

# MODEL BUILDER

ICD 08545

SEPTEMBER 1984

\$2.50

volume 14, number 152



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Span: 49 1/2 in. Area: 425 sq.in.  
Engine: .20 — .25 Radio: 4 ch. req'd.

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SEPTEMBER

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Cover: The scene is late spring or early summer of 1940. The smoke has cleared over Dunkirk, the phoney war is over, and everyone in the RAF knows the Luftwaffe is coming. Four Training Command Acting Pilot Officers roll their Tiger Moths into a mock combat engagement, not knowing how soon the combat may become real, while patrolling Hurricanes of Fighter Command draw contrails overhead.

A restored "Tiggie" belonging to F.W. "Spanky" Allen, Federal Way, Washington, provided the detail research for this fine painting by aviation artist, Bob Benjamin. The original 24 x 30-inch acrylic on canvas painting, plus several others, is available for sale. Bob's address is 1222 26th Ave. NE, Olympia, WA 98506, phone 206-352-2602.

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clás'sic (klas'ik), n. 1. a creation of enduring quality, value or esteem. 2. serving as a standard, model or guide. 3. a perfect specimen. 4. definitive. 5. pertaining to the highest class or rank.

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Wing Span: 57-1/4"  
Engines: .25 to .40

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141 Winchester St.  
LITTLETON  
Hobby Land  
101 Union Street  
NASHUA  
Hobby Emporium  
Royal Ridge Mall  
**NEW JERSEY**  
EDISON  
Central Jersey R/C Supply  
1581 Route 27  
PH: (201) 985-8660  
MARTLON  
Hi Fly Hobbies  
Route 70 & Cropwell Road  
PH: 609-983-8060  
MIDDLESEX  
Middlesex Photo & Hobby Center  
730 Union Avenue  
POMPTON PLAINS  
Hobby Hut  
567 Route 23  
PH: 201-338-2077  
RAMSEY  
Hi Way Hobby House  
Route 17  
RANDOLPH  
Carri's Hobby Center  
508 Route 10  
PH: 201-366-4300  
RED BANK  
Hobbymasters, Inc.  
62 White Street  
WALLINGTON  
Bedmarz Service Center  
R/C Hobby Supplies  
356 Main Ave

**NEW MEXICO**  
ALBUQUERQUE  
Valley Hobbies, Inc.  
5522 4th St. N.W.  
PH: 505-345-9688  
CARLSBAD  
The Schettlers  
1009 N. Eighth St.  
**NEW YORK**  
BROOKLYN  
Brooklyn's Model Masters  
1307 Gravesend Neck Road  
PH: 212-339-9250  
BROOKLYN  
Wall's Hobby Shop  
7909 5th Ave  
PH: 212-745-4991  
DEPEW  
Depew Hobby Center  
6866 Transit Road  
PH: 684-5555  
EAST SLIP  
Hobby World  
232 E. Main Street  
PH: 516-27-4499  
ELMSFORD  
Andy's Hobby Shop  
36 Main Street  
KINGSTON  
J & J's Hobbies, Inc.  
2615 Central Ave  
ROCHESTER  
Edmund's Hobby Shop  
152 Broadway  
ROCHESTER  
G & G Hobbies  
1339 Dewey Ave  
ROCHESTER  
Panco Hobbies  
2676 East Ridge Road  
READING  
Wall's Hobby & Craft  
4300 W. Genesee St  
UTICA  
American Hobby & Sports  
2107 Whitesboro Street  
PH: 315-724-4959  
**NORTH CAROLINA**  
CHARLOTTE  
Respac Inc. - Science Hobbies  
2615 Central Ave  
GREENSBORO  
Sports & Hobbies Unlimited  
2144 Lawndale Drive  
Lawndale Shopping Center  
HENDERSOVILLE  
The Hobby House  
1211 Asheville Hwy.  
PH: 692-6683  
HIGH POINT  
Bernie's Craft & Hobbies, Inc.  
2291 English Road  
KING  
King R/C  
102 Hwy 52  
PH: 983-3969  
**NORTH DAKOTA**  
GRAND FORK  
King R/C  
102 Hwy 52  
PH: 983-3969  
NORTH DAKOTA  
8909 Cedar Ridge Hwy.  
PH: 615-482-2900  
NASHVILLE  
The Toy Mart  
113 Graylorn Drive  
PH: 615-883-1648  
OKLAHOMA  
ARLINGTON  
The Hobby Hub  
903 A Pioneer Parkway West  
AUSTIN  
J & J Hobbies  
6241 Kenniston Dr.  
EL PASO  
Hal's Hobby Shop  
No. 57 Sunrise Center  
PH: 915-755-1914  
FORT WORTH  
Pet's Hobby Shop  
7241 Grapevine Highway  
PH: 817-281-0921  
HARTLEY  
Mark's Hobby Hut  
804 White Street  
HOUSTON  
Clear Lake Models  
117 Camino S. Shopping Ctr.  
PH: 713-488-6315  
HOUSTON  
Larry's Hobbies  
2327 FM 1960E  
PH: 713-443-7373  
HURST  
Roy's Hobby Shop  
1309 Norwood  
SAN ANTONIO  
Clyton Hobbies  
5707 E. Moudou  
SAN ANTONIO  
Dick's Hobby Shop  
Terrill Plaza  
113 Plaza Cardon  
SAN ANTONIO  
Kelley's Hobby Center  
5514 Walnut Road  
UTAH  
DREM  
Miniature Aircraft Prod.  
811 W. 400 N.  
SALT LAKE CITY  
Douglas Models  
P.O. Box 9276  
2065 E. 33rd South  
SALT LAKE CITY  
Pioneer Hobbies  
170 East 800 S.  
**VERMONT**  
SWANTON  
The Hobby Shop  
RFD 1 Rt. 7  
PH: 802-524-2715

**OKLAHOMA**  
OKLAHOMA CITY  
Campbell's Hobby House  
3500 N. MacArthur  
TULSA  
House of Hobbies  
6914 E. Admiral Plaza  
TULSA  
Wines 'N Things  
1350 Sky Drive  
**OREGON**  
CORVALLIS  
Trump's (D.J.'s) Hobbies  
PH: 503-889-6115  
PORTLAND  
Strictly R/C  
7865 S.W. Capitol Highway  
**PENNSYLVANIA**  
BATH  
Valley Crafts & Hobbies  
PH: 215-833-6681  
LANSDALE  
Penn Valley Hobby Ctr.  
837 W. Main St.  
MILTON  
Kreg's Newland  
63 Broadway  
HAZARETH  
Trailand U.S.A.  
105 Balvedere Street  
PITTSBURGH  
Bill & Wall's Hobby Shop  
116 S. Highland Street  
READING  
Iron Horse Hobby House  
60 South 6th St  
UTICA  
Reading's Science Hobbies  
116 S. 10th St.  
WARMINSTER  
J.C. R/C Hobbies  
13 York Road  
PH: 215-672-5200  
RHODE ISLAND  
EAST PROVIDENCE  
A & R Hobbies  
56 Alce St.  
PH: 401-438-2754  
**SOUTH CAROLINA**  
GREENVILLE  
The Great Escape  
Pleasantburg Shopping Center  
1426 Laurens Road  
PH: 803-235-8320 or 242-4229  
MYRTLE BEACH  
Ed's Hobby Shop  
702 Main Street  
TENNESSEE  
KNOXVILLE  
Tennessee Model Hobbies  
8909 Cedar Ridge Hwy.  
PH: 615-482-2900  
NASHVILLE  
The Toy Mart  
113 Graylorn Drive  
PH: 615-883-1648  
OKLAHOMA  
ARLINGTON  
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J & J Hobbies  
6241 Kenniston Dr.  
EL PASO  
Hal's Hobby Shop  
No. 57 Sunrise Center  
PH: 915-755-1914  
FORT WORTH  
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HURST  
Roy's Hobby Shop  
1309 Norwood  
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Clyton Hobbies  
5707 E. Moudou  
SAN ANTONIO  
Dick's Hobby Shop  
Terrill Plaza  
113 Plaza Cardon  
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Pioneer Hobbies  
170 East 800 S.  
**VERMONT**  
SWANTON  
The Hobby Shop  
RFD 1 Rt. 7  
PH: 802-524-2715

**VIRGINIA**  
ALEXANDRIA  
Hobbymasters, 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 Hive  
111 E. Magnolia  
CASTLE ROCK  
Aero Motive Products  
607 Spirit Lake Highway  
KEAT  
Kent Hobby  
1313 W. Meeker  
Suite 110, Meeker Mall  
PUYALLUP  
Fingrove Model Supply  
1101 136th St. East  
PH: 845-7675  
SEATTLE  
Webster Supply Co.  
17818 Aurora Ave. N  
SEQUIIM  
Hobby Hobbies and Guns  
605 W. Washington Suite 7  
TACOMA  
Bill's Hobby Town  
13923 Pacific Ave.  
PH: 206-531-8111  
WALLA WALLA  
Harley's R.C.  
Route 1, Box 277A  
PH: 509-529-2618  
**WEST VIRGINIA**  
CHARLESTON  
Fountain Hobby Center  
200 W. Washington St  
WISCONSIN  
LA CROSSE  
Hobby Hub  
4636 Memorial Coulee Road  
Shelby Mall  
MARSHFIELD  
Mid Wisconsin Hobby Center  
Central Square  
PH: 715-791-8111  
MILWAUKEE  
All In 1 Hobby  
South Gate Mall  
333 So. 27th Street  
PH: 414-645-4555  
MILWAUKEE  
Milwaukee Hobby  
1423 S. Muskego Ave  
PH: 414-672-2700  
WAUSAU  
Pope's Hobby Land  
648 South 3rd Ave  
CANADA  
BAWLIF. ALBERTA  
B & P Transport Ltd.  
Box 6  
PH: 373-3953  
CALGARY. ALBERTA  
Calgary Hobby Supply Ltd.  
Box 3173, Stn. "B"  
CALGARY. ALBERTA  
P. M. S. Hobby Craft  
Calgary North Hill Centre  
PRINCE GEORGE. BRITISH  
COLUMBIA  
M. S. M. Enterprises  
6692 Essex Crescent  
WINNIPEG. MANITOBA  
Central Jeweller Hobby Ltd.  
134 Main St.  
PH: 589-2037  
ST. JOHN'S. NFLD  
Capitol Hobby Centre, Ltd.  
6 Freshwater Road  
DUNDAS. ONTARIO  
Skeperart Hobbies, Inc.  
139 York Road  
SCARBOROUGH. ONTARIO  
Toronto R/C Hobby  
1869 Lawrence Ave. E.  
PH: 416-755-1766  
WILLOWDALE. ONTARIO  
Kerth's Hobby Shop  
5205 Yonge St.  
PH: 222-4721  
ANCIENNE. LORETTE. QUEBEC  
Passa-Tempos Pneumatics  
1459 Notre Dame  
PH: 418-872-4113  
ARVIDA. QUEBEC  
LeModele Reduri Enr.  
118 Mathias. CP 341  
PH: 418-548-2136  
MONTREAL. QUEBEC  
Can Air Hobbies  
5850 Gouin Blvd. Quest  
PH: 514-332-3565  
SASKATOON. SASKATCH  
Collins' Aero-Craft  
238 First Ave. North  
PH: 652-4775  
YORKTON. SASKATCH  
Radio Control Hobbies  
39 Berit Ave.  
AUSTRALIA  
SYDNEY. N. S. W.  
Pyramont 2009  
Burmes  
137 Pyramont Street  
PH: (02) 692-0694  
ENGLAND  
NORFOLK. NR17 1DG  
Pegasus Models, Ltd.  
Caston, Attleborough  
INVERCARSILL  
Model Shop  
55 Arcada Den St.  
PH: 89439

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



**from  
Bill  
Northrop's  
workbench**

• This issue marks the beginning of the 14th year of publishing **Model Builder**. No, 12 times 13 is not 151, the number of issues published as of the August 1984 issue. We skipped a total of five during the first few years, when deadlines occasionally got ahead of us. In fact, the very first issue should really have been October, as that was when it finally appeared, and we gave away over half of the copies at the 1971 R/C Aerobatics



At 4 ft. 10-1/2 in., Belinda Northrop still looks quite small in contrast to Jim Johnson's magnificent 1/3-scale Waco F-3, seen at Giant Scale Squadron Fly-In. See text for more information.

World Championships in Doylestown, Pennsylvania. A total of 4,000 were printed.

Speaking of World Championships, the United States is hosting the Control Line World Championships, September 17-22, 1984 at the site of the 1983 Nationals, Westover AFB, Chicopee, Massachusetts. Teams representing 19 countries will compete in Speed, Aerobatics, Team Racing, and Combat. The list includes: Australia, Austria, Brazil, Canada, Denmark, West Germany, Finland, Hungary, Ireland, Israel, Italy, Japan, Mexico, Netherlands, South Africa, Sweden, Switzerland, United Kingdom, and the United States.

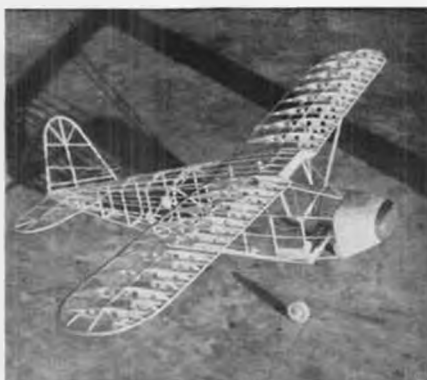
Tom Fluker (Combat) and Les McDonald (Aerobatics) will be defend-

ing their current world champ status while representing the USA. Other U.S. team members include Ron Colombo, George Cleveland, Howard Rush, Robert Baron, Jim Casale, Bill Werwage, Bob Spahr, Carl Dodge, Chuck Schuette, J.E. Albritton, Walter Perkins, Bob Oge, Stew Willoughey, John McCollum, Tom Knoppi, Dave Elias (Team Manager), and Bob Hunt (Assistant T.M.).

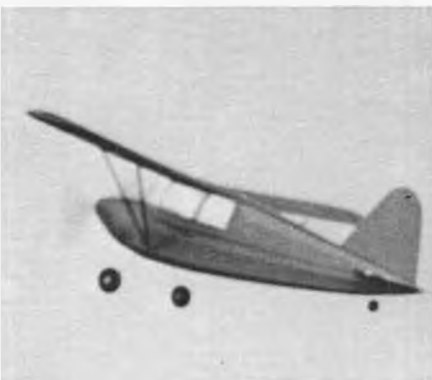
**TURNAROUND REPORT**

John Britt, Kansas City R/C Association, reports that the new FAI F3A "Turnaround" pattern was used at the clubs 29th (!) Annual Pattern contest, held June 9 and 10.

"We had six entries in the new FAI F3A Turnaround event, and many others had wished they'd tried. The judging went



Tom Hughston, Plano, Texas, built this 50 in. Stinson rubber scale from Megow plans.



The Stinson in stable flight. Megow plans are available from Model Builder Plans Service.



Hughston's 30-inch span Fairchild 24 in flight. Built from Seaglen kit. (P. 95 for address)



MB Editor's FB-100 on Gee Bee floats at Lake Elsinore, Calif. Groovy-smooth flight, Enya .45, JR radio. Like dem win-ders?



David "Kung Fu" Carradine, in jacket at far right, helped bring cerebral palsy handicappers out to Giant Scale Fly-In at Sepulveda, CA.





That beautiful Kawasaki powered F-3 Waco takes off at Sepulveda Basin Model Aircraft Park. Sight and sound is totally realistic.



Great Planes Rearwin Speedster by Dick Skoglund, Lancaster, Calif. Kraft radio, O.S. .90, Zinger 14-6, nice flying weight of 14 pounds.

very well, with only about 5% to 7% score variation between individual judges. We used an FM wireless mike tied into a P.A. system for our head linesman to call the maneuvers (for the judges). All the pilot had to do was fly. It worked great. Since it was over the P.A., the spectators were fully attentive during each flight. The event drew much more enthusiasm from the crowd than AMA pattern . . . lots of fun!"

An interesting side effect of the new pattern. Other aerobatic competition organizers please note!

#### COUNT YOUR BLESSINGS

While the new frequencies available to U.S. fliers are still coming over the horizon, and are being met by a super-confusing flag identification system and scattered groups of negative thinkers(?), it is time to reflect on how lucky we

really are. The following item appeared in the BARCS newsletter, edited by George Stringwell.

One of the BARCS' farthest flung members is Chris Charles, currently residing in Brunei (Borneo). I received a note from him the other week, saying that he was shortly moving to Australia, and adding ". . . Not before time, too." The reason for this latter comment was made clear by the copy he attached of a letter which he had received from Brunei's Director of Telecommunications. This is quoted verbatim below:

"Dear Sir,  
Re: Remote Control Aircraft License.  
"We are sorry to inform you that we are no longer issuing/renewing remote control aircraft licenses. You can either:  
1. Export your aircraft model with proof of export submitted to this depart-

ment, or,

2. Surrender the aircraft model to the police or this department.

"May we remind you that an offense under the Emergency (control of radio-communications) Orders, 1967, carries a maximum penalty of three years imprisonment or fine of \$3,000, or both.

"We are sorry for any inconvenience caused.

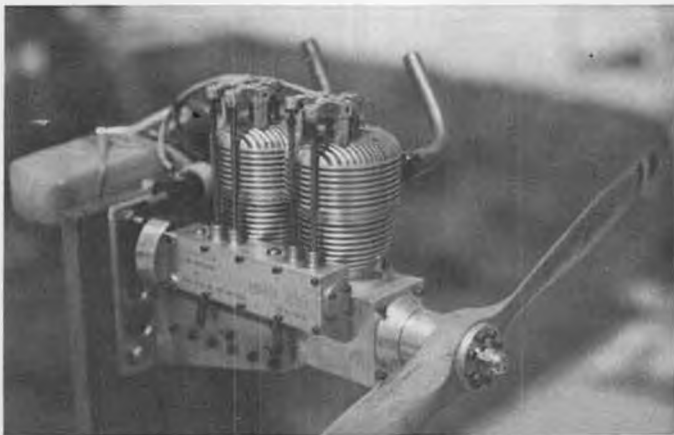
"Yours faithfully,

Lim Kee Beng

For Director of Telecommunications  
Brunei, Darussalem"

#### FLY-IN TRY-IN

The Giant Scale Squadron of the San Fernando Valley, California, IMAA Chapter 79, QSAA Chapter 7 (pause for breath), which will host the 1984 IMAA Fourth Annual Fun-Fly, August 16, 17, 18, and 19, put on a trial run on May 5 and 6



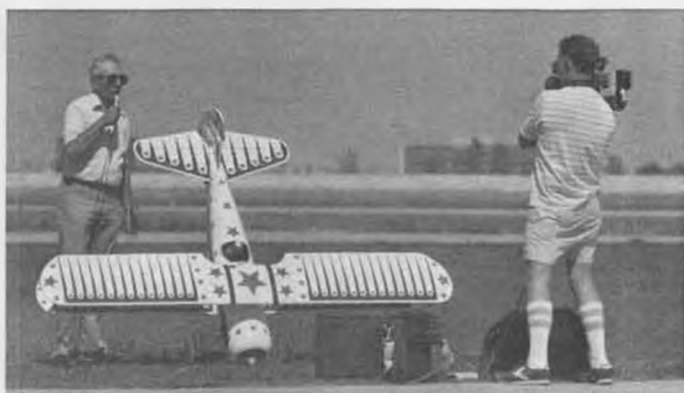
Two-cylinder four-stroke by R. J. VonBergmann. Turns 7,000 rpm with 20-6 Zinger. Idles down to one grand. Weighs 7.5 lb. Info avail.



John Pahlow's beautiful blue and white, 1/3-scale Tiger Moth from Practical Scale kit imported by Ralph Brooke.



PT-19 built from Pilot kit by John Eaton, Redondo Beach, Calif. Power is an Enya 1.20 4-stroke w/ Bernhardt ignition conversion.



Fly-In Director Walt Clark talks about the coming IMAA Fun Fly Festival in August, as TV tech/modeler Chuck Colwell records.

at Sepulveda Basin, site of the Big Show. This month's photos are mostly of aircraft that were displayed and/or flown at the event. The star attraction, in our eyes, had to be the 1/3-scale Waco, built and flown by Jim Johnson, of Oxnard. Jim doubled the Pica Waco F-3 kit drawing, which of course, is 1/6-scale. Power is a Kawasaki 3.15, radio by Futaba, prop is a hand-carved 24 x 8 x 14. Covered with polyester fabric, the finish is three coats of nitrate, followed by auto primer and a 1984 Mercury Cougar metallic maroon. Pilot by Hawke. All up weight is 42 pounds. Flight is slow, rock steady, and just plain realistic!

The Fly-In was directed by Walt Clark, a very active member of both IMAA and QSSA, who will also be Festival Coordinator for the IMAA annual in August. The Basin site is still undergoing improvements aimed toward accommodating the huge crowds and multitude of modelers and industry exhibitors who are expected to attend.

#### UPF-7 COMING

Nick Karstens and Pete Westburg are fellow alumni of the famed Douglas Aircraft Company, and their drawing techniques and attention to detail are very similar when it comes to producing scale views of various aircraft. Although Pete's drawings are more well-known, probably because he produced more of them, Nick's are certainly no less in quality. The DC-1 drawings presented in our June and July '84 issues can attest to that, as well as the more detailed Fokker D-VII and Douglas X02D-1 which were published in May and June '79 and March, April, May '82 respectively.

Nick, is now working on drawings for the Waco UPF-7, using original factory drawings as furnished by John Eney, of Warminster, Pennsylvania, who is building a ZPF-7 (275 HP Jacobs powered. The UPF-7 has a Continental 220 HP.)

The Waco drawings are downstream quite a way, so don't hold your breath. However, watch Westburg's plans ad for availability of the Karstens Plans for the other three plus a couple of interesting, cut-away perspective drawings.

#### RUBBER DUB DUB

Among those who know and care, quality of strip rubber used in rubber powered model aircraft has always been a concern of both the seller and the modeler. Unfortunately, because of the relatively small quantities consumed by the modeling public, the manufacturers have not held that same concern.

George Schroedter, proprietor of Champion Model Products, La Verne, California, wrote to tell us why he has temporarily discontinued advertising rubber strip.

"From my phone conversations with the factory since March of this year, I have learned that they have never tested their rubber strip for energy return. The reason given was that it is not a test that they can perform quickly from a sample while the batch is being mixed. They have agreed to conduct tests in an effort to find the means of controlling the energy return, but as of two weeks ago,



Tom Laurie, Newport Beach, California, with his Stinson SR-5. Restoration took ten years. It flew on its 50th birthday, and has already won trophies.

they have yet to identify the factors that influence energy return. Hence, the reasons why certain batches of rubber strip perform better than others are a mystery.

"I have told the factory that I cannot reorder until they can guarantee at least 3400 Ft.Lbs/Lb. The factory in turn has told me that until they find the means of controlling the energy return, they cannot guarantee any figure.

"Many modelers unfortunately are under the impression that the factory could turn out good rubber if it wanted to, but that it makes this poor stuff because it is more profitable. Perhaps

some of the above will clarify the facts."

Fortunately, lots of modelers are not that concerned with the finer points of rubber quality. They're more interested in the satisfaction of seeing their scale, rubber powered models fly successfully and realistically. Such is the case of Tom Hughston, out of Plano, Texas.

Tom is really happy with the way his 50-inch span Megow Stinson 105 turned out, as built from Model Builder's Collector Plan No. 481-C.P. He made a 12-inch prop by epoxying 1/64 plywood blades to a 9-1/2-inch plastic prop,

*Continued on page 108*



#### Advice for the Propworn

Dear Jake:

I'm not a modeler, but my son and I went to the Toledo Show and were totally enthralled. What does it cost to take up modeling?

—Ready in Reading

Dear Ready:

Your lawn, your wife's patience, and the family food budget.

—Jake

★ ★ ★

Dear Jake:

What do the Pattern experts mean when they talk about a smooth entry and a smooth exit?

—Pre-Novice in North Platte

Dear Pre-Novice:

They're referring to avoiding the bumps on the flying site's access road with their Winnebagos.

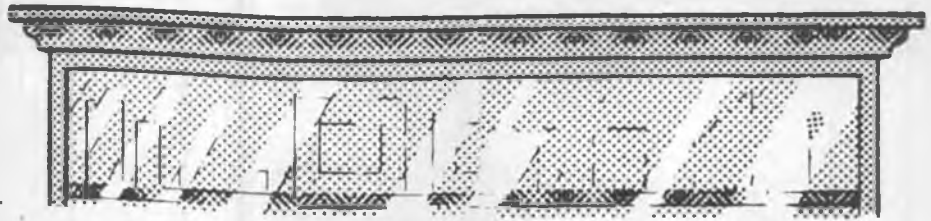
—Jake

★ ★ ★

*Continued on page 65*

# 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.



• K&S Engineering, 6917 W. 59th St., Chicago, IL 60638, (312) 586-8503, has announced two new products for soldering jobs around the workshop.

The Model 1210 Soldering Gun replaces the Model 1200 Soldering Gun. The Model 1210 Gun maintains the same power (100 watts) during operation. Instant heat is great for those tough soldering jobs. A spare tip and a wrench is included in each very unique and colorful package.

The Model 910 Soldering Iron supercedes the Model 900 Soldering Iron. It retains the same electrical characteristics (115 volts, 60 watts) during operation and gives heat quickly. Being lighter in weight and shorter in length makes for easier handling. This high capacity iron is more than adequate for your soldering needs.

For further information or prices, contact K&S at the above address or phone number.

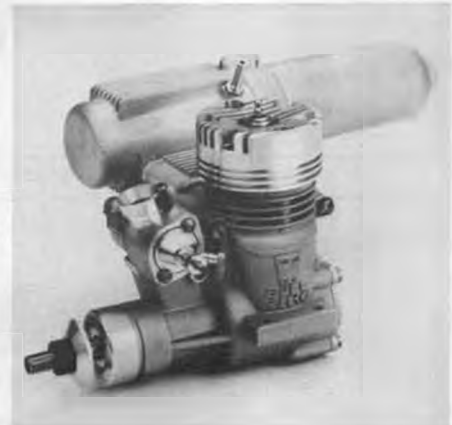
★ ★ ★

Buzz Waltz R/C Designs sure knows how to catch a glider guider's attention! No doubt you took notice of the beautiful young lady who is modeling the latest R/C sailplane from that company! The glider is called *El Primero*, and it is the newest addition to the fast growing line of Buzz Waltz R/C Designs, 255 N. El Cielo, Suite 476, Palm Springs, CA 92262.

The *El Primero* is a two-meter sailplane kit. The wingspan is 77-3/4 inches with a wing root of nine inches and outer panels that taper to seven-inch tips. The total wing area is 660 square inches, and with a flying weight of 33 ounces, the



Vintage engine book from John Pond O.T.



World Engines new Bull Ring 40, Schnuerle.



Stampo SV-4-B, SV-4-C, Champ, Tomahawk, and Diablo engine cowls and oil coolers from T&D.

wing loading is 5-1/2 ounces per square foot. The airfoil is a 12%, basic flat-bottom with slight Phillip's entry for wind penetration.

The wing is made in two sections for

easy transportation to and from the flying site and is joined together with two 1/8-inch steel wing rods. The main spar is 1/8 x 3/8 spruce and is shear webbed to the tip.



Linda Waltz of Buzz Waltz R/C Designs, poses with *El Primero*.



Dumas Products new Mach 3.5 V-bottom race boat.



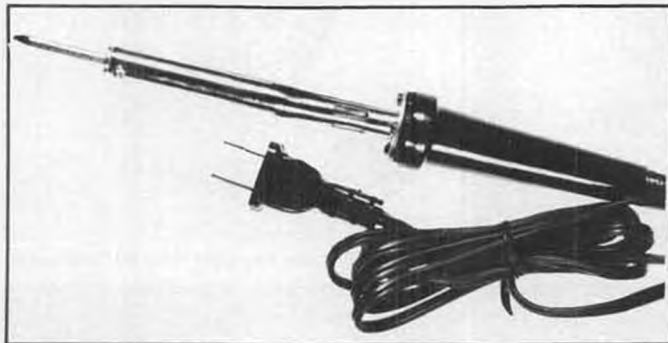
CaRa Products automatic lead-acid or gel-cel battery charger.



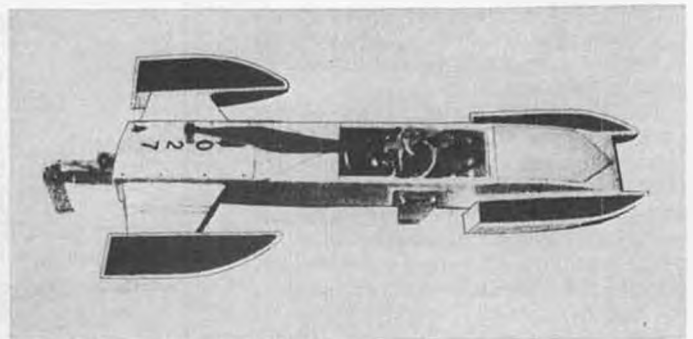
K&S Engineering Model 1210 Soldering Gun.



New Monokote video tapes available from Top Flite.



K&S Engineering Model 910 Soldering Iron.



L&K Water Sports 20, 40, 60, and 90-size canard hydros.

The *El Primero* can be launched by either hi-start or 12-volt winch. A separate fuselage detail on the plan shows how to modify the nose for electric power for self-contained launching.

The roomy but attractive fuselage will house all standard radio systems and yet have enough room for an electric motor system.

Kit features are: precision cut and sanded balsa and plywood parts, hardware package, easy to follow instructions, and two sheets of full-size rolled plans.

The kit price is \$24.95, and the *El Primero* is available directly from Buzz Waltz R/C Designs at the above address. Dealer inquiries welcomed. Write for information.

Also new from Buzz Waltz R/C De-

signs is a kit version of the popular *Sunrise 2540* as featured in the January 1984 **Model Builder** magazine.

This model is a .25 to .40-size low wing trainer which was developed from the Buzz Waltz high wing trainer, the *Begin Air .25*. It can be flown either three or four-channel control (rudder, elevator, throttle, or rudder, elevator, ailerons and throttle). With a flat-bottom airfoil, the *Sunrise* is excellent for teaching that first-time student, and yet it is also capable of doing all the basic maneuvers.

The wing is held in place with two 1/4-20 nylon bolts. The span measures 54 inches for a total wing area of 540 square inches. The fuselage is 37-1/2 inches long and three inches wide at the cabin for ample radio room. Flying weight is 3-3/4 pounds.

The plan is designed so that it will



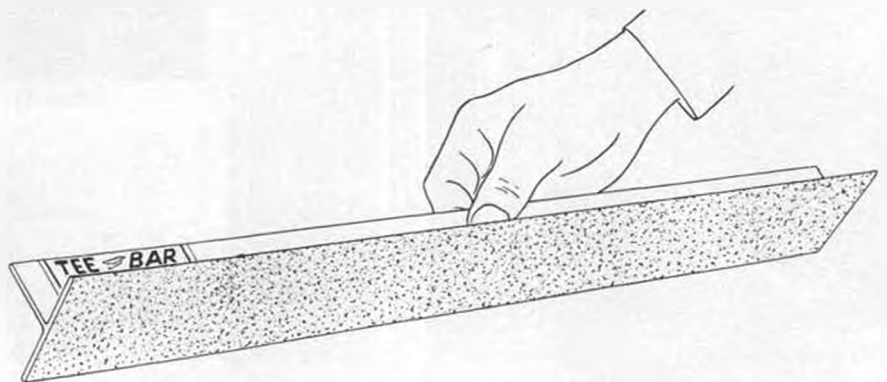
Indoor Model Supply's new book and offers.

easily convert to a seaplane with the use of the Buzz Waltz float kit.

The kit includes precision cut balsa and plywood parts, glass filled nylon motor mount, nose gear, dural main gear, assorted hardware, plus full-sized rolled plans and an easy to follow instruction manual.



*Sunrise* low-wing trainer from Buzz Waltz R/C.



Tee Bar sanding blocks, Ruff-Stuff self-adhesive sandpaper, and more from Applied Design.



Robbe Model Sport ASW-17 sailplane for sport or competition.



Robbe Super Cub for aerobatics, glider towing, or skydiver drops.



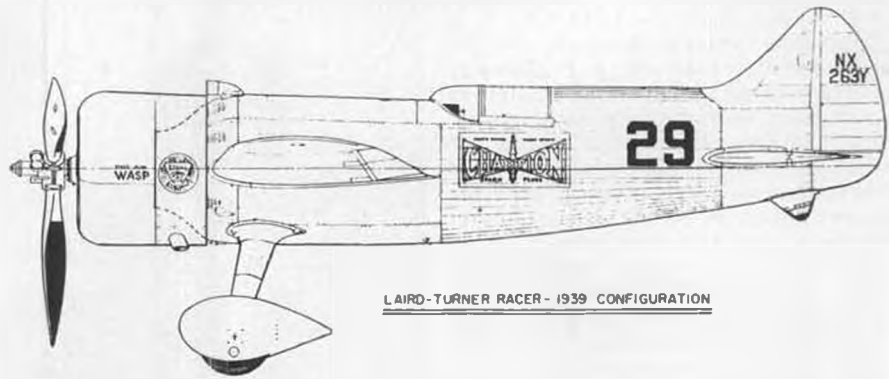
Mod-Ler Prop Stoppers for finger protection.

Kit price is \$44.95, and the *Sunrise* is available directly from Buzz Waltz R/C Designs at the above address. Dealer inquiries welcome.

★ ★ ★

Top Flite Models, Inc. has recently released its MonoKote™ II videotape and has made available a combined tape featuring both MonoKote I and II videos. Modelers can now select from three different tapes to learn the ease and variety of MonoKoting. All tapes are available in VHS or Beta format. They are excellent for use at home, at club meetings, or in hobby stores.

MonoKote II, "Advanced," is a full-color, one-hour tape. It features tips on creatively designing color schemes and patterns, how to cover wing tips and



Thompson's Vintage Era Race Plane Classics *Miss Champion* plans, plus others of the same era.

multi-coloring with MonoKote. The two-hour combination tape features Top Flite's original video, MonoKote I, "The Basics," and the new MonoKote II program. The first part of this colorful tape (MonoKote I) takes the modeler through MonoKoting fillets, tail surfaces, wings, fuselages, simple hinging and trimming. The second hour (MonoKote II) is devoted to more advanced design techniques and creativity with MonoKote.

MonoKote I or II may be purchased individually for only \$39.95 each. Tapes may be rented for the same price and when returned undamaged, a \$20 refund is given. MonoKote I and II (combination tape) is available for purchase from local hobby retailers for only \$79.90.

For more information or to order,

contact: Top Flite Models, Inc., "MonoKote Videotape Offer," 1901 N. Narragansett Ave., Chicago, IL 60639.

★ ★ ★

Robbe Model Sport has announced the availability of two new R/C flying models: an ASW-17 sailplane for thermal competition or sport flying from slope or field, and a Piper *Super Cub* designed for .60 to .90 four-stroke engines or .60 two-stroke.

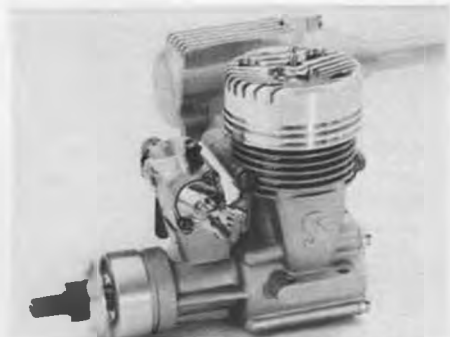
*Continued on page 100*



Mod-Ler Model Kleen solution. Makes 2 gal.



Royal Sunshine Ind. "Mighty Missile".



World Engines new Super Tigre S-29.



World Engines new Zenoah G-23.

# NOVAK'S QUARTER

## QUARTER MIDGETS ARE FLYING AGAIN IN CALIFORNIA

By ELOY MAREZ . . . Yes! Quarter Midgets are flying again, and a few people are having a lot of fun racing them. The rules are less restrictive, the speeds are faster, and the fun has definitely returned!

• There is little doubt that the past few years have seen a general decline in R/C aircraft racing activities! Though there are several theories as to why, it is impossible to explain definitely why this is so, any more than one can explain why certain other events have gained in popularity. Even the king of R/C racing, Formula One, has suffered. Gone are the days of the 140-entry Bakersfield races that we used to enjoy. Even the lower-key racing events, such as Quarter Midgets, and the once-popular, non-AMA "Quickie" racing dropped to a new low, so much so that the once-prestigious Quarter Midget Racing Club which was once instrumental in the early growth and popularity of Quarter Midget racing was disbanded. True, there have been pockets of activity of various racing events throughout the country, but general interest of even one has ceased to exist. Formula One has managed to survive mostly through the efforts of a few dedicated individuals in the National Miniature Pylon Racing Association (NMPRA).

It suddenly appears however, that a reversal of the downwards trend is now taking place here in Southern California. Formula One events report a few more entries every race, and Quickie racing has seen a sudden and rapid growth, though California Quickies are somewhat out of the norm of what the rest of the country is flying. The local groups, recognizing the difficulties of policing or enforcing certain rules, have dropped all engine requirements but those readily and visibly obvious. It must be a .40, of course, front intake, with an eight-millimeter carburetor throat, and generally, 15% nitro fuel, and stock, balanced-only props as furnished by the sponsoring club.

All of a sudden, Quarter Midgets, too, are back in the air. Someone held a race . . . and people came! Old airplanes were dusted off, radios reinstalled, the Coxes and the Rossis had the oil washed off and were remounted. All of a sudden, they were back on the line, and waiting for the "go" flag. Next race, new fliers and new airplanes started to show up, more races were scheduled, and it looks like these little-but-fast racers are being given a second chance.

Back in the heyday of QMRC and Quarter Midget racing, I used to enjoy this phase of the hobby, so I have more than a passing interest. I just had to get out to a race to see some of the action and to see what changes have taken place since I used to sweat out ten laps



The Expert Class winners (left to right): Christopher, Novak, and Root with their racing machines and very important turn callers.



The Standard Class winners (left to right): Bob Baker, Bob Autry, and Randy Bloom. The fliers will long remember this day at the races.

without cutting. Since those days, we've seen complete elimination of the idle rule, fuel tank pressure is permitted, and propeller modifications are now allowed. No doubt about it, they are faster!

I found this out through a recent visit to what became known as "Novak's Race," held May 6, 1984, at the field of the Pomona Valley R/C Club, in Cucamonga, California, and sponsored by Novak Electronics. Organization and CD duties were ably handled by Tony Lopez, of the above club, with ample help from a large number of club members.

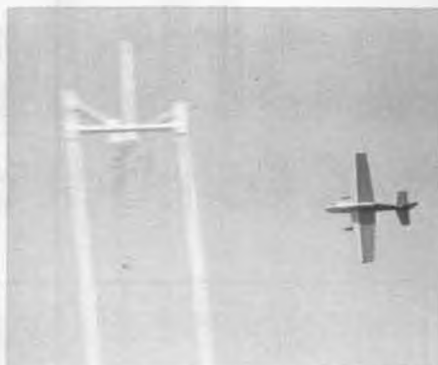
Twenty-two race pilots came out to try their machines and luck in two classes, Expert and Standard, flying the AMA two-mile course. The airplanes on hand were a mix of those seen in previous years: a mix of Prather Toni's and Root Li'l Cobras, with a number of newer designs. In general, with the relaxed engine and prop rules, airplane speeds do not vary greatly, success seems to be more a matter of preparation, strategy, and piloting skills.

After all the dust and nerves had settled, the following winners were

# R MIDGET RACE



Always fast and consistent, Bob Nickles was flying an ancient *Li'l Cobra*, seen here going into turn three in perfect form.



The pylons were triangular structures made of PVC water pipes. They are lightweight, require minimum of hassles, wires. Visible!



If he's racing, he cut! If he's landing, he's high! Anyway, here's a look at one of the Prather *Toni* racers in flight.



When you're on the clock, you've got 90 sec. to start it, set it, clear the area, and get into position. It's here that time flies!

awarded the checkered flag.

#### EXPERT CLASS:

First Place — Tom Cristopher  
Second Place — Bob Novak  
Third Place — Bob Root

#### STANDARD CLASS:

First Place — Bob Baker  
Second Place — Bob Autry  
Third Place — Randy Bloom

If I learned one thing, it is that when I start racing again, I'm changing my name to Bob!

In addition to trophies, the first place

winners in both categories were also the happy recipients of a Novak Electronics NER-'91 receiver. This is the latest model, AM narrow band, dual conversion receiver . . . one of only two currently on the market that will still be legal when the last of the new frequencies and narrow band requirements go into effect in 1991.

Winners of Fast Time trophies, plus Cox .15 engines courtesy of K&B Manufacturing Co., were: Expert — Lyle Larson, time 123.0; Standard — Bob

Autry, time 131.07.

Another thing that has not changed since my racing days is that after the winners were announced, a lot of "I could have beaten so-and-so, *BUT . . .*" and, "Wait till *NEXT* time," were heard.

We're waiting till next time, as a good time was had by all, for which we all thank Bob Novak, Tony Lopez, and the rest of the crew. No doubt about it, Quarter Midgets are alive and well in Southern California . . . we'll see you at the races! ●



Those responsible for this event: Bob Novak (Novak Electronics), and Tony Lopez, CD, from Pomona Valley R/C club.



"Lightning Lyle", fastest man of the day with his 123.0-second fast time in Expert Class. He couldn't have done it without Randy!

# The Razorblade

## for R/C Combat or Sport

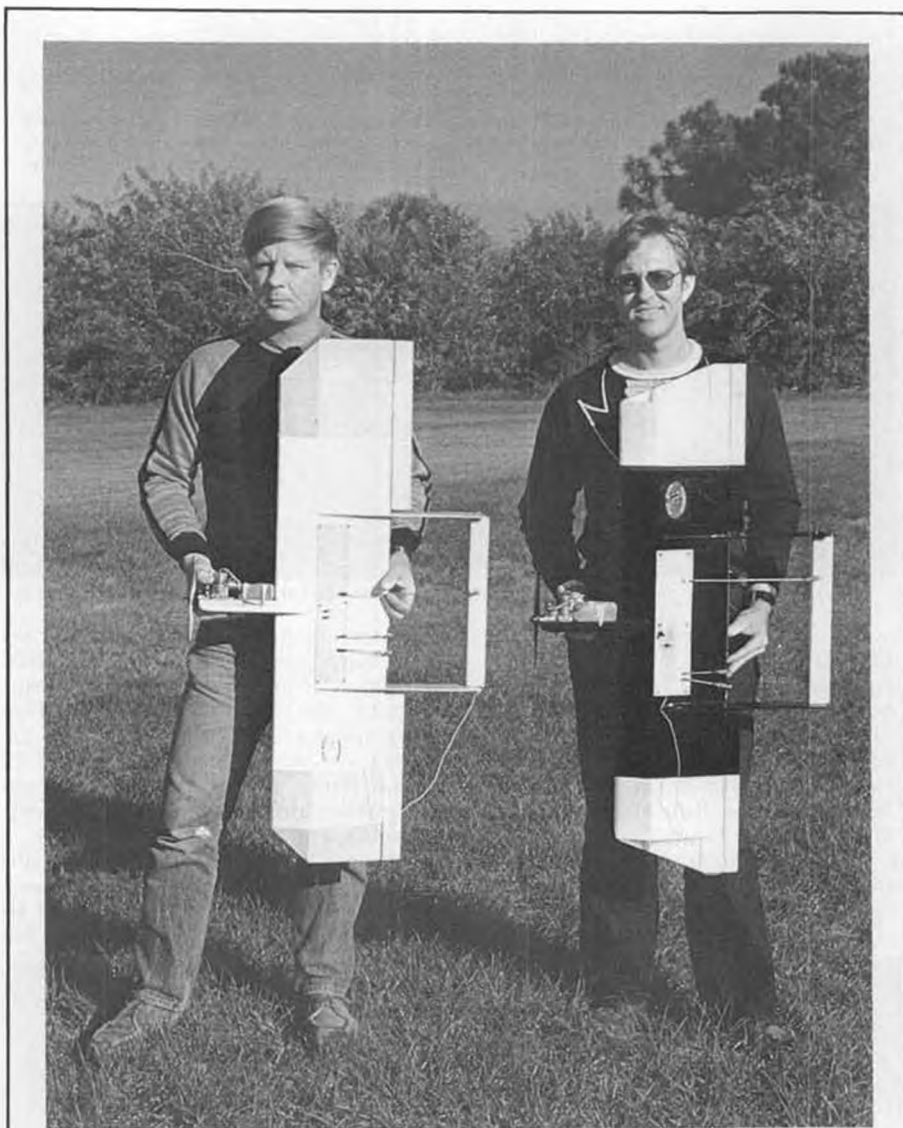
By TIM FARR . . . Here is an R/C model that was designed from the start for one thing . . . R/C Combat flying. It is quick to build, it handles very well, and it's cheap! Several "Razorblades" have been built and flown successfully by members of the Palm Beach Aeronauts, Florida.

• **COMBAT!** There has never been any endeavor created in the fertile mind of man that has not been contested at some time or another. Someone is always trying to be higher, wider, taller, stronger, faster, slower, or more of *something*, than anyone else. If you don't believe it, why not try a little experiment the next time you are out driving on the freeway. When you find yourself following another car for awhile that is traveling at the same speed you are, pull over to the left lane and slowly, but ever so slowly, increase your speed so that you just barely creep on by him. Nine times out of ten, if the difference between your speeds is slight enough, you will notice his speed increase just enough to prevent you from passing him without increasing your speed some more. If you do this, and then change lanes back in front of him, not long after that he will pass you again. Try it and see if I'm not right!

What's the point? Well, this model is the point, or at least one result of the point. Back around 1970, several club members and I used to find ourselves flying together at the same time, and started flying in formation with each other. Then, one of us would try to get on the other guys' tail. One thing led to another, and pretty soon we added crepe paper streamers, and it became full-scale combat!

About that same time, there was an article in one of the model magazines concerning R/C combat. I no longer remember who the author was, or which magazine the article appeared in, but the author proposed modifying C/L Combat planes for use with R/C and flying R/C Combat with them.

In order to keep the cost down, he proposed that engines be limited to inexpensive .15-size C/L engines with no throttles, and that the radios be inexpensive two-channel "glider" radios opera-



Bill Milam and Tom Mavracic with their *Razorblades*. Fox .15 and Veco .19 powered.

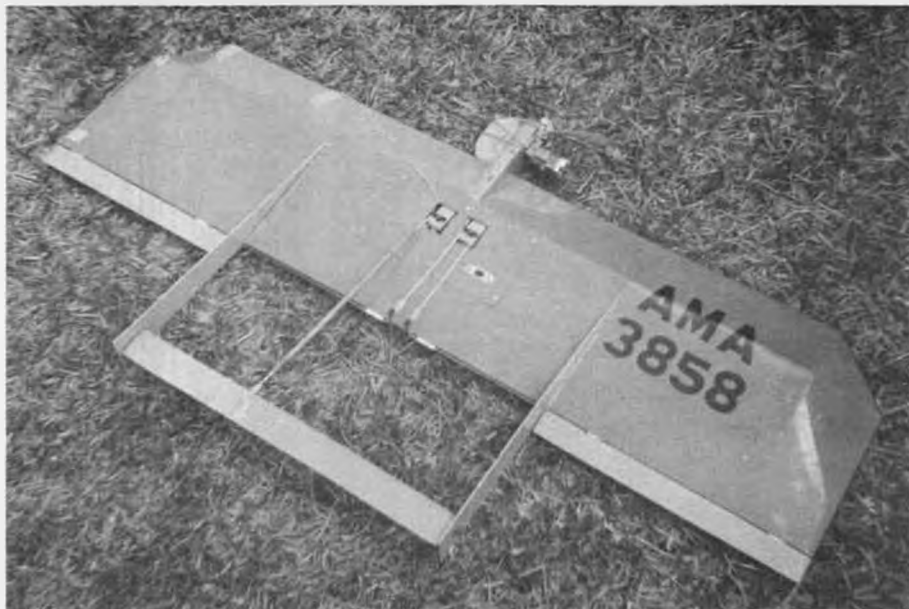
ting aileron and elevator surfaces only. Because there was to be no throttle, the fuel was to be limited to two ounces.

Needless to say, that article struck a very responsive chord in me, and I set out to find a suitable C/L Combat kit to modify. A preliminary study of all the C/L Combat kits available at the time quickly convinced me that there simply were none that were suitable for conversion to R/C.

Undaunted by this, I just sat down and proceeded to design my own concept of what a super-simple R/C Combat ship should look like. The layout was strictly contemporary C/L Combat: a wing, an engine pod with the engine right up against the leading edge; two thin plywood sheet tail booms glued to the wing; and a long, thin, all-flying stabilizer (or "stabilator") pivoting between the booms at the rear. Construction was







The original (1971) *Razorblade* had full ailerons, short fuselage, and a tail-heavy condition which was hard to counter-balance. Later ships had tapered ailerons, longer nose.

somewhat more robust than was common practice with C/L ships of the era, however.

Being inveterately lazy, I designed the wing to use standard 36-inch lengths of wood, and to have a rather unusual, diamond-shaped airfoil which would allow me to cut the ribs out with an model knife and a straightedge. This also would allow me to build the wing pinned flat to the workbench so that there would be no possibility of warps. The wing was designed to be completely sheeted with 1/16 balsa for strength and durability, and the tail booms were to be made from 1/16 birch plywood. The stabilator was to be just a piece of 1-1/2 inch trailing edge stock (leftover from making the ailerons) with the thick edge razor-planed to a symmetrical airfoil shape.

When the "thing" was done, I stepped back and surveyed my masterpiece . . . and, quite frankly, was appalled at what I had done! Everything had seemed quite logical during that creative frenzy, but

taken as a completed whole, the thing very obviously was a monster! Laying there on the workbench, it didn't even look like an airplane, but it did look like something very familiar. I couldn't put my finger on it . . . until I noticed an old single-edged razor blade laying on the bench next to it, and in one swift instant it was crystal clear: this was . . . the *Razorblade*!!

I was not about to subject myself to the unbridled derision of my fellow club members by taking it out to the club field in broad daylight . . . *not that crew!* So, it sat on the workbench for several weeks while I tried to decide: A) if I should ever actually attempt to fly it, and B) if so, how?

It would be comparatively easy to take it out to the field at a time when there was very little likelihood of anyone catching me (a technique I had employed on more than one occasion with other of my more exotic "masterpieces"), but this time there could be no secrecy . . . the darned thing had to be



This Fox .15 BB C/L engine would be great for a *Razorblade* R/C Combat ship.

hand launched, and that necessitated the presence of at least one "witness."

Well, finally, I took the bull by the horns and just went out to the field with it. Braced for the worst, a "volunteer" was enlisted, the jeering crowd was moved back to a supposedly safe distance (a precaution that required surprisingly little urging!), and caution (followed shortly thereafter by the first *Razorblade*) was thrown to the wind!

I would really like to tell you that the ship flew right off the drawing board but sadly, it did not. The CG was positioned too far aft as a result of my following the C/L practice of placing the engine right up against the leading edge. At the same time, the stabilator travel was too great, which, combined with the CG position, produced a totally uncontrollable ship that quickly had the whole crowd scrambling for their very lives!

The robust construction vindicated my building technique, however, and saved the day. After wrapping a ton of solder around the engine and reducing the stabilator travel quite a bit, it did fly . . . well enough to assure me that I was on the right track. Thankfully, my limited success muted some of the more vocal critics . . . most of whom were at the back of the crowd, anyhow!

*Continued on page 88*



Close-up photo of the *Razorblade* showing inexpensive .15-size C/L engine, pushrod linkages, fuel tank mounting details, etc.



Flying the *Razorblade* is not as difficult as it would first appear. Without landing gear, takeoffs are by hand at 45° angle. Easy!

# CAVALIER 40



## HOBBY SHACK PRODUCTS\$ IN USE

By BILL CLENDENON . . . The Cavalier 40 is a remarkable new Pattern ship for those modelers who demand quality of manufacture and quality of flight performance in an almost ready to fly R/C model.

• To describe the *Cavalier* from start to finish is just about impossible. Completeness, flyability, *low cost*, speed of construction, all enter into a very *avante garde* portfolio. To sum it up would be like saying, "When you open the box, you have opened a symphony with John Williams conducting!"

Please don't think I am bulling this up for Hobby Shack. Quite to the contrary, I found a couple of minor flaws. Hobby Shack *did not* say that their kit was perfect, but it sure is close!

Before we get to the kit itself, I will point out the two minor flaws I found, and then we will get to the meat of the action.

First of all, inspect the balsa dowel pushrods, if they are soft, or if you are in doubt about their strength, use 5/16 or 3/8 diameter hardwood dowels in place of them. Secondly, on page 13 in the

instruction manual, the middle photograph shows the rudder/nose gear steering linkages being on opposite sides of the servo wheel. This is incorrect. The steering linkage should be on the same side of the servo wheel as the rudder pushrod. Don't you wish all the kits you built had problems this minimal? (*Hmmm. Could the nose gear tiller have been on the opposite side of the strut end? wcn*)

The *Cavalier* is offered in two sizes: a .20-size and a .40-size, and retracts are optional for both. The retracts are worth it, so go the full nine yards.

I chose the .40-size and retracts, of course, and a K&B .40 for power. The radio was Hobby Shack's own Cirrus brand seven-channel. This is a darned good radio, and I urge you to consider it when you purchase your *Cavalier*.

