

# MODEL BUILDER



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OCTOBER 1984

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volume 14, number 153

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Cover: What! Another Byron Pitts? Yes, another Byron Pitts. But take another look into Robyn Dance's eyes, and you'll say, "So what!", just like we did. Actually, the Byron Pitts is kinda special, as it is the flagship or forerunner of a fantastic line of large scale aircraft that have projected Byron Originals, of Ida Grove, Iowa, into a dominating position as a kit manufacturer, known all over the world. This example was constructed by Rob Olney, of Springvale, Victoria, Australia. The Zinger prop is turned by an OS 61 FSR, through a Byrodrive unit. Covering is Econocote, and it has had more than 20 flights. The excellent studio photo was taken by professional photographer, Kevin Poulter.

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# 1984 SIG IMAC CHAMPIONSHIPS

## JUNE 16 - 17TH



Chuck Lauritzen (Hazel Crest, IL) checks out the traffic in the pattern before taxiing on to the runway with his O.S. .90 powered, blue and white 1/4-Scale Clipped Wing Cub.



Larry Kramer (Dyersville, IA) tunes up the O.S. .60 4-stroke, on son Chris' white & yellow Smith Miniplane.

The 10th annual meet for the International Miniature Aerobatic Club competition format was held at Sig International Field. Modelers came from 9 states — Iowa, Missouri, Illinois, Colorado, Nebraska, Kansas, Minnesota, Florida and Texas. The 121 entries flew scale-like aerobatic patterns in a "box" before the judges. 60% of the entries were Sig designs and they proved once again how ideal they are for this type of contest, winning 6 of the 7 first places. Saturday night Hazel and Maxey hosted a dinner for all the participants and their families at Montezuma Memorial Hall.



Above: Wayne Hershberger starts Super Chipmunk for son Steve (DeKalb, IL). Left: Lee Pohar (Rockford, IL) assisted by Orville Shields waits for the all clear with a Liberty Sport. Below: This sharp O.S. .61 Skybolt is by Steve Bornhoeft (Hampton, IL).



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See the October issues of RC MODELER and MODEL AVIATION for results and more pictures from the Championships.

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NORTH DAKOTA  
MINOT  
Aeroplane Factory HobbyShop  
Minot Intl. Airport  
WILLISTON  
Tri-County Hobbies  
103 22nd St. West  
OHIO  
AKRON  
Miller's Hobby Shop  
10111 Kanawha Blvd  
PH: 216-848-2264  
BEAVERDAM  
Buckeye Hobby Shop  
7940 Ingham Road  
BERLIN HEIGHTS  
Daniel's Hobbies  
36 Center Street  
BUTLER  
Pete's Hobby Shop  
48 Cleveland Street  
CLEVELAND  
National Hobby, Inc.  
5238 Ridge Road  
FINDLAY  
Jen's Model Supplies  
721 Rockwell Ave  
LAKEWOOD  
Wings Hobby Shop Inc.  
1712 Detroit Ave  
PH: 221-5383  
LANCASTER  
Slater's Inc.  
Plaza Shopping Center  
1141 N. Memorial Drive  
LIMA  
Callahan Hobbies  
1229 E. Elm St.  
MANSHFIELD  
John's Hobby Shop  
15 N. Main  
MIDDLETOWN  
G & G Hobby Shop  
1720 Central Ave  
NORTH CANTON  
Modeler's Haven  
4255 Portage N.W.  
PROSPECT  
Lighthouse Hobby Supply Co  
507 E. North Street  
TOLEDO  
The Hobby Stop  
4907 Summit Street
- WAPAKONETA**  
Dad's Toy Shop  
129 E. Augustine St  
YOUNGSTOWN  
Boarman Hobby Center  
6820 Market Street  
Thompson Radio Supplies  
110 S. 6th Street  
OKLAHOMA  
OKLAHOMA CITY  
Campbell's Hobby House  
3500 N. MacArthur  
TULSA  
House of Hobbies  
6914 E. Admiral Place  
TULSA  
Wings 'N Things  
1350 Skally Drive  
OREGON  
CORVALLIS  
Trump's (DJ's) Hobbies  
1875 N.W. 9th St.  
PH: 503-753-7540  
ONTARIO  
Hobby Shack  
903 E. Isadore Ave  
PH: 503-899-6115  
PORTLAND  
Strictly R/C  
7868 S.W. Capitol Highway  
PENNSYLVANIA  
BATH  
Valley Crafts & Hobbies  
301 303 West Main Street  
PH: 215-837-9066  
BATH  
Dick Wetzel's Hobbies  
514 E. Main St.  
PH: 215-837-6681  
LANSDALE  
Penn Valley Hobby Ctr.  
637 W. Main St  
MILTON  
Kreb's Newstand  
83 Broadway  
NAZARETH  
TANZER U.S.A.  
105 Baldwin Street  
PITTSBURGH  
Bill & Walt's Hobby Shop  
116 Smithfield Street  
READING  
Iron Horse Hobby House  
60 South 6th St  
READING  
Ort's Hobbies  
536 N. 10th St  
WARMINSTER  
J.C. R/C Hobbies  
1423 S. Mushage Ave  
PH: 215-672-5200  
RHODE ISLAND  
EAST PROVIDENCE  
A & R Hobbies  
56 Alton St.  
PH: 401-438-2754  
SOUTH CAROLINA  
GREENVILLE  
The Great Escape  
Pleasantburg Shopping Center  
105 Laurelwood Street  
PH: 828-335-8320 or 242-4229  
MYRTLE BEACH  
Ed's Hobby Shop  
702 Main Street  
TENNESSEE  
KNOXVILLE  
Tennessee Model Hobbies  
8909 Oak Ridge Hwy  
PH: 615-482-2900  
NASHVILLE  
The Toy Mart  
113 Graydon Drive  
PH: 615-883-1648  
TEXAS  
ARLINGTON  
The Hobby Hub  
903 A Pioneer Parkway West  
AUSTIN  
J & J Hobbies  
610 Kennison Dr  
EL PASO  
Hal's Hobby Shop  
1037 FM 1960E  
PH: 214-443-7373  
HURST  
Roy's Hobby Shop  
1309 Norwood  
SAN ANTONIO  
Clyde's Hobbies  
5707 E. Moabud  
SAN ANTONIO  
Dick's Hobby Shop  
Terrill Plaza  
SAN ANTONIO  
San Antonio  
Kellie's Hobby Center  
5514 Walnut Road  
UTAH  
OREM  
Miniature Aircraft Prod  
811 W. 400 N.  
SALT LAKE CITY  
Douglas Models  
2065 E. 33rd South  
SALT LAKE CITY  
Pioneer Hobbies  
170 East 800 S.
- VIRGINIA**  
ALEXANDRIA  
Modelmasters, Inc.  
5710-F General Washington Dr  
RICHMOND  
The Hobby Center  
1709 Willow Lawn Dr  
WASHINGTON  
BELLEVUE  
R/C Model Shop  
14020 N.E. 21st St.  
PH: 747-9914  
BELLINGHAM  
Hobby Hvt  
111 E. Magnolia  
CASTLE ROCK  
Aero Motive Products  
607 Spirit Lake Highway  
KENT  
Kent Hobby  
1313 W. Meeker  
Suite 110, Meeker Mall  
PUEBLO  
Figrrove Model Supply  
10611 136th St East  
PH: 845-3675  
SEATTLE  
Webster Supply Co  
17818 Aurora Ave. N  
SEQUIM  
Fred's Hobbies and Guns  
609 W. Washington Suite 7  
TACOMA  
Bill's Hobby Town  
13923 Pacific Ave  
PH: 206-531-8111  
WALLA WALLA  
Herley's R.C.  
Route J, Box 277A  
PH: 509-529-2618  
WEST VIRGINIA  
CHARLESTON  
Fountain Hobby Center  
200 W. Washington St  
WISCONSIN  
LA CROSSE  
Hobby Hub  
4336 Milancon Coulee Road  
P.O. Box 11  
MARSHFIELD  
Mill Wisconsin Hobby Center  
Central Square  
171 So. Central Ave  
MILWAUKEE  
Art in a Hobby  
Marshfield  
South Gate Mall  
333 So. 27th Street  
PH: 414-645-4555  
MILWAUKEE  
Casanova's Hobby  
1423 S. Mushage Ave  
PH: 414-672-2700  
WAUSAU  
Pope's Hobby Land  
660 South 3rd Ave  
CANADA  
BAWLW, ALBERTA  
B & P Transports Ltd  
Box 6  
PH: 373-3953  
CALGARY, ALBERTA  
Catalpa Hobby Supply, Ltd.  
Box 3173, Stn. B  
CALGARY, ALBERTA  
P.M.S. Hobby Craft  
Calgary North Mall Centre  
PRINCE GEORGE, BRITISH  
COLUMBIA  
M.S.M. Enterprises  
6692 Essex Crescent  
WINNIPEG, MANITOBA  
Cennir Dwyer Hobby, Ltd.  
1354 Main St.  
PH: 418-548-2136  
ST. JOHN'S, NFLD.  
Capitol Hobby Centre, Ltd  
6 Freshwater Road  
DUNDAS, ONTARIO  
Skycraft Hobbies Inc.  
139 York Road  
SCARBOROUGH, ONTARIO  
Toronto R/C Hobby  
1869 Lawrence Ave E  
PH: 416-755-1766  
WHITBY, ONTARIO  
Keith's Hobby Shop  
5205 Yonge St  
PH: 222-4721  
ANCIENNE, LORETTTE, QUEBEC  
Passes Temps Phoenix  
1459 Notre Dame  
PH: 418-872-4113  
ARVIDA, QUEBEC  
LeMolele Reclut Enr.  
118 Mathews, CP 341  
PH: 418-548-2136  
MONTREAL, QUEBEC  
Can Air Hobbies  
5850 Gouin Blvd Ouest  
PH: 514-332-3565  
SASKATON, SASKATCH.  
Collins Aero Craft  
238 First Ave North  
PH: 652-4775  
YORKTON, SASKATCH.  
Radio Control Hobbies  
39 Betts Ave  
AUSTRALIA  
SYDNEY, N.S.W.  
Pymont 2009  
Burmes  
137 Pymont Street  
PH: (02) 692-0694  
ENGLAND  
NORFOLK, NR17 1DG  
Pegasus Models Ltd  
Luton, Luttenhough  
NEW ZEALAND  
INVERCARSILL  
Model Shop  
45 Arcade Dea St  
PH: 89439

DEALERS: Write For Details On How Your Name Can Appear In This Column





## from Bill Northrop's workbench

### CONGRATULATIONS JENNIE

Of all the reader mail we receive daily, the following is one of the best and most satisfying letters to cross our desk in a long time. I wish we could receive a lot more like it.

"Dear Mr. Northrop,

Thank you for giving me a year's subscription to **Model Builder**. At the Skyscrapers in Galeville, New York, I won third place. I'm 8 years old and I've been flying three years. My dad just builded me a Raincrow (?) handlaunch glider by Ried Hull. It flies great!!

Thanks again

Your friend,

Jennette Yokel

Rochester, New York"

And we say thanks to Dad. It's up to the "Dads" to pass the greatness of modeling on to the new generations. No one else has closer access to the "new blood" we need . . . except possibly elementary school teachers, such as Ray Roberts, of Berkeley Hall School, in Los Angeles, California. We'll talk more about Ray's model airplane building instruction classes in a future issue, but for now it's about a rules proposal that Ray has submitted to AMA.

Under the General Section of the AMA rules, having to do with the classification, Ray proposes that contestants under the age of 12 be classified as Elementary Modelers, and contestants 13 to 15 years of age be classified as Juniors. Whoops! The way that reads, modelers from their twelfth birthday to thirteenth birthday have no classification! We think Ray intended to say "under 12" for Elementary, and 12 to 15 for Juniors. Anyway, he wants a competition slot for fourth, fifth, and sixth graders in the eight to 12-year old levels (of course, under eight is OK, too), to avoid competing with the more accomplished

young teenagers. As most any adult with children knows, a couple of years difference at that age amounts to an incredible spread in accomplishment capabilities.

Next we have John Thompson, of Cottage Grove, Oregon, who proposes that the Senior class be eliminated. He feels that as there are very few entries in the current Senior bracket, and as most Senior age modelers could hold their own against Open competitors, that only two classes are needed . . . under 16, and 16 and older. Dues for Senior members should remain reduced.

Perhaps we can simply keep the Junior, Senior, Open classifications for competition, but change the ages, i.e., up to 12, 12 and over to 16, and 16 and over respectively.

Speaking of proposals . . . by the time you see this, the deadline for proposals for the 1986-87 rule period, September 1, 1984, may have passed. It would appear that Contest Board members aren't going to have too many decisions to make, as so far, only a few official proposals have been received by AMA (this is being written on July 16).

### BOOK REVIEW

One of the best known scale-views artists in the world is Sweden's Bjorn Karlstrom. Many of his drawings have appeared in American magazines, particularly the now defunct *American Modeler*.

Now a 132-page book of Karlstrom drawings is available directly from Sweden, if not found in your local hobby shop book rack. All of the aircraft illustrated in the book were Swedish Air Force Trainers from the year 1926 through 1983, but the variety of aircraft used includes designs from many other countries, i.e., Bristol, Avro, Heinkel, De Havilland, Focke Wulf, North American, Klemm, Buckler, and Scottish Aviation.

The book is a mixture of English and Swedish language: drawings in English, picture captions mixed, also the introductory text. A book all scale enthusiasts will enjoy, with a photo of Bjorn as a bonus!

If you can't find it at your dealer (it's called *Flygplansritningar 1*, which implies more to come), it can be obtained by mailing a bank check for \$12 U.S. to Allt om Hobby, Box 9185, S-102 73 Stockholm, Sweden.

### HOBBYPOXY COLORS

Once again we have some Hobbypoxy color formulas for military aircraft, this time the trainers. U.S. trainers for WW-II used "Identification" or "Chrome" yellow, also called ANA 614 Orange Yellow. The blue fuselages on U.S. trainers was called ANA 501 Light Blue, sometimes called "True Blue".

British and Canadian trainers used a yellow that was simply called "Yellow".

The formulas are as follows:

ANA 614 ORANGE YELLOW  
20 parts H49 Cub Yellow  
Four parts H47 Bright Yellow  
One part H66 Dark Red  
One part H10 White  
ANA 501 LIGHT BLUE  
Four parts H25 Sky Blue



*Model Builder* cover artist, Bob Benjamin, is hard at work on the installation of an O&R .60 in his *Buzzard Bombshell* O/T model. "Magneto" supervises the operation. No, he doesn't step on models or chew on balsa . . . but there are no mice in the workshop!

Three parts H24 Dark Blue  
One part H65 Bright Red  
One part H67 Maroon  
RAF/RCAF YELLOW  
Nine parts H49 Cub Yellow  
Seven parts H47 Bright Yellow  
Three parts H55 Cream  
Two parts H66 Dark Red

All of the above formulas are to be mixed with an equal amount of gloss or flat Part B Hardeners.

### INDUSTRY NEWS

Effective June 15, 1984, the kit manufacturing, R & D and Marketing Divisions of House of Balsa, Inc., were consolidated into Bob Martin R/C Models, Inc. All personnel connected with House of Balsa Kitting Division were transferred to Bob Martin R/C Models. Martin's company is well known for its line of glider kits which feature Dura-Lene fuselages. The company has manufactured and sells the popular Hoby Hawk glider, originally designed and produced by Hoby Alter, best known for his world famous Hoby Cat sailing catamarans.

House of Balsa will continue to market Pacer Glue Products, Tuf-Grinds, and some new accessory items.

### CHARGING DON'TS

We've had several frantic calls from modelers experienced in electric power operation who expressed deep concern over recommendations made by Mitch Poling in his August *Electric Power* column regarding modification of the Robbe Automax 21 and Astro Flight Dual chargers.

First, they say to **NOT** use the Robbe charger at a higher rate than the recommended 2.4 amps. If you know what you're doing, this may be OK, but it can definitely shorten the life of the charger if it is used at higher rates too many times.

Secondly, do not shunt (bypass) the diodes in the output charge lines of the Astro Flight Dual Charger. This is like the old (and not so smart) trick of sticking a penny in a blown-out fuse socket! The fuse was there to protect the house wiring from a dangerous overload. The diodes are installed in the charger to prevent the same thing!

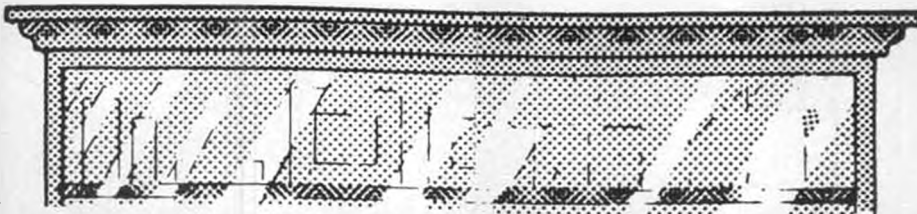
Mitch will no-doubt have some

*Continued on page 106*



# 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.



• Circus Hobbies is proud to announce its newest addition to the JR line of radio control systems. Now available is the Century 7, seven-channel, single-stick radio system in two great versions: pattern and helicopter!! These new radios offer all of the features of the Century 7s that have received such unbelievable response from flyers across the country. If single-stick is your "cup of tea", you did not have much of a choice before now. Circus Hobbies and JR think you should have a choice, and this system is the right one!

The Century 7 Single-Stick transmitters are made with an all-aluminum case, have a new dust-proof open gimble, ratcheted electrical double trims, plug-in RF module, plug-in receiver crystal, direct servo controller, servo reversing on all channels, trainer system with new inhibitor circuit, dual purpose meter which serves as both RF output and voltage meter, fuse protected charge circuit, carrying handle, and are available on all 53 MHz and new 72 MHz frequencies.

Features for the pattern version include: dual rate or exponential rate on ailerons, elevator, and rudder (rates are user selectable), aileron/rudder mix, flap/elevator mix, v-tail mixer, and end point adjustments for aileron, elevator, rudder, and landing gear.

Features for the helicopter version include: dual rate aileron, elevator, rudder, inverted flight switch with inhibit circuit, adjustable pitch curve, ATS tail rotor compensation, high idle, throttle hold, hovering throttle adjustment, and tail rotor end points.

All systems come with rechargeable



Circus Hobbies single-stick Century 7s in two versions: Pattern and Helicopter.



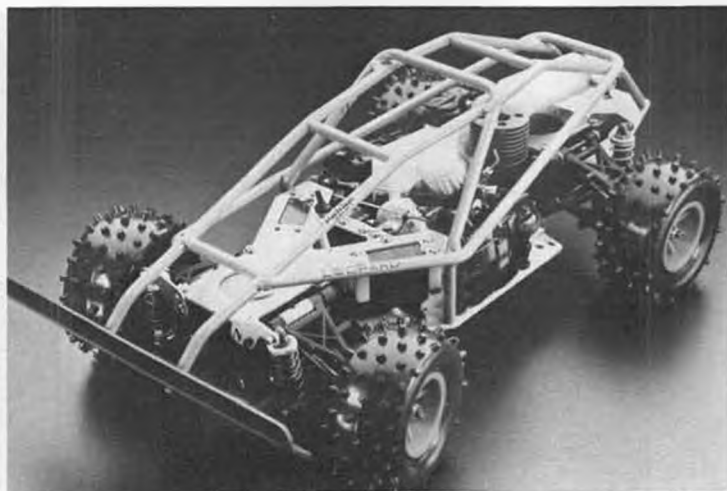
Ackley Metal Products: spinners, cowls, etc. custom-made to customer specs from aluminum.



Robbe German Navy mine sweeper, the *Schutze*.



Robbe offshore oil drilling tender, the *Rembertturm*.



Robbe Model Sport *Leopard 4* R/C off-road, 1/8-scale car.



J.C. Development's J.C. Timer.



Midwest Products Co., Inc. *The Trawler*.

batteries, charger, micro seven-channel receiver, switch harness, three servo trays, all necessary servo mounting hardware, output fittings, frequency flag, instruction manual, and four 401 ball bearing output high performance servos. Servo upgrades are available.

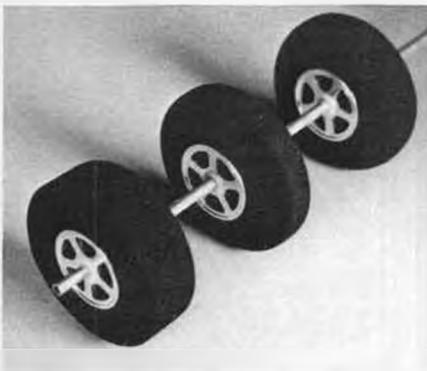
System prices are \$399.95 for the Century 7 Pattern system, and \$419.95 for the Helicopter system. See your local



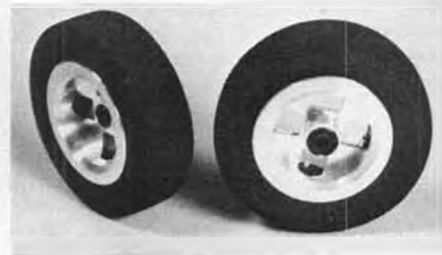
Franklin Chem. quick drying hobby glue.



Mammoth Scale Plans Douglas Skyraider. (Advertisement page 76.)



Golden Gate Hobbies Tetra Super Wheels.



Golden Gate Hobbies MK aluminum wheels.

dealer or purchase your R/C system from Circus Hobbies directly: 3132 S. Highland Dr., Las Vegas, NV 89109.

★ ★ ★

Carl Goldberg Models, Inc., 4736 West Chicago Avenue, Chicago, IL 60651, now has available at your local hobby shop a very handy engine test stand (No. 293-ETS-1) made from hard maple, finished in clear lacquer. This stand will firmly hold engines from as small as .049 cid to as large as .61 cid. No workshop or test bench should be without one.

For prices and/or additional information about this excellent test stand, see your local hobby shop or write to CG Models, Inc., directly at the above address.

★ ★ ★

Ikon N'wst has done it again! The folks at Ikon have kitted another scale beauty. This one's the first R/C version of the WACO UPF-7 ever to be kitted.

The structure is interesting to build and fairly simple. The 72-inch, 1/5th scale UPF-7 has one-piece wings. The flying weight is 14-16 lbs. Power required is a 1.20 cid four-cycle or larger. Field assembly time is 10-15 minutes. The wing loading is 23 oz/sq ft. The UPF-7 flies very smoothly and is aerobatic.

The advance price is \$125 with delivery starting in September, after delivery starts, the price will be \$155. Get your order in now and save \$30. A catalog for more details on this and other fine planes may be obtained by sending \$2 to Ikon N'wst, P.O. Box 566, Auburn, WA 98071.

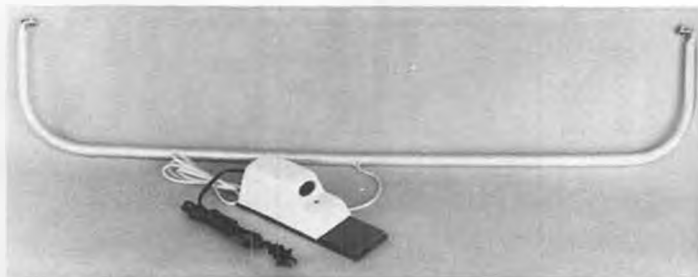
★ ★ ★

Coverite announces that Black Baron Epoxy is now available in brushing liquid form. Like its aerosol version, Black



Precision Built Models and Kits *Laser 200* in 1/3-scale and 1/4-scale for Turnaround Pattern.





Firecat Technology/Valectro Pro-Bow-40 foam cutting tool.



Ikon N'wst Waco UPF-7 biplane kit in 1/5 scale.



Hobby Shack/Pilot Akro 1204M and 804M scale-like models.



Hobby Shack/Pilot Four Star 1204H (and 804H, not shown).

Baron Brushable is completely premixed to a precise formula requiring only one goof-proof can. This totally eliminates mistakes in mixing, and there are no wasteful leftovers: just put the lid back on, and use again and again.

Black Baron Brushable (BBB) works magnificently with any spray equipment. It can be sprayed or brushed on almost any surface, including all fabrics, woods, metals, ABS plastic, fiberglass, etc. BBB is quick drying and is actually dust free in 30-60 minutes! Black Baron has outstanding adhesion, and being an epoxy, you know it has phenomenal durability, yet does not get brittle with age.

Both the brushable and the aerosol versions come in 12 aircraft colors: white, fire red, electric blue, lemon yellow, international orange, black, cub yellow, brite red, dark blue, light blue, cream, and an aluminum that looks like aluminum, and actually gets tougher each day (probably the only aluminum paint like it!). The line includes a light

gray primer, a clear, and a thinner. Aerosols come in big 13-ounce cans, retailing for \$4.79. Brushables come in half-pint cans, at \$4.74; while a full pint of thinner is \$4.28.

Ten of the colors are a match for Coverite's unique Permagloss iron-on covering. The only fabric covering with a shine and the only fabric covering that is totally fuel proof and dirt proof.

Coverite, 420 Babylon Road, Horsham, PA 19044, (215) 672-6720.

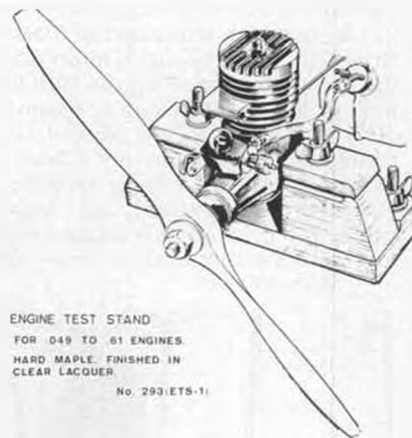
★ ★ ★



Rhom Products Rom-Rotary Fuel Pump.

Firecat Technology, Inc., Suite 1930, 707 Continental Circle, Mt. View, CA 94040, (415) 969-2743, the exclusive

Continued on page 99

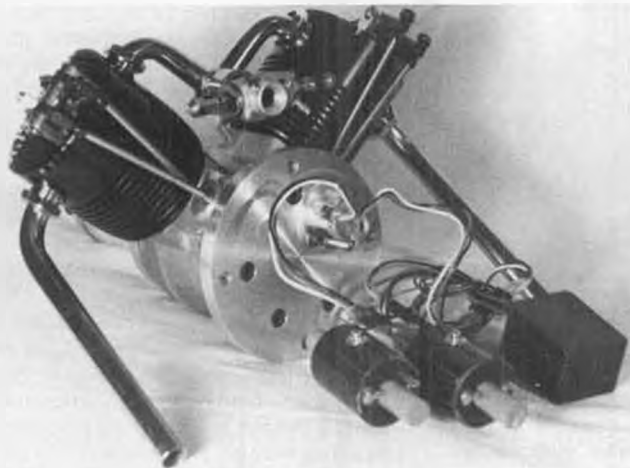


ENGINE TEST STAND  
FOR .049 TO .61 ENGINES.  
HARD MAPLE. FINISHED IN  
CLEAR LACQUER.

No. 293/ETS-11

CARL GOLDBERG MODELS INC

Carl Goldberg Models Engine Test Stand.



ABOVE: Coverite's new brush-on liquid paints, premixed, in 12 colors.

LEFT: Pearson Power Products Ignition V-twin (1.82 cid).

# 1st EUROPEAN FAI-F3C C

By HORACE HAGEN . . . A member of the FAI jury selected for Europe's first FAI-F3C Champs reports on all the activities last May at Eibergen, Holland.

• I found out about this championships at last year's FAI plenary meeting in Paris. At that time, I mentioned to the delegate from the Netherlands (Tony Aarts) that I intended to go to the championships as an observer. He had spoken to the contest organizing committee, and they were looking for qualified people to serve as international judges and members of the FAI jury. He asked me if I would be willing to serve as a member of the FAI jury.

Earlier this year, I received a large envelope containing all of the contest details and an invitation from Mr. Kristiaan Lulofs, the head of the organizing committee. Shortly thereafter, I made travel arrangements for my trip to the Netherlands. I also decided to combine this trip with a mini-vacation in Germany to visit my hometown.

I arrived in the Netherlands on May 13, and together with friends, I did some sightseeing before the contest. I arrived in Eibergen the afternoon of Thursday May 17. I was very much impressed by the flying site. The site is the club flying field of the Eibergse Radio Modelvliegclub (Eibergen Radio Model Flying Club), and is located on a farm just outside of town. A large club house, complete with kitchen, bar, building room, and bathrooms is located next to the field. Very impressive for a club of only 50 members!



The Swiss "White Team" performs surgery on Ueli Mueller's Bell 222 machine inside the repair tent. Ueli and fellow team members took the third place team trophy.



Frances De Proft of Belgium flies his second place *Superior* with Jean Pierre Du Pont calling the maneuvers. Note the round helpads to the right . . . started out as square pads!



Dutch team member, Cees Verplanke flies his *Star Ranger*. Cees also participated in a demonstration flight for the Dutch royal family.

The flying site was well prepared for the competition. Two FAI site plans were laid out on the field at 45 degrees to each other to accommodate the prevailing winds found at this location. While I was looking the site over, I noticed that the course contained two-meter *square* helpads. Apparently, the Eibergen club had not looked at the new FAI rules which show helpads of two-meter *diameter*. The Eibergen club promised to change the pads by morning of the

first contest day. With safety in mind, a seven-foot high chain-link fence was strung along the crowd control line in order to separate the flying and spectator areas. In addition, the club has erected another chain-link fence between the judges' stand and the crowd line.

The weather was not the best this day. The sky was overcast, the temperature was in the 60s and a fairly stiff breeze was blowing.

Later that evening, we had dinner at the Motel Eibergen Restaurant and met some of the contestants and their team managers. A pilots' briefing was called after dinner by Mr. Lulofs at the clubhouse on the field. Many questions were asked and dealt with by either the organizing committee or the FAI jury members.

On the morning of the practice day (Friday, May 18) we gathered at the flying field and observed the training flights. Each contestant was allotted a 15-minute interval during which he could set up his machine. This time was kept somewhat flexible and some pilots used two such intervals as time permitted.

The processing of the models was also done this day, and was carried out in a large tent located next to the pit area. A total of 26 contestants from 11 countries had registered. I was very much interested to see how the processing crew checked for metal tip weights in the main rotor blades. Initially, they used a metal detector of the type used by beachcombers. This turned out to be less than satisfactory as the detector



# HOPPER CHAMPIONSHIPS

could not localize the metal objects to less than a few inches. As an example, the detector would go on when it got within about six inches of the rotor hub. In addition, the device could only be used outside the tent because other large metallic objects had to be at least several feet away from the induction coil for it to function properly.

A few hours after the processing started, a fellow helicopter pilot showed up with a metal detector used to find electrical conduits and water drain pipes in building walls. This device is ideally suited to the purpose as it can localize objects to within a fraction of an inch. I was intrigued by the device, and asked if

*Continued on page 84*



This is a view of the flags of the participating nations and the crowd control fence mentioned in text. White tent visible on the left side of photo was repair station.



CD Gerard van Wijngaarden shakes hands with 1st place winner Ewald Heim (Ger.). Frances De Proft (Bel., 2nd, left), and Christian De Mayor (Bel., 3rd, right) await their congratulations.



The victorious team managers receive their moment in glory. (L to R): Germany (second), Belgium (first), and Switzerland (third). The champagne flowed freely. Trophies were awarded at banquet.

## FIRST EUROPEAN CHAMPIONSHIPS 1984

### F.A.I. R.C. HELICOPTER PROGRAMM F3C

E.R.M.V.C.

N.R.C.H.A.

K.N.V.V.L.

EIBERGEN

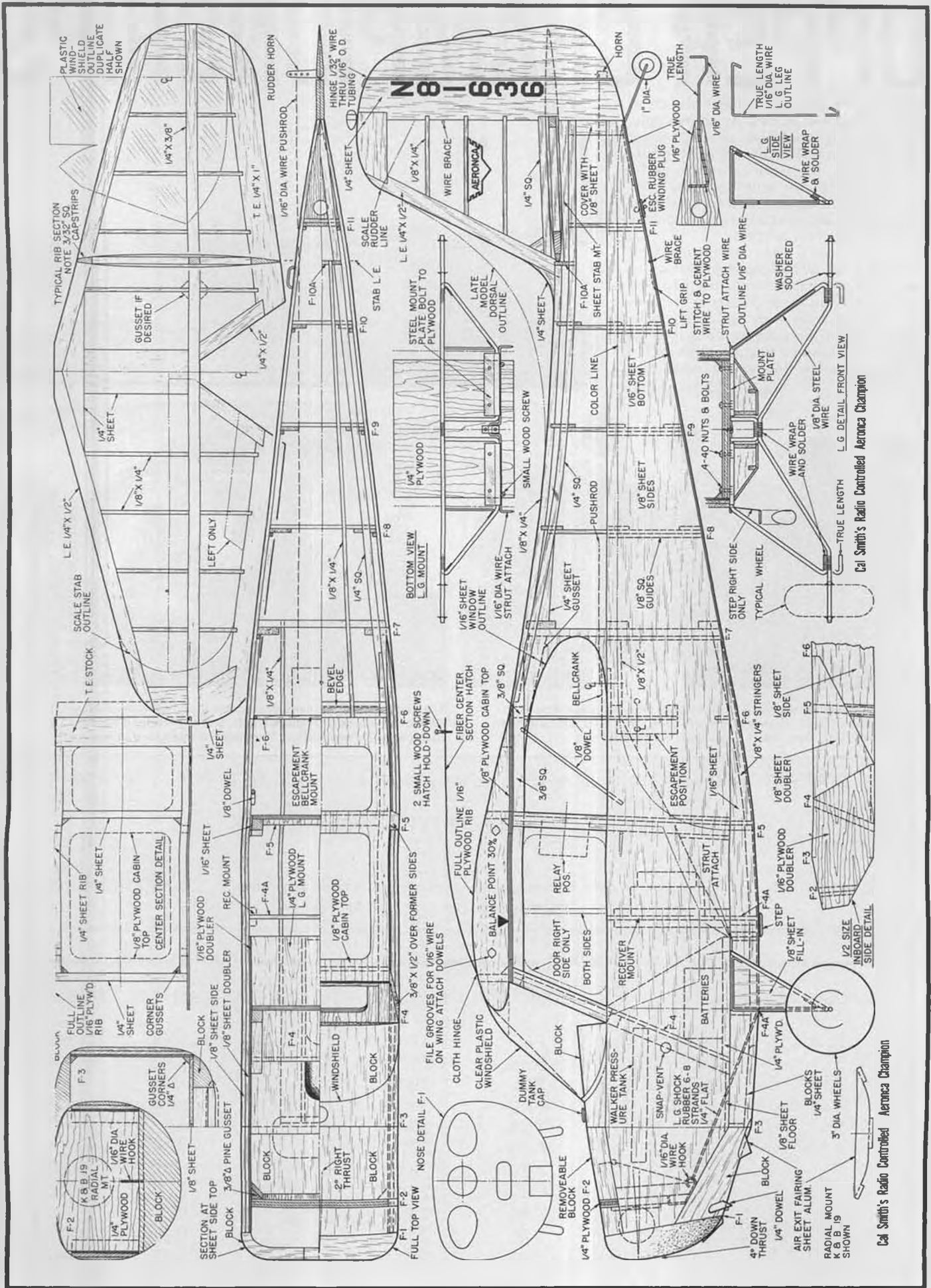
NETHERLANDS

# FINAL RESULTS AFTER 3 FLIGHTS #

#### TOP 11 INDIVIDUALS

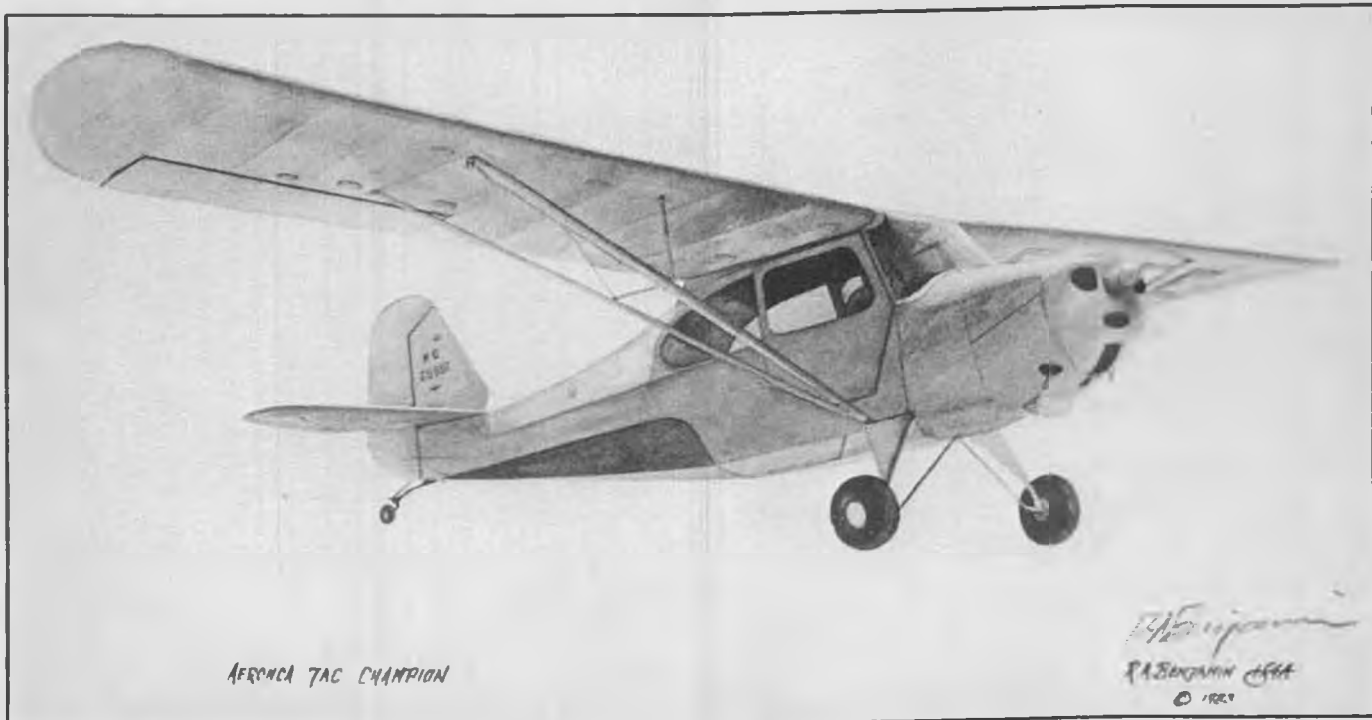
#### TEAM STANDINGS

PLACE	NAME	COUNTRY	RESULT	PLACE	COUNTRY	RESULT
1	E HEIM	FRG	2940	1	BEL	8633
2	F DEPROFT	BEL	2935	2	FRG	8300
3	C DEMAYER	BEL	2864	3	SWI	7642
4	J DUPONT	BEL	2834	4	FRA	6288
5	U MULLER	SWI	2784	5	NED	6194
6	M DAVIDEIT	FRG	2706	6	GBR	6099
7	G WACHSMUTH	FRG	2654	7	NOR	4050
8	C VERPLANKE	NED	2644	8	ITA	3107
9	L MOUNT	GBR	2626	9	DEN	2226
10	D GRABER	SWI	2548	10	SWE	1977
11	R CICUREL	SWI	2310	11	LUX	1423



Cal Smith's Radio Controlled Aerona Champion





Bob Benjamin's monochrome sketch of the Aeronca Champion captures the spirit of this classic aircraft. See page 100 for ordering instructions.

## CAL SMITH'S **AERONCA CHAMPION**

A classic scale design from the mid-50s which disappeared along with the magazine in which it was originally published. Complete building instructions included with plans. Background story by Bill Northrop.

• To the new generations of modelers who came into the hobby over the past 25 years and may not have heard of him, we introduce the late S. Calhoun Smith. Cal Smith was a former designer of control line and R/C models during the post-World War II years, and his work mostly appeared in *Air Trails* magazine. At the time that his R/C Aeronca *Champion* was published, the magazine was using one of its less than model-type aliases, "Young Men". To be exact, it was the July 1956 issue.

In the July 1956 issue of . . . er . . . "Young Men", just to give you an idea of the status of R/C at the time, there were only ten ads that had anything to do with R/C materials in the whole magazine,

and of the companies represented, only three exist today . . . Ace R/C being the most prominent. There were 65 other model advertisers in the 68-page magazine.

As this was an era when rudder-only was the primary control system in use, most designs published featured this meager arrangement. And of course, the model pretty much had to be an inherently stable design that could fly well without any control, as this was the normal condition! It's funny, but old-timer free flight with radio assist, the perfect type of model to use as a start in R/C, was unknown in those days! Certainly, scale R/C was very limited in the choice of subjects, with cabin-type light-

planes such as the *Champ* being almost the only way to go.

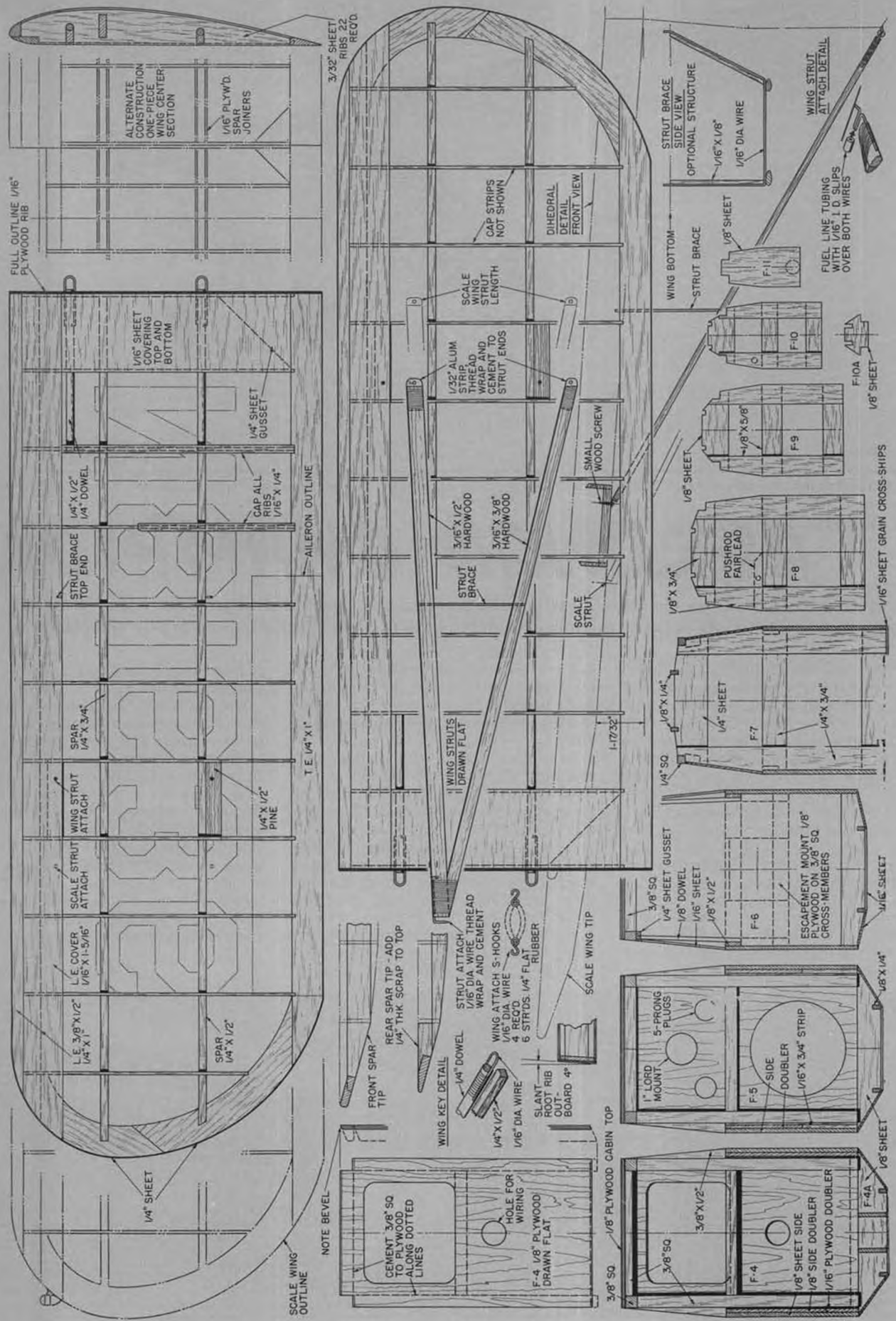
Cal Smith mentioned in his article that the *Champ* structural design was based on the famed J-3 *Cub* design by Chuck Hollinger, which had previously appeared in *Air Trails* (or whatever). This *Cub* went on to be a popular kit by Berkeley, and eventually, with improvements, became the early Sig J-3 *Cub*.

Rather extensive building instructions were included with the full-size plans for the "Air-Knocker", and not published with the article. We'll follow the same procedure. The scale is 2" = 1'0", and the only deviations were the span,

*Continued on page 95*



From the original construction article comes this photo of the *Champion* model. Engine doesn't have to be mounted vertically as shown.



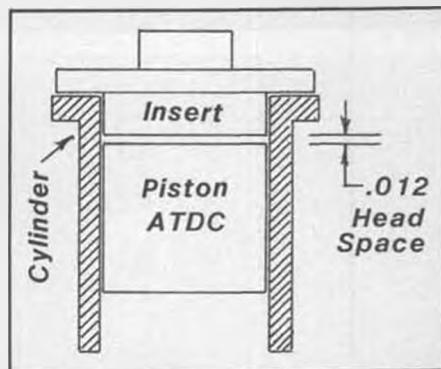


# FUEL LINES



JOE KLAUSE

P. O. Box 2699  
Laguna Hills, CA 92653



## SECRETS, SECRETS

When a group of children, around five years of age, gets together, it's common to hear one of them declare, "I know a secret." If a playmate asks, "What is it?" He or she usually says, "Well, I'm not gonna tell." Seeing the attention, another one often butts-in with, "I know two secrets." Of course, the ultimate is, "Oh yeah, well I know a jillion, jillion secrets."

I'm sure that there is a good explanation of this behavioral game. However, that's of no real concern. The important thing to be aware of is that this activity is carried into adulthood. Commonly, we know it as gamesmanship. It's sometimes used in marriage or business, but it is universally used in pursuing one's hobby. Golfers are renowned for audibly mumbling, "Good luck," as the friendly opponent begins a backswing. The list of such examples is endless, and our hobby is replete with them.

"Has that servo always been so jittery on down elevator?"

"Forty seconds for a Rat pit stop ain't too bad."

"Great climb! Just a bit more rudder tab will really get you transition."

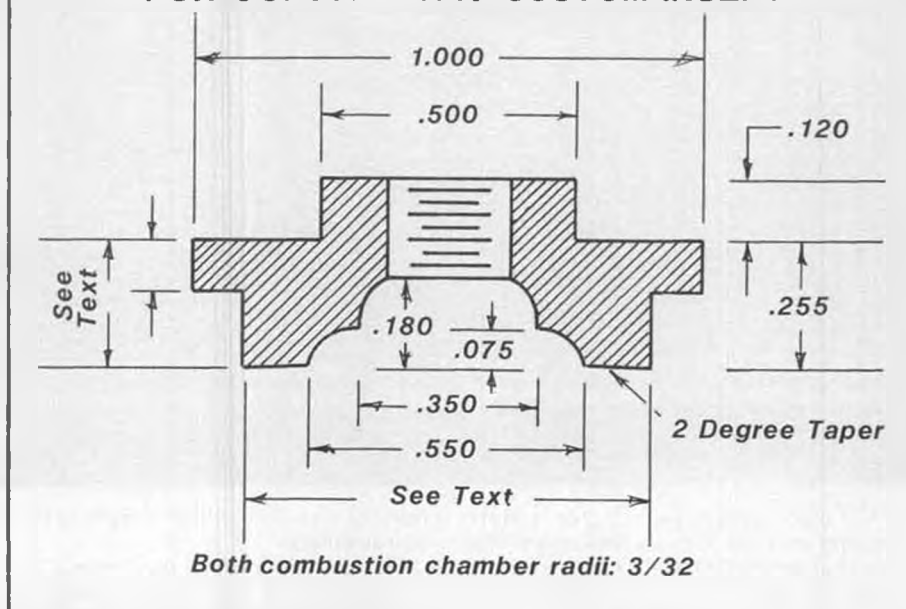
"Sounded a little rich, didn't it?"

We've all heard many such comments that are obvious gibes. The ones to be wary of are much more subtle. If you're an engine worrier, you're a prime candidate for the sophisticated gamesman. If the worrier sees a buddy turn a fast heat, he'll more than likely mosey over and say, "Got a really tricked-up engine there, huh?" The pro gamesman will only utter one word, "yep" . . . even if the engine is "stock-out-of-the-box". At that point the worrier reaches for his Roloids. Even if you're not a worrier, the chances are that you're convinced that any guy who wins a lot is using "trick stuff". Being in the engine business, I'd have to say that most of the time you'd be right. There are indeed "tricks" to obtaining superior performance from an engine. In future columns, I'll describe various techniques that can be used. To start things off, here are the details of a very effective head insert configuration.

## FAST COMBAT "SECRETS"

Without going into all of the technical reasons as to why it works well, the accompanying drawings depict a custom head insert for the Fox Combat Mark IV engine. The material for the insert is

## FOX COMBAT MK IV CUSTOM INSERT



Modifications detailed above are for the Fox Combat MK-IV engine with 40% nitro fuel. The insert is made from 2024-T3 aluminum.

2024-T3 aluminum, and the cross-sectional drawing provides all of the constant dimensions. There are three dimensions that will vary from engine to engine. They're shown with the teasing notation, "See Text." The reason why they vary is because of engine production tolerances.

The first one to consider is the diameter of the portion of the insert that slides into the cylinder sleeve. It is important that it almost matches the inside diameter of the sleeve. In fact, when I machine this insert, I make it five-thousandths (.0005) of an inch less than the sleeve. Obviously then, you must accurately measure the bore at the top. If you want to sacrifice about a thousand RPM, make it a three to four-thousandths loose fit.

The other two unspecified dimensions are controlled by the height of the piston at top dead center (ATDC). The production machining of the crankcase, crankshaft, connecting rod, sleeve and piston all affect this. So, with those parts assembled, measure the distance from the top of the piston (ATDC) and the top of the shoulder of the sleeve. Once this is determined, and knowing that the desired clearance between the bottom

of the insert and the top of the piston is twelve thousandths (.012) of an inch, you can easily calculate the depth of the plug portion of the insert. The third variable dimension is the difference between the depth of the plug and two-hundred-fifty-five thousandths (.255) of an inch shown in the drawing.

From the foregoing, it's not hard to understand why custom engines are more expensive than those straight off the assembly line. Similarly, production line automobiles do not win stock car races.

Let me add a note of caution, this head insert is for a Fox Combat MK IV engine with 40% nitro fuel. The same general configuration may or may not work well with another engine of similar displacement. I realize that this has been quite specific. If it appeals to you, let me know. If you'd like more general type information, again, let me hear from you.

OK Combat guys, with this and your machinist buddy's help, you can trick-up those Foxes-out-of-the-boxes and play a little gamesmanship. Or games-womanship? Ooooh no! Certainly never gamespersonship. . . .



## TOP FLITE Elder

By BILL CLENDENON . . . Top Flite has a sure winner in the antique-looking "ELDER" sport plane. The novice builder and flier should consider it above many other so-called trainers. Try it with a 4-cycle engine!

*Photos by Robert B. Sykes*

• I'll warn you now . . . don't start digging in your files to find out if the British, French, Germans, Cherokees, or Apaches used the *Elder* in WW-I. Pity they didn't, because by looks it could have held its own.

Factually, the *Elder* is an airplane designed by Top Flite's prexy, Scott Christensen. It did not exist as a full-size airplane, but you can get some really good arguments at the flying field by keeping your mouth shut and very discreetly setting it up and then walking off to snicker and watch.

You can have almost as much fun watching people argue about what it is, as you can flying it.

Top Flite has decided to offer the neophyte a trainer that doesn't look like a shoe box or a high wing cabin clone of 48 dozen other trainer kits. The *Elder* can be finished in an infinite variety of schemes or detailed as much as you want. The *Elder* possesses very nice moments, a comfortable wingspan with sufficient chord, and a good amount of stabilizer area. Put all of this together with a flat-bottomed airfoil, and you have the chemistry of a good trainer.

Now, if any of you Pattern folks want to strap a .40 glow engine on the *Elder*, then I suggest you don't read the rest of this review. It is not intended for that, and it would be absolutely ridiculous!

The *Elder* can be flown with a .25 glow engine or a four-cycle equivalent. In my case, I used the HP .21 four-cycle from Tower Hobbies. This thing runs like a cat

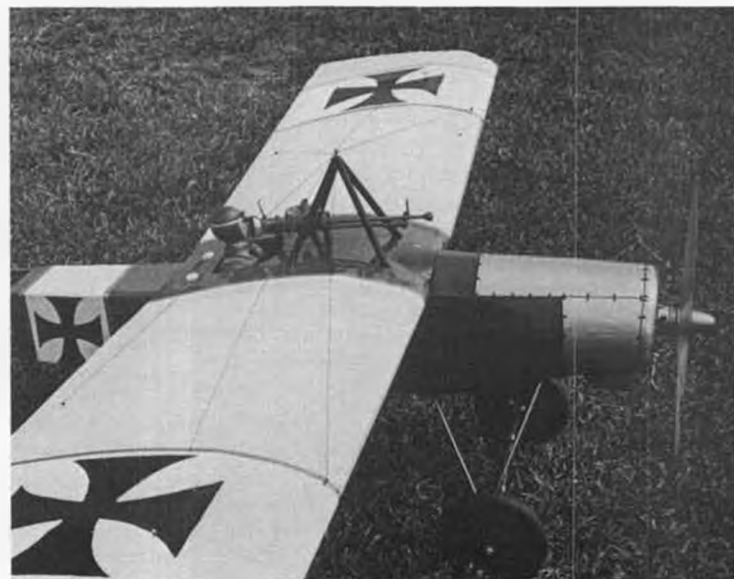
purring on a cold winter's night in front of a fireplace.

The construction of the *Elder* is very straightforward, consisting of balsa, ply, and spruce. At this point, I would like to interject my only comment for what could be an area of improvement. I feel the wire tail skid could be a little tricky on takeoffs for a rank novice. I would recommend that a steerable tailwheel be used as a modification to the kit. An experienced modeler could assist a beginner in this task and have the modification complete in about 15 minutes.

