

# MODEL BUILDER

JUNE 1982

\$2.50

volume 12, number 125

ICD 08545





# Soar into the world of silent flight...

## with Top Flite's **Metrick** 2 meter R/C sailplane

Soar with the **Metrick**, Top Flite's 2 meter radio-controlled sailplane. This is *the* sailplane that's docile enough for the novice yet offers experienced pilots a superb competition machine.

Scott Christensen, co-founder of The League of Silent Flight, has designed the Metrick for the novice sailplane pilot who's looking for ease of building and gentle flying characteristics. For the competition pilot, the Metrick offers a host of subtle refinements in design . . . modified Eppler 205 airfoil, full-flying stab., optional spoiler and releaseable tow hook installation . . . that place it above the competition.

Careful engineering and attention to aerodynamics are the mark of the Metrick. **WINGS:** • Super strong D-box wing construction with webbed Spruce spars, stressed for full 12 volt winch launches • 2 piece wing panels, joined by 2 hardened steel rods • Modified Eppler 205 airfoil • 7.0 to 8.5 oz. per sq. ft. wing loading. **FUSELAGE:** • Hardwood nose block • Generous area for radio installation with easy access through canopy/hatch. **TOP QUALITY FEATURES:** • Comprehensive, full-size plans with easy-to-follow, illustrated instructions to help the builder from start to finish • 2-channel

operation with 3-channel, 4-function capability for optional spoilers and tow hook • Clean, accurate die-cut balsa and plywood parts • Adaptable for electric or .049 power • Full-flying stabilizer.

**Top Flite's Metrick . . . Soaring above the competition.**

### SPECIFICATIONS:

Wingspan . . . . . 78½ in.

Wing Area . . . . . 600 sq. in.

Length . . . . . 43 in.

Flying Wt. . . . . 28-36 oz.

(ballast space provided)

Radio Equip. . . . . 2-channel

Kit No. . . . . RC-29



**TOP FLITE MODELS, INC.**  
2635 S. Wabash Ave.  
Chicago, Illinois 60616

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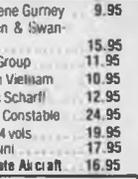


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JUNE

1982

Volume 12 No. 125

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Cover: Ken Willard was coaching Belinda Northrop, age 8-1/2, on how best to pose while holding his "Duckling" for a possible cover photo, when I snapped the shutter. We thought this candid shot had more appeal than those taken after Ken had backed out of the picture. The Duckling is powered by a G-Mark .03 R/C, and the radio is a Cannon Super Micro. A 4 x 5 transparency was made from the original color print 35mm neg.

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MODEL BUILDER (ISSN 0194 7079) is published monthly by RCMB INC., 621 West Nineteenth Street, Costa Mesa, California 92627. Phone (714) 645-8830.

Subscriptions: \$25.00 per year, \$47.00 for two years. Single copies \$2.50. Add \$7.00 per year for postage outside the U.S. (except APO & FPO). All payments must be in U.S. funds, drawn on a U.S. bank.

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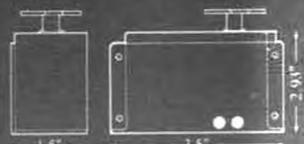
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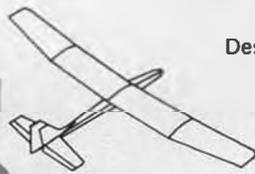
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Optional Power Pod is Available

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From left to right,  
Gene Soucy, Charlie  
Hillard & Tom  
Poberezny



**SPECIFICATIONS**

Wing Span - 68"    Wing Area - 1400 sq. in.  
Length - 62"  
Power - Quadra  
Weight: Ready to fly, less fuel  
16 lbs. with Econokote finish  
18 lbs. with Epoxy/fiberglass finish

# THE EAGLES ARE HERE!

The Rolls-Royce of Aerobatic Airplanes is Now Available in 30% Sport Scale . . . in Full Color . . . and in a Lavish, Complete Kit Concept.



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Thanks to our exclusive Byro-Foam modular construction, building the Eagle is both a fascinating and rewarding experience. Twenty-five years of manufacturing experience, plus our special injection molding process, assures warp-free wings, fuselage and control surfaces. Each and every foam component, with its smooth yet tough and resilient surface, needs only a light sanding prior to covering. Minimal shaping required.

**Authentic Flight Performance**

Value and ease of assembly are only part of the Eagle story. Spectacular aerobatic performance is the rest. The Eagle from Byron Originals promises the kind of unlimited performance one has to experience to fully appreciate. But perhaps the thing that makes our Christen Eagle really different is the fact that it's a Byron Originals kit - the latest addition to the finest line of RC kits available.

The Eagles are indeed here!  
Experience one today.

## New Quadra Power Package From Byron Originals!

More than a year of factory applications have proven this to be the perfect power system for our Pitts and Christen Eagle. The light, yet rugged nylon engine mount provides a quick and positive means of securing the Quadra engine to firewall. It's pre-drilled and adjusted to automatically position engine beneath the Pitts and Eagle cowling. Power Package also includes special prop/spinner adapter bolt, 18x8 maple prop, 3/4" spinner assembly, 9/64" ball driver, Loctite, and all required fasteners.



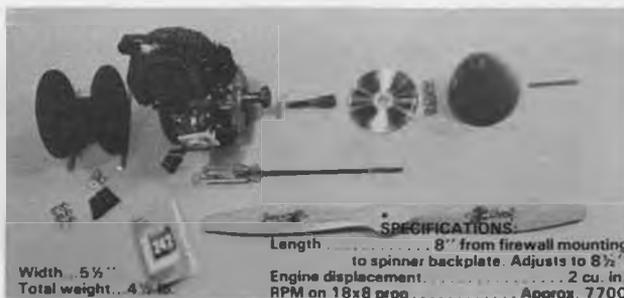
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Deluxe decal kit	53.63	45.59	& 2.65 ship.
	50.00	42.50	& 1.65 ship.

(Color feather paint scheme)

Byron Originals Quadra Power Package with engine	216.50	184.03	& 2.65 ship.
Power Package less engine	56.50	48.03	& 1.65 ship.

Send \$2.00 for detailed Eagle info packet.

SEND TO: Byron Originals, P.O. Box 279, Ida Grove, Iowa 51445  
Ph: 712-364-3165 Telex 439012 IDAG



**SPECIFICATIONS:**

Length . . . . . 8" from firewall mounting to spinner backplate. Adjusts to 8 1/2"  
Width . . . 5 1/2"  
Total weight . . . 4 lbs.  
Engine displacement . . . . . 2 cu. in.  
RPM on 18x8 prop . . . . . Approx. 7700



## from Bill Northrop's workbench

### PENNY WISE AND POUND FOOLISH

● The above old saying was used as the title to a piece written by Ray Cummings, editor of "Hear Ye," newsletter for the veteran Valley Forge (Pennsylvania) Signal Seekers. It is reprinted herein (with his permission) because the subject is very important to the future of our hobby and Ray has made it quite clear.

The other day I went to the Super Market to pick up some items for dinner. While I was there I bought a hammer, light bulb, and a can of automotive oil. One stop shopping is the name of the game, but it all leaves me with a little pain. There is a price that is paid for this type of business encroachment. In this case, it happens to be the demise of the old fashioned, honest-to-goodness hard-

ware store that I remember as a child.

The hardware store then was a fascinating place where one could wonder at the clutter that seemed to abound in all directions. Fortunately, there was always someone there who seemed to know exactly where everything was, and you usually could get what you were looking for. If it is was a hardware item, they had it. It amounted to inventory, in depth, that was concentrated in one spot, and if you went there, you knew you would come home with what you needed. The hardware store today is a far cry from that sort of place, and you can thank the greed of the Super Market for making it happen.

In any business, there are items that turn over fast and appeal to the masses. These items usually can pay for the rent and allow the owner to carry the specialty items that are for the more selective buyer. These items usually have a very limited mark up and are carried only as a service to this community. When the big conglomerate stores take away the bread and butter sales, it usually results in the smaller, specialty stores finding that they cannot make enough profit to stay in business and as a result, they close. If this keeps up, one can expect to deal directly, by mail, with the manufacturer for the things you cannot find.

All of this has a direct relationship to the Hobby Store business. To find a well stocked Hobby Store today is a minor miracle of business management, because of the competition, attitude of big business and customers always looking for the lowest possible price to pay for anything. If price alone is the only consideration, then the days of the local hobby store are numbered. Service is being phased out in today's mentality as a way of doing business. In the automotive world you can see this in the demise of the obsolete "service station" in favor of the ones that just pump gas. Lots of changes are not for the better, and for everything that we take with us, there is something that we leave behind. Being able to go to a place that is reasonably close and find what you want, even if it is a small, low profit item, like a tail wheel bracket or an antenna post, is a luxury behavior pattern that is under attack.

The fast moving items that represent entry level into any hobby can always be

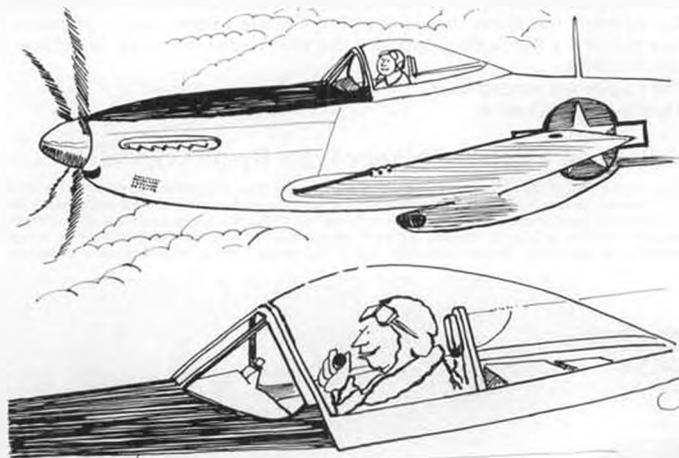
found. Toy stores, Drug stores, 7-11 stores and the like will have (at least over the holiday season) the gift items like Train sets, Kits and Nationally advertised hobby items. The latest fad is to see the number of assorted businesses that are carrying Kerosene heaters... they are springing up everywhere it seems to me. What is the problem with this philosophy, I hope you ask?

When one develops an interest in any hobby and stays with it long enough to get involved, sooner or later he is going to need a place where specific items are needed that will not be carried by the quick, multi-media stores that carry a little of everything and nothing of anything in depth that you will come to need. That is the problem. By skimming off the periferial trade of impulse buyers and lazy shoppers, they are literally robbing the dedicated and committed specialty store of a big market that is vital to the success of his business. That happens to be the hobby shop for me, that carries all the hard-to-get items that you will never find in the Super Market. I really hate to see it, for every sale that is made there, is hurting the guy who I need, who makes my life easier in the RC hobby.

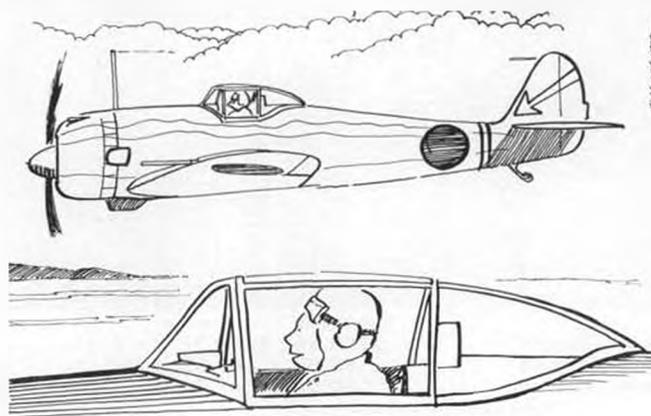
Every RC hobby store manager who I have talked to tells me that there is a very limited mark up on RC items. In other words, it's not the RC items that carry the load in order for him to pay his bills. Stores that carry a huge inventory of RC items are really walking a tight rope for survival. We, as buyers in this hobby, do not make it any easier for them by flaunting Nationally advertised prices from mail order houses coming from ads prominently displayed in almost all the trade publications every month. Sometimes I wonder just where it's all going to end up and my sympathy goes out to the local guy who is doing the best he can just to stay in business.

There is nothing wrong with making a reasonable profit. It's the accepted way of doing business. Competition will usually keep the pricing range within a moderate limit and the intelligent buyer will be able to fix the mean selling price of any given item with just the minimum of shopping around. The RC buyer is well insulated against getting ripped-off because rarely

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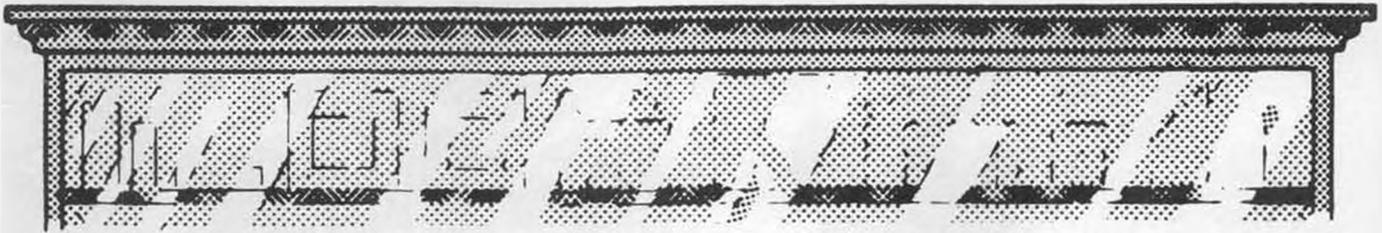


"You know, Harry, some day there'll be hundreds of men who will wish they could've flown the P-51."



"You know, Hiroshi, some day there'll be hundreds of men who will wish they could've flown the Oscar."

# 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.

• Several months ago, Sig released the first of two giant scale Cubs, the 1/4-scale version of Hazel Sig-Hester's famous clipped wing Cub. Now, Sig has the 1/4-scale 'long wing' or standard J-3 Cub ready for shipment, not a partial or semi-kit, but a complete kit in the well-known Sig tradition. The kit is chock full of top quality Sig balsa, plywood, precision die-cut parts, molded ABS cowl and scale engine, molded bungee covers and air cleaner cover, strong formed main gear and scale leaf-spring steerable tail wheel, full color decals, and four sheets of plans. A giant photo-illustrated instruction book, scale data on the full size plane, plus fiberglass pushrods, and a value packed bag of hardware round out this latest offering from Sig. Takes a .60 to 1.5 sized engine, glow or gas. \$169.95. See your dealer, or direct, postage free. The latest Sig catalog, #43, is available for \$2.00, postpaid. Sig Manufacturing Co., Inc., Montezuma, IA 50171.



Long awaited Sig J-3 Piper Cub in quarter scale.



Futaba's RTF aircraft/engine/radio combination.

★ ★ ★  
Hobby shops and clubs should contact Satellite "Hot Stuff" City for use of its latest offering, 'Hot Stuff Video Tips.' A one hour VHS videocassette has been prepared showing construction, speed/strength demonstrations, new time-saving building techniques and the

fastest fiberglassing you've ever seen. This is a must for progressive hobby shops and clubs. The tape is free and can be kept for viewing and/or copying for up to 60 days. A \$30.00 refundable deposit is required for each cassette.

Yes, copying is permitted and encouraged. Hobby shop owner/managers and club secretaries send a S.A.S.E. to: Satellite City, P.O. Box 836, Simi, CA 93062, for an order form, or call (805) 522-0062 for details.



The HB .21 Grand Prix with positionable exhaust port.



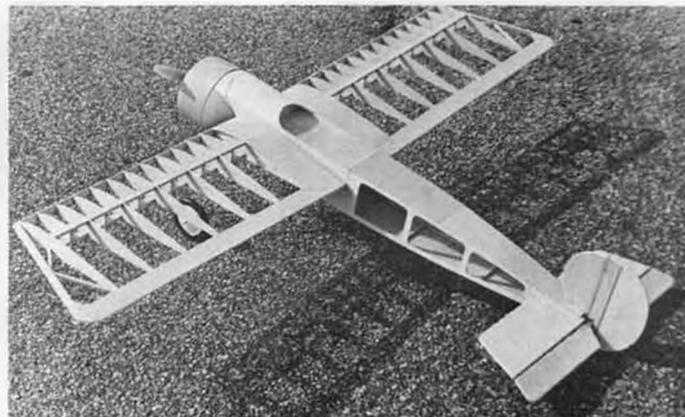
Ace R/C 2 x 5 Redundant Power Source.



Versatile Datamaster tester by Ace R/C.



Delta "Eagle" 1/8-scale gas car with four-wheel independent suspension.



"Endecker" E-III by Nick Zirolli Models.

★ ★ ★  
 Futaba Industries has just put together its K-FT-4L Trainer package, perfect for the novice or sport radio control flyer. This complete package consists of its durable 50-inch wingspan trainer, complete with OS Max .25 and the popular FP-4L R/C system installed. Only minor gluing and assembly are required. All you need to start flying is fuel, starting battery, glow plug clip and wrench, a 3/32 allen wrench, and your favorite cyanoacrylate adhesive. Good penetration, predictable sink rate, and a clean, crisp glide, all add up to a stable, easy to fly trainer. Suggest list, \$389.95. Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

★ ★ ★  
 The Black Baron from Coverite has announced the introduction of a true epoxy model paint, packaged in an aerosol spray can. The Black Baron calls his new, no mixing required material, BLACK BARON EPOXY PAINT. Super gloss, extremely durable finish, excellent flexibility, superior flow and leveling, and great resistance are claimed for this new offering from Coverite. Packaged in 13-ounce spray cans, Black Baron Epoxy Paint is available in Fire Red, Electric Blue, Lemon Yellow, International Orange, White and Black. List price per can is \$4.79. Perfect for use over all of Coverite's iron-ons, it is also recommended for use on wood, fabric,



Fiberglass 50-inch trawler hull, with plans, from Dynamic Models.

paper, acetate, fiberglass, etc. Two to three coats will yield a deep, ultra smooth shine.

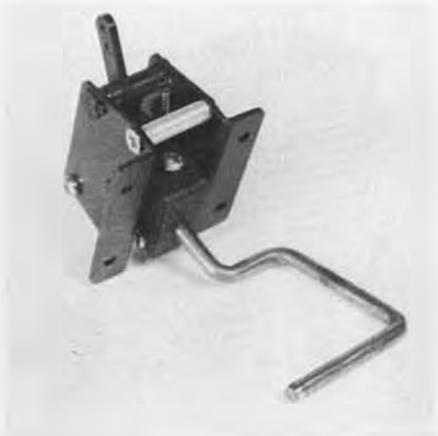
From the company that has introduced Micafilm, a reversible iron-on covering film; Ironex, a cleaner for irons; Primex, a clear first coat; Graphic Stars in four sizes and three colors; Supershrink, the ultimate drum tight covering, and four new colors in the Permagloss line, all this in the past 12 months! Coverite, 420 Babylon Road, Horsham, PA 19044.