To build the *Cavalier* is an absolute

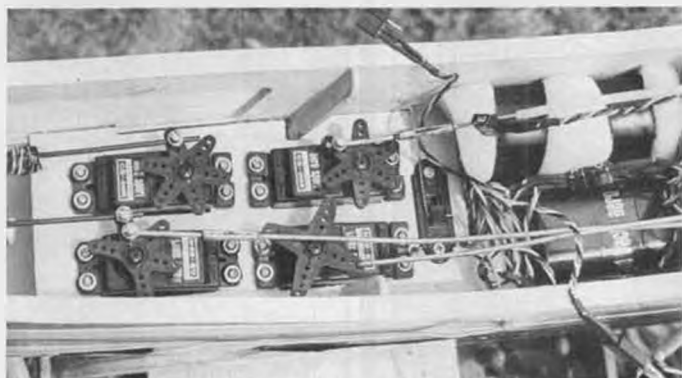
misnomer. Hobby Shack's "E-Z Series" kits are in actual fact almost ready to fly (ARF), as close as ARF can be. The airplane can be assembled in about six hours' time and that includes help from my two little elves who are five and three years old. (*So that's how he does it! wcn*)

The *Cavalier's* colors are beautiful, shiny, and fuel proof. The retracts fall into premolded openings and take about five minutes to install. You will need extra steel pushrods if you do opt for retracts.

The E-Z concept is based upon an inner shell of balsa and plywood and an outer skin of very dense foam, and then a skin of clear protective plastic. The result is a light, strong, and durable product.

The construction is started by joining

*Continued on page 84*



The author chose Hobby Shack's Cirrus seven-channel R/C system to control his *Cavalier 40*. It worked flawlessly.



The completed *Cavalier 40*, ready to fly, weighs 6-1/2 pounds, and is powered by a K&B .40. Stripe on cowl applied by author.

# Simply Scale

By CLIFF TACIE

• Another season begins! I know that sounds peculiar, because you're reading this in the fall, but you have to keep in mind that I'm writing this in the spring. Because we live in the north country, we spend our winters in the workshop and look forward to that harbinger of spring that tells us another flying season is upon us . . . the Toledo R/C Exposition.

This year's Toledo Exposition, the 30th annual, was held April 6, 7 and 8, and as usual, it was shoulder-to-shoulder modelers for three solid days. I'm told that over 30,000 people attended this year, and personally, I think that's a conservative figure.

Naturally, my main interest at events of this nature is scale aircraft. Because it is an RC exposition, only radio controlled models are allowed to compete in the various categories of Military Standoff, Nonmilitary Standoff, and Precision Scale. When it comes to competing, Toledo is a whole different ballgame from your standard, AMA scale contest. The Precision Scale class at Toledo is designated for any models displaying cowled dummy engines or raised rivet detail. Many modelers are under the misconception that if their model has rivet detail or other surface detailing they will be put into a Precision Scale class in a contest sanctioned by AMA. Not true! This is only a Toledo rule, not an AMA rule.

It's interesting to note that there is no "builder of the model" rule at Toledo. In fact, there were several fine models displayed this year which were entered by their owner, not their builder. I frequently encounter modelers who, rather than being inspired by "Toledo quality" models, are discouraged by what they see because they feel they can't possibly compete in AMA contests against these types of models. *Hogwash!*

To quote a statement from Mr. Joe Jablonski of Pittsburgh, Pennsylvania, "The only flight the majority of these entries experience is that of being carried in and out of a station wagon!" It's true, a lot of the beautiful models you see at shows such as Toledo are built for exhibition, not flying, so don't be discouraged.

Toledo is great fun and interesting competition. It's a static scale contest, and one of the best. Just keep in mind that as the Simple Scaler, you'll find more down-to-earth models when you compete in the average AMA flying competition.

The quality of the models this year was, as usual, quite high. Some modelers feel it's getting harder to tell the Standoff models from the Precision Scale models. The practiced eye could tell, however, and if the truth be known, the practiced eye could also tell that there were only one or two truly Precision Scale models displayed, even though a half dozen were entered in that category.

One of the outstanding efforts in the Precision Scale category had to be Merritt Zimmerman's DeHavilland DH60 *Moth*. Presented previously in my article on the Kitchener Scale Rally, the *Moth* is an outstanding example of what a master craftsman can accomplish. Merritt's talent as a machinist is evident throughout this model from the small metal fittings to the corrugated metal on the gas tank. In conversation with Merritt, he told me he even made a tool by which he can turn out pinked tape of any width from materials such as Super Coverite. Sounds like something some manufacturer should investigate; I'll bet you could sell a bunch of them!

The other impressive model in the Precision Scale category was also the eventual winner, a PZL P-23A "Karas"



The Gemini Twin from O.S. seems to be a natural for this Aeronca C-3 owned by Dwight Hartman, Argenta, IL, and built by Rick Quinlan, Bluemound, IL. The 13 lb model was entered in Precision Scale at Toledo.

Polish reconnaissance and light bomber. Built by Larry Gordon of Fenton, Michigan, this model attracted a lot of attention with its extensive detailing. A large model, it had the wing area and moments that gave you the impression it should be a fine flier. Larry's *Karas* also won him the Best of Show award at this year's Toledo Exposition.

Rather than go into all the details of who won what, with what, and how, I would like to make a few general observations from the standpoint of a Simple Scaler.

Today's scale models seem to be growing in size. Of course, there are always the usual assortment of "Giant Scale" models. These are usually quite large and should be considered in a category by themselves. However, the size of what must be considered the average scale model seems to have increased from the .40 to .60-size to the .60 to .90-size.

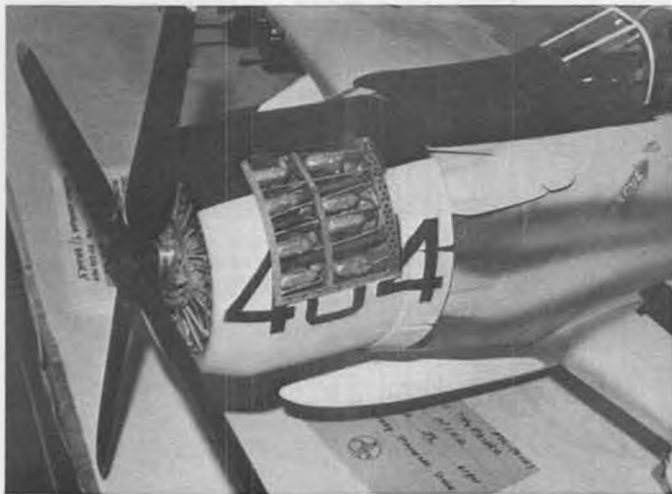
With the increased popularity and availability of today's four-stroke engines in the .90 to 1.20 range, I would imagine the large model is here to stay. When I say large, I mean wingspans in the 75 to 90-inch range with weights from 11 to 14 lbs. A model of this size is not really "giant," but it's large enough



The Toledo Show winner of Military Standoff Scale was Delbert McGehe, Urbana, IL. This Grumman XF5F-1 *Skyrocket* is powered by a pair of H.B. .40s, and painted with DuPont acrylic laquer.



John Hodgson of Massillon, Ohio, likes to scratch build. He entered this Culver Dart GK built from RCM plans in Non-military Standoff. Span is 59 inches. Covering is Super Coverite and Chevron paints.



This is Standoff?! Phil Nigg of Urbana, IL, entered this scratch-built Douglas AD6 Skyraider in Military Standoff Scale. Extensive dummy engine detail and great weathering. Didn't even place!



What an effective weathering treatment given to this F4U-1A Corsair by Roger Van Buskirk. Roger entered Military Standoff Scale with this beauty!

to make it easier for the average pilot to capture more realism in his flying, instead of skittering here and there like a little buzz bomb.

Whoa!! Before you "Schoolyard Scale" fans get all over me about that last statement, let me clarify! The experienced builder of the smaller model is accomplished enough to know that brute power alone can make an overweight, limited surface area model fly, but not necessarily realistically. The small models *must* be constructed *lightly* and powered accordingly, a feat at which the average modeler is not always proficient. He has better luck with an airframe that can carry the extra ounces (pounds?) that he has a tendency to build into his pride and joy. So, to set the record straight, I like *all* scale models, including Schoolyard Scale, but I think we can all agree that they should be flown with the objective of realism in mind.

It was interesting to see an electric model among the scale competitors this year. Keith Shaw of Ann Arbor entered a small Spitfire MK 1A in the Military Standoff Scale category. The model was described as weighing 25 ounces "dry" and 80 ounces with a full load of fuel (batteries!). With 670 square inches of wing, that equates to about a 17 oz/sq.ft. loading, which is probably lighter than most of the scale models you see with conventional glow engines! The rules for Sport Scale in the AMA handbook say that electric motors of any size may be used. Is there a future in scale competitions for the electrics? (We hope so! wrf)

For those of you who like statistics, here are the final standings:

#### PRECISION SCALE

**First Place** — Larry Gordon, Fenton, Michigan: PZL P-23A Karas

**Second Place** — Merritt Zimmerman, Cleveland, Ohio: DeHavilland Moth

**Third Place** — Robert Wright, Harrodsburg, Kentucky: Ryan STA

#### NONMILITARY STANDOFF SCALE

**First Place** — Steve Chobrida, Windsor, Ontario: 7AC Champ

**Second Place** — Cliff Tacie, Mt. Clemens, Michigan: Clip Wing Cub

**Third Place** — Lynn Lockrow, Indiana, Pennsylvania: Monocoupe 110

#### MILITARY STANDOFF SCALE

**First Place** — Delbert McGehe, Urbana, Illinois: Grumman Skyrocket

**Second Place** — Dennis Wann, Bryant, Ohio: Hawker Sea Fury

**Third Place** — Jeff Troy, Valley Forge Signal Seekers: Bleriot XJ-2

See you next year at Toledo?

#### COCKPIT DETAILING

In my last column, I discussed finishing that cockpit area to give your model that completed look. Part of the cockpit treatment consisted of installing a "cover plate" in the cockpit area so you can't see all the goodies (and baddies) inside. In a recent conversation with my good friend Skip Mast at the Toledo show, he made an interesting observation. Looking at my *Clipped Wing Cub* on display, he suggested that I paint my cover plate in the cockpit a flat black to give that area more "depth." At that time, it was still white artist board, and in considering his suggestion, it seemed to merit investigation.

I just now got through reinstalling my cover plates which I sprayed flat black, and I've got to give Skip credit... he was right. It looks terrific black! I highly recommend it for that simple cockpit treatment.

I've mentioned before, I'm always open-minded to tips, not only in my own building techniques, but to my column as well. If you have any tips like Skip's to share with us, send them in

please! It just may help me and the rest of our readers out there make a simple improvement in our models!

#### FROM THE MAILBOX

In discussing Toledo, I mentioned a quote from Joe Jablonski. Joe was nice enough to write me in response to an article I wrote in the January 1984 issue of "Replica," the newsletter of the National Association of Aeromodelers. As Secretary/Treasurer of NASA, I receive quite a bit of correspondence, and I think you might be interested in what we're discussing.

Firstly, my article as it appeared in *Replica*...

"In the 'Soap Box' section of the December 1983 issue of *Model Aviation*, Brad Shepard expressed his concerns in a letter entitled 'Is It Still Sport Scale?'"

"It's an interesting article, and I believe it deserves addressing by you out there in the scale fraternity. Brad says that he thinks we've drifted away from the original intent of Sport Scale. Have we really? Was it *really* intended to be a flying event? I've talked to a large number of scale enthusiasts this year about just this very thing, and I've been very surprised that not everyone *does* want it to be a flying event!"

"Brad had the foresight to offer a suggestion of change along with his criticism of the existing event. He suggests an

*Continued on page 85*



An electric powered (!) model entered in Military Standoff Scale by Keith Shaw of Ann Arbor, Mich. It is a Spitfire Mk 1-A, and it features four-channel control, Jomar SC-2 speed controller, Astro Flight cobalt 25 with gear reduction. Weighs 5 lb, has 670 sq. in. of wing, scratch-built!



1. Look at all those trophies and prizes! The five biggest trophies were for low-wing entries. Next year maybe YOU should be at the West Coast SAM Champs!



2. Paul Forrette built and flew this snappy-looking Saddler *Pacemaker*, a low-wing design. Paul won Texaco with this model.



3. WOW! Here is a really good-looking low-winger called a *Dragonfly* as built and flown by Ted Kafer, SAM 21. Looks modern!



# PLUG SPARKS

By JOHN POND

• In 1983, during the May 14-15 West Coast SAM Champs at the famous Dichondra Ranch, this columnist (and contest director) announced well in advance of the 1984 W/C SAM Champs that that premiere O/T event would emphasize low-wing designs with additional prizes for this type of aircraft.

This was brought about by talks between this writer and Gene Wallock wherein ideas were discussed to bring new interest to the R/C Assist Old Timer contests such as has been witnessed by 1/2A Texaco and 05 Electric events.

Finally, Gene offered two trophies

for low-wing models. Not to be outdone, *three more* trophies and a huge sweepstakes trophy were offered by Gary Pond (No. 2 son). Before you could say, "low-wing," there were perpetual awards for Class AB, Class C, Antique, Texaco, and 1/2A Texaco.

As can be seen in Photo No. 1, there was a real flock of trophies and merchandise befitting the stature of the West Coast Champs. In all cases, prizes were offered to tenth place.

Although the announcement of intent to feature low-wings at this contest was made a year in advance, the problem was how to induce Mr. Average Contestant to build a one-of-a-kind

model for only one major contest. It was then that this writer proposed to give low-wingers preferential treatment in their times.

The announcement was made that all flights made by low-wings would be given a 50% increase in time: i.e., if a four-minute flight was made, this would count as six. The reader would immediately say, "What an overkill!" As it turned out, most modelers preferred to stay with their tried-and-true pylon designs.

SAM 21 member Paul Forrette, who has been flying low-wings for the longest time in 1/2A Texaco, was delighted. As Paul puts it, "You can't tell whether



8. This Old Timer model called the *Rudder Bug* was originally designed for R/C, not F/F! Walt Good airplane built by George Steiner.



9. What's this?! It is a close-up view of the decoy radio receiver spotted inside George Steiner's *Rudder Bug*. . . and it looks like an old Airotrol rig, too! See text.



LEFT: 4. Dave Marshall scratch-built this gorgeous Peerless Panther. Dave hails from the SAM 21 organization. Taken at the Merwin dichon-dra Ranch.



RIGHT: 6. It's a biggie at 14 feet of span... Ron Kiel, SAM 27, poses with his Michael Roll 14-Foot Berryloid Winner.

LEFT: 5. If you could only see this in color! The color scheme is purple with pink and white trim. Angus Crosbie's Atwood Starliner gets you right in the eye! OUCH! All kidding aside, it looks very nice.



7. Brad Allen, Sacramento, likes the Megow Aero Champ design! He had two of them on the field. Looks like a real lightweight!

into a dive that broke the Yates up badly. Those "flying lumberyards" sure leave a lot of balsa laying around!

Other interesting models were on the field, albeit they were not low-wing. The former SAM 27 Prexy, Ron Kiel, can be seen in Photo No. 6 with a good-looking Michael Roll 14-foot Berryloid Beauty Winner of 1937. This model, powered by an OS .60 four-cycle, was a neat flier;

the wing is above or below the fuselage at 1000 feet." His Peerless Panther, built to 1/2A scale, turned out to be a winner. Hence, it is no surprise to see Photo No. 2 of a Saddler Pacemaker which promptly won high time for low-wings in Class C. This, coupled with his win in 1/2A Texaco, was enough to win the Low-Wing Sweepstakes Trophy for Paul. (See Photo No. 1: the tallest trophy!)

Not to be outdone, fellow SAM 21 member Ted Kafer labored mightily for two weeks to produce a lovely "Dragonfly" as seen in Photo No. 3. This advanced-looking model, as designed by Charles Williams for the March 1938 issue of *Flying Aces*, would fool the casual observer to think this was a recently designed pattern model. We have other photos which we will run later in the hope that this will encourage the construction of low-wing models for the 1985 season.

As far as the flying went for the Dragonfly, the first attempt was rather "hairy" as Ted built in down thrust in this low-wing model. This is something you don't need as the thrust is pulling directly in front of the center of resis-

stance. Ted had quite a time keeping the model from demolishing itself on its first flight as the down thrust gave the model dangerous diving tendencies. Time ran out on Ted after the second flight, as he was having his problems with a brand-new, untested model.

The model that this writer thought would win easily was Dave Marshall's scaled Peerless Panther seen in Photo No. 4. Dave had been flying this model for over a year. Scaled to Playboy Senior size, the Panther is an excellent flier. What happened? He dinged it at the meet and was unable to complete his flights... that plus engine trouble!

Angus Crosbie drove all the way from Santa Monica, California, with his wife and new baby to fly the Bill Atwood "Starliner" as shown in Photo No. 5. The color scheme was something else: purple with pink and white trim! Wow!

Crosbie had the same trouble as other low-wing contestants: an untested model at a big contest. Failing to get a satisfactory flight, he then flew his big, ten-foot Yates Cabin. This flew well until the plane hit some turbulence about 30 feet off the ground, upsetting the model



10. Start 'em young! Bill Bowen's grandson, Brent Presser, poses with what appears to be a Kerswap. Model is electric powered.

11. Walter Eggert, designer of the Soaring Eagle series, launches a 1/2A version of same. It flies excellently! Slick little ship.





13. Here's a beautiful Art Gray *Toughie*, carefully reproduced by Gus Munich. Flies as good as it looks. Elliptical wing & dihedral.



12. Jerry Persh has a great time flying this Frank Zaic *New Yorker* from his home field, Manassas Battlefield Park.

however, in the stiff wind, the model was thrown over on its back. Taking it through a split S was just too much for the wings. Clap hands, Charlie! Ron says he will have it back together for the popular "Fly-For-Bucks" meet to be held at Colusa over July 14-15.

Let the reader overlook this obvious item, most O/T Annuals in California, whether they be free flight or radio control, are run over a two-day period. This is in answer to the demand for more time to fly more models with better times.

While running the meet (with camera in hand), this writer spotted an old-time friend, Brad Allen, with not one, but two Megow *Aero Champ* models. The photos of the duo didn't turn out as expected, but Photo No. 7 does full justice to Brad's creation.

Weatherwise, the wind did come up between 11 a.m. and noon as predicted by the contest director. Those fellows flying a little early took their chances on the light early morning lift, particularly if they felt their model would not penetrate the afternoon breeze. Let Ed Solenberger tell you about that with his 1/2A *Anderson Pylon* missing his qualifying, on-field landing by less than ten yards!

This writer's attention was attracted to a more modern-looking model buzzing around the sky. Identifying it as an early R/C design, Walt Good's "*Rudder Bug*," he found that George Steiner (runs GSP,

an R/C repair shop) had recreated this famous model as shown in Photo No. 8.

Inspection of the radio system revealed a system very similar to the Berkeley Airotrol tube set marketed in the early fifties. Photo No. 9 (a close-up) shows the radio gear. *But hold on!* This model flew entirely too smoothly for a dual-channel setup. *It was a decoy!* Looking carefully under the alleged radio set was a modern digital proportional set that operated this model through maneuvers not readily attainable during the fifties.

In retrospect, things ran very smoothly thanks to the ladies: Neva Nicholau, who did the recording; Maryann Pond, who worked both registration and recording; and Judy Staben, who ran the frequency board. A neat surprise was in store for the girls as Angus Crosbie had donated six wristwatches from the Ship Chandelry outfit he is employed by. These were awarded to the girls after all the prizes had been awarded. *Surprise girls!* We appreciate all your work and love you for it!

Before we list the results, Jim Kyncy should be singled out as the outstanding modeler of California as he beat many a good man that day. Jim not only won the tough Texaco event, but cleaned the boys in the very popular 1/2A Texaco. Not content with that, Jim scored two seconds, one fourth, and one fifth to garner a total of 59 points to win the Grand Championship Sweepstakes Per-

petual Trophy. It seems like Jim Kyncy and Don Bekins have a lock on this big trophy that can barely be seen (ha, ha) in Photo No. 1 behind the number one table (it is over three feet tall!).

Before wrapping up this excellent contest, we would like to run Photo No. 10 showing Brent Presser, the grandson of well-known modeler Bill Bowen, as an excellent example of starting them young in Old Timers. Brent has his own R/C gliders, free flight models, and now an electric O/T *Playboy*. Note that terrific dichondra grass background! An incredible flying site!

Let's take a look at the results of one of the best California contests.

**WEST COAST SAM CHAMPS  
MAY 12-13, SPONSOR: SAM 21  
RESULTS (Only to 10th place)**

**CLASS A**

1. Eut Tileston (30) (*Lancer/Ellfin*) ..... 21:00
2. Jim Kyncy (30) (*Kerswap/Torp.* 19) ..... 20:09
3. Don Bekins (27) (*Alert/Torp.* 19) ..... 18:29
4. Bill Bowen (30) (*Baby Playboy/K&B* 19) ... 13:38
5. Loren Schmidt (51) (*Ranger/K&B* 15) ..... 7:45
6. Don Carll (21) (*Gas Bird/Fox* 15) ..... 7:37

**CLASS B**

1. Don Bekins (27) (*Playboy/Torp.* 19) ..... 21:00
2. Jim Kyncy (30) (*Kerswap/Torp.* 29) ..... 21:00
3. Ed Solenberger (27) (*Playboy Jr./Torp.* 29) ..... 20:49
4. Don Carll (21) (*Playboy Sr./McCoy* 29) .. 19:21
5. Nick Sanford (27) (*Playboy Jr./McCoy* 29) ..... 16:48
6. Loren Schmidt (51) (*Zipper/Fox* 29) ..... 7:33

**CLASS C**

1. Ed Solenberger (27) (*Playboy Jr./McCoy* 60) ..... 21:00
2. Nick Sanford (27) (*Playboy/McCoy* 60) .. 20:45



15. Charlie Havis, SAM 35, England, likes biplanes . . . F/F type! This one is a *Brooks Bipe* from *Aeromodeller* plans.



14. Neat lookin' Bowden *Contest Model* by Tony Penhall, SAM 35, England. Imrie photos.



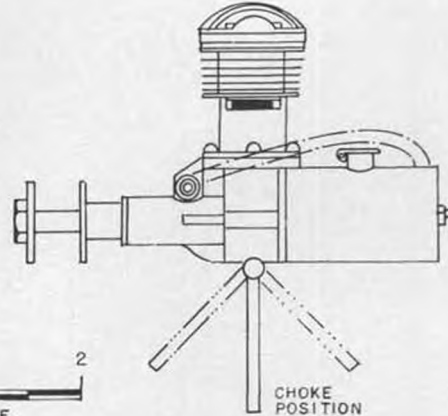
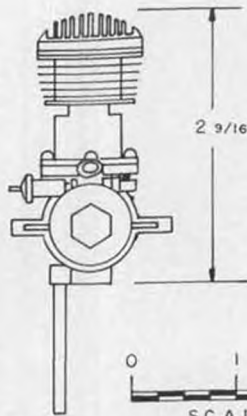
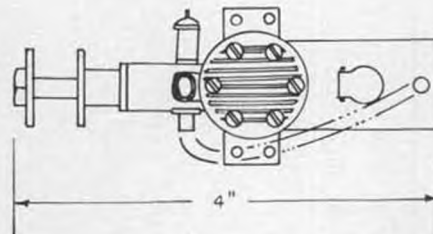
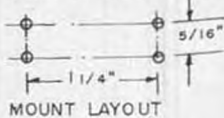


16. Here's a cute shot of Max Starich's granddaughter holding his *Flying Aces Commercial*. Model flies well!

- |   |       |
|---|-------|
| 3. Guy Hughes (30) ( <i>Playboy/McCoy 49</i> )          | 19:59 |
| 4. Eut Tileston (30) ( <i>Westerner/US 90 4/c</i> )     | 19:19 |
| 5. Jim Kyncy (30) ( <i>Anderson/McCoy 60</i> )          | 18:29 |
| 6. Loren Schmidt (51) ( <i>Challenger/Egre 60</i> )     | 15:37 |
| 7. Leshar Dowling (21) ( <i>Sailplane/Cyke</i> )        | 15:00 |
| 8. Ted Kafer (21) ( <i>Playboy/Cyke</i> )               | 13:45 |
| 9. Bruce Augustus (30) ( <i>Bombshell/K&amp;B 5.8</i> ) | 11:54 |
| 10. Bill Squire (21) ( <i>Playboy/ST 35</i> )           | 11:16 |
- ELECTRIC**
- |  |       |
|--|-------|
| 1. Augst Fabian ( <i>Playboy</i> )       | 20:41 |
| 2. Bill Burlson ( <i>Playboy Cabin</i> ) | 15:06 |
| 3. Jim Caughram ( <i>Playboy</i> )       | 14:10 |
| 4. Eut Tileston ( <i>Playboy</i> )       | 11:20 |
| 5. Ted Kafer ( <i>Playboy Cabin</i> )    | 8:17  |
- TEXACO**
- |  |       |
|--|-------|
| 1. Jim Kyncy ( <i>Anderson/OS 60 4c</i> )      | 27:21 |
| 2. Don Bekins ( <i>Gas Bird/OS 60 4c</i> )     | 23:15 |
| 3. Charles Critch ( <i>Dallaire/OS 60 4c</i> ) | 20:09 |
| 4. Eut Tileston ( <i>Westerner/OS 90 4c</i> )  | 17:58 |
| 5. Jim Caughram ( <i>Yates/OS 60 4c</i> )      | 17:32 |
| 6. Gene Downey ( <i>Dallaire/OS 60 4c</i> )    | 16:10 |
| 7. Bill Burlson ( <i>Gas Bird/OS 60 4c</i> )   | 12:50 |
| 8. John Drobshoff ( <i>Folly II/Cyke</i> )     | 12:20 |
| 9. Loren Schmidt ( <i>Dallaire/OS 60 4c</i> )  | 11:00 |
| 10. Nick Nicholau ( <i>Dallaire/OS 60 4c</i> ) | 10:33 |
- TEXACO 1/2A**
- |                                     |       |
|-------------------------------------|-------|
| 1. Jim Kyncy ( <i>Anderson</i> )    | 30:00 |
| 2. Paul Forrette ( <i>Panther</i> ) | 26:53 |
| 3. Bruce Augustus ( <i>Mike</i> )   | 26:32 |
| 4. Don Bekins ( <i>Playboy</i> )    | 25:25 |
| 5. Brad Allen ( <i>Aero Champ</i> ) | 19:57 |

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DRAWN BY ALLEN POND



- |                                       |       |
|---------------------------------------|-------|
| 6. Don Carll ( <i>Playboy Sr</i> )    | 19:43 |
| 7. Bill Barton ( <i>Lanzo</i> )       | 18:59 |
| 8. Loren Schmidt ( <i>Viking</i> )    | 14:25 |
| 9. Ed Solenberger ( <i>Anderson</i> ) | 12:22 |
| 10. Ron Keil ( <i>Diamond</i> )       | 11:08 |
- ANTIQU**
- |   |       |
|---|-------|
| 1. Loren Schmidt (51) ( <i>Dallaire/OS 60</i> )             | 30:00 |
| 2. Eut Tileston (30) ( <i>Westerner/OS 90 4c</i> )          | 29:32 |
| 3. Gene Downey (I) ( <i>Dallaire/HP 61</i> )                | 28:03 |
| 4. Jim Kyncy (30) ( <i>Anderson/Rossi 60</i> )              | 26:55 |
| 5. Charlie Critch (21) ( <i>Contest Winner/K&amp;B 45</i> ) | 24:10 |
| 6. George Steiner (I) ( <i>Miss America/OS 60</i> )         | 17:26 |
| 7. Ted Kafer (21) ( <i>Flamingo/Spitfire</i> )              | 14:06 |
| 8. Bruce Augustus (30) ( <i>Trenton Terror/Cyke</i> )       | 10:41 |
| 9. Angus Crosby (I) ( <i>Flamingo/Tigre 40</i> )            | 9:13  |
| 10. Nick Sanford (27) ( <i>Scram/OS 40</i> )                | 4:42  |
- LOW-WING CLASS AB**  
(No winner)
- LOW-WING CLASS C**  
Paul Forrette
- LOW-WING ANTIQUE**  
(No winner)
- LOW-WING TEXACO**  
Ted Kafer
- LOW-WING 1/2A**  
Paul Forrette
- OVERALL SWEEPSTAKES FOR LOW-WINGS**  
Paul Forrette

**GRAND CHAMP SWEEPSTAKES**

- |                   |         |
|-------------------|---------|
| 1. Jim Kyncy      | 59 pts. |
| 2. Eut Tileston   | 52 pts. |
| 3. Loren Schmidt  | 39 pts. |
| 4. Don Bekins     | 37 pts. |
| 5. Ed Solenberger | 27 pts. |

**ENGINE OF THE MONTH**

As usual, this writer would like to acknowledge once again the generosity of Karl Carlson, noted engine collector and manufacturer heading up Replica Engines, for the use of his engine.

The Mite as manufactured by the Mite Manufacturing Corp., 257 Water St., Brooklyn, NY, was first advertised in the February 1947 issue of *Model Airplane News*. This new diesel (actually a compression ignition engine) was priced at \$18.95. At that time, claims were made that the record-setting model in Class A Speed used a Mite (speed was 67.6 mph).

The Mite diesel was similar to the Drone in that it featured a fixed head giving a compression ratio of 13.5 to 1.

*Continued on page 90*

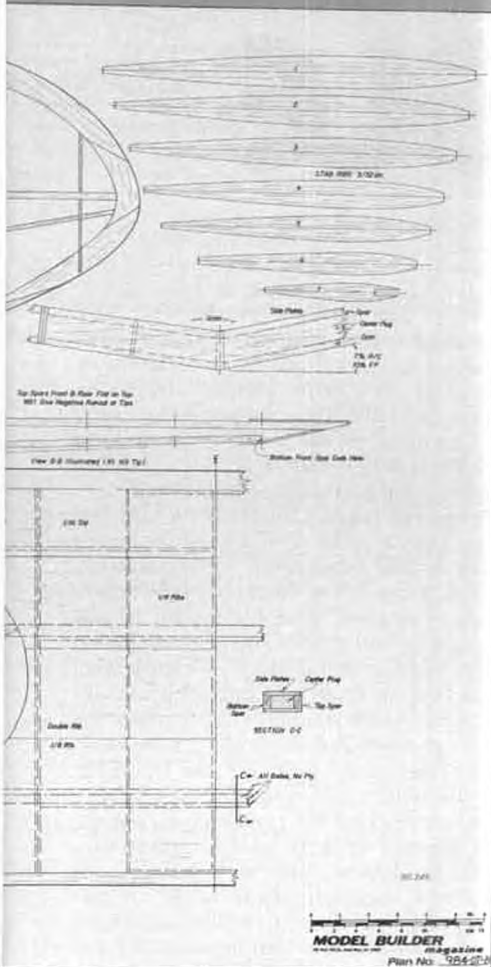
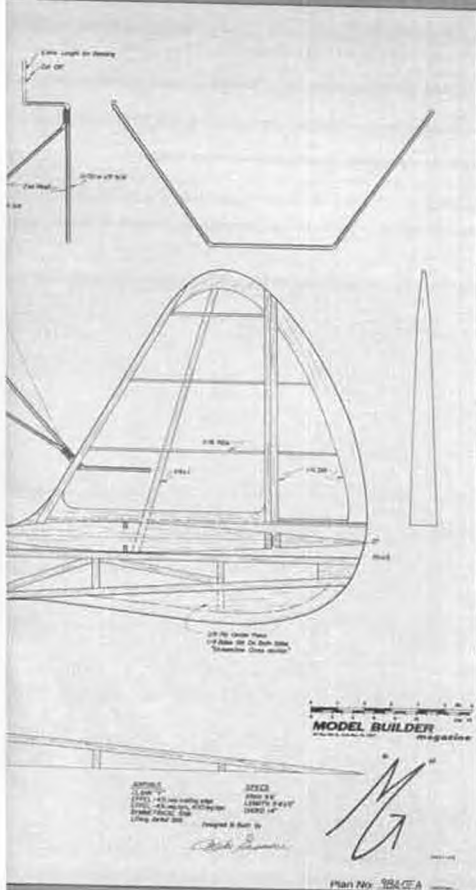


17. Hal Cover builds neat models! McCoy .60 powered Foote *Westerner* of his flies well and really performs! SCAMPS meet.



18. How about a rubber job turned gassie? This is a *Pacific Ace* scaled up for .020 Texaco. Carl Taylor says it works great!





The designer of the MG-2, Mike Granieri, poses with the ORIGINAL MG-2 which appeared in the February 1937 *Popular Aviation*. Framework is 47 years old!

## OLD TIMER MODEL OF THE MONTH

# Mike Granieri's 1936 MG-2

Designed by: Mike Granieri  
 Drawn by: Al Novotnik  
 Text by: Bill Northrop

edited by Jim Adams.

We might have presented Mike Granieri's MG-2 about a year ago except for a slight misunderstanding between Mike and MB's editor. We thought he wanted to continue supplying plans . . . he thought we were going to do it. Bad communication!

Anyway, we found that Mike's plans are somewhat vague in several areas, but knowing model builders, we have not presumed to solve the vagueries in our

• This month's O.T. model is already well-known by active R/C O/T fliers, as it's a highly competitive design, especially in the fuel allotment events. S.A.M. members now also know some of its history, as the original cabin version was featured in *SAM SPEAKS*, the official SAM newsletter for March/April 1984, as

*Continued on page 104*



Another photo of Mike Granieri with two different sizes of the MG-2 built by Esio Grassi.



Here's an oldie photo of a family of MG-2s in front of Miss SAM Champs 1977, Tricia Webster, Jim Clark, and Jim's wife Marianne. Models range from full-size to .020 Replica.

# R/C AUTO NEWS

By DAN RUTHERFORD  
PHOTOS BY AUTHOR

PRODUCTS IN USE

## DELTA'S



The 1984 Delta Super Eagle chassis is draped in the MRP Budweiser Spyder Can-Am body. Rear air dam on body has been cut out, and new hub-carrier wing mounts have been used to position the wing low and forward for better high-speed steering.

# SUPER EAGLE

• While it seems as if it was only a couple issues back that the Associated RC500 and Delta Eagle were compared head-to-head, and that those two articles would be quite enough when it comes to dealing with 1/8-scale suspension cars in one six-month period, such is not the case. These ground-hugging "boinger cars" continue to be developed, each month seems to bring another small change that offers a potential improvement in handling, durability, or ease of maintenance.

Besides, the timing of the Eagle vs. RC500 battle was all wrong. When it was published, Delta had already released the subject of this article, the Super Eagle. To refresh your memory, the conclusion reached by the Dirty Racing Team was that while we preferred the Delta Eagle over the RC500, your own choice of race car should be dictated by the brand your dealer stocks more than any other factor, as the cars were close in performance and even a superior car isn't worth much of you can't get parts readily.

As you might suspect (and here is where the cart gets put before the horse

as far as tests are concerned), the Super Eagle is enough improved that while it doesn't blow the RC500 out of the water, it does nicely nudge it into a close second place in the fight to offer the best 1/8-race car to the racing public.

The most obvious change from Eagle to Super Eagle is the radio tray layout. The steering servo has gone from the right side to the left, in addition to being moved rearward. The throttle servo is in the same place, but the receiver and battery pack now occupy the space formerly allocated to the steering servo.

These changes result in a layout that is not only a bit handier to work with, but has, more importantly, equalized weight distribution left to right.

The Eagle was definitely heavy on the left side, and in US road racing, if you are going to have to put up with chassis imbalance, it would be better to have a chassis that is heavy on the right side. However the ideal setup is still a balanced chassis, and the informal balance-it-on-your-fingers test shows the Super Eagle to be very close in lateral weight distribution.

Before leaving the radio tray, gen-

erally not the most inspiring area of any suspension car, take another look or two at the method used in mounting the five-cell battery pack and Rx. The DRT has tried most every other system, and this is easily the best, most convenient yet seen. We even adapted this technique to the RC500 with excellent results.

Out back are the single most-needed improvements found in the "Sooper Iggle": machined, all-aluminum carriers. The molded nylon pieces were OK, but they could be bent in a crash, in more than a few cases they would actually break. Even if they didn't bend or break, they needed serious massaging to eliminate binding upon installation when new. Art Carbonell (Delta Team driver) says that on really hot days, they would also lose some rigidity and actually steer the car from the rear. (An example in full-scale cars would be the IRS Corvettes which are notorious for having the rear end tell the car which way to go, accounting in large part for their success in slaloms and such parking lot activities, but also responsible for delivering slightly unpredictable high-speed handling when pushed to the



limit.)

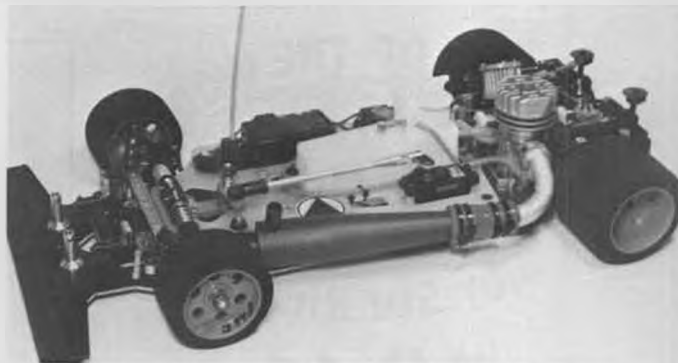
Whether or not the rear end actually did steer my *Eagle*, it certainly wasn't felt at the Tx, but then it rarely gets real hot here in Seattle, and Art's feel for a car is much, much better than mine anyway. So the *Super Eagle's* aluminum rear end shows its advantages in initial setup, greatly increased crash resistance and minimal maintenance. In addition, the axles carrying the wheels now spin freer in their bearings, as the bearings are held in much more precise alignment than before, and now the wing can be mounted further forward by using the new carrier-mount wing sockets. This mod results in improved steering at high speed.

Still in the rear, Delta has engineered the best braking system I have ever used. This brake is so good that you simply forget about it! Its very smooth, even action, and no fading tendencies whatsoever give you great confidence. Set that sucker just before the all-important main event, and you will have exactly the same amount of braking on the last lap as you did for the first. Two steel rotors, loosely pinned to the differential housing, are squeezed by steel pads carrying a rulon (similar to Teflon) lining. This rulon-on-steel combinations is so good that you may want to consider home-brewing your own conversion no matter what make of car you race.

At the other end of the chassis is a new front end setup, referred to as a "four-bar" front end. It looks trick, works beautifully, is super strong and you can tune it easily. Still, this is what I call band-aid engineering. Effective, yes. Well done, ditto. But it's still band-aid engineering.

The lower arms are the same as used

The naked *Super Eagle* looks like this equipped with stock Picco engine, "swoopy" header and new pipe that nestles alongside the radio tray as low as possible.



A major improvement over the older *Eagle* is the redesigned, machined rear hub carriers.



New four-bar front end is good old band aid engineering in the author's opinion, but it still is a very effective, strong, and easily tunable setup.



This is a terrific way to mount receiver, antenna, and battery pack. RX and batteries are mounted to fiberglass plates. Here the receiver is flipped up to show batteries underneath.



Here's a close-up shot of the *Super Eagle* front end. All metal is aluminum, including the front axles! Threaded upper links are tubes instead of heavier rods. Inboard attachment point for the links can be raised for quicker steering response.



*Continued on page 62*



# 1941 FRENCH MICRON 5cc DIESEL



The stately French Micron 5cc diesel engine started the 40-plus year lineage of that country's most noted model engine manufacturer . . . a company which produces engines to this day. The Micron 5cc has no compression adjustment. Fuel's OIL CONTENT was varied to control ignition of ether/kerosene mixture.

## THE FIRST OF THE FRENCH . . . THE BEGINNING!

When Lindbergh landed his *Spirit of St. Louis* at Le Bourget Airport outside of Paris, he electrified the world with the flight across the Atlantic. America was suddenly "air minded" . . . but SO WAS THE REST OF THE WORLD! Aeromodeling took off like a shot from a cannon . . . and a Frenchman named M. Gladioux was caught up in the excitement.

Bill Brown in the USA manufactured the first truly successful spark ignition model engines. A Swiss company, Klemenz-Schenk, started production in 1941 of the first commercial compression-ignition engine (we call them diesels today) named the DYNO 1. Diesel engine popularity took Europe's

modeling fraternity by storm. Diesel engines are still (today) widely accepted there, but NOT in the USA!

Early in 1941, Mr. Gladioux handmade probably less than a dozen test engines before going into the model engine manufacturing business under the trade name Micron. When he was satisfied with his test engine . . . it was time to put them in the hands of other modelers for the true "acid test." Picture No. 1 shows one of these test engines . . . and it is truly RARE. It represents the beginning of the manufacture of Micron engines . . . which are still being produced today after more than forty continuous years of production! Their address today is: MOTEURS MICRON, Denis Dupuy, 10, rue de la Neva, 75.008 - Paris, FRANCE.

## VITAL STATISTICS

The engine is 5-3/4 inches long including the gas tank, 2-1/8 inches wide, and 3-3/4 inches high. It weighs 9-3/4 ounces, and has a displacement of 5 cubic centimeters (.30 cubic inches).

## UNIQUE FEATURES

Unlike the Swiss Dyno 1 engine, this Micron has NO WAY to adjust the compression ratio . . . the oil percentage is varied in the fuel to get the "right situation" for the engine to run! The same path was followed by the American Drone Diesel which appeared after World War II.

The needle valve was unique, but it was similar to the early Brown Jr. engines and the much later Fox glow engines. The needle tapered on one side only and was, at best, crude. After the initial test batch of engines, Mr. Gladioux designed what is probably the world's finest needle valve system . . . it is still

*Continued on page 103*



The original, preproduction engines probably copied their "tapered-sliced" needle valve from the American Brown Jr. which was so successful. The first true production versions had a magnificently designed and manufactured, five-piece needle and valve assembly . . . which is STILL USED on today's modern Micron Moteurs.



The left engine mounting lug shows date of manufacture as March 27, 1941. This engine was handmade and homemade. One of the three cylinder hold-down bolts shows near the date. The sand-cast crankcase appears unbelievably crude . . . but this was the start!

By BILL FORREY  
PHOTOS BY THE AUTHOR

# R/C SOARING

## TOP FLITE ANTARES

Sometime in the upcoming issues of *Model Builder*, you will see a product review by this author on the Top Flite *Antares*. I have the kit in my possession and am currently finishing up the fuselage construction and will soon be starting the wings and stab. I can't tell you what I think of the kit just yet because that would spoil the article later on. For now, you will have to wait for my opinion.

However, I know of a modeler who has just completed his, and I can tell you what HE thinks of the kit and airplane. The modeler's name is Brad Teeter, and he lives in Long Beach, California.

Brad is a master builder. His work is as flawless as any I've seen, and he is very particular about the quality of the materials he works with, i.e., he loves to pick out the best balsa for his projects.

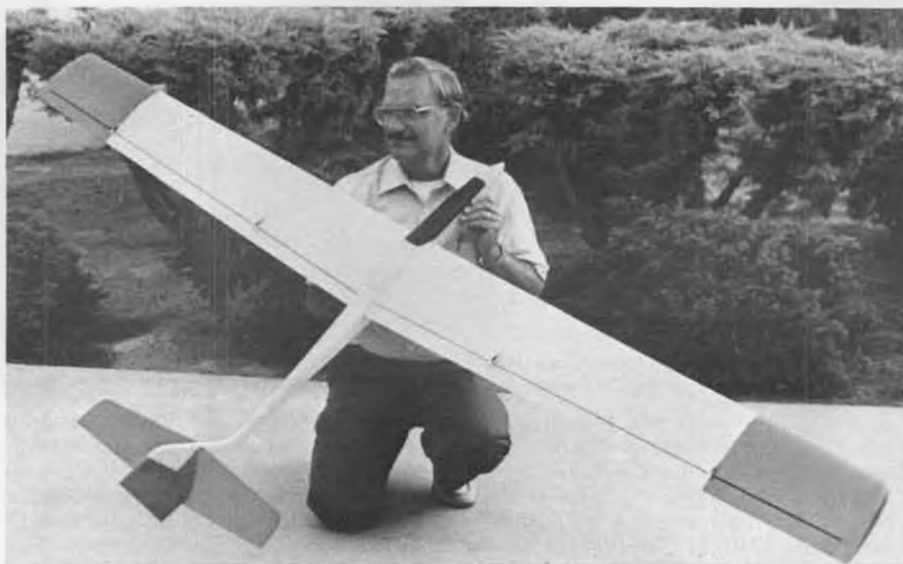
First of all, he was told by a few of his friends that the kit was "junk." Then he was told the *Antares* didn't fly that great. Well, thank goodness Brad doesn't believe everything he hears, or he would have never built one. As it turns out, he is very glad that he *did* build one!

As for the quality of the wood in the kit, Brad did replace a few pieces that he felt weren't up to his standards. There were some others that could have been better, but weren't worth replacing. No big deal here, that's true with a lot of kits these days.

Another area of criticism by Brad's friends was the "die-crunching." The bottom line here is that a few ribs needed a little sanding here and there, but it wasn't nearly as bad as some people made it out to be. (Besides, all the ribs are sheeted over and cap-stripped, so what if the edges aren't as smooth as they could be, die-cutting saves you, the modeler, MONEY.)

The last area of criticism, flying ability, was answered for Brad after one hand launch, some flight control trimming, and two winch launches. The first winch launch flight was spent fine-tuning aileron and elevator controls. The second winch launch was when the fun began. Brad is happy to report that the *Antares* flies like a dream and is a blast to fly. The three things that impressed Brad the most were its long, flat, fast glide, its ability to slow up to a crawl with the flaps, and its fast and fun roll rate.

Brad told me that the *Antares* is a lot of work for the builder, which is something I'm finding out for myself. This aircraft is an all wooden one. The fuselage, the wings, and the empennage are all pretty conventional, but there are a lot of pieces to assemble. As Brad is allergic to CA glues, he has to work with alliphatic resin glues such as Titebond, etc. Yet in spite of this, he finished his *Antares* in one month's time (60 hours of actual work, plus another 30 or 40 just thinking



Brad Teeter, Long Beach, California, is rightfully proud of his newly completed Top Flite *Antares*. It looks nice, flies great, and is a kick to fly. Color scheme is yellow and red. See text for more details. Author is currently working on an *Antares* for future review.



Support your 1985 US F3B Soaring Team! By purchasing these beautiful 3 X 4-inch red, white, blue, and yellow patches for five bucks each from Ms. Helen Olsen, Chairwoman, Team Fund, 8875 Oveida Plaza, Westminster, CA 92683, you too can be part of the team!

things out . . . gee, he builds like me).

One thing you have to know about Brad is that he is an accomplished builder. He builds an average of 20 models a year, not all for himself, but he builds models for others who pay him to do so. He enjoys building, and he is never idle.

Anyway, Brad is very happy with the way his *Antares* turned out, and he is having a blast flying it. That's what is important in the end.

### ANTARES AIRFOIL:

#### EPPLER 199 (???)

When I first heard of the *Antares*, I was speaking to Scott Christensen at one of the local slope soaring sites. Scott had

come out west from his Chicago area HQ for a trade show and was taking some time out with one of his products, a two-meter *Metrick*. He described the *Antares* to me in a way that I could visualize it pretty well, and in a way that got me very interested in doing a product evaluation on it.

The one thing that sorta bugged me about it was the airfoil. Instead of going with a time-tested and proven section like the Eppler 193 or 205, Scott did something quite out of the norm: he took the upper curve of the E-193 section and wedged it to the bottom curve of the E-205. Frankly, I thought Scott was making a serious mistake. I was



Dennis Brandt prepares to heave Larry Jolly's F-4 Phantom glider from the cliff at Pt. Fermin, California. F-4 pics by Jim Brandon.



The Phantom sweeps in close to the cliff. This model (and several others) has been made for upcoming TV pilot film.

of the opinion that you just shouldn't mix and match thickness distributions and camber lines like that. Sure, people had been building the E-193 with a flat bottom for years, when it really should have had a slight "undercamber" or cusp near the trailing edge. These people said it flew great this way, but somehow the thought of a E-193/E-205 merger sounded crazy to me. Scott insisted all along that it flew great, so I postponed judgment.

When Michael Selig started sending us his computer work for his various airfoil sections, I got the idea to run this Eppler hybrid through the Eppler program to see how it compared "theoretically" with other theoretical computer outputs of the E-193 and E-205. This

common factor, the Eppler program, would at least give us an idea how the three compared to each other, I reasoned. As you can see by the overlays, the new airfoil is right in there with the others.

Compared to the E-193, the Antares airfoil has a wider range of lift at low drag values, especially at the low  $C_l$  end (important in a high speed, shallow dive), yet it shows no significant loss at the high  $C_l$  end. Compared to the E-205, the new section has improved lifting ability at high  $C_l$  (important on launch or in a tight, high-speed turn), but it is not quite as good at the low  $C_l$  end where the 205 can practically hit a zero lift coefficient before the drag increases, while the Antares section picks up drag

at  $C_l = 0.1$ . Well, three out of four ain't bad! You would have to admit that according to the computer, the Antares airfoil is a good one!

Anyway, what all this proves . . . well, maybe a better word would be *reinforces* . . . is that Scott was giving it to me straight, the E-199 or Antares airfoil really is as good as he says it is. Wait a minute, did you say E-199? Where did you come up with that one, Forrey? I didn't. Michael Selig thought it up . . . 193 plus 205 divided by 2 is 199, get it? Thank you Mr. Selig for all your work, and good luck at Princeton in the fall.

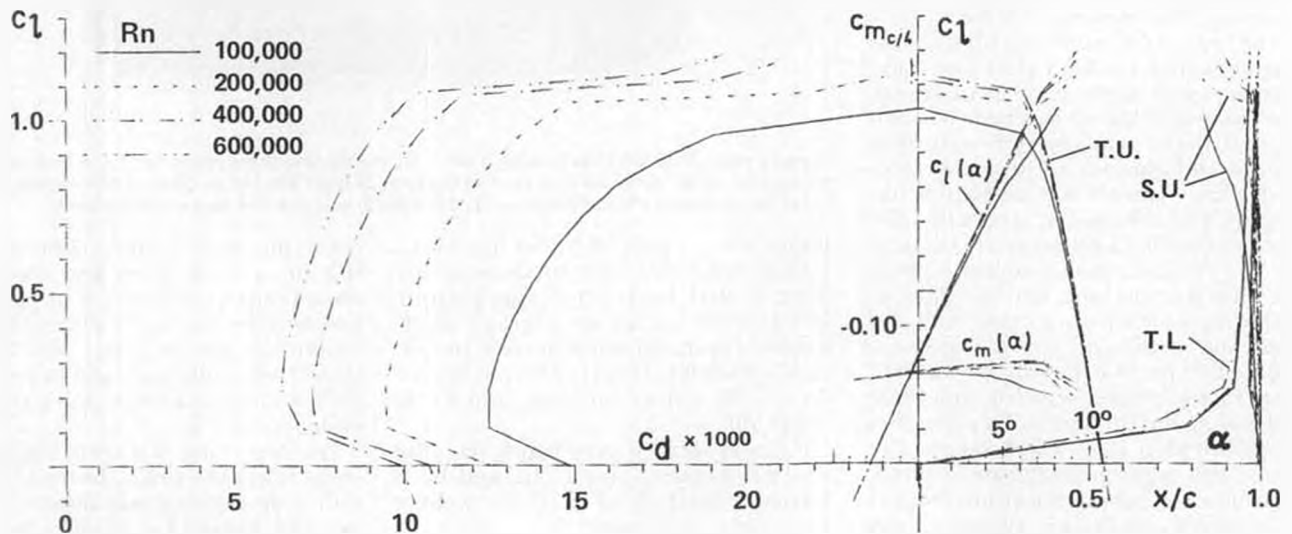
#### WHAT'S GOING ON OUT THERE

I received a nice letter from Coulter Watt of Whitestone, New York, recently wherein he related his *Sagitta* modifica-

Data courtesy of Michael Selig.



(NOTE: The Antares airfoil is derived from the upper surface of the Eppler 193 and lower surface of Eppler 205.)



$C_l$  = Coefficient of lift for section.  $C_d$  = Coefficient of drag for section.  $C_{m_{c/4}}$  = Pitching moment at 1/4-chord of section.

Alpha symbol ( $\alpha$ ) = angle of attack of section per airfoil centerline.  $C_{l(\alpha)}$  = Lift coefficient at angle ( $\alpha$ ).  $C_{m(\alpha)}$  = Pitching moment at angle ( $\alpha$ ). T.U. = Transition point, upper surface (airflow not laminar). S.U. = Separation point, upper surface (flow not attached). T.L. = Transition, lower.





Larry and model. Flat-bottom airfoil flies this plane well.



Full-size or model? Sunset patrol over the Pacific Ocean.

tions and interest in the Selig airfoils . . .

Dear Bill,

It's been a long time since we've written one another, but I've been busy and have spent little time building models. I did manage to build a Sagitta 600 this winter and have just finished painting it. I unbalanced the rudder and made a nine-percent thick stab, made the aft hatch smaller which allows one to wrap the fuselage, or completely enclose the fuselage right at the wing pin carrier tube. The forward hatch was also shortened by 1/2 inch. The fuselage was then wrapped with fiberglass all the way around at that point, and the rest of the fuselage was also glassed over with two-ounce cloth. This seems to be a very hot little plane from what I've seen.

My Sagitta 900, foam winged flaperon job is still screaming around the sky in fine fashion. I only use the flaps for -6° to

+8° deflection, otherwise aileron functions starts to fail. I have 4-1/2° of dihedral per wing panel; this gives the plane great stability for high altitude flying when it's all I can do to keep track of it. Yet, with full-span ailerons, she will roll very nicely. Aileron throw is 5/8 up to 1/8 down; this is done with my Ace Silver Seven (love that radio!).