The fuselage is no more than a built-up frame of balsa sticks, a few die-cut

pieces of 1/4-inch sheet balsa, and 1/4-inch square spruce sticks. It is designed so that a novice should have no problems at all if he follows the instructions. When building the second fuselage side frame, it is imperative that wax paper be placed over the completed first side frame, and that the second frame be built on top of the first for an exact match. I used regular Zap and Slo Zap with Zip Kicker accelerator throughout. Use Slo Zap on all areas of hardwood for good penetration. The 1/4-inch square spruce longerons can be easily done if the lengths are cut oversize and the ends sanded to the

By all means put a pilot in the cockpit of this airplane! A machine gun looks great also, both may be purchased through Williams Bros. Do you agree with the author that this could pass for a WW-1 fighter? We do!





correct angle.

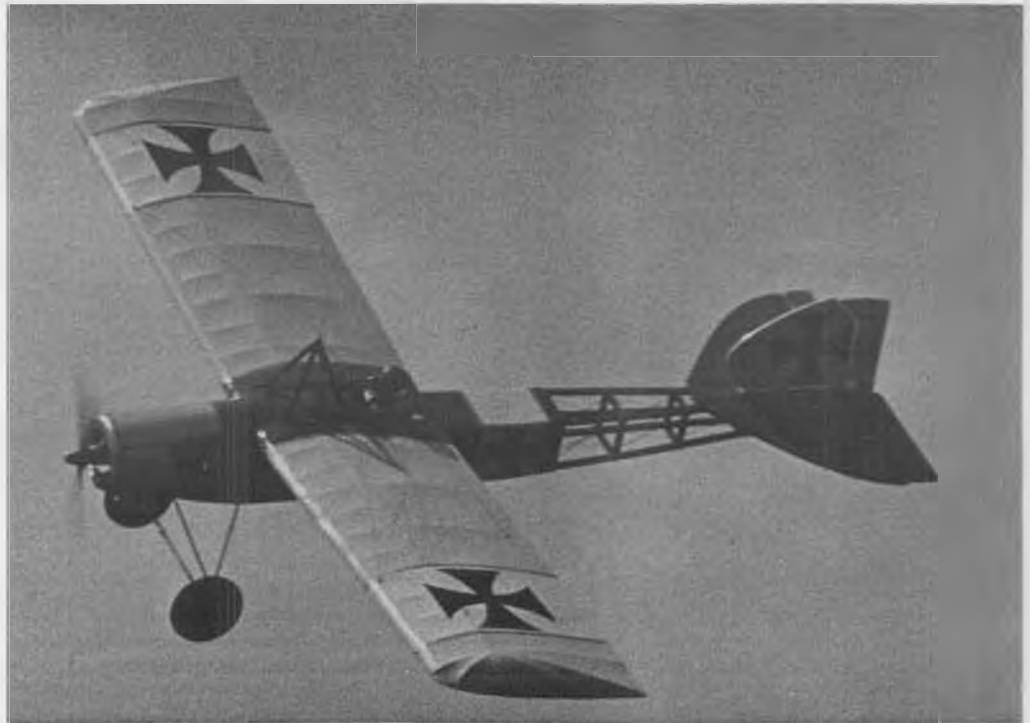
When you join the fuselage frames, make certain that the front crosspiece joiners (from the wing trailing edge to the front of the fuselage) are square vertically and horizontally. This is another absolute must. There is simply no substitute for accurate construction. You will be rewarded when you make your first flight.

When you bend the frames at the rear to glue in your top and bottom 1/4 square spruce cross pieces, be certain to use triangles, setsquares, or something, to insure the perpendicularity of both sides of the frames to your work surface. I should note that the forward part of the fuse has about one degree of positive incidence, so don't be perturbed when your frames don't sit flat on your building surface when placed upside down. The slight bow should be in there.

Another must is to place your fuel tank in your fuselage, and drill the holes in the firewall for your fuel lines, and also the mounting holes for your engine mount and throttle linkage. After this, you can add the respective front formers and balsa longerons. The front sheeting can be added in stages at this time. Be sure to wet your sheeting pieces to facilitate bending, and let this dry overnight; trim to size and glue in place.

When your sheeting is in place, sand the front end of the fuselage (from Former F-1 to Former F-2) to a nice radius to round off the front and make Monokoting easier . . . I can't help but wonder if Scott was glancing at an *Eindecker* when he did this one.

The stabilizer and rudder should be no problem at all. They are simply some die-cut pieces and balsa stock that can be Zapped together in five to ten minutes. I would advise against assembling the empennage to the fuselage at this time, because it will make covering the tail group much easier. When you do cover the bottom of the horizontal stab, leave the bottom portion that will be Zapped to the fuselage uncovered so that you will be gluing wood to wood



The Top Flite *Elder* makes a gentle left turn, clearly showing its antique heritage.

and not wood to Monokote.

You can decide at this point if you wish to scallop the trailing edges of the rudder and elevator. For simplicity I chose to leave mine in the stock configuration. Besides, I like its appearance just the way it was.

The wing is of very conventional design and structure. I should interject that the fuselage top formers and sheeting *should not be added* until the wing center section and dowel have been located and the appropriate hole has been drilled in the former that is at the wing leading edge. With the wing center section lying flat on the fuselage, you can get it lined up on the fuselage with a very exact fit. Another plus is that you can have better control of the wing dihedral by attaching the outer wing

panels to the center section while it is on your building board. But make sure the building surface is flat. Remember you are going for accurate construction first and a pretty airplane second. The outer wing panels are not at all hard to build. Just make sure when you joint the panels to the center section that they are supported at the proper dihedral on both sides. This is very critical.

Drill the wing hold-down locations on the fuselage and wing, and tap the fuselage hold-down accordingly. I chose to use my own 1/4-20 nylon bolts instead of the 8-32s provided because I like 1/4-20 bolts and I've got a zillion of them laying around.

Now, above all, do cut out the cockpit area as shown and add a Williams Bros. pilot figure if you don't add any other detail at all. This really adds flavor. The novice may want to delete the king posts provided and the rigging strings, but I do think a Williams Bros. machine gun (even unpainted) would put the spice of life into the *Elder*. The choice is up to you.

The landing gear is a novel, functional arrangement, and it is quite easy to solder together. I used tin plated wire to wrap around mine, and I fluxed it with Kester brand flux. The solder flowed on beautifully after very little time from my soldering iron.

I think it would be kind of silly to say that I didn't use Monokote on my *Elder*. Monokote works; it does the job and does it well. Quite truthfully, I will confess that I also use Coverite's materials . . . depending on what type of airplane I'm building and depending on my whims at the moment. I think that these two brands are the best to be found. Bar none. ●



The author mounted an HP .21 four-stroke engine inverted in the *Elder's* cowl. This is an excellent choice for both performance and sound. Don't be tempted to put a screaming two-cycle .40 in the nose . . . that's way too much power!



## The Fabulous Return of Love's Labors Lost. . . And Sylvestor's Thrust Stand Explained

By FRED LEHMBERG

• The world is truly a rosy place today! The world wasn't quite as nice a little over a year ago at the April 1983 SAM 49 Spring R/C Assist Bash where we lost our 1/2A Texaco Feather Merchant in one of those famous Taft boomers. One year and six days later, we received a telephone call from Honey (I don't know her last name), who works at the Topper Motel Restaurant, in Taft, California. She informed us that her husband had found the errant bird only a couple of miles from the model field as he was hiking through the kitty litter! (Taft is home for a kitty litter factory. wrf)

Today, the Sunday following her call, I drove up to Taft to pick up the model. I thought I might have the time for a flight or two, so I took along the 72-inch version with the Fox .25, as it was on the same frequency as the model Honey's husband found. Honey wasn't at Topper's, but she had left word to give me the model, which the lovely little girl at the desk did.

As it turned out, once I was at the Taft flying site, I made only one flight. On that one flight I cheated, for I gave the Fox .25 only about sixteen seconds at full throttle and about a minute at idle, instead of the usual 25 seconds at full throttle per the SAM rules. I timed only the glide, which was over 12 minutes, which ain't too shabby! Only one flight was made because I got my mouth into gear with a local flyer named Loop. He has the nickname "Inside and Outside," and was flying a *Deweyville Special*. He was interesting to talk to, and a good flier. I hope to see him again.

I digress too much. To get back to the story, the returned model was given a quick field charge AND EVERYTHING STILL WORKED! After a shot of fuel (just for me, for I'm sure the engine must have been turned over by someone), the engine felt very free and "right," so I'm



SYLVESTOR EXPLAINS HIS TEST STAND TO WALLABY WILLIE

sure it will run. The Monokote was hardly faded, and had only one hole in it. This defect I had dumbly provided just before the last flight. The only other damage was a broken 7-4 prop (the last flight was handlaunched . . . for ROG a 6-4 or 6-3 is used). That is the extent of damage after all four seasons of the year in the great outdoors of Taft!

The preceding short story sure says a lot for Futaba and Monokote, doesn't it? It also says a lot for Honey and her husband. I was so astounded at the whole thing that the only name I took down was Honey's . . . which is lousy reporting! Honey even had to be talked into accepting a reward, which I prefer to call a gift to two fine persons. With

immigrants like these people (Honey said she was German, so it may be an error to assume that her husband is also), this country can only improve in national integrity.

Incidentally, Hardy Robinson lost his 1/2A at this year's April 49er meet. Maybe Honey's husband will find Robbie's, too. Let's all hope so . . . and remember the Topper Restaurant when you visit Taft!

I just went out to the hangar to tell The Lads the good news, and got a real put-down! Chickums asked me something to the effect of, "How can any dummy lose a model that is radio controlled?" You tell him, Robbie.

At the end of this exchange, the door



FIGURE 1

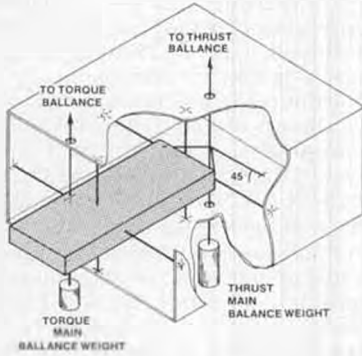


Diagram of Suspension System

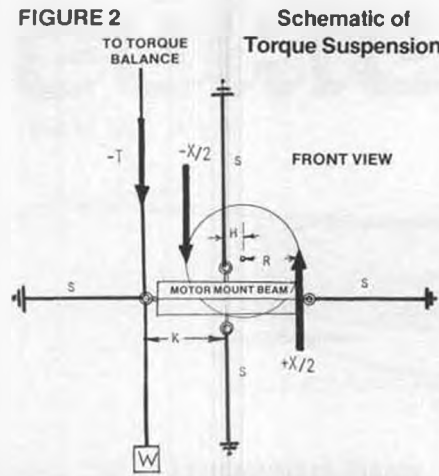
to the convenience room opened and out stepped a very strange looking character. He had long ears, powerful legs, was wearing a flight helmet with goggles . . . he even had some propellers and a starting battery stuffed in his navel!! I figured he either had the world's record for big navels or he was a kangaroo! As it turned out, I wasn't very far wrong in either event!

"Mr. Lehmborg," said Silli (he hasn't called me that since he applied for his position), "This is Wallaby Willie, who is visiting us from down under . . . Australia". He looked as if he was introducing the sovereign of the British Empire.

I said the usual amenities, appropriate to Silli's introduction, which pleased Willie to the extent that he said, "My name is really Wilberta, mate. If I was a William, I wouldn't have a pouch to carry these props and a startin' battery. I've enjoyed your 'Chickum Tracks' . . . it's fair dinkum! As long as you deal the dinkum oil and 'ware of the yakka, I'll stay your mate!" I was a bit non-plussed at this foreign language, but because of her expression (yes, *her*, not *he*), I invited Willie into the Inner Sanctum, where I discovered many interesting facts about our visitor. Willie claimed that she was a reincarnation of a WW-I fighter ace. She had seven victories . . . all behind the German lines and, thus, unconfirmed. However, her details of the aerial combat convinced me!

Willie is a really impressive personal-

FIGURE 2



Schematic of Torque Suspension

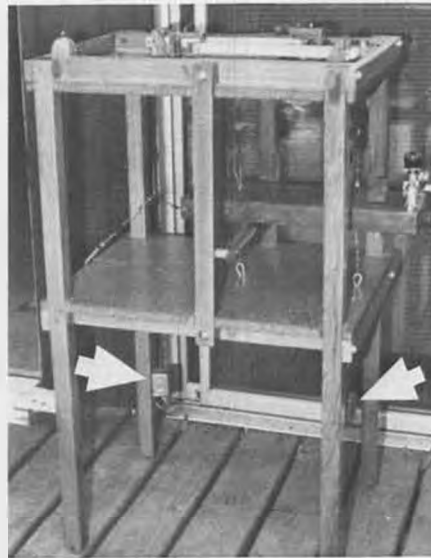
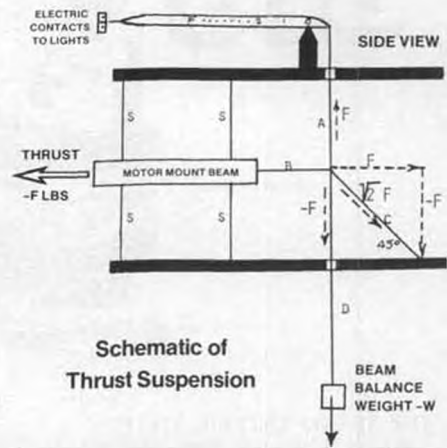


Photo 1. A McCoy Redhead .29 rests in the motor mount of Silli's static thrust test stand. Arrow on the right points to the torque main balance weight. Arrow on the left indicates thrust main balance weight.

ity! She wanted to come to the US, visit Taft, and, in particular, meet Sylvester and Chickums. She had only enough money for a one way trip, so she tried out for the Australian Olympic Team. She made it, and when she got here, she jumped ship and headed for the Hangar!

FIGURE 3



Schematic of Thrust Suspension

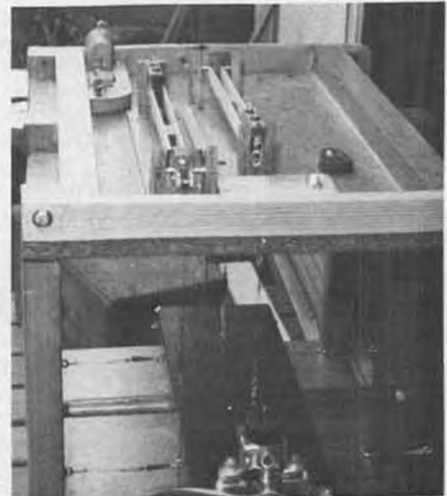


Photo 2. The thrust balance is located just to the right of center on the top platform. The torque balance is next to it on the left. Note the robust construction of the stand: bolts, screws and glue are necessary for safety.

With planning like this, is it any wonder that the Aussies pulled the America's Cup from the New York Yacht Club's firm grasp? Wallaby Willie is a person Texas would cherish, hold close, and call its own . . . believe me! The NYCC might try crewin' a 'roo or two!

Continued on page 97

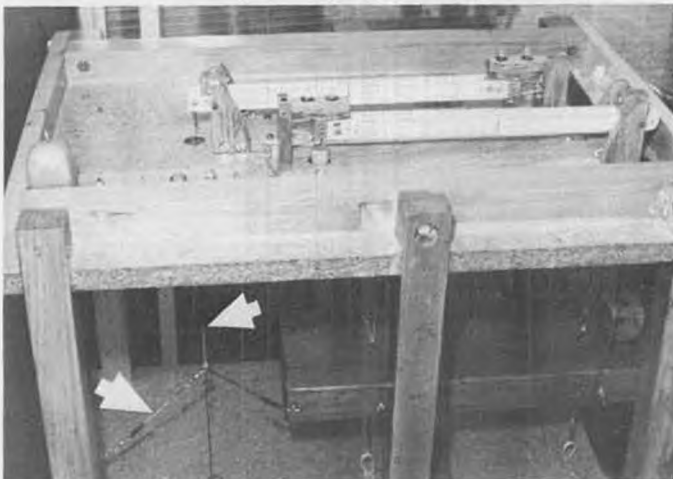


Photo 3. Here is another side view of the test stand showing the thrust yoke suspension. The diagonal line (left arrow) carries 1.414 times the thrust while the vertical line (right arrow) carries the full value of the thrust (100%). Note balance beams & indicator lights.

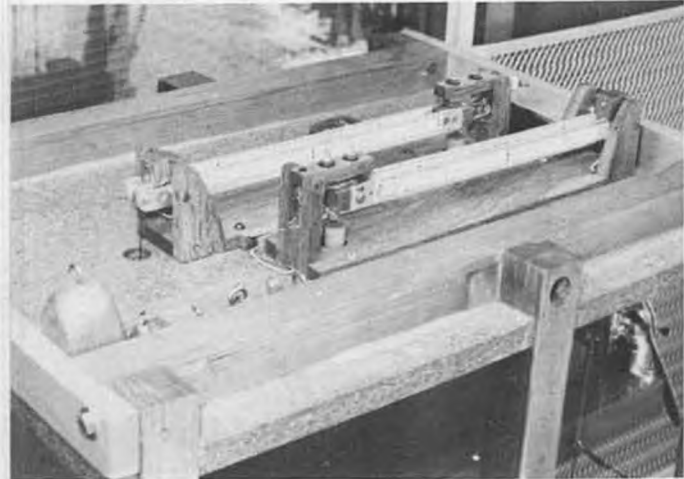


Photo 4. Balance weights (left foreground) are stored where they can be easily reached. Large weight at left is a two-pound thrust calibration weight. Other weights are used for calibration and for balance. See text for explanation of test stand equipment.

# BIG BIRDS

By AL ALMAN



## THE BEARD AND BIB MYTH

Given a choice, I'd rather become a legend and then a myth; however, no one has seen fit to ask me 'bout my druthers. And so a very distorted fairy story has been perpetuated these past few decades . . . a story told during a lull in the day's flying and 'round campfires on dark, damp, and windswept nights . . . that I was born with a humungous beard and tummy, and could not fit into anything else but a pair of huge bib-overalls tailored by Omar the Tent-maker.

This is a blatant lie! Although I have been sporting a beard and "comfortably" large bibs for some years, I was almost hairless when born . . . and my overalls are only 2XL. The proof, as they say, is in the pudding . . . or in this case, in the accompanying vintage photo that clearly shows the slim, boyish figure, and young, innocent, hairless face of an eighteen year old. The pic was taken at Keesler AFB in early '49, and the little freeflight model was an original design that got sucked up into a mighty thermal and disappeared on a heading for Central America. This same design was enlarged to 70 inches a few years later and flew with an Arden .19 and a modified Berkeley Aerotrol system that actually "worked" some of the time.

Anyhoo . . . hopefully this picture will lay to rest anymore conjecture, speculation, or dead-reckoning about my very private and sensitive self.

## VIABLE ALTERNATIVES

The latest press release about the Quadra 35X and 50X glow engines made me realize how well-off we are. It wasn't too long ago that choices for BIG Bird power were extremely limited; not only were there few engines available commercially, but those that were being advertised and sold left a lot to be desired because they couldn't anywhere come close to the reliability, dependability, and smooth running we'd come to expect from the forty and sixty size engines. Back then messing with BIG Birds truly was a tinkerers art in every respect . . . but, to get the much sought after total feeling of realism, a converted chainsaw engine was the only way to go.

Boy, have things ever changed in a relatively short period of time. To begin with, gas engines have been improved. There are now a slew of good two to four

cubic inch displacement engines out there at reasonable prices . . . and even though glow type Quadras are just being introduced, many BIG Bird people have been using alky for some time.

But the really BIG news is that we do have all sorts of viable alternatives to the gas engines . . . and the fact is that between the four-strokers and the new breed of BIG two-cycle glow types, there's an engine for just about anyone.

In the four-cycle category are numerous makes and sizes; in addition to the surprisingly powerful .90s and 1.2s that abound, you can also opt for the Magnum V-Twin 1.8, the OS 240 Gemini four-cylinder, the OS 240 Twin, the Saito 270 Twin, the Magnum 270 three-cylinder radial, the Technopower three-cylinder radial, or the OS 300 five-jug radial. All in all, it's quite a lineup, and it's absolute proof that the BIG Bird movement has (at long last) been recognized as a major part of modeling . . . and of course, a major part of the market. None of the manufacturers would have put time and money into R&D if they weren't dead sure that there was a ready market.

The new BIG glow engines are really something! They're designed to swing BIG props in the 7000 to 8000 rpm range, and considering their somewhat meager displacement, they do a magnificent job. Of course, it's the glow fuel that allows an engine with only 1.5 cubes to easily match the output of a Quadra. My Super Tigre 2500, for example, is new and is still being run very much on the rich side . . . yet it's quite happy turning a 20x6 at 7200 rpm, which, as the saying

Joe Manuel's scratch-built Curtiss Robin finally flew . . . with a reworked E&L Evra churning up the air. "The Evra is more engine than it really needs . . . after the rework," Joe says. He left the cowl off for the maiden flight just to be sure the engine wouldn't overheat.



John Haskell, Shelby, North Carolina, reclines beside his nicely done Air Tech Eagle. The bird weighs 18 pounds with a modified Q-35. John likes the way an 18-8 prop works with the Q-35, and he likes the way Mickey Mouse and his Futaba 7-ch. pilot the model.



From the frozen north (Fairbanks, Alaska) comes this photo of Paul Caulkett's 20-pound Byron Originals Eagle finished with Econokote. A Tartan Twin up front really makes this bird sparkle. We appreciate photos from our readers . . . thank you, Paul.





Here's a shot the author didn't think he got. On the first flight of Ikon N'wst's Aeronca C-3, the bird got hit by a savage gust of wind, just as she became "unstuck." Damage was minor, but could have been much worse judging from the plane's attitude here.



Doug MacBrien's OS2U Kingfisher does its thing. The plane looks great and flies great too! Doug's plans for this interesting scale subject are really top-notch. Doug extensively test flies all his designs before they're marketed. Contact author for address.

goes, ain't too shabby.

For those concerned about fuel costs for glow engines of this size, you're gonna be pleasantly surprised; not only does my 2500 seem to stretch out each ounce of petrol, but seeing as how it can run on low or no nitro and only five to ten percent oil, mixing two gallons of alky with a good brand of 15 percent nitro stuff will yield three gallons of five percent nitro, seven percent oil fuel at a nice and easy overall cost.

My biggest objection to the typically small glow engine, the whining, irritating, "gnatty" sound of high rpm due to small props, is eliminated with these larger glow types swinging BIG props only half as fast... which greatly reduces that #&\*&# prop noise. And as the nitro "bark" is so minimal that it can hardly be detected, the overall engine noise is as acceptable as the sound coming from most decently muffled gas burners... and more acceptable than many of the "token" muffled Quadras.

I've run my 2500 with ST and Tatone mufflers, and both do a good job. Although the ST clamps to an exhaust adaptor that allows it to be rotated to virtually any angle, and will therefore accommodate the engine in either an upright or inverted position. The Tatone muffler allows for a much more compact and neater installation... which is sure to please anyone trying to keep their bird looking scale-like (even I hate to butcher up a cowl).

There are a few other options you can look into: either the four strokers or the BIG two cycle engines can be easily converted to *ignition* using the CH Electronics CDI equipment, or you can find out what real lugging power is like by converting an ST-2500 to *diesel*. At the present time, I'm about to start testing my Tigre with a Davis Diesel head and expect to be able to use at least a 20-8, if not a 20-10, most of the time. Actually, I've been wanting to get away from gas engines for a while... partly because of the fuel being dangerous, but mainly because no matter how well balanced these engines are, they can't

equal the smooth running characteristics of a large four-stroker or a large two-cycle glow. Also, these other engines weigh less than a gas burner, which means that a much lighter, more nimble BIG Bird can be built.

What all this boils down to is that you don't need a Quadra-type engine in order to fly, and enjoy, BIG Birds. Whether your thing is puddle-jumpers or high performance craft like the Zlin or CAP 21, you can tailor the bird to suit the engine... and as all the other types of engines are lighter and smoother running, the airframe can be built with far less beefing up and re-engineering... in other words, more like the forty and sixty-sized birds so many of us are used to. Now that we've got equivalent power and sound, gas engines are no longer it; they're just one of the many choices that can be made.

#### CURIOUS, QUAIN, OR FANCIFUL HUMOR

That's the definition of whimsey, and it's also part of the way Bill Hannan describes his new book, *Scrapbook of Scale, 3-Views and Nostalgia*. Actually, he adds photos and philosophy to round

out this definition of his latest publication.

If you don't recognize his name, then you're missing out on one of MB's most delightful columns, as "Hannan's Hangar" is good and easy reading... no matter what your modeling persuasion may be.

The same can be said for and about Bill's new *Scrapbook*. It's an enjoyable 56 pages long, and although it may hold more absolute info for a scale buff, any modeler should find himself having one helluva good time immersed in Hannan's latest effort. Yeah, I know... this ain't exactly a publication for BIG Bird lovers, but because of its charm and potential use for scale people, I felt that I had to mention it. I'm glad I finally got around to reading it!

★ ★ ★

"Too many pilots practice only on good days. Anyone can fly on a good day!"

★ ★ ★

**PITCH STABILITY AND DOWNTHRUST**  
Gotta admit that I really was trying to

*Continued on page 58*

#### THIS IS IT!

The photo that tells the real story. This is Al Alman before bibs and beard. Al does not yet wear Omar the Tentmaker designer bib overalls... this is 1949... although he does admit to being one of Omar's old friends.



# R/C SOARING

• It's been a rough, but exciting month. A month with one big reward for many months' worth of preparation and 15 hours of hard labor. That big reward was my first child, a son, Matthew Howard Forrey.

Good things really can come in small packages, and Matthew was born pretty small: 20-1/2 inches long, and 7 pounds 10 ounces. This is a rather normal size for a human baby, but even so, he's tiny! The doctors tell us that he was born three to four weeks prematurely because of various tell-tale signs, but he is in very good health, as is his mommy, my wife Kathy. Imagine how big that little guy would have been had he gone full-term! Bear in mind that babies typically gain one to two pounds in the last four weeks of pregnancy.

Well, I just thought I'd crow a little bit by mentioning the biggest thing to happen to me since I got married two years ago, and one of the three all-time biggies in my entire life.

Now the adjustments begin!

## READERS NEED YOUR HELP

One of the big responsibilities of being a magazine columnist is handling correspondence, and in the case of "R/C Soaring," a lot of it! I never have claimed to be an expert in this field, nor have I ever claimed to know it all when it comes to aerodynamics. Over the past few months, I have accumulated a number of letters either asking me something I don't feel I can adequately answer, or asking me to pass on a question to my readership. The following letters are from this group of letters.

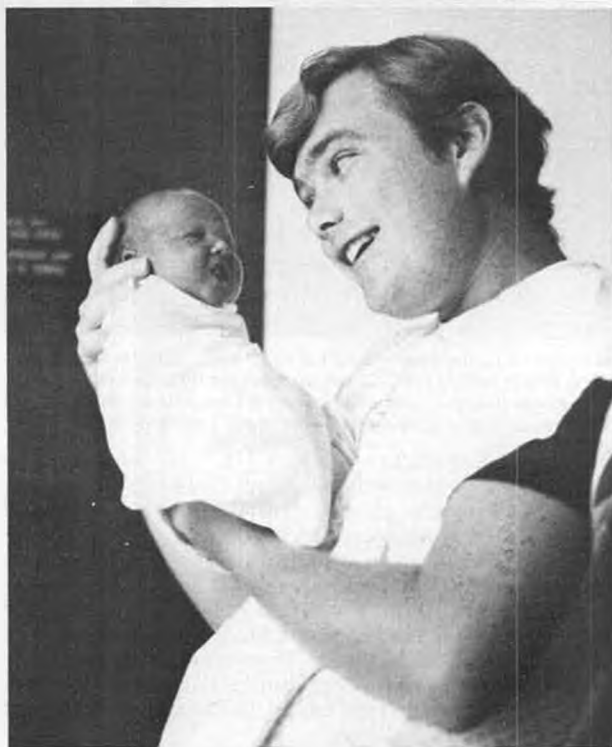
Michael T. Kelly, P.O. Box 110226, Anchorage, AK 99511, writes: "Do you know if there is an airfoil design program available for the Apple IIe computer? I would greatly appreciate any information that you may have on the subject." Well, I don't have any. If anyone out there reading this column has access to such a program, would you please let us know? It would be a great idea to share it with others through "R/C Soaring."

Michael also asks about the availability of a copy of *Soartech, Volume 1*, which is now out of print and sold out. If someone out there has a copy, AND IF it is not copyrighted, would that someone please make a Xerox copy of it for him, he will gladly repay you for your troubles.

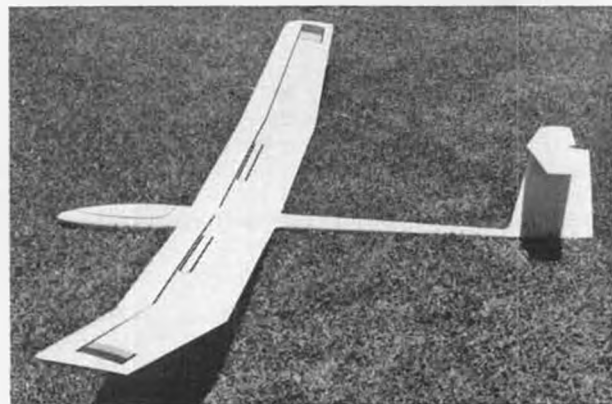
Jim Clark, 4975 Condit Rd., Sunbury, OH 43074, writes: "Firstly, I would like to say that I like your magazine, and find your column to be both entertaining and educational. It is really top-notch (although more sailplane construction articles would be appreciated).

"I have been getting more into scratch building and have had some success, but one area that frustrates me is fuselages. My built-up fuses seem too fragile, and the component fuses I have tried (Bob

"Now Matthew, it's not polite to stick your tongue out at people!" No, the author hasn't taken up with hand puppets or dolls... he's just proud to be the father of Matthew Howard Forrey, a 2/7-scale replica of himself at 20-1/2 inches long and 7 pounds, 10 ounces. Matt should be working on an AMA *Delta Dart* very soon, then on to a *Gemini MTS* after that...



Mike O'Reilly of Adelaide, South Australia, designed, built and flew this 120-in. sailplane to a first place in the South Australia Championships recently. Features Eppler 193 airfoil, spoilers, and all-moving T-tail. Fuse is molded fiberglass. More news from Mike in future issues.

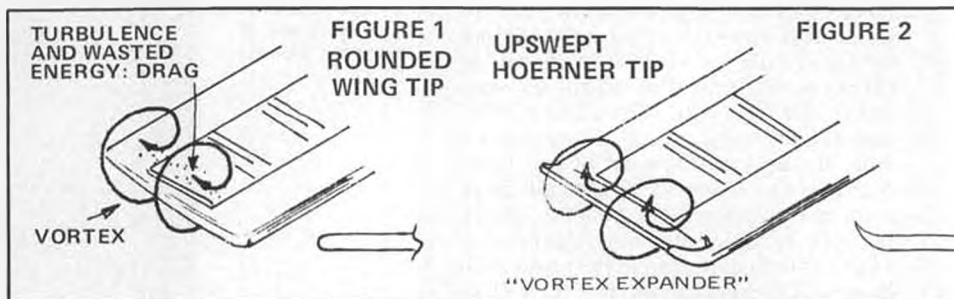


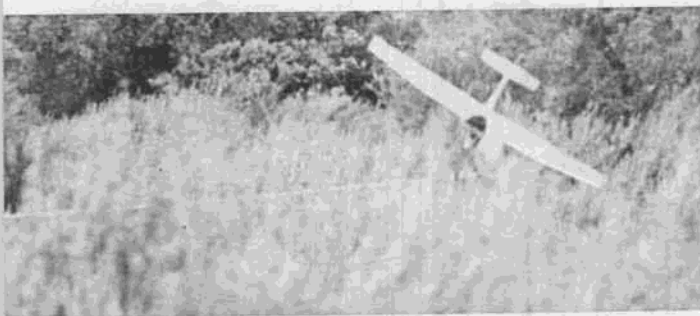
Martin and Hi Johnson plastic jobs) are too heavy and don't glue well. I would like to try fiberglass now to see if I can find that ideal medium for my design efforts. Your columns on making molds for 'glass fuses (April and May issues) were very good, but I'm not sure I want to invest the time and money in such a venture just yet.

"Obviously, someone has made the fuselage molds described in your col-

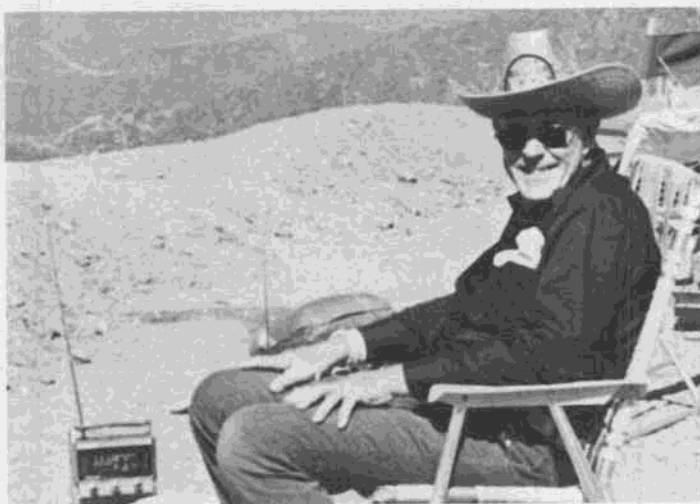
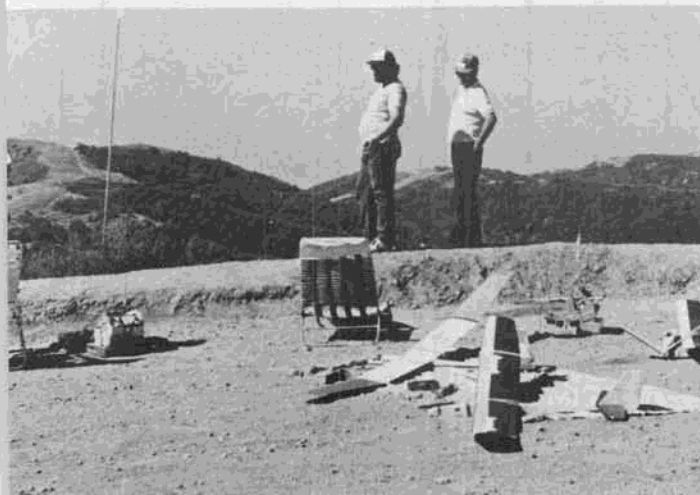
umn, and the Standard Class size is virtually identical to the design parameters I want to use. Is it possible that the owner of those molds might be willing to sell me a couple of fuselages made from them? If so, I would be very interested. I have enclosed a self-addressed, stamped envelope and would appreciate your sending me any relevant info you can.

"Keep up the good work on your





Paul Altenhoff is assisted up a steep, overgrown hillside carrying Bob Champine's modified Pierce Aero Paragon after 9 hr, 53 min. flight.



ABOVE: Bob Champine waits patiently for the slope lift to improve prior to record breaking flight.

LEFT: It ain't all glory... a lot of it is pure boredom. The planes are a modified Paragon belonging to Champine, and a very modified, E-211 Oly II. See text for the whole story.

Photos by Dick Everett.

column, particularly relating to airfoils and construction techniques."

Thank you for the kind words, Jim, they're appreciated too!

I wrote to Jim with my inadequate answer, namely that I knew of no source of such fuselages that was currently in production. If some enterprising modeler out there wants to make a few bucks, then molded epoxy-fiberglass fuselages would be one way to do it as there just isn't anybody out there putting out these things by themselves at the present time. With a good design, one could make some respectable change. How about it? Anybody out there with an idle mold just waiting to be used for profit? Let us both know!

Ed Bollin, Ph.D., 2932 San Xavier Road, Sierra Vista, AZ 85635, writes: "... I would like to see... a thorough analysis of all the tip stall MYTHS!!

"... I cannot break myself of low-altitude, downwind leg turns, so I destroy quite a few. I have lately noticed that my ships with upswept Hoerner tips (like the *Aquila*) seem to withstand my poor flying techniques much better. I don't really think that the tips do much for

vortex problems, but they sure seem to be more stable turning into the wind at near vertical bank attitude. Is there anything to this, or am I dreaming???"

Well, Ed, I will have to say again that I'm no aerodynamicist, but perhaps we can think this through logically based on hunches and limited knowledge... and perhaps we will get some reader response!

Firstly, the principle behind a lifting surface (i.e. a wing) is a differential of air pressure between upper and lower surfaces. Under normal flight, this means a lower pressure on the upper surface than the bottom surface. Near the tips, the higher of the two pressures wants to curl up and around the wing tip to equalize the two pressures. Or, you could say (incorrectly) that the upper surface's lower pressure "sucks" the higher pressure air from the lower surface around the wing tip. Either way, air travels from the wing's lower surface to the upper surface whenever lift is being generated. This causes the above mentioned wing tip vortices (see Figure 1).

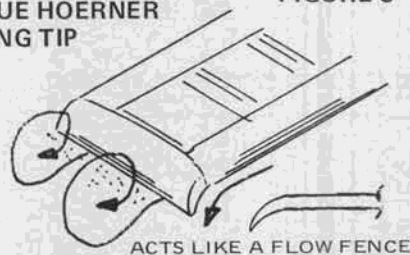
Wing tip vortices are not good for performance as what they are are lift



Next month, a mini-review of the Rowing *Merlin*. Joanne Forster. Pic by Mike Forster.

TRUE HOERNER WING TIP

FIGURE 3



ACTS LIKE A FLOW FENCE

FIGURE 4  
MODERN WING TIP  
AS SEEN ON "DASSEL"

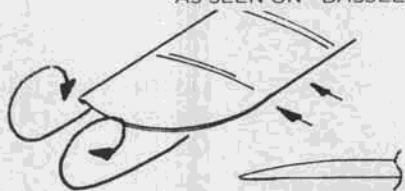
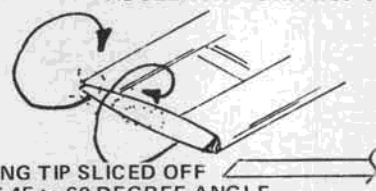


FIGURE 5

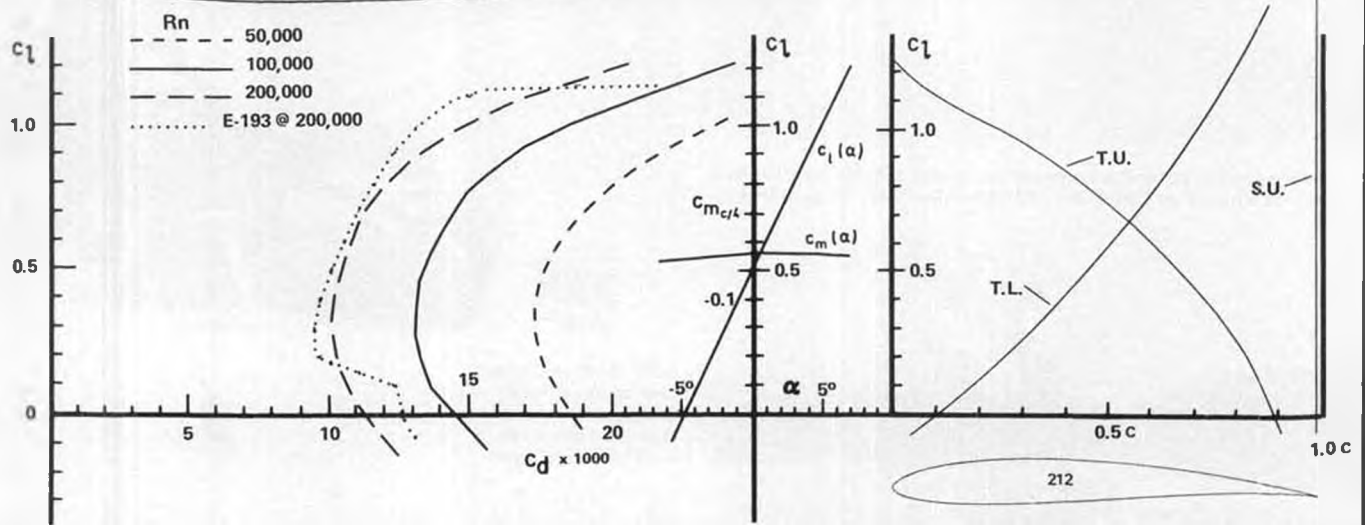
QUABECK WING TIP  
AS SEEN AT YORK WCs '83



WING TIP SLICED OFF  
AT 45 to 60 DEGREE ANGLE



# Eppler 212



Coordinates for the Eppler 212. For hand plotting, it is not necessary to plot each point. Skip every other point and use French curves.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
X	99.68	98.76	97.35	95.47	93.12	90.32	87.09	83.47	79.53	75.28	70.80	66.11	61.28	56.36	51.38	46.42	41.50	36.69	32.02	27.55
Y	0.092	0.372	0.803	1.307	1.844	2.418	3.023	3.645	4.269	4.881	5.465	6.008	6.496	6.915	7.256	7.507	7.660	7.708	7.647	7.473
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
X	23.30	19.33	15.65	12.31	9.327	6.729	4.534	2.758	1.410	0.499	0.032	0.122	0.800	1.984	3.648	5.780	8.363	11.38	14.81	18.62
Y	7.188	6.794	6.295	5.701	5.023	4.275	3.473	2.636	1.790	0.967	0.224	-0.398	-0.970	-1.532	-2.045	-2.486	-2.840	-3.097	-3.252	-3.301
No.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
X	22.79	27.28	32.05	37.06	42.26	47.59	53.00	58.43	63.82	69.09	74.18	79.02	83.53	87.64	91.28	94.38	96.85	98.62	99.66	100.0
Y	-3.248	-3.099	-2.861	-2.548	-2.175	-1.759	-1.320	-0.878	-0.452	-0.063	0.271	0.535	0.713	0.794	0.776	0.659	0.458	0.231	0.061	00.00

leaks, because they try to equalize the lift-generating pressure differential. In the case of your *Aquila*, where it flies in a more forgiving manner, I would assume that you are saying that it doesn't tip stall as easily. There are a number of contributing factors here, most notably, wash-out in the tips. Does the *Aquila* have more washout than your other designs? And what about those wing tips? Are they also affecting the tip stall? I'm inclined to say that they are. If there is a heavy vortex formed in the described turn, and there should be, then it must be raising the pressure over the top surface and decreasing its likelihood of

Continued on page 90

The Eppler 212 is currently being used on the Multiplex *Contest Flamingo* sailplane manufactured in Germany.

Velocity (pressure) distribution graph for the E-212 is at right. Velocities are relative to the zero lift line, not airfoil center line. Note large pressure difference at trailing edge. This is called "aft loading," and it is probably responsible for the high coefficient of pitching moment ( $C_m$ ).

Airfoil data and coordinates taken from *MTB 1* available in the USA from Wilshire Model Center, address in ad page 74.

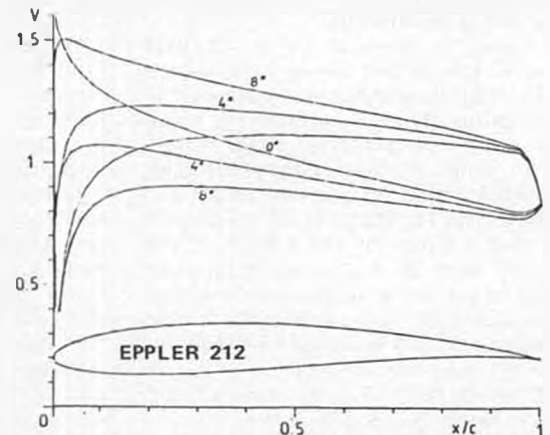
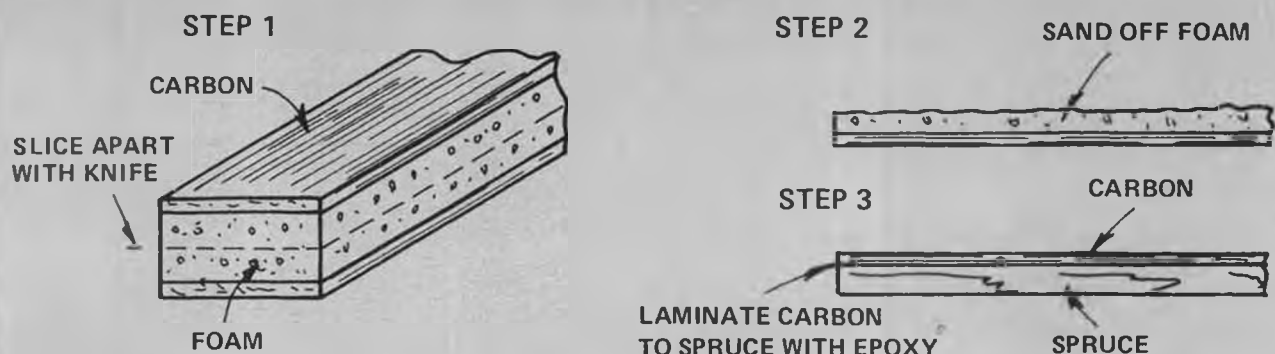


FIGURE 6

## DR. CHRIS ADAMS' CARBON FIBER SPAR DESIGN



MARK'S MODELS CARBON/FOAM/CARBON SPARS



# Electronics Corner

By ELOY MAREZ

## GADGETS AND GIMMICKS? — OR R/C GOODIES?

The many new electronic techniques and components, more of which seem to appear every day, have made it relatively easy for the R/C equipment manufacturer to offer the prospective purchaser a number of features and functions not previously seen. I feel that it is important to everyone in the market for a new radio system, be he looking at his first or his tenth one, to carefully evaluate these unusual items and to consider if they will actually provide him with something useful for his money, or if he is merely going to pay for "chrome and wire wheels" that might look impressive but which will not actually add anything in the way of reliability, longevity, or ease of operation.

To begin with, all of these features greatly increase the mechanical complexity of a transmitter, something that you will pay for at the beginning, but which we should accept as we all know that additional accessories do cost. However, what must also be considered is that this complexity will also add to any future maintenance costs. It used to be that a technician could remove the back cover and find one printed circuit board with everything on it, and all of the mechanics exposed and easy to troubleshoot and repair. No more! Removing the cover on a modern competition type transmitter uncovers a technician's

nightmare of sub-assemblies and component boards in every available cubic inch of space. The simple task of replacing an On/Off switch that used to take ten minutes can now take as long as an hour . . . and we are charged for this service by the hour. This is definitely a case where simplest is best. (*Very similar to looking under the hood of a modern car. It's difficult to find the engine, hidden by the maze of compressors, belts, ducting, pumps, hoses, etc. wcn*)

In detail, let us look at some of these features. For example, the digital display. Digital reading devices are in vogue . . . nothing seems to appeal like a bunch of flickering numbers. The first transmitter on which they appeared came out as early as 1976, and there are presently a number of so-equipped transmitters from which to choose. They are usually multi-function devices, which can be switched to display various types of information, some useful, and in my opinion, some superfluous, to say the least. Let's see what this display can tell us, and consider its merit.

As a voltmeter, it can be used to test not only the transmitter's internal battery, but also the airborne battery through a jumper cable. This has some useful value . . . but *only* if one will take the time to religiously use it to monitor battery status and condition. There are many such devices on the market, all require only familiarization and con-

stant application.

As a tachometer, it requires the use of a plug-in, cable mounted optical pickup sensor. In my opinion this is a questionable feature for a couple of reasons. One is from the safety viewpoint. To begin with, you should *always* make engine adjustments and take RPM readings from the rear. You then wind up having to hold the transmitter in one hand, and the sensor in the other, which leaves you without a free hand to set the needle valve. Also, the idea of aiming something at the prop while you are looking somewhere else, at the transmitter in this case, is not high on my list of clever things to be doing.

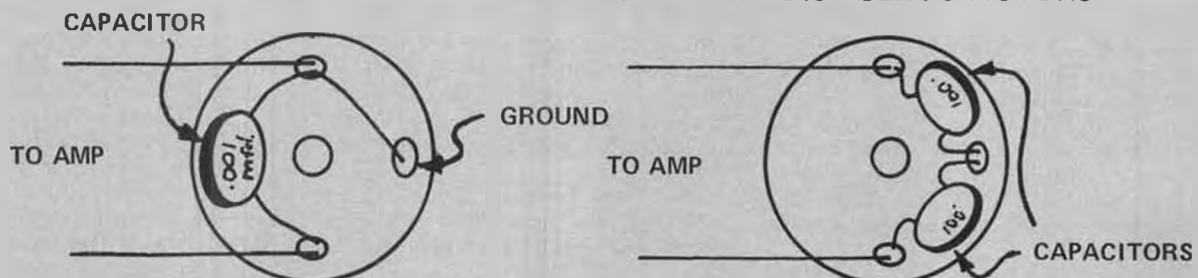
Now, as to the use of this digital device as a clock or timer. My feeling for the former is: Who needs it? I really don't care what time it is while I am flying; if I don't have time to finish a flight I wouldn't take off in the first place. Time elapsed is nice to know, as well as count-down or count-up for some types of competitive events, but the cost of that is having to take your eyes off your airplane. This is not a good habit, and I don't have to tell any experienced flyers that this is bound to cost you an airplane sooner or later. Even if you are alone, under certain sky conditions and with certain airplane colors, the time required for the eye to refocus from 100 yards away to 15 inches and back again, could be time enough for the plane to disappear entirely.

Another new/not new feature which we are seeing is fail-safe. Not new, because some of the pioneer reed systems had this type of device built in, which time proved to be a feature that most of us did not consider worth having and which was dropped. Present day fail-safe systems are quite a bit more sophisticated and probably more "fail-safe" than those early ones, but let us look at the options, and the end results.

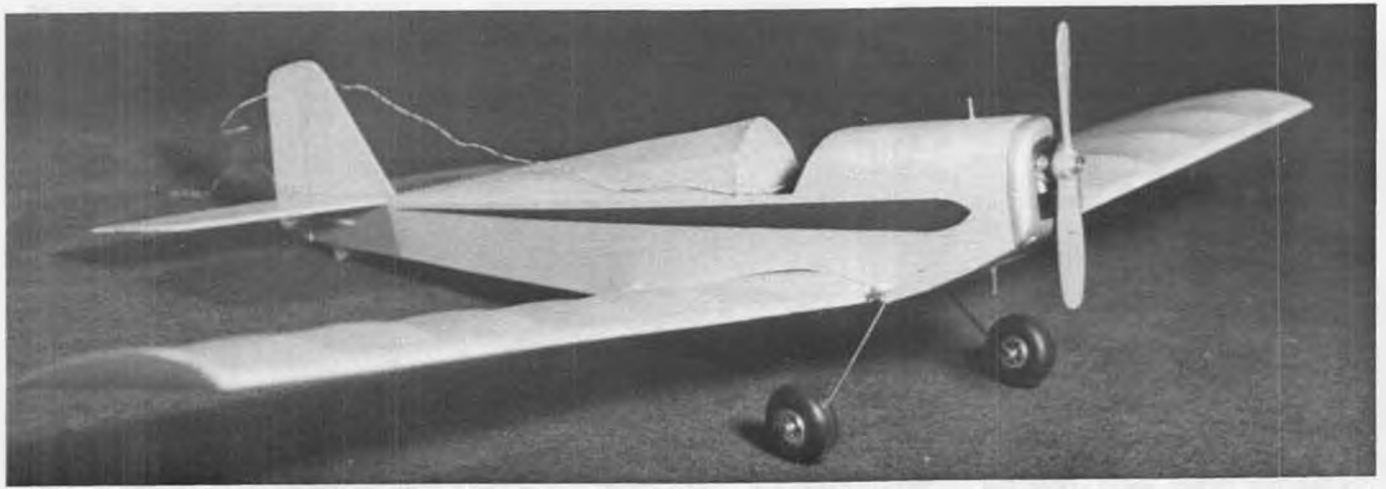
You are given a choice of fail safe modes, all based upon the receiver suddenly not getting a signal for a certain number of seconds. You can set it to have all your servos stay with the last given commands, travel to predetermined and preset positions, or have them all go to center neutral. The difference that one will make over the other, as I see it, is only in the location of where you are going to pick up the

*Continued on page 93*

## HOW TO ELIMINATE RADIO INTERFERENCE FROM NOISY SERVO MOTORS



Install noise eliminating capacitors to the rear of the servo motor as indicated. Small, .001 mfd, 6 volt units will do the trick. One capacitor should be all that is needed, as indicated on the left. If severe noise requires, use two capacitors as on the right.



No, the *Basic Low-wing Trainer* is not a scale model of anything, it just looks that way! Add a pilot and windshield . . . and *voila!*

# THE Basic Low-wing Trainer

By RANDY WRISLEY . . . The *Basic Low-wing Trainer*, or simply *B.L.T.* for short, is a fun little .049 gas or 035 electric powered model with a very descriptive name. It builds quickly, flies easily, and is plenty cute!

• The *Basic Low-wing Trainer* is a simple-to-build, simple-to-fly sport model. It has an interesting history. When the belt reduction unit came out for the Astro 020 electric flight system, I built the *B.L.T.* for it. On a good day, the model would stagger around the field, gaining perhaps 30 feet of altitude. Disgusted, I gave the model to a friend.

When Astro Flight came out with the 035 electric system, I borrowed the now dusty and neglected model back and installed the new system. It didn't even fly as well as I remembered! After a hard landing and some fuselage damage, I threw what was left of the *B.L.T.* in a corner of the shop.

When I finally got around to removing the electronics, by chance I checked the motor batteries. It was a six-cell pack alright, four cells connected to the motor and two connected to each other!

As the Astro 035 was now installed in my *Thush Mite* R/C Old Timer (MB plan No. 584-O.T.), I rebuilt the *B.L.T.* for gas. I still feel that if you built it lightly, used an 035 electric with belt reduction, and six or seven cells hooked up properly, *B.L.T.* would make a great electric!

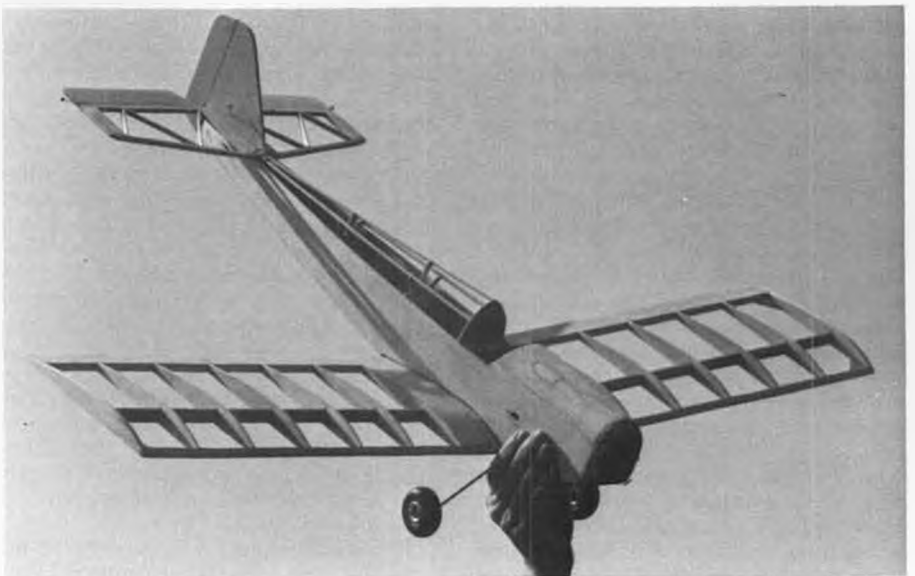
## CONSTRUCTION FUSELAGE

Begin by cutting two identical fuselage sides from medium 3/32 balsa. Cut the formers from balsa or ply as indicated. Install the doubler parts, using the former as a spacer.