★ ★ ★  
 Historic Aviation has its #82W catalog for the aviation aficionado available for only \$1.00. Books on all phases of aviation: military, Golden Age, combat, individual aircraft (10 different books on the F4U are listed), antique, historical, pilots and aces, even technical and

service manuals are listed. Books on airships, air racing, and aerobatics are listed, too.

'Handbook of Airfoil Sections for Light Aircraft' contains over 100 airfoils with coordinates, graphs, etc. Many are suitable for model aircraft usage. 'How to Cast Small Metal and Rubber Parts' is an excellent guide for restorers and hobbyists. Remember, \$1.00 for catalog #82W from: Historic Aviation, 3850 Coronation Road, Eagan, MN 55122.

★ ★ ★  
 Bavarian Precision Products is pleased to announce the new H.B. 21 Grand Prix, the most unique Schnuerle ported ABC engine ever offered to the retail market. The most startling feature of this new .21 engine is its capability for the user to rotate the cylinder block and cylinder head so the exhaust port can be posi-



Sailplane wheel retract unit by Modelle, from The Sailplane Factory.



Coil Over Shock Kit from RCH.



Astro Flight's Challenger Cobalt 05 electric motor.



Super Pumper 5 by Robart.



Heavy paper and cardboard model of Vultee P-66 Vanguard, by Meta Models.

tioned on the right side, left side, or straight back! The flexibility of this design gives you a powerful Schnuerle/ABC .21 that should fit in any installation. The *only* tool necessary to change the exhaust position is a screwdriver.

The .21 Grand Prix comes complete with the new, easy to adjust Multi-Mix, Two-Speed HB Carburetor. Twin ball bearings and ABC Piston/Sleeve construction means high wear resistance and ruggedness, typical of all engines manufactured by HB. The aircraft and car versions are planned for early spring delivery and a marine version will be released later. Horsepower of 1.05 at 24,000 RPM is claimed for this 10 oz., .21 sized bomb. For additional information on this and all HB engines, contact: Bavarian Precision Products Co., P.O. Box 6, New Canaan, CT 06840.

★ ★ ★

From the home of the Silver Seven, Ace R/C, comes some new electronic items available in kit or assembled form, to make R/C safer and a lot more fun. The first item is the 2 X 5 Redundant Power Source, an item that is cheap insurance for large pattern ships and giant or 1/4-scale models. By utilizing two battery packs of five cells each (the extra cell makes up for the slight voltage drop in the 2 X 5 device, and gives a 20% voltage increase to the servos for more power. Most modern receivers are voltage regulated, so no problem here), should a cell, or even a complete pack fail for any reason, the 2 X 5 automati-

cally switches over to the other pack. In kit form for \$12.50, or assembled for \$19.95, less connectors.

Also from Ace R/C is its Datamaster, a Digital pulse meter with servo driver. Crystal controlled to 0.01 milliseconds accuracy, it can be utilized to check travel, throw, end point adjustments, linearity, and centering accuracy of *BOTH* servos and transmitters. Can be used for setting up new aircraft, noting and recording transmitter/servo travel, etc., and reprogramming your transmitter later, if needed. A piece of lab quality equipment for any serious R/C hobbyist's work bench. In kit form for \$39.95 and factory assembled for \$49.95. For more information on these and other new items, send \$2.00 to: Ace R/C, Box 511D, Higginsville, MO 64037.

★ ★ ★

For all interested and would-be R/C boaters, Octura Models, Inc., long a leader in R/C boating drive lines, props, cooling systems, etc., offers a copy of its fact filled newsletter, *Ye Compleat R/C Boater* for the low cost of simply sending a stamped, addressed #10 sized envelope. Filled with many ideas and concepts of how to set-up and fine tune many types of R/C boats. Well worth the cost of a stamp and envelope. While you're at it, enclose \$1.00 for the new catalog and price list, to be available very soon. Octura Models, Inc., 7351 N. Hamlin Ave., Skokie, IL 60076.

★ ★ ★

*Continued on page 82*



Skyboy, Schweizer, and Skykid (top to bottom) from California Model Imports.



Quarter-scale "Spirit of St. Louis", from John Pahlow's plans by Granada Services.



Dremel flexible swing arm lamp.



Looking like Grand Central Station at rush hour, the WRAM Show had its usual wall-to-wall crowd checking over the exhibits. All WRAM photos by Jerry LaFavor.



# WORLD

BILL NORTHROP and JOHN ELLIOT

## NEW FREQUENCY SUMMARY

● The following summary of the AMA's proposal to the FCC for new R/C frequencies should hopefully clarify what is in the works. It was prepared by Model Retailer's Bob Hoeckele, from a phone conversation with AMA Frequency Committee Chairman Bob Aberle.

Assuming that there will be 50 new R/C frequencies for model aircraft:

(1) We will no longer be sharing our frequency numbers with the industrial users. If one of them, due to very high power and close proximity to an R/C field, interferes with us, there will be plenty of other frequencies to move to.

(2) All existing equipment is useable for five years from the implementation date.

(3) All existing equipment is useable from year six to year eight from the implementation with a change in crystal and retuning by a qualified service representative using prescribed test equipment.

(4) After the eighth year all **receivers** that exist now will be made obsolete.

(5) Transmitters, as they exist now, operate on a narrow enough bandwidth to be useable **forever**, with crystal and tuning changes.

### WRAM SHOW, 1982

The WRAM (that's Westchester . . . County of New York . . . Radio Aero

Modelers) Show, held annually in White Plains, New York, at the Westchester County Center, was, if the crowd density was any indication, another roaring success. The weekend of February 20 and 21, 1982, cooperated by offering only slight rain and snow, along with mild temperatures . . . not bad for traveling, but too bad for flying instead of attending the show. Most of the regular exhibitors were on hand, along with a few new ones from the local area. We noted that the static model display was down quite a bit in quantity, though the quality was outstanding, as usual.

Several all-new (not new and improved!)



Exquisite tractor-trailer R/C truck by Wedico of West Germany. Available in U.S.. See text for details.



Sterling's Piper Vagabond. Span is 33 inches, for rubber, C/L, or R/C, and .049 power.



Executive Design's class Monocoupe 90-A, with molded cowl and wheelpants.



Golden Age Reproductions plans make it possible to build this beautiful little Comet Seversky P-35.



You can almost see the grin of satisfaction on Skip Ruff's face as he and Bill Destefani swoosh by in "Mangia Pane", the P-51 after which Skip modeled his Byron review project.

items were noted for 1982. Some were mentioned in our IMS Pasadena Report, and more will be covered in the Toledo write-up. Nick Zirolì's AT-6/SNJ in quarter-scale is real impressive, with its massive, but reasonably light fiberglass fuselage and 10-gallon radial cowl. Executive Design's Monocoupe 90A, displayed uncovered, is a real pretty model. It appears to be quarter-scale.

Jerry Behrens, the quarter-scale plans man, is now offering kits for several of his designs, with more coming.

We got a big charge out of MRC's new Toyota four-wheel drive HI-LUX. Frank Ritota hooked a skate board on the rear bumper, balanced himself (more or less) on the board with transmitter in hand, and that sucker had enough power and grip on the smooth concrete floor to pull him around! Frank weighs 160 pounds.

Sharing a corner of the EMS (Electronic Model Systems) booth was the most beautiful radio controlled 18-wheeler (tractor trailer) scale model truck we've ever seen. The Wedico Truck Kits are manufactured in West Germany, and marketed in the U.S. by H.J. Dallmann Corp., 11707 Darlington Ave., Los Angeles, CA 90049. Lots of detail, working lights, exotic drive mechanism, and all-metal construction, all first class. They're not inexpensive.

Ben Shereshaw and son, Jon, were showing the prototype of a beautiful single-cylinder ignition engine. Displacement is 2.6 cu. in. Complete performance specs should be available at Toledo. It's a Bantam, of course!

Phil Draper, Draper's RC Service, Bethel, Conn., introduced the Redshift Engine, a hand-built import from England, featuring new ideas in fuel metering and flow. Phil



Jerry Behrens's JB Special suspended over his booth at the WRAM Show.

was also showing his new muffler, designed to pull out the exhaust, and do it quietly.

Dave Acton, Actionaire, Box 364, White Plains, N.Y. 10603, has a nice quarter-scale PT-19 semi-kit. Fuselage is a plywood box, while wing and stab is foam. Also included are fiberglass cowl and wing fillets. Finished weight is 21½ lbs., span 9 feet.

We were pleased to see Banner Model Co. displaying. This company produces a nice wheel with a unique hold-on device which eliminates an exposed axle stub. Weren't sure they were still at it, and this



Nick Zirolì's T-6 just about eats up his whole booth. A stunning copy of this most famous military trainer.



Skip Ruff and Bill Destefani. Bill totally impressed with the looks and flying capability of Skip's Byron model of his Reno racer.



Gathering of R/C scale ships on display at Flabob Airport antique and homebuilt fly-in near Riverside, CA.



Neat little homebuilt designed by the late Ken Rand, not much larger than some BIG Bird models.



Quarter-scale Curtiss R3C-2, Quadra powered, by Al Mays.



Replica Eindecker E-III with genuine LeRhône engine, slowed down to a soul-stirring "tick-over."

was reassuring. Those oil tempered, spring steel axles are the best.

Obviously, we haven't mentioned all of the more than 100 exhibitors, but as stated earlier, some were covered in our previous reports on Pasadena, and many were saving their really new stuff for the big one in Toledo. That one will have to be spread out over several issues!

**"HE TRAVELS FASTEST WHO TRAVELS ALONE."**

Who said that? Remember our January 1982 cover shot by Alan Davis of Bill Destefani's P-51 and of the Byron P-51 built

and finished by Skip Ruff? Sure you do. Who can forget a pair of P-51's like that! Well, it seems that the BARKS R/C Club of Bakersfield, California, was having a fun fly in February at Condor Field in the Taft area when Bill, invited by Skip to come out to an R/C 'Happening,' arrived by Mustang, North American variety, not Henry Fords! Destefani's P-51 has raced at Reno and won the Silver race in 1980, placed 6th in the 1980 Gold race, and 3rd in the 1981 Gold race.

The surprise of the afternoon was when Bill invited Skip for a ride in 'Mangia Pane,'

the twelve inch to the foot P-51. Who could say no to an offer like that? Well, let's have Skip describe it . . .

"What was it like? Well, it was everything I imagined it would be! It included a bunch of high speed passes on the deck followed by rolls. As far as aviation is concerned, it was definitely the high point in my life, and regarding pleasurable experiences, I can only think of one thing better and I'm even having second thoughts about that! Wotta Machine!" Skip adds this footnote . . . "It says a lot for a model when a full size war-

*Continued on page 65*



Forrest Edwards' latest hand-built five-cylinder engine, mounted in Concept Fleet. Yummy! Pat Rardin photo.



Replica Fokker DR-1 triplane, complete with steerable tail wheel, from the Shilling-Appleby Air Force.

# Duck the DUCKLING



BY  
KEN WILLARD



Taking advantage of the throttlable G-Mark .030 R/C engine, our designer has come up with a cute little water bird that's small enough to take along in your fishing tackle box, just in case they ain't biting!

•In the past, the design and development of small radio controlled models has been hampered by the lack of a small engine which could be reliably throttled down so the model could be taxied out for takeoff, then, once airborne, run at a cruising speed rather than zipping around all the time at full power. Some throttles have been made for .049 engines, most notably the Hiscott, but for the even smaller engines, like the .020 and .010 Cox, no throttles exist other than homemade. In my opinion, that is one reason why the Tee-Dee .020 and .010 engines were discontinued: today's radio modeler wants the flexibility of power from idle to full throttle.

When the G-Mark .030 engine appeared, it eliminated the shortcoming of small engines' lack of throttle. The speed range, using a 4-1/2 inch dia. by 2-1/2 inch pitch Cox prop, is from 5,000 rpms up to 20,000 rpms, using Cox "Red Label" fuel, or Sheldon's 40% nitro. Yes, those fuels are expensive, but, as I tell the guys with their .40s and .60s, "You

fellows *spill* more fuel in a day's flying that I use." So, the expense is secondary. One two-ounce bulbful will last all day.

The Duckling was specifically designed to use the G-Mark .030 engine. To make the design even more versatile, a quickly removable landing gear can be installed so the model is "amphibious" and can be operated off a runway as well as a pond. The only thing that I did, when flying off water, was to remove the rear half of the muffler on the .030 to make it easier to prime, and also easier to clear out any water which got into the engine when the Duckling decided to dunk. And it does, occasionally, but usually without damage; a quick dryout in the sun and you're ready to fly again. The all balsa sheet construction, when waterproofed with an overlapped Super Monokote covering on the outside, and clear dope on any exposed wood, makes it shed water "like off a duck's back."

Of course, the size of the Duckling requires that you use small radio equipment. The plans show the Cannon Super

Micro unit, but by some rearrangement of the receiver, servos, and battery pack, other small units can be installed. They may be a bit heavier, but the .030 has plenty of excess power for this size model. One minor problem is that the model is so small that a full length antenna trails too far aft. Solution: shorten the antenna, but get someone with the right equipment to retune your receiver to your transmitter with the short antenna installed. Another solution: run the antenna back to the top of the fin, then over to one wing tip, and let it trail from there a few inches. In any event, the model's size means it can't go too far out or you'll lose sight of it.

The construction technique is, to say the least, ultra simple. The sheet balsa structure, with some small amount of block balsa carving on the engine pod and the tip floats, can be Hot Stuffed together in a couple of evening's work. As you can see from the photo of the cut out parts (a few are not shown) there are only about 35 pieces in the whole

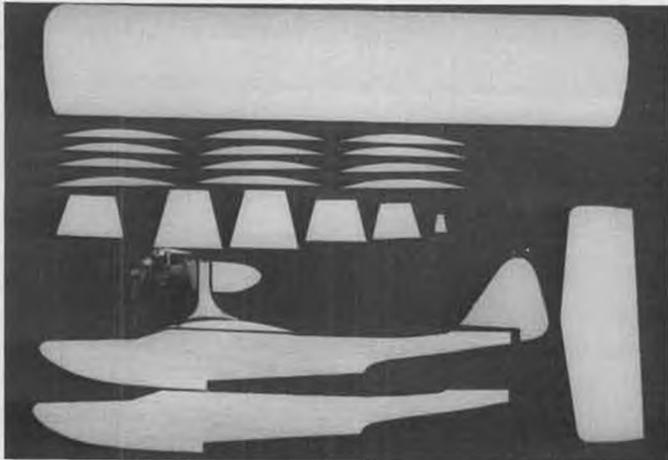


Proof that a little color and decorating go a long way in improving looks, here's the Duckling all ready for plastic clothing and make-up. G-Mark .03 R/C engine.

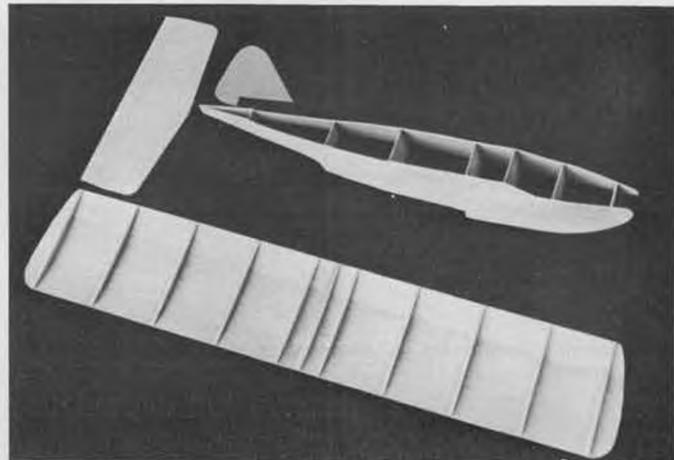


Ken gives his Duckling the old heave-ho over a local pond. Cannon Super-Micro.





Best way to build a model of this type is make yourself a kit (or two!) of cut-out parts first. Assembly then goes quickly.



See? Just a few moments later, with a little C.A. glue, and things are taking shape. Waterproofing interior a good idea.

model. So let's put them together.

### WING

Build the wing out of one piece of 1/16 sheet balsa, 25 by 5 in size. Cut out the 12 ribs to the shape shown on the side view of the hull, place them in position on the plans, with a sheet of wax paper on the plans to keep the ribs from sticking to them. Place the sheet of balsa over the ribs, and hold it in place while Hot Stuffing the ribs to the sheet by piercing the wood with a pin at 1/2 inch spacing along each rib. Be sure the sheet of wood is flat on the table top (which also must be flat) at the leading and trailing edges. Then, when you lift the wing off the table, it is all formed except for the dihedral. Slice the wing in half between the two center ribs, Hot Stuff a piece of 1/2 inch trailing edge stock between them, and viola, instant dihedral! Wing structure done.

### ENGINE PYLON

This is probably the trickiest part of the construction. Cut out the length of 1/2 by 1/8 inch plywood and insert it in a 1/2 by 1/8 inch hole cut out in the center of the wing so the bottom of the plywood pylon is flush with the bottom of the center ribs. Next, cut out the 1/2 inch thick pieces of basswood which serve as the mounting surface for the backplate of the engine. Hot Stuff them to the sides of the plywood pylon, then, using small pieces of balsa block, build the housing for the servo behind the pylon. The plans show the sizes for a

Cannon Micro-Mini servo, but you can adapt the size to fit a slightly larger size if necessary. Note that one side is left open so the servo can be inserted and removed easily. To hold the servo in place, wedge small blocks of balsa which will fit under the servo mounting lugs. The vibration of the .030 is so small that the wedge fit will retain the servo in place. Cover the opening on the side with tape, as shown in the photo.

Finally, add the balsa fairings to the plywood pylon and sand to a streamline shape. These fairings also serve to increase the strength of the pylon in the longitudinal axis.

### HULL

This is easy. Just remember one thing . . . the inside of the hull must be waterproofed. Here's how I did it. Cut out the hull sides, Hot Stuff the bulkheads. Next, glue the bottom in place. Then, before going any further, apply a couple of coats of dope to the *inside* surfaces. Following this, attach the servos to the hull sides with servo tape, make the necessary holes in the bulkheads aft of the servos and route the flexrods back to the openings at the rear. Where the flexrods exit the sides, seal the holes so water can't enter. This can be done with either Hot Stuff and baking soda, or with epoxy.