It's been a pleasure to read your articles over the months. The Mike Bame 253515 airfoil has interested me for quite some time now, and I think it's time to do something about it. Mike Selig's series of airfoils have caught my eye, and I've been thinking about writing him for the profile coordinates. Now that you have published this Selig S2027-145-83, or "Epplerized MB-253515," I'm wondering if anyone you know has tried Selig's airfoils? Computers and computer readouts are one

thing, but practical application is another game altogether. I'd be most interested in hearing what people are saying about his airfoils. I've wanted to build a nice, thick (strong) wing for launching reasons. A friend's Gemini MTS flies very well, and that has the MB 15% airfoil.

Have a good summer, and I'll be looking forward to a note about the Selig airfoils.

Best wishes, Coulter.

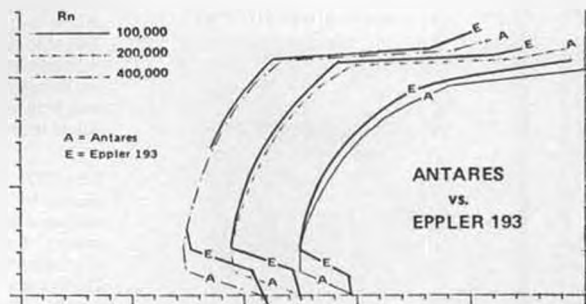
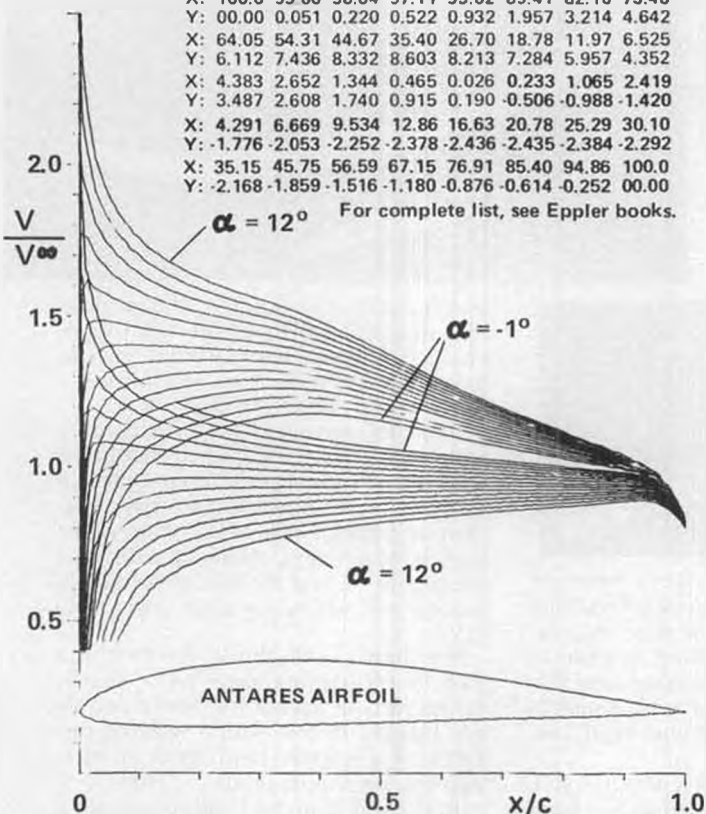
Responding to one item at a time, in order, I would have to agree with Coulter about the Sagitta 600 mods. The horizontal stab has always been just a little too ineffective at low speed, and either increasing its area or increasing its aerodynamic efficiency by thickening it is a good idea. Stab stall is often the limiting factor in low speed flight, not

Continued on page 96

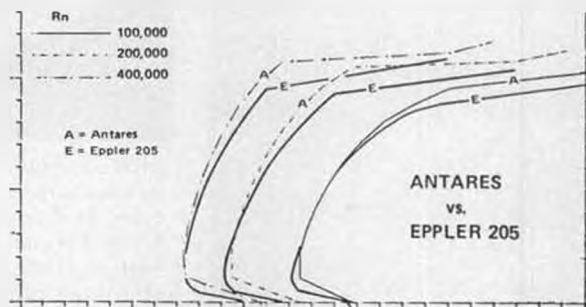
Antares airfoil coordinates for hand plotting.

X:	100.0	99.66	98.64	97.11	95.02	89.41	82.10	73.48
Y:	00.00	0.051	0.220	0.522	0.932	1.957	3.214	4.642
X:	64.05	54.31	44.67	35.40	26.70	18.78	11.97	6.525
Y:	6.112	7.436	8.332	8.603	8.213	7.284	5.957	4.352
X:	4.383	2.652	1.344	0.465	0.026	0.233	1.065	2.419
Y:	3.487	2.608	1.740	0.915	0.190	-0.506	-0.988	-1.420
X:	4.291	6.669	9.534	12.86	16.63	20.78	25.29	30.10
Y:	-1.776	-2.053	-2.252	-2.378	-2.436	-2.435	-2.384	-2.292
X:	35.15	45.75	56.59	67.15	76.91	85.40	94.86	100.0
Y:	-2.168	-1.859	-1.516	-1.180	-0.876	-0.614	-0.252	00.00

For complete list, see Eppler books.



The Antares airfoil is virtually identical with E-193 at max lift coefficients. It is slightly better than E-193 (less drag) at lift coefficients less than  $C_L = 0.2$ . Overall improvement. Should be faster than E-193.



The Antares airfoil has slightly better lifting properties than the E-205 (less drag again) at  $C_L$  above 0.6 and higher max lift. E-205 slightly better (less drag) at low  $C_L$ . Should thermal better than E-205.



This photo was taken at the end of the contest (some contestants had already left the field), and it shows the variety of designs flown.

# FIRST ANNUAL INLAND SOARING SOCIETY R/C HAND-LAUNCH CONTEST

By BILL FORREY . . . R/C hand-launch gliders are making a comeback in the West, and this first annual event should help to stimulate more interest in the sport/hobby everywhere. R/C HLG is fun!

• Lately in the world of R/C Soaring there has been a rising interest in small sailplanes of 60-inch wingspan or less. There has been a very remarkable increase in activity as well. Of the two things I have mentioned in my regular "R/C Soaring" column in the last six months which have generated the most mail . . . and we are talking a 600% increase here . . . one of them was Dick Vader's *Skywalker*, a 50-inch hand-launch or slope glider. (The other was a computer program offer.)

I don't have any explanation for this

**RIGHT:** Ed Depue won the contest with a spectacular last round flight of 9:36 out of a possible 10:00 with his original design HLG, the *Tossette*. See text for the whole story.

**LEFT:** One of the most interesting HLG models was this very lightweight elliptical wing design flown by Allan Guthmiller of Las Vegas. Flew extremely well in the early rounds but did not fare well in the wind later on.

**BELOW:** Original design by Ron Black suffered broken tail boom. Looks like a miniature Bob *Dodgson Camano!*



phenomenon, but I certainly welcome it. I personally get the greatest soaring-type thrill from catching a really low-level thermal and working it up to as high as I dare. It's challenging, and that challenge brings an immense sense of accomplishment when answered successfully.

When you stop to think about it, R/C HLGs make a lot of sense for busy people. They are generally small, light,

simple, quick to assemble, cheap (does that ring any bell\$ out there?), tough, easy to transport, easy to build, easy to design, and easy to store when not flying (they can be left in your car!).

You need not lug a heavy winch out to the field, charge lead-acid batteries, walk out to turnarounds (do people still do that?), hunt down lost hi-start parachutes, untangle rats' nests, or any other launch equipment related hassle. Just keep your Tx and Rx Ni-Cds on trickle charge and when the urge arises, GO FLY!

Everybody (well, almost) lives within a five to ten-minute drive of a nearby schoolyard or vacant lot. Some people are blessed to live within walking distance of a suitable field! With an HLG you can be spontaneous . . . FREE!

R/C hand launched gliders are not a very clearly defined group of sailplanes





The top five finishers: Ed Depue with *Tossette*, first place (left), Dennis Brandt, Larry Jolly, John Brown, and Jimmy Brandon, second through fifth, flying *Flingers* (MB plan No. 9842).



Frank Green, Albuquerque, NM, with his stock *Zephyr*. Combined business trip with pleasure!



LEFT: Gary Anderson chose to fly his Kraftkit *Tercel* over his *Gnome* because of its lighter weight. Gary is a member of the newly-formed Soaring Society of Del Rey. Gary is from author's home town, Santa Monica, California. RIGHT: Russ Jackson copied *Tercel* wing and made his own fuselage and tail. Entered his first contest at this event.



Dieter Lamprecht, Huntington Beach, Calif., made up three wings for his *Gnome*: stock (seen here), stock w/ E-182 airfoil, and constant taper/polyhedral w/ E-205. He liked the latter for its handling, but flew stock anyway.

as far as physical descriptions go. After all, ANYTHING can be launched by hand (within reason). I used to hand launch my 118-inch *Mirage* with great success. However, for the remaining portion of this report (you mean, this is a contest report?), we will define an HLG as having a wingspan limit of 60 inches. Why? Because this size has become the most popular among glider designers, because it is the most comfortable size to throw, because the micro-sized R/C systems now available make it practical, because of storage and transportation reasons, AND BECAUSE THE CD SAID SO!

John Lupperger's ambitious and in-

spired plan was to be the CD of an annual R/C HLG contest, and to make that contest A BIG DEAL! Lest I make John out an egotistical modeler, let me tell you that he is NOT! It's just that he got bit real bad by the HLG bug and wanted to share the JOY with as many other modelers as possible.

So John set the wheels in motion. He contacted many manufacturers for prizes (NOT for a raffle!) which were given to the contestants according to where they placed in the final tally. I believe that everybody came away with a prize, too. He drew up a plan for an HLG which he named the *Gnome*. He offered this plan FREE to all early registrations at \$2.50. (Heck, the plan alone is

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Bob Davis of Yucaipa, California, scaled down a *Bird of Time* to 60-inch span. CD liked design so much, he's going to draw up plans for sale.



Curt Hurley flew this HLG, the *Cuda*. Before the contest, Curt had only 15 minutes of flat land soaring experience. He likes the slopes!



Craig Eversole, Long Beach, Calif., likes flying the slopes too, but decided to try his hand at HLG thermal soaring. Liked it!

## R/C Hand-launch Glider

# FLINGER

By LARRY JOLLY . . . This is one R/C HLG that has style, performance, and a proven competition record. The author (right) is well-known among sailplane enthusiasts for his excellent glider designs. Build yourself a winning little "Flinger" HLG!



• Even before Olivia recorded "Let's Get Physical," quite a few Southern California glider guiders were throwing their gliders into low-level thermals. This phenomena grew to the point where several of these affected individuals would get together and have contests to see who could stay up the longest from a hand launch.

Before I became active in R/C hand launch, I couldn't see the attraction. After all, the weakest hi-start could get your sailplane five times as high as it could be thrown. Even after walking out to the parachute and back six times, you wouldn't be as tired and sweaty as you would be after a ten-minute workout with a hand-launch model. Did I say hand-launch model? Oh yes, it didn't take Dave Thornburg or Chris Adams long to figure out that they could throw a specially designed model much higher than a *Cirrus* or *Windrifter*. And as time went by, we saw *Sunbirds*, *Zephyrs*, *Tercels* and now the *Flinger*.

What's a *Flinger*, mister??? Well, a *Flinger* is a new generation hand-launch model. No, that doesn't mean that it dyes its empennage red and green, and has a safety pin through its nose, or that it sticks its nose in the grass every chance it gets. It is a model that was designed to be strong and yet light enough to give decent performance, and to take full advantage of its diminutive aerodynamics.

The *Flinger* is a little longer than most hand-launch models. Its wingspan is 57 inches. This yields a model with enough wing area to be super flyable and yet have enough aspect ratio to give a decent L/D. I know that free flight doctrine calls for a hand-launch model to have fairly low aspect ratio. This is because free flight models are designed for minimum sink and downwind journeys. R/C hand-launch models must have the ability to circle tightly, ride light air, and then penetrate home, or to the next upwind thermal!

The *Flinger* has all of these virtues and uses them to her advantage. After flying my prototype *Flinger*, Michael Bame told me that he had just about given up on small models because of their apparent inability to cover ground. But the *Flinger* changed his mind. He was impressed with the way the model could dart across the sky from one thermal to another.

If you decide that you want to build a *Flinger* for hi-start or winch launchings, go ahead. Take it easy, you don't want to fold the wing. In fact, if you're a little heavy footed, I'd suggest that you change the spars from 3/32 x 3/16 to 1/8 x 1/4 spruce. This would help ensure against wing failure. Build *Flinger* to the plans and you won't have anything but fun! In fact, *Flinger* is the most fun sailplane I have ever designed. If you don't have a small radio, SHAME ON

YOU!!! All of the manufacturers market small, "micro" airborne systems that work great! They are also very reasonably priced. Let's face it, that classic Citizenship and Heathkit GD 47 that you've been saving on the shelf are never going to come into vogue again.

So, order a set of *Flinger* plans from W.C.N. and get down to your local hobby dealer and check out his micro systems. Oh yes, while you're there, pick up the following materials so that you can start your *Flinger* when the plans arrive.

### MATERIALS REQUIRED

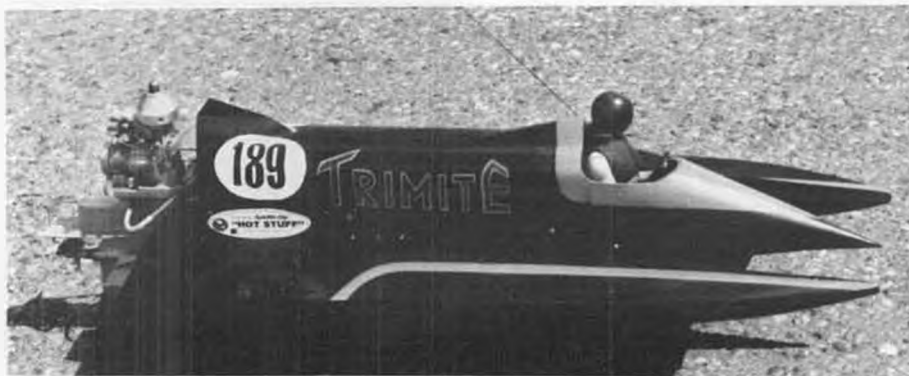
- 4 — 1/8 x 1/8 x 30 Balsa longerons
- 2 — 3/32 x 2 x 30 Balsa fuselage sides
- 2 — 1/8 x 3/16 x 30 Stab and rudder outlines
- 1 — 1/8 x 3 x 24 Elevators and 1/8 gusset material
- 2 — 3/32 x 1/8 x 30 Stab and rudder ribs
- 5 — 1/16 x 3 x 30 Wing sheeting and fuselage sheeting
- 2 — 1/4 x 1/4 x 30 Balsa leading edge
- 2 — 3/16 x 3/4 x 30 Balsa trailing edge
- 4 — 3/32 x 3/16 x 30 Spruce spars
- 4 — 1/16 x 3/16 x 30 Balsa cap strips

You'll also need some scrap 1/16, 1/8 and 3/16-inch sheet balsa for the ribs and some 1/16 and 1/8-inch plywood for the various plywood parts. As for hardware, you'll need two small Sullivan cable-and-tube pushrod assemblies, some nylon hinge strip, and two paper clips, as well as the various building and



Radio equipment layout inside the *Flinger* fuselage. Fuselage is designed to accommodate various receiver/servo combinations.





Dennis Caines, from Olympia, Washington, built a *Sprint 7.5* outboard tunnel boat from *Model Builder* plans (No. 6841-A&B), and redesigned the top cowl.



Dennis Caines with redesigned *Sprint 7.5*. New cowl resembles Rick Frost's OZ tunnel.

# R/C POWER BOATS

By JERRY DUNLAP

## HOW DO YOU SPELL RELIEF?

The relief I was seeking wasn't from an upset stomach caused by overeating. I was seeking relief from *four straight* model boat races when the weather made racing virtually impossible. What I was suffering from was a severe case of M.B.R.F. This disease is not nearly as serious as some maladies that go by other abbreviations. But Model Boat Racer's Frustration can sometimes cause irritability when the afflicted person attempts to run his 3.5 Tunnel Outboard in one-foot waves and 25 mph winds.

The early season racing in my area has been so bad that some of us have given serious thought to applying for disaster relief funds. The problems caused by the weather made me begin to think about how some of us derive our enjoyment from this hobby of model boating. Some of us put so much emphasis on the racing aspects of model boating that we completely forget about some simple pleasures available to us.

I personally reacquainted myself with one of those simple pleasures this past Memorial Day. Due to some quirk in the model boating schedule, there was no race that weekend. I decided to go out and do some individual running if the weather would cooperate. I had absolutely no desire to run my boats in the rain and wind. I'd been doing that for two months. So, I waited out a three-day weekend and finally got a weather break on the last day.

I had all my boats and equipment in the little red Datsun pickup by 8:00 a.m. and was on my way. The morning was really beautiful. When I arrived at the running site, I had the pond all to myself. The water was glass smooth. By 9:30, I was shedding my light sweater and wishing I'd worn my cutoffs.

The boats had all been adjusted to run on choppy water. I began the process of resetting engine angles and heights to trim the boats for maximum performance on smooth water. I was having a great time, and all I was doing was re-adjusting things to work properly under normal conditions. The adjustments

were simple and the results were most gratifying. By noon, I had this wonderful feeling of accomplishment. The three boats I'd brought out were running superbly.

What's the point of all this? Don't look for relief at the competitive event. Model boat races often create more grief than relief. Don't stop entering races, if that is a true interest of yours; however, for real relief, you should try taking your boat out to the pond on a nice day when all you have to do is kick back and spend some time with perfect water conditions and no contest pressures.

Enjoy what the model boat is doing. When you are able to make the boat achieve maximum performance, appreciate that accomplishment. This type of achievement is to be cherished every bit as much as winning a race. Find your relief in the simple aspects of this hobby and you just might find more satisfaction in the complex phases.

## MODIFYING THE "SPRINT 7.5"

I can already hear the groans. The boat hasn't been out for more than a couple of issues, and Jerry's already making modifications. Actually, I haven't modified mine, but a couple of model boating friends have. I thought I might share the

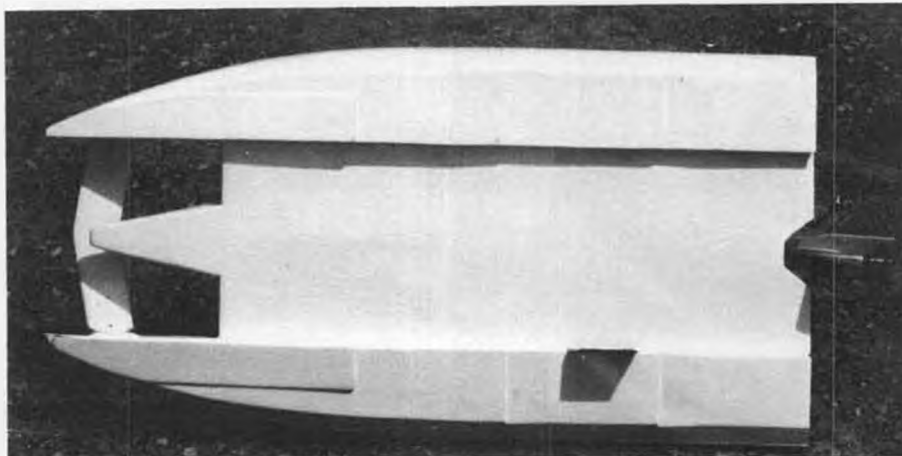
results of these modifications because I think they are interesting.

The first modification was a redesigning of the cowl to make the boat resemble a full size OZ tunnel driven by Rick Frost of Great Britain. Powered by a Johnson V-8, this boat holds the current speed record for outboard powered boats at 146 mph. The record was set last fall at a site in Great Britain.

Dennis Caines, an active model boater in the Northwest and second place finisher in the 3.5 Tunnel class at the 1983 B.C. NAMBA Nationals, came up with this very eye-catching modification. He also used a scale paint scheme of Rick Frost's boat. Dennis built the hull according to the plans, and extended the cockpit sides forward to create a pointed cowl. I really like the restyled cockpit, and I am planning to incorporate the idea in the next *Sprint 7.5* I build.

One of the nice things about building a wooden model boat is the flexibility wood offers to those who wish to make changes. From watching Dennis' boat run, I can see that this cowl change didn't hurt the performance characteristics of the boat one little bit.

The next two modifications were not as successful as the one Dennis made to the cowl. One of my modeling friends,



Here is a bottom view of the author's modified *Hotshot IV*. Sponson steps are clearly seen. The author details his construction of the steps in the text. Note shadow of turnfin.

who loves to try "something different," decided to add steps to the sponsons. To create the steps, he glued on tapered wedges. The wedges were spaced at five-inch intervals running from the transom to the bow.

I inquired how the boat ran. He told me the boat ran great down the straight-aways, but didn't turn very well. He wasn't using any type of turnfin.

The *Sprint 7.5* was designed to run without a turnfin using flat sponsons. The problem with using wedges to create a stepped running surface arises when the wedges prevent the sponson edges from grabbing or digging in while cornering. The wedges keep the boat too loose in the corner, so the boat slides out while cornering. I have tried wedges on other tunnels and experienced this same handling problem while cornering. A turnfin will help to improve the cornering as *something* is needed to prevent the boat from sliding out while cornering.

The third modification had to do with placement of the outboard. The plans for the *Spring 7.5* show the transom mount 2-1/2-inches in from the back edge of the sponsons. I feel this moving of the engine helps the cornering. Another friend who races tunnels in my area wanted to know my feelings about moving the outboard back to the sponson edges. This is the position where the outboard is located on most model tunnel bots. I told him to give it a try if he wanted to experiment with engine location.

He mounted his K&B 7.5 flush with the back of the sponsons. After two races, I believe he's giving serious consideration to moving the engine forward as is shown on the plans. His *Sprint 7.5* just doesn't turn very well. It is quick going down the chutes, but must give up too much through the turns. After watching his boat, I'm still of the opinion that inserting the engine is a good idea.

#### WHILE WE'RE DISCUSSING MODIFICATIONS

I received a letter from Arliss Messer, back in Minnesota, asking about incorporating some of the *Sprint 7.5* ideas on a Dumas *Hotshot 45*. I did make some changes to my *Hotshot 45* before de-



The author's *Hotshot IV* skims along at high speed over placid water.

cid to redesign a smaller 7.5 tunnel. I added the inside sponson ramps, inserted the engine, and mounted a front air deflector. The boat did run better with these modifications. I was also using the sponson lips to help improve the cornering. The performance characteristics of the Dumas *Hotshot 45* can be improved through these modifications.

As we're discussing modifications, let's look at what I've been doing with the Dumas *Hotshot IV*. I just love to modify Jay Brandon's Dumas model boats. I don't think I've ever built one exactly like the instructions depict. And I've built more Dumas kits than any other manufacturer. I've built Dumas *Deep Vees*, *Drag N' Flies*, *Hotshots*, *SK Daddles*, and even a *Star* sailboat. Most of the model boat building techniques I use were gained by building Dumas kits.

I really don't feel guilty about modifying the Dumas *Hotshot IV* because I was somewhat responsible for the design. The photos I've enclosed will give a fairly good indication of the major modifications I've made. For purely cosmetic reasons, I redesigned the top cowl. This is the cowl design used on the *Sprint 7.5*, and it is similar to the cowl on the Dumas *Hotshot 45*.

The transom on my *Hotshot IV* has been changed somewhat. The transom extensions have been eliminated and the engine was inset 2-1/2 inches. The transom on my *Hotshot IV* is now the same as that on the *Sprint 7.5*. The transom modifications are fairly easy to make. It is simply a matter of cutting

away some of the stock pieces.

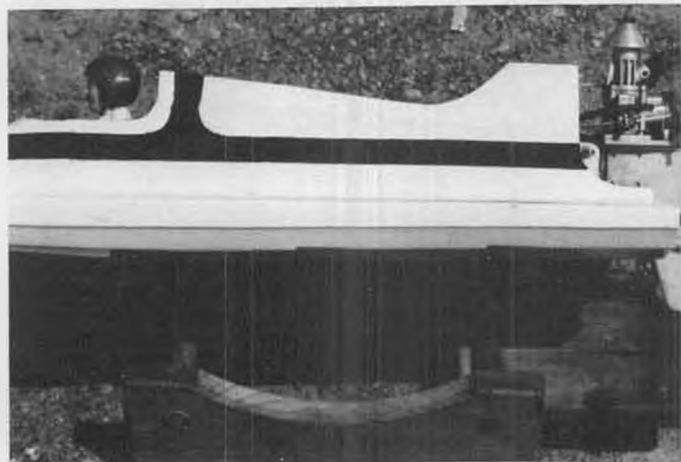
A change that cannot be seen easily in the photo is the flattening of the top deck curves. I am talking about the deck curve from the top of the chines to the cockpit sides. I'm not really sure this modification does anything, but the boat will have a thinner profile fore and aft. The deck curvature was decreased by using a disk sander to remove the curve. It is then necessary to sand the sponson stringer to where it is level with the cross frames.

The radio compartment was moved further forward by installing a frame across the radio compartment 2-1/2 inches forward of cross frame No. 3. This allows the radio equipment to be placed further forward and assists in balancing the boat.

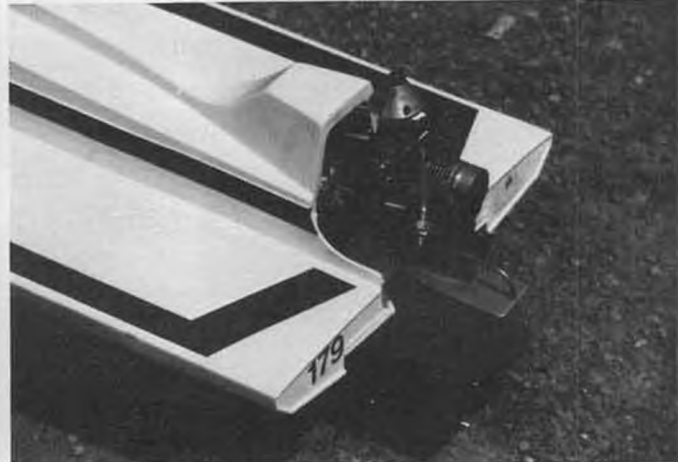
The last modification I made on the *Hotshot IV* was in the area of the stepped sponson bottoms. The directions with the kit tell how to add sponson steps that could be described as "collective steps." This means that the sponson bottom is applied, and then steps are placed on top of the sponson bottom and then a step is placed atop a step.

I wanted to try what might be described as a "step-down" configuration. Instead of adding on steps, I built the steps into the bottom of the sponsons. If you place my *Hotshot IV* on a flat surface, the bottoms of the sponsons are flat on the surface and the steps are up. I'm not all that sure this type of step

*Continued on page 76*



The sponson breaks on the author's *Hotshot IV* are the "step-down" variety . . . a process detailed in the text. Note engine inset and cowl.



The modified transom is plainly seen on author's *Hotshot IV*. Rear sponson extensions eliminated, engine inset 2-1/2 inches.

# ELECTRIC POWER

By MITCH POLING

• Astro Flight has come out with a lot of new motors recently, both in samarium cobalt and in Super Ferrite versions. I would like to begin this month's column by sharing with you my experiences with one of these new motors, the Astro Challenger 25.

I have been flying the cobalt Challenger 25 this last month in the *Aqua Sport*, with excellent performance. ROW is within fifty feet; it practically leaps off the water, and the climbout is fast . . . better than any motor I have used before. The usual flight time on twelve sub-C cells and a 9-4 Top Flite nylon prop is between four and five minutes.

The motor is quite well made, with large brushes and a huge motor shaft, this one won't ever bend! The motor weighs 13.5 ounces.

The motor mounts with 6-32 screws. I use 3/8-inch long ones, and I bolt the motor behind the firewall. I am quite

pleased that Astro has set up the motor for 6-32 screws; these are readily available in hardware stores. The photos show the installation: it is quite simple. I have now gone entirely to firewall mounting for all my planes: it is convenient, neat, and "universal." I can mount any motor to any plane, which is important if you test or use a lot of them.

The Challenger 25 is supplied with 14 sub-C cells if you order it as a system. I use 12 cells for a couple of reasons. Firstly, I have a lot of six-cell packs around, so it is easy to make up a 12-cell pack. Secondly, I am a sport flyer, and I prefer duration to absolute power. The Challenger 25 is really a "race wind" on 14 cells, and even on 12 cells it is "hotter" than the usual pattern type wind. This shows up in shorter duration, and, of course, higher rpm and performance.

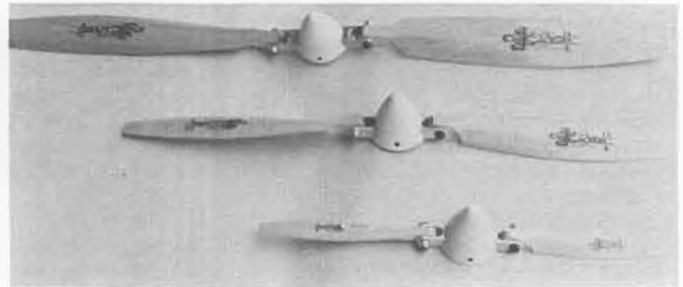
Below are the results of my own static testing with both the 14-cell and 12-cell



Here is a very simple method of mounting an electric motor to an airplane: simply place the motor behind a 1/16 (or thicker) plywood firewall and drill 3 holes. The two small ones are for the actual mounting screws, washers.

packs. The packs were charged with an Astro Dual Charger, and the charges were stopped when the charge voltage stopped rising. The packs were SR brand, 1.2 Ah electro-power packs. The readings are at the end of each minute, except for the first reading, which is at zero, and the last reading, which may be a fraction of a minute.

With the fourteen-cell pack and a 9-4 Top Flite wooden prop, the results were: 11,300 rpm, 28 amps; 10,500 rpm, 24 amps; 9,000 rpm, 18 amps. The total run time was two minutes. With the same fourteen-cell pack, an 8-4 Top Flite nylon prop produced the following



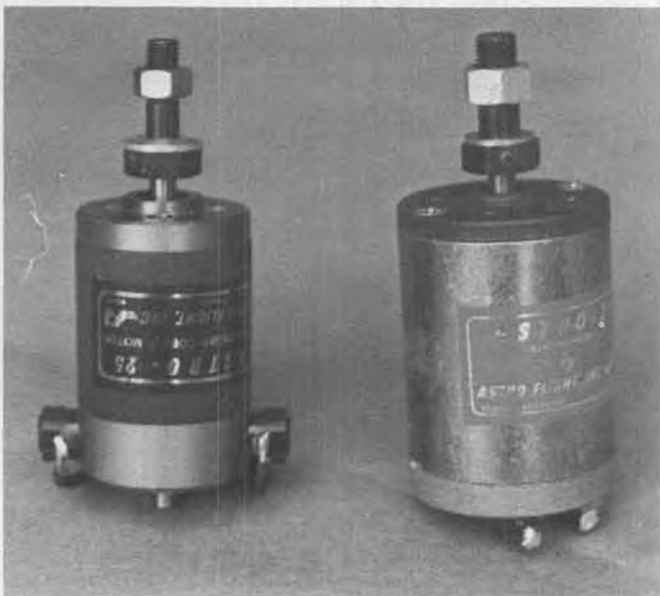
ABOVE: Wiltshire Model Center is currently marketing these great folding props made from Zinger props and machined aluminum hubs. Address given in text.

LEFT: Jack Hardwicke, Enfield, England, scaled the plans out of *MB* magazine (9-82) to make this *Brigadier* Old Timer.

motor- prop/airframe	11.90 1.20	12.00 1.20	12.10 1.20	12.20 1.20	12.30 1.20	12.40 1.20	12.50 1.20	13.00 1.20	13.10 1.20	13.20 1.20	13.30 1.20	13.40 1.20	13.50 1.20	14.00 1.20	14.10 1.20	14.20 1.20	14.30 1.20	14.40 1.20	14.50 1.20
rpm	11300	10500	9000	8500	8000	7500	7000	6500	6000	5500	5000	4500	4000	3500	3000	2500	2000	1500	1000
amps	28	24	18	16	14	12	10	8	6	5	4	3	2	1	0.5	0.2	0.1	0.05	0.02
time	2:00	1:30	1:00	0:45	0:30	0:20	0:15	0:10	0:05	0:03	0:02	0:01	0:00	0:00	0:00	0:00	0:00	0:00	0:00

Here is a printout from Bob Boucher's (Astro Flight) computer analysis of a Challenger 15 on 7 cells (1.2 Ah). See text for uses.





The Challenger 25 (left) and the older Astro 25 for size comparison. Challenger 25 produces as much power on 12 cells as the older 25 does on 16. Total system (incl. batts.) weighs 6 oz less at 42 total.

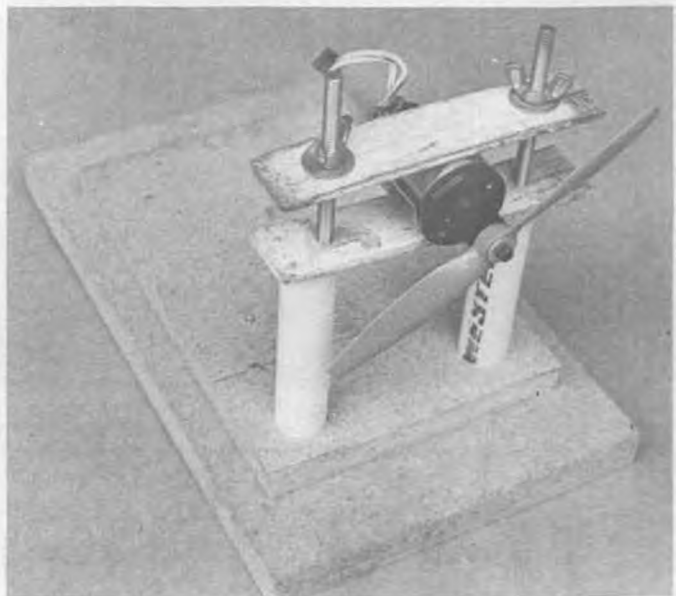
results: 15,400 rpm, 22 amps; 13,140 rpm, 18 amps; 11,800 rpm, 16 amps. The total run time was three minutes.

With the twelve-cell pack, a 9-4 Top Flite wooden prop yielded: 10,500 rpm, 22 amps; 10,150 rpm, 20 amps; 9700 rpm, 19 amps, 9,000 rpm, 16 amps. There was a three-minute run time. With the same twelve-cell pack, an 8-4 Top Flite nylon prop produced: 12,000 rpm, 18 amps; 11,200 rpm, 17 amps; 11,000 rpm, 16 amps; 10,700 rpm, 15 amps, 10,000 rpm, 12 amps. Four minutes was the total run time.

As mentioned before, the 9-4 on 12 cells gives four to five minutes of **flight** time on my float plane. This is with on/off control only, no throttle. In the case of high power motors like this one, a throttle is a real benefit, because you can use the high power when you need it, and use cruise power the rest of the time. The reason I used on/off control was because I had accidentally water soaked my electronic throttle, and it was out of order at the time.

As an example of how much more time you can get with a throttle, I

Astro Gear Drive for 25 or 40 motors. High quality is obvious. Unit mounts with two screws. Reduction is 1.7:1.



Author's test stand. Stand is easily made from simple materials. Leisure LT-50 motor is seen clamped in place for testing. See text for details on how to build your own.

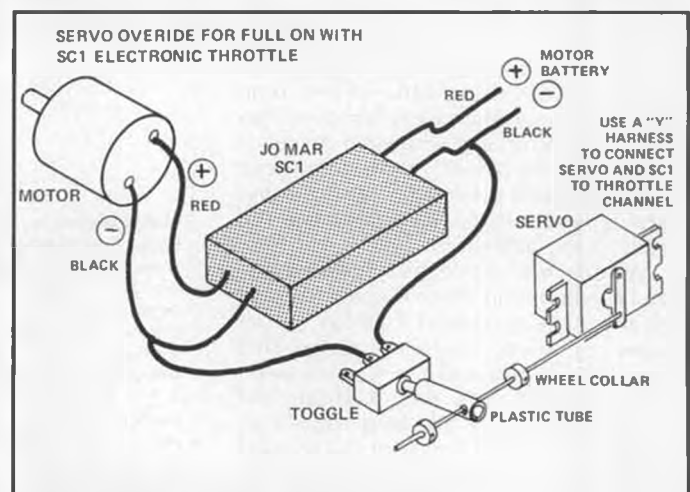
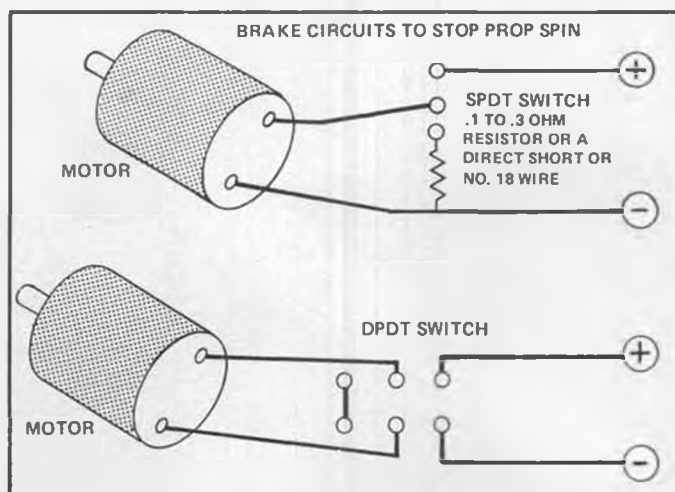


routinely get over six minutes with the throttled Keller 25/12. In static tests, the Keller gives three minutes of run time with twelve sub-C cells and the 9-4 Top Flite prop, which is the same as the Challenger 25. So, with a throttle, you should get six minutes or better with the Challenger 25. I recommend the Challenger 25, it is well made and well designed. Use it on fourteen cells for hot competition, Twelve cells for sport flying, and with a throttle for maximum duration.

Astro also offers gear reduction units for the 25 and 40 motors. They are very well made, feature excellent machining

throughout, and have all-steel gears for maximum longevity. The reduction is 1.7 to 1. You will need a drill press to install the pinion gear over the motor shaft if you are performing a retro-fit as it is a very tight fit. The motor can still be used for direct drive, which is very nice because you can leave the pinion gear on (it would be quite difficult to remove it). It is possible to put the direct drive hub on in front of the pinion gear. The gear unit installs quite simply with just two bolts.

*Continued on page 67*



The author describes the importance of motor braking and speed controller override in the text. These circuits tell "how to."



The BIG Sig Cub powered by a .90 or 1.20 four-stroker is becoming a very popular combination. This one belongs to Tony Della Vecchia, Newtown Square, Pennsylvania, who flies with the Mt. Holly, New Jersey, club, the High Rollers. The model weighs 13 lbs., uses Enya .90 4-cycle, 15-6 prop, Ace battery backup system, Permagloss yellow paint. Great flier!!!



Ikon N'wst's newest kit and first-ever biplane, the Waco UPF-7. The prototype turned out nicely, and with a lighter finish, could be flown by a

# BIG BIRDS

By AL ALMAN



• A good woman, like a good airplane, is awfully hard to find . . . and although many of us spend a lot of time searching for both, very few ever succeed in either of these glorious quests.

What's all this got to do with BIG Birds? Well, it so happens that I've got one of these hard-to-find good women and she just got through cleaning up my (ugh) workshop. And lemme tell ya, this wasn't any ordinary undertaking because my shop was in BAD shape. Yeah, I know . . . everybody thinks that theirs is the worst . . . what with being knee-deep in balsa, spruce, and basswood dust and crammed with all sorts of itinerant tools and parts of countless *BIG Birds*. Okay then, maybe mine wasn't the worst . . . but it would've easily qualified for the top ten in world-class competition. I'd put little, if any, time into setting up when we first moved into our new home, and with each succeeding project the place began to look more and more like an official refuse dump (the only reasonably clear area was the path to the bathroom).

When Dee made her sudden announcement that she was going to "start cleaning the shop next Tuesday," I became a mass of mixed emotions. That she had the guts and the stamina to do what I could only dream about was heady stuff, so I allowed myself to imagine a cleared and spiffy table top I could actually work on (the thought was so exciting and stimulating that I felt tremors running rampant throughout

my body). But, just as suddenly, this picture of utopia disappeared (not my trembling, though) as I remembered that once, shortly after we were married, she "straightened up" another workshop, and I had one heck of a time finding where anything was. You know how it is . . . no matter how badly confused and messed up your worktable appears to be, YOU always know under which pile your favorite knife, or glue, or clamps, or ruler is. Good intentions don't mean a thing when you can't find doddily squat. . . .

My qualms were laid to rest, however, when Dee informed me that although she'd be in charge, I'd be assisting and putting my own tools where I wanted

Manly Mayes, a Puget Sound Rocs member, poses with his O.S. 1.2 four-cycle powered Senior Telemaster. Though definitely overpowered by the 1.2, a 16-8 prop at medium throttle settings allows him to get some good stick time. Word is he's almost ready to solo.



them to be. And so it was on that fateful Tuesday morning, this dedicated, dynamic duo dove in . . . and although it took three long days and nights (*Egad, it must have been a real disaster area! wrf*), the outcome was never in doubt; the "Good Guys" won! I now have some great stuff for the ROC's upcoming auction . . . but best of all, I no longer have to sweat a visit by another modeler, and I can invite anyone into my workshop; indeed, who knows, *Better Homes and Gardens* might even want to do a layout on this miracle conversion. (*Did you take before and after shots of the place? wrf*)

Of course, it's not till you're pretty well all neat and gussied up with everything in its place that you realize how damned unsafe you were . . . from the fire hazard of accumulated sawdust to the pointy and sharp-edged booby traps laying around waiting to "bite." It really is frightening to see how close you've come to ripping and impaling yourself. Now, if I can only maintain this fear, I'll probably keep my shop neater . . . longer.

The bottom line here is that neatness does count . . . especially in your work area. If you happen to be the compulsive-neatness type, then you're home free; but if you're like most of us, you're probably way overdue on a shop clean-up. Look at it this way: a decent cleaning is insurance against a sudden need for



1.20 4-stroker; otherwise one of the new 20 to 30 cc 2-cycle glows would be a suitable engine. Also a good flier!

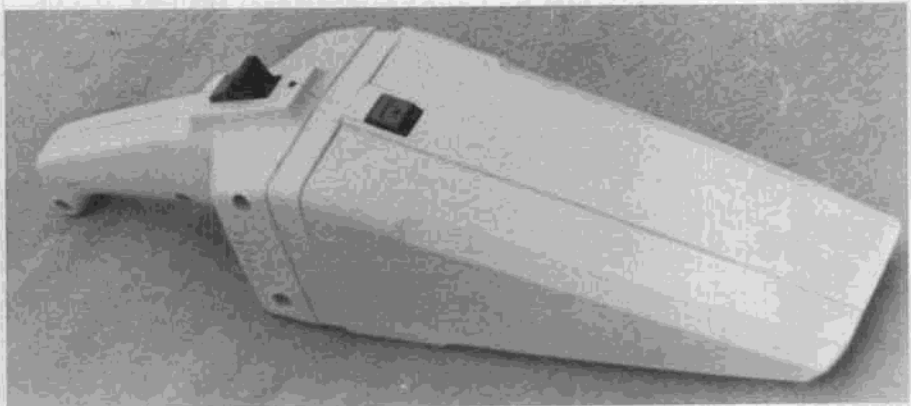
stitches and sutures . . . or worse. And for those who know me and find it hard to believe that I've really got a natty-looking shop at long last, just ask for "The Natty Shop Pic," and I'll send you one. (I want a "before" picture! wrf)

#### THE RIGHT STUFF

Like most everyone else, I've messed up my share of engine mounts over the years. Trying to drill, and then tap, those nicely machined aluminum mounts using just about any kind of oil or fluid that was handy never did seem to work out too well. Often the holes would end up wallowed out, and no matter how slowly and carefully I used a new tap, it would never cut cleanly. And, of course, I sorely abused many of John Tatone's mounts by leaving pieces of taps in 'em.

Well, I finally got some smarts and picked up a can of aluminum cutting fluid . . . and all of a sudden I began to enjoy drilling, tapping, and threading. There's nothing like using the right tool for the job, and my AlumTap does what the can says it'll do . . . it makes the machining of aluminum quick, easy, and precise. When I drill, my holes are clean and true, and when I tap and thread, all edges are sharp.

A real bonus is the versatility of this fluid; it can be used with most other metals, or nylon, with very good results, as some of my tinkering seems to indicate. A call to the manufacturer, Winfield Brooks, backed up my findings. "Al-



CLEAN UP YOUR ACT!!! Or better yet, clean up your workbench, as the author and his wife did this last month. Cordless vacuum cleaners are extremely handy to use in the process.

though we do make fluids for the harder metals, many of our customers prefer to use AlumTap for all their shop work," the Win-Bro chemist told me.

So, a couple of bucks will put a can of good cutting fluid in your shop. Like an old commercial for Pennsylvania Dutch Noodles used to say . . . "Get to know what good is!"

#### HEY, AL . . . HOW ABOUT COVERING AND FINISHING?

Yeah . . . *how about* covering and finishing? I'm still trying to figure this one out. As I've made no attempt to hide the fact that I like to build, *hate to finish*, and love to fly, I can't understand why I get queries about how to finish up that BIG Bird. To me, the covering and finishing part are a means to the only thing that really counts . . . getting that flying machine into the air where it belongs. However, because the world seems to be waiting breathlessly for some definite word, I'll give you my best shot.

#### COVERING MATERIALS

I don't recommend the use of any of those plastic films because they impart little if any strength to the airframe, and because they're terribly prone to hangar rash. As one of Murphy's Basic Laws clearly states, "A BIG Bird's susceptibility to hangar rash will be absolutely absolute." Thus, every finger, every doorway, and every blade of grass becomes your mortal enemy.

In comparison, the polyester materials

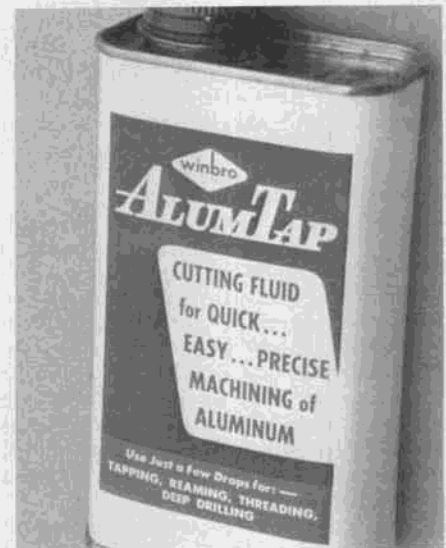
have a lot more to offer; they're very much stronger and puncture resistant, and judging from the condition of the Coverite on my six year old, much flown, much traveled, and much handled Aeronca C-3, these are the coverings to use. And don't overlook products like Micafilm and Ceconite just because they don't have their own adhesives. Initially, I also shied away from them because it seemed like too much trouble and expense to have to mess with applying Balsarite before I could even begin to cover. However, as I found out, it's nowhere near the hassle you imagine it to be; by applying Balsarite only to the areas you want your particular covering to adhere to, a small amount will go a l-o-n-g way (and this stuff really works). By using Micafilm, you end up with a very tough and very light finish. Ceconite, on the other hand, is not quite as light . . . but is incredibly strong and has controlled shrinkage built right in.

Although most all of the polyester stuff is touted as being fuel-proof and useable the way it comes off the shelf, you'll find that they seem to stain and get dirty awfully easy unless they're sprayed

*Continued on page 69*



LEFT: This P-38 fuselage plug is about to be molded for Mike Minnick's kits by T&D Fiberglass Specialties. At something over 12 feet, and weighing between 38 to 45 pounds, this P-38 *Lightning* is going to be a biggie. Power will be a couple of 2.20s or larger . . .



Here's a good cutting fluid for all-round shop use . . . it's a really handy item for us BIG Bird people who tend to fabricate a lot of our own goodies. See text for report on its use.



# Pattern *D&W* Flying

By DICK HANSON



Here is a Dick Hanson Models *Dalotel* done by Larry Kennedy of Franklin, N.C. Uses OPS 5-port and tuned pipe.

• Our recent *Tipo 750* project is finally going through flight testing. As flight testing is a never-ending process, we will tell you how things stand at the present time.

This project consisted of taking a standard *Tipo 750* kit and modifying it for more maneuverability at lower airspeeds. The object was to see if it had competitive potential as a "Turnaround" model powered by a .90 four-cycle engine!

Here are the modifications: fuselage: none; stab: increase elevator area by moving the hinge line to 50% of tip chord — also, anhedral was reduced by 1-1/2 inches (from 3-1/2 to 2); rudder: increase chord by one inch and eliminate stationary rudder cap; engine: replace ST .60 and pipe with an O.S. .90 four-cycle engine; fuel tank: eliminate 16-ounce tank and install 10-ounce Sullivan.

The finished model weighs exactly 7-1/4 pounds. This includes a normal tri-gear setup using Royal retracts and obsolete Goldberg wheels. The only weight loss was the engine change. The .60 weighs 18 ounces plus nine ounces

for pipe and header (that's 27 ounces); the .90 weighs 23 ounces. That's a four-ounce savings . . . big deal.

The ST .60 will turn an 11-7 at about 14,000 rpm on the ground. The O.S. .90 turns a 12-10 at 10,000 (plus) on the ground. Let's see . . . 7 times 14,000 is 98,000, and 10 times 10,000 = 100,000. That quick math was pitch in inches times rpm. The two-cycle unloads considerably more than the four-cycle in the air, so actually, the in-flight (level) rpm gives the speed edge to the .60, but the pulling power of the .90 from low speeds is obviously better.

How much better? I don't know yet, and it may be that a properly set up .60 will pull a bigger prop than the .90. The catch is, a pipe is required for maximum power and minimum noise. This ups the weight again and adds extra drag.

As it is, the model is very gentle and easy to fly. It's also slower in level flight. **THIS WAS THE GOAL!**

We have now tried three designs with the .90, and we can safely say that a .90-powered, seven-pound model that is around 700 square inches of wing area and that uses an efficient wing airfoil

(not an old, super thick, high drag board as used on old-time Pattern models) will fly the AMA Pattern very well. Also it is an excellent constant speed setup.

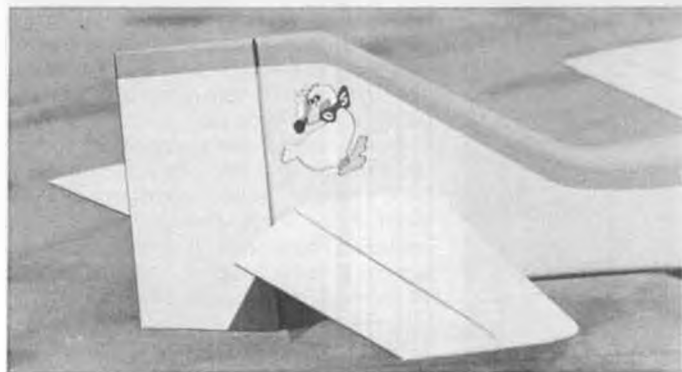
Now for our propeller selections with this model: we have tried the D&W 12-10, the MK 12.5-8 and a modified 12-8. More evaluation is required, but these props work OK for now.

A mixture control is a very desirable item on almost any Pattern plane, so we included one on the O.S. I wonder when the other four-cycle manufacturers will get the hint? About the only thing we don't like on this model is the marginal power level for 15+ winds.

The upwind/downwind speed difference is obvious at the top of the square maneuvers (8+ rolling square). A lot of models suffer on these maneuvers, but a top-notch FAI Turnaround model needs a considerable power margin over the familiar setup. I'm certain that a 1.2 engine would do the trick here, but the O.S. .90 is so nice I just had to see what it could do.

The modifications to ailerons, eleva-

*Continued on page 75*



The author's "duck-tailed" *Tipo* has been successfully test flown by the author. Note modified tail surfaces.



Tim Langlinais, Lafayette, La., sent in this photo of his *Hippo Tipo*. Compare with the "duck-tailed" version to the left.



# Electronics Corner

By ELOY MAREZ

## SOLVED: THE SUPER CYCLE PUZZLE

Back in our June issue, I included some information about the old Electrostar Systems "Super Cycle" battery capacity tester and made a plea for more information as needed by Ernest Kiszivath in Florida, who had a defunct unit that he was trying to bring back to life. I do believe we were the cause for a lot of Super Cycles to be removed from their cases, the response was tremendous, and I would like to thank everyone who took the time to run down the mystery component and write in to help Ernie.

First to be heard from was Ken Smith, in Philadelphia, Pennsylvania, who identified the semiconductor in question as a Q200E3, a 200-volt, 800-milliamp Triac. Forget about trying to find one with that number, you probably won't; however, I was able to locate an equivalent: a TCG 5655. The TCG (Technician Component Group) line is common in this part of the country, but if you have trouble locating a supplier in your area, inquire from New-Tone Electronics, Technician Component Group, 44 Farland St., Bloomfield, NJ 07003. Most large electronic component suppliers

carry at least one brand of replacement semiconductors with their own cross reference guide, and they might be able to come up with some other manufacturer's number which would also work.

To add frosting to this particular cake, Arthur Cervenk of Rockledge, Florida, sent in a complete schematic diagram, not only to me, but also directly to Ernest. Art mentions that he got the schematic from the past owner of Electrostar Systems; it is dated "7-30-76." We never do know when something will come in handy, do we?

Anyway, copies of my copy of Art's schematic are available to all of you Super Cycle owners who would like to plan ahead, please send your SASE. Our thanks again to Ken, Ernie, *und alles!*  
**12-VOLT GLOW PLUG DRIVER  
CIRCUIT GLITCH!**

Not everything went as well with the June column as the above did. The voltage regulator circuits got slightly scrambled, we're showing the correct ones, thoroughly checked, this month. Hope we didn't ruin anyone's batteries, plugs, or days!

