, WW-I, racing planes with skids, and even such things as the German rocket plane, the Komet.) In regard to the removing of the statement about what the modeler did not build, it was stated that "contestants will *not* comply; an unenforceable rule." This was of interest to me, since at the contests I attended this year this appeared to be carried out very effectively. What experience have others had?

At any rate, the procedure has begun and now it becomes a process of deliberation and communication. As has been urged repeatedly over the years in this column and others, it is of great importance that you provide your scale contest board member with input so that he will be able to more effectively "feel the pulse" of his district.

A last thought on the subject is that those who are scale oriented, but not necessarily contest minded, must remember that you too have a stake in this. In the long haul you can very often discover that kit manufacturers and equipment suppliers follow various rules trends out of necessity. Therefore, your voice is of importance as well, since what you might have available to "Sunday fly" may in part be determined by

*Continued on page 79*



## 1936 Classic

# WACO YKS-6



PHOTOS BY AUTHOR

Vince Mariani, also a modeler, is the proud owner of this immaculate full-size VKS-7. It was this aircraft that inspired Jack Burns to do the YKS-6 model presented on these pages.

**By JOHN BURNS . . . Who can resist the charm and appeal of the cabin Wacos of the 1930's? Our author couldn't, and ultimately came up with this 1/8-scale replica that has proven to be a fine flier. Original model is powered by an O.S. Wankel, but conventional engines of .25 to .40 cu. in. displacement could also be used . . . a shame to have a cylinder sticking out of that cowl, though!**

• Another biplane that is built like an overgrown Peanut Scale model and powered with a Wankel rotary engine? Of course!

I'd been bugging Mr. Northrop for some time to publish another article, when I finally realized I had to get his attention. I don't want to give away any trade secrets, but those three color photos of my Waco YKS-6 biplane model were like flashing the green light at the drag strip. Hence, this article. To quote a famous expression, "If it has two wings, it's got to be good."

Every modeler has his favorite planes . . . warbird, classic, current . . . so when I saw this beautiful red-and-white VKS-7 at Oshkosh in 1970 and again at a couple of EAA conventions, I had to build a model Waco. Naturally, several photos were taken of the VKS-7 and of other cabin Wacos.

The Waco cabin airplane article in *Historical Aviation Album* Volume II was memorized, and drawings of the YKS-6 were obtained and used as the basis for the model drawings.

My pile of magazines was ransacked to find the January 1956 *M.A.N.* and June 1970 *A.A.M.* articles on Waco models. Wm. Wylam's drawing of the C-6 Waco was obtained, and several EAA *Sport Aviation* magazines were cut apart to extract pictures of Waco cabin airplanes.

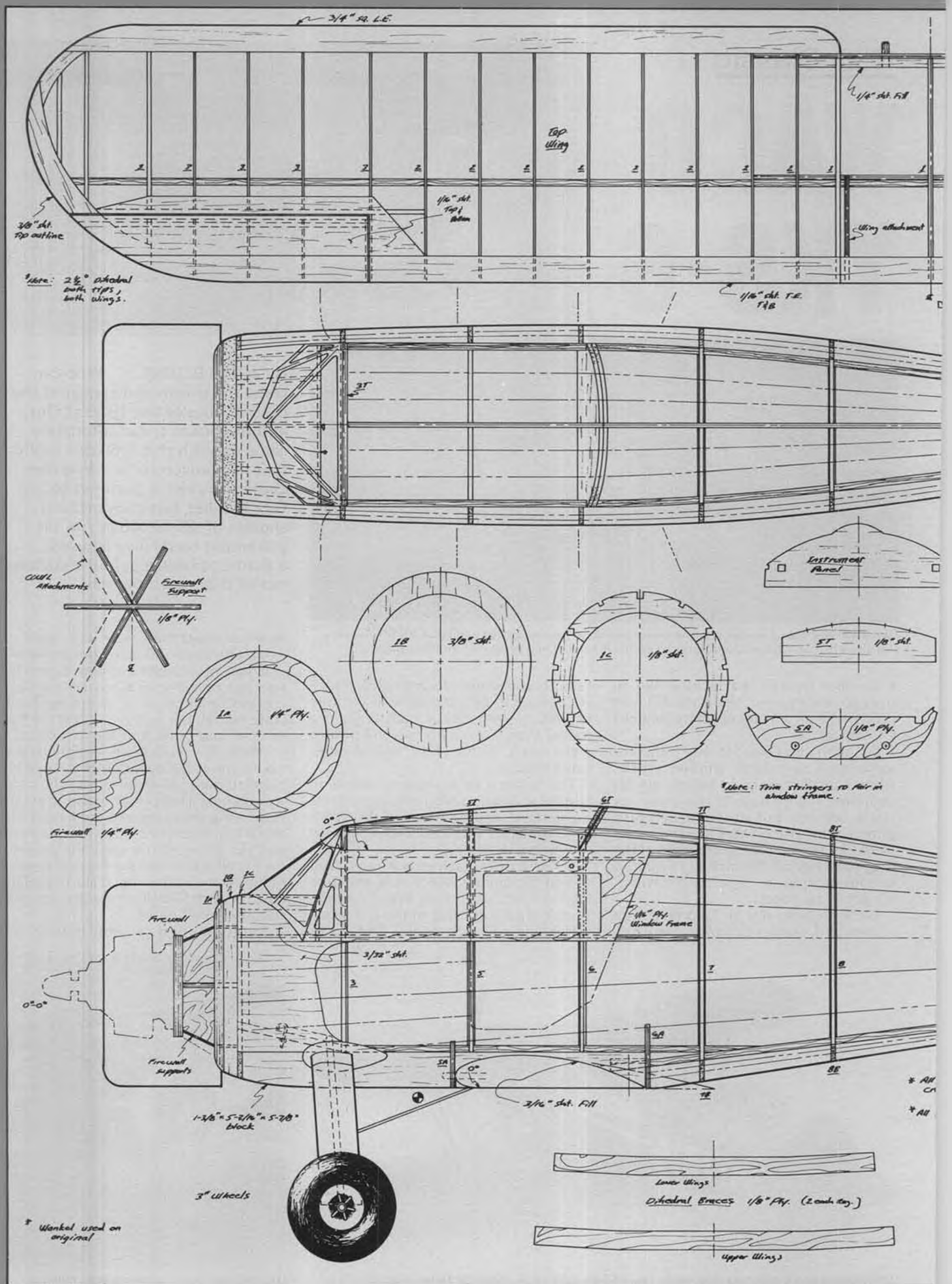
If you have been listening carefully, you just noted several sources for data and documentation so necessary for a scale model, not just for contest use but to draw and build it in the first place.

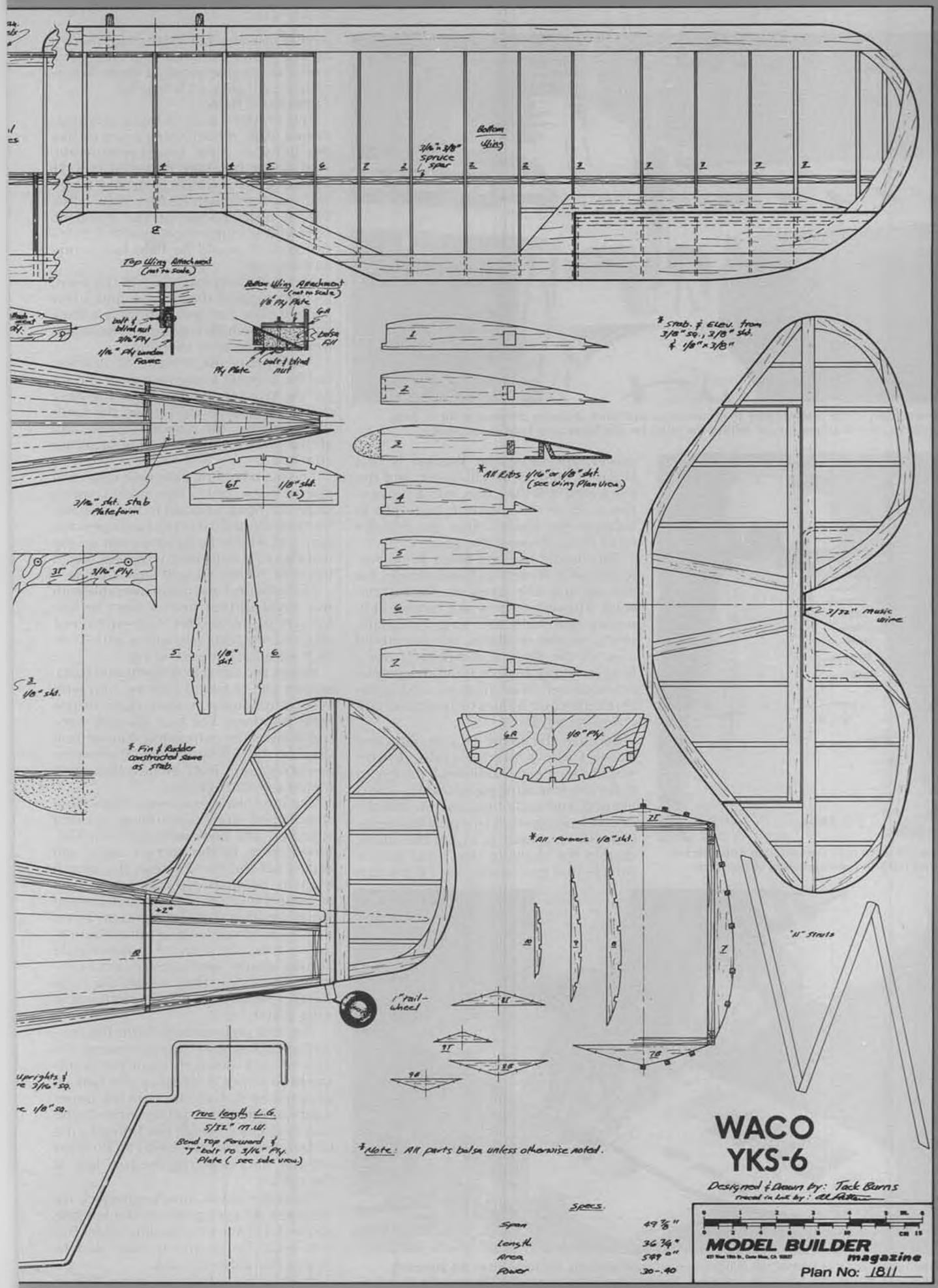
When this model was designed, the object was to have a model that could be handled fully assembled, so 1/8 scale was chosen. That puts it in the approximate wing area range of the Falcon 56, Skylark, and similar models that perform well on .30 to .40 size engines. Imagine my joy when I found my Wankel engine fit perfectly inside the scale fiberglass cowl! A round-engined airplane needs a round engine, right?

Another good reason, besides its


Cabin Wacos had distinctive lines when viewed from any angle. Realistic finish is good ol' silk and dope, finished with Aerogloss paints. YKS-6's were powered by 225-hp Jacobs engines.

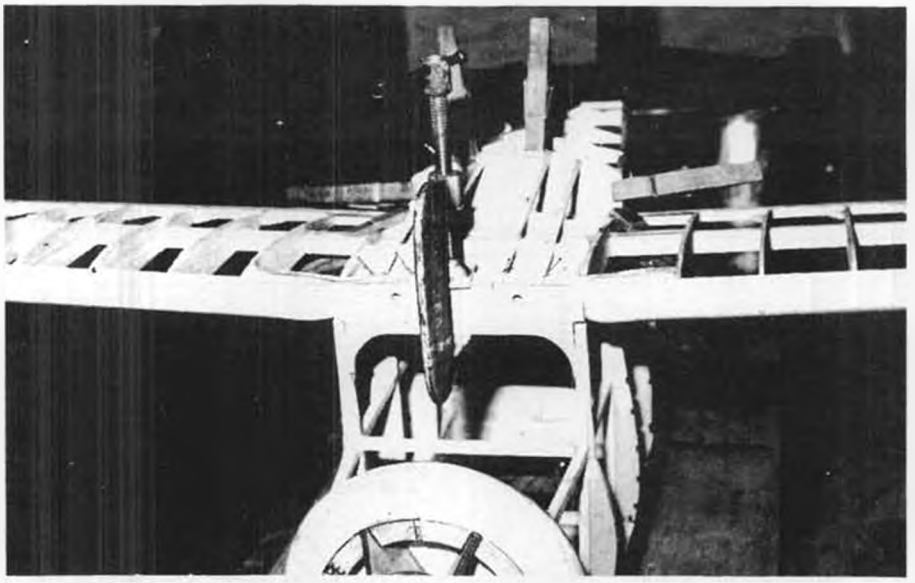
OK, OK, so it's not a scale Jacobs radial under that cowl. At least it's round!


3/4" sq. L.E.
1/4" sht. Fill
Top Wing
1/4" sht. Top & Bottom
3/8" sht. Top outline
Wing attachment
* Note: 2½° Dihedral both tips, both wings.
1/16" sht. T.E. T&B
3T
Cowl Attachments
Firewall Support
1/8" Ply.
1B 3/8" sht.
1C 1/8" sht.
1A 1/4" Ply.
Instrument Panel
5T 1/8" sht.
5A 1/8" Ply.
* Note: Trim stringers to fair in window frame.
Firewall 1/4" Ply.
Firewall
Firewall Supports
1/16" Ply. Window Frame
3/32" sht.
1-3/8" x 5-1/16" x 5-7/8" block
3/16" sht. Fill
3" Wheels
* Wankel used on original
Lower Wings
Dihedral Braces 1/8" Ply. (2 each req.)
Upper Wings

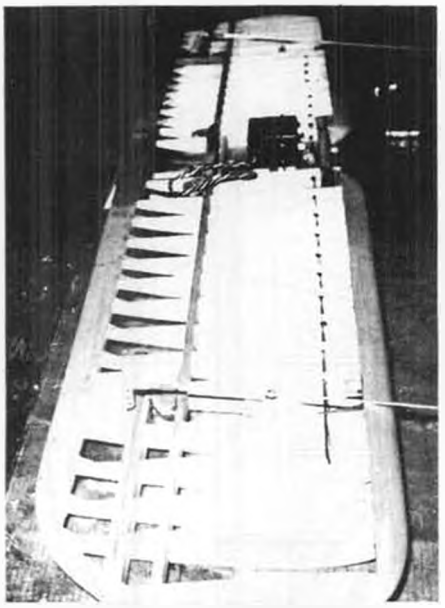





This plan has been reduced to 29% of full size.
FULL SIZE PLANS AVAILABLE — SEE PAGE 100



The section of the fuselage over the top wing is built with the wing clamped in place. Also provides perfect alignment for drilling the holes for the front wing hold-down dowels.

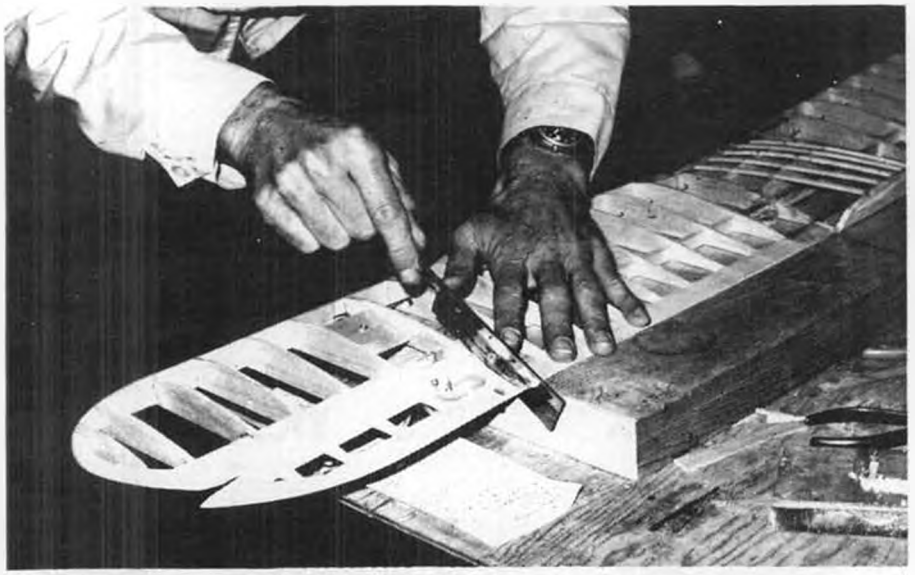


Aileron servo is in the top wing, top ailerons drive bottom ones by means of pushrods.

power, for using the Wankel is that biplanes tend to be tail heavy, and the extra weight of the rotary over a conventional .30 or .40 engine is just right to balance this model. Also, no cylinder head sticks through the cowl.

This model has one-piece wings fastened with dowels and two screws for the top and one screw for the bottom wing. However, there are twelve little screws that hold the wing interplane struts, so the model is left assembled most of the time. It is definitely *not* a field assembly project. Besides, has your screwdriver ever slipped and gone through your beautifully doped silk covering? #@$%*!!

Because the plane is a smooth and stable flier, a quarter-scale version would be great. Additional design to make the four wing panels removable is needed, and socket head screws for the strut fastenings would simplify that problem. All you need is to get the plans, double the drawing sizes, and have a vehicle that can handle the 75-3/4 inch overall fuselage/tail length. No, there is no Wankel engine that size. I'd recommend an engine rated at three horsepower, swinging a 22x14 prop.



Ailerons are built as part of the wing structure, then carefully cut loose after the pushrods, bellcranks, horns, etc. have been installed. The last step before preparing the wing for covering.

**CONSTRUCTION**

This model is built like an overgrown Peanut Scale model with a structure like the full-scale steel tube construction. The major fuselage material is 3/16 square spruce, which is strong, tough and not that much heavier than balsa. Even a quarter-scale version could be built with 1/4 square spruce with 1/8x1/4 stringers. It would be light but strong and durable.

The only sheet material is in the front, to help support the firewall and a few gadgets. The forward bottom is a thick balsa block which is easier to shape and more durable than sheeting.

Appropriate use is made of plywood for the firewall, a unique engine mount for the Wankel, bulkheads for the wing dowels and fastening screws, the landing gear base, the dihedral braces, and all the places where the wing struts are attached.

The main landing gear wire is formed like on many control line models, with a large "U" loop J-bolted to the ply base. The rear struts float in the fuselage at the rear end. The large balsa fairings on the main struts are epoxied, wrapped, etc. to the wire. Mine still split after a while.

The tailwheel was made steerable with two small springs from a horn on the bottom of the rudder, but experience dictated replacing one spring with 1/16-inch wire for better steering.

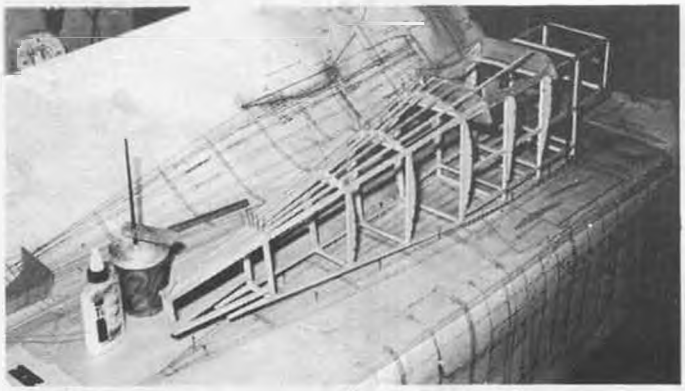
Wings and tail are conventional balsa, spruce and plywood construction with the components in their approximate scale positions. The four ailerons were *not* done in the corregated skin method used on the full-size planes. There were 34 corregations in 67 inches, about two inches per corregation.

The interplane struts were made from streamlined aluminum tubing, epoxied together. The ends were carefully flattened, bent to the correct angle and drilled for the No. 2 screws that attach them to the wings. A simple jig was used to hold the wings in correct alignment while the struts were being fitted. This is a fussy, but most necessary procedure to assure true alignment. A quarter-scale version would need stronger strut construction since they would be fully functional with the four removable wing panels.

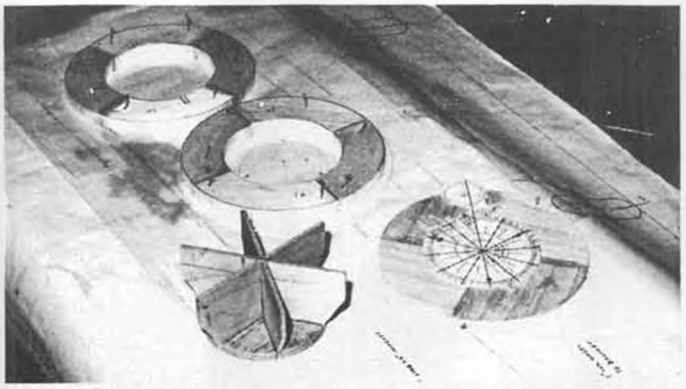
The fuel tank extends from the firewall to back of the instrument panel. It is easy to look down through the windshield to check the fuel in the tank. A streamlined Robart fitting on the upper right side aft of the cowling connects the tank fuel line through the fitting to the carburetor. Thus, the tank can be filled without disconnecting the fuel line at the carb.

The radio switch and charging jack are mounted on a ply panel on the left side above the lower wing leading edge. The jack must be on the outside skin to charge the airborne pack.

It would be a shame to beat a hole in



Basic fuselage structure is a simple 3/16 sq. box, with formers and mucho stringers to give the nicely rounded cross-section.



The O.S. Wankel required an extended motor mount to get the prop in the correct location; may be necessary with conventional engines.

the cowl for a glow plug connector, so a jack is installed on a ply panel on the lower forward left side. It is wired with two-strand lamp cord: one wire to the engine base and the other wire to a small insulated alligator clip on the top of the glow plug . . . all inside the cowl/fuselage. This requires a special cord from the field box glow plug battery. (Come to think of it, my first control line model eons ago was wired like that.)

The exhaust pipe for the Wankel was made from a brass tube bent to exit from a slot in the rear of the cowl. After many runs it is blackened just like the full-size stack. Although it was not possible to install the regular Wankel muffler inside the cowl, the long pipe plus the unique humming sound makes the Wankel quite tolerable, even to clubs with strict muffler rules.

The cowl is supported on four spruce posts epoxied to the engine support . . . not neat, but it works. There is a scale air gap all around the rear of the cowl, which is necessary to cool the Wankel (which runs *very* hot).

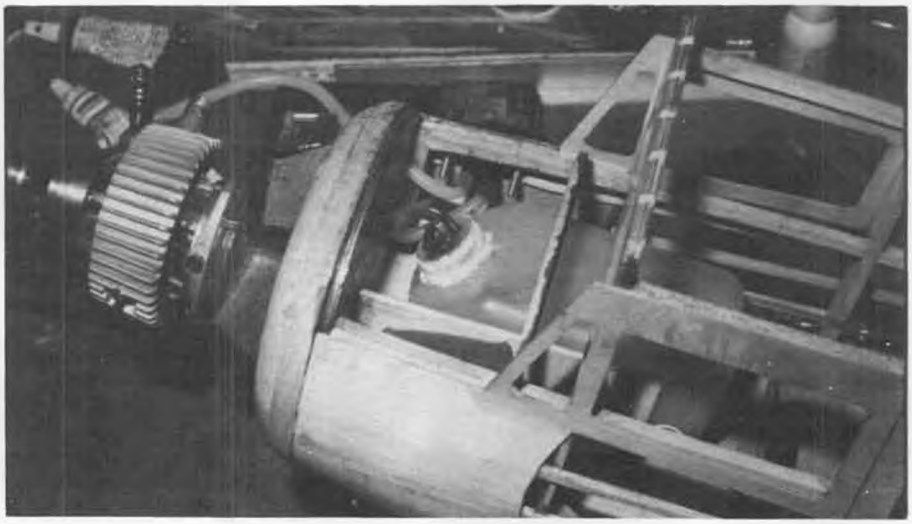
The propeller most commonly used for flying is a three-bladed 10x4 Tornado; not scale, but it holds down the rpm. This plane doesn't need the full 16,000 rpm the Wankel can turn on a 9x4 two-blade prop. An 11x4 painted black has worked nicely, too. A twelve-inch prop would be close to scale, but $1.00 landings get to you after a while!

Since the Wankel has a 6mm shaft (0.236 in.) and props commonly have a 1/4-inch hole, a brass bushing was made from tubing to slip on the prop shaft to accommodate the 1/4-inch prop holes. An exactly centered and balanced prop is essential, especially at the rpm turned by the Wankel.

Wheel pants were optional on Wacos, but mine has flown from grass fields a lot, so no pants were fitted. The three-inch wheels are scale size.

The engine cowling was fitted almost an inch aft of the scale position for access to the needle valve and for priming the carburetor, an essential procedure in the Wankel starting routine, which also requires an electric starter.

The upper and lower ailerons are connected with DuBro ball link rods and fittings. After all, the full size planes had "ball joints on all (aileron) socket

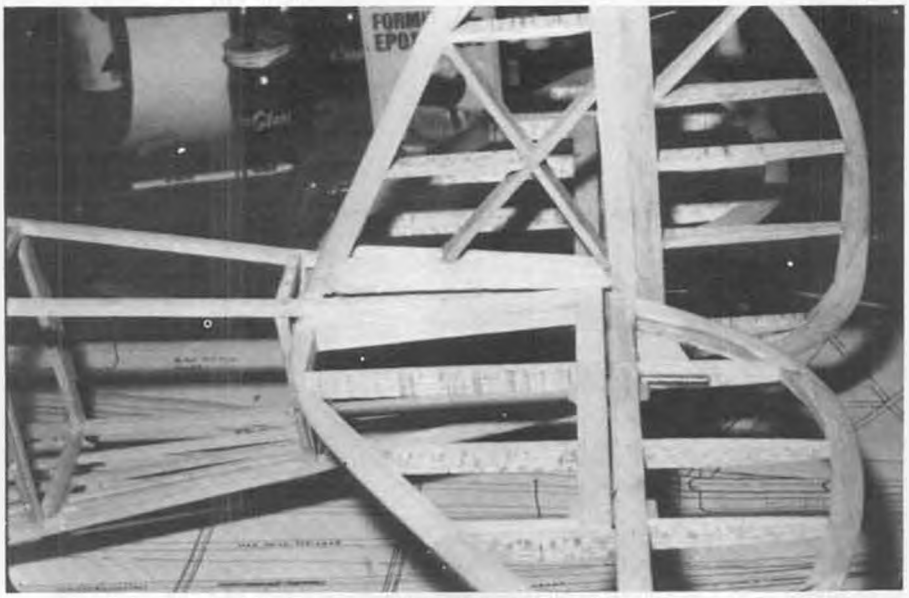


Tank and engine installation details. Tank is hooked up to a Robart "Super Fueler" mounted on the right side, so fuel line does not have to be disconnected from the carb during fueling.

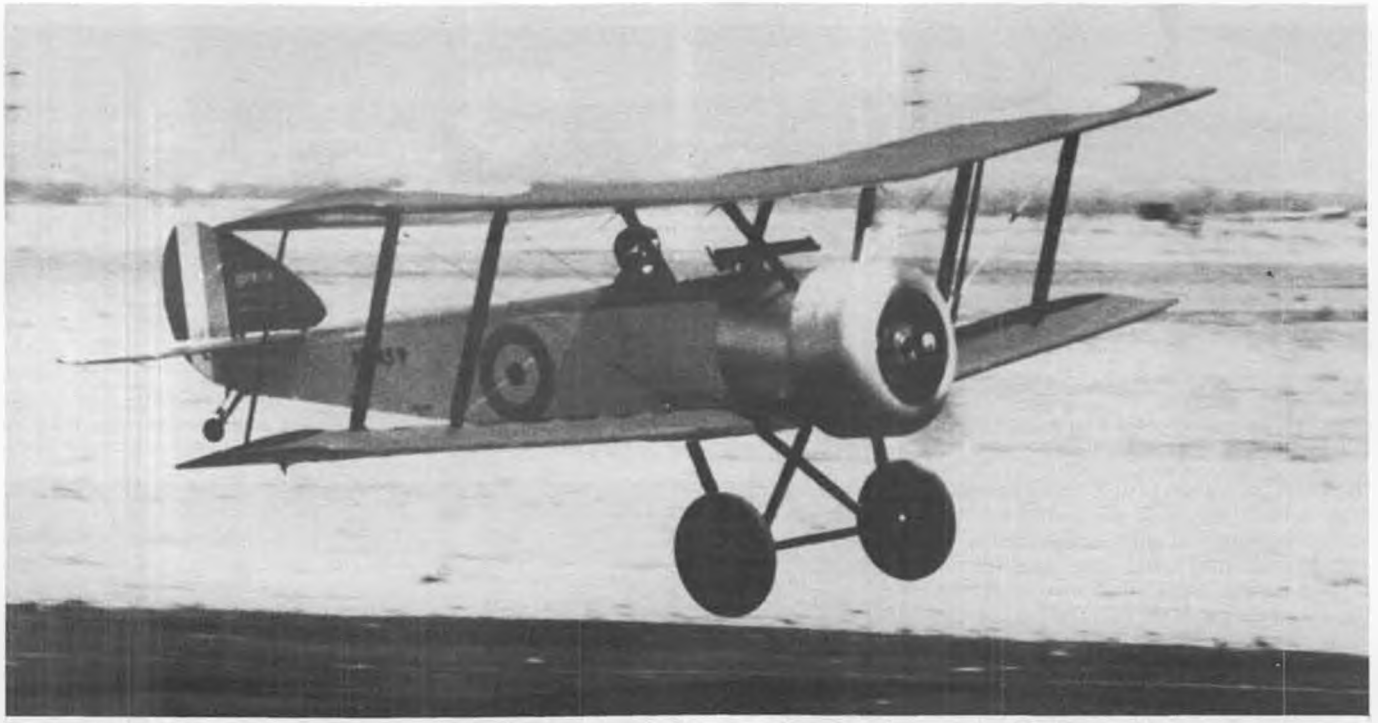
linkage points" (ref. P. Matt). On my model, the aileron servo and drive linkage were installed in the upper wing so that the upper ailerons drive the lower ailerons. This is the reverse of full-size, but the fuselage area above the bottom wing is very busy with the other three servos. In a larger scale model, the three servos could be under the rear seat and the lower wing would be large enough for the aileron servo(s) and linkage.

The model was covered mostly with red silk and doped eight to ten coats. I used clear, 50-50 clear and thinner, and 25-25-50 clear, pigmented and thinner at different stages in the painting, since it is

*Continued on page 75*



Tail surfaces are built from 3/8 balsa, sanded to a streamlined cross-section. Outlines could also be laminated out of 1/16 thick strips for higher strength at no increase in weight.



PHOTOS BY AUTHOR

Making a high-speed (?) low pass over the runway is Ken Runestrand's big Sopwith Pup, built from a Balsa USA kit. With Quadra power, top speed in level flight is probably no more than 30 mph . . . a real fireball!

# GIANT SCALE FLIGHT LINE

By LEE TAYLOR

• This column is being written during the Sacramento Sunrise Mall Model Expo, while surrounded by about a hundred model planes, and while watching our video tapes of the IMAA West Coast Regional Fly-In. These distractions, plus all the GORGEOUS girls that keep walking by, make this article just a little difficult to write!

When this display started five years ago, there was one monster Fokker D-VII shown that was regarded as completely impractical. It was surrounded by literally dozens of Falcons, Quick-Fli's, Ugly-Sticks, and other "practical" models. This year, the giant models completely dominate the show, and every bird here has flown extensively. The growth of Giant Scale has overshadowed all other activity here, and while the percentage of modelers who actually are involved in the giants is still small, their influence and effect far exceeds that percentage.

The most impressive thing about the big-bird movement is the attitude of non-competitiveness, and the extreme freedom to build and fly just whatever and however the individual modeler wants. Without the constraints imposed by artificial competition rules, the diversity of modeling subjects is fabulous to watch. At this show there is Paul Sim's Quadra powered Aeronca Champ on floats, Ken Runestrand's giant Balsa USA Sopwith Pup featuring an Eastcraft onboard electric starter on its Quadra, two Runestrand L-4 Piper Cubs, a standard J-3 Cub, and a half-dozen other giant models, including a 13-foot all-fiberglass KA-6 glider. All these builders had a favorite subject, and with the complete freedom from competitiveness enjoyed by the Giant builder, the diversity of planes that appear is just plain fascinating!

With all that wing, Ken's Pup is a real floater even at an all-up weight of 32 lbs. Prop blades barely stick out beyond the 13-1/2 inch diameter cowl.

In the Sacramento area we have everything from Monokoted Telemasters to a 13-1/2 foot, 120+ lb., Grumman Goose, and literally every single step in between. This large diversity of models makes for very interesting shows and fly-ins.

At the IMAA Regional Fly-In last week, we had 53 fliers registered, with an estimated 70-80 planes total on the field. The only "type-group" was three Hobby Lobby Grumman Tigers!

Most of the problems that have plagued giant models from their beginning are starting to show some solutions now. Ron Shettler's developing of the

Quadra engine opened the floodgates of giant modeling, of course. This engine started off as being an excellent, very economical entrance to giant modeling for virtually all of us, and it continues, much improved, to be unequalled in its class. It didn't take very long, though, for planes to appear that were just plain too much for the Quadra, and for a long time this market went untapped. Now, however, there are beginning to be quite a few engines to fill these gaps, and they are almost universally very good products.

The new Kawasaki engines, originally developed by Bob Siegelkoff of C.B. Associates, and now distributed by both Bob and EWH Enterprises, in both 2.6 and 3.14 cu. in., are earning the reputation of being fine, smooth-running engines. The Kioritz engine, at 2.44 cu. in., has had absolutely nothing but rave reviews from everyone I have talked to who is flying it. The newest Roper 3.7 engine is one that I personally have been playing with, and it is a neat, compact piece of machinery that I have been almost completely happy with so far. The Hustler engine by EWH has been completely reworked to eliminate the vibration and electronic ignition problems it had originally, and reports say that it is one of the most powerful on the market. It is also very compact, making it a choice for tight installations such as on the Nosen Mustang.

There are a couple of other engines around that I have not mentioned, but basically the supply of fine, excellent-running engines now completely fills our needs from the .60's all the way up to the 3.7 cu. in. class. And, inside word has it that super-engines up to the 5 cu. in. class will shortly be introduced on the market, and at prices that will make them affordable. They won't be cheap, but at least they will be available for those projects that just plain MUST have brute strength.

On that last subject, I know that statement will horrify quite a few modelers who still view giants as the voice of doom of modeling, but the only response that I can make to those people is a big, toothy grin! The giant models have breathed a whole new life into the modeling hobby, and the people they are attracting, and the cooperation they elicit from the non-modeling, formerly antagonistic public, has been one of the highlights of my modeling experience. People who formerly looked upon us as overgrown kids playing with ridiculous toys are now coming up to us with great enthusiasm, saying "WOW, how do I get into this?!!!" and coming to US with offers of cooperation and help that was flatly refused before. It has been said that the only difference between men and boys is the size and price of their toys. While we know that isn't true in modeling, it sure has that effect on the impression that I have been getting from the public. Response from the public has been almost exactly opposite from the response that was originally shown by the modeling fraternity. The public LOVES these big birds! Moreover, they love the giant fighters and heavies, and these particular birds will not live up to their appeal, or be safe planes to fly, until they have sufficient power. The bigger engines will be necessary for these birds to be safe, and to show what they can do.

Dick Hershey, in straw hat, discusses his almost-finished Grumman Goose project with spectators. This monster spans 13-1/2 feet, weighs over 120 lbs., and is fitted with two Roper 3.7's.

Wally Rinker doesn't quite manage to dwarf his 1/2-scale Stolp Starlet, said to be a magnificent flier with its 6 cu. in. Husqvarna (motorcycle?) engine. Spans 13 feet, weighs 57 lbs.

Along those lines, I recently saw my FIRST Nosen Mustang fly somewhat as a Mustang should. It was at the Morgan Hill Mammoth Scale Fly-In, and it was powered by one of the Kawasaki 3.15 engines. Because of the bulk of the engine, it couldn't be completely cowled. This detracted from the classically beautiful lines of the Mustang nose, and the plane flew with the gear hanging down, but it did fly, flew well, and exhibited sufficient power so that it was no slouch in the air. All the Nosen Mustangs I have seen before flew more like .40-powered Senior Falcons. This one got up and went. It had a long way to go for total realism, but at least it wasn't doggy. The light in the darkness begins to glimmer!

As long as I am on my soapbox, I might as well harangue the manufacturers one more time. There are two things that there is just plain a crying need for in our hobby, and I have yet to see any good answer to them. First is LANDING GEARS. There is a need for some spring-loaded, oleo shock strut gears that could fit a universal mount so they could be mounted in several different types of planes. I see this as a basic strut about eight inches long, with an upper end of solid rod stock. It would slip into a mounting block that can be mounted any way the modeler wishes, and trim-

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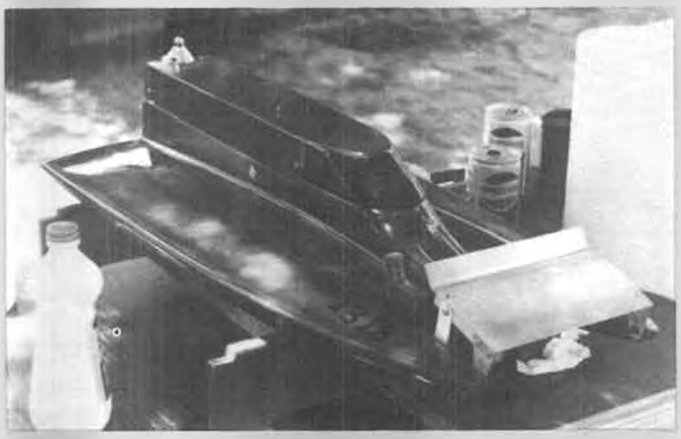

Jim Reed's Dumas Hotshot 21 with highly modified top cowl and forward mounted wing. Jim's wife, Debbie, ran this boat at the All-Ladies Regatta early this year (1980). Lou Foschi photo.


Top racer, Norm Teague, with his George Campbell designed Prather Outboard Tunnel. Lou Foschi photo.

# R/C POWER BOATS

**By JERRY DUNLAP**

**ANOTHER JANUARY ISSUE ALREADY?**

It's hard to believe that we are starting another publication year with this January 1981 issue of **RCMB.** The occasion is somewhat special to this contributing editor because it marks the fifteenth year of writing articles on radio controlled model boats. I've lost count of how many boats I've built and reviewed during that time. I do, however, remember the first boat I reviewed for a model publication. It was the G&M 44-inch fiberglass "Lightning Bolt" with an O&R gasoline engine. It wasn't very fast, but even back then it was much less expensive to run a gasoline engine rather than one requiring nitrated fuel.

Writing model boating articles has afforded me the opportunity to build and try out a variety of boats, engines, and radio systems. The improvement of equipment used in this hobby/sport during the time I've been writing boating articles is most encouraging. People who have entered the hobby in the last few years really can't appreciate the evolution that has taken place in this activity since the mid-60s. It has been very interesting and exciting to this writer and I'm looking forward to further developments and innovations in the years ahead.

**HOW WAS YOUR 1980 MODEL BOATING SEASON?**

Since most of the material dealt with in this column is related to model boats that have the potential to enter some type of competition, it's probably safe to assume that some readers of this material race their boats. I know that many readers don't race and yet receive much satisfaction from building and running them just for the enjoyment the activity provides. There are those of us, however, whose main interest in building a model boat is to make it run as fast as possible and then enter an organized racing event. The variety of opportunities to participate in some form of organized competition is overwhelming. Model boat racing is just one of possibly thousands of ways to compete against others with a similar interest.

The basic reason to enter any competitive activity is to do well and hopefully be the winner. In all my experiences with competitive activities, I can't recall anyone telling me they wanted to enter an event so they could lose. You don't

Check out this twin outboard setup on Ron Coveney's Prather hull. Special motor mount was designed by Norm Teague.

John Perry's Circus Circus unlimited (old type) gets off to a start at the O'Neil and Knudson race at Legg Lake, in So. California.

Jack Garcia bowls a strike with John Brodbeck Sr.'s Circus Circus (cabover type) at Legg Lake. Placed 3rd overall.

Vic Drew won the District 8 Sport 40 class with his R/C Glass Circus Circus. Vic sells this boat; for more information contact him at 1628 Corona, Medford, OR 97501.

Dist. 8 champions in deep-vee and monoplane classes (l to r): Jack Peters, 1st in Deep-Vee 40; Jerry Dunlap, 1st in 20 Mono and 20 Vee; and Doug Smith, 1st in 40 Mono.

compete to lose, but it *is* part of competition. I feel it is very important to examine the reasons why you are losing and also to look closely at why you are winning. This last year was the most successful year I have ever enjoyed in the sixteen years I've been racing model boats. I believe there are some definite reasons behind the success I had and would like to share them with you.

It may seem out of place to talk about setting goals for an activity that is supposed to be a hobby; but I think it is very important. There's an overworked saying that goes something like this: "If you don't know where you're going, you probably won't get there." I had two main goals for 1980: to win a District 8 Championship in at least one class and to win at least once class at the 1980 NAMBA Nationals. I achieved both of those goals, and the reason was that I had a plan.

To reach those goals, I knew it would take the best equipment. I began gathering the necessary equipment right after the completion of the 1979 racing season. I spent considerable time during the months of November through April preparing this equipment. It was my intention to "have it all together" beginning with the first race of the year in April.

In specific terms, let me describe my plan for winning a District 8 Championship. I really enjoy racing in the .21 Monoplane Class. It was most apparent that the Prather 31-inch Deep-Vee was a boat capable of winning races if properly set up. I managed to obtain one for a review article. I've had good luck with the K&B .21 engine and was able to obtain two Futaba radio systems through some racing success and picking up some used components. This combination of equipment has proven to be the most successful race boat I've ever campaigned. It was very fast and also very dependable. I could really get out and go with this setup. I only lost two out of thirteen District 8 races I entered with this boat.

Another boat I built during the break between racing seasons was Steve Muck's Sport 40. Unlike my Prather 31-inch Deep-Vee, this boat was not faster than most of the others in its class. Knowing that I couldn't blow the barn doors off the competition in Sport 40, I had another plan. The goal with this boat was to finish every heat and avoid situations that might cause accidents. Let the faster boats pass. Just make sure you get the points. The plan was successful and I won a number of awards with the boat because it was the most reliable, not necessarily the fastest.

Mike Wight was 1st in the Dist. 8 Championship Series for Outboard Tunnel. Boat is an Excaliber II from RCMB plans.

Evaluation is an important component to help reach a goal. For instance, 1980 was not a good year for me in the Outboard Tunnel Class. I began the year with a new boat and it took the first half of the season to find out that the boat wasn't going to prove successful. It ran great with no other boats on the water, but it wound up inverted too many times

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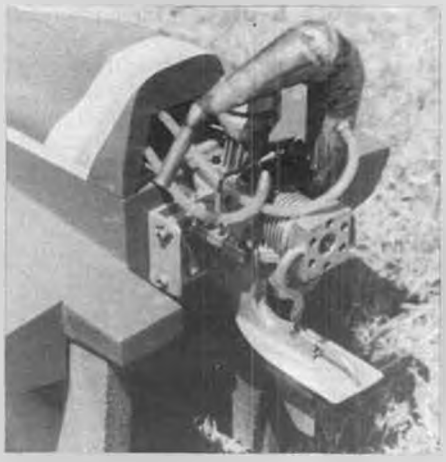


Joe Monohan runs this slightly (?) modified K&B Outboard on a Prather hull in the Modified Outboard class.

Dennis Caines drove this highly decorated Excaliber II to 1st place in heat racing at the Northwest Outboard Championships in Portland, Oregon. Also placed 4th in the enduros.

Chugging through the damp early-morning grass, Chuck Heller's J-3 Cub is a good example of the incredible realism attainable with Giant Scale. Power is the relatively new O.S. Gemini four-cycle twin, plenty of power for this 15-lb. putt-putt.

# I.M.A.A. Eastern Regional FLY-IN

By BOB BECKMAN PHOTOS BY AUTHOR

• The Thistledown Flyers of Napoleon, Ohio is a four-year-old, forty-member club whose primary interest is Giant Scale. They were enthusiastic supporters when the International Miniature Aircraft Association was formed in April 1980. Two of their members have become officers of the new group: Corky Heitman is Vice-President and Tom Rausch is a Director. It was only natural that they would be selected to host the first IMAA sanctioned fly-in in the eastern part of the U.S.

The IMAA meet format is pure fun-fly. No prizes, no trophies, no competition of any kind. It's certainly an idea whose time has come, and this pleasant, low-key type of activity is showing up in many phases of our hobby. One interesting result is that many long-time modelers who have been inactive for years are finding renewed enthusiasm, especially for Giant Scale.

In this one shot, Jerry Smith's camera plane catches the pits and parking areas, Dick Coutchure's 1/4-scale 1934 Bird biplane, and lots and lots of flat Ohio farmland.

The Thistledown Flyers club has a magnificent site. A level grass field about 350 feet square is surrounded on three sides by fields deliberately planted with low-growing crops (i.e., *no* corn). The fourth side is a parking lot, with plenty of space for campers and motorhomes. Permanent structures on the site include a clubhouse complete with a kitchen, and a covered transmitter impound hut. And lots and lots of clear airspace. By the time you get this far west in Ohio, you're in the flatlands.