Depending on the weight of the balsa you use for the tail feathers . . . and use medium weight for the best compromise between weight and strength

. . . you'll have to put the receiver and batteries in the forward compartments. To determine where, temporarily assemble the wing, tail feathers and hull, with the engine mounted on the pylon, and balance so the balance point is as shown on the plans. You may find that instead of locating the batteries and receiver where I did, they will have to be in the forward compartments. Or maybe the receiver in the compartment just behind the servos, and the batteries up behind the noseblock. Whatever you do, be sure the balance point is where

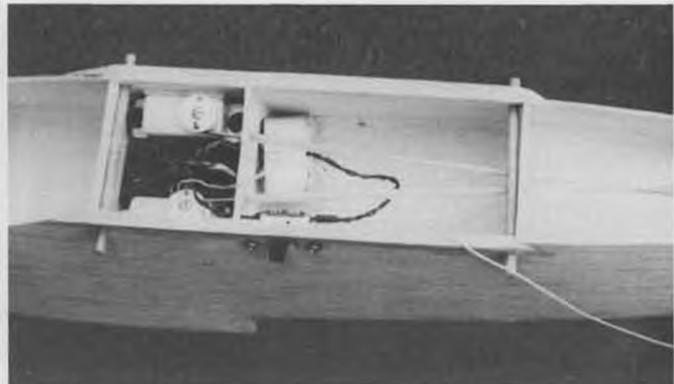
*Continued on page 69*



Ken checks throttle prior to making a flight on land. Yes, it was a Sunday!



Engine mounting pod is built up to enclose throttle servo. Plastic cover sealed with tape. Note tank mount, spring starter.



Simple and compact radio installation. Servos double-stick foam taped to fuselage sides. Good exit angle by crossing pushrods.



Jerry Thorne's Commanche. All photos taken at Tangerine meet by Frank Broach.



Super Chipmunk, by Donald Muddiman.

# 1 TO 1 SCALE

By BOB UNDERWOOD

PHOTOS BY FRANK BROACH

• A conversation recently with several budding scalers brought forth, a question directed toward me concerning the most difficult areas represented in the field of scale modeling. The question certainly has no simple answer. After careful consideration, I chose three distinctly different areas of concern that for me seem to be important. While I am not certain what order I would place these in, these are the three areas.

### Weight and Structural Considerations

Early in my modeling career I found that my thinking ran to building a model that was very often overbuilt. The rationale for this practice was based on the fact that the model could better survive the little "crashes" that occur. The problem with this approach is that the weight, and more importantly, the wing loading, moves toward the never-never lands of crash looking for a place to happen. You can find scale modelers who will attempt to convince you that those 40 oz./sq.ft. designs really aren't that much of a problem. Experience seems to dictate, however, that every ounce in that direction simply reduces the margin of safety and flight perfor-

mance you can expect.

To expect to build a scale model that can survive the type of crash that a trainer is bound to endure is not too practical. Therefore, why not move toward the concept of keeping it light and thereby producing a better flying model less likely to get into crash situations due to stall problems, etc. Careful consideration of several points will help produce desired results.

First, remember there is nothing you

can put in your model that is lighter than air (except maybe helium!). Try then, to keep parts lighter by using built-up areas rather than solid. Such parts as ailerons, elevators, rudders, etc. can save ounces by such a technique. Generally, you'll not experience problems of structural integrity. Careful use of aircraft grade plywood can help. If you weigh a sheet of, say 1/8 thickness ply compared to something like a 1/8 thick piece of Lite-Ply, you'll find significant differences. It is in the area of structural pieces, such as bulkheads, spars, etc., that we very often tend to over-build.

Secondly, you might try to analyze the basic needs of the model. One might be tempted to build the fuselage of a twin engine model in much the same manner as if he were going to mount an engine on the structure. In actuality, the fuselage is only a device to hold the surfaces in their respective positions and may be built much more lightly.

In like manner, a model that dupli-



Leonard McCoy's Dornier DO 236.



T 34C by Ramon Torres.



Bill McCallie's F8F Bearcat.



YF16 by Norm Holland.



Richard Trueshel hides behind his Globe Swift.



Burnis Fields, Florida hobby shop owner, built this DH 82A Tiger Moth.



Blue Angel A4 by William Williamson.

cates a non-aerobatic aircraft probably doesn't need a wing like an ironing board. Aside from not having to experience high 'G' loads, such as those produced by loops, etc., it also probably never needs to operate inverted.

This column has spoken to various weight savings techniques on previous occasions. These include, of course, careful selection of wood, lightening holes, etc. Remember the one ounce you save in the tail equals three or four ounces in the nose. Think light. Go on a diet.

#### Duplicating

A second area of concern is that of duplication of the original. This requires a great deal of time and consideration. When the original full scale was produced, the builders were not troubled with this problem. You, however, have to not only deal with the size reduction aspect but with the placement of various items. Certainly the most difficult part of this is taking care of the relative position

of features. Emblems, writing, stripes, stars, canopy frames, rib outlines, are all prime candidates for this problem. It is not always easy to measure these since you may be working in two dimensions around curves. In addition, any alteration to certain proportions will tend to throw everything off. A slightly extended nose moment, an enlarged stab, are examples of commonly altered areas.

The prevention of this problem developing can be brought about in a variety of ways. Aside from measuring carefully, give your model the continuous eyeball treatment. Every step of the way compare it to your documentation. Get a second opinion. You would be surprised how easy it is to begin to "not see" a certain aspect after you have lived with a model for a long time. Ask a friend to compare your work with the documentation. You'll find that certain individuals "see" this sort of thing better. People who are used to working with propor-

tions, such as carpenters, artists, draftsmen, very often are more effective at spotting this type of problem.

One aspect of this concern is very evident. That is the width of striping such as might be found around emblems, stars, etc. It is also easy to make a mistake in this area since often the masking technique blocks off part of the emblem and makes it difficult to view properly. Another problem may develop when you attempt to duplicate lettering using rub-on type letters. Exact size is often difficult to locate and filling a specific space may not occur easily. Obviously, if the letters are a tad small, you can stretch the spacing and make it work. Letters that are a smidge wide may cause more concern. At any rate, check and recheck.

#### Emotional Level

All the talent in the world will not deal with this concern. Over the years, I've noticed excellent flyers and builders who reduce to jelly when it comes to that

*Continued on page 17*



Push-pull Dornier DO 335 by Bill Kinsey.

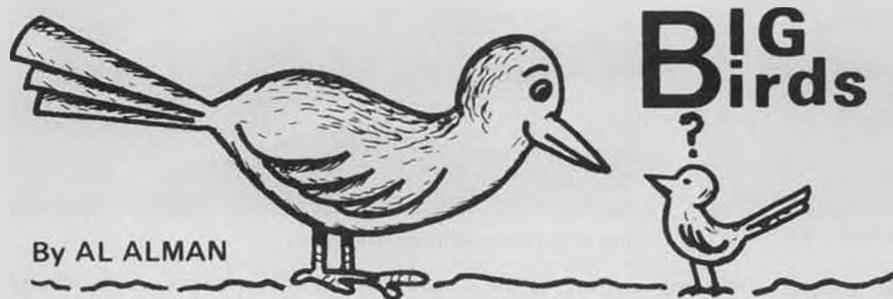
Frank Vidmar and his Christen Eagle I.



Ted White getting his new Platt Jungmeister ready for its maiden flight. Went all out for scale. Uses OS .91 and 14x6 prop.



Dale Bessant's first BIG Bird is this fine Nosen Citabria. Uses Webra .91, which is more than enough for this 14 pound aircraft.



• My only exposure to model diesels, some 28 years ago, really soured me on that type of engine; they were spastic, cantankerous, very rough on mounts (had to crank with extremely high compression in order to offset the ubiquitous leak) and literally bit the hand that fed them. As I remember they never fully realized the potential to perform.

All in all, trying to get those small McCoy and OK diesels to do their thing was pretty much a comedy of errors, and would have made a dandy plot for the Three Stooges. Of the dozens of guys I've talked to who also had these engines almost everyone experienced much the same problems and frustrations I did (at least mine got off the ground, whereas a number of diesel owners never even got

that far). There was one exception, however, and he had no complaints; I suspect he either never tried to run his, or quite possibly he didn't even know enough to ask any questions or not to be happy.

This negative feeling about diesels was well reinforced throughout the next few decades by the many myths and horror stories I heard; some of the juicier ones told of failing shafts, disintegrating crankcases, holes in pistons, overheating, no idle, tearing up mounts and the ability to kick back and eat your lunch with savage fury when being started. On top of all this, the "experts" were quick to point out that diesel operation was limited to the smaller displacement engines (only up to a .25) because anything bigger just wouldn't perform.

I gleefully accepted these stories as the gospel, and did my bit to perpetuate them by adding my own sordid experiences any time I could find someone who'd listen. You know how it is when you don't like something or someone; you're only too happy to believe anything bad you may hear, even if the source is questionable (like the universally vague "they").

And so it was that I approached my current flight tests with, to say the least, guarded optimism. I just couldn't believe that Bob Davis had been blatantly lying about the goodness of his conversion heads, else he would have been run out of town on a rail a long time ago. Yet, hadn't all these stories I'd taken a part in stood the test of time . . . ?

My nine-foot Aeronca C-3 was used as the test-bed. Originally this bird flew with a '68 vintage Enya .60 that ran extremely well on a 14x4, even though it was over the hill and far from being able to match the power of a modern Schneurle. At the time I installed the diesel converted Eagle III in its place, I



Take a good look at Ted White's Jungmeister on its maiden flight, as we understand, just before going to press, that it was totally demolished in Phoenix by a radio glitch.



Bill Winter and Herby Clukey (that's him with the glasses) are doing this cardboard biggie. We'll have Chapter 2 on this adventure of the Bobsey Twins next month, also more about cardboard planes. John Preston photo.



Close-up of the "Diesel-Eagle" in Alman's C-3 "Airknocker". Cowling left off for easy tinkering and more revealing photo. Tubing muffler extension keeps big cockpit clean.

had something over fifty hours of airtime on the C-3... so I was working with a flying machine that I knew very well.

Before installing Bob Davis' nice looking diesel head, I racked up about three hours with the Fox, burning methanol, and found out how much better my bathtub flew with the added power of a Schneurle. The engine handled both a 14x4 and a 14x6, although I flew most of those three hours with the 14x4. With the Eagle I could do better loops and stall turns, but even this powerhouse would start to lug with that fifteen pounds of airplane hanging behind her. I tried a 16x4, but found it was just too much for the Fox.

Then came conversion time, and it is as easy and uncomplicated as the instructions say it is. You just remove the original head and replace it with the Davis Diesel Head, being careful when handling the gasket. I'm certainly not an engine expert, although I do love to

tinker, and feel that this head exchange is well within the capability of any modeler. If you can't manage this, then you should definitely bypass stamp collecting and just spend your time watching adult movies on Pay-TV.

And then the fun started. I put an hour of ground time on my "Diesel-Engine" (DE), getting used to its characteristics and checking RPM and "thrust" readings on different props. I say "thrust" because I used a fifteen pound fish scale tied to the tailwheel and anchored to the ground, and know that none of my readings were accurate; however they were *relative to each other* and that's all I was shooting for. A Royal Pro-Tach was used for checking prop speeds.

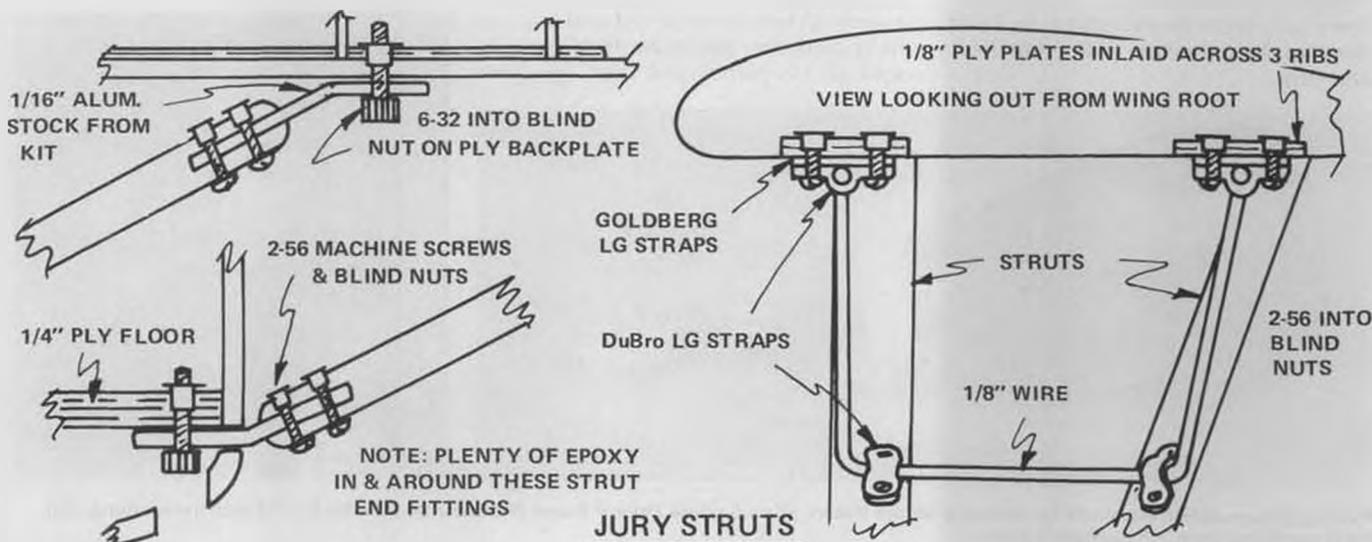
On both the 14x4 and 14x6, the DE fell a bit short of the readings obtained with the same props on the glow Eagle: 200 RPM and five percent, thrustwise. However, when the 16-inch props were run, it was like being born again, as the



Hold'er Newt, she's ararin'!' Cecil Haga, one of the tallest shorter Texans, is dwarfed by his 175 inch "Chaparral" distance and task machine. More about it in text.

diesel's ability to effectively handle a large piece of lumber was clearly demonstrated. Although the 16x4 tached at

*Continued on page 95*



# FUEL LINES



JOE KLAUSE

P.O. Box 2699  
Laguna Hills, CA 92653

## FANS

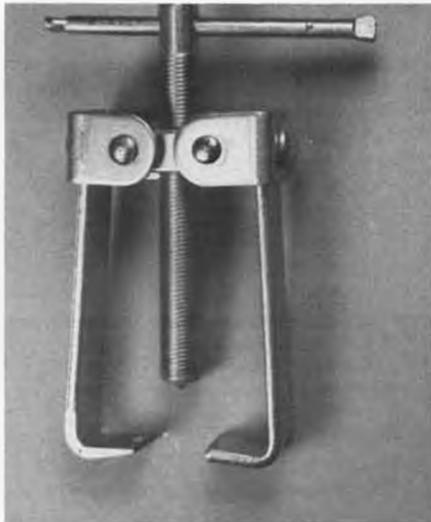
Back in the January issue I offered a few suggestions for New Year resolutions for modelers. Then, I asked for some from the readers. It's a pleasure to report that at least two people read that column. One "lady" had a suggestion for me. My response is, "The same to you, lady!" The other letter came from Bruce McKinnon, of Marshall, Texas. He made several resolutions, such as promising not to practice inverted landings, but the one that cracked me up was his final one, "...not to fly my airplanes in the house any more." He didn't say whether or not he was a quarter-scaler.

## CHANGES COMING

What changes? Well, the first word of the title of this column is fuel, isn't it? That's where it's likely that we'll see considerable changes over the next few years. In fact, in several areas of our country, modelers have recently changed their area rules about fuel. What I'm talking about is the nitro content of the fuel for racing events ...both control-line and pylon.

At the Southwest Regionals in late January, the Southwest Control-Line Association (SWCLA) adopted K&B 500 for its Big Goodyear event. The Southern California Control-Line Association (SCCA) has recently chosen 5% nitro fuel for AMA Slow Rat Race. In the Texas-Louisiana area, local rules specify 10% nitro fuel for Quickie Rat and Super Slow Rat events. In the eastern Pennsylvania-New Jersey area, the clubs are currently considering specifying the fuel for their Sport Racing event.

In pylon racing, throughout the country, the fuel or nitro content is specified for Quickie 500. Quarter-midget has had fuel restrictions practically from its inception. In Texas, the fledgling Quickie 300 event has a fuel rule.



K-Mart gear puller, showing one modified tong and one stock. See text on what to do. This one cost \$1.98!

What are the reasons behind such rules? Well, some years ago a "Let's change the rules so I can win" philosophy led to some of those rules. Fortunately, the popularity of this philosophy has waned. Why? Because the same guys kept winning no matter how the rules were changed. They won because they worked at it, and finally, a lot of modelers realized the naivety of that kind of rule changing.

Nevertheless, in more recent times, fuel restrictions have continued to grow in popularity. The major reason seems to be the skyrocketing cost of nitro ...\$25.00 to \$30.00 per gallon. About six months ago a friend of mine went to a two-day west coast control line contest. He was big on the high-nitro racing events. When he returned and realized he'd used over \$60.00 worth of nitro, he sold all his planes and took up diesel

team racing. I thought that was a little bit drastic. As someone else once commented, "I'd rather eat worms than fly a diesel." (To Bob Davis ... "Down Boy! wcn). However, it does highlight the changing mood of modelers away from unlimited fuel events. A number of prominent modelers, notably in pylon racing, have strongly advocated abandoning nitro fuels.

Well guys, as if the cost of nitro isn't enough to ban its use, something else has developed that I think will deliver the *coup de grace*! Have you checked the 1982 prices of glow plugs? If you haven't, you're in for a jolt. Although some popular brands are still in the \$1.20 or so range, other favorites are now as high as \$4.00 each!

When you race with high-nitro fuel, it's not uncommon to use a plug a flight. Guys, a heat race in Rat or Formula I will cost you \$5.00 to \$6.00 ... assuming you don't wipe a prop! With very low or no nitro fuel, plugs last a lot longer, and the cost of a race should average about a buck or less. The hey day of nitro guzzling may soon be gone.

Will we go to all alky FAI fuel? It's possible, but I would guess that 5% nitro fuel will become the favorite. It's not hard on plugs or the wallet, and it makes it easy to set up an engine and to needle the carburetor. Think about it. Discuss it with other modelers and at your club meetings. If your club or group comes to a consensus, let the appropriate people know. Write to NMPRA, the Racing Advisory Committee, or other appropriate group or association, AND write to your contest boards, your district VP and his associate VP and his associate VP's. They're all listed in Model Aviation.