The June sketches showed the basic IC connections on the left. The center

drawing was incorrect, a new one is shown here. Use 130 ohms for 1.25 or 120 ohms for 1.5 volts output. The sketch on the right is correct; the following values for R2 will give you these voltages: 100 ohms/2.25; 120 ohms/2.5; 130 ohms/2.8; and 170 ohms/3.0. I have found that 1.5 volts from a regulated power supply like this really makes a plug glow, but I prefer a little less voltage for longevity's sake.

## USING THE LEISURE CHARGERS AT REDUCED RATES

I received a letter from my home state; Bart Ziman, of Austin, Texas, wrote:

"I was wondering if you might be able to answer a couple of questions for me, as I have run out of sources.

"I have a Leisure 6/7 cell charger that I would like to use to charge my 250 mAH flight pack. It would be nice if I could perform both slow and quick charges. The problem I am having is determining what size resistors to switch into the circuit.

"I figured, 'Hey, I know the charge currents expected and the voltage involved; I'll just plug that into Ohm's Law, and presto, I'll have the total resistance necessary.' All was well until I got to the voltage part. I didn't think, initially, about the opposing voltages and their change during charging. So, please help! What voltage do I plug into this fine little formula?

"Question 2: What type of variable resistor do they use in the variable rate chargers? I read something about it being transistorized. I was wondering why I couldn't just solder one into my charger. Any problems?

"I promised myself I would keep this letter under one page, so I'll let you go. Thanks in advance for any help you may be able to give, and we really appreciate the time you devote to us fledgling electricians."

Well Bart, this is one of those "bad news and good news" situations. The bad news is that I can not give you a definite set of values to crank into Ohm's Law to come up with those resistor values that you are looking for, but the good news is that there are other ways to arrive at them, and I can help there.

The reason I cannot give you any definite values is the same one that you ran into, namely that of *changes*. The charger sees the battery as a load, effectively a resistor. As the battery charges, its internal resistance increases, and as if that wasn't enough, it also changes with differences in temperature, state of charge, and even age.

Such calculations are also complicated by the fact that the average, simple AC R/C charger, built around a small transformer, or a resistor type DC charger powered by a small battery will experience a voltage drop as the load is increased, thereby causing a drop in the charge current.

An AC charger with a large enough transformer, or a DC charger operated from a heavy enough source, or a more complicated constant current charger



Champion Model Manufacturing's Dual Automatic Trickle Charger will charge your 8-cell TX battery and 4-cell receiver battery to max, then trickle charge them indefinitely.

will not be affected by the added load, though the battery resistance will increase nonetheless. Whether we have both, or just one value changing, Ohm's Law, like any other formula, is just not going to work without constants. You can come up with a usable figure by measuring the current that a given voltage will cause to flow into a half discharged battery, thus getting its apparent resistance. You can then use that resistance and the formula to calculate the resistance needed for different current values. But while you are doing all that, you could just as easily have done it, often quicker, by using the time honored method of electronic tinkers since Ben Franklin: cut and try! In this case, try a series resistor and measure the current. if it is higher than desired, increase the resistance, and vice versa.

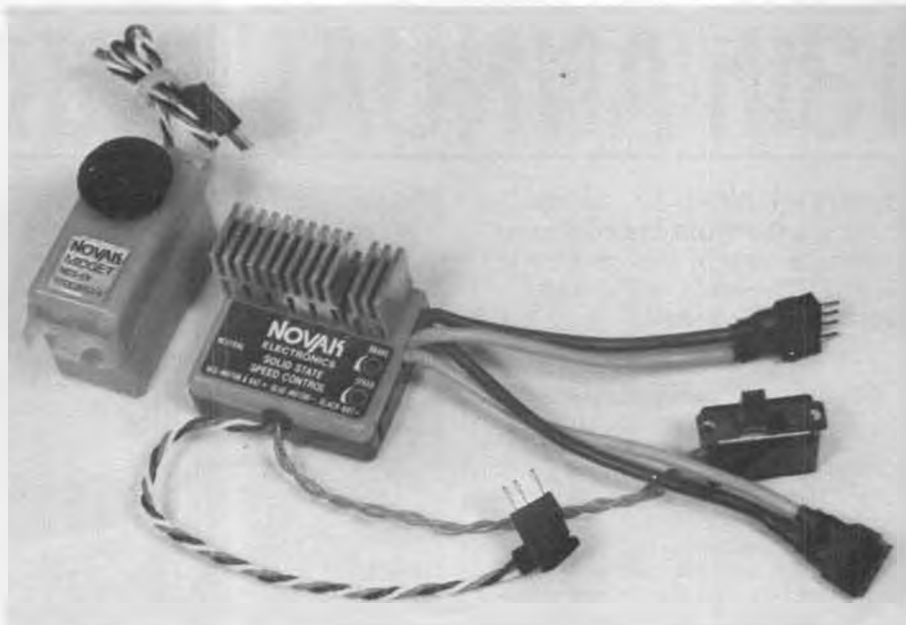
As I have some notes from previous experiments, I can even give you some beginning values. Using a healthy, 12-volt source, you can charge a four-cell, 250 mA Ni-Cd pack at the following rates, using the resistors stated:

- Slow Rate (C/10, 10 hours) @ 25 mA, 300 ohms, 5 watts.
- Quick Rate (C/5, 5 hours) @ 50 mA, 125 ohms, 5 watts.
- Fast Rate (C/1, 1 hour) @ 250 mA, 28 ohms, 5 watts.
- Fast Rate (4C, 15 mins) @ 1 Amp, 15 ohms, 20 watts.

The same values will charge larger packs at the same rate, though in correspondingly longer times; a 500 mil pack will require twice as long as the above times. It is definitely recommended that the higher rates be used with a timer equipped charger only, as serious overcharging and probably damage will result if the battery is left on for longer periods at these rates. And, of course, the battery should be fully discharged before charging is started for the full period at the higher rates.

The resistance values shown are not all standard ohmage values, and may have to be made up of more than one unit. Remember that resistors in series add; two 150's make 300, while resistors in parallel divide; two 150's make 75.

At long last and finally, we get to Bart's Leisure Electronics charger, which is a



Novak Electronics has a new electric power speed controller, the NESC-1, designed for use with electric powered cars with from three to ten-cell power packs.

DC charger, designed to charge a six or seven-cell pack at a nominal four amps. It sets the rate to the six-cell battery through a series .67 ohm resistor, and parallels another .67, for an effective value of .335 ohms for the seven-cell. In this case, those small resistances would not have an appreciable effect on the lower rates indicated for the 250 mA Ni-Cd batteries, a simple, external plug-in adapter can be made and used, disregarding the internal resistances.

The best way of all, as Bart states, is to use an electronic circuit, by which you can adjust the charge rate at the turn of a knob. While slightly more complicated and expensive, it does have the advantage of allowing you to charge batteries of varying cell quantities and capacities. The circuit shown is one I have been using for years in an AC powered system that charges all the new and many old batteries I use in test and photo equipment.

However, there are a couple of catches . . . it seems like there always are, doesn't it? In this case, a low value potentiometer like the one needed is hard to find on the retail market. A higher value will

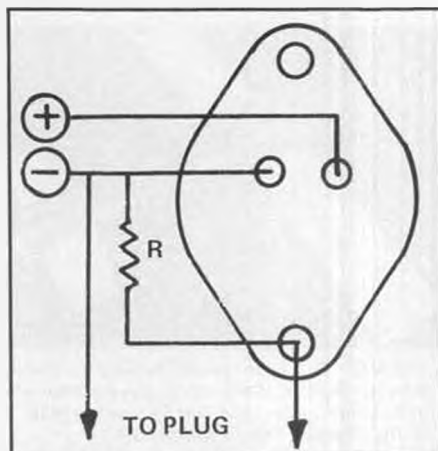
work, but it will make the setting critical, and the residual resistance at the low end will reduce the output on the high end. There are some wire-wound units sold for use as padders, volume controls for remote speakers, that will work well.

Also, due to internal loss, this circuit will only work to about 300 milliamps with twelve-volt input; you'll have to resort to the resistors mentioned for the higher currents. The circuit can be connected directly to the output of the charger, again disregarding the internal, very low value resistors. If desired, a meter can be permanently installed in the positive side of the output to set and monitor the current.

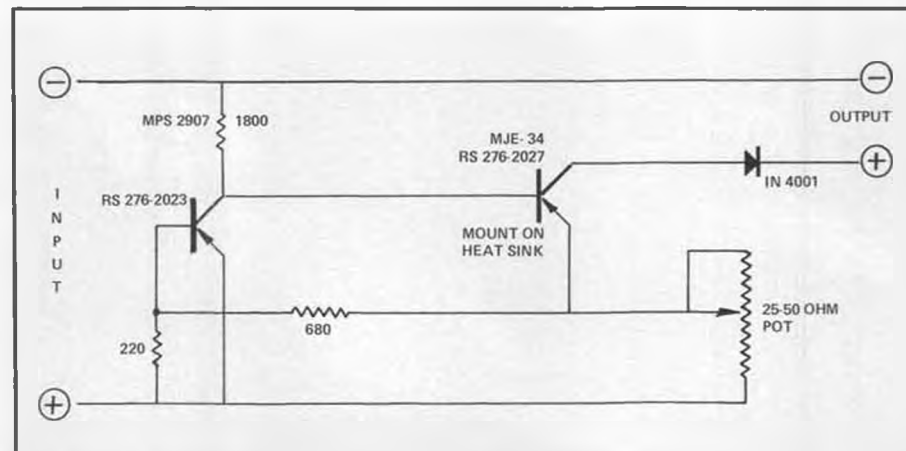
The first circuit will work with up to eight cells at up to 250 milliamps when powered by twelve volts. The second one I cannot say definitely, but I would guess that it will be close to that also.

The only thing left to say is that any time you are going to quick or fast charge Ni-Cds, be sure that they are the types designated for such rates . . . they all are not. Have fun!

*Continued on page 73*



Corrected diagram for LM-338K voltage reg. glow plug power circuit from our June issue.



Here is a circuit which will allow you to vary the voltage output of your Ni-Cd battery charger. The author has been using this circuit for years with one of his AC powered units. See text.

# 13th ANNUAL NORTHWEST R

By MIKE HAZEL . . . Model Builder's Control Line columnist reports on one of this country's largest C/L events, the Annual Northwest Regionals.

• Once again, scores of competitors and spectators flocked to Eugene, Oregon over the Memorial Day weekend for this traditional west coast event. The contest is held at the local C/L club's flying field at the Eugene municipal airport. The Eugene Propspinners are the sponsors for the meet, and they are ably assisted by several other people in the area.

The flying field consists of five circles, all of which were kept full of action throughout the two day affair. The action normally starts on Friday, when early arrivals immediately start testing their equipment. As there are no time restrictions on the site, the test flying literally goes from dawn to dusk.

The earliest arrival this year was the Canadian contingent from Alberta. They must have experienced some confusion with time zones, or international date lines, as they showed up on Wednesday!

The weather looked rather threatening and gloomy right until the last minute. The Oregon spring weather pattern did its usual thing with a quick change, and the rain-laden clouds dissipated by Saturday morning.

This contest always enjoys good local media attention. Reporting teams showed up from the local newspaper and two television stations. Some of the modelers were able to catch a glimpse of themselves on the evening news broadcasts.

This year's participation in the events saw a shift in numbers. The overall entry was similar to the previous year, but increases were seen in the Stunt and Carrier events. Combat and Racing entries were down somewhat, though NW Sport Race had the highest entry of all events.



Here is part of the "sea" of Carrier entrants hard at work in the pit area. This year saw a dramatic increase in Carrier entries.



Industry support has display of goodies

The racing action on Saturday was kicked off with the Goodyear event. Entries were significantly down in this event, and no fast scores were to be seen. Top finalist was Paul Gibeault of Edmonton, Alberta. Paul used a Ballard designed *Midget Mustang*, with a Nelson .15 ABC. Other specs included use of a low compression head, and a .375 bore intake. Forty percent nitro fuel provided the urge, along with a Kustom Kraftsmanship fiberglass prop. His time was 7:14.

The Rat Race event followed. The entry level and overall performance was similar to the preceding event. Paul Gibeault repeated his winning ways, using a Gillott design *Shark*. He used a K&B .405 engine to motor in for a 5:41 score.

Numbers were a bit more significant over in the Carrier circle, and the entrants had to scramble to get their flights in. All three classes were flown, and there was a total of 25 entries.

Dave Green of Astoria, Oregon took first in the hotly contested Profile class. His score was 218.5, which was also good

enough for a new NW region record.

Bob Danielson of Bothell, Washington, led the pack in Class I with a 300.3 score. It was interesting to note that the next few places were within a twenty point spread, but Bob's score was over 100 points above that bunch.

Roy Beers of Vancouver, Washington, took the top honors in Class II with a score of 264.1

An interesting entry that was seen in the pits was Orin Humphries' *Corsair*, which was christened "*Humper's Hawg*". This was a Class II entry, with Super Tigre .60 power. Going for simplicity in moving surfaces, there is a pop-over rudder for low speed flight, but no flaps. On the top side of the wing, near the leading edge, there is a turbulator strip, presumably to assist in low speed flight. I had no information on how this worked out.

One observation that I had was that there were very few *Guardian* designs to be seen. What a welcome change that is from a number of years ago when the Carrier pits looked like the scene of some look-alike contest.



ABOVE: This Stunt model belongs to Randy Schultz, Seattle, Wash. Design is a composite of Fancher's *Imitation* and *Excitation* planforms. Powered by O.S. .45 FSR.

LEFT: "*Humper's Hawg*" is a Super Tigre .60 powered *Corsair* by Orin Humphries, Spokane.



# REGIONAL C/L CHAMPIONSHIPS



never been better, as evidenced by the tremendous in the photo above.

The officiation was headed by Mike Marcum.

One of the more low-key events flown was Profile Scale judged by Tom Kopriva and Mel Marcum. This has become a popular alternative to the Precision Scale event for many modelers. Randy Schultz repeated a win this year, using a Midwest kit of the ME-109. Randy seems to have a lock on this event in the NW area contests.

There were four classes of Combat competition flown over the two days. On Saturday, the FAI and Slow events were flown. The draw was done double elimination, which means plenty of matches for the fliers, and lots of good spectator interest.

John Salvin was the top killer of the day, winning both of these events. He posted a four wins, one loss record in FAI, and five straight wins in Slow. John hails from Orinda, California.

Back over in the racing circle, it was time for bitty-bore action, namely Mouse racing.

Rich Schaper was the fastest entrant in the Junior Class I division, with a 6:44 time. In the Open Class, Fred and Joyce Margarido, otherwise known as the M&M team, turned in a respectable 5:10 score for first place. They are from Fremont, California.

Class II Mouse Race was dominated by the team of Joe Armstead and Mike Petri, who are both from Redwood City, California. The time was 11:12 for the 200-lap final.

The last racing event for the day was Slow Rat Race. Vic Garner (the Livermore Flash) repeated a win this year, using his number two airplane. His HP powered design motored in for a 6:31 score.

It is almost traditional that some event or activity is added each year to this

*Continued on page 82*



"Team Tuxedo" members Dave Green (left), and Bill Varner display their Yippee design Rat Racer. Powered by a K&B 40S.



Jerry Thomas' latest asymmetrical wing Jet Speed design, Ironside Hummer, features aluminum wing, tail, and fuselage.



Terry Miller set up this fantastic display of new and old ready-to-fly plastic models. How many can you ID? Sign lists: A.C. Gilbert, Aurora, Comet, Cox, Testors, and Wen-Mac.



Dick McConnell poses with his FAI Combat entry. It is a modified Firefly design, powered by a Fox .15 BB engine.



Loren Howard dials the carb on his Fox powered Mustang Profile Carrier entry. Bob Pfingsten lends a helping hand.



# Free Flight

By BOB STALICK

• Bullet Bob pays off!! It was a mere four months ago when the Bullet hit the newstands with hints, tips, and answers for the questions that had been bugging modelers about free flight. In the time since the first announcement, several of my well meaning friends have sent in the usual, "What's a P-30?" and "What's a hand launch glider?" type questions. I dismiss these obvious pot-boilers with a sniff. But, when an authentic question such as the following comes in the mail, it's time for action.

Here 'tis, "Could you tell us how a pacifier tank is worked? I've been experimenting for a long time on my T.D. .049 and haven't had much luck. How does the thing work. Thanks. If you find this fit for your column, it will make

the second time you have helped me. I appreciate it in infinite quantities." The above question is from Eric Ryberg.

Well, Eric, all you have to do for a magazine columnist is to compliment him. Read further in this column, and you'll probably find out all you ever wanted to know about pacifier tanks . . . and more!

## SEPTEMBER MYSTERY MODEL

I had been passing over this sketch for a number of years, and for some reason, I didn't put the designer and the model together until just recently. I just saw those crazy dihedral stab tips, and figured that it was some demented soul craving self-expression. But this is a gas model, and the designer is now very well known as a most successful rubber powered model flier. I mean, one look at his rubber models, and you know who the designer is. But why should it be different for a gas model? If you know the designer, you don't win anything, but if you know the name of the design and send it in to Bill Northrop at **Model Builder** first, you get a nice prize . . . like a one year subscription to **Model Builder** magazine.

## SEPTEMBER THREE VIEW:

### GEORGE FULLER'S DIXIELANDER POWER MODEL

This is it! The first mass produced, high powered pylon model which set the trend for rear fins. This design dates back to the 1950's. It's the *Dixielander*, one of Great Britain's all time gifts to modern free flight. It is an exceptional performer even today . . . no less than three

of them regularly make the scene here in the Northwest in A Gas.

Fuller combined several features within his design that I would like to point out: 1) a 100% CG location and a 45% stab; 2) undercambered (NACA 6409 derivative) wing with 350 square inches of area and extreme washin and washout patterns; 3) rear fin to handle the power; 4) sidewinder engine mounted on hardwood beams on a profile style fuselage; and 5) the model is lightweight for fast climb and good glide.

I have two *Dixielanders* that I fly. The oldest one was built in 1971 and is on its second O.S. Max .15. It consistently flies the same way, contest after contest and year after year. I have no idea how many awards it has won, nor how many flights it has made, because I've lost track. It is my most dependable model. Greg Davis and Clarence Haught each fly one (apiece, that is) with S.T. .15 engines. These are very hot machines.

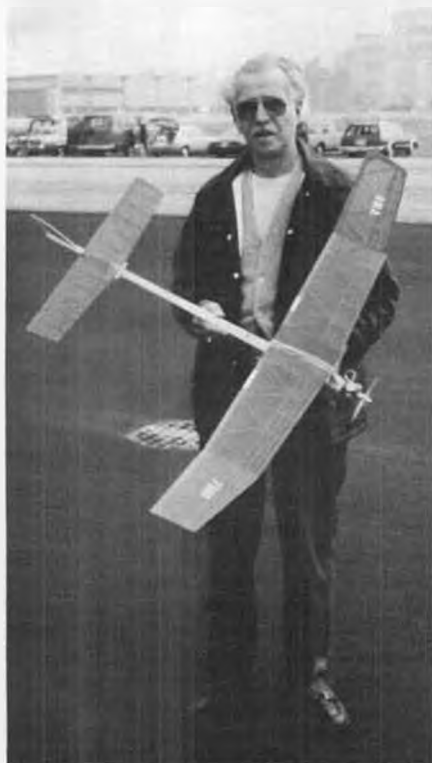
I have a second *Dixielander* that is much newer and less tested. It has an O.S. Max .25.

Steve Helmick reports that his spies in Australia claim that the original *Dixielander* qualifies as a Nostalgia model. If this is the case (are you reading this Bob Larsh, Harry Murphy, or Ralph Prey?), then you can forget about the *RamRods*, as the *Dixie* will blow them all away.

Well, I don't know where you can get full-size plans to this ship, but I do know that I built my first one in 1971 from a tiny three-view that I found in *Aeromodeller* magazine. The three-view this month should be enough for you to build your own. You really will not be sorry.

## SEPTEMBER DARNED GOOD AIRFOIL: XIANGMING WAKEFIELD

In 1979, the People's Republic of China showed up at the World Champs at Taft with a full complement of models. For many of us, it was our first opportunity to see the Chinese models and fliers close-up. Yi Xiangming was one



Carl Fries poses with one of his favorite F/F ships at Wright-Patterson AFB, October 1982. He is a member of Thermaleers and the CIA.



Gary Fries finishes retrieving his fine-flying Class B ship at the Lawrenceville, Illinois, AFB. He is a computer wizard and is not currently building models (for shame! wrr). Model is powered by a K&B .21. Photo by Carl Fries.

of the Wakefield team members, and the highest placing contestant from China . . . ending in 29th place.

This is the airfoil that he used on his elliptical wing ship. In conjunction with this wing airfoil, he used a NACA 4406 stab foil on a 22% stab. The balance point was at 67% of wing chord.

To me, the airfoil looks very much like a fast climbing Benedek section, except that Xiangming set the wing incidence at 3.3° which is quite high for a fast climb. Nonetheless, it's a fine looking section and worthy of consideration for Wakefield and Coupe.

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

Here it is . . . just what you've been waiting for: the September version. This month, we (actually, I do have a mouse in my pocket) feature some bits about fitting your gas model with a pacifier. Undoubtedly, the question that permeates our readers minds is: "Why pacify a gas model?"

The answer is: any gas model will run more steadily and with a bit more power (provided you enlarge the venturi) with a pressure tank. A pacifier tank is one way to provide pressure to the fuel system. You can get pacifier tanks all made up and ready to use from FAI Model Supply (see ad in this issue of **Model Builder**), or you can buy the pacifiers alone from NFFS Supply for 45¢ each. (Get the small ones.)

Pacifier tanks can be used in two ways. They can be used with a pinch-off timer or with a flood-off timer. For smaller engines, I use and prefer the pinch-off type. Somewhere in this article, you will see a picture of just such a setup on a 1/2A model. This is a simple setup: just attach the fuel line from the pacifier to the needle valve nipple and pass it through the timer loop. I would strongly urge that in T.D. engines, a Kirn-Kraft needle valve assembly be used. The regular T.D. needle assembly is OK, but it is prone to leaking.

Now, here's how to use the pacifier pressure tank:

1. Fill the tank until it is approximately the size of a walnut.
2. Attach the fuel line to the needle valve nipple and open the needle until fuel begins to fill the venturi.
3. Close the timer to shut off fuel flow.
4. Grasp (I like the sound of that) the fuselage firmly, and apply pressure with



Jim Bennett (right) and Richard Sander (left) pictured meeting two years ago at Bonne Terre, Missouri. Both are currently members of the Thermaleers, Inc. club. Bennett, of course, is the editor of our NFFS Symposium paper (he's also a neighbor of Carl Fries). Looks like a decent place to fly free flight! Photo by Carl Fries.

one finger (or thumb, if you are left handed like me) against the fuel line between the timer and the needle valve. Open the timer arm and set for length of engine run.

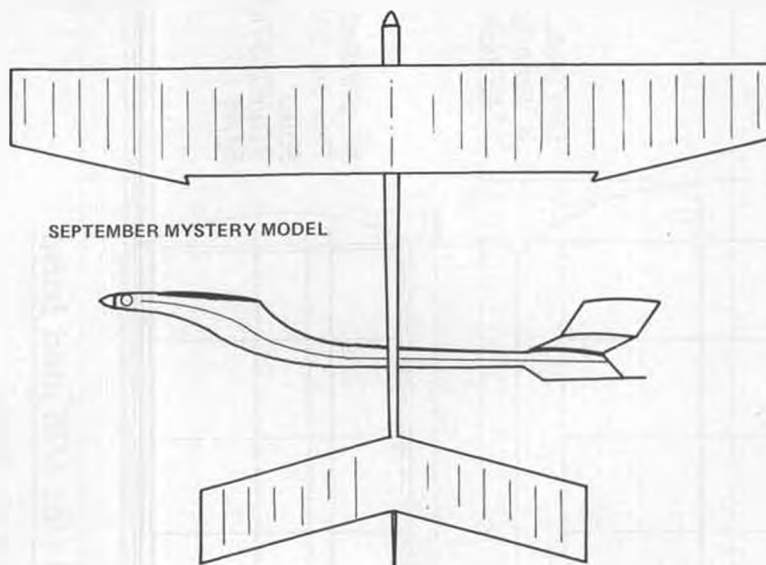
5. Prime the engine and start it. As soon as the engine begins to burn the prime, remove pressure from fuel line. If the engine continues to run, then adjust the needle valve for peak performance. If the engine stops, immediately reapply pressure to the fuel line.

6. Check to see if the engine was

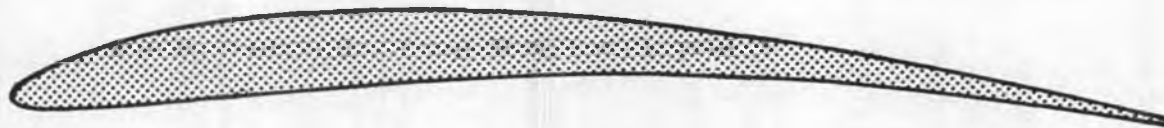
flooded out or leaned out. If flooded, close the needle a bit. If leaned, open it slightly.

7. Try the starting procedure once again. Once the correct setting is obtained, very little fiddling with the needle valve setting should be necessary from contest to contest.

8. The engine will be shut off by the timer when it pinches off the fuel flow. Engine stops tend to be very clean and without run-down if the timer has enough pressure to constrict the line.



#### DARN GOOD AIRFOIL – XIANGMING WAKEFIELD



Station	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	0.9	2.3	3.3	4.54	5.53	6.42	7.54	8.23	8.84	9.15	9.23	8.84	8.0	6.7	5.0	3.0	1.76	0.5
Lower	0.9	0.12	0	0.22	0.5	0.69	1.33	1.8	2.26	2.7	3.4	3.8	3.75	3.4	2.4	1.3	0.7	0

# DIXIELANDER

BY GEORGE FULLER  
A NOSTALGIA? MODEL

SPAN 50"  
AREA: 350 Sq. In.

Sketch Taken From  
YEOMAN KIT PLANS

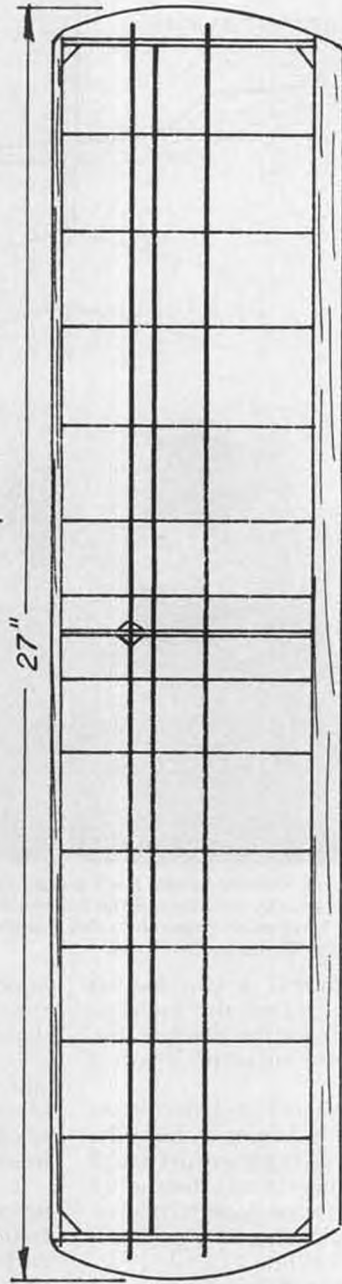
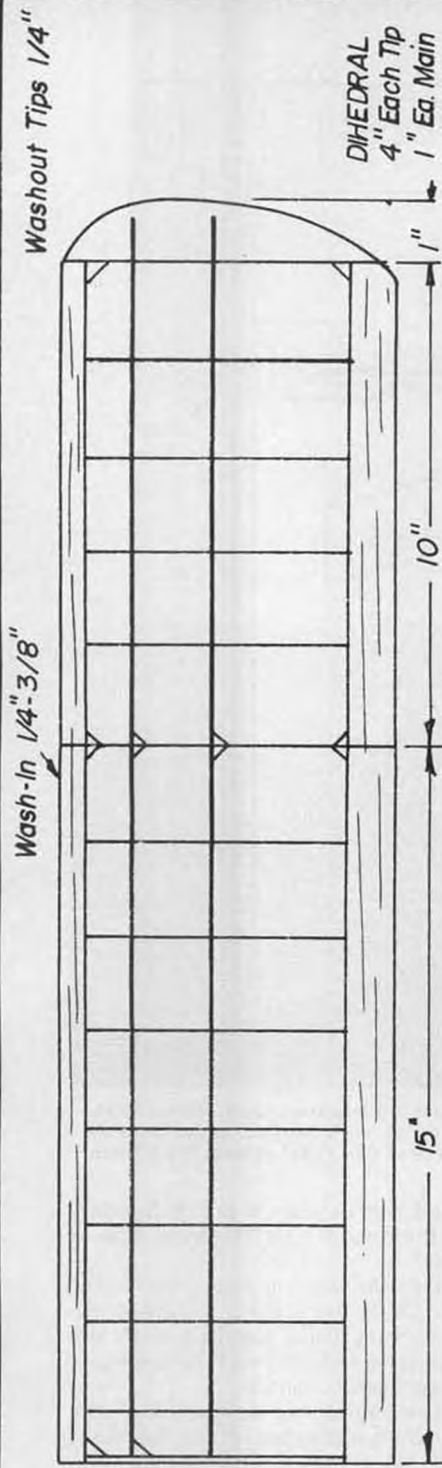
Recommended Power Any  
Glow .15

Power/Glide Pattern  
Is RIGHT/RIGHT

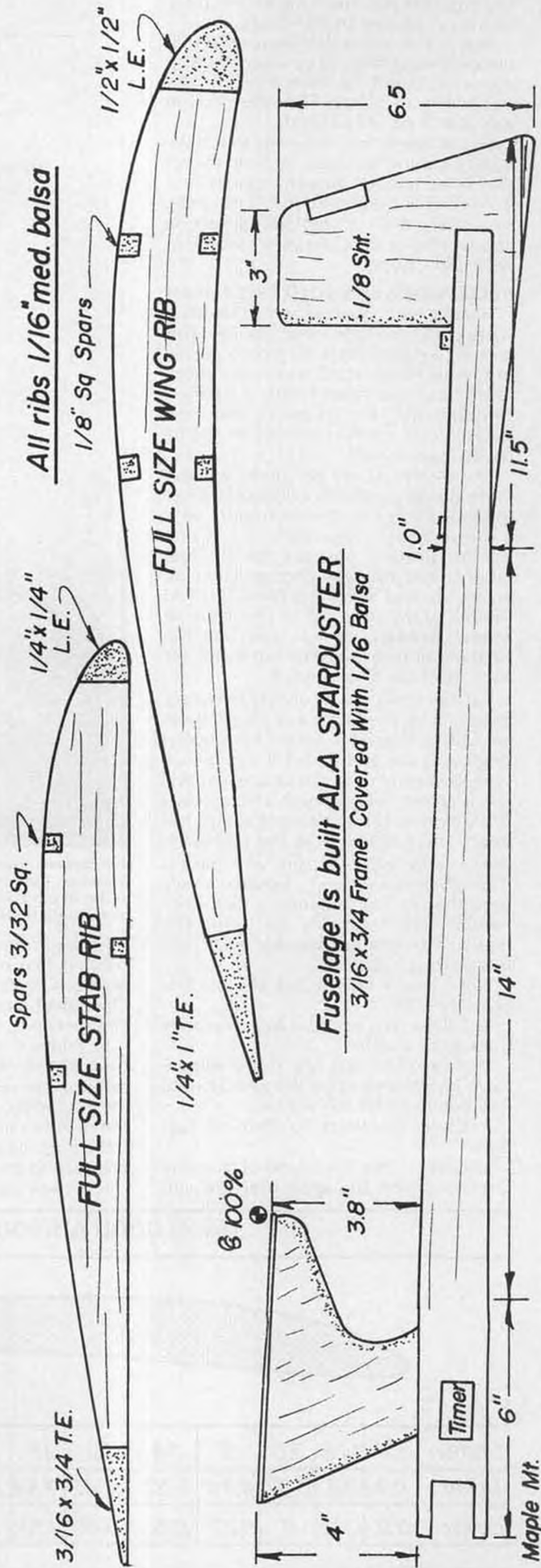
Details In Column

Scale 1/4" = 1"

Drawn By BOB STALICK 5/84



Wing & Stab  
Tips are Sht.  
Balsa  
STARDUSTER  
Style.....



All ribs 1/16" med. balsa

1/8" Sq Spars

1/4" x 1/4" L.E.

Spars 3/32 Sq.

FULL SIZE STAB RIB

FULL SIZE WING RIB

1/2" x 1/2" L.E.

1/4" x 1" T.E.

Fuselage Is built ALA STARDUSTER  
3/16 x 3/4 Frame Covered With 1/16 Balsa

1.00%

1.0"

6.5

Timer

6"

14"

11.5"

Maple Mt.



An out of focus *Dixielander* begins its skyward climb. Model is this month's 3-view (left). Note the "bump" on the bottom of the fuselage indicating the presence of a pacifier tank.

9. After a day's flying, I recommend that the pacifier tank be removed, all residue squeezed out, and wiped down with a soft cloth. Some folks store their tanks in talcum powder to soak up any excess fuel.

10. After using a pacifier tank for awhile, you will notice that it has become distended. It is now time to replace it before it decides to explode fuel into your face. The new tank will have more pressure than the old one, so you may need to readjust your needle to compensate.

I use the above system on all of my AMA class models up to .15-sized engines. It works well.

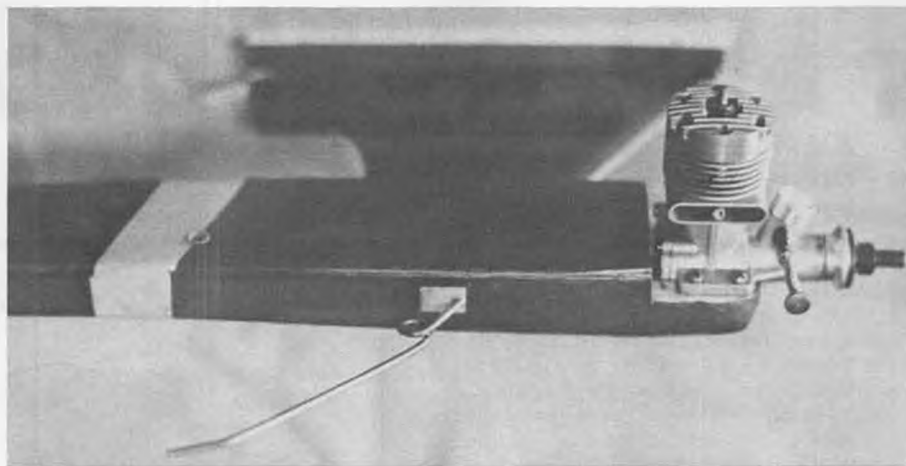
Using a pacifier with a flood-off system is just a bit more complicated, and I wouldn't recommend it for 1/2A sized engines, however, many of the high zoot FAI fliers use them regularly. In brief, a T fitting is inserted into the fuel line with one length of tubing connected to the needle valve nipple and the other line running through a flood-off timer. Starting procedures are similar to those described above, but the engine stops not by leaning out the fuel supply, but by squirting all remaining fuel into the venturi via the flood-off. T fittings are available from NFFS or from Fourmost Products.

Now, that's probably more than you wanted to know about pacifier tanks. Thanks for asking. (Or is it tanks for asking?)

The letters from Dave Linstrum asking me to explain P-30 and plug Phil Hainer's wonderful kit, and from Bill Gieskieng asking about hand launch gliders will be summarily ignored by Bullet Bob this month . . . but thanks for writing, guys.

#### A FEW PRECAUTIONS ABOUT PROPELLERS FROM THE "SATELLITE"

No one who has ever seen a propeller shed a blade while the engine is running at full revs will (or should) treat our gas models with other than the utmost respect. These things are dangerous.



Front end of author's *Dixielander* showing engine installation and landing skid wire.

Recently, the "Satellite" carried a few suggestions by Ralph Prey to help reduce the risk.

"First of all, look at the grain of the wood. Needless to say, it should be straight-grained from tip to tip. Any variation of the grain by more than 1/4 inch is asking for it. Also, be sure the wood is stiff, and that is a good grade of wood, like maple. Some props in years gone by were made of soft woods like basswood. Don't use these props on a Schnuerle engine.

"If you have to make the hole in the hub larger, use a prop reamer. Fox makes several that are excellent for K&B props, it is a two-step reamer, and it works better than a drill. If you must use a drill, try to use a drill press, and when drilling, place the prop on the base of the drill press with the back of the blade against the base . . . just as if the base were the prop drive washer. This will at least get the hole true in relation to the prop drive washer, and any variation will hopefully be taken up by the nut washer.

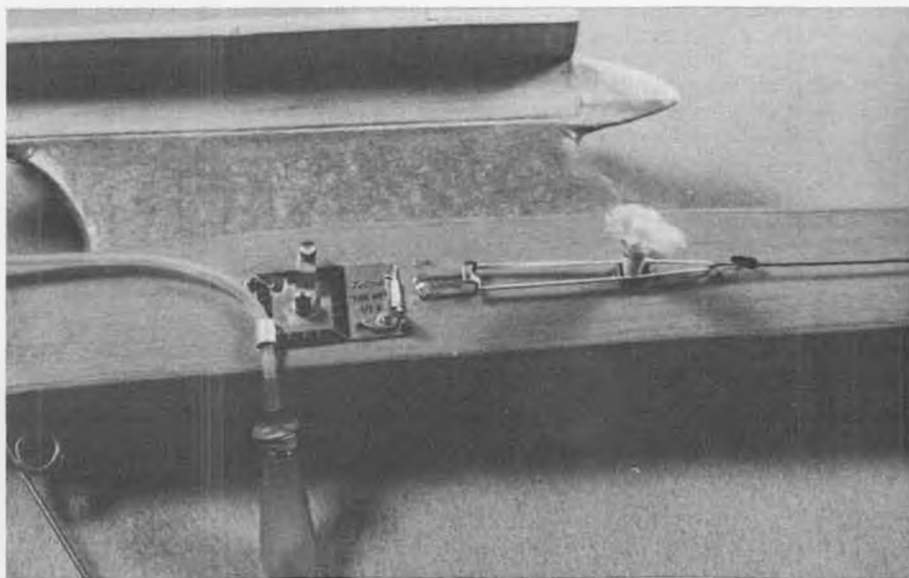
"But before tightening the nut against the washer, check the washer for flatness against the prop hub. Any variation can be sanded flat. After the prop is tightened, check it for blade track. This

can be done by using a straightedge from some point on the fuselage to the top of one prop blade. Record this measurement, and then rotate this blade 180°. Take another measurement from the same point on the fuselage to the tip of the blade. The difference is the amount that the prop is out of track. If the difference is more than 1/32 on an eight-inch prop, you'd better take it off and true up the back of the hub because that prop is a potential hazard. Anything more than 1/16 on a prop of nine to 12 inches diameter is too much, and you'd better do something about it also.

"An investment of \$25 in a prop pitch gauge will also help to keep props intact. I always check the pitch of any prop I buy before using, and it is amazing what a difference there is in actual pitch between blades. If you do repitch the prop by sanding the back side of the blade, then you must rebalance it too. It is good practice to check balance on all props before using . . . it pays off."

Well, gang that about does it for September. Keep them cards and letters coming, and catch a thermal for me the next time you are out flying.

*Continued on page 104*



Close-up photo of a 1/2A gas model showing pacifier setup. Note Tatone Tick Off 1/2A timer.

# FUEL LINES



JOE KLAUSE

P. O. Box 2699  
Laguna Hills, CA 92653

## REAL TORQUERS UNITE!

Guys, in this column in the recent July issue, I was foolish enough to denigrate the expression a "real torquer." A lot of modelers take pride in their engines, and obviously, many of them genuinely like the expression. They sure let me know about it! Frankly, I'll readily admit that it does have a catchy sound.

Well, as if that indiscretion of mine wasn't enough, I also made some inane comments about the merits of campaigning for ladies in our hobby. You're right! I heard a few choice words about that! To sum it all up, here's one letter that cracked me up:

Dear Joe,

In reference to your article in July '84 *Model Builder* magazine. Since the term "real torquer" is a slang term and not formally defined in the language, it will probably be a waste of time trying to fight its usage. However, it applies to any engine regardless of basic design or displacement and is not an exclusive four-stroke term.

Now about your comment on female participation in the hobby: I eat, sleep, have children, raise children, and solve all domestic problems with my wife. Why, oh why, would I want her interested in my hobby?! And as for girl friends being interested . . . heck, my wife doesn't even know I have one if you'll just be quiet about it!!!

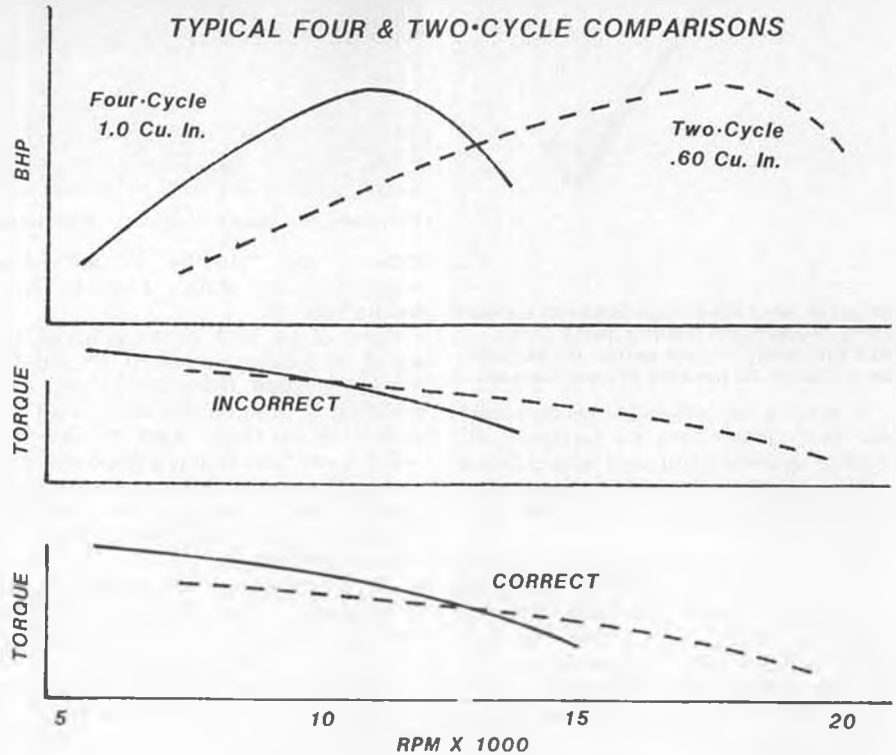
Sincerely, (Signature)

P.S. Just joking!

Guys, just in case he may not have really been joking, I've deleted his name. Nonetheless, I think his comments are incisive and well taken.

## ERASER TIME

Why stop at two modest boo-boos? Go for it! I did, and managed to make a creditable mistake when I drew the four and two-cycle engine comparison chart for the July column. Dave Gierke, one of the few really great model builders, mentioned it in his recent letter, "... the graph shows the correct relative BHP



arrangement between the four and two-stroke engines, but not the torque. To be correct, the four-stroke torque must be greater than the two-stroke torque at all RPM's where the four-stroke HP is greater . . . not as you have indicated on the graph." Dave, you are absolutely right! I goofed when I drew the torque curves. I can't explain it, other than to say it was careless drafting. It's particularly embarrassing as I had emphasized the irrefutable equation:

$$\text{BHP} = (\text{Torque in ounce inches}) \times (\text{RPM}) \div 1,008,400.$$

Naturally enough, a job well done, even a mistake, deserves an award: the accompanying photograph shows mine. . . .

OK, to set things straight, I've drawn

another graph. The upper two sections are a copy of the one in the July column. The lower portion shows the correction. As you'll notice, the four-cycle torque curve is higher than the two-cycle one until the RPM where the four-cycle BHP becomes less than the two-cycle. Looking at the torque curves, and considering popular modeler jargon, as Dave Gierke also wrote, "... There definitely is a case for calling these little gems *torquers*. . . . OK guys, I give in, call them *torquers*. . . .

## SEATING PISTON RINGS

This subject came up during a recent telephone conversation with a fellow modeler.

He wanted to know a quick way to seat the ring on a new engine or a replacement ring on an old engine. Let's take the new engine, and let's also assume that it is a non-ball bearing engine.

Firstly, remove the head and backplate. Secondly, insert the front end of the crankshaft into the chuck of an electric hand drill, then gently tighten the jaws of the chuck. With the piston at bottom dead center, smear a very, very small amount of 1000 grit aluminum oxide lapping compound on the inner wall of the sleeve. Thoroughly spray WD-40 over the same area. Hold the sleeve in place and then energize the

FOR BIG MISTAKES

Yes guys, the author is only human . . . as we all are . . . perhaps you have use for one of these king-size boo-boo fixers? Now, aren't you curious about WHY this photo is here? The answer's in the text.

Continued on page 67

# Boston Beany



By **BOB BIENENSTEIN** . . . If simplicity of design and efficiency of flight in a Bostonian model interest you, this little gem has already caught your eye! Its all-sheet-balsa construction makes it quick and easy to build.

• When I saw the 14-gram, West Coast Bostonian rules, I thought it would open the door for an all-balsa model. I have flown this model indoors quite often. It consistently will do over a minute below a 24-foot ceiling. I have flown it outdoors several times and have had no problems with the wind.

As far as flying adjustments, the model is flown right-right by using a slight amount of right and down thrust with some right rudder. The right wing panel has approximately 1/16 washin warped into it (trailing edge down). For indoor flying, I use a .076 x 30-inch loop of Pirelli; outdoors I use a .12 x 24-inch loop.

Why not try a folder for outdoor flying? I would increase the pitch to eight inches. The prop shown has a six-inch pitch and a six-inch diameter. Also, I think a hand launch type DT would be in order.

Building the model is quick and easy. Here are a few helpful hints:

## FUSELAGE

After cutting out the sides, lightly score them at the cabin area to facilitate a clean bend as shown on the plan view. To keep the fuselage straight, assemble over the plan view. When all the formers are in place, remove the fuselage from the plan, add the landing gear and all crosswise sheeting. Don't sheet where the wing mounts. The wing will cover this section.

The nose section is planked with soft 1/16 x 1/8 strips. Taper the strips in the nose area by approximately 1/16. This will allow for the taper of the nose sections. Now add the 1/32 plywood nose former. Finish the fuselage with fine sandpaper. Add the windshield and side windows. I used .003 plastic film.

## WING

Sand the wing to airfoil shape. Bend in

the undercamber by steaming and pinning the wing to a flat board with a piece of 1/16 square by 16-inch long balsa placed under the high point. Use scrap pieces of balsa as clamps and don't pin through the wing. When this has set, glue turbulators (heavy thread) in place. Cut dihedral breaks and sand the angles like a H/L glider wing.

## RUDDER AND ELEVATOR

Just sand to a streamlined shape and glue in place.

## PROP

Cut the prop blank as shown on the plan. Don't trim out the hub area as shown on the side view until the blades are carved. With the length of motor used, it is essential that you have an S hook. For indoor flying, the shaft can be fixed to the prop. Outdoors you need a

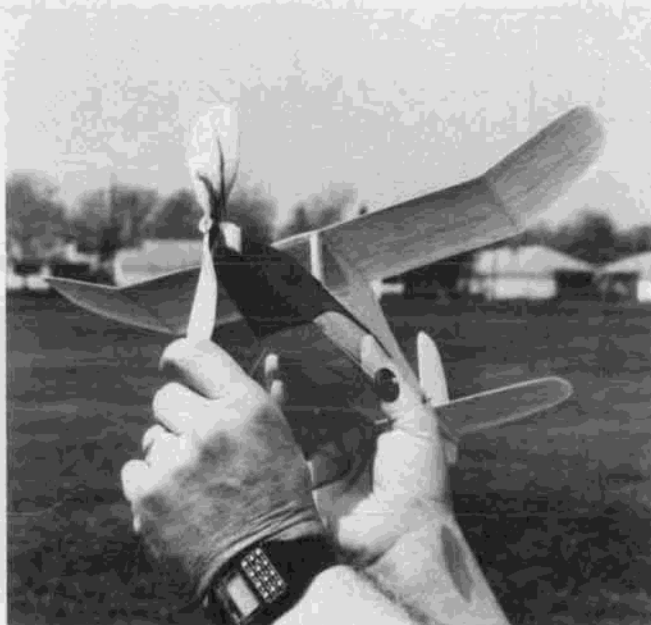
freewheeler. Also, lock the nose block in place with a rubberband stretched over it with the end anchored to the fuselage. You don't need a winding hook, just slip off the prop and wind the rubber. I wind mine with an indoor winder.