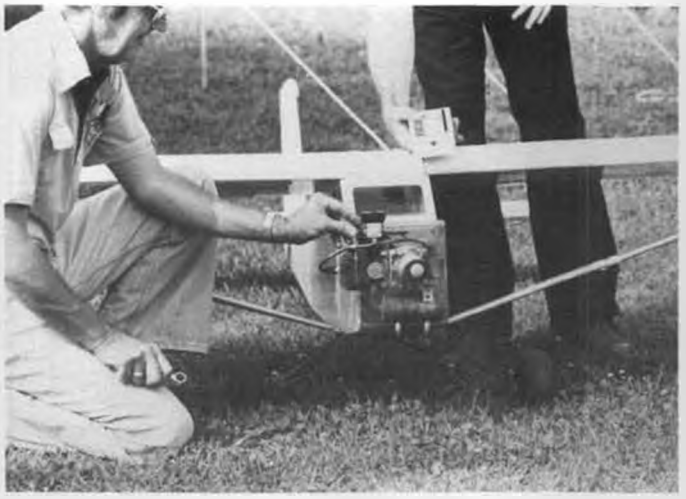

With his white scarf flapping in the breeze, the pilot in Dick Coutchure's Bird waits for someone to give him a prop so he can keep his appointment with the camera plane.

The weather forecasts for all three days were horrible, but except for some rain Sunday morning that cleared up by 10 a.m., you couldn't ask for better flying weather. Unfortunately, the forecasts kept away some people who had planned to attend. Even so, the turnout was good for an event that had had little advance publicity, with almost 40 planes registered to fly and the usual group of uncompleted models on display.

For me, the fascinating people I met and talked with were the real highpoint of this fly-in. One of the new friends I made was Jerry Smith, the "Here's How" columnist for *RCM*. Jerry's Webra .91 powered Sr. Telemaster camera plane made several flights each day, snapping action in the air as well as on the ground.

Another new acquaintance is Canadian Bob Cooper. Bob is the new Quadra man at Trail Manufacturing. He told me


Vince Mariani's big red Waco YKS-7 beats up the field. This one looks so realistic because it's 1:1 scale, a perennial winner at Oshkosh. See also the photo on p. 13.



Jim Cline tunes the Kioritz engine in his BIG Telemaster. A real work-horse of an airplane, used for banner towing, etc. Weighs 28 lbs.

Miles Reed really enjoys his flying, puts on a fantastic aerobatic show with his Kioritz-powered 1/3-scale Sheber Pitts Special.

The Higgins Aero Composites CAP 20L, built entirely of epoxyglass shells with urethane foam cores. At a weight of less than 20 lbs., it's agile with a Quadra. Three flew in the meet.

Corky Heitman's big Stinson SR-9 lifts off. Kioritz engine turned this putt-putter into a performer. Built from Barron plans, it spans 10-1/2 feet and weighs 37 lbs.

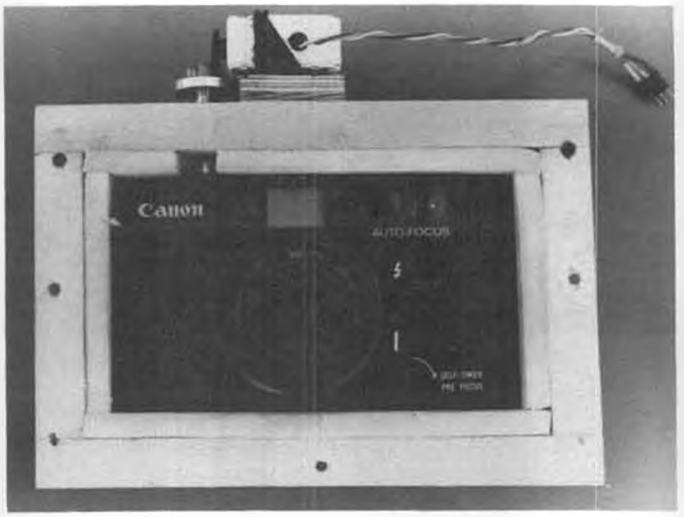
Not exactly scale, but still big and beautiful, is this double-size (20 feet) version of the pre-war Cleveland Albatross sailplane, flown by these three unidentified modelers.

that Trail is definitely interested in the radio control market for their engines and doesn't expect to rest on their laurels. They recognize and plan to meet the challenge of the newer engines that are appearing.

One of those new engines is the Kioritz, and I got to meet the man who found it hiding in a back-pack leaf blower. Dick Roush and his brother Tom have formed Roush Manufacturing to import, convert and market the engine. I've seen several of the Kioritzes in operation, at Napoleon and at other fly-ins, and it is impressive.

Another new product that impressed me was Darrell Higgins' composite construction CAP 20L. I first met Darrell and saw his plane at Toledo last April. At that time I wasn't very impressed. the plane seemed heavy and, frankly, the construction method hadn't really registered with me. The entire plane (fuselage, wings, and tail surfaces) consists of epoxy/fiberglass shells with urethane foam injected for rigidity. Refinement of

The business end of Jerry Smith's camera-carrying Telemaster. He gets some beautiful shots with this relatively simple rig.




Jerry Smith's airborne camera setup. Retract switch is used on the transmitter; every time switch is changed, the servo arm presses a plunger and activates the self-winding automatic camera.

Stormin' by is Cliff Tacie's Nosen Citabria. At the other end of the runway he did a split-S, pulled out right over the runway when . . .

. . . aileron flutter did this. Luckily, both ailerons came off clean and Cliff made an uneventful landing with just rudder control.

the many molds and improved manufacturing techniques have brought the weight down to 18 lbs. or less. Darrell expects to have special versions of the kit that will meet the Las Vegas T.O.C. rules. The three Quadra powered CAP 20L's that flew that weekend performed well.

Speaking of good flight performances, without a doubt the best I saw all year was Miles Reed and his Kioritz powered Sheber Pitts. When Miles flies, everything else stops, both to give him air room and because everyone wants to watch. The precision of his maneuvers is almost unbelievable. I've seen a lot of good flying all over the country, but I've never seen anything to match Miles. I've also seen the full-scale Red Devils perform, and the realism of this model's performance is a prime example of what Giant Scale is all about.

From the technical standpoint, engines were the big item in 1980. Understandably, the Quadra is still in the majority . . . there were 15 at Napoleon. There were six Kioritz engines, a couple of Kawasakis, and a Roper. The rest were glow engines, some direct drive, some geared.

One of the glow engines was the O.S. 120 Gemini four-cycle twin in Chuck

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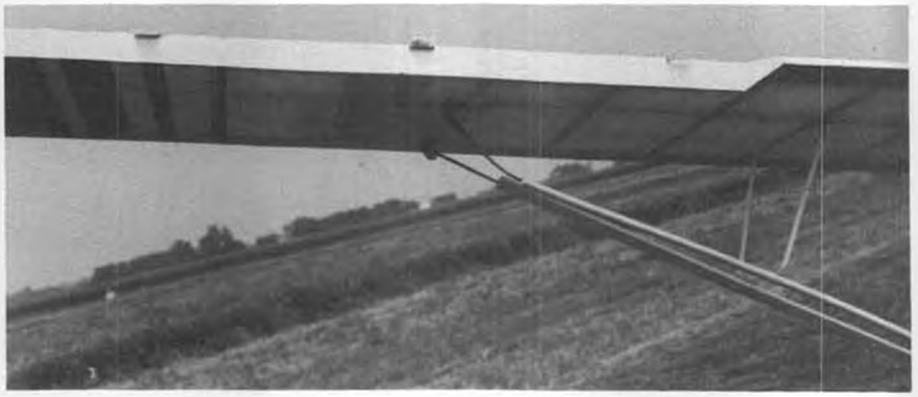


Here's what the aileron flutter did to the wing struts on Tacie's high-powered Citabria. Hinges had been pinned with straight pins, but they pulled right out.


Nope, this is not Snow White's Doc. It's the International Miniature Aircraft Association's President, Don Godfrey. Jerry Smith took the photo (no, dummy, not with his camera plane!).

# FUEL LINES

**JOE KLAUSE**
P.O. Box 2699
Laguna Hills, CA 92653

• In the October '80 issue, I commented about a series of previous articles, during 1979, on 1/2A engine tuning. Since then, there have been quite a number of requests for information about that series. Add to that the occasional request for other information that's been previously published, and one comes up with the "brilliant" idea to provide a recap or index of the Klause columns to date. If you are interested in any one, I'm sure Bill Northrop will gladly sell you a back issue. Just write (with money) to **R/C Model Builder** and your copy will be on its way post haste. Here, in brief, are the topics and dates of the columns:

10/78 Fuel Ingredients
11/78 1/2A Starting Techniques
12/78 1/2A Glow Heads & Nitro
1/79 1/2A Engine Break-in
2/79 The Uni-Flow Tank
3/79 1/2A Props & Engine Tips
4/79 Cox T.D. Engine Tuning, I
5/79 Cox T.D. Engine Tuning, II
6/79 Cox T.D. Engine Tuning, III
7/79 Reed Valve Engine Tuning
8/79 Engine Performance Comparisons
9/79 1/2A Part Failures
10/79 Fuel Tubing
11/79 Small Engine Advantages
12/79 Power Losses
1/80 Power Losses
2/80 How Engines Operate
3/80 Preflight Suggestions
4/80 Carburetor Adjustments
6/80 Glow Plugs
7/80 High Compression
8/80 Recommended Engines
9/80 Stock 1/2A Engine Cylinders
10/80 Engine Test Stands
11/80 Engine Mounts
12/80 Engine Lubrication

So much for the past. . .

Larry Geiger of Salina, Kansas, sent in a few briefly worded questions that are loaded with potential information. All too often we so-called experts become oblivious to the needs of most of the modelers. Larry's letter highlighted this for me, and it's a pleasure to excerpt his words and to offer comments.

*Dear Joe,*

*I have a few questions you may be able to answer for me. . .*

*1) Why do high compression heads work on some .049's and not on others?*

*2) How loose does a rod need to get before resetting is necessary?*

*3) The Golden Bee, Black Widow, and Tee Dee all have different power outputs. Why? I realize the T.D. has a tapered piston, but what else? Timing? And can I change the timing myself, and how?*

*4) What's the best prop for the most output for an .049?*

*5) How can I make them run reliably, and how can I soup up the old Golden Bee?*

Larry, your questions are well conceived, and I'll do my best to help out. Let's take them in the order you asked.

1) High compression heads will work on all .049's. When you encounter difficulty, it usually means too much compression due to an accumulation of manufacturing tolerances on various parts of the engine. For example, if the top of the crankcase that abuts the cylinder is a bit low, then in effect, the crankpin will be higher at the top of crankshaft rotation. Thus the rod and piston will be pushed higher into the cylinder. If we add to this a cylinder that is just a tiny bit short, we have an accumulation of tolerances. In some instances the piston at top dead center will protrude above the glowhead seat in the cylinder. If an insufficient number of head gaskets is used, the piston will sometimes actually contact the head. Further, the volume of the combustion chamber of the head will vary slightly from one to another, especially from one production run to another. So you can see that it's not unusual to have too much compression if you start out with a high compression glowhead. It's usually manifested in a reed valve engine by being cantankerous and generally hard to start. The prop just seems to want to rock back and forth while the engine gives off sickly, gasping sounds. What's the solution? Simply add one or more copper gaskets under the glowhead. If you want to go a step further, and if you have an accurate tachometer with which you can read 50 rpm changes, such as The Royal Pro-Tach, here's what you can do. Using a given prop and fuel, keep adding gaskets and taching the engine until you notice a drop in rpm. At that point you can leave it alone or back off one .005-inch copper gasket. Don't be surprised if you find you're using three or four gaskets, especially if you're using 50 or 60 percent nitro.

2) An oversimplified answer to this one is that almost any "play" in the ball-socket joint is too much. During each revolution of the crankshaft the ball will slap around in the socket. At 20,000 rpm or more, that's a lot of slapping, and the more the play, the harder the slap. Uncorrected, it will get progressively worse until something fails . . . usually the crown of the piston. As a practical matter, most operational 1/2A engines have some small amount of play. Here's my test for too much. Hold the piston with one hand and the rod with the other. Move them close to your ear and push and pull on the rod. If you hear any clicking, it's too loose. When you reset the ball-socket joint with one of the commercially available reset tools, remember to use an absolutely flat steel surface as an anvil, otherwise you can damage the piston.

3) The power difference between the Golden Bee and Black Widow is mainly attributable to the bypasses. The Golden Bee has a single bypass cylinder, and the Black Widow has twin bypasses. Because of this the Black Widow engine is more efficient at transferring the fuel/air mixture to the top of the cylinder. The T.D. engine is obviously even more powerful. One reason is that it has rotary induction that precisely times the intake of the fuel/air mixture from the carburetor through the crankshaft and into the crankcase. The other two engines utilize a reed valve induction system that is more inefficient, not only because of timing, but also because the induction passages are smaller. The T.D. with a larger intake passage can handle a greater volume of fuel/air mixture. Further, the bypasses of the T.D.'s have more volume, the cylinder timing is different, and both the cylinder and piston are tapered for more efficient compression of the fuel/air mixture. Essentially, the Golden Bee and Black Widow engines were designed as sport type engines. The T.D. was designed as a high-performance competition engine.

As for changing the timing of Golden Bee or Black Widow cylinders, it's not worth the effort. Not when you can buy a T.D. cylinder and piston assembly for $6.50. Remember, all Cox .049/.051 cylinder and piston assemblies are interchangeable on all Cox engines.

4) Here are some prop suggestions. For 1/2A Combat, free flight, and pylon racing, a 5x3 prop seems to be the best. For control line racing; a 4-3/4x4 is good for reed engines and a 4-3/4x4-3/4 works well on the T.D. Both of these last two are custom made of fiberglass. Unfortunately, they are not readily available. The next best choice is a 5x4.

5) This last question requires a rather lengthy answer, and, in fact, it was covered in the July 1979 issue of **RCMB.** Please refer to that column for all the details. Again, copies of it are available from **R/C Model Builder.** If you don't want to get that involved, just install a T.D. cylinder and piston and high compression head on your Golden Bee, and you'll improve performance significantly.

Larry, I trust that this has been helpful. If you or any other readers have additional questions, just send them to the address at the head of this column. Remember, no question is unimportant.

Until next month. . . •

Most of a shipment of 50 SBC-4's, being sent to France under the Lend Lease Act of 1941, were on the high seas aboard the French carrier *Bearne* when France fell. They and the carrier spent the war at the island of Martinique.

# CURTISS SBC-4

By PETER WESTBURG

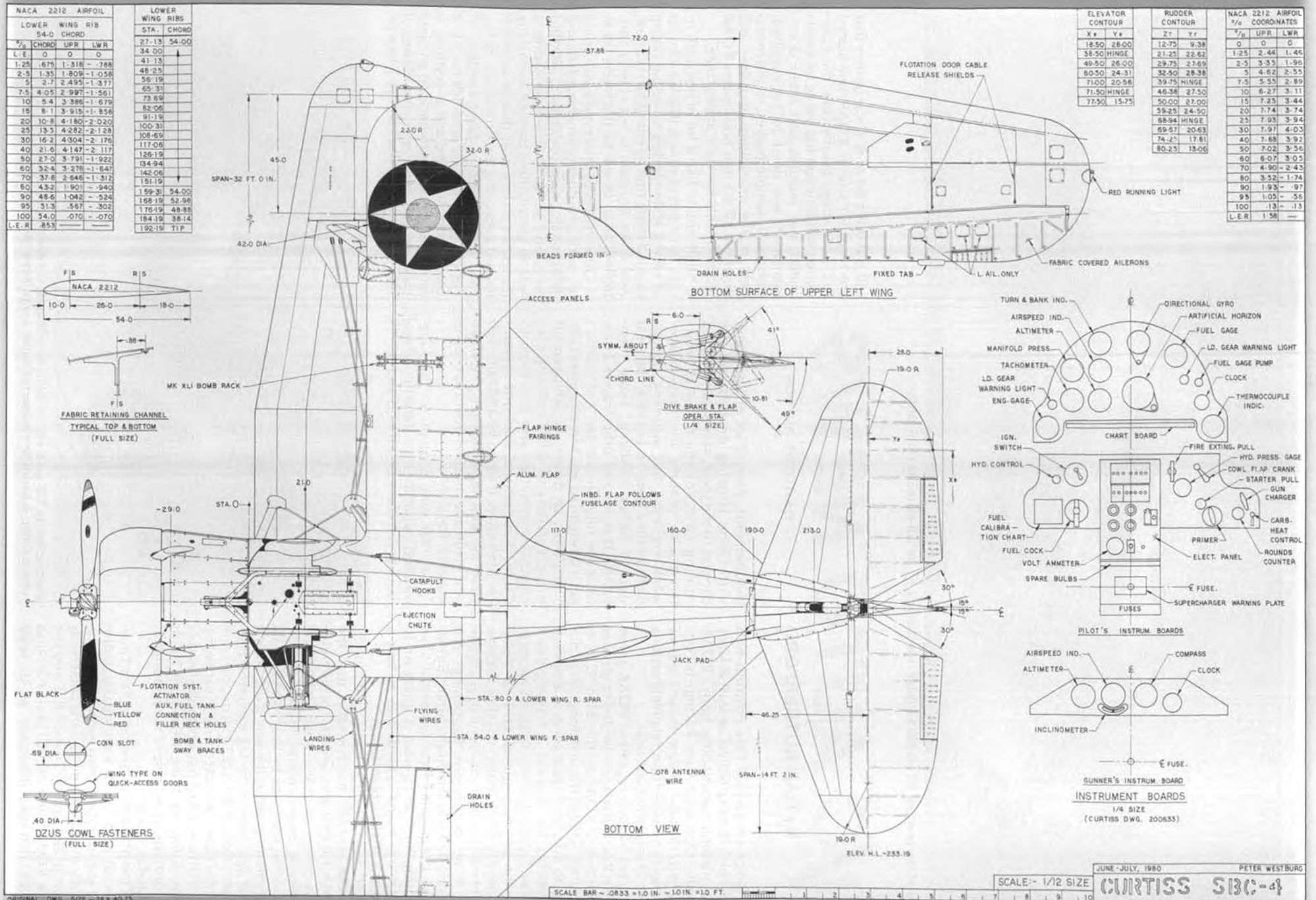
CONCLUSION

Canopy slid forward and rear deck folded down for firing from rear cockpit. Gunner had a monkey tail safety belt to keep him from falling out. Nat'l Archives photo.


Contemporary artist's rendition of the SBC-4 shows great attention to detail. 2-S-10 was leader of the 4th flight, had black cowl and fuselage band, lemon yellow tail and wing chevron.

Curtiss landing gears were rugged, but occasionally broke under the stress of a very hard carrier landing. Here it appears that the right main gear on this SBC-3 has failed and folded inward, doing a job on the 52-gallon auxiliary fuel tank.


Final version of the famous Helldiver was the SB2C, direct descendant of the old F12C-1. A total of 7,535, including 900 A-25A's, were built in WW-II. Photo courtesy Ed Young.


NACA 2212 AIRFOIL
LOWER WING RIB 54-0 CHORD
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L.E 0 0 0
1.25 .675 1.318 - .788
2.5 1.35 1.809 - 1.058
5 2.7 2.495 - 1.377
7.5 4.05 2.997 - 1.561
10 5.4 3.386 - 1.679
15 8.1 3.915 - 1.858
20 10.8 4.180 - 2.020
25 13.5 4.282 - 2.128
30 16.2 4.304 - 2.176
40 21.6 4.147 - 2.117
50 27.0 3.791 - 1.922
60 32.4 3.278 - 1.647
70 37.8 2.646 - 1.312
80 43.2 1.901 - .940
90 48.6 1.042 - .524
95 51.3 .567 - .302
100 54.0 .070 - .070
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LOWER WING RIBS
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27-13 54.00
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168-19 52.98
176-19 48.88
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ELEVATOR CONTOUR
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2.5 3.35 1.96
5 4.62 2.55
7.5 5.55 2.89
10 6.27 3.11
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20 7.74 3.74
25 7.93 3.94
30 7.97 4.03
40 7.68 3.92
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90 1.93 .97
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L.E.R 1.58
72-0
37.85
FLOTATION DOOR CABLE RELEASE SHIELDS
RED RUNNING LIGHT
BEADS FORMED IN
DRAIN HOLES
FIXED TAB
L. AIL. ONLY
FABRIC COVERED AILERONS
BOTTOM SURFACE OF UPPER LEFT WING
22-0 R
32-0 R
45-0
SPAN-32 FT. 0 IN.
42-0 DIA
ACCESS PANELS
MK XLI BOMB RACK
FLAP HINGE FAIRINGS
ALUM. FLAP
INBD. FLAP FOLLOWS FUSELAGE CONTOUR
F S
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NACA 2212
10-0
26-0
18-0
54-0
.88
FABRIC RETAINING CHANNEL
TYPICAL TOP & BOTTOM
(FULL SIZE)
6-0
SYMM. ABOUT
CHORD LINE
41°
10-81
49°
DIVE BRAKE & FLAP OPER. STA.
(1/4 SIZE)
28-0
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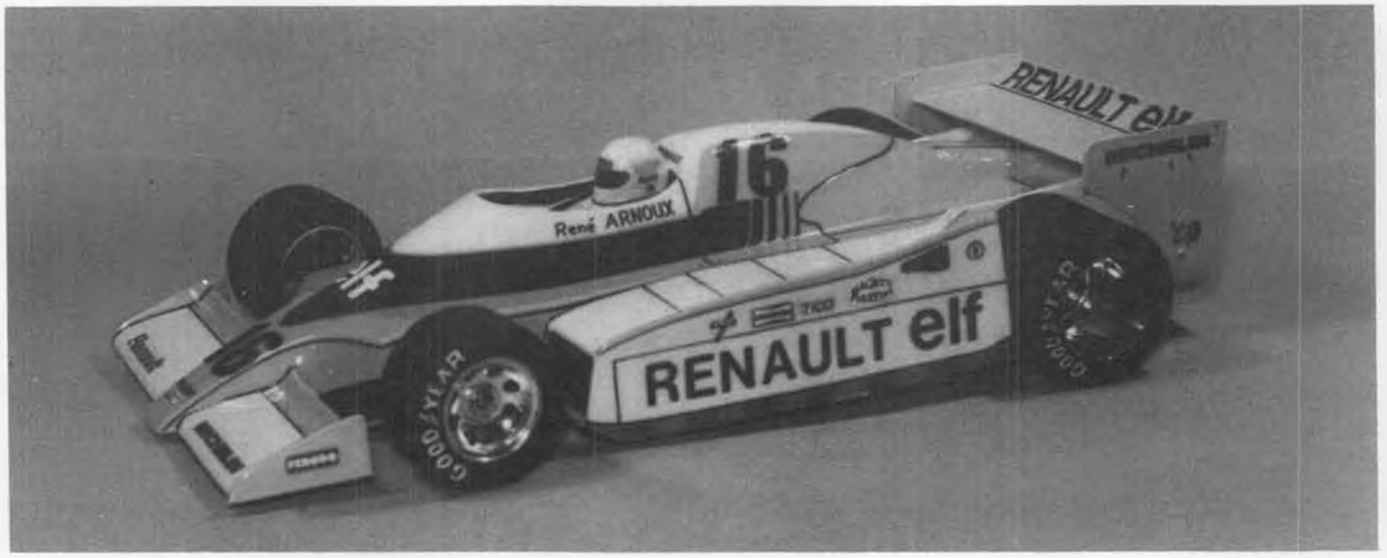
STA. 0
29-0
117-0
160-0
190-0
213-0
CATAPULT HOOKS
EJECTION CHUTE
JACK PAD
30°
15°
15°
30°
FLAT BLACK
BLUE
YELLOW
RED
FLOTATION SYST. ACTIVATOR
AUX. FUEL TANK CONNECTION & FILLER NECK HOLES
BOMB & TANK SWAY BRACES
LANDING WINGS
FLYING WIRES
STA. 80-0 & LOWER WING R. SPAR
STA. 54-0 & LOWER WING F. SPAR
46.25
.078 ANTENNA WIRE
SPAN-14 FT. 2 IN.
DRAIN HOLES
BOTTOM VIEW
19-0 R
ELEV. H.L.-233.19
.59 DIA.
COIN SLOT
WING TYPE ON QUICK-ACCESS DOORS
.40 DIA.
DZUS COWL FASTENERS
(FULL SIZE)
TURN & BANK IND.
AIRSPEED IND.
ALTIMETER
MANIFOLD PRESS.
TACHOMETER
LD. GEAR WARNING LIGHT
ENG. GAGE
DIRECTIONAL GYRO
ARTIFICIAL HORIZON
FUEL GAGE
LD. GEAR WARNING LIGHT
FUEL GAGE PUMP
CLOCK
THERMOCOUPLE INDIC.
CHART BOARD
IGN. SWITCH
HYD. CONTROL
FUEL CALIBRATION CHART
FUEL COCK
VOLT AMMETER
SPARE BULBS
FIRE EXTING. PULL
HYD. PRESS. GAGE
COWL FLAP CRANK
STARTER PULL
GUN CHARGER
CARB. HEAT CONTROL
ROUNDS COUNTER
PRIMER
ELECT. PANEL
℄ FUSE.
SUPERCHARGER WARNING PLATE
FUSES
PILOT'S INSTRUM. BOARDS
AIRSPEED IND.
ALTIMETER
COMPASS
CLOCK
INCLINOMETER
℄ FUSE.
GUNNER'S INSTRUM. BOARD
INSTRUMENT BOARDS
1/4 SIZE
(CURTISS DWG. 200633)
JUNE-JULY, 1980
PETER WESTBURG
SCALE:- 1/12 SIZE
CURTISS SBC-4
SCALE BAR - .0833 = 1.0 IN. - 1.0 IN. = 1.0 FT.
ORIGINAL DWG. SIZE - 28 X 40-75
SHEET 4 OF 4




One of the prettiest F1 bodies available, the Renault F1, in 1/8-scale and from MRP.

# R/C AUTO NEWS

By DAN RUTHERFORD

PHOTOS BY AUTHOR

• Once in awhile this column will deal with things political, at least as far as the national sanctioning body, ROAR (Radio Operated Auto Racing) is concerned, mainly because these kinds of things can range from relatively serious to outrageously hysterical.

Latest happening within ROAR is that Mike Reedy has been elected to serve as President of ROAR for the '81 to '82 term of office. One of the first things Mike did was to ask that I again serve as Regional Director for Region 7, having been "fired" about halfway through my term by the previous president, Rick Perry. Some day when material is slow to come to mind I'll tell you all about it, as it is one of those outrageous happenings just referred to and terrifically funny. But for now, once again I have somewhat of an "inside line" as to what is going on in what has to be regarded as at best a slightly shaky organization.

Actually, it isn't as bad as that sounds. ROAR is small, much smaller than the AMA, for example, and has considerably less power in many areas, while also exerting more control in others. The problem seems to be that ROAR is still functioning about the way it did several year ago, before the big explosion took place, that of the 1/12 electric cars and all the racers attracted to R/C car racing by them. So Mike has a big job ahead of him, trying to bring ROAR up by its bootstraps, more able to meet the needs of today's racers.

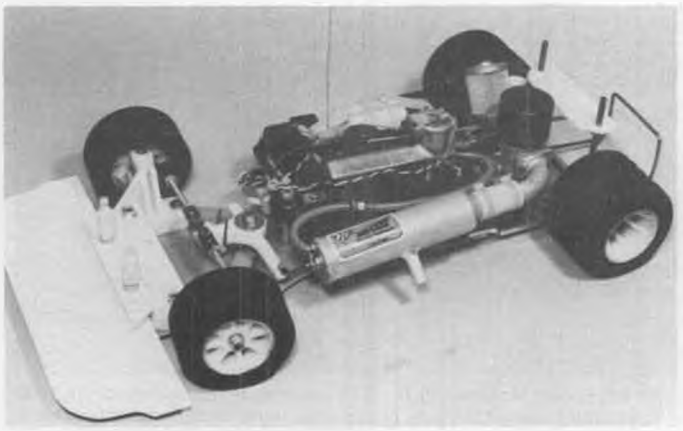
One of the problems being faced now is what to do about keeping the bodies we use for racing from evolving into the wildly modified type of thing commonly seen in slot racing. Toward this end the new ROAR rulebook will likely contain a much stronger statement as to scale requirements. After a lot of discussion with Gene Husting on this and the dangers to the sport, as well as increased tooling costs for the manufacturers faced with winning the body-of-the-week contests, and assuming out-of-scale bodies were to become the next step to better handling, Gene mentioned that he and other racers knew what the rules should say, just couldn't get it down on paper. Me, being basically a smart-ass, sat down and whipped off three versions of what nobody else could (evidently) do and sent them to Gene. I suggested that one person couldn't cover it all, so he and Mike just took the best features from the three and made one rule that ought to keep us covered for awhile.

But that isn't enough, so the long-awaited committee to determine legal bodies will soon be formed and ROAR will publish a list of R/C car bodies that are legal for use in ROAR sanctioned R/C car racing. Exactly how the committee will function has yet to be determined, but pictures and other documentation will need to be supplied, along with sample bodies, to the members of the committee and they will determine if the new body meets ROAR requirements for scale appearance.

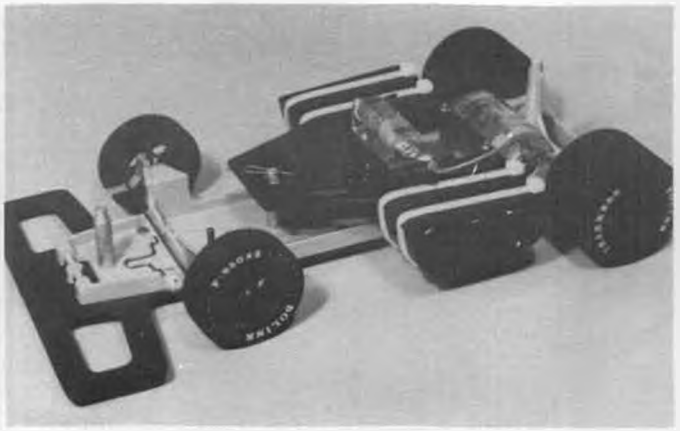
Might sound like a lot of hogwash to you, but a few of us feel that the aspects of racing scale models of actual racing cars is a thing that needs to be retained. And if the situation is not closely controlled, all of us will be the losers for it.

Other things of interest are also going on, such as a discussion about banning differentials, suspension cars, nitrated fuels, and so on in 1/8-scale racing. I hate to see anything banned, especially things like differentials that do so much toward improving the driveability of the cars, and so tend to favor keeping an "open" class in 1/12 and 1/8 racing, a class where anything and everything is fair game. However, to back up an open class we also need restricted classes of racing that local clubs can use when (if)

Electric cars in 1/8 scale are available, even though not widely publicized. This 12-cell model is from Delta, is basically a converted Super J with Astro 15 motor. Very smooth running.



The Dirty Racing Team's Associated RC-300, as it appeared when first built. Now fitted with new Associated gear-type differential.



BoLink's "Performance Car" in all its nakedness. Kydex radio tray and bumper, resistor speed control, BoLink's own wheels and rubber.

open cars get so expensive and complex that club racers cannot easily afford a competitive car.

These aspects are currently being discussed within ROAR. By the time you read this the '81 rulebook ought to have been voted on and ready for publishing. When there are some results of the voting available and these results affect club racers, we'll go over it in this column.

**CLUB RACERS**

The line above a couple of spaces brings to mind something that I probably should have covered last month, and that is how this column, ratty piece of garbage that it is, will approach anything having to do with R/C cars. Well, almost anything. First, I regard myself as a pretty fair club racer. Better equipped than most, possibly, but still a club racer destined to never, ever be a threat to win the big one at a ROAR Nationals. Club racing with friends and family is the only reason for me to be racing R/C cars. If I am reasonably competitive at these local races, win once in awhile, have a good time while winning as well as losing, then my objectives have been met.

Secondly, I regard the club racers of the land as the most important people in R/C car racing. You will tend to hear only about sponsored racers like Gary Kyes (MRP), Art Carbonell (Delta), Bill "The Greek" Jianas (Associated), and so on, but I have learned that they are very skilled drivers capable of driving a tank of a car faster than you and I can push our perfectly set-up cars. Forgot Bob Welch, a person I regard very highly as a racer. Bob has never had a big National win in Cam-Am to show as proof of his skill, but he races with us locally and I have seen him drive cars that were way off in all the important areas, tweak, brake, etc., and still go fast . . . with a car that was difficult to just keep pointed the right way on the straights.

Also, these drivers and others are sponsored, a considerable advantage when it comes to being competitive. All kinds of stuff to tinker with, piles of motors to choose from, bodies to try for one run and then toss; mass goodies to play with while coming up with the Magic Combination. You and I have no such advantage. So when looking for the latest accessory, car chassis, or whatever you think you need to go faster, try not to be overly influenced by who won what race with what car and related components.

For instance, Delta's Art Carbonell won both events, F1 as well as Can-Am, in the 1/8-scale racing at this year's Nationals. As it happens, Delta is very big on producing a full-blown race car that will win out-of-the-box, and so Art was racing a very stock kit car, very nearly an exact copy of what my wife and I race, as we both have absolutely stock kit Deltas. But on the right day and at the right race, Art could also win big with a car that Associated, MRP, PB, SG, Thorp and others make. In fact, once he did just that, winning a six-cell National title for Associated, racing one of their 1/12-scale RC12E's. That car was one that I watched Art put together from a kit, right there amid the food being served at the same counter Art was using for a work table at Rattey's diner. As I recall, prior to that '78 ROAR Nationals, Art had never driven a 1/12 electric car, yet he won one of the most prestigious of that year's events.

*Continued on page 91*


Stock car racing at indoor sites is big stuff up in our columnist's neck of the woods. This is a Leisure 100SS electric car with an old but still produced Challenger body by JoMac.


Associated's RC-300 with the Porsche 30KL body, also by Associated. Dan will do a full test on this car in a month or so, he sez.

PHOTOS BY AUTHOR

At left is 630 N. Alvarado St., Los Angeles, as it looks today; in 1937 it was the home of Ohlsson Miniatures. Irwin Ohlsson later teamed up with Harry Rice and moved the operation to 3340 Emery St., Los Angeles (above), to produce the famed O&R engines.

# * IGNITION ENGINES REVISITED *

**By BILL SIMPSON . . . Ever wonder what became of the facilities where great old engines, such as the Super Cyclone, O&R, Bunch, etc. were built? Come along on a mini-tour of the Los Angeles area and let's find out.**

*Bill Simpson describes his profession as an Equine Sanitary Engineer, saying he makes his living following the horses "with a shovel and broom."*

*He has flown in competition in both U-Control and Radio Control pattern, speed, and scale. He finished 1st in R/C pattern competition in the 1976 West Coast Championships.*

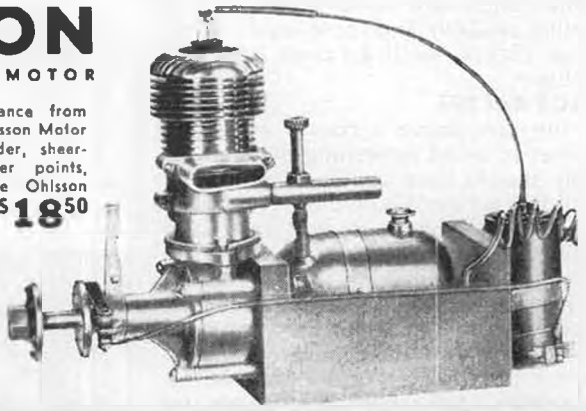
*He is a former editor of the National Society of Radio Control Aerobatics and B.I.R.D. Club newsletters. He has written numerous articles over the years in modeling publications, including coverage of the R/C pattern competition at the 1977 AMA Nationals.*

*Bill is a ten-year member of the Model Engine Collector's Association and has more than 200 ignition engines in his collection. His 21-engine Orwick collection contains every model of the Orwick manufactured and is the only complete Orwick collection in the world.*


OHLSSON

RADIAL MOUNTED MOTOR

Get the dependable performance from your gas model that only an Ohlsson Motor can give you. All-steel cylinder, sheer-ground piston, platinum timer points, radial mounting, are exclusive Ohlsson features. 1/5 HP. Complete, $18.50



OHLSSON MINIATURES 630 NORTH ALVARADO STREET LOS ANGELES, CALIFORNIA


• My World War Two years were spent in Inglewood, California, a suburb of Los Angeles, in the noble pursuit of a high school education. There were no model airplane engines available in those years, the manufacturers having converted their facilities to the war effort. We modelers, who dreamed of someday building and flying a real gas powered model, had to be satisfied with building solid and rubber powered models and looking at pictures of model airplane engines in the manufacturers' ads.

The larger engine manufacturers continued to advertise all during the war, even though they had no engines to sell, in order to keep their name before the public and maintain a demand and, no doubt, for good will.

The *Model Airplane News* ad for the Tom Thumb engine ($7.50) listed the manufacturer as Warren Sales and Service, 412 Brett St., Inglewood; within bicycle riding distance of my school. One day after school I pedaled down to the home of Tom Thumb engines. My naive mind envisioned a brick building, taking up the entire block, surrounded by a chain link fence, smokestacks billowing from the roof, and a huge neon sign on top proclaiming, "Home of the Tom Thumb Engine."

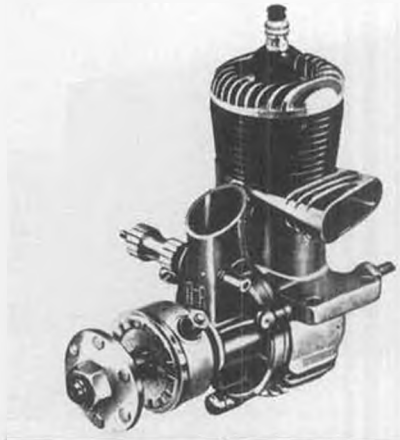
Well, it turned out that the 400 block of Brett St. is a residential street of very modest homes; 412 was just like every other house on the block. It didn't even have a garage. There must be some mistake. Could this be the home of the famous Tom Thumb engine?

The Tom Thumb was actually built by the Bunch Model Airplane Co. Bud

The popular Contestor engine, designed by Dan Bunch, was manufactured at 2636 Humbolt St., Los Angeles. Building is now used by Pacific Packaging Machinery Co.

Duromatic Products, maker of the old McCoy racing engines, used to occupy this building at 11500 Tennessee Ave., Culver City. Testors engines and airplanes are built here now.

Advertised home of the Tom Thumb engine was 412 Brett St., turned out to be this residence in Inglewood. Only the paper work was done here; engine itself was built by Bunch Model Airplane Co.




**Ohlsson & Rice**

Emery at Grande Vista, Los Angeles 23, Calif.


Warren probably only did the paperwork at his Brett St. home.

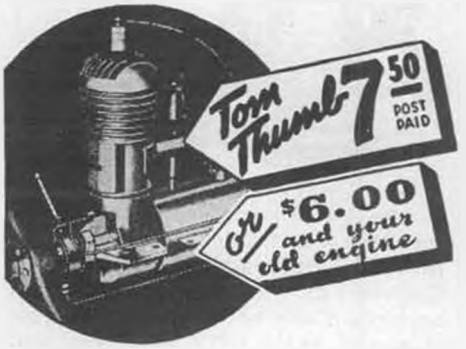
Following the Second World War, hundreds of small firms jumped into the manufacturing of model engines. In 1946 there were 176 different engine manufacturers. The demand for engines, built up during the war years, was tremendous. The postwar years were truly the golden era of model engines.

Many of the more popular ignition engines of that period were manufactured in the Los Angeles area. Did these manufacturers, who ran full-page ads, and in some cases two-page ads in the model magazines, have huge factories or were they working out of the corner of a small machine shop? What products and services are now dispensed from the former home of Bunch, Ohlsson & Rice, Atwood, and Anderson manufacturing companies? All of these names have now disappeared. The facilities in which they were manufactured are still there. It might be interesting to see how they have changed.

I'm still employed in Inglewood, not having progressed far in life, and 412 Brett St. is as good a place as any to begin. The house looks no different than I remembered it 35 years ago. The present occupant says he has lived there three years *and still receives mail addressed to Bud Warren!* "He invented a model airplane motor, didn't he?" he asks. If you're still around, Bud, send a change of address card to the Inglewood post office, will you?

During the latter part of the war and the postwar years, the Bunch Model Airplane Co. listed an address of 5009 So. Hoover St., Los Angeles, about six miles from Bud Warren's home. Later the address was listed as 5013 So. Hoover, which is another door in the same building. Dan Bunch has long since left us, having died by his own hand. The former home of the Tom Thumb, Warrior, Mighty Midget, Gwin Aero, Speedway, and Tiger Aero engines, almost within the shadow of the Los Angeles Colosseum, is now a Baptist Church.

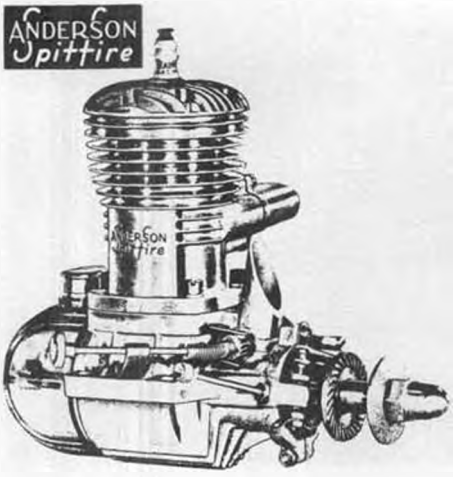

The Tom Thumb is the most powerful easy starting 1/5 H.P. engine made. Clip the coupon below, enclose money order for $7.50 (also your old motor for special $6.00 offer), and receive a *brand new* assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore 7/8"; Stroke 3/4".

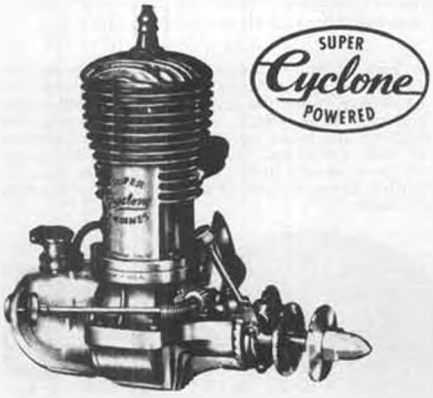



**WARREN SALES & SERVICE**

412 Brett St. Inglewood, Calif.

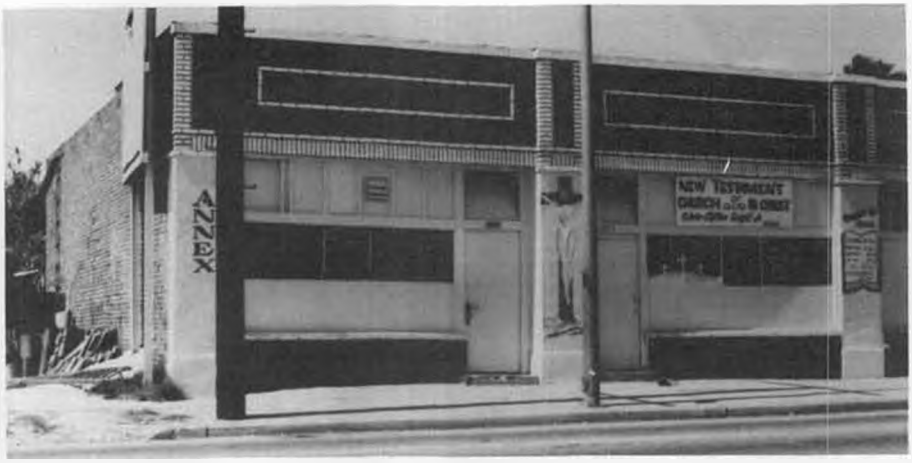

The door on the left is 806 E. Gage St., Los Angeles, home of Phantom Motors. Out of sight to the right but in the same building is 6408 McKinley, headquarters for Hi-Speed Sales (Torpedo engines). Both companies were owned and operated by Bill Atwood.


My first engine was a Vivell. My second was an Orwick. I still have both. In 1946 I built an all-aluminum U-Control job, riveted together. It was understandably heavy and needed a lot of power. At the same time when you could buy an O&R .60 for $16.50, the Orwick .60 was selling for $32.50. The Orwick was the *creme de la creme* of model engines of the time. I delivered a lot of newspapers to save up that $32.50.

My Orwick instruction sheet lists an address of 1523 W. 70th St., Los Angeles. The address is a modest home on the southwest side of town. Henry Orwick passed away a number of years ago. Might the present occupant know the whereabouts of Mrs. Orwick? "I've lived here twelve years," she says, "and I've never heard of Mrs. Orwick." Did she realize that a very famous model airplane engine was once manufactured in her garage? I didn't ask.