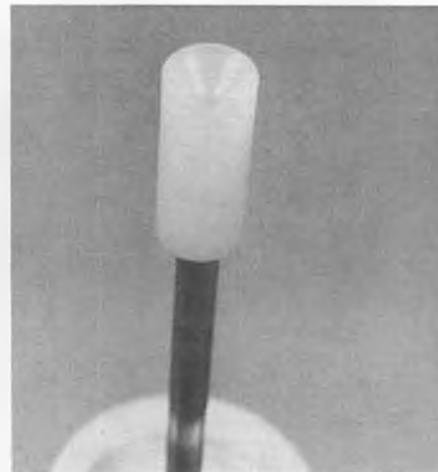
## HELPFUL PRODUCTS

The first photograph shows a gear puller. I read about this in the February issue of Model Aviation, and bought one at a local K-Mart for \$1.98! That's a great price, but you'll have to do a little work on it before you can use it to pull prop drive plates and other sometimes troublesome jobs. As you can see in the

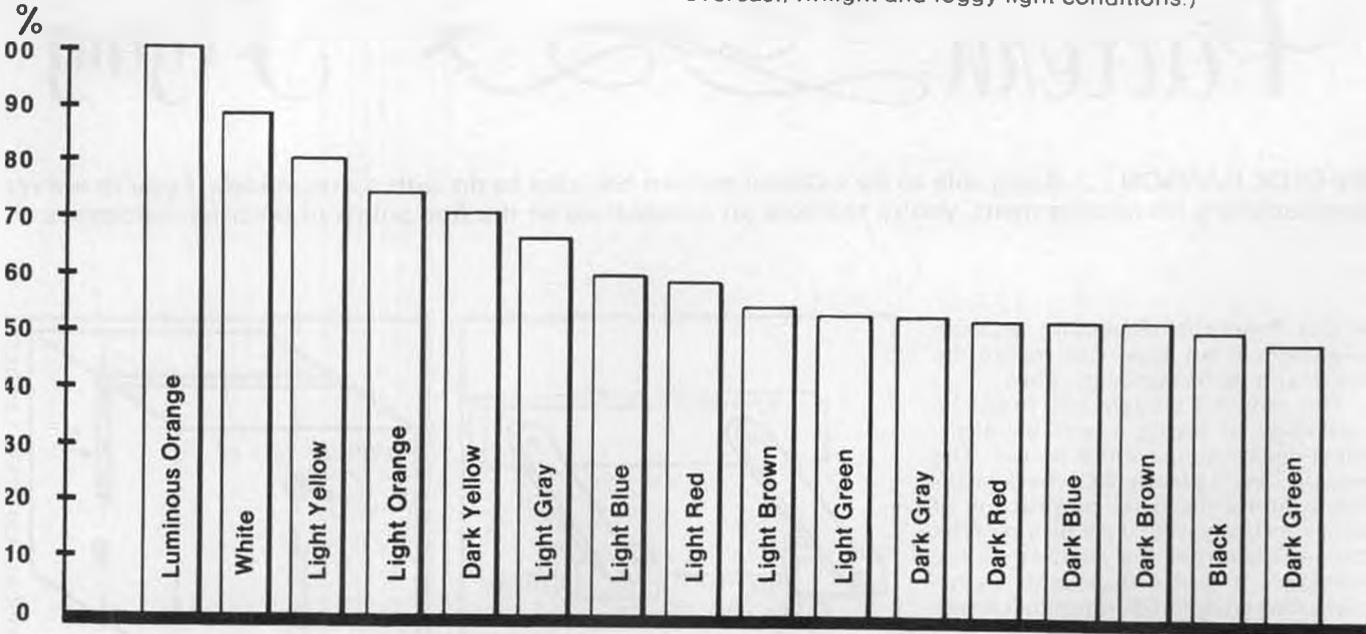
*Continued on page 15*



Fueling bulb modified especially for refueling Mouse Racers. It's a 4-ounce Pyland Brand (Sullivan) unit. Probe is 3/16 inch brass tubing, and tip is machined from 3/8 diameter nylon.



## INDEX OF VISIBILITY



# MODEL AIRCRAFT VISIBILITY

By Dr. GEORGE A. OBSSUTH . . . The ability to fly an R/C model well has a great deal to do with how well you can see it! Here are some thoughts on coloring and marking that will make your model more visible.

• The cry of the "red-faced crasher bird" can be heard from time to time in areas not too close to buildings, large trees, etc. "I ain't got it, I ain't got it."

"Losing" a plane can be due to a loss of radio control, mechanical failure, or, in more cases than realized, it is the result of poor orientation due to our inability to "see" exactly where the model is and which way it's going.

"Seeing" an R/C plane in flight is really two separate and distinct visual functions. The first is to simply see that the plane is there. Second, and more important, is the ability to tell the direction, speed, and attitude of the aircraft. Generally, the second type of "seeing" is more important for sport and pattern flying. The first type is more important with gliders and sailplanes, but it is still necessary to orient the craft.

To understand model visibility, there are some basic facts that we should know. The most basic fact is that in order to see *anything*, it must be different than its background. In other words we need *contrast*. Contrast in models means that it is either of a different brightness than its background or a different color. It may be both different in color and brightness. Texture contrast is of little value for our purposes.

Generally, it is better to have brightness contrast than it is to have color contrast. In other words, it is easier to see a small white spot on a black background than it is to see a small red spot on a green background. We should also

remember that in R/C flying it's not just the ability to see the plane, but the ease of telling different parts of the plane. Therefore, combinations of two or possibly three colors are recommended.

The color of a model is the result of daylight being reflected off of it, and some colors reflect more light than others, therefore, some colors are going to be brighter than others. For example, yellow will reflect back more light than dark blue; therefore, we have both color and brightness contrast in such a color combination. If you imagine a black and white photograph of yellow and blue as compared to a photo of green and red, the yellow and blue will show greater contrast, while in some cases the red and green may both appear as an equal shade of grey. (Equal brightness . . . different colors.)

Well what does all this really mean?

A. *Models should be colored two, possibly three colors.* One color alone will not provide adequate contrast with its background under all conditions. Also, a single color doesn't allow for easy identification of individual plane surfaces such as wing top versus wing bottom. Small amounts of many colors are not good because they may blend together at normal flying distances and do not provide the contrast desired.

B. *The color combination should be one that would have brightness contrast if photographed in black and white.* You can still choose colors that don't upset your artistic sense.

C. *Designs should be in areas no smaller than 1-1/2 to 2 inches wide in order to be seen at typical flying distances.*

D. *Try to have two colors vertically divided on the rudder surface as this is an important visual reference.*

E. *The pattern on the top of the wing should be very different than the pattern on the bottom, but BOTH surfaces need a pattern.*

Also remember that:

1. Big planes are easier to see
2. The closer you fly the easier it is to see (within reason).
3. Too much or too little daylight will reduce contrast.

Recently, some articles have appeared which quote a study done by the German Air Force. The study rated colors on a scale of 0 to 100, with zero being a color which is totally invisible, and 100 being equal to a color visible under all conditions. The May issue of the "K factor" reported the following results:

White	88
Yellow	70
Orange	47
Light grey	43
Pastel blue	43
Medium red	23
Medium blue	8
Black	8
Dark blue	8

However, Mercedes Benz (also Ger-

*Continued on page 68*

# Pattern *Q* x Flying

By DICK HANSON . . . Being able to fly a decent pattern has a lot to do with a true model. If you're always compensating for misalignment, you're too busy to concentrate on the fine points of precision aerobatics.

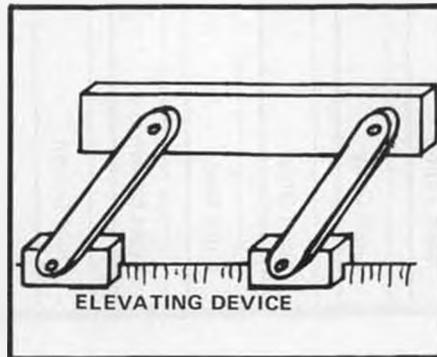
• Our Pattern birds require accurate alignment if we expect to realize the maximum performance possible.

This month I thought you might be interested in seeing a portable alignment device we use which we call "The Square Deal". We use it to check alignment during the basic construction of wings and stabs, plus it greatly simplifies the installation of the stabilizer in the fuselage. It is also invaluable in re-evaluating completed models for correct alignment.

It's really quite simple, consisting of four very accurate aluminum straight edges, plus some wooden blocks and fixtures. It can be set up on any solid surface that will allow you some walk around space to check the setup. The best setups are on a kitchen table or counter (don't forget to get clearance from Mom!).

If necessary, the setup can be done on a floor *but*, your knees will hate you in the morning . . . especially if the floor is of the "standard cold basement" type.

In order for the jig to be accurate, the parts must of course be accurate. We purchase 60 and 36 inch rules which are sufficiently straight to permit the edges

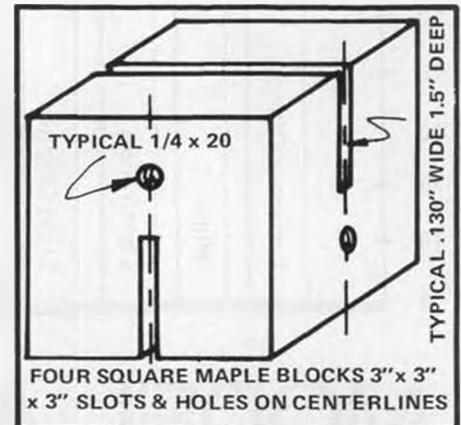


ELEVATING DEVICE  
Leveler is used to raise fuselage for 0-0 wing and stab setting.

to touch along their entire lengths when they are held together, also, they are slightly rounded on the edges to prevent nicking.

The wooden blocks are formed on a joiner to produce exactly square parts measuring 3 x 3 x 3. The saw slots are centered, as are the 1/4 x 20 holes for the locking screws.

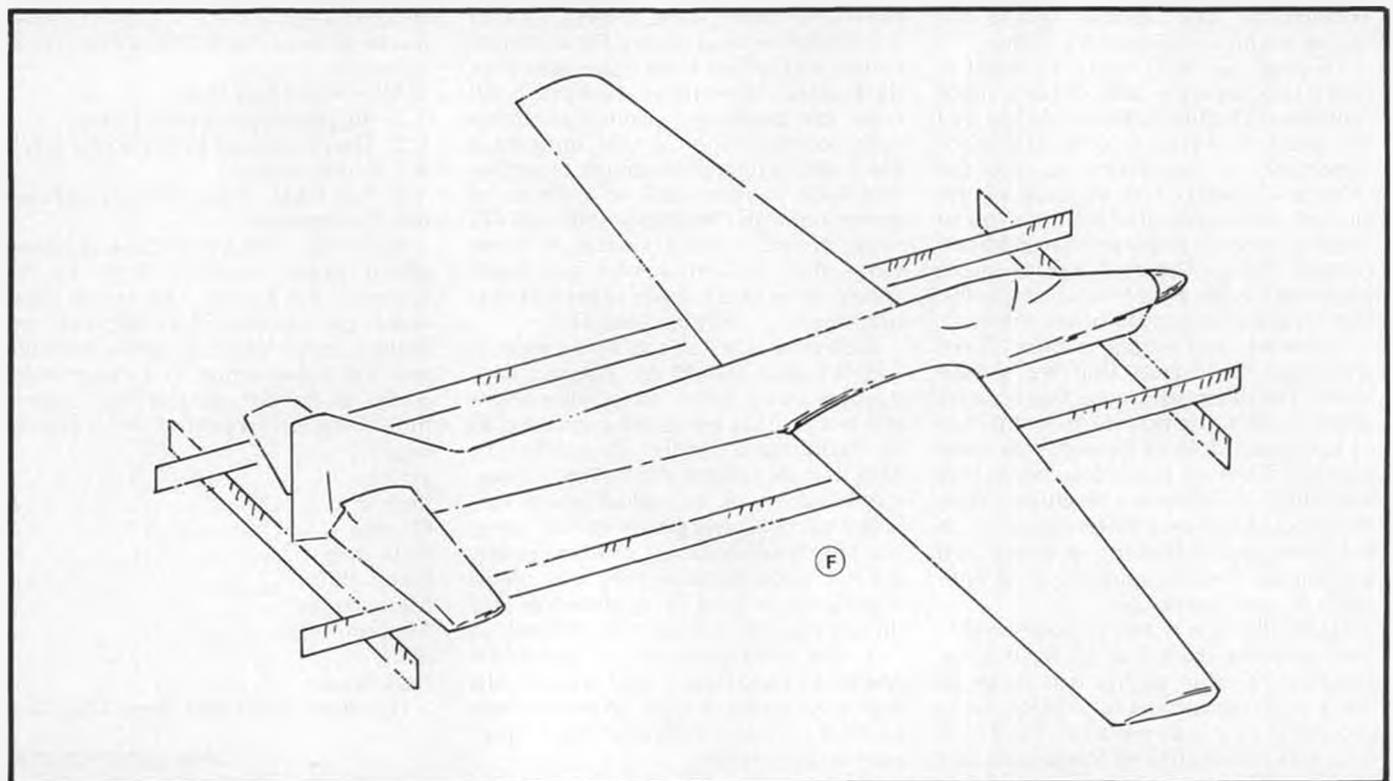
The other items we find handy for use with the set up are a 6 inch pocket scale, a tape measure, a 90° triangle and some strong string.

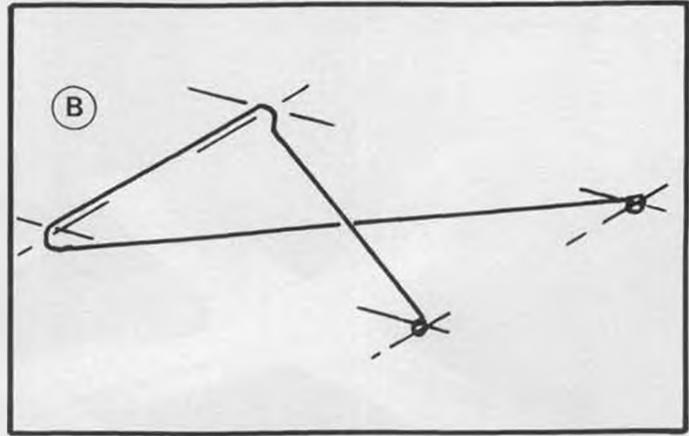
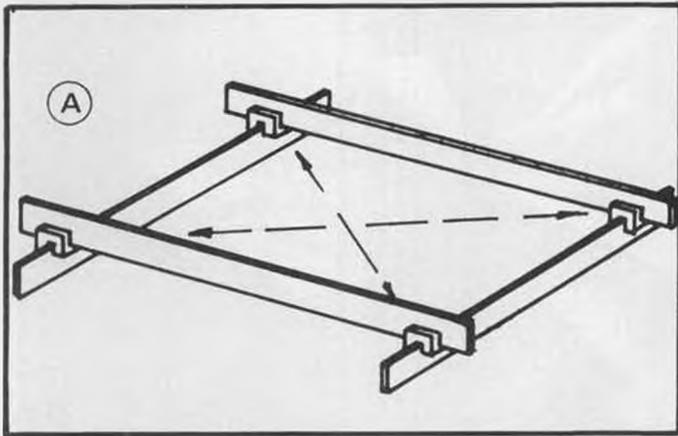


FOUR SQUARE MAPLE BLOCKS 3"x 3" x 3" SLOTS & HOLES ON CENTERLINES  
TYPICAL .130" WIDE 1.5" DEEP  
TYPICAL 1/4 x 20

Four corner blocks carefully cut, drilled, and tapped from 3x3x3 inch maple.  
**A typical set up is done as follows:**  
Form a rectangle using the four scales and blocks. The size will be dictated by the size and shape of the item being checked.

The blocks should be located to permit easy measuring, for instance: if the blocks are located the same distance from each end of the scale, the center will be 18 inches on the 36 inch scales and 30 inches on the 60 inch scales . . .





elementary but important.

The screws are then tightened and the assembly is checked for square . . . we do this by measuring from one end of a long rule to the other end of the paired rule. Now compare this with the distance from the other paired ends. See sketch "A". If you are squaring the airframe, it's important that this be exact, and we simply tie the jig into square using a piece of string as shown in sketch "B". By shifting the string slightly at the end where it passes over the blocks, you will get an exact center. This will hold the jig very well.

We must insure that all the beams are parallel . . . simply sight over the top edge of the one long beam to the underside of the opposite side. See sketch "C". You can easily see an error of 1/16 inch over the 60 inch length. Shim as required under the supporting cross beams. This technique will result in all four scales being absolutely parallel.

We can now measure vertically from any point and obtain true references.

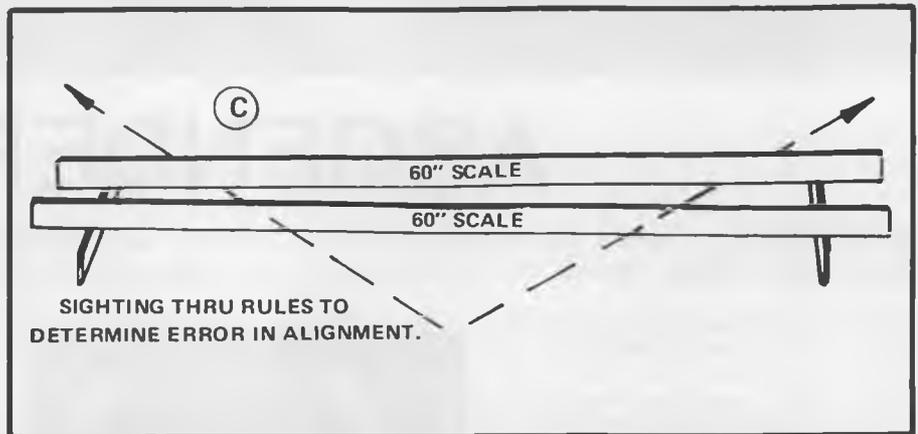
Here are some typical setups.

**Stab or wing panel without tips**

Make a setup wide enough to permit panel to slip between scales. Draw a center line on the root and tip. Push pins into centerlines and rest pins on the scales. See sketch "D".

Flip panel over and repeat. If the centerlines shift, your jig is not parallel (or the pins have moved).

You can get the panel to within a few thousands of an inch accuracy doing this.



**Stab or wing panel with tips**

Make setup as wide as possible to permit the wing (half or entire wing) to rest on the scales. See sketch "E". Measure one side and compare it to the other. You will find differences of 1/32 easy to detect.

**Aligning stabilizer — see sketch "F"**

Place the assembled wing and fuselage squarely on the jig. Install stabilizer and square with wing, locate stab with wood slivers and C.A. adhesive. Double-check for correct incidence.

Jack the tail post vertically until the wings are parallel with the beams. The stab can then be measured from the beams and the incidence will be easy to determine.