Bend the landing gear from 3/32 music wire and lace it to Former 2 with dacron control line. Epoxy the firewall in place. While the glue sets, align the sides. Once you're satisfied, use instant glue to affix Former 5.

Glue the 1/8 square cockpit stiffener in, and pull the tail together. Install the remaining formers: 2, 3, 4, 6, and 7.

Don't let the weird top stringers scare



All framed up and ready for covering. The *B.L.T.* is lightweight, simple, and small . . . just perfect for schoolyard flying. Constant chord wing is very easy to build.

you. Here's how they're done: run a 3/32 square spruce strip from Former 4 to 7. With the stringer just sitting there, cut a notch in a piece of 1/8 x 1/4 balsa. Place the notched stick on Former 5, raising it up until it slips into position. Now you can glue this stick to the former. Repeat the procedure on Former 4, then do the rest of the stringers. It is much easier if you don't permanently attach any of the stringers until all the 1/8 x 1/4 pieces are installed.

Cement the 3/8 balsa filler block into place as shown, then plank the fuselage bottom with 3/32 balsa applied cross-grain.

Now is a good time to mount your engine: while you still have access. I have shown the engine inverted . . .

don't be afraid of it! With the Cox stunt tank now being used on Cox's long tank .049s, you simply turn the model upside down for starting. If you want, you could even side mount the engine or mount it upright.

Once you have the motor where you want it, plank the top of the fuselage with soft 3/32 balsa. The cowl is shaped from a 3/8 piece of balsa. Be careful not to make the opening too large. Remember, you have to have the same size hole to let the air out! Sand the completed fuselage smooth, and set it aside until we get the rest of the model built.

## WING CONSTRUCTION

Using a template, cut out 19 wing ribs. Slice 1/16 of an inch from the top of seven of them for use in the center section.





Photo shows some of the "fuselage damage" the author refers to in the text.



Five ribs have 1/16 of an inch of material removed from the upper surface to accommodate the 1/16 sheathing (top surface only). The 1/32 ply dihedral braces are clearly visible.

Pin the leading edge, trailing edge, and spruce spar down over the plan. Cement the ribs in place, excepting those at the dihedral breaks. I cement a piece of 1/8 square balsa between each rib at the leading and trailing edges. It really helps to stiffen the wing, and keep the ribs from breaking loose.

When that's done, saw through the wing at the dihedral breaks and raise each wing tip up 1-1/2 inch. Epoxy the 1/32 ply dihedral brace in place. Add the remaining 1/8 balsa gussets, and ribs. Plank the only the top of the center-section with 1/16 balsa.

Remove the wing from the board and cement the 1/8 balsa end ribs on. Once you have the LE shaped and the rest of the wing sanded smooth, it's finished.

You will find it a good idea to cement a piece of 1/32 music wire to the trailing edge at the center section to prevent the rubber bands from cutting into it.

#### TAIL SURFACES

Cut the fin and rudder from 1/8 medium density sheet balsa. The elevators are also made from the same stock, joined together with a length of 1/8 dowel. The horizontal stab is built up from the wood sizes indicated. Sand the completed tail surfaces smooth, and round all the outside edges.

#### FINAL ASSEMBLY

Not too much to say here. Cover the model before you glue the tail surfaces

together on the fuselage. I used a plastic film the first time, and one of the new cloth type iron-ons the second time. If you plan to paint, keep the tail light!

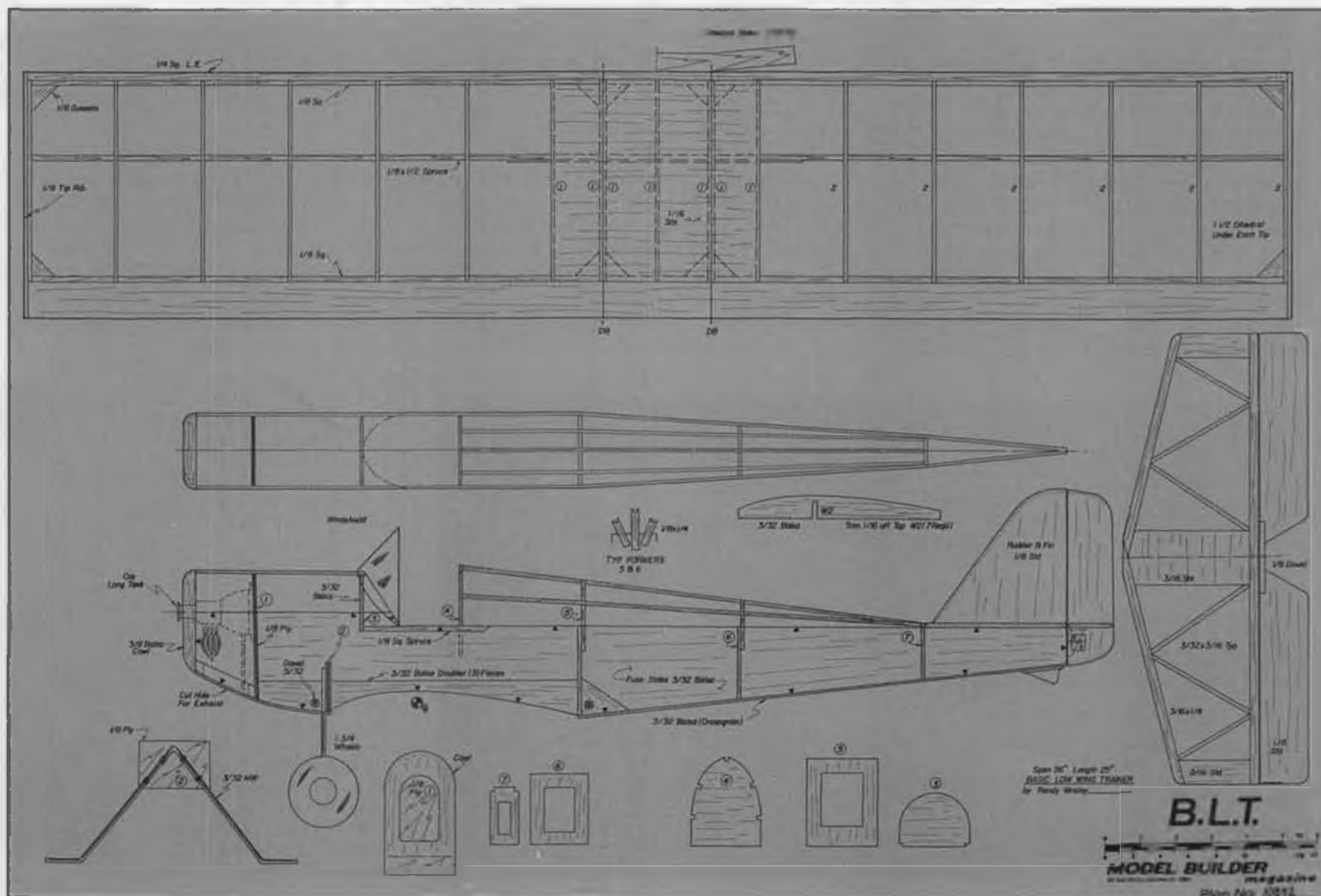
Install the radio with an eye toward the center of gravity. The model must balance at the spar! Once the radio is in, and the wheels are on, its time to go flying!

#### FLYING

If the CG is correct, and you haven't found any warps, you're ready. Use a 6-3 prop. ROG takeoffs require a little practice, but the B.L.T. is easy to hand-launch. Just grab it behind the wing, and have the model skyward!

Happy flying!

### FULL-SIZE PLANS AVAILABLE – SEE PAGE 106



CARL GOLDBERG

# Jr. TIGER



By AL TUTTLE . . . Goldberg Models has a real "thoroughbred" in its new *Jr. Tiger* low-wing trainer/sport plane. Al gives his unreserved recommendation to all who are ready to take this model, build it, and fly it!

• The *Jr. Tiger* is Carl Goldberg Model's .15 to .30-size version of its larger *Sky Tiger*, and is advertised as the plane to fly when ready to step up from the *Eaglet*. Retail price of the kit is \$49.95, which is reasonable at today's prices.

Upon opening the protective shipping box, I was pleasantly surprised to find a bright blue box displaying color photos of the various versions that could be built, i.e. "Executive 4-Place", "Naval Aircraft", and a "Homebuilt", plus several pictures of the model in various stages of construction.

It has been a long time since I had built a Goldberg kit. In fact, the last kit was the *Shoestring* which, I believe, was one of the first commercially available kits for the then-infant NMPRA (National Miniature Pylon Racing Association) of which I was then a member (4-J). If memory serves me correctly, I believe I built the *Shoestring* sometime during late 1967. Anyhow, it seemed to me then that there were an awful lot of smaller

parts and pieces, but that the kit quality was quite good, the plans (printed blue line) were excellent, the instructions were adequate and printed right on the plans, which to my mind was rather awkward.

The biggest question on my mind when opening the box was what changes had Goldberg Models made in its kits these past 17 years. The first thing that I looked at was the plans, and sure enough, they were printed blue line, very complete, explicit, and showing views of the different versions that could be built, but no instructions were printed on the plans. Both wing panels are shown which means that both panels can be built simultaneously. There is a 32-paged instruction book profusely illustrated with photos and sketches. This is a COMPLETE instruction book. If you can read, you can build this model!!! Very impressive. The instructions cover: selecting radio control equipment, engine and propeller choices, adhesives,

how to tack cement, how to use epoxy, bolt-on wing options, tools and supplies needed, additional items needed to complete the kit, plus optional items/parts, wood parts identification, an isometric drawing showing major components and parts prior to covering, how to cover the model, engine and radio installation, preflight checklist, balancing the model, and how to perform several simple maneuvers. All hardware is included, and there is even an ABS molded pilot. (*Whew! wrf*)

The additional items needed to complete the kit are: four-channel radio, adhesives, .15 to .30 R/C engine, two-inch spinner, six running (not walking) feet of covering material, small can of fuel-proof touch-up paint, 1/8 and 1/4-inch wide striping tape, one two-inch and two 2-1/4-inch wheels, one 1/4 by 8 by 12-inch foam rubber, 1/16 by 1/4-inch wing seating foam tape, a box of No. 64 rubber bands, and Wilhold R/C 56 (canopy glue).



LEFT: The *Jr. Tiger* is the from the Goldberg Models *Eaglet*. Both are seen here in a side-by-side pose. Each comes setup with tricycle landing gear for easy take-offs and landings.

RIGHT: The author installed a Super-Tigre .25X in the nose of his *Jr. Tiger*. He modified the muffler by drilling out the stinger, or exhaust pipe, to 3/8 in. diameter and installing a 3/8 in. brass replacement. No increase in noise, but power is better.





**LEFT:** The author poses with his beautiful, red, white, and blue *Jr. Tiger*. His flying field is a no longer used airstrip located on the south side of Maui's central valley. (Gee, some guys have it rough.) After two flights, the *Jr. Tiger* was flying like a champ and doing aerobatic stunts! This is a remarkable characteristic in a trainer.

recommended grit takes an exceptionally long time to bevel the control surface leading edges. I also knocked-off the edges of the surfaces to be bevelled prior to bevelling. This resulted in making short work of this task. Instructions do not call for knocking-off these edges first.

### WING CONSTRUCTION

I elected to build the bolt-on version rather than the dowel/rubber band version. Instructions are very clear on how to do this. The required hardwood blocks and nylon bolts are not included in the kit. The wing is built directly over the plans and goes together quite easily and rapidly. The leading edges are 1/4-inch dowels and fit into semicircular notches in the rib leading edges. The centersection sheeting is die-cut and fits fairly well.

Assembling the two wing panels to the correct dihedral is a breeze as dihedral jigs are furnished and are placed on the leading and trailing edges at the fourth rib positions. The panels are then butted together, the dihedral joiners added, and held in place with two die-cut ply joiner clamps while the adhesive dries. The only thing that I didn't like about the wing, and this is a strictly *personal* view, is the plastic wing tips, and no matter how hard you try, the covering seam is

Optional parts are: four-inch silicone rubber tubing (small size for exhaust extension), additional CG (Carl Goldberg) pushrod connectors (No. 212), and paint for the pilot figure.

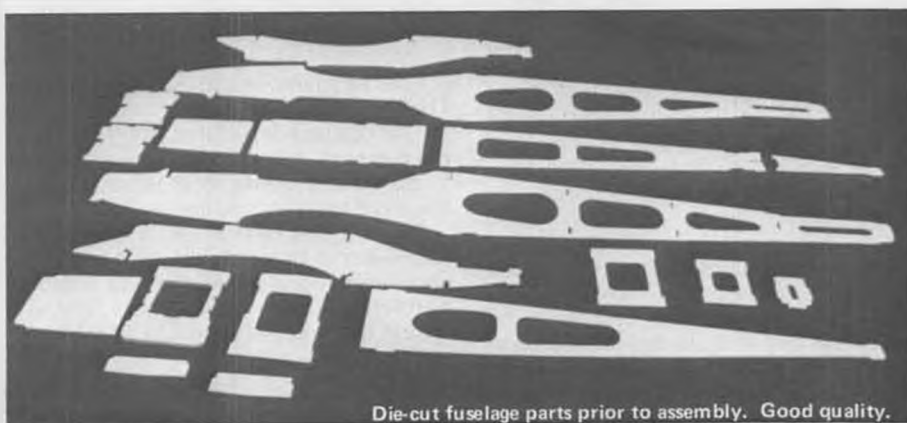
All parts, including the Lite Ply ones, are die-cut. The plywood die-cutting was excellent, with a minimum of cutting required to remove the parts from the sheeting. The balsa die-cut parts popped right out. All wood parts are identified using the wood parts identification drawing on page four of the instruction book. I used a soft lead pencil and identified each part prior to removal from the sheets.

### TAIL SURFACE CONSTRUCTION

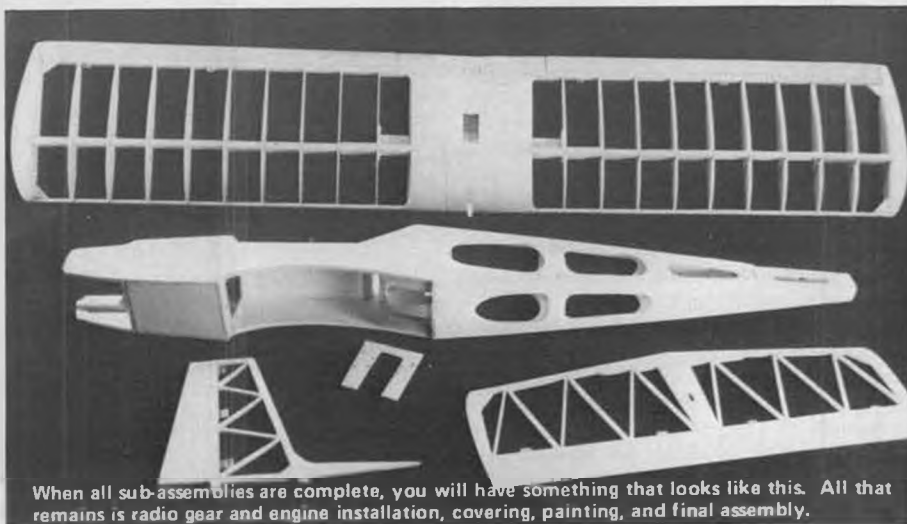
The empennage is constructed first, and is of built-up construction. The rudder and elevator are sheet balsa. Construction is straightforward and posed no problems. The kit includes a couple of rather neat gadgets called "bevelling tools." One is for the rudder and the other is for the elevators and

ailerons, both are used for obtaining the proper bevelled angles on the control surface leading edges. Instructions call for a 100 to 200-grit sandpaper to be glued to the surface of these two units. I used an 80-grit sandpaper, as using the

*Continued on page 88*



Die-cut fuselage parts prior to assembly. Good quality.



When all sub-assemblies are complete, you will have something that looks like this. All that remains is radio gear and engine installation, covering, painting, and final assembly.



# ELECTRIC POWER



By MITCH POLING



Noted Pylon racer, Art Arro, flies electrics year round to sharpen his flying skills. Model is a hybrid "Lady Electricus" design powered by an Astro Flight Super Ferrite 05 motor. 36 oz.

• I often get letters from readers who have converted glider kits or Old Timers to electric power, but the photos I received from John Mountjoy (Winston-Salem, North Carolina) were different! He has converted a *Train-Air 20* (Northeast Aerodynamics, 568 Main St., Haverhill, MA 01830, phone (617) 374-0229) to electric power, with an Astro Challenger cobalt 15, 12 sub-C Sanyos, and a Jomar SC-1a throttle.

John says it flies very well indeed, with ROG in fifty feet, and loops from level flight. Vertical power at the beginning of the flight is good enough for square loop, and it doesn't snap roll when slowed down, which makes for beautiful landings.

What really got me though, was the flying weight, 61 ounces, from a kit plane! So, I wrote John for more information on how he did it, and he obliged with some of the details.

John uses the Ace Silver Seven radio with three Bantam Midget servos, a 250 mah receiver battery, and the Jomar throttle with an aluminum, nine square inch heat sink. The cobalt 15 is turning 13,800 rpm on an 8-4 Top Flite nylon prop, and all wiring is the Wilshire super flexible wire.

The fuselage is covered in silk and dope, which John says is super light, and the flying surfaces are covered with Coverite Micafilm. The weight of the wing, which has 52 inches of span and 485 square inches of area, is only 9.5 ounces with a Bantam Midget aileron servo in it! I just built a wing for my new seaplane, the *Seagull*, that weighs that much, with no servo! John obviously does careful building.

The fuselage, finished with landing gear and three-inch Trexler wheels, is 13 ounces, again very good. At 61 ounces all-up, the wing loading is 18.1 ounces per square foot, which is quite reasonable.

John lightened the wing by using 3/32 shear webs where the 1/8 webs were called for, built-up ailerons instead of the heavy, solid stock in the kit, and 1/2-inch lightening holes were cut in the ribs and the tips. The basic design of the wing is quite light, which helped, but these changes probably cut out at least an ounce.

The stabilizer and fin are solid 3/16 sheet, and John cut lightening holes in them as well.

The fuselage went in for more extensive modification: the motor is mounted



A close-up of Art's model. Note annular cooling scoop behind spinner cone. A prop stop device is used to save props and motor armatures. Art uses SR batteries.

in a rolled, 1/64 ply tube glued to the firewall (F1), and the main landing gear was moved to just behind F2 making the plane a taildragger (this saves the weight of a nosewheel).

A 1/2 x 1-1/2 inch slot was cut in the windshield, and holes were cut in the bottom of the fuselage behind F2 for battery cooling air. The heat sink is inside the plane, in the cooling air flow. That is clever!

The fuselage is wide enough to slide the batteries in 3x4 (the wing saddles had to be thinned to do this), which makes for a compact installation.

This is the neatest adaptation of a kit I have seen in quite awhile, and as it is a semisymmetrical airfoil equipped sport pattern plane, it will be of special interest to those who would like to try electric sport pattern. The *Train-Air 20*

looks like a good one to try. Well done, John!

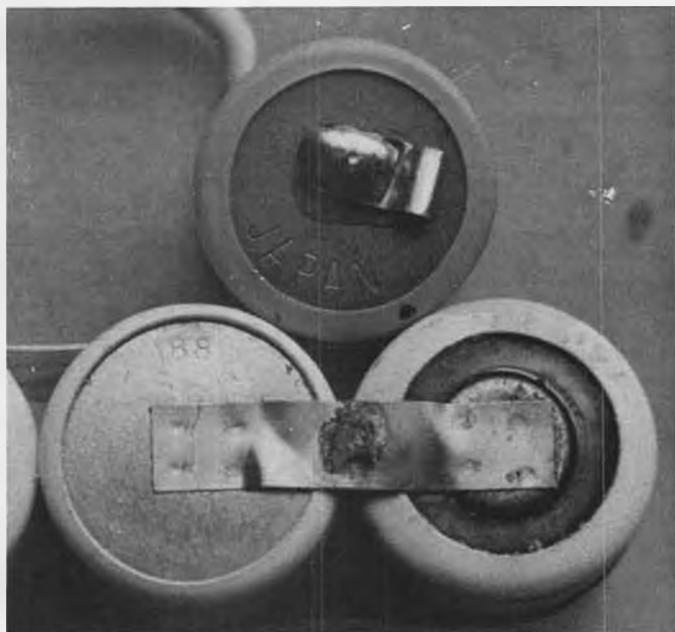
John says that his next kit will be the Top Flite *Elder*. Powered by the Astro 15 with reduction gear. I think the *Elder* looks ideal for electric conversion. (See page 16 for a review of the *TF Elder*. wrf)

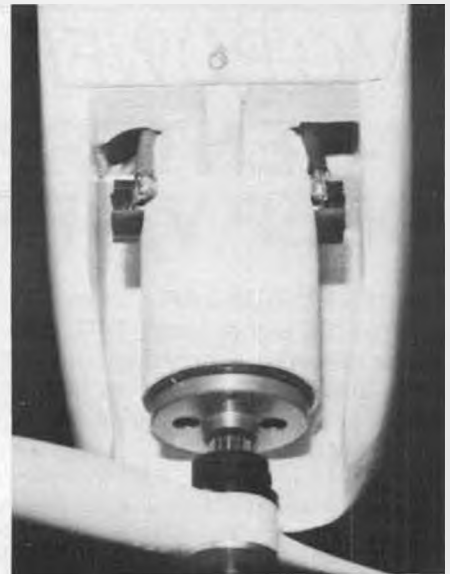
John, by the way, has quite a fleet of electrics, including a *Wasp* with an Astro 05 cobalt motor, the *Leisure Playboy* with an LT50 motor turning a Geist 11.5-8 prop, and the *Electricus* with the Astro 05 cobalt motor. He obviously enjoys his electrics!

## CULTURE CORNER

I got another rare reader contribution: a limerick! Ed Barsdits is hereby appointed Poet Laureate for Electrics, and here is his limerick!

There are bargains to be found out there in electronics surplus stores; Ni-Cd cells that are "plain wrap" can be identified by the markings on the ends. Sanyo says "JAPAN" and GE says "188."





Northeast Aerodynamics *Train-Air 20* converted to electric power by John Mountjoy.

**THE ELECTRIC FLYER**

*Finding glow powered models quite hectic,  
The model builder switched to electric.*

*Now his flying's more calm  
(Electric's a balm),*

*And as a bonus, his plane is less septic!  
You know, this is contagious! I'm*

*going to do one of my own!*

**THE DAWN FLIGHT**

*The electric flyer was up with the sun  
It's time, he said, to have fun!*

*So off to the lake he went*

*Flying floats, touch-and-goes all silent*

*Early risers watch in amazement*

*Enough flying at last*

*No noise, no complaints, what a blast!*

*Say, Ed, that was fun! Thanks for the*

*idea and your limerick. If other readers want to try writing one or two, feel free to send them in!*

**NEW SEAM CHAPTER, NEW CONTEST FORMAT**

Bill Kubiak (St. Paul, Minnesota) wrote an enthusiastic letter about his success in organizing a SEAM chapter and the activities of same. One activity which is now planned is a fun fly for a one-design event. The tentative rules specify an Airtronics *Olympic 650* or Airtronics *Monarch*, and three servos (maximum) for rudder, elevator, and motor on-off. AxMan 075 motors and AxMan 1.2 Ah GE batteries of seven cells will be the only power combo allowed . . . no other exotic motors or batteries. Other restrictions will be: direct drive propeller; no reduction drives; and two-wheel fixed landing gear. There will be no weight restrictions.

The rules look good to me, the *Oly 650* and the *Monarch* are naturals for electric power, but AxMan motors and batteries?

Mountjoy's *Train-Air 20* is powered by an Astro cobalt 15 and 12 sub-C Sanyos.

It turns out that AxMan is a local discount surplus store, and they were offering motors for \$2.50 and 10-cell battery packs for \$10. Now that is a bargain! By now, I'm sure these motors are all sold. The packs turned out to be excellent: all the cells were good. The packs were made up three or four years ago and were never used.

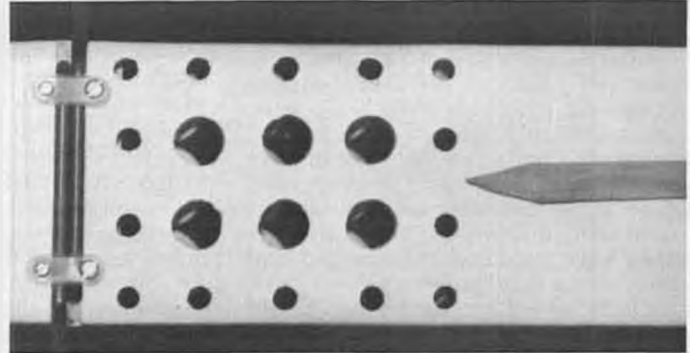
**TWO BURNING QUESTIONS**

Are there bargains to be had out there in motors and batteries? How do you find them? The answers to these questions are: 1) you bet there are; and 2) usually

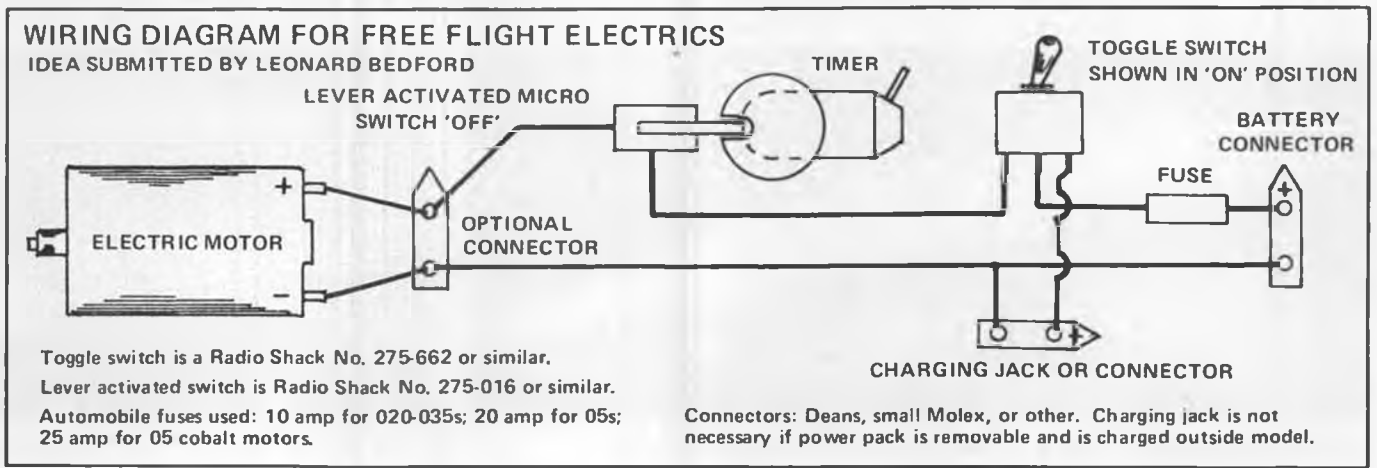
*Continued on page 80*



The *Train-Air 20*'s battery compartment and Jomar speed controller with heat sink (popsicle stick pointer) behind cooling slot in window.



Cooling air exit holes on bottom of fuselage assure adequate flow. Note the position of the cells relative to the holes.



# R/C POWER BOATS REVIEWS THE J-5 ENTERPRISES DEEP V OFFSHORE HURRICANE

By JERRY DUNLAP . . . Here is a large (66 inches long), R/C, gasoline powered, inboard motorboat that builds easily and loves large lakes or ponds . . . bring on the rough water!

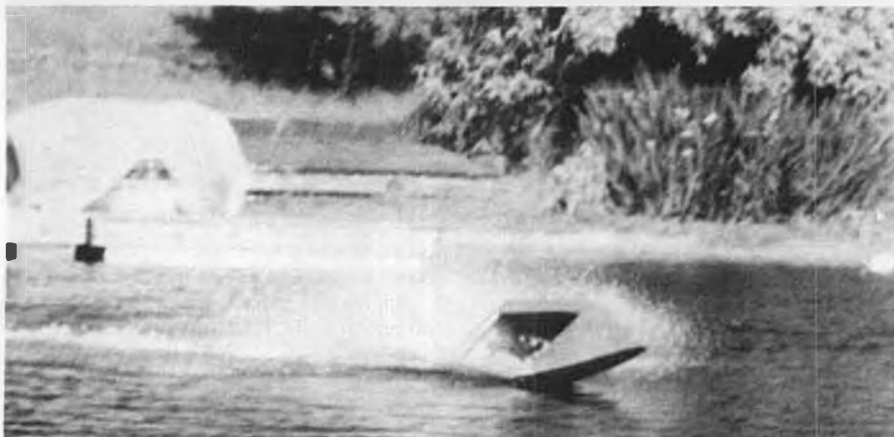
• I had considered renaming my column "Big Boats" for this review, then we could have "Big Birds" and "Big Boats" all in the same issue. However, not wishing the magazine to get too "big" for its bindings, I elected not to go with a column name revision.

But when it comes to the "Hurricane" Deep V Offshore, we are talking about a big model boat. With an overall length of 66 inches, it is the largest model I have ever built. The *Hurricane* is also the first model boat I have built that used a gasoline engine. Another first for me with this model was the use of a centrifugal clutch in a model boat. Because of its size, power, and the clutch, the *Hurricane* was a most unique model boating endeavor.

J-5 Enterprises, P.O. Box 82, Belmont, Ontario, Canada N0L 1B0, offers a variety of large model boats for both inboard and outboard gasoline engines. They produce a 77-inch pickle fork unlimited Hydro, a 50-inch fiberglass deep vee, the 48-inch "Tornado" wooden deep vee, a 48-inch deep sea cruiser, and a 57-inch outboard tunnel hull. J-5 Enterprises has a complete line of drive trains, gasoline inboard engines, and even a gasoline outboard engine to be used with their model boat offerings. They have a catalog of boats and supplies that is very informative.

"Jerry, why would you want to build a model 5-1/2 feet long?" This is a valid question and one that deserves serious consideration.

Although there is a Giant Boating Association to govern the racing of boats



The J-5 Enterprises *Hurricane* Deep V Offshore power boat banks into a turn at high speed. This design would be well suited to unprotected waters as the V-hull slices through waves.

like the *Hurricane*, it was not my intention to build the boat for racing. The national model boating association to which I belong does not even recognize boats with engines this large as an official class.

For the individual who wants to run a model boat on large bodies of water and is not necessarily concerned with high speed, then a boat like the *Hurricane* makes an excellent model. That it operates on a gasoline/oil fuel costing considerably less than the nitro fuels used for glow engines is another positive attribute. There is additional savings when one considers it is not necessary to purchase an electric starter, starter battery, and continually replace glow plugs.

## BUILDING THE HURRICANE

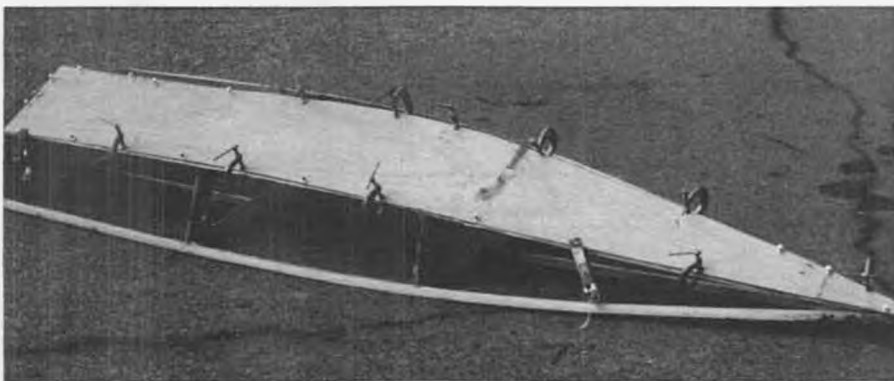
One might think that a boat the size of the *Hurricane* would be more of a challenge to build than a smaller boat. Actually, the *Hurricane* is easier to build than many smaller model boats. The boat uses a very simple framework consisting of the transom, two crossframes, a keel, and top and bottom shear strips. I have built some model boats half as long that used three times as many frames.

Full-size plans are provided to show all frame locations. The framework is definitely one of the most simplistic structures I've ever built for a model boat.

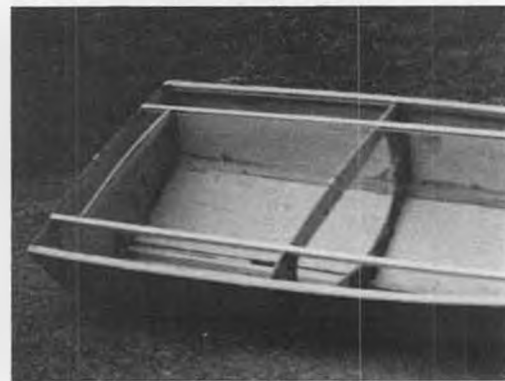
Once the framework is completed, the top and bottom shear pieces are beveled to accept the bottom and side sheeting. The 1/8-inch mahogany plywood sheeting conforms very easily to the framework. The use of an epoxy glue like Hobby Pox II is recommended for attaching the sheeting to the framework. Small clamps can be used to hold the sheeting to the framework as the epoxy sets. The two-piece top deck is attached after the bottom and sides have been affixed. There really isn't a great deal to tell about building the basic hull for the *Hurricane*. It is much simpler than building one of my tunnel hull designs.

## INSTALLING THE HARDWARE AND ENGINE

The drive train for the *Hurricane* includes a rudder and rudder bracket, 1/4-inch shaft, shaft log, drive dog, centrifugal clutch, and universal joint. It has been some time since I installed a straight shaft in a vee hull. All of my small vees use outdrives and cable for the



The bottom sheeting is attached to the framework using clamps and map tacks.



Side sheeting is applied the same way as the bottom





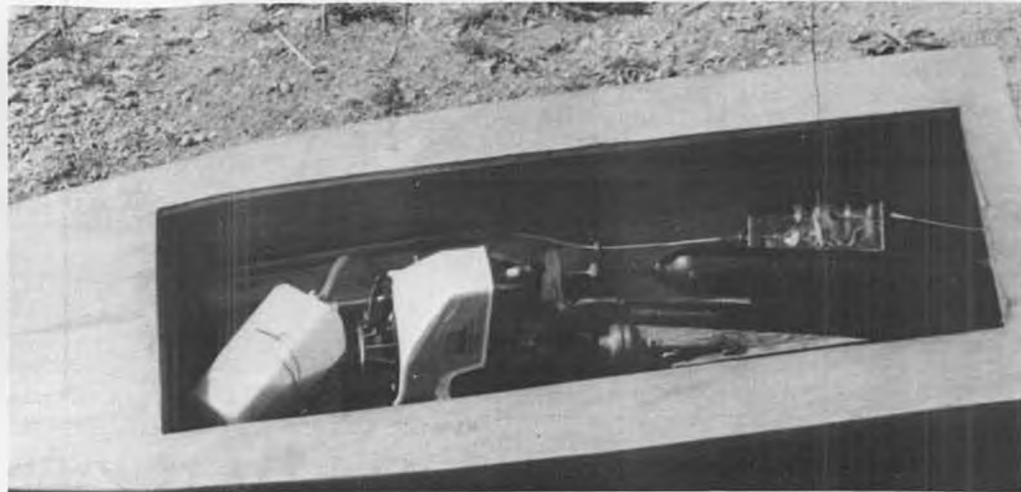
**LEFT:** A head-on shot of the *Hurricane* shows the deep V of the hull.



**RIGHT:** The J-5 *Hurricane's* TML 35 cc gasoline engine can be idled and the clutch used to make the model highly maneuverable at low speeds, like full-size.



Here is a transom view of the model which shows rudder assembly and Octura X465 prop.



Engine compartment details: fuel tank rests in front of engine with Quadra Charger tuned pipe. G&M radio box is visible at right in rear of boat.

shaft material. The full-size plans show the specifics for shaft location and shaft angle.

I would recommend one modification to consider when installing the shaft log. The shaft log has a strut blade welded to the back edge. This strut blade extends through a slot cut in the bottom of the hull. Although the keel is fairly thick where the blade comes through the hull, there needs to be more support for the strut blade than just a tight fit in the strut blade slot. A method of increasing the support for the strut blade would be to slot the keel and then use angle aluminum braces on each side of the strut blade. The area around the keel where the strut blade comes through the hull could be built up with pieces of wedge shaped wood to make a flat surface for the aluminum strut mounts to be bolted or screwed into the wedges.

Mounting the TML 35 cc engine was different than a typical glow engine

installation. The engine is mounted to a vertical, actually slanted mount, rather than a motor mount like a glow engine. What you really end up doing is mounting the centrifugal clutch assembly and then the TML 35 bolts to the clutch housing. When I first saw how the engine was mounted, I couldn't believe it would work for such a large engine. But it does, and it's actually a very simple method for mounting the engine.

The actual engine mount is half-inch plywood. This proved to be rather soft material when the bolts with washers were tightened to hold the engine to the clutch housing. I would suggest that 1/8-inch aluminum plate material be employed to make a surface plate to protect the plywood when the bolts are tightened.

#### FINISHING THE HURRICANE

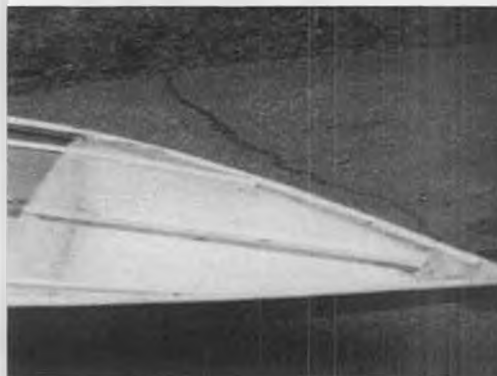
This review is being submitted before the *Hurricane* receives a final painting. However, the boat has been run exten-

sively with a fiberglass coating to seal the hull. I elected to use fiberglass cloth on the hull because I don't feel the three-ply 1/8-inch mahogany sheeting is the strongest material available for model boating applications. Plans call for running the *Hurricane* in nearby saltwater bays and inlets that often have chunks of wood floating about. I wanted the added protection of fiberglass in case the boat hit something floating in the water. There is no doubt that by using cloth and resin on the entire hull that the weight was increased. However, the boat is now very well protected and has an extremely smooth finish that will accept the final painting very nicely.

#### INSTALLING THE RADIO

The radio installation for the *Hurricane* was almost identical to that used in my smaller vee hulls. A G&M Models radio box holds the radio equipment.

*Continued on page 74*



sheeting: map tacks and clamps. Use epoxy.



Nearing completion: map tacks and clamps hold deck sheeting in place while epoxy dries.

# Simply Scale

By CLIFF TACIE



## "84" MINT JULEP

If ever you find yourself in the area southwest of Louisville, Kentucky, on the last weekend of April and the birds are chirping, and the trees are greening, and the flowers are blooming . . . and it's raining . . . you *must* be at the Mint Julep Scale Meet!

Hosted by the Southern Indiana R/C Modelers in cooperation with the Kentucky Department of Parks, the Mint Julep Scale Meet is held annually on the last weekend in April, and although spring is definitely in full bloom at the beautiful Rough River Dam State Resort Park this time of year, the weather has proven to be most unpredictable. This "84" Mint Julep was the 12th annual, and of the last five that I have attended, I think we've seen rain at some time during the weekend at least four of those years. This year was no exception, with the beautiful, sunny days of Friday and Saturday giving way to a driving rain on Sunday.

Weather never deters the avid scale modeler however, and this year saw 47 models entered. This number is down from the 80 odd models seen the last couple of years, but I think there's a good reason for that and we'll touch on it a little later. This year's 47 models were spread over the categories of Giant Scale, FAI Scale, and four Stand-Off Scale events; Expert and Sportsman class, Divisions I and II.

The Southern Indiana R/C Modelers are believers in promoting scale modeling and they try to accommodate all levels of competition. To balance some



Would you believe a 99 static score for Charles Baker's T-28? It finished second in Sportsman Division 1. The judges obviously liked it, as well they should.

of the inequities of flight scoring mechanical options versus actual flying maneuvers, they utilize the two Divisions to insure you compete against the same type of model. Division I is for aircraft on which the prototype had retracting gear, more than one mechanical option, or was designed especially for racing. Division II is for aircraft that the prototype had fixed gear, no more than one mechanical option, or was not designed especially for racing. This type of category dividing enables the beginner scale modeler to enter the Sportsman Division II event with his Piper Tripacer or Aeronca 7AC Champ and have a confidence-building experience while competing only against modelers and models at his own level. For the Simple Scaler, who is a more accomplished builder and flier, but is interested in the light aircraft type subject, Expert Division II class gives him

the opportunity to compete against his peers without being at a disadvantage from the start. Division separation is a great idea, unique to the Mint Julep, but admittedly is only practical at the larger scale meets.

The Mint Julep is also part of the Scale Masters program, and gives us the first opportunity of the year here in the Midwest to qualify for the Scale Masters finals. The Mint Julep sends 15 fliers to the finals, taking the top five in FAI, the top five in Giant Scale, and the top five by score in Expert Sport Scale, Divisions I and II combined.

I mentioned that the number of models was down this year from previous Mint Juleps. I personally believe this happened because the meet wasn't promoted in its usual manner. I had become accustomed to receiving my Mint Julep flier in the mail in late March encouraging me to pre-enter. That



Bob Underwood (past *MB* contributing editor) entered his *Bonzo* in FAI Scale and took first place! Bob's Standoff Scale, Expert Division 2, *Hiperbiplane* was awarded a third place.



Bill Miller and helper demonstrate the 20-second cycling of the retracts in Bill's EAA DC-3 for the judges. Made from a Royal kit, the model weighs 11 lbs, has two OS .40s. Took 2nd in Sportsman D-2.



ABOVE: Gary Wild, Indianapolis, Indiana, received a 96 in static judging! The Sig Citabria features an opening door and a complete cockpit. Weighs 7.5 lbs, ST Bluehead 60.



Are you seeing triple?! Three CAP 21s from Great Planes and Steve Ellison. A simple subject for scale; it's a very aerobatic performer!



Hal Parenti and son, Gary, prepare Hal's Bearcat for flight. FAI model weighs 12 lbs, powered by Webra .61, silk & K&B covered.



C'mon . . . now you're seeing double?! Two Varga Kachinas from the workshop of Bud Atkinson. The larger one powered by Tartan Twin, smaller one by a .90. Great fliers!

didn't happen this year, as they didn't mail out fliers this time around. Pre-entries were down to only seven, according to Dale Arvin, the Co-CD, and I can only attribute that to the lack of usual promotion. Let this be a lesson to all clubs out there, you just can't promote your event *too* much!

Everyone attending had a great time this year. If you got there early as we did, you were able to get in some practice flying Friday afternoon on the long, smooth, full-scale runway. The sun was shining, it was warm, and the wind was a little stiff, but it was straight down the runway and not at all gusty. Saturday's two rounds of flying was blessed with sunny skies once again and practically no wind at all. Sunday morning the skies threatened, and we got in one round of flying before the rains came. The fourth round was made in the rain for those who wanted to brave it, and most of us did!

Airplanes? Yep, there were many impressive models. Of course, Tom

Cook had his F-4 Phantom there, this year entered in Giant Scale because of its weight. Tom handily won this event, followed by Don Anderson flying a Kraft Super-Fli to second place and Bud Atkinson in third with his Varga Kachina. Bud and Alice Atkinson have the distinction of being the only contestants to have attended all 12 Mint Julep Scale Meets, and Bud usually has a new model each year! This year he had two Varga's; his Tartan Twin powered Giant Scale Varga, and a smaller, identical twin .90 powered Varga for Sport Scale.

Many pilots feel the more the merrier, and bring more than one model to the meet. Hal Parenti entered his Bearcat in FAI and his venerable P-39 in Expert Division I, taking a second and a first, respectively. Ralph Jackson campaigned his well-known Windecker Eagle in Expert Division I and a very nice Nieu-



Ouch!!! Let this be a lesson to all: practice safety at YOUR field. Accident cost author 45 stitches, lost Tuholer, and possibly more!

Continued on page 59



Although not entered or flown at the Mint Julep, this 1/3-scale Kimbrel Dormoy Bath tub from Model Builder plans was a real winner! Bill Brenchley, Marion, Illinois, powered this model with a Saito FA 80 four-cycle twin. Model weighs 13.5 lbs.



Don Brann poses with his "Silhouette Scale" Monoprep. Don finished sixth in his first scale contest, the Mint Julep, and proved that the AMA rules do work! (See text) An OS Max FS .60 four-cycle engine powers the eight-pound model.







1. Annual group photo taken at the Salinas Area Modelers Old Timer meet. An 8X10 color print of this shot was given to each contestant.



# PLUG SPARKS

By JOHN POND

• As we reported last year, the tremendous amount of interest in Old Timer R/C Assist, as generated by no less than 10 SAM Chapters (plus independents such as S.A.M., Colusa, etc.), has resulted in almost a competition itself to put on the best prepared, best run, and the best awards of trophies and merchandise. The California (or for that matter, the West Coast) boys never had it so good!

An outstanding feature of this contest is not the contest itself (S.A.M. Annual), but simply a gathering of all the modelers for a color group shot. This occurs about 10 or 11 o'clock of the first day of competition. Of course, it is nigh well impossible to get everyone to stand still at one

time, but those who do stand for the photo receive (that very night!) an 8x10 color photo at the evening banquet. This in itself is a big inducement to attend the meet!

Also, when entering the meet, you are issued a metal type decal to put on your shipping box, trailer, or what-have-you. The Salinas Aero Modelers (S.A.M.) have been doing this for four years. Gets to be a nice collection!

Photo No. 1 is exactly what we are talking about. Inspection of the photo shows Ed Solenberger is missing (again!). Always flying! On the very edge of the photo is a transmitter antenna . . . that's Ed!

This meet, held on June 2 and 3 at the new flying field of the Salinas Aero Modelers (S.A.M.), was well attended by many contestants coming from as far as Phoenix, Arizona. Actually, every major SAM Chapter was represented at this meet; 31, 41, 49, 26, 21, 27, 30, and 51. (The list is in ascending order from Phoenix).

Contest Director Jack Jella reports there were 43 contestants attending with over 160 entries. Photo No. 2 shows Jack at the processing desk, with Judy Staben acting as contest recorder. The trophies are unusual, as they are propeller style, the props being beautifully finished laminated types on a suitable base.



2. LEFT: Genial Jack Jella, CD for the S.A.M. Annual with Judy Staben, the recorder.



3. RIGHT: Here's a shot for nostalgia! Alex Schneider, Nats winner in the early years of R/C, poses with Jack Albrecht holding his Anderson Pylon.



4. ABOVE: Steve Roselle, SAM 21, flew this fine electric powered *Peerless Panther*. Note the special charging box in the background.



5. RIGHT: Bill Barton, head honcho of SAM Chapter 51, the "Rocking Chair Legion," poses with his 1/2A *Texaco Lanzo Record Breaker*.

Size - 36"	SHEET BALSA DENSITY (LBS./CU. FT. FROM SHEET WEIGHT IN OZ.)															Density Equivalents	
	2#	3#	4#	5#	6#	7#	8#	9#	10#	11#	12#	13#	14#	15#	16#	lb/ft <sup>3</sup>	oz/in <sup>3</sup>
1/32" x 2"	.04	.06	.08	.10	.13	.15	.17	.19	.21	.23	.25	.27	.29	.31	.33	2	.019
x 3"	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.41	.44	.47	.50	3	.028
x 4"	.08	.13	.17	.21	.25	.29	.33	.38	.42	.46	.50	.54	.58	.63	.67	4	.037
1/16" x 2"	.08	.13	.17	.21	.25	.29	.33	.38	.42	.46	.50	.54	.58	.63	.67	5	.046
x 3"	.13	.19	.25	.31	.38	.44	.50	.56	.63	.69	.75	.81	.88	.94	1.00	6	.056
x 4"	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25	1.33	7	.065
3/32" x 2"	.13	.19	.25	.31	.38	.44	.50	.56	.63	.69	.75	.81	.88	.94	1.00	8	.074
x 3"	.19	.28	.37	.47	.56	.66	.75	.84	.94	1.03	1.12	1.22	1.31	1.41	1.50	9	.083
x 4"	.25	.38	.50	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	10	.093
1/8" x 2"	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25	1.33	11	.102
x 3"	.25	.38	.50	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	12	.111
x 4"	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	13	.120
3/16" x 2"	.25	.38	.50	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	14	.130
x 3"	.37	.56	.75	.94	1.12	1.31	1.50	1.69	1.88	2.06	2.25	2.44	2.62	2.81	3.00	15	.139
x 4"	.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	16	.148
1/4" x 2"	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	Calculate the weight of a given part in advance for various densities by figuring the volume of the part and multiplying the volume by the density in oz/in <sup>3</sup> .	
x 3"	.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	(Kermit Walker)	
x 4"	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33		
3/8" x 2"	.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00		
x 3"	.75	1.13	1.50	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50	4.88	5.25	5.63	6.00		
x 4"	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00		
1/2" x 2"	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33		
x 3"	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00		

The author describes the usefulness of these charts in the text. Copy and save!



7. Ivan Taggart still flies the PB-2 that won the Texaco event at Wright-Pat AFB in 1980.

Meeting Alex Schneider was absolutely great, and in the retrieval of the writer's "Super Clipper", which dove out of the clouds 1,000 feet into the ground, we had time to reminisce over the three R/C wings by Schneider in successive years at the Nationals. Alex used a three-channel system of tuned reeds by Rockwell, and a two-speed ignition setup on an Anderson Spitfire. In those early days, Schneider was something else to watch with his Schneider Cub design. It was so far superior with reeds, the outcome was almost automatic. (**Model Builder has Schneider Cub Plans, No. 8802.**)

Of course, the Mustangs Club, of which Schneider was the leading light, also had fellows like Regalia, Albrecht, et al, and all flew Schneider Cubs! With that in mind, we simply had to take Photo No. 3, showing Alex Schneider and Jack Albrecht with Jack's Anderson Pylon, powered with an Anderson Spitfire. Those guys never gave up on those Spitfires!

While looking for models of interest to photograph, this columnist ran into fellow SAM 21 member, Steve Roselle, with his electric powered Peerless Panther as seen in Photo No. 4. Although

#### SOME WEIGHTS OF COVERING MATERIALS

Type	Color	Weight (gm/ft. <sup>2</sup> )
Aluminized mylar	chrome	0.274 to 0.314
Condenser paper (Micro-X)	tan	0.314
Ultra-fine Japanese Tissue (VA-167 Vintage Aero)	white	0.826
Japanese tissue (Sig)	red	1.062
Aristo Superlite	orange	1.134
Ultralite Japanese (Micro-X)	yellow	1.142
Japanese tissue (Peck)	white	1.195
Ultralite Japanese (Micro-X)	white	1.238
Micro-Span (Micro-X)	white	1.270
Aristo Superlite	white	1.320
Tissue (Sterling)	white	1.628
Std. Artist's tissue	red	1.671
Silkspan, lightweight (Sig)	white	1.709
Aristo Rayspan	yellow	1.986
Aristo Bamboo paper	white	2.000
Sig Bamboo paper	white	2.182

The covering weights do not include doping. Using brushed 50/50 nitrate dope, the first coat should add about 0.372 gm/ft.<sup>2</sup>, while the second 50/50 coat will add about another 0.207 gm/ft.<sup>2</sup>. A typical Peanut Scale ship with about one square foot of covering and two coats of half-and-half dope/thinner would pick up about two grams of weight over the bare-bones structure.



6. Otto Bernhardt takes very good care of his models. His trailer is neatness personified. (Looks like a Lanzo Record Breaker and a Taibi Powerhouse are going along for the ride. wrf)





8. "Goliath Chasing David," could be the title for this one. Models are a Yates Ten-foot and a Bay Ridge Mike built by Jim Caughram.



9. Brad Allen, SAM 21, at the West Coast SAM Champs with a good performing Thor, a 1939 design from Model Airplane News.



10. Electric powered Goosenek from Model Craftsman magazine, built by Gus Munich.

Steve labored mightily to finish his model for the West Coast SAM Champs which gave point bonuses for low-wing designs, he failed to complete the Panther in time. As a matter of fact, inspection of this photo shows he has left the cowl unfinished in order to enter this meet!

Steve is using the standard 05 electric motor with the seven-cell battery combination as outlined in the electric rules developed by Jack Alten and adopted by SAM 21. These rules will be used at the SAM Championships at Bong Field. It will be interesting to see who wins.

One reason for running Photo No. 5 showing Bill Barton of SAM 51, is to call attention to their unique club name, "The Rocking Chair Legion". Rather appropriate in some respects. Bill is seen with a 1/2A Texaco version of the Lanzo Record Breaker. Bill didn't particularly shine this day, as he flew too late and got trapped in the stiff wind with a light model.



13. Clarence Bull, Eugene, Oregon, has a ball flying this diesel powered Baby Bombshell. Site is Harts Lake Prairie. B. Stalick photo.