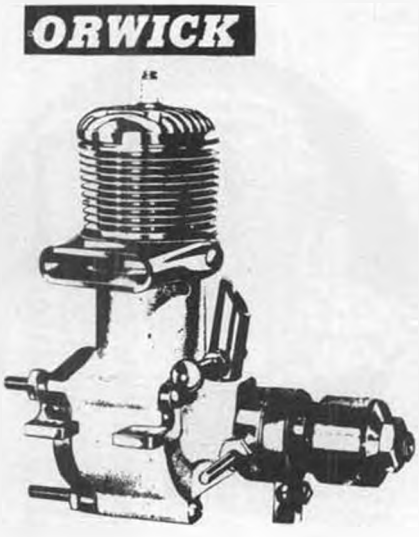



Bunch Motors used to be located in this building at 5013 S. Hoover St., Los Angeles, has since been converted into a church.


ARA Auto Air Conditioning now occupies the building at 5452 W. Adams St., Los Angeles. The highly regarded Dooling racing engines were built here in the 1940's.

In 1940, Phantom Motors (Atwood Phantom) listed their address as 800 E. Gage St., Los Angeles. In later years it became 806 E. Gage St. Hi Speed Sales (Torpedo) in 1940 listed their address as 6408 McKinley St., Los Angeles. All three addresses are doors in the same brick building on the corner of Gage and McKinley streets. Actually, there is no door at 800 E. Gage, and that is undoubtedly why the address was corrected to 806 E. Gage St. (Maybe that is why Bill Atwood called it Phantom Motors? No such address!) Both Hi Speed Sales and Phantom Motors were

*Continued on page 88*




Another hot ignition engine from the '40s was the Orwick, built here in Henry Orwick's backyard shop at 1523 W. 70th St., Los Angeles.

Photo No. 2. Typical line-up of C/L Stunt models entered in the Nats O.T. C/L event. How many of those ships do you recognize?

Photo No. 3. The Dmeco Bipe was popular in post-WW-II years. This slick example was built and flown by Glenn Stucker (we think). Correct us if we are wrong.

# PLUG SPARKS

PHOTOS BY AUTHOR

By JOHN POND

Photo No. 1. Doug Dalke readies for a flight with his Trixter Barnstormer.

• Wha-a-t! Old Timer control line? Yes, sir! That's exactly what we had at the AMA Nationals directly following the SAM Championships at Wright-Patterson AFB.

Before all you guys start throwing this issue in the circular file, remember *all* model flying is fun. Modeling is sorta like women . . . they are all good, just some are better. So it is with control line, sometimes known as "horizontal free flight," "rock on a string," etc. It has its following, and no small band it is, either!

Actually, if it wasn't for the enthusiasm of Doug Dalke, shown in Photo No. 1 with his Trixter Barnstormer, this columnist might not have entertained the idea of continuing O.T. control line.

O.T. C/L competition first started at the 1977 Riverside AMA Nationals and showed considerable promise of interest. Unfortunately, the writer was unable to attend the 1978 Nationals at Lake Charles (for the first time in many years). The control line events were not held, much to the chagrin of those who were counting on it.

The 1979 Nats at Lincoln, Nebraska, again featured the revival of the control line events. Although attendance was not that great, a definite growth could be noted in the number of entry sheets. Those attending, especially Doug Dalke, were promised that the events would be run at the 1980 Nationals. The events were to be Stunt Ignition and Stunt Glow, with all designs prior to December 1950.

Sure enough, on Monday, August 11, the writer and his life-long buddy, Bill Bowen, left the SAM Champs at Wright-Patterson AFB to drive to Wilmington AFB, seat of the AMA Nationals. Arriving at Nats Headquarters, Bryant Thompson, Category Director for control line, was hunted up and in less time than it takes to write this, things were completely sorted out (nothing like writing several months in advance, requesting time and space at the Nationals).

This writer was particularly impressed at the friendliness and cooperation given by the Contest Director and his assistant on the field. In ten minutes, all contestants were registered and a flight line set up. It was simply great the way things ran! Photo No. 2 amply demonstrates the way things were running as

Photo No. 4. John Pond flies C/L too! John entered the Nats with this Yates "Dragon," featuring authentic colors and Orwick .64.

Photo No. 5. You can't run a Stunt contest without judges! Harvey Hendricks and Arlie Prezler did a super job.

Photo No. 6. Collaborators on the recent fly-for-bucks O.T. R/C meet in Colusa, Calif., were David Johnson, Publisher/Editor of the *Colusa Sun-Herald* (sponsor of the meet), and Contest Director Frank Swaney, right, newly moved to Colusa. Story in text.

this shot was taken halfway through the first round of flying.

Photo No. 3 shows a Dmeco Bipe that was quite popular directly after WW-II. We are not exactly sure who built this model but wanted to point out that fellows can turn out good-looking and different models in the control line events.

One of the most pleasant aspects of the day's flying was the enthusiasm of the modelers themselves. C.D. Pond almost fell off his chair when the contestants got up and gave a round of applause for the contestant who had just finished his pattern run. When was the last time anyone ever applauded your flight? No question about it, these control line events were popular.

Photo No. 8. If you don't think today's R/Cer has it made with the modern equipment, get a load of this rig used by Walt and Bill Good in their 1939 Guff. Bruce Lester photo.

Two events were offered, for glow powered and ignition powered stunt models. Unfortunately, the ignition event suffered a dearth of entries, to the point where it was a walkover for Pond and his model.

Photo No. 4 shows the J.C. Yates model, "Dragon," faithfully reproduced to color and trim. Even an Orwick .64 was used to complete the simulation of this old model. The only thing missing is the old AMA gold decal on the tail. Anyone know where to get one? The Yates design, which preceded his famous "Madman" series, was featured in the November 1947 issue of *Air World* (a follow-on to *Flying Aces*). The only concession to modern materials was the use of Coverite instead of silk, but Coverite can be painted with only a little base preparation. The Yates Dragon was the forerunner of many famous Veco designs such as the Chief, Warrior, etc., and the Kenhi Bobcat, et al. It is easy to see the family resemblance.

Photo No. 5 is simply beyond adequate description. Imagine sitting all day in the broiling sun and humidity with no cover, just to judge a stunt contest. Well, Harvey Hendricks and Arlie Prezler did just this, much to this columnist's delight. The only break they took all day

Photo No. 7. Steve Roselle, SAM 21 newsletter editor, with Merco .60 powered Flamingo.

was the interval between rounds. What a great bunch of guys! Before we run off unto other things, Arlie Prezler is President of WAM, among the other things he does. Arlie also belongs to the Lodi R/C Club and flies radio control too! This guy does everything!

Hopefully, next year we can get more entries in the Ignition event. It's really not that tough to run an ignition engine, fellows!! So keep your eyes on this column for announcements for next year's activities. Oh yeah, who won?


Photo No. 9. Two original Wakefield designs by Jorgen M. Larsen, Farum, Denmark, called "Victory" and "Liberty." See text for details. Photo by Sven-Olov Linden.

Photo No. 10. Master craftsman Phil McCary shows off his rare 1941 "Stall-Proof Gassie," a Flying Aces plan. A neat sport flier with Arden .09. Is it really stall-proof, Phil?

Here are the results:

O.T. STUNT (GLOW)

| | | |
|---|---|---|
| 1) | Lou Wolgast (Smoothie) | 315 |
| 2) | Martin Cwiakala (Yak-6) | 310 |
| 3) | Jim Renkar (Ringmaster) | 288 |
| 4) | William Gibbs (Ringmaster) | 285 |
| 5) | Doug Dalke (Barnstormer) | 283 |
| 6) | Terry Meidrow | 280 |
| 7) | James Lee | 246 |
| 8) | Glenn Stucker | 222 |
| 9) | Don Hollfelder (All American) | 220 |
| 10) | Mark Overmier | 175 |

O.T. STUNT (IGNITION)

| | | |
|---|---|---|
| 1) | John Pond (Dragon) | 145 |

For those interested in competing next year, the rules are based on the official 1950 AMA C/L Stunt rules. Copies can be obtained from this writer, along with a sample list of acceptable designs. Why not try your luck?

**ENGINE OF THE MONTH**

The year 1940 found Clifford William Rogers leaving the Syncro Devices organization to make his own brand of cheap engines, which eventually had the name of "slag engines" appended on them. Rogers put out a motor known as the Rogers KD-29 (KD = Knockdown), which was practically the same as the Syncro B-30 and Syncro PC-2. Bob Reuter, in an article on slag engines, noted that the patent drawings for the KD-29 were of the B-30/PC-2 combo. What the heck, when you have a winner, why yell "whoa" in the middle of a horse race!

The price of the Rogers KD-29 was extremely attractive at $4.95. At this price you had to mail order the engine from Rogers himself. As far as can be ascertained, the motors were actually produced by the Judson Co. of Philadelphia. (Now you know where the Judco engine came from.)

Rogers got a terrific break from the Hobby Industry Association when they came out with their Air Youth program, aimed specifically at young people. Rogers promptly had his motor approved for the younger set, added a coil and condenser to the knockdown kit, and priced it at $6.95. Without exaggeration, he must have sold a million of them, as every kid on the block had one!

In this same year, Rogers came out with an assembled engine in response to the requests of those who had very little mechanical ability. This engine featured a front rotary valve but still had the rear intake upon which the tank was hung. Why throw away all those thousands of castings because of a "new" design?

The engine we are featuring is the postwar version known as the Rogers 29/35 (another "new" design). The engine still had the same crankcase, shaft, and timer. About the only real change was a new, more deeply finned cylinder and a stub outlet where the original intake was previously.

The Rogers .29 featured a bore of 13/16 in. and stroke of 9/16 in. giving a displacement of .292. Almost all the parts were claimed to be made of an aluminum alloy. This so-called "V-alloy" had a high zinc content which wore very quickly when used in cylinder and piston combinations. The timer was the same as the prewar model, being a commutator brush or wipe-type employing a fiber insulator to keep the points from making continuous contact. Actually, this system gave a constant and even pressure on the point mechanism without resorting to the usual spring or cam type of contact. One thing for sure, you didn't have to adjust the points under this system!

Photo No. 12. C.D. Dave Brodsky (left) has to smile at Ed Solenberger's crash helmet, replete with an .010 (Ed sez it was overpowered with an .020). Nick Sanford inspecting kit prize.

The *Air Trails* test team, under the direction of Walt Schroder (this guy gets into everything!) and Louis Garami, found the strobatic tests of the Rogers .29 turned a standard 10x4 at 8,200 rpm, while higher pitch 10-inch propellers only turned 6,300 rpm. A high pitch 9-inch propeller was tried and gave 7,000 rpm. Walt noted the engine was extremely consistent at all stages with all sizes of propellers.

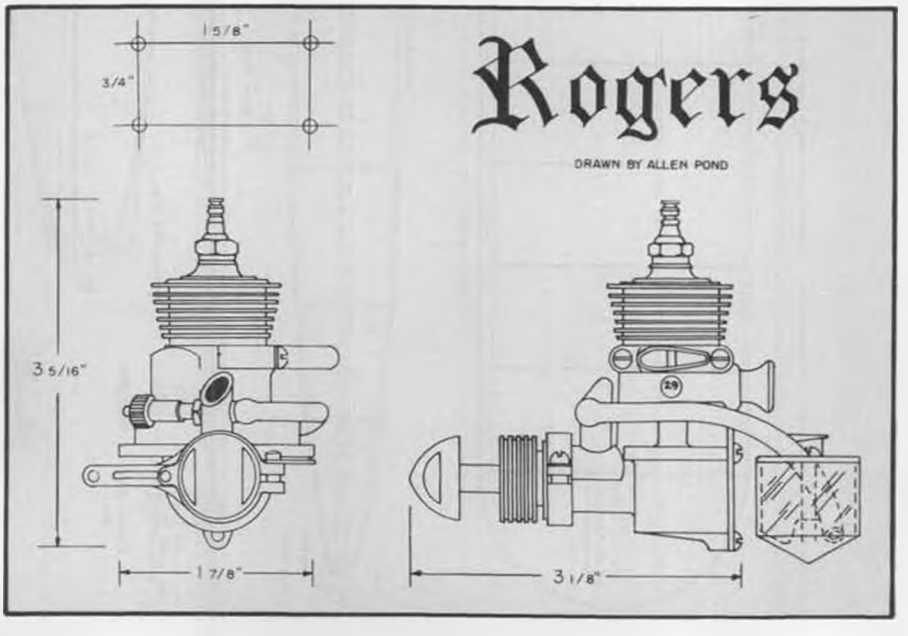
In summary, the author realizes that in order to keep costs to a minimum, the use of aluminum alloys was dictated. It truly was a shame that some parts (such as the piston, cylinder, etc) weren't made of steel. The Rogers would have been a nice running sport engine.

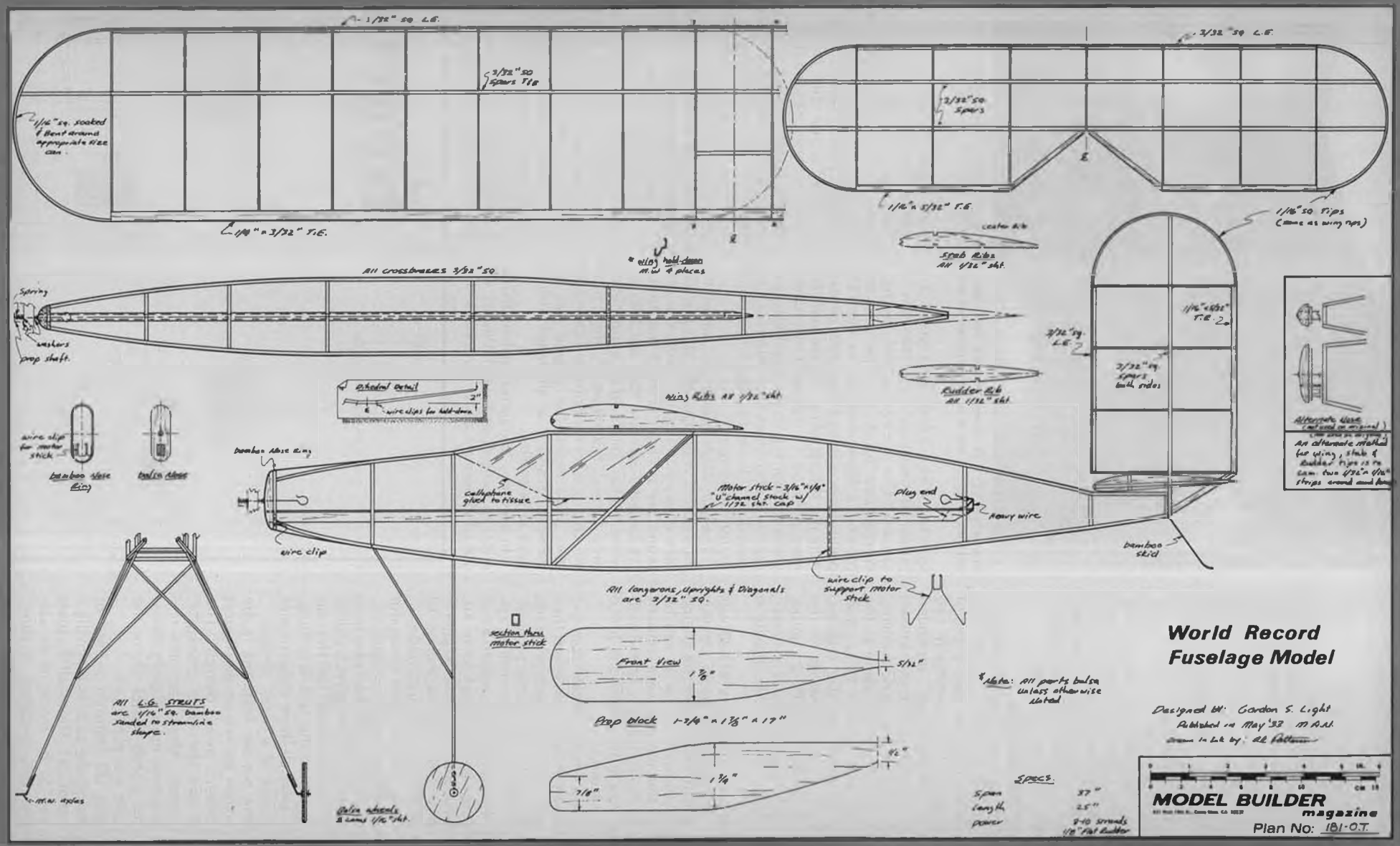
Interest in "slag" type engines (Syncro, Rogers, Judco, Genie, Buzz, et al) has recently arisen due to the efforts of Mark Fechner, of Salt Lake City, who has single-handedly championed their cause and sponsored a "Slag" event at the SAM Championships. If you want a lesson in futility and frustration, not to mention humility, try your engine starting prowess on a slag engine!

**FLYING FOR FUN (DOLLARS)**

How would you like to be building a model in your den, generally minding your own business, when a fellow by the name of F.L. Swaney (some famous character in O.T. flying) calls you up and says he would like to organize a contest in 30 days? How do you answer that when the contest schedule is loaded?

Swaney goes on to say that David Johnson, Editor and Publisher of the *Colusa Sun-Herald*, found out that Frank

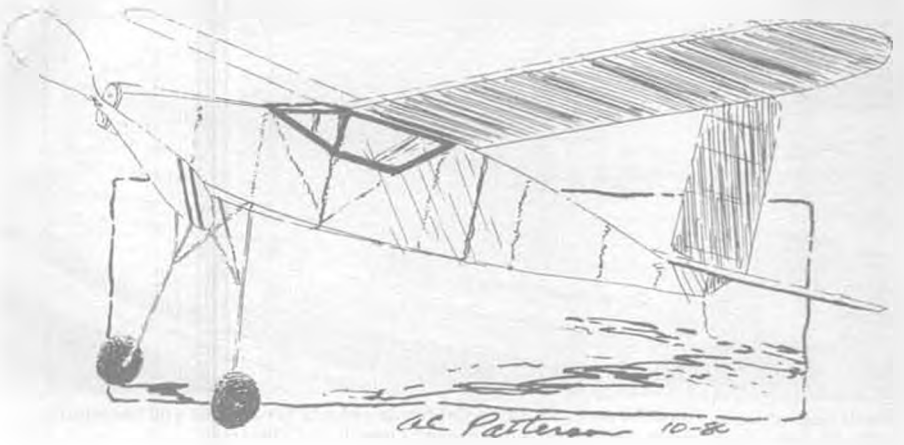





This plan has been reduced to 28% of full size.

FULL SIZE PLANS AVAILABLE – SEE PAGE 100

# '32 WAKEFIELD WINNER




**OLD TIMER Model of the Month**

**Designed by: Gordon S. Light**

**Drawn by: Al Patterson**

**Text by: Phil Bernhardt**

• The May 1933 issue of *Universal Model Airplane News* carried the full-size plans for this nostalgic looking cabin rubber job, designed by Gordon Light and published under the title of "Build This World Record Fuselage Model." The original text was not specific, but that "world record" probably refers to the 25:53 flight made during the eliminations for the Wakefield event at the 1932 Nats, actually called the Fifth National AMLA and NAA Championships, held on September 9-10 in Atlantic City, New Jersey. Light went on to win the Wakefield finals with an O.O.S. flight of 7:57. Later, British officials declared the results of the Wakefield event null and void, for the trivial reason that *the event was not held on the traditional date.*

(It's interesting to note that famed gas model pioneer, Maxwell Bassett, took 4th in Wakefield at Atlantic City with one of his early gassies, which went O.O.S. with only 2:55 on the stopwatch. Gas and rubber models competed side-by-side until just after the 1933 Nats, where Bassett showed what a gas model could do by entering all three outdoor events. . . Stout, Moffett, and Mulvihill . . . and winning all three by a large margin. NAA officials then began to see the light and wisely split gas and rubber into separate events.)

Gordon Light's 1932 Wake could be competitive in O.T. Rubber events today if built lightly. The original weighed only 1.8 ounces, presumably without the motor. We'd be curious to see how this moderate climb/long run model would fare in competition against the more common rocket climb/short run ships. Build one and let us know! •

had recently moved from Long Beach into Colusa, California. It didn't take Johnson long to contact Swaney and offer to sponsor an O.T. R/C contest to the tune of $500 in cash for prizes. Did that ever get attention! And you didn't even need a 2x4 (if you know the joke).

A date was found directly after the SAM Champs. With excellent publicity, the meet got off the ground in no time flat. There were very few Californians who didn't know about this spectacular meet. Photo No. 6 shows Johnson and Swaney, the guilty culprits for this meet.

Well, you couldn't have asked for a nicer day at the Colusa High School Athletic Field on 16 August. Lift was so good, it was a good thing there was no penalty for overflying a max flight. In one case, better than four minutes elapsed before the writer could safely set his Swoose down.

The Texaco event was run a little differently this time, with flights of only 30 minutes being permitted. This helped speed up the flight lines and wouldn't you know it, only one contestant registered two 30-minute flights. Something to be considered in future contests!

Half-A Texaco evoked quite a few laughs. Needing five entrants to form an event, Ed Solenberger kindly charged up the R/C gear in Pond's Triangle (Pond had just driven in from Lovelock, Nevada, on the way home from the Nats). A mass flyoff was proposed and everyone launched at the same time. In my haste to launch the Triangle, the receiver was left off and the model free flighted out in big wide circles. After chasing it for over ten minutes, the model abruptly changed direction and glided back to the field and landed in one corner. Charlie Critch, timer, clicked his watch and said, "Official flight." The contestants, headed up by Ed Solenberger, were going out of their minds claiming the model was not controlled, to which Critch answered, "The rules state only the model must take off and land in the boundaries of the field."

More darn fun! For the longest time it appeared this "free flight" would win the R/C event, but for some obscure reason the mass launch system was negated and Jim Kyncy was allowed to fly alone and beat Pond's flight. There are killjoys in every contest! (Maybe it was just as well, as the kidding about "F/F your R/C model" is getting out of hand.)

Probably the proudest guy on the

*Continued on page 93*

**Photo No. 13. Another of Bob Knutson's experiments back in the old days was this Zomby-like design, featuring a Snuffy VI wing and tail on a *dural* fuselage. Bantam .19, later had folding prop!**

**Photo No. 14. Noted FAI Power flier Bill Lovins recently built this little Brigadier 38, just for a change of pace. Lotsa fun!**

Aerial view of Santa Paula Airport, Southern California's Mecca for antique and homebuilt aircraft. It's one of the few remaining privately owned airports in California.

The Camarillo Flying Circus R/C Club was on hand, put on a good show. Here Don Thomey carries out his Curare for a flight.

PHOTOS BY AUTHOR

# SANTA PAULA'S 50th

**By TED OFF . . . A report on the recent two-day airshow celebrating the 50th anniversary of Santa Paula Airport, Southern California's No. 1 gathering spot for full-size antique and homebuilt aircraft.**

• There was something for every model builder. For the scale builder, there were classics from the 30's and some of the latest exotic experimental designs. For the R/C flier, there was a great show by the Camarillo Flying Circus. For people who just enjoy planes, there were three Pitts Specials showing off their aerobatics, a Bucker Jungmann doing the same maneuvers in slow motion, ultralight powered gliders, Mike Dewey clowning in a Cub, parachutists, hang gliders, and a five-plane pylon race. It was Santa Paula Airport's 50th anniversary. But, let's go back to the beginning. . .

Powered hang gliders were given their chance to perform also. This particular one is a Pterodactyl Fledgling, powered by a 440cc Xenoah snowmobile engine.

About 50 miles north of Los Angeles lies the small town of Santa Paula. It is known for its oil museum and as the town where Union Oil Company was founded. South lies the Santa Clara River and South Mountain, one of the larger oil fields in California (obviously the writer is in the oil business). Santa Paula is also known as having one of the great small plane airports of the United States.

In these days of big government, Santa Paula Airport thumbs its nose at the world. It celebrated its 50th anniversary as one of the few privately owned airports in California. Each hangar owns a couple of shares in the airport corporation and when a hangar is sold, the ownership shares go along with it. As a result, the airport is one big family, with antique airplane restorers, new designers, and just plane fliers side-by-side, building, flying, and telling stories.

The Camarillo Flying Circus's models on the line prior to the model airshow.

To quote Dale Gunnels, one of the hangar owners: "We're just a bunch of big boys with our toys." The toys are something else again. There are over 100 hangars and many of them contain one-of-a-kind restorations of famous

Gorgeous DH Tiger Moth restored by Stan Worth and John Gerney. (It is with sadness that we report the death of Stan Worth on August 31, just three weeks after the meet. Stan was killed when he apparently stalled while doing low-level aerobatics in a similar T-Moth.)


Ten bucks bought you a ride around the airport in the front seat of this Great Lakes biplane flown by Bill Lively.

Indicative of the projects you'll find in Santa Paula's hangars is this incredible *scratch-built* Boeing F4B3, being constructed by Jim Dewey. Should be flying within a year.

In contrast to the big F4B3 is Nate Rambo's 1/4-scale F4B4. Basically the same airplane but with bigger fin, other minor details.

Five Howard DGA-15's participated in a sort of mock pylon race around the airport, here the two leaders head for the finish line.

Airport founder, Ralph Dickenson, 85 years of age, lands his Cessna 180 to cut the ribbon, thereby opening the show.

planes of the past.

I arrived bright and early Saturday morning, loaded down with a bag of lenses and a few rolls of black-and-white film (ugh, but Northrop insisted). It was a two-day celebration but I figured life would be quieter Saturday.

Right in the covered entrance to the airport, the Camarillo Flying Circus R/C Club had a display of what the locals are flying and building. There was a bit of everything, from Nat Rambo's beautiful 1/4-scale Boeing F4B4 down to some hot 1/2A racers.

Because Santa Paula tends to be a bit windy at times, a flying display of ultralight powered planes was scheduled for 8:30 in the morning. The ones flown were designed and built by John Ballantine's UltraSport Inc., located nearby in the Simi Valley. They had two of these powered hang gliders in the air for what seemed like an hour, and they appeared to handle well with their 440cc snowmobile engines.

I'd promised my wife that after this ultralight demonstration, I'd be home in

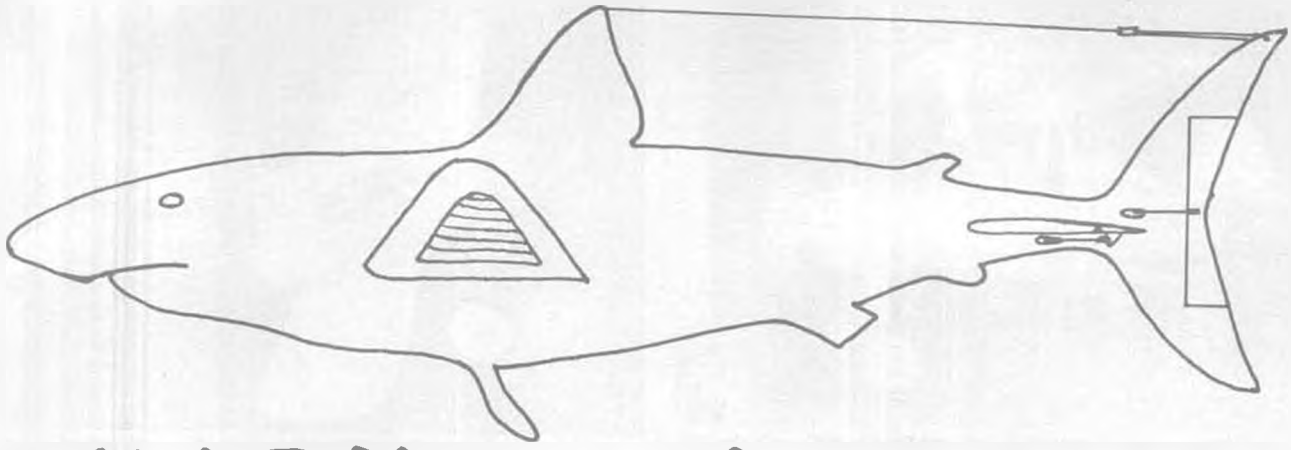
*Continued on page 86*

Perry Schreffler going up for a aerobatic performance in his Bucker Jungmann C-104.

Vari-Eze's abound at Santa Paula. This especially nice version was built by Jim Kern and is owned by Bob Keenan. Very high performance on only 100 horsepower.

Dan Grey lands his big Pitts after his unique "double Pitts" routine; see text.

Spotless 1936 Spartan Executive, owned by Don Dickerson, taxis out for takeoff. Just another of the many rare antiques to be found at Santa Paula.



# SHARKS FLY BETTER!

By DAVE THORNBURG

• In the city of San Francisco, out in Golden Gate Park, you'll find one of the last great bargains left in America. For a mere fifty cents . . . the price of two Tootsie Rolls, or one mediocre cigar . . . you can climb up into the center of a huge doughnut-shaped aquarium and watch fish as big as Aunt Agnes swim 'round and 'round and 'round. Sharks and sea bass and tuna and catfish and manta-rays and creatures as pig-ugly as the girl who had a crush on you in junior high . . . all doing these slow, lazy circles around you, like U-control trainers on 70-foot lines.

Not too exciting, you say? Rather be home watching Dallas on the tube? Then you must not care much about aerodynamics, about what makes one model fly better than another. Water is nothing more than fat air, and the creatures that plow around in the sea are merely slow-motion versions of the creatures . . . and the creations . . . that plow the atmosphere. The fish is second cousin to the flying machine.

Look carefully at the shapes of the big ocean-dwelling fish and what you see are the shapes of jets and rockets and high-performance sailplanes: long, flowing lines and sleek curves and carefully filleted joints. And streamlining, streamlining everywhere. Not a Wright Flyer or a Curtiss Pusher among 'em.

Look especially at the sharks. Paleontologists say the sharks are among the earth's oldest living creatures, older than some of the hippies in Golden Gate Park, older even than the cockroach, which originated in Galveston, Texas, over 200 million years ago. Very old, those sharks. And they're about the most streamlined creatures around. Watch how effortlessly they move. They're extremely efficient fish, terrific underwater soarers.

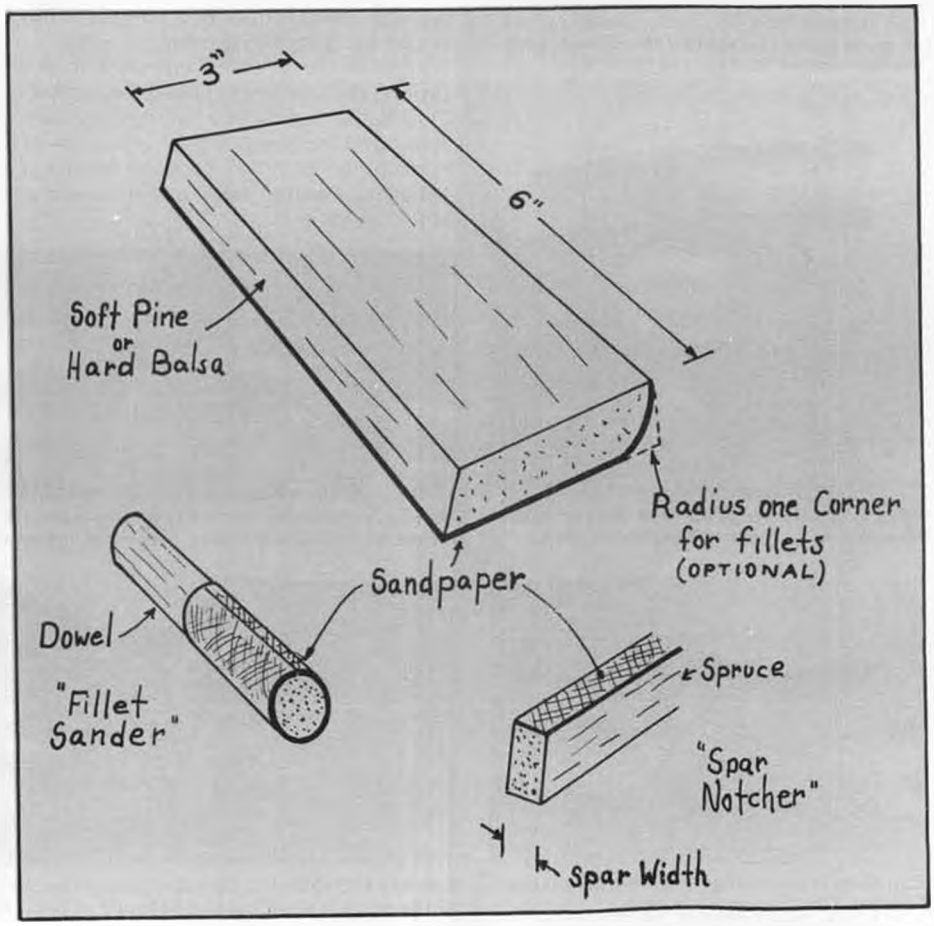
What makes them such effortless underwater soarers is the same thing that makes an ASW-20 outperform a Franklin Primary: careful attention to all the little details of drag reduction. Every inch of a shark's body is smoothed and rounded and filleted to eliminate drag. No square corners on a shark. No lumps and bumps and bony protrusions like you find on your basic milk cow, for example, or on granny's feet. Everything on a shark has been sanded and rounded and blended smoothly into everything else.

Occasionally you'll find, in one of the model mags, a design and set of plans that calls for leaving the fuselage corners square. It may be a handlaunch glider, a rubber model, a free flight, an R/C glider. It's always accompanied by Dudley Designer's carefully researched explanation, and it goes something like this:

"Welp, I tried rounding the corners on the number six prototype, and it didn't fly a darn bit better, so you might just as well leave 'em square. It's easier."

The thing is, old Dudley is probably right . . . both times. He probably *couldn't* see any difference in the model's performance, by merely round-

*Continued on page 82*



Beautiful in-flight shot of the Wanitschek AS-W20 cruising by. Very fast, as are most all of the current breed of scale type gliders being produced in Europe.

# R/C SOARING

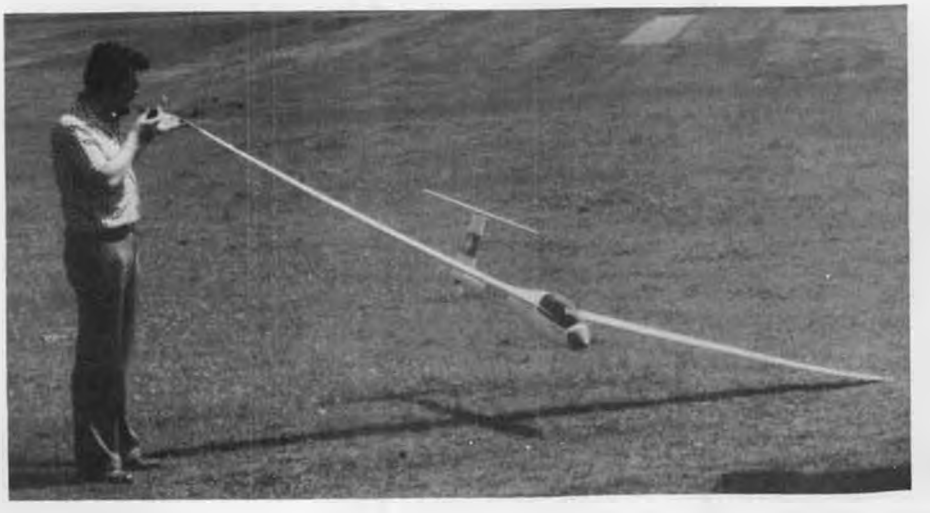
by Dr. LARRY FOGEL

PHOTOS BY AUTHOR

• Return with me to West Germany, where the Autobahn provides convenient cross-country connections. You cruise in the right-hand lane at 75 miles per hour and watch the traffic swish by in the left lane. Nowadays, it's most uncommon to see a dirty or dented car. Germany is neat, clean, and orderly. The beautiful green rolling hills are used efficiently. This attitude is also reflected in their R/C sailplane design, building, and even in the way they fly.

Stuttgart is the center of all this flying activity. Within an hour's drive, you reach Wanitschek Modellbau (30 Scharenstetter Strasse, 7928 Giengen/Brenz). Herb Wanitschek formed this firm about ten years ago after moving from the Sudetenland in Czechoslovakia. His wide experience in modeling set the stage for his providing an array of kits for the local community, then later for all of Europe and overseas. In fact, his kits deserve better representation in America. They include the Bonnie, which is a two-meter span flying wing, and a 1/6-scale LS-1 which can also be V-tailed (even though there's no full-size LS-1 of that configuration). His AS-W20 is also 1/6 stand-off scale (2.5 meter span). It can be flown in the conventional manner or with the foam wings rotated about the main spar through a "twisting gear." The airfoil is a thin, flat-bottom Eppler 193, which is less than 10% thick. The fuselage is of top quality epoxy fiberglass.

The Wanitschek WA-23 is designed for aerobatics. The 2.3 meter span Eppler 374 wing with ailerons makes this plane particularly suitable for F3B competition. For those who appreciate larger machines, there's the T-tailed AS-W17 (3 meter span) that can be flown with or without ailerons and with either built-up or foam wings. The fuselage is also of seamless epoxy fiberglass.



Herr Wanitschek shows that his model's wings are indeed very strong. Note that the degree of flex increases as you get out towards the tips, a mark of proper wing spar design.

Here's Herb Wanitschek himself, holding one of his larger scale sailplanes, the LS-1 Club (147-1/2 inch span). Note the UHF antenna dangling from the fuselage.

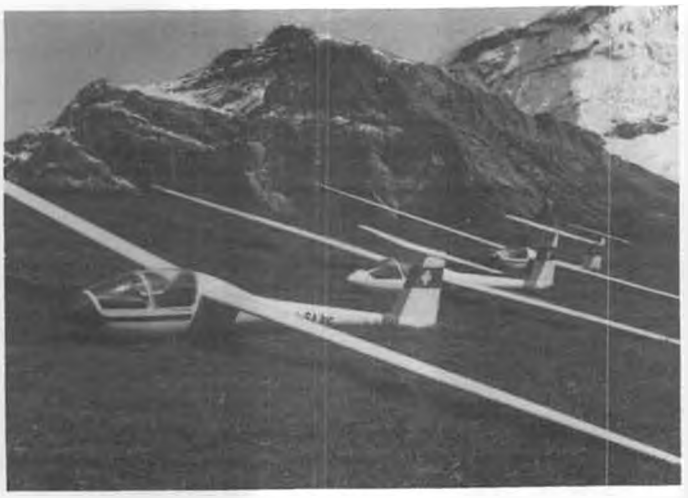
The Orlice is a copy of the 15-meter class sailplane developed at the military academy at Brunn. Here is a scale sailplane especially for thermaling in light air. The efficiency of the V-tail is complemented by its convenience in clearing rough terrain. I've flown the Wanitschek LSD Ornith, a semi-scale copy of the one of the best looking two-place gliders, designed by Lembke and Schneider. The fixed landing gear adds a touch of reality at little cost in terms of drag. The 20.66:1 aspect ratio Eppler 392 wings span 3530 mm. All up, the plane weighs from 1800 to 2300 grams.

The still larger PIK-20C is a copy of the original Finnish design. Here the Eppler 374 wing ensures a wide range of aerobatic performance. The plane comes finished in green, yellow, or white, with spoilers in the foam wings (3615 mm span). This kit is in heavy demand.

The HP-18 is a 1/4 scale replica of the original Bryan Aircraft design. The wing airfoil goes from a Ritz 3-30-15 at the root through 3-30-12 at the mid-section and on to a 2-30-10 at the tip ... a compromise to allow both aerobatics and thermaling. We're now up to 3750 mm. The LS-1 Club is of this same span, while its sister ship, the LS-3-17, has the same fuselage and still greater span (4250 mm). It's intended for cross-country flying.

The Jantar 2 is a 1/5-scale (4100 mm span) of the 20.5 meter full-scale Polish sailplane. Here, the Eppler 203 at the root transitions into a modified 193 at the tip. According to Herb, this large machine loops, flies inverted, rolls, and performs other aerobatics without difficulty. On our way to the local soaring site, I asked about any high-speed flutter that might be induced by the wing-twisting device. He assured me that there's no problem, as recently demonstrated by an *unscheduled* dive from a

It's hard for us to decide which is prettier . . . the Richair Jantar or the Swiss Alps! What a flying site!



The three Richair models are, front to back: the LS-1C (198-1/2 inch span), Jantar (177.9 inches), and PIK-20D (137.8 inches).

very high altitude.

The Jantar 1 is a 1/4 true scale version of the Polish high-performance glider (4750 mm span). This plane is for the experienced pilot who can appreciate the joys of "full-scale feel." Spoilers are recommended, retractable landing gear is nice, and a scale pilot provides an opportunity to hide the radio receiver. The airfoil is the Ritz 3-30-15 at the root and 2-30-10 at the tip to permit aerobatic flight. The aspect ratio is 25.1:1.

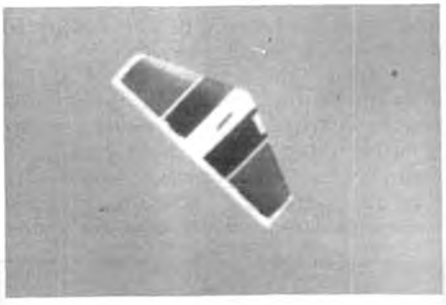
Wanitschek provides only top quality kits . . . items well worth your attention. In addition, there's an assortment of items and German literature related to R/C soaring. For example, his full-color 1/4-scale instruments come with individual plastic case and cover glass. They really dress up the cockpit.

I then took an hour's drive west of Stuttgart to visit Wilfried Klinger, who owns and operates Wik-Modelle, Wiesenstrasse, 7134 Knittlingen/ Wurtenburg. Wil also moved to Germany from the Sudetenland, establishing Wik-Modelle in 1958, after twice winning the German free flight championships. He offered several radio controlled kits in the early 1960's. His 1/6-scale Kestrel (2840 mm span) was a familiar site on U.S. slopes in the early 1970's and is still available, as is the same scale V-tailed Salto (2300 mm span) and the Bussard (2900 mm span). He recently added the Condor, an elegant looking higher speed sailplane (3300 mm span), and several different versions of the Astir. His 1/5-scale Speed Astir is 3000 mm span, while the Twin Astir is 3590 mm. These are complemented by the 1/4-scale Astir CS-77 of 3750 mm span. These are truly beautiful craft.

Wil was particularly proud to point out that the CS-77 is all fiberglass . . . and that includes the wings. He slammed the trailing edge of a wing against the edge of a workbench . . . no damage. There's no foam or ribs in these wings. A single spar provides all the required strength. Look forward to seeing the Astir sometime soon. You won't be disappointed.

Kirchheim is southeast of Stuttgart. Kirchheim-Tech is the mountain just south of town . . . and is probably the most famous R/C soaring site in all of Europe. The slope is steep and uniform. A road leads up to three separate soaring sites halfway to the top. Here the forest that covers the mountain is cut away, leaving large grassy areas suitable for launching and landing in three separate

Pretty DG-200 is an original scratch-built effort by Alfred Schaufler.



At last, a non-scale glider! Klaus Szabo's HRS-1 flying wing, a bit worse for wear, is a common sight at Kirchheim-Tech.

More awe-inspiring scenery. Here we're looking down from the Lukmaner Pass (6500 feet above sea level) to the tiny town below.

Our Soaring columnist didn't get the identification on this vintage European sailplane, duplicated here in 1/4 scale by Klaus Segle. Anybody have any ideas? Larry thought it might be a Schleicher design from the 1950's but couldn't pin it down exactly.

directions (covering about 200 degrees). On a typical day, two of the sites are active at the same time. I worried about frequency conflict, but in Europe there are many more authorized frequencies than I'm accustomed to, and I was assured that there's no problem, even though I could clearly see the planes flying at the other site.

You simply park your car, assemble your ship, check the frequency with a shout, and toss your plane out into the lift. Soon you're out over the town at about 800 feet. You lock onto a thermal and climb a thousand feet to circle just below the full-scale gliders that also enjoy the prevailing lift at the Tech. It takes an experienced eye to separate the models from the full-scale sailplanes.

Oh yes, a few of the pilots enjoy non-scale ships. For example, Klaus Szabo flew his HRS-1, designed by Hans Rupp. This agile flying wing went through its paces without hesitation, yet they're not yet satisfied. A second generation of this ship is on the drawing board. I watched the two-meter V-tailed Jet tear around the sky. This pod-and-boom aileron controlled foam wing ship is offered by Eismann Modelbau, 78 Herzo-Georg-


One of several scale sailplane kits from Wik-Modelle is this Speed Astir, one of three versions of Astirs offered. At 1/5 scale, it spans just under ten feet.