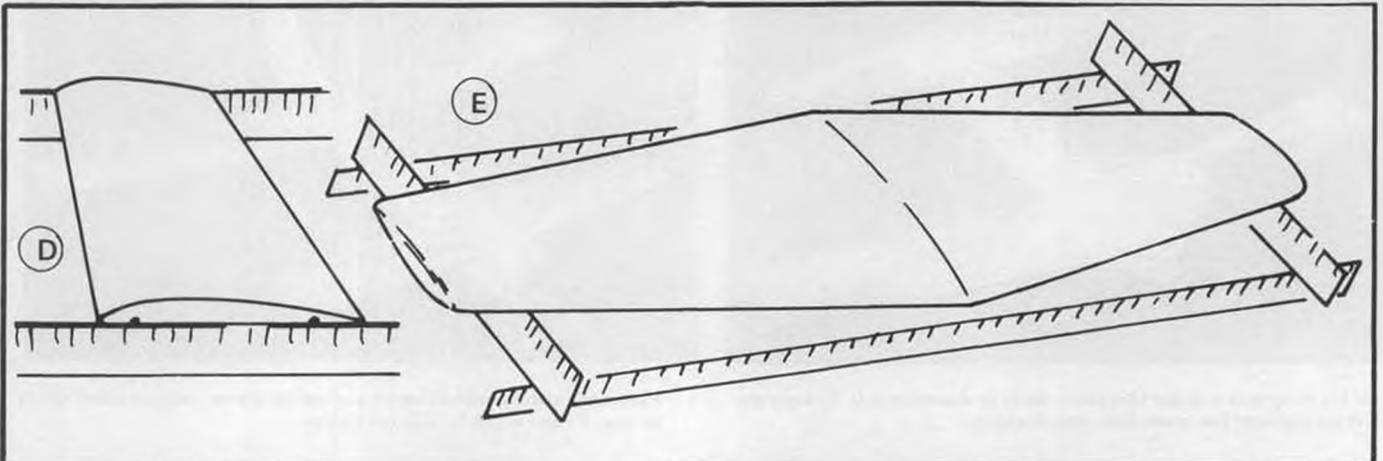
We have made our own little bits and pieces to help speed up alignments. One of these is a device used to lift or

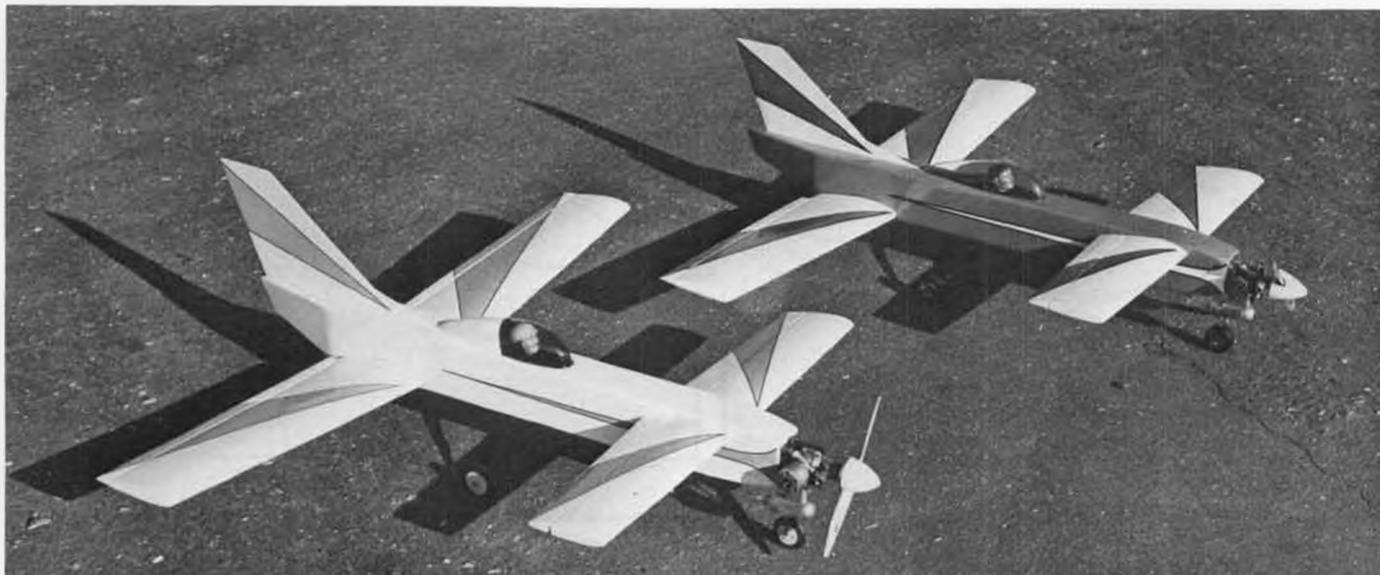
locate the tailpost or stabilizer. See sketch "G".

Also, the various plumb devices such as the "Robert incidence meter" and the Sears "angle finder" can be used to speed up the alignment process.

Accuracy with the "Square Deal" can be as close as you want. We use a fine line marking pencil for center lines and it's line is approximately .010-.020 wide. Once the part or assembly is squared to the centerlines, it should be good enough for anyone.

The 36 and 60 inch straight edges are not cheap, approximately \$10.00 each. The maple blocks are shown in the plans, and we have them made by a cabinetmaker. If you like, we can provide you with the pieces. Just write us directly for current prices. (See Dick's ad for his address. wcn)





# ASCENDER

By SKIP RUFF . . . Here's one that will have those "civilian" spectators saying, "Which way do it go, Mister?" Unlike many odd-ball designs, this one doesn't give up exceptional flying ability just to look different.

- My goal in designing the Ascender was to come up with something simple and a bit unconventional. With canards being all the rage these days in the home-built and ultra-light fields, I decided to go with the flow, and the end result is what you see here. It may not be pretty, but it is functional.

I do not enjoy building wings, so the model was designed around ACE foam wings. The fuselage is more or less a slab sided box with the engine and canard surface (elevator) at the front and the wing and radio at the rear. I did not mount the engine pusher style, as it is on most canards, for two reasons. First of all, I have a natural aversion to using my prize radio as nose ballast. Secondly, I fly off a dirt field, and prop erosion caused by pebbles kicked up by the nose-wheel is pretty bad on a pusher. The only real disadvantage to the tractor design is the gunk coming out of the muffler and splattering all over your nice covering



Skip and his Dad, Gordon, with their Ascenders, at famous Taft F/F site.

job. Just be sure to take plenty of paper towels and 409 with you to the field.

## CONSTRUCTION

First off, you will need three sets of ACE foam wings; two sets of tapered

panels for the canard and main wing, and a set of constant-chord panels for the center section of the main wing. Of course, you will have plenty of the constant-chord wing left over so you might want to talk some of your buddies into building one so as not to be wasteful. That is, unless you plan on building seven or eight of them yourself!!

The part numbers and prices of the items you will need to order from ACE are listed below.

TAPERED WING SET . . . #50K101 . . .

\$3.50 (2 req.)

CONSTANT CHORD SET . . . #50K102 . . .

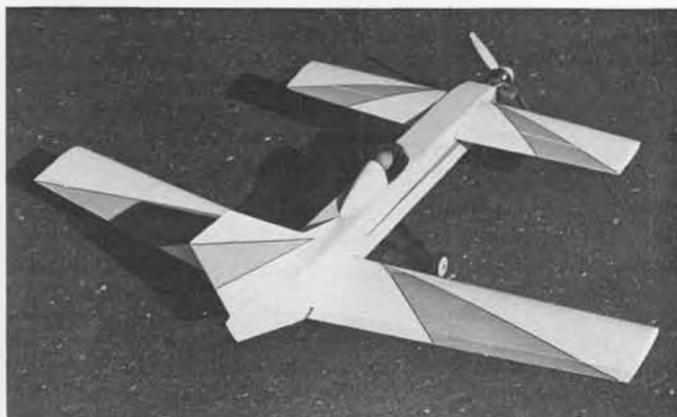
\$3.50

These are available from:

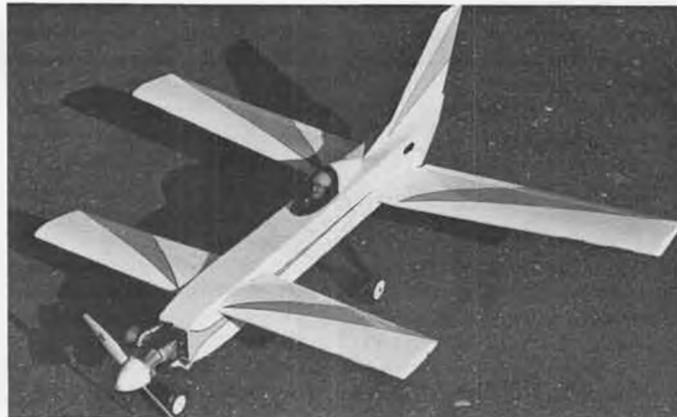
ACE R/C, Box 511D, Higginsville, MO 64037. Be sure to enclose an extra \$1 for postage.

## FUSELAGE

Begin by cutting the sides from 1/8 inch med. balsa and gluing the 1/8 x 1/4 longerons, vertical members, doublers



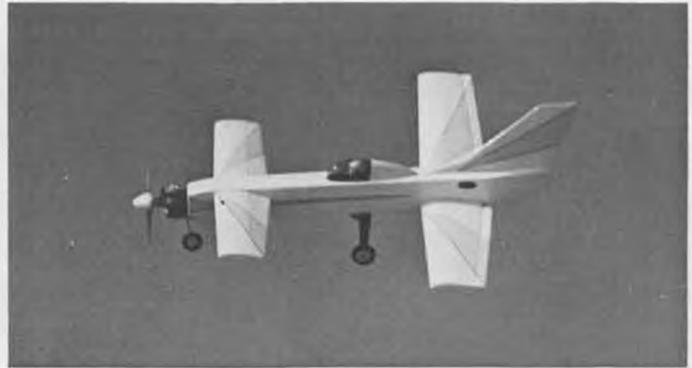
Ace foam wing sets make this one a quicker assembly job. Econokote used throughout for lower heat requirement.



Forward engine position keeps grit out of motor, puts receiver safely to rear. Power is .15 to .25. No rudder.



Scramble! Skip and Gordon do a formation takeoff for the camera. Ship is fast and groovy.

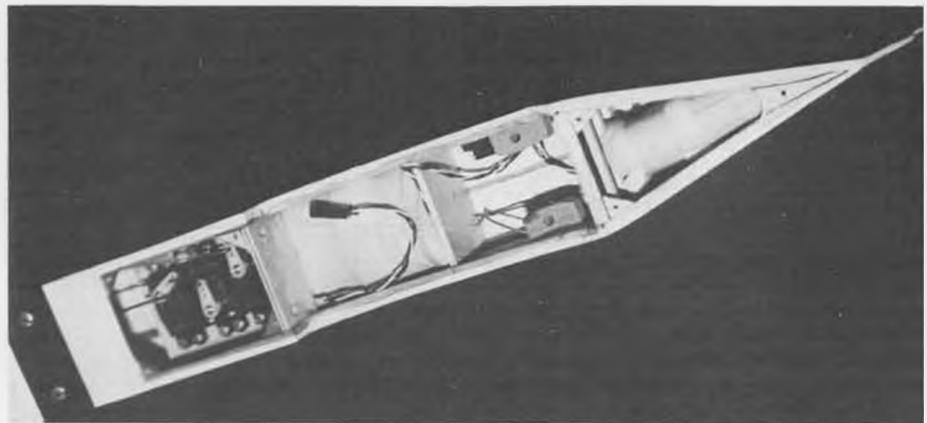


Inspection pass. "Elevator" moves down for "up", and vice-versa. Just hook it up correctly and then fly it like any plane.

D-1 and D-2, and the hardwood wing mount blocks in place. As the nose curves slightly inward at the firewall, it is best to pin the fuselage sides down to a flat board and block up the front about 1/8 inch while gluing in D-1. When dry, the two sides may be joined, using F-1, F-2, and the soft 1/4 square crosspieces. Use plenty of epoxy around F-1. The tapered sides at the rear should be cut off at the break and re-glued back on after beveling the joint.

The canard is constructed by cutting off the inside portion of the tapered panels until they are 12-1/2 inches long each. Epoxy the two halves together, lining up the mold lines on the leading and trailing edges and making sure the TOP surface is straight (no dihedral or anhedral). Cut off the elevator section and bevel it as shown to provide clearance when it moves down ('up' position). Cut 2-3/4 inches out of the center of the elevator to make the two halves. Make up the elevator horn from 3/32 music wire and 1/8 aluminum tubing, and epoxy in place on the canard. The model was designed for a .15 to .25 engine so, if using one of the larger sizes, I would recommend a couple of strips of glass tape along the bottom (and top) for strength. The canard may now be epoxied in place on the fuselage.

Now is the time to install the elevator pushrod and necessary linkage hardware, as this area will be inaccessible when the top and bottom sheetings are applied. Leave the pushrod long enough to trim to proper length when installing the servos. The threaded end should be positioned midway in the clevis to allow minor adjustments one way or the other



Radio installation. Use three or four channels. Simplest is 'Y' connector to aileron and nose gear steering servos. Battery pack fits in tail cone section.

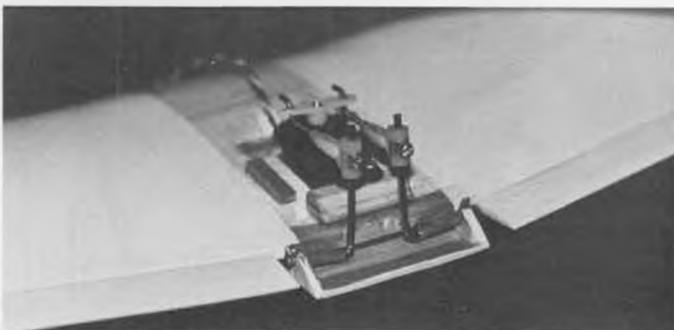
without running out of thread.

The 4 ounce Sullivan tank is next. It must be tilted down slightly at the rear to clear the canard. A length of nyrod (inner or outer) should be installed in which to run the receiver antenna forward through the fuselage, as the receiver is mounted at the rear. I used the small size GOLD-N-ROD for my throttle linkage, so now is the time to install the outer tube. Leave enough at the rear for trimming when the servos are installed. The two pieces of plywood for the landing gear mount are epoxied in next and finally the 3/32 top and bottom sheeting is glued on crossgrain. The 1/8 balsa fin may also be glued on if desired.

#### WING

The wing utilizes full length tapered panels and a 4 inch piece of the constant-chord section. Using care, and a Dremel

jigsaw if possible, cut a slit in each panel for the 1/16" ply spar. The center section is cut in two. Epoxy the center section halves to the spar and, after curing, epoxy the tapered panels to the spar and the center section while blocking up the tips 2 inches. You will have to bevel the outer panels at the joint for a good fit. Use care and lots of eyeballing here to make sure you don't build in any twists. Block sand the trailing edges until they are a 1/4 inch thick, in order to match the aileron stock. Bend the aileron links, as shown on the plans, from 3/32 music wire and 1/8 inch tubing, and epoxy them to the wing. Position the wing on the fuselage, taking measurements fore and aft, and eyeballing it with the canard to make sure it is straight and level. If it doesn't line up with the canard, sand the wing saddle until it does. With the wing

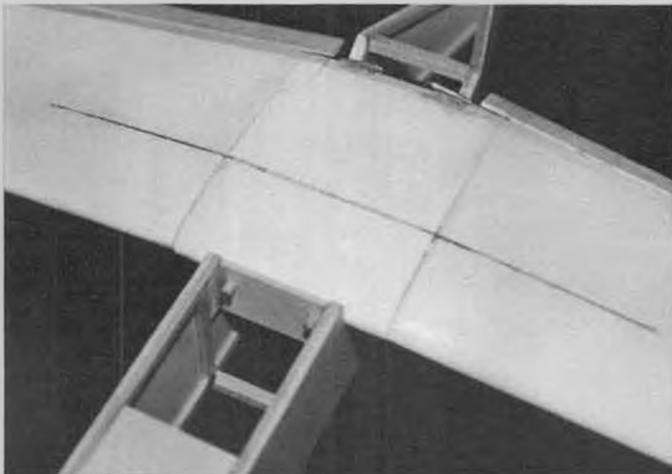


Aileron linkage is compact and simple. Skip uses Futaba gear, S-20 servos. Reinforcing glass tape on wing is suggested.

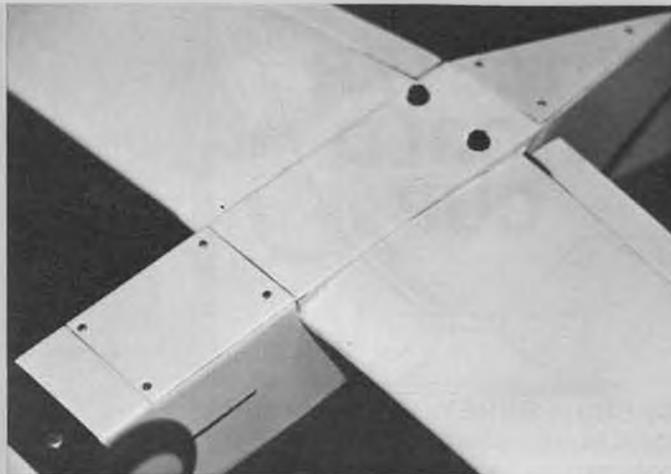


Upside-down view of elevator linkage. Remember, "Up is down and down is up." Halves will be aligned when glued in place.





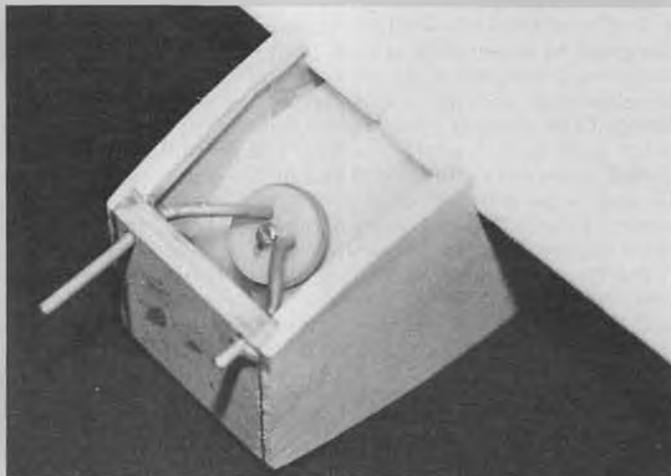
Center section and outer wing panels are butt-joined and reinforced with ply dihedral spar notched into cores.



Hatches and wing provide covers for everything (l to r): servos, receiver, and battery. Hallco landing gear.



Upside down view of canard installation. Tank tilted slightly to clear. Note glass tape strengthener. Everything here gets sealed.



Sullivan tank installation is snug and compact. Do it right! All of this gets sealed in by bottom and top planking.

secured to the fuselage with rubber bands or tape, insert a 1/8 drill bit through the holes in F-2 with your fingers and drill out the foam wing for the 1/8 dowels. To the bottom of the wing, glue the balsa pieces that fair it in with the fuselage. According to the nylon bolts you are using, drill the ap-

propriate size holes through the wing and into the hardwood blocks inside the fuselage. The wing may now be removed and the 1/8 dowels epoxied in place.