11. Long Island modeler, Mal MacLean doctors diesel engine on his Cloud Chopper.

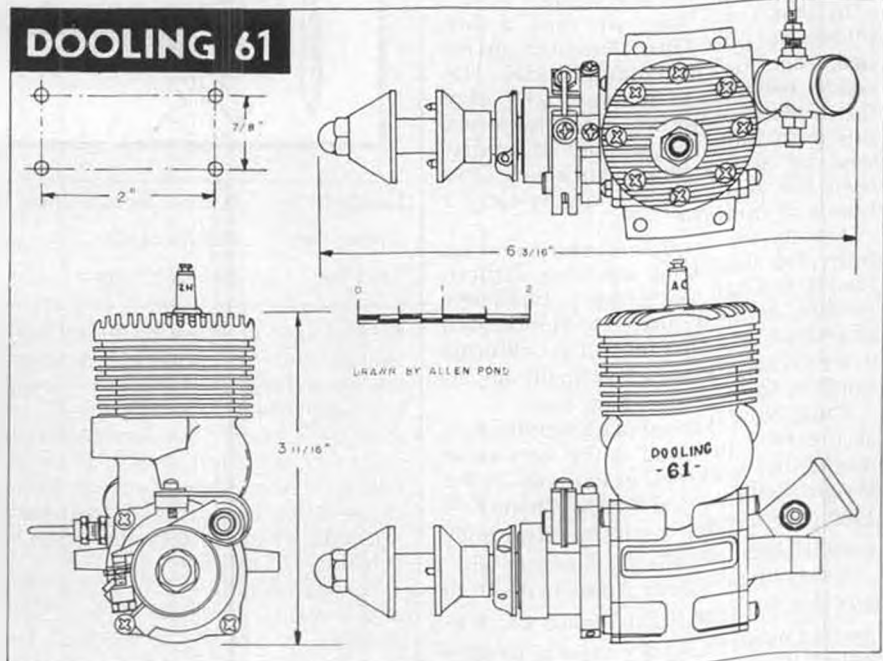
Everyone who is connected with the Old Timer movement knows of Otto



12. A 75% Winged Yankee makes a great 020 Replica class flier, as David Hicks found out.

Bernhardt, who runs an Old Timer specialty shop known as 77 Products at 17119 So. Harvard, Gardena, CA 90247. Otto has just about everything you need in ignition from the special, static free ignition systems to practically any motor

14. Ed Lamb built and flew this all red Spook 72 at the Northwest Old Timer Championships that were held at Parker Field. Photo was taken by F/F columnist, Bob Stalick.





15. Gerhard Everwyn stops in front of the modeling section of the new Aerospace Museum in Munich, Germany. See text for story.



17. Len Edelstein, South Africa, is learning the hard way . . . with Goldberg Valkyries . . . this is his SECOND one!



16. The late Ron Warring with one of his renown 1948 Wakefield designs.

you would want to convert to ignition. His work is simply impeccable.

In that same line, we took a shot (Photo No. 6) of Otto Bernhardt and his neat trailer box for holding models. The reader will note a place for each part of the airplane. With such a precise setup, this does limit the number of models you can take to a meet. However, Otto feels he wins enough, so why carry a bunch of models?

Among the modelers who came up from the southland was Ivan Tarbert. Ivan hasn't had much time to build new models, as he has moved to Florida for a year or so, and then moved to California in the Oceanside area, and finally moved north to the Santa Barbara area.

Photo No. 7 is proof of his wanderings, as the PB-2 pictured is the very same model that won the Texaco event at the Wright Patterson AFB SAM Champs in 1980. The model is still in surprisingly good shape and still is a threat to win.

It may be of historical note to mention that the first free flight Texaco event as revived by the SCAMPS was won by John Keller using a PB-2 model. Originally

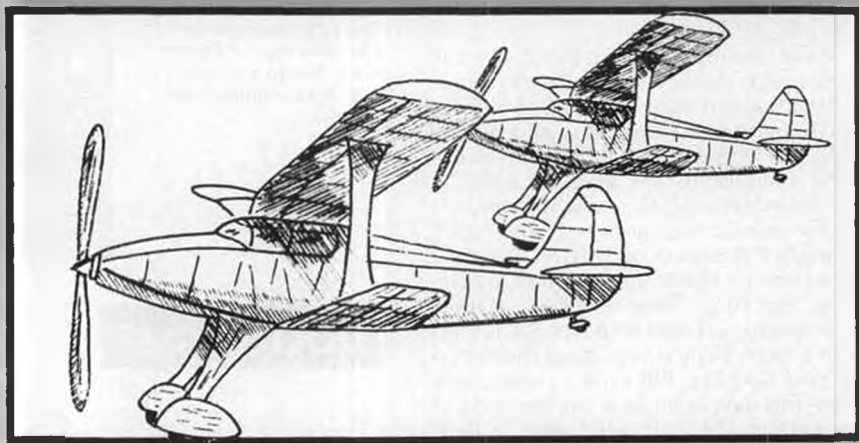
designed as a payload model, the design has proven to have excellent weight carrying characteristics as an R/C model.

(MB Plan No. 877-O.T.)

Continued on page 62

#### OLD TIMER OF THE MONTH

# KILTIE GULL BIPLANE



Designed by: Henry "Scotty" Mayors

Drawn by: Al Novotnik

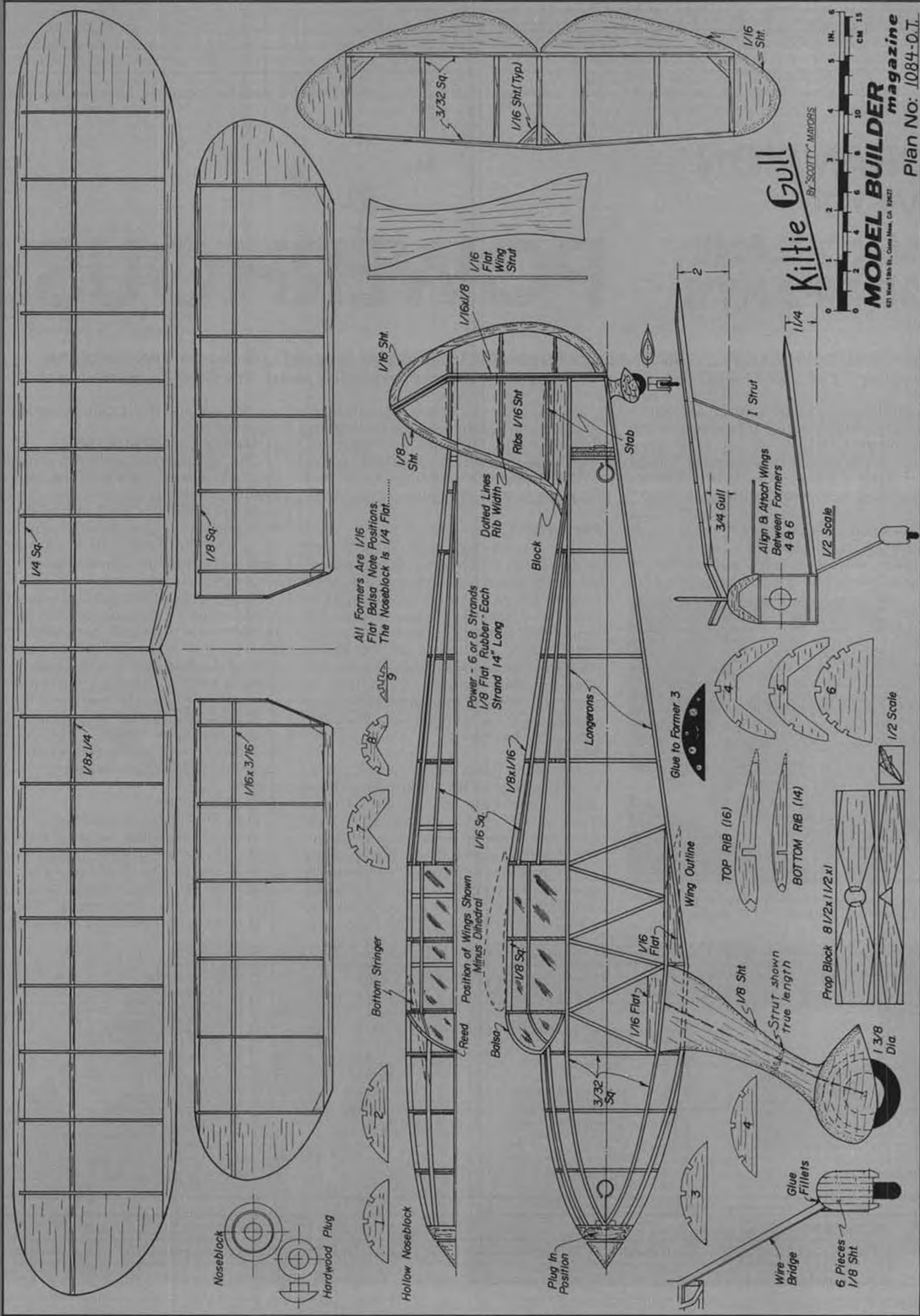
Text by: Bill Northrop

• I feel like I'm repeating myself. Nevertheless it's true: this is a model I've always wanted to build! Some proof of this lies in the fact that the full-size plans (except for the wings), printed on four pages of the February 1939 issue of *Flying Aces*, had been cut loose from my copy of this issue, but fortunately, slipped back into place, where they have remained to this date.

Anyway, it's the "Kiltie Gull Biplane," and it was designed by Henry "Scotty" Mayors. In typical "23 Skidoo" *Flying Aces* lingo, the subheading said, "Here's

a nifty, ace-high sky-scooter that's even better than the swell jobs good-old 'Scotty' Mayors has given us in the past. And best of all, it's so designed that all you newly-fledged 'balsa brothers' can turn it out in full stride with our old-time modelers. So clear off your workbenches, fellows . . . and go to it!"

Nothing special about the construction. It is light, even by today's standards, and should go together without too much trouble. The original model was trimmed to turn with the torque, and downthrust was advised. As for balance, the designer only suggested that weight should not be added, but gave no hints as to the balance point. We'd suggest that you start the trim flights with the balance point on bulkhead No. 5, just under the top wing. •



# Kiltie Gull

BY SCOTT'S MAYORS

MODEL BUILDER magazine  
 871 West 18th St., Chico, Calif. 95927

Plan No: 1084-O.I.

All Formers Are 1/16 Flat Balsa. Note Positions. The Noseblock Is 1/4 Flat.....

Power - 6 or 8 Strands 1/8 Flat Rubber - Each Strand 14" Long

Glue to Former 3

1/2 Scale

Prop Block 8 1/2 x 1 1/2 x 1

1 3/8 Dia

6 Pieces 1/8 Shit

Wire Bridge

Glue Fillerets

Strut shown true length

TOP RIB (16)

BOTTOM RIB (14)

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

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1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale

1/2 Scale



# PRODUCTS IN USE

## CHAMPION MODEL AEROPLANE COMPANY'S

# POWERHOUSE



By RANDY WRISLEY . . . Sal Taibi's immortal Old Timer design lives on! Join us for a review of this modern kit of a SAM legal design that features some unique preformed parts! It's 4-cycle powered too!

• Little needs to be said of Sal Taibi's famous *Powerhouse*. It has one of the winningest records of any cabin type Old Timer around. Champion Model Airplane Company's kit is a slightly modified, but very faithful and "legal" kit for those interested in SAM Old Timer competition. The only changes of note are a modernized landing gear mount with 1/16 plywood reinforcement, and a two-piece trailing edge.



The plans do not show routing for pushrods as model was originally a F/F design.

While the *Powerhouse* is not difficult to build, the warning on the box stating the kit is not intended for beginners should be heeded! What follows is this writer/builder's impression of the Champion Model Airplane Company's kit.

### PACKAGING

The box was well packed; it arrived undamaged, which says a lot these days. While there are no numbers marked on individual parts, they are bagged in plastic and labeled as to what area of the model they pertain to. The only discrepancy I found was that a portion of the stabilizer outline was bagged with the wing tips, and vice versa. Even the strip stock was banded and labeled as to area of usage. On the whole, I would rate the packaging excellent.

### PLANS

The plans came rolled, which I like. Typical of most Old Timer plans, those plans could be improved on. Firstly, there is no center of gravity shown. Secondly, only the left wing was drawn. The stabilizer plan is drawn on top of the wing, making it difficult to properly position the wing ribs, especially when one builds the right wing on the reverse side. It would be nice if the right wing

was shown, and the stabilizer was drawn separately.

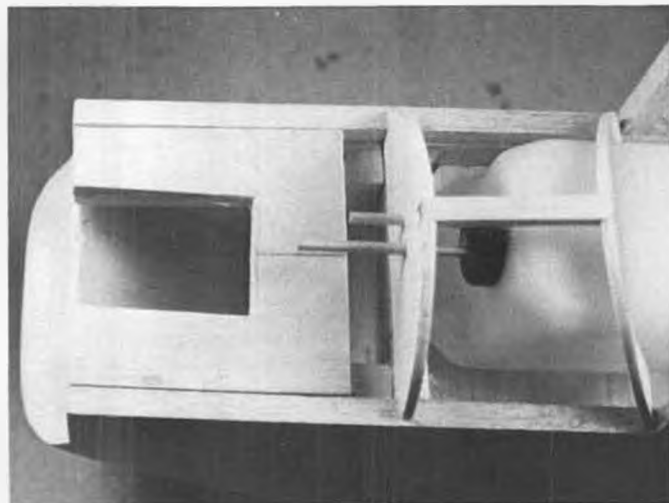
### FUSELAGE CONSTRUCTION

One of the outstanding features of this kit is the machining of the fuselage outlines. All the curves come precut, making assembly of the fuselage simple. Remember, we are dealing with 5/16 square lumber here, and not having to soak and bend the outlines shaves *hours* off of construction time.

While some of the lumber was much harder than I would have selected, the quantity was sufficient. No problems at all were encountered during construction of the fuselage. I used Titebond for the assembly of the sides, and epoxy to install the firewall. Jet was used for the 3/32 balsa filler in the nose area, and all other low stress areas. I routed and installed Nyrods to the rudder and elevator, none of which was shown on the plans.

### TAIL SURFACES

Only the suggested outlines for the rudder and elevator are shown on the plans. The construction of these surfaces is left up to the builder. (*This was originally a free flight design which may account for the omission of this R/C structure. wrf*) However, the kit does



The author made this 1/4-in. plywood motor mount to fit the OS Max .61 four-stroker. Rails shown on plan require this plate.



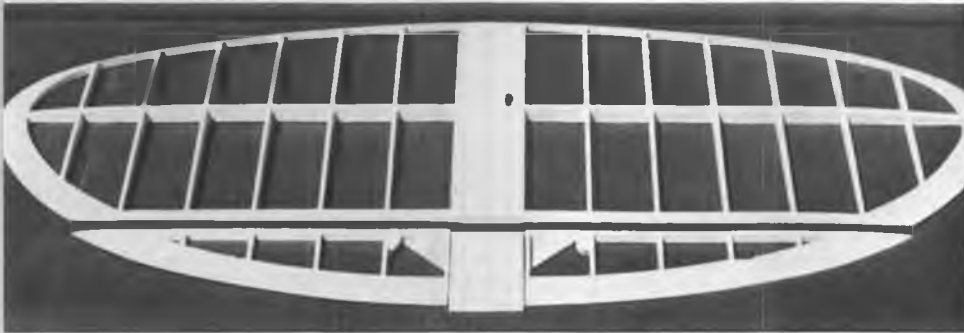
If you want a perfect engine for your Champion *Powerhouse*, look seriously at an OS Max .61 FS. It's in character with this model.



All framed up and ready for covering (well, almost!), the *Powerhouse* is a model builder's delight. Look at all them STICKS!



Sal Taibi designed the *Powerhouse* in Sept. of 1938. This fact allows it to be flown in SAM Antique events where it is a very winning ship.



The stab is made of preformed TE pieces and straight stock to be sanded to airfoil shape.

include a wire elevator joiner for R/C use.

The stabilizer is built from 1/8 x 1/2 flat stock, then sanded to airfoil shape. The rudder is made from flat stock. The leading edge of the stabilizer comes pre-laminated, again saving the builder time. Anyone with some experience in model building shouldn't have trouble with the tail surfaces.

#### WING CONSTRUCTION

The wing was a simple structure to build. All spar stock was cut to proper length making splicing unnecessary. The wing tips were machine cut and fit very well. The two-piece trailing edge came prebeveled, and it fit very well too.

The ribs are provided in the kit and are die-cut. An apology for the necessity of die-cutting came printed inside the bag containing the stack of ribs. It was needed! I would rate the quality of the ribs as poor. The ribs had to be stack sanded, and care had to be taken not to sand too much material away. It was also necessary to trim the ends of the ribs to fit the two-piece trailing edge. Again, this was not a real problem, just a nuisance.

The precut dihedral braces would have fit just fine, but I chose to lower the dihedral from eight inches per tip to six inches. Even so, it was possible to use the material provided. I added shear webs as recommended by Champion.

#### RADIO INSTALLATION

A new Hobby Shack Cirrus radio was installed in the *Powerhouse*. There is plenty of room for this rig. Two rails were run down the sides, and a couple of cross pieces were epoxied to the rails so the servo tray could be mounted. The builder must plan his own installation, so experience helps.

#### ENGINE INSTALLATION

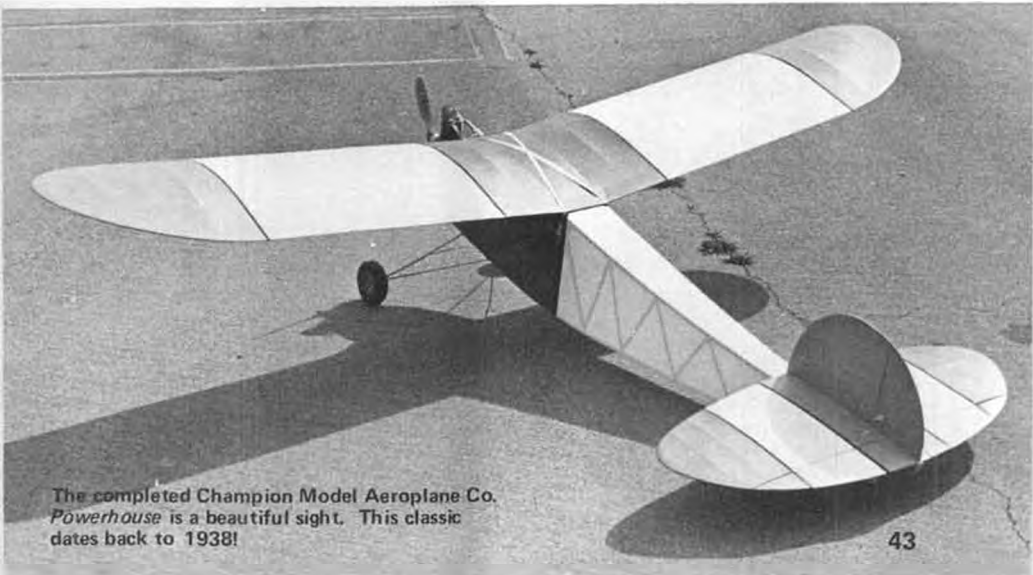
An O.S. Max .61 FSR four-stroke was selected for the *Powerhouse*. It was quite a trick to get the fuel tank high



Preshaped fuselage sticks are cut from sheet stock. Grain is straight, pieces are curved.

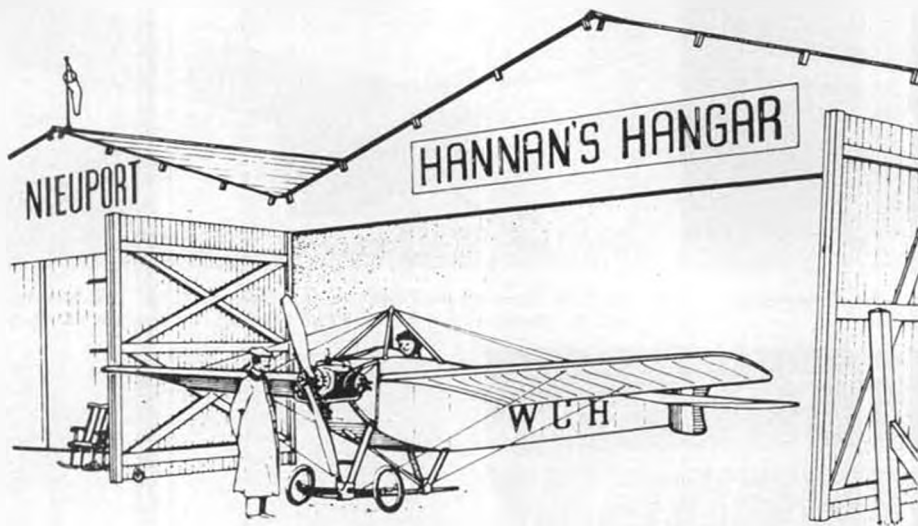


Randy Wisley's 6'3", 240-lb frame dwarfs the rather large *Powerhouse*! Hard to do!



The completed Champion Model Aeroplane Co. *Powerhouse* is a beautiful sight. This classic dates back to 1938!

Continued on page 72



"... Live for the present but respect the past."

Our lead-in quote this month is from a Transworld Airlines calendar via Carl Hatrak, and ties in nicely with one from Richard L. Evans sent in by Ken Hamilton: "The past is to learn from and not to live in..." Ken wonders how this relates to those who prefer vintage aeroplanes with propellers and two wings...

#### FALLING FREE FLIGHT

From the June 1983 *Final Glide*, Region 12 Soaring Council, this item: "How far can one fall and not be killed? The record is claimed by Soviet Lt. I.M. Ilyich Chisor, who fell out of an Ilyushin bomber during 1942, without a parachute, from an altitude of 22,000 feet. His estimated falling speed was 117-185 mph! Fortunately, he struck the ground at the edge of a snow-covered ravine. Unfortunately, he slid all the way to the bottom of the ravine, sustaining spinal injuries. Fortunately, he survived to tell the tale... and recovered!"

#### TOM'S STINSON WINS

Tom Laurie's restored full-size Stinson, described in *MB* a few issues ago, was awarded two prizes during its very first fly-in judging. Tom, and Gee Bee owner Bill Turner, entered it in a Merced, California event and the aircraft was declared winner of the Golden Age Special Award and the Mayor's Trophy for the most outstanding antique. Quite an introduction, and our congratula-

tions to Tom and his restoration crew, which included many model builders.

#### MORE PLANS

New from Berwyn "Burt" Thompson is a quarter-scale plans set for Roscoe Turner's famous "Miss Champion" racer. Burt is a cartographer by trade, so working over large delineations is a regular routine for him, and this presentation is an outstanding example of clean, uncluttered work. Anyone who may have tried drawing construction plans knows that it is not as simple as it may appear, and we found a study of this "Miss Champion" technique fascinating. For further information on this and other Thompson productions (see ads in *MB*), send a stamped envelope to: Thompson, 219 White City Blvd., Springfield, IL 62703.

#### SMALLER PLANS

At the other end of the size scale, David Diels has released more drawings for models under 30 inches in span, including Peanuts. The samples sent to the Hangar included a Boeing F4B-2 spanning 15 inches, and a 16-inch span Curtiss BF2C-1 Hawk. Prices are reasonable and the drawings comprehensive.

Dave has been conducting surveys among his customers and the results include the following: 1. Most who responded prefer to scratchbuild, rather than to use kits; 2. Most reported no



Dean Mc Ginnes, Lakeland, Florida, works on his Sorrel Guppy built from *MB* plans. Weighs 5.5 grms., flies for 40 seconds, but needs extensive "tuning." Photo by Ellis Oglesby.

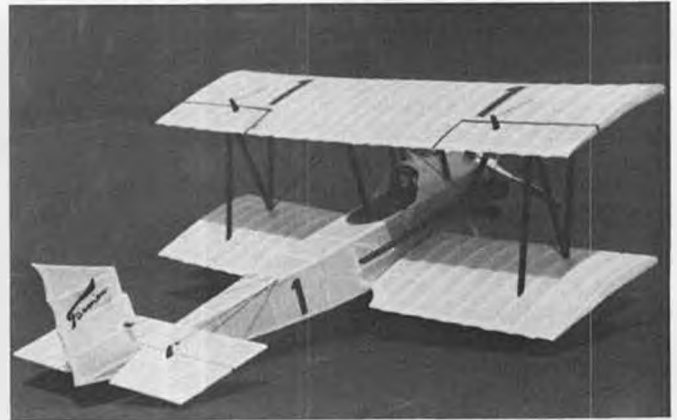
difficulty in locating building supplies; 3. Most prefer models larger than Peanuts; 4. Quality was stressed as the most important factor, whether in kits, wood or plans. Diels' request for future subjects resulted in over 400 choices! That ought to keep them busy. In addition to plans, Dave now stocks thrust bearings and replacement clear plastic for Mattel Vac-U-Forms. A stamped envelope will bring the complete list: Diels, Box 101, Woodville, Ohio 43469.

#### TO MAKE 'EM BIGGER, FIRST MAKE 'EM SMALLER

George Ardwin, the fellow who markets aviation theme rubber stamps, is also a commercial photographer who often applies his camera talents to model building, notes that a simple way to enlarge plans or three-views involves projecting a 35mm slide of them onto paper for tracing. However, some modelers do not have the proper equipment to make a good, distortion-free slide in the first place, and George wonders if there might be enough interest in offering a service to produce them? The idea would be that the plan or three-view could be copied onto precision glass-bound slides and re-



Gee Bee builder/pilot, Bill Turner, demonstrates proper launching technique with *Geogyro* model. Note Bill Northrop, Bob Hahn in background.



Gene Dubois built this fine Peanut Scale Farman sport biplane. Photo was taken by E.R. Van Gorder of *Flying Models*. Gene is a master builder, and his Peanuts always look terrific.





Here's a delightful original Bostonian by Gerald Myers of Redway, California. Its lineage is rather strange ... see text for story.



Lubomir Koutny of Czechoslovakia built this magnificent Italian Re 2005 in 1/20-scale. Rubber powered, of course!

turned along with the original for a reasonable charge. Any interest out there? If so drop a line to: George Ardwin, 60 Ely Ave., Box 56, Sabina, Ohio 45169.

#### WORLD TRAVELER

Regular readers may recall Milan Kacha's fine scale Zlin, mailed from Czechoslovakia for one of the early *Model Builder* Postal Peanut Contests. After the meet it resided for a time in Fernando Ramos' house. Next, it was air-mailed to England where it was successfully proxy-flown at the Woodvale Internationals. The latest chapter in the story of the wandering Zlin is that B.G. Sinclair has forwarded the Peanut to Japan, where it is now under the care of Ichiro Yamada.

#### MORE ON JAPAN

Shoichi Uchida reports that tiny scale models are gaining in popularity in his country, as are other forms of indoor models, and that a recent meet in Toyota-city received coverage on television. Categories flown included Penny Plane, Ornithopter and Peanut Duration, and there were approximately forty entrants.

In Penny Plane, Kazuyoshi Komori placed first with a time of 10 minutes, 13 seconds, followed by Ryuji Matuzawa (9 minutes, 59 seconds), and Kaoru Hamada (9 minutes, 42 seconds).

In the wing-flapper class, Mashiro Yamanashi placed first by proxy with a



This 1909 Grade monoplane built by Lou Roberts from Benno Sabel plans now resides in Dick Sherman's model museum in New Hampshire.

time of 6 minutes, 5 seconds. In second was Kazuyoshi Komori (5 minutes, 37 seconds), while in third position was Ryuji Matuzawa with 5 minutes, 17 seconds.

Peanut Duration times were particularly impressive, with the first-placed Tuyoshi Yamazaki's entry staying aloft for 3 minutes, 3 seconds. In second, Jiro Sugimoto's model did 2 minutes, 33 seconds, while Kazuhiyo Suzuki finished third with 2 minutes, 12 seconds. Our reporter, Shuichi mentioned almost apologetically that his entry "only" reached 1 minute, 57 seconds! Certainly most Peanuteers would be thrilled to achieve times of that caliber! We did not receive descriptions of the winning models, however we do have the identities of the Japanese Pistachio Nut models which were proxy-flown to

good effect in Florida:

#### MINIATURES IN MIAMI

Doc Martin and his Florida flyers have set the pace again, with the world's first "INTER-GNATS" for truly tiny flying scale models. Not only were the entries of great variety (mixed nuts?) but the durations would have been credible for Peanuts or larger scale models.

Evaluating the results of this contest calls for readjustments in thinking, as very few builders have experience with designs this miniscule. Consider, for example, Category I, which was restricted to models *under two grams* in weight! Such weights are not uncommon in microfilm models, of course, but in flying scale models? Results were as follows (average of two best flight times

*Continued on page 76*



Inter-Gnats models are being judged by Doc Martin in Florida. Almost all are too small to be seen. Note bi-focal goggles! Bob Andrews photo.



Spectacular D.H. 80 *Puss Moth* rubber-powered model by Jacques Delcroix of Orleans, France. Note DT setup: must fly very well!



# Free Flight

By BOB STALICK

• As you read this, many of you are just now unpacking from the Reno Nats. Others are getting in the last test flights in preparation for the Seguin FAI finals, still others are looking forward to the last contests of the year. Those of school age are looking forward to their first days of class . . . perhaps! As for me, as I write this column, I am looking forward to the fourth of July and waiting for enough good weather on a weekend that I can go out and do some test flying. Yessiree, it's a great time of the year for outdoor free fliers!

For those of you who thought to take cameras along to the great meets, why don't you look over those pictures you've taken, and you send some of them to **Model Builder** "Free Flight" with the important info attached. It's your chance to make some of your friends, or even you, semi-famous. I'd appreciate it, and so would the rest of our readers who may tire of photos of the northwest area fliers. Now . . . on to our features for October.

## OCTOBER MYSTERY MODEL

This is one that many of us middling old-timers will recognize right away.



As requested of "Bullet Bob," here is a picture of a model DTing, not being launched as most others are. A picture like this is not as easy as a takeoff pic!

Most of us built one or gave it a lot of thought "back when." That it was available as a kit *only* made it that much more appealing. Several different sizes of the model were designed, built, and flown. The one shown in the sketch is the 64-inch version . . . big for those days.

The one I remember best of all was flown locally by my good friend, Ken Elwood. Ken's was equipped with the standard parachute style dethermalizer. It "worked" by using a rubber band ejection system that forced the chute out through a little hatch built into the underside of the fuselage. The chute streamed back behind the model and, according to the directions, opened up, slowing the model down, and allowing it to descend to the ground. I guess I watched Ken put up dozens of flights with his ship . . . I don't recall that the chute ever opened, but the drag of that silken wad on a string trailing behind the model did, indeed, slow down the ship, and it did, eventually, come down.

Nevertheless, it was a popular model, and it is a great design for Nostalgia consideration. If you know the name, write



Author's son, Tom, poses with his FAI Class A model, the *Zingo*, designed by Tom Hutchinson and kitted by Campbell's Custom Kits. Rossi .15 on a Kraft mount. K&B finish over Japanese tissue (wing double-covered).

it on a postcard or letter and send it to Bill Northrop at **Model Builder**. A one-year subscription waits for the winning entry. If you have the time, and once-upon-a-time built one of these ships, you might drop a few lines with your most memorable experiences about it as well.

## MYSTERY MODEL WINNER

As promised last month, we are going to be keeping up to date with the mystery model winners on a monthly basis. This should be more interesting for you, the reader, and a lot more exciting for the monthly winner.

Roger Morrell of Redondo Beach, California, was first in with the correct answer to August's mystery model puzzler . . . and to a lot of you it must have been puzzling because the response was pretty light this time. The model is our very own Bob Stalick's *A/Wonder* as drawn by Bruce Hannah, and redrawn in MM form by Al Novotnik.

Congratulations, Roger, on solving this brain-buster! Enjoy your *free* one-year subscription.



Bill Brenchley supplied these photos from the Third Annual Egyptian F/F Champs as hosted by the Sky Squires R/C Club of southern Illinois. Here Charles Hermanek of Decatur, IL, launches his P-30 model.



Bud Brown, Lawrenceville, Illinois, poses with his P-30 entry at Egyptian meet.



Dottie Odum launches her Peanut biplane. She took 3rd place in Peanut Scale at Egyptian.



Dave "VTO" Linstrum is up against the wall for this picture with his Campbell's Custom Kits Zeek 1/2A model. Model is covered in red (top) and blue (bottom) Micafilm for excellent visibility at altitude. Medallion .049.

**OCTOBER THREE-VIEW:  
CHOU YAODONG'S A-2**

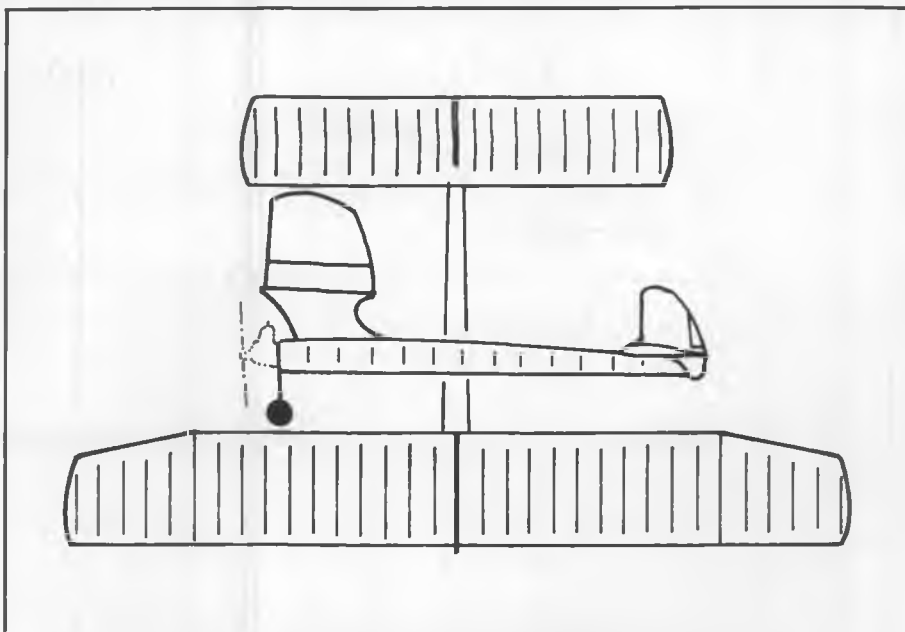
At the 1979 Taft finals, I was impressed with the models that were present with the fliers from the People's Republic of China. Although many were not up to the technical level of the so-called "Western Nations," these ships were built with exquisite craftsmanship and attention to detail. Yaodong's Nordic was no exception.

The airframe on Yaodong's model is equal to the state of the art with its high aspect ratio wings, moderate tail moment arm, and small stabilizer. Of note is the undercambered stab airfoil and the unusual wing airfoil. Because this wing section is a new one to me, I've decided to feature it as the October Darned Good Airfoil . . . just in case anyone would like to give it a try.

Yaodong did not fare too well in the 1979 competition, placing 34th. However, his score reveals six consecutive maxes followed by a 123 . . . just missing the flyoffs by virtue of a bad last flight.

**DARNED GOOD AIRFOIL: XGD-4**

This is the airfoil used on the wing of Yaodong's A-2. It looks to me to be a good compromise section: one that is not intended as an all-out, calm weather airfoil, and yet it is not so thin that it can't handle bubbly, thermal air. It has a



**OCTOBER MYSTERY MODEL**

nice, unhooked rear section, which should make it worthy of consideration for circle tow. It passes the Eppler test for top camber at the rear, so someone west of China should see fit to give it a try.

It strikes me that not only does it deserve some consideration as an A-2 airfoil, but it looks right for Wakefield as well. If someone out there has given it a try, I'd like to hear about it. Drop me a line.

**CORRECTION SECTION:  
FLYMAX STAB AIRFOIL**

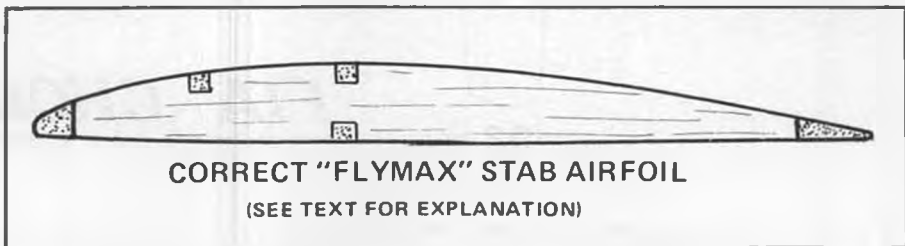
In the July issue of *Model Builder* "Free Flight", I extolled the easy, buildability of the *Flymax* 1/2A Gas model. I even suggested that it could be built in a weekend and taken to the Nats and flown competitively in 1/2A Gas. Lyman Armstrong wrote to ask me the question: "The stab airfoil looks funny, is it?" I

wrote back to him to say, "Yes, it is." The only explanation I had, as I don't have a computer to blame the mistake on, is that I goofed. The stab airfoil shown on the three-view is too large (too much chord). So, herewith is the correct one.

For those of you who built the *Flymax* with the large chord stab, and even got it to fly . . . congratulations! Sorry for the mixup.

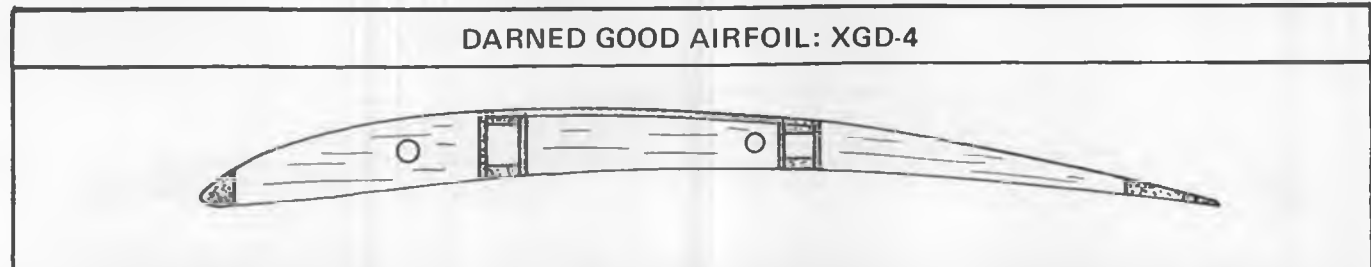
**SPECIAL CONTESTS BY SPECIAL CLUBS**

It's not the general practice of this columnist to write up and comment on local club contest results. Occasionally, some contests are worthy of note. I was pleased to receive a note from Bill Brenchley, of the Sky Squires R/C of southern Illinois commenting on his club's sponsorship of the Third Annual Egyptian Free Flight Championships.



**CORRECT "FLYMAX" STAB AIRFOIL**

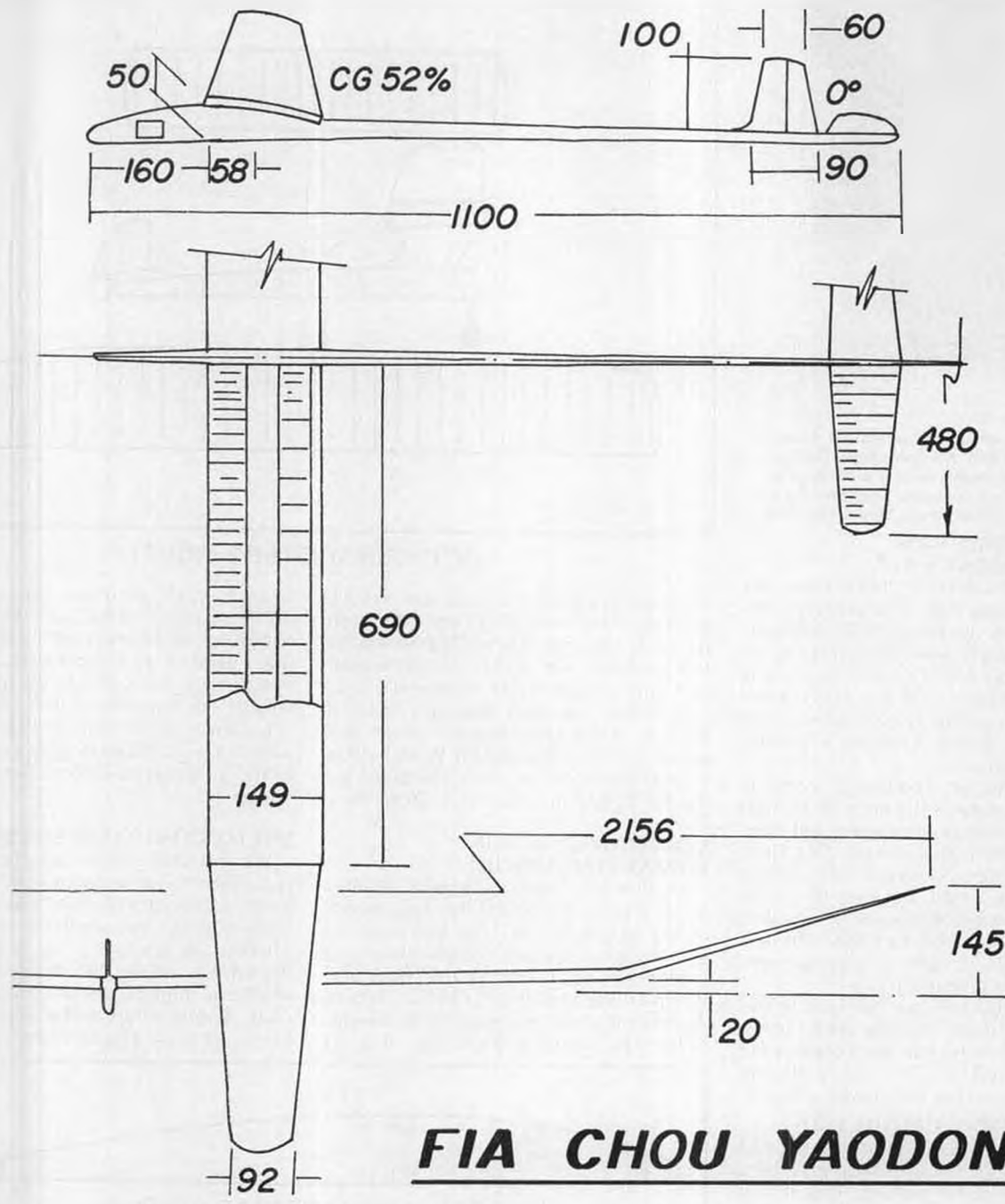
(SEE TEXT FOR EXPLANATION)



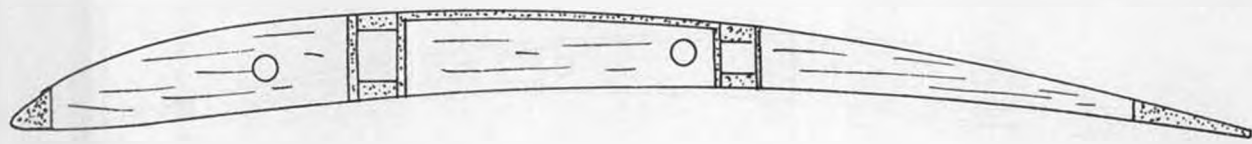
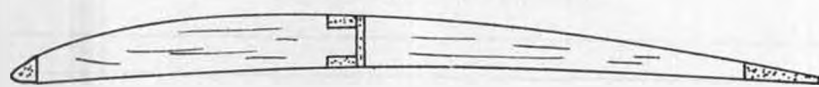
**DARNED GOOD AIRFOIL: XGD-4**

X	0	1.25	25	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
Y1	0.8	2.05	2.85	4	5.05	5.9	7.15	8.05	8.6	8.95	9	8.55	7.5	6.15	4.55	2.7	0.5
Y2	0.8	0.04	0	0.3	0.6	0.9	1.5	2.05	2.5	2.8	3.35	3.5	3.55	3.15	2.35	1.3	0





**FIA CHOU YAODONG**





Dorothy Odum cranks that winder putting turns into a very stretched rubber motor. Hubby Louis holds. Scene is the Egyptian meet.



Carl Fries, Crestwood, Mo., readies his 1/2A model *Candle in the Wind* for a flight at the Egyptian meet.

That's right!! An R/C club sponsored a free flight meet. In addition, 32 free fliers showed up to compete. Ray White, of St. Louis, showed up with his ornithopter and proceeded to set a national record of 10 minutes and 30 seconds.

Bill notes that the free flight meet outdrew the annual R/C scale contest also sponsored by his club. The message seems to be that free flight is alive and well in Bill's part of the country.

I think this kind of cooperation is excellent for the health of the entire hobby. . . . Now, I wonder if any free flight clubs have done the same to promote R/C or Ukie?

Bill, you should be proud of your group. I've included some of the pictures of the meet in this column. Thanks for sharing the good news.

#### ZINGO KIT BY CAMPBELL

Tom Hutchinson's death left all free fliers just a bit poorer. His well-known kit line, RM Products, however, was purchased by Lee Campbell. Lee has just brought out Tom's *Zingo* Class A, FAI Power model in short kit form. The kit is available for \$19.98. It's typical of Tom's no-nonsense approach to good

flying models. The *Zingo* is an excellent choice for A or B Gas and literally flies off the board if built according to plan.

My youngest son, Tom, just completed one . . . it's his first "big" gas model and his first new model in three years. One of the local fliers, Avery Clark, built one and flew it with a K&B 21. All of the ones I've seen fly superbly. The more power, the faster, but the ship seems to handle it well.

For your kit, contact your local, progressive hobby dealer, or order directly from Campbell's Custom Kits, P.O. Box 5996, Lake Worth, FL 33461. Lee will also send you his complete catalog for only a 20¢ postage stamp.

Incidentally, Lee plans to provide kits for two other RM designs: the *Maverick 1/2A*, and the *Ultimate Dragmaster*.

#### BULLET BOB'S BITS 'BOUT FREE FLIGHT

Since last month, I've received several letters inquiring about free flight. Two of them were serious inquiries. One, sent by the notorious Dave "VTO" Linstrum, deserves special treatment.

Dave asks: What is a max?

Bob replies: Choose from the following:

- a) A blue ribbon hung from the neck

of WW-I German aces.

- b) A very large fellow with a shaved head who is employed as a bouncer at the Sugar Shack near Los Alamitos.

- c) 180 is

- d) The best sound that a free flier can hear from his timer.

Dave asks: What is a Seelig?

Bob replies: Choose from among the following:

- a) A Seelig isn't a what, it's a who.

- b) A Seelig timer is a very nice piece of free flight equipment available from Doug Galbreath, 707 2nd St., Davis, CA 95616.

- c) A Seelig timer is the timer of choice for most of the world's FAI fliers.

Thanks, Dave for your inciteful questions. I hope my answers were helpful.

On a more legitimate note, I received two letters that had a number of questions about rubber powered free flight. These, from Dusty Miller and Glen Kaler, I will treat with the respect due.

Firstly, the question that is not about rubber models, but about . . . Seelig timers. "Can you provide us with instructions for Seelig timers? We have several of these devices; however, none in-

*Continued on page 82*



"Where'd it go?" "It's right here on the winding stooge!" Dottie Odum and Louis Odum prepare a P-30 entry.



Roy White and wife (name?) wind up their record breaking ornithopter for a Category III flight of 10 min., 30 seconds.



By FERNANDO RAMOS

# Free Flight Scale

• Winston Churchill once wrote, "Failure is not fatal. Success is not final. What matters is perseverance." These words apply beautifully to Tom Laurie and his Stinson project.

Firstly, Tom Laurie shouldn't need an introduction to old-time modelers. He has a couple of his models in Frank Zaic's *Yearbooks*. More recently, he has had some fine scale F/F models featured in *MB*.

Ten years ago, Tom acquired a 1934 SR5E Stinson . . . completely disassembled! It had been sitting on a trailer for years, the home for wasps and mice! Even disassembled, the Stinson is one big machine. It compares in size with the *Reliant*, so you know what I mean.

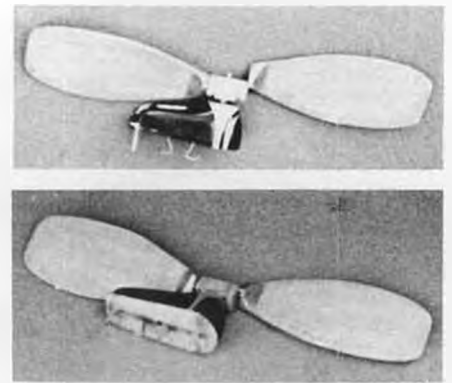
When Tom got the remains at home, it was systematically stripped, and all areas carefully inspected. Several tubes in the fuselage had to be cut and replaced. All of the bulkheads and stringers also had to be replaced. Most all of the sheet metal looked like wrinkled newspaper that someone tried to iron out. The wings needed a lot of rework as well. In fact, one spar near the root had to be cut and a new piece spliced in.

The last two years were spent working

on the Stinson full-time, and still the myriad of detail persisted. The airplane was becoming absolutely beautiful. Much of the sheet metal was replaced, but much of it was reworked and made to look better than ever. The Stinson has spent the last six months or so in the Flabob airport (a suburb of Riverside, California) in Ed Marquart's hangar where it could be put together under the watchful eye of this well-known antiquer.

Finally, the day of truth was chosen. Tom called a bunch of us who had personally helped during the long restoration. We met for breakfast at six o'clock in the morning. The day was as clear as you would ever want. However, when that happens out here, there's only one reason why . . . the Santa Ana winds! By the time we arrived at the Flabob airport, the winds were blowing pretty hard. Naturally, they do not blow down the runway, but crosswind!

Tom's wife and daughter arrived with so much food, that even though flying the magnificent SR5E wasn't possible, we had a grand time eating and visiting with many of the troops that came up from San Diego like Bill Hannan, Bill



Slightly out of focus photos of Bob Wetherell's pivoting prop blades. See sketches.

Noonan, and Warren Shipp. In spite of the winds, Bill Turner, test pilot and owner of the replicas *Miss Los Angeles*, and the Gee Bee Model Z, taxied the Stinson up and down the runway several times to check the brakes, and controls in general. This day was not to be the first flight of the exquisite Stinson, it would have to wait.

Bill Turner was scheduled to go to San Francisco on business, so it would have to be in a couple of more weeks before the test flight could be made. Soon after Bill arrived in San Francisco, that area had some rather hefty earthquakes! Bill decided he would rather be down South on weekends, therefore the following Saturday was chosen for the "Big Flight."

This time the weather was cooperative. The preflight was carefully made, but when it came time to start the engine, it wouldn't. After some checking, it turned out to be a fuse that had slipped out of its holder . . . remember, this is 1934 technology!

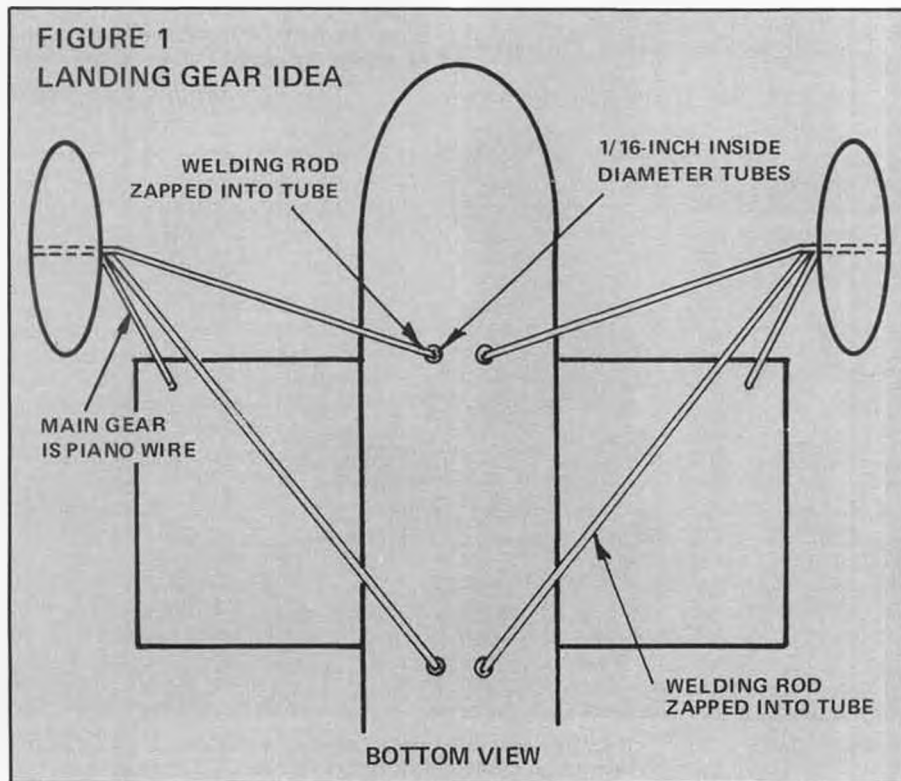
With everything in order, Bill poured on the power to the original 225 hp, nine-cylinder Lycoming dash five radial . . . what a sound! The beautiful Stinson took to the air without a glitch. Bill flew it for about 30 minutes before making a perfect wheel landing. The smile on his face told the whole story. Yes, perseverance is definitely required in order to succeed in such a restoration project.

The first fly-in that the Stinson will make is in Merced, California. Naturally, Oshkosh and Blakeberg are next this summer. The awards this airplane will surely win, will hopefully counter for the many years of hard work, and expense.

Tom will once more have the time to get some modeling done!

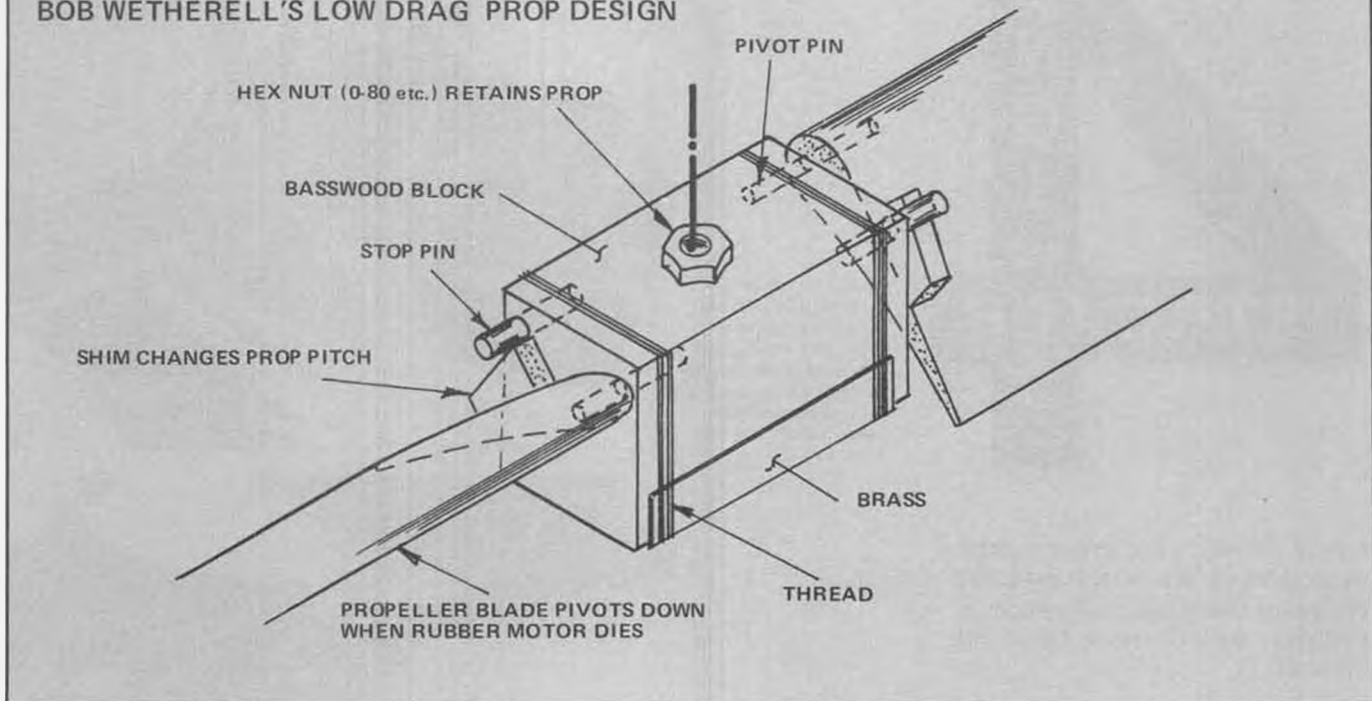
## BOB WETHERELL'S PROP DESIGN

I've said it before, and I'll say it again: scale modelers are very clever! This axiom certainly prevails in the name of Bob Wetherell. At the last Scale Staffel contest, Bob entered a superb model of the D.H. *Puss Moth*. Most rubber scale modelers consider this design impractical because of the landing gear layout. A large diameter propeller cannot be used. A solution, of course, is to make a smaller diameter prop with a gear box and a couple of additional loops of rubber. This setup makes it possible to swing the smaller diameter prop at the most efficient rpm. No, this is not an





**FIGURE 2**  
**BOB WETHERELL'S LOW DRAG PROP DESIGN**



article about gear boxes, but on the propeller Bob used along with the nose block.