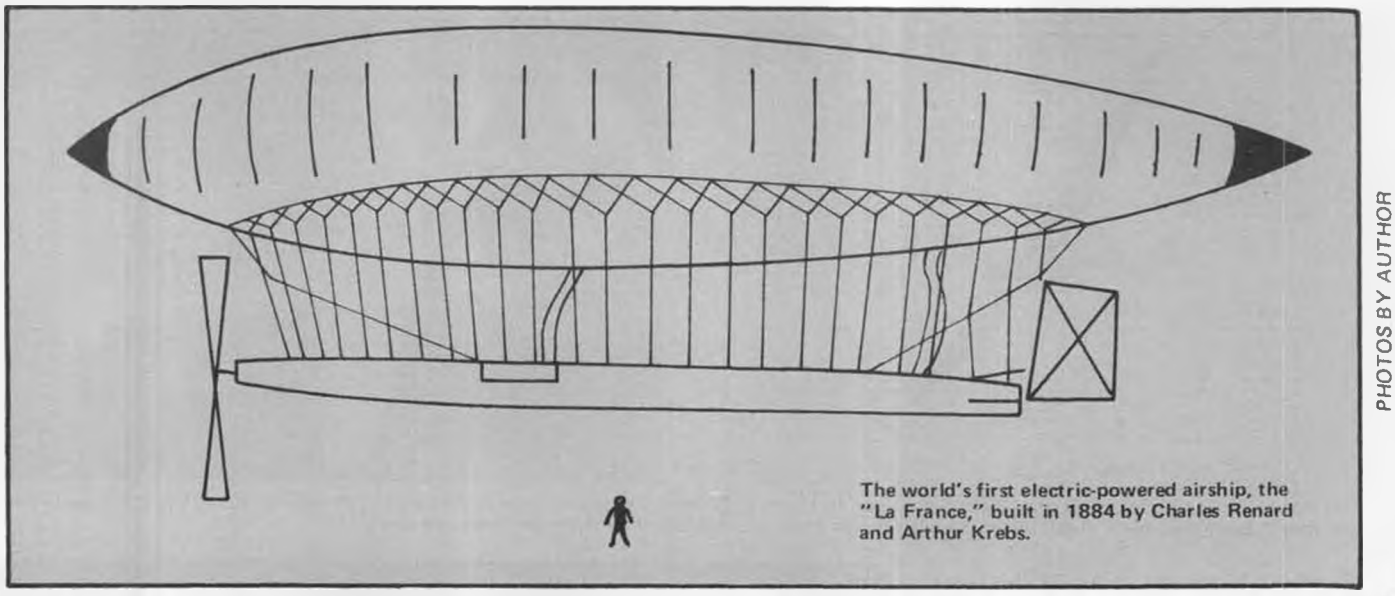
strasse, 8882 Laringen. Although I didn't have a chance to visit Eismann, I understand that he also offers larger models, the AS-W20 in 1/5 and 1/3.5 scale (3 and 4.2 meter span, respectively) as well as the SB-9 in 1/5 and 1/3 scale (4.4 and 7.334 meter span, respectively). If I may refresh your memory, 7.334 meters equals *24.06 feet!* You need a sizable space to land this bird. The fuselage of this giant scale ship is 2.5 meters long.

For a change of pace, I drove into Switzerland. There's a fine model airport just north of Einsiedeln. Then, I watched a precision/duration contest in a valley between rocky peaks on the road to Chur. A gasoline engine-driven winch was equipped with a second reel to tow in the parachute after each launch. Easy to operate, reliable, and not too noisy . . . but quite a bit larger than what I'm used to. There were quite a few Hobie Hawks and some newer designs such as the Multiplex Flamingo, a sort of scaled-up version of the Dassel. It handled well

*Continued on page 96*

Our roving columnist spotted this gasoline-driven winch at a contest in Switzerland. It's equipped with a line return reel that brings the parachute back to the winch after release from the model.

Pretty rugged, those Alps. The model isn't nearly as close to those peaks as it looks, but then again, if someone did lose an airplane in there, successful recovery would be almost impossible.



The world's first electric-powered airship, the "La France," built in 1884 by Charles Renard and Arthur Krebs.

PHOTOS BY AUTHOR

# ELECTRIC POWER

By MITCH POLING

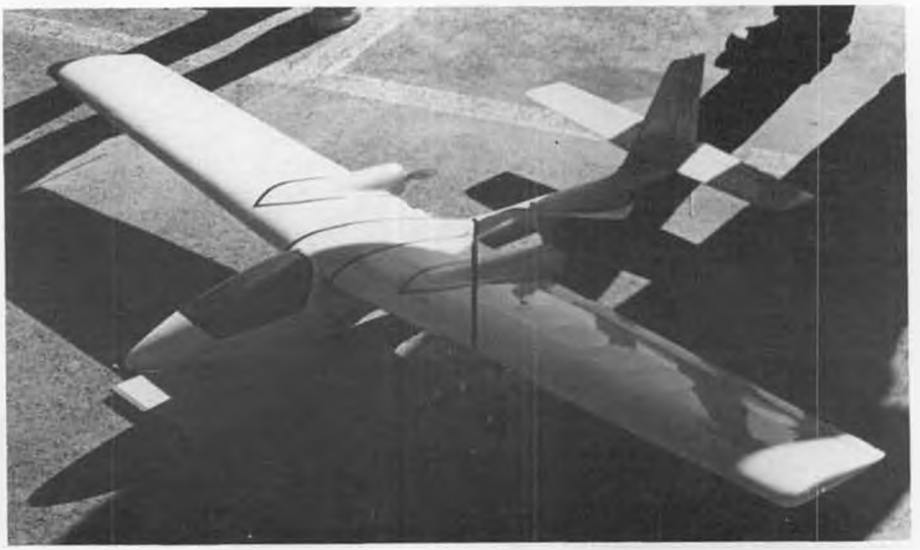
• Bob Boucher wrote an excellent article in the September issue of RCM about the solar powered Gossamer Penguin, and at the end of the article he listed some of the milestones in electric flight. His mention of the electric dirigible "La France," which first flew in 1884, brought back memories of my visit to the Musee de l'Air in Meudon, France, two summers ago. The huge gondola, over 100 feet long, and the 30-foot prop were hanging from the ceiling in the museum, and even now the dirigible would look impressive in flight; it was about as long as the Goodyear airships of today.

The La France was built for Charles Renard and Arthur Krebs, with Krebs in charge of the motor design and Renard in charge of the battery design. The gondola is made of bamboo covered with linen, and the prop is quite clever: an "X" frame covered with linen. The airship had a rudder and elevator, and the center of gravity could be adjusted by a sliding weight. The motor was eight horsepower, driven by lightweight batteries. The reference I found called them chromate cells, designed by Renard. This doesn't really explain what the cells were made of, and since my field is chemistry, I looked up some possibilities. If sodium dichromate and iron were used as the plates, the battery could be about half the weight of a lead acid battery for the same amount of power. The only drawback is that these cells would not be rechargeable, but it would be simple enough to change the plates once the cells ran down.

The airship first flew on August 9, 1884, with Renard and Krebs aboard, and they found it could do about 15 mph and travel in any direction with full control. They flew for 23 minutes and returned to their starting point, the first airship ever to do so. In 1885, it carried three people from Meudon to Paris and back, a round trip of about twenty miles. If you are in Paris, I really recommend taking the time to go to Meudon and seeing the magnificent museum there. The guidebook for the museum is a treasure, complete with photos of all the aircraft on display including the La France, along with silhouette type three-views of each aircraft. If you wish to order the guidebook, write Hall de Chalais-Meudon, Parc de l'Onera, 8, rue des Vertugadins, 92360 Meudon, France. I think the cost of the book is about $8, and well worth it.

The first electric model airplane that flew successfully (that I know of) was reported in *Aerial Age Weekly*, July 28, 1919, page 939. The model must have flown in late 1918 or early 1919. I've drawn an "artist's conception" of what it probably looked like from the measurements given by John McMahon in his column on "Elementary Aeronautics and Model Notes" in *Aerial Age Weekly*. I'll quote John's article verbatim:

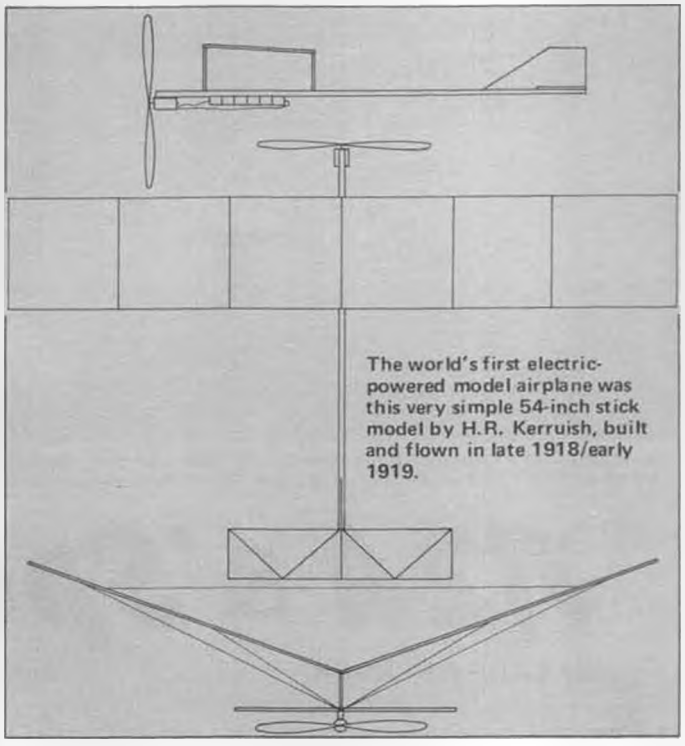
*Experimenting with models driven by electricity has never been attempted in this country (USA) to the knowledge of the writer* (McMahon, July, 1919). *The only one to have experimented in this respect with any degree of satisfaction was Mr. H.R. Kerruish, an English model flyer who experimented with a model driven by an electric motor and carrying its own batteries. It weighs inclusive 9-1/2 ounces. It had an area of 3-1/2 sq. ft. The thrust (static) given is 2 oz., which is just sufficient to fly it, leaving hardly any reserve of power. The chief dimen-*



One of the two Electra 225's flown by the Boucher brothers at the first Electric Championships, at Sepulveda Basin in early 1975. Shown here is Roland's model, with slightly shortened wings.

An Andrews H-Ray with Astro 10, by an unidentified builder. Flown at Sepulveda Basin in 1975.

Another Andrews model, this one an S-Ray with Astro 15. Bob Boucher's prototype P-68 Victor in background.



The world's first electric-powered model airplane was this very simple 54-inch stick model by H.R. Kerruish, built and flown in late 1918/early 1919.

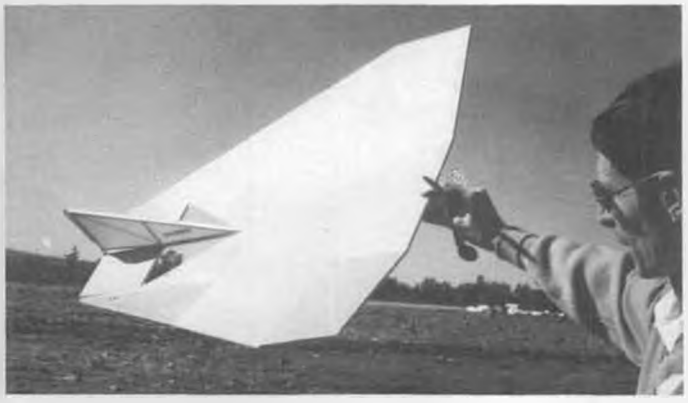
*sions are: Span, 4 ft. 6 ins.; chord, 9 ins.; overall length, 2 ft. 11 ins. Elevator, span 18 ins., chord 4 ins. The propeller, 14 ins. in diameter and 10 ins. in pitch. The complete weight of the plant is 5.5 ozs., and of the model, 4 ozs. It is very lightly built, but nevertheless is quite strong. It flies at 7:15 mph (sic) in a dead calm, but will not fly in any wind. The power plant is made up of a common tri-motor (tripolar-motor?) specially wound and carefully lightened, driven by six small cells constructed somewhat on the lines of the Delarue silver chloride cell, but embodying alterations which are only known to Mr. Kerruish. The thrust of 2 ozs. mentioned above is given off by the plant for a period of about one and a half minutes. He cut weight down in every possible way, carpet thread soaked in glue for bracing is used instead of wire, and the planes are covered with the lightest chiffon doped with the thinnest solution sufficient for coherency. The model has flown quite well in suitable weather. The model was given its initial flight in the road opposite the inventor's house after dark, when little traffic was about, enough light to do so being afforded by the gas lamps. The model was started off in the middle of the road and the inventor keeping up with it by running, which was possible owing to its slow speed. As it has such a small reserve of power, it only rose about 4 ft. high, but kept fairly consistently at that height, so that it was possible to keep it going in the direction desired by lightly pushing the front to one side or the other. On one occasion the model was steered down the road in this manner for a distance of 152 yards, the flight then only finishing owing to a connection working loose.*

John then goes on to describe $CO_2$ motors, which sound exactly like the ones used now. I have no doubt that the electric plane flew as described. The silver chloride cells are still used today, and they have up to three times the power-to-weight ratio that ni-cds do. The only reason they are not used in our models is that they cannot be recharged and are very expensive. The airplane John describes is very much like one I built and am flying now as a preliminary to solar power, and mine weighs just over three ounces for the airframe with a six-foot wingspan. So, my hat is off to the accomplishments of Mr. Kerruish. It

*Continued on page 92*

Ed Sweeney's Twin Kaos with two Astro 15's was 2nd in Aerobatics at Sepulveda.

Free flights were also flown at the first Electric Champs, but the brisk wind was a bit much for lightweights like this Eaglet.



Bill Hannan's "Electrokite," a scaled-up Stringless Wonder with VL-101 power unit.

Col. Hurst Bowers may not smile down at you from a Chicken Bucket in the sky, but he sure puts a lot of other things up there. An example is this 42-inch, S.T. .23 powered Mr. Mulligan. Can fly with three or four channels.

# 1/2-A & 'Sport' SCENE

By LARRY RENGER

PHOTOS BY AUTHOR

• Lots of things have been going on the last month. I finished the Peanut Scale Corsair I was working on, and attended the Flightmasters Annual. I finished the RAM "Quickee 18" review article I was working on (see p. 48 this issue). I even went flying for the first time in a few months. Boy, do you get rusty fast! The Peanut Scale Corsair is only of importance to this column because of a new technique I developed in finishing it. I haven't developed the Flightmasters photos yet, so maybe next month for them.

Now, about that Corsair. I built the structure all from 1/32 balsa, and covered it with condenser tissue. As a result, it is extremely delicate. I sprayed a Floquil finish directly on the raw tissue. Now comes the interesting part: how to put on the stars and other decorations? What I did was take a piece of 1/4 mil (.00025 in. thick) aluminized mylar and sprayed it with spray mounting adhesive. It was then smoothed down over the release paper from some Avery labels. A top coat of adhesive was put on it and then an overlay of Microlite covering. (I think that condenser tissue would work better here, and that is what I'll use next time.) What I had now was an adhesive backed opaque (but colorless), very thin, lightweight, paintable film. I was able to spray it white, then mask and decorate it to my heart's content. Once the paint had dried, I cut out each piece of decoration and stuck it to the correct place on the model.

The result is that the white stars remained white even though they were put directly over the dark blue finish. I was able to make very small Japanese flags to put under the edge of the cockpit. All this with minimal handling of the model and very small additional weight compared to a mask and spray job right on the aircraft. For a 1/2A model, this technique can come in very handy. If you have some tricky lettering to do, you can do it against a hard surface on a drawing board, right on a piece of the film painted the basic model color. It is a great way to decorate your scratch-built models when decals aren't available. How about instrument dial faces?

Another interesting thing about the Corsair is that it was built from a photographic reduction of a 20-inch wingspan Comet kit. I was able to use a reducing Xerox machine, but a camera and enlarger would do the same job. For the purposes of the 1/2A flier, you can scale the models up! The printwood and plans are just blown up the same ratio. Just rubber cement the printwood pattern

G-Mark's .03 is the smallest available powerplant equipped with a working carburetor throttle. Cannon Electronics imports them.

Ron Lowe with his Cox Piper Arrow. He was involved in this model's design during his years in Cox's engineering department. Tee Dee .049 makes it really move.

directly to your wood and start cutting! The only real caution is to select an appropriate stringer size for the use and size of the model, then be sure to cut all notches to fit. How about blowing that Corsair up to about 36-inch span and putting in a Cox R/C Bee and three channels of lightweight radio? I bet you could keep the weight under 12 ounces and have a really fun airplane. Between Comet, Guillow, and Sterling, you would never run out of possible subjects.

One final hint about those stick-and-stringer models is the problem of die-crushed balsa instead of die-cut. A cure is to wet the crushed areas to make them expand back to their proper form, then, when the part has been separated from the sheet, use a cyanoacrylate glue such as Jet to rebond the fibers and harden the crushed areas. Weight gain will be minimal. Beware of hard spots when sanding, however.

I received a new newsletter recently. This one is rather unusual, in that it is from the National Association of Zimbabwe Aeromodellers. In it is part one of a discourse on getting started in 1/2A R/C model aircraft. The information was written by a Mr. D. Lund, and he seems to have it all together in his presentation. I couldn't fault a thing, and he seems very thorough. I hope the rest of the series shows up. Incidentally, also in this excellent newsletter is a warning that the fumes from sprayed polyurethane paints are highly toxic and that you must wear a proper vapor-trapping spray mask with filters to be safe. Your simple sanding mask won't protect you. The poison is cumulative, so just because it hasn't bothered you yet, don't be fooled into careless acts.

First photo for the month is one of a former Cox employee, Ron Lowe. Ron was heavily involved with many of the recent R/C styrofoam models produced at Cox and is shown here with his Tee Dee .049 powered Piper Arrow. He uses only two channels, but that baby really flies. I was flying my Black Widow powered S-Tee at the same time, and it was no contest even though his model weighed half again what mine does. That big thing on the ground looks awfully large to just be a place to lean his radio. I wonder what it is really for? Almost looks like an airplane of some sort. Can't be, though . . . no place for an engine.

Model Merchant is alive and well and is turning out good airplanes. Their P-40 features retracts as part of the kit. Construction is mostly of plastic. More details in text.

The Dumas V-10 "Short Stuff" is now available with a glass hull for even faster building.

Happiness is your first successful flight! Pamela Miller holds her unscathed Cox Cub aloft in victory over the gods of the air in smoggy Southern California. If she smiles any wider, the top of her head may fall off. The model was later modified with polyhedral and a reduced rudder to make it even easier to fly. The results and modifications were published in **RCMB**, May 1980 issue.

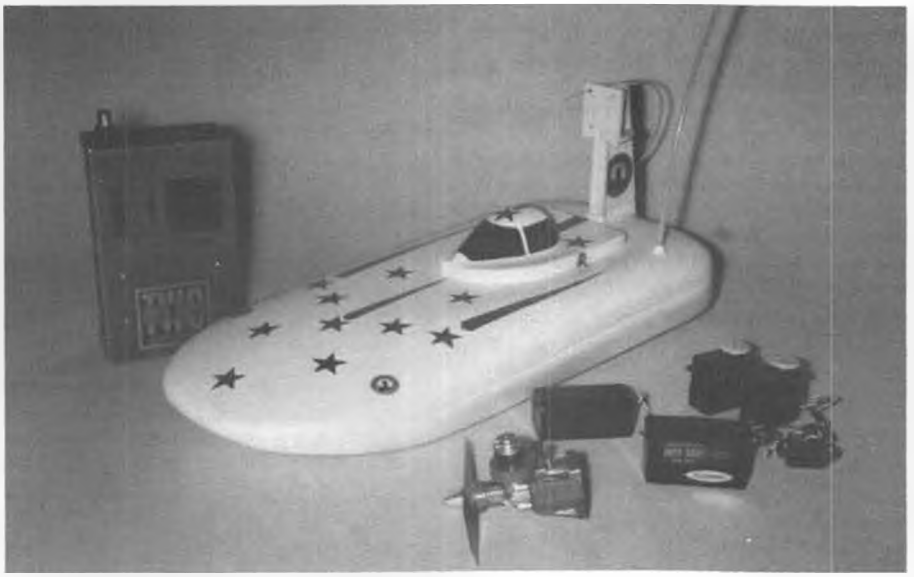
Yes friends, there *is* a true throttled, muffled 1/2A engine. G-Mark makes, and Cannon Electronics imports, an .03, and here it is. Somehow, although you do get throttling from an exhaust restrictor sleeve and there are some add-on throttles available, there is nothing like a system which was designed to go together in the first place.

Dumas has redone its popular "Short Stuff" deep-vee boat with a fiberglass hull. As always, the model looks perfect, and the building time and impact resistance are vastly improved. Jay Brandon, president of Dumas Boats, has been careful not to neglect us small engine type modelers. I don't have his catalog

*Continued on page 66*

Twin Tee Dees on a flying wing! It's the Simitar Twin, from Bill Evans R/C, 20825-1/2 Roscoe Blvd. Canoga Park, CA 91306.

Pamela Miller is elated at the success of her first R/C flight. She used the single-channel Cox Cub as a trainer.



PHOTOS BY AUTHOR

# PRODUCT$ IN U$E

## THE RAM "QUICKEE 18" BOAT, by LARRY RENGER.

• "The RAM Quickee 18 is a lot of fun." There, in a nutshell, is the entirety of this review. But Bill Northrop probably would like me to amplify that statement a bit, so I guess I had better.

This review actually covers three products: the RAM boat kit, the Hobby Shack "Aero Sport Two" radio system, and Cox's newest engine, the R/C Bee .049. I am really pleased how these elements balanced out to a good working system. The boat is very quick to build, the radio system is inexpensive and works perfectly, and the stock engine features an extra large capacity tank, a throttle, and a muffler. All told, an inexpensive entry to both Boating and R/C. You can use both radio and engine in an aircraft, too.

There are lots of reasons for building a boat. For some people, it is just the thing that they do. They would not be interested in an airplane or car. My own reasons were different, as I am primarily an airplane modeler. The major purpose was to give my oldest son, Jimmy (age 6), a chance to run a radio controlled vehicle with minimum chance of disaster. The second reason was that his daddy wanted to play too!

Boats give a different dimension of performance than aircraft, and esthetically have their own charm. I have come to enjoy leaving various wake patterns in the water and watching the sun sparkle on them. The sensation of speed is much greater with a boat than with an aircraft because of the available position reference. In addition, running a boat is far more relaxed than flying. If you have flotation in the hull, you just can't lose much more than an engine conrod even in the worst spill. You can't even make the Quickee 18 capsize if you try. (I tried.)

For a first effort at boating, the Quickee 18 has some significant plus points. Construction is simple and rugged, since all parts are preformed and trimmed plastic. No finish is required, though you can paint it if you so desire. The boat is fuel-, oil-, and water-proof. The engine used here is easy to mount and requires no external plumbing to hook it up. Bolt it in, slip the throttle wire in place and it is ready to run.

Construction of the boat was very fast, but it did take longer than the instructions would have you believe (so what else is new?). The main problem I had was the the Super Jet adhesive I used was reluctant to set off at first. Once I learned that a light sanding of the mating surfaces solved the problem, the remaining construction went very quickly. Some of the fits were less than perfect, but no structural problems resulted, and the boat doesn't leak.

The things I especially liked about the design of this model were the use of a plastic bag full of styrofoam chips for emergency flotation; the well-registered and solid motor mount; and the clever, ultra-simple, shock absorbing rudder servo linkage. Two areas which gave me problems were failure of the hatch to remain in place with engine vibration; and that, with the extra long

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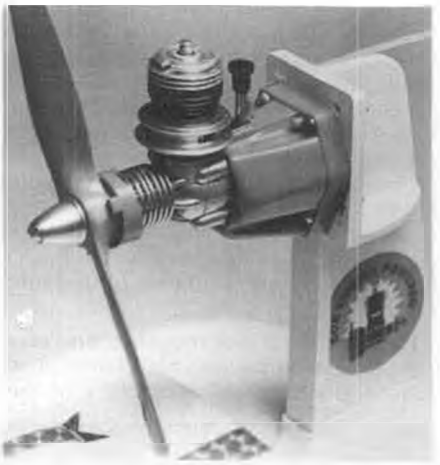


The Cox R/C Bee features an extra large capacity tank, new spring starter design, throttle, and muffler. Runs great, and the mounting holes are identical to other Cox engines.

Resting easy in the water, the RAM Quickee 18 makes boating a pleasure. Airprop boats are the absolute easiest way for a beginner to get started in R/C power boating.

Hook-up and adjustment of the throttle are probably the easiest of any engine. A rubber muffler slips over the outside of the throttle sleeve. Idle is low and quite reliable.

# FREE FLIGHT AND CONTROL LINE


This photo, dated 1926, supplied by Pete Westburg, is of a Travel Air B-4000, powered by a Wright Whirlwind J-5, 220 HP. Note shock strut replacing earlier split-axle, bungee cord type landing gear, and the rounded upper wing tips, replacing the Fokker D-VII type "elephant ear" aileron style.


**". . . A civilization does not rest on the using of its inventions, but solely on the fervor that goes to the making of them."**

• This month's keynote, quite applicable to model aeroplaning, is from Antoine de Saint-Exupery's "The Wisdom of the Sands."

**WHY DO WE PERSIST?**

Ever try explaining your fascination/obsession to a non-enthusiast? A frustrating task doomed to failure in advance. Even justifying our efforts to fellow enthusiasts with different specialties may take some doing. But every once in awhile, someone manages to capture a glimpse of that elusive appeal, and nails it down in ink on paper. Witness John Oldenkamp, editor of the *National Free Flight Society Digest*, attempting to explain his attraction to the Taft, California U.S. Free Flight Championships, from which we have abstracted the following: "We will overlook or deny ourselves the animal pleasures and needs, a full bladder or empty stomach, or the rules of the road perhaps, if the goal is to partake the joy, excitement, yeah, pure thrill of Free Flight, and should the destination be Mecca, Taft, for such an event as the USFFC, nothing is over the line.

"Grown men, all of us, acting like Boy Scouts whose leader has abdicated, we will grumble mightily, but no one will admit to true discomfort. We are having fun, or a version of it. If Free Flight is dead, then we living witnesses will stand up in defense."

**CONTEST OF BELGIUM**

Roger Aime was kind enough to report upon the Flemalle, Belgium Peanut Scale contest, which attracted 50 entries representing a number of different countries. Multiple entries were permitted, and the European version of the 9-inch overall length rule was employed. The first and second placing models took advantage of its possibilities by using high-aspect-ratio wing, short-fuselage-length subjects. However, it is interesting to note that the third-place model with a 13-inch span wing, conforming to the original Peanut Scale rules, had a higher duration score, confirming that the balance between static and flying scores is still needed to win, regardless of subject configuration.

Results through fifth place and their duration times are:

| | |
|---|---|
| 1) C. Frugoli (Gossamer "Mojave Condor") | 1 min. 20 sec. |
| 2) E. Fillon (Gossamer Condor) | 1 min. 16 sec. |
| 3) C. Frugoli (Farman Moustique) | 1 min. 45 sec. |
| 4) E. Fillon (Gossamer Condor No. 2) | 1 min. 2 sec. |
| 5) R. Aime (Bleriot XI) | 52 sec. |

Other interesting subjects participating included a Bleriot "BG," Bucker Jungmann, D.H. 7, Hirondelle, 1909 Grade, Wibault, Morane G, Folkerts, and of course, the inevitable Lacey and Piper Cub!

**AND SPEAKING OF INTERNATIONAL PEANUT CONTESTS**

Dr. John Martin has given the official word: there will be another Peanut Gran Prix at Westbaden, Indiana next year. To be billed as the "Peanut Le Mans" (it is scheduled to run for 24 hours continuously!) the event is slated for June 26, 1981.

The first Westbaden Peanut Gran Prix attracted more than 60 models and had entries from six countries, making it truly international by FAI definition, which requires at least five nations in contention. Represented this year were Argentina, Canada, England, France, Germany, and the USA.

**Famous French Wakefield modeler, E. Fillon, with one of his several Gossamer Condor rubber-powered indoor scale jobs, all contest winners J.F. Frugoli photo.**

For the '81 meet, a few changes will be instigated. Categories will be revised to include:

PIONEER (up to WW-I)

WARPLANES (combined WW-I and WW-II, but excluding civil types such as liason aircraft. Example: olive drab Cessna . . . you get the message.)

GOLDEN AGE (between WW-I and WW-II)

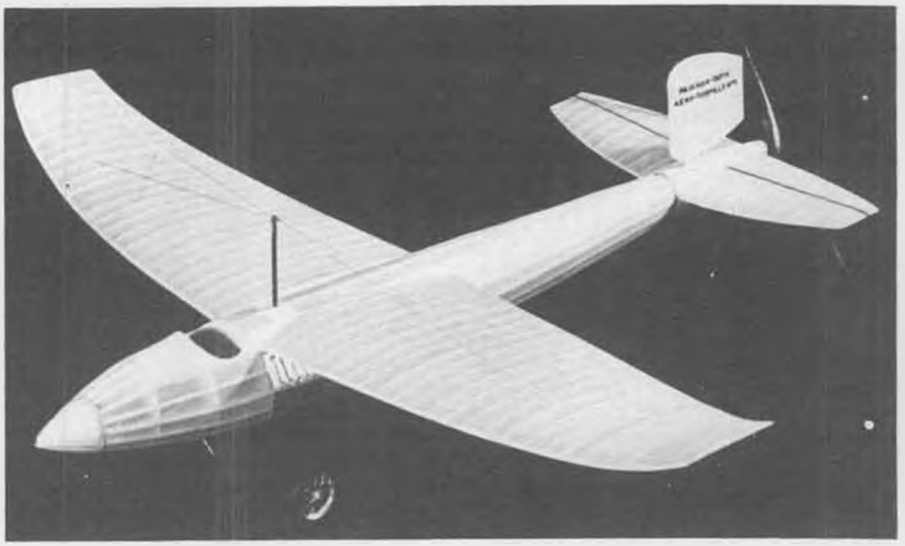
MODERN (after WW-II)

and introducing a new category,

WEIRDO (to include autogiros, helicopters, multi-engine aircraft, triplanes, quads, and flying boats [not float-mounted aircraft]. Specifically excluded,

*Continued on page 76*


**Magnificent model (and photograph) by Nick DeCarlis of Florida. His Peanut Scale "Mr. Smoothie" racer spans 13 inches.**



PHOTOS BY BILL WARNER

## 1911 PAULHAN-TATIN

# Aero-Torpille No.1

**By J.F. FRUGOLI . . . Winner of the Pioneer Class at the 1977 Parcel Post Proxy Peanut Contest was this very unusual and good-flying early bird, which managed an average flight time of 28.5 seconds. Presented by one of France's best Peanut designers.**

• Aiming to enter the prestigious MB P.P.P.P. contest, I looked, like lots of entrants, for an original and unpublished model. After much searching, I decided on the P-T, quite a futuristic design for 1911. "The pilot landed at 130 Km/hr. and he wasn't killed!" was the triumphal commentary of a contemporary chronicler writing in the *Aerophile*. Rather than being inspired to build this plane based on that, I decided that the excellent layout of the plane, elliptical dihedral, and generous tail surfaces made it the perfect choice.

Weight being the enemy, I used Micro-X indoor wood to help keep the tail as light as possible. It is highly recommended that the builder of this model pay strict attention to keeping the tail light so as not to have to add weight to the nose for balance.

**FUSELAGE**

The fuselage is made up of three parts. The central body is made up of the "keel and former" method (as illustrated in the book *Flying Models of WW-II*). You will notice that the formers 6 through 10 are thinner. Small sections demand extra care and alignment. The paper covering will add a lot of strength later. The nose block is made of hard balsa half-cones with some balsa strips glued on to represent stringers. The 1/32 piano wire in the nose has the function of "antenna" and front motor hook. Epoxy it in solidly!

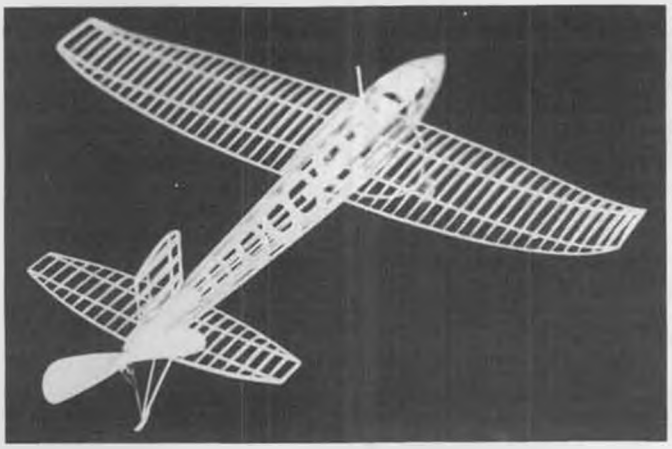
The sternpost is the essential piece, not only supporting the prop assembly, but the stabilizer, rudder, skid and its struts, and the hope of the builder to get a light model. It can be made from a very soft balsa block, hollowed out, or by covering styrofoam with thin balsa sheet (1/72 in. thick) and hollowing to get it light.

The "FRENCH CONNECTION" flexible prop-shaft drive allows the alignment problem caused by the prop installation and the 1.5° downthrust to be easily solved. I used bits of hypodermic needle (useful recovery of a painful remembrance) and some U-Control cable to make it up as shown on the plan. Tin the ends of the cable and then solder them into the hypodermic tubes. A thin brass washer is soldered on to serve as a thrust washer. Its position near bulkhead 12 keeps the cable free from any tension which might interfere with its operation.

The propeller is laminated from balsa strips and is quite light and efficient. As Peanuts are hand-launched, the fact that it extends below the tailskid is of no consequence.

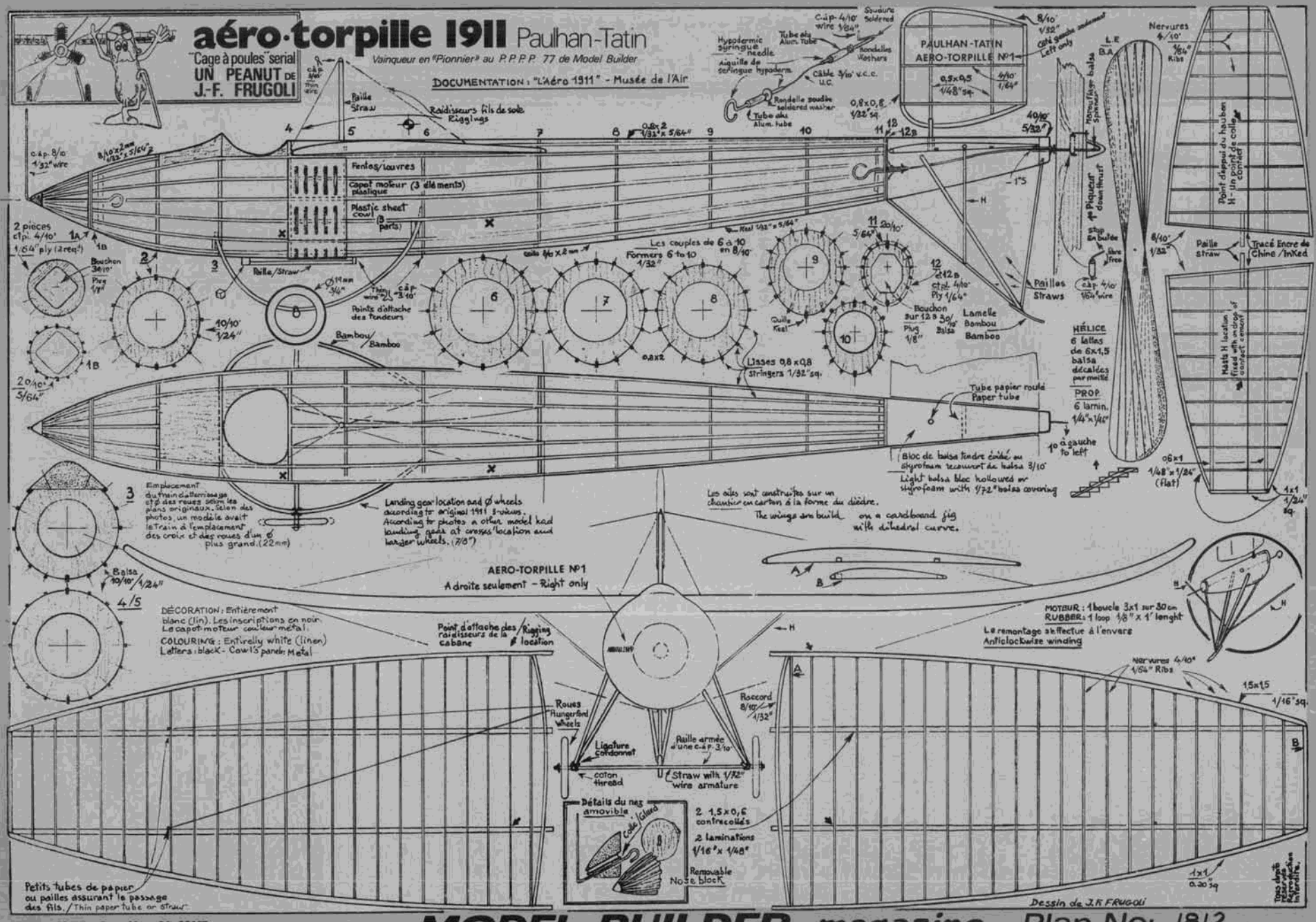
The tailskid assembly is made up of fine, tough straws which grow in the south of France. If you can't find these in your local hobby shop, you may have to improvise with broom-straws. Whatever you use, remember to keep it light back there. They are glued together with rubber cement. The struts labeled "H"

"Aero-Torpille" is French for "aerial torpedo" . . . a fitting name, judging by those clean lines. Doesn't matter that the prop hits the ground, as Peanuts are hand-launched.



Weight of the finished model is about 1/2 oz., most of this being nose weight to balance the busy tail section. *Build the tail light!*

Noted scale F/F'er, Bill Warner, with the Aero-Torpille he built from Frugoli's plans. All photos in this article are of Bill's model.

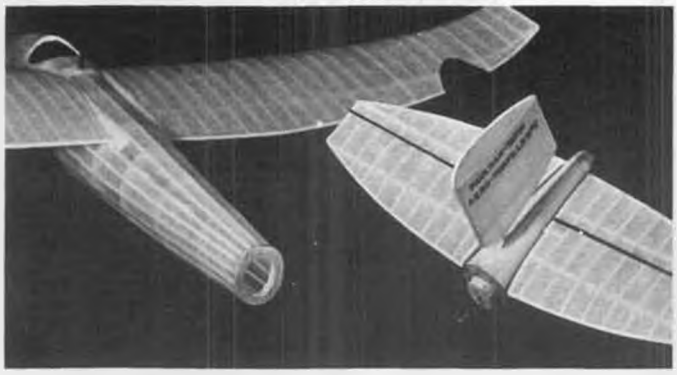



621 West 19th St., Costa Mesa, CA 92627

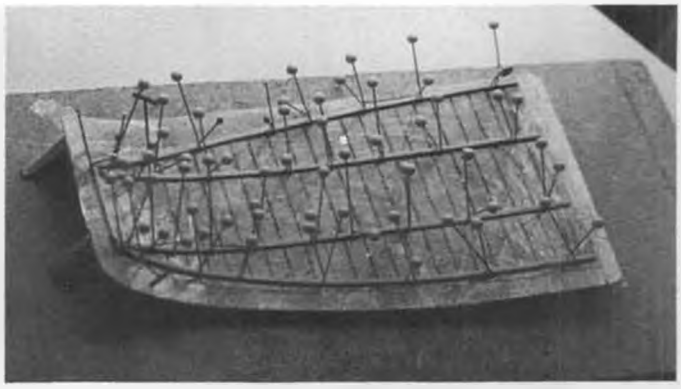
**MODEL BUILDER magazine** Plan No: 1812

This Peanut plan was too large to reproduce full size on a two-page spread in

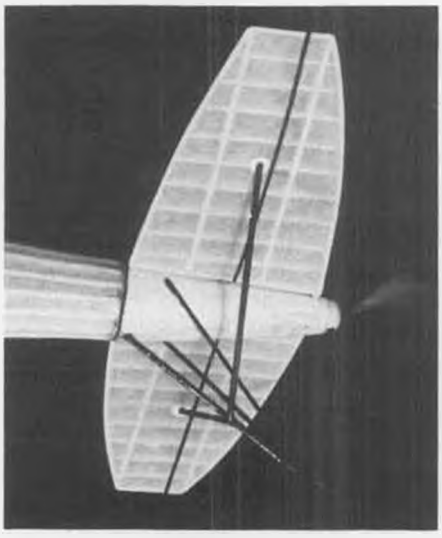
FULL SIZE PLANS AVAILABLE – SEE PAGE 100



Tail section is removable for winding. Lettering on the rudder and on the fuselage was done on a piece of Scotch Magic tape, then carefully stuck in place.



The elliptical dihedral wings are built in a special jig. L.E., T.E., and spars are soaked and then laid up on the form.



Tailskid is built from thin bamboo strips or, lacking these, you might try broom-straws.

Prop is driven through a flexible cable drive, fully detailed on the plans.

on the plan are glued in place only after the plane has been flight tested and the final stab adjustment made.

The two parts of the stab fit into a paper tube, as does the rudder. After flight adjustments are made, a drop of cement will keep it in place.

**THE LANDING GEAR**

Use split bamboo with the shiny side facing out on the two principal curves. Make a template with the curve needed, soak the bamboo, and bend using a flame or a soldering iron to heat it. Keep trying until it matches your pattern. The axle is the classical straw strengthened by some .015 music wire and tied with cotton thread to simulate the original "shock absorbers." The curved legs of the landing gear are glued on the formers with rubber cement. Hungerford 3/4-inch spoked wheels complete the setup.

**WINGS**

For the rather unusual wings, you must first build a jig of balsa or cardboard. Trace the front view curve of the underside of the wing on a couple of sheets of cardboard or balsa and then "plank" across them with thin balsa sheet or cardboard to give you a curved construction surface. You might want to cut out a wing panel from the plan and cement it directly onto the jig you have just built. A bit of Saran Wrap over this and you are ready to lay the soaked 1/16 sq. L.E. and T.E. over the form to get that double curve. It might help to cut forms for them also as seen from the top. The spars are 1/16 x 1/48, made from balsa sheets glued together with hard glue. The ribs are made as shown on the plan, with form "B" lengthened to the size of "A." Cut the ribs in a block and then cut each down to length as they are needed. (There are 48 in all!)

Note: The left wing has about 5/64 inch wash-in at the tip. The wings must be covered before attaching to the fuselage. The joining points are covered after assembly.

**STABILIZER**

This is built inside a cardboard form. All ribs have the same thickness, with the root rib being shortened for each successive one.

**FINISHING**

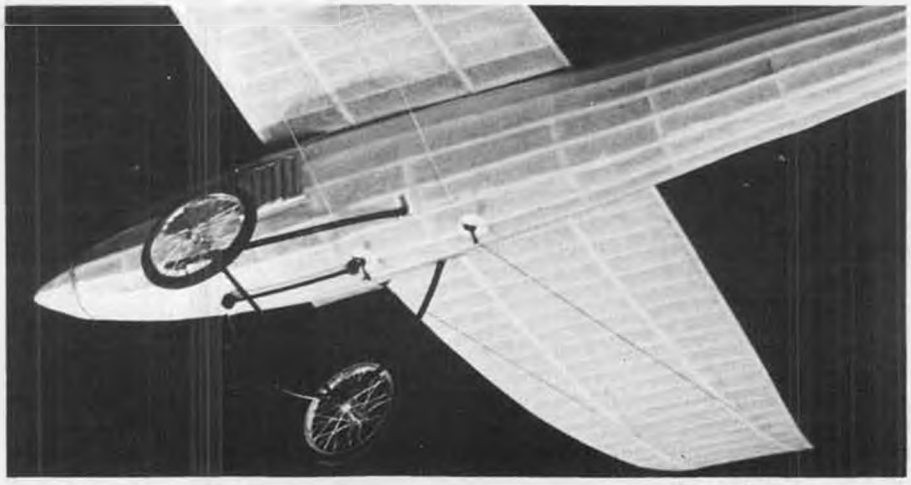
Covering is antique white, the lightest tissue you can find. The only markings (black) are AEROTORPILLE. No. 1 on the right side of the fuselage and PAULHAN-TATIN AEROTORPILLE No. 1 on the left side of the rudder only. Shrink the tissue using steam or after-shower humidity to avoid warps. One coat of 50/50 nitrate dope or banana liquid is enough.

The metallic engine cowl is made up of thin plastic sheet. Rigging is done with silk thread, as it does not ravel and is very strong.

**FLYING**

On the original, only a little nose weight was needed to secure the correct balance. Winding is done from the rear and anti-clockwise. The rubber is wound with the sternpost withdrawn so as not to put a stress on the flexible connector cable, and is then hooked up.

In conclusion, this short exposition is therefore based on the recovery of a needle that a delightful and gentle feminine hand wildly planted in your delicate posterior epidermis. With some wood, glue, and paper, you can then begin construction. Good flights. . . •



The main landing gear is also made of bamboo, formed to shape over an open flame or around a soldering iron. Rigging wires are gray silk thread; engine louvers are beer-can aluminum.

Bob White in earlier days, seen here launching an Unlimited at Taft's Gardner Field. Vic Cunnyngham, Sr., in background.

Top Canadian A/2 flier, Pete Allnutt, poses for Dave Linstrum's camera at KOI meet.

# FREE FLIGHT

by TOM HUTCHINSON

PHOTOS BY AUTHOR

Tom Hutchinson's new address:
20518 S.W. Leeds Ct.
Aloha, OR 97005

• You can always tell what time of year it is by the topics under discussion in free flight newsletters. Spring is marked by mentions of new models being rushed to completion for test flying, or a discussion of the FAI program, then is followed by summer's anticipation of the big contests, the results of the USFFC, Nats preparations and announcements, accounts of joyful flying sessions, etc. The autumn of my year is filled with accounts of who won what, from the top dogs at the Snyder Swamp Invitational Crawfish Boil and Model Retrieving Seminar to World Champs and U.S. Team members. But the upcoming winter months are the most fun to follow in the newsletters. That's when you get the real "goodies" . . . the how-to-do-it features, where the local experts reveal their secret building and flying techniques. Actually they really don't intend to keep them as secrets, but they're too busy flying and repairing during the summer months to take time to put something in print. The winter "building and thinking" season is when most of the creative modelers seem to thrive.