**LANDING GEAR**

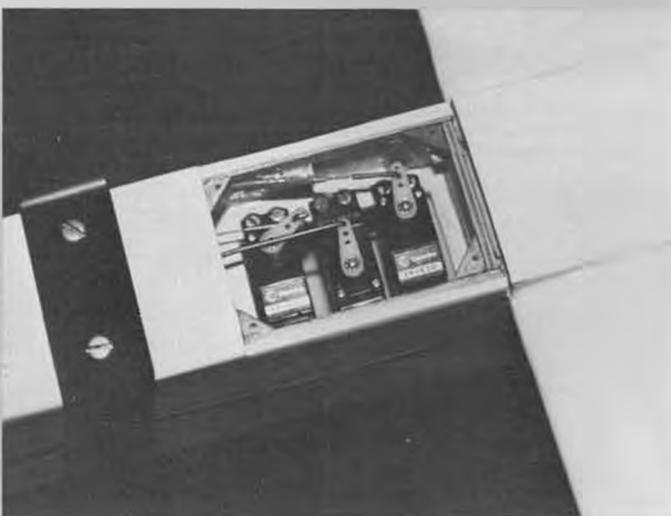
The main gear is a HALLCO unit P/N B105-2, for models 1.7 to 2.7 lbs. in

weight. It is attached with wood screws and bent down slightly for more ground clearance. The nose gear is bent from 3/32 music wire and inserted through a hole drilled in the nylon motor mount. When the model is all finished, it should sit with the nose 1/8 to 1/4 inch lower

*Continued on page 70*



Completed engine and steerable nose wheel/installation. OS .25 with muffler makes it a spry performer.



Futaba S-20 servos are a snug fit. Don't plan on using anything much larger. Direct aileron to nose gear link possible, but difficult.

# 2-METER WORLD CUP

By **BILL FORREY** . . . Two meter sailplanes have put R/C soaring competition back onto the high burner. This report of the Third Annual will help you understand how it happened.

- The Two Meter World Cup is a contest designed to accomplish several things. Its primary purpose is to promote the development of high performance 2-Meter Class competition, testing both pilot and model performance. The 2MWC rules were intended to be fun to fly and to be different than any other contest format in use. These goals have been successfully met in the 2MWC.

The Third Annual 2MWC was held this year in Las Vegas, Nevada, in the dirt parking lot of the Silver Bowl football stadium. The contest was a two-day



Gaggle of SFVSF planes, includes 2nd and 3rd spot models (foreground). All use fiberglass fuselages, all original designs.



Skip Miller (1977 FAI World Champ) crashed his Hustler-SM early in contest (radio).



The **BIG WINNERS** (l to r): Bill Forrey, 2nd; Don Edberg, 1st; and Larry Pettyjohn, 3rd. All with ailerons, 1st and 2nd used E-205, 3rd used MB-273515.

affair, Saturday and Sunday, the 6th and 7th of February. Joe Welch, Jr. of the Southern Nevada Soaring Society was the contest director and principle organizer of the contest. Mike Reagan, President of the San Fernando Valley Silent Flyers, was assistant CD and winch master for the contest. The Boy Scouts of America, Las Vegas chapter, pulled winch lines both days of the contest, no small task. A local R/C power club helped with flagging chores for the distance tasks.

This year's 2MWC had a flying site on par with previous sites with a few exceptions. Green and white frequency had a definite problem with interference, too many contestants had problems with it to be individual radio problems. One member of the R/C power club said that, "we never fly green and white here." The other problem was the surface of the field. It was rockier than the previous 2MWC sites, and plans to roll the rocks under with a steam roller didn't quite work: the rocks still managed to cause damage. The field did have some very nice improvements over previous sites. The Silver Bowl ticket office was made available to us, as were the snack bar and restrooms. The computers were run in the office, which acted as a scoring/flight grouping area, an equipment storage area, a winch

battery charging area, and a repair station for broken gliders.

The first day of the contest began with some delays due to slow winch equipment set-up, but once under way, moved smoothly. Round one was four-lap speed on a 150 meter course (FAI speed has now followed suit with a four-lap speed event). Speed events always please crowds. This one was no exception.



Lots of ballast in Rick Schramack's "Whisper Speed", which was FAI ship used at Sacramento World Champs. E-182 airfoil.



Dave Johnson and his Dodgson Design kit "K-Minnow", which he flew to 3rd place last year.



Jim Wichert and slightly modified "Algebra 2M" English kit designed by Sean Bannister.



Neil Tinker, John McMillan, and Jack Nunn (l to r), three of the four Canadian contestants.



Don Edberg launches his Hustler-M in Round Two. Took first in Round One and never relinquished it. Yes, Mabel, it was chilly there!



Alex Bower and his 2-meter TERN. Thick section, but second fastest in speed. Rudder and elevator. Finished seventh.



Chris Hanzlic and "Hbu" 2-meter. Lost an aileron on speed run. Uses E-205 section.



Last minute contestant, Mike Reagan, President of co-host SFVVF club, with Lyre Bird 8. Model was also quick, last minute project.

Radio problems caused quite a few crashes and near-crashes. There seemed to be an unusual amount of "glitching" on a couple of frequencies. Simple

answers couldn't be found, but the transmitter impound area was run rather loosely for the first dozen flights, and at least one of the impounded transmitters was found to be ON!

were responsible for these results, I don't know, but at least I CAN say that thicker is not necessarily slower.

One last thing about thick sections that has been my observation based on SFVVF experimenting: thick sections are



Reagan's Lyre Bird 8 pulls hard turn during distance run, and heads for the moon! Note sighting device for judging turns.

This year's speed times tended to be faster overall. Last year's fast and slow times were 39.5 and 90.0. This year's were 30.8 and 78.8. The top ten speed fliers last year averaged 42-1/2 seconds, this year's top ten were quite a bit faster at 35.8! It is interesting to note that Don Edberg turned in the two above noted fast times.

An interesting debate has been raging within the San Fernando Valley Silent Flyers club for the past three years. It is the age old question of which sections are better: thick sections (13-15% of chord) or thin sections (anything less than 12% of chord). Each type has its advantages and disadvantages. I personally think that for distance flying, at least, the thin sections tend to do better. However, in the speed event, where wing loadings tend to be a little outrageous, there seems to be little difference in performance. Six of the nine airplanes that had sections over 14% thick placed in the top ten, one of the nine had radio problems (Mike Bame). Now, whether it was the pilots, or the airplanes, or a combination of both that



Reporter, photographer, and 2nd place winner, Bill Forrey with Poohawk. Built in under two months, employs CAR, stabilator.



Rodger Roth helps Larry Jolly (right) hold his "Altair" for photo. E-182, built-up wings, octagonal 1/8 lite-ply fuselage, flying stab, flaps.



Peter Stevens, England, with English kit back-up ship Factor. Crashed primary model day before start of competition.



Chris Adams, Reno, with FAI test-bed. Eppler 214, camber-changing flaps, ailerons, Might have made top ten, but popped off line once.



Dave Johnson launches his K-Minnow. Has been cleaning up in Pacific N.W. against unlimiteds with this Dodgson Design bird.



Oops . . . or so it would seem. The 727 is headed for nearby Las Vegas airport. The 2-meter is minding its own business.



Grrunt! Laird Owens launches Lea Goodrich's "Zephyr Deuce". Uses E-387 at root, modified to low camber at the tip.

stronger for equal construction techniques; thick sections "hang" at a slower speed before stalling; they tend to be able to pull higher  $C_L$ s; thick sections are miles easier to build and bury things inside (like ballast, servos, hinges); and finally, by virtue of their thickness, they are less prone to flutter due to their torsional strength.

Personally, I chose to fly with the Eppler 205, as did Don Edberg and quite a few others. My time was a 40.1 which was not quite as fast as I had hoped, but not disgraceful either (12th fastest) considering it was my first attempt at a speed run and I only carried 1-1/2

pounds of ballast (14-1/2 oz./ft.<sup>2</sup>).

There was a long delay after the speed round was completed while the results of the speed runs were entered into the computer, and then flight groups were organized. Duration was next on the agenda.

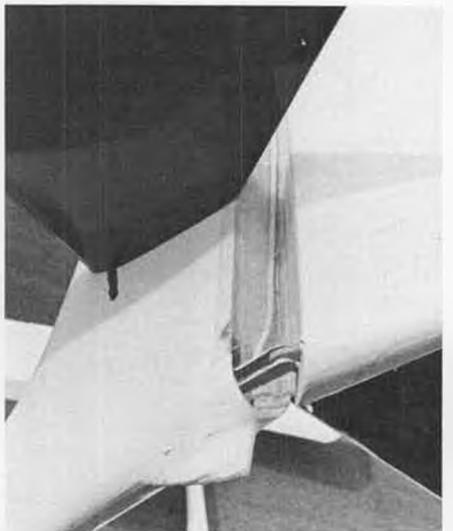
Lift was intermittent. Only eight fliers came close to the ideal 600 seconds. One flier, Joe Wurts, had the all time high flight in his flight group. While all the others in the heat were off to the southeast scratching for lift, Joe tried the east and turned a little north . . . whammo, one king-size thermal. Joe quickly "specked-out," and maxed, and nobody else was able to find lift. Since all rounds except speed are scored man-on-man, the next closest flier got a measly 541 points for his 338 seconds.

Most times averaged about 250 to 300 seconds. Of the 64 fliers who were still

flying after the speed event, only 13 managed any kind of landing points. This is really not too surprising, as not too many people practice "runway" type landings, and as landing points were hard to come by. One point was deducted from 100 for every centimeter



Inside of Alex Bower's TERN, showing servo installation and humungous ballast box! Wonder if Satellite City rented that space?



Rudder detail on Alex Bower's TERN. Shows hinge beveled and scotch taped . . . shows mylar "gap-sealer" . . . shows clevis actuator and horn out of airstream . . . shows antenna running up fin post.



**TOP TEN** (l to r, top): Oliver Northrup standing in for Joe Newland, 5th; Rick Schramack, 4th; Larry Pettyjohn, 3rd; Bill Forrey, 2nd; Don Edberg, 1st; Joe Welch, C.D. (l to r, bottom): Gary Ittner, 10th; Fred China (Canada) 9th; Woody Blanchard, Jr., 8th; Alex Bower, 7th; and Dick Odle, 6th. Dave (The Computer) Peltz, far right, scored the contest.

away from the center line.

Unlimited distance (bury-your-opponent if you can) was the next event on day one. Contestants were given four minutes to complete as many 150 meter laps as possible. Man-on-man rules meant that you flew against only those guys in your heat, but you had to beat them all if you wanted that 1,000 points.

Temperatures were still low enough that most people never took off their jackets all day. The wind continued to blow 5 to 10 mph up until sunset. Lift for the distance round was about as good as for the duration round, which is to say, not good.

The distance event could have been termed L/D event. The average number of laps flown was about eight. If you were fortunate enough to find lift, you could have done ten laps, which five fliers did. Don Edberg was far and away the best in the round with 13 laps, whew!

By the end of the round it was clear who was number one. Don Edberg had amassed a perfect 3,000 points. His next

closest competitor was Larry Pettyjohn who had 2,697 points (90% of Don's score). Chris Adams was tight on Larry's heels with 2,682. So ended the first day of competition.

Later that evening, all the fliers, wives, friends, helpers and anyone who was interested, gathered at the Sundance Hotel and Casino in Downtown Las Vegas for what would have to be called the best banquet any glider contest ever had. There was so much food it was incredible, and get this . . . FREE champagne! If you didn't come to this 2MWC, you really missed out on a lot of fun. We even had a fire alarm during dinner (it turned out to be fake, but what a touch of Vegas!) Joe Welch gave a short speech and presented baseball caps with defective 2MWC patches to those first three fliers who totalled their aircraft that morning. Ah, consolation prizes!

The next morning came too early for everyone. And to make matters worse, the sky looked gloomy. Clouds hung like a blanket of gray cotton over the

entire sky. Well, at least it wasn't as windy or cold!

The contest organizers and equipment handlers (myself included) were on the field at 6:15 AM. Everything was ready to go by 7:30.

Day two of the 2MWC is supposed to be a day of concentrated strategy. Three rounds of simulated cross country, or distance goal as it is sometimes referred to, are scheduled. A ten-lap goal is set up over the same 150 meter lap course. Working time allowed for completion of the ten laps is five minutes. The way it is scored is similar to full-size soaring contests. If you finish the course, and nobody else does, you get the 1,000 points. The other guy who didn't finish is left with a small fraction of the 1,000 points.

In heat number three of the first round, three contestants finished and two did not. The three that finished received points according to how fast

*Continued on page 84*



Oliver Northrup shows the full aileron deflection on his 2-meter bird. He finished 15th.



Mike Bame with his molded fuselage design, which he sells, showing the root fillets to cut down parasitic drag.

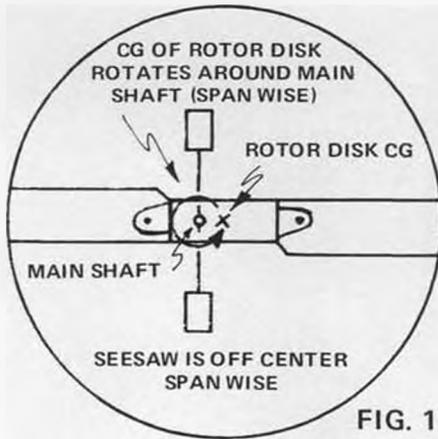


FIG. 1

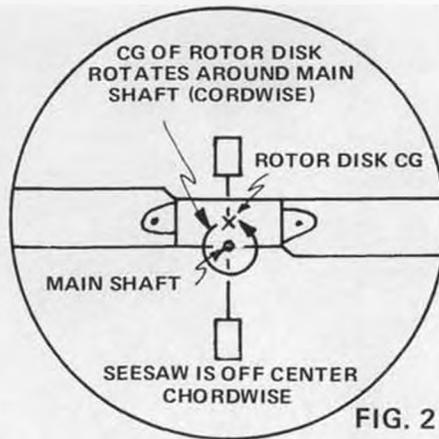


FIG. 2

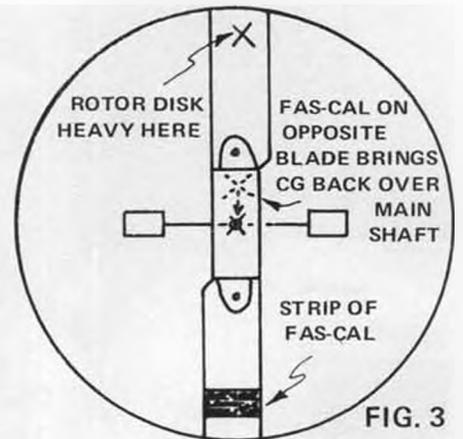


FIG. 3

# CHOPPER CHATTER

By RAY HOSTETLER

PHOTOS BY THE AUTHOR



• Just received my March '82 issue of *Model Builder*. Now all of you already know that *Model Builder* is a consistently excellent magazine, but the March issue struck me as a little extra special.

First off, WCN opened up with a baffling discussion of "I" vs. "we", from a writers point of view. In the fall of '81, my wife began prompting me to write as "I" instead of "we". (She's an English teacher so she ought to know.) I kept telling her that I didn't want to sound too egotistical using "I" all of the time. She replied that "The readers read the article because they are interested in your personal point of view and experiences." I couldn't argue with that too

much, so if you look back on the fall '81 issues they are all "we". The later issues are all "I".

Then in *R/C Auto News*, Dan Rutherford wrote some very straight stuff that touches the heart of most every columnist. I especially liked the first part of Dan's article concerning manufacturer's reps. and/or their relationship to the magazines. Just thought I'd let you know that I agree with you, Dan.

For the next two months (maybe three) I'm going to give my latest method of setting up main and tail rotors for smooth, vibration-free flight. Some of you may have read my two articles on vibration that were published in *RCM* a

few years back. I've learned a few things since then (yes, there is hope. . .), and I'd like to pass this information on to you.

The key to balancing is the High Point Balancer I've been telling you to get a hold of for the last two months. The credit for the Main Rotor balancing sequence (setting up and using the balancer) goes to Don Chapman. Don has been an innovator in R/C helicopters for quite a few years. This balancing procedure is just one of his many developments.

Rather than tell you right off how it's done, I'll let you suffer through a light dose of theory. This will help you understand why I do things the way I do.

## BLADES vs. DISK

Everybody thinks in terms of rotor blades. I guess it's just because that's what you see when the helicopter isn't flying. But we're really looking at a disk. A rotor disk is just like a large paper plate on top of the model helicopter. As long as you think about individual rotor blades, you'll miss the point.

You've heard in the past that the "CG of the blades must be the same". Really this is a minor point, good for a starting place. Let's say that the "CG of the rotor disk must be exactly centered on top of the main rotor shaft". There are not two CG's, there is one CG. Now the "two CG" method on each blade may work; depending on how precise the rotor hub was manufactured and how accurately the head was put together. In the end it boils down to mostly luck. If

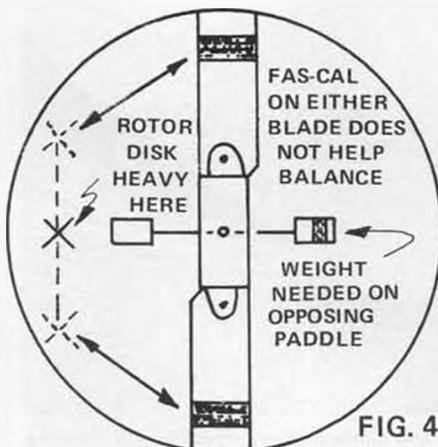


FIG. 4

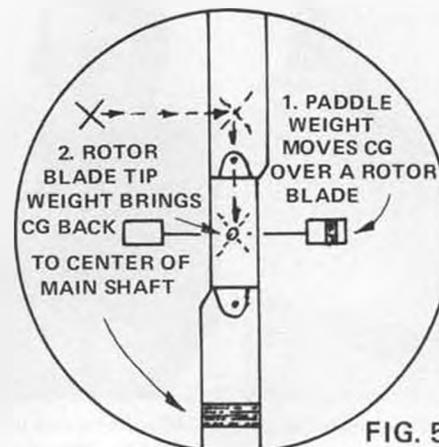


FIG. 5

you get a "good" rotor head, and you put it together just right, everything might work out to give a smooth head. As most of you have learned, that doesn't happen very often, does it? And when it does, you can't duplicate it on other ships.

#### SPANWISE ERROR

Just to show you how individual blade balancing fails, consider the following example, exaggerated for clarity. (See Fig. 1). This rotor head has two perfectly balanced blades on it. Will it run smoothly? Of course not. The CG of the disk is not over the main shaft. If "X" is the CG of the disk, look at how the mass moves around the main shaft. This will give us a severe lateral vibration, to say the least.