What we are talking about is a full-feathering prop. It's as simple a device as you can imagine! You might wonder why Bob felt that he needed such a device on a scale model. I'm sure what led up to this cleverness was that some kind of freewheeling device was necessary. In order to have true freewheeling in a gear box, there has to be some type of clutch to disengage the gears. No one wants to go through all of that. Bob's solution was to simply feather the prop blades. (Incidentally, Bob could have freewheeled the prop using Vince Costanzo's freewheeler as mentioned in this column some time back.)

One thing Bob stressed is that he has no power tools. Everything he did in making the prop was done using simple hand tools. Bill Hannan graciously took a couple of photos of the prop for me as my own camera had color film. Hopefully, between the accompanying picture and sketches you should be able to figure out how easy and clever this prop is. Bob flew his *Moth* in some pretty windy weather. The model performed flawlessly, and when the motor ran down, the prop feathered, leaving the model to glide with minimum drag from the motionless propeller. His goal was set and accomplished.

#### BENTOM GEAR BOXES

Even though I did not cover gear boxes in the foregoing text, I want to pass along something that may stimulate some thought. The other day I was in a model shop that had some Bentom brand, rubber powered foam models of the more popular WW-II fighters. I had seen them before, but never paid too much attention to them. The Me 109 was painted rather neatly, so it caught my

eye. I bought one of the kits, which at ten bucks was far from cheap, but on the other hand, what is cheap these days? These models are made in Japan and come with a small, lightweight gear box. This compact unit has a clutch arrangement which allows the propeller to freewheel. I've assembled the model, which takes all of about five minutes, but I haven't painted it yet. As soon as I finish playing with the model and the gear box, I'll pass on my findings. (These models are available through California Model Imports, P.O. Box 1695, Garden Grove, CA 92642. Ask for prices. wrf)

#### LANDING GEAR IDEAS

The model that I'm furiously working on for the Flying Aces Nats this summer has created some interesting challenges. One of them is the landing gear (see Figure 2). Because two of the struts originate from the center of the fuselage, normal mounting techniques are impossible. (The main gear leg comes out from the stub wing.) My solution is simple, how effective it will be is speculative until the first flight. The front portion of the keel is made from 3/8x1/2 hard balsa. Four 1/16 ID tubes are drilled

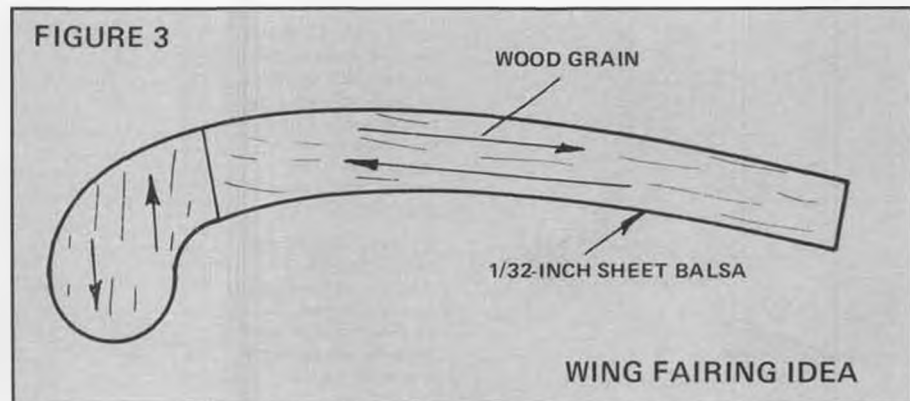
into the keel where the landing gear struts plug in. The main gear is attached to a bulkhead and carried into the stub wing. It is made from 1/16 diameter piano wire. The other struts are made from 1/16 diameter welding rod. Why? For two reasons. Firstly, it is much easier to bend welding rod than piano wire. If the angle of the bend is not in the same plane as the other struts, it is an easy matter to twist it correctly. Secondly, welding rod should be more forgiving in a prang. Because the gear is rigidly attached to the fuselage, the welding rod should yield better in a hard landing. At least I hope so, otherwise the keel will be the first part of the airplane to go!

Where the three 1/16 diameter wires come together, I epoxied an aluminum tube with the inside diameter just large enough to fit over the three wires.

I've talked about the use of welding rod before. I now use it for making the cabanes on all of my gas F/F biplanes. I might add that it should not be used for the main landing gear, as it is not springy like piano wire.

*Continued on page 78*

**FIGURE 3**



# 4 STROKERS

By DICK HANSON

ENGINES

*Model Builder's Pattern* columnist branches out into a new monthly endeavor the subject of which is probably very obvious: four-cycle engines!

• "Beware of propellers which are bolted onto the hub using the multiple bolt arrangement," said the wise man . . . And here's why: the engine delivers its power in short pulses which transfer to the propeller through the drive washer. When the front washer is tightened properly against the propeller, the power pulses are absorbed over the entire hub of the propeller. This is an old setup that has withstood the test of time and has only one drawback. The propeller compresses, and the grip on the drive washer is reduced.

The full-scale practice of bolting the prop to the hub and thereby solving the problem looks better at first examination. Properly done, it is. Improperly done it is downright *dangerous!*

Here is a possible scenario: our hero takes a new propeller, drills a couple of nice holes 180° apart and mounts the prop. The manufacturer says to use four bolts, *but . . .* two seems adequate. His new prop is a trifle thinner than what the engine manufacturer allowed for when selecting cap screw length. This leaves him with a prop held on by two bolts that have bottomed in the hub and are applying only *mild* compressive force

Photo 1. When adjusting four-cycle engine valves, it is advisable to use both a wrench and a screwdriver. This prevents clearance changes when tightening the lock nut.

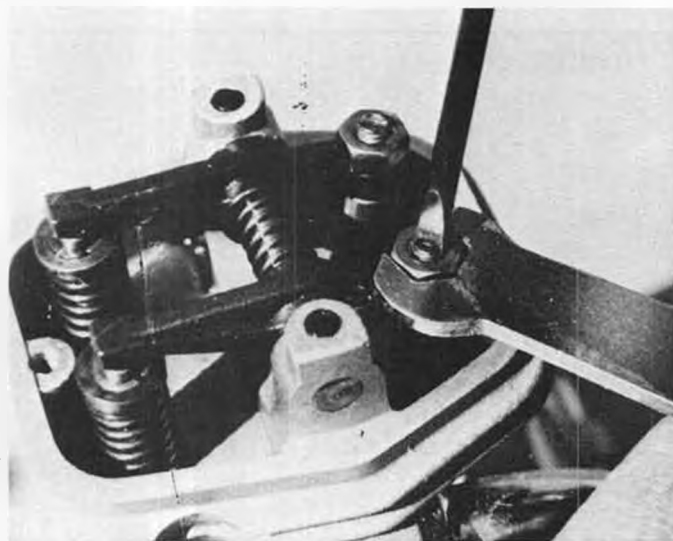


Photo 2. Beware of losing the valve stem keepers; they are held in place by spring pressure and can be dislodged if improperly handled. See text.



between the front and rear drive washers.

The bolt holes which were drilled slightly oversize to allow easy bolt installation now play a critical part in the upcoming scene. Each time he flips the prop, or the engine fires, the prop slips back and forth a little. The power pulses are now being applied *directly* to the prop mounting bolt holes. These pulses cause the bolts to bump rapidly against both sides of the mounting holes in the prop. The holes elongate and the situation gets critical. Now remember, all force is being transmitted through a lever arm (the distance from the crankshaft centerline to the mounting bolt pattern). If we now add the final ingredient, a propeller, which has a wood grain that lines up with the prop, the disaster is ready to go. And go it does!

Having witnessed this kind of disaster

firsthand, I can speak with firsthand knowledge. The prop exploded at a low speed, approximately 3000 rpm, just after the engine started. The modeler had not used a starter or a chicken stick, just a leather glove, so no undue force had been applied in trying to start the engine.

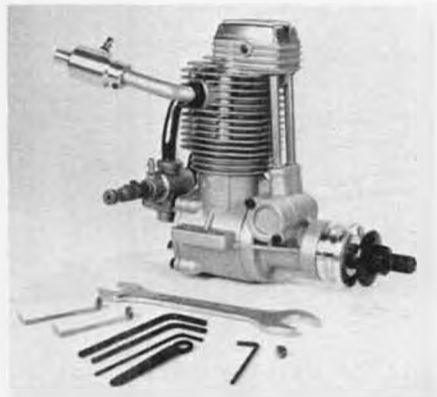
*My physical injuries were minimal:* a bruised toe and a tiny cut on the shin.

Picking up the propeller pieces, it only took a few minutes to reconstruct the accident.

Now that you know what *can* happen, be careful! I hope that the engine manufacturers will take a bit of advice: *devise a better setup!*

For now we will personally use the old-fashioned compression washer and short drive pins. *Your choice of prop*

*Continued on page 70*



LEFT: O.S. FS Series engines come with all the tools needed to accomplish a valve adjustment. They even come with a spare valve stem keeper (right foreground). .61 cid.

RIGHT: Would you believe that O.S. also has a four-cycle marine engine! The chrome band around the engine's cylinder is a water jacket. .61 cid.





# BEACHEY MONOPLANE

By HOBY CLAY . . . Here is a Peanut plan with a double bonus: a very interesting history of the Beachey Monoplane, and a scale three-view for your documentation (see page 36). Hop to it!

• Lincoln Beachey was a renowned aerobatic pilot in the pre-World War I era. He was a pioneer and innovator and his flamboyance and popularity enabled him to make a real contribution to the early development of the airplane. Reams have been written about him and his exploits. The information that I have available to me is from three articles in the *American Aviation Historical Society Journal*: Summer 1961, by Hud Weeks; and Spring 1964, by Willis Nye, with a drawing of the monoplane. In February 1964, Hud Weeks published a lengthy article in the *American Aircraft Modeler* about this intrepid aviator, together with a number of photos of the planes that he flew.

Born in San Francisco in 1887, by the age of 15 he had become proficient in the repair of gasoline engines and was, with his brother Hillary, a professional

motorcycle racer. His knowledge of engines led to his association with Captain Thomas Baldwin, an early balloonist and dirigible builder. In 1903, he built his first dirigible, and he and Hillary developed a number of innovations which advanced the state of the art. He participated in airship races and exhibitions through 1910, but had already learned from Glen Curtiss how to fly the Curtiss biplanes.

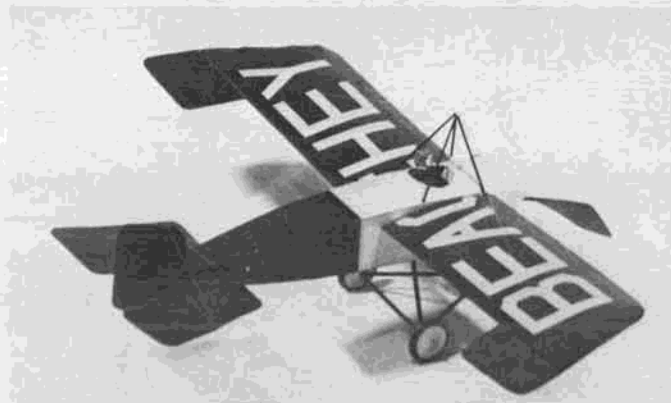
By early 1911, Beachey was giving airplane flying exhibitions, and on August 20 he gained his reputation as a number one airman by demonstrating a mastery of control and daring against the cream of the world's aviators from France, England, and the United States, flying an early Curtiss pusher. He tested planes for Curtiss and gave exhibitions all over the US. An inveterate showman, people flocked to his airshows wherever he

appeared. He didn't invent the loop or other aerobatic maneuvers, but he perfected their execution. He was one of the prime movers in the field of aircraft design development, and always strove to obtain a vehicle capable of more daring and difficult maneuvers to astound his airshow audiences.

In 1914, he went to France and bought an 80 hp Gnome rotary engine. With this lightweight, aircooled engine in hand, he commissioned designer Warren Eaton to build his most famous mount, the clipped-wing, Curtiss-type pusher biplane known as the "Little Looper" or "Pocket Pusher."

Embarking at once on an exhibition tour, he looped for Orville Wright at Dayton, and raced Eddie Rickenbacker in an auto at the Iowa State Fair. Over a

*Continued from page 53*

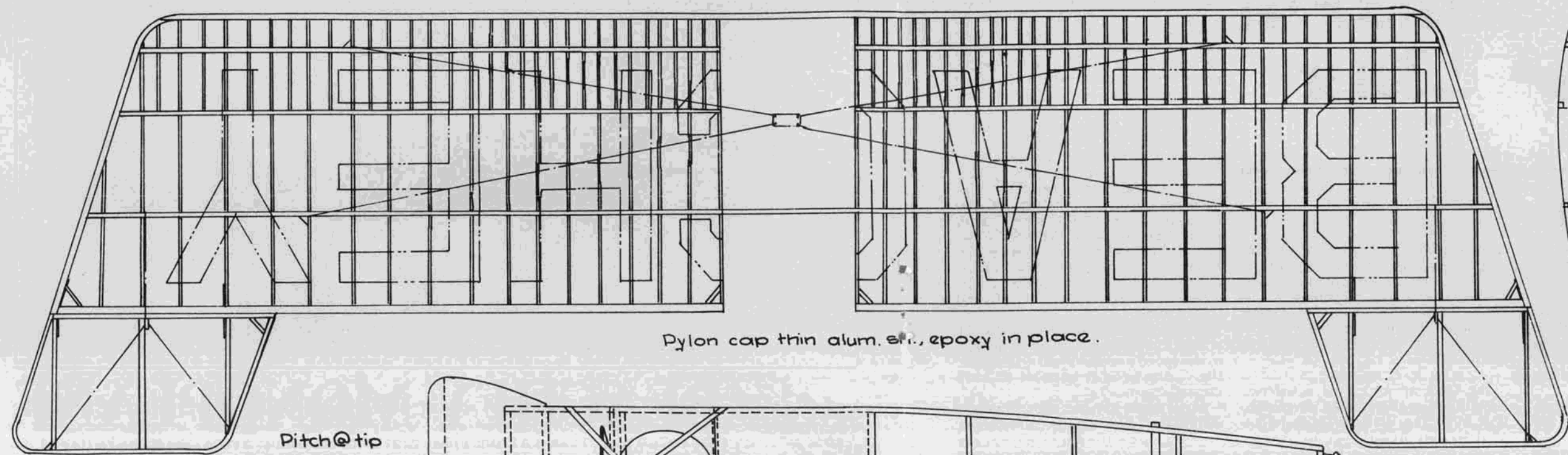


ABOVE: Lincoln Beachey had his name painted on the upper surface of his wings so that people could read it as he performed the death-defying vertical dive which eventually claimed his life.

RIGHT: Author prefers the "backwards-looking" props as they yield better power characteristics with their variable pitch.



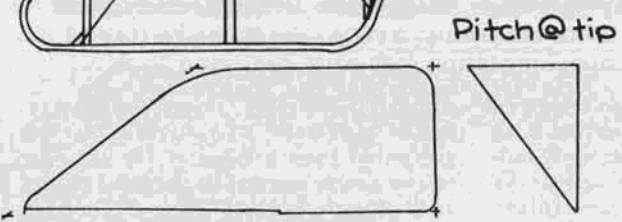




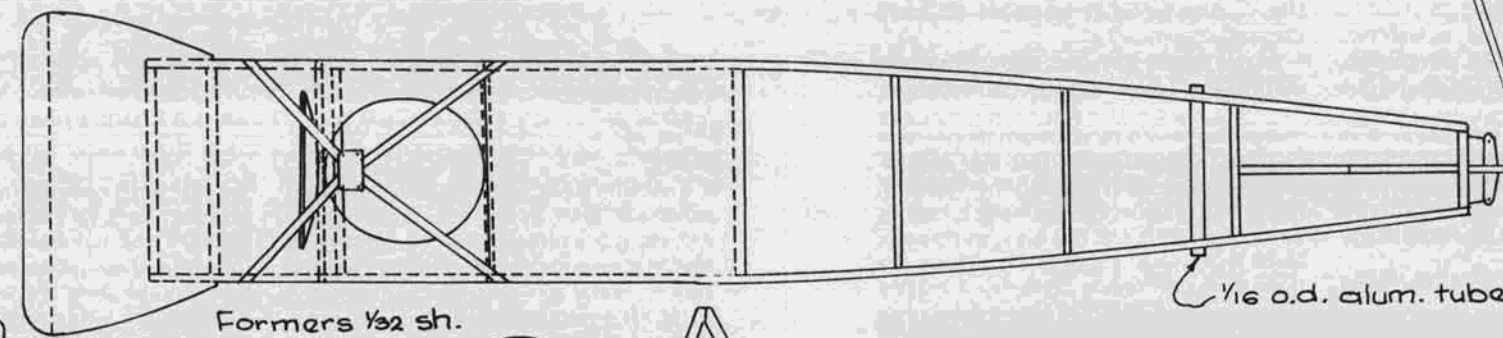
Typical Wing Rib  $\frac{1}{64}$  sh.  
 Wing L.E.  $\frac{1}{16}$  sq.  
 T.E.  $\frac{1}{32} \times \frac{1}{16}$   
 Spare  $\frac{1}{32}$  sq.  
 Tips 2 laminations  $\frac{1}{32} \times \frac{1}{16}$

Tail surfaces & ailerons outlines 2 laminations  $\frac{1}{64} \times \frac{1}{32}$  basswood.  
 Ribs  $\frac{1}{32}$  sh. &  $\frac{1}{32}$  sq.  
 Note elevators and ailerons are interchangeable. Attach with soft wire.

Pylon cap thin alum. sh., epoxy in place.



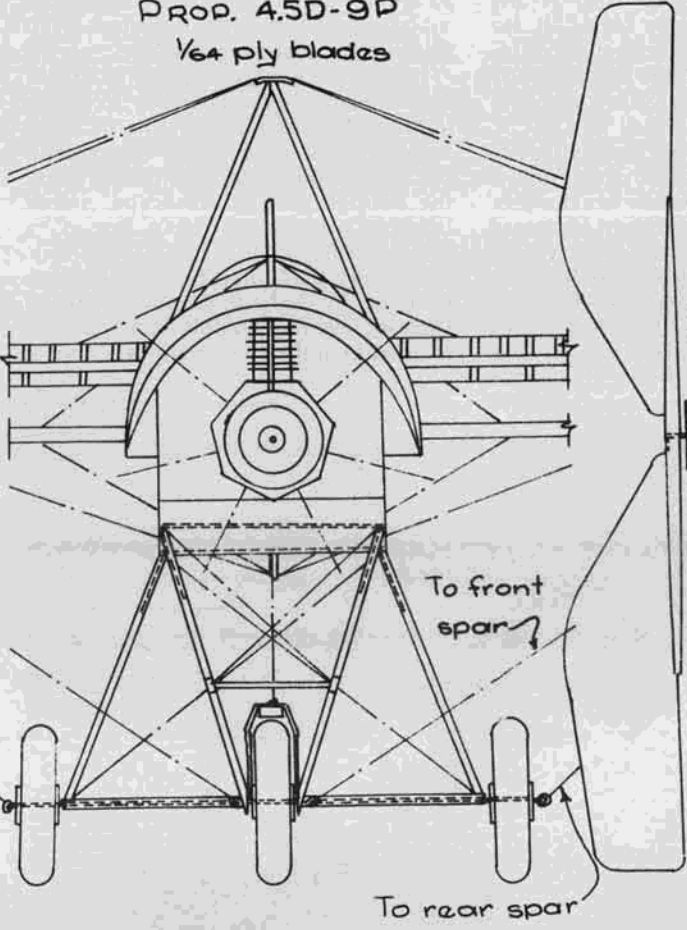
PROP. 4.5D-9P  
 $\frac{1}{64}$  ply blades



Formers  $\frac{1}{32}$  sh.

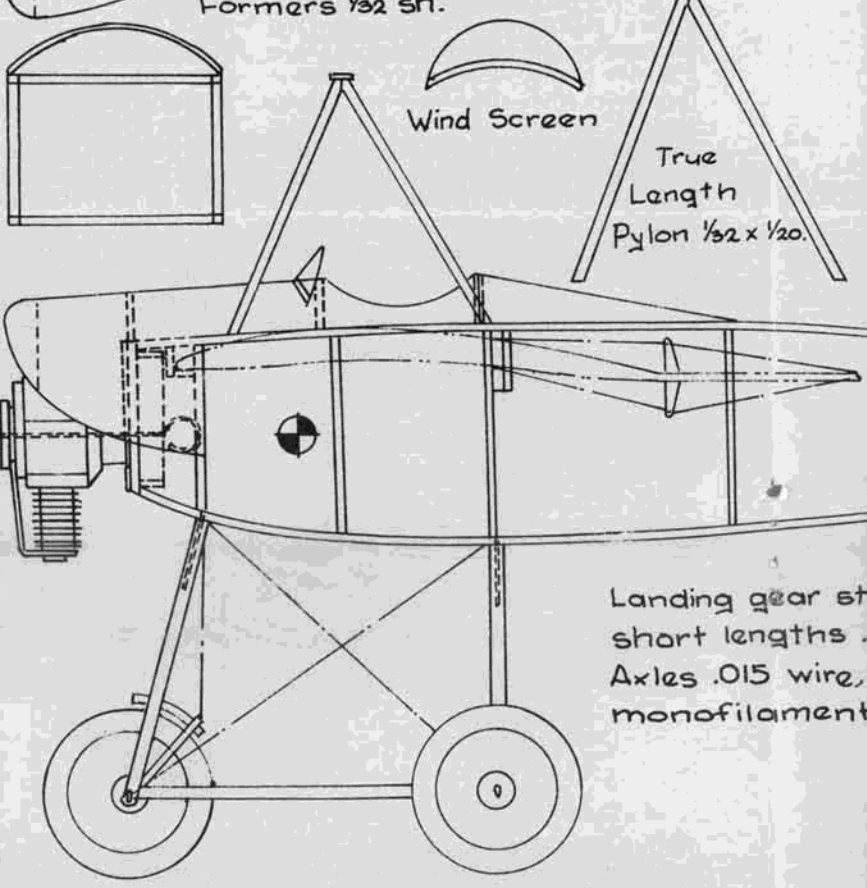
Typical control horn  $\frac{1}{64}$  ply.

$\frac{1}{16}$  o.d. alum. tube.



To front spar

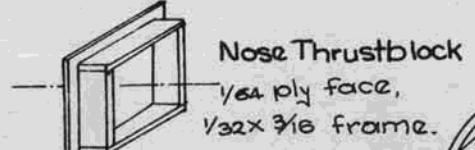
To rear spar



Wind Screen

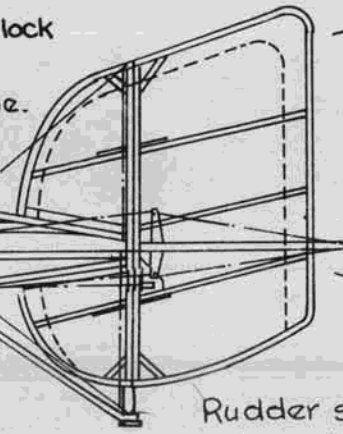
True Length  
 Pylon  $\frac{1}{32} \times \frac{1}{20}$

Fuselage structure  $\frac{1}{20}$  sq.  
 Crossmembers aft of cockpit  $\frac{1}{32} \times \frac{1}{20}$ .  
 Cowl & turtledeck  $\frac{1}{64}$  sh.

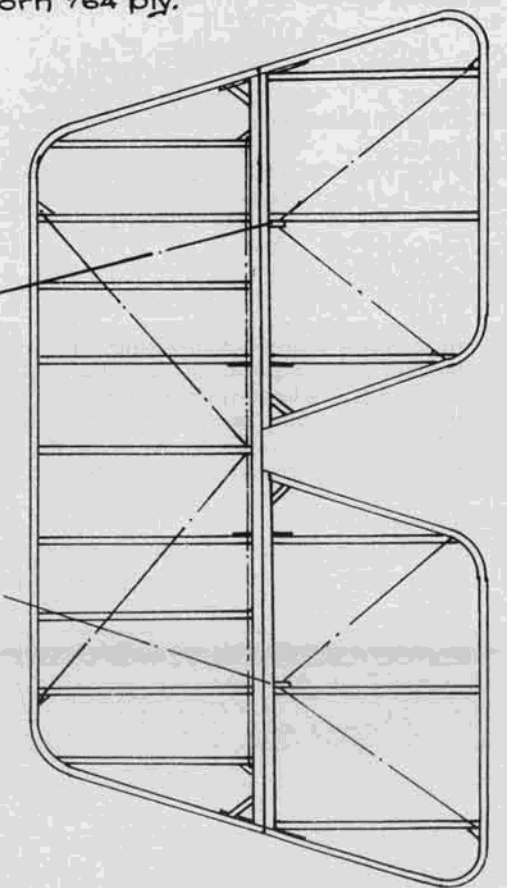


Nose Thrustblock  
 $\frac{1}{64}$  ply face,  
 $\frac{1}{32} \times \frac{3}{16}$  frame.

Landing gear struts  $\frac{1}{20} \times \frac{3}{32}$  streamline,  
 short lengths .015 wire let-in - see front view.  
 Axles .015 wire, form small eyes to attach 2lb.  
 monofilament rigging. Styrofoam wheels.



Rudder shown enlarged to 8% of wing area.



# BEACHEY MONOPLANE

PEANUT SCALE  $\frac{1}{2}''=1'$

2/76

THE



# Control Line

By MIKE HAZEL

PHOTOS BY THE AUTHOR

• Good grief! It just occurred to me that I have been writing this column for over one year now. How time flies! After humming a few bars of "happy birthday to me", I would like to express my gratitude to those of you in readerland who have taken the time to write. I also appreciate the photos, as it is difficult to always have a wide selection of various modeling subjects.

Whilst on that topic, I again solicit photographs that can be used in the column. Black and white is the best medium, with the size either 3x5 or 4x6 working best. Also remember to include the information separate from the photo, rather than writing on the back.

★ ★ ★

Have you been wanting to build a speed plane, but don't know how to go about it? It used to be that there were kits available at most any hobby shop but no longer.

For those of you who would like to start a speed project from kit form, I highly recommend Chris Sackett's products. He has a line of the Wisniewski "Pink Lady" design, ranging from 1/2A to class D sizes. In case you are not familiar with the design, it is a generously sized, smooth flying ship, excellent for the novice and expert alike.

The P.L. is a little more work to build than many other designs, but that is where the kit comes in. Most of the fabrication has already been completed, you mainly just fit the parts, assemble, and paint. The kits include full-size plan, speed pan, finished aluminum wings,

control unit and control assembly, shaped fuselage and tail, and other hardware. You can also opt to purchase a "raw" kit, and save some money. The difference being the amount of shaping completed. For more details you can write Chris at: Box 82294, Burnaby BC, Canada V5C 5P7.

★ ★ ★

The latest arrival in the newsletter department is the W.A.M. Propwash. W.A.M. is the Western Association Modelers, an organization that centers around the California Bay area. This body is similar to the AMA, in that it provides liability coverage for flying, promotes and sanctions organized modeling activities, and regulates safety considerations.

Members of the organization's many

clubs participate in a contest season that starts in March, and goes through October. Although the focus seems to be on competition, the emphasis is on fun, as there are many sport flying type of events along with the "hardcore" ones. One interesting point is that all competition flying is done with a system of proficiency classes. This allows any novice a good place to start.

If you fly in the Northern California region, you can find out what is happening by writing to: W.A.M., 6073 Sunrise Drive, Lower Lake, CA 95457.

★ ★ ★

I recently had a conversation with Jim Ricketts, the AMA Racing Advisory Committee chairman. We briefly discussed the contemporary views of the racing troops. The general consensus is that the big gun racing events need to be reorganized, in the interest of safety and participation.

It is this writer's observation that CL activity increased overall, most notably in the speed and stunt ranks. However, the racing activity appears to have stagnated somewhat.

In any event, the cost and complexity will have an effect on the participation. Taking a look at the Rat Race event will reveal one more factor, namely physical prowess. Consider the fact that a competitive airspeed is around the 160 mph mark. Many flyers cannot hang onto this kind of aircraft for 140 laps, even solo. Note that I said "hang onto". There is a quantum difference between hanging



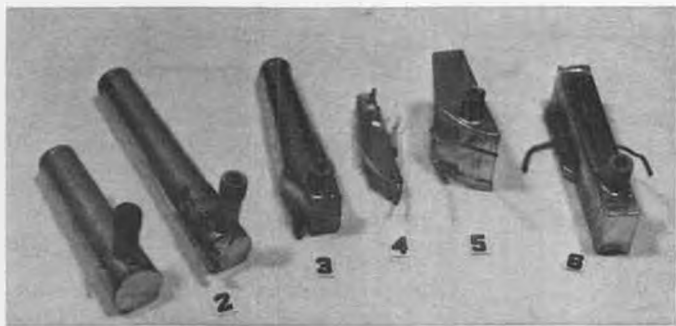
Chris Sackett's Class A Pink Lady viewed from the "business end." Power is by Super Tigre X-15, fed by suction uniflow tank. Quality workmanship is evident.



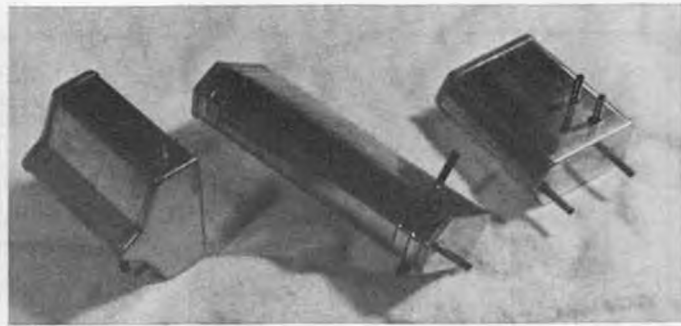
The Skat Rat kit was manufactured by Carl Goldberg Models in the sixties. It still may be appropriate for some restricted racing events.



Chris Sackett sends this photo of his Class A Pink Lady (his own design). Features long fuselage & stab for stability, liftoff dolly.



Here are some examples of racing type fuel tanks. See text for details on these strange looking contraptions.



These are some typical standard-vented tanks: all have rich to lean characteristics.

on, and actually piloting in a race scenario.

So what we have is an event in which many participants must rely upon the availability of a veteran heavy duty pilot being available. It is interesting to note that nearly all the Rat pilots have flown for a long time. Their competency and skill levels have increased over the years as the performance dictated. At this point, it is very difficult for a novice to "catch up".

At the 1983 Nationals, a straw poll was conducted among the racing people about the possibility of stepping down to a .21 size engine. This proposal would bring about the existence of a racing craft that most pilots would be capable of flying, as both the airspeed and weight would be reduced.

Is there a fly in the ointment? Of course! Understandably, some people may be concerned over the investment they already have in the event. Good engines don't come cheap, y' know. However, I don't think there are any participants who can't see that the event needs to be revitalized.

What about the engine manufacturers? Should this be a concern? It certainly should be. Producing a new engine, or making modifications to existing lines to satisfy what could be a short term or limited market, is not what the manufacturers enjoy doing.

However, in this case there should not be a problem. How many .40 size engines have you seen lately marketed for "Rat Race"? Despite the numbers used in the CL ranks, they are sold as "Pylon" engines.

Speaking of limited markets, let's now take a look at the Slow Rat event. Here is a class that was originally intended as an

entry level racing event, but due to rules that were too open, it evolved into a high performance level. It was nearly as difficult to pilot a competitive Slow Rat, as one of the .40 Rats. In '84, a rule requiring a 10% nitro fuel was enacted, and this took the edge off of the high speed. However, this is more of a quick fix to the problem, which will mainly benefit current participants, of which there are few. The benefit, besides slowing things down slightly, is the reduced cost to race. The actual savings in the fuel cost are not that great, but it does reduce the tendency to break engines.

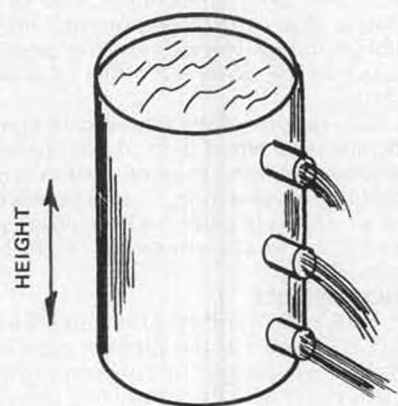
Let's look at the question of consideration for the manufacturers. If a proposal passes which changes the engines, there should be no problem, as

there is currently no major make of high performance 35s. The chickens have already bolted from the coop, so to speak. This in turn makes the event even more difficult to compete in, as the supply of available engines is ever decreasing. It would appear that a major rework of this event would prove to be beneficial in the long run.

Bill Lee, of Houston, Texas, has previously stated some ideas on these subjects in another publication. To summarize, he proposes that for Slow Rat, an engine class is chosen that provides a large selection of compatible engines. One such class is that of the Quicky 500 RC Pylon event. This calls for front intake, single bypass port 40s.

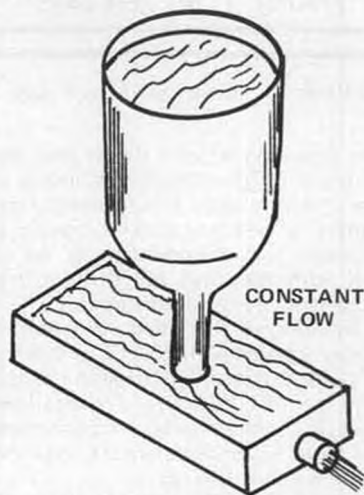
*Continued on page 60*

FIGURE 1



VARIATION IN PRESSURE HEAD

FIGURE 2



CHICKEN HOPPER PRINCIPLE

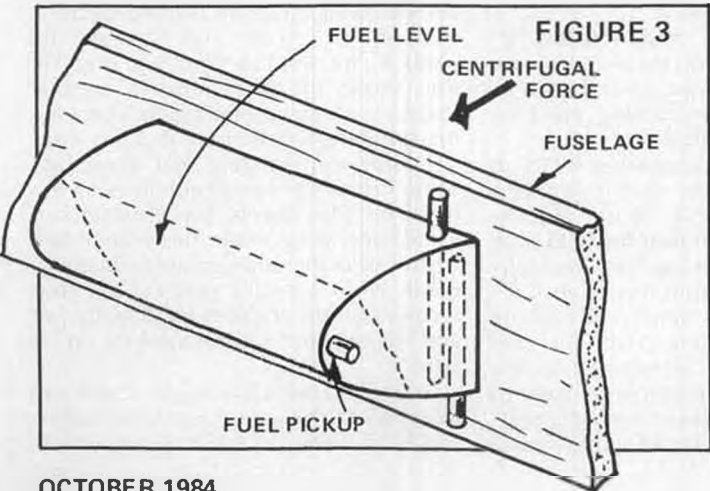


FIGURE 3

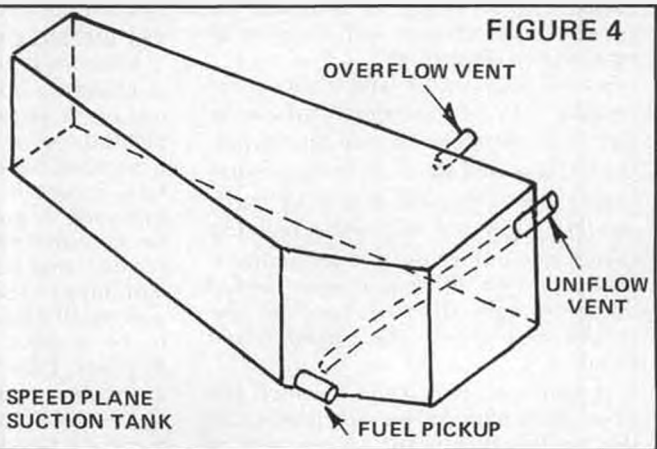


FIGURE 4



WATCH OUT FOR  
THE SNAKE OIL!

## HIGH-TECH HEADQUARTERS

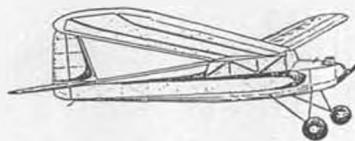
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thrust alone, neglecting the horizontal component, can be misleading. It is permissible to consider thrust as being composed of a horizontal and a vertical component provided these two components intersect at a point on the thrust line. However, this point of intersection need not be at the prop; any point on the thrust line is valid. By choosing a point on the thrust line somewhere near the back of the plane, I can legitimately claim that a downward component of thrust causes the plane to pitch nose up.

Another "rudder-only" model had the engine mounted in a pod above the wing, yet it required about the same amount of downthrust as models with the engine well forward of the wing. This, and other experiences, lead me to doubt that thrust components, either horizontal or vertical, are the primary cause of the observed effect of downthrust.

Bill was one of the few who went into details as to why I didn't have my head screwed on right; most of the letters just said that I was wrong . . . and then went to a "sincerely yours." Okay, who's got anything to say about Mr. Kuhnle's remarks?

### HOROSCOPE

**LIBRA** (September 23 through October 22): You are the pioneer type and hold most people in contempt, especially those who fly control line and play golf. You are quick-tempered, impatient, and scornful of any advice . . . most particularly when it has to do with starting engines and flying BIG Birds. You are not very nice!

### THE BIG SIG CUB . . . AND THE BIG "E"

Since my reviews on these birds were published, a bunch of Cub and BIG "E" owners have written, telling me how pleased they are with their birds.

Sig must have sold countless BIG Cub kits, 'cause it seems that just about everyone is guiding a .90 or 1.2 four-stroke powered Cub into the wild blue yonder. And no one has had any really bad things to say about this design; it's making all the pilots happy, and proving to be a great starting point for new R/C'ers. Like the full-size Cub, this 1/4-scale rendition is teaching many to fly . . . and in spite of some rough treatment, it is bouncing back for more man-

handling.

Obviously, not nearly as many BIG "E" models are flying . . . but their owners and pilots are also quite happy . . . and some deliriously so, like Peter Heck who lives in Tinton Falls, New Jersey. He just can't seem to stop raving about his airplane. . . .

Al, if anything, E&L's advertising understates the quality of this kit and the performance of the finished product. The box-to-sanding time estimate of 20 hours is very conservative, indeed, and the quality of the parts and parts fit is excellent. Any beginner could build this kit as a first effort in RC, and there's no doubt in my mind that it would make an excellent intermediate trainer, or even a basic trainer.

Perhaps the enclosed photo of "The Gambler" will inspire you to build another BIG "E". You know, if you look at this plane for a while you can see that with just a few cosmetic changes here and there, it could probably be made into a good looking Standoff Scale model of a number of full-size ships.

Gotta agree with Peter! With a little more prop and the control surface throws toned down a bit (good place for dual-rate), the BIG "E" would do well as a trainer. Her constant speed and solid "feel" should help instill and promote confidence, a big factor in those early days of learning when the typical beginner knows he's a good two hours behind the airplane and is certain that he's never going to catch up.

Well, Peter, I may very well get around to putting another BIG "E" together, but right now I'm in the middle of getting E&L's new BIG Learn "E" ready for a review. What with "training wheels," a shoulder wing, and a constant chord, this birdie may be the answer. Gonna try to have her ready soon. . . .

### A6M5 "ZERO"

If you dig WW-II warbirds, and scratch building is your thing, then you might want to seriously consider Nick Zirol's scale Zero. This is the classic WW-II Japanese fighter, and according to Nick, "It builds up fast and easy for a scale model."

She's got 1400 squares packed into 91 inches, and depending on the engine used, comes in at 23 to 28 pounds. The recommended power ranges from 2.2 to 3.2 cubes, and if kept light, it should do well with a decent turning Quadra. Nick shows retracts and flaps on the plans if you want to go whole hog. He also shows all the templates on one sheet . . . which is a nice touch. There are no separate instructions that list construction step-by-step, but there are some instructions and guidelines on the three big plan sheets. The plans looked good, and they made me wish that I hadn't so many other projects lined up. From what I could see, I'd say that Zirol's statement about building up fast and easy was not wishful thinking on his part.

The rolled plans, a fiberglass cowl, and a canopy can be yours by simply contacting Nick Zirol, 29 Edgar Drive, Smith-

BIG Birds . . . Continued from page 21

goad you guys when I threw that pitch stability and downthrust business at you some months ago. A surprisingly large number of readers picked up on the challenge and answered back; no one sided with me, and Bill Kuhnle, from Richardson, Texas, had this to say:

I believe your explanation of pitch stability and downthrust is, at best, incomplete. It requires: 1) that the prop be at the front of the plane; 2) the tail be at the back; 3) the tail produce a downward force; and 4) the downward component of thrust act at the prop.

I know from experience, planes that violate one or more of the above can be stable, will nose up in response to increased speed, and will respond as expected to downthrust.

Several years ago I built a successful "rudder-only" R/C model with the wing and "tail" of identical size and airfoil. The CG was well aft of the forward wing trailing edge, thus the rear wing (tail?) was lifting upward. Yet, with increasing speed, the model did not nose down. Instead, when the plane was spiraled down to gain speed, and then the rudder neutralized, the model would loop!

Downthrust does tend to pitch the nose of the plane down. But, attributing this to the downward component of

town, NY 11787, (516) 234-5038.

#### FLY-IN'S

Last call for the Double Nickel Squadron's Third Annual Fly-In and the Puget Sound Roc's First Annual BIG Bird Four-stroker Tea Social and Fly-in, both to be held on September 22 and 23.

The Double Nickel boys will be holding theirs at the Terre Haute's R/C Club Field. For more information about this sanctioned event, contact Event Director Ed Ice, 5010 N. 15th Street, Terre Haute, Indiana 47805.

The Rocs will host their Four-stroker Tea Social and Fly-in at their new field in Yelm, Washington. It's also sanctioned (IMAA and AMA) and free . . . no fee. Our Tea Social Director Bruce Edwards has a bunch of flyers he's just dying to give away, so write to him and get all the poop: 8304 53rd Street, Court, West, Tacoma, WA 98467.

And the QSAA's Eighth Annual Las Vegas Fly-in is coming up next month. They're gonna limit entries to the first 200 airplanes, so don't tarry. For a complete information package, contact: Pat Bunker, 6532 Bourbon Way, Las Vegas, NV 89107.

#### TIP OF THE MONTH

"If you can't be fair, be arbitrary!"

Al Alman, 605 168th Street, East, No. 95, Spanaway, WA 98387. Most of us will be doing most of our building pretty soon . . . so don't forget to take some in-shop pix of what you're working on. I can use 'em and they help other folks get a second wind. (You know how it is when you start feeling a little jaded . . . you need some support and a little help to get going again.)

FLY SAFELY!

#### Simply Scale . . . Continued from page 35

port 28 from the Procter kit in Giant Scale. Steve Ellison tore them up with two sizes of Great Planes' CAP 21's in FAI and Expert Division II. Steve wow'ed the crowd and the judges with some spectacular flying, including, of course, a snap roll on take-off! (Steve was a world class pattern competitor about 10 years ago. wcn)

John Morris flew to fifth place in Giant Scale with a P-51 and to first place in Sportsman Division I with his B-25D. Lynn Elston had two P-51's in FAI and Expert Division I. Last but not least, Bob Underwood flew his usual assortment of unusual aircraft: the colorful Hiperbipe to third place in Expert Division II and his hard-to-describe "Bonzo" (Time for bed, Ronnie!) racer to first place in FAI.

I used to bring two models to the Mint Julep also, but I found myself doing so much preparation getting ready to fly and cleaning up afterwards that I was tiring myself out and not enjoying it. This year I just brought along the Clipped Wing Cub and had a ball, finishing second to Steve Ellison's CAP 21 in Expert Division II.

I mentioned in my last column that the system does work, and we proved it at the Mint Julep. A friend of mine, Don



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Brann, loves scale models and was eager to try entering a scale contest, but his interests lie in the simple models, and he had no experience in campaigning his "Monoprep" model. Built from D.B. Mathews' plans (a good concept, that "silhouette scale"), Don had done a nice job of building the model and it was a good, realistic flier with its O.S. Max FS .60 four stroke. Don, however, didn't have a lot of documentation on this rare bird. He wanted to compete with me at the Mint Julep, so I volunteered to help him put together a presentation to document the model, using the material he had on hand. We had no three-view, but Don had had a couple of black and white photos from a reference book photographed and blown up to 8 x 10 and they looked great. The AMA rulebook for Sport Scale says all you need for proof of scale is, "A selection of photos of the aircraft modeled, sufficient to show the outlines of the aircraft in side-view, front-view, and plan-view. The photographs need not be taken from directly overhead or at exactly 90 degree angles to the side or front of the outlines, but can be pictures taken from oblique angles which allow the judge to interpret the outlines." We reminded the judges of this paragraph in our presentation and they used the two photos to determine outline.

Color was tough to prove. All Don had was reference in "U.S. Civil Aircraft" that said the "Monoprep" was developed from the "Monocoupe" and basically similar, and that the "Monocoupe" standard color scheme was the "familiar shiny black of the fuselage and the empennage, with bright orange-yellow wings." This was the color scheme of the model, so we put it to the judges to decide if this was sufficient. The rule book says it is. We put his documentation in an attractive package of a "View Binder" notebook with

orange and black cover art, presenting it in the most professional way possible.

To the judges' credit, they were objective and followed the rulebook and for his efforts, Don was awarded an 89 static score on his "Monoprep". Flying in Sportsman Division II class in his first scale contest (a major one at that), Don finished in a respectable sixth place. The encouraging experience has moved him to further research his "Monoprep", turning up more documentation, and he's now talking about building a second, more scale, "Monoprep". The wrong kind of judging could have easily discouraged Don enough that he would have come away from the contest feeling he couldn't be competitive.

So, plaudits to the Mint Julep judges and to the current AMA Sport Scale rules. They do work!

#### GOOD NEWS AND BAD NEWS

How often have you heard variations of all those "Good News, Bad News" anecdotes? The Good News . . . An extra portion of gruel for all the slave rowers this noon. The Bad News . . . the King wants to go water skiing after lunch!

Well, here's another one. The Good News . . . My local club has established a safety committee and three new flight rules. The Bad News . . . The action was initiated due to my misfortune.

In preparation for the World Scale Championships in Paris, I have been out practicing with my Spezio Tuholer on a regular basis. The local club members have been outstandingly cooperative and accommodating during this period, usually avoiding any flying during the time my Spezio was in the air. Sometimes, however, we tend to get impatient and careless, and so goes my story.

I was flying the Spezio for that "last flight of the day," having planned on wrapping up my flying sessions with the Spezio after this so I could start sprucing

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it up for static judging in Paris. I was about half-way through my flight plan when another modeler, flying a Quickie 500 decided to make a down-wind takeoff with a real stiff wind blowing. Needless to say, he lost control of his model on takeoff and it veered toward me, striking me in the left calf while it was about a foot off the ground. It knocked me to the ground and my transmitter flew out of my hands. I got the transmitter back just in time to see my Spezio heading straight down, about 50 feet high; it was not an airplane that would fly itself.

The end result was the loss of my number one Precision Scale model, possibly the loss of a World's Championship (I'm an optimist), and 45 stitches in my left leg to remember it by.

As I mentioned, my club has now instituted three new rules. As a result of my misfortune, they rationalized quite correctly the typical progress of the neophyte R/C flier and came to a startling discovery. Think about it if you will . . . when a new R/C flier starts out with his first trainer model, he doesn't really have too much control over it. Usually he ends up crashing it at least once during his learning curve. When he crashes it beyond repair, it's time to build another model. But does he build one like the one he just crashed? No, he probably takes a step up to a more advanced trainer, a harder to fly model, feeling it's time to progress. He proceeds to fly and crash his "step up"

model and then builds his first low winger, while in fact, he still isn't capable of flying his first trainer type model without crashing it! I know we're all impatient when it comes to learning to fly, but we must not allow new (or old!) modelers to proceed in this manner.

The rules my club instituted make sense:

1) All new, repaired or altered aircraft must be safety inspected before flight by an instructor or competent pilot. The aircraft must make its test flight takeoff and landing from the center of the field.

2) Instructors, pilots and student pilots shall not fly aircraft that are beyond their ability.

3) It is the responsibility and duty of all flight instructors to stop the flight of unsafe aircraft or pilots and to enforce all of the above rules.

I'm not usually one to harp to safety, but at this time I'd just like to remind everyone out there to use a little common sense when they're flying their models. It's easy to get hurt by someone else's negligence and we can all prevent it from happening.

Incidentally, I'm still going to Paris. The leg is healing, and I'll be taking my Bellanca Citabria which I've been feverishly refurbishing. Just the experience gives me material for a future column! Watch for my report on the competition at the Paris Scale World Championships!

(The fact that Cliff has not taken out a "contract" of the thoughtless Quickie owner proves he's a real gentleman! wcn)

★ ★ ★

Are you a scratch builder who wants to blow up that three-view into plan-size drawings? George Ardwin of Sabina, Ohio, a professional photographer, is offering a service to the scale modeler which you'll probably find valuable. George will photograph your three-views onto black and white slides that you can project to any size you like!

He takes a shot of each view, and is offering his service for price of \$5.50 for the first slide and \$3.00 for each additional slide. That comes to \$11.50 for three slides of a three-view drawing. These are 35mm black and white negatives in a glass slide mount and the price includes postage and handling.

If you're interested in this service,

which sounds quite reasonable to me, write to George. The address is: George Ardwin, 60 Ely Ave., Box 56, Sabina, Ohio 45169. I'm not out to give free advertising, but if someone is offering a service of value to scale modelers, I sure want to let you know about it.

★ ★ ★

A reminder for you four-stroke buffs. The World Engines/Hamilton Hawks Four-Stroke Rally is coming up September 29th and 30th at Joyce Park in Hamilton, Ohio, near Cincinnati. If you haven't preregistered at this time, I'm afraid you're too late to take along a plane. They're full as of Toledo weekend! But if you'd like to see first hand what it is that everyone's all excited about, this is your opportunity. They'll be lots of four-stroke models (100 pre-entries) of all shapes and sizes. I'll be there with my Clip Wing Cub (barring any further misfortune!) and you can be sure that most of the modelers who were there last year will be too. If you're there, and you see me come up and say, Hi! I always like to meet new Simple Scalers!

Keep it scale and simple! ●

### Control Line . . . Continued from page 57

Several competitive brands are available.

He also suggests consideration of a 10% nitro rule to keep speeds down, and maybe even looking at the .21 size engine, with further restrictions, for this event too.

Another possible option addresses the effort of putting a large, 300 square inch wing on a Quicky Rat type design. I personally like that idea, as the planes are easy to put together, and "feel" like a racing plane (on the piloting end, that is).

Now, how about some of your thoughts. . .

### OLDIES BUT GOODIES DEPARTMENT

Speaking of racing, one of the photos displays a Carl Goldberg "Skat Rat" kit. This is a design that typifies the Quicky Rat type of plane as previously mentioned. By the way, there was a plane that was called "Quicky Rat". Of the two, the Skat Rat was superior in many respects. It featured generous wing and tail areas for good stability, and good ground handling characteristics. There was plenty of beef in the engine mount and wing joint areas for strength. The landing gear was not strong enough, but was easily modified.

As I recall, the kit was made available sometime in 1963, and I built my first one the following year. I guess that plane is dear to my heart, not only because I built five of them, but believe it or not, it was my very first control line plane.

If you look at the photo closely, you may be able to see that there are details on fabricating a fuel shutoff, tank modifications for fast fill, and use of a "hot glove". This was all state-of-the-art stuff back then. There was also some general information about racing. Can you



imagine trying to find a kit manufactured today that is up to date in the same fashion?

Perhaps this kind of racing plane may become popular once again, only this time as a "slow" class. Talk about coming full circle!

#### ENGINE SIZES REVISITED

Some while back, we talked about the vast array of engine sizes, including the question of how some of the odd sounding ones came into being. This discussion did lead to some responses.

One of them came from William Dahlgren, of Glenview, Illinois. His letter reads in part,

*"The enclosed material indicated that the engine size/class dilemma goes back at least to 1946, so the problem is nothing new. Actually the size/class question is only relevant to the contest flyer, as the sport flyer will match his model design to his engine and fly them big, little, hot, mild, or whatever.*

*"To digress a bit, the .36 limit came about (in Combat) in the fifties. The event had been sized, in the first place to accommodate the .35 size stunt engines commonly available at the time, but it was discovered that the then-new O.S. 35 displaced .355 cubic inches and was, therefore, technically illegal. To keep the lawyer types from having a litigation fit, the AMA rounded the size off to .36 so that an engine displacing .35 anything would be legal.*

*"The .65 limit for D speed came when the older speed engines designed to the .60 displacement limit were becoming collector items and no new ones were being designed (as the market was miniscule). There were then a number of engines available that had been designed with boats and cars in mind and that used a larger upper displacement limit. The .60 limit was extended to .65 to multiply the number of engines available and usable for the event."*

Thanks for the enlightenment, William.

#### TANKS A LOT DEPARTMENT, CHAPTER ONE

Certainly one of the areas of mystery to a novice control line flyer can be that of the fuel tank. Much grief will be encountered if at least a very basic understanding of tank operation is not followed. OK fledgling students, join us now for Fuel Tank Operation 101. Several areas will need to be covered. This month we will look at some basic tank designs. Later we will cover some of the information more in depth, and look at other types of tanks, such as bladders.

The first thing that must be understood is that an engine and its fuel tank must operate as a team. This principle is a way of life in the high performance competition events, as maximum power will never be realized without consistent and predictable fuel delivery.