The winter months are also the time for free flight's "second season" of competition to be unveiled. Indoor flying is very much alive and well in all parts of the country, and this year's World Champs/Peanut Grand Prix/NIMAS VNART Record Trials has probably served to kindle the flame just a notch or two higher. If you or your club have never tried flying indoor before, now would be a good time to begin! A blimp hangar is not necessary; one of the advantages of flying indoors is that any site can be used for competition (unlike outdoors). With fewer worries about weather and lost models, indoor makes a nice change of pace from outdoor free flight, and the competition can be just as keen inside. This month's column, then, will be slanted towards the indoor side of the hobby.

Bruce Kimball packs in the turns on his Wake at Harts Lake.

### P-24: THE WMC BEGINNER'S INDOOR EVENT

My club, the Willamette Modelers, has for many years been holding indoor contests during the wet Northwest winters. As we gained experience, times climbed in the so-called "beginners" rubber events we flew (EZ-B and Pennyplane) to the point that only the experts flew them. We devised an event designed to attract newcomers to flying indoor rubber models, which is not too different from what EZ-B and Pennyplane were supposed to do. However, *our* beginners' event seems to have really caught on, since P-24 is now rivaling HLG for popularity at our contests.

The key to this event is the rule that a commercial, unmodified plastic prop must be used. This automatically limits the minimum weight the airplane must carry, preventing "flimsies," so that the resulting model is easy for the newcomer to handle. Model design is restricted to a maximum overall dimension of 24 inches, motor sticks must be made of solid balsa, and the only permitted covering is Japanese tissue. All bracing must be wood.

At the first few contests, models tended to be similar to beginner's R.O.G. models; even modified Sleek Streeks could achieve the 60 seconds necessary to be competitive in our 40-foot ceiling. Last season, some larger models showed up as several people simultaneously decided that the event looked like fun. Our best times are now about 3-1/2 minutes, but nobody seems to have a lock on the event.

If you don't notice the plastic prop chugging away at high rpm, a P-24 model looks much like a Pennyplane in flight. They fly fairly slowly, so don't tend to get damaged very easily. The combination of easy handling and good performance makes P-24 a real fun event, even for an experienced flier. The fact that they're easy to build makes them much more attractive than the Manhattan/Bostonian classes which have been proposed for beginners.

We haven't found the optimum prop/rubber combination in our limited experience. I used a North Pacific Star Flyer prop on the design in the 3-view, since it was light and didn't have too much pitch. Others have used Sterling or Peck-Polymer props with equal success. The low pitch of the North Pacific prop enables the model to hang on the prop without stalling, which is a nice flight pattern for our low ceiling.

We think the P-24 event has brought new life and new blood into our indoor sessions. Maybe it can do the same for yours!

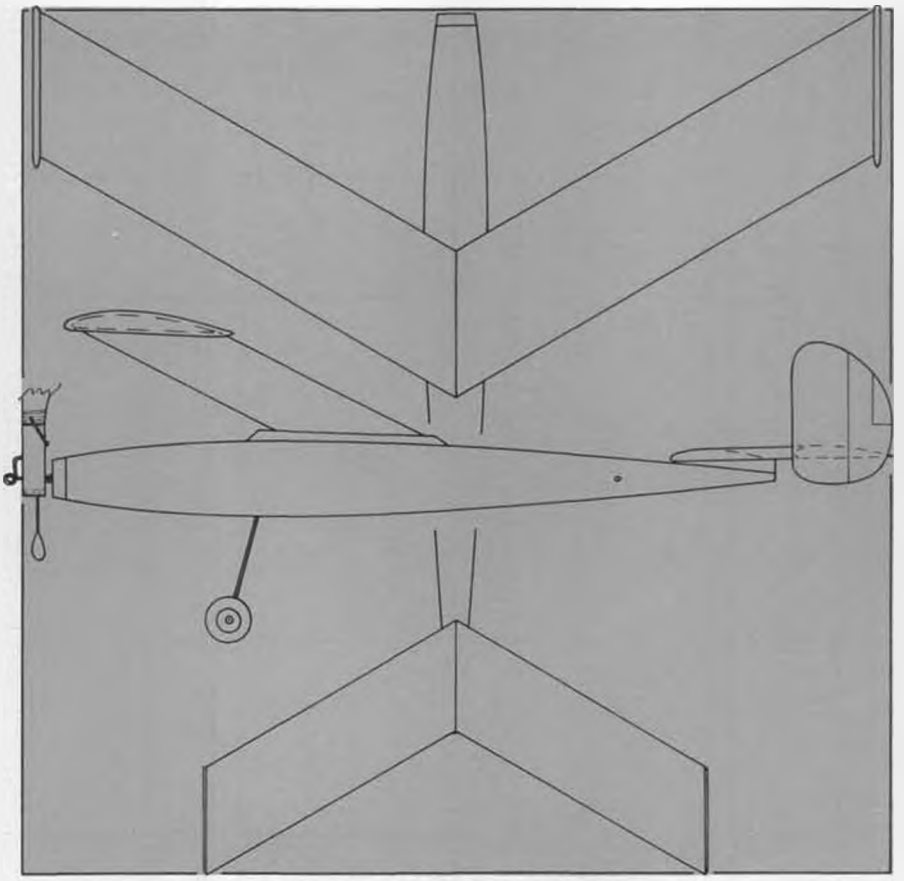
### AND ON A SLIGHTLY HIGHER LEVEL: JIM RICHMOND'S STARWALKER

Former World Indoor Champ, Jim

Richmond, holds the absolute world record for Indoor Duration with this model. Here's his own account of his success (from *Indoor News and Views*, an absolute necessity for anybody interested in indoor models. Edited by Bud Tenny, Box 545, Richmond, TX 75080).

"This plane was designed and built in the winter of 1977-78 for the specific purpose of making world record attempts. Its success at breaking existing records (three world and three national to date) has been a surprise even to me, since I regarded it as sort of an interim design, an expanded version of my FAI ships. The primary reason for its excellent performance is simply that its light wing loading of .0096 gm./sq. in. is less than that of any other competitive model ever built (at least insofar as my historical records indicate). Of course, the plane has a few other good characteristics besides light weight. It is a pleasure to fly in still air with its slow motion operation, but its delicate structure and slowness are a detriment in the turbulence and drift of Akron. It took three days of determined effort to finally get one good flight up and down in one piece. By that time the plane was a patched-up mess. (Well, there were a few other flights one might call good . . . including one over 50 minutes . . . but these weren't record breakers.)

"Oh yes, the plane has ONE nasty trait. It refuses to do a good performance without first getting smashed and then patched up. Each record (and the non-record 50) were preceded by such events."



JANUARY MYSTERY MODEL

**PENNYPLANE PROPS**

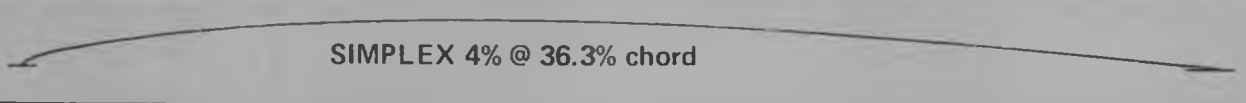
If you'd like to build an indoor model that's something in between my P-24 and Richmond's Starwalker, you might consider building a Pennyplane. The only point of added difficulty from the P-24 is that you have to build a prop. Let John O'Leary tell you how, in an excellent article swiped from the *Minneapolis Modeler:*

"Let's make a Pennyplane prop. Carefully select 1/32 C-grain stock, about 5 to 7 lb. per cu. ft. Cut the prop blades to shape using a cardboard template which has 1/16 dia. reference holes to mark the prop spar axis and the 45 degree pitch angle reference line. If you determine that you want a 22 inch pitch prop these 45 degree reference holes will be 3.5 inches from the prop shaft axis. (See Fig. 1.)

"When cutting the prop blades, flip-flop the template to achieve equal stiffness and grain configuration (Fig. 2). Stack the blades and sand the perimeter to get identical blade shape, then lay flat and sand to get a blade root thickness of about .030 tapering to approx. .010 at the tip. Now reposition the cardboard template over the blades and, using a fine felt tip pen or very soft pencil, mark through the template to establish your prop axis and 45 degree angle reference points on the backside. Now connect the points with a straight line.

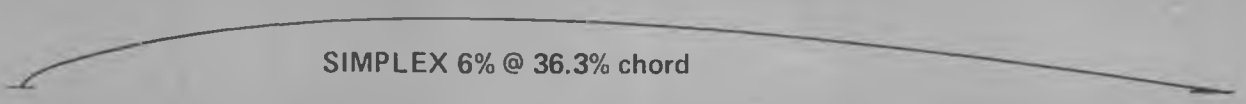
"Now we select an appropriate pitch forming fixture, i.e. a precarved block of your selected pitch I'll stick with 22

DARNED GOOD AIRFOILS



SIMPLEX 4% @ 36.3% chord

| STATION | 0 | 1.25 | 2.5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UPPER | 0 | .82 | 1.23 | 1.83 | 2.28 | 2.64 | 3.18 | 3.56 | 3.80 | 3.94 | 3.98 | 3.76 | 3.33 | 2.72 | 1.95 | 1.04 | .53 | 0 |

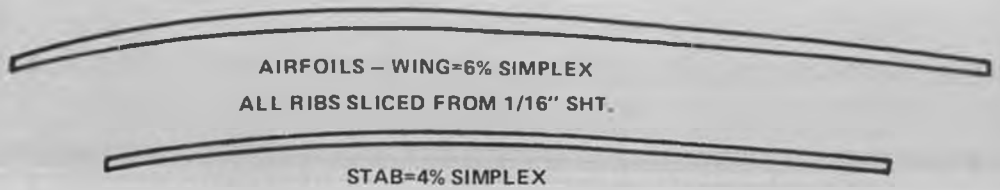


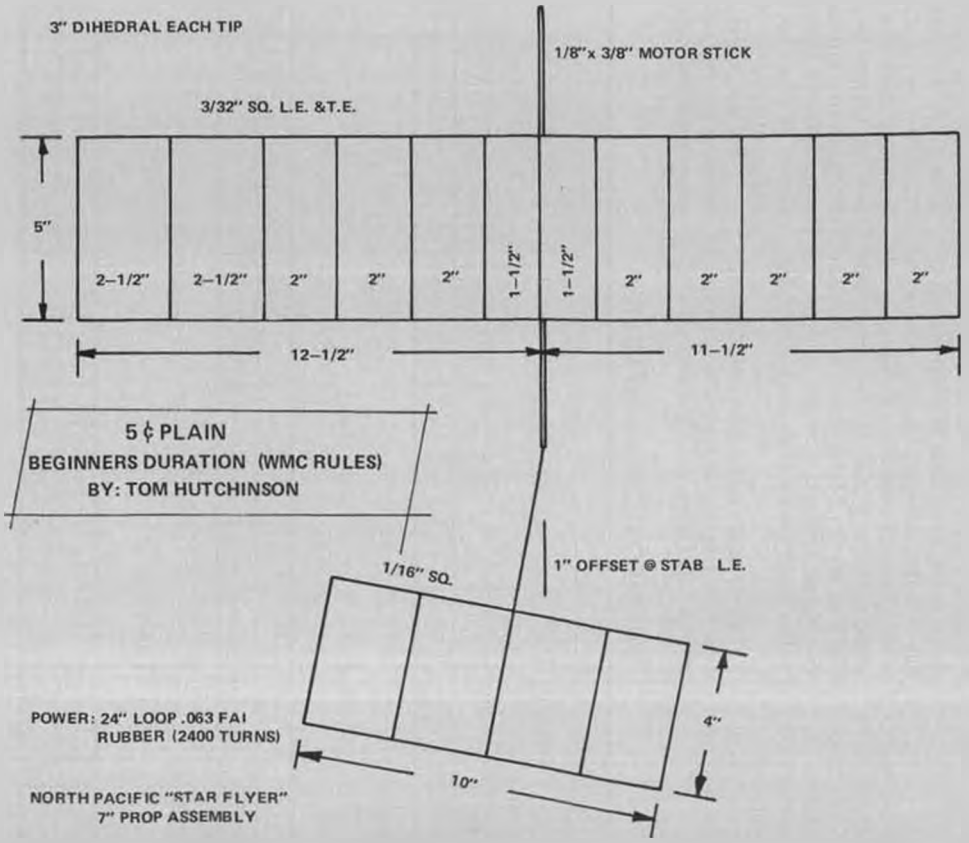
SIMPLEX 6% @ 36.3% chord

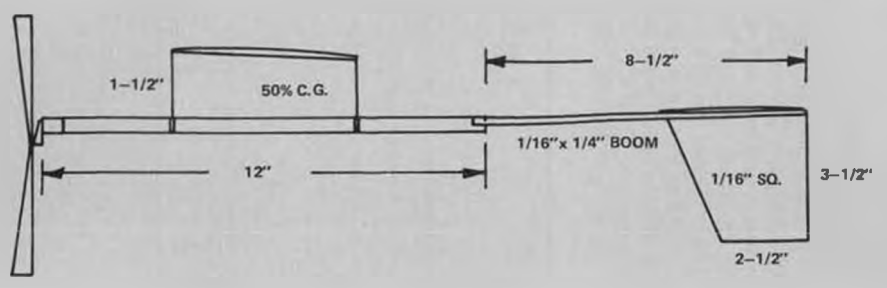
| STATION | 0 | 1.25 | 2.5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UPPER | 0 | 1.24 | 1.85 | 2.74 | 3.42 | 3.96 | 4.78 | 5.33 | 5.69 | 5.91 | 5.97 | 5.64 | 5 | 4.08 | 2.93 | 1.55 | .80 | 0 |

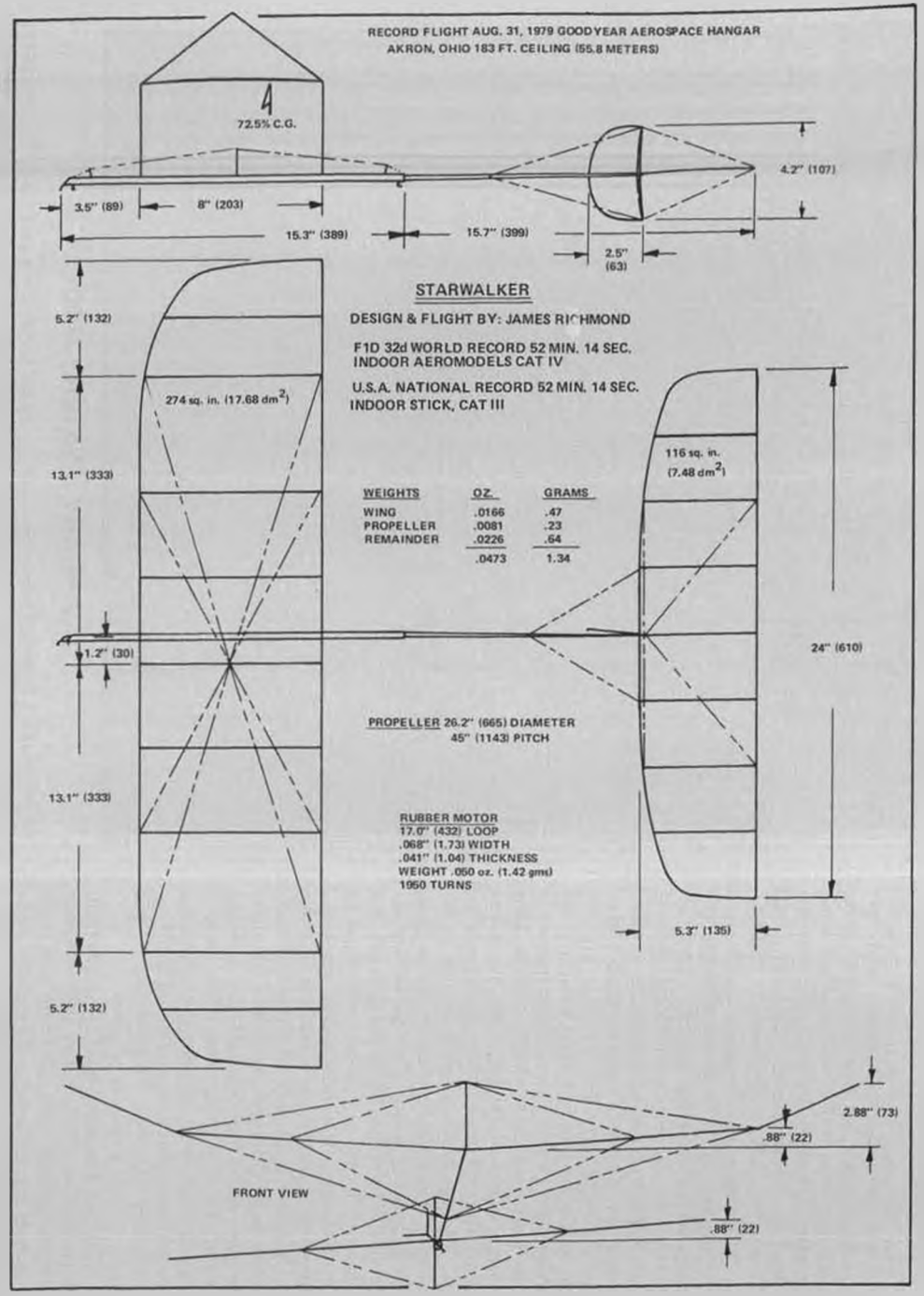
SIMPLEX 7%

| STATION | 0 | 1.25 | 2.5 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UPPER | 0 | 1.44 | 2.16 | 3.20 | 3.99 | 4.62 | 5.57 | 6.22 | 6.64 | 6.89 | 6.96 | 6.58 | 5.83 | 4.76 | 3.42 | 1.81 | .93 | 0 |


AIRFOILS – WING=6% SIMPLEX
ALL RIBS SLICED FROM 1/16" SHT.
STAB=4% SIMPLEX


3" DIHEDRAL EACH TIP
1/8"x 3/8" MOTOR STICK
3/32" SQ. L.E. &T.E.
5"
2–1/2"
2–1/2"
2"
2"
2"
1–1/2"
1–1/2"
2"
2"
2"
2"
2"
12–1/2"
11–1/2"
5¢ PLAIN
BEGINNERS DURATION (WMC RULES)
BY: TOM HUTCHINSON
1/16" SQ.
1" OFFSET @ STAB L.E.
4"
10"
POWER: 24" LOOP .063 FAI
RUBBER (2400 TURNS)
NORTH PACIFIC "STAR FLYER"
7" PROP ASSEMBLY


1–1/2"
50% C.G.
8–1/2"
1/16"x 1/4" BOOM
12"
1/16" SQ.
3–1/2"
2–1/2"


RECORD FLIGHT AUG. 31, 1979 GOODYEAR AEROSPACE HANGAR
AKRON, OHIO 183 FT. CEILING (55.8 METERS)
72.5% C.G.
4.2" (107)
3.5" (89)
8" (203)
15.3" (389)
15.7" (399)
2.5" (63)
STARWALKER
DESIGN & FLIGHT BY: JAMES RICHMOND
F1D 32d WORLD RECORD 52 MIN. 14 SEC.
INDOOR AEROMODELS CAT IV
U.S.A. NATIONAL RECORD 52 MIN. 14 SEC.
INDOOR STICK, CAT III
5.2" (132)
274 sq. in. (17.68 dm²)
116 sq. in.
(7.48 dm²)
13.1" (333)
WEIGHTS OZ. GRAMS
WING .0166 .47
PROPELLER .0081 .23
REMAINDER .0226 .64
.0473 1.34
1.2" (30)
24" (610)
PROPELLER 26.2" (665) DIAMETER
45" (1143) PITCH
13.1" (333)
RUBBER MOTOR
17.0" (432) LOOP
.068" (1.73) WIDTH
.041" (1.04) THICKNESS
WEIGHT .050 oz. (1.42 gms)
1950 TURNS
5.3" (135)
5.2" (132)
2.88" (73)
.88" (22)
FRONT VIEW
.88" (22)

inches for the purposes of this article (dimensions on Fig. 3). Or, if you choose, you can get excellent results with a can or jug-formed prop about which much has been published, or a J. Jones prop form (my preference), available in many pitches.

"Prepare your pitch forming block by giving it about four coats of dope and tracing the prop axis, the 45 degree reference lines, and the prop outline in the correct position. I go a step further and contact cement (3M Sprayment, now called 3M Craft Mount) Glad Wrap material on top of the doped surface.

"Now soak your blades in hot water for 10 to 15 minutes and lay them up on the form by strapping with dressmaker's elastic tape or some old 1/4-inch gum band. Protect the top of the blades with blotter material which you have cut out slightly oversize to the prop blade template. I generally make two props at a time, so I lay up four blades on the pitch forming block. If you're making EZ-B props, put an intervening layer of Japanese tissue between the blades, which will facilitate separating them after the blades are oven cured.

"With water, respray the blades which are strapped to the prop forming block and place in a 180-200 degree oven for an hour.

"Select some tough, springy 8-10 lb., 3/32 sq. stock for the prop spar. Sand to a round cross-section which tapers from .08 in. at the root to approx. .02 in. diameter at the tips. (See Bob Meuser's 'No Non-Cents' article.) Match the two prop spars for flex, weight, and size. The prop spar should extend to 1/2 to 2/3 along the prop spar axis. Attach the prop blades to each of the prop spars with the glue of your choice. Glue choice is not particularly important in Pennyplane, but I'd stick to Micro-X or thinned Ambroid for EZ-B.

"Construct a prop assembly fixture as per Fig. 4. Make a number of Japanese tissue hubs by selecting the correct size music wire (3/32 for Pennyplane). After polishing so no burrs remain on the cut

This month's featured Jr./Sr. flier is Barry Zeigenfuse, shown with his 1/2A Orbiteer, 1st in Sr. 1/2A at the Nats.

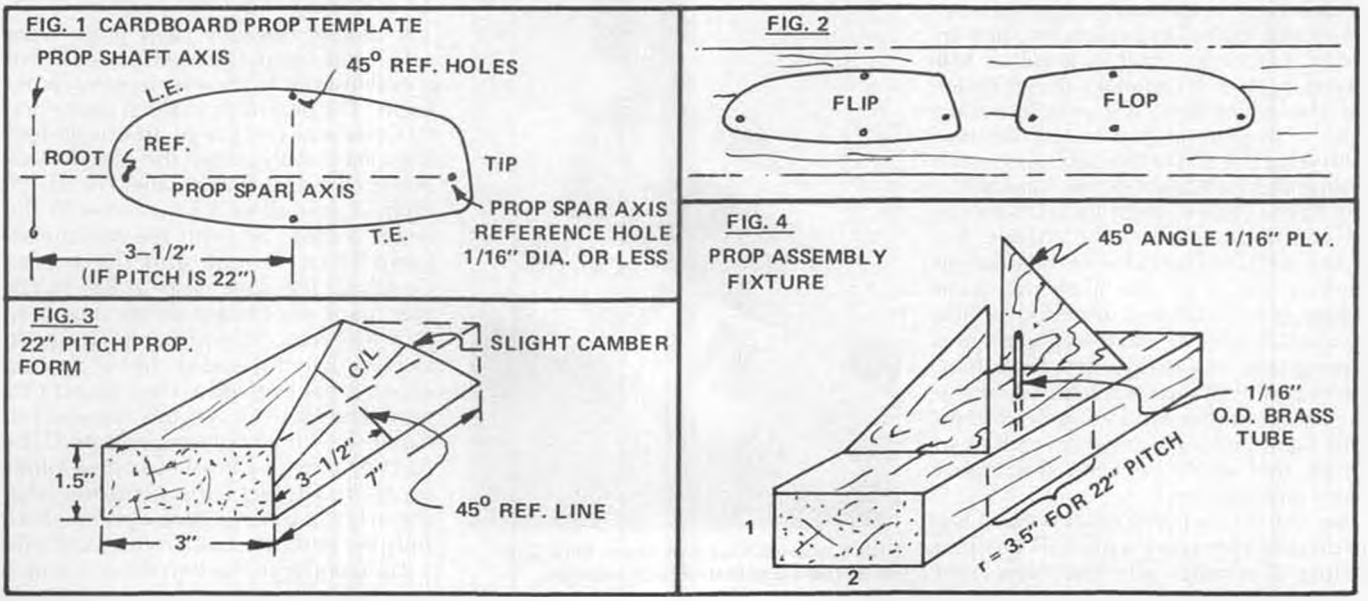
MIAMA's Doc Martin feeds Pirelli to his AMA Scale Dornier airliner. Linstrum photo.

end, rub the music wire with wax paper or silicone treated release paper. Cut strips of tissue approximately 3/4 x 1-1/4 inches long. Moisten the short end of the tissue and wrap (once) around the music wire. Carefully apply thinned cement to the tissue and roll the music wire between your fingers, applying more cement as needed. Take care not to get cement on the music wire, which will make it difficult, if not impossible, to remove from the tube. Let the tube set up on the music wire for 30 seconds or so and then push the tube off the end of the music wire. Let dry completely before cutting to length (about 3/4 inch) two hours to overnight. You'll find that you'll goof the first five tubes, but by the end of the evening you'll be making them like a pro.

"Preshape the music wire prop shaft so the wraparound portion matches the O.D. of the paper hub. Do not form the rubber hook at this time. We are now ready to assemble and complete the prop. Take the two prop blades with the spars attached. Trim the prop spars at the root so that they will join at the center. Position the prop shaft over the tissue tube, but do not glue at this time. Insert prop shaft into tube in fixture. Push (should be a moderately tight fit) both prop spars into the tissue tube hub and twist the blades so that the 45 degree reference lines coincide exactly with the 45 degree plywood reference plates on the fixture. Now, tack glue the blades to the 45 degree plates and carefully Hot Stuff the prop shaft and prop spars to the paper hub. Cut away the tack glue areas and free the prop from the fixture. Now form the reverse 'S' rubber hook and your prop is complete.

"Making indoor props is relatively simple after you've tooled up to do the

*Continued on page 64*



And the Albuquerque guys accuse the Californians of changing rules monthly! From left, Les Pardue, Phil Shew, and Vic Cunningham try to decide how to change the rules after Joe Klause and Charlie Johnson turned 6:48 in Big Goodyear at '79 S.W. Regionals.

Jet Speed design sure doesn't seem to have come very far in the last ten years or so. Current Open record is 212.93 mph.

# Control line

By "DIRTY DAN" RUTHERFORD

PHOTOS BY CHARLIE JOHNSON

• Some things in life are simple (most things, actually), but there are a few little trivialities that seem to defy easy comprehension. One of those things is the dating of magazines. You walk into a store looking for the latest copy of whatever magazine you are interested in and in checking the cover date usually end up wondering where in the hell a whole month or two has gone.

Way back when I first started writing for what was then just simply **Model Builder**, the mag was always dated for the month in which it was issued. In May, you bought, or the postman dropped off, the latest issue and, amazingly enough, your calendar matched up with the month stamped on the magazine.

Of course, it was too good to be true, much too logical a situation for such an illogical business. And so good ol' **MB** caved in, in order to make things easier for the advertisers, the people selling ads . . . in general, just to fall into line with what the rest of the publishers were doing and had been doing for years. I still have a copy of the note WCN sent to all contributors when the change was being prepared for. One of the funniest memos you are ever likely to come across, it was a bit like somebody trying to explain why we have leap years and having only 25 words or less to do it in. Anyway, the change was made. And you do already understand about lead times and such, that built-in two-month or so pause that exists between the time I write and you read.

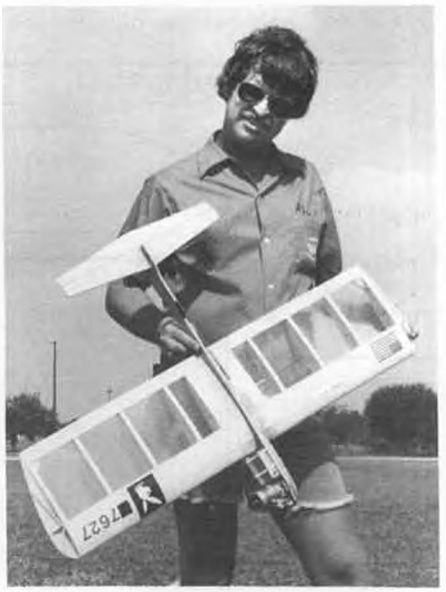
So. What I am trying to say is that this is probably the issue you will get just before Christmas and the New Year season. And I would really like to say something that is stupidly appropriate about having a Merry Christmas and a Happy New Year.

But then again, this issue might get to you too early to be timely, or worse yet, after the Holiday Seasons are all over with.

Let's just forget the whole thing . . .

**MORE ON BIGGER (AND BADDER?) BADYEAR**

In the past couple of columns I have come out in favor of the switch to 3.5cc (.21 cu. in.) motors for Goodyear, but not all agree with the idea. So this month I have decided to print a couple of letters that recently flashed across the desk. First up is Tim Gillott, a racer's racer in every sense of the word. Tim, in the following letter, was responding to a letter that I had written and that was published in the *Flying Lines* newsletter. My letter said basically the same thing as the last column or so, you aren't missing anything there. And Tim's letter was addressed to the FL newsletter, where it was published, in case the phrasing sounds strange. If that has you totally confused, I'm happy for you, and here is Tim . . .



Rick Foster with his own design Slow Combat at the Texas State Championships.

*I read Dirty Dan's rambling observations in the August '80 issue and while he is* (maybe was, after this) *a friend of mine, he needs to be enlightened on the 3.5 engine in Goodyear issue.*

*It would certainly help if he were active and competitive in Goodyear, but is not now nor has he ever been as far as I know. The best thing that has happened to Goodyear yet, use of .014 by 60-foot lines, has finally gotten the speeds back down to a reasonably sane 110 to 120 mph. If you allow 3.5's, even with the larger model, you will see the speeds jump 10 to 15 mph and there goes Goodyear the same route as Rat, so fast that many people are simply unable to fly it. The reason Goodyear has lessened in popularity is because, being a racing event, it has evolved as the competition grew and finally it was too fast and too expensive for all but the dedicated. The hard-to-come-by Rossi was only a minor problem. The fact is that no matter what the event, it will evolve to a point where only the dedicated with money will win.*

*For Goodyear, the best thing to entice*

*beginners, i.e. new people, into the event, is to keep the speeds down and the cost down as low as is possible. The .15 accomplished both.*

*Of the engines Dirty Dan mentions, the Picco 3.5 is the only engine the beginner could be truly competitive with by using it out of the box. It costs $200.00 and availability in large quantities is questionable. The OPS is next in line but will not run as fast as the Picco will stock, although it can be made to run faster than the Picco. Cost of the OPS is $120.00, add the rework and it too is about $200.00.*

*Aside from possibly the K&B and Super Tigre, none of the other engines need to be considered as competitive. I speak from experience, having built several K&B, OPS, and Picco engines for R/C cars. The rpm differential between my best Rossi and the OPS, using the same prop and fuel (60%), was 3,000 rpm and there is probably another 500 more because the Rossi had a full race head with a Glo Bee plug (4L), while the OPS had a car head with a Fox idle bar plug. By using the Glo Bee I am sure another 500 plus rpm could be added.*

*The bottom line is that by allowing 3.5's, you double the cost of an engine to $200.00 to be competitive, you require new airplanes to be built, and worst of all, you allow the speeds to go back up, and in conjunction with heavier models, make it next to impossible for a lot of people to fly. The only sensible answer is to keep the event for .15's only. If you want a cheap beginner's event, with lots of interest, stay with your Northwest Sport Race, which is legislated to make it so restrictive and boring most of the top racers who could cause it to evolve stay out.*
*Tim Gillott, Salinas, CA.*

In answer to Tim, and so that you know too, he is right in saying that I am not now active in Goodyear. And I have never been competitive with racers like Tim, but then I have lots of company there, as very few have his dedication and skill. I have, however, been very competitive in this area, which at one time had heavy activity in Goodyear, so I know a bit about the event. And as Goodyear locally has gone from hot to very cold, I am looking at this issue from the standpoint of trying to get some interest in Goodyear going again.

I am not convinced that the speeds will go so high that an average flier can't handle the models, but if this is so, we can always cross-propose the original proposal, specifying even larger models. Has to be a trade-off there someplace, where bigger models will go slower but possibly also pull harder. Time to consult a computer expert . . .

Why World Engines chose to advertise the Picco in magazines catering only to model airplane fliers I have yet to figure out, but the situation did serve to cause everybody to think that all 3.5 motors sell for $200.00. This is not so, of course, but as long as we are talking bucks, how much does a top-notch Rossi cost? Several years ago, when we did that Project Goodyear thing here in this column, we bought a rebuilt Rossi from George Aldrich for $120.00. The motor ran fine for quite a long time but did end today has to cost a lot more than it did then. Add in the fact that you might not even be able to find a motor at all. My R/C buddies who are into Pylon and Quarter Midget claim the Rossi .15 has not been produced for two years now. This could be; I hear that even the top C/L Speed fliers are having trouble getting parts.

**Dick Stubblefield draws a crowd. Dick won this match 6 cuts to 2, doing some phenomenal flying. In Texas the matches go for three minutes rather than five. Texas State Champs.**

As it happens, I am running a Picco 3.5 in my Delta 1/8-scale R/C car. Yes, it is expensive. But the sucker is fast and damn near bullet-proof, right out of the box. I used to carry spare motors to the car races . . . still do, in fact, but since racing the Picco I have not had to change motors once. In this case, I had been running two 3.5's, one in the car, one as a spare. The previously used motors cost about $140.00 each, counting the necessary carb, head/heatsink, trick rod, higher rate bearings, and so on. Even at $200.00, the Picco comes off a lot cheaper than two of the other motors. And, incidentally, I don't know of anybody who has actually paid $200 for a Picco. They are available for considerably less, and in large enough quantities to satisfy the needs of the C/L racers. Besides, there are many other 3.5's available. The new O.S. 3.5 looks terrific and is selling for $100, so with this motor and others, we aren't looking at higher costs. Like I said, Rossi .15's, worked to be fast and to restart, are already quite expensive.

As Tim points out, and rightfully so, the engine size, model size and so on are not the real problems. It is the true, gung-ho, win-at-any-cost enthusiast that has slammed the door in the face of many Goodyear racers. Tim himself is just such a racer, will do most anything

*Continued on page 81*

**Ron Odner launches Slow Combat for Bob Autry at recent Upland, California meet.**

Don Srull's Japanese Shinden pusher flew well enough to beat most conventional ships.


Here's the troublesome AVRO 504 that gave our columnist fits just before the F.A.C. Nats . . . see text for sad tale of woe. Span 36 inches, power is a D.C. Dart .035 diesel.

PHOTOS BY AUTHOR

# FREE FLIGHT SCALE

FEATURING COVERAGE OF THE

# F.A.C. NATS

By FERNANDO RAMOS

**MECCA REVISITED**

The lead to this month's column implies that I have been to Mecca at least twice. In this case, I can truthfully say I've been there three times. The first time this journey occurred was to the First Annual Flying Aces contest in 1978. The second time was when I flew my Charger biplane to Oshkosh in 1979, and the third was this year, when I attended the second Flying Aces Nationals. Bill Noonan and I had been planning this trip since last year, making arrangements to travel together. I would like to recount this most wonderful experience.

The story begins with the saga of the 504, an AVRO 504. I spent considerable time building and detailing this model at 1"=1' scale to compete at the F.A.C. Nats, followed by its entry at the AMA Nats. (Both contests were held at Dayton this year.) The engine used was the D.C. Dart .035 diesel.

Three weeks before departing for Dayton, I had the AVRO ready for the first test flight. I located a nearby barley field and acquired permission to fly my models on it. The Dart was started and the model launched. What a rewarding sight it is to see a biplane take to the skies! It was rock steady for about 40-50 feet. Then suddenly it veered to one side and went in. No problem, the grass was as soft as a mother's arms. An adjustment to the rudder would take care of the unwanted turn. Another launch, but this time the AVRO crashed in the opposite direction.

I did everything imaginable to correct the problems. After about two dozen flights, the AVRO landed in the only bare spot available, and it was concrete. The model was repaired and taken out again with the same results. I eventually put the "worn out" AVRO away for another time, and finished my back-up ship, Flyline's Kinner Sportster. I installed pendulum ailerons, figuring this would give me a fighting chance during those initial flight tests.

A large 18x30x36-inch box was made to carry my five airplanes. The plan was to put a handle on it, and carry it on the plane as luggage. When Bill arrived at my home, he brought some neat signs to place on the box, indicating that the contents were fragile instruments, this side up, etc. Both boxes, Bill's and mine, were given the supreme test at the bus station at the Disneyland Hotel. Both boxes were casually thrown into the baggage compartment with a crunch and a thud. Obviously, the signs went unnoticed. We knew that if they had survived this test, the airline couldn't be any worse. As it turned out, we were right.

We left LAX aboard a 747 enroute to hot and muggy Dayton. After renting a car (that's cheap!), we headed for the University of Dayton, which was headquarters for the F.A.C. Nats. Some old friends from all over the states started arriving, and immediately the significance of this event was being realized. It isn't only the building and flying of the models that count, but the people associated with it that makes our kind of modeling imcomparable!

There is a three hour time difference between California and Ohio, and

One of the more spectacular models to appear was this 60-inch-span Russian Tupolev "Bear" by Dennis Norman. Weighs only 6 oz., ready to fly. Photo at right shows that winding this beast for an official is not exactly a one-man job.

naturally, it was quite easy to remain wide awake into the wee hours. Fortunately, there were many modelers in the same boat, so we continued to talk into the early morn.

The flying site was one of the best I had ever seen. The meet was held at Dayton-Wright Airport, the home of the Air Force Museum. The vast expanse of green grass is most incredible to see, especially for a Californian. It is reminiscent of the old airdromes you've seen in movies, where airplanes could land in any direction, depending on the wind. Both the F.A.C. Nats and SAM Old Timer Champs contests were held there, and we didn't get into each other's way. Friday, the first contest day, was for WW-I and WW-II Peanut Dogfight, full-factor Peanut, and catapult. The weather was very windy, which made it tough for some of these lightly built models. Regardless, many official flights were made.

In each of the scale events (not mass launch), you have four official flights you can make before submitting your model for judging. Most modelers preferred to fly just one official, then have their models judged. This way the model is not apt to be damaged much as a result of flying. No scores were given to those who did not make at least one official. A board posted all of the scale scores or timing results, and were recorded by a most efficient crew soon after each happened. A well organized bunch, I'd say! That evening about ten of us went out to dinner and continued enjoying the F.A.C. enthusiasm and camaraderie.

Saturday's weather was much better from the standpoint of wind. However, the humidity was something else! I got a kick watching natives from that part of the country, continually pulling out their handkerchiefs, and wiping their brows with it. Standard equipment I'd say.

Saturday's events were Schneider Race, WW-I and WW-II Dogfight, F.A.C. Jumbo, and F.A.C. Power. In power, I flew my Kinner and was rewarded with a couple of neat flights. The pendulum is sure fun to watch work.

The mass-launch events are getting tougher and tougher. It didn't seem to matter whether they were WW-I or WW-II or racers, they all flew incredibly well! The state of the art is progressing by leaps and bounds.

Those of you who enjoy competition, and who have never attended a meet of this kind, are going to be left behind. I know that the word "competition" strikes a sour chord with some of you, but let me point out something. The attitude of the F.A.C. contingent is *not* that they are there to whip the pants off of someone else at all costs. If he wins, he wins, and he's happy of course. If not,

Not as unusual as his Tupolev bomber but right up there with the best, in terms of construction and finish, is Dennis Norman's fine Me-109.

A few models waiting for judging. Biggie is a Jumbo scale Gipsy Minor by Leon Bennett. Spans a whopping 60 inches, makes long, satisfying flights.

Norman's Tupolev bomber makes an unforgettable sight in the air. Rubber motors are completely enclosed in the inboard nacelles. How about one of these with electric power?

Phil Cox, who does some of the most beautiful F/F scale work we've ever seen, flew this vintage Franklin Sport in F.A.C. Scale.

Another off-the-beaten-track model is this Arado 240-A light German bomber by Fernando Ramos. Rubber motors are enclosed in the 12-inch nacelles. Best flight time to date: 26 secs. Fernando plans to build another, lighter version in the near future.

Allen Schanzle built his Spitfire to the same size as the Guillow kit, so he could make use of the vacuum-formed parts.

there's always next time or the next event. The whole concept is centered around fun and trust. No one is bending the rules, worries about someone else cheating during timing, etc. You would have to be there to know what I mean.

There might have been a Fike or a Lacey around, but if so, they weren't too common. (I do remember that Mike Fike won Peanut with a Lacey.) This is common at the F.A.C. Nats. These designs aren't considered by many of the F.A.C. clubsters. We all know that the Fikes and Laceys will fly, but how about Dennis Norman's 60-inch-span Russian Tupolev "Bear," or Pres Brunning's beautiful Martin B-26 that flew for 54 seconds! Or Don Srull's Japanese Shinden pusher flying the pants off the conventional designs. Mike Midkiff's SBD Dauntless, looking ever like a well detailed gas model, including a pilot and gunner. There were so many that you just couldn't believe it! I was told that there were 109 entries, with an average of at least four or five models per contestant. That, my friends, is a lot of flying scale models!

Saturday evening a banquet was held and awards given out, followed by a magnificent talk by Robert Hull, author of *September Champions*, which is a recent publication on the Golden Age of Racing. He was very good and enjoyed by everyone there.

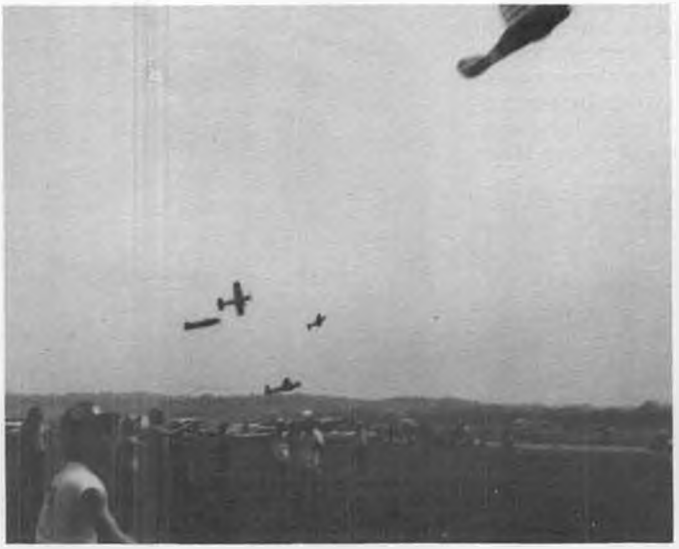
Sunday, the last day, all the race events were held along with GHQ Peanut, F.A.C. Scale, and Embryo. When the day's events were over, and all the awards handed out, many started packing to leave for home or prepare for the upcoming AMA Nats events.

There is always a bit of sorrow when you have to say good-bye to so many outstanding individuals . . . buddies you only get to see every two or three years. But there is always the anticipation of the next F.A.C. meet in 1982.

In closing, let me just say that I find it difficult to say all that can be said about F.A.C. people, planes, and philosophy. The excitement, the flying, the story-telling, etc. Again I have to say, you have to be there. I had so many thrills, such as Earl Stahl coming up to shake my hand, the thrill of placing second in F.A.C. Power, and the thrill of all of those who came up to thank me regarding this column . . .

I don't want to miss the next one! •

John Stott is a tough competitor, won Thompson Trophy with this Cessna Racer.



Mass-launch events are exciting for fliers and spectators alike. This is the start of a Thompson heat, Stott's Cessna disappearing at top.

Bob Thompson's Keystone bomber. Note big rubber prop in front . . . typical of Flying Aces approach to powering multi-engine A/C.

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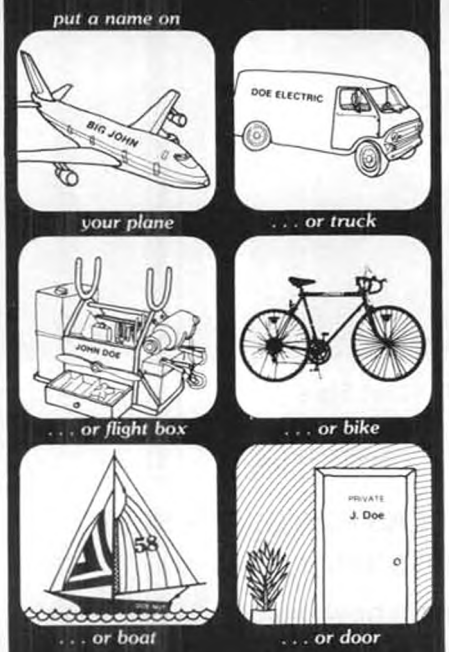


THE BLACK BIRDS T.M.