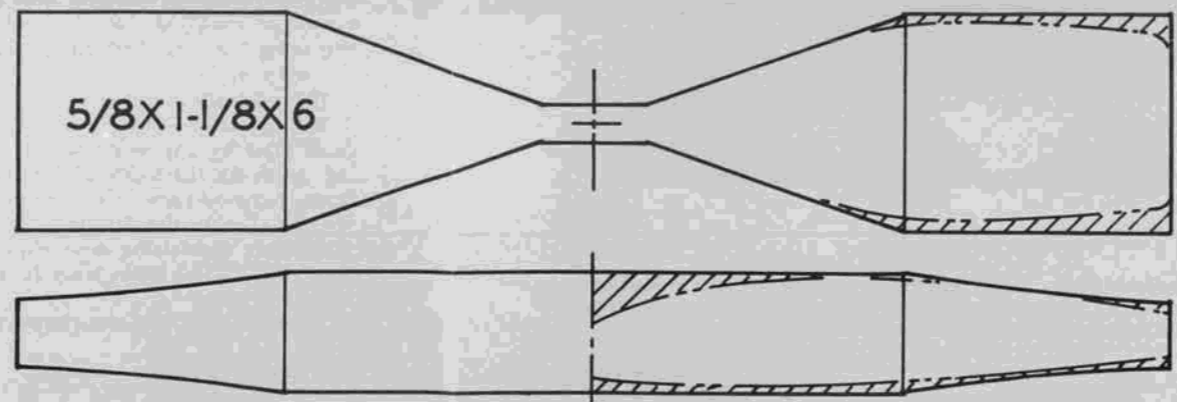
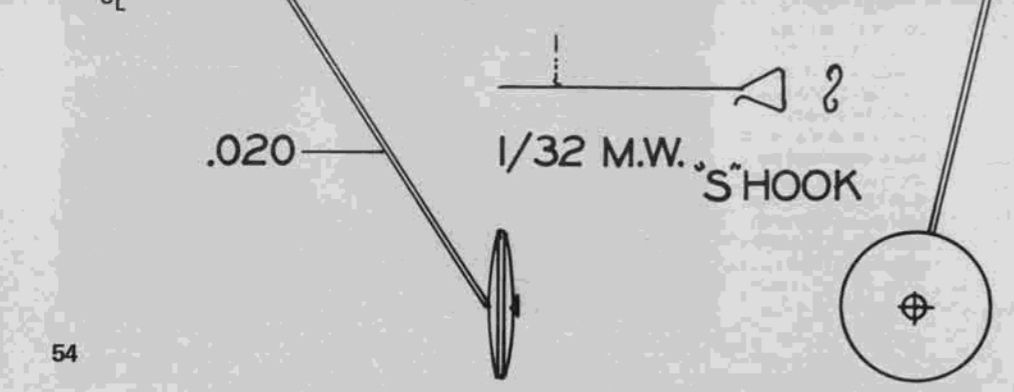
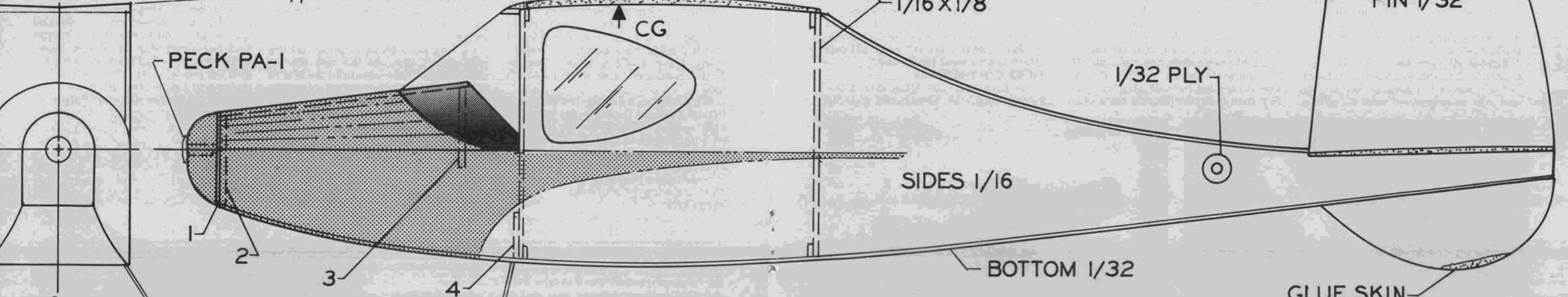
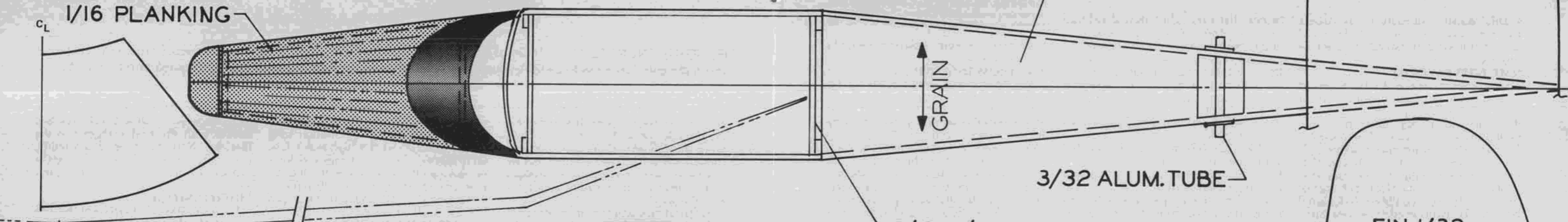
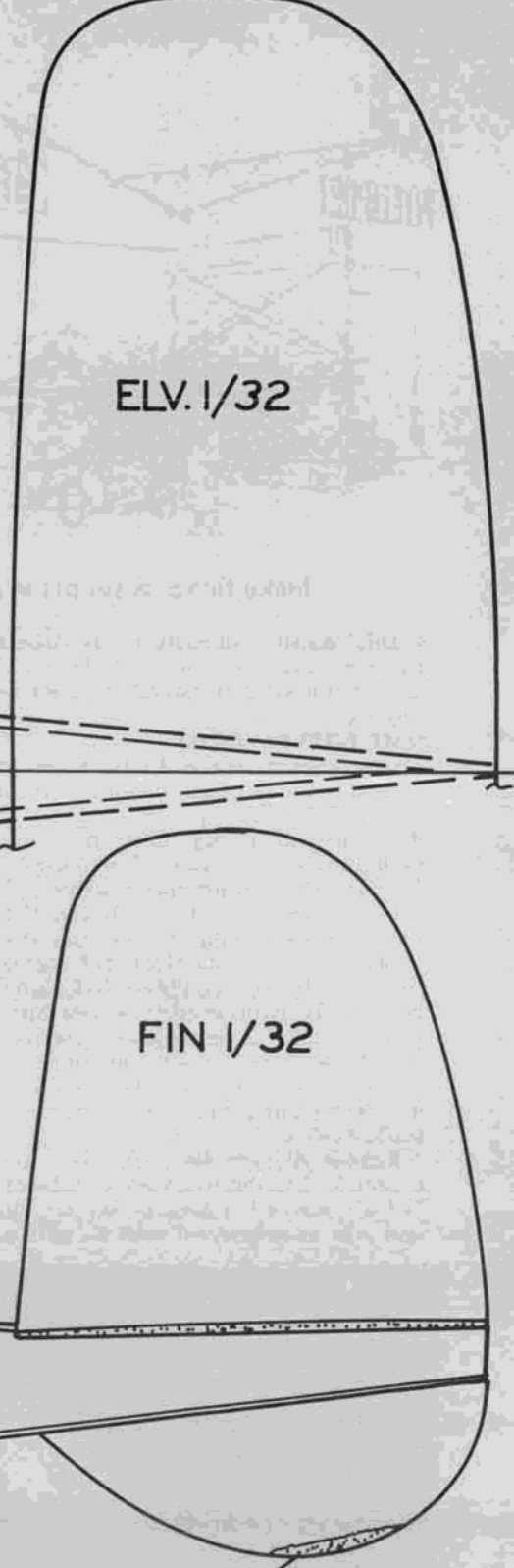
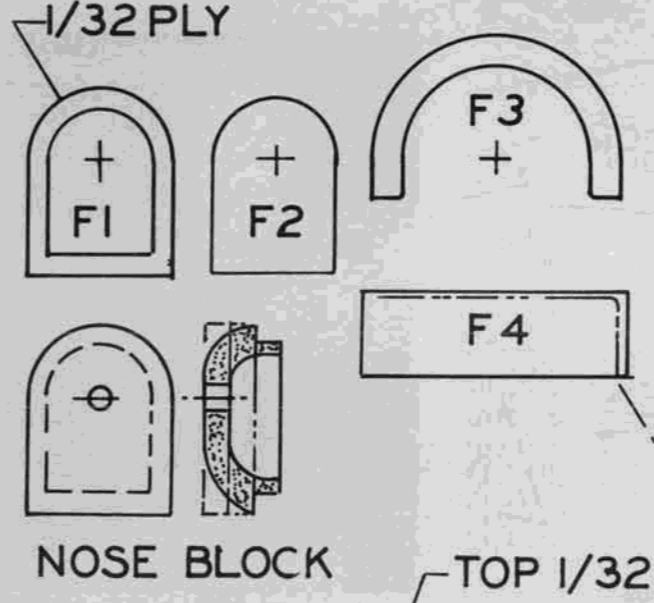
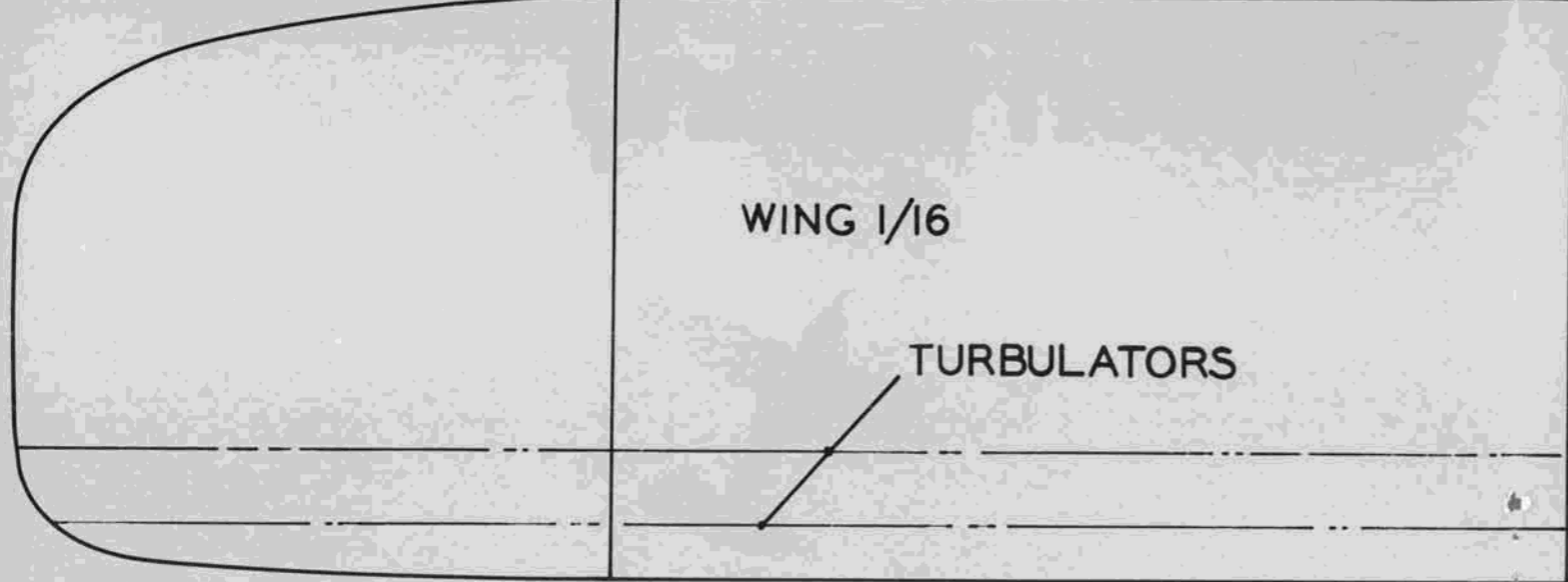
## MISCELLANEOUS

I would like to comment on the materials that I used and that you should use. To keep the weight down, use the sizes shown on the plan, all quarter grain must be as light as you can find. For speed of building, I use Super Jet, Hot Stuff, or Zap. If you fly outdoors, give the model a very thin coat of clear dope, and lightly sand afterwards with 600 grit sandpaper. Do your thing with tissue for trim.

Have fun!

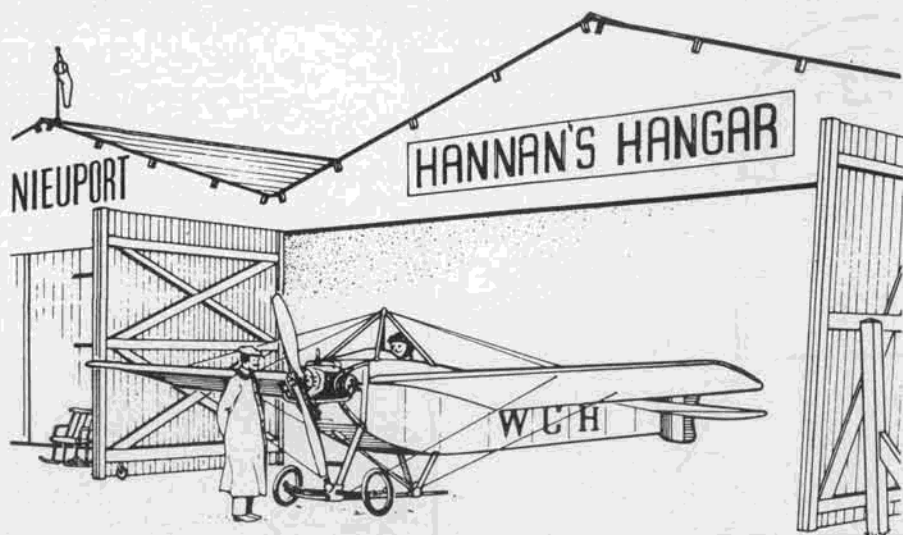
The author holds his *Boston Beany* up for close inspection. The motor is wound and ready for flight. You can make this balsa prop using the prop blank provided on the plan. It appears that the author has beefed up the prop with a few strands of carbon fiber . . .





**BOSTON-BEANY**  
14 GRAM BOSTONIAN  
DESIGNED & DRAWN BY  
BOB BIENENSTEIN AMA 268  
12-15-83





"Make things as simple as possible, but no simpler."

• This month's quotation, by Albert Einstein, submitted by Frank Scott, of Dayton, Ohio, leads handily to our first subject:

#### SIMPLICITY SAVORED

Responses continue to be received related to the satisfaction available from the less complex types of models. For the time and money invested, simple models have few equals in fun returned. Though often regarded as suitable only for beginners, our mail indicates that their appeal extends far beyond that limitation, offering a welcome change of pace even to expert builders. As Colonel Bob Thacker (who, in addition to tackling high-tech R/C scale projects . . . see last month's feature construction article . . . also flies low-tech catapult gliders) puts it: "Some things feature unwarranted sophistication."

Reader William Beck, of Lakewood, Colorado, had this to say on the subject: "I built one of the Bentom Sky Boy kits and was so impressed with its perfor-

mance that I thought I should tell you about it. The Sky Boy is a very well engineered model and a fantastic flier. I gave it just 80 turns to test-hop it, and it flew nearly the width of a city block over our church parking lot. I thought that being of foam construction it would just be a moderate flyer, but it far surpassed my expectations, and flew perfectly on the first flight.

"I highly recommend this kit for youngsters. It would be a nice gift to give to an air-minded kid, or to build for a boy to get him started."

On the issue of young newcomers being dissuaded from the hobby by video games (which International Plastic Modelers Society President Rob Wolf describes as "disposable entertainment") one wonders if basic models might not supply a useful counterbalance. Although they may not supply the "instant gratification" attributed to TV, they do require considerably less attention span than complicated types of air-



Bill Bishop, founder of the Comet Model Airplane Co., admires the Comet Phantom Flash presented to him by Bill Hannan.

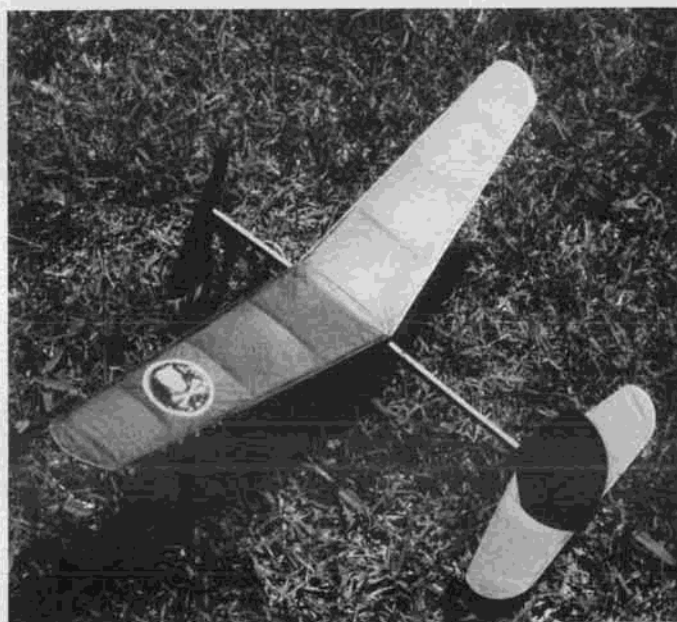
craft, and may help replenish the ranks of model builders.

#### AND FROM ENGLAND . . .

Ray Malmstrom, well-known for his many published designs, responded to our mention of the San Diego Scale Staffel Peck Profile model contest during which 12-year-old Ms. Terry Allen soundly defeated all entrants regardless of age: "Simplicity is the most difficult thing in the world to achieve . . . the fun contests are the best, I always believe. How delightful that among experts, including Walt Mooney (and I am one of his humble admirers), the best duration time went to a lass of 12 years age . . . maybe she did have more faith . . . and perhaps a 'direct line' to the great aeromodeler who watches over all our efforts with a most kindly eye."

#### MORE COMMENTARY

Joe Bickinella, of Alhambra, California, adds: "A 12-year-old girl? Ye



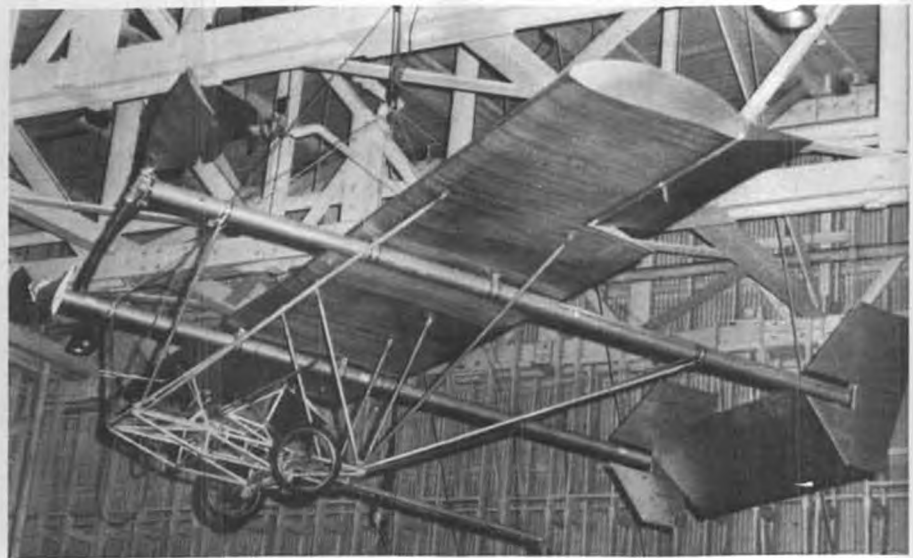
Dick Johnson's Phantom Flash from deep in the heart of Texas, is an example of a simple design which was a source of inspiration to many model builders during the '30s and '40s.



Shoichi Uchida, Japan, sent these Pistachio Nut scale models of a Vagabond and a Nesmith to the Florida "Gnats" proxy contest. See Indoor column for contest results.



Tom Winter launches his *Boston Bus* for a *Beatrice Daily Sun* reporter. This photo appeared on the front page!



Would you believe a full-size, man-carrying, rubber-powered aircraft?! This photo was sent in by George Perryman. See details in the column.

gads! You poor, ancient, male modelers . . . that should teach you adult toy builders to keep the kids in their own age group!"

**AND FROM RICHARD MILLER**

Our resident hangar philosopher offers this profound observation: "Any endeavor which has the capacity to absorb all the intelligence, ingenuity, and patience an adult human being can muster, and carries with it such a potential for joy, no matter how ordinary or inconsequential the results may appear to others, is not kid stuff."

**PHANTOM PHLASH**

One of the most fondly remembered, prewar 10-cent kits was the *Comet Phantom Flash*. This 16-inch span ROG model sported pleasing proportions, exotic-looking landing gear, black tissue, and sinister-appearing pirate insignia.

For a forthcoming contest, Walt Mooney has proposed a one-design event with all entries to be judged for fidelity to the plans as well as duration. In the same week as Walt's announcement, a letter arrived from Dick Johnson,

Simple, yet graceful, this Brown Jr. CO<sub>2</sub> powered model built by Morton and Adam Grosser weighs just 28.3 grams with a span of 21.5 inches.



of Texas, with a photo and description of his *Phantom Flash*: "We talk about getting young people started with this hobby, and heaven knows that a lot of us oldsters drew blood on this model (an

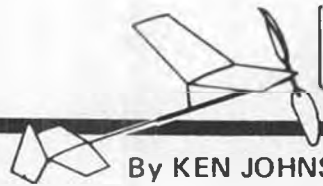
*Continued on page 66*



Tom Laurie (left) shakes hands with Bill Turner who has just successfully test-flown Tom's full-size Stinson restoration. In the foreground, *MB* Editor/Publisher Bill Northrop records the action on video tape. In the background, Bill Noonan covers the action on film.



Emmanuel Fillon, France, not only builds rubber-powered jets and P-nut helicopters, but Pistachio Nut scale models as well. Photo by Alain Parmentier.



# INDOOR

By KEN JOHNSON

## INDOOR SITES

Florida's Dr. Martin has put out a call for Category I and II indoor sites for national record trials for fliers from all over the US. With the loss of West Baden the "NART" meet is cancelled for '84. The chances of setting Category III national records in a 66-foot site are very slim. Autogiro and Ornithopter models might set records as they don't climb all that high . . . sometimes. But the other types of models are at a severe disadvantage.

The United States Indoor Championships were held in the Michigan State Fair Coliseum June 18 through 20th. The ceiling height in this building is 66 feet. Keep your eyes open for a Category I (26 feet, 3 inches) building and a Category II (49 feet, 2-1/2 inches) room with little or no drift and a clean ceiling. Ideally, it should be close to motel or other lodgings and nearby eating places, perhaps with meeting rooms for banquets, etc. Indoor modelers from all over would converge on these sites for 1985 NART (record trials).

## NEW ZEALAND MODELER

Recently, I received a note from a far-away Auckland, New Zealand modeler asking for information on indoor models in general and ornithopters in particular. David Ackery flies indoor hand launch glider as well as Peanut Scale and Easy B duration. I'm sure he would appreciate hearing from other modelers in the United States and elsewhere. I have heard that indoor flying in New Zealand and Australia is sparse, so anything we can do to assist in spreading the word would be welcome. Write to: David Ackery, 134 Hillsborough Rd., Mt. Roskill, Auckland, New Zealand. Tell him about your indoor activities/club doings and even share your latest model designs with him.

## COVERING WITH PLASTIC FILM

Many indoor modelers are covering duration models (like Pennyplane, Giros,

and Flappers) with Ultrafilm, Microlite, and Absolite plastic sheeting. Printed below are complete instructions from Ray Harlan. Ray is a mail order supplier of many indoor products and materials.

In you wish to contact Ray for further info or catalogs, write: Ray Harlan, 15 Happy Hollow Rd., Wayland, MA 01778.

## APPLYING ULTRAFILM WITH SPRAY CEMENTS

With proper care, spray cements can provide a lighter, more uniform adhesive for Ultrafilm (and other plastics and condenser paper) than any brushed-on coating. Brushed-on adhesives are difficult to control and take much longer to apply. A light spray adhesive will add less than .00012 oz. per square inch, or less than .0002 oz. for an Easy B wing. One of the best features of spray cement is that it allows repositioning of the film if a mistake is made while covering.

The first step is to choose the right product. Many spray cements (such as 3-M Spray-ment) produce a cream-colored lacy pattern that is too heavy and is not uniform. Much more suitable are 3M Super 77 and 75, and Grumbacher 548 with fine, transparent sprays. The Super 77 is a high-tack adhesive that now comes with an extra fan-spray nozzle which is ideal for indoor models. For the lightest covering, Number 75 is best. It has a lower, but more than adequate tack, and is formulated for temporary bonds. The air loads on indoor models are so low that this adhesive is essentially permanent. Grumbacher 548 sprays uniformly, has moderate tack, but is heavier than No. 75. It has an orange tint that makes it easier to see.

When setting up to cover a model,



Indoor rubber stripper built by Bob Oppergard. Here is another precision unit for Indoor use. No word as to whether this one can be purchased or where. Photo by John Hankes.

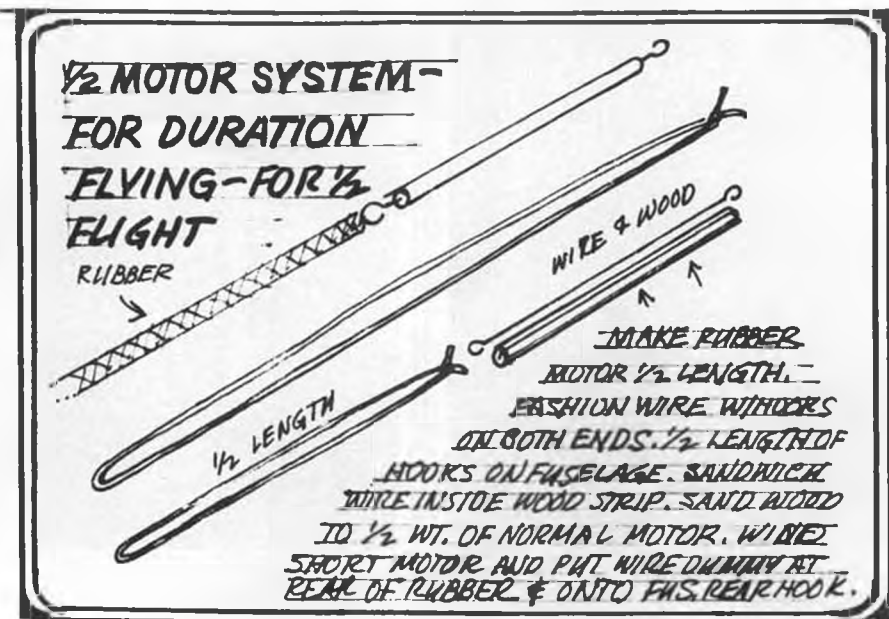
two essential items must not be overlooked. Firstly, be sure the room is well ventilated. This means open windows and fresh air. Secondly, cover the floor where you will spray with lots of newspapers, at least three feet beyond each edge of the largest frame you will spray. You don't want gummy furniture. Spraying in a large, open-top box will help contain the overspray.

To help see where you are spraying, try this: shine a flashlight horizontally across the spray zone a few inches above the floor. Turn out all other lights when you spray. The aerosol droplets will reflect light from the flashlight so you can see them more easily. This is a good way to estimate how much cement you are applying, and where. A black plastic background also helps you see the droplets and can be cleaned with paint thinner.

Use just one pass on a narrow wing, and no more than two on a wider wing (one each for the leading and trailing edges). For No. 75 and 548, hold the can 12 to 24 inches above the frame. For No.



Cesar Banks walks his Mic ship back to his setup area. World Indoor champ, Erv Rademsky, admires Cesar's fine model. Johnson pic.





Grumman *Duck* scale model built by the author's son, Chris. This 13-inch airplane was decorated like the one in the movie, "Murphy's War." It was a real labor of love. Johnson photo.

77, use 24 to 36 inches. Spray at about one foot per second. You will be surprised how little adhesive is required. Remember: less is lighter.

The best covering method is to borrow a microfilm technique: cover the wing flat and add dihedral later. If the sprayed frame is put over a traced outline on the board, it can be adjusted to eliminate skew and wiggly outlines. You may need to tack glue it to the board if it doesn't want to stay in place. There is no rush; the spray adhesive will stay tacky enough for several hours.

Ultrafilm can be applied either from a light balsa hoop larger than the frame to be covered, or two people can hold it with a hand at each corner. A little practice will get smooth coverings without crushing curved ribs. If you make a mistake, carefully peel back the covering and rework it. Lightly press on the outline to secure the Ultrafilm. Then, cut it out with a pencil soldering iron (a 23 to 47-watt iron with a thin, chisel tip is good). Not only is this much easier than trying to use a razor blade, it seals the film edge and prevents rips that might propagate readily. After cutting off the excess film, turn the frame over and press the ribs to secure the film to them.

Dihedral in wings can be added at this stage. The film near the dihedral ribs will loosen. To draw it tighter, wet a small brush in spray cement (from a spot sprayed on paper) and lightly coat the film on top of the rib. You may want to thin the cement with some toluene (Elmer's contact cement solvent) to

make it brush easier. When the coat gets tacky, gently nudge the loose film against it with a thin, flat (but dull) tool, or balsa sliver, from below the wing. Be careful not to push too much film onto the cement strip or the dihedral rib will bow excessively. If this happens, pull the film apart and rework it. This technique requires some practice. But remember, loose film is not too detrimental to long flights.

These covering suggestions should get you well on your way to indoor modeling without the frustrations encountered with paper and other plastic covering materials. Soon you will be devising your own special techniques to further simplify the job.

#### PLASTIC PROPELLERS

This column has mentioned the pros and cons of plastic propellers at various times. It is known that many modelers



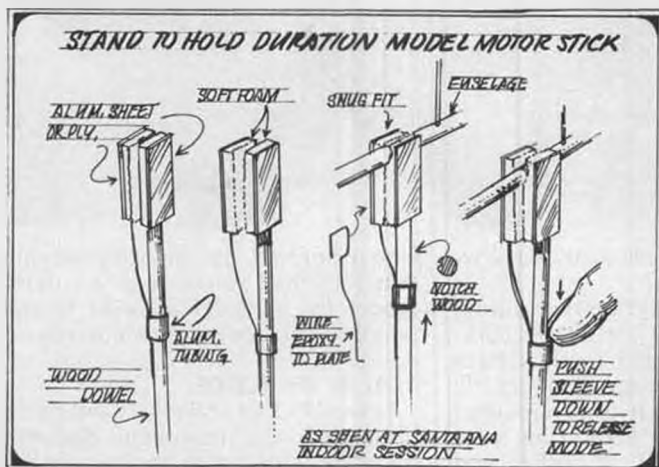
Carlo Godel's *Easy B* rubber model begins a trip to the ceiling at Luther Burbank school gym in Burbank, Calif. (Left to right: Robert Mehmen, Mike Schultz, Tony Naccarato.) Photo by Mary Lou Sberna.

would not build Peanut and flying scale planes if they could not use plastic type props.

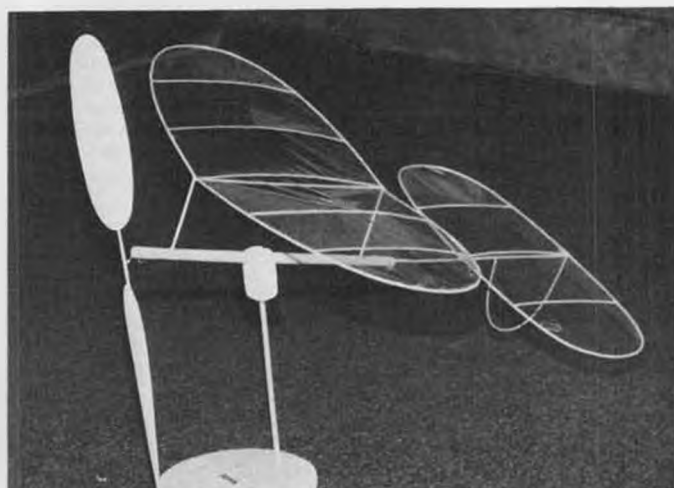
True, they are convenient (no need to carve a wooden prop), and they help the modeler in getting his model into the air quickly. In past columns I have described at some length why they do not appear on my models. They are heavy and the pitch is rather low. The surface area is



BE-2E Peanut biplane poses for the camera. Modeler Chris Johnson builds 95% biplanes. Model is a stable flier, and logs one-minute flights regularly. Johnson photo.



The author was impressed with the way this Indoor model motor stick holder worked, and is sharing the idea with us.



Here is an excellent Penny Plane model built by John Hanks of Verona, Wis. John is a fancier of Ray Harlan's Ultrafilm. Hanks pic.

# PISTACHIO PROXY RESULTS!!!

The latest MIAMA club Pistachio Proxy contest results appear at the end of this column. Here are some of the planes entered:



First of the Pistachio Proxy pictures is this *Found* built by Walt Everson. The model was able to rack up 91.4 points for a 3rd place in Category I.



MIAMA's Millard Wells flew this SE-5 to 3rd in Category III. Model weighs 3.1 grams. Bob Andrews photo.



Stearman trainer (six-inch span) and Boeing F3B-1 Pistachio (8 in.) built by Chris Johnson. F3B-1 took 1st place in Category III.

sparse, and I like to use wide blades for more pulling power.

Recently, my son, Chris, and I returned from the U.S. Free Flight Champs in Taft, California. Three plastic props from Chris's models were left in the back of our station wagon. The sun shone on them for four days in the car. When I found them this morning, they looked like anything but propellers.

Unfortunately, one of the props was from his outdoor BE-2E Jumbo Scale model. The four-blader was made from two 9-1/2-inch props, joined together with epoxy ribbon adhesive. It was time to go back to the hobby shop for new props. Keep this in mind if you plan to leave your models in the sun (in the car) for more than a few hours. Melted props are the pits!

## TAFT INDOOR REPORT

Cesar Banks of San Diego, California cleaned up this year at the very warm Taft High School contest. His Easy B model won with a flight of 10 minutes, 41 seconds. In Novice Penny Plane, Cesar's 6 minutes, 6 seconds won over Joe Foster's 6 minutes, 5 seconds and Earl Hoffman's 5 minutes, 47 seconds. Then, Mr. Banks moved over to the other gym and won indoor Hand Launch glider. Second pace was taken by Phoden Taikopoulos.

## TAFT OUTDOOR FOOTNOTE

As the sun set over Taft on Sunday, the many modelers were busy fun flying all over the area. Campers, tents, and motorcycles filled the eye for as far as one could see. All of Chris' and my outdoor models were flown out or busted. We took out some of our indoor models and launched them into the dead calm evening air. I watched as my son's flying wing indoor stick model circled overhead at 40 feet. My Peanut Scale Leonardo da Vinci ornithopter was wound and launched. I followed it slowly on foot as it drifted off across the



ABOVE: Author's son Chris built these four Grapenut (Pistachio) models. Note the small matchbook for size comparison. Chris is 16.

RIGHT: Gary Bates and Millard Wells wind the author's da Vinci flapper. Millard flew the miniature Ornithopter for a time of 48 sec. Won Special Award at recent MIAMA proxy meet. Bob Andrews photo.



area. No more than 200 yards was covered in three chases.

Then, a novice Penny Plane was wound and released (YES, OUTSIDE!). As darkness came over the field, I walked back with the Microlite covered model. I'll bet that last flight was over 12 minutes. I chased that airplane across the field, over a creek, through tall bushes, and beyond a blacktop road.

Several gas airplane model builders

who witnessed the flight commented that they had never seen an indoor model fly. Who'd have ever thought people would see indoor models fly outdoors?

## YOU BE THE JUDGE

Several Indoor Scale fliers and contest directors had a meaningful discussion on scale judging at the recent Taft

*Continued on page 64*



# Free Flight Scale

By FERNANDO RAMOS

• In all of the years that I have been writing this column, one area that I have never covered is the "test flying" of a scale model. It has not been intentional, it's been more an oversight on my part. There's nothing quite like the moment of truth, when that first launch is made. I've built a great deal of models over the years, and that first toss is still an exhilarating experience!

In order to minimize shock on that first flight, a few hints are in order. Obviously, my approach may be different to others, but it works OK for me. I'll first discuss F/F gas or diesel power, then rubber power. I've said it before and I'll say it again, F/F Power Scale has to be the toughest of all scale events. I believe that is the reason not much of it is being done across the country. This includes electric power as well. Nowadays it is just easier to put in an R/C unit into the plane and eliminate the prospect of losing the model on the first test flight.

## PROPER WING ALIGNMENT

There are several considerations before the first test flight. An example would be making certain that the wings are accurately attached to the fuselage. There are three different aspects to ponder just in the proper attachment of the wings to the fuselage. The first is that the dihedral angle must be the same on each side of the fuselage. If you are building a cabin model and have a one-piece wing, then the dihedral angle *should* be the same. However, if it is the plug-in type, like I use, then you can readily see how one wing could have more or less dihedral angle than the other one.

How many of you take the time to see that the wing is "square" to the fuselage? That is, measure out from the fuselage to a point out on the trailing edge of each wing panel, then from that point to the tail post. If you don't take the time, *do it*, you'd be surprised at how far off your eyeballs can be!

The last check is the incidence angle of the wings. Again, if your model has a one-piece wing, it will simply set on top of the cabin, with the incidence angle preset by the cabin. However, if the wings plug in, you can readily see how the incidence angle could vary from one side to the other if care was not taken. Any one of these factors not considered, could lead into some interesting test flying.

Let me digress for a moment and explain how I minimize error in these



## ABOVE AND RIGHT:

Ed Ross sent in these two photos of his recent Peanut Scale models, a Bede 4 (above) and a McDonnell Douglas F-4E Phantom as featured in the April 1974 *Model Builder*. See text for whole story.



three previously mentioned areas. With infrequent exception, all of my scale models, whether monoplane or biplane, incorporate plug-in wings. I prefer this method for several reasons, but the major one is the elimination of the problems mentioned. After building the two sides of the fuselage, one on top of the other, I carefully locate and mark the wing attachment points. At the same time, I measure the correct incidence angle. Using a plywood root rib template, I drill three holes, two are for locating pins, and the third is for a larger diameter tube for rubber bands to pass through. (The rubber bands hold the wings to the fuselage firmly between two hooks.)

## FUSELAGE ALIGNMENT

The next step to consider is that extreme care be taken when framing the fuselage so that it is square, particularly where the wings attach. The tail post should be in line with the centerline of the fuselage. Often, if care is not taken, dissimilar hardness of longeron material

can cause a fuselage to bend more to one side than the other. This, of course, causes the tail post to be out of centerline.

Unless the fuselage looks as bad as a banana, there is a simple cure for this problem. Spray water on the tail section of the framework, it doesn't have to be saturated. Pin the fuselage upside down over the plan view (most fuselage structures have one portion that is flat). Carefully bend the sides to align with the drawing. Use right triangles to hold them in place. Next, place diagonal cross members between stations top and bottom.

At this time, check the tail post to see that it is vertical. If not, place a few diagonals running from an upper longeron to a lower one. Do all this while the fuselage is pinned down. Let it dry overnight thoroughly.

You can readily see how all of these constructional hazards can occur, and

*Continued on page 84*

**"I HAVE TWO GOOD REASONS TO START IN R/C FLYING!"**

**"EL PRIMERO"**  
(THE FIRST)

WING SPAN 77 3/4 INCHES  
WING AREA 663.50 INCHES  
WEIGHT 26 TO 30 OZ

**BEGIN/AIR 25**  
(25 TO .40 PRIMARY TRAINER)

WING SPAN 54 INCHES  
WING AREA 510.50 INCHES  
WEIGHT 1 1/2 LBS



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## R/C Autos . . . Continued from page 27

on the *Eagle*, the anti-roll bar setup is the same, and shock mounting is essentially as before. The kingpins are now pivoting at their lower mounting point, and the top of the kingpin is retained by a short link. This arrangement obviously now gives some control over camber changes through full steering travel, as well as allowing static setting of camber regardless of ride height.

The short links shown in the pics give faster steering response than before, although they can be replaced with longer links that attach further inboard on the upper bar which would result in slightly slower steering. Or, the stock links can be raised a washer at a time (the washers go between the bar and the ball attach point) to further quicken the steering. It is suggested that no more than four washers be used here.

Also new in the front end is the anti-lift fixture (a threaded rod, wheel collar, spring, and adjustment nut) that can also be used to adjust ride height. The anti-lift bar keeps the front end from lifting (but you had guessed that already, right?) in maximum acceleration situations which gives better steering. On weird tracks that have a hump in the straight, and the car is set just so, the anti-lift also serves to eliminate having the car blow over which is quite a thrill in itself, but not the best way down the straight.

As an aside, if you have an '82 or '83 *Eagle* and are considering switching over to the new four-bar front end, I would give this move very serious consideration first. The older setup still is very effective and virtually bullet-proof, as is the new version. However, band-aid engineering usually gets replaced with clean-sheet engineering, and while I have no "inside scoop" information, I would not be at all surprised to see a completely new front end, come the '85 racing season.

Detail refinements include a molded nylon front bumper that is virtually unbreakable (unless racing in cold weather, in which case Delta offers, you guessed it, a "cold weather" version that

is more flexible and white), a one-piece rear bumper, more lightening holes all over, lower mounting of servos and battery pack, machined aluminum bulkhead which replaces the nylon piece, and located at the forward end of the radio tray, new seals on half-shafts and a couple more things I've probably overlooked.

An item that cannot be missed is the extremely detailed setup sheet supplied with *Super Eagle* kits. No other manufacturer comes even close to what Delta has done here. The racer builds his car according to the outstanding drawings supplied, and then he is carefully led through proper setup of the car in a step-by-step sequence.

Prior to building the *Super Eagle*, I had raced an *Eagle* for two years, and I figured that if it was worth knowing I already knew it. Wrong, I picked up some more tips in the first reading and of course there were a few new things to learn with the changes in the chassis. The sport will be much better off if all manufacturers follow Delta's lead here.

When it came time to slip a radio system in the *Super Eagle*, there was only one choice for a couple of reasons. First, the Kraft pistol-grip unit has proven to be super reliable as a whole, the servos are adequately fast and tough as nails, and all the necessary extra features (servo reversing, end-point adjustments, etc.) are offered. Secondly, the Delta guys believe in Kraft's system, so they kinda "encourage" you to use it by drilling the radio tray to accept the KPS-23K servos.

I suppose this could present a problem if you were intending to use other servos as new mounting holes might need to be drilled. In a worst-case situation, fiberglass adapter plates would need to be made up. But why fight it? I bolted in a Kraft system that already had two full seasons of club racing plus an enduro to its credit. In the past, that much racing time was enough to justify sending the radio in for service at least a couple times; this particular system hasn't been out of a race car since it was new, and it is still working perfectly.

Power for the car was also dictated by personal preference, both mine and

Delta's. While other rear exhaust .21s will work and can be made to fit the car, a Picco .21 literally slips right in with the '84 Picco pipe and Delta-produced "swoopy" header making a clean and just-so installation.

Right here the article gets a little strange, as just to my left are the remains of the motor being described. Yep, blew it up just yesterday. It was a big-time blow-up, too. We lost a rod down the straight, the flailing rod knocked a chunk out of the piston, the trashed piston in turn scarred the liner. With the DRT having used Picco .21s for several years, this grenade-shot came as a real surprise! The motor was just 25 laps short of completing five races, and the plan had been to run it in three more club races before pulling the back door to check the rod prior to a six-hour enduro.

While the motor is presently a mess, post-race dissection revealed a plug that had lost the seal around the central post, which of course means the motor went dead-lean for who know how many laps, in fact, fifty feet before going BANG, it was seen to hesitate as if dying lean on the straight.

So, while the motor did pop in a big way, my faith in Picco .21s has not been shaken. They are still the way to go for power and reliability in a car motor; I will, and have many times, run a stock Picco against any and all custom-built motors without ever being shy in the horsepower department.

On-track experiences with the *Super Eagle* have been absolutely terrific. The car is so honest and predictable that it really comes down to how fast the guy at the controls can drive it. No need to compensate for peculiarities in the chassis or to spend hours and hours resetting the car for a different race track. You simply build it stock, set it up initially as outlined in the setup sheet, and race it.

If you just have to get that last two percent, then it is on to different springs, tires, wing locations, anti-roll bars, and so on, to get the car just perf for your style and track conditions. While there are a lot of combinations that can be tried, the basic chassis is so solid that even small changes and their effects are immediately apparent. Never in all my years of racing have I been able to fine tune a race car so precisely and with such predictability.

Now, that does not mean that just changing built-in variables always improves the car, of course. The first race I went with the basic setup and the car felt really close to what I wanted. At the next race, lighter springs, a lighter front roll bar, and stickier front tires went on the car, and I didn't like it all. I had to really struggle to make the A main where it is normally not a problem (although it is very rare for me to be the top qualifier). That setup went in the notebook as a no-no, after which I switched to stock springs in the back, a step heavier in the front, slightly harder tires up front, I retained the small roll



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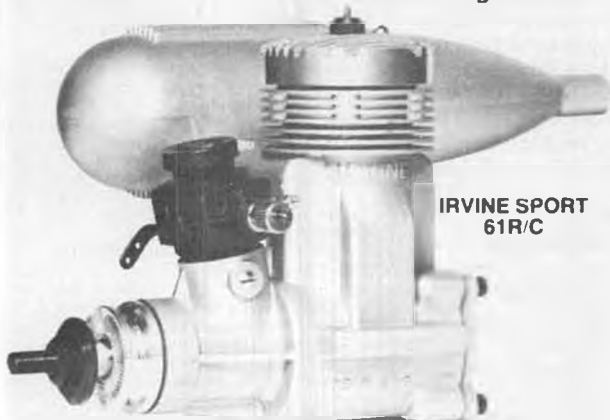
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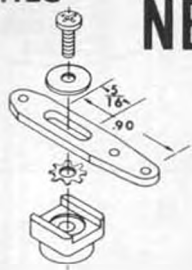
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bar, and the car hooked up just super . . . too hooked up in the sweeper where full throttle couldn't be used all the way through. Increased caster in the front helped, as did a switch to the new forward-mount wing to the point where now the car will not only run the preferred tight line around the sweeper, but it can actually be driven down from the middle line to a very tight exit line which is a dandy feature to have in hand when needing to shut the door on a racer trying to slip inside!

The point is that all of the adjustments built in to a *Super Eagle* can be utilized. There is no guessing game going on in the pits. An experienced racer can quickly and accurately bring the car to a very high level of performance, and it takes an outstanding chassis to respond to fine tuning the way the *Super Eagle* does.

### AND THE BOTTOM LINE IS?

The bottom line is that standing on its own, the *Super Eagle* is presently the best suspension car available to the racer in 1/8-scale. Add to that the setup sheet, super plans, subtract a couple points for gawd-awful packaging of the product (a plain box with a small label at one end, Delta stickie across the top!), then add tons of points for the fact that Delta markets not just a race but everything you need to complete it, all of these accessory items being of the highest quality . . . and you have a package that sets the high-water mark for the race car biz. ●

Indoor . . . . . Continued from page 60

Champs contest. The question came up as to whether scale judging (indoor or outdoor rubber type) should be done during or after the scale contest. There are views for and against both ways. If the scale judging is held before the contest, more models must be judged. Some fliers will enter several planes and all of their models may not fly. One or more may crash before logging a minimum flight. In the case of Outdoor Scale, a thermal flight may take the model away forever. Even with indoor, a model may get stuck in the ceiling, or land in an area where retrieval is forbidden. In this event, the model is unavailable for after-the-meet judging. If your model is judged prior to flying, and it does fly well, GREAT! But suppose you put in two good flights, then you blow a motor winding for the third flight. All is not lost, because the plane has already been judged. You can still get your trophy.

If your motor blows and the fuselage is destroyed before the judging, the chances of you getting a good judging are less likely.

I favor the preflight judging, especially since my Clerget Peanut model was wiped out during a wind (at the Taft Indoor Scale). I felt pretty negative about turning it in for judging with a patched-up fuselage.

How do you feel about this issue? Let me know your preference. The consensus of the fliers at our Taft meeting was that judging the evening before would be ideal, even if it meant that each flier would enter fewer (maybe two) planes.

Motor breakage occurred on each of my two entries in Indoor Peanut at Taft because of the extreme heat. In Outdoor Rubber Scale, six motors broke in a row on the first wind (per motor) from the 100+ desert heat. Oh well, I still had a great time!

### WEIGH ALL THE WAY

Many duration builders weigh each part (stab, fin, wing, etc.) of a model as the plane is built and assembled. They know that a "good" stab will weigh, say, .0004 oz. A "good" prop will weigh .0006 oz. If the part comes out weighing more, it is discarded and another is constructed. At completion, the finished craft is again checked for weight.

In Indoor, the weight of your plane is extremely important. If it is heavy, it will not fly as long. This credo is applicable to scale type indoor events, as well. If you are not weighing your planes, you should be.

Next time we will look at several types of Indoor scales. Some you can buy, and a few you can construct. Weighing the rubber is important too.

Write questions and comments to Ken Johnson at his **NEW ADDRESS!!!!** 10927 Andasol St., Granada Hills, CA 91344.

### PISTACHIO SCALE RESULTS

The first international proxy contest for Pistachio (Grapenut) size models was

held in Miami, Florida, on May 13, 1984. Billed as the First Inter Gnats meet this contest was for scale models having an eight-inch span and six-inch length.

The MIAMA club honcho, Doc Martin, reports that 21 models arrived. Butch Hadland's impeccable Chester Goon arrived from England with the box crushed and the model flattened. No other casualties were reported. The four entries from Japan were excellent.

Category I (models under two grams), Category II (two to three grams), and Category III (over three grams) were the main classifications. A special class, Pistachio Ridotto, was for the smallest model to qualify with a flight of 30 seconds or better. Dave Aronstein of New York won this event with a 5-3/16-inch Pottier P-70-S. Millard Wells entered a PAMA with a 5-1/16-inch span, but it flew for only 17.5 seconds.

Doc Martin says, "We're counting on SIG (Small is Good) to kit some of these little gems."

The rules used for judging were the new Peanut Scale rules, except that single covering was allowed, and hand launching was OK.

The next Inter-Gnats proxy meet will be held in December of 1984. Get those entries built and trimmed. Contact Dr. Martin at 2180 Tigertail, Miami, Florida, 33133, for all the information.

### SCORES

CATEGORY I:	Avg. of 2		Total
	Static	Best Flights	
1. Dave Aronstein (Bleriot VII)	58.8	58.8(Max)	117.6
2. John Martin (Elias Airsport)	62.0	44.2	106.2
3. Walt Everson (Fuund)	51.3	40.1	91.4
4. Dave Aronstein (Pottier P-70-S)	58.8	30.0	88.8
5. Richard MacEntee (Alco Sport)	70.0	16.6	86.6
6. Millard Wells (Wee Bee)	40.7	38.5	79.2
7. M. Wells (PAMA)	61.2	16.3	77.5

CATEGORY II:	Avg. of 2		Total
	Static	Best Flights	
1. Iiro Sugimoto, Japan (Harev)	82.0	58.1	140.1
2. Millard Wells (Harev)	68.0	43.0	111.0
3. Millard Wells (Waco E)	74.8	32.9	107.7
4. Richard MacEntee (Elias)	77.2	26.5	103.7
5. John Martin (Lunkeer Stratoplane)	61.2	26.1	87.3
6. Soichi Uchida, Japan (Vagabond)	71.2	16.0	87.2
7. Chris Johnson (WAWI DH-6)	62.0	21.7	83.7

CATEGORY III:	Avg. of 2		Total
	Static	Best Flights	
1. Chris Johnson (Boeing T3B-1)	86.0	31.6	117.6
2. Siro Takeuchi, Japan (Cougar)	88.6	23.1	111.7
3. Millard Wells (SE-5)	70.3	32.3	102.6
4. Millard Wells (Bristol Scout)	74.1	24.4	98.5
5. Soichi Uchida, Japan (Cougar)	79.8	8.8	88.6

PISTACHIO RIDOTTO: For the smallest scale model to fly 30 seconds (in ascending wingspan length):

	SPAN		Stat.
	Best Flight	Best Flight	
4. Millard Wells (PAMA)	5-1/16	17.5	61.2
1. Dave Aronstein (Pottier P-70-S)	5-3/16	30.0	58.8
2. John Martin (Elias Airsport)	5-11/16	44.5	62.0
3. Millard Wells (Wee Bee)	6	41.1	40.7

**LONGEST FLIGHT:** Aronstein 1:15.2

**WORST DAMAGE:** Butch Hadland, England

**SMALLEST PLANE:** Millard Wells (PAMA)

**MOST DISTANT ENTRY:** Soichi Uchida, Ogaki-Chi, Japan

**HAD MOST FUN:** Everyone, and thanks to all you proxy fliers!!

Special award for highest point total: Ken Johnson's Da Vinci Ornithopter: 143.3

A Russian Gnat entry withdrew because he was afraid the US Post Office would squirt it with Raid. Keep politics out of the Inter-Gnats, I say!! ●



MODEL BUILDER

Dear Jake . . . . Continued from page 8

Dear Jake:

A friend of mine swears his transmitter antenna was struck by lightning. But I don't believe it, especially as he's still here to tell me about it. Have you ever had an experience like that or heard about one? If it is true, what measures can we take to prevent it from happening to us?

—Concerned in Concord

Dear Concerned:

It is a very real hazard, not only to transmitter antennas, but also to U-control lines. The only safe solution is to fly free flight. One additional caution: never launch your free flight from under a tree during a thunderstorm.

—Jake

★ ★ ★

Dear Jake:

Will you be at the Nationals, and if so, how will I recognize you?

—Autograph Seeker

Dear Autograph Seeker:

Yes, I'll be there, and I'll be wearing sunglasses.

—Jake

★ ★ ★

Dear Jake:

We have a model boat club with 33 members, most of whom are very active. One of the guys, I'll call him Bud, but that's not his real name, is a real wise guy. Usually he's obnoxious but harmless; however, lately he's gone too far. He has an R/C submarine that he's been using to ram other ships. He denies it, and always says we hit a rock or a piece of wood, but it never happens unless he's there with his sub. We need to prove he's doing it and then stop him. What do you suggest?

—Aquanaut in Alaquippa

Dear Aquanaut:

Depth charges.

—Jake

★ ★ ★

Dear Jake:

What's the best way to get started in R/C?

—Newcomer in Newton

Dear Newcomer:

With a glow driver and a chicken stick.

—Jake

★ ★ ★

Dear Jake:

What's the difference between a pusher propeller and a tractor propeller?

—Uncertain in Urbana

Dear Uncertain:

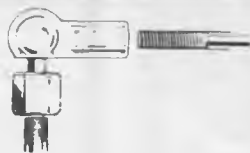
A pusher propeller has opposite pitch from a normal propeller. I've never seen a tractor propeller, but I imagine they're used on farm machinery in someplace like Nebraska.

—Jake

Send your problems, questions, or comments to Dear Jake, c/o MB, P.O. Box 10335, Costa Mesa, CA 92627. Anonymity is assured.

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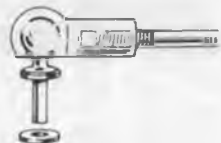


**2-56 Threaded Ball Link**

5-piece ball link set, excellent for off-set steering, throttle and servo hook-ups. Ball is threaded for 2-56 nut. Threaded coupler 3/4" with 3/8" 2-56 thread, for up to .072 wire. Self-threading nylon socket, washer, and 2-56 nut.

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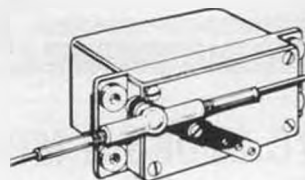


**Rivet Ball Link**

Ideal for throttle hook-ups. 4-piece ball link set for permanent installation. Includes 1 steel ball with pin and washer for peening on, 1 self-threading nylon socket, and 1 threaded coupler 3/4" long, with 3/8" 2-56 thread for up to .072 wire.

No. 182

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**Aileron Connector Ball Link**

5-piece set includes 1 2-way self-threading nylon socket, 2 threaded couplers 3/4" long with 3/8" 2-56 thread, for up to .072 wire. 1 ball threaded for 0-80 (1/16" dia. thrd.), and 1 0-80 nut.

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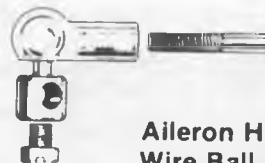


**Ball Link Sockets**

Self-threading nylon ball link sockets. When switching radio to another plane, you can keep the same trim setting for future flights by leaving the nylon links on the pushrods. For up to .072 wire.

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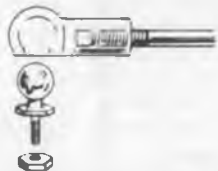


**Aileron Horn Wire Ball Links**

Change old strip aileron connectors to ball link control. Fitting also useful as dual take off connectors. 8-piece set includes 2 horn wire ball links for 3/32" dia. wire, 2 self-threading nylon sockets, 2 threaded couplers 3/4" long 1/16" ID with 3/8" 2-56 thread, 2 4-40 screws.

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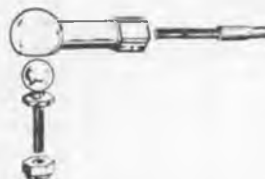


**1/16 Threaded Ball Link**

This 4-piece set fits perfectly in servo arm hole, bellcranks, nylon horns, and throttle arms. Set includes 1 ball threaded for 0-80 (1/16" dia. thrd.), 1 self-threading nylon socket, 1 threaded coupler 3/4" long, 1/16" ID with 3/8" 2-56 thread.

No. 190

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**Heavy Duty 4-40 Ball Link**

This heavy duty ball link is perfect for any 1/4 scale application. 5-piece kit includes 1 ball with 4-40 thread, 1 self-threading 4-40 nylon socket, 1 4-40 stud, 1 3/32 ID brass coupler, and 1 4-40 lock nut.