Success in the racing and speed type events must depend upon a steady full power engine run, while the stunt and combat planes must run in the desired fashion throughout maneuvering.

If you will refer to Fig. No. 1, you will

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see the principle that causes the rich-to-lean engine settings that are typical in a standard vented tank. Simply stated, as the pressure head decreases the engine will lean out due to the fuel supply decreasing. In reality, the height in the chart translates into a nearly horizontal position within the tank when subjected to the centrifugal force encountered when flying in a circle. Some tanks are designed tall and thin, as this reduces the variation in the pressure head.

One way to combat this variation in pressure head, is a change in venting. Also a tank can be set up with another chamber, see Fig. No. 2.

Now let's take a look at these different designs. Referring to Fig. No. 3, we see a cross section of an elliptical wedge shaped tank, with standard venting. Note that the vent tubes are symmetrical in purpose. One acts as the fill, and the other as the overflow. One vent is open into an empty part of the tank, whether the plane is upright or inverted.

A tank with uniflow venting will deliver fuel at a very nearly constant rate. Look at Fig. No. 4. The example shown is of a typical speed plane suction tank. Note that the vent outlet is near the pickup tube. This is fairly typical, but is not what makes it work. The obvious difference between this and the standard vent is that the uniflow vent opens up into the fuel, rather than into empty space. Air is replaced in the tank as fuel is used. As the engine uses fuel, the atmospheric pressure in the air space is decreased. The air pressure outside the tank will therefore be higher, and at this point a bubble of air will travel through the vent tube, through the fuel, and into the air space. This action happens very fast, and from the inside of the tank, you would see a steady stream of bubbles.

At this point, it is very important to

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note that the uniflow vent can be the only place for air to enter the tank. Otherwise, it will not work in the described fashion. This means that any fill tubes must be capped off, and there certainly can be no holes or leaks in the tank.

Another variation of tanks is that of the multi-chamber type. This is the chicken-hopper design, where a large tank feeds a small tank, which contains the fuel pickup and vent. This arrangement has the ability to deliver fuel at a most steady rate from full to empty. This feature allows you to optimize the needle valve setting, rather than having to make an in between compromise, as with a standard vent tank. That in turn, makes the exact tank placement a bit less critical.

Now please refer to the photos of tanks, and we'll describe them.

The picture of three tanks displays rather typical designs. On the left is a profile type tank, the other two being suited for either profile or full fuselages. The one on the far right is a pressure

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98	104	106
114	118	118
124	125	126

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54	86	86
	96	106

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tank, the vent on the inboard side received crankcase pressure from the engine. All of these tanks have one thing in common: standard style venting.

Now look at the six-tank photo. All of the examples are racing types. Number one and two are Rat Race tanks with standard configuration; fuel pickup is in the back of the tank, and the vent is standard. Number three is a Gillott Rat Race tank, it has standard venting, but the fuel pickup is in the outside corner. Number four is a uniflow speed tank, with the pickup in the outside corner. It is very similar to the design in Fig. No. 3. Number five is a tank for profile fuselage, ala Slow Rat. The fuel pickup is on the outside corner, and a uniflow vent is

incorporated. A mechanical type of fast fill is used, rather than a rubber type as on the other tanks. Number six features a chicken hopper chamber on the left side. The chamber is a piece of square bras stock that is fed through a row of small diameter holes. The vent tube on the right enters into the chicken hopper chamber.

One clarification that should be made at this point, is that it makes little difference whether the tank is operating on suction draw or pressure feed. The vent still serves the same function; that is to replace fuel delivered with air.

More information next time.

Speaking of next time, please be advised that the control line column is

now going monthly. So, see you next month. Mike Hazel, 1073 Windemere Drive NW, Salem, Oregon 97304. •

Plug Sparks . . . Continued from page 62

Couldn't resist the charm of Photo No. 8, as Jim Caughram, former SAM 21 prexy, pulled out his 10 ft. Yates Texaco entry and lined it up with his 1/2A Texaco entry, a Bay Ridge Mike. Of particular interest is that both models carry the same color scheme: transparent red with yellow scallop trim. Outstanding!

With a stiff wind blowing pretty much during the whole day, several models were lost in the clouds. This columnist's huge "Super Clipper" was lost for five minutes and was last seen coming down in a dive about 500 feet away. Scratch that model.

Chuck Patterson was the most fortunate, as his model landed over by the mobile home section and was notified, just after he went back home! Nick Sanford's model, however, is still lost, despite a considerable amount of air search by Jack Jella.

Jack, who owns and operates an air service known as "Air Trails," has always done this at free flight meets after the contest, and saw no reason for not hunting up some errant R/C models. To date, Nick's model is among the missing. We hope some inconsiderate motorist didn't pack it away as happened six years ago to Nick at Taft.

In a review of the results of this hotly contested meet, the writer is struck by the outstanding tenacity and will to win demonstrated by Don Bekins. Most everyone knows Don as a fierce competitor, but this meet at Salinas was probably the high-water mark of his career in O/T R/C modeling. Don was involved in not one, but four flyoffs, tying with as many as four other competitors. Don ended up taking second in Class A (did not take his fourth flight), second in Class B (tied with four), first in Class A (beating four others), first in 1/2A Texaco, and second in Texaco in a flyoff. The only event Don failed to place was Antique Ignition, gaining only tenth place. Truly a remarkable performance.

Before closing off the report, the reader will be surprised to see the name of Sal Taibi in the list of contestants. Sal had an ignition McCoy .60 in his *Dallaire Sportster*, and for his first R/C contest, did quite well. Just when we thought Bruce Norman was tired of coming out to the coast and tormenting us, now Taibi has adopted R/C flying. Oh well, move over for another trophy!

I know the reader may be tired of reading results, but this meet was spectacular for results, and the weather was really that good! Take a look at this:

**Class A (12 entries)**

1. Eut Tileston (Lancer/Ellin)	23:16
2. Don Bekins (Alert/Bantam)	21:00
3. Jack Albrecht (Kerswap/McCoy 19)	20:41
4. Chuck Patterson (Kerswap/McCoy 19)	19:13
5. Loren Schmidt (Ranger/K&B 15)	15:43

**Class B (16 entries)**

- 1. Ed Solenberger (Playboy/Torp 29) ..... 21:00
- 2. Don Bekins (Playboy/Torp 29) ..... 21:00
- 3. Chuck Patterson (Kerswap/McCoy 29) ..... 21:00
- 4. Jim Kyncy (Kerswap/K&B 29) ..... 21:00
- 5. Jack Albrecht (Kerswap/Torp 29) ..... 19:40

**Class C (25 entries)**

- 1. Don Bekins (Playboy/O&R 60) ..... 36:00
- 2. Ed Solenberger (Playboy/McCoy 60) ..... 36:00
- 3. Jack Albrecht (Kerswap/McCoy 60) ..... 32:55
- 4. Jim Adams (Playboy/Super Cyke) ..... 24:17
- 5. Ray VandeWalker (Cumulus/OR 60) ..... 19:38

**Antique Ignition (17 entries)**

- 1. Otto Bernhardt (Lanzo/McCoy 60) ..... 30:00
- 2. Jack Albrecht (Anderson/McCoy 60) ..... 27:16
- 3. Sal Taibi (Dallaire/McCoy 60) ..... 22:22
- 4. Ray VandeWalker (Cumulus/OR 60) ..... 20:38
- 5. Nick Sanford (Scram/Spitfire) ..... 18:02

**Antique (14 entries)**

- 1. Eut Tileston (Westerner/OS90) ..... 32:52
- 2. Jim Kyncy (Anderson/Rossi) ..... 30:00
- 3. Bruce Augustus (Lanzo/OS 61) ..... 24:49
- 4. Loren Schmidt (Lanzo/OS 61) ..... 23:26
- 5. Jim Adams (Miss America/OS 60) ..... 17:26

**1/2A Texaco (23 entries)**

- 1. Don Bekins (MG) ..... 30:00
- 2. Stan Lane (Anderson) ..... 28:22
- 3. Paul Forrette (Panther) ..... 28:02
- 4. Jim Kyncy (Anderson) ..... 25:15
- 5. Bruce Augustus (Mike) ..... 24:23

**Texaco (37 entries)**

- 1. Eut Tileston (Westerner/OS 90) ..... 30:00
- 2. Don Bekins (Gas Bird/OS 60) ..... 30:00
- 3. Jim Kyncy (Anderson/OS 60) ..... 25:15
- 4. Jack Albrecht (Lanzo/Spitfire) ..... 24:55
- 5. Don Hoyle (Mite/Atwood) ..... 24:00

**Electric (8 entries)**

- 1. Jack Albrecht (Playboy Cabin) ..... 13:06
- 2. Jim Caughram (Playboy) ..... 13:05
- 3. Steve Roselle (Panther) ..... 9:31
- 4. Roland Boucher (Playboy) ..... 9:15
- 5. Bill Burleson (Playboy) ..... 7:38

**Electric Open**

- 1. Don Bekins (Playboy/Astro 10) ..... 14:00
- 2. Loren Schmidt (Playboy/Astro 10) ..... 7:43

Wow! Wotta contest! What times! Time to have a beer!

**ENGINE OF THE MONTH**

Regardless of which hobby you were in, be it model planes, boats, or race cars, any modeler worth his salt has seen, operated, and/or been exposed to the Offenhauser ("Offy") type race cars as produced by the Dooling brothers. These cars set the standard for years after 1940.

It wasn't until after the war that the Dooling brothers came out with their version of a race engine. Encouraged by initial success, the Dooling 61 was finally advertised in the November 1947 issue of *Model Airplane News* and December 1947 issue of *Air Trails*. Of course, most everyone knew that Dooling engines were commercially available far before that as one only had to read the nationally published *Model Craftsman* magazine with its special Race Car section.

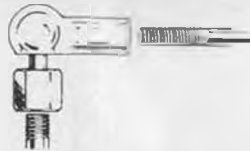
On the coast (and for that matter, everywhere) the *Rail and Cable News* as edited by W. Lloyd Baab carried all the latest developments of Tom and Al Dooling. As one thumbs through the back issues in chronological fashion, one can see the use of Hornet engines being replaced by McCoy and in turn being supplanted by Dooling.

For this month's subject, The Dooling 61, we are indebted to Charlie Critch, one of the new, upcoming collectors whose engines are always a joy to behold. We hope to use more of his subjects in the future.

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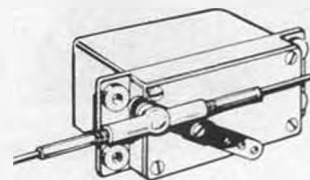
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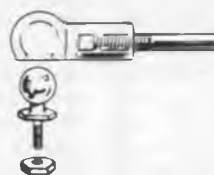
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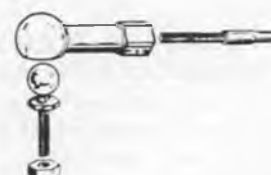
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## COVERITE

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when the Dooling hit the market, it was one really hot engine. Most free flighters shied away from this engine, not knowing quite what to do with all that power. Many a wing was taken off when that Dooling 61 "unloaded" in flight.

Actually, in some respects, the Dooling 61 was rather slow in being introduced via advertising. It wasn't until after the Dooling engines had swept the field in the National Car Races that the brothers decided it was time to hit the commercial market. The motor, as produced by Dooling Brothers, 5452 West Adams Blvd., Los Angeles, CA 90016, was sensational! Priced competitively at \$35 to match McCoy and Hornet prices, this engine was quickly adopted by the speed boys, both airplane and car.

As reported in the *Air Trails* review on engines, a warning was issued to the average modeler that here was truly a precision made engine requiring cleanliness of the fuel and the engine. With the high speed developed by this engine, any small amounts of dirt, grit, etc., could quickly ruin the needle bearings employed in the crankpin end, and the two crankshaft roller bearings. It paid to keep your Dooling clean and use only filtered fuel.

Where did all these rpm figures come from? When realizing that the bore was 1.015 in. and the stroke was only .75 in., then one could appreciate the tremendous revolutions this engine was capable of. Naturally, with such a short stroke,

the engine was not able to turn a large propeller. However, properly set up, there wasn't an engine that compared to the Dooling. It was truly the Cadillac of racing sixties.

For specifications, the main cylinder and crankcase were a one-piece aluminum alloy casting with integral cooling fins. The bypass was actually machined so as to provide a uniformity of power output. The cast aluminum cylinder head employed eight Phillips head screws to stand the pressures developed by the domed piston designed to improve high turbulence combustion.

The piston was aluminum, as in all racing practices, and fitted with two "slipper" type piston rings. To compliment the piston, the connecting rod was forged from 14ST duraluminum, heat treated, with hardened and ground race to accommodate the roller bearings mentioned before.

An interesting feature of these roller bearings was the lack of "caging" ... the bearings being held in place by a keeper backed up with a retaining ring somewhat on the order of a "Waldes" ring that snaps into a groove.

For power output, the crankshaft was built-up of three pieces 4140 heat treated steel using a special steel crankpin. No shaft ever failed here!

An aluminum alloy rotary valve using a very large port opening was counter-balanced and a heat treated shaft cast in place. Timer points, which were excellent, were taken directly from high speed, full-size race car types with the bracket fitting close to the cylinder.

The carburetor was one of the first angled intakes made of aluminum alloy casting screwed directly to the back cover plate.

The Dooling boys didn't overlook any angle as the car and boat engines came furnished with flywheels, and as shown here in the aircraft version, furnished with an aluminum propeller adapter. Other than that, for \$35 you didn't get any coil, condenser, or plug.

The displacement of the Dooling 61 was actually .607 ci with a 14 oz weight as sold. According to manufacturer's performance figures, the Dooling developed its best power, 1.35 hp (!) at 15,500 rpm. Recommended propeller sizes were 8-9 and 9-11 for free flight. Claims were made for 16,000 rpm using the foregoing propellers.

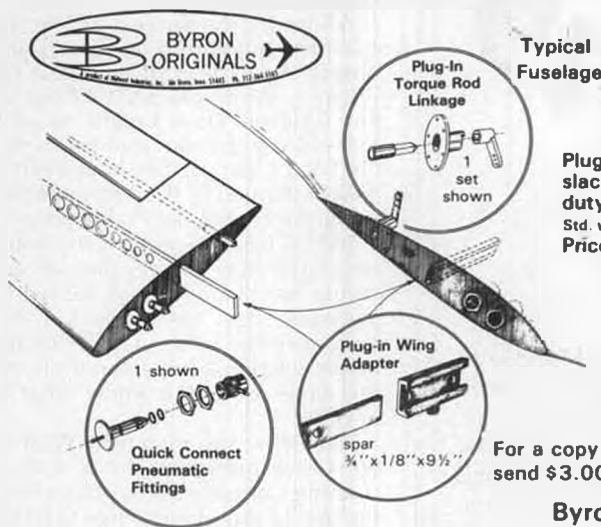
Summarizing, this was one of the last racing ignition engines produced in the USA. Thereafter, the glow versions dominated the field.

### HE WHO LAUGHS LAST. . .

Received a most interesting letter from Rockland Russo, 1425 Kensington Ave., Salt Lake City, Utah 84105, wherein he states that he did not fly models until college. His second model was an old-time rubber model, a *Modelcraft Black Bullet*. At that time, in the fifties, nothing seemed to work, for the usual reasons: primarily no one to advise the kid on what he was doing wrong.

However, time goes by, and everyone eventually learns. In the early seventies,

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the Old Timer concept was a new thing around Utah. While Rocky did not compete, he did go to contests to assist. Anyway, here is Russo's story.

"The first Old Timer contest I attended was a disappointment. I have a real fondness for rubber power. I went to the local contest with a *Korda Wakefield*, a *Lanzo Stick* and a *Black Bullet* only to find that the locals had decided that because no one was going to show up with rubber powered models, the events were cancelled with no prior notice.

"The CD was apologetic, but no other rubber models made their appearance. One of the gas model flyers laughingly suggested that I fly against the gas powered .020 Replica models. That statement indicated to me that these guys were not experienced rubber flyers. I pointed out that I could not match their gas engine motor runs, but the assembled flyers voted to waive the rules and allow my models to enter.

"I flew the *Modelcraft Black Bullet* as I felt this was my most consistent airplane. Compared to their 20-second motor runs, I was getting some motor runs as high as 1:25! After five straight maximum flights, there was very little laughter at the 'silly rubber stuff.'"

The foregoing indicates to this writer that we can all learn. Never knock the other fellow's game unless you have tried it out thoroughly. As this columnist has repeatedly said, "All forms of flying are good, just some are better."

### THOR

Got a shot (No. 9) of Brad Allen and his "Thor" design which appeared in the February 1939 issue of *Model Airplane News*. However, not many know it, but this model was featured in an October issue of *Life* under "Life Goes to a Model Contest." Under the SAM Rule Book definition line of "publication," this model has been termed an Antique, qualifying well before December 31, 1938.

### READERS WRITE

Since we published one photo sent in

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by Gus Munich, 24 Skipper Drive, West Islip, NY 11795, there is no stopping Gus with his string of different Old Timer models. This time, Photo No. 10, his latest "rare" design is the "*Goosenek*" as designed by Reinhold in the December 1940 issue of *Model Craftsman*. Although the model is mounted on the car top, the lines of this design are quite easily seen and appreciated.

If the model looks a little different in the nose, it is because builder Munich decided to use a Robbe EF76 electric motor employing a 3.6 to 1 gear ratio. Gus says with 12 Sanyo 1.2 AH batteries and a 14-6 prop, the current draw is 12 amps static with the prop turning 4600 rpm. All-up weight of the model is 4 lbs, 12 oz, a shade heavy for 840 square inches of wing area.

Gus further states that the model is no great shakes at climbing, but will climb to 500 feet three times per charge. His "nonthermal" flights are measured at an

average of 10 minutes per charge.

Gus is also responsible for sending in another photo of another seldom seen design, a "*Cloud Chopper*" as pictured in Photo No. 11. Mal MacLean is seen reworking the variable compression screw in a Drone Gold Head diesel.

The *Cloud Chopper* was originally a design by NFFS Editor Bob Meuser which held the hydro record in 1940. The plans were made available by Bob to this columnist for those desiring to recreate this "out-of-the-mill" type O/T model.

Last but not least, David L. Hicks, 4 Patricia Lane, Washingtonville, NY 10992, sends in Photo No. 12 of a 75% *Winged Yankee* as originally designed by Sal Taibi.

With an .020 for power, Dave says this "*Yankee*" model is an outstanding performer at 75% of original size. The only problem, he further remarks, is trying to keep the model. This Taibi design has a

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disconcerting habit of flying away.  
**CHARTS AND WEIGHTS**

This columnist has been the recipient of many graphs and charts on balsa weights. Other materials have been covered in the form of graduated listings. However, about the best we have seen for compactness and ease of research are the two charts that appeared in "Buzz Bugs" as ably edited by Ed Lidgard.

Most fellows sort of look these charts over and say, "Well, that's nice," but never do anything about it. Estimating (or should we say guesstimating?) the weight a new model is rather easy after you have done it one or two times. Looking at any plan with a tape rule, it doesn't take too much effort to figure out how many balsa sticks and how much balsa sheet you will require. Figuring the average 8 to 10-pound balsa stock from Chart 1 will give you a good idea of how much your new jewel will weigh "bare bones."

Now that you know the weight of your framework, the next thing to do is to decide what you are going to use to cover the gem. Chart No. 2 gives a listing of the various types of covering materials. If you don't see your favorite, there are many quite similar on the list, so no

great problem in estimating covering weight here.

Surprise! After several models, you can almost look at them and estimate the weight accurately. Try it, you'll like it!  
**NORTHWEST SALLIES**

**Model Builder's** "Free Flight" columnist was kind enough to send some photos of the action of SAM 8 and the Willamette modelers. Bob Stalick, who can be reached at 5066 N.W. Picadilly Circle, Albany, OR 97321, reports Old Timer activity has grown to the point where SAM Chapter 8 is very seriously considering the sponsorship of the 1985 SAM Championships.

Photo No. 13 shows Clarence Bull with a diesel powered *Baby Bombshell*. This combo would make a terrific sport model. Most *Baby Bombshells* are generally (over) powered with Cox .049s (Tee Dees, that is) or with Tee Dee .020s for the Replica Class. This shot was taken at Harts Lake Prairie area which is generally used by SAM 8 for its contests.

On the other hand, Photo No. 14 was taken by Stalick at Parker Field, Oregon, during the Northwest O/T Champs sponsored by the Willamette Model Club. Shown is an all red *Spook 72* built

by Ed Lamb which to many people's surprise is a good performer.

### 1985 SAM CHAMPS

While on the subject of Northwest activities, this would be a good time to broach the subject of next year's SAM Champs. While the SAM 8 boys under Ray Chalker, Dave Knight, et al, have expressed a definite interest in staging the SAM Champs, they have been completely stymied by the Army people also using the Harts Lake Prairie area.

SAM 8 has had all sorts of problems. No matter how far they plan ahead and secure permission to use the field on a particular day, the Army has a most disconcerting habit of scheduling maneuvers (completely unannounced) on the same day. You know what takes priority!

Jack Jella, the incoming West Coast SAM vice-president (he is a shoo-in, running unopposed) has been favoring the use of the Madera area used by the Fresno Gas Model Assn. for many years. Here is an area that was set up to be developed for housing. All streets are in, but there are absolutely no homes. Imagine being able to drive every 1000 feet for another street intersection. This certainly makes free flight retrieving quite acceptable.

According to Jack, the best part is the number of excellent motel/hotels available in Fresno, roughly 15 miles south of the flying area, plus the fact Fresno is a large city with many activities, including the annual California Rodeo. Don't say we didn't tell you what is cooking!

### HURLEMAN ENGINE REVISITED

Just received a note from Bill Simpson of Rancho Palos Verdes, California, wherein he submits a Xerox copy of an original letter from William L. Brown, president of Junior Motors Corp., to Mel Anderson at that time living at 1500 So. Fremont Ave., Alhambra, California. This pretty well confirms the writeup on Hurlleman engines in the "Plug Sparks" column several months ago. Here is the letter dated April 15, 1935:

Dear Mr. Anderson:

We have your letter of April 10th, in which you enclosed a copy of the folder describing the Hurlleman Aristocrat engine. For your information, we would advise that when Bill Brown Junior first developed his miniature gasoline engine, it was built in our home workshop, where we have some fine precision tools.

One of these motors was flown at a National meet, and we received a letter from Mr. Hurlleman asking whether we were interested in his making the motor for us. The demand for these engines exceeded the capacity of our home workshop, and we made arrangements with Mr. Hurlleman to build motors for us in accordance with the instructions and plans we furnished him.

Bill Brown, Jr. worked one summer with Mr. Hurlleman, producing the Brown Junior Motors. After a number of motors were made, it was decided to form our own company to sell them; and the Junior Motors Corporation



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secured its charter from the State of Pennsylvania. Mr. Hurlleman was given the opportunity to build the necessary dies and tools and to produce the motors for us, but his terms were so outrageous that we decided to build them ourselves, and equip our own shop at the same time putting in the necessary equipment to produce motors better and cheaper than they had been built before.

We feel that the Brown Junior motor now being built in charge of the original designer and developer, is a better engine than anything so far produced on the market, and full automotive practices are used in our shop production. The Brown Junior Motor is a better engine, and can be sold at a lower price than the hand built Hurlleman motor, and you can draw your conclusions as to the ethics of this competitor.

(Signed, William L. Brown, President)

If there was any uncertainty in the air as to how and when the Brown and Hurlleman engines were produced, this letter certainly clarifies things. Thanks for the letter, Bill Simpson!

### AEROMODELLER MUSEUM FOR MUNCHEN

Gerhard Everwyn, Dachsteiner 12A, 8 Munchen 82, Germany, sent in a most interesting report on the Duetscher Museum in Munchen.

Originated by Oshar Von Meller in 1903, the building of the museum started in 1906. Completed in 1914, World War I postponed the formal opening until 1925. The library was established in 1932 containing 700,000 items. Unfortunately, during WW-II, the museum was severely damaged.

The existing buildings, about 1000 square meters of ground area, were used for aviation. This became inadequate by 1970, and plans were started for a larger Aerospace Hall. Cornerstone ceremonies were held in 1978 by Presi-

dent Walter Scheel for a new hall devoted to aviation and space flight. Five levels now give an additional 7000 square meters, plus the original, making a total of 8000. There are 1000 exhibits of which there are 50 aircraft ranging from 1903 to 1982.

Recognizing that model airplanes paved the way to the modern airplanes of today, a complete section of the new aerospace hall was set aside to trace the development of model airplanes and rocket technology from the earliest times to present date. Model enthusiasts can now study materials, methods, free flight, engines, control systems, etc., etc. It took an experienced aeromodeller, Mathaus Weidner of the museum staff, to set up this section in a singlehanded and dedicated effort.

Mr. Weidner believes this is the first time that a public museum has taken aeromodellers and model airplanes seriously. However, in the interests of not collecting everything, only the milestones of model aviation are highlighted.

Photo No. 15 with Gerhard Everwyn holding a camera gives the reader a glimpse of the section devoted to model aviation. When the formal opening of the Aerospace Hall took place on May 5, 1984, many leading government personalities were on hand. Even Helmut Kohl, the West German Chancellor was on hand to cut the blue ribbon formally opening the hall!

From a modeler's standpoint, the formal opening of the hall was highly satisfactory with a model helicopter exhibition and competition being staged at this time. Over 2000 guests were invited.

Concluding, Gerhard says, "Suddenly, Munchen has become the focal point of aviation in Germany."

### 1/2A TEXACO CHALLENGE

Last month we reported that SAM 1836 (San Antonio) and SAM 41 (San Diego) had scheduled a postal meet on April 29. Conditions weren't that great at either site, hence, the results (five-man teams) looked like this:

#### SAM 41

1. Russ Schuppner
2. Don Hoyle
3. Art Way
4. Jack Oakes
5. Ernie Wrisley

#### SAM 1836

1. Jim Reynolds
2. Eddie DeSha
3. Kelso Barnett
4. Wayne Belcher
5. Don McClusky

Best part of these type of meets is that anyone in the club can fly, however, only the top five are recorded for competition results.

George Wagner, editor of the SAM 41 newsletter, "San Diego Aeronauts" reports with that much fun, they will no doubt have another postal meet. Hey you guys! How about letting some of the other SAM chapters in? This could be real fun!

Best idea is to write George Wagner,



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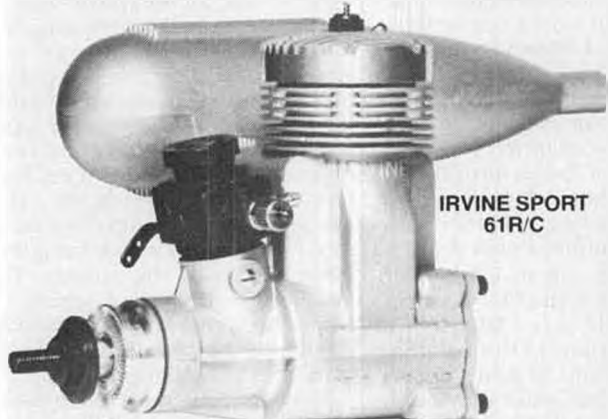
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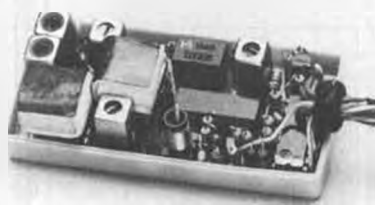
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Ed with his beloved models.

Ed says things have been a little hectic around the household since his daughter and her husband (plus four kids!) stored all their stuff on his front enclosed porch while they located a place to rent about 15 miles away.

Eventually, the things were moved out of the way and Ed can again get to his forty-some-odd models in the cellar. Ed is not a one-type modeler as he dabbles in everything from Peanut Scale to R/C Stunt. His latest creations are two rubber powered "Sparky" models for a one-design contest at Galeville.

Ed says he is now working on two new building benches in the cellar. The benches are 2 ft. x 8 ft. end-to-end, to make one 2 ft. x 16 ft. long bench. Now his grandsons and their friends can work at the same time. Inasmuch as the grandsons are staying with him, he has a captive audience. As Ed says, "I'm going to have a school in modeling."

Don't forget, Ed, to indocrinate them in Old Timers, the best ever! ●

and better yet, a modeler who could get things down on paper that were understandable to the lowest beginner.

Photo No. 16 received from Dave Baker shows Ron Warring about a year or less before his unfortunate demise. In this picture, Ron is holding one of his original Wakefield models that were so successful in that era. Dave is particularly pleased that Ron has seen fit to turn his models over to SAM 35 for safe keeping. They are going to have a model museum yet!

#### SOUTH AFRICA

Just received the most disconcerting news that Jack Abbott would not be able to attend the SAM Championships at Bong Field, Wisconsin.

Having just received a telegram to the effect that his illness was preventing him from taking that long-planned trip, the columnist received a follow-up phone call several hours later directly from South Africa. Jack sez he and Joanne will try to make it to California next year.

In the meanwhile, the mail brought some photos of South Africa O/T activity. Seen in Photo No. 17 is Len Edelstein's second *Valkyrie*. Readers of this column will remember a photo of Len's initial effort in the April 1983 issue of **Model Builder**. Len found out that he had built the first *Valkyrie* too light as the original built-up construction couldn't handle the rough air generated by R/C flying. The first model ended up as a plastic bag of balsa strips. (*Whotta catastrophe! wrl*)

In the second model, Len has found that using spruce strips is the answer. As with all *Valkyrie* models, its majestic flight is the feature of the South African model meets.

#### THE WRAP-UP

While renewing several SAM memberships in my position as secretary-treasurer of SAM, a nice letter from Ed Rowe, R.D. No. 3, Box 170, Maple Drive, Endicott, NY 13760, arrived with a clipping from the local newspaper showing

#### Four-stroker . . . Continued from page 52

attachment should be based on safety first.

While we're on the subject of safety, we must mention the possible risk of using high power starters. These can, *and do*, rip the entire prop, spinner, and washers from the engine in a split second. The parts are flung with great speed and can be injurious to bystanders.

So much for the sermon.

#### ADJUSTING FOUR-CYCLE VALVES

Let's look at the valve train on the poppet valve engine. The engine shown is the Enya 1.2 which is an overhead valve, pushrod engine. It's possibly the most common arrangement in the world for four-cycle engines of *all* types.

I can think of no practical reason for disassembling the valve train, but if you must, beware of losing the valve stem keepers. These are small metal wedges (see Photo No. 2) which keep the valves assembled with the springs. They are installed in the valve spring keepers while the spring is compressed and can accidentally be dislodged if you should compress only the spring.

Some of you must be old-time hot rodders who see possibilities in increasing spring tension to gain higher revs, but *please don't do it!* You will just cause more wear.

The *valve float* you may have heard of is not a loud banging sound; that's detonation. Valve float is a flat, odd sound. Once valves start to float, the engine will cease to develop more rpm or power. Think about it.

I have flown my O.S. 90 powered model using an 11-10 prop that turns 11,000 on the ground and much more in the air. No valve float has occurred, so I suspect this engine will turn upwards of 13,000 without float.

It's interesting to note that the model performs much the same using a smaller diameter prop at high revs or a larger

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Most of the publications have acknowledged the passing of Ron Warring, one of the outstanding modelers

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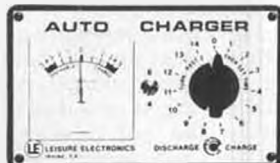


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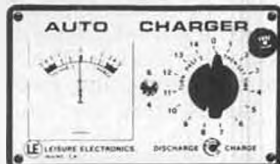
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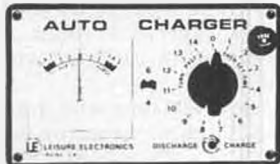
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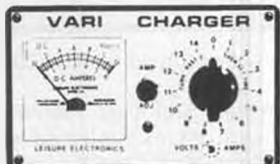
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"How effectively are we using the power generated by the engine?" We plan to spend a whole article on this one topic.

Back to the engine photos.

Notice the wrench and screwdriver in Photo No. 1 being used simultaneously to set the valves. This is necessary to insure the adjusting screw doesn't slightly rotate as the nut is snugged down.

You will find it also desirable to adjust the screw while there is still a little drag on it caused by the locknut. This is a good technique because the threads give a tiny bit as they are finally tightened.

I can now successfully adjust the valves without using a gauge by simply "jiggling" the rocker as I adjust the screw. It's a feel that you can learn with a little patience.

We will be back next time with (hopefully) our fancy ignition setup for four-strokers.

**Powerhouse . . . Continued from page 43**

enough for proper fuel feed. I decided to install a six-ounce tank mounted well up in the cowling. While the tank does project back into the cabin area a little, it is not really all that noticeable, and it does provide a means of checking fuel supply.

### LANDING GEAR

The landing gear is prebent. I had no trouble with it whatsoever. Four-inch

Robert wheels were selected, and worked very well.

### COVERING

Carl Goldberg's new Colortex was selected for the *Powerhouse*. I chose a red, white, and blue color scheme because I did not have enough of one color to do the job! It turned out very well, as the photos show.

Colortex is neat stuff to cover with: it shrinks up well, does not tend to loosen, and it can be sprayed with clear dope for seam sealing. (Note to Mr. WCN: Your *Powerhouse* wouldn't be fuel soaked up front if you had had Colortex when you built it!) (After ten years of use, Monokote need not apologize! wcn)

### INSTRUCTIONS

The instructions provided with the kit consist of the 1938 magazine reprint, a reprint from March '74 *Model Builder* by Bill Northrop on R/C conversion of Old Timers, and a page of assorted notes. Again, someone with building experience will not have any trouble with these.

### FLYING

Here's where the *Powerhouse* really shines! Mine weighed 94 ounces for a wing loading of approx 12 ounces per square foot. The first flight went without incident. In fact, with the .61 up front, swinging a 13-5 prop, I don't think it was on the ground more than five feet! Climb is as impressive as the glide. The model is easy to fly and positive on the controls.

By the way, the center of gravity falls between 3/4 to one inch behind the main spar!

### CONCLUSIONS

The *Powerhouse* is an excellent flying model. It is also an excellent trainer, from a flying standpoint. Construction will require an experienced builder. The kit is very well thought out and very highly prefabricated. If the plans could be improved a little, and the die-cut ribs replaced with machine cut ribs, the kit would be outstanding. As is, I would rate this kit as very good. Try one, I think you will be satisfied!

For further information, write to Champion Model Aeroplane Co., P.O. Box 891, Woodbridge, NJ 07095. Send an SASE for free catalog.

**Beachey . . . . . Continued from page 53**

million postcards with a photo of this event were sold, and I have seen a calendar with this scene, or a similar race with Barney Oldfield, which was performed a number of times.

Late in 1914, Beachey commissioned Eaton to build still another small, fast ship, this time a monoplane, for his 1915 exhibition tour. It would use the same Gnome engine. The monoplane, probably finished in January or February, 1915, began undergoing testing. No plans were saved, but Eaton and Beachey's mechanic, Art Mix, were able to recall many of the specifications and dimensions which Hud Weeks gleaned from interviews with them. The mono-

prop turning 9,500 to 10,000 rpm.

The more I experiment with props, the more I find that running the engine at its max torque rpm not max horsepower rpm is a desirable and practical arrangement. I guess a torque gauge is going to be one of my next projects.

Prop efficiency is a much ballyhooed phrase, and for now the only real test is flight performance.

About eight years ago I ran a couple of quick tests to look at the direction of air flow just forward of the prop tips and just aft of the tips. Also I tried this on a pusher engine setup. The differences were very surprising!

It really gave me a look at, "Where does the air go?" which translates into,



plane was as fast as it looked. Design speed in level flight was 103 mph compared to 80 in the clean *Little Looper* with the same engine.

Beachey was so busy that he never really had time to check out the new plane. However, the Panama Pacific International Exposition officials pressured him to use it at the San Francisco fair in March. He was able to do some practice flying early in the month, transferring the Gnome from the *Little Looper* to the monoplane and back each time.

On the 13th, it was flown at the fairgrounds three times for short periods, and on Sunday the 14th of March, 1915, he agreed to fly his aerobatic routine in it before a crowd estimated at 50,000. He accomplished a series of loops and climbed to 3,500 feet to perform his famous vertical dive. From the dive, he flipped to inverted and continued down at a 45-degree angle so the crowd could read his name on the wings. He then resumed the vertical dive, probably with the throttle wide open, against the advice of the designer.

During this series of maneuvers, it is estimated he attained an airspeed of 250 mph. He continued the dive to about 500 feet, then apparently panicked a little and snapped the wings while pulling out too fast.

The airplane dumped into the bay. His injuries from the crash landing were relatively minor, but the top cowl crushed back over the cockpit trapping him inside where he drowned.

His incredible performances in such a short time (he died at 28) are a credit to his energy, daring, and probably excellent press agents. Because of his stature in the early aviation historical annals, this short-lived, one-of-a-kind airplane is significant. In addition, its appearance as that of being ready to jump off the ground is unique for an airplane of the period.

Willis Nye's drawing, while beautifully done as his all are, was probably made mostly from photos: it is not completely dimensionally accurate. Some of the dimensions shown were probably filled in after the drawing was finished as they do not scale. In addition, the ailerons and elevators were not drawn identically, while Eaton and Mix both insist they were interchangeable. For these reasons, I determined to draw up as accurate a three-view as I could, and I enlisted the aid of the late Russ Barrera, then an AMA Scale Contest Board member, to perfect the drawing and obtain his authentication.

During early 1976, we corresponded several times, and the drawing you see here is the result. Like Beachey, I really haven't created anything... just collected and used the work of others to obtain the result I wanted. And that result was to come up with a model of a plane with which I was particularly enamored, and which could follow AMA scale rules.

Several sizes of this model have been built from this data, the most fun of



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which has been this Peanut Scale version. Interestingly, this 28-foot span, 18-foot long prototype essentially satisfies both sets of Peanut Scale rules at half-inch scale. The only deviations from true scale in this model are a small amount of dihedral in the wings and the enlarged rubber needed to cure a dutch roll wallow.

### BUILDING A BEACHEY

The structure shown is relatively simple and light. Mine weighs just under 12 grams. The only drawback to this design for modeling purposes is the short nose, which requires some nose weight for balance as a rubber-powered model. This is not an uncommon problem with antique designs.

Frame the fuselage, building the leading edge and spar pockets accurately, and attach the wire landing gear strut stubs and cowl formers. Obtain a bottle

1-1/2 inches in diameter (a can will work if you cut off the end flange). To form the engine cowl, moisten a piece of 1/64 inch balsa sheet two inches wide by 2-3/4 inches long and strap it on the form with 1/2-inch projecting over the end. Glue in three strips of 1/32 sheet, cut across the grain and progressively narrower, on the inside front edge of the sheet which is overhanging the bottle. When dry, the thickened, laminated edge can be shaped with the tip of an emery board to create the rolled front edge of the aluminum prototype's cowl. Mount the cowl and trim to shape, but don't fasten the rear of the engine enclosure to the fuselage sides until they are tissueed.

Wing ribs are shown to scale shape and spacing. Use of sheet ribs makes it easiest to obtain the correct under-camber. Stack and pin them together,

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sand to uniform section, and cut the spar notches in the entire stack with a piece of hacksaw blade. Make the laminated tips, bending the cardboard forms slightly after the strips are taped in place to approximate the wing undercamber. Build the entire wing in one piece, carrying the edge strips and all spars across the centersection for handling strength until assembly. Attach the ailerons with fine steel wire before covering. The rudder, elevators and ailerons are flat, but the stabilizer has airfoiled ribs. Put in all the gussets and small blocks for running the rigging before covering.

Cover with fine tissue or condenser paper and color with Floquil applied with an airbrush for best results. The entire airplane is black, except for the wheel discs and the fuselage forward of the rear end of the turtledeck which are aluminum. You will need to mask off the fuselage at this line each time you spray color.

If you don't have silver tissue, make some on a small frame for the wing letters. A light coat of clear dope on the back side of the tissue while it is still on the frame will help stick the letters when

softened slightly and carefully with acetone.

Turn the crankcase on a Moto-Tool or electric drill from a balsa block into which has been inserted and cemented a 1/8-inch birch dowel spindle, drilling the shaft hole 1/32 while it is still in the chuck. Cut it off with a razor saw and trim off the seven flats. Cylinders can be made from thread-wrapped balsa dowel, but are more realistically simulated using lengths of the flexible sections of plastic drinking straws with the ends capped with balsa. Assemble and paint the engine flat metallic gray. Pushrods are fabricated from .015 wire. Build the nose thrust block and attach the engine, slipping the assembly into position before gluing the rear of the cowl to the fuselage sides. Cut away the cowl and tissue at the wing-mount pockets and attach the wing to the fuselage after trimming away the unnecessary center-section spars and trailing edge. Put in about 1/8-inch, nonscale dihedral.

Turn and paint the three wheels, making sure they're identical. If you use styrofoam, prime them with four or five coats of diluted white glue to keep the

paint solvents from dissolving the foam. Attach all the landing gear struts and the pylon, painting them black. Make the little pylon cap, working in the holes for rigging before trimming and filing to shape, and attach with a small dab of epoxy. The little tension cable actuated drag brake sprocket can be made from a narrow strip of the same material with end holes worked in to slip the axle through. Fabricate the brake shoe from balsa and paint the same color as the dummy engine. Imbed the .015 wire axle in the cross-strut fairing and drill the front struts for the axle, reinforcing with a little smear of epoxy. Slip on the wheels and form small eyes at the axle ends to attach the rigging.

Use two pound test nylon monofilament fishing line for the rigging. If you think it out, the landing gear struts can be rigged with two pieces, and each side of the wings with one. The control wires can be omitted for simplicity, but the wing rigging is functional and should be installed.

Mount the tail feathers and install the safety skid. Skid struts are slivers of bamboo painted black, one to each bottom longeron. The short vertical piece is 1/32 round balsa. Rig the tail and slide in all the control horns. Alternate entrance and exit of the elevator control wires through the two fuselage entrance points and to the top and bottom of the elevator horns to allow up and down movement. If you mull that over, you'll see when I mean. The flippers specified by Beachey for low, slow maneuvers before his audiences are monstrous, so flight adjustments must be made carefully, identically and minutely. But you'll no doubt need to make them to get the bird to fly most efficiently.

Glue on the windscreen and mount a half-inch scale pilot if you agree with the **Model Builder** staff and me that the model won't fly without one.

The prop shown has been discussed on these pages in the past. I think it will give better flights than any commercially available one due to its larger blade area and its ability to change the pitch. Try one, you'll like the results.

Slip in a length of two-strand 3/32 or 1/8-inch Pirelli for power and balance where shown, or no further aft than the tip of the pylon. Test fly with low winds, adjusting the surfaces to get the pattern right. This is not a one-minute-plus flyer, but 30 seconds can easily be beaten with a little patience and practice. ●

### Hurricane . . . . Continued from page 33

The radio box was located on the right side of the boat and I've never had more room to mount a radio box. The rudder linkage is a straight piece of Du-Bro linkage wire that was threaded on each end with Du-Bro clevice linkages connecting the rudder servo output and rudder arm.

The throttle linkage is Du-Bro flex linkage mounted inside a brass tube that is bent to allow the butterfly valve on the

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carb to work properly. The linkage motion on the TML is a left-to-right direction as compared to a typical forward and back motion on a glow engine carb. The flex linkage allows you to achieve this left-to-right direction for throttle movement. The throttle moves easily with no binding.

**RUNNING THE HURRICANE**

Running a gasoline powered boat is very simple. There is less to contend with than starting a glow engine. Put some gasoline/oil mix in the tank, choke the engine by placing a finger over the carb and pulling on the recoil starter, then pull on the starter until the engine fires. Just like starting your lawn mower ... unless you have an electric lawn mower.

The centrifugal clutch is a very handy device to have on a boat this size. Because of its size, it is easier to start the boat in the water. Once you get the idea of the amount of throttle needed to start the engine without engaging the clutch, the engine can be started without the boat moving. Docking the boat is no problem whatever, because the clutch can be used to ease the boat up to a dock or to the beach. Once you open up the throttle the clutch engages immediately and the boat is going full speed almost instantly ... if wide open throttle is applied.

The brochures provided by J-5 Enterprises claim the *Hurricane* is capable of speeds over 30 mph with the TML 35 and Quadra-Charger tuned pipe. Although I haven't officially timed the *Hurricane* I built, I think it is probably running about 20 mph. It may be that I still need to work on adjusting the carb or play with the tuned pipe. I am not unhappy with the speed of the boat.

The boat corners well both left and right. As can be seen in one of the photos, the boat banks considerably when cornering. There is also quite a bit of water coming up the side of the boat when it is running straight. One of the next things that will be added to the boat are ride strakes like those used on both full-size and model deep vees. I believe the strakes will increase the speed by lifting the boat out of the water.

**SOME THOUGHTS ABOUT BIG BOATS**

I am developing an interest in design-

ing a large boat for a gasoline engine. This interest isn't fueled by a desire to create another racing class, but rather to have a boat that can be operated inexpensively and on large lakes or in the salt water that is very close to my home. For me, this type of boat and engine makes an ideal sport type of model. If the water gets a little rough, the boat can handle those conditions easily. The *Hurricane* is really fun when you have waves one to two feet high.

There has been some criticism of large boats like the *Hurricane* being unsafe. I do not feel this is a valid criticism. I have seen a 70 mph outrigger lose radio control and go one hundred feet up a beach. Maybe someone can figure out which type of model has more potential for causing damage; a twenty-five-pound gasoline boat going 30 mph or a twelve-pound outrigger going 60 or 70 mph. I think the main consideration is that neither boat is safe when it is out of control. From what I have been able to determine with the *Hurricane*, a large boat presents no greater problems in the area of operating safely than those present when running an outrigger type boat. The important thing one needs to remember is that the potential for danger is always present.

It would appear to me that a large boat using a gasoline engine would make an excellent choice for many people who might wish to have a model boat suitable for operating on unprotected waters. The cost of operation and maintenance of a gasoline engine is considerably less than a glow engine. Being able to start the engine with a recoil starter eliminates all the starting support equipment needed with a glow engine.

There are definitely some merits that need considering when selecting a model boat like the *Hurricane*. I was favorably impressed in my first experience with a "Big Boat." •

Hannan . . . . Continued from page 45

for flight score) 1. Dave Aronstein (by proxy): Bleriot VII, 58.8 seconds; 2. John Martin, Elias Airport, 44.2 seconds; 3. Walt Everson, Found, 40.1 seconds. Other models performing in this class included a Pottier, an Alco Sport, a Wee Bee, and Pama.

The next category conducted was for heavier models, over 2 grams but under 3 grams. In this group, Jiro Sugimoto's Lacey from Japan was proxy-flown to first place with an average time of 58.1 seconds. Note how closely that compares with the winning duration in Category I. Second was Millard Well's Lacey, which achieved 43 seconds; third, Well's Waco E biplane. Other finishers were MacEntee's Elias, Martin's Junkers Stratoplane, Uchida's Piper Vagabond from Japan, and Chris Johnson's DH-6 biplane, which had been mailed from California.

Finally, there was the "Heavyweight" Category III, for models weighing more than 3 grams. First-placing Chris John-

son's Boeing F3B-1 achieved 31.6 seconds duration. Second place Siro Takeuchi's Cougar from Japan was proxied to a time of 23.1 seconds and also attained the highest Pistachio scale score, with 88.6 points. Third was Millard Well's S.E. 5, followed by his Bristol Scout. Soichi Uchida's Cougar completed the field.

But wait folks, there's more! Another event, dubbed "Ridotto", was conducted for models even smaller than Pistachios. In this class, John Martin's sub-miniature (5-11/16" span) Elias Airsport flew for an incredible 44.5 seconds! Not far behind that duration was Well's 6" span Wee Bee which managed 41.1 seconds. However, static judging tipped the "scale" in favor of Dave Aronstein's 5-3/16-inch span Pot-tier, which placed first in class, although its flight time was "only" 30 seconds.

We normally do not give contest results in such detail, but it appears that small scale models have opened the door to international contest participation to almost anyone who may care to enter. Proxy rules combined with the small cost of mailing tiny aircraft to virtually any spot on the globe open entirely new horizons for fun.

Also, one need not be a world-beater to gain some sort of reward for effort invested. At the Miami contest, special awards were an added attraction: Longest single flight: Aronstein, 1 minute, 15.2 seconds. Most Distant entry: Soichi Uchida, Ogaki-Chi, Japan. Worst damage in shipping: Butch Hadland, England. Smallest plane: Millard Wells, Pama. Highest point total: Ken Johnson's da Vinci Ornithopter.

Tongue firmly-in-cheek, Doc Martin noted the lack of squabbling found in many other sports: "Keep politics out of the INTER-GNATS, I say". As Marshall McLuhan and Quentin Fiore have pointed out: "Politics offers yesterday's answers to today's questions."

#### POSTSCRIPT

Just as this column was being prepared, word arrived from Ichiro Yamada, of Japan, that a team of entries is being sent to Belgium for proxy-flying in the International Contest of Flemalle.

#### FRANK'S LATEST

Frank Zaic has announced two additional publications. The first is a reprint of "The National Model Airplane Meet in Pictures", which was originally published during 1939 by Walter Farunk and Frank. This came about because the authors were frustrated by the lack of space in model magazines for comprehensive coverage of Nationals contests, and decided to take matters into their own hands. This 10-1/8 x 8-1/2-inch book is the result, and features hundreds of photos of models and their builders. Many of the names will be familiar today, for instance: Robert Reder, later a guiding light of Monogram Models; Pete Bowers, now a leading aviation historian; Harry Rice and Irv Ohlsson of O&R engine fame; Irving Polk, Ed Lidgard, C.H. Grant, Earl Stahl, William Winter, Jim Cahill, Ray Marquart, Henry Struck, Roy Nelder,



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Also included are Wakefield results, 1938 Nats results, some three-views of 1939 winning entries, a selection of 1937 gas model photos, and even a page devoted to practical photography advice for modelers.

From a human-interest standpoint there are numerous highlights: For instance a picture of three kids running a Brown Junior ignition engine on the bed in their hotel room! Or, how about the team of contestants who arrived at the contest in a used schoolbus they had raised money to buy . . . as a commentary on how inflation has affected things since, the price of their transport had been a mere \$90! The eldest entrant that year was John J. Marty, from St. Louis, who commented: "At 60 years I sure get a lot of fun out of building and flying gas models. I think that it is the greatest hobby for anyone from 6 to 60. I expect to keep on building and flying as long as I can hobble out on the field."

#### ZAIC INDEX

The second release from Model Aeronautics Publications is an index to all of its offerings, including the *Year Books*, *Model Glider Design*, *Circular Airflow*, *American Boy* reprints and R.J. Hoffman's classic *Model Aeronautics Made*

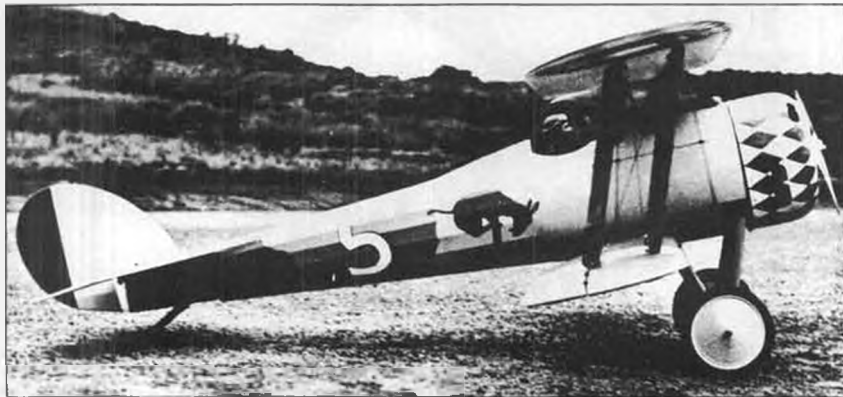
*Painless*.

In compiling the master index, Zaic was surprised to learn just how many plans were featured in his publications . . . 1,394! Of these, Frank himself drew some 1,120, which were produced in such diverse locals as New York, Austria, and California.

We consider this index a bargain at the asking price of one dollar. Tentative price for the 1939 Nats book is \$4. Both items are available from: Model Aeronautic Publications, Box 135, Northridge, CA 91328.

#### BOSTONIANS BLOSSOM

It would seem that the Bostonian class has served as a frustration vent for quite a few modelers. Not only can they engage in designing scaly aircraft with minimal restrictions, they can exercise their senses of humor in rationalizing their motives. Here's Gerald Myer's story: "My Bostonian started with the outlines of the 1937-38 German Moller Stomo. Then the fuselage ballooned as I tried to fit in the Boston Box required by the rules, and I wound up with a side view more like the Call Air agriculture plane. Thus, a sleek sophisticated German lady wound up marrying an American cowboy, and the Porsche Pickup was born. Lessons learned: 1. Gull wings are difficult, but possible. 2. Dr. Martin's color dyes from an art store work great on balsa wood frameworks . . . no warping, no problems dissolving water-base glue, and Cadmium Orange is an almost perfect match for orange Japanese tissue covering. 3. My models do not fly right



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off the building board. Porsche Pickup was intended to go to the right under power, but refused. I tried to force the issue, and she showed me! She started to the left, quarter-rolled to the right, then split-essed (or something) to bonk her nose on the hard meadow. I resisted the impulse to stomp her on-the-spot; repaired her, unwarped everything, put a touch of wash-out in both wings and tried again. Now she goes left under power, right in the glide, and both plane and builder are happier. Moral: Listen to what the model is trying to tell you!"

#### SHORT MEMORY?

Carl Hatrak, who recently retired from TWA to devote more time to the hobby, favored us with a copy of the company newspaper *SKYLINER* featuring a mini-review of Bob Serling's new book about TWA, entitled *HOWARD HUGHES' AIRLINE*. Quoted was a 1930s incident which offers some insight to Howard Hughes, the man. Howard had purchased the one-and-only DC-1 from TWA, intending to prepare it for a round-the-world trip. However, the transport sat for-

lornly at Burbank Airport until finally an airport official telephoned Hughes to ask how long the plane might remain there. "Oh, that's where I left it," Hughes replied, "I forgot where it was."

#### IF THAT SEEMS FAR-FETCHED

Another story was related to me by the late Bob Duke, who had served as a security guard lieutenant for Hughes: One afternoon, Howard arrived at the very busy Grand Central Airport in Glendale, California, accompanied by an attractive and now-well-known movie star. Hughes explained to Bob that he wanted to perform "a little tuning" on one of his aircraft, and told the actress to wait in Duke's Buick automobile until he returned.

Some hours later, with a very restless and annoyed young lady still in his car, Bob decided to investigate the cause of the delay, at a hangar located some distance away. "Oh," said a mechanic, "Mr. Hughes took off some time ago, headed for New York."