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F/F . . . . . *Continued from page 57*

job. It took me a week to write this @#%¢¢ article, but I can knock out a half-dozen props in an evening with ease."

**DARNED GOOD AIRFOIL:**
**Simplex 4%, 6%, 7%**

I guess it's time to round out the series of Simplex airfoils by presenting the ordinates for those thicknesses omitted earlier. As mentioned in the March and April 1980 columns, the big advantage of the Simplex airfoils is that ribs can be cut for different chord lengths by using just one template, and all will end up similar in shape. This makes them particularly useful for indoor models with curved wing and stab outlines. They're just as useful for constant-chord surfaces; I used the 6% and 4% Simplex sections for my P-24, and John O'Leary uses a 7% Simplex section for his "Munchkin" Pennyplane design.

**MYSTERY MODEL**

I think I gotcha this month! This design verges on the Old Timer era (pre-1950), and has to rank with Blanchard's "Gawn" as one of the ugliest models to grace this feature. It was published in an American magazine, by an American designer, and features a swept-forward wing, twin rudders, swept-back stab . . . only thing missing was anhedral somewhere. If you think you know the identity, send your guess to the **RCMB** office and see if you've won the free subscription. (Don't check with me to see if you've won . . . I learn about the winners the same time you do.)

**MYSTERY MODEL WINNERS**

*Each month, as we're putting the magazine to bed, someone will say, "Yipe, we forgot to put in the Mystery Model winners . . . Oh well, we'll catch it next month!" Then all of a sudden we find it backed up several months. And now we have a new record . . . almost a whole year!*

*Last January's Mystery Model was the "Stare," by Edwin Howe, published in June '55* Flying Models. *Winner: Joel Chesler, Malverne Park, New York (a Brooklyn Skyscraper).*

*February was Don Wenzel's "Lightning Rod," from Oct. '60 M.A.N. Winner: Bill Hale, Columbus, Ohio.*

*W.M. Karr, Fresno, California, was the only one to send an answer for March 1980's model, and that was correct . . . Bob Munroe's "Big Eagle," from Flying Models.*

*Don Assel, Canton, Ohio, had the earliest postmarked answer to April's Mystery Model, the "Eureka," by Norman Marcus, of England. In fact, he sent a wrong answer by earlier mail, but corrected it in time!*

*May was Don Drury's "Caja," from March '59 Flying Models. Winner: Jules Damare, Jr., Mandeville, Louisiana.*

*June's winner was Bob Norton, Bakersfield, California, who correctly named Bob Hunter's A/2 design, the "Niblick," from June '59 Flying Models. Bob had a device on this one that prevented circling during the tow!*

*In July, Larry Conover's "Pan Am Caribbean Clipper" was first identified by Jerry Barnette, of Fredericksburg, Virginia.*

*Eugene Jensen, Gresham, Oregon had the earliest answer to the August MM, Dr. Stan Hill's "Vector Director."*

*Rudy Kluiber, Lakewood, Ohio, has extended his* **MB** *subscription with the only response to the September puzzler, O. Niemi's "Pulteri" from August '60 Aeromodeller.*

*Joe Bilgri's "Drifter" was first identified by Ray Berens, North Hollywood, California, as the Mystery Model for October.*

*And finally, the first of many to spot Leon Shulman's "Banshee" in the November issue was Joe Gregory, of St. David, Illinois.*

*We do our best to handicap this contest, as the answers come from all parts of the country, yet the magazine is mailed from one location, and obviously doesn't hit all newsstands the same day. We go by the postmark on your envelope or card, which is not necessarily the date you write your answer. Handicap is based on postal zones from the mailing Post Office in Virginia.*

*All the above winners are given a new or extended one-year subscription to* **R/C Model Builder**. *wcn.*

**YOUNG FREE FLIGHTER OF THE MONTH**

Mrs. Lois Zeigenfuse is a proud momma; just read her letter:

"Enclosed is a photo of my son, Barry Zeigenfuse, with his modified Orbiteer and the trophy he won for his first place finish in Senior 1/2A Gas at the 1980 Nationals, held in Dayton, Ohio. His winning time also established a new Category III Record.

"Barry has been building models since he was eight years old and has been winning at free flight competitions since 1971. He also won 2nd place in Senior Outdoor Hand Launch Glider at the 1980 Nationals. He is presently attending Penn State University, majoring in Electrical Engineering Technology."

If you're a young free flighter (Jr. or Sr.) or the proud parent of one, send a photo of you and a model, and a brief history of your accomplishments, and I'll feature you in this space. (Photos of any type are welcomed . . . clear black-and-white ones, 4x5 inches or larger . . . we can't use color prints.)

**1981 NFFS SYMPO: ABSTRACTS, ANYONE?**

The NFFS is soliciting papers for the 1981 Symposium publication. Papers should cover some aspect of the art or science of free flight models. Send an abstract of your proposed paper immediately to Jim Bennett, 324 Helfenstein Ave., St. Louis, MO 63119.

* * *

(P.S.: If Indoor isn't your thing, and you HAVE to go to a contest during the winter, the 31st Southwestern Regionals is taking place Jan. 31-Feb. 1, 1981, in Buckeye, Arizona. They invite you to

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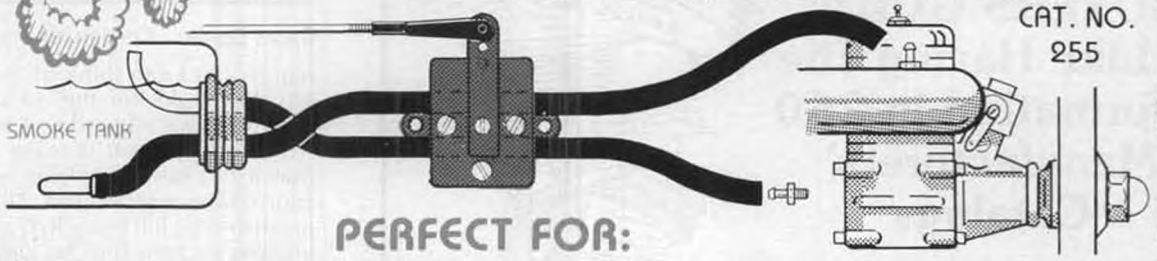


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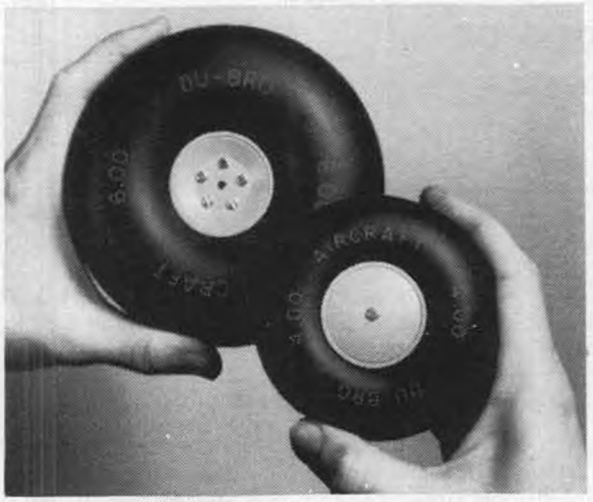


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throw off the cold weather blues and plan to join them at the second longest running contest after the Nats. Write Skip Jackson, 11827 N. 31st Ave., Phoenix, AZ 85710, for details.) •

**Quickee . . . . .** *Continued from page 48*

tank on the R/C Bee, I could use no longer than a five-inch diameter prop without hitting the cockpit.

The engine worked flawlessly. I ran it rich one tank before trying out the boat, and made a slightly rich run the first time we had the boat in the water. After that it was "crank it up all the way." We did not try out the muffler, but the throttle was very effective. With the engine low, the boat putters around very slowly and flat in the water. When you gun it, the bow comes up, the speed at least triples, and a very satisfactory wake develops.

The boat was easy to run, so much so that my four-year-old (Tommy) could enjoy running it too. We have built a couple of family picnics around "going to run Jimmy's boat" and you may be sure we will do it again.

Recommendations:

1) The basic boat is designed well and the instructions are clear and complete. FOLLOW THEM!

2) Don't forget about sanding the joining surfaces to improve bonding!

3) If you have a weedy condition in your pond I would use the alternative air rudder shown in the instructions. We hit some seaweed a couple of times, and it sure slows things down.

4) For the experienced modeler, I would recommend more power, at least a Tee Dee .049, and possible as much as a sport .10 would really make this boat sing.

5) I tried adding some trim tabs at the bottom rear of the hull to lower the nose a bit. The speed did not improve, but the handling of the boat in the turns went to pot. The stock design seems to work well.

6) Like I said in the beginning of this report, buy one, it is FUN! •

**Sport Scene . .** *Continued from page 47*

handy, but I can think of at least eight kits they make for the .10 and smaller engines, both inboard and airprop.

The next aircraft is really unusual in that it not only is a flying wing, but it sports twin engines, too. The model is produced by Bill Evans R/C aircraft. The engines are twin Tee Dee .049's. A mixer is used so that the control is by elevons. Bill makes these flying plank designs in all sorts of sizes for different powerplants.

Believe it or not, that "Mr. Mulligan" is a sport model. The airplane was built by Col. Hurst Bowers and is powered by a .23. He enjoys flying the 42-inch span model with either three or four channels of control. I gather that he has more than one of them! Hurst is co-owner of Flyline Models, so perhaps it will show up as a kit someday. That is a good size of airplane to give you good performance without hassle while not eating you out of house and home with the fuel bills. You can add a lot of detail and make it look good too.

Final item for the month is a demo model of Model Merchant's P-40 Warhawk. This model is for Tee Dee .049 power and three channels. However, the third channel is for retractable landing gear, not throttle. Quite an unusual model, the fuselage is thermoformed plastic and the wings are sheet styrene foam bent over a spar. The engine is cowled in by the spinner and the prop actually sticks out ahead of where the airplane would normally stop. Looks a little weird on the ground but looks great in the air, and you don't lose performance as you would trying to keep a big spinner balanced adequately for the bearings on a .049. Proportions have been tweaked to give you a real flier's model. •

**Boats . . . . . .** *Continued from page 21*

when going through a corner with competition. I switched to another boat in midseason and managed to do somewhat better. This boat also has some negative characteristics and I will be building a new tunnel for the 1981 racing season.

The most important item in making 1980 successful was reliability. I had only one radio problem in all the heats I entered. We are pretty sure that this was caused by interference by a CB radio

because the radio performed fine after the heat. But that one problem dropped me from first to fourth in the final standings of that day's racing of A Monoplane. Most radio problems are caused by poor installations, not interference.

Although the reliability of my engines didn't match that of the radio equipment, it was very good. Engine reliability is probably the most difficult item to achieve in model boat racing. It takes time and patience to learn how to keep an engine operating consistently. Avoiding driving errors is extremely important when it comes to increasing reliability. After racing for sixteen years, I find myself a much more cautious and patient racer. Many model boat racers give away a heat through a driving error.

I hope some of these thoughts will assist you if you are planning to enter your boat in competition in 1981. Competition can be very enjoyable and also very frustrating. Analyze what it is that is causing frustration and consciously work to eliminate those problem areas. Look at what you are doing correctly and strive to emulate that during every race. Success in any endeavor is related to the amount of time and effort expended to reach that success.

**RCMB'S PUBLISHER GOES TO THE BOAT RACES!**

Walt Schroder sent me some information and photos of the O'Neil and Knudson R/C Unlimited race held at Legg Lake, California, on August 24. Lou Foschi, who has been just super about sending photos and results, also provided some information on this event. Walt Knudson, who owns the full-size U-14, "Miss O'Neil and Knudson" unlimited hydroplane, was race sponsor. All those who participated were most appreciative of his support. Walt Schroder reported the final heat was rather hectic. The results of the race were as follows:

1) U-31 Circus Circus, John Perry driving
2) U-40 Miss Bardahl, Jack Bishop driving
3) U-31 Circus Circus, John Brodbeck driving
4) U-25 Pride of Pay 'N Pak, Sam Hall driving
5) U-7 Notre Dame, Russ Kominitsky driving
6) U-80 Van's P-X, Joe Monohan driving

Fastest heat: Russ Kominitsky, with a 1:43.3 for five laps.

Lou sent along an article written by Lynn Miller for the Southern California R/C Unlimited newsletter, and it contains some information that might be of interest to those readers who enjoy the R/C Unlimited type boats.

*INTERESTING OBSERVATIONS*

*During the 1980 Governor's Cup at Prado Lake on July 20, 1980, I poked my head under boats and peeked into engine compartments. By now I probably know more than anyone what is running right now in Southern California. The table which I have drawn up shows the hardware and the order of finish for this one race. The following observations are a summation of other facts.*

*About one-third of the boats were running Rossi .65's but another third were still running OPS .60's. Slightly more than half of the boats were using a cable. Many boats had built-in self-lubricating systems for their stuffing boxes. None used a three-bladed prop. Practically everyone had the water pick-up built directly into the rudder, and most used a lock nut to hold a "floating" high-pitch prop in place. One very fast boat had such a shallow strut that the top of the prop was above the bottom of the transom. Over half the boats used dual*


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*rudder servos, but only four boats had the rudder on the right side of center. One boat had the receiver in the front, and the rudder servos were in a separate box in the rear. Another had two radio boxes side-by-side, separated by the tuned pipe and joined together by a small channel under the pipe. Several boats had no visible whip antenna. Almost all turn fins were tilted inward two or three degrees, and most were mounted as far outboard as possible. About half the boats had weight compartments in the front, and everyone had added some kind of weight somewhere.*

1) *J. Monohan, Van's PX, Rossi .65, cable*
2) *D. Keck, Pride of Pay 'N Pak, OPS .60, solid*
3) *R. Blackford, Valu Mart, OPS .60, ?*
4) *J. Bishop, Miss Bardahl, Rossi .65, ?*
5) *L. Feeback, KYYX, Rossi .65, solid*
6) *R. Henry, Country Boy, Picco .65, cable*
7) *B. Vanderbush, Redman, OPS .60, cable*
8) *E. Keck, Miss Budweiser, OPS .65, solid*
9) *J. DeLong, Squire, Rossi .65, ?*
10) *I. Cotton, Oh Boy Oberto, Picco .65, cable*
11) *P. Jennings, Atlas Van Lines, OPS .65, cable*
12) *M. Deming, Shakeys Special, OPS .60, cable*
13) *B. Harvey, Miss Bardahl, OPS .60, solid*
14) *J. Perry, Miss Circus Circus, Rossi .65, cable*
15) *S. Hall, Miss U.S., ?, solid*

### R/C UNLIMITED CLASS BOATS

Roger Newton, NAMBA's R/C Unlimited Chairperson, has completed an R/C Unlimited Master Hull Roster. This list is available to anyone interested by sending a stamped, self-addressed envelope and $2.00 to Roger Newton, 14518 167th Pl. S.E., Renton, WA 98055. This list will be updated annually and the updates can be purchased for $.50 and a stamped, self-addressed envelope. The list goes back to when Unlimited Hydroplane racing was resumed after World War II.

### NORTHWEST CHAMPIONSHIP RESULTS

NAMBA District 8 completed its seven-race Championship Series with a race at Kent Lagoon on September 13 and 14, sponsored by the Seattle Model Yacht Club. The District 8 Double Points race was held in Medford, Oregon over the Labor Day weekend, August 30 and 31. The results of the seven-race series are as follows:

A HYDRO
1) Jerry Dunlap, Hustler II
2) Chuck Rudorfer, Crapshooter
3) Randy Seiser, Gator
4) Doug Smith, Hughey
5) Mike Wight, Crapshooter Outboard

B HYDRO
1) Randy Seiser, Gator
2) Vic Drew, R/C Glass Sport 40
3) Vic Roberts, R/C Glass Sport 40
4) Rick Smith, R/C Glass Sport 40
5) Larry Knudson, Hughey

A MONO
1) Jerry Dunlap, Prather 31 Vee
2) Paul Dunlap, Dumas Deep-Vee
3) Jack Peters, Schoeff Vee
4) Maren Dunlap, Dumas Deep-Vee
5) Ron Erickson, Schoeff Vee

B MONO
1) Doug Smith, Wardcraft
2) Jack Peters, Prather 40 Vee
3) Ron Erickson, Wardcraft
4) Bill Hornell, Wardcraft
5) Bill Brazzle, Dumas CF 40

C HYDRO
1) Larry Knudson, Miss Olympia Beer
2) Norm Nordby, Miss Madison
3) Ron Erickson, Wing Ding
4) Randy Seiser, Gator
5) Don Nauditt, Original Hydro

A DEEP-VEE
1) Jerry Dunlap, Prather 31 Vee
2) Vic Drew, Prather 31 Vee
3) Kevin Zinski, Schoeff Vee
4) Don Dees, Prather 31 Vee
5) Jesse Shehan, Outboard Vee

SPORT 40
1) Vic Drew, R/C Glass
2) Gary Ginader, Dumas U-76
3) Jerry Dunlap, Muck Sport 40
4) Vic Roberts, R/C Glass
5) Chuck Rudorfer, R/C Glass

A OPC TUNNEL
1) Mike Wight, Excaliber II
2) Larry Knudson, Original Tunnel
3) Bill Brazzle, Hughey
4) Leo Dreith, Hotshot

## RC Accessories

**THE NEW MINI STARTER STARTS THE SMALL ONES FAST.** Specially designed for quick sure starts for ½A glow engines, the mini starter features a 12 volt high speed permanent magnet motor with ball bearing front end. The drive cup is designed to fit the COX T.D. prop nut or a small spinner, a grove for a marine o ring is provided, and a rubber boot for starting jerobee cars. Replacement rubber cups and boots available. (4013)

**12 VOLT BATTERY CHARGER.** Designs to charge all 12 volt gel cells and motorcycle batteries overnight from a 110 volt wall outlet. Carry this mini charger in your flight box and don't be caught with a dead battery. (4006)

**SUPER POWER STARTING BATTERY.** Super high power light weight starting battery uses new G.E. Gates Cells. This 12 volt 2.5 amp hr battery weighs only 2 lbs but has more starting power than most batteries three times its size. (4014A)

**DRILL CHUCK.** This nifty drill chuck plugs directly into your mini starter converting it into a high speed drill or grinder. High quality Jacobs chuck accepts up to ¼ inch urills. (4022)


**POWER PANEL.** This nifty power panel is specially designed to provide proper power forms to your starter, glow plug and fuel pump. It features high and low glow plug outputs and a center off reversing switch for your fuel pump. (4015)

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Actually, it's a super powerful **12-volt** starter that can also be used with higher voltages - anything up to and including 24 volts.

This is the starter that can grow with you. Even if you don't need its super power now - or its ability to work also with higher voltages to start bigger or balkier model engines - you may require it in the future. Buy it now and you won't have to buy a bigger starter later. Ask your dealer - you'll find it's only a few bucks more.

### SUPER HI-TORK SULLIVAN STARTER

When used with a **12-volt** battery, this starter will provide a full ½ horsepower of 288 inch ounces of torque. That's 25% more power than our famous regular starter. Enough power to start almost any engine, including most ¼-scale engines.

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Torque ..... 230 in. oz.
Horsepower ..... 2/5 HP
Capability ..... Starts almost any engine
Free-Turning RPM ..... 4400
Models ..... HT and HTD
HTD has aluminum cone and pulley instead of nylon

*2/5 Horsepower*

### SUPER HI-TORK SULLIVAN STARTER USED WITH **12-VOLT** BATTERY


Torque ..... 288 in. oz.
Horsepower ..... ½ HP
Capability ..... Starts almost any engine, including most ¼-scale engines.
Free-Turning RPM ..... 3500
Model ..... HTD-24

*1/2 Horsepower*

### SUPER HI-TORK SULLIVAN STARTER WITH 24 VOLTS (Two 12-Volt Batteries or Other Combination)


Torque ..... 570 in. oz.
Horsepower ..... 1 HP
Capability ..... Starts all engines used, including ¼-scale, boats, helicopters, etc.
Free-Turning RPM ..... 7000
Model ..... HTD-24

*1 Full Horsepower*

*Free-turning RPM is the RPM when starter meets no resistance. When starters are applied to a model's engine, differences in RPM's are less pronounced.*
*These starters are not for use on engines with Byron reduction gear*

***IMPORTANT NOTE - The price of Sullivan Starters is expected to increase substantially within a few months. If you're considering one, don't delay.***

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Wing Span - 57"
Length - 55"
Wing Area - 600 sq. in.
Ready-to-fly weight - 8½ lbs.

2. Russian Aerobatic Team

### Pitts Special

Wing Span - 68"
Wing Area: 1400 sq. in.
Length - 62"

**Factory Price $212.95**
(plus $12.00 shipping)

### Authentic Scale MiG-15 Factory Price $136.55

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### Byro-Jet—The first practical and proven ducted fan!

The MiG-15 and F-16 both employ the new Byro-Jet propulsion system. Byro-Jet's exclusive "pusher" design provides an unmatched degree of thrust efficiency. Experience the thrill of realistic jet flight without the prohibitive expenses and hassles of tempermental racing engines, high nitro fuels and complicated fan systems.

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The deluxe caliber of Byron Originals kits and accessories exemplifies not only our concern for high quality and functional design, but also our commitment to provide modelers the world over with the most complete kits available. This "complete kit concept", including the finest state-of-the art construction methods and materials, is our way of making sure you enjoy your hobby to the fullest.

## Precision Prop Reduction Systems

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Extra speed and thrust—at flying speeds! That's what combining the new Byro-Drive II and the well known Quadra can do. This winning combination will effectively turn 22" props with double the normal pitch, resulting in dramatic power increases during power maneuvers and steep climbs. The Byro-Drive II is designed to accept any Quadras built after 1968 that utilize the 4 bolt rear mounting flange. Units are available either with or without the C.D. ignition Quadra engine. Byro-Drive II also accommodates magneto Quadra engines.

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Double the thrust of your .60 size engine with the proven Byro-Drive from Byron Originals. This widely acclaimed prop drive unit, with its superior design, performance, and dependability record, has satisfied the growing needs of quarter scalers round the world. Unit is fully assembled. Belts, 3½" spinner, 20 x 8 maple prop, tensiometer and 9/64 ball driver included.

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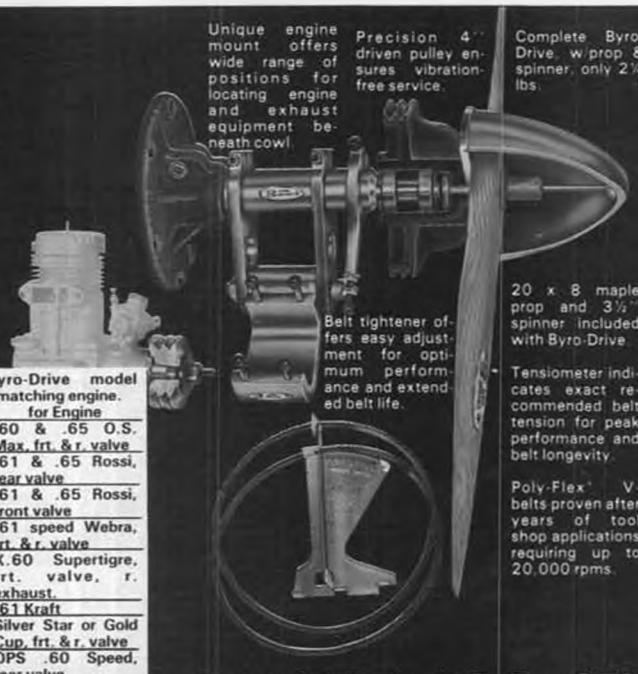


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| WFR-14- | .61 speed Webra, frt. & r. valve |
| TFR-13- | X.60 Supertigre, frt. valve, r. exhaust. |
| KF-15- | .61 Kraft |
| HPFR-16- | Silver Star or Gold Cup, frt. & r. valve |
| OPSR-17- | OPS .60 Speed, rear valve. |

Retail Value $135.44

**Factory Mail Order Price $108.35**

Plus $2.50 shipping

Prop. & Spinner Inc.

Byron Originals, P.O. Box 279,

# Authentic Scale Modeling at Its Finest

**Sold Separately!**
**Factory Price**
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plus $2.00 shipping
(Tuned Pipe not included)

**Items included in kit:** •Wheels, •Hinges •Landing gear •Control horns •Special tools •12 oz. fuel tank •Nose wheel fairing •Necessary linkage •All required fasteners •Three complete decal sets •Balsa and plywood die-cut parts •Scale flying stab assembly •Shock-absorbing nose wheel assembly •Hand-layed fiberglass fuse (epoxy) •Detailed canopy and cockpit assembly •Detailed and fully illustrated assembly book •Pre-shaped control surfaces (injection molded polystryene) • Three-view with detailed decal and painting instructions •Injection molded wings with aluminum extruded wing spars already molded in and ready to plug into fuselage.

**F-16**
**Factory Price**
**$196.55**
plus $10.00 shipping
(fan & starter extension not included)

Wing Span - 47"
Length - 74½"
Effective wing area - 750 sq. in.
Ready-to-fly weight - 9½ lbs.
(less opt. tanks & rockets)

BYRON ORIGINALS
**ByroJet**

The proven Byro-Jet is specifically designed for today's Schnuerle .60s and low nitro fuel. This simple yet highly efficient fan system is constructed entirely of rugged glass-filled nylon. Total weight, less engine & pipe, only 11 ounces.


Wings easily removed for transport

Model shown with optional rockets and fuel tanks.

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Now you can recreate in accurate 1/5 scale one of the most famous fighter aircraft of WWII – the P-51D Mustang. After more than three years of testing and development, this classic fighter of 36 years past has finally been judged ready for the modeling world. Experience the thrill of realistic sound and unbelievable flight performance plus standard features never before offered.

All things considered, the P-51D from Byron Originals represents the ultimate in authentic scale modeling. Call or write for details.

**Included in Kit**
Exact scale landing gear, with functional Oleo strut, serves as a good example of the authentic details evident throughout the P-51D.

**Complete Power Package Included in Kit Price!**
- Complete drive unit & mounting
- 24" nylon four-bladed prop
- C.D. ignition Quadra engine
- 5½" Spinner




**Wing Span - 85"**
**Length - 76"**
**Ready-to-fly weight - 23 lbs.**

**Factory Price**
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plus $9.00 shipping
(retract system optional)

## Exclusive Quick-start Capabilities!

Byro-Jet's exclusive quick-start capabilities makes starting a fast, easy and safe operation. No complicated belt-start procedures and no hatches to remove and reassemble. Simply attach starter extension to your Sullivan starter...insert into tail pipe until contact is made with the fan...and hit the starter.

**Byro-Jet Tuned Pipe System Complete**
Retail Value
$67.31
**Factory Mail Order Price**
**$53.85**
Plus $1.75 Shipping

**Exclusive Tuned Pipe System!**

In addition to increasing power output by 15%, this unique Byro-Jet Tuned Pipe System provides the necessary noise suppression plus a means to completely conceal muffler within fuselage. Available for both rear and side exhaust .60 engines.

**Ida Grove, Iowa 51445**

---

**IMPORTANT**: You must check an engine below (B) to receive proper Byro-Jet Pipe and/or Fan Unit.
Send me:

_____ Pitts Special Kit(s) @ $212.95 plus $12.00 shipping and handling
_____ Pitts & P-51 Fiberglassing kit @ $39.00 ea. plus $2.50 shipping
_____ Byro-Drive(s) Model No. _____ (See model listing) at $98.50 ea. plus $2.50 shipping
_____ Byro-Drive II (Quadra engine included) at $243.00 plus $3.50 shipping
_____ Byro-Drive II (Quadra not included) at $138.95 plus $2.50 shipping
_____ P-51D Mustang Kit(s) at $499.95 plus $10.00 shipping. (Quadra and drive unit included)
_____ P-51D retract system at $135.95 plus $2.50 shipping. (Gear not included)
_____ MiG-15 Kit(s) @ $136.55 ea. plus $8.00 Shipping & Handling (Choice of four decals see below)
_____ F-16 Kit(s) @ $196.55 ea. plus $10.00 Shipping & Handling (Three decal kits included)
_____ F-16 Tank & Rocket option @ $26.95 (includes shipping and handling)
_____ Byro-Jet Fan Unit @ $49.95 ea. plus $2.00 Shipping & Handling
_____ Sullivan Starter Extension @ $11.50 ea. (includes Shipping & Handling)
_____ Custom Byro-Jet Pipe System @ $48.95 ea. plus $1.50 Shipping & Handling
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A. Check one MiG-15 Decal Kit:
_____ 1. Chinese _____ 2. Russian Aero Team _____ 3. Russian _____ 4. Czech Aero Team

B. Determine engine to be used and check accordingly

_____ Webra .61 Speed #1030 Front Valve, rear exhaust
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_____ O.S. Max .60 & .61 FSR, Front Valve, S. Exh.
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5) Dennis Caines, Excaliber II

B DEEP-VEE

1) Jack Peters, Prather 40 Vee
2) Doug Smith, Wardcraft
3) Ron Erickson, Wardcraft
4) Bill Brazzle, Dumas CF 40
5) Don Dees, Wardcraft

**NORTHWEST OUTBOARD CHAMPIONSHIPS**

The Rose City Model Yacht Club hosted the 4th Annual Northwest Outboard Championships on September 21 at Force Lake, East Delta Park, in Portland, Oregon. This year's event featured four heats of heat racing and two sections of 10-minute enduros. The weather was excellent and the water conditions were ideal for racing the tunnel boats. Heat ribbons and very beautiful trophies were presented to the event winners. The results of the heat racing are as follows:

1) Dennis Caines, Excaliber II
2) Shawn Hoagland, Excaliber II
3) Dave Blacksten, Original Tunnel
4) Jerry Dunlap, Excaliber II
5) Doug Smith, Klampon-Kai

The results of the 10-minute enduros are:

1) Mike Wight, Excaliber II
2) Larry Knudson, Original Tunnel
3) Vic Drew, Excaliber II
4) Dennis Caines, Excaliber II
5) Brian Durkin, Mongoose

The results of the Sport 40 Class are:

1) Vic Roberts, R/C Glass
2) Bill Brazzle, Dumas Drag 'N Fli
3) Dave Blacksten, R/C Glass

I'd like to wish all you readers Season's Greetings and Best Wishes for the New Year. This column is always open for questions, photos, race results, or opinions. Such items can be sent to: 119 Crestwood Dr. S.W., Tacoma, WA 98498. •

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**Giant** . . . . . *Continued from page 19*

med to a length that matches the particular plane. It would be held in place with multiple set screws. This universal gear would eventually also slip into a retract unit which is capable of handling the loads of a plane such as the Nosen Mustang. Dave Platt has a small scale gear for his Me-109, but it is only usable on planes up to about 20 lbs. max, and it isn't scale for very many birds. The first individual to come out with this kind of gear will give the same help to modeling as did Ron Shettler with the Quadra.

The second item is servos. While there are a couple of heavy-duty servos on the market today that are flying almost all of the big birds with safety, they ALL share one common fault carried over from the smaller designs. That is, they have 1/8-inch square output shafts. When building servos that are capable of handling the kinds of loads that a 400 sq. in. control surface can generate, wouldn't it be a little wiser to go to something like a 1/4-inch square output shaft? I have seen three planes destroyed because the output shafts sheared under flight loads.

As long as I'm yakking about servos, I have a couple of recommendations for you guys, based finally on some experience with the brutes. If you want some servos that *are* capable of flying your big bird without straining their guts out, at least to quite the extent that most do, I can now personally recommend the EWH Heavy-Duty Servo (EWH Specialties, 607 East Abrams St., Arlington, TX 76010), and the EMS-20H (Electronic Model Systems, P.O. Box 1242, Placentia, CA 92670), as being servos that have seen a high degree of usage and satisfactory performance in planes that demanded the best. I am referring to extensive flight in planes over 50 lbs. Both of these servos still use the 1/8-inch output shaft I was complaining about earlier, but they have demonstrated that they are among the best that is available at this time. They are also among the least expensive!

One caution: when using *any* high-powered servo, be darned sure that you have one of the heavy-duty battery packs, 1,000 mil minimum, aboard your plane. These giant servos produce lots of power, and they take lots of electricity to do so. Again, I speak from experience. Jim Folline's gorgeous PT-19, which I flew for two years, no longer exists because I substituted a standard battery pack for the failed giant pack for just one single ten-minute flight. It lasted seven minutes. Don't you make the same


IS YOUR MODEL BUILDING OVER—BUDGET and UNDER—FINANCED ?

Save some bucks with the

"SILVER SEVEN" Super Transmitters

and the new

"ATLAS "Heavy Duty Servo

THE FOLLOWING FEATURES ARE STANDARD ON ALL SILVER SEVENS!

*Servo Reversal Switches
*Independent Throw Adjust on all Channels
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11G207 $159.95 Complete Systems start at $284.95

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ATLAS SERVO

Size:.937" X 1.09" X 1.75"
Weight: 1.82 oz.
Thrust: 8 lbs.
14G20A Atlas Kit, $28.95
14G20AC Atlas Assy., $36.45
81K22 Atlas Ball Bearing $3
81K21 Atlas "O" Rings $1


NOTE: All servos come less connectors.

THE FOLLOWING OPTIONS ARE AVAILABLE FOR THE SILVER SEVEN

*MIXER - mixes any two channels together either bi-directionally or uni-directionally. (11G505 $11.95) Note: Currently, the Exponential and Mixer can't be used at the same time.

*PROGRAMMABLE PUSH BUTTONS - move the control surface to an in-flight programmable location at the push of a button. For one or two functions. (11G510-One Function $8.95) 11G511-Two Function $11.95)

*EXPONENTIAL RATE on three channels gives a "soft" neutral for smoother flying. (11G500 $17.95)

For more info, send $2 for our 80/81 Catalog.

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NEW 1/8 GAS CAR
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# ASSOCIATED

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free
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mistake.

Batteries have continuously been my nemesis, and is one of the things that I personally am just plain paranoid about. Of the five radio-failure crashes I have had in the past five years, three of them have been battery failure problems. And I don't mean batteries that just ran out, I mean batteries that for one reason or another failed catastrophically. There are any number of equipment items and techniques available that do a great job of checking your batteries (I personally make extensive use of a battery discharge checker), and most of these systems/procedures will do a great job of guaranteeing that your batteries are in as good a shape as they can be before you shove the throttle forward. But not a single one of them will do you a darned bit of good when the battery flat fails in the air, though, and that is the place that is the only important consideration of all of these techniques. If a battery fails in the air, right now, it doesn't matter how careful or knowledgeable about battery care you are, you still have a crashed plane.

For some time, I have been thinking about a backup battery system to help get around this problem. This system would have a giant pack (1,200 mil) for the standard flight pack, and this giant pack would handle all of the normal flight chores. In case of failure of this pack, for any reason, there would be a small dry-cell pack which would automatically take over the power functions, and enable you to get down safely even with a totally failed main pack. This would be accomplished with a small electronic voltage sensing circuit in a battery pack Y-harness. When the main pack falls to a specified low voltage, this circuit would sense the danger and automatically switch to the backup pack. It would "lock out" this main pack (would not switch back to the main pack if it built up again), and would light a small LED indicator to tell you that the main pack had failed when you land and check it.

After the crash of the PT-19, this desire for a backup battery system came to a boil, and I contacted one of the electronic wizards in my area. Seems he had been thinking somewhat along the same lines, just needed a little catalyst which I provided to get the thing finished, and I hope by the time my next column comes out I will be able to present this idea to you. As I said, all the checks and fancy warning circuits in the world won't do you a bit of good if that battery pack just flat fails in the air. This system will give you a backup for this most unreliable part of your radio. Look for it next time.

**THINGS I HAVE SEEN AND LIKED**

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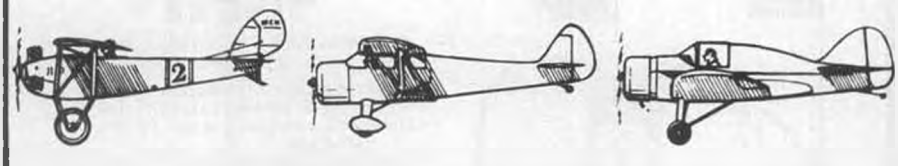

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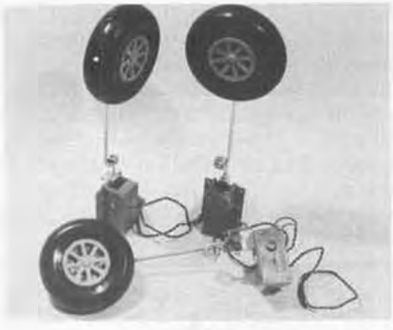

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modeler should be using on his major control surfaces. These links are about double the size of the standard items, and they are both made for 4-40 rod. This increased rod size is vital to our big birds, and no one should continue to use the smaller 2-56 threaded 1/16-inch wire on these big birds. It just isn't stiff enough for our uses. These heavy-duty links from EWH and Sig are much more attuned to our needs.

• • •

Kraft's Steel-Pin Kwik-Links are a nylon clevis with a steel pin which snaps into the nylon part. While these are the standard-sized clevis (2-56 thread), they are a finely-made item, and for the lighter applications, these seem to be one of the best-made items on the market. Consult your Kraft Systems accessory catalog for these. They are one of the small inconspicuous items that Kraft has in abundance.

• • •

Fred Eastman, of Eastcraft Specialty Products, has to be a visionary type of guy, because he foresaw that I am basically lazy and came out with the ultimate lazy-man's accessory, an on-board, radio controlled electric starter for just about any size engine imaginable. I have three of these units, one on a .60, and two on Quadras, and you can't believe how totally spoiled I have become. There is just something about shoving your plane out on the runway, and waiting until someone starts cussing you about blocking the activity. I then say, "Oh, 'scuse me," and from fifty feet away, punch the button on my transmitter, start the engine, and go fly while savoring the open mouths around me!

These items are among the most finely developed in all of modeling. I have had absolutely no trouble at all with them, and the batteries on the starter recently cranked over the Quadra engine in demonstrations at the aforementioned Mall Show for the entire weekend without recharging. If you want the ultimate luxury item for your model, I highly recommend the Eastcraft on-board starters. Eastcraft Specialty Products, P.O. Box 25, Irwin, PA 15642. (NOW can I have my crash-damaged starter back, Fred?)

• • •

One problem that the Quadra has always had is keeping the muffler in place, and mufflers that are just plain too restrictive. Quarter Headquarters (P.O. Box 12321, San Francisco, CA 94112) has come out with a heavy-duty cast aluminum muffler for the Quadra which is the best approach to this problem that I have seen so far, and it is recommended. The muffler body is about twice the size of the stock muffler, it is quite rigid so that you can bolt it tightly to the engine (muffler loosening caused by thin, flexible mufflers has always been a problem), and it has exhaust pipes that are big enough to allow the engine to breathe. The Quadra is susceptible to

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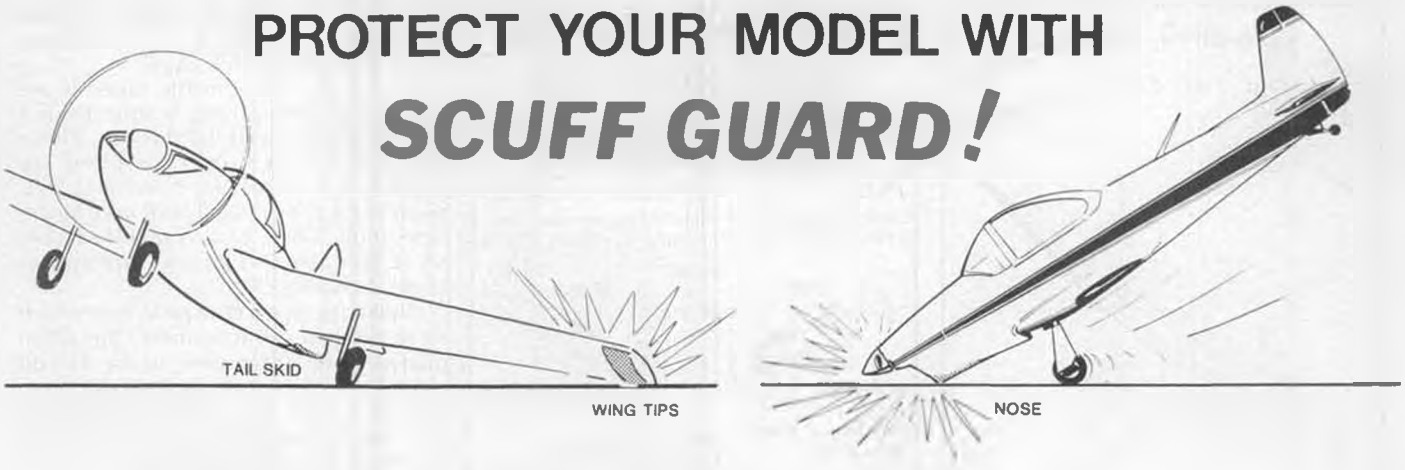


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"exhaust choking," in that too small an exhaust pipe or system will cause a considerable loss of power. The Quarter Headquarters unit is quite good in this respect.

• • •

C.B. Associates (21658 Cloud Way, Hayward, CA 94545) has an exclusive line of extremely well-thought-out items for the giant scaler, and among the best are the tailwheels (three sizes) and their cable control systems.

The tailwheels are scale leaf-spring items, and cover the size requirements from small to very large. The medium size is perfect for the Nosen Champ/Cub size planes, while the quarter-scale size is a monster that will hold up even the heaviest planes.

The cable control system is a fully developed system that has to be seen to be appreciated, and I strongly encourage anyone who doesn't want to use the servos located out close to the control surfaces to investigate the C.B. cable systems. I personally strongly advocate locating the servos at the control surfaces, and using very short, strong pushrods. If you don't want to do this, then the only recommendation that I have found satisfactory is the cable system as supplied by C.B. I DO NOT like long pushrods.

• • •

That's about it for this month. If you have any questions, it is best to call me personally, (916) 786-2725, EVENINGS ONLY. I do this column, the newsletter for IMAA, and also a newsletter for the EAA chapter here, so my writing overload is kind of extreme. If you do wish a written reply, please enclose a self-addressed, stamped envelope.

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**Waco . . . . . ** *Continued from page 17*

relatively small and easily handled. White dope trim was painted on the cowl and around the cabin windows. The long white stripe and license numbers (my AMA number) on the fuselage are Trim Monokote, carefully overcoated with clear dope so the fuel



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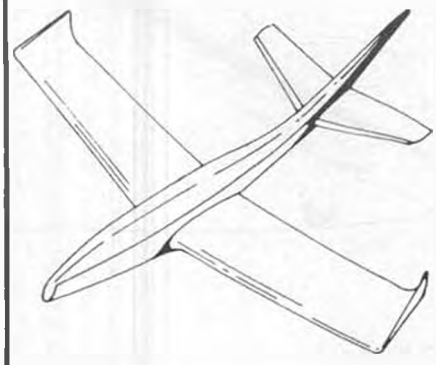

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exhaust won't remove them.

The "five-piece" windshield is made from one piece of plastic with the bends in the proper places. I used a plain piece of paper to cut, fit, bend, redo, etc. until it was correct before cutting the piece from plastic. The windshield "joints" are narrow strips of Trim Monokote.

**FLYING THE WACO**

Like any taildragger (and) biplane, the takeoff is the most interesting part. This plane definitely does not like crosswinds, especially from the left. A conscious use of some right rudder must be applied while opening the throttle, and don't firewall it! Just a touch of up elevator at the right moment and it is flying. When your heart stops going 240, full throttle will make the Wankel Waco climb like a homesick angel.

Very often, half-throttle takeoffs are the best, and most flying is done around half or even one-third throttle. Those low passes at a slower airspeed are beautiful! It is amazing how many R/C pilots think they must fly full bore all the time. (Full "bore" on a Wankel? Maybe, Mr. Chinn, we should say " full epitrochoidal chamber"?)

Unlike the open cockpit Wacos which were often used as trainers, the cabin planes were not meant to be kicked around the sky. Scale judges take note. The model can loop, do a Cuban eight, do a poor roll (me?), and even fly inverted, but the long diagonal struts complain . . . they bend.

I was surprised and pleased with the landing characteristics. The approach is honest and steady and it often sets down without a bounce. Dead-stick landings are OK, too, as long as the nose is kept down and the airspeed up. Sounds like full-size instructions, doesn't it? This should come as no surprise because scale models very often duplicate the habits of the big bird . . . and *that* is why we build them. •

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**Hannan . . . . .** *Continued from page 50.*

but eligible for other appropriate categories, are canards, pushers, and flying wings, which have proven their ability to equal or exceed performance of the more conventional machines.)

In the words of Doc Martin, "Now is the time to start looking forward to participation at the Second World Peanut Gran Prix (either in person or by proxy) . . . If you think it is a bit premature to have all these plans, you are wrong. Model builders are the worst procrastinators I have ever seen. I'll bet many will be staying up late next June 25, trying to finish a Peanut for the contest."

The 6th annual National Indoor Model Airplane Society Record Trials will also be held on June 24 through 26, with classes for virtually every category. Full details and entry forms may be obtained by sending a stamped envelope to: Dr. John Martin, 3227 Darwin Street, Miami, FL 33133.