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Hannan . . . . . Continued from page 57

interesting choice of words. wch) . . . I can't help but note that this little ROG, the 10-cent kit of years gone by, is flying with 19 cents worth of Pirelli! No matter, the memories that it brings back are priceless."

Dick also has a few suggestions for contest awards in the form of honorariums outside the usual categories. For instances, he would give prizes for the following: 1) the craziest contraption offered by a junior; 2) the most obscure entry; 3) a subscription to *TV GUIDE* for the poor wife of some avid modeler; 4) a hank of good rubber to the entrant with the lowest duration time!

### MODEL ROTORCRAFT JEANS?

A commercial for Levis clothing currently featured on television, includes some quick glimpses of an R/C model helicopter apparently being flown indoors. Details, anyone? (Yes, please! wrf)

### DRY-LAND SEAPLANES?

According to the April *Air Interna-*

tional magazine, the Schneider Trophy air race will be revived and flown over the old Solent course in England. Invitations have been extended to France, Italy, and the USA, as well as to the United Kingdom. Paradoxically, the ability for the entries to take off from or land on water will not be a requirement! Truly these are strange times in which we live. . . .

One wonders how the outcome of this race for full-size aircraft may affect the Flying Aces Club model Schneider Race rules. They have been conducted over land all along, but the waterborne configuration was the thing which set them apart. . . .

### EIGHT-INCHERS

Sub-Peanuts seem to be gaining popularity in various parts of the US, France, and Japan. Called "Grapenuts" in Ohio, and "Pistachio Nuts" in Florida, the little sky critters offer certain advantages: Their cost is absolutely minimal, as is the time investment, assuming one does not get too carried away with detail. Disadvantages (Bjorn Karlstrom of Sweden says, "negative advantages") include difficulty of construction because of the delicate wood sizes involved, and trickiness of achieving the flight trim for consistent performance. Yet, those who have mastered the little gems report durations in the 25 to 45-second range and better.

Perhaps the most important plus of this size model is the ease with which packing and mailing for proxy flying may be accomplished. The small container required can be rendered highly damage resistant without excessive weight, helping to keep postage expense low and putting truly international competition within the reach of almost anyone.

### GOOD QUESTION

Miami indoor model advocate, Doc Martin, reflects upon contest participation: "Why do I get so tired after eight

hours of having fun?"  
**SO NOW YOU KNOW . . .**

*Khaki*, that hard-to-define color, takes its name from a Hindu term meaning "earth."

### MAN-CARRYING, RUBBER-POWERED AIRCRAFT

Thanks to George Perryman and Hurst Bowers, we have a few details of this monumental project. Constructed by Jack Edwards, a retired Delta Airlines engineer, the project was a serious attempt undertaken during the 1970s. The craft has a wing span of 32 feet, is 18 feet long, and is constructed of wood, aluminum, and fabric. The main landing gear wheels are 20-inch bicycle types, and the smaller tailwheel features a brake. The propellers also feature brakes to keep them from turning while the rubber motors are wound from the rear. The propellers were designed to automatically feather when the motors ran down, and are of seven-foot diameter.

Although the machine was flown three times in towed flight as a glider, lack of suitable rubber prevented it being properly tested under its own power. Large quantities of flat strip rubber were not available in this country, and an attempt at substituting rubber tubing proved the deficiency of that material. Thus, the aircraft was donated to the Ben Epps Georgia Air Museum.

Jack is good natured about his project, and doesn't consider it a total failure. He says the lesson learned is simply: "Don't build one of those again."

### THE BOSTONIAN BUS?

Yes, and it received front-page coverage in a Nebraska newspaper! Tom Winter sent us a copy, as well as photos of the model, one of which is presented this month. *Beatrice Daily Sun* Staff Writer Mike Davis wrote the article, which was entitled, "Rubber Band Planes Making a Comeback," and presented a lucid account of indoor model flying.

Tom's *Boston Bus*, complete with driver and passengers, managed a 42-second duration from ROG under a 26-foot ceiling during the interview. Our congratulations on this fine publicity.

### HANDY HINT FROM THE HANGAR

Credit Joan Hannan with this discovery: White Sewing Products Company, a division of the White Sewing Machine Company, is now marketing a Japanese manufactured, fabric-marking pen called "Mark O' Magic." This felt-tipped instrument is intended for use in drawing patterns on clothing fabrics as a sewing aid. What has this to do with model building? Everything! The colored lines produced by the pen are easy to see, but after a time (about 48 hours, according to the package instructions), the lines disappear. And judging from preliminary tests here at the Hangar, the product also works on balsa wood. Thus, it would seem that it could be used to mark out such parts as ribs and bulkheads on sheet balsa; the parts can be cut out, and the markings will gradually vanish. This could be particularly useful for models in which the parts may be

seen through the covering, as is the case with certain colors of tissue and translucent plastic film coverings.

The Mark O' Magic pens should be available at fabric stores and craft stores.

#### PARTING THOUGHT

Thanks to Ken Hamilton we have this anonymous quotation: "People rarely succeed at anything unless they enjoy doing it."

#### Fuel Lines . . . Continued from page 52

drill. A variable speed drill works best. Otherwise, begin by intermittently pressing the "go" button on the drill. It will only be necessary to lap the ring to the sleeve, in this fashion, for about fifteen seconds.

Afterwards, completely disassemble the engine and thoroughly clean all parts with liquid detergent and warm water. An old toothbrush makes a great scrubbing brush. Do not remove the ring for cleaning. If you do, you'll change the "set" of the ring and you will have been wasting time. Instead, soak the piston and ring in a solvent, and then carefully use the detergent. Keep slowly moving the ring around the piston groove. Do this very carefully, especially if it is a pinned ring. When everything is clean, blow dry the parts, coat them with WD-40, and reassemble the engine.

With a new ring in an old engine, the procedure is the same, except it's important to check the fit of the ring in the sleeve before installing it on the piston. If the cylinder is badly worn near top dead center, you'll probably see light between the ring and sleeve. In that case, it may be necessary to replace the sleeve.

How about ball bearing engines? The procedures are the same except that I use an old junker crankcase and crankshaft etc., to lap-seat the ring. Otherwise, there is a very good possibility some lapping compound and WD-40 could get into the ball bearings of your new engine. *That's a no-no.* If you don't have an old junker engine to use as a lapping fixture . . . well, you could always borrow one from your buddy. If none are available, then you just may have to go back to a prolonged engine break-in in order to seat the ring.

Guys, I'll close this month with a suggestion. You can purchase erasers similar to mine at most novelty stores. They're great for club raffles or gifts to buddies whose new engines you've borrowed to use as a ring lapping fixture.

#### Electric . . . . . Continued from page 39

Now you can take on any F3E event, or fly quarter-scale! MB offers plans for a quarter-scale *Monocoupe* designed by Bob Boucher for the ferrite 25 or 40. Needless to say, this plane would be ideal for the Challenger 25. For quarter-scale, be sure to use a throttle to keep the start-up current at a reasonable level.

## THE BEST THERE IS

TOM BRIGHTBILL - OVERALL NATS WINNER with his winning DODGSON DESIGNS multichannel gliders: the open class WINDSONG, standard class CAMANO 100 and 2-Meter K-MINNOW.



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Speaking of throttles, I prefer to have the absolute maximum power at the top end, and the (approximately) 300 rpm power loss is something I prefer to get around. The diagram shows how I run a servo in parallel with the Jomar throttle. At full speed, the servo turns on the toggle switch. It moves proportionally with the signal in all other speeds too, but does not shunt the electronic throttle until the throttle stick is advanced to full on. I use the Cannon Micro Servo, which weighs only half an ounce, and the total increase in weight is one ounce. Because the Jomar throttle is so light, the grand total is only 2-1/2 ounces, which is quite acceptable for 15-size or larger planes. A Bantam Midget servo would make the total three ounces which is quite manageable and really no more than many

other electronic throttles on the market. **ASTRO'S NEW COMPUTER AND PROGRAM**

Besides new motors, Astro has a new computer, and Bob showed me how he can simulate motor performance on it. The output is very complete, if you want a detailed analysis of a motor you are interested in, I'm sure Bob would send you a sheet for the price of an SASE.

What I find particularly interesting is that the program can show you predicted performance for any winding, motor frame, and number of cells. If you want a custom winding, and you need to know just what it will do, this is the way to go. For that matter, if you are a computer owner, wouldn't it be neat to have the program? Maybe Astro will get into selling software.



# Hobby Horn

Wing Span—78 1/2"  
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Anyhow, if you have an experimental application, or want to explore the potential of an Astro motor in a special application, Astro has the ability to tell you right now how it would look. Impressive!

#### AND SPEAKING OF COMPUTERS . . .

I bought a computer system recently, primarily for word processing applications, and I wanted the least expensive way to go. For me, this turned out to be the Atari 800XL CPU, the Atari 1010 cassette reader, the AtariWriter word processor cartridge, and the Atari 1027 letter quality printer.

I shopped carefully, and even after taxes I was able to keep the entire system under \$800. I did not buy it from a single

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computer store, but from a chain of stores: the computer in one, the printer and AtariWriter cartridge in another, and the cassette reader in yet another. This worked out just fine. I did have to exchange the printer, however, due to repeated jamming, but even this worked out just fine as it was exchanged promptly and on the spot.

I have been using the setup for four months now and have turned out at least 500 pages of writing. *I like it!* In fact, the thought of using a typewriter gives me a bad case of writer's cramp! If you have been toying with the idea of getting a computer that will do "real work," I recommend this combination!

#### DO-IT-YOURSELF TEST STAND

As you probably are aware, I do a lot of static testing, and a motor test stand is an absolute necessity. Because I test so many different types of motors, I need a test stand that is universal, and because I am a lazy builder, it has to be simple to assemble and use. Actually, I wound up making a more complicated one first, then I refined it to the one pictured on the opening pages of this article. It has been very satisfactory: it handles all motors from 020 to 40, and has successfully withstood two years of use.

The vertical tubes are both four-inch lengths of 3/4-inch PVC pipe, and the 1/4-inch threaded rod is eight inches long. These lengths will accommodate motors swinging props up to nine inches in diameter. If you plan on larger props, increase the lengths by whatever you need.

The motor holders are two 5-1/2-inch pieces of yardstick. (*This is what you would call a low-budget project! wrf!*) There is 3-1/2 inches of spacing between the uprights. Two wing nuts and washers go on top to clamp the motor in. I used two pieces of 3/4-inch pressboard measuring 12 x 7 for the base. The upper sheet of pressboard has two blind nuts set in it (drill a recess for them) for the threaded rod, then it is nailed to the lower sheet of pressboard sandwiching the blind nut between the two. This makes a good, heavy base which is enough to keep an 05 from moving the stand. I put my foot on the base when testing a 40, or clamp it to the workbench!

The only critical part of the stand is the

yardstick material: it should be tough and springy, not punky. I used a pine yardstick, but it was tough pine, not the softer variety.

Now, slip the motor between the two holders, and tighten down the wing nuts. They should be firmly tightened, but not tightened "gorilla style" (you know what I mean!), so that the motor will not shift at full power. Even a Challenger cobalt 25 with 14 cells is secure in this stand, the motor does not shift. As a safety precaution, I rotate the motor so that the brush holders (on the Super Ferrite and cobalt motors) are perpendicular to the yardstick pieces, so that even if the motor did start pulling out, the brush holders would hang up and prevent the motor from coming out completely.

One other thought: if you wanted to measure static thrust with this stand, it would be easy, just put some good ball bearing type wheels on it and rig up a spring scale to measure the pull. So there you have it, a handy motor stand, and easy to build too!

#### FOLDING PROPS

Jack Dobbins wrote in to ask about folding props and how to make them from regular wooden props: just the right question! Wilshire Model Center carries folding props made from Zinger props, the ones shown in the photo are from 8-4, 12-6, and 16-6 Zingers. The workmanship is excellent, featuring machined aluminum hubs and a spinner. I think the best way to go is to order one from Wilshire, then see how it is done and decide whether you want to go through the work of doing it yourself. Wilshire's address is 2836 Santa Monica Blvd., Santa Monica, CA 90404.

#### MOTOR BRAKE CIRCUITS

Along these same lines, a problem with both folding props and larger, regular props is windmilling. This adds a lot to the drag of the aircraft, and is especially a problem for gliders. The usual solution is to use a double-throw switch to that a resistor can be placed across the motor terminals when the motor is off. This resistor should be a very low value: about .1 to .3 ohms, or even a direct short (no resistor).

Jay Olson has a similar solution using a DPDT switch. His system features a very simple layout with a minimum of wiring. (See the drawings for details of both methods.)

Jay believes in testing his setups, so he held a motor out the car window at 35 mph, with this setup, and the prop did not windmill. The short is a very effective brake, and does not harm the motor.

Besides the benefits of drag reduction on the aircraft's glide, it is nice to be able to stop the prop horizontally so that the prop will not catch in the grass and bend the motor shaft or break the prop. Thanks, Jay, for the hint.

#### CORRESPONDENCE CORNER

One of the pleasures of writing a column is the worldwide contact you have. Jack Hardwicke from Enfield, England, sent in a long letter with photos of his *Brigadier* built from my

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plans in **Model Builder**. Jack saved all the hassle of international exchange, etc., by scaling the plans from the magazine. He's a resourceful fellow!

He used riblets between the ribs to keep the airfoil from sagging between those ribs, and then covered the plane in tissue.

Jack put in an airscoop to cool the batteries because the instructions from MGA (*Who? wrf*) emphasized this strongly. The MFA Hummingbird 20 motor is about equal to the Astro 075, and uses eight sub-C cells. Jack finds that a 7-4 is the best prop with this combination.

He is now flying with six cells instead of eight, which results in the leisurely and gentle flight that the *Brigadier* is so good at. (With eight cells it was rather "zippy.") Flights of six to eight minutes are the norm with climbs to high altitude.

This is Jack's second R/C plane, and he is having a lot of fun with it. Jack had his son check it out for him and then teach him how to fly on it.

Jack wondered about cooling, as I don't show it on my planes, and neither does Larry Jolly. I have never had any problems with overheating, so I do not have cooling scoops, or even cooling holes in my planes. One reason is that the weather in the Pacific Northwest is usually quite cool, and the motors and batteries are not subjected to flying in temperatures over 70° very often. Another reason is that I usually wait fifteen minutes or so after each flight before I fly again (while the plane is charging). Finally, after every two flights, I touch the battery pack to see how it is doing. Usually, it is just fine (body temperature). If not, I take it out and let it cool. So, take your choice, you can install all the cooling devices, or go for good house-keeping: both work fine.

Jack also asked about the electronic regulators which run the receiver from the motor pack. I do not use these. I prefer to use a separate receiver battery.

A 250 pack weighs two ounces, a regulator comes in at about one ounce, so there is only a one-ounce penalty (or none at all if you use very small receiver packs, 100 mah or so).

I do not recommend using a regulator on any pack smaller than eight cells. They do work, but if the motor battery gets too low, the receiver will get erratic, and then it will be hard to turn the motor off. This runs the battery even lower . . . and then you crash! So, be alert!

Jack has the same problem I do: that the local park where he flies is very popular for soccer playing. Right on the stroke of 10 a.m., they show up . . . Ah, Jack, you are missing a bet! Electricians allow you to fly right at dawn! Nobody is going to complain about the motor noise, and you often will have at least two hours, usually more, before the soccer players appear. By then, you will have flown yourself to exhaustion, and the rest of the day is still yours! It is a good feeling . . . I know, because that is how I get my flying in and still accommodate the rest of a busy day. Besides that, there is no wind, and it is so refreshing in the early morning. Try it, you'll like it!

For now, be an early bird, fly electricians!

### BIG Birds . . . Continued from page 41

or brushed with something.

A reminder here is that you don't have to get your covering materials from a hobby shop. Many BIG Bird lovers make semi-annual treks to their nearest fabric shops and pick up yards of nylon and dress sizing at easier prices. Now, I haven't tried this route, yet . . . but I understand that Balsarite works great with just about anything you can find in a fabric shop, and that there's enough shrinkage in these materials to do the job.

What are my druthers? Well, I've used, and can recommend: all of the different



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Coverite stuff, including Micafilm; Jerry Nelson's Lightweight Ceconite; and all of the "tex" materials (Worldtex, Solar-tex, and Colortex) all have the same English birthplace). Each product has its own advantages and disadvantages . . . and what's an advantage or disadvantage differs from user to user. Your choice would depend on what you're looking for in a covering and what you're willing to overlook or put up with.

For example: Super Coverite is quite strong, but requires much more heat than most of the others. All the "tex" materials, however, work with low heat and can accommodate curved and rounded areas better . . . but are not as strong as Coverite and stain easier. Micafilm is nice to work with, but has no adhesive of its own; nor does the tremendously strong Ceconite, which offers no color options. There's no doubt that both price and availability would also be factors to reckon with.

#### SURFACE PREPARATION

Each and every bird needs some amount of sanding prior to covering, and it's all too true that the better the wood is finished, the better your overall finish is going to look. Frankly, I use

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really coarse sandpaper and "dragon-skins" for quick, basic shaping, and then go to my "standard" 220 grit for the final work. I'll admit to owning some 320, 400 and (even) 600 wet-or-dry paper, but I rarely ever use the stuff. I simply do not have the patience (even less as I grow older) to go for a super finish, and I don't feel the need to have aircraft suitable for close scrutiny. My birds fly at least as well as, if not better than, most others. . . and in the air where it counts, my stand-way-off scale types look as real as any 1000 man-hour work of art. . . so I'm content, because I got in a lot more flying while this other yahoo was doing his panel lines and 8,964 rivets. Everyone's got a different list of priorities. . . which is just fine with me.

#### FIBERGLASSING

I do like the strength and smooth surface of a resin and 3/4-ounce cloth finish. . . and usually 'glass all my soaring machine fuselages and parts of the BIG Bird bodies. Contrary to what you may hear from people who don't know any better, 'glassing an airplane does not

have to automatically put it into the "lead sled" category. There are two important "secrets" here: don't layer the resin on too thick or heavy (don't puddle. . . I apply three thin coats); and do use the time-honored and proven custom of scraping (a single-edged razor blade with the corners rounded to prevent gouging is perfect). By applying a minimum of resin, and then scraping, you end up with a faster, stronger, lighter, smoother finish with very little sanding required.

#### PAINT

I lean toward both Hobbypoxy and Superpoxy because they're extremely durable and resistant to scratches and scrapes (especially skidding screwdriver blades). I also use a lot of automotive laquer and enamel because (1) they're dirt cheap (I scrounge all sorts of colors in partly filled cans from paint shops when they're about to throw out "dated" stuff. . . and I have never had any problems), and (2) because they dry so fast.

I've had too many bad experiences with spray cans being spastic, so I just don't use 'em anymore. For awhile, I tried an old Badger airbrush that was totally inadequate for anything much bigger than a 1/2A model, but recently threw it out while in a rage because my *Cub* ended up with an unsolicited spackled finish. Now, I've gone back to an old Montgomery Ward sprayrig that I bought for thirty bucks back in '65. The trigger effectively varies the spray pattern, and though the little compressor works its heart out, it does give the gun what it needs. . . so I can't complain.

Okay. . . you asked for all the sordid details, and there they are. Believe me, if it was financially feasible to have others finish my airplanes, I'd certainly go that route. . . but, so far, Bill Northrop just won't okay that part (or any other part)

of an expense account.

Guys, I guess what this all boils down to is this: if you're uncomfortable with the way your birds look, as compared to most of the others parked nearby, then by all means put more work and time into upgrading those beasts. But, if it don't make a hill of beans to you that these other aircraft look better close-up, then keep on truckin'!!!!

#### HOROSCOPE

*Virgo (August 23 through September 22):* Although you are optimistic and enthusiastic, you have a reckless tendency to rely on luck while flying. Most Virgos have trouble telling left from right once they are in the air and, as a result, get laughed at a lot by other people.

#### CLEANING UP . . .

#### THE FUN AND EASY WAY

Shortly before I left the Dallas-Ft. Worth area, a rather rotund flying buddy by the name of Chuck Cunningham kept extolling the many virtues and advantages of hand-held, rechargeable vacuum cleaners.

"You just can't beat it for small clean-up jobs, and especially getting sawdust and small pieces of wood out of your way, pronto," Chuck would tell me. "It's easy and fast. . . no draggin' out a big vacuum," he'd keep reminding me.

So right after moving up here to the "Evergreen State," I bought one. It's not the more expensive Black & Decker that Chuck had (he received it as a present), but a "Brand X" that was on sale. . . and so far I have found out that Mr. Cunningham handed out sage advice. It's one of those tools that endears itself to you right from the start. . . and then your relationship gets even better the more you use it. These hand-held vacs make being neat and clean fun, and if I'm too tired or lazy, or whatever, I can always count on my son, Adam, to handle the small-scale vacuuming. My only problem is trying to get the machine back. . . 'cause he wants to vacuum everything.

Anyhooooo. . . if you don't have one yet, start dropping subtle hints, because Christmas and Canukah (and maybe your birthday) are coming up soon. It's a near perfect gift for the modeler who has everything else!

#### NEW PLATT BIPE FOR THE BIG FOUR-STROKERS

Although a number of Dave Platt's planes could be flown with four-strokers, they were really designed for glow two-cycle. Figuring that it was about time, and that fair is fair, Dave is presently rectifying the situation. Dave is developing a special, new scale model for us four-cycle lovers; and according to Dave, "It just might be one of the prettiest military bipes of the Golden Age."

Platt didn't give any target date, and I did promise not to tell you what this birdie is. . . but I can mention the specs: two inches to the foot scale; 75-inch span, about 12 pounds; 2200 squares; and of course, for .90 to 1.2 four-strokers. Here's one last tidbit to ponder: it's not an American bipe. . .



## \*Before Z-FP foam primer

During the Dark Ages the Epoxy Plague wreaked havoc among modelers and hobbyists. O'er the land oozed the gooey, heavy, slow-drying pestilence.

Behold, Z-Foam Primer (Z-FP™), a clean, fast, weightless accelerator/primer all-in-one!

We won't call it a religious experience, but we've ZAPPED the competition once again. Normally cyanoacrylates "super-glues" may not be used on any type of "foam" components without decomposition resulting.

- Allows the use of super-glues to bond Styrofoam\* instantly
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- The resulting bonds are stronger than the foam!
- Perfect for a multitude of craft projects!

Please Note: 2 drops of food coloring per 2 oz. bottle will tint Z-FP just enough to let you see where you've sprayed the foam.

\*Styrofoam is a registered trademark of Dow Chemical Corp.

or Those in the Know: The Z-FP/Slo-Zap Adhesive System offers increased Strength in a Quicker Time-Frame and with a Tremendous Weight Savings. We enthusiastically recommend this method for the entire line of Byron's excellent kits as well as any other possible foam to wood application.

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One last point to remember: there is no other product of its kind. Anywhere!

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1. Put Epoxy back on your shelf.
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3. Prepare foam by spraying Z-FP in appropriate areas.



4. Position sheeting, then tape to Foam Core (Byron CAP 21 Wing Illustrated).
5. Apply enough Slo-Zap to wood to create an even bond.



6. Immediately position wood in place: hold firmly against Foam Core for approx. 20-30 sec.



7. That's it!

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**NEW FROM IKON N'WEST**

I didn't think that he was ever going to do it, but Emil Neely finally broke out of the monoplane rut and finished testing his 72-inch Waco UPF-7. Yeah, he's actually turned out a biplane! And it's not a bad looker, as you can see from the photo.

Last month I mentioned a little something about eyeballing this Waco during construction, but I wasn't sure Neely could go all the way through with a biplane.

I'm pleasantly surprised!

This bird's 1/5-scale, has something under 1600 square inches of wing area, and because Emil went wild with painting the finish, she grossed out three pounds over his estimated thirteen . . . which makes her a bit much for a 1.2 four-stroke (you know how "dirty" bipes are). Neely feels that a Monokote finish would save about two pounds over the way he did it, which should allow for a better match with a 1.2. A very viable alternative would be one of the new breed of BIG glow engines, like the ST-2000/2500, a Moki, or a Tartan single. The UPF-7 flew well, and had a classy look in the air, but I'm still trying to convince the stubborn Mr. Neely that a more forward balance point would make her fly even better.

By the time you read this, Ikon should have the Waco kits ready to go, so write to: Ikon N'West, P.O. Box 566, Auburn, WA 98071, for all the particulars. (Ask for Emil von Grossevogel! wrf)

**THE FORKED-TAIL DEVIL**

If you've got a couple of 2.2 cid or larger engines laying around not earning their keep, and you've got a "thing" for and about the P-38 *Lightning*, then contact Mike Minnick (7813 SW 6th Ct. N., Lauderdale, FL 33068, (305) 721-3681) to get on his list.

This twelve-foot, three-inch biggie will be available by late fall or early next year, and will weigh approximately 38 to 45 pounds. It'll feature a fiberglass fuse, booms, cowls, and wing tanks with panel lines, rivets, and air vents molded in. It

will feature foam core wings and a clear canopy.

Photo No. 5 shows Tom Keeling's wife (Tom is otherwise known as T&D Fiberglass Specialties) holding the P-38 fuse plug he's about to mold for this kit. It's gonna be some BIG Bird, and it should look fantastic in the air. . . . Which reminds me, I once flew a recon version called the F-5; egad, that was a mighty flier!

**FLY-INS**

IMAA's four-day Fly-In Festival (August 16, 17, 18 and 19) is gonna take place at the Sepulveda Basin near Los Angeles, and it promises to be the BIG Bird gathering of the year. This fourth annual fly-in will be devoted to modelers and their airplanes, with no side-show attractions to eat up the precious time; most of us go to fly and socialize, and we'll be able to do just that.

This festival is both IMAA and AMA sanctioned, and for your brochure with all the info, write to me . . . or to Festival Coordinator Walt Clark, 5255-2 White Oak Ave., Encino, CA 91316.

For you guys in the middle of the country, the Double Nickel Squadron's Third Annual Fly-In might be a good happening to take part in. Of course, it's sanctioned and takes place at the Terre Haute's R/C Club Field. These guys have run two successful fly-ins and know how to make you happy . . . so get all the poop from Event Director Ed Ice, 5010 N. 15th Street, Terre Haute, Indiana 47805, about their September 22 and 23 fly-in.

Also on September 22 and 23, but many miles away in Yelm, Washington, the Puget Sound Rocs will be hosting their First Annual BIG Bird Four Stroker Fly-In and Tea Social at the new "Roc's Roost." It's free . . . no fee, and we're IMAA and AMA sanctioned. Our Tea Social Director is Bruce Edwards (8304 53rd St, Ct, West, Tacoma, Washington) and he's got flyers for you.

You won't want to miss the Quarter Scale Association of America's Eighth Annual Fly-In in Las Vegas . . . from October 25 through 28. All entries must be prepaid and will be limited to the first 200 airplanes. Headquarters will be at the Showboat Hotel, and flying will take place at the El Dorado Dry Lake. For a complete info package, write to Pat Bunker, QSAA Secretary, 6532 Bourbob Way, Las Vegas, NV 89107, (702) 870-6076.

**TIP OF THE MONTH**

Having children is hereditary: chances are if your parents had no children, you won't either.

Al Alman, 605 168th Street, East, No. 95, Spanaway, WA 98387. Keep me in mind when you get going on those special and/or winter projects, guys; those pix'll be most welcome.

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**CHRISTY MIXER**

The word from Ace R/C is that its Christy Mixer, an on-board device which can be used to mix two channels, such as for ailerons/rudder, or elevator/flaps, will not operate with the Novak receiver. Apparently, the output signal voltage level is not adequate under the load imposed by the mixer. Also, the channel spacing in some transmitters might require the changing of pot #1 in the mixer from 10K to 50K.

Should you run into any other problems, or have any questions as to the use of the mixer, Ace is the place to inquire.

**LITTLE SHIPS AND LITTLE RADIOS**

Another Floridian was heard from this month: Phil Thibodeau of Jacksonville feels quite strongly about some of the industry actions, as follows:

"I guess I must have missed Mr. Mueller's letter regarding ultra-small/light receivers, but I am very interested in the general subject. I have been wondering when someone would come up with a package that all the rest of us who like the 'little ships' could use. I for one, have a real mental block about investing \$1000 in a model which can be rekitted in an instant. I often wonder just how MB and all the other magazines think that Joe Average & Jr. can afford that kind of involvement.

"When I came into the hobby (RC, that is) it was near the end of the escapement, galloping ghost, and reed era. We made a mega-jump to proportional and its development, and no one in particular (the fellows who can now afford the \$1000 models) ever looked back to see the rest of us who got 'left in the dust'. In particular, I wonder about the several generations of young folks that the industry has lost in its rush to accommodate the Quarter Scalpers who must make Joe Average, Jr. really feel inadequate. Without them in a follow-on purchasing group, the airplane model hobby industry can only face a long decline as the QS'ers die off.

"Where do we find a reasonably reliable, throttleable .020 or .049? An ultralight two or three-channel (or four or six) R/C unit? My Tee Dee .01's and .02's are kept as curiosities now as I am afraid that if I crank one up and blow a plug or snap a prop, it'll be gone forever. They gave excellent service hauling Top Flite's crew of tiny single-channel ships around. Remember the *Roaring 20*? One of those on a two or three-channel rig would be a blast . . . five or six would blow my mind zipping around the pylons.

"With today's advances in electronics, there must be someone out there who can/will answer this problem and create the better mousetrap."

When we get through with this one, would anyone like to discuss the downwind turn? Or maybe we'll revive the Mode One/Mode Two controversy!

My first impulse was not to use Phil's letter here, but to answer him personally.

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I would have done this not to avoid the controversy, because in some points I see things slightly differently, but because the main theme is a little too far out of the intended course of this column. However, on second thought, it all has to do with the same thing, that of flying model airplanes with radio control, and it will be interesting to hear from those modelers out there who have opinions, pro or con, on the subject.

Firstly, let's cover the easy part: the equipment picture, which is not as black as it might appear. Throttleable .020 and .049 engines are readily available from Kustom Kraftsmanship, whose advertisements appear monthly in this and other magazines. Joe (no relation!) Klaus has customized Cox engines in both those sizes, for all types of flying including R/C. He also has all parts, both custom and stock, for those engines, including the .020, plugs and all. Parts for most other Cox engines are also on hand.

Still on the subject of engines, Cannon R/C Systems imports the excellent Japanese "G-Mark" engines, available in .03 and .061 displacements complete with throttle and muffler for R/C use. Bill Cannon is also well-known for his small and lightweight radio systems. His latest catalog lists a .54-ounce receiver, .47-ounce servos, and a 1.42-ounce battery. This totals up to less than three ounces for a two-channel, two-servo system. Maybe that is still too heavy for some applications, but every year at the Inter-

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national Modeler Show, I see indoor R/C flying with blimps and rubber powered models. A few years ago they also flew CO<sub>2</sub>, but it was dropped, I believe they flew too fast. Anyway, most of these small and light models are flying on Cannon equipment.

That was the easy part . . . now for the rest! It is difficult not to philosophize about the inequalities of life: the haves, and the have-nots. It is a cold, hard fact that many people in this country cannot afford the necessities, much less the luxuries, of which R/C and any hobby is. I don't have the answers to that, and I wonder if anyone ever did or ever will. However, I see another problem closer to us, the one of the Joe Average,

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Juniors, as Phil calls them, many of whom can afford R/C, at least in its more modest levels, but are more interested in expensive stereo equipment on which to play what to them passes for music, electronic games, clothes, cars, etc., the many things that give them an "in" with their peer groups, something that R/C does not. It is a known fact in this country that the teenage market is large and profitable, and a lot of products are manufactured only for it. Just look at the TV and (non-model) magazine advertisements. I believe more should be done about attracting these thousands of young people who can afford the model hobby, than in providing yet cheaper equipment. We should not forget that cheaper can also mean a reduction in quality.

There are a couple of other things which we shouldn't forget. One is that for a nonessential product, such as model equipment, a manufacturer must produce for the market, not vice versa. He has to sell his product, the same as those who make shoes or bread. If interest does not exist, or fades, he has to look elsewhere. As an example, look at

the fad, because fad it was, of a few years ago in 1/2A R/C. For one season and part of another, we saw a rash of small airplane designs, and many products being produced just for them. Almost as fast as it started, interest died; and how many new 1/2A designs did you see at Toledo this year? I firmly believe the reason, which brings me to the second point, is simply that larger airplanes are more fun to fly. Flying around your head with a small airplane which you have to keep close merely to be able to see it is just not as enjoyable. I don't feel as much a pilot as I do with a larger one, which must be flown through a maneuver. I believe this is one of the main reasons for the current interest in large airplanes, which I don't think will turn out to be a fad. The guys have discovered the pleasure and challenge of using the rudder and more than one control at a time.

On the other hand, I don't agree with some of the super heavy monsters which have been created, I've always been able to differentiate between quantity and quality. We should all hope that one of these lead sleds don't result in some adverse publicity and legislation which could hurt us all.

Judging from the amount of mail I get on the subject of flea-weight equipment, a lot of interest does exist, and I wish more equipment was available to you. I will certainly continue to publish all such information that comes my way. In the meantime, the bottom line as I see

it Phil, is not that our industry is incapable of producing a super-light mousetrap, but that we modelers, including enough Joe Average, Jr.s., would purchase them in enough quantities for them to make the profits they need to keep the doors open. The R/C industry is not blind to these and other problems. Last year it formed an organization named the "Radio Control Hobby Trade Association," to deal with promotion outside the existing hobbyist, the needs of Joe Average, etc. Any of you who would like to address them may do so: P.O. Box 41395, Chicago, IL 60641-0395.

Off the soapbox . . . except that we'd like to hear your views on the subject. In the meantime, let me tell you about a couple of interesting products I've discovered recently.

Firstly, there is the "Dual Automatic Trickle Charger" whose name just about tells the whole story, from Champion Model Mfg., P.O. Box 204, Cortland, Ohio 44410. It is an AC powered system charger, designed for the normal eight-cell transmitter and four-cell receiver Ni-Cd battery packs. Where it does differ is that this charger senses and acts on the full charge of the batteries, reducing its rate from the average 50 down to a trickle rate at which the batteries may be maintained indefinitely.

The benefits of such a feature are numerous. Firstly, it saves the batteries from overcharging. Secondly, it keeps them at their peak until you are ready to use them, without fear of self-discharge or the necessity to repack them. This trickle charge function is also useful to infrequent fliers, or those who have to store their systems for long periods due to weather, or for any other reasons. Ni-Cd batteries just do not like to lay around idle for long periods, especially in a discharged condition. Changeover from normal to trickle charge is indicated by a lighted LED.

Use of the Dual Automatic Trickle Charger is simple, different from that of most other chargers only in that you can plug it in and forget it. The charger requires only the installation of plugs compatible with your R/C system before use, though I would recommend the use of polarized connectors on its output cables, with adapters then being made to plug into your different systems. This, of course, increases its usefulness and versatility as it may be used with any number of different radios. If you only have one R/C system, or one type of system, you can order your charger with the proper plugs already installed.

For further information, inquire from the above address . . . just don't forget to mention where you learned about it.

## NOVAK ELECTRONICS NES-C-1 SPEED CONTROL

Speed controls for electric powered models are not new, they have been around in one form or another since the earliest interest in that kind of propulsion. They have ranged everywhere from the crude mechanical wiper on a resistor which has become the standard due to size and cost, to rather elaborate

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The Thermic Sniffler is a small three ounce device which rides in your R/C glider and transmits instantaneous rate-of-climb audio information to your ear via a monitor receiver at your side. It uses the variation of the air pressure with altitude to detect a climb or dive of your model. It's really the same as the electric variometer from full-scale soaring, but reduced in weight to a few ounces. The Thermic Sniffler is so sensitive it can detect the up and down motion of your R/C glider to a few inches per second. You can hear the tiniest thermal by the change in the audio tone which is sent to the monitor receiver via a radio link; a rising tone means "up" and a descending tone means "down". The monitor receiver has been designed and matched to your Sniffler Transmitter to give the best range with a minimum of spurious signals from R/C transmitters. Receiver uses earphone only, no speaker. Both transmitter and receiver use a 9v transistor radio battery, not included. **SPECIFICATIONS:** Dimensions, 3/4" x 1 1/2" x 4 3/4"; Weight, 3 oz. w/battery; Frequency, 49.830, 49.845, 49.860, 49.875, 49.890; Adjustable Tone: 0 to 2000 Hz.

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electronic devices often as large as the rest of the receiver/servo system. The recent availability of a new power handling transistor called a MOSFET (Metal Oxide Semiconductor Field Effect Transistor) has changed all that, and made available a new generation of speed control technology that far surpasses anything previously available in efficiency as well as size and weight.

Most recently, Novak Electronics, a company which has been providing us with excellent quality state-of-the-art servos and which has just recently introduced the second narrow band receiver of the type we will need to be legal in 1991, has produced just such a MOSFET speed controller. Novak's speed control, the NES-1 is designed for 1/10-scale off-road and 1/12-scale road cars. It's made for three to 10-cell operation, is 99% current efficient, and has a voltage drop of 0.05 at a five-amp load. Its response time is 15 to 25 milliseconds (.015 to .025 seconds), and its current consumption is only 20 mils at 7.4 volts.

Physically, the NES-1 measures 1.45 x 1.30 x .5 in. (37 x 33 x 13 mm) and weighs only 1.4 ounces (40 grams) with plugs. A further weight and space savings results because it also provides the voltage necessary to operate the receiver and steering servo. An On/Off switch is provided on the end of a four-inch cable for ease of installation and mounting.

For maximum efficiency and control under all combinations of car/driver/

transmitter, the critical neutral, high-speed, and brake positions are individually adjustable.

Competition requires all the possible advantages, this one sure looks like a necessity for electric cars and boats, and we all know how much more enjoyable flying is with a dependable throttle. The NES-1, complete with a special fuse which is recommended, and must be used under the warranty, is priced at \$179.95. A special heat sink, necessary for operation at currents higher than 10 amps, is \$19.95. It is available at some hobby shops, especially those that cater to the electric racing and off-road cars. If not available locally, contact Joanie at Novak Electronics, 2709-C Orange Ave., Santa Ana, CA 92707; (714) 549-3741. •

**Pattern . . . . . Continued from page 43**

tors, and rudder were to increase control force using reduced movements. You might suspect that the model would be sensitive around neutral using such big surfaces, but it just isn't so.

We set up the servos to give maximum throw and we fly the model on high rates all the time. The linkage ratios (servo arm length vs. control surface horn length) are obviously arranged to reduce surface throw. This setup reduces the need for "super servos" as any servo error has much less effect. Little "glitches" are also dampened out better with this setup . . . and effective servo

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power is increased.

Snap rolls which are quick and accurate are now much easier on this model due again to the bigger control surfaces. Snaps are just stalls with a twist, so it's easy to lose headings because the rudder usually changes the heading before the actual stall starts. By simply starting the snap with full elevator first, it all works well. Try it!

You may have seen recent ads and articles suggesting that the trend to the slower style of flying is one certain person's new ideas. Not so! A number of fliers have pushed for this for years. This time the majority is ready to listen.

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No. 10C	8-32 x 1	24 Pk	\$2.75
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No. 11C	8-32 x 1-1/2	24 Pk	\$2.98

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No. 15B	8-32 Blind	12 Pk.	\$1.25
No. 15C	8-32 Blind	24 Pk.	\$2.10
No. 16B	4-40 Lock	12 Pk.	\$ .45
No. 16C	4-40 Lock	24 Pk.	\$ .75
No. 18B	6-32 Lock	12 Pk.	\$ .50
No. 18C	6-32 Lock	24 Pk.	\$ .85
No. 19B	8-32 Lock	12 Pk.	\$ .55
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No. 21C	8-32 x 1-1/2	24 Pk.	\$1.55
No. 23B	10-32 x 1-1/4	12 Pk.	\$1.10
No. 23C	10-32 x 1-1/4	24 Pk.	\$2.00
No. 24B	10-32 x 1-1/2	12 Pk.	\$1.35
No. 24C	10-32 x 1-1/2	24 Pk.	\$2.50
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No. 26C	1/4-20 x 1-1/2	24 Pk.	\$4.00
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Just as the owners of front-engine Indy cars were upset by finding out their expensive equipment was suddenly obsolete, some modelers will be wondering why they invested in radios with triple rates and other fancy gadgets plus an engine that will turn 18,000.

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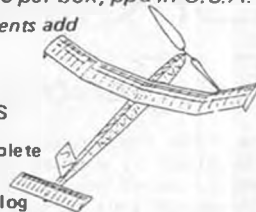
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the fancy radios usually have very accurate sticks plus features which make the servo installation and setup much easier. Just ignore the mix 'em up, couple 'em up switches and concentrate on learning to wiggle the sticks.

As for the engine, most two-cycle .60's can be set up to run in the 11,000 rpm range, but you must expect some horsepower loss. The salvation here is in using efficient props. Some folks still consider the variable pitch prop to be the way to go. Personally, I consider them risky. The best combos I have tried are standard engines using 11 to 12-inch long props with eight to ten inches of pitch.

Our original 840-square inch Dalotel flew great on a modified 12-8 prop and an S.T. pipe. This pipe is very easy to set up because it isn't peaky like some maximum power pipes.

I called Chip Hyde the other day to see how his Rossi powered Dalotels were performing. (These Dalotels are our version of this model, so naturally we were interested.) Chip and his dad Merle, have worked out a power combo of Rossi .60, power pipe, and an 11-inch prop that works very well. As I understand it, they use 11-10 D&W props which turn about 11,000 on the ground. Let's see 10 x 11,000 = 110,000, which is about the same as 7 x 16,000 = 112,000.

Obviously, the engine horsepower is down, but it's still very effective. Just as a passing note, most good Pattern .60's

develop their max torque in the 10,000 to 11,000 rpm range. (Check your old magazines which list engine power charts and you will probably find your favorite engine's power curves.)

As I mentioned earlier, it may be possible to beat the big prop swinging ability of a four-cycle .90 with a two-cycle .60, but it's really going to be tough to beat a 1.2 four-cycle, especially when you figure that the total power plant weight of a .90 is 24 ounces and the 1.2 is 28 ounces.

The normal .60 weighs 18 to 20 ounces plus header and pipes. That brings the weight to 26 to 30 ounces. If you don't believe me, get some accurate scales and weigh all the pipe components.

We are still evaluating our ignition setup for Pattern work, and it does show promise! The use of gasoline for the fuel doesn't look as good as a methanol-nitro mix.

The reason I keep falling behind on these evaluations is the unfortunate fact that there are only 26 hours in a day! ●

R/C Boats . . . Continued from page 49

configuration is any better than what is called for in the directions. The boat does run well and turns extremely well with the use of a turn fin on the inside sponson wall.

Step-down sponsons are built differently from conventionally flat-sheeted sponsons. The bottom of the sponson framework is applied in the following manner: beginning at the back of the sponson, a 1/8 x 3 in. piece of sheeting is applied across the sponson. On the inside of this 1/8-inch piece, a piece of 1/2 x 1/16 is glued from sponson wall to bottom chine. Space this piece so 1/4 inch extends beyond the edge of the 1/8 inch bottom piece. This gives you a glueing platform for the next bottom piece. Glue a 1/4 x 1/16 scrap piece on top of this platform piece. You are now ready to glue the next sponson piece in place. Use a section of 1/16 plywood two inches long. Bevel the front edge where the piece fits flat on the sponson framework. This forms the "step-down" part of the sponson.

To form the next step, glue another section of 1/8 material three inches long in front of the 1/16 x 2 in. part. Repeat the steps to create the glueing platform of another 1/16 x 2 in. section. Add on another two-inch section of 1/16 plywood. Repeat the process of adding on a third section of 1/8 x 3 in. bottom. The 1/16 plywood in front of this piece should run the remaining distance to the front of the sponsons.

To create the forward-most step, I glued the step onto the 1/16 bottom. This front step only runs halfway across the sponson. Five inches in front of the second step, glue a strip of 1/16 x 1/8 halfway across the sponson from the inside of the sponson. Glue the 1/16-inch step section from the strip forward to the bow. Fill all the gaps in the sponson steps with putty or epoxy with micro balloons. On the inside of the sponsons,

glue cap pieces over the places where the 1/8-inch pieces form butt joints with the 1/16-inch pieces.

This step-down sponson method is more involved than building flat sponsons or collective sponsons. In checking out the type of steps used on full-scale tunnel boats, I've found they use step-down rather than collective sponsons. The search for the perfect bottom continues. Now you don't even have to purchase those girlie magazines to find out about bottoms.

Jerry Dunlap, 119 Crestwood Dr. S.W., Tacoma, WA 98498.

**Flinger . . . . . Continued from page 35**

applied. Use whichever method suits your needs.

Cut the fuselage sides from two medium pieces of 3/32 wood.

Cut the dihedral braces from 1/16 plywood, and the shear webs from 1/16 balsa.

**BUILDING THE WING**

If your building board is long enough, cut the wing panel drawings from the plans and build both right and left wings at one time. Start construction of the wing by pinning the bottom leading edge sheet, the balsa trailing edge, the center sheeting, and the bottom cap strips in place. Don't forget to block the bottom leading edge sheeting up to match the bottom rib contour. I use a piece of trailing edge stock.

Using a rib as a guide, glue the bottom spar in position. Using a shear web as a spacer between each rib, glue ribs W1-B through W1-G in place. Glue the top spar in position. Fit and glue the vertical grain balsa shear webs along the front of the spar. Now you may add the balsa leading edge.

If you used Hot Stuff, Zap, or Super Jet to build the center panel, it's now dry, so you can raise it up to 2-13/16 inches for the dihedral, and you can build the tip panel directly onto it.

Use the same sequence that you just used to build the center panel in making the tip panel. Make the tip dihedral braces from hard 3/32 balsa stock stripped to 9/32 width. The *Flinger* uses the "cross-your-heart method" for the dihedral brace construction. I like to cut a strip the full height of the brace, and also the full length. I then cut the proper angle to match the bottom spar, and have found that the excess fits nicely between the top of the brace and the bottom of the top tip panel spar. Glue the two braces and rib W1-H in place. Add the top sheeting and cap strips to the tip panel.

If you haven't already built the other wing half to the same point of construction that you now have this half, do so. When both halves are complete to this point, lay them over the wing plan to check that they will match up correctly. Raise one wing center panel up 2-5/8 inches and see if the two panels will form a good center joint. If not, carefully fit the offending panel with a sanding block. When you have a good fit, glue

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the panels together and add the two center plywood braces and both rib W1-A's. Now, add the top sheeting and cap strips to the center panel which is pinned to the board. When that panel is complete, pin the other panel to the board and give it the same treatment.

Remove the wing from the board and carefully shape the leading edge and finish sand the wing. Make the wing tips from a piece of 1/8 balsa and glue them in place along the centerline of the wing rib. Add the 1/16 balsa triangular braces and finish sand the wing tips. Glue the 1/32 x 1 x 1 plywood bolt mount in place on top of the wing. The wing is now completed except for covering and installing the leading edge dowel used

for wing attachment.

**BUILDING THE FUSELAGE**

Lay the fuselage sides on your building board, bottom facing bottom. This ensures that you build a left and right fuselage. Now mark the location of the plywood former.

Glue all the longerons in place. When dry, lift the fuselage sides from the building board and pin them together, longerons out. Now sand the edges, this ensures that both fuselage sides are the same. Don't forget to bevel-sand the longerons at the tail where they glue together.

Lay the airborne radio equipment you intend to use in the *Flinger* on the drawing. If your equipment fits easily,

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you may want to narrow the front former's width. Conversely, if your equipment is larger than that shown, make the former wider. Needless to say, the thinner the fuselage, the less frontal drag your *Flinger* will have. When you have the former cut to shape, notch it to accept the pushrods and whatever clearance for wires that you might require.

Place the fuselage sides right side up over the top-view of the drawings, longeron side in. Cut two pieces of 1/8 square balsa the same width as the former. Place the former, the two 1/8 x 1/8 balsa cross members, and the 1/8 plywood wing mount in position and pin

the sides together at the tail. Check to see that everything lines up squarely. When everything is straight, hit it with the CA give.

Cut the nose block from medium balsa and glue it in place between the fuselage sides, then glue the pushrods in place. I use Sullivan small cable assemblies. Make sure the outside housings are securely glued along the entire length of their run.

Glue the plywood floor and 1/16 top and bottom sheeting in place. Carefully tack-glue the canopy block in place. Now sand the entire fuselage to shape. The object is to blend the box fuselage into a pleasing shape with rounded, smooth contours.

#### TAIL SURFACES

Build the tail surfaces flat on the plan out of 1/8-inch thick materials. When the structures are dry, sand them to shape. Don't sand the surfaces too thin. You don't want them to flutter.

#### FINAL ASSEMBLY

Finish sand the entire airframe smooth. Place the wing on the fuselage and check the fit. If the fit is not good, add wood, or subtract it with a sanding block. Be careful that you don't change the incidence angle. Carefully drill the 3/16 hole for the wing pin in the front former. Line the wing up on the fuselage squarely. Holding the wing carefully in place, drill through the front former into the wing with a long 3/16 drill. Glue the 3/16 dowel in place in the wing leading edge. Now put the wing in place in its mount. Make sure the wing is square to the fuselage. Drill through the wing's trailing edge and into the 1/8 plywood wing mount.

If everything looks good, open the hole in the wing to accept an 8-32 nylon bolt and tap the wing mount for the same. Check that the tail surfaces will line up squarely to the wing. If not, carefully sand the fuselage wing saddle with a sanding block.

Now cover the entire model with Super Monokote. Be careful with the tail surfaces. They are thin, but if you're careful, you can successfully cover them without putting a twist in them, so take your time. I use Rocket City Nylon Hinge Strip for hinges, but you can also use

Monokote or tape hinges . . . take your pick.

Now is a good time to glue the plywood control horns in place. Make sure the horns line up with the pushrod exits.

Remove the Monokote from the stabilizer where it glues to the fuselage, and on the top where the rudder and fin glue to it. Align the tail surfaces with the wing and glue them in place.

#### MOUNTING THE RADIO

Make up some cross-members from plywood and balsa to mount your servos to. Put the receiver and battery pack in position and check the center of gravity. If necessary, rearrange the equipment or add lead to the nose to achieve proper balance. I use a 3/16 balsa former behind the receiver to keep it in place. It also keeps the fuselage from crushing from an over-zealous grip. Make up the pushrods as shown on the plans. Be careful that you have both the servos and control surfaces at neutral when you solder the connections in place.

The only trim adjustments you will have are on the transmitter. The rudder should move one inch each way and the elevator 1/2 inch each way. Make sure the batteries are charged, and let's head to the flying field!

#### FLYING FLINGER

Assemble your *Flinger*. Do the controls move in the right direction? Is the center of gravity correct? If everything is right, gently toss the model into the wind. Correct any trim problems until you get a flat glide.

Now, carefully launch the *Flinger* overhead and hard. The model should climb dramatically and transition into a gentle thermal-hunting glide.

You'll soon find that the *Flinger* will ride the lightest lift. With practice, you should be able to get 45 seconds to one-minute flights in dead air.

Good luck with your *Flinger*. I hope you enjoy your *Flinger* as much as I have enjoyed mine. Do be careful to warm up before a hand-launch session: you don't want to overdo it!!!

C/L . . . . . Continued from page 47

contest. This year it was the addition of the Old Time Stunt event. The entrants were required to fly a simplified pattern, using a plane design that was from 1951 or earlier.

Bob Emmett of Renton, Washington, used a Fox .35 powered *Barnstormer* to post a 283.5 score for first place. Bob noted that the plane he flew was built 22 years ago.

This ended the first day of competition, though test flying continued until dark. About fifty modelers converged upon one of the local pizza parlors to refly and reflect on the day's activities.

On Sunday the temperature went up a bit, as did the humidity. The exact conditions seemed to vary through the day, and this gave the speed fliers fits trying to find "the" needle setting. There were 39 event entries, so the circle was kept rather busy. Strict time limits

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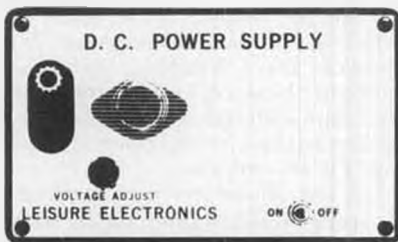
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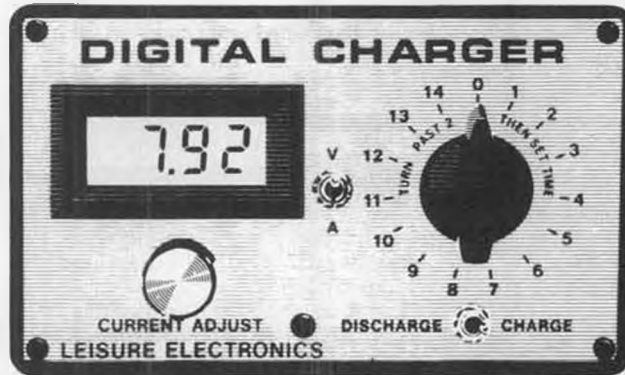


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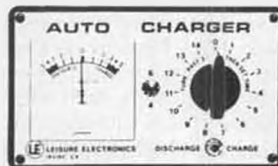


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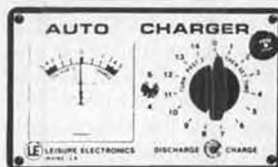
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were used to ensure that everybody got a chance to get in as many attempts as possible. Most participants were a bit disappointed in their performance, as speeds this year were somewhat low.

The only event that really had a contest going was Formula 40. The top four entrants were within three miles per hour of each other. Top speedster in this class was Loren Howard of Vancouver, Washington, with a 143.14 clocking. He used an original upright design with K&B power.

Other notable performances were a

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157.56 speed in FAI by Chuck Schuette, and the high speed of the day in Class D by Frank Hunt, at 189.90.