#### HOW TRUE!

Model builder Herb Kelley, Yucca Valley, California, concluded a letter

regarding his latest projects with this line: "I have been passing through time too rapidly to really get caught up, but I keep trying!" Which reminds me of this closing thought, by Andrew Connor Lutz in the *Christian Science Monitor*: "In the present age, the minutes of our day seem to move faster than our feet can carry us." •

F/F Scale . . . Continued from page 51

#### WING FAIRING IDEAS

Another hassle was the wing fairings. They aren't very long, but are quite high, and flow around the leading edge of the stub wing. I stewed over this challenge: trying card stock, carving balsa, etc. None of these ideas were satisfactory in my opinion. (See Figure 3.) Notice the direction of the grain in the 1/32 sheet balsa fairing. In order to have the fillet flow or bend the same all around the wing root, the wood grain had to be changed in the front. If there were any irregularities in the assembled fairing, I used vinyl spackle to fill them. I was very pleased with the results of this fillet.

In the past, I have never used balsa for fillets, always opting for card stock. However, this worked so well, that I'll continue to use balsa . . . well . . . maybe I should qualify that last statement. I will use balsa for fillets on my power models only. As filling of the grain is necessary to obtain a smooth finish, the extra weight would not be desirable on rubber models.

#### A HUMOROUS TESTIMONY

I received an interesting letter from Perry Peterson. He wrote this letter for the *Nebraska Freeflighters* newsletter. This work is edited by Tom Winter, 1010 Eastridge Dr., Lincoln, Nebraska 68510. I know you'll enjoy it.

"Back in the mid 1940s, I decided to try my hand at building a flying model. I really don't know why . . . no one on our block had much luck with 'em. It must have been the pretty pictures on the kit boxes.

"My first attempt was a Grumman Avenger built on the half shell. The plans didn't say how to attach the fuselage stringers. Rather than alternate from side to side as one should, I put on all of the left stringers first. Yup, you guessed it! My little half-built bird took on a strange new shape. Looking down from the top, my poor TBF looked about as symmetrical as a half moon! . . . But I survived.

"The next project was a British fighter. It wasn't one of those sleek *Spitfires* or *Hurricanes*. It was an ugly plane . . . must have been a *Typhoon*. I followed the plans very closely and even consulted all of the wise 13 and 14 year old modelers I could find. I was determined to succeed this time. The plans didn't warn me about possible downthrust requirements, nor was there a provision for thrust adjustments. The maiden flight gave me a first-time view of a heart-rending power stall followed by a very undignified landing on the poor, frightened bird's tail feathers! . . . But I



# SHIPSHAPE.

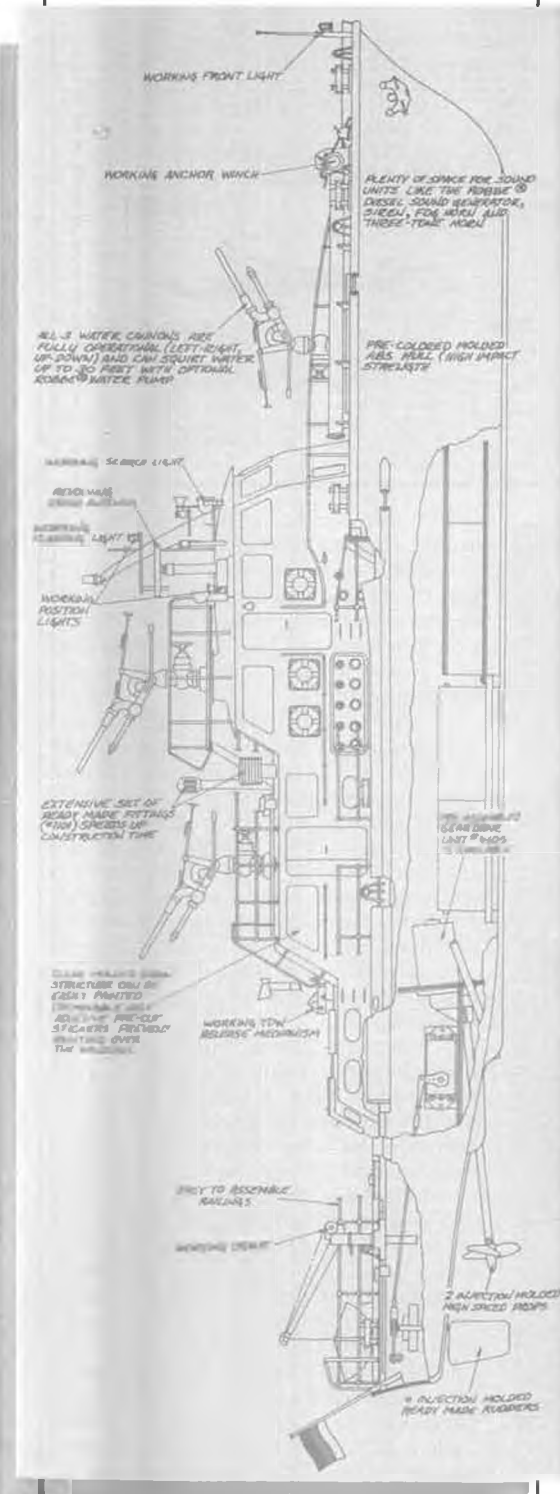
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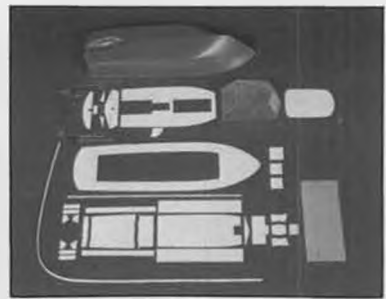


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survived.

"Next was a Taylor *Cub*. This one was REALLY going to fly! With the fuselage almost ready for the tissue and banana oil, I decided to check the rubber strip for power. After properly installing the motor, I wound it up pretty tight. The fuselage suddenly re-kitted itself! I

didn't think balsa could crackle that loud! . . . But I survived.

"Next came a real building frenzy. I set about building everything I could get my hands on, not caring if it would fly or not. Was it just me, or do other modelers go bananas at some point in their model building careers?

"Then, I even became boastful and bragged about a sure ten-second flight capability for any of my models. I'd take them up on top of my dad's two-story garage and give them a javelin heave straight up. What a way to get ten seconds! The sad truth is: my *Spitfires* spit, my P-40s peed, and my Zeroes zeroed! I went back to the kit box for another reassuring look and sure enough, there it was, it said, 'flying model.' Sure had me fooled! . . . But I survived.

"I gave up all that kid stuff when I started high school. Then in a weak moment in 1974, I bought a copy of *Model Builder* magazine. The Peck-Polymers ad really freaked me out . . . took me back 27 years! Instant nostalgia! I rushed down to Chick's Hobby Shop and bought a *Druine* Peanut kit and sent off for a *Cougar* Peanut kit. The *Druine* was a 'lead sled' and did not perform well, but the *Cougar* flew right off the board. For the first time in my life I'd built a plane that flew well. I was irrevocably hooked! I read everything about free flight scale models I could get my hands on. Each new model FLEW and looked a little bit better than its predecessor.

"Then guilt reared its ugly head. If my workbench had more than one model under construction at one time I'd feel guilty . . . too guilty to enjoy model building. Somehow I felt one project should be completed before starting another. After a year of this kind of frustration, I came very close to leaving the hobby! . . . But I survived.

"It was time to either allow several model projects under construction at one time, or pack it in and give up this frustrating hobby. It took a few months for the complete transition, but it was worth it. For the past five years my workbench has been graced by at least four projects at a time under various stages of completion. Now I take great comfort knowing there will always be a project waiting that will suit my mood at the moment! . . . Surviving has never been more pleasant!"

**STINSON UPDATE**

I have an addendum to my opening story. Tom Laurie won Grand Champion Antique at the Merced Fly-In. As mentioned before, this is just the beginning for this exquisite restoration!

**Electric . . . . Continued from page 31**

they can be found in surplus stores or mail order catalogs. However, just last week I saw GE sub-C cells in plain gray cardboard wrappers for sale in the local hobby store for \$1.50 per cell! Usually these batteries are aimed towards the off road electric car market, so check shops that carry off road stuff.

How do you avoid junk? For batteries, that is easy. Buy either Sanyo or GE and you will not miss. Any cells they make are fast chargeable, and deliver excellent power.

How do you spot GE or Sanyo cells? Even if they are in a "plain brown wrapper", the GE cells will always have the numbers "188" stamped on the bottom, often with a letter such as "188E". Look for it, if you find it, you are OK. Sanyo will always have "JAPAN" in capital letters stamped on the bottom. Again, look for it, if you find it, you are OK.

GE also sells a general consumer line of nickel cadmiums too; you will find them in hardware stores and photo stores. They come in bubble packs and have a printed, black label. Often, they come with a small wall charger or adapter for the wall charger. These cells are not in the "bargain" price bracket, but they are suitable for electric power too.

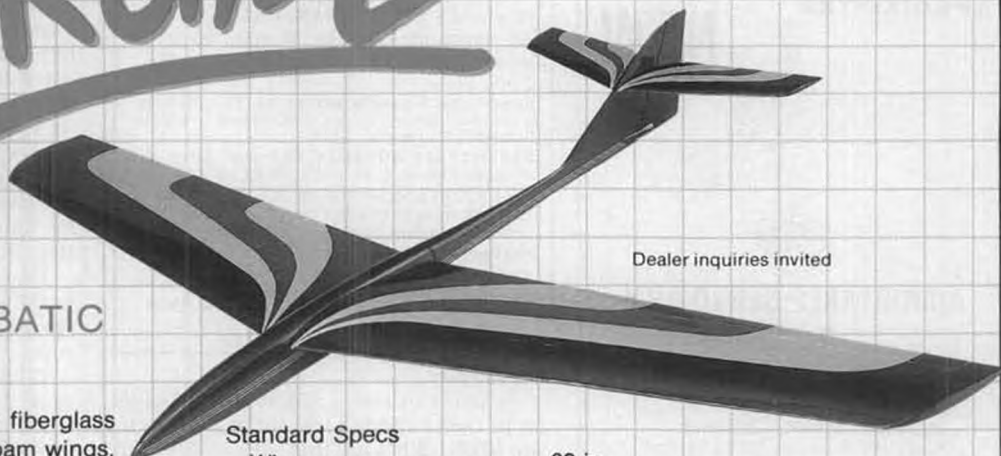
These general consumer type cells do not come with solder tabs, and sometimes other bargain cells don't either. You can solder to the ends of these cells, but do it right!

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Correct technique for soldering Ni-Cd cells is to sandpaper the ends of the cells so the solder will hold after it cools. Use 60/40 rosin core solder, and two-inch lengths of 18 gauge or heavier insulated wire for cell connectors. Extension cord ("zip cord") wire is fine for this. Use a pencil iron for all soldering. A 25-watt iron is marginal, but can be used. A 40-watt iron is perfect: it heats the cell ends up enough to make the solder flow, and is fast enough to do it quickly without overheating the cell.

Pre-tin the ends of the cell: a dot of solder about a quarter-inch in diameter

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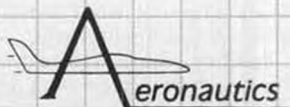
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is fine. Make sure it is "well flowed" onto the cell end: it should not be standing up like water drops on a waxed car! If it does not flow onto the ends well, chip off the solder and do some more sanding.

I do not try to cool the cell while soldering. However, if I have to keep the soldering iron on the cell for longer than a count of ten, I pull the iron off and find out why. Usually it is because either the end needs more sanding, or there is not enough solder on the iron to make good contact. Keep the iron fairly "drippy" with solder.

Strip a quarter-inch of insulation off each end of the wire connector and pretin it. Now solder the connector to the cell, and connect the cells in a string, plus to minus, "like sausages in a string."

There you have your bargain pack! You might ask, why buy cells at regular prices if the bargains are available? The reason is easy, you get more performance from cells that come from SR, Astro, Leisure, Wilshire, and others, and the cells are better matched.

On the other hand, the bargain cells are quite adequate for sport flying, you may lose about 10 to 15% in power with bargain cells, and perhaps that much in duration also, but for a glider, old-timer model, or sport pattern ship, that usually is not a major penalty. If you want to try electric power on a shoestring budget, it is a good way to go.

#### FINDING GOOD BARGAIN MOTORS

Motors are a trickier story. You have to know what you are doing to find a

good motor. The problems are the brushes and the armatures. Many bargain motors have poor brushes, and many are wound for high voltage and will hardly turn with a six or seven-cell pack. It is safer to go with motors you know are designed for electric powered models.

However, even among the latter, there are some bargains to be had. Again, check the hobby stores, that sell "off road" motors, these are excellent for electric flight. Leisure Electronics sells an excellent "stock" off road motor for \$15. It is sold in many hobby stores. Astro Flight sells four motors, the 05 and 075 plain bearing airplane motors for \$18, and the 05 and 075 marine motors for \$16.

You will, of course, have to experiment with props for these motors. A good starting point is a 6-4 or 7-4 prop on a six or seven-cell pack. The right prop should run for three to four minutes "on the bench" with a fully charged, sub-C pack. A run time less than that will overheat the motor and batteries. Astro sells an excellent prop adapter (No. 5021) for 05 type motors for \$4.

How did the fellows in St. Paul know the AxMan motors were good? They had expert help! Tim Engel, who works for a toy company and was a motor designer for the Cox *Fibrini* electric plane, looked the motors over and gave the go ahead.

By the way, the motor in the Cox *Fibrini* was excellent, so Tim did a good job on it. I reviewed the plane a couple of years ago, and my feeling at the time

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was that it needed a sub-C pack for more duration (it came with a 600 mah pack). I also had difficulty flying it, as it was not stable and seemed always to be on the verge of a stall. I think a beginner would find it an awesome challenge.

A good, ready-to-fly, electric plane is badly needed, it should be a high-wing plane, a taildragger for easy hand launches and durability, and it should have a light wing loading for docile flying. So far, I have seen nothing on the market that qualifies, which is too bad.

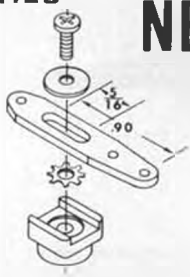
But, I digress! Bill got his electric organization going in a very logical way, if you want a group of electric fliers, you might try it. He joined SEAM (headquartered at 11632 Flamingto Dr., Garden Grove, CA 92644) and asked for



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a list of other people in his area who were members. He got a list of five others, called them up, and talked-up electrics to members of the local soaring club.

Seven people showed up at the first meeting. This got the club going and organized. At the second meeting, a month later, they had a "batteries and charging" session, from which everyone learned something. The third meeting featured Tim Engel, and was really interesting, with much learned about motors. Roger Liebacker bought a motor at AxMan that wasn't very good (the armature was wound for too high a voltage), so he rewound it and got a good performer. He was the next featured speaker! The club also started monthly fun flies, and will have a contest in



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September.

As you can see, a SEAM group builds on its own experiences, and it all starts to snowball. Bill says that the interest in electric power is fantastic, and he is very pleasantly surprised that the club is moving along so fast. If you live in the Twin Cities area, and you are interested in electrics, contact Bill at 5829 Scenic Ct., Minnetonka, MN 55345, phone (612) 934-9652.

### F/F ELECTRIC MOTOR TIMER

Leonard Bedford (Seattle, Washington) sent in a very simple electric free flight timer switch idea. Basically it is a lever type switch which is held down by a disk on the timer shaft. A slot which is cut in the disk allows the switch arm or lever to pop up, thus turning the motor off. Another on-off switch is needed to keep the motor off until you are ready to start. A small toggle switch is ideal for this.

The timer can either be a standard free flight engine timer with a flood-off or DT disk, or a Tomy timer (from the windup toys) with a weighted pawl and a home-made disk. Weight the pawl so that a complete revolution is about 35 seconds. If you slow it down much more than this, it becomes unreliable.

Leonard mounted everything on a one-inch by three-inch, 1/32 fiberglass board with epoxy, and made the fuse very easy to get to. If you plan to ROG the model, this is necessary as the fuse blows easily if the model noses over. That, of course, is a lot better than blowing the motor!

Leonard's diagram shows the details. Leonard recommends the Wilshire flexible hookup wire to make wiring in fragile free flight models much easier. Thanks, Leonard, for the tip.

### ELECTRIC HYBRID

And now for a set of nice cool photos for the hot summer days. Arthur Arro sent pictures of his "Lady Electricus" which were taken last winter. Art flies year-round. The plane is a hybrid consisting of a Goldberg Gentle Lady wing on the Larry Jolly Electricus fuselage and empennage. The marriage is a good one, with average flights of 15 to 20 minutes in Michigan winter conditions.

The flying weight of the Lady Electricus is only 36 ounces with the Astro Super Ferrite 05 motor and EP Max 900 mah

cells from SR batteries. Art says he prefers these cells for their superior power to weight ratio. I agree, they are fantastic batteries and deliver very close to 900 mah even under high load.

Art uses a prop stop to save props and motor shafts, and uses annular cooling behind the spinner cone.

He is planning a new wing with 600 squares and an Eppler 193 airfoil. The new wing should eliminate the large trim change between power-on and glide caused by the flat-bottom airfoil of the Gentle Lady. He figures the wing will be lighter too, due to one-piece construction and Coverite Micafilm.

Thanks for the info, Art, the plane looks super-clean. I like the Astro Super Ferrite 05 too: it's specialty is long motor runs.

Well, till next time, try electric, it's pure poetry in motion!

### Free Flight . . . Continued from page 49

cluded instructions."

The Bullet suggests that instructions are available from Doug Galbreath (address above) and can be obtained with an SASE. If that's not your cup of tea, then drop me an SASE, and I'll send you a copy of what Doug sent to me with my last Seelig order.

Rubber motor fabrication: here are the questions asked. As I don't consider myself a rubber motor expert, I will give my best shot to the answers, and I will also hope that the real experts will choose to let me know if they disagree.

Modeler: How is strand length determined for any particular model?

Bullet: I believe I understand this question to mean how long should a motor be on rubber models that don't have a motor weight requirement. If so, then strand length is determined by how long the fuselage is and where the CG should be located. Old-style Mulvihill models had motors of 48-inch length and used a 1/4-pound of rubber. Strand length is the distance between the motor peg at the rear and the rubber winding hook at the front.

Modeler: What are the considerations when dealing with a rubber motor governed by weight as in the Wakefield or Coupe classes? What we are interested in are some general comments about rubber motors.

Bullet: Rubber varies somewhat in thickness and density. In the classes you mention, the weight is the governing factor. Consequently, the models you fly must be alterable to accommodate different motor lengths. I suggest that when the model is built, you incorporate several rear hook locations for the model.

If you haven't already done so, then I'd suggest you take a look at the different length winding hooks made by Jim Crockett Replicas, P.O. Box 12600, Fresno, CA 93778. This will allow you to use a shorter or longer motor length while still keeping the required motor weight.

One other thought, you might order different batches of rubber to get a

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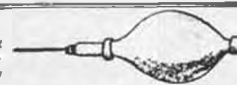
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thinner (or thicker) or denser (or less dense) motor. I have also found that using different widths of motors (24 strands of 3 mm rubber instead of 12 strands of 6 mm rubber) often pays dividends in better flights.

Modeler: How is the motor actually constructed? Is each loop stacked or is

each succeeding loop laid beside the previous loop? I don't want to create a short strand which might break prematurely.

Bullet: I used a stranding board to make my motors. A stranding board is a two-inch by two-inch stick of wood with a large nail driven in at one end and a series of holes drilled down the length of the board. Another nail is used to serve as the anchor at the other end of the motor. It is placed in the hole in the board that best corresponds to the final motor length. The rubber motor is looped around these two nails and tied off. The rubber strands are not stacked, but laid in flat (untwisted). Using this system, no short strands are created . . . presuming you maintained the same tension on the rubber as you were winding it between the two nails.

Modeler: What is the preferred method of breaking in a motor?

Bullet: I don't know about "preferred." Here's what I do:

- a) I cut the motor to size and strand it as described above;
- b) I lube it thoroughly after washing and drying it;
- c) I fasten one end of the motor around a doorknob that has a piece of cloth wrapped around it (to keep the motor from chafing on the doorknob);
- d) I insert a half-inch dowel through the other end of the loop;
- e) I pull on the motor until it is about twice its original length;
- f) I wait and hold the motor in place for awhile . . . until I can feel the rubber relax;
- g) I pull the motor until it is about three to four times its original length and hold it there until the motor relaxes again; and
- h) I then release the motor and store it for use in a plastic baggie.

Modeler: What is the best rubber lube? I am presently using 50% KY

surgical jelly and 50% glycerine.

Bullet: Sounds like you are using a good rubber lube. I use Roger Taylor Lube which I get through Peck-Polymers, Box 2498-MB, La Mesa, CA 92041. Maybe there is better lube than you and I use, but I don't know what it is.

Modeler: What is the best method of putting in turns?

Bullet: My best mentor for winding motors is John Lenderman. He stretches the motor literally until it cannot be stretched any further . . . and then starts to wind. He stays way out there until the motor is single-knotted and then begins to come in. The "come-in" phase is slow and gradual. You can tell if you are coming in too fast because the knots pile up in odd shapes. The knots should be uniform throughout the motor when winding is complete.

By the way, I'm a chicken when it comes to winding this way . . . that's why John wins a lot of contests and I don't.

Modeler: Is it possible to predict the number of turns a particular motor will take? Is there a formula to get us into the ball park?

Bullet: I like the old adage: "Wind until it breaks then back off one turn." Seriously, I would suggest that you make up a test motor using the same rubber you plan to use in competition, wind it until it breaks, and use the number of turns as a guide for when you are out in the field. Recognize that heat and sunlight will affect the motor on the field as will dust and other natural field conditions. Normally, a motor in the field will not take as many turns as one run in a test situation.

Maybe one of our readers has a better answer to these questions. If so, please drop me a line at **Model Builder**, and I'll include it in a future issue.

### IN CLOSING . . .

I've run a bit over my allocated space this month. Return to those thrilling days of yesteryear next month at the same time and the same place. . .

Thermals. ●

### F3C Champs . . . Continued from page 11

I could check its sensitivity. I was able to find a straight pin lost in the grass. As I had not seen this device before, I asked where I could purchase same. The owner promised that he would sell it to me at the end of the contest as he could buy another more readily. The device costs about \$10 in Holland.

The processing area was restricted to contestants, their mechanics, team managers, contest officials, and members of the press. During conversations with some of the club members, I found out that the Eibergen Club was losing this field due to the encroachment of residential housing within the 1 km required buffer zone. On the positive side, I was told that the club was getting an even better field at another location. Apparently, the club is able to sell the present clubhouse and build a new one at the new location. I was very impressed



by this facility and can hardly wait to see the new one.

I was anxious to find out what types of helicopters the European fliers were using for this competition. It didn't take very long before I got my answer. The Heim Star Ranger, Schlueter Superior, Kalt Baron 50, and Graupner Helimax represented the bulk of the machines in that order. The Heim mechanics were used in a variety of machines namely the "Star Ranger," "Bell 222," and some home-built fuselages. During the practice sessions, the thing that surprised me was that most of the contestants practiced engine-off autorotations several times. This was an indication to me that everyone knew that they must do this maneuver in order to win the championships. It also proved to me what I have said for some time at the annual FAI meeting, and that is that it makes no sense to have the normal landing and autorotation landing as mandatory maneuvers and then choose one of them. We know what people will select.

Later that afternoon, the starting order was chosen by the FAI jury consisting of Tony Aarts (the Netherlands), Lars Waegner (Federal Republic of Germany), and myself. This was done using a random drawing procedure. To our amazement, there were no frequency conflicts when the drawing was complete, so the order stood as drawn. At the end of the practice day, everyone met for dinner again, and later that evening the final pilots' briefing took place. The starting order was announced at this time.

During this session, one question caused quite a stir. The question concerned the time interval between the announcement of a maneuver and when "NOW" is called. The jury got the impression that what the person wanted to know was "could a pilot practice a maneuver between those two times," or "could he practice a maneuver during the interval between maneuvers." The answer to the latter is of course no! The rulebook is quite clear on this point when it states: "The competitor may make only one attempt to execute each maneuver during any one flight." With regard to the former question, the rulebook does not cover it specifically, so the jury decided to discuss this point after the briefing session and report back to the pilots before the start of the actual competition. The jury's decision was posted the morning of the first contest day.

The actual competition got underway Saturday morning at about 10:00. The FAI judges were Rudy Hadorn of Switzerland, Wolfgang Roth of the Federal Republic of Germany, and Henk Schoenmaker of the Netherlands. The sky was partly cloudy or sunny depending on your point of view, and there was a fair amount of wind. The championships had been publicized in the local press, and a fair number of spectators attended. An admittance fee was charged with the monies going into the club's contest fund. The competition

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was interrupted at about 11:00 a.m. when Mr. Pieter van Vollenhoven (a member of the Dutch royal family) arrived via full-size Alouette III helicopter. Mr. van Vollenhoven announced the official start of the competition and also presented a very nice trophy to Mr. Dieter Schlueter for his pioneering efforts in model helicopters. The ceremony was enjoyed especially by those of us who have been involved with R/C helicopters for many years.

After the ceremony, the contest got started again. A quick calculation made earlier indicated that one round of flying should take about four and a half hours to complete. Thus, the first round should be complete at approximately 14:30 hours. However, due to the interruptions, the actual end of the first round was around 15:30 hours. I was told by the contest director that we could continue until 19:00 hours. I suggested that we stretch that limit a little in order to complete two rounds so that we could all breathe a little easier in case the weather changed on us preventing the completion of the second round the following day. In addition, it is fairer to the contestants to fly under nearly identical weather conditions. After the first round, the first through third place individual finishers were: Jean Pierre Du Pont of Belgium; Ewald Heim of West Germany; and Ulli Muller of Switzerland respectively. The team results were: Belgium, first; Germany, second; and Switzerland, third. The tabulation of

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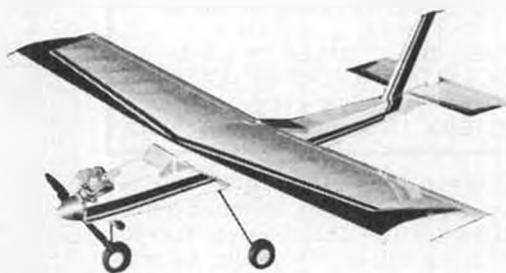
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scores was done on an Apple II computer by Mr. Willi Vaags and his assistants. The results were posted at the end of the round.

Some of the spectators and contestants were annoyed by the fence that was located behind the judges. When I questioned the need for such a fence, I was told that there was a fatality on this field a few years ago caused by a model, and that the club was doing everything they could to keep that from happening again. In my opinion, the fence created a safety hazard for the judges in the case where they tried to evade an out-of-control model coming at them from the course. In addition, I found it unacceptable for the club to erect a three-

foot-high advertising banner on this fence because it just about made it impossible for the spectators and other contestants to see the precision flying done on the course itself.

With the hard work of the frequency and line coordinators, the second round was completed in record time at 19:30 hours. We did have a serious problem about halfway through the second round when the judges were unable to see some of the maneuvers due to the setting sun. Because this problem would get worse as the day wore on, the jury decided that the judges should be moved to the opposite side of the field. This did not change the wind relative to the course, but did meet with objections

from some of the contestants because they had to fly some maneuvers left to right instead of right to left. In the end, most realized that there was no choice if we wanted to finish the second round. At the end of the second round, the individual ranking was: Heim, first place; De Mayer, second place; and De Proft, third place. The team standings did not change from the first round. It was a long day and everyone retired shortly after dinner.

Sunday morning arrived amidst rain showers. At this point, I felt vindicated for suggesting that two rounds be completed the day before. However, the rain did not last, and the contest got underway at 10:00. The third round was flown at a leisurely pace and was completed at about 15:00 hours. The results of the third round were not made public. Only the contestants knew their score for the third round. Thus, only those that saw the score sheets knew the winner. This secrecy did not last very long.

To provide some breathing room for the contest officials while they finalized the scores and prepared for the award ceremony, the field was opened for demonstration flights. The first to fly was Dieter Schlueter flying an original "Cobra" owned by one of the Dutch pioneers. The model was flown complete with training gear and Dieter flew it very well. One could easily see that he enjoyed that flight. Additional demos were put on by Len Mount (GBR), Wil Snitjer (NED), Ewald Heim (FRG), and Frances De Proft (BEL). I think that these demos were more exciting to the spectators than the contest itself.

The winners were announced during a formal ceremony, complete with flag raising and three-tier platform. In first place was Ewald Heim of West Germany flying his "Star Ranger" design. In second place was Frances De Proft of Belgium flying a Schlueter "Superior" design, and in third place was Christian De Mayer of Belgium flying a "Gold Ranger," a joint design effort by De Mayer and Du Pont. One unexpected problem did come up when the second and third place winners were both from Belgium and the club had only one flag per country. The officials decided to use the FAI flag in place of one of the Belgium flags. The Belgians did not seem to mind. The winning teams were Belgium (first), Federal Republic of Germany (second), and Switzerland (third). As head of the FAI jury, I had the honor of announcing the winners in English and German, and the contest officials presented a bouquet of flowers to each winner. The trophies were not presented at this time. The organizing committee had decided to do that at the closing banquet later that evening. However, the champagne flowed (sprayed) quite freely. Many pictures were taken by members of the press and most of us returned to our motels to get ready for the banquet.

The banquet was held at the hotel "De Kroon" in Eibergen and started at 20:00

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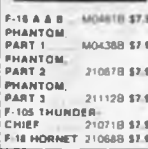


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hours. Most of the Eibergen R/C Club, the contest officials, and most contestants were in attendance. I think there were about 100 people there. A very nice way to end a great competition. The evening started with two free drinks paid for by the club, continued with the presentation of the individual trophies and team trophies, and presentation of a bouquet of flowers to the FAI judges and members of the jury. A buffet dinner followed the award ceremonies. Everyone seemed to take several turns at the buffet table, and the evening ended all too soon after many interesting discussions with new and old friends.

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Championships was a great success. The competition was run in a safe, professional, fair, and friendly atmosphere. The Eibergen Model Flying Club is to be congratulated for a job very well done. •

**Jr. Tiger . . . . . Continued from page 29**

practically impossible to hide, as the covering has to be glued to the tip, for if you use an iron hot enough to attach the covering, you will melt the plastic wing tip. Also, they are difficult to repair if you should happen to drag a wing tip on a paved runway.

The aileron horns are wire and have to be bent to shape. Die-cut ply gauges are furnished to obtain the correct bend angle.

**FUSELAGE**

The fuse is constructed entirely of die-cut Lite Ply and three-ply mahogany. The firewall is first assembled by laminating two 1/6-inch thick, three-ply plywood pieces, and then drilling the holes for the fuel lines, pushrods, and nose gear bearing. The nose gear bearing is then installed, which completes the firewall assembly. Formers BC and DE are assembled, and after the glue dries, a 1/4-inch diameter hole is drilled through former BC (for the bolt on wing version). The formers, floor pieces, and aft top and bottom pieces have tabs on them which fit into slots in the fuse sides.

The fuse sides are prepared by instal-

ling the doublers and hardwood motor mount (engine mount?) bearers. The fuse is assembled dry and held together with rubber bands and masking tape. The alignment is checked by placing the fuse over the fuse plan top view. Once alignment is obtained, the fuse is glued together using the thicker type cyanoacrylate glues such as Super Jet. All the parts fit well, and the fuse alignment was such that it needed no adjustments when placed over the plan view. The ply hatch was assembled and fitted next.

The next steps were engine installation and fuselage completion. This consists of fitting the engine to the die-cut ply breakaway mount, two of which are supplied . . . one of these being a spare. The mounts are three-ply, and appear to be quite tender, so I don't know how well they will stand up. I would opt for five-ply if a replacement is needed. The engine is secured to the breakaway mount via supplied 4-40 blind nuts and bolts. This assembly is secured to the hardwood bearers with 4-40 blind nuts and socket head bolts, also supplied. The mount even has an "R" stamped on the top right-hand side so that the engine will be off-set to the right with the mount installed properly.

The empennage is assembled to the fuse next, and the fuse then sanded smooth. At this time, the hardwood mounting blocks for the wing attachment bolts are installed. However, prior to doing this, install the servo rails, fit the servos, and drill the servo mounting screw holes. If you don't, there ain't no way that you are going to perform the servo installation after the mounting blocks have been installed, as the blocks hide the two outboard servos. This is not mentioned in the instructions, and I wonder how many modelers will mouse-trap themselves if they use the bolt-on wing option.

The wing is then fitted to the fuse, aligned, and the mounting holes drilled through the wing and mounting block. Wing is then removed and the block holes tapped for the 1/4-20 bolts. The wing mounting holes are opened up to obtain a clearance fit for the mounting bolts. If you want, you can apply thin cyanoacrylate glue to the mounting block threads, and after the adhesive

cures, run the 1/4-20 tap through the holes to clean up the threads. It may or may not strengthen the threaded portion of the blocks, as I never had a failure prior to using the cyanoacrylate, but it does give one piece of mind.

This completes the airframe construction.

#### COVERING

All surfaces were given a final sanding in preparation for covering. I used the recently introduced Coverite Preprimed Micafilm for the covering material. All surfaces to be covered were given a coat of Balsarite (Coverite), and the Micafilm was applied in the same manner as the other mylar covering materials. Because Micafilm does not have an adhesive backing, it is necessary to apply Balsarite to the underside of the material when overlapping the seams. This is no big deal and is easily done by using a small paint brush and running a bead of Balsarite to the underside of the material that overlaps. The seam can then be sealed with the iron. You don't have to wait for the Balsarite to dry. The Micafilm goes on easily and goes around compound curves like nobody's business. It shrinks up nice and tight, and doesn't warp the surfaces.

If this material is as good as the rest of the Micafilm line it will be great, as I have a glider that I covered with clear Micafilm three years ago and it has yet to show a sag or wrinkle! And I have carried it with me on trips to Florida and California.

The control surfaces were hinged with the material supplied, and installed prior to painting.

In order to have more leeway with the paint scheme, I went with the "Home-built" version. Finish used was acrylic enamel with hardener, and it went on so nicely that only one spray coat was required for each color. Since the Micafilm is preprimed, a primer is not necessary. A word of caution: clean ALL the surfaces to be painted with a cleaner such as Dupont Prepsol 2 prior to painting to get rid of those greasy fingerprints. I didn't do this (I only wiped it down with a damp rag), and much to my chagrin, the paint lifted off in a couple of places when removing the masking tape. Those areas that lifted off had a beautiful fingerprint on the underside of each piece of lifted paint!

I wanted to use the new Coverite Black Baron brushable paint now available on the mainland, but wasn't able to obtain any out here in the Hawaiian islands. Oh well, maybe next time.

#### FINAL ASSEMBLY

The pilot and seat were assembled, painted, and installed. The canopy was trimmed, fitted, and installed. Canopy fit was excellent and installation was no problem.

The nose gear, engine breakaway plate (which I sealed and painted during the finishing process), and engine were next installed. Servos, receiver, and battery pack were installed and located in the areas called for on the plans. The hard balsa pushrods and connectors



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were assembled, and the elevator and rudder control horns installed. All pushrods were installed and connected to their respective servos. The aileron servo, pushrods, main landing gear, and wheels were installed which completed assembly of the model.

The wing was assembled to the fuselage, and with the prop and spinner installed plus an empty six-ounce fuel tank in position, the balance was checked. The plane balanced at the CG (center of gravity) with a slight nose down attitude . . . beautiful!

The engine used is a Super-Tigre .25X with the Stu Richmond muffler mod. This mod consists of performing a hemorrhoidectomy to the muffler outlet. The standard size outlet restricts the engine breathing, so the tailpipe is cut off, the hold drilled and reamed for a thin-walled, 3/8-inch diameter brass tube which is pressed in. This mod does not increase the engine noise by any noticeable degree, nor is the idle affected, but it sure does increase the revs at the top end!

The radio gear is my trusty Kraft Series 74 KP7Z, with KPS-14 servos, and a Sanyo 500 mah battery pack. The servos are mounted three-abreast on servo rails with room to spare. The only mechanical interference encountered was with the left-hand aileron control horn hitting the rudder servo pushrod connector. This was fixed by screwing in the aileron horn connectors a couple of turns and cutting off the excess aileron horn.

#### FLYING

All-up, dry weight (less fuel), ready-to-fly is 4 lbs. 4 oz. The propeller used is a Zinger 8-5.

The first flight was short and uneventful: the plane tracked nice and straight and was airborne after about 75 feet. During climb-out, the engine started to sag, so I throttled back to half throttle and brought the plane around for landing. Halfway back on the downwind leg, the engine died, so the first landing was dead-stick. The glide was very good, and the landing was no sweat. I did notice that the nose was a little heavy, and I had to crank in a bit of up trim. The Super Tigre engine was brand new and this was its first flight. I took off with what I thought was a rich enough needle valve setting. I even held the plane vertical (nose high) with throttle wide-open prior to takeoff and the engine didn't sag. The needle valve was opened a bit more and the nose high, throttle wide-open test was run again, and it was held in this attitude for approximately 30 seconds with no engine sag.

The second flight went very well. Axial rolls are a bit slow, and the plane tends to dutch roll rather than do a true axial roll. Roll speed can be increased via the aileron control horn adjustments. The plane tracks nicely through inside and outside loops. Four-point rolls, surprisingly enough, are fairly good. It doesn't knife-edge too well as it wants to kick out, probably due to the wing dihedral. It can be held in knife-edge, but it takes a bit of work.

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played no bad habits.

The plane was flown several more times for the in-flight pics. Unfortunately, my son Perry, who is my regular photographer, was not available. Club members Jack Arnold, Terry Nutt, and club pres Mike Slater graciously volunteered to take the color in-flight photos.

Dave Cowan, mode 1 pilot *extraordinaire*, flew the plane while I took the B&W photos. Dave not only flies R/C, but also flies DC-9s for Hawaiian Airlines... a very talented and all-round nice guy (he even makes the trophies for our club contests). We count ourselves extremely fortunate to have Dave in our midst.

After the photo sessions, I tried a couple of terminal dives (power dives?) to see if: 1) there was control surface flutter at high speeds; and 2) if the wings would come off or part company. Well, there was no evidence of control surface flutter, and the wings held together even when putting it into several consecutive snap rolls immediately after pulling out of the dive. Those 5/16 inch square spruce spars really do the job.

The plane sets on the runway at a slight nose-down attitude. Consequently, the aircraft leaps into the air when rotating to a takeoff attitude. This nose-down or negative attitude does let the aircraft stick on the runway when landing.

I followed the instruction book exactly and made no modifications to the airframe. If you do decide to build a *Jr. Tiger*, leave it alone, as it does not need any structural mods, and I don't believe one can improve on its flight characteristics or strength a whole heck of a lot.

The Super Tigre .25X is a real honker with an excellent idle. Although the instructions call for an engine as small as a .15, I feel as though performance with a .15 would be marginal.

At the beginning of this tirade, I

mentioned that the *Shoestring* had lots of little pieces, etc. Well, the *Jr. Tiger* still has quite a few small parts, but not nearly as many as with the *Shoestring*, and ALL the parts fit very well.

The only criticism that I have is the plastic wing tips as mentioned earlier, and I agree that is pretty nit-picking. The die-cut ply parts are great as long as the dies are kept in good shape. If not, it could be a real chore to get the parts out of the sheeting.

#### SUMMARY

This little jewel is a real thoroughbred, and I wouldn't hesitate to recommend it to anyone who is ready to step up to a low-wing aileron trailer. This plane has more going for it in the way of aerobatics than a lot of so-called aerobatic airplanes on the market today. Here on the islands we call it an *OHOAA*. That's Hawaiian for *One Heck Of An Airplane*. It appears as though Goldberg has a winner here. You can't go wrong with this kit!!!

Aloha, Al Tuttle, MBMM.

Soaring . . . . . Continued from page 24

flow separation. This could have the same effect as washout. The unswept wing tips used to be described as "vortex expanders" because they supposedly did just that... a handy thing for a beginner to have, but not the kind of thing to increase L/D performance or minimum sink. See Figure 2 for an illustration of this effect.

As for improving the performance of the sailplane, vortices have to be minimized. If tip stalling is a problem, check for poor flying technique and warps in the wings. The goal here is efficiency. The tip designs in Figures 3, 4, and 5 all tend to move the vortex away from the lifting area of the wing, and they tend to decrease the strength of the vortex. Figure 3 is the true Hoerner wing tip as found on modern Cessna power planes. Figure 4 is a wing tip design made popular by the Austrian *Dassel* and *Feil* designs seen at the 1979 F3B world champs in Belgium. (The *Feil* is the current world speed record holder.) Figure 5 is a wing tip design found on many modern German F3B ships, most notably those of Dr. Helmut Quabeck.



They all work, but types 4 and 5 are easier to construct.

That's my opinion, what's yours? Let's collect opinions and facts on the subject of wing tips and air them through this column . . . how about it?

Let's get on with other topics.

#### NATIONAL RECORDS, LSF LEVEL V

Leave it to the guys who have been in the hobby a long, long time to have the enthusiasm and desire to do great things. Case in point: I recently received a phone call, then a follow-up letter from Dick Everett (a modeler since the '30s) who was co-conspirator in several notable achievements. His letter was in the form of a photo-copied portion of a newsletter (I think) wherein he described the following events:

**"WALLOCK DOES IT AGAIN"**

"On the second of May, he (Gene Wallock of P&W fame, part-cutter for many fine sailplane kits including Pierce Aero kits, and modeler of many years. wrf) magically obtained a sanction for sailplane record trials. He immediately suggested that I apply for a CD license and assist him in running the trials. Assisting Gene means he directs you to do all the work his way while he chuckles up a few jokes by the million.

"Glendora Canyon Road was selected for the trials site, so a trip had to be made on Thursday to check it out. Bob Champine (Fourth man through the sound barrier and career test pilot, also an LSF Level V aspirant in search of an eight-hour slope flight. wrf) and Dean Landreth got off fairly early, each trying to see how many attempts they could make, and both soon found some fair air and managed good flights. Bob Champine did 2:58:00 and Dean almost four minutes. Dean had to leave early this day, but Bob decided to practice. His next flight lasted nearly six hours before he lifted his boards and landed a half-hour after sunset.

"The following day, attempt after attempt was made with no success, until son Dennis decided to try a model concocted the night before: an *Olympic II* fuselage and tail and a Standard Class (100-inch) Eppler 211 wing. This was done at 12:02:03 (slightly after noon) because the record for Standard Class at that time was six hours plus.

"After some really excellent saves, soaring very close to the cliff, and at one time 100 feet below the road we were standing near, he managed to work it up so high that he lost sight of it momentarily, only the sun flashing off the chrome tape on the leading edge allowed him to pick up the model again, visually. From then on, he didn't allow the model to get so high.

"At about eight in the evening, the sun had been down almost an hour, Dennis decided that if he was going to land the model within 100 meters of the launching spot, that he'd better land! He spun it down, then had a hard time seeing the model below the horizon, but a five-cell flashlight showed the model the way home for an eight-hour, six-minute, and 43-second flight. Two

# GREAT GIFT

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new records for Standard Class and Modified Standard Class had been set.

"On Saturday, 'Cinco de Mayo', the wind came up early. Dean Landreth got off at 8:45:45, followed by Bob Champine at 9:07:52, and Paul Altenhoff at 9:09:50. Soon all three were up, up, and away.

"There were some tight, low passes (several), and an attack by a red-tailed hawk . . . but the fliers landed with Dean's new record for Two-meter Class of 9:59:02, Bob's Unlimited Class record of 9:53:10, and Paul's LSF Level IV, four-hour flight.

"Other important achievements besides Paul's were Trent's four-hour-plus flight for an LSF Level IV, Dennis' two-hour-plus flight for Level III, Dean's eight-hour-plus flight for Level V, and Bob's completing his Level V requirements with his eight-hour-plus flight."

Congratulations to all you dedicated R/C soaring types who endured so many hours on the sunny and windy slopes. Thank you Dick Everett for sharing your experience with us.

#### STAN WATSON'S SUB-20 F3B RUN

I received a very nice letter from Stan Watson, 3402 Hickory Lane, Hazel Crest, IL 60429, in which he relayed the account of his fastest-ever speed run through the 150-meter F3B course (four laps for a total of 600 meters).

"Well, Bill, I finally broke 20 seconds in an official contest. Yep, 19.60 in good air, with a good model, from a good winch. No secrets, right? The model is as it was in 1982: two servos driving elevator



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and coupled rudder-aileron. And, as you once noted, 'no glide slope control.' "

PEGASUS 116 — 19.60 SECONDS

MAY 20, 1984

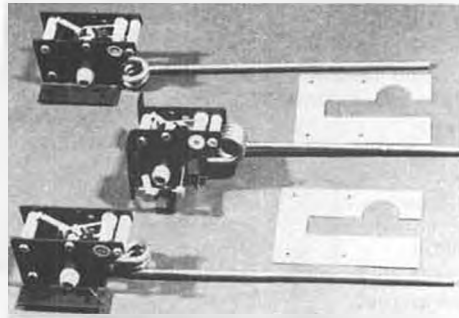
BY STAN WATSON

"The Pegasus series has been characterized by T-tails, large horizontal stabilizers, and long tail moment arms. Large models were the first made, and have been successful in cross-country work, perhaps as a result of the characteristics listed above. Versions were made in the 160 to 184-inch span range, with aspect ratios from 13 to 22, and all have been successful.

"The most recent development work has been on F3B models. I began with

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<p>1938 <b>POWERHOUSE</b> • • \$39.95</p> <p><b>50" SPAN 380 SQ. IN. 32-38 OZ.</b> <b>3 CHANNEL .09 TO .15 POWER</b></p> <p>"SERIES 50" Kits are Full Kits with Machine Cut &amp; Sanded Parts, Formed Landing Gear, Partial R/C Hardware, Detailed Full Size Plans, and Printed Assembly Instructions. (2 or 3 Ch R/C Gear Req'd.)</p> <p>COMING: 54" Quaker; 48" Flybaby; 48" Miss America; 48" Cleveland Viking; 50" Cleveland Cloudster.</p>	<p>In addition to the Just Released New Ruler, the following partial kits are also available.</p> <p>The 1936 FLYING QUAKER (Megow's) 84" \$21.50 The 1937 QUAKER FLASH (Megow's) 67" span \$17.50 The 1937 "LONG" CABIN, 78" span \$20.00 The 1937 AIR CHIEF (Ideal's), 61" span \$20.00</p> <p>Partial kits are Rib, Tip, and Former kits. They feature Machine Cut and Sanded Parts, Full Size Construction Plans, and building notes. They meet SAM FF and R/C requirements.</p> <p>COMING: 120" KG-2; 84" Miss Delaware; 96" Lanzo RB</p>
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100-inch versions with full-span flaperons, then lengthened the span, fuselage, and increased the stabilizer size to the present configuration. Most F3B models have stabs with areas about 10% of the wing area. The Pegasus 116 has a stab of about 15% of the wing. While this helps 'control' the E193 in the speed run, the duration and distance performance is also aided by this extra size. Average speeds in contests don't seem to suffer at all, perhaps because of the sense of confidence that comes from flying a model that is so stable that even beginners find it fun and relaxing to fly.

"Some of the 'specs': dry wing loading of 16.5 oz/ft<sup>2</sup>; speed (ballasted) loading: 21 oz/ft<sup>2</sup>; wing area: 1038 in<sup>2</sup>; wing span: 116 in; wing aspect ratio: 13:1; airfoil: E193; stab airfoil: NACA 0009.

"I have had lots of success with this design: I won the LSF Grand Championship in 1983 (best combined speed and duration score), finished LSF Level V, and at our club contest on May 20, 1984, became the first American to make a speed flight under 20 seconds, 'officially.'

"I owe thanks to members of both

S.O.A.R. and S.F.V.S.F. for help over the years. Mike Bame graciously spent time and effort in cutting cores for the wings, and I was given lots of information on winch design by Dave Peltz, Alex Bower, and Bill Forrey. Jack Hiner and Dan Pruss have been advisors and 'devils advocates' over the years. Roger Roth and Rick Shrameck were helpful in discussions of the winches and launch techniques used at the World Championships. Last but not least, I must thank the 'thermal god' that is so important in flying speed, as we all know. To quote an old sage (was it Dave Thornburg?): 'They all look good in lift.'"

### DR. CHRIS ADAMS' CF SPARS

For those of us who have been around in R/C soaring for a few years, the name Chris Adams is a familiar one. He was very active in the '70s on a national level, and was one of the first five or six Level Vs in the League of Silent Flight (LSF). Well, several months ago, Chris sent in a really handy hint for you guys out there who are looking for easy ways to beef up kit models or original designs with carbon fiber (CF). I'll let Chris explain:

"I have been using carbon fiber spars in my two-meters and larger F3B ships, and I'm using an easy method to obtain long samples. I use the Flite Spars manufactured by Mark's Models. Originally, they were sailboat battens for full-size sailboats, and now many use the entire spar in their wing structure. This seems to be a bit of an overkill, so I've modified their use. The spars consist of a foam sandwich of carbon, approximately 1/64 thick, on either side of white foam (see Figure 6). The spars themselves are great substitutes for spruce spars, however, if used as a lamination with a spruce spar, the spruce allows one to glue sheer webs and ribs to the carbon better.

"To prepare the carbon, take the carbon spar and slice it down the middle to separate the carbon layers. I then take a razor plane and shave off the foam, then wet sand the residual foam off. This roughens and prepares the carbon for gluing. I should mention that the carbon sanding should be done outside and with gloves as the carbon particles are quite itchy. I've also used a Dremmel sanding drum to prepare the carbon surface, but one has to be careful not to sand through. The carbon fiber is also dangerous when it splinters, and it will puncture your skin more easily than a needle. The carbon strip is then glued to the spruce spar. I use Hobbypoxy II.

"The Flite Spars represent a readily available source for cured carbon in large lengths appropriate for model uses. The sizes are: 1/4 x 1/2, 3/8, 1/4, and 1/8 x 1/2, 3/8, 1/4 by 48 inches and are obtained from Mark's Models, 1578 Osage St., San Marcos, CA 92069."

Thank you, Chris, that was a valued contribution.

### AIRFOIL OF THE MONTH: EPPLER 212

This month we have a special treat. The "Eastern Soaring Lines," newsletter of the Eastern Soaring League, Gordon Stratton, editor, featured in its May 1984 issue a very interesting article authored by Dr. R. Eppler, the noted aerodynamicist and low-speed airfoil researcher. It really is a commentary on several airfoils, not just the E-212, but I think you will find it interesting:

"Some Comments on Airfoils by Dr. Eppler

"The following has been excerpted from a letter from Dr. R. Eppler to the ESL's 'Woody' Blanchard. The coordinates for the Eppler 211 and 212, and the Quabek 2.5/8 and 2.5/9 were previously published in the March 15th newsletter.

"Concerning the Quabek airfoils, I include some computer results. These airfoils seem not to be developed by my program as the coordinates are not smooth. I had to do a lot of smoothing until I got the included results. You see the following differences to my airfoil 211, which was developed for unflapped F3B models:

"A) Both HQ airfoils are better for lift coefficients greater than 0.2, but less than 0.7.

"B) Both HQ airfoils have, for Reynolds numbers equal to 50,000, one lift coefficient without bubble warning

( $C_l$  approx = 0.75). For this special point, they are probably much better than the 211. It should, however, be noted that the area without bubble warning only seems to be relatively large for HQ-2.5/9. This airfoil shows for  $R_n = 50,000$  already severe separations on the lower surface below  $C_l = 0.6$ , which reduce  $C_l$ .

"(C) Airfoil 211 is much better in  $C_l$  max, and around minimum sink and optimal glide. It has a better  $C_d$  there, and less bubble warning.

"(D) Airfoil 211 also covers a much wider area of lift coefficients at the lower end of the polar. This was designed specifically for F3B models. The bubble warning of the upper surface does not matter in this area as it concerns only the trailing edge. The HQ airfoils have a little less warning at the lower surface for  $C_l = 0.25$ , but much more separation there. All airfoils have been analyzed for the same lift coefficients. Where they show no points, they have a separation before 40% chord.

"Of course, (this) information concerns the exact profiles. I cannot judge if one or the other airfoil is less sensitive to production errors. Moreover, in a contest, the airfoil contributes little compared to the pilot. (Amen to that, wrf)

"If you look for a precise airfoil which is good for medium  $C_l$  ranges, which is very important for normal, 'flying for fun,' I would recommend more my airfoil 212, which was designed for this application."

So there you have it: a comparison by Dr. Eppler of the Dr. Helmut Quabeck airfoils and the Eppler 211, plus a description of the applications for this month's airfoil. Take that and run with it!

#### CONTESTS COMING UP

Again, I would like to offer this space on a monthly basis for contest announcements of some importance (estimated turnout of 50 or more fliers). Ambitious CDs would be wise to get the relevant and vital info to me at least three months in advance of the event. I have decided not to limit the amount of advance notice (up to six months) as the response to this offer has been light.

I have two announcements this month, both from California. The first is a really important contest for sailplane pilots in the western states. It has become a classic event over the last 12 years that it has been held.

The second special event is a one-design contest. One-design contests are a lot of fun to fly in because they pit the building and flying skills of the fliers against each other without the variable of glider design. This is a real test of ability because everyone is on a more-or-less equal competition baseline.

#### VISALIA, CALIFORNIA

The annual Fall Soaring Festival will be held on October 6 and 7 at the CVRC field: Shrik Rd. and Goshen Ave., Visalia, California. Entry fee will be \$15 before September 1 and \$18 after this deadline. The events will be AMA sanctioned AA Task T4: two rounds of three flights to total 15 minutes, with spot landing.

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The person to contact for this event is Fred Hover, 1228 Seeger Ave., Visalia, CA 93277. You may also contact the assistant CD, Phil Hill at 13401 Avenue 328, Visalia, CA 93291. Fred's phone number is (209) 733-9099, and Phil's number is (209) 625-0245. BERMUDA DUNES, CALIFORNIA (NEAR PALM SPRINGS)

The D.U.S.T. club is hosting the Buzz Waltz El Primero One-design Contest and beauty event for same. The date is set as Sunday, December 2, 1984, with sign-ups beginning at 8 a.m. The beauty event will be judged at 9 a.m. and the top three most beautifully finished models will win prizes. The flying will begin at 10 a.m. Thermal events will be three-minute, five-minute, and seven-minute precision duration. Launching equipment will be provided: hi-starts. Landing points will be earned by flying through a gate on approach to a runway with 25, 50, 75, and 100-point graduations. Fly-offs (if needed) will be won by a max flight from three hand-launches (max time to be determined by CD at the time of fly-off). There will be many merchandise prizes for first (a four-channel radio system) through fifth places. Any questions regarding the contest should be directed to Dan Metz, D.U.S.T. club president, (619) 568-3327.