**GREASY KID STUFF?**

The shift away from internal combustion engines in Free Flight Scale continues; witness the remarkable rebirth in interest for rubber power, and the increasing popularity of electric motors and $CO_2$ powerplants. (First and second places at the U.S. Nats this year were taken by electric and $CO_2$ powered models, respectively.)

However, interest in "real engines" seems never to have been lost by youngsters, who according to Dave Linstrum, in speaking of his 12-year old son, Carl says: "...he loves 'em! Something about the mystique of lotsa noise, racing fuel, the fast climb, etc. Half-A has always been his favorite event, sometimes flown with .051 as Class A. He is looking foward to next year, when I will

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let him handle an old Cox .15 and McCoy .29/.35 for Classes A/B/C. Kids get turned on by the noise and the speed. Grease is a necessary evil."

**WORDS OF WISDOM FOR MODEL DESIGNERS:**

"You don't put a piece of wood just because there's a hole, you put a piece because it's needed!" Walt Mooney.

"I think it be too heavy!" Ove Petterson, of Denmark, as reported by Ed Carson.

**NEW CATALOG**

"CHE" Hobbies offers their latest compendium of kits and supplies. While catering particularly to free flight competition needs, even the casual sport flier is apt to find items of interest available from this source. Kits stocked run the gamut from hand-launched gliders and Nordics through FAI Power types, with a sprinkling of Old Timers, profiles and scale models thrown in for good measure.

Need propellers? CHE offers 'em for everything from tiny rubber and $CO_2$ powered models up to laminated wood airscrews over 12 inches in diameter. Miscellaneous offerings include balsa and rubber strippers, vacuum-based vises, electric motor systems, rubber motors and winders, covering materials, and so on. A buck sent for a catalog will be applied toward your first order: CHE Hobbies, 10900 Eastwood Ave., Inglewood, CA 90304.

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**SOLAR POWER**

The Gossamer Penguin, originally intended as a back-up spare for the English Channel-crossing Gossamer Albatross, has made a series of successful flights under electric power derived directly from sunlight via solar cells. As usual, model builders are directly involved, including Dave Saks and Dr. Paul MacCready himself.

Piloting the creation, which employs no "cheater" batteries, has been 95-pound Janice Brown. This is reminiscent of Joan Hughes, the British woman pilot who flew the reproduction Demoiselle in the "Magnificent Men" movie, after it refused to leave the ground with heavier male pilots!

The Gossamer Penguin itself weighs approximately 68 pounds, has a 72-foot span, and flies at about 16 miles per hour.

**A WAY AROUND OPEC?**

According to a UPI release, a government agency in the Philippines has been running a motorcycle on a mixture of coconut oil and gasoline. Since it is a two-stroke engine, it would seem likely the same stuff would work in a model ignition engine. The agency claims a mileage increase for the mixture plus a "sweet scent" to the exhaust. Drawbacks? Only a bit smokier, they claim, but for model aerobatic types that might be an advantage!

**PROGRESS**

Frank Scott reports interesting trends in rubber-powered scale models noted during the massive Flying Aces meet (over 300 miniatures at one place!): "The outsides are looking more substantial, with opaque finishes; but the internal structure is going away. Also, I think the day may be past when high-wingers have an automatic advantage over their low and mid-wing brethren."

**WHAT'S IN A NAME?**

William B. Stout, of Ford Trimotor and early model aeroplane promotion fame, was also a fan of flapping-wing machines. In his typical innovative manner, he wasn't satisfied with the usual label "ornithopter." No sir, Bill came up with an original. According to the January 1947 *Science Illustrated*, he called his design the "GEFLOPIGATOR"!

**THE BAD NEWS**

The famous *Flying Aces Club News*, edited by Dave Stott and Bob Thompson, is no more. Publication has ceased with the 74th issue of this fondly-regarded newsletter. The influence of Stott and Thompson has spread virtually worldwide, and their strictly fun-oriented contest events have been adopted or emulated in many different places. Consider this sampling of their "wares":

1) Creation of Peanut Scale. More of this type model are flying than any other scale form, regardless of size.

2) Flying Aces Scale. The original rules were designed to encourage unusual subjects by awarding bonus points for difficult designs.

3) No-Cal Scale. Fast construction, low-cost fun via profile scale models for both indoor and outdoor flying.

4) Embryo Endurance. The innovative class for realistic sport models that R.O.G. from a common card table.

5) Thompson Trophy. The mass-launched model racer event.

6) Battle Bird Combat. Another category for mass-launches catering to WW-I or WW-II models.

The *FAC News* itself, strove to preserve "the spirit of the skies," keeping alive the marvelous aura of the fondly-recalled *Flying Aces* magazine of yore. Truely, Dave Stott and Bob Thompson have earned the right to rest upon their laurels.

**THE GOOD NEWS**

Closure of the Stott/Thompson publication does *not* mean an end to the Flying Aces Club! On the contrary, the group will have a new "Supreme Commander" and Editor, in the person of Lin Reichel. Lin has been deeply involved in the FAC effort almost from the beginning, and was instrumental in spreading the word throughout Pennsylvania and Ohio long ago. Reichel will carry on the "missionary work" of the FAC, and expects to publish the newsletter every two months, as was approximately the case in the past. Further, the circulation is likely to be expanded, under a new policy. While rather restricted previously, the new publication will be available to anyone who may care to subscribe. The cost will be $9.00 per

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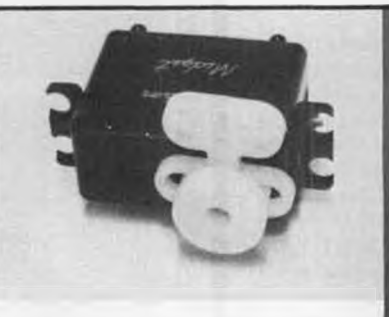

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**SIGN OFF TIME AGAIN**

Remember, if you insist on procrastinating, DO IT NOW! •

---

**1 to 1 Scale . .** *Continued from page 12*

some of the rules emphasis.

**A "TAG-A-LONG"**

At the Nats this year I had a very nice conversation with a couple of C/L scale fellas from California. During the chat they lamented the fact that it was becoming increasingly more difficult to transport their models because of the latter's size. Since many of them are now virtually an R/C size model and often are one piece, they just won't fit in many vehicles, especially since new automobiles are gradually getting smaller. I told them about the trailer that I built to transport my models and they were interested in some details. While the sketch provided in this article comes a long way from being a set of detailed plans, perhaps others would be interested in what I used (and the mistakes I made). Actually, I borrowed my ideas from Len McCoy of Kansas City, after picking his brain at several contests in 1976.

I purchased a Sears trailer frame through catalog sales. They have several to choose from, however the one that I have is listed in the catalog as "Kit for 56x44-inch Trailer," 28H6158NV. I was warned that the small wheels would give me fits, but I have not found this to be true. I clean and repack the bearings each spring. The trailer sets out during the entire year and the only problem that I have encountered is a trend toward minor cracking of the tires from the weather. I pulled the trailer to California and back in 1977 for the Nats and the desert heat caused no problems. Actually, my van wheels ran hotter than the small trailer wheels. This is perhaps due to the fact that, fully loaded, the trailer weighs only 400 to 500 lbs.

I extended the hitch about three feet to allow for a longer bed than the original design. Also, with the extension, I can open the rear van doors while the trailer is hitched. The substitution required finding a piece of square steel stock. The piece I have is 2-1/2 inches square and is simply bolted to the same holes in the original frame.

The bottom and sides are constructed of 3/4-inch plywood. I used an exterior grade and coated the outside with fiberglass resin. In addition, the bottom was sprayed with auto undercoating using spray cans, available in auto supply stores. The heavier plywood was used because I felt some extra weight might make the trailer less bouncy. It also would tend to make it less prone to twisting on rough pavement.

The top was something that I goofed on. The front is curved to allow turning clearance. The forward lid is piano hinged to the fixed piece on top at the very front. The rear half of the top slides out and keys into the rear wall of the trailer. Two locks are placed at the center on each side, using hasps. The problem is that even with a fitted canvas top cover, it tends to leak water along the piano hinge and at the center seam. One of next year's projects is to replace the top with a lightweight one-piece type that fits down over the trailer sides a few inches.

The canvas cover uses snaps and eyelets with rope to hold it down. The tiedowns for the rope can be the gadgets

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used for awning pull ropes or boat cleats cut in half. They are mounted toward the bottom edge of the side. One piece of rope is laced through the eyelets and the hold-down on each side and end of the trailer.

The inside bottom is covered with scraps of carpet. In order to hold things in place, I screw eyelets into the plywood floor, mount the model on some foam, and using strips of foam attached to clothesline, tie the model down. As long as there is no slack in the foam or rope, the model (or toolbox, etc.) will ride right with the trailer. In spite of the fact that some roads will make the trailer become airborne, no damage has occurred.

Make certain that you load the trailer so as to maintain some hitch weight. Mine runs with about 50 pounds on the hitch. Any car from compact on up should be able to handle it and hardly know it's back there.

As to the cost, I would hesitate to estimate this now. Exterior or marine grade plywood is expensive. The frame and running gear is listed at $225 in the catalog. The canvas top I have was made by a custom boat cover place and cost $35 in 1977. I also purchased a spare wheel, tire, and bearings. The resin I used came from a boat supply store; a gallon did the job. A trailer supplier provided the lights and car wiring harness as well as the hitch, ball, and safety chains. In Missouri, the license runs $7.50 a year and the personal property tax is just a few dollars. During the winter I wrap it in a big plastic paint drop-cloth that helps keep out some of the water.

Leonard McCoy used to keep his trailer in the garage during the flying season and could actually store contest gear in it between uses. An extension cord provided power to charge right there and much time was saved loading up for trips. That sounds like a nifty idea.

If you have such an outfit, let us know what some of your helpful suggestions might be.

**FOR THE 1981 NATS**

The November 1980 issue of *Model Aviation* noted that FAI specifications will be used to select the scale teams for 1982. This recommendation, along with several others, was made to AMA by both the scale team of 1980 and NASA. In addition, the Executive Council was asked to approve sending the Sport Scale team in 1982, even though it will not be an official event until 1983. As an incentive to do this, it was pointed out that NASA has some $800 of the slightly over $1000, raised selling patches for Scale '80 in Ottawa, available to help send the team. In addition, experience would indicate that another $1000 could easily be raised prior to the 1982 event. Hopefully, at its next meeting the council will approve sending the team.

Be certain to read Monty Groves' material in *Model Aviation* as well as the FAI requirements in your rulebook. Assuming that the same basic pattern will be followed for 1982, the specifications you need to consider are as follows:

Engine size maximum:
Precision Scale: 10cc
Sport Scale: 10cc (1 engine)
15cc (2 engines)
20cc (3 or more)
Model weight maximum: 6 kg (13.2 lbs.)
Surface loading: 100 gm/sq. dm
(32 oz./sq. ft.)

The surface loading requirement is a critical one which causes some problems. The total area of the wing *and horizontal tail surface* is included. This also includes the portion of the wing and tail in the fuselage cross-section. Have fun calculating those elliptical wings and tails!

In a future column, we will treat the finer points of the FAI requirements, both preparation of the model and documentation and the flying portion.

**SHORT SHOTS**

Have you tried Sig Koverall? It is a heat shrinkable *fabric* which requires very little paint to fill. There is no adhesive on the back, but it can be applied in the same ways as silk by using dope, glues, etc. It comes in 48x36 and 48x72-inch sheets.

Robart has placed on the market formed struts which fit their newest offset P-51 type gear leg. I suspect people had a problem bending the offset accurately. They are plenty long on both ends and can be bent for the

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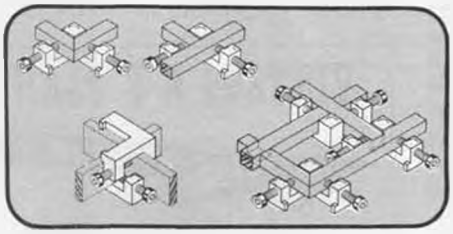

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C/L . . . . . *Continued from page 59*

to win. I admire him for this kind of dedication and envy his abilities. But the fact remains that he and his peers, the Kilsdonks, Ballards, Lees and so on, have pushed the event to the point where only a few models and one hard-to-locate engine, needing custom work, are competitive. In time, say five or six years, these same racers will be able to do very nearly the same thing to *any racing event;* I point the finger to Slow Rat as my perfect example-of-the-month. And that was not necessarily meant to be nasty . . .

However, in the meantime, you and I, average racers of the land, can have a hell of a good time once again, building new models (in many cases just building a new model to compete with, not to replace an existing machine, as that one has been hanging, unused, for too many years), racing K&B against OPS, against S.T., against Picco, and so on.

And I ask you, what good is an event in which the masses don't participate? Racing activity in Goodyear is presently very low; any change almost has to be for the better.

**ANOTHER LETTER**

The Gulf Hawks Model Airplane Club of St. Petersburg, Florida, is heavily into Class A Goodyear, restricted to plain bearing .15's, and they do not like the idea of going to 3.5 motors. Courtesy of Paula Conner, club secretary, here is a letter the club circulated to the members of the C/L Contest Board:

*Control Line Contest Board:*

*In reference to Mr. George F. Lieb's proposal in* Model Aviation; *issue of October 1980, page 90, CL-82-5.*

*This proposal is to allow engines of up to 3.5cc to be used in Class A Scale Racing. Models in the 2.5 to 3.5cc range, to be of 1/7 scale instead of the present 1/8 scale.*

*Mr. Lieb may have good intentions; however, there are numerous engines in the .15 cubic inch range at reasonable prices on the market. Some of the high performance .15's on the market are getting expensive, but they aren't nearly as expensive as the high performance .21's now available. You can still buy a Cox or Fox .15 for less than $25.00, as opposed to a World Engine Picco 3.5cc R/C Car engine, which lists for $199.95 (rear cover* Model Aviation, *Nov. issue). We as a club would not even consider having a scale event if we had to spend $200.00 for each engine.*

*Mr. Lieb is also quite wrong in another area. That is, a 1/8 scale .15 being as fast as a 1/7 scale .21. The old axiom that there is no substitute for cubic inches is as true in models as in automobiles. A .21 would have to be much larger to bring the model speed down for the .15's to be competitive against them.*

*Our club, the Gulf Hawks of St. Petersburg, Florida, was 50% responsible for the Class A Scale racing event as it now stands. We as a club feel this is a fun event and the speed is not too extreme. You can get into it as it now stands without spending a large sum of money.*

*I myself would much rather fly my Little Toni .15 than the Macci I have which is powered by a Fox .36 Combat Special. The 100+ mph models are impressive, but not fun for beginners to fly.*

*We as a club sincerely hope you vote against this proposal, as we'd very much like to keep the event as it now stands.*


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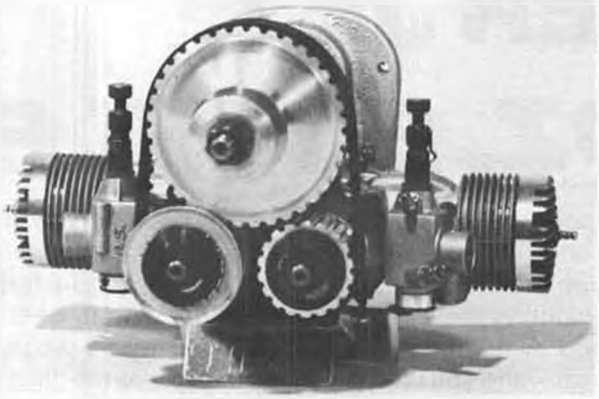

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*Respectfully,*
*The Gulf Hawks (Charter No. 207)*
*Chris Brimmer (President)*
*Chris Ward (Vice-President)*
*Joel Kubus (Treasurer)*
*Paula Conner (Secretary)*

Good letter, and I can see their point. But it needs to be mentioned that regardless of what happens with this proposal from George Lieb, they can still keep their event as-is. The AMA is very tolerant of special local rules and restrictions, allowing them to deviate from the AMA rulebook. Even totally off-the-wall events, such as Northwest Sport Race, can be dreamed up and still be raced under an AMA sanction and with full coverage as far as insurance is concerned. All it has to be is safe and you can do your own thing, no problem.

**SPEED SECRET**

For you poor souls who have read this far, how about an easy way to get some more power as well as extra mileage? The tip is some new oil, imported from someplace in Europe (I really don't know where, would tell you if I did) and now available from Delta Manufacturing, 27 Race Car Court, Lorimor, IA 50149. Telephone number is (515) 763-2220, if you want to call.

The oil is super slippery and (get ready for a shock) we are presently using it in 25% nitro fuel in 7% oil blends. Sure, only 7% oil sounds a bit low, but this is fuel used in R/C car motors, units that are severely over-revved frequently and that can run quite a bit hotter than the same motors used in model airplanes. Remember that expensive Picco I mentioned earlier on? Ain't no way I would take a chance with that motor, yet all it knows for fuel is Delta's 25% nitro, 7% oil mixture. But you don't need to buy the fuel to get the oil. Delta is selling quarts of the oil for around $8.00 per. More expensive than castor, but then you don't need near as much, either.

When you get some of the oil, I don't know exactly what percentage to suggest you use. Having run it for quite awhile in cars, I would be inclined to at least try dropping the oil clear down to a 5% mix, if interested in maximum power and mileage, although I would be prepared to lunch a motor and so wouldn't risk something good. I know you would be safe at 7%, but even if using a heavy mix, say 10% of the Delta oil, the increase in power and mileage would be significant. The only other caution I might throw in, just to keep somebody from doing something really stupid, is that we run this low oil fuel exclusively in ball-bearing motors fitted with ABC and AAC piston/cylinder sets. These are very resistant to seizing, just sag noticeably if run over-lean. If I were to use the oil in a plain-bearing motor using a steel liner, I would be more cautious and go with about 9% or 10%.

In any event, the oil does work very well and you'll like the free power it gives. Let me know how it works for you . . . •

**Sharks! . . . . . .** *Continued from page 40*

ing the corners of the fuselage. And it certainly *is* easier to leave them square.

This same argument applies to my car's gas mileage. If I do nothing to my car but overinflate my tires a bit, I probably won't see any real change in my mileage. Ditto if I merely set my valves. Or regap my plugs, or my points. No one of these things alone is going to make enough difference in my car's performance to notice.

But suppose I do them all at once: points, plugs, valves, timing, carb tune-up, tires. Now I'm going to see a measurable improvement in my gas mileage.



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Just so with a typical model built from a kit. Since the design was considered good enough to kit in the first place, it probably has a reasonably high level of performance already engineered into it. So you're not likely to make a quantum leap in your model's performance by any one act of drag reduction. However, if you're willing to do a number of small things all at once, then you're going to find that your "stock kit" flies noticeably better than the same kit built by your old flying buddy Harley Hacker. And everything you do will make your plane look less and less like a crude wooden flying machine, and more and more like . . . a shark.

Aha, you say, Thornburg is about to give us the sales pitch for a thousand dollars' worth of woodworking tools, tools to round corners and gouge fillets and carve noseblocks and hum and whirr and grind and fill our lives with sawdust and our wives with indignation and send us all to the poorhouse, do not pass GO, do not collect $200.

Nope.

The tools you need for streamlining a model, for making it more shark-like and hence more efficient, consist mostly of sanding blocks, and they're 100% homemade. You can make up a complete set of them in an hour's time, and it will be the best hour you ever spent.

Until I began kit manufacturing, back in '72, I never really appreciated the virtues of the humble sanding block. Not that I didn't believe in sandpaper. I just kept a lot of loose sheets of various grades lying about the workbench, and when I had some sanding to do I bent one of them around the nearest piece of scrap balsa and went to it. This method works, but only marginally. Most of your skill and effort goes into keeping the sandpaper from slipping off the block, and keeping the loose edges from ripping away at parts of the model you never intended to touch. Besides, it wastes sandpaper; you never get full use out of a sheet before it becomes so creased and torn that it's practically useless.

Much better you should spend a little time making up some blocks in advance. I like to use 3/8 x 3-inch hard balsa cut into 6-inch sections, as per the drawing. Pine is cheaper; I simply like the weight of balsa. Four sanding blocks cover the spectrum I usually need: one with 80-grit paper, one with 120, one with 240, and one with 400.

Don't skimp on the quality of the sandpaper: buy the 12-inch-square sheets of garnet paper available at hardware stores and better hobby shops. It costs 30¢ and up per sheet, but it lasts forever when glued to a block of wood.

And don't bother with special glues to hold the paper down. Rubber cement, contact cement (spray or liquid), white glue, epoxy . . . anything will work. Just


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be sure to clean both surfaces of lumps before you join them. When the paper finally wears out, I seldom remove it; it's much easier to glue the new sheet over the old, as long as the surface remains perfectly smooth and even.

To make an even niftier block, radius one of the corners and lap the sandpaper up the side of the block, as the drawing suggests. Then you can use that edge of the block for getting into filleted corners, and the square edge for the unfilleted ones.

In addition to the four 3 x 6 flat blocks, I like to have on hand a few odd and assorted shapes. The handiest of these are round, made from dowels, in 1/4, 1/2, 3/4, and 1-inch diameters. Again, 6 inches makes a nice length, long enough to wrap one end with fine grit paper and the other with coarse. Gluing the paper to the dowel is a bit trickier than with the flat blocks; try cutting the paper to exactly the length needed for one tight wrap around the dowel and a smooth joint, then hold it in place with lots of rubber bands while the glue dries.

Every model you build will generate its own peculiar sanding blocks, if you let it. The trick is not to get carried away, not to let the sanding blocks themselves become a hobby (nobody needs *two* crazy hobbies). Still, there are a few odd blocks in my collection that have paid for themselves over the years. One type is used to square the spar notches in die-cut (and hand-cut) wing ribs; it's made from a scrap piece of wing spar. Another smaller version makes notches for turbulator spars and fuselage stringers. And still another . . . but why go on? It only shows my age, and how many models I've built and crashed. The point is, sanding blocks are easy to make, and dollar for dollar, are the handiest tools in your workshop.

But admittedly they're not the only tool you'll need to make round and shark-like airplanes. A good razor plane is also useful. The one I use comes from West Germany and goes by the brand-name "Fix." I bought it at Henry J. Nicholls' shop in London about ten years ago, and I still haven't worn out all four of the German-steel blades!

Lacking a good razor plane, you can do a certain amount of rough shaping with a long-blade modeling knife such as the X-Acto No. 26, although this requires more skill than the razor plane. And don't forget a small coping saw, hardware-store variety, for handling spruce, pine, and plywoods. And that's about it, as shark-shaping tools go.

* * *

Okay, now that you have the tools, what do you do with them? Let's take a typical sailplane kit, the Olympic II by Airtronics, and see what we can do to make it more shark-like.

The Oly II is already a clean and streamlined design; we're going to have a tough time improving on it. Suppose we start with the tailfeathers, traditionally the last parts to be built, and often the sloppiest. A lot of modelers seem to feel that since the wing is what flies, the lowly stab and rudder don't deserve much attention. I've actually seen Oly II's built and flown with *perfectly square* leading edges on the rudder and stab! The planes in question did fly, by the way, but . . . not as well as they might have!

Look again at our shark. No blunted leading edges on him, not even on the smallest fin. Every surface has rounded (well, actually *parabolic*, but that's a quibble) leading edges, and every surface tapers to a lovely knife-edge at the rear. To extract the maximum performance from our Oly II, that's exactly how our rudder and stab should be shaped.

Of course, there's a limit to how thin you can shave a trailing edge, especially one made out of balsa. You have to be practical; make it too thin and it will be prone to warps and hangar rash. That's why few plans call for edges any thinner than 1/16 or 3/32 of an inch at the rear. Modelers who want to go thinner have been known to substitute a piece of straight-grained spruce for the last 1/8 to 1/4 inch of balsa at the very edge. Then they can shave it down to razor thinness, just like the surfaces on the 240+ mph ship the Austrian team used to set the current FAI sailplane speed record.

And what about the Oly's "stab mount," those two triangle fillets glued to either side of the fuselage? How

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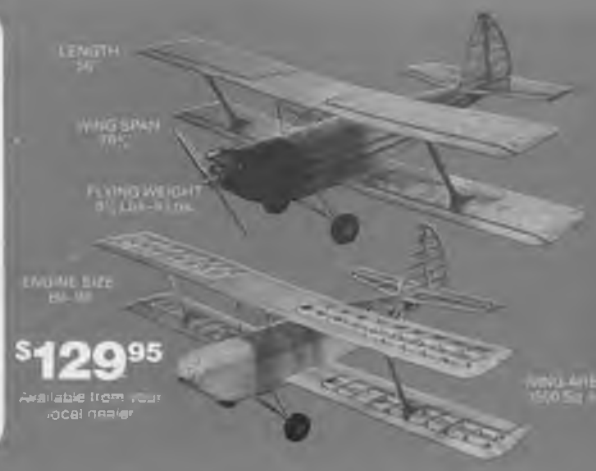


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would they be shaped, if they were on a shark? From a top view, they'd probably be shaped a lot like wing ribs. . . rounded at the front, long and tapering at the rear, so the air coming down the fuselage flo-o-ows over them smoothly. Also, they'd be true fillets in cross-section, instead of just simple triangles. And that's where your dowel-shaped sanding blocks come in. (Here's a tip: whenever you're sanding fillets that are already glued in place, cover the surrounding balsa with masking tape to keep from gouging it accidentally with fingers or sandpaper.)

Looking at the rest of the fuselage, you can't do much better than to follow the shapes and cross-sections shown on the plans. This means razor-planing the corners down to rough shape, and finishing the job with your flat sanding blocks. You ought to be able to streamline that noseblock a bit more than the plans show; no self-respecting shark would be caught dead with so blunt a nose! Here's where your coping saw comes in handy. Draw a nice parabolic curve on the top of the block and saw away at it, remembering to keep the blade as vertical as possible so that you come out with the same shape on the bottom of the block as you have at the top. I find a coping saw handy for rounding corners, as well, but this takes confidence. Most people prefer the razor plane.

All this sounds like too much work, you say? It is, unless you want a model that looks just a little better, and flies just a little better, than your neighbor's. For that, you'll have to expend an extra hour, maybe two, on a kit that's going to take between twenty and forty hours to build, anyway. What's an extra five to ten percent tacked onto the building time of your model, if it makes it look and fly better? Try it on your next ship. Apply the "shark test" to everything that sticks out into the wind: *How would this piece look if it were part of a shark?*

And meanwhile, next time you go swimming, take a good, close look at a shark. It'll give you food for thought. •

**I.M.A.A. ....** *Continued from page 24*

Heller's Cub. This was another eerily realistic performer. The sight and sound of that bright yellow Cub shooting landings had me daydreaming about things from forty years ago.

In propellers, there was no strong trend, brand-wise. I saw every make available plus some homemades. The 18x8 is the most common size on Quadras, with a total range from 18x6 to 20x6. Most of the Kioritz engines were being run with 20x10's, while the bigger Kawasakis and Roper had 24x8's and 10's. My personal feeling is that we are still under-propping these big-bore gasoline burners. I'm still amazed at what I saw Dave Landveter do earlier in the year with a homemade 21x12 on a Quadra.


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I noticed that there were very few true scratch-built models at Napoleon. Two-thirds of those registered were built from kits, and most of the rest were built from someone else's plans. The workmanship on most of the aircraft was of a very high level.

This first IMAA Eastern Regional Fly-In was certainly a success from my point of view. Lots of big birds to look at, lots of interesting people to talk to, and lots of great flying to watch. The only thing I could possibly want added to all that is some flying of my own! If I can get out of the darkroom and out from behind this typewriter for a while this winter I just might have time to get something in the air next spring.

Below I have listed the pertinent data on most if the aircraft mentioned and pictured, organized as follows: aircraft type; scale; owner; source (i.e. scratch, plan, or kit-built); engine; prop; and weight.

1) 1934 Bird; 1/4 scale; Dick Coutchure; scratch-built; Quadra; Dynathrust 18x6; 25 lbs.

2) CAP 20L; 3.25"=1' scale; Darrell Higgins; Higgins Aero Comp. kit; Quadra; Dynathrust 18x8; 17.5 lbs.

3) Citabria; 1/4 scale; Cliff Tacie; Nosen kit; Quadra; Zinger 18x6; 18 lbs.

4) Piper Cub; 1/4 scale; Chuck Heller; Nosen kit; O.S. Gemini 120 four-cycle twin; Top Flite 18x6; 15 lbs.

5) Pitts Special; 1/3 scale; Miles Reed; Sheber plans; Kioritz; Zinger 20x10; 20 lbs.

6) Stinson SR-9; 1/4 scale; Corky Heitman; Barron plans; Kioritz; 22x8; 37 lbs.

7) Telemaster (BIG); NA; Jim Cline; blown up from kit; Kioritz; 20x10; 28 lbs.

8) Sr. Telemaster; NA; Jerry Smith; Kit; Webra .91; Top Flite 16x6; 12 lbs. •


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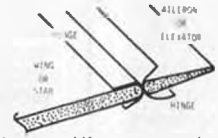

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**Santa Paula . .** *Continued from page 39*

nearby Ventura to mow the lawn and do all such good things as husbands are expected to do on Saturday morning. Fortunately, there were just too many open hangars and I got trapped taking pictures and visiting with the friendly owners. Here are a few random hangars that caught my fancy:

Just around the corner from the R/C exhibit was one of Jim Dewey's masterpieces, a full-scale Boeing F4B3 that he is scratch building. It will be flying in about a year. Jim is a master craftsman, with over 50 years of building and flying those "wonderful machines." Over the years he's restored, built or rebuilt-from-scratch everything from a 1928 Primary Glider to the Deweybird, a two-place high-performance ship of his own design. Over the past 20 years or so that I've visited the airport, Dewey Aviation always has had two or three fascinating projects in the works.

Down hangar row a bit is one owned by the Moth experts, Stan Worth and John Gerney. In addition to the two or three they're working on in the hangar, they'd pulled out for display a DeHavilland Tiger Moth immaculately restored in the shiny blue and grey color scheme of the Royal British Flying Club. Listening to John talk, I got the feeling they know the location of every Moth, whether flying or otherwise, in the world.

Scattered all around the airport were several examples of the Vari-Eze. This is a small two-passenger canard designed by

Burt Rutan, who operates out of Mojave Airport. The one I particularly liked was built by Jim Kern and owned by Bob Keenan.

Some of us are glider nuts. At the opposite end of the airport I came across two teenagers polishing up a Fournier RF-4D, the French motorglider that has been kitted in one form or another so many times for us modelers. Found out that this beautiful example is owned by Mira Slovak. Ah, there's a story. Mira was the gentleman who flew out from behind the Iron Curtain with a planeload of passengers in 1953. Later he flew a Fournier RF-4 from Europe to the West Coast, only to crash and almost kill himself at Santa Paula Airport. In recent years he's appeared at local airshows in an aerobatic Polish Lunyak glider, sliding to the ground in a series of loops and rolls to the tune "Born Free." It almost ruined my day to find out he'd given this plane to a museum.

The above is just a taste of what's hidden in the hangars of Santa Paula Airport. Saturday and Sunday are visiting days even when there's not an airshow. If you're around, drop by. In the past I've seen a swarm of Ryan ST's, three Aeronca C-3's in a row, Stinson Reliants, Monocoupes, and a replica of the Glenn Curtiss 1909 Biplane, to name a few. Clete Roberts has a hangar with a 1946 Piper J-3 Cub, a 1931 Buhl Pup, and a 1948 Stinson. Just wish I could say some magic words and open up all the hangars!


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Back to the airshow. After the ultralight show, the runway was opened up for $5 plane rides. I decided to go along on one to get a good aerial picture of the airport. On landing in a standard Cessna 172, I discovered I'd blown it. For $5 more I could have done the same thing in the front open cockpit of a Great Lakes biplane, complete with canvas helmet and flown by Bill Lively.

Ken Holden of the Camarillo Flying Circus R/C group had organized an R/C demonstration just before the start of the main airshow. Unfortunately, on Saturday their time was cut from a promised 45 minutes or so to 20 minutes. As a result, it was a hurried show to say the least. Nevertheless, in addition to other acts, Don Thomey flew his Curare through some precision aerobatics. There was a fun 1/2A pylon race between Ken and his son. And Stan Hinman had a pretty thermal flight off the hot runway with his Bird of Time. I understand from Ken that on Sunday they got their full time schedule and did it up right.

The start of the show introduced quite a bit of nostalgia for the old timers. Ralph Dickenson, now 85, and with Dan Emmet, the founder of the airport, landed a Cessna 180 to cut the ribbon opening the show. On board was his son, grandson, and great grandson. As I


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understand, Dan just recently quit flying his Beech Staggerwing.

That reminds me, there was another great plane I forgot to mention: Ralph's son, Don, flew a 1936 Spartan Executive for the show, acting with a Beech Staggerwing as guard planes for an air race I'll mention later. The Executive was one of those planes 20 years ahead of its time.

After the ribbon cutting, Congressman Barry Goldwater Jr. arrived in a Bonanza with a U.S. flag that had flown over the Capital. Promptly, Kal Irwin took off in an old biplane and dropped 67-year-old Ralph Wiggins from about 5,000 feet with the flag flying below him and his parachute. This was in celebration of Ralph and Ken's first jump together back in 1937.

For those (like me) who like to watch the Pitts Special perform, there were three of them. Dr. Tom Grubbs put on a great precision show in a jazzy green/black/white S-1S. A last minute fly-in, Earl Banning, who is now the British National Champion, did a four-minute free-style show that left my heart pounding. (For scale builders, his Pitts was a dream . . . dark blue and grey with British roundels on the underside of the lower wing and a Union Jack across the upper wing.) Then Dan Grey, a Santa Paula local and current United Airlines pilot, put on one of his unique "double Pitts" shows. He first flew a precision aerobatic performance with his R/C 1/4-scale Pitts. Then, throwing the controls to a friend, jumped into a full-size Pitts and duplicated the routine. Wow! As I remember, Dan Pulled this same stunt a couple of years ago with an R/C scale and full-size Chipmunk.

Then, for those who like their aerobatics slower, Perry Schreffler, with 40 years of flying, put his Bucker Jungmann through its paces. The contrast between the Jungmann and the Pitts is quite something.

The pylon race was among five Howard DGA-15's. That's right, five Howards! This plane is a five-passenger high-wing taildragger built during the early 40's as a private plane and later used as a Navy courier plane. The engine is a 400-hp Pratt & Whitney Wasp. The roar as these aircraft took off brought tears to my eyes. The race itself was kind of anticlimactic, and I don't even remember who won. The fun was seeing five of these planes in the air at the same time.

The show finished with four "damn crazy" hang glider pilots throwing themselves off the top of nearby South Mountain and landing gently on the runway.

Santa Paula has had and will have other airshows. Obviously, the 50th was something special. •

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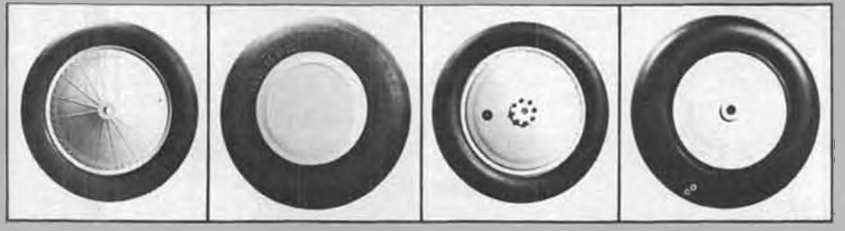

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**Engines . . . .** *Continued from page 32*

owned by Bill Atwood, manufacturing different engines in the same building and hiding that fact from the public by using the side door address on McKinley St. for one business and the front door on Gage St. for the other. During this period the ads for the Atwood Champion listed their address as 1104 Architect Bldg., Los Angeles. Bill Atwood was very busy in those days.

Across the street and down a few doors is 6425 McKinley, the 1950's home of Allyn Sales, which manufactured the Sky Fury engine. Jedlick Mold Makers now does injection molding at the facility.

Again across the street and down a few doors is 6714 McKinley, the 1940-1942 home of Bunch Motor Co. The building is now boarded up. The buildings in this complex are next to a railroad siding. Did the aluminum and other raw materials in those days come in by rail?

The most successful engine of both the prewar and postwar years was the Ohlsson & Rice. The Ohlsson Miniature began life in 1937 at 630 N. Alvarado St. in Los Angeles, corner of Clinton. The building is now a cabinet shop. Irwin Ohlsson formed a partnership with Harry Rice and moved to 3340 Emery St., corner of Grande Vista. There were 148 employees at that facility at one time. Ohlsson & Rice was the biggest advertiser in the model magazines, buying either the two-page centerfold or the outside back cover, the most expensive page in a magazine.

Model engine production ceased in the 1950's after Irwin Ohlsson sold his interest in the company to Harry Rice. The invention of the glow plug in the late 1940's was the demise of the prewar designed ignition engines. New engines came on the market designed to withstand the greater power developed by the glow plug and fuel, and the older designs could not compete. The O&R was no exception.

In the 1970's, Harry Rice went into production of the O&R "Compact"

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engine designed for all sorts of outdoor power applications. That business has now ceased.

Harry Rice is now retired and lives near the Colorado River. As for Irwin Ohlsson, there is better than a 50-50 chance that the glow plug you have in your model engine was built by Irwin in the back of his house on the Palos Verdes Peninsula in California.

The offices in the front of 3340 Emery St. are now boarded up. Certified Enameling Co. occupies the back. Huge enameling tanks now occupy the space where literally tens of thousands of O&R engines were produced.

Harry Rice began his career in the model engine field in 1937, making parts for the James Motor. The address for the James was listed as 1700 W. Adams St., corner of Normandie. A Shell Station now occupies the location.

Mel Anderson Manufacturing Co., which made the famous Anderson Spitfire engine, listed an address of 1819 Third Ave., Los Angeles. The small building is now boarded up. Mel Anderson, now 78 years of age, lives in Alhambra, California.

One of the best-known ignition engines was the Dooling. Dooling engines and race cars were manufactured at 5452 W. Adams St. The building now houses ARA Auto Air Conditioning.

Another well-known racing engine was the McCoy, manufactured by Duromatic Products, 11500 Tennessee Ave., Los Angeles. Duromatic was long ago swallowed up by the Testors Corporation. Testors is still at that same address, manufacturing its line of engines, planes, etc.

Miniature Motors, home of the Bullet engine, 8400 Higuera St. in Culver City, used a picture of their building in their full-page ad. The site is now a parking lot for The Pen Shop.

The Baby Cyclone and Super Cyclone engines were manufactured at 1229 Airway Drive, Grand Central Air Terminal, in Glendale. The famous flying field where Howard Hughes and many Hollywood celebrities kept their aircraft is now an industrial tract. Major C. C. Mosely, owner of the facility, died a few years ago.

The Contestor engine, designed by Dan Bunch, was built by Lucas and Smith Manufacturing Co. at 2636 Humbolt St., Los Angeles. Pacific Packaging Machinery Co. now occupies the premesis.

The Hassad Custom and Bluestreak racing engines were built at the Del Mar Airport in Del Mar, California. The airport, next to the Del Mar racetrack, was closed about 15 years ago. Today Ira Hassad operates a machine shop in El Cajon (east of San Diego), California.

Minijet Motors ran a full-page ad in the 1940's in *Model Airplane News*. Their address at 161 E. California St. in Pasadena is now the home of the Big Orange Graphics, Inc.

Pacific Airmotive Corporation was one of the few large, well-financed corporations to enter the model engine manufacturing business. Their product was the Dennymite engine. The listed address of 6853 Lankershim Blvd., North Hollywood, is the site of a major aircraft engine overhaul facility, the same today as it was then. The Dennymite engine business was sold to Ohlsson & Rice in the 1950's.

There are those who say that model engine manufacturing in the United States is dead, that the market has been taken over by the Japanese and Germans. Well, consider this: In its heyday, Ohlsson & Rice, the largest and undoubtedly most successful of the ignition engine manufacturers, built 750


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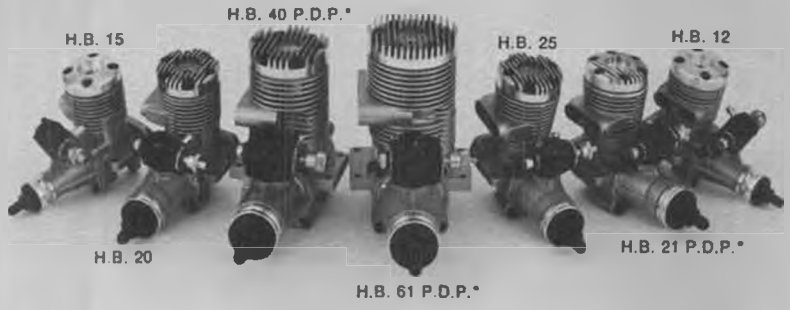


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engines per day. Today, Cox Manufacturing Co. makes over SIX THOUSAND engines a day! To paraphrase Mark Twain, the reported death of the model engine industry in this country is slightly exaggerated.

The writer wishes to thank Irwin Ohlsson, Mel Anderson, Timothy Dannels, and Clarence Lee for assistance in this article. •

**R/C Cars . . . .** *Continued from page 29*

What this has to tell you is that these few sponsored racers, pictures in the ads and all of that other hoopla, are very good race car drivers, good enough to win with most any brand or scale of car. What they can do, and usually what they race, has little to do with what we club racers are doing with our weekends. Keep that in mind, and realize that this is something I also keep in my mind when looking at new products, whatever they may be.

**SPEAKING OF NEW PRODUCTS. . .**

One of the most significant new developments is actually an idea warmed-over and redone. And that is the release of yet another ball-type differential for the 1/12 cars. BoLink really scooped the racers of the U.S., as well as the other manufacturers, when Bob Rule imported the Schumacher differential. They worked well, still do as a matter of fact, the units proving to be so popular that Bob was actually able to drop prices on the diffs. I had one of the first diffs around here and immediately decided they were the way to go. Since that time Leisure Electronics designed and produced a diff; MRP liked it and bought parts in bulk to package as its own diff. Thorp got in on the act with a well-made piece that offers the feature of being able to change wheels without disturbing the adjustments on the diff. Even though not available as a complete unit, JoMac does make a diff for its new Lightning 2000 race car, the diff coming as standard equipment on a couple of models of the car. Or you can just buy all the pieces separately.

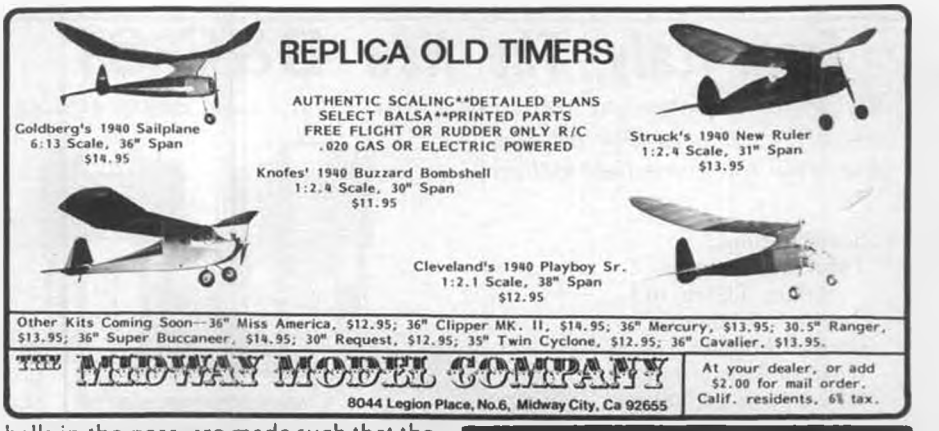
Left out of the equation was Associated. Its cars were being fitted with diffs, to be sure; I was adapting BoLink diffs, as were many others. There seemed to be several reasons for Associated being slow in releasing its own 1/12 diff. First, they wanted to put out not just another diff; that has already been done before, they wanted a better one. And the price had to be right. Compounding the problem was the fact that most of the guys working at Associated are also racers, and as each racer tends to have his own views on the ultimate trick, the design was "finalized" several times, each time being worked over yet again.

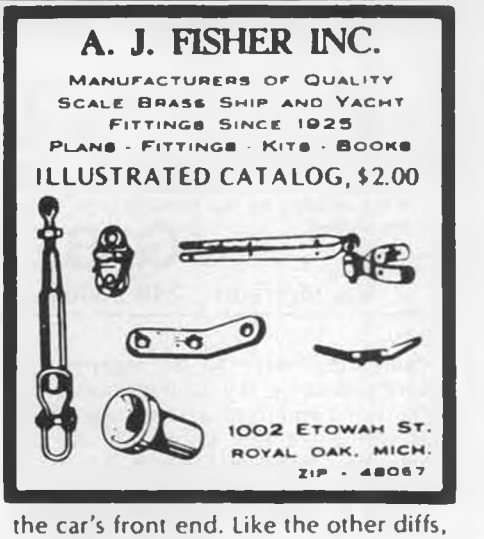
Finally the design was locked in and the diffs released last spring. And I must admit that the wait was worth it. In my opinion, their diff really is a step better than the others, quite possibly the ultimate development of the basic idea. The little molded-in pockets in the main gears, the ones that act as carriers for the balls in the gear, are made such that the balls simply snap in place and don't fall out when changing rear gears. Anybody who has had to change main gears on the other diffs, especially those who had to dig and scratch for that one ball that dropped off the table, will appreciate this feature. As a side note, we have been installing balls in any gears we are likely to need at the races, just to avoid the hassle of a last-second swap.