In the Class A contest, Jim Rhoades of Salt Lake City snuck by the M&M team on his very last attempt, with a 159.94 speed. It took him all day to dial in the setting on his Rossi powered ship, which featured a pressure fuel system and centrifugal fuel switch.

The activity in the Precision Aerobatics circle was very hotly contested this year. All four PAMPA proficiency classes were flown.

Bob Danielson grabbed a first in the Beginner division with a 232.5 score.

Dan Cronyn of Seattle posted a 338.5 for top honors as an Intermediate entry.

Al Resinger topped the Advanced group with a 435.5 total. Al is from the Vancouver, British Columbia area.

Top grunt in Expert was Paul Walker, who put up a very good flight to earn 542 points. Paul was flying his new version of the *Bad News*. The design features a 680 square inch, built-up wing with Monokote, and a dope finish fuselage. Total weight is 47 ounces, which is light for this size plane.

Event Director Don McClave shared some observations on this year's activities. First of all was the fact that there was much more activity, which reflects a renewed interest in the event both in the region, and nationwide. Four years ago there were only seven entrants at this meet, and this year the total was 26.

As for equipment, many entrants are campaigning entries that have been built for the Reno nationals. Lighter weight and lower wing loadings are the goal here to help compensate for the high altitude, thin air. Don speculates that after flying lightweight aircraft, most entrants won't bother going back to heavy finished planes.

It was also noted that the powerplant choice was almost universally the O.S. FSR, the only distinction was whether it was a .40 or .45 size.

On the opposite end of the field, it was time for more racing. The sport classes were being flown. The first event up was NW Sport Race. The rules for this call for a kit airplane, a Fox .35 stunt engine with suction feed tank, and no shutoffs or other typical racing equip-

ment allowed.

Vic Garner turned in a 8:37 in the 140-lap feature for first place.

Racing was finished up for the day with NW Super Sport Race. This event is quite similar to Slow Rat, except with more limiting restrictions on the engine, and mandatory use of an outboard fuel tank. Richard Schaper of Longview, Washington, took first place with a 7:51 time, using a K&B .35 powered Bobcat design.

More Combat action got underway on Sunday, in the form of the 1/2A and Fast classes. John Salvin was on his way to making the Regionals his benefit this year, but was held to fourth in the Fast event. Bob Stettler came out as top killer. Bob won six straight matches to earn his victory.

In the 1/2A event, John Salvin came out on top with a three-and-oh record.

It should be noted that the hardest working individual in the Combat arena was Event Director Dave Childs. Dave was somewhat ill, but persevered to officiate for the entire weekend.

One of the spectator's favorite events is Precision Scale. This year's top finisher was Bob Danielson, who entered a T-28A. Bob built the .60-powered plane from a Dave Platt RC kit. This event was judged by Earle Moorhead and Mel Marcum.

The last flying event of the day was Balloon Bust, which is a misnomer, as several airplanes are also busted in the process of trying to pop the balloon on a stick.

Richie Salter took first place in the Junior Class, and Daddy-O Dick Salter won the Open Class. There was a three way tie for second place, which was settled at the awards ceremony. Event Director Dave Mullens had an impromptu "blow-off" to determine placings. John Hall was able to blow up his balloon to the bursting point first, so he took the second place.

The last official event of the meet is when the crowd of tired, happy contestants gathers during the awards ceremony.

Contest Director John Thompson presided as the master of ceremonies as he doled out the \$2,000 worth of awards, which included some 90 beautiful plaques, and lots of merchandise.

The new wrinkle in the awards this year was the inclusion of grand champion recognition, which had been discontinued some years ago. First place went to Bob Danielson, second went to Paul Gibeault, and third place went to the M&M Team, (Fred and Joyce Margarido).

Next year, make sure you set your sights on going to Eugene, Oregon, on Memorial Day weekend.

F/F Scale . . . . Continued from page 61

lead to a disastrous test flight. Alignment is the key. Incidentally, if the tail post is vertical, one can assume then that the stabilizer platform will be true.

If you are building a rubber model, and it has a "tweaked" tail post, then the diagonals running from upper to lower longerons can't be used. They would be in the way of the rubber motor. I would suggest tack gluing them in anyway. Then, after bulkhead and stringers have been added, they could be removed easily.

#### FIXING WARPED FLYING SURFACES

Next, for successful test flying, we need true flying surfaces. That is, wings and tails without warps. Flat flying surfaces are easily obtained if a few steps are followed. Let's start with the wings.

One warp that is desirable is called washout. This adds stability to a model. The trailing edge of the wing toward the tip is "bent" upward. On the other hand, washin is just the opposite, and not generally used (more on this later).

I have found that the following steps assure a uniform type of washout or "twist" in a wing panel. I usually washout the trailing edge at the tip about two to three degrees. I start the process by building the wing panel flat on the workbench. I place the trailing edge down, followed by the spars, ribs, then the tip and leading edge. All of this is left to dry.

Meantime, I cut a long, triangular wedge that runs from the root to the tip from a 1/8-inch balsa sheet. This long wedge is cut with a three degree angle. After the wing panel has dried, I place this long wedge under the trailing edge. Naturally, some unpinning will be necessary. I let the wing assume the "twist" caused by the wedge. In other words, don't force anything. Any other wing components that are required, like upper spar(s), are glued in place at this time.

When the structure has dried, I spray the whole wing with water while it is still pinned down. This tends to eliminate any stresses which may occur during construction.

There isn't too much to say about the tail until I mention covering. However, I recommend spraying both the rudder and stab with water before unpinning to eliminate stresses.

#### COVERING TIPS

The next question might be, how can I maintain washout or keep the tail surfaces flat after covering? I'll assume that the covering used will be Japanese tissue. Many warps occur after water shrinking. Too much water on the surfaces can soak through the wood, thus softening it, and causing warpage after the tissue dries. To eliminate this possibility, use an airbrush to water shrink the tissue. Spray the water on evenly, then blow dry the surface. This way the wood doesn't get a chance to get wet.

Once the tissue has dried, doping is next. Always use nontautening dope: either nitrate or butyrate. (I don't like using butyrate.) These are available at most all aircraft supply houses around the country. As the name implies, nontautening dope has a plasticizer added so that it will not shrink the covering. After brushing on a coat of clear dope,

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and letting it dry to the touch, I'll carefully pin the wing down with the wedges in place. This is left to dry for 24 hours before putting on another coat. This pretty much assures you that everything will remain the same.

The tail is handled similarly, except if the rudder is flat, that is, without an airfoil shape. I'll build a light wood frame and cover it with tissue. The tissue is sprayed with water and left to dry and shrink. After the tissue has dried, I attach the tail onto the tautly stretched tissue using white glue. When this has dried, the structure is removed and the excess tissue is trimmed away. This technique provides both wrinkle-free and warp-free structures.

#### LATERAL BALANCING

There's one last consideration. If you are building a one-piece wing, balance it by using BB's, *et al*, epoxied to the lighter side. Another similar idea is to place a long wire through the fuselage (before covering any of the structures) right on the thrust line. Have the wheels, engine, wings, and tail temporarily

pinned in place. The model should remain level. If it doesn't, then add weight to the required side until it does. In other words, it shouldn't roll on its axis.

#### LONGITUDINAL BALANCING

At this point, it may be a good idea to check for CG (center of gravity). Check your plan to see where this balance point should be. Use this point as the fulcrum. Generally, it's about 25% back from the leading edge of the wing, or usually where the front wing spar is. If the balance point or CG is not known, the 25% rule is a pretty safe one. Either prop the model at the balance point using a special stand, or hold it with your fingers on this point and see how it balances fore and aft. Add weight where necessary until the model's nose is pointed downward. Whatever you do, don't have the nose pointed upward! Your model would most likely be destroyed on its first flight with this tail heavy condition.

Some of you may wonder why you would check for CG before the model is

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covered and painted. The answer is simple. If the model needs tail weight, for example, it can be added *inside* the structure; in essence, it can be concealed. The same with nose weight. After the model has been covered and painted, you'll find that the CG will remain pretty much the same as before.

**ENGINE THRUST**

OK! We are almost ready for the moment of truth, the fruits of our labor. If you followed the previous guidelines, then you have the best chances for a successful test-flight. However, there is one last item to consider: the engine's thrust line. I don't use any scientific formula for this, just a bit of logic. It is almost a guaranteed thing that if no

down thrust is used in a power model, that model will most certainly "loop the loop" from hand launch. The end result will be predictable . . . and disastrous.

I start with a bit more down thrust than might be needed, because a powered flight toward the ground is much safer than the disastrous loop. Also, a bit of right thrust is required in order to eliminate engine torque.

**FINAL CHECK**

Let's go flying! In Southern California, there "ain't" no tall grass unless you are flying over someone's crop! If you are lucky enough to fly over the tall stuff, test flying should not be a traumatic experience! Before you start the engine and point your model into the wind, you must make a final check.

Firstly, recheck the CG; the nose should be pointed slightly downward. Secondly, if your model has adjustable tail surfaces, i.e. elevator, rudder, or ailerons, a drop of glue should be used to keep them from moving. Thirdly, it is also advisable to put the prop on backwards. This keeps the engine from over revving; personally, I don't do this. I prefer to over prop an engine. In other words, I use a larger diameter prop than recommended. With a glow Pee Wee .020, I always use a wooden 6-3 prop, never nylon; you won't break the nylon prop in a prang, but you will damage the crankshaft. With a glow .049 engine, I'll use a 7-3. With diesel engines, I'll use an 8-3 on an .035 (.5 cc), and I'll use a 9-3 on

an .049 (.75 cc), etc. Finally, if you've done everything as prescribed, you shouldn't have any warps, but check again anyway. When everything checks out, prepare the engine for starting.

**START YOUR ENGINE, TRIM YOUR PLANE!**

I use a glass syringe to measure the amount of fuel that I put into the tank. I try to get an engine run of 15 to 20 seconds on the first flight. This allows time for needle valve and compression lever adjustments. I look for an actual inflight engine run of about 10 seconds. With an out of trim model, even 10 second seems like forever, so don't go much more than that! Know ahead of time which way the wind is blowing. A ribbon on a spindly pole is an ideal wind sock.

With the engine running properly and the model in hand, run into the wind until you get some airspeed for the model. Launch it as straight as you can. Do not toss it upward. This could be disastrous! Pointing it downward will most likely end in a crash landing. If all is well, the model should make a gentle left climbing turn (clockwise from the ground looking up).

At this point, if you can get your heart out of your throat, check for the following: is the climb too steep? Is the model circling too tightly to the left? Is the model looping? When the engine quits, a power model usually glides to the right. If it is gliding fine going to the left, don't change a thing. As in the power mode, observe the model in the glide. Is it stalling? Is the glide too steep? Does it circle to tightly to the left or right?

If change is necessary, make only one change at a time. Under power, if the model circles too tightly to the left, but OK in the glide, add right thrust. If it loops under power, more down thrust is required. Get the idea? In the glide, if you feel that it is too steep, give a tweak of up elevator. Break through the glue joint, make the change, and glue the elevator again. Remember, only one change at a time! After you do this for a while, it becomes second nature making the proper adjustments during testing.

For rubber power, every aspect is pretty much the same as for power. However, one area that can raise havoc is the rubber motor. Because the length of the rubber motor is much longer than the length of the fuselage, the rubber can shift its mass fore or aft as it unwinds and goes slack. This does wonders for the CG, which in turn screws up the glide. To avoid this pitfall, the motor needs to be braided so that there is no slack between "hooks." This way the CG remains the same even in the glide. There's nothing like experience, of course, but I hope you will find this information useful.

**NO-CAL CONTEST AT '84 NATS**

A couple of items in closing. Peck-Polymers is sponsoring a contest for "Low Cal" rubber powered profile models. This will be held at the '84 Nationals in Reno, Nevada. The date is Tuesday, August 7 (you'd better hurry)

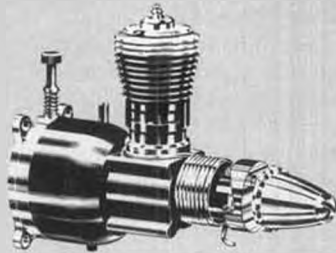
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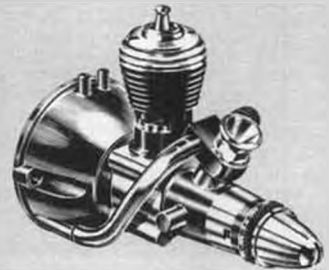
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- No. 150 .049 Black Widow (as shown)
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- No. 1001 .020 Pee Wee with throttle
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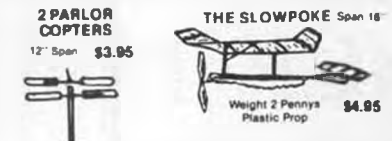


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**A LETTER TO THE EDITOR**

Dear Bill Northrop,

As an off-again, on-again modeler for many years, and a regular reader of Model Builder since my last return to the hobby, I wanted to drop you a line and share some pictures of a couple of my recent creations.

The Bede 4 is a Peanut Scale model from plans by Bill Hannan, whose column in your magazine is always a treat to read. I converted the airplane to a tail-dragger, which was a Bede option, and added a hand-carved pilot, which was a lot more work than I thought it would be. I also employed Cessna-type wing tips, instead of the up-swept ones featured on the original Bede 4. I figured a home-builder could put on any kind of wing tips he wanted, and I think the Cessna ones look better. The little Bede flies' pretty well, but I tend to build kinda heavy (I'm working on it), so it isn't a record breaker by any means.

I built the F-4 catapult glider from plans in the April 1974 issue of Model Builder. It is, I discovered when I showed the drawings to an F-4 pilot friend of mine, an F-4E, not an F-4C as the plans indicate. I made a few little changes to the design. The wing on mine is made from 3/16 inch balsa, carved to an airfoil shape like a hand launch glider's instead of the flat, 1/16 inch wing called for. I covered the Phantom with lightweight Silkspan in many small pieces, using thinned white glue, and I opted for the more common "lizard" paint job instead of the Thunderbird markings shown on the plans. The model was painted free-hand with a brush using plain old Aero Gloss Black, Stinson Green, Camouflage Tan, and Cessna Gray. (Did you ever see a gray Cessna?) I used a Mattel Vacu-form to make the canopy, and the decals are

from Microscale. The decals are designed for a 1/48-scale plastic model, so they're a little too small... but awfully close. The F-4's tail pipes are extensions for the knobs on a car stereo that were left over after we installed a stereo in my son's car. I didn't plan it, but the knob extensions fit perfectly and don't look half bad. The F-4 hasn't flown yet, due to fairly equal parts of bad weather, lack of time, and apprehension on my part. There's one question about the thing that I haven't figured out yet. The F-4's wingspan is about 10-1/4 inches, and it's to be launched with a 25-foot loop of 1/4-inch rubber. Does that make it a rubber-powered Peanut?

Please keep up the good work in Model Builder, especially the Peanut plans every month.

Cheers, Ed Ross.

## Cavalier . . . . . Continued from page 17

the wing halves with rib doublers in the middle. I used Slo Zap here and for the leading edge dowel.

A plastic top and bottom center section saddle and fairing fit like a silk glove. I used regular Zap CA wicked under the edges to glue these to the wing. At this point, install your servos (aileron and retracts) and check for smooth operation. Incidentally, I used regular servos for retraction (one in the wing and one for the nose gear) with a Y connector, which Hobby Shack can supply you with.

One thing to do early in the construction is to install the elevator and rudder pushrods... before installing the elevator and rudder assembly. If you do it after the rudder and elevator are installed, you are a patient soul; it could be very difficult.

I did opt to use 1/4-20 nylon bolts and to tap the holes in the hold-down block instead of using the blind nut fasteners and steel bolts supplied. This was purely preferential and in no way indicates subpar quality on the kit's part. Take your pick.

Check all of your alignments and make sure everything is equal, because it will benefit you in the end.

I had to file my motor just a tad so that my K&B .40 would fit properly. Test fit the cowling sections together (taped together) and trim the cowl so that it is properly centered to blend into the spinner contour (this takes about 30 minutes). Glue the cowling together internally for a clean ridge externally. For aesthetic reasons, you may choose to paint a white stripe across the cowl extending the fuselage stripe, or use a piece of "graphics" trim from Coverite as I did. I do think that it enhances the appearance of the Cavalier.

Have you noticed that I have not said anything about hinging the control surfaces? Well... I can't because the only hinging needed is the rudder. You can really get spoiled with this kit very quickly!

Getting down to brass tacks, the best part is yet to come. At first, I thought this

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thing could not possibly fly as good as it looked. Wow, was I wrong!

I had to add some ballast aft of the CG because my *Cavalier* came out a little too nose heavy. Another nice feature is that the CG location is printed on the fuselage. Like I said, it's a spoiler!

Flying day was warm, clear, and gusty. Everything can't always be perfect, so I thought this would be the real test of the *Cavalier*. With a wingspan of 57-plus inches and a weight of just over 6-1/2 pounds, a good, thick, symmetrical wing section, and a generous leading edge radius, the stage was set.

The takeoff roll was about 50 feet, and it came up without any horsing-off. Now . . . one thing happened that has never happened in any kit review that I have done. With over a half-dozen witnesses to vouch for it, the *Cavalier* did not require any trim changes whatsoever. This impresses me more than any amount of pretty construction. If any airplane is all gloss with no performance and no stability, then time and money have been wasted. In this case, the *Cavalier* is well worth the money. It penetrates well, lands with a gentle flare at about 1/4-throttle, stalls are straightforward with no funny tricks. I did try a knife-edge loop, but the wind kept screwing me up.

Remember that I suggested that you should check the balsa dowel pushrods for softness? Well, unfortunately, my elevator pushrod parted company, and my beautiful *Cavalier* went straight in. A total wipe-out! Hobby Shack is not at fault. Mine was apparently an isolated case. My enthusiasm for the design was not dampened, so I ordered a second *Cavalier*. This model would be a threat in any contest. The way it can do axial rolls will absolutely blow your mind.

Have you ever seen Dennis Cunningham of CBS TV do a movie review? Remember when he reviewed the movie "E.T."? He politely and unheraldingly gave it a "10," the only "10" I have seen him give. Well, I give the Hobby Shack *Cavalier* a "10" (the only one I've ever given) for a job darn-well done. Keep up the good work, Paul!

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### Simply Scale. Continued from page 19

event between Sport Scale and F4C, and then goes on to describe the event proposed. It's interesting to note that with the exception of a weight limit and engine limit, the event he proposes is the 1984 FAI F4C rules!

"Unfortunately, not many modelers understand, or care to understand what the FAI F4C event is, as evidenced by a letter of complaint to the AMA that I saw recently concerning the Scale Team Selection Trials. The author of the letter brilliantly displayed his lack of comprehension of World Championship competition. Fella's, FAI F4C is not an event for prima donna's. The models seen at this year's team trials were typical of any model seen at a World Championship; the flying was as good, if not better than what you'll see at a World Championship! Just about anyone who is at least reasonably competitive in AMA Sport Scale could do as well at a world level if he elects to build to a specific weight limit, power within a specific limit, take on the financial burden of FAI stamps, qualification fees, and travel expenses, etc., etc.

"FAI F4C in 1984 begins using a Stand-off system of judging and has thrown away the ruler. Accuracy of outline and finish, as well as color and markings, are judged at three meters (about ten feet).

Surface detail and craftsmanship are judged at one meter (about three feet). Sounds just about like Brad's proposed event, doesn't it?

"So, if we already have an event like Brad proposes, what do we do with Sport Scale to take the emphasis off the static score? Should we do as he suggests and tell the judges they are to ignore all detail? It won't work. You can't put blinders on the judges. A judge needs to be as objective in his job as he can be, and here we're asking him to judge subjectively! (Look 'em up in your Webster's if you're not sure of the difference!)

"If you guys out there really want Sport Scale to be a flying event with less importance on the accuracy of scale, you have to eliminate the even-Steven, 50-50 split between static and flying scores. Take it out of the hands of the judges. Maintain the 100 points possible for flight, but cut the static to a possible high of 30 points total: 10 points maximum for each category of outline, finish, color and markings, and craftsmanship. After all, we don't seem to be using the lower end of our scale of one to 30 points per category now anyway! In this way, even the guy with an average plane is going to come out around 15 to 20 points, and that means he's not very far back from the "perfect" score of 30. Think it would work?

"I'm not advocating this, understand.

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down-time for repairs).

Unfortunately, I have become disillusioned with this event. In recent years, the quality of Sport Scale aircraft has been fantastic and the competition tough, which is as it should be... on a nationwide level. But, what about local-level competition where Sport Scale has become a "prima donna" event?

Firstly, at competitions and shows, I have frequently noticed the same people campaigning the same aircraft. While the quality and detail of their Sport Scale entries cannot be disputed, the question arises whether the model should be entered with "freshman" products. Where is the incentive for the novice modeler? Where is the incentive for the person who has a casual, but sincere, interest in becoming more fully involved with the hobby? After all, this IS a hobby: an outlet for relaxation away from our vocation... it is not THE vocation!

Secondly, as a result of these "museum" pieces being entered in all classes of competition, these standards have been adopted as the norm. I know, first hand, of several occasions where better-than-average modelers have declined competition. The general feeling expressed was, "Why go up against a big name and a PROFESSIONAL contestant?"

In reference to the static shows I have visited, Sport Scale is transformed into a Disneyland fantasy. The only flight the majority of these entries experience is being carried in and out of station wagons. Their engines are cosmetically correct but, obviously unoperational: built for static display only. Isn't the idea of a static show to promote the hobby? Or is it to promote a facade?... Again, I enjoyed your article, but felt compelled to voice a different viewpoint.

Joe's response is understandable, and reflects what a lot of modelers feel about "Toledo quality" models. Remember guys, those models are almost never seen at AMA scale events or contests (with the exception of my own). Your "old faithful" scale model will look respectable at any real contest, and it even flies!

Regarding an entry class, don't forget

that Sport Scale is divided into two classes, Sportsman and Expert. Most major contests, such as the Mint Julep here in the east, utilize these different classes to provide the neophyte scaler or simple scaler a place to compete without being intimidated by the more expert or serious competitor.

Brad Shepard himself wrote to me in response to my article; here's some of what he had to say:

The letters I have received all concur with my thoughts, and I guess we would be hard put to find out HOW MANY modelers out there are engaged in scale building and flying, but are "turned off" by what is happening at AMA meets. The entry fees are going into orbit, some guys "hassle" the judges to win a trophy, detailing on Sport Scale is getting absurd, etc. Two letters that came in were from lifetime modelers who build beautiful "birds" but no longer engage in AMA meets, their main complaint was that their words to the proper authorities in AMA have "bounced off the wall," and they have given up "fighting city hall." Scale has fallen into the hands of a few who want to see it their way, not what a majority wants, be that as it may, I have too much fun and enjoyment in this hobby to get all riled up like that, and I will continue to build and fly scale models.

Your suggestion of going to 30 points on static is a jewel, that will go a long way toward solving the problem of static judging and it should force the guys who like to detail their models into F4C competition which would accomplish the very thing we're after.

I don't know how to get it through the heads of some of our premier scalers that (1) we are not all interested in knock-down, sweaty competition, and (2) that the AMA is made of mostly sport fliers. The competition is there if you want it, but let's not have our whole organization revolve around the wishes of a few.

That's only a part of Brad's letter to me, but you can see where he's coming from. Like most of us, he likes Scale and he wants to keep on enjoying his hobby. I would like to address his point about our wishes not being heard by the AMA. I

I'm only suggesting it as one plausible solution to Brad Shepard's perception. What do you think?"

I received several responses to my article with a variety of opinions expressed. Let me share some with you...

Joe Jablonski of Pittsburgh, Pennsylvania wrote:

I enjoyed reading your article which appeared in the January 1984 issue of "Replica" regarding Sport Scale, and I would like to make a few comments.

I have been involved in R/C flying for over 10 years with Sport Scale being my major area of interest. It is a good blend of building technique and skill, resulting in a finished product that is practical enough to fly more than once (with little

really believe that the problem (and I'm very guilty of this myself) is that we modelers don't know the proper procedures to follow to make the desired changes in our rules. And, for the most part, we don't bother to read our AMA rule book and find out how to make changes, rather, we sit back and say to ourselves, "Gee, I wish we didn't have this rule, or that rule," or "I'd sure like to see this happen." It's not going to happen by wishing, guys. We've got to learn the rules we're required to play by! (Incidentally, Brad, one of the reasons we have organizations such as NASA is to give all us scalers a louder voice within the AMA for the purpose of insuring that the rules we're playing by are acceptable to the people they most affect . . . us.)

Kermit Walker, of Lodi, CA, also expressed his opinion . . .

Regarding Sport Scale, and what its intended nature is or was: I think the present 50-50 split in scoring is about right if, and it's a big if, the judging is done critically enough and skillfully enough, by qualified judges who are supplied with adequate rules and guidelines. I really think that the major problem is the lack of sufficiently clear guidelines in the rulebook.

Kermit goes on to tell me about a local scaler who has a bad experience at a West Coast scale contest. It seems that the modeler was competing with a scratch-built design featuring operating landing gear struts (don't they all?), scale cowl panels, exact scale outline and airfoil, super workmanship, etc. At this contest, his model received a static score of only 77: much lower than the 97 score it had received at the Nats. The stinger was the fact that another obviously Stand-off Scale model received an 85 score from the same judges.

Without seeing the documentation presented with the two models, I really wouldn't comment on whether justice prevailed. I can say that it's not unusual to once in a while receive an abnormally low score from a set of judges. It's happened to me too. Let's face it, maybe the subject just didn't "turn them on!" For the most part, judges do their best to remain objective, using only the documentation provided to reach their decisions on how accurate your model is to the "real thing," but remember, judges are only human. We can help them in their thankless duties by making the rules simpler, not complicating the rules by adding restrictions and instructions to ignore details.

Kermit continues:

The point is, I think the really critical problem in R/C Scale contests, at least at the local and perhaps regional level, is the lack of trained, experienced, motivated judges backed up by clear rules and guidelines. As one small example, why is there no altitude criteria for the height of the horizontal 8? I've found that I can hide some of the flaws in my performance of this difficult maneuver merely by flying at 50 to 75 feet, instead of 20 feet where it belongs, without any

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downgrading for excessive height due to the lack of any judging guidelines. (Not after the judges read this!)

Kermit, you may be able to hide the flaws in your horizontal 8 by flying high, but I'll guarantee you, I'll get a better score by flying it well at the 20-foot level!

Obviously, there are many different viewpoints and opinions on the subject of scale judging and competition. We must remember that not all scale modelers are interested in "all out" competition. We have to maintain events that are low-key for the beginner and simple scaler and still keep the interest of the serious competitor.

For the most part, today's AMA Sport Scale rules, when followed as written, meet our requirements. The proof of the pudding is in trying them out. In my next column, I'm going to show you that they do work, as evidenced by our recent trip to the '84 Mint Julep.

Perhaps you have an opinion? Please share it with us.

**JOIN NASA**

I mentioned I am Secretary/Treasurer of NASA, the National Association of Scale Aeromodelers. NASA is recognized as the official special interest group for Scale within the AMA. We are here to help promote all forms of scale aircraft modeling from free flight to R/C. We're supportive of both the competitor and the "Sunday flier." Through a newsletter, "Replica," we maintain a line of communication to our members, and occasionally poll our members on controversial rules proposals to the AMA contest board members.

Perhaps you'd be interested in joining NASA. (I have mixed emotions as I mention this . . . each new membership means more work for me!) Our dues are low, only six bucks a year. If you'd like to join, or just want information on NASA, send me a SASE, and I'll be glad to send you a membership form.

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Keep it scale and simple! ●

### Razorblade . . . Continued from page 16

Back at the "Skunk Works", I lengthened the nose far enough to allow mounting of the two-ounce fuel tank between the engine and the leading edge of the wing. A muffler was added to the engine, as was a spinner, and the ship not only looked better, but the CG was in the right place without all that solder wrapped around the engine! This, then, was the winning combination. It not only looked good . . . but it flew beautifully!

In the ensuing months, I built several more copies of the *Razorblade*, each of which had the same terrific flight characteristics: unbelievably fast under power; fantastic maneuverability without being at all hard to control, yet, surprisingly, having a slow, floating glide that made landings an absolute breeze!

The *Razorblade* had an unexpected drawback, however. All my former "buddies" refused to fly combat with me and my *Razorblade*! What was worse, I could never convince even one of them to build a *Razorblade* of their own so that we could enjoy some real combat practice.

One day my "helper" forgot to turn on the receiver before launching the ship, and I didn't notice it either. The technique was to launch it upward at a 45-degree angle, and let it go for a second or two in order to build up speed and a little altitude before starting to feed in any control. It "grooves" so smoothly right from the launch that I often let it climb a couple of hundred feet before touching the stick at all! I was doing that this day when I finally started to feed in a little turn . . . then a little more turn . . . and then a whole lot of turn . . . completely without visible result!

I was looking down at the transmitter,

to see if I had forgotten to turn it on, when the awful truth finally dawned on me! I turned to my "helper" and asked him if he had turned on the receiver, to which he shrugged and replied, "No, didn't you?" I just handed him the transmitter, said "Here, you fly it," and walked away.

Well, when the ship finally arched slowly over and started to head downward, it was just a minute speck in the sky. To this day, I am still firmly convinced that just before it hit the ground, it may well have become the first model airplane ever to go supersonic!!

Eventually, I gave up trying to convince people that they really could fly a weird-looking R/C ship with no tail, no throttle, and no landing gear, and went on to other projects. A year later, employment considerations forced me to move away from the area. However, I still maintained my ties with the club, continued to receive the club newsletter, and attended club meetings whenever business travel "mysteriously" happened to put me in the area at just the right times.

Early in 1981, some ten years after the *Razorblade* first flew, one of the club newsletters made mention of the fact that some of the club members were into flying combat again and wondered if there were any ships that had been specifically designed for the purpose. The editor went on to make mention of the "*Razorblades*" which he had seen fly many years before, and asked if there was anyone in the club who could tell him where to obtain plans for the ship.

Obviously, my interest was rekindled, and I set out to look in my musty old files for whatever information and snapshots that I might have stored away. There were no plans for the ship . . . there never had been! The ship was so simple to build that I never bothered to draw them. I just built them from some dimensioned outline sketches that I had done on old notepaper.

Immediately, I sat down and drew up plans showing the construction details, parts list, etc., and mailed them off to the newsletter editor who passed them on to the interested parties. Several new ships were built from those plans, which, to my everlasting gratification, proved to be just as easy to build, and which flew

with the same superior flight characteristics as the original ships had displayed over ten years before!

Now, if a combative spirit lurks deep down in your soul, and you are possessed of enough courage to brave the initial reaction at the club field, this little ship will certainly set you apart from the crowd! It is very quick and inexpensive to build, has unbelievable flight characteristics, and fits unobtrusively into the most compact of cars when it comes time to go to the airport! Go ahead and try it, you'll love it! And you can always say, "The devil made me do it!"

### PARTS CONSTRUCTION

You may as well start by cutting all of the parts out at once: there aren't that many of them! Cut six full-ribs and two half-ribs from 1/8-inch sheet. It's easy because you can use a straightedge to guide your knife!

Next, the two wing tips and their four triangular tip braces are cut from 1/4-inch sheet. Again, you can cut them out with a straightedge to guide your knife.

Now cut the two tail booms and the hatch cover from 1/16 birch plywood. No need to saw them, as a sharp knife and a straightedge will do the trick here too. They will seem too flimsy at first, but don't be misled into substituting something heavier. I guarantee you that they are strong enough for the job they have to do, and that's not the place to add extra weight . . . trust me!

Finally, cut the fuselage rib and fuselage side from the 1/2-inch sheet. That's it!! All the preshaped parts are done!

### FUSELAGE

This will undoubtedly be the easiest R/C fuselage you have ever built! Epoxy the two 1/2-inch square hardwood motor mounts to the 1/2-inch fuselage rib. When the epoxy has set, drill four motor mount holes and mount your motor with T-nuts. Glue the two half-ribs to the sides of the fuselage rib and set this assembly aside until it is needed later.

### WING

This wing will probably be somewhat different in construction technique than any you have built previously, but construction is both easy and quick. First, lay two sheets of 1/16 balsa down on the workbench side-by-side. Hold the edges together very tightly and tape over the seam with a full-length piece of masking tape. Press the tape down firmly so as to assure complete adhesion of the tape to the balsa. Then, turn the two joined sheets over so that the tape is on the bottom. Bend the tape "hinge" so that the two sheets make a 90-degree angle with each other, and run a bead of aliphatic resin glue down the crack formed by the two sheets. Flatten the sheets out and pin them down to the workbench. A bead of glue will squeeze up where the sheet edges close on each other, but not to worry, we'll use it. Carefully place one of the 1/4 x 1/16 doubler strips over the joint and pin it in place. The glue that squeezed up will hold it.

Next, glue the 1/4-inch square trailing edge along the back edge of the sheet flush with the edge, and the 1/4-square spar along the other edge, but NOT flush with the edge as you did with the trailing edge. This one has to angle upward slightly, and only half of it is on the sheet. There should be 1/8 inch hanging over the edge.

Glue the fuselage rib onto the 1/16 sheets in the exact center, and make sure that it is aligned perfectly at right angles to them. Also, make sure that the engine exhaust points down. Then, glue three 1/8-inch wing ribs on each side of the fuselage rib, six inches apart. If you measured correctly, the last rib should be just at the edge of the 1/16 sheets at each end.

Next, glue the top 1/4 x 1/16 joining strip, the 1/4-square top spar, and the 1/4-square leading edge in their respective places. The 1/4-inch sheet wing tips can be glued and pinned in place, as can the top triangular tip braces. The trailing edges of the tips rest on the workbench, so they will automatically be squarely aligned with the rest of the wing. All of this can be done faster than it takes to tell it, and it is finally time to rest and wait for the glue to set. However, if you build with some of the more modern adhesives like Hot Stuff, Zap, Jet, etc., you may not get to take this rest.

When the glue has set, remove the pins that are inside of the wing, but leave those around the edges that hold the whole assembly to the workbench.

The next thing to glue in place is the top rear 1/16 sheet. This one is the last of the full-length sheets, and should cover only half of the 1/4 x 1/16 joining strip. The center sheets cover only the area from the wing tip to the 1/8-inch rib closest to the 1/2-inch fuselage rib, and should leave a 12-inch opening with the fuselage rib exposed in the center. The front sheets cover all the way from the tip to the fuselage rib, and rest on the half-ribs that are glued to the fuselage rib.

While you are waiting for these last glue joints to dry, fill in the time by gluing four 1/2-inch square hardwood pieces inside the corners of the opening in the top of the wing. Later, these pieces will be drilled in the center for the screws that will hold the 1/16 plywood hatch cover in place.

When the glue has set, remove the pins that hold the wing to the workbench and turn it over. The last sheets to go in place are the bottom leading edge sheets. The bottom triangular tip braces may be added at the same time. And last, but not least, the 1/2-inch thick fuselage side may be glued in place on the crankcase side of the fuselage. Be sure to carve it round to match your engine spinner before you do, however. This is about the only chance that you will have to do any carving on this ship! Oh, yes, now you can remove the masking tape from the original two sheets of balsa, too!

#### TAIL ASSEMBLY

Glue one of the 1/16 plywood tail booms to the trailing edge of the wing

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on each side of the hatch opening. They should be one inch from the edges of the hatch opening, which will place them 14 inches apart. Be sure that the glue does not fill in the holes at the trailing edge through which the aileron torque rod wires will pass.

The stabilator is made from a 14-inch piece of 3/8 x 1-1/2 trailing edge stock. Use your razor plane to round off the thick edge of the stock to a symmetrical, streamlined shape. Then, with a sharp knife and a straightedge, cut a 1/16 wide slot the full length of the stabilator, 1/2 inch from the leading edge. Epoxy a length of 1/16 music wire into the slot which protrudes about 1/2 inch from the stabilator at each end. The ends of this music wire are then placed through the small holes in the tail booms and secured in place with small wheel collars on the outer ends of the wire, outside of the tail booms. Leave enough play so that the stabilator may pivot freely without binding, but not enough to be sloppy. Drill the two mounting holes for a small nylon control horn in the stabilator, just to one side of the center, and mount the horn. This completes the tail assembly.

#### AILERONS

The ailerons are made from the same 3/8 x 1-1/2 trailing edge stock that you used for the stabilator, and are mounted in a conventional manner. The music wire torque rods are epoxied to the individual ailerons, and are of unequal length. They should be mounted such that both wires terminate on the opposite side of the fuselage rib from the stabilator control horn. Be sure to place a molded nylon aileron bearing on the wires before the second bend is made, or it will be too late. You must use a bearing to support the torque rods at the inner ends, right next to the bend, or you will surely have aileron control problems! Attach a type of control horn to the wire that is secured in place with a wheel collar, and you will have an

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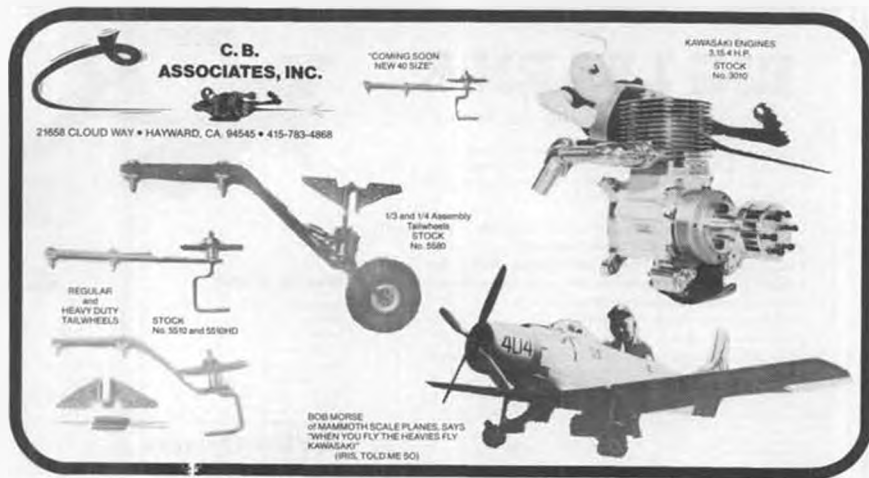
infinite range of aileron travel adjustment.

#### MISCELLANEOUS

The hatch cover is the last thing you will have to build. You previously glued four pieces of 1/2-inch square hardwood into the corners of the hatch opening. Now, drill a small pilot hole in the center of each of them. This hole will allow you to screw a No. 4, 1/2-inch sheet metal screw into the wood. You can also do the same on the centerline of the fuselage rib, a quarter-inch from the edges of the opening. These six small screws are used to secure the 1/16 plywood hatch cover in place.

You can mount your servos any way that you want, but I used nylon side mounts and secured them to the sides of the fuselage rib with double-sided foam tape after first coating the rib with five-minute epoxy (smeared on with my finger). The epoxy gives the rib a smooth, nonporous surface for the foam tape to get a secure grip on.

Cut a small rectangular hole in the hatch cover and secure your radio on-off switch to it so that the radio may be turned on and off from the outside. Cut holes as required in the hatch cover so that the aileron and stabilator pushrods



may exit freely, but make them no larger than absolutely needed.

Wrap the battery pack with foam padding and stuff it into the leading edge cavity on one side of the fuselage rib. Do the same on the other side with the receiver.

Finish the ship with the covering of your choice. I used Monokote everywhere except the engine pod, which I coated with epoxy glue smeared on with my finger, followed by one coat of colored epoxy paint.

#### FLYING

This is the fun part, but in order for it to be fun, you should first take a few precautions. Check the CG: it should be at, or only slightly aft of the leading edge. There are several things that you can do to achieve this without just adding ballast weight somewhere. Use a spinner . . . the heaviest spinner you can find. There is nowhere that you can add weight that will have as much leverage as it does in front of the prop! Use a muffler. Again, use the heaviest muffler you can find for your particular engine. There are several good reasons for the muffler besides adding weight, although that is a prime consideration. Noise is a good reason to use a muffler. Many flying sites require it anyway, and I happen to dislike the sound of an unmuffled engine. It may not be required where you fly, but its use could save you the trouble of having to find a new flying site in the near future.

The muffler is also your landing gear. When you float it down to a smooth landing, it will skid on the muffler, and not on the engine directly. This saves having to dig the dirt out of your exhaust after each flight! The muffler also collects and directs the exhaust "goop" along the bottom of the wing, preventing the propwash from blowing it up and over the leading edge and back into the servos which are somewhat exposed.

Check the stabilator travel. . . start out with no more than 15 to 20 degrees at most. Remember, there is no horizontal stabilizer to smooth things out for you if you start having trouble keeping your thumb from quivering! When you have some time with the ship, you can adjust it up or down to suit your taste.

Now, finally, to the actual flying! Have your helper hold the ship with two

hands, one on each side of the fuselage pod with his fingers curled down over the leading edge. Tell him to keep loose, however, because if he doesn't, he just might turn into an "orangutan," get excited, and crush the thing! You can both stand up at a comfortable height to start the engine. Be sure to check the controls before launching. . . remember what happened to me?

It doesn't take an Olympic hammer thrower to launch this ship. Exactly the opposite is true: easy does it. Have your helper angle the ship up at about 45 degrees, bend his elbows slightly so that he draws the ship in towards himself, then just straighten out his arms, smoothly chucking the ship away from himself and straightening out his hands at the same time. The ship will pull out of his hands smoothly and climb away with surprising speed! Nothing to it!!

Let the ship climb away for a second or two to pick up speed and altitude before you start to control it. It sounds real "spooky" at first, but after you have done it a time or two, it will seem as completely natural as taking off with a conventional ship.

Good luck, and please, write me a note and let me know how you like it! (Model Builder will forward all mail.) •

#### Plug Sparks . . . Continued from page 23

To the best of this writer's knowledge, no variable compression heads were ever manufactured for the Mite.

One terrific advantage of this engine, besides not requiring the use of coil, condenser, or batteries, was the light weight of the motor itself at 2.6 ounces (including plastic tank) and the overall height at less than 2-1/2 inches.

The motor had a needle valve for normal flying, but those desiring a throttle found to their delight that the engine could be easily set to run only 1800 rpm. This was a great feature for the testing of free flight models. In addition, the throttle also acted as a shutoff valve, hence, a simple timer linkage arrangement could be used to activate the throttle arm.

For those interested in the technical aspects of the Mite engine, the lightness

of the engine can be attributed to the use of magnesium die-cast parts: crankcase, cylinder head, and back plate. Of course, the cylinder was of steel with the intake bypasses being milled in the front and rear. The cylinder was honed and lapped to size with the exhaust ports then milled on each side.

The one-piece crankshaft was machined out of alloy steel and also ground and polished. A hub shaft (Cox engines used this feature later on) was a standard 10-32 by one-inch long hexagonal machine screw. The crankshaft main bearing was bronze (a so-called "special Navy type"), honed to size.

The balance of the engine found the piston being machined, ground, and polished 4130 alloy steel. This steel was also employed on the connection rod and wrist pin.

With the tank made of Lucite (a clear plastic), the metal fuel line actually meters the fuel to the engine. The standard needle valve, when once set for maximum performance, is merely a jet thereafter as the 17ST aluminum throttle arm (and throttle) is then used to throttle the engine to the desired rpm. (Something on the order of the Hurler-man choke nut.)

The drawing shows the full length of the throttle arm, but this can be shortened to suit the individual arrangement of the model. The only drawback to this system is the ease that the throttle lever can be moved. Care should be taken that the arm sticks out of the cowl slot only to the degree necessary for finger operation.

*Air Trails* magazine, in making strobac tests on this engine, reported that the Mite turned 6800 rpm with an 8-10 (yes, that's right!) propeller, and ran 7000 rpm with a 9-4 prop.

Wrapping up the report on this Class A type engine, manufacturer's figures were given as follows: displacement, .098 cu. in.; bore, .500 in.; stroke, .500 in.; 9000 rpm on an 8-8 prop. The most noticeable feature was the Mite's ability to be throttled to low rpm without the motor overloading and subsequently quitting.

However, with the fierce competition in 1948, the Mite was just another "cute" engine that failed to make any impression on the market.

#### 40 YEARS AGO, I WAS. . .

It is simply great to hear from the original designers of the 1930 era, and it was a distinct pleasure to hear from Walter Eggert, 26 Moredon Road, Huntingdon Valley, PA 19006, as he describes his latest version as seen in Photo No. 11.

"The plane is exactly the same as the original I designed and built in 1939 except for strengthening the wing structure and building a lighter tail to move the balance point to 40% of the wing chord.

"The model is one of the most pleasureable R/C models I have ever built. The model was a challenge and turned out to be well worth the effort.

"Getting around to myself, my father and I were very active in modeling in the early thirties. Our first Hurler-

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powered plane (a crutch stick type) was flying in 1934 with an engine that was a 1933 Christmas present. I was 12 years old then.

"The second plane my father and I built was a high-wing parasol model we called 'Old Reliable.' For 1935, it was rather advanced for its time. I followed this up by building a lighter version that was quite competitive in local meets.

"During 1939 and 1940, I worked for Megow Model Corporation as a designer. I designed the second generation 10¢, 25¢, and 50¢ line of rubber flying scale models. Of course, I also designed the Class A, B, and C line of the *Soaring Eagle* design. My last effort was the low-cost *Aero Champ* designed especially for the Megow 199 engine. I might also mention that my father worked in the Megow engine department.

"As a sidenote, I designed the advanced needle-ended axle trucks for the Megow railroad department. This type axle, now used on all HO railroad trucks, permitted locomotives to pull up to 100 cars in place of the small half-dozen or so at that time.

"At present, I am very active with my 13 year old son who is an excellent builder and flier. He has won his share of local and national awards." (*Who says history doesn't repeat itself? jp*)

Eggert concludes by outlining the various offices he is holding concurrently with SOTS, Delaware Valley Federation, the Warmenster Air Scouts, and SAM 76. The foregoing hardly is

representative of 54 years of modeling. One of these days, he will regale us with some of his further reminiscences.

### **READERS WRITE**

Jerry Persh, 4908 Sauquoit Lane, Annandale, VA 22003, sends in Photo No. 12 of his good-flying "New Yorker" built from **Model Builder** plans (No. 777-O.T.).

This Frank Zaic design flies well according to Persh, but not contest performance. The model climbs and glides to the right. Using 18 strands of 1/4-inch flat FAI rubber, the model gets quite high. However, the glide is something else! Jerry opines that a folding propeller would improve the glide, but this would detract from the authenticity of the design.

In closing, Jerry feels this Zaic model is simply great for sport flying. The model also looks outstanding with a blue silk covered fuselage and double tissue red wing and tail. It looks good and flies well!

Gus Munich, former head honcho of the Model Engine Collectors Assn. (MECA) now living at 24 Skipper Drive, West Islip, NY 11795, sent in a picture of a rarely seen model. (See Photo No. 13.)

The "Toughie" as designed by Art Gray was published in *Mechanix Illustrated* in 1943. However, this beautiful design has been authenticated as an Old Timer as three photos of this model appeared in the August 1941 issue of *Air Trails*.

Shown originally with a three-bladed prop, this model won plenty of beauty

awards.

Munich's rendition of the *Toughie* is no slouch either, as it is covered in attractive transparent blue Monokote. This shows off the elliptical wing with elliptical dihedral to good advantage. Of course, the whole structure is well constructed.

Gus says that he flies the model for sport only by three-channel radio control: rudder, elevator, and motor cutoff. Overall weight is five pounds. The Ohlsson 60 swings a 14-6 prop at 6800 which gives excellent thrust.

### **JB-3**

In the May issue we reported the Old Timer events at the Australian Nats and in the process showed a picture of a JB-3 captioned as a Wakefield design.

"Not so!" says Cor Burger, Boksdorlaan 20, 1185 E.C. Amsterdam, Holland. He goes on to say he was surprised to see a Dutch O/T in the column, but the information that the model is a Wakefield design is erroneous. The original model only spanned 36 inches with a weight of 100 grams: too light and too small for Wakefield! Cor reports that the designer was Jan Beremer of the famed prewar Rotterdam Aero Club (for models). Cor has built Wakefield designs from 1939 to 1969, so this should qualify him as some sort of an expert. He is now presently building O/T Wakefields!

### **SAM 35**

President Alex Imrie reports that SAM 35 continues to get bigger and bigger,

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and interest has now swelled membership to well over 800! A great diversity of interests is shown by modelers dedicated to Free Flight, Control Line, R/C Assist, Glider, Rubber, and Electric events. They have everything cooking that SAM has here in the USA!

As an example of the level of interest, over 100 vintage models were entered at the Model Engineer Exhibition. Needless to say, the SAM 35 O/T section was absolutely jammed with models.

Imrie has sent a series of photos, but we will only use one or two per month to stretch things out. Perhaps the most interesting picture is Photo No. 14 featuring a Bowden Contest (beginner's model) as designed by Colonel C.E.

Bowden. This design, which appeared in the immediate post-WW-II years, was built by Tony Penhall, complete to the P-51 like "radiator" that houses all the ignition system. Balance can be easily attained by shifting the radiator to suit CG requirements.

Our editor, Bill Northrop, will like Photo No. 15 showing Charlie Havis with a *Brooks Bipe*, a popular design around 1950. You don't see many vintage biplanes these days!

### SAM AUSTRALIA

The upcoming AMA Nationals at Reno is attracting a lot of Australian modelers after this writer's visit to the Nats in Australia. Guess they must have believed what I told them about the wonders of our Nationals!

One fellow, though, is not coming, and he is Max Starich. This quiet, determined fellow has been responsible for the present interest generated in Old Timers in Australia. However, contest-wise, he seems to have dropped into the background, but not to the extent that we don't know what he is doing.

Photo No. 16 shows Max Starich's granddaughter holding his latest recreation of the *Flying Aces Commercial*. Most surprising to most modelers is the series of *Flying Aces* models by Julius Unrath: with very few exceptions, all were good little fliers. Max can vouch for that!

### SPARK PLUGS

No, not "Plug Sparks," but the real things. With good spark plugs getting harder to find as time goes by, and the fantastic prices being charged, Leo Kelley, 512 East Bay Drive, Olympia, WA 98506, took it upon himself to inquire as to the availability of model spark plugs from Champion Spark Plug Co. of Toledo, Ohio. Here is what the Champion people had to say:

Dear Mr. Kelley,

Champion is interested in and concerned about the needs of any possible customer and your situation is no different.

We are constantly evaluating the potential of the miniature engine plug market and have not as yet found that its size warrants production of any meaningful quantity of product. Based on information contained in your letter, a request will again be made to determine

if production is warranted and profitable. Should the review be unprofitable, we will communicate with you.

In the meantime, we hope you will continue to use Champion products in all your automobiles and gasoline engine applications.

Sincerely,  
Donald R. Frich

Manager, Marketing Services

Well, that pretty well summarizes what this writer has been saying for the last 10 to 15 years. If someone wants to come up with some real dough and order 10,000 spark plugs, then Champion will make them for you. Biggest problem is the sales. Is there enough demand to warrant the gamble?

Anyway, don't say we didn't tell you what the situation is on spark plugs.

### 1/2A TEXACO POSTAL MEET

I have been receiving the Tri-City Newsletter which includes the news of SAM 1836 (San Antonio), wherein they have enthusiastically embraced the 1/2A Texaco event, both R/C and F/F versions.

With such interest, it was only natural that they should start corresponding with SAM 41 (San Diego) as they are quite 1/2A Texaco oriented. In less time than it takes to tell about it, a postal contest was organized for May 6. We are waiting for the next issue, as so ably edited by Jim and Nina Reynolds, for the results. How do you like 'm, Texas or California? Should be interesting!

### TAFT REVISITED

In last month's column, we featured quite a few photos taken at the SCAMPS Annual Spring Contest. While this writer was there, he was able to get quite a few good shots for you, the reader, to enjoy.

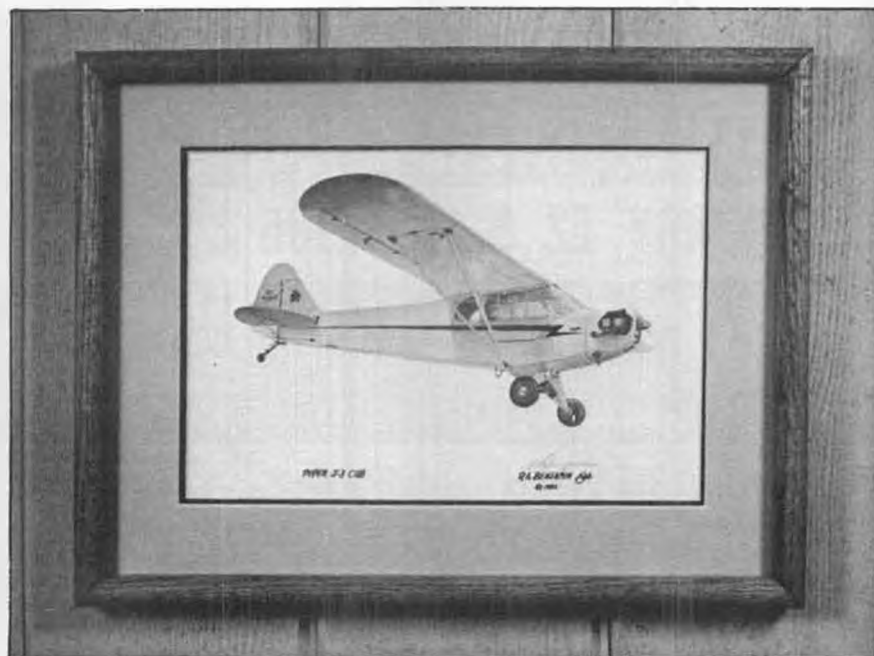
Photo No. 17 pictures Hal Cover, SAM 13, SCAMP member, with a McCoy 60 powered *Don Foote Westerner*. At the time this shot was taken, Hal was still checking the model out. Upon entering the model in the meet, it wasn't long before he hooked a real Taft boomer. Bye, bye! We do hope Hal gets his model back!