This is one contest I wouldn't miss! The El Primero glider is a very reasonably priced two-meter at \$24.95, and it is a high quality glider with its machine cut and sanded ribs (no die-cutting). Its

large size stab makes it a stable beginner's plane, or a relaxing expert's "fun plane."

#### NEXT MONTH, I SWEAR!

I will get to Dave Peltz' report on the new FAI and AMA rules (or lack thereof), so just be patient. Also, the latest in high performance cross-country ships from Larry Jolly Model Products will be featured... it's incredible to say the least! So, stay tuned to that Thermal Sniffer and find that thermal!

#### Electronics . . Continued from page 25

pieces. Because in any event, the end result is that, friend, if you lose control of your airplane, you are going to crash!

Let's look at the individual options; the "last given command" and the "preset command" modes. Can you think of any possible combination of control settings under which your airplane is going to land itself, or at least come down in an attitude and location where little damage will take place? I don't know of any!

The everything-to-neutral mode might do you some good, if you are flying a model with enough built-in stability to allow prolonged straight and level flight without any control input. But how many of those are around? The very high maneuverability that we demand in our airplanes also effectively cancels out such high degrees of



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stability. And something else appears to think about at this time, should all those ideal conditions be met. Supposing such a failure occurs soon after takeoff, with a nearly full gas tank. Even at half throttle, most models will maintain altitude, and in spite of the lower speed, by the time they do come down, they will be at least in the next county, if not in the next state. Best to crash within sight and salvage the pieces, wouldn't you think?

There is yet another feature, this one a complete new one, worthy of a second look from this critical viewpoint which we have adopted this month. This is an automatic servo check system, by which, upon the actuation of a switch on the transmitter, sequential movement of all servos, and controls, take place, supposedly telling you that everything is working and doing so normally.

Not so! It is possible to do this, and it is being done, all electronically, providing no test at all for the mechanical integrity of the all-important stick assemblies or for the actual movement of any given control surface in the proper direction.

Wrong input is a definite possibility in this day of switch operated servo reversing, and when many of us fly more than one airplane with the same transmitter, thus adding to the possible confusion.

There is still nothing that will save you from an in-flight failure, but you should at least give yourself all the possible chances by taking off with everything working properly. This should include a range check before the start of every day's flying activities, and a control check before every flight. It should be the last thing you do before the airplane is released, and should include the individual check of each control, not only for movement, but for the *proper* degree and direction of movement, in both directions. When I say proper movement, I do not mean that you should be satisfied to see the surfaces wiggle. You should accustom yourself to think out the action and its effect, such as "left aileron up, right aileron down: left turn", to coincide with movement of the aileron stick to the left.

Having an electronic genie to run the controls back and forth is not a sufficiently safe control check, and it should not be solely relied on. Since the Wrights, or at least very soon after, pilots have been making control checks. Can you afford not to do so?

All of this is not to say that we should stifle R/C equipment development, or not to accept something simply because it is new. I am suggesting only that we carefully evaluate these and other new features that will surely come along, with a view as to whether or not it is something that we can use to either improve our flying or to add to the life of our models. If it is a worthwhile feature, our manufacturers will keep building it in, and possibly even refine it. If not, thumbs down!

### SERVO UPDATES

This month, we heard from one of my

favorite countries. Frank Higgins, of Tauranga, New Zealand had this to say:

"I have a number of W.E. (World Engines) S-12 servos that have been redundant for a number of years. Is it possible to use the mechanics and motors with a modern servo amp, i.e., Ace? The motors are all three ohms. I would only use them in thermal soakers so power would not be a problem".

First I'd like to say that if one of your major problems is deciding where to go on your next vacation, I'd like to recommend New Zealand. I can promise that in those two relatively small islands, you'll find any scenery or climate that you like, from hot springs to glaciers, from beaches to mountains. Plus you will find some of the friendliest and most hospitable people in the world. It doesn't take long to learn the language either: a "round-about" is a traffic circle, a "serviette" is a napkin, and if someone offers to "shout", you don't have to cover your ears, he is merely insisting on paying for the next round. The "birds" are exceptional, and eating fish and chips out of a newspaper on the banks of the River Avon is a gourmet meal without comparison. I was there many times, back in my Air Force days, flying the "Globies" down "to the ice" (the C-124 Globemasters down to the Antarctic). Sigh. . .

Anyway, to answer our down under friend Frank, yes, with some considerations. First, the feedback pot. The Ace servos use a 1.5K ohm pot, and the amplifier is designed to work with that value to give the desired 90-degree output shaft rotation. Any deviation from that will affect the output; higher resistance will give you less travel, and vice versa. I do not know the value of the pot in the WE-12's, but if it is of the above value, you are home free in that respect.

As for the motor resistance, that is a little lower than is commonly used with most of today's servos. However, the combination will work, and will do so a little faster than it did with the old amplifier, though some increase in current consumption may be expected. I really haven't made this type of conversion, but it might be worth experimenting with a resistor in series with the motor to reduce the overall current drain. Some reduction in speed will also take place, and I do not have any recommendations as to the size of this resistor, except to start with a total of 10 ohms (motor and resistor), and try different combinations until the lowest current drain that will also give you usable speed and power, is reached.

The other thing to watch for is servo motor noise. The way to test for it is to make use once again of that extremely useful antenna-less or antenna-down ground check. In this case, use two of the original servos, set the system outside on a non-metallic support with the receiver antenna extended, and walk away until you lose solid contact.

Then, replace one of the standard servos only with a converted one. Operate the control into which it is plugged,

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and look for movement or twitching of the other servo. Obviously, it'll help to have a long balsawood arm on the servos, so that you can see movement at the distance involved.

If there is no reduction in range from that previously obtained, nothing further is required, you've been living right! However, if operating the converted servo causes movement in the other one, you're getting some motor noise back into the system.

The cure is relatively simple, and involves only installing some small ceramic capacitors, .001 mfd will do nicely, across the motor contacts, and ground them to the motor body. Many servo motors have a ground lug, on others you will have to find a solderable rivet or screw to connect to, as the motor body itself is usually made of aluminum, and will not accept electrical solder. Do not use acids or corrosive flux solders!

Two different installation diagrams are shown. I would first try the one using only one capacitor, for simplicity's sake. It is usually sufficient to quiet down most motors, if it doesn't do so, then try the more elaborate (by one capacitor) circuit.

Frank also wrote "By the way, without wishing to stir up an old argument, for your satisfaction, I have it on good authority that 90% of all R/C flyers in N.Z. fly Mode 1. It's the only way to go". Nope, we are not about to stir up any old arguments, though I told you that those Kiwi's are great people, didn't I? (No argument that they're great people, but the reason they fly Mode 1 is to compensate for being south of the Equator! wcn)

### ABOUT M.E.N. CHARGERS — AND THINGS!

I'll bet you though Canton is in Ohio, didn't you. Well, so did I! Either we are all wrong, they've moved it, or there is more than one. Anyway, we heard from Ralph Croaning, in Canton, South Dakota, who wrote:

"I'd like to comment on some things

in different columns. First off you mentioned the MEN charger and referred to a review of it. So far so good, but in the review, it states that you can 'leave it plugged in and forget it and it will continue to slow charge your batteries at a safe rate until you are ready to use them later'. Later the article specifies that the slow rate is 40 mA. I do not classify this as a safe rate for extended periods for anything less than a 4 AH pack (c/100 rate). Comments?

"Secondly, you mentioned somewhere that you liked the Goldberg servo connectors but didn't like to trust a 4-40 screw to hold your primary controls. Good thinking . . . BUT, if you throw away the screws that come with the connectors and substitute 4-40 cup-point set screws, they will dig into the wire and hold as if they were welded! A drop of light-duty Loctite (if you are a real fanatic) will ensure permanence but will still allow removal when necessary. While on the subject, I don't know what you use for pushrods, but if you are using music wire, I have a suggestion for you. The "spring" to music wire will tend to make pushrods or aileron torque rods vibrate and contribute to wear or to flutter of the surfaces. A 'dead' or untempered wire will minimize this effect, and will also allow adjustment bends to be readily made. I use either gas-welding rod or the "stepped" bicycle spokes (which go to 1/16" in the unthreaded part) and can recommend either of these unreservedly. Although I have not gotten into 'Giant' models, I have used this setup with up to .60 power with absolutely no problems and I go back to Esquires and Babcock 465 mHz equipment, so you would think something would have surfaced by now if it were going to!"

First things first, the MEN charger has been mentioned twice or maybe three times in recent months. As is often the case, the initial mention brought more comments and letters which were dis-

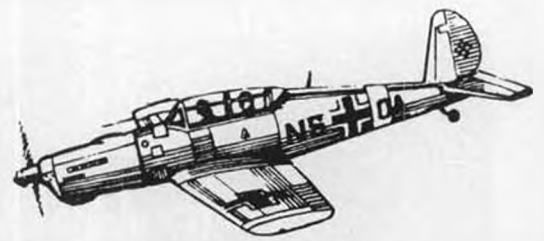
cussed in subsequent columns. I must agree with Ralph, after all you don't argue with formulas, and in the last mention of the MEN C50/4 charger (August '84), I did mention that the rate of this charger in the slow function is too heavy for the average 500 mil pack. This is an excellent charger, for what it is intended to do, but in the case of a true "trickle" charge to be maintained for long indefinite periods, the battery makers recommend from a C/25 to C/100 rate.

Now, as Ralph says, secondly . . . did I say that? Well, yes I did, and while his comments are slightly out of the general subject of this column, anything having to do with the safety and longevity of our models, is *not*, so they have been included. Again, Ralph is right, and can prove it with years of experience . . . to those of you newer to the hobby, the Babcock equipment mentioned was in use in the 50's. I would only add a couple of general recommendations. One of which is to keep the wire part of any pushrod as short as possible, as a further aid to keeping down vibration. And, in going through servo arms or control surface horns, keep those bends as straight as possible, and adjust the holes for a snug but free fit. No slop, no bind! •

### Aeronca . . . . Continued from page 13

stab outline, and dihedral. Plans are quite accurate, as they were developed from dimensions taken from the real aircraft. The span had been reduced to increase wind penetration (by raising wing loading), an important feature when flying rudder-only. The stab area and dihedral had been increased to improve stability. Dotted lines provide the necessary modifications for scale outlines. Control surface hinge line locations are fairly easy to guesstimate. Other mods to suit modern construction materials and adhesives are up to the

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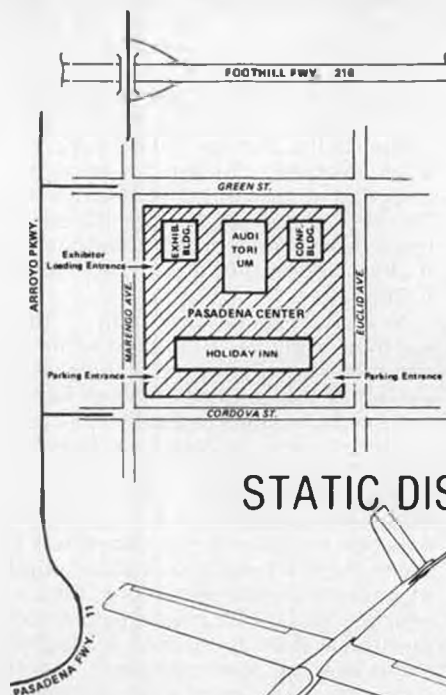
**JANUARY 12 & 13, 1985** Saturday 10 AM - 6 PM  
Sunday 10 AM - 5 PM

## Pasadena Center, Pasadena, California

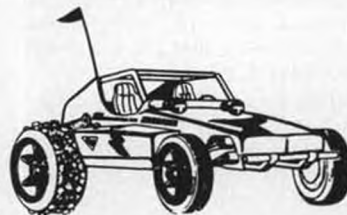
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individual builder.

If any of our readers would like to see other "lost" designs from the old *Air Trails* publication, or have full-size plans they would like to share with other readers, drop me a line. Famous designs never die, they just fade away for a couple of generations, only to return again, just as new now as they were then . . .

**P&F&CT . . . . Continued from page 19**

Willie batted her eyes (she does have pretty eyes) and said, "Sylvester showed me a good piece of his efforts that was really fair! In fact, if he doesn't smoke too many fags, doesn't drink too much grog, and doesn't horse around with the Shielas, I think he would be great china plate!" Again, I got confused at this foreign language and figured it was time to return to The Lads and ask Sillie what this "good piece" was! To compound my confusion, as we left the Sanctum, Willie remarked, "You will really like this piece . . . fair dinkum!" Shaking my head, I dove into the convenience room for a moment of recovery from Willie.

When I came out, Willie was in number one listening mode as Sylvester told her of his plans for the tests he intended to run on his new thrust stand. I had last seen the thing when it was still under construction, and I have had very little opportunity to talk about it with either of The Lads. It looked rather neat, which is what I believe Willie meant when I overheard her state to Silli, "Mate, ya want drinkin' with the flies when you did this piece! It's grouse, extra grouse."

Sillie looked pleased, and said to me, "Chief, I know I told you that I was going to do these studies of engine and propeller performance, but we can also use this stand to break in engines. A brace mounted just under the front end of the suspended engine block and bolted to the legs will safely hold the engine block and provide a very rigid and adjustable mount for breaking in new engines. This is just a side use for this equipment, however. Before we get too far into this equipment, I would like to point out some details that will make the discussion a lot easier." He handed Willie and me a set of photos and drawings.

Sylvester continued, "Photos 1 through 4 show details of the stand. As you know, this stand differs from an ordinary test stand (which is intended only to hold a motor and safely run it) in that you can measure the **static thrust** (or pull of the propeller) and the engine/propeller torque. Additional data that will be recorded includes temperature, barometric pressure, and relative humidity. Knowing what these parameters are will permit the adjustment of the test data to a given standard temperature, humidity, and pressure. Throughout this discussion it must be kept in mind that we are talking static thrust, not dynamic thrust: the performance during flight,




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where the propeller is advancing at flight velocity. Again, however, this 'unloading' of the propeller in flight can be estimated and the static data so corrected.

"So, the engine is mounted on a hard-block using a Tatone Universal Motor Mount. This block is firmly supported by vertical wires to prevent vertical movement and horizontal wires to prevent horizontal movement. The streamline bar passing beneath the engine block has an oversize hole drilled in it which is a little bigger (3/4 vs 3/8) than a dowel set in the engine block. The idea is that if one of the suspension or restraining wires should break while the engine is running, this 'hole and pin' will not permit the block to leave the stand. Yet, the 'slop' between the hole and pin permit slight movement about the position of repose the block assumes when no forces act upon it. Calling the front of the stand the end with the propeller (Photo 2), the left side of the picture will be called the left side. In other words, 'left' or 'right' assumes the viewer is in cranking position for starting the engine. Using this convention, the torque balance is to the left in all photos, and the static thrust balance is to the right.

"The balances are quite conventional in design, balanced on knife edges, etc.,

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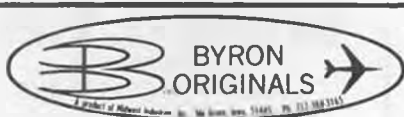
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except they apparently have no balancing weights to 'zero' the beams. This function is provided by the torque and thrust main balance weights shown in Figure 1. These weights also provide a damping function to make data-taking less difficult. In Photo 4 the beam balancing lights, switch, and battery power supply are shown. These lights indicate when either beam is balanced by their manner of blinking. All wires shown are for suspension and/or restraint except the two vertical wires running between the main balance weights and the balances. The suspension and restraint wires do a very good job, making the block quite impossible to move in any direction except front and back (thrust axis) and a rotation about this axis (torque). These movements must be



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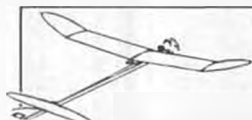
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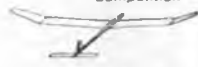


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made without effort if good measurements of thrust and torque are to be made.

"Looking at Figure 2 shows why up and down movements and right/left movements are not possible. The wires labeled S in this figure may be located in Figure 1, where similar wires located toward the block rear prevent any 'yawing' of the block. The thrust bridle and the 45° stay at the rear complete the suspension and restraint wires. There will be more on this 45° stay in just a moment." Silli stopped talking and went over to the water cooler. Here was my chance to offer my two bits worth towards poking a hole in his thrust machine!

"Silli, old buddy, I can very plainly see that you have a suspension that will support the engine nicely. However, you are using a Tatone mount that will fit an engine of almost any width. As only one lug is movable on the Tatone, I assume you have to measure K for each engine." I started out, smugly. "I can see that torque can be measured by a force X multiplied by a moment arm R, but, if H changes all over the place, I think the whole machine falls apart when H is any value but zero!" With this excellent thrust, I went to the water cooler to see how he would parry. Much to my sur-

prise, it was Willie that leaped to the defense, and believe me, a 'roo can LEAP!

"Apparently, Mr. L, you have overlooked the fact that we are making these measurements with beam balances!" Willie started off with her lovely eyes flashing! "Consider, please, Figure 2. What is the torque about the shaft? Of course, it is Torque = (-X/2)(-R) + (X/R)(R) = XR. Also, it is at once intuitively obvious to the most casual, unlearned aborigine that we are saying that the torque is the product of drag on a representative blade element times its distance from the shaft. In the figure, we were considering a blade element on each blade of a two blader. Looking at Figure 2, the point of suspension has been moved a distance H to the left. The torque about this new origin would be:

$$\begin{aligned} \text{Torque} &= (-X/2)(H - R) + (X/2)(R + H) \\ &= XR/2 - XH/2 + XR/2 + XH/2 \\ \text{Torque} &= XR \end{aligned}$$

It is obvious that this is the same torque as measured about the engine shaft. Of course, at balance the torque produced by the beam balance weights times the distance K equals the engine torque and the block is level, therefore it is the correct torque that is being measured as long as H is between zero and plus or minus R." Willie paused to

get her breath and I discovered I was holding mine! She delivered that speech without any of those foreign words and phrases that are so confusing. The truly amazing thing was she really flapped those ruby lips in the wind! Until this moment, I actually suspected her of ventriloquism, for she hardly moved her lips when talking to The Lads or me. Even P.M. Maggie would have been proud of Willie. And, as a hush falls upon The Hangar, we see that Wallaby Willie is preparing to speak!

"Still referring to Figure 2, connect the torque balance to the point indicated. The weight of the beam will produce an upward force which will try to raise the left side of the thrust block. There will also be a small up or down force because the attachment point on the block is not on the block's center of gravity. A weight W is selected to balance the beam and make the thrust block level. This is accomplished with the system's turnbuckles and the weight W. When an engine is placed on the mount, modeling clay is placed (if required) on either the end of the beam or the weight W. It is not always required, for it takes a lot (relatively speaking, mates) to move the CG enough to bugger up the system!" She looked over at me and, batting those big beauts said, "Did yer 'ave a dinkum dekkko at wat all this earbashin' 'as been about?"

I hastily assured her I understood her lecture(?) and, wondering if, perhaps, she included Martin Simons in her china plate cupboard. I looked over at Sylvester, who was pleased as a pig about the previous interchange. I asked him if he would mind continuing the discussion of the thrust stand. He implied that he would do so.

"Actually, Chief, you cut 'Our Girl' off a little early. She described the action all the way up to the point where the torque was to be measured." As he stopped and rubbed his tummy with three of his hands I wondered if he had read my thoughts about Martin! Sillie continued, "The torque arm K is three inches. Let's balance the beam, thus measuring the force producing the torque (with this three-inch arm) to counteract the engine torque. Let's say this force is 2.10 ounces. The torque, then, would be the product (3 in.)(2.10 oz) = 6.30 in.oz." He picked up Figure 3 and looked at me with a quizzical look.

"As you see, for thrust measurement we have a different problem. The engine (propeller, actually) thrust is horizontal and for the figure, to the left," Said Silli. "The thrust balance must, of course, measure only a vertical force. This means that we must turn the thrust -F ninety degrees. Also, we want only thrust force to be measured.

"First, as with the torque balance, the main thrust balance weight must be provided to zero the balance. Also we must provide the bridle B, which may be located in Figure 1. At the point of attachment, we must run a wire down to the 'floor' of the test stand, making a 45° angle, as shown. Now, pull in the

direction of -F with a force of, for instance, five pounds, which is transmitted to the 'floor' via the 45° wire. The balance is upset, requiring movement of the beam weight to a certain position F. Therefore, at this moment of beam balance, a pull of -five pounds to the left is balanced by a force of F pounds up and the remainder via the 45° wire to the floor. In Figure 3 you will note that the wire C is marked with a dashed arrow and F and -F are also drawn as dashed arrows. F and -F are components of the force vector C. As the components form a 45° triangle, the vector C can only equal the square root of the sum of the squares of F and -F, or the square root of two F<sup>2</sup>, which is 1.414 F. Since we have said that the thrust is horizontal and -5 pounds, F is +5 pounds, -F is -5 pounds, and C is 7.07 pounds. To offset the component -F of C, the force in the vertical wire to the balance can only be an upward force of 5 pounds, which is provided by the movement of the beam balance weight to the position F, which is the design position for weighing (offsetting) a vertical weight of -5 pounds. Therefore, we have turned the thrust 90° and measured it as we would a weight."

Silli, assisted by Willie, gathered up his notes and sketches. As they were doing so, Silvestor remarked, "The building of a stand such as this is not at all difficult. Care must be taken to build it strongly: bolt, glue, and screw everything together. Finish it well with something that will resist all the fuels. Polyurethane is very good for both gasoline and alcohols. Take a lot of care in the design and construction of the two balances. In fact, if you could find two lab balances similar to those used in science classes, it would save you a lot of work. In this event, they must be of the type used for the determination of specific gravity, for the problem is weighing something under the pan, not on top of the pan. If you elect to design and build your balances, build them of metal and hardwood and use a very durable knife-edge. Checking the accuracy, or calibration of the stand is very easy. The thrust and torque main balance weights have hooks beneath them for hanging known weights."

Silli pointed at the two largest weights in the weight storage rack on the "top floor" and said, "These are two-ounce and two-pound weights for checks of the stand during long run periods. Every few months it would be smart to check the full range of calibration, using a small bucket of water that is weighted on a separate balance of known and reliable accuracy." He looked over at Willie and suggested, "Why don't we go and find us a cold one?"

"Don't mind if I dew, so long's ice cold, gotta good 'head ... I miss me Aussie brew ... she's a beaut drop, kidum, now." As they passed the Hangar door and thus almost out of earshot, I heard Willie drop the outback from her speech and begin a lively discussion with Silli about various ways to modify the static thrust machine to measure dynamic thrust!



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... So, the next "P&F&CT" will describe the first data from the thrust machine. Data to be recorded will be static thrust and torque at maximum RPM for a given propeller, temperature, barometer reading, and relative humidity. The same will be done for slower RPM settings. A series of tests must be made varying each of these parameters in turn. As data is accrued less testing will be required, but the first runs will be made in a careful manner with a system of checks and cross-checks to verify our credulity in the data.

See ya in the Chicken House, y'hear? Alfred Lehmborg, 2646 Bolker Drive, Port Hueneme, CA 93041.

Counter . . . . Continued from page 9

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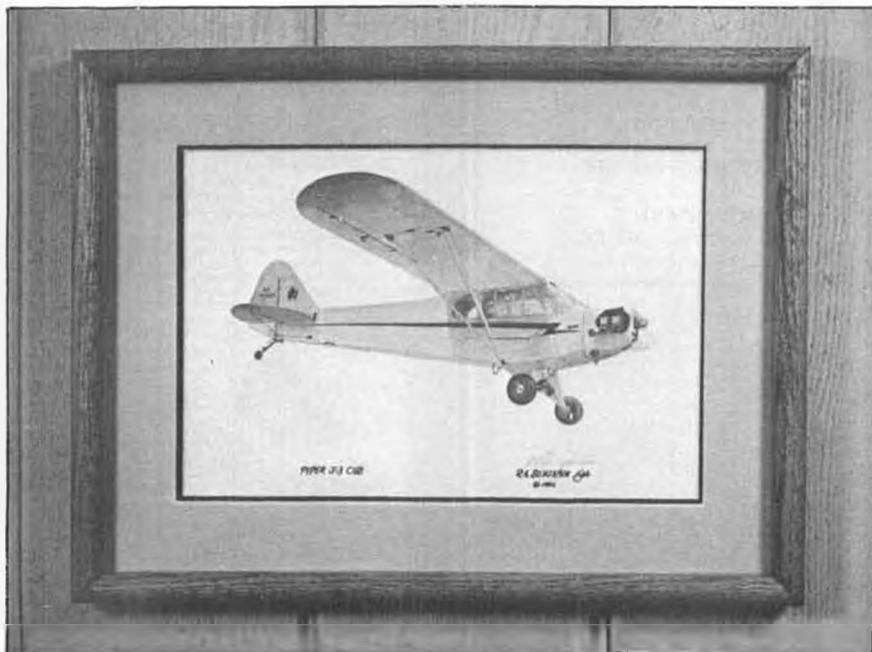
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ment engines, spans 70 inches with a wing area of 835 square inches, and requires a four-channel radio (as do all of the models). The 804M is for .60 — .90 displacement engines and spans 56 inches with a wing area of 540 square inches. Both models are fully aerobatic and are great for FAI Turnaround or free style flying events.

The Four Star 1204H and 804H are high-wing trainer models that can be painted to look like a Decathlon, Citabria, or Piper Cub. The 1204H is for 1.20 displacement engines and spans 75 inches with a wing area of 915 square inches. The 804H is for .60 — .90 displacement engines and spans 60 inches with a wing area of 589 square inches. They are very easy to fly and are extremely stable, making them excellent trainers or Sunday fun flyers.

What is it that makes these models four-cycle kits? Special attention to construction resulting in a lower flying weight; firewall positioning that allows for mounting of the larger four-cycle engines; specially designed airfoil to get the maximum performance from four-cycle engines. Kits feature: one-piece, blow-molded cowl; die-cast aluminum motor mount; formed canopy/windshield; full-size plans; paint scheme instructions; extensive hardware; quality balsa and hardwood parts.

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★ ★ ★

Robbe® Model Sport is a first-class manufacturer of R/C scale boats. This month's new products are prime examples of this fact. Firstly, we have a military subject, a German mine sweeper.

The fast mine sweepers of the Schutze class were commissioned by the German Navy in 1960. The prototype displaces 240 tons and has a top speed of 24 knots. Armament consists of one 40 mm cannon. It also features extensive special

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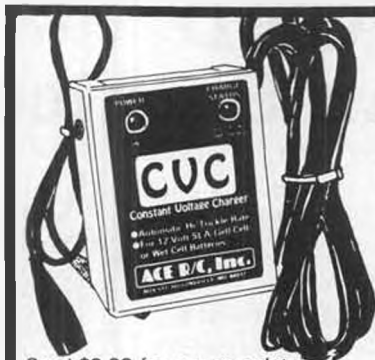
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equipment for mine seeking and sweeping.

The Robbe model of the *Schutze* is an exact replica of the original. The hull, developed from the original plans, is vacuum molded in thick ABS plastic. Parts for the superstructure, smokestack, gun cradle, and substructures are also included in the kit as vacuum moldings. The deck and other parts of the superstructure are either printed, die-cut, or sawn to shape. Extensive prefabrication of the model's components make the *Schutze* suitable for modelers who have little building experience with scale ships. An extensive set of fittings (No. 1092) containing over 240 pieces is available separately.

The design layout of the *Schutze* makes it possible for the experienced modeler to fit a wide variety of optional special functions. Working lights, rotating radar and guns, horns, sirens, diesel sound generators, and operating winch are all feasible.

The *Schutze* has a 47-1/4-inch length overall and a 7-3/4-inch beam.

Secondly, Robbe announces the addition of its 1:50-scale *Rembertiturm*, a ship that was born out of the need for a modern vessel, capable of supplying the ever-growing, offshore oil-drilling industry. Because of the harsh working conditions, the ship had to be extremely strong and maneuverable. A reinforced hull was designed for strength, and the kort nozzels and bow thrusters were provided for maneuverability. The on-board winches and crane also enabled the *Rembertiturm* to off-load supplies at sea.

Robbe has duplicated all of these working functions in a beautifully detailed scale model. The winch set (No. 1079) and the fittings set (No. 1078), further enhance the operation and detail. The spacious hull provides ample room needed to add many more special functions such as an anchor winch, three-tone horn, fog horn, diesel sound generator, lighting system, and drive unit for the bow thruster. The winch set, fittings set, and special functions sets are available separately, allowing you the opportunity to build your *Rembertiturm*

exactly the way you want it.

The *Rembertiturm* has a length overall of 47-1/2 inches, a beam of 10-1/2 inches, and a weight of 26-1/2 pounds.

Finally, if you're into offroad R/C car racing or offroad fun with a 1/8-scale gas powered car, and you want the ultimate in high-tech and high performance, then look no further: Robbe has just introduced the most sophisticated four-wheel drive vehicle available.

The *Leopard 4* was designed from the very beginning as an all-out competition car. Adjustable ground clearance, oil filled shocks, spring preload, castor angle, and toe-in adjustments are just a few of the features that allow you to tune the *Leopard 4* to any track condition. You can even use two servos to really tighten up the steering.

If it's traction you want, then look even closer. The *Leopard 4* features three full-function differentials. (Two are standard, a third is optional.) Power is transmitted through the system using super-efficient cardan drive units: no more troublesome chains and lost power. Each wheel is supported by two ball bearings. In fact, Robbe uses a total of 18 ball bearings throughout the drive train.

When you go fast, you have to be able to stop fast, so Robbe has mounted the inboard disc brake on the center differential. The results are truly proportional braking on all four wheels.

The main chassis is constructed of a light alloy material, and is designed to give the lowest possible center of gravity. Any flexing of the chassis is eliminated by the welded steel roll cage, which protects radio and engine while allowing maximum access during quick pit stops.

The *Leopard 4* is fully assembled, ready to mount your favorite engine and radio. Also available is the *Leopard 2*, order No. 3721, which comes unassembled with one differential. The *Leopard 2* can be upgraded to a *Leopard 4* at any time.

With two major wins in Germany, the *Leopard 4* is well on its way to the European championship. To find out more about both *Leopards*, see your nearest Robbe dealer.

Likewise, to find out more about the *Schutze* and *Rembertiturm*, see your nearest Robbe dealer, or contact Robbe directly: Suite 345/55, The Office Center, Princeton Meadows, Plainsboro, NJ 08536.

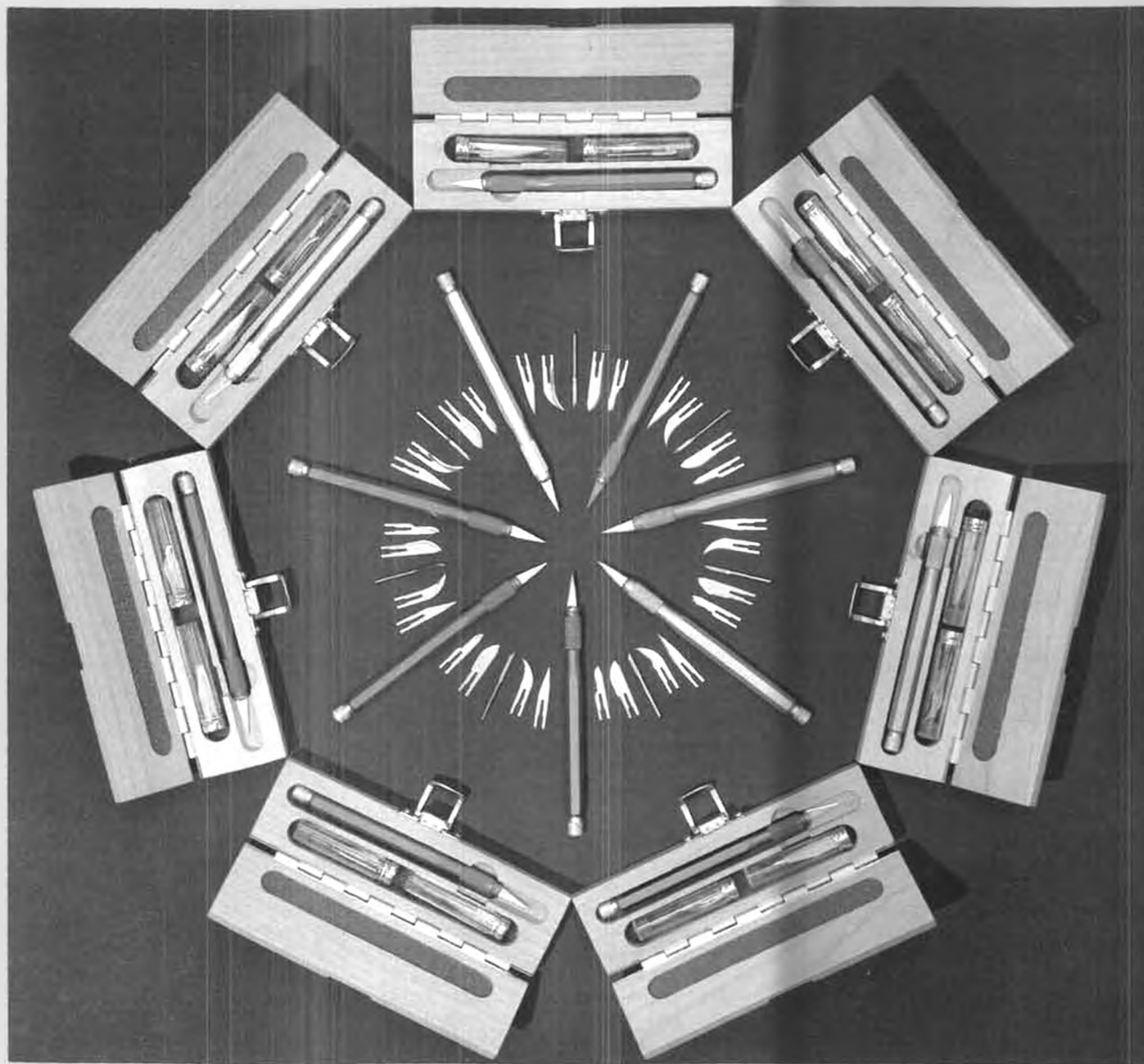
★ ★ ★

Golden Gate Hobbies, P.O. Box 4412, Burlingame, CA 94010. (415) 467-3170. has announced the availability of some really sharp-looking aircraft wheels: MK aluminum wheels, and Tetra super wheels.

The MK aluminum wheels are the "Rolls Royce" of model aircraft wheels. The wheel hubs are polished, machined aluminum. They resemble polished automobile mag wheels. A nylon center insert is installed to prevent radio noise. They are of lightweight design. The tires are of soft rubber composition providing smooth landings with minimal bounce.

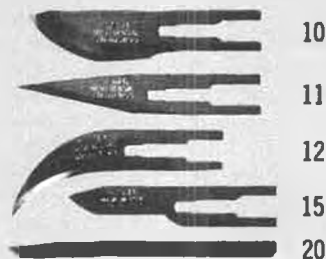


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The Tetra super wheels come in three styles. Style "U" has the appearance of a normal aircraft wheel with round side walls. Style "V" has the appearance of streamline wheels such as those used on pylon racers. Style "R" has a radial type appearance. All three styles come in the following diameters: 50mm; 55mm; and 60mm. Plastic inserts are provided which eliminate radio noise and may be drilled to fit 5/32 axles. The wheel hubs are polished, machined aluminum. Slots are cut in the wheel hubs which give the appearance of automobile mags. Behind the wheel hub is a plastic disk which may

be removed and painted or covered to match aircraft colors. The tires are of soft composition which provides soft landings and are suitable for any type of runway composition. Each tire's appearance is that of black velvet. The list price of the Tetra super wheel for any size or style is \$5.70 each.

★ ★ ★

The latest miniature boat in Midwest Products' line of Laughing Whale designs is *The Trawler*, a working scale model of an eastern rigged trawler.

This deluxe kit includes: Midwest Micro-Cut<sup>®</sup> basswood and balsa parts, simplified plank-on-frame construction, die-cut and machine-cut material for frames, deck, pilothouse, dory, keel, and rudder; all material for planking, moldings, rub rails, bits and mast; and registration numbers.

A complete fitting set includes: running lights, search light, mast head light, bow light, and propeller. Two complete full-size plans and an illustrated step-by-step instruction booklet permit even the beginning hobbyist to make a most realistic replica.

Specifications for *The Trawler* are: length overall, 25 inches; beam, 7-1/4 inches; height, 18-1/2 inches; scale, 7/16 inch to the foot; kit number, No. 954; and suggested retail price, \$56.95.

*The Trawler* is ready now, and available at your local hobby shop today.

For further information, contact Midwest Products Co., Inc., 400 South Indiana Street, Hobart, IN 46342, (219)

942-1134, Telex: 725463 Midwest Hobt.

★ ★ ★

Mammoth Scale Plans, 3351 Pruneridge Ave., Santa Clara, CA 95051, announces the availability of its latest, top-quality, giant scale plan, the Douglas Skyraider. No other information about this plan was furnished, but an SASE will surely get you all the details and a list of other big scale plans offered by this company. All of Bob Morse's plans are exceptionally well detailed and sell from \$21.50 to \$33. Cows, wheel pants, and canopies can be ordered also.

★ ★ ★

From the people who brought you Rom-Air Retracts comes the latest in 12-volt electric, glow fuel pumps. Rhom Products Mfg. Corp., 908 65th Street, Brooklyn, NY 11219, (212) 833-4842, proudly announces its new Rom-Rotary Fuel Pump.

Features of this quality pump are: self-priming, reversible actions; 12-volt DC operation; mechanically coupled pump mechanism and motor; specially designed, spring-loaded "lip" seal; hardened and ground steel drive shaft; self-venting; mounts directly to fuel container; all-metal, anodized to resist corrosion; heavy-duty, high torque motor; and two lengths of tubing, one pickup strainer, and one double-ended filter included with each pump.

The list price of one unit is \$48.50 plus \$2 for postage and handling. Delivery takes eight weeks. Order directly from the above address.

★ ★ ★

And from the folks who brought you Titebond aliphatic resin glue, Franklin Chemical Industries, comes the latest in versatile hobby, woodworking, craft, and repair glues. It's called Home, Shop & Craft Glue.

Manufacturer claims for this new formulation include: fastest drying glue available for work in porous and semi-porous materials; extra thick formulation which resists running and dripping, yet dries clear and strong, nonflammable; produces no harmful fumes; and gives the strength of many wood glues with the clear-drying feature of white and craft glues.

For further information, contact Regina Kiernan, Public Relations, (614) 445-1383, or write to Franklin Chemical Industries, 2020 Bruck St., Columbus, OH 43207.

Look for this new glue in craft and hobby stores everywhere.

★ ★ ★

Precision Built Models and Kits, 1818 6th Avenue W., Bradenton, FL 33505, (813) 747-7006, announces the release of two new scale aircraft: a 1/3-scale *Laser 200* and a 1/4-scale *Laser 200*.

The 1/3-scale *Laser 200* kitted by Bob Godfrey comes with preconstructed, built-up wings that weigh less than three pounds. The wingspan is 90.25 inches and the wing area is 1615 square inches. The finished weight will be 16 to 17-1/2 pounds, but can be more according to the engine used.

All parts in the kit are numbered for

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easy construction and correspond with the numbers in the 17-page instruction book. This book also includes 40 photographs for visual reference.

Epoxyglass cowl and wheel pants, T-6 6061 aluminum spar and formed landing gear, rolled plans, all plywood and balsa, and the canopy are included in this quality kit as well as all the hardware, flying wires, axles, and C.B. tail wheel assembly.

The new 1/4-scale *Laser* was designed for the new Turnaround Pattern event, but it can also be flown in Standoff Scale and Fun-fly events.

The recommended engines are .60, .90, and 1.2 cubic inch. The finished plane should weigh 7-1/2 to 8 pounds.

The wingspan is 73.5 inches and the wing area is 800 square inches.

This kit has plug-in foam wings, wood construction, epoxyglass cowl and wheel pants, canopy, tail wheel assembly, formed T-6 6061 landing gear and spar. All of the small parts are included for a complete kit.

A removable tail section gives you excellent storage and transportation capabilities, and the tuned pipe fits inside the fuselage.

The plane has been extensively tested by Don Lowe, a top Pattern flyer. Here is one airplane to cover all your competition needs. Priced at \$159 plus freight, this kit is the same excellent quality as the 1/3-scale *Laser* produced by this

company.

For more information, contact Bob or Pat Godfrey at the above address and phone number.

★ ★ ★

J.C. Development Co., 2716 Bayberry Way, Fullerton, CA 92633, (213) 690-2019, (714) 879-3266, has come out with a handy, stick-on electronic timer for a multitude of uses. It's called, appropriately, the J.C. Timer.

The J.C. Timer will keep track of any period of time between zero and fifteen minutes in one-second increments. Just stick it on your transmitter case, automobile dash, telephone, airplane instrument panel, etc., using the supplied double-stick foam tape, and you are set



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No. 784-O.T. FAIRCHILD PT-19	\$3.00
Rubber powered scale model from 1940 <i>Air Trails</i> . 23 inch span. By Earl Stahl.	

... no other installation or assembly is needed ... even a "super powerful" battery comes with the J.C. Timer *pre-installed!*

One button controls the timer's primary functions: start, stop, and reset-start. A four-digit, highly accurate, LCD (liquid crystal display) read-out ... yes, four-digit, the "1" appears to the left when ten minutes or more time has elapsed ... tells you what you want to know at a glance.

For a mere \$4.25, you can know how long that power plane has been in the air and you can keep track of battery life or fuel consumption easily enough. Try it, you'll like it! •

**Workbench** . . . Continued from page 6

further commentary and recommenda-

tions regarding these points in his November column, as the October column has already been processed, but we felt it important enough to insert these cautions at this time.

### TONGUE IN CHEEK?

Have you heard about the Kline-Fogelman wing? We had read a little about it over a year ago, and saw a rough sketch of the so-called airfoil. It's either a revolutionary discovery or the biggest con job in the science of aeronautical engineering (Richard Kline and Floyd Fogelman are advertising executives).

The Kline-Fogelman wing is duplicated by cutting and folding a flat sheet of paper into a paper airplane. *Omni* magazine published an article about it in its April 1984 issue, and even included a full-size pattern, along with folding, cutting, and gluing instructions.

It is claimed that, "Since the Kline-Fogelman wing defies one of the major laws of flight, aerodynamic experts predicted that its design should propel it to the ground. Instead of sinking, the Kline-Fogelman wing soars. Instead of stalling, the Kline-Fogelman wing could prevent one of the major causes of airplane accidents. NASA, the Air Force, the Navy, and the Army have tested its revolutionary properties ... especially its resistance to stalling ... and the design is already protected by two separate U.S. patents."

If you cut chordwise through the wing of the glider as you would a solid wing, in order to examine the airfoil, you would have two paper-thin (obviously) surfaces, joined at the leading edge in a sharp fold, and looking like two single lines converging to a point. Assuming the top line is horizontal, the bottom line slopes down and away from the top line at about a two to three degree angle, beginning where the two lines join, and ending about half of the chord length back from the leading edge. Try that one in your airfoil computer!

We're looking into the copyright legalities of reproducing the pattern and folding instructions, but in the meantime we'll make up a few K-F wings and see how they fly. Hmmm ... advertising executives. Are you as suspicious as I am?

### FOUNDATIONS

The above one-word title headed up another excellent editorial by Ken Sykora (King Sugar), editor of *The Flightplug*, newsletter for the Southern California Ignition Flyers (SCIF). Read it and believe it.

"Every successful building starts with a good foundation. A solid base is the key to its usefulness and longevity.

"And it's the same thing with modeling. Lasting satisfaction and rewards grow out of getting a 'handle' on basic fundamentals.

"Every 'trade' has its 'tricks', and the building and flying of model airplanes seems (some days!) to have more than its share. 'Cause when you think about it, today's competent F/Fer needs quite an array of skills. For example: carpenter/

cabinet maker, paper/silk hanger, plumber, engine mechanic, painter, electrician, metal worker, jig builder, blueprint reader, draftsman, wire bender, aerodynamicist, prop maker, (bike rider!), etc., etc.

"Yet these varied skill requirements (and the personal pleasure of developing them) is one important reason, we think, that F/F (and specifically OT) has continued to attract, and retain, recruits over the years.

"But today's modeling newcomer (youngster or adult) faces a bewildering scope of options. This is outwardly exciting, but it can also be confusing.

"Just consider the extremes in the current range of entry paths. By passing one's credit card across the counter, the average hobby shop can get you 'in-the-air' instantly; with a ready-made R/C rig. At the other end of the spectrum, is the lure of peak professionalism in the FAI international 'olympics' scene. Now we're talking machine shop, the cutting edge of exotic materials/technology, trimming expertise in the 'fast lane', and the nether world of electronic meteorology!

"Both of these extremes can discourage the neophyte. The 'ready-made' rout bypasses the learning cycle ... leaving the 'flyer' completely ignorant of how and why things don't (or do!) work. And this lack of personal satisfaction in learning 'growth' is the reason, we bet, that hobby shops have few ready-made repeat customers.

"And the FAI-level road can be just as (initially) unrewarding for the 'green' modeler. This arena involves gobs of tender, time, talent and travel ... just to reach the 'competitive' ranks! ... and only a handful of this top class ever know that rich reward of being world champ. (We've always thought that devoted actors would make good FAI recruits ... they're so attuned to hard work, extreme performance pressures, constant frustrations, and huge odds against ultimate success.)

"So what's the foundation-building newcomer to do? Well, how about tippy toeing into OTing? (You knew we'd get to that point, didn't you!) But seriously folks, the current OT scene offers; beginners a broad menu ... from the simplest 'Two Bits' rubber model, to high powered contest gas ships that require your full attention(!) to build and fly effectively.

"Also, OT flyers tend to be an easy going, helpful bunch of clowns ... an ideal seedbed to help the beginner sprout and grow!

"So what 'da say, guys? In the club room and on the flying site, let's hold out a hand to the 'new boys'. Remember, they have it tougher than we did. They're encumbered with a confusing range of choices. We, in the Golden Age, had it easy. Lack of funds, and the raw state of modeling technology forced us to learn from the ground up. We owe it to the 'kids' to teach them that this path can be a rewarding, life-long road to the pleasures of modeling.

— KING SUGAR" •

# PLANS CATALOG

## ILLUSTRATED LISTING OF MODEL BUILDER PLANS (PART I)

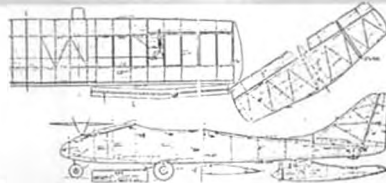
Beginning this month, we will present, in chronological order, starting with Volume 1, Number 1 and working forward, a complete Full-Size Plans List, with an illustration of each model listed.

By keeping this, and all ensuing issues until the listing is concluded, you will have a complete illustrated catalog of MODEL BUILDER Full Size Plans.

See the regular Full Size Plans advertisement for ordering instructions and special sales.



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**No. 12712 TWIN TRAINER** \$4.00  
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**No. 2723 E-Z BOY** \$3.50  
Half-A competition free-flight for '72 rules and all modelers. By Al Vela



**No. 9712 FAIRCHILD 22** \$3.00  
Scale old-timer for single channel radio or freeflight .020 power. By Tom Laurie



**No. 1721 SHOCER** \$4.00  
Hot Class A/B Free Flight contender for 1972 Rules. By Mel Schmidt



**No. 3721 YANKEE GULL** \$5.00  
Expandable R/C soaring glider with 8' 4" to 12'-0" wing span. By Le Gray



**No. 11711 NANCY** \$4.00  
Scale-like, 96" span R/C glider featuring easy construction. By Jack Elam



**No. 1722 PUSS MOTH** \$4.00  
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**No. 3722 MISS COSMIC WIND** \$3.00  
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**No. 11712 BI-PRENTICE** \$4.00  
Training type R/C biplane for fun flying. Uses .29-50 engines. By Bill Northrop



**No. 1723 WHITE TRASH** \$4.00  
A proven, trophy winning R/C sailplane with 7 and 10 ft. span. By Rick Walters



**No. 3723 SIEBEL S 201** \$1.50  
All sheet balsa profile freeflight scale for .020 power. By Jack Headley



**No. 2721 MINNOW** \$3.00  
Control-line Profile Goodyear racer, "Cosmic Wind." By John Penhallow



**No. 2722 FOKKER E-III** \$5.00  
WWI R/C scale for .60 engines. Rudder, elevator, and throttle. By Berni Huber



**No. 5721 SEAHORSE II** \$4.00  
Excellent trainer, designed for land or sea, 19 to 35 power. By George Wilson



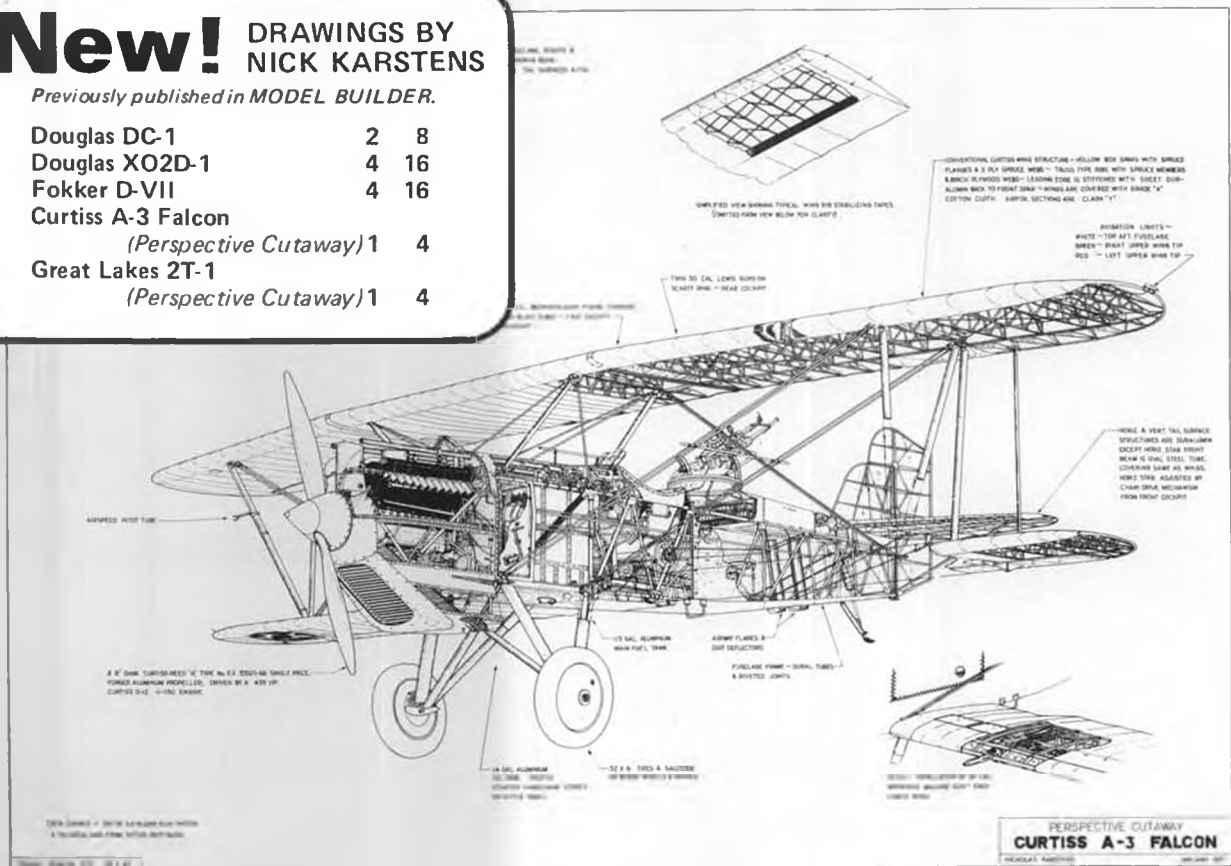
**No. 12711 CURTISS-WRIGHT JR.** \$4.50  
Two inch scale model of famous pusher light plane. R/C By Ralph Fidance

# Peter Westburg's SCALE VIEWS

## New! DRAWINGS BY NICK KARSTENS

Previously published in *MODEL BUILDER*.

Douglas DC-1	2	8
Douglas XO2D-1	4	16
Fokker D-VII	4	16
Curtiss A-3 Falcon		
<i>(Perspective Cutaway)</i>	1	4
Great Lakes 2T-1		
<i>(Perspective Cutaway)</i>	1	4



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1/24th scale: 1/2" = 1 ft.	Shts \$	<b>Czech Avia B-53A</b>	2	8	<b>Waco ATO Taperwing</b>	2	8	
<b>Douglas O-35/B-7</b>	1	4	<b>Davis D-1K</b>	2	8			
<b>Douglas XO-36-XB-7</b>	1	4	<b>Douglas O-25C</b>	3	12	1/10 scale: 1.2" = 1 ft.	Shts \$	
			<b>Douglas O-31A/O-31B</b>	3	12	<b>Berliner/Joyce P-16</b>	4	16
1/12th scale: 1" = 1 ft.			<b>Douglas O-38/O-38B</b>	2	8	<b>Curtiss BFC-2 Goshawk</b>	4	16
<b>Boeing F4B-4/-3</b>	4	16	<b>Douglas O-43A</b>	3	12	<b>Curtiss F9C-2 Sparrowhawk</b>	4	16
<b>Boeing P-12E</b>	3	12	<b>Douglas O-31C/Y10-43</b>	3	12	<b>Curtiss P-6E Hawk</b>	4	16
<b>Curtiss A-8 Shrike</b>	3	12	<b>Douglas O-46A</b>	3	12	<b>Fiat CR-32</b>	3	12
<b>Curtiss Gulfhawk IA</b>	2	8	<b>Fokker D-17</b>	3	12	<b>Great Lakes Trainer</b>	4	16
<b>Curtiss N2C-2 Fledgling</b>	4	16	<b>General Western Meteor</b>	1	4	<b>Hawker Fury Mk I</b>	4	16
<b>Curtiss O-1B/A-3 Falcon</b>	3	12	<b>Grumman F2F-1</b>	3	12	<b>Hawker High Speed Fury</b>	3	12
<b>Curtiss P-1B Hawk</b>	3	12	<b>Grumman F3F-2</b>	3	12	<b>Hawker Persian Fury</b>	3	12
<b>Curtiss XP/YP-23</b>	3	12	<b>Stearman 4E Mailplane</b>	2	8	<b>Monocoupe 90A</b>	2	8
<b>Curtiss SBC-4 Helldiver</b>	4	16	<b>Travel Air 2000</b>	2	8	<b>Swedish Sparmann P-1</b>	2	8

### ORDERING INSTRUCTIONS

Price includes 3rd or 4th Class mail. For Airmail or First Class in U.S., add 25% of total order. For Overseas Airmail (includes Canada and Mexico), add 50% of total order. Remit by International Money Order or U.S. funds drawn on a U.S. bank for overseas or-

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