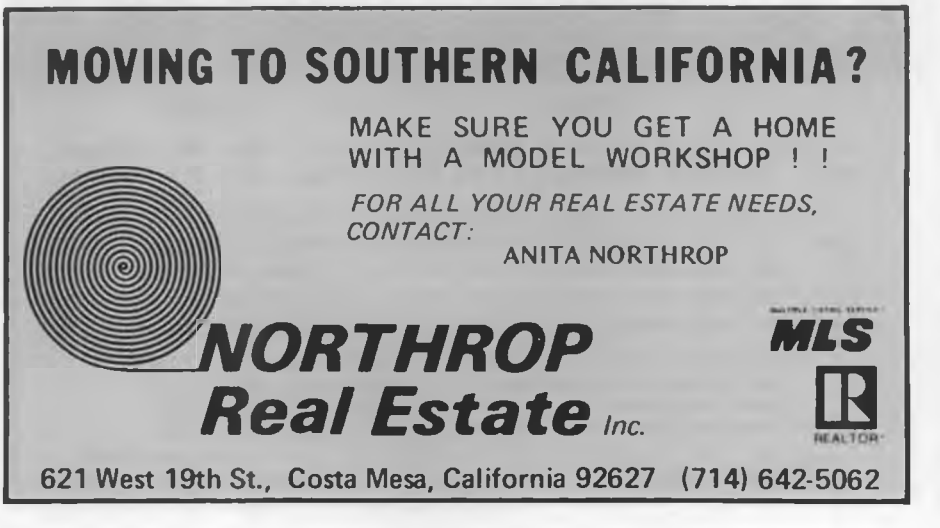
As long as the gear mold was being changed, a lot of effort went into making the gears run even quieter . . . a major accomplishment, as the pre-diff gears had already been quieter than the opposition's. These gears are now so quiet that with proper setup, you can hardly hear any gear noise at all, the cars just whooshing by.

I suppose I could go on about the different features of the Associated diff, but all I really care about is how it works. And I think it is the best. The neat thing, probably the single item that gets the most attention and helps it to work so well, is the fact that the adjusting nut can be clamped right down hard to eliminate any slipping of the main gear, and still the differential action between the two rear wheels is very light and free. What this means to the racer is that when traction is good, one needn't trade off a little gear slippage to get the car to tuck into the corners nicely. You just tighten up the nut to eliminate gear slippage, which results in getting the car to launch harder off the exits of corners, yet when it comes time to tuck into a tight corner, the diff is still very free and won't fight the car's front end. Like the other diffs, you can back off on the adjusting nut to get some gear slippage, a great feature for those days when you've got more power than traction, but then all the diffs do this.

Naturally, not all of the news is good. The instructions furnished seem to overlook the fact that not all potential buyers are familiar with this type of diff. A couple of friends just had their first introduction to diffs via the Associated diff and kinda ended up scratching their heads until they finally figured out the instructions. And even though the balls don't fall out of the gears, there are a couple of drive washers that need careful aligning before assembly is complete, and it is not always easy to get this setup right, especially when in a big

# From Italy, The New B&C-61

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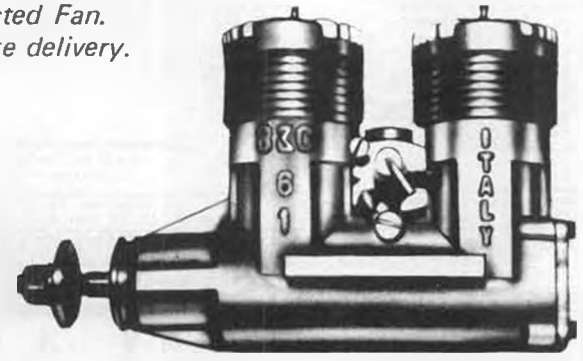


**Specifications:**
**Total displacement - 9.92cc (.61cu. in.)**
**Stroke - 17.50mm**
**Bore - 19.00mm**
**Weight - 510g (18 oz.)**
**HP - 2.10 at 24,000 rpm**

The twin inline B&C-61 is a shaft-induction, Schnuerle-scavenged, lapped piston motor with a four ball-bearing crankshaft. It uses a one-piece sand-cast crankcase and the connecting rods are machined from high-duty alloy with bronze bushed big-ends. Engine is an alternate firing type with a single R/C Perry carburettor, so it has low level of vibration and easy starting. The MINI-VOX Super Silent muffler, designed for this engine, and all other parts are available. Anyone interested in acquiring or other information, may write directly to the manufacturer. Shipping to all parts of the world. Dealer inquiries are invited.

## G. BERTELLA

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hurry.

Still, these have to be regarded as minor problems. If you're serious about 1/12 racing and think a better, smoother diff will cut a few tenths off the lap times, you need to look at the Associated diff. You'll like it.

There is another new product that, at this writing, is still in final stages of development, but may be available as you read this. And that is the new 1/18-scale race car from Delta Manufacturing. It is termed the "Pocket Rocket," as it is very small and yet is way out of the toy class, being a for-real race car. Several prototypes have been built and thrashed mercilessly. I have been promised one or two to play with, in fact I may possibly get involved in writing the building and tuning instructions, so this is a product you will be hearing a lot about. R/C racing in very small places in just right around the corner and it ought to be hot . . . stay tuned.

**IN PURSUIT OF MORE R/C CAR STUFF TO READ. . .**

Two quite good newsletters are available from Delta Manufacturing, 27 Race Car Court, Lorimor, IA 50149, and Associated Electronics, 1928 East Edinger, Santa Ana, CA 92705. Being factory rags, you can expect to see each respective newsletter do a lot to punch up the image of its outfit's own cars, which is expected, but even for racers campaigning cars of other manufacture there is a lot of good material to go over. Associated, if asked, will simply put your name on the mailing list for a year or so; no charge for the newsletter. Delta has a slightly different approach, in that they are really only in the newsletter business to keep owners of Delta race cars informed, but even if you don't own a Delta, I would imagine that a letter, preferably complete with stamped, self-addressed envelope enclosed, will net you a copy of the current newsletter. In either case, if you prefer to call, try Delta at (515) 763-2220 and Associated at (714) 547-4986. Tell 'em Da Dirt sent ya. . . ●


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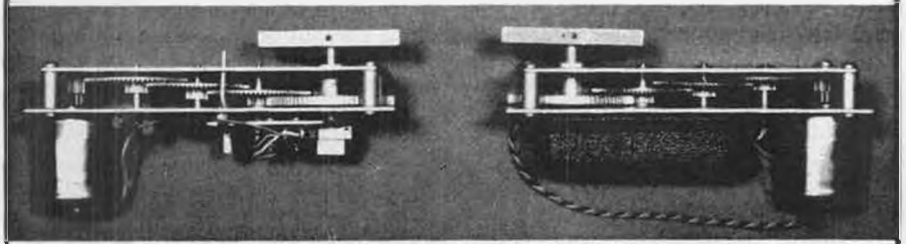

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**Electric . . . . .** *Continued from page 45*

must have been quite a sight to see him flying by gaslight!

The first major contest for electric airplanes that I know of that included all categories was the Astro Flight Championships at Sepulveda Basin, Los Angeles, in January, 1975. There were entries in free flight duration and scale, control line, R/C pattern, R/C scale, and R/C glider. It was a very windy day, and the planes had to be held down, but lots of flying and fun went on. The photos show the variety of entries. I entered a Baby Flite Streak with an Astro 020 in control line and even managed a loop, and one fellow in free flight did an out-of-sight flight on his Astro 020 Old Timer (no determalizer!). The R/C planes were very advanced; in fact, I haven't seen anything like them in contests since, except in Europe. Bob Boucher's Electra 225 looked like a fighter out of Star Wars, and easily took first in aerobatics. It flew at 80 to 90 mph, and was pure power in the air. It was powered by twin Astro 25's, and is offered by Astro Flight as a kit. Ed Sweeney came in a close second with his twin Astro 15 Kaos pattern plane. It too did excellent aerobatics, at a flying weight of (by guesstimate) six pounds. Ed also had a Quickie 500 using a Benson solid state throttle and the Astro 15 that did loops, rolls, and inverted flight easily. On the small side, my Jr. Electra Fli (34-inch span, 18 ounces) did R.O.G., loops and rolls with a Cannon two-channel radio. My feeling after the contest was that I had seen electric flight come of age, it was that impressive.

So, what will the future hold? The big breakthrough will be batteries, with a power-to-weight ratio in the same range as glow fuel. This will allow the usual straight-up type of flight favored by many, and the 15 to 20-minute flights that are a big favorite at my local flying field. Thus goes progress! As for what the batteries may be, I don't know. I am amazed that there has been so little progress in batteries. The batteries in the La France, almost a hundred years ago, are as good or better than most in use today, and the silver chloride cells used in Kerruish's model sixty years ago are still better than what we fly in our models now. So, there is lots of improvement yet to be done. Let's charge forward with electric power! (I take all responsibility for bad puns.) ●



**Plug Sparks . .** *Continued from page 37*

field, when it came to handing out the cash, was Speed Hughes, who won the Limited Engine Run event and placed second in the Antique event, while his son, Bob, took third in Antique. Of course, all the modelers were tickled pink when Loren Schmidt finally scored his first win since starting to fly Old Timers. He did it with the ten-foot Yates Cabin model that Nick Nickolau had discarded. How about that for irony? Results looked like this:

| | |
|---|---|
| CLASS ABC | |
| 1) Speed Hughes | 21:00 |
| 2) John Pond | 19:22 |
| 3) Ed Solenberger | 16:28 |
| ANTIQUE | |
| 1) Loren Schmidt | 34:52 |
| 2) Speed Hughes | 34:02 |
| 3) Bob Hughes | 26:41 |
| TEXACO | |
| 1) Homer Johnson | 60:00 |
| 2) Charlie Critch | 49:07 |
| 3) Nick Nickolau | 42:58 |
| 1/2A TEXACO | |
| 1) Jim Kyncy | 13:53 |
| 2) John Pond | 11:02 |
| 3) Nick Sanford | 10:03 |

According to Frank Swaney, David Johnson was pleased with the superb turnout. The contest was held during the week of "Pioneer Days," in competition with other activities such as street dancing, various entertainments and competitions (about six in all), but the model airplane contest drew a steady and large crowd all day to become the best attraction of the town's activities. How about that?

Photo No. 7 shows one of the many unsung heroes of any club: the newsletter editor. Communication is the lifeblood of any club; without that, interest rapidly falls off. Steve Roselle, although drafted for the job, has turned out to be one of the best SAM 21 newsletter editors yet!

Photo No. 8 is one of those pictures that ought to give every R/C'er humility. With today's sophisticated equipment, hardly anyone experiences any trouble (most glitches are THUMB glitches!). In this photo, you can readily appreciate the preparation and time that went into flying R/C models in those early days. The photo, another original from Bruce Lester, is of the R/C unit and eight-foot "Guff" model built and flown by Walt and Bill Good in 1939. Walt was one of the true R/C pioneers, and his WAG (**W**alt **A.** **G**ood) equipment was the most reliable on the market until tuned reeds made their debut in the form of Alex Schneider and his Cub with Rockwood equipment.

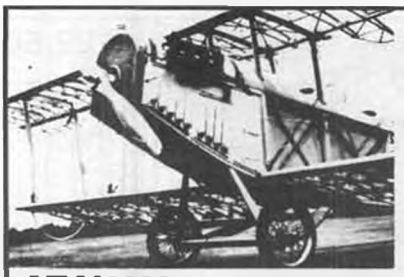
**WHATEVER HAPPENED TO . . . ?**

Every so often, in our correspondence, we run into what has happened to some of the old modelers. Emerson H. Hoffman, of Rt. 6, Box 1045, Lebanon, PA 17042, writes to say:

*I am ordering a plan for a Cloud Cruiser. I am hoping this is a plan by Harry Moyer of Lebanon, Pennsylvania. I would like to build it for old time's sake.*

*Harry was a WW-I fighter pilot and ran a small model shop in Lebanon for years (1930 to late 1950). Harry was sort of the untitled prez of our free flight club for years, mostly the Flying Quaker types with Brown Jr. motors and Ohlsson .23 engines in the smaller versions.*

*Harry gradually became senile and for over ten years has been in a nursing home, unable to recognize his own children. I know he had a set of plans published in* Model Airplane News *and I would like to build the plane as a tribute to him. Harry has been a member of AMA from the start and always carried his number (183, I think) on his planes.*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*There are still three members in our new club, the Lebanon Valley R/C Club, who remember Harry and flew with him back in the "good old days." I am sure they would get a kick out of seeing one of Harry's old models in the air again (R/C of course). I know Harry would still be out there on the flight line if he could. He got a lot of kids like me started in modeling. He also had the first R/C rudder-only plane in the county (you know, the type with tubes and ten pounds of batteries). For those who knew of Harry, this is an update on Harry Moyer, one of the real old timers of our hobby.*

**VICTORY-LIBERTY**

Photo No. 9 is from Sven-Olav Linden, of Sweden, who states the two Wakefields belong to his good friend, Jorgen M. Larsen, of Farum, Denmark. Sven recounts that Jorgen designed and built the "Victory" in the Spring of 1940. He was a young student then, reading *Model Airplane News* and the column "Design Forum," as written by the editor, Charles Hampson Grant. Consequently, his design got a Grant X-8 airfoil.

Inspired by American designs, he put on a folding propeller and "snap-up" single landing gear. Called JML-14 at that time, the wing and stabilizer had high aspect ratios. To add effect to the stab, double fins were installed. It was an advanced design in Europe at that time.

Then things started to happen. Denmark was invaded by the Nazis. A few weeks later, the Danish magazine *FLYV* came out with the regulation that modelers should not mark up their models in such a manner to displease the invaders! That was when Jorgen made up his mind and called his model "Victory." He put the name on in four-inch-high white letters on a red fuselage! No one could miss that!

Jorgen spent a year, 1944-45, in a concentration camp, but for other reasons (quite similar, no doubt). When he was freed and safe at home, he built another Wakefield of the same design called "Liberty."

Jorgen is no slouch as a flier, as he participated with his Wakefield models at the first international contest after WW-II at Eaton Bray, England. To add to its laurels, Victory won the 1942 Danish Championship, while Liberty competed in 1952 at the World Championships, representing Sweden.

**FREE PLUG DEPT.**

It is always a real pleasure for this columnist to see competition rubber models put into kit form. With Lucky Moody (Modelcraft Pacific Ace) and Ed Kelly (Korda and Climber) blazing the way, it remained for Charlie Werle to produce the Reid Hull 1941 Mulvihill Winner.

Werle, who operates under the name of Werlewind Mfg. Co., 3620 Morse Ave. No. 8, Sacramento, CA 95821, has every right to brag about performance, as in three months the design has captured first at the NCFFC Summer Contest, 2nd at the U.S. F/F Champs, and just lately, 1st and 3rd at the big Fresno Annual.

The Reid Hull kit comes darn near complete, as it includes precut ribs, finished wing mount, rudders, noseblock, finished propeller with ball bearing washer, Japanese tissue, and contest rubber. All that remains now is to add a bottle of Hot Stuff to the box, shake well, and presto! A complete model. Charlie has really made it that simple for $20.00. Real attractive price!

**S.A.F.F.S.**

SAM Chapters in California are springing up like Brussels sprouts. The latest club to be formed is the Sierra Antique Free Flight Society, operating out of Carson City, Nevada (okay, okay! So it's on the Nevada side of the border).

Photo No. 10 depicts Phil McCary displaying an old *Flying Aces* design called the "Stall-Proof Gassie." Phil, who moved from Beverly Hills, California to Carson City, is one of the motivating factors in the formation of the new club in the Carson City/Reno area.

In collaboration with Phil, Ron St.

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Jean, 3744 Dale Dr., Carson City, NV, has been offering his home as a meeting place. Manny Gomez is, at present, the newsletter editor. Had to smile at his accompanying letter, wherein he states, "Our activities are barely organized. Heck, our meetings are barely organized!"

Interest is quite high and the club enjoys a variety of interests . . . O.T. R/C, O.T. free flight, and modern free flight. We can do nothing better but wish them all the best with their new club. With season organizers like Ron and Phil, they can't miss!

**POWER PLUS**

With all the hue and cry being made over the new Schnuerle engines appearing in the O.T. R/C Limited Engine events, a lot of the complaining Johnny-come-lately modelers don't realize what has been done in the past.

Just received a letter from Gordon Codding, who claims to have put a Super Cyclone in a Comet Interceptor. Now, this writer has seen a Little Dynamite in a Comet Mercury, Ohlsson .60 in a Zipper, and Carl Goldberg reports a Forster .99 in a Zipper, but this latest claim takes the cake.

Codding says he did wager a $5.00 bet (big stakes in those days!) with another kid that he could put his .64 Super Cyclone in his Interceptor and get it to fly! The kid left Gordon several loopholes and he promptly took advantage of them.

First off, the dual coil supplied with the twin-plug Super Cyclone in those days was abandoned in favor of the lightweight Aero coil. Also, to keep the weight as close as possible to the center of gravity, Gordon abandoned the plastic Cyclone tank and made a tank out of the front bay of the fuselage! (Thoroughly gasoline proofed, of course.)

To make sure the model would not lose its adjustment, as the Super Cyclone weighed practically the same as the Ohlsson .19, he used a .19 size prop with full retard setting on the spark. Darned if it didn't fly! Codding failed to say how long the model lasted, as this writer has folded Interceptor wings using Arden .19 engines!

The whole point of this article is to point out to those fellows who would limit power will find there is always someone who can "build a better mousetrap." Recent efforts to have Schnuerle engines outlawed only left other loopholes such as PDP (Perry Directional Porting), fuel pumps, and last but not least, hot fuels in the 60-70% nitromethane range.

**ALL-RUBBER MEET**

In the same line of thinking, the SCAMPS staged an extremely successful rubber-only contest at Mile Square, California. Twenty contestants provided 36 entries in four events.

To quickly summarize, Cliff McBaine won the Commercial Rubber event (this event is limited to models of 36-inch wingspan or less) with a Gordon Light Ranger. In the regular Old Timer Rubber (any size goes), Hal Cover was selected winner in a tie with McBaine and Ed Wallenhorst. Whew! What flying!

The Twin Pusher event was real fun this time, with Wade Wiley's Burnham model nosing out Jim Adams' version of the Dela Mater Stagger Twin. Even O.T. Rubber Scale was a pack of fun with Andy Faykun winning using a Stahl "Grasshopper" (Stinson L-19). Ernie Wrisley was second with a Joe Kovel version of a Stinson Junior.

The best part of the whole meet was that the club collected $90.00 in entry fees. Now, how about that for a neat way to get the treasury in good shape?

Photo No. 12 shows some of the participants who won at the P.C.C. meet we described some time back. We took this shot to show how some of the prize recipients react. Then, too, we like to acknowledge the work of those unselfish officials, the Contest Directors. Dave Brodsky is no exception!

Photo No. 13 shows another one of the "idea" models that Bob Knutson used to crank out in the good old days. This Bantam powered model, looking somewhat like a Zomby, featured an aluminum fuselage! Bob didn't report on how it flew, but he surely was ahead of his time by at least 20 years!

**IDENTIFICATION**

Some time ago we ran a photo submitted by Al Hellman, showing a 12-foot R/C model in Florida, December 1940. Al Pinson was correct in his identification that it was an electrician who built the model, but he had the name wrong.

It remained for Ivan Tarbert, who has recently moved back to Florida, to correctly identify the flier. Tarbert states the guy's name was Fred Stevenson, who owned a small electric shop in Miami. Later on, the shop became a model and construction electric shop known as Acme Electric, N.W. 17th Ave. and Flagler St., Miami.

Tarbert states the transmitter had a four or five-inch telephone dial on the face with a notch cut in the edge; one for the rudder and one for the elevator. Evidently there were two different frequencies operating the receiver. Control was by escapements.

Fred was the first modeler in South Florida to play with radio control. The



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model is his design. Ivan sez he was one helluva nice guy and a great modeler!

**THE WRAP-UP**

Photo No. 14 just about summarizes this column very nicely. William "Bill" Lovins, of 2517 S. Cook, Denver, Colorado, sent in this pic of his Brigadier 38 with the following comments:

*I began modeling about 33 years ago and like so many free flighters, I kept pace with the state-of-the-art stuff until I finally got hooked on FAI Power. This has occupied all my efforts until recently. This kind of competition gets very hectic and recently I decided to duplicate the first F/F model I built that actually flew successfully . . . just to relax and ease the tension.*

*I wanted to avoid any attempt at competition, so the end result was this little Brigadier 38. The model is built from the original plans using wood far too heavy for competition and covered with Permagloss Coverite. The result is a truly indestructible model.*

*Powered with a Cox .049 QZ engine, no effort has been made to limit the motor run. The only modification is the dethermalizer system. If I had known what that was in 1947, I'd still be flying the original with an Arden .09!! The model is trimmed to fly in 30 to 40-foot circles (both power and glide) and is just a delight to fly! The model will fly in a gale and frankly, is no respecter of thermals. What a nice way to unwind!*

How about that? Another modeler has found out what this Old Timer kick is all about . . . FUN!! •

**Soaring . . . . .** *Continued from page 43*

and landed on the spot on time . . . and I've a motion picture of that flight to prove it.

If you're a high flier, try the Malorja Pass (1815 meters). There you launch into an unending valley with ease of landing being assured by the cow pasture behind you. It's even more of a kick to fly at Lukmaner Pass (1980 meters). There you're between snow-covered mountaintops overlooking a tiny town far below. The landing area is about an acre of flat but rough terrain used for building and maintenance equipment storage. Talk about problems in depth perception! Then there are the soaring sites at Mirren and Adelboden, but the weather closed in and I returned to Zurich.

There I met Richard Studer, President of Richair S.A. Inc., P.O. Box 44, CH-6318 Walchwil, Forchwaldstrasse, Switzerland. Rich is very cosmopolitan and speaks perfect English (as well as many other languages). He's lived in Kenya, Brazil, Canada, France, and even Texas. He is an electronic engineer and a full-scale glider pilot. 'Nuff said!

Richair now offers three models. The PIK-20D spans 137.8 inches. The wing covers 821.5 square inches with an aspect ratio of 23:1. This plane flies fast at 7.1 pounds (perhaps suitable for F3B competition). The Jantar is larger with a

177.9 inch span, and covers 1333 square inches. This plane weighs in at 12.1 pounds, while the LS-1C is 1/3 scale and spans 196.8 inches, covers 1559.3 square inches and has a flying weight of almost 20 pounds. These planes come almost ready to fly with epoxy fiberglass fuselage, wings (with built-in ailerons and spoilers), stab, and rudder. The kits also contain the instrument panel, canopy frame, and plexiglass canopy. The pushrods for ailerons and spoilers are already installed. The surfaces are all white; no paint is required. You can have one of these in the air in a few hours. They fly on appropriate Wortmann airfoils, and, although I didn't have an opportunity to fly these planes, I know of the Jantar's fine performance by reading the January, 1979 issue of the British *RCM&E* magazine (page 41). To order these kits, contact Steve Hangartner, who represents Richair in America, 172 Washington Avenue, Pleasantville, New York 10570.

Returning to West Germany, I stopped in at Gewalt Modellbau, 22 Albatrosse, 7410 Reutlingen. I had trouble talking with Uwe Gewalt until 18-year-old Andreas Blum took on the task of translating. I'm now convinced that English, as taught in the German school system, is worthwhile. Gewalt offers a variety of kits, books, and accessories. You can buy a fuselage, a piece of balsa, or an ARF sailplane. Most of the larger planes have fiberglass fuselages and balsa-covered foam wings. Some of the planes are Gewalt products; others are the work of other producers. I had a hard time keeping the source of each plane properly identified. I could list each and every item, but if you really want to know what's available, purchase the Haupt-Katalog 1980, from Gewalt. Of course, it helps if you can read German. The price list comes separately under the title "Verkaufs-Preisliste."

I also visited Tscheulen Flugmodellbau, 18 Bohlstrasse, 7311 Owen-Teck. Ernst Tscheulen offers an LS-2 at 1/5 scale (3.5 meter span), the Thermy at the same span, the Glasflugel 604 at 4.4 and 4.7 meters, the Libelle at 4.7, the AS-W17 at 4.8, and the Jantar at 5 meter span. The workmanship on these items is top-quality, but you're expected to complete the building of the finished product.

West Germany is a hotbed of entrepreneurship. There are many highly skilled individuals who will put together a wing or two at a reasonable price. (I wish there were fewer miles between Stuttgart and San Diego!) I wanted to visit Rodelmodell, Wiesenstrasse, 8939 Ettringen, and other manufacturers such as Klaus-Dieter Horn (KDH) Modellbau, D-4952 Porta Westfalica-Backhausen (KDH offers a very small scale AS-W17, 1.525 meter span), but there just wasn't enough time (or money). I did visit a fantastic model shop in the tiny town of Weilheim, a few kilometers from the Teck. There Martin Scheuffler manages a very large inventory in immaculate array. He has every item you could ever dream of at his fingertips . . . what a pleasure.

I've run out of time and space, so let me complete the story next month. Stay well and happy. •


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**Counter . . . .** *Continued from page 8*

above and also has the equalizer circuit for overnight top-off.

All of the new and improved Leisure Electronics chargers are easily recognizable by the bright yellow box label, and all are warranteed for 60 days from date of purchase.

Leisure is also coming out with its new Black Label 05 racing motor, for those who want to be the fastest at any cost (and it will cost you plenty!). This little dynamo is rewound with high-temperature wire that is actually welded, not soldered, to the commutator. The armature is precision balanced and the commutator is diamond turned for the smoothest possible finish. Ball bearings front and rear replace the original stock bronze oilite bearings. This is the same motor used by Team Leisure and is currently the hot tip on the West Coast racing circuit.

All from Leisure Electronics, 11 Deerspring, Irvine, CA 92714.

* * *

The sailing schooner in one of the photos is the newest addition to the Laughing Whale's fleet of distinctive wood ship model kits. It's called the Eastport Pinky, a highly developed type of boat used extensively in the herring fishery around Eastport, Maine during the 1850s and 1860s. The Laughing Whale's replica is a true scale 1/2" = 1' museum quality model measuring 33 inches in length and 7-1/4 inches across the beam. Construction features a precut basswood keel and frame members,


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With all this in mind, the going price of $129.50 seems quite reasonable. If ordering direct from the manufacturer be sure to add $4.50 for shipping and handling. The Laughing Whale, P.O. Box 191, Wiscasset, ME 04578.

* * *

Associated Electronics sent a short note announcing the release of its new RC 300-D 1/8-scale car kit, the "D" standing for differential. This latest car is basically the same as Associated's popular RC 300 car but also includes that company's new limited slip differential, the current hot tip in R/C car racing. (Dirty Dan talks about differentials in his R/C Auto News column this month and has much to say about the Associated unit.) Asking price on the RC 300-D is $290.

From Associated Electronics, 1928 E. Edinger, Santa Ana, CA 92705.

* * *

Slope Associates, an apparently new company up in Seattle, Washington is introducing a rather novel product: custom-made wing transport bags, complete with zippers and 3/8-inch thick internal foam padding . . . just the thing for the "compleate" R/C'er. These bags are made from heavy waterproof nylon and can be ordered in any of ten different colors. A basic price of $39.95 will get you a single-color bag up to nine feet long; multiple colors or longer lengths will cost more.

As we said, these are custom-made bags, and so you will of course have to supply certain information when ordering, such as span, chord, airfoil, dihedral, sweep, etc. If you're interested, your best bet is to send an SASE for the company's poop sheet and ordering instructions, which describe the product in much more detail than we can go into here. Write to Slope Associates, 2317 N. 63rd St., Seattle, WA 98103.

* * *

R/C boat racers will want to check out the new Viper 21, 3.5cc class hydroplane being produced by Futuraglass Design.

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WANTED — OLD MODEL ignition engines, cars, etc. Paying top dollar. Bill Simpson, 7413 Via Lorado, Rancho Palos Verdes, CA 90274 (213) 377-3532

This particular hull was designed by Frank DeSimone and joins the other competition proven Futuraglass hulls including the Sport 40, and 1/8 scale and .90 size scale hydros. The Viper 21 is 30-1/2 inches long, 16 inches wide, and features a prejoined fiberglass deck and hull with a glossy gelcoat finish. Sponsons are filled with urethane foam for extra flotation. The hull is priced at $89.95; an optional hardware kit, No. 1308, is also available for another $53.95.

Not pictured but still worth mentioning are the two fiberglass dummy engines for 1/8-scale hydros. You have a choice of a Rolls Royce or Allison engine, both featuring colored blocks (didn't say what color . . . black, probably) and detailed valve covers. Cost of each is $25.

From Futuraglass Design, 1 Cannon Dr., Nashua, NH 03060.

• • •

Don't know the name of the pretty young lady holding the model, but that Taube in the photo is the latest kit to be released by Balsa USA. It's a 62-incher designed for engines from .35 to .60 cu. in. and is described by the factory as being a great flier. The fast-building kit includes rolled drawings, die-cut parts, hardware bag, and formed landing gear. The price is an amazingly low $24.95.

Direct only from Balsa USA, P.O. Box 164, Marinette, WI 54143. •

**R/C World . . .** *Continued from page 12*

"Right, Bill, and now we've got something really new and exciting. It's a prepainted iron-on fabric that. . ."

"Which way does the grain go, Sid?"

"But let me tell you more about. . ."

"Never mind. Which way does the grain go?"

"OK, OK, it goes the long way. The

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rolls will be about 48 or 52 inches wide. That hasn't been decided yet. Actually, you can hardly. . ."

"How much heat do you need?"

"To stick it on, you can set our Top Flite iron at the No. 2 position, just about the same as for Mono. . ."

"Does it sag? Can you pull it up tight?"

"Good grief, Bill, gimme a chance to tell you?"

"Sorry, Sid, but I've been waiting all these years and I'm getting impatient. Besides, I'm just hitting the main points that most modelers complain about relative to iron-on fabrics."

The above was pretty much the way our conversation went for the first few minutes. Once we talked with Sid for a while, our skepticism changed to enthusiasm as we learned more about the new covering material that will soon be available from Top Flite (maybe by the time you read this).

Fabrikote, as it's to be called, is a close-woven fabric, coated on one side with colored adhesive, as is Monokote, while the outside is treated with fuel-proof paint, ready to be used as is, or painted further if desired by the builder. Sid says it will pull as tight as a drum, in fact, it will add skin strength to your structure, as with doped fabric. It will even pull tight enough to warp weak structures. The sample we ironed onto an old glider wing panel produced a very high-pitched ping when we snapped it with our finger.

Actually, there will be two fabric covering materials from Top Flite. The second, called Superlite, is finished clear on the outside but with the color/adhesive on the inside. Lighter than Fabrikote, and quite translucent, Superlite will be popular with R/C glider and O.T. builders. Dyed-in-the-wool silk-and-dopers will be hard-put to resist the temptation they've been able to withstand against Monokote!

We will give a more detailed report on these new covering materials in the next issue. Right now, we can only say it appears that Sid Axelrod has done it again!

**WHAT SWITCH?**

Here's a "why didn't I think of that" idea that will probably be adopted by many R/Cers, for aircraft, boats, and cars. It's a simple and clean way of mounting your receiver switch internally, out of sight and away from harm, with almost no evidence on the outside of the model that a switch even exists.

Mount the switch inside the fuselage/body/hull so that the switching motion is crosswise to the length of the model. Next, install 1/16 I.D. tubing guides through each side of the fuselage/body/hull leading to about a half-inch short of the switch toggle. Trim the tubing flush with the outside surface.

To operate the switch, simply insert a piece of 1/16 wire, push the switch toggle, and remove the wire! For consistency, establish a standard; push from the right or standard side (looking from the cockpit) to turn on, push from the left or port side to turn off.

Two final touches. Install a knob on the outside end of your "switch key," or at least bend over about a half-inch of it. Fasten a red flag on the "key." Now you can leave the "key" pushed into the left/port/off side of the model (remove it for scale judging), and the flag will remind you to "turn on" before flying.

**FCC REFUND**

If you obtained or renewed your FCC radio license between August 1, 1970 and February 28, 1975, and paid over $4, or up to and including $20 to the FCC when submitting your application, you may be entitled to a refund. Specifically, R/Cers paid a fee of $20 for their Citizens Radio Service Station License, if they obtained or renewed their license within those dates.

The refund program has come about as the result of four decisions by the U.S. Court of Appeals for the District of Columbia Circuit in December 1976. The court held that fees collected by the FCC between the above dates were not valid. The FCC was directed to recalculate those fees and make refunds.

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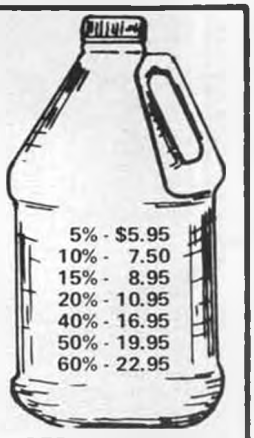


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72) who are eligible will be reimbursed $17.99 for R/C licenses applied for during the period. In order to collect the refund, obtain a Fee Refund Program request form and instructions (Phase II) from your local FCC office, or order a copy by mail from the FCC Refund Program Office, P.O. Box 19209, Washington, D.C. 20036. For specific details, you may call the toll-free number (800) 424-2901. *This number is for fee refund business only, don't use it for other FCC business or complaints.*

This refund deal applies to nearly all FCC license fees collected during the specified period, and the total refund is approximately worth $31 million, so everyone eligible might as well collect their piece of the action!

**CONTESTANT-JUDGES**

For the first time ever, wholesale contestant judging was employed for R/C Pattern at the 1980 Nationals. Although, as in all sports, there are a few competitors who feel that only their peers are worthy and/or capable of judging their particular sport, the majority still believes that a trained and practiced official does the job best.

Larry Sartor, a long-time and active pattern judge, a Level 1 in the United States Pattern Judges Association, was one of a few USPJA members who worked at the 1980 Nats. He is Vice President, Central Region of the USPJA, as well as an AMA District VIII Associate V.P., from Oklahoma. The following are his comments on contestant-judging at the 1980 Nationals, and before presenting his report we will state quite emphatically that we are in total agreement with him.

*Contestant-judging had its trial and is, in my opinion, a miserable failure and should not be used at a national or any other major contest. Unqualified, untried and unwilling Novice and Advanced pilots sat and judged (?) Master and Expert maneuvers. Most of these contestant-judges had never really watched many of the maneuvers before they were selected and were told they had to judge. Only a few of the contestant-judges had taken the time to read the judges guide. More than once after a maneuver was called, and before it was flown, I heard a judge ask what was the maneuver supposed to look like. On several occasions, a pilot let his plane get behind the zero line and should have received a zero for the maneuver he was doing or had just completed. Once, the contestant-judge sitting next to me did agree that the plane went behind the zero line but then stated the pilot had called "maneuver complete" before going behind the line and therefore should not receive a zero. Apparently I was the only one watching the turnarounds and set-ups for the next maneuver. Maybe I should have forced the issue, but how do you go about getting four other judges to change their score to a zero when they did not observe the infraction of the rules and if they did observe it, make up their own rule to excuse the pilot from any penalty? A final example of a contestant-judge's thoughts on scoring was the judge who wanted to score a maneuver that was totally unrecognizable just because he felt the pilot should get something for an exit and entry! A zero had been agreed upon by the other four judges.*

*Contestant-judging is very unfair to the pilots. They are already competing with each other and should not be placed in the position of also having to judge the flights of their competitors and friends. In this instance, contestant-judging was also very unequal. With three sites in operation and two flight lines at each site, the judges were picked for the most part, from pilots at each site. The flying at each site was divided into two time schedules, with half of the pilots flying from 7 a.m. to 10:30 a.m. and the other half flying from 10:30 a.m. until 2 p.m. Contestant-judges were selected from the group not flying at that time period. These judges saw, at the most, about one-sixth of the contestants who flew in this Nats, and that was all. No attempt was made to get any kind of equal exposure for pilots. What we had were six local contests going on at the same time instead of one national contest. A little hero worship and regionalism were both at work, and this is understandable with the type of judging set up. There were no balances or counter-balances to help eliminate this kind of influence.*

*The method of scoring imposed on the judges was not the most desirable system. With the five judges indicating their score for each maneuver by placing a clothespin beside a number, a single scorekeeper had to write down all five scores, keep time for the flight, and was also supposed to be looking for pilots flying behind the zero line. Almost no one paid any attention to this last item. Scoring really became a problem for judges and scorekeepers when a Novice began flying the first series of maneuvers after his takeoff. The judges had to hold up their score cards and while supposedly watching the maneuvers, were expected to indicate three scores in a span of about twenty to thirty seconds. During this same very short time, the scorekeepers had to record fifteen scores. There are bound to be errors in a scoring set up like this.*

*I do not mind the use of display cards to show the judge's score as he marks the pilot's score down. I do mind having to handle the display cards and letting someone else write my score down for me. I believe each judge should mark his or her own score down on the score sheet and initial or sign each score sheet. If you want to use the display cards, then*


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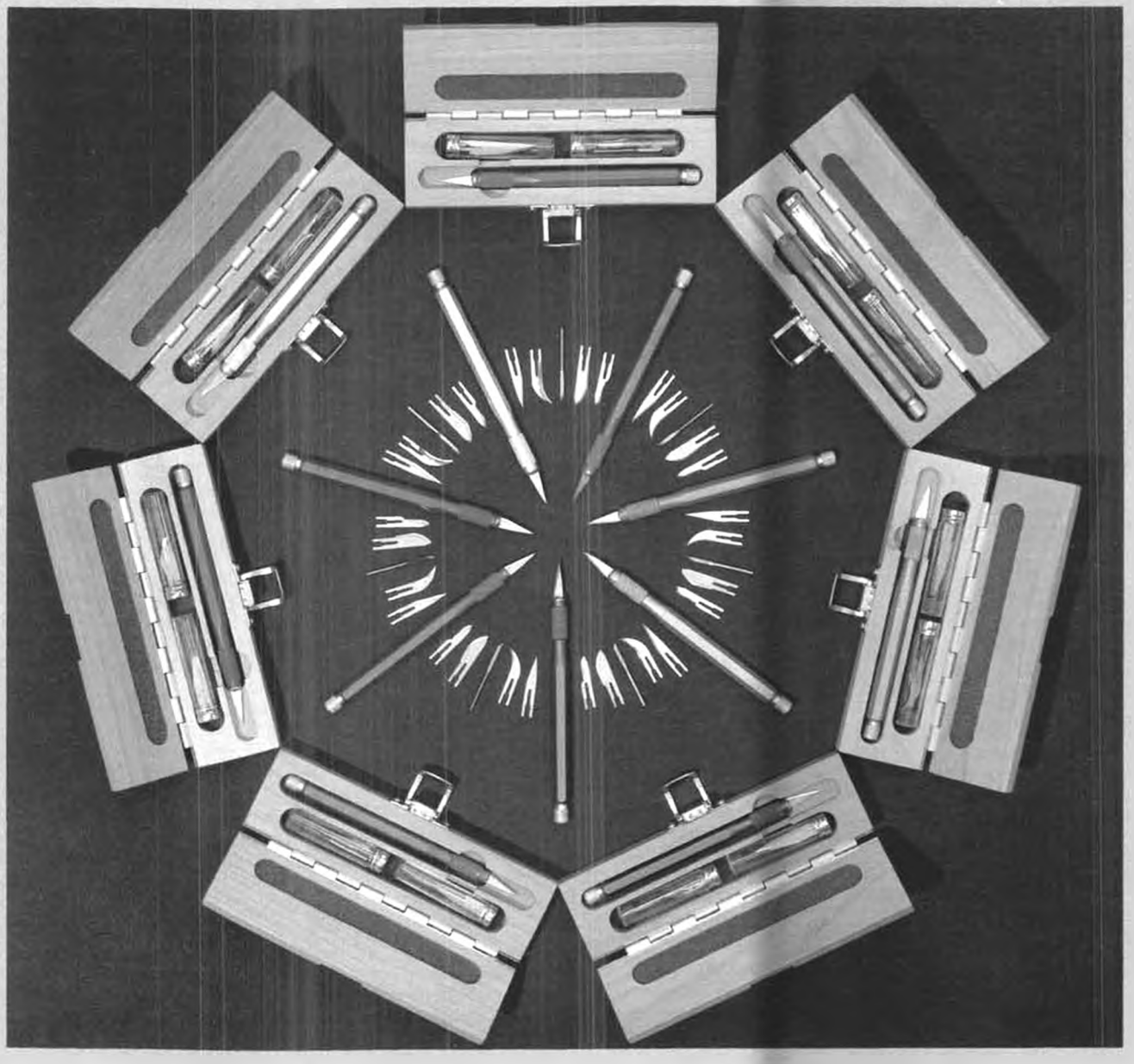

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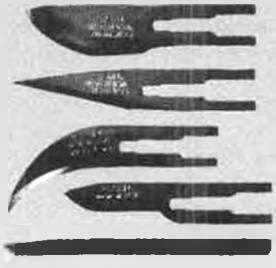


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*round up enough personnel to stand or sit behind the judges. They can indicate the judge's score for the spectators to see. If they make a mistake and hold up an incorrect number, it will still be correctly recorded on the score sheet. The judge will know that his true score for each maneuver is recorded and the pilot can see for himself how each individual judge scored his flight.*

*I hope that sanity and the majority's wishes will rule when we gather for the 1981 Nats.* Pilots please *let your District V.P. or A.V.P. know what you think of contestant-judging at national or major contests. Send a copy to A.M.A. headquarters and also to your N.S.R.C.A. representative. Personally I think contestant-judging is the worst system we have ever used at a Nats.* Express your individual opinion. *Do not let me or one or two individuals or an organized group speak for you if they do not represent your opinion.*

We are quite willing to publish rebuttles to the above if submitted by knowledgeable individuals in a responsible manner. There are obviously two sides to every situation. •

**Workbench . .** *Continued from page 6*

East, was kinda touchy (sorry, Bob, nobody's perfect!). The other, and more friendly letter came from Jim Adams, editor of SAM SPEAKS, the Society of Antique Modelers newsletter. Jim correctly pointed out that the aircraft is very obviously the Navy version of the Army PT-22. Jim also sent along a copy of a San Diego map, which located the photo as having been taken just off Ocean Beach, on the Pacific Coast, northwest of the U.S. Naval Air Station, North Island, in San Diego Bay, and due west of Lindberg Field, the commercial airport handling passenger traffic out of San Diego. Jim figures the time as high noon sometime during 1941 or 1942. Anyone wish to challenge that?

**HAWLEY BOWLUS REMEMBERED**

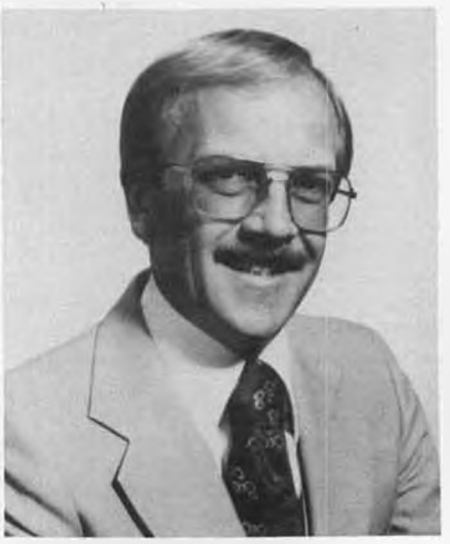
William Hawley Bowlus, probably best remembered for his famous pod-and-boom Albatross gliders, died in 1967 at the age of 71. His memory will be honored by a Bowlus/Albatross historical display at the SSA Phoenix convention in early 1981. Mike Shoen, 6719 E. Malcomb, Paradise Valley, AZ 85253, is attempting to gather all information and documentation possible for this occasion, and would appreciate the loan or sale of any such material for the purpose of copying. He is also seeking the location of remaining Bowlus aircraft, glider trailers, travel trailers, and motor homes (yes, he built these too).

A beautiful and informative poster on Bowlus has been prepared by artist Bill Neale, whose work has been featured in *Road and Track* and *Flying*. The original art was completed in 1980, and the printed copies are identical in size (18 by 27 inches) to the original and the inks and paper selected most closely approximate the original. The paragraphs on the poster back were written by Herman Stiglmeier, and are reprinted courtesy of *Soaring* magazine (October 1967). These copies are available through Mike Shoen at $6 each, or $25 if signed by the artist.

**INDUSTRY NOTE**

Word comes from Top Flite Models, Inc., that G. Scott Christensen has joined the firm as Vice President of Manufacturing. He becomes a member of the executive staff, along with President Sid Axelrod and Vice President Bob Nickels. Some R/C glider modelers may recall that Scott holds League of Silent Flight membership card LSF 1, as he is one of the founders of this world renowned organization.

Scott's duties at Top Flite will include streamlining of production capabilities, new products, quality control, and personnel supervision. He will also be involved in new model design and development. A native of Minnesota, Scott has been a modeler for 30 years, and has been in model manufacturing for 12 years. He has served as a design engineer for the consumer power tool industry, and holds a patent for power tool attachment design. He's a graduate of California State at Fullerton. •



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*The plane shown here has been camouflaged for photographic purposes. †Requires three or four channel radio systems.

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