You may have laughed at the last example and said "I don't fly rotor heads that have hubs like that. . ." Well, that might be debatable. . . If the hub is out by several thousandths, that's enough to set up this lateral (spanwise) vibration. You can't see it, and it's unrealistic to try to measure it.

#### CHORDWISE ERROR

Let's look at the next major problem to which many of you may never have given consideration. We assumed in the last example that the head was equal spanwise. It wasn't. We can't assume that it is equal chordwise, either. See Fig. 2. Here both blades are the same again, but the head will still shake. But instead of a lateral spanwise imbalance we have a lateral chordwise imbalance. I can't emphasize enough that the blades can be perfect, but that's not what's causing the problem!

#### OUT WHERE?

The Kaven Jet Ranger head is a good example of how all of this can be far from perfect. Most of you who are familiar with it will recognize these faults. Spanwise, each axle is independent of the other. This leads to different lengths (arms) from the mainshaft, same as Fig. 1. Then the blade holders all fit differently on the axles, which gives another compounding error.

Chordwise (Fig. 2), the hub is held to the seesaw by bearings that you have to epoxy into place. If you really try, the head can be off center as much as 1/16 to 3/32 of an inch. In helicopter setup, this is as good as a mile out. In both cases, it is impossible to measure and be accurate about anything.

All helicopters have these same errors, some more than others. You can see how the collective head is going to give more problems than the fixed pitch head, because there are more places for the collective head to be set up out of tolerance.

#### TRIAL AND ERROR, ERROR, ERROR

As I look back over previous years, I can see where I was right in some procedures, but wrong in others. In other words, there is a sequence of events needed to get everything right. If one thing is done out of sequence, the whole process may not give satisfactory results. I'd like to show a few drawings



Two steel counterbalances for different size mainshafts. Left one is three inches high by one inch diameter; weighs 9 ounces. Other is 2-1/2 by 1, weighs 8 ounces. Both for .50 to .60 powered ships.

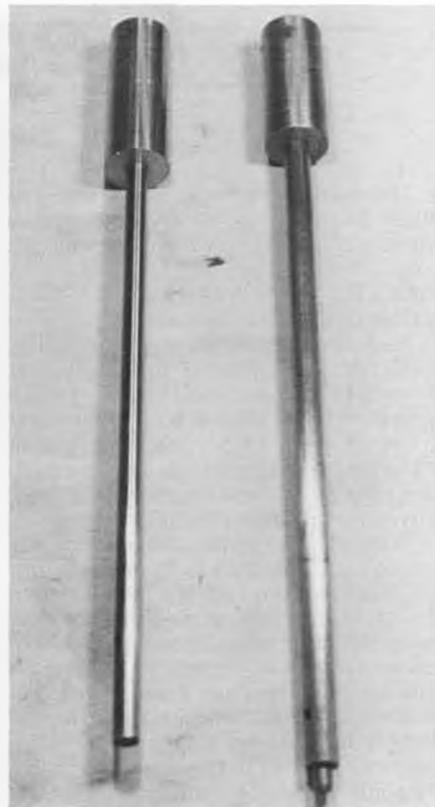
that demonstrate the general "out of balance" possibilities.

In Fig. 3 we have a rotor disk, out of balance at the point indicated. (Heavy spanwise. Consider the rotor disk as a big paper plate, and put a little blob of clay in the heavy position marked by the "X".) How do we correct this situation? Add a strip of sticky Monokote or Fas-cal to the other blade. This brings the CG back over the mainshaft. This is why some people recommend trying various widths or amounts of tape on each blade. If the vibration gets better, add more tape. If it gets worse, take off the tape and put it on the other blade, and see if this helps vibration.

This is not really a bad approach in the given example, but look at what happens when the same method is used in Fig. 4.

Given the disk is heavy on the left side (chordwise), adding tape to one blade or the other will pull the balance out no matter which blade you choose. To correct this example you have to add weight to the opposite paddle to bring the CG back over the main shaft. To deal with chordwise imbalance, we place wheel collars on the flybar and move them in or out as required to bring the CG over the mainshaft. Don't confuse this with weights on the flybar to change rotor head sensitivity; although they can be used to correct chordwise imbalance if you are very careful. They are just too big to provide the extremely fine adjustment I'm talking about. We could try to vary the wheel collars by trial and error, just like varying the tape on the blades, but then things start to get messy. Tape on the blade first? Which blade? Maybe tape on the paddle? Which one? Was that better over there or over here? What if I tried. . .

And that's not the end of it. Figure 5 shows an example of where tape is needed on the blade as well as the flybar! The disk is heavy on the left front as shown. Adding weight to the paddle or the blade independently does not help matters. We have to add enough paddle weight to bring the heavy point



Detail of mainshafts as they slide into counterbalances. Left one for Hughes 300, right for Kavan Jet Ranger.

over a blade, then tip weight on the opposite blade to finally bring the CG over the main shaft.

Hopefully, all of these examples have shown you a little bit more of what's going on in your rotor head. It's not as simple as it initially appears. The more you've flown helicopters, especially the complex collective pitch designs, the more you'll be aware that balance is critical. And when you fly lots of various ships (even of the same design) some are pure "dogs" to track and balance while others offer very little resistance. It just depends on the "luck factor".

To finish up this month, I've given some photos showing the basic necessities for the balancing procedure. You'll need your rotor head, and extra main shaft (brand new and perfectly straight), and a counter balance as shown. When you lay the rotor head on the balancer you need this piece of machined steel to keep the head from flopping to the floor. Most any machine shop can turn one of these counterbalances for you. It should weigh about eight ounces for a .50 or .60 size head, and four to six ounces for a .25 to .40 size ship. The counter-balance must fit to the main shaft with zero slop. For this reason, I suggest you give the machine shop the main shaft you intend to use so they can give you a nice friction fit.

Order a new main shaft and have a counterbalance machined for you. Next month I'll give the process to set your rotor head up so you'll never again have to guess at how much tape to add to any particular blade. Sound nice? ●

# the Electronics Corner

By ELOY MAREZ

• The mail for the past few weeks has been encouragingly steady, and covers a variety of subjects, which we will get into immediately:

## DRY CELL TRANSMITTER CONVERSION TO NI-CDS

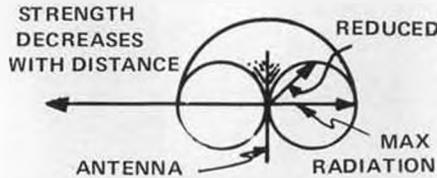
Had a note from up in silicon valley, from Mr. Earl Levin, of Sunnyvale, CA, who asks about converting a dry cell powered Cox Model 8020 transmitter from dry cells to Ni-Cds, stating that, "The set my son has seems to go through dry cells at an alarming rate . . . is there any way this drain can be reduced?"

Well Earl, there probably isn't any way to reduce the current consumption; most present day radios are designed to be as economical as possible, power-wise, but it still takes a certain amount of battery power to do the job. On the off chance that you have a defective component in your transmitter that is robbing your battery, I'd check or have someone check the consumption. Though I cannot pinpoint the exact drain for this particular transmitter, I would guess that 125 to 150 mA ought to be about right. If it is much over, something's wrong.

Answering your question about the conversion to Ni-Cds is easier . . . yes, and I recommend it. It is far cheaper in the long run, the assurance of having adequate battery life for any given flying session is wonderful, and the whole thing is not difficult at all. In fact, you don't even have to shop around for individual parts, just order yourself a Stock No. 39K9 Transmitter Ni-Cd Conversion Kit from Ace R/C. It contains not only the cells, but a charger, LED charge indicator, plugs, and can't-go-wrong instructions. The 1981 price was \$24.95, however, this is 1982, and there is no need to discuss prices about anything. Ace R/C does have a new catalog, for \$2, which will give you current prices on all of it's many fine and interesting products. Let us know how it works when you get it converted.

## MODE ONE VS THE WORLD.

Had a most interesting letter from Mr. Eugene Mathis, of Daphne, Alabama, which I can't share with you in it's entirety because of limited space, but it is obvious Mr. Mathis knows of what he speaks, besides being a true Southern



Theoretical radiation and reception pattern of a simple wire or whip antenna, shown cut in half to show how the pattern from the center of the antenna varies. In actual practice, the shape is modified by nearby metallic objects, is not that sharply defined.

Gentleman. And I don't make the last statement simply because he agrees with my Mode One opinions. Of the others, he writes, "learners and experts alike work under a handicap with the Mode II and even more so with the single stick. These abominations require more co-ordination, not less." Since Gene also writes about such fun things as driving B-29's, he must know a thing or two about things that fly in the night!

Gene adds a PS: "Tell that fellow Northrop he needs a haircut, and also that ancient pelican, WS, needs a shave." Well, Gene, WS, Walt Schroder, has moved back to damyankeeland, New York, and needs that fuzz just to keep warm. And I can't argue with the editor's blue pencil so I'll let him answer if he wishes (in 25 words or less!) (Gene must be so busy trying to figure out those Mode I sticks, that he's gotten behind in his readin'. Walt left a year ago (this month) and my hair is cut as short as the G.M. will allow. D'you suppose them B-29s had separate control columns for elevator and ailerons? Those poor Navy and Marine fliers on my carrier only had one (single) stick in the F-6s, F-4Us, TBF "turkeys," and SB2Cs we had on board! wcn . . . That's 76 words, but what the hell, I'm editor!)

## OOPS!

My Variable Speed Control, February issue, has a minor error in the schematic and drawing. On the incoming AC wires, read black where it says white, and vice versa. The Speed Control will

work as shown, but there is one of those if, if, if, problems.

The wiring, as shown, could cause a problem, for example, if you have a tool or appliance plugged into the speed control, with it's switch "OFF", and were working inside whatever it is supposed to control. The white wire, shown connected to the fuse and switch, while effectively switching the device off, still leaves a voltage between the black and green ground wires. To be on the safe side, move the fuse and switch over to the black wire; everything will then be turned off.

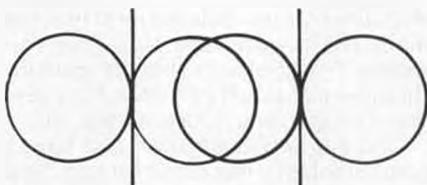
To be on the safest side, never work on anything that is plugged into AC unless you are absolutely sure of what you are doing. In checking for voltages, which you sometimes have to do, use meter leads with clips on them. With the device unplugged and turned off, clip the leads to the proper point, then plug in and turn on. Never use tools or appliances with frayed or broken AC cords; change them. Never work on or with anything electrical while standing on damp floors. A piece of scrap rug between you and that concrete floor while using the drill press is a good idea. If you don't think electricity will kill you, read the following, which unfortunately appeared in our local paper, *The Register*, January 4, 1982.

## SHOCK KILLS MAN CLIMBING AFTER TOY

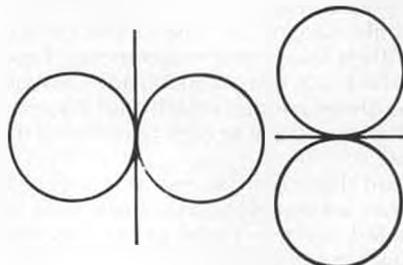
LONG BEACH (AP) — A 19-year-old Lakewood man was fatally electrocuted Sunday while trying to retrieve a model airplane that had become entangled in high voltage power lines, police said.

Southern California Edison employees were removing the victim Cory Thorpe, from a power pole when police arrived at the scene at 11:10 a.m. near Redondo Avenue and Ocean Boulevard, said police Lt. Norman Benson.

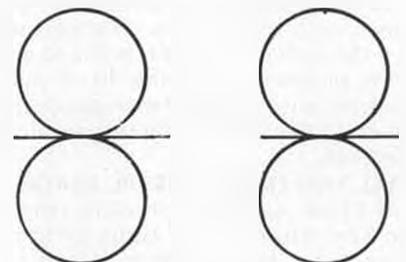
"He was flying a remote control balsawood glider when it got tangled up in the wires. He shinnied up about a 40-foot pole and either grabbed hold of or touched a wire, and it electrocuted



Maximum signal transfer occurs when antennas are similarly polarized, parallel to each other.



Lessened signal transfer occurs when the relative antenna orientation changes from the parallel positions.



Minimum signal transfer takes place when the antennas are end-to-end. Actual results of any orientation are affected by distance.

him," Benson said.

We'll even ignore the reference to the "toy" in this case, we're just sorry it had to happen.

## TWO BIRDS WITH ONE STONE

Had two somewhat similar letters . . . one from Charles Castaing, New Iberia, LA, who is building a Byron Bonanza, with electric retracts and lights (flashing, strobe, and landing!) He is concerned about the possible effects of all the associated wiring on the range of his radio system. So right . . . the time to ask questions is *before* you have reached 'rotate' velocity on the first test hop.

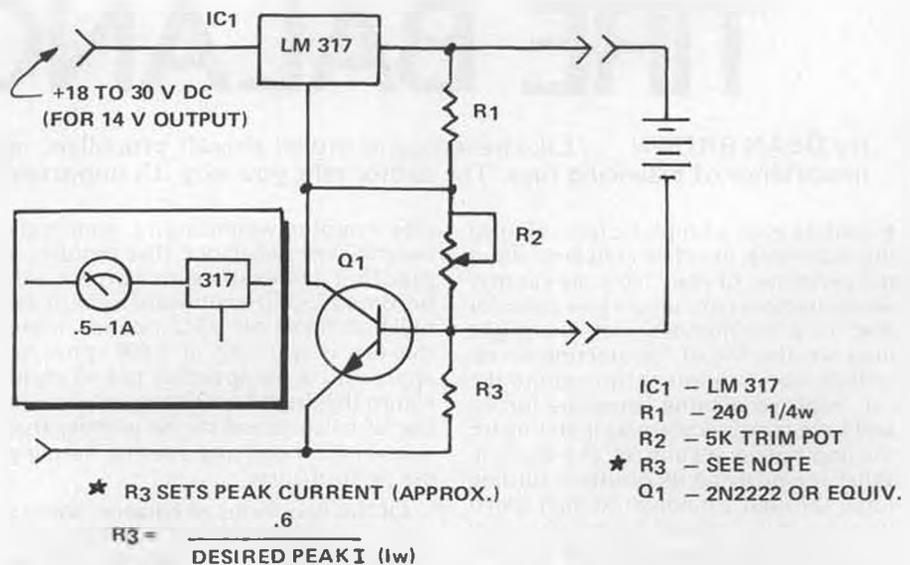
The other letter comes from a little further away, from J. Onderka, in Judibana, state of Falcon, Venezuela. Sigh . . . my travels last year took me down that way; the 15th floor of the Caracas Hilton, the Venezuelan island of Margarita and neighboring Curacao will always be fondly remembered. Anyway, Mr. Onderka has some of the same concerns; his project being an all aluminum 131 inch Cessna 140. By all means, send "fotografias" when completed.

Mr. O. has been told that problems may occur from "reflections by the aluminum parts and shielding when the antenna is on the opposite side for some moments because the antenna and frequencies involved are omnidirectional."

First, generally speaking, a certain amount of receiver detuning can be expected when it is installed in close proximity to a lot of metal. However, they have been greatly improved in that respect. When R/C helicopters first came out, they were plagued with radio troubles due primarily to receiver design, however, present day technology has come to our rescue and most systems will now work glitch-free, even in all-metal helicopters. This also mean that they will work better than older radios in installations such as our two friends describe. If at all possible, tune, or have tuned, the receiver right in the airplane, with everything installed and working. This compensates for the detuning effect.

As for the long leads on servos and other components, which sometimes are the cause of stray radiations, there is a new cure. RAM (Radio Controlled Models) now markets some ferrite beads called "RF De-Glitchers", which are claimed to be more efficient than the previously used series choke. They are simply slipped over the wires in accordance with the instructions received. I haven't tried them, but I do know of their effectiveness in other non-R/C but similar applications. The way to test their worth is to compare antenna-less or antenna-down range checks with and without; there should be some improvement when they are in place.

The range check is also an important tool to determine if an unusual installation is going to cause deterioration of radio range. Test the range, antenna off or down, in a simulated installation, on top of a non-metallic box or stool, with



Set output voltage with charger connected to a high capacity (5000 uF or better) electrolytic (low leakage). Meter can be inserted in input lead of LM 317 to read output current. Set output at 2.33V per cell for Gel Cells, 1.35V per cell for Ni-Cds.

the receiver antenna strung out as in the bird, all servos in position. Establish a standard distance at which the system begins to drop out. Then test it again in the airplane, with every thing as closely as possible in the same relationship. You will experience some drop in range, but are probably safe with as much as 25% less. Much over that and I would suggest an antenna extended check, looking for at least twice what the takeoff run is expected to be. The range will increase rapidly with altitude.

Now, on the question of shielding, or reflection by metal. Both happen, the former when said metal is between the transmitter and receiver antennas, and reflections when the metal is on the side away from the receiver antenna. There are many variables, such as the length and shape of the metallic object, and it's distance from the receiving antenna, all of which have to do with wave length, which is another way of saying frequency. With all the metal that we already fly around with; the engine, the pipe, gear, pushrods, etc., I would not be at all surprised if we are not already experiencing a lot of this, with moments of complete signal blackout. However, due to the rapidly changing relationship of the model to the transmitter, the loss of signal is of such short duration that it doesn't affect the flight path and goes unnoticed. I have heard of airplanes with a blind side, that always glitch in a certain position relative to the flyer, and there are flying fields known to have a blind spot in some corner on some particular frequency. Usually this is the corner with the power lines, metal warehouses, or something similar which may be causing a signal reflection.

In both cases, and especially in the case of Mr. Onderka's all metal bird, get the antenna out of the airplane as soon as possible, and as much of it as possible, installing the receiver right against the fuselage side. Mr. O asks about the use

of two antennas, in a "Y", running to different points of the airplane. It is possible that this might help, as could also using a center-tapped antenna, which is called a dipole. But our receiver's are designed for the antenna type and length installed, and we would probably do more harm than good by simply changing it without also changing some of the input circuitry. Since it takes some sophisticated equipment, not to mention knowhow, to accurately measure and evaluate antenna gains, we'd best leave this one alone.

What we will do, however, is resort to a vertical antenna, which is vastly superior in our application. Single element antennas, such as we are using

*Continued on page 88*



Inexpensive and simple-to-use component lead bender. Neat and convenient. See text.

# TIRE BALANCING

By DEAN BROWN . . . Like balancing of model aircraft propellers, many car modelers also overlook the importance of balancing tires. The author tells you why it's important, and how to do it.

• Adding even a simplistic form of front tire balancing to other concerns about the condition of your 1/8-scale car may seem unimportant, unless you consider that for a few minutes work you might improve the life of the steering servo, reduce vibration forces throughout the car, improve steering cornering forces, and have more accurate wing setting for the top speed section of the straight. What seems to be inconsistent turning force through a medium to high speed turn could be caused by imbalance of the front tires. What appears to be front end lift at top speed on the straight because of wing position could be caused instead by imbalance of the fronts. Especially, it seems, with some of the molded rubber fronts.

While new sponge rubber fronts always seem to be in pretty good balance . . . but should be checked, and rear tires of the same material also do not seem to be a problem, some of the molded rubber fronts at various times are badly out of balance because of differences in the density of the material throughout the tire. There is a section more dense than any other within the tire structure. The tire is said to have a heavy side, which will cause the greatest relative centrifugal force at high rotational speed and accounts for a badly bouncing tire.

For example, if not offset by opposite

side counter-weighting, a seemingly insignificant imbalance that requires a piddling 1/40-ounce to correct will become a localized outward force in the neighborhood of 1-1/2 pounds when the tire is spinning at 5,000 rpm! An approximate car speed of just 43 mph! Figure that both fronts can be this much out of balance and it's no wonder that severe tire bouncing results, harming car performance.

Of the two forms of balance, we can only work toward having static, or standing, balance. We can't do anything about dynamic, or running balance, except to take care where we place counterweights. It's not good to put all counterweights on one side of the tire width. Divide them equally, if possible, and put them at exactly opposite sides of the tire width.

And not even this simplistic form of balance testing can be done with reasonable accuracy unless the tire/wheel can turn very freely on some form of horizontal axle. The starting torque of either plain type or ball bearings . . . the force required to barely start the bearing turning . . . must not be so high as to mask any imbalance of the tire. If the tire to be checked for balance does not turn freely and slowly to a stop after being spun on an axle, you will have to provide other bearings for balancing purposes or, perhaps, buy and modify a benchtop

prop balancer. You might even take the idea behind the design of a benchtop prop balancer and provide your own knife-edge parallels, complete with a threaded axle shaft and nuts to make a fixed assembly of axle, wheel, and tire.

Guess what you are going to use for counterweights? Unless you have something better, use 5/8-inch x #18 brads. Even the worst tires I've worked with didn't require more than six or seven of these brads (approximately 1/40-ounce) to counterweight the heavy side.

One final suggestion about front tire balancing by this method. Don't expect or try for perfection, specifically if very sensitive rotation of the tire is possible. Striving for perfection can lead to putting so many brads into place the tire soon weighs a ton and still isn't in perfect balance. Although not an exact method to balance front tires, you'll feel a lot better about the condition of your car after performing one of the two stepwise balancing procedures.

It's something like the feeling you might experience after you've washed the family car. It always seems to run better, and never mind if there's no conclusive mechanical explanation.

## BALANCING PROCEDURE WITH FREELY TURNING WHEEL BEARINGS

1. With the tire mounted on a wheel and, if necessary, trued on both the face and sides, place the assembly onto an axle that is level horizontally.

2. Give the tire a gentle stroke and observe that it turns freely and slows evenly to a stop. (A quick halt means the bearing friction is too high for the necessary free rotation.)

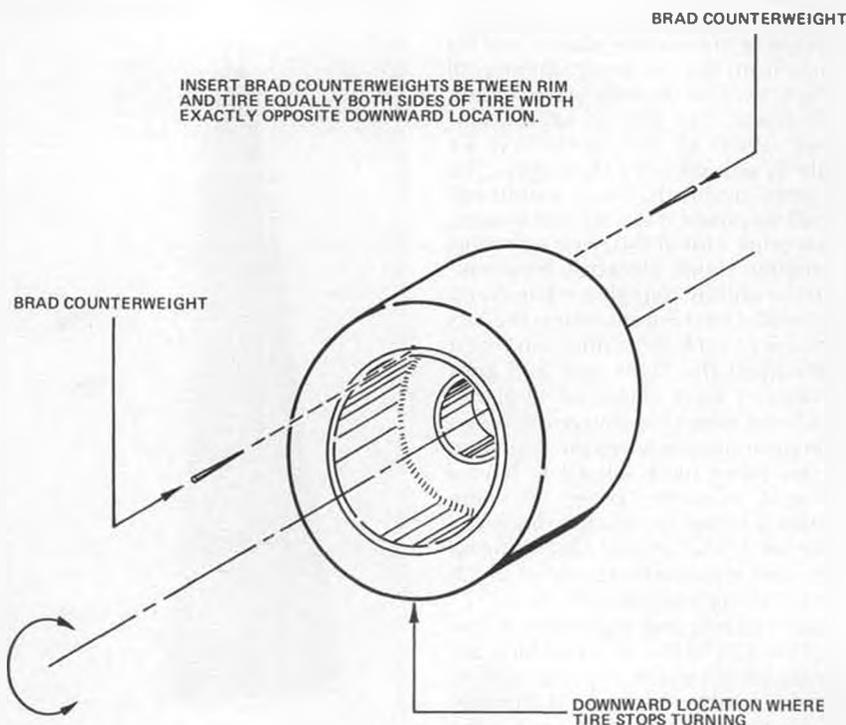
3. Repeat two or three times, watching closely each time and noting, or marking the downward point on the rim, where the tire stops turning. It might even roll back and forth before stopping.

4. If the same side of the tire stops downward each time, the tire is heavy at that location.

5. Calling the downward position 6 o'clock, insert a brad on either side between the wheel rim and tire exactly at the 12 o'clock position. Use pliers to squeeze the brad into place so the head is flush with the sidewall surface.

6. Repeat Step 2 to learn if more counterweighting is required at the 12 o'clock position. If so, put a brad opposite to the first one on the tire width to minimize adverse effects on dynamic balance.

7. Add the number of brads necessary to achieve static balance, alternating sides of the tire and placing brads virtually head-to-head when they are on



*Continued on page 65*

# R/C AUTO NEWS

By DAN RUTHERFORD

PHOTOS BY AUTHOR

● Painting the bodies for RC race cars is at the same time one of the easiest and hardest tasks in getting ready to race. It's easy if you know what you are doing, and can be very frustrating if you don't know the first thing about it. For this part of the article, it will be assumed that you don't know diddly-squat about painting a body for your new toy.

The bodies themselves are molded from a material called Lexan; all the manufacturers use the same type of material although it might not be the same brand name. No matter, same stuff. And sometimes the thickness of the Lexan will vary from one manufacturer to another, or in some cases a company will pull some lightweight bodies, which they may or may not make available to the average racers. Again, no matter.

Lexan is pretty tough stuff, but most paints do not like to stick to it, and there is the problem. Rather than tell you what doesn't work, here is what I have used with consistently good results. The RM line of acrylic lacquers, used with RM medium thinner, has worked real well and I have easy access to as much of it as I can eat (usual deal, good friend with a body shop).

As laziness has recently set in more



Joe Alves squinting, but when the shutter was snapped, he was winning . . .



Typical DRT (Dirty Racing Team) simple-and-quick paint job on a Parma Sorbello in 1/12 scale.

and more, I have also depended upon a brand of touch-up paint, marketed under the Tempo label. Comes in 5-1/4 ounce cans, is a DuPont Lucite lacquer, and can probably be found in auto parts stores. Mine comes from Delta, as they stock the primary colors, mainly as a convenience item for their customers, and the paint works pretty well, unless you want to get into tricky paint jobs, where that huge fan of spray from this type of can makes shading and such almost impossible. For two-color paint jobs, which is about all I have time for anymore, it does the job and eliminates the mixing and cleaning hassles involved with using an air-brush.

Although I have never used it, we have racers in our club who use Rust-Oleum paint from Local Hardware; it seems to stick fine, but watch for a few colors that come out being a bit yukky . . . patio furniture colors don't always look good on a race car, ya know.

Another that I have used is the Mr. Concours paint from BoLink. Using a brush and doing this painting free-hand, without benefit of masking-off windows and such, I thought it worked pretty well and is a good alternative if you don't have spray equipment. However, I had a little trouble with it when spraying it on, and as I race more 1/8 scale than 1/12, and the Concours paint isn't completely fuel-proof (although you could get by with it, if you had to), I just went back to my lacquers.

Continued on page 38

## REBUTTAL

Dan:

I read your April 1982 column (RC Auto News) with a great deal of interest and noticed that you felt it was time to speak up.

Well, you are certainly right about that.

I started racing model cars (slots) over 20 years ago, and built my first gas R/C car in 1967.

I know all about the pros and cons of factory teams because I have been on both sides of the fence.

You are dead wrong with your assessment of the situation in RC cars, particularly in singling out one manufacturer as a "spiritual" cheater and making another eligible for sainthood.

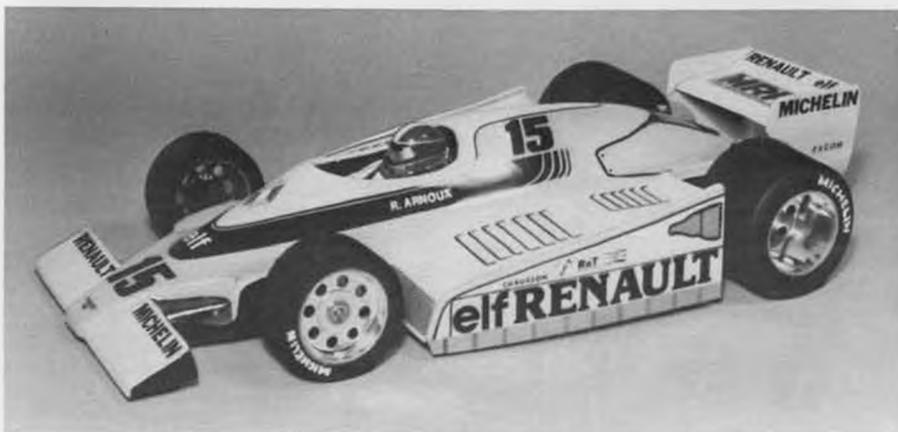
Now before you say "Hey, this guy works for Associated," you should know the facts.

Sure, I have designed some ads for Associated, but it is no financial windfall. And when I won the Nationals with an RC-1 in 1971, I distinctly remember paying my own way. After the Nats, I switched first to Taurus and then finally to Thorp cars. At the ROAR Nationals last year in Boston, I ran an MRP car because I liked the way it worked.

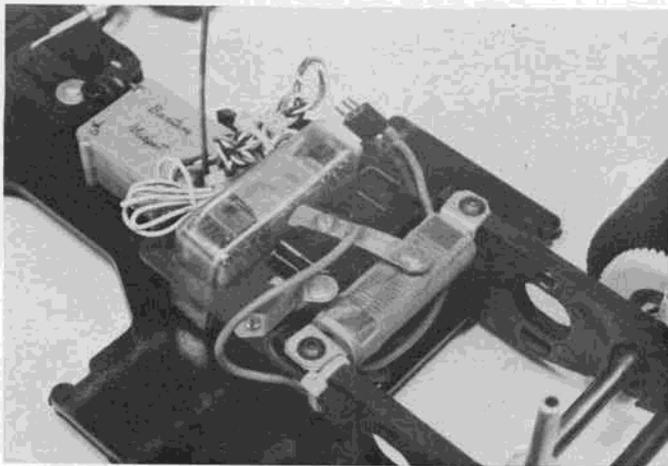
The point is, that I am no factory racer, just a racer like you, trying to have a good time with my hobby.

What I cannot understand is why do you have such a "sour grapes" attitude, and why do you feel it is so necessary to

Continued on page 76



A much better paint job than above, by Bob Welch, on this MRP Renault Formula 1 car, in 1/12 scale.



Clean radio installation in a 1/12 MRP car. This one used by Gary Kyes to win a couple of National Champs. Box-stock, too!



Frequency Balls and Ball Tubes, from Kimbrough. Check the new Kimbrough servo saving output arm, not shown.

Before we get too far in this, the reason for using lacquers is that in order to get the paint to stick, it has to have something to grab onto. Certain thinners (RM, for instance) have something in them that actually attacks the Lexan, giving a very slightly crazed surface to latch onto. As some of you may have found out, lacquer (or most any kind of paint) does not stick well to a previously painted surface, is worse on a waxed surface, and if any kind of silicone treatment is on the paint . . . well, just forget it. Wet-sanding with 400 paper not only cleans the surface but also leaves a "tooth" for the paint to grab and this is basically what the thinners are doing for you on lexan bodies. And before this gets too confusing, I am not suggesting that you sand the inside of the body shell before painting, although it can't hurt anything, and may be necessary if using Rust-Oleum. The Dirty Racing Team hasn't sanded on a Lexan body for years, it just isn't necessary with lacquers.

When the DRT gets ready to do up new bodies, this is how we go about it; there are other methods, feel free to experiment. First we make sure the body will fit the car, as in having clearance for front wheels at full lock, the pipe on 1/8 cars, resistors and receivers on the twelfths. Place the chassis on the edge

of the table, hold the body up to it at approximately the height you want and see if anything will hit. This is very important; you might be surprised how many bodies just won't fit properly, depending upon the car and how it is laid out.

Next, the antenna is removed from the car and the body propped into place over the chassis. A nudge here and there to get it all lined up and then locations for wing tubes, front body posts, antenna and pipe outlet, engine clearance, and tank access for 1/8 cars is marked directly on the exterior of the body with a felt-tip marking pen. From here, you have to make the decision as to whether or not the body should be cut out and almost completely mounted before painting. If we are doing a body style for the first time, it generally gets holes for body posts, wing tubes, antenna and anything else punched in, and these are then enlarged where required to give proper clearance. On a 1/8 body, we might even cut away to clear the motor, carb, pipe, tank and so on. With a body that we have done many times, like the MRP Spyder we use exclusively in 1/8 racing, no cut outs are made, as we know from experience just how to mount it. The locations for stuff are still marked with the pen, however.

In no case do we trim the lower edge

of the body or cut the wheel wells out.

Before painting, any cutouts in the body need to be covered over with a scrap of masking tape, to avoid overspray coming through and landing on the exterior of the body shell.

Speaking of masking, that is almost the next step, after washing the body out thoroughly with warm water and dish soap. Actually, we just spray the inside of the body with alcohol, blow it dry with compressed air. Quicker is all.

For masking, avoid the cheap tapes like the plague they are. We use only 3M tape, I guess it is actually marketed under the Scotch brand name. Few plain old hardware stores stock it, you'll probably have to call around to find some; try stores that supply body shops and if you run into a well-stocked one, they'll even have the hard-to-find 1/16 and 1/8 inch widths. The 3M tape is much more expensive; grit your teeth and pay for it, it's worth it.

We have all the widths, right up to the really wide stuff, and from this roll we cut the backgrounds for the numbers. The technique is to stretch a length of tape across a clean, smooth surface; a sheet of glass is fine, for example. Then, tracing around a form that is held on the tape, we cut the backgrounds, commonly known as "meatballs". Just about anything will work for this form, even cardboard, I suppose, although the one we made is cut from 1/4 inch plexiglass and rectangular in shape. Do be sure that the meatball is large enough for any numbers you may be using. The background masks are then carefully peeled up and stuck on the inside of the body shell, one on each side, another in the front. Notice that if the body has been pre-marked you can nicely avoid the embarrassment of placing your numbers where body posts stick through.

Yes, I know that almost everybody offers mylar stick-on number backgrounds, we just find it much neater, and a lot cheaper, to paint them on. For the masking of a design on the body, you're on your own, as it can get just as involved as you have the patience for. I



Mylar sticky sheets available from Associated Electrics.

Continued on page 77



1. The girls get their share too! Sandy Chapin collects a plaque from C.D. Bob Haight.



2. Bill Stroman manges to laugh though the landing gear on his Goedecker Taube has been wiped out.



# PLUG SPARKS

By JOHN POND

• Located on the southwest side of Las Vegas is a large area known as El Dorado Dry Lake, sometimes mistakenly called Henderson Dry Lake. This is the flying home of the Vegas Antique Model Plane Society (VAMPS), and it is without a parallel in the early portion of the year.

Readers may tire of hearing about the opening old timer free flight meet of the year, but this writer finds the meet always seems to get better. Perhaps it is because the VAMPS members make a contestant feel right at home.

Such is the case of Bob Haight, the perennial C.D. of this most delightful meet. Bob can be seen in Photo No. 1, handing out the prizes at the end of the two-day meet. As can be seen, Sandy Chapin is one of the girl competitors, and a good looking one at that!

Actually the photo does Bob



5. Floyd Denny flew all events and placed, except for Class C with this Playboy. Fred Caballero in background. Craig photo.



3. Phil McCary did a little coaching for Bill Hanmer and his Foo-2-U2. It worked . . . he won! Craig photo.



4. Bull sessions and free advice go on forever. Frank Szuchs gets inside info on the habits of his Buzzard Bombshell. (Craig)



6. Good shot of Fred Emmert's Kerswap. (Hmmm . . . wonder if Pond took it?)

Chambers, the sparkplug and originator of the meet, a disservice, as he can barely be seen behind Haight. Bob is one of those rare birds in Las Vegas who is a real straight arrow at running the gaming tables. Standard joke with Chambers is, who are you working for now? Anytime Bob thinks something is wrong, it is either shape up or ship out. Bob has been in that routine more than once.

Weather is just phenomenal in Las Vegas in February, when the rains start to disappear at that time of the year. Biggest hazard on the flying field is actually the launching site, as many times the models descend to almost the exact point of launching. Make sure you are a good distance from your car or else you will find the model in your trunk!

Moseying around (between flights, snapshots, bull sessions, and beer), the writer ran unto Bill Stroman, as seen in Photo No. 2, who is becoming a staunch O/T fan. However, the VAMPS do offer a SAM Flying Scale event, so Bill has to bring out his priceless models and turn them loose into the blue.

By that we mean, the flying scale event

is simply a matter of guts. If you want to run your motor as long as you want, there is no restriction. Bill figured his slow climbing Taube might do the trick in piling up a lot of flight time before going out of sight. Although Bill won, this writer has to shake his head at the thought of all that work disappearing into the overhead blue.

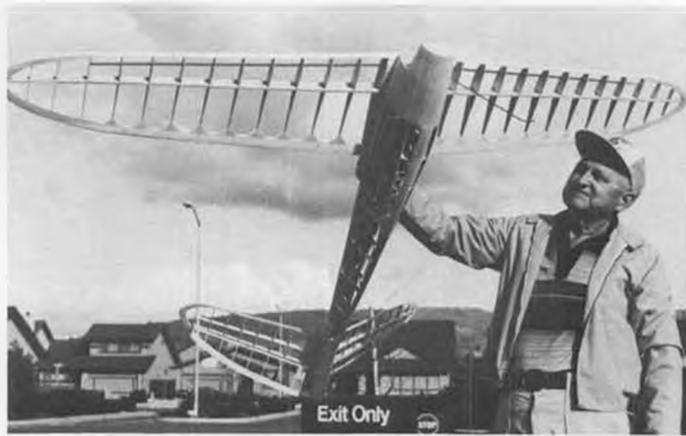
The VAMPS offer