The percentage of recovery has been quite high in the Taft area, as the hills and valleys are dotted with oil pumps. Eventually a maintenance man will run into a model that landed in the area. Just the other day, one turned up for Fred Lehmborg after a year's absence. There's always hope! (See this month's "P&F&CT." wrf)

Photo No. 18 is of Carl Taylor who is always one modeler that goes in for the unusual. For years he has built FAI power jobs that are of canard form. He gets them to go pretty well! This pic shows him with a scaled-up *Pacific Ace* utilizing an .020 Cox engine for power.

Upon asking if he could fly the model in the gas-powered F/F events, this writer informed him that in Old Timers, we build replicas of old-time gas models using, as best as we can, the original ignition power. Then, too, the model has been scaled. Free Flight Old Timer rules strictly prohibit this, as there is no added weight of a radio set to carry aloft, where as scaling is allowed in R/C

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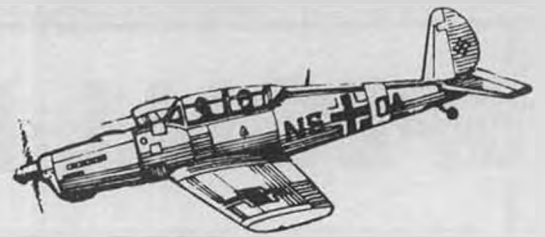
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So, don't let anyone tell you that you can fly a rubber model design in the gas events!

#### GHQ ENGINES

Everyone knows about the infamous GHQ engine, but darn few people know that this engine was derived from the good Loutrel engine as originally designed by Louie Loutrel.

It took a letter from James Wilson of Islip, New York, to remind the readers that despite the fact that GHQ was a cheap production engine, the Loutrel engine should not be put in the same class. Jim says:

*The original Loutrel engine which was made by Bill Bintlil was hand made in the back of a small store in Brooklyn. I know, as I put quite a few together and broke them in. This was always done for shipping, and they would not go out unless they had a scale pull of 7 to 7-1/4 pounds on a dolly.*

*I recently received a GHQ from one of the club members. I could not believe what had happened to the Loutrel in the transition to GHQ. No wonder it was a standing joke.*

*I know the Loutrels were good runners, as I flew many eight and nine-foot models with them.*

How about that men?

#### MARIN COUNTY FUN

SAM 26, which joined forces with the Marin County Flyers (primarily a rubber power flying scale club), announces through Tim Brennan that their Annual will be held in October, featuring the popular *Pacific Ace* event, a CO2 Old Timer event, a Flying Scale event, and Joe Ott Special Awards.

Last year, the Modelcraft *Pacific Ace* event drew 28 entries! Just read these rules and you will know why it is so popular.

1. The event is confined to the 30-inch *Pacific Ace* built per the plan outlines (beefing up is permissible).

2. Freewheeling props only; no folders permitted.

3. Unlimited attempts for three official flights. Three-minute "max" flights. Any flight over 30 seconds is official.

4. Event is to be flown on both Saturday and Sunday.

#### CO2 O/T RULES

1. Any Old Timer conforming to SAM vintage rules can be scaled to suitable size for CO2.

2. Any CO2 motor.

3. Maximum size tank is 3 cc. (Turbo-tank 3000 is acceptable with a single charge.)

#### RUBBER SCALE

This event is open to any rubber-powered scale model. There will be no limit on flight length. Judging will be on the "Mooney System." If the model is not available for judging on Saturday morning, low scale score will be given. Where ties occur, a flyoff will be held on Sunday.

In addition, a special trophy will be awarded to the highest placing Joe Ott flying scale design.

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Well, you got the dope on this one, be there! In case you get tired of winding up rubber models, there will also be the standard O/T Gas events, Class A, B, C, Antique, Texaco, 1/2A Texaco, and if entries warrant, an Electric O/T event. There's something for everyone!

#### THE WRAP-UP

With more R/C O/T contests than you can shake a stick at, especially in Northern California, it is inevitable that rivalries develop, particularly among the top winners.

Nicholas Nicholau, spark plug and editor of SAM Chapter 30, "The Fabulous Thirties" newsletter, reports that he received a phone call. The two top Texaco fliers, Don Bekins and Jim Kyncy, have made a bet (especially after the excellent showing by Jim at the West Coast Champs). The winner takes the shirt off the loser's back after the final results of the Salinas Area Modelers' June meet are known. Jim and Don are really going at each other. Bekins claims Kyncy is trying to use psychology on him. "It just ain't gonna work this time," claims Bekins. That's going to be a lot of fun to watch!

Nick also reports, "We all know that SAM 27 harbors a slew of cantankerous trophy thieves and Sunday School drop-outs who couldn't spell 'Anteek' even if they knew how to fly one. There is always one of those characters who can't resist a good, practical joke no matter how long it takes.

## ZENOAH G-38 QUARTZ



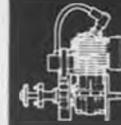
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"Nick Sanford at the Western SAM R/C Champs on Saturday, returned a pair of 1-1/2-inch wheels to August Fabian that he borrowed 55 years ago (yes, believe it or not, 55 years!). Nick admits that Nick Sanford is a gentleman, but didn't realize he was that old. Nick has a memory like Bill Merwin has dichondra seeds. Now if we (SAM 30) could get the rest of those characters to straighten up and fly right."

Now, how about that? More darn fun going on all the time! Next month, we will continue with Jack Jella and his S.A.M.A (Salinas Aero Modelers) Annual at their new field. Even the Southern California boys are coming up for this fun!



wing stall. Compare the stock *Pantera* with the stock *Sagitta 900* if you want to see a really noticeable difference in low speed stall characteristics. The *Pantera* will continue to "hang in there" with its nose high long after the *Sagitta* has rotated forward and gained speed. When the stab quits functioning at very low Rn (Reynolds numbers), the wing is still functioning and has quite a bit of pitching force to be counteracted, which results in the sudden nose dive on landing approach. The *Pantera* doesn't do this because of its increased tail volume (area and moment). The wings are virtually identical in every respect. It's the stab folks!

Strengthening the *Sagitta* fuselage in the way that Coulter suggests sounds like a good idea. Although I've never heard of this particular area of the *Sagitta* fuselage being a problem, Coulter's mod doesn't sound like it would make the fuselage noticeably heavier, and it would definitely increase its strength . . . so why not?

Flaperons were never meant to be deflected more than six or seven degrees. Their function is best used to change the wing's camber only, not become a flap or spoiler substitute. Drag is part of the reason. Any more deflection than what Coulter has described here will do a couple of things: 1) it will cause a tremendous pitching moment force which will have to be balanced aerodynamically by the positive lifting force of the stab (down stick . . . go too far and you will either run out of down elevator or the stab will give up!); 2) when the flaperons are deflected more than, say, 15°, the minute differences in aileron throw which are a result of normal turn commands just won't make much lift or drag differential between the wings . . . throws must be exaggerated . . . as Coulter has pointed out. You are much better off using flaperons only as camber changing devices for improved thermaling, speeding, or launching, and either use separate flaps (uncoupled from ailerons) as Dr. Quabeck does on his F3B ship, the *Dohle*, or use spoilers in conjunction with five degrees of positive flap (one-piece flaperon) as Ralf Decker does with his 1983 World Champs winning F3B ship for your spot landing or glide path control needs. Either system works very well.

Aileron differential is even more important with flaperons than with regular ailerons (there's SO MUCH MORE surface area being deflected!). I have an Ace Silver Seven too, and I love the selection of mixers that are available for it. The one that Coulter undoubtedly has is the Dwight Holley Mixer. I have one of these and will be using it with my *Antares*. Quoting from the Ace catalog: "This option was used by Dwight Holley on his *Gobbler* to help him capture the title, 'World Soaring Champion' in 1981.

"When it is added to the Mixer Option (11G505) it gives the following

capabilities, all done electronically at the transmitter: FLAPERONS, which combine the function of ailerons and flaps into two surfaces instead of the normal four. CAR, which couples the rudder to the aileron; the amount of rudder movement achieved when the aileron stick is moved is fully adjustable, it can be engaged or disengaged by the flip of a switch (included), and the trims remain independent. DIFFERENTIAL AILERONS, which allows adjustability of the amount of up versus down movement on each separate aileron surface by simply turning a pot, giving the ability to fine tune the plane for optimum turning performance with minimum adverse yaw."

One other thing that I have for my SS is a set of backup frequency modules for the TX and three receivers to match them. Changing frequencies is a five-minute proposition for me . . . much better than sitting around waiting for a crowded channel to clear! Hey, I'm getting off the subject here!

I'll have to go along with Coulter on his curiosity about the Selig S2027-145-83. I belonged to the club which developed the "thick wing controversy" as a biproduct of discovering that thick airfoils can be superior in some applications (launching, thermaling, ability to carry balast, etc). That club is the SFVFSF, home to Mike Bame (current president) and Ed Slobod (Pierce Aero Co., *Gemini MTS*). A few comments from Ed Slobod and Mike Selig would be in order here, (Note: Ed is also one of the US's few remaining wind tunnel model designers and builders at Hughes Aircraft.)

" . . . Regarding Mike Selig's 'improved' Bame section . . . I tend to be skeptical. If there is an improvement, it is probably less discernable than the difference between two *Gemini*s. Of course, I'm just guessing, and my appraisal is no more valid than a computer designed airfoil."

Maybe so, Ed, maybe so . . . but aren't you curious? I am! I still say that one of the best ideas the SFVFSF ever came up with was the L/D testing of various gliders at five o'clock in the morning using simple inclinometers (theodolites) to measure altitude as the plane flew measured laps. I'd really like to see somebody try a *Gemini* with two wings using the MB and MS airfoils and fly this sailplane through the traps. Maybe some day?

Now let's hear from Michael Selig:  
Dear Bill,

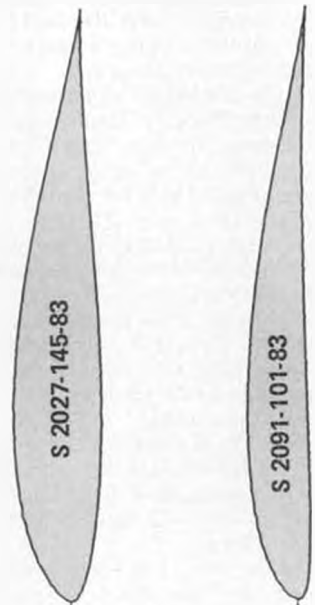
I'm finally getting a letter to you!

The airfoil business here is good. I have had several letters, maybe 60 in total. It seems as though people are mostly interested in thermaling type airfoils, although I've had several interesting letters relating to F3B, slope racing, and the general, "Give me your best . . ."

I would guess that approximately 35% of the letters are from California . . . you have their attention!

Although a lot of folks took the time and trouble to write to Michael Selig to obtain his coordinates, apparently few have reported back with any kind of

news about them. I have only heard of one such report. Somewhere in all my correspondence (I'm presently behind in that department), there is a letter from a group of guys who built a rather large cross country ship using the S2091-101-83 (March 1984 MB). The plane flew very well from their report.



X	Y	X	Y
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.99674	.00035	.99647	.00037
.98707	.00150	.98604	.00164
.97126	.00367	.96916	.00413
.94970	.00699	.94635	.00758
.92292	.01150	.91825	.01321
.89147	.01713	.88548	.01970
.85594	.02373	.84870	.02725
.81693	.03107	.80852	.03560
.77501	.03888	.76553	.04444
.73070	.04689	.72028	.05346
.68454	.05479	.67332	.06236
.63700	.06231	.62316	.07084
.58856	.06920	.57628	.07865
.53965	.07526	.52717	.08554
.49073	.08029	.47831	.09130
.44220	.08416	.43016	.09571
.39450	.08677	.38310	.09857
.34805	.08805	.33747	.09978
.30323	.08794	.29361	.09929
.26043	.08644	.25186	.09709
.22002	.08356	.21254	.09321
.18232	.07934	.17589	.08769
.14765	.07382	.14216	.08064
.11622	.06708	.11153	.07224
.08823	.05927	.08419	.06274
.06384	.05060	.06033	.05240
.04320	.04130	.04012	.04159
.02645	.03168	.02380	.03084
.01374	.02205	.01156	.01992
.00517	.01269	.00357	.00980
.00077	.00401	.00004	.00090
.00058	-.00312	.00228	-.00627
.00375	-.00864	.01078	-.01262
.01662	-.01315	.02476	-.01894
.03283	-.01845	.04378	-.02488
.05397	-.01844	.08752	-.03027
.08063	-.01936	.09581	-.03497
.11236	-.01939	.12833	-.03890
.14883	-.01873	.16474	-.04200
.18960	-.01750	.20467	-.04420
.23417	-.01581	.24773	-.04546
.28205	-.01374	.29350	-.04574
.33271	-.01142	.34154	-.04504
.38555	-.00894	.39139	-.04338
.43995	-.00643	.44256	-.04076
.49528	-.00398	.49465	-.03721
.55088	-.00171	.54723	-.03285
.60605	.00025	.59994	-.02792
.66005	.00182	.65225	-.02282
.71218	.00296	.70342	-.01790
.76168	.00367	.75270	-.01340
.80795	.00397	.79932	-.00946
.85038	.00391	.84257	-.00617
.88634	.00354	.88176	-.00360
.92140	.00295	.91625	-.00174
.94911	.00222	.94545	-.00055
.97109	.00144	.96884	-.00005
.98705	.00073	.98597	.00020
.99674	.00020	.99646	.00009
1.00000	-.00000	1.00000	-.00000

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Well, Coulter, thanks for writing, and I hope I've been able to answer your question regarding the Selig airfoils to your satisfaction.

### CONTESTS COMING UP RICHLAND, WASHINGTON

The 1984 Northwest Soaring Society Tournament is scheduled for September 15-16 in Richland, Washington. This is a very special thermal soaring contest in the Pacific Northwest.

The tournament started in 1976 by the Northwest Soaring Society (NWSS). The NWSS is a regional organization that includes all local clubs in the northwest. The very soul of its existence is its newsletter. The tournament was designed to bring together all the clubs for one big contest. The award is a very large traveling trophy that is passed on year after year to the present.

In 1979, the tournament was expanded to include another feature. This was the award of the NWSS Season Championship to the person who maintained the highest annual scoring average for that year. The contest was moved to the end of the season so that the award could be made in front of all.

An unexpected bonus has resulted from honoring the Season Champ at the Tournament . . . It gives everyone with competitive juices a try at beating the Season Champ one last time. Therefore, the Tournament Champion always has the great honor of beating the winningest person in the NWSS. Last year, we drew Alaskans, Californians, Alberta and British Columbia, Idaho, Oregon, and Washington. Bob Dodgson, Camano Island, Washington was last year's winner.

The NWSS tournament this September is open to everyone with an AMA license. You all are welcome!! Come fly with us.

Roy Anderson, NWSS Secretary, 1658 Cambridge Dr., Walla Walla, WA 99362.

The following announcement was received early enough to be included in this column, even though it is for an

October contest. I felt that this one deserved the extra plug, so here goes: 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.

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.

Phil wrote the following brief letter:

Dear Bill,

*We hope to see you here again this year. We expect to see 150 fliers. This should be enough info (above) . . . I loaned my copy of Model Builder out, and the guy lost it, so I'm going from memory as to what info you required. If you have room (I do, wrf), you might mention that we have overnight camping on the field and a bar-b-que Saturday night plus entertainment (belly dancers if we can get them again).*

*Thanks in advance for your help,*

*Phil Hill, assistant CD.*

If you or your club is planning a big bash, and you would like some advance publicity, let me know about it; I'll put your announcement in the column for all to see. Let's all help promote R/C Soaring! (P.S.: Remember the three-month lead time deadline!)

### FUTURE COLUMN STUFF

Next month, we will feature some exciting news from Dick Everett about Bob Champine's recent LSF Level V slope flight and Dennis Everett's recent Standard Class and Mod. Standard Class national records.

Also, Stan Watson's successful attempt to break the 20-second speed barrier, "officially." Not many US pilots have gone faster than 20 seconds in four-lap speed (FAI), and Stan is one of 'em.

Also next month, we will hear from Dave Pletz, the thorn in AMA's deserving flesh, and his report on the errors in the AMA rule book. Also, we will feature

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<b>DEPERDUSSIN RACER</b>		

a rundown of the new, provisional FAI event: R/C Soaring Cross County Racing which was approved by the CIAM last December (1983) by a vote of 14 for, one against, and six abstain.

If there's room, we will also feature some happenings from "down under." Maybe in the next two months I can catch up on all the good stuff that's been sent in!

Stay tuned, and go find a big thermal to park it in, OK? ●

### HLG Contest . . . Continued from page 33

worth more than that!) He put together an ad campaign through **Model Builder** which donated the space to the contest (as well as a free subscription and about three Uber Skiver knife sets). And he talked Bob Sliff at Hobby Horn into kitting the *Gnome* for lazy modelers, modelers in a hurry, or those who hate to scratch build. This kit, along with the *Tercel* kit from Kraft, and the *Zephyr* HLG plans from *Model Aviation* provided ample designs as a basis for the contest.

As the title of this story indicates, this contest was hosted by the Inland Soaring Society of Riverside, California. The contest was a one-day affair, June 3, 1984, held at the University of Middle School's athletic field, a field barely long enough for an F3B length winch line, but more than adequate for a hand-launch

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meet.

The contest itself consisted of four rounds of two tasks. The first task (and the first round) was a hand launch to a spot landing. The CD's rules were very simple, but strict: the contestant's landing would be disqualified if he or she made one complete 360° turn during the approach. This rule was intended to prevent anyone from thermaling to gain a longer approach to the spot. The spot was the center of a standard AMA 25-foot graduated tape. Each contestant was allowed two tries for his or her best landing to count. There were quite a few near-perfect attempts scored.

Rounds two, three and four were ten-minute time slots in which the contestant was allowed to make as many throws as he needed. The object was to clock the longest flight possible during the ten minutes. Ideally, one would throw at time zero point one and immediately catch a thermal for a 9:59 flight. This ideal never really came close to happening. Most flights were maxed at around six or seven minutes. This event was scored man-on-man in small, skill-matched flight groups.

One area that has me just a little puzzled is the fact that a contestant could either throw the model himself or have someone else throw it for him. This was instituted to help the beginner flier. Throwing a model with one hand while holding the transmitter with the other can lead to some free flight activity between the time of model release and the time of finger contact with the control stick. A beginner can really fumble here. My question arises when I think of one of the CD's reasons for limiting the span of the model to 60 inches... that being to prevent the more athletic types from entering with larger, more efficient aircraft, then out launching and out flying everyone. Well, they still out launched most people by a dozen feet or more with some of the best little gliders you ever saw. It didn't work out as planned in my opinion, in spite of helper/throwers for the beginners.

What's the answer? Well, I believe there shouldn't be any span limitation (the bigger they are, the harder it is to get a high launch). If someone only has a *Pierce Arrow*, *Gentle Lady*, or *Oly 650* to

enter, that's fine, let him. Beginners find these types of gliders much easier to fly than the flitty little 60-inchers. I believe a beginner has a slight handicap with something this sensitive to the control inputs or the whims of the winds. Let the more experienced fliers fly these little guys, they fly fine in their hands, and they are a lot of fun to horse around. As long as there can be designated launchers of the flier's choosing, things will be more-or-less equal in the launching department anyway. End of opinion.

The contest was a roaring success. (What I said above was meant *only* as my opinion, I heard nobody complaining about the rules or the way the contest was run.) Everybody had fun, and to a man or woman, they all said they'd like to do it again.

## AIRPLANES FLOWN

I was amazed at the variety of HLGs at this contest. Almost half of the planes flown were original designs or modifications of existing designs. Seven were *Flingers*, a new design by Larry Jolly and one of this month's feature construction articles. Five were *Gnomes* or *Gnome* derivatives. Three were Kraft *Tercels* (see July 1984 *MB* for review of *Tercel* kit). One was a House of Balsa 2x4, one was a *Son of Savage* slope ship, another one was a scaled-down *Bird of Time*, and there were two or three *Zephyrs*. The rest were original designs. These figures may not be precise because they are based on a quick, end of the contest scout of the field, and people tend to move around a lot taking their gliders with them, but a glance at the main photograph at the beginning of the article will confirm these figures as pretty close.

The winner of the contest is a guy who designed his own ship, Ed Depue. The ship is called "*Tossette*." It has a wingspan of 54 inches with a wing area of 315 square inches. The spar is 1/8 x 1/4 spruce with shear webbing out to the tips. It has a highly modified E-205 airfoil: turbulator strips instead of sheeting; and mild "undercamber" sanded in on the rear 50% or so of the lower surface of the wing. This last item increases the camber and lifting ability of the section. It worked nicely.

The *Tossette* weighs 8.2 ounces for a

wing loading of only 3.75 ounces per square foot. This is a result of judicious use of carbon fiber reinforcing, a Cannon Super Micro receiver system, and lightweight balsa. According to Ed, he has rebuilt the model twice as the result of some hard knocks and general use. This model was not new at this contest having been flown for two or three months prior.

Second through fifth were taken by the *Flinger* design and the following pilots: Dennis Brandt, Larry Jolly, John Brown, and Jimmy Brandon.

The *Flinger* has a wingspan of 57 inches, an area of 330, an average weight of 12 ounces, and an average wing loading of 5.2. The airfoil is an E-205. D-tube sheeted with 1/16 balsa. The spar is 3/32 x 3/16 spruce and is shear webbed out to just beyond the polyhedral break. The *Flinger* is winchable this way, but the designer recommends 1/8 x 1/4 spruce spars for best results. (The difference in weight is only about six grams anyway.)

Performance of the *Flinger* is very good. The L/D this ship has is excellent. It is (in my opinion) not a floater, so it appears to want to be flown a little faster than most in a thermal. This may be due to its wing loading and the unturbulated, unaltered Eppler 205. It is fully aerobatic (as much as a poly ship can be), and is a very sturdy plane.

Dennis Brandt flew a beautiful *Flinger* to second place. Its color scheme is yellow, black, and white, and it is visually very striking.

Dennis was in the lead going into the final round, but brought his plane down early in his last flight from an easy 700 feet up and climbing because he heard someone tell him to. Nobody can figure it out, but it was very likely his timer or spotter. You see, in a man-on-man contest like this, if someone hooks a really good thermal (like Ed Depue did in the last round) and skies out with it for 9:36, as Ed Depue did, then anyone who gets a flight time around three or four minutes gets buried. Unfortunately for Dennis, who was trying not to bury fellow club members and *Flinger* fliers John Brown or Larry Jolly in the last round (same heat as Ed), his well-meaning "voice" in the background was unaware of Ed's flight time or position in the sky. Ed's airplane is all white... and in the Riverside, California, smog, it fairly disappears in the haze. So, as a result, Ed buried the "team," and Dennis fell from first place to second. So much for teamwork. Congratulations Ed.

In order to prevent teamwork like this from practically guaranteeing a block win for the good fliers next year, the CD has decided to provide timers for the fliers instead of having them choose one for themselves. I would go a step further and make it a different thermal task also. I think that a format where the most two-minute maxes in a ten or fifteen minute time period determines the winner would minimize or eliminate the nine-minute, bury-them-all flight under the current rules.

Frank Green came all the way from Albuquerque, New Mexico, to fly in this contest . . . well, to be completely honest, he planned a business trip around the contest. Frank was there with two sailplanes, a Kraft *Tercel* and a Bob Owens *Zephyr*. The *Zephyr* was chosen as his primary ship for the contest because the *Tercel* was very new, and at that time, practically unflown. Frank was more comfortable flying the *Zephyr*.

Frank took sixth place behind Jimmy Brandon (fifth), John Brown (fourth), Larry Jolly (third), and the two leaders, Dennis Brandt (second) and Ed Depue (first).

The *Zephyr* has a 52-inch wingspan, Eppler 387 airfoil, seven-inch root chord, and a ten-ounce weight. As I said before, the plans for this HLG are available from *Model Aviation*.

Greg Auman, Jr. placed seventh flying a *Gnome*. This model was designed by the contest CD, John Lupperger. It has a very unusual and noteworthy design element: the airfoil is derived by taking a true Eppler 205 airfoil and adding the 1/32 balsa sheeting and cap strips to the top and bottom. This thickens the airfoil from approximately 11 percent to approximately 12. The result appears to be a more forgiving airfoil, one that is slightly less prone to the "funnies" at low speeds, and one that seems to handle a little better too. Of course, this is the opinion of only two people who have flown these little HLGs equipped with these two airfoils, and there are so many variables in this comparison that these results may not always hold true. Nevertheless, it is interesting to know.

There were two versions of the *Gnome* at the contest which differed from each other in one design area: the stab. The original model calls for an all-flying stabilator, where the kit version marketed through Hobby Horn has separate stab and elevator. Both fly fine.

Next in line in the standings was Jim Brandon, father of the previously mentioned, fifth place Jimmy Brandon. Jim flew a *Flinger*.

John Lupperger placed just behind Jim Brandon flying (what else?) a *Gnome*. John managed to CD the contest, with help from the Inland Soaring Society club, AND get in all of his rounds. This is a lot easier to do in a HLG contest than a regular thermal soaring contest because of the fewer organizational headaches (lack of winches, primarily). Scoring was easily accomplished in the ten minutes between rounds. You AMA CDs should take note of this!

Tenth place belonged to Curt Hurley when the smoke and dust cleared. Curt flew an original design called the *Cuda*. Its wingspan is 51-1/2 inches; it has a six-inch root chord, Eppler 205 airfoil, D-tube construction, spruce spars, and an all-up weight of 12-1/2 ounces. The fuselage has 1/64 ply doublers, Futaba receiver, and World 22A servos.

Curt also has an aileron wing for this design which he actually flies more often. Curt is primarily a slope flier. He figures that he has about 300 hours of

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stick time on the slope and only 15 minutes of stick time over flat land. It was interesting to note that Curt wasn't the only slope flier at this contest as there were at least a half-dozen others who had either never flown thermal before or were flying in their first thermal contest with very limited experience. I would guess that slope fliers just prefer to avoid launching equipment expenses and hassles, that's why HLG events attract them.

Well, those were the top ten fliers and their rigs. My apologies to Larry Jolly, John Brown, Jimmy Brandon, and Jim Brandon for only mentioning their names, but they all flew *Flingers* as did Dennis Brandt, and that glider was well covered.

Ed Depue had the longest flight of the day at 9:36. He was followed by a guy who had never flown thermal before, Seijo Oi, who logged a 7:05. Larry Jolly had the third longest flight at 6:37.

I saw several other unique original designs at the contest. The one that stuck out in my mind the most was Allen Guthmiller's elliptical wing glider. Allan came from Las Vegas, Nevada, where he is a student at the University of Nevada, to fly this model which looks like a scaled up indoor model. He covered the wings with clear Monokote after painting the entire framework with green Aerogloss dope. The effect is quite beautiful.

Summarizing the model, we would like to note that its wingspan is 48 inches, wing area is 450 square inches, root chord is 12 inches, aspect ratio is 5.12:1, and the airfoil is an eight percent thick semi-symmetrical original design. Wing incidence was set at one degree.

This model proved very good at thermaling in light lift and no wind; after the end of the second round, Allan was in third place. However, the model's 4.8-ounce wing loading proved a little light in the breeze which came up in later rounds. I wonder how he would have done in the contest had he tried a little ballast.

Other facts about this glider were: a carbon fiber arrowshaft tail boom; 450 mah battery pack; World servos; rudder only turns were nice and flat (no ele-

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vator needed); very stable flight; small Sullivan cables inside tail boom . . . and that's about it.

Bob Davis of Yucaipa, California showed up with a scaled down *Bird of Time (BOT)*. You could say it was a "Micro-BOT." The wingspan was the full 60 inches. I believe that he told me the wing area was 315, but I'm not really positive about this figure (I lost the piece of note paper it was written on). Anyway, this figure is very close to what it should be by looking at the model.

Bob uses a Futaba receiver, World S22 servos, and a 100 mah battery pack. The total weight of the *M-BOT*, ready to fly, is around 20 ounces.

Craig Eversole of Long Beach, California, who is also an avid slope flier, brought his *Skywalker* look-a-like, which he hasn't named yet. Like the *Skywalker* (which I am still hoping **Model Builder** can get from Dick Vader as a construction article), it features a Jack Chambers airfoil and a solid sheet wood wing. Actually, the model was flown with only one wing, but Craig has two wings which he uses on the same fuselage. The wing that he used for the competition had a five-inch root chord and 59-inch span. For slope flying, Craig prefers his 50-inch, six-inch root chord version (basically a *Skywalker* wing). Craig admitted that neither wing was particularly well-suited for flat land HLG.

One last design to cover, then we'll

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wrap it up.

Russ Jackson is making a comeback in our hobby after a six to eight-year leave of absence. He entered his first-ever contest at this first annual event, and although he didn't do too well by his own admission, he had a lot of fun. Russ has been active in F/F modeling in years past, so he knew how to build already. The model he designed for this contest was based on the Kraft *Tercel* wing. The fuselage is basically a pod with an arrowshaft tail boom. The empennage is V-shaped rather than the more usual upside-down T. The model weighed 11 ounces and flew quite well.

I think that we will see more of this kind of contest in the future, both here and in other countries, most notably England, because of the strong appeal of this kind of action-packed, physical competition. HLGs are a highly visible, attention-grabbing activity that both modelers and non-modelers alike become curious about. Just last week the club which I belong to held a HLG contest on a Wednesday evening at 6:00, during which a young observer and his mother stopped by and started asking the usual "how much does it cost" type questions. The HLG gliders were what this kid was interested in the most, not the two-meters, nor the Standard Class airplane, nor the cross-country *Comet* (14-foot wingspan) which were on the field. Why? Because HLGs aren't intimidating. They look easy to do. People can relate to throwing a small glider around like they can't relate to a winch. Every-

body has thrown paper gliders, right? How much harder could this be? Well, everybody has to answer that question for themselves, and in order to do that they have to start building. The more people we can start building HLGs, the more people we will have in the hobby . . . which will benefit all of us! So get yourself started on a HLG (like the *Flinger* elsewhere in this issue) and start recruiting!

The Second Annual ISS Hand Launch Glider contest is scheduled for the first weekend in June 1985 at the same field. Watch for future announcements in the model magazines. ●

Counter . . . . Continued from page 11

The Robbe® ASW-17 (order No. 3107) is a beautiful, high performance glider designed to appeal to the intermediate, as well as the more advanced glider pilot. The high degree of prefabrication will please those who prefer flying to building.

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Specifications for the *Super Cub* are: wingspan, 82-1/2 inches; fuselage length, 49 inches; and flying weight, approximately 10 pounds.

For further information regarding these or other Robbe products, contact Robbe Model Sport, 55 The Office Center, Suite 345, Plainsboro, NJ 08536, or see your local Robbe dealer.

★ ★ ★

If it's fiberglass cowls, wheel pants, or fairings you need for your scratch-built or semi-kit airplane, you owe it to yourself to check out what's available from T&D Fiberglass Specialties, 30925 Block, Garden City, MI 48135, (313) 421-6358.

What's new at T&D? Looking at the photo, from left to right, we see the following: a cowl for the Precedent Models (England) Stampe SV-4-B with oil cooler; a cowl and proper oil cooler for converting the above model into an SV-4-C. Thirdly, we see the cowl for the Precedent *Champ* which will cover the Quadra engine. Fourthly, we see the replacement cowl for both the Jim Messer and the Great Planes *Tomahawk*. Number five new product is a cowl for the Pilot *Diablo* (wheel pants also available). Lastly, we see the replacement cowl for Air Tech's Spinks *Acromaster* (also available with an improved set of wheel pants).

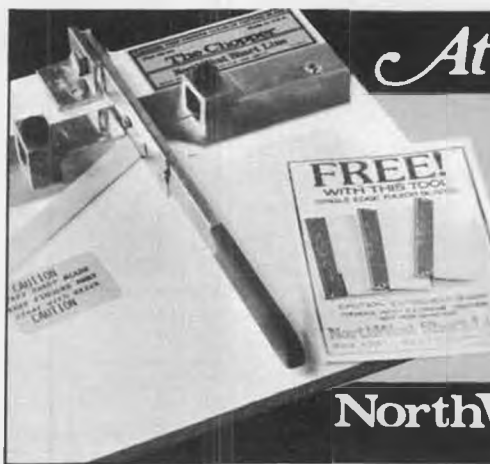
As you might guess, these are by no means all of the fiberglass parts offered by T&D; send \$1 for the complete catalog. Send an SASE for prices on the above mentioned parts.

★ ★ ★

Lew Gitlow of Indoor Model Supply, Box C, Garberville, CA 95440-0039, (707) 923-3500, has a deal for you! The revised edition of Ron Williams' classic book, *Building and Flying Indoor Model Airplanes*, is now available. It has 272 pages, over 300 illustrations, and weighs one and one-half pounds. It contains numerous full-size plans for the avid Indoor modeler.

Beginning in the month of August, IMS will begin shipping this fine book, boxed and postage-paid, along with two free plan sheets of the IMS *Easy B*, for only \$14.95. For \$20, IMS will include either a *Slow Poke* or *Easy B* kit. A free 16-page catalog is sent automatically with either order.

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## NorthWest Short Line

BOX 423 SEATTLE, WA 98111

World Engines has three new engines to tell you about this month! The Zenoah G-23, the SuperTigre S-29, and the SuperTigre "Bull Ring" 40.

Based on the popular G 21/40-46 Series of SuperTigre engines, the new "Bull Ring" 40 offers the power of Schnuerle porting in a compact case and at a very economical price. This new, ringed engine sports double ball bearings on the crankshaft, a proven Mag V carburetor, and a generous heatsink head, making it ideal for helicopter usage. Included with the "Bull Ring" 40 is a large expansion chamber muffler, identical to that used on the S-40/45.

The SuperTigre "Bull Ring" 40 is an excellent choice for the modeler who is seeking both good power and an economical price in a .40-size engine.

The SuperTigre "Bull Ring" 40 is available exclusively from World Engines.

The new S-29 is the latest addition to SuperTigre's totally redesigned "S" Series of model airplane engines. The "S" stands for Schnuerle porting, and the S-29 is based on a new crankcase design. The crankshaft is supported by double ball bearings and drives a piston with a single, pinned ring inside a chromed sleeve. The S-29 employs SuperTigre's proven Mag IV carburetor and has a very generous set of cooling fins on the head. This added cooling power means that the S-29 can be used for helicopter applications without any added heatsink.

On 5% nitro fuel with the stock muffler, the SuperTigre S-29 turns a 9x6 Rev-Up prop at 13,000 rpm. Its compact size allows it to be used in place of most .20-.25 sized engines, yet it is powerful enough to fly many .40-size models easily. The S-29 is also an excellent choice for *Crocket*, *Playboy* and *Baron 20* helicopter pilots.

The SuperTigre S-29 is available exclusively from World Engines.

The new Zenoah G-23 model airplane engine is a compact yet powerful gasoline ignition engine that fills the gap between large glow powered engines and the two cubic inch plus chainsaw engines now being marketed for large scale model airplane usage. Its small size allows it to be mounted in the Sig 1/4-scale Piper J-3 *Cub* cowling with no



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cutouts.

This engine comes from one of the oldest manufacturers of full-scale airplane engines in the world. Technical features of interest include pointless magneto spark ignition, a strong die-cast aluminum crankcase with built-in firewall radial mount, a Walbro carburetor, an aluminum piston with two compression rings in a chromed cylinder bore, and oversize cooling fins on the cylinder head. A closed-end expansion muffler is available as an optional part. The bore is 32 mm and the stroke is 28 mm. Weight is 2.53 pounds. The G-23 is very easy to flip start by hand, as proven by the fact that World Engine's Harry Roe could start an engine that had been left in near zero degree weather eight times out of 10 on the first flip with no difficulty. It also offers the economy of gasoline as opposed to glow fuel.

The Zenoah G-23 is an excellent choice for the large scale modeler searching for a powerplant for one of the 1/4-scale lightplanes (Piper *Cub*, Taylorcraft, Stinson) that have become staples of the movement to "BIG Birds".

The Zenoah G-23 is available exclusively from World Engines, 8960 Rossash Road, Cincinnati, OH 45236. It retails for \$199, add \$29.70 for G-23 muffler.

★ ★ ★

John Pond Old Time Plan Service, P.O. Box 3215, San Jose, CA 95156, (408) 292-3382, has just released *Vintage Engines of Yesteryear, Volume 1*. This three-ring notebook is full of classic

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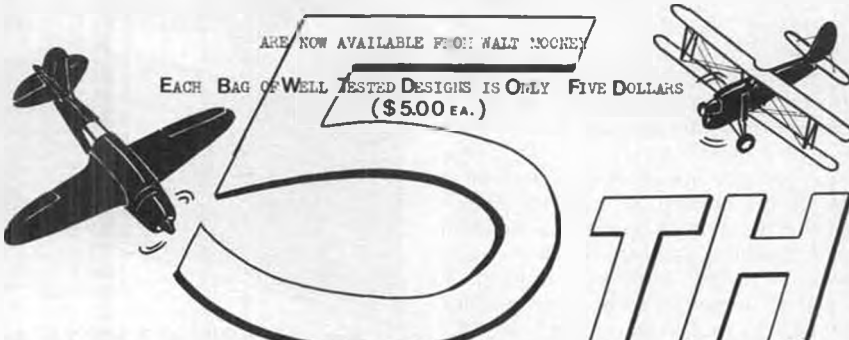
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engine three-views and summaries concerning facts, figures, and histories, of same.

If you are into engine collecting, modeling history, or SAM competition, you are going to want to have this publication on hand as a reference tool. If you follow the "Engine of the Month" section of John Pond's "Plug Sparks" articles in this magazine, you have seen reduced-size versions of Allen Pond's excellent engine three-views, 52 of which appear full-size in this first of two volumes. Reprints of John's write-ups appear on the flip side of each engine three-view for easy reference.

For further information and/or price, call or write to John Pond at the above

phone number or address.

Applied Design Corp., 738 Penn St., El Segundo, CA 90245, has several handy cutting and shaping tools for the model builder.

Whether you are in the market for Mini Sander sanding tools, self-adhesive sandpaper, Tee Bar sanding tools, or Mini Saws, ADC has what you need.

The Tee Bar tool is a T-shaped aluminum extrusion sanding block for use with Ruff-Stuff self-adhesive sandpaper. It comes in two sizes: 11-inch and 22-inch. Both are handy to use, will never wear out, and have large, true surfaces.

Do-it-yourselfers will like the new Ruff-Stuff self-adhesive sandpaper sheets (9 in. x 11 in.) which can be made into custom sanding blocks of any shape. It adheres to plastic, metal, glass, rubber, finished wood, or any clean, nonporous surface. Just cut to shape, peel off the backing, and apply . . . instant adhesion is assured.

The Mini Saw is a compact, 10-inch hack saw with a rugged, die-cast frame and comfortable, chip-proof plastic insert handle. The receding nose and adjustable, six-inch blade gives good work access. Cuts hardened music wire, wood, plastic, and metal.

Contact ADC at the above address or see the ADC ad in this issue of **MB** for further information.

Power fliers who like to keep their

birds clean and who like to protect their fingers while hand-starting model engines will want to know about two new products from Mod-Ler Company, P.O. Box 70, McKee, KY 40447.

The first is a powdered chemical model cleaner called, appropriately, Model Kleen. When mixed with water, a two-ounce package of Model Kleen will make a full gallon of solution which will keep indefinitely. Just spray on Model Kleen over your fuel-soaked model and wipe away the residue with a clean cloth rag or paper towel.

Secondly, Mod-Ler is now marketing finger guards for flip-starting model engines. Prop Stoppers are tough, flexible vinyl sockets which fit over your fingers like little gloves and fit easily in your pocket when not in use. Prop Stoppers are cheap insurance when it comes to saving your fingers.

Model Kleen sells for \$1.98 per two-ounce package (makes one gallon) and Prop Stoppers sell for three for \$1.50 (small, medium, large sizes to fit all finger sizes). Send SASE to Mod-Ler for its complete line of hobby accessories.

Dumas Products introduces the new V-bottom Mach 3.5 race boat for the .21 cu. in. engine size Monohull Class.

This high speed Mono has a 30-inch length and 11-inch beam, with fiberglass hull and deck already joined. (Engine and radio not included.) The new MACH 3.5 is now available: Kit No. 1431. This model will also be available in a larger size for 7.5 engines.

For further information, write to Dumas Products, Inc., 909 E. 17th St., Tucson, AZ 85719.

Much attention has been given to the proper care and feeding of Ni-Cd batteries, but the poor motorcycle battery or gel cell in the average field kit gets nothing but abuse. It is either allowed to go dead due to undercharging, or is boiled dry by overcharging. Winter storage is also a hit-or-miss proposition which destroys many of these batteries.

Now CaRa Products has a unit which will eliminate all of these problems and insure a fully-charged but not over-charged battery at all times, whether the next flying session is the next day or six months later.

This unit charges at a fixed rate until the battery reaches its fully-charged voltage (which is adjustable to match each individual battery), then shuts itself off. It checks the battery 120 times per second and turns on and off as required to maintain the fully-charged condition within a few hundredths of a volt. It costs only pennies per month in electricity and so can be left connected at all times. This will dramatically increase the life of the battery, as well as providing the convenience of being ready to use at all times.

The unit carries a lifetime limited warranty against defects in materials or workmanship, and even if damaged due to abuse will be repaired for a maximum charge of \$10 plus \$2 return shipping.

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One glance through our new catalog will prove why Byron Originals is recognized for quality the world over! And since one picture is worth a thousand words, we have packed this catalog full of not only color and black and white photos, but highly descriptive illustrations as well.

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The standard model is for the normal 12-volt battery, but 24-volt models are also available. Please specify which is desired when ordering.

The list price of this unit is \$39.95, but as an introductory offer, it is available for \$29.95 plus \$2 shipping and handling direct from CaRa Products, P.O. Box 221, Canton, SD 57013.

Dealer inquiries are also invited.

★ ★ ★

Blast off into space with the Mighty Missile. Watch the yellow parachute open and bring the nose cone floating gently down to earth. The Mighty Missile is 31 inches tall and two inches in diameter, and made of sturdy fiber tubes. When you slide the inner tube against the end of the outer tube, you compress the air which causes the nose cone to blast off with a loud bang. It's also fun to use as a target pop-gun. It's furnished with 42 colorful emblems so each Missile can be custom decorated. It is available from Royal Sunshine Industries, Inc., P.O. Box 83, Palm Beach, FL 33480. It is made completely in the U.S.A. by happy people.

★ ★ ★

Thompson's Vintage Era Race Plane Classics<sup>®</sup>, 219 White City Blvd., Springfield, IL 62703, introduces its new *Miss Champion* Laird-Turner racer (1939 configuration).

Model specifications are: wingspan, 76 inches; wing area, six square feet; weight, 20 pounds; length, 72-3/4 inches; and stabilizer span, 28-1/2 inches.

The *Miss Champion* comes as a three-sheet plan set for \$27.96. Plans are shipped rolled, and are each 42 inches by 96 inches.

Build and fly a replica of one of history's most famous racing planes from the Golden Age of flight.

★ ★ ★

L&K Water Sports, 3564 Avenida de las Palmas, Tucson, AZ 85730, (602) 296-1193, has just released its newest products, the L&K 20, 40, 60, and 90 Hydros.

After a two-year research and test program, L&K developed a canard hydro design that is very easy to build, set up, and race. L&K claims that this canard design is much more stable than any other hydro. All sizes are constructed of Lite Ply and balsa. They are all lightweight and strong . . . which means they are also very, very fast.

The kits come with pre-cut wood parts, sponsons that are sanded to shape, and pre-bent aluminum support rods. If you desire a prebuilt kit, L&K can supply you with one.

Call L&K for prices.

★ ★ ★

**When contacting manufacturers featured in "Over the Counter," tell them you saw it in Model Builder!**

**Engines . . . . . Continued from page 28**

produced, and will be covered in later Micron engine articles.

The Micron engines produced today

are far different from the extremely rare test engine shown in Photo No. 1. Today they are considered to be among the highest rated engines in appearance and in manufacturing excellence.

A fine series of opposed, inline, multi-cylinder engines is prized by collectors around the world. However, in late 1983, the factory did produce a limited edition of only 20 reproduction engines similar to the 5cc model shown in Photo No. 1 . . . at roughly \$125 each! They copied a slightly later model that used the new, fine, five-piece needle valve assembly and incorporated a spring-loaded plunger system to shut off the fuel supply with a clockwork timer. This slightly later model was the first mass produced Micron engines.

Photo No. 2 is a close-up of the left mounting lug . . . and here the casting crudeness really shows up. Remember, this was the beginning! Of major significance is the stamped date which indicates March 27, 1941, as the date of this engine's manufacture.

Photo No. 3 shows the crude, semi-tapered needle valve that was discarded. The photo also shows casting "pock marks" characteristic of the small, crude sandcastings of that era.

This extremely rare engine is valued at 1500 French francs today . . . about \$200 (minimum).

In 1983, this engine was removed from a large, seven-foot free flight model that was made from thin sticks of hardwood, and covered in very light fabric. It had a large, hand-carved propeller that has



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Nick and his P-40 "Warhawk"

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P-51 "WARCAT"	2 1/4" = 1"	88" Span	\$27.00 p.p.	U.S.A.

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**Nick Zirolli**

29 Edgar Drive, Smithtown, N.Y. 11787 U.S.A.

stayed with the model, which was called *The Wren*. The prop was painted with brown paint AFTER it was put on the engine... so some of the paint is still on the nut and the prop shaft. The model was NEVER FLOWN... this engine has never been in the air.

I acquired the Micron 5cc through an R/C pen pal in the north of France. Rather than being in my "Engines of the World" collection, I have a somewhat "inner feeling" that this particular engine belongs in the world famous Louvre Museum in Paris!

### RATINGS

To rate a handmade, homemade model plane engine of this stature in terms of appearance, excellence of

manufacture, and performance would be grossly unfair... this was the beginning!

### MG-2 . . . . . Continued from page 25

own fashion, leaving them up to the individual builders. If you run into any unsolvable problems, contact us and we'll either give you an answer or pass the problem on to Mike.

If you did not see the SAM SPEAKS article, we can tell you that the original MG (you don't need an explanation of the initials, do you?) was a cabin model, first built in 1935. After a mistrimmed flight in 1936 that ended in a collision with a car, the model was rebuilt into a cabane strut version that served as a prototype for the MG-2. It certainly is one of the prettier OT designs, and it flies as well or better than it looks.



### Free Flight . . . Continued from page 51

### MYSTERY MODEL WINNERS

No question that the earliest post-

marked answer (including handicapping) to the November 1983 Mystery Model was correct. It was the designer himself, Bob Hawkins, of Peoria, Illinois, who was the first with the mostest! The name of the model was simply "Jetex Free Flight".

F.D. Wolfe, Fort Worth, Texas, was first to identify the "Fortastrop" as December 1983's Mystery Model. One writer sort of thought it was the "Bootstraps". Similar name, but that's all, because "Bootstraps" was R/C, and from Berkeley! Can someone name the designer? Our source didn't include this information.

Another Fort Worth Texan won the January 1984 M/M quiz. It was Ed Turner who named it as the "Taltos" (Pegasus), by Erno Frigyes.

A frequent Mystery Model contestant, Terry Rimert, of Baldwin, Florida, was the first of many, many correct answers to the February '84 mystery. It was indeed, the late Paul Del Gatto's "Flying Ballooney", a valiant attempt to control the usually comical exhaust thrust of a simple rubber balloon.

For the March Mystery Model, Dr. Gene Smith, Jr., Stillwater, Oklahoma wrote, "My MB came in the mail 15 minutes ago. I can't get any faster than that!" Well, Gene it was fast... and correct enough. It was John Winter's "Queen of Hearts".

April's Mystery Model, Gary Christiansen's "Perdido", was first identified by Martin Bradshaw, of Placitas, New Mexico. It was published in the April 1955 issue of M.A.N.

Bill Haught, Cincinnati, Ohio, dropped us a postcard with the correct identification of the May M/M. It was Ken Ernest's "Supersonic", as seen in Frank Zaic's famed Yearbook for 1953. Cor Burger, of Holland also sent us an answer on this one, but there was simply no reliable way to figure the handicap!

Another regular M/M contestant, who has won so many times that his subscription must presently expire in the 21st century, is Rudy Kluber, of Lakewood, Ohio. He just extended his subscription again by naming the June '84 model as the "Skyfire", featured in the April 1953 issue of Flying Models, and designed by Earl Cayton.

Sooner or later we get a tie, and this time it's with the July '84 M/M, which brings us up to date. Tom Cope, an Old Timer nut from Issaquah, Washington, and M.R. Halsey, Jr., of Albany, Oregon, did it to us. They both correctly, and on the same day (sorry, there's no A.M. or P.M. on the postmark) named John Tatone's "Frisco Kid" as the July Mystery Model.

Now that we are up to date, we hope to continue with monthly results instead of allowing the answers to accumulate. Next month we'll have August's winner(s), in November it'll be September's winner, and so on.

To those newcomers who may not understand, and to the regular readers

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**WOULDN'T IT BE NICE IF . . .**

We'll close out this month with a thought provoking piece by Marlin Kinning, editor of "The Corsair", newsletter for the Joint Military R/C Flyers Club, of Oceanside, California.

**"RC NEEDS A SPOKESMAN"**

"The R/C hobby is in need of something other businesses and industries have successfully used for decades . . . an articulate and credible spokesman. Take the California wine industry for example.

"One of the first American vineyards to offer a well known spokesman was Paul Masson, whose wine many of you may have tasted for the first time only after Orson Welles persuaded you to do so. Welles' reputation as a connoisseur gave Paul Masson more credibility than it could ever have earned on its own merits.

"If Orson Welles can sell inexpensive California wine before its time . . . and convince the American public that he actually likes it . . . then certainly the R/C hobby industry can put together an argument of equivalent persuasion and find a spokesman of similar caliber to demonstrate to the public that R/C is fun; and that every red-blooded citizen should try it at least once.

"Imagine! If such a campaign was super-successful, someday we would be able to watch the NATS on the Wide World of Sports; or, instead of the Isuzu-Andy Williams San Diego Golf Open, this same sponsor may air the big one.

"How would you like to turn on your TV set in 1990 and hear the announcer say: 'Good afternoon, ladies and gentlemen. Welcome to the 1st annual Isuzu-R/C Miniature Aircraft \$400,000 International Championships, live from Las Vegas, Nevada.'

"Far fetched? Not if we can produce the right spokesman, because, like that well-known wine was until recently, R/C is behind its time.

"But who do we get to speak for R/C? It's too bad Andy Rooney is not a flyer. We'd not only get a few laughs but a whole lot of attention as well. John Wayne and Elvis are gone. There has to be somebody out there somewhere who has movie star status or who is some sort of national figure.

"How 'bout it R/C Industry? If you can get Orson to drink enough wine, maybe he'll consent to make R/C a famous sport ranking way up there with pool, bowling, or golf. But if the number one choice has a previous commitment, here's a sample ad to try:

**HELP WANTED: BRIGHT, ARTICULATE RESPONSIBLE INDIVIDUAL TO BE SPOKESPERSON FOR R/C MINIATURE AIRCRAFT PUBLIC RELATIONS CAMPAIGN. R/C EXPERIENCE MANDATORY. THE RIGHT INDIVIDUAL WILL BE ATTRACTIVE (i.e., LOOK LIKE EVERY MOTHER'S SON OR DAUGHTER), MATURE AND POSSESS A SINCERE ENTHUSIASM FOR THE HOBBY. MUST BE A NATIONAL FIGURE, INSTANTLY RECOGNIZABLE. INTERESTED PARTIES SHOULD CONTACT, uh . . . uh, CONTACT, uh . . ."**

who may have forgotten, here's how we determine the winners.

1. The Postmark on your card or letter determines the time of your answer . . . not when it arrives, or what day you write the answer . . . only the postmark.

2. To that postmark we apply a handicap, based on the distance to your address, in postal zones, from the single mailing point in Virginia, where the magazine is printed. (Bet you thought it was mailed from Costa Mesa.) Those in the eighth zone have no correction added, those in Zone Seven have one day added, those in Zone Three have five days added, etc.

As variable as postal service is known to be, there is no perfectly fair handicap,

but this one is about as accurate as possible.

Boy, Stalick, you really started something!

**Workbench . . . Continued from page 8**

which works nicely. He's had some excellent "back-yard" flights on 400 turns, but has not cranked in full turns with a winder because of space limitations. He'll now add landing gear strut fairings, and other details.

Tom's other model, of which he sent photos, is a 30-inch span Fairchild 24, built from a Seaglen kit. It has put in several 40 to 50-second flights.

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and short wheelbase make it perfect for wheelies, spinouts, donuts, figure eights, and uphill climbs... Wild Willy was engineered to do it all. From asphalt to mud, from sand dunes to rocky slopes, Wild Willy takes them in stride. ■ **STUNTABILITY**...

It's all in the engineering... technology that only MRC-Tamiya could create. We've given Wild Willy an ability for super, quick acceleration beyond conventional off-road cars. And we've coupled this with a front wheel independent suspension, four ball bearings, long trailing arms and differential gear on the rear axle. It adds up to stuntability you're going to love. Then, to make sure this wild buggy keeps its balance, we engineered spring wheelie casters to keep it right side up while it's hotdogging through the boonies. But just in case, we had a strong roll bar built into the rugged chassis to keep Willy in one piece. ■ Wild Willy... engineered, conceived and built to be the first, high performance, off-road stunt buggy ever made. It's pure pleasure. Go for it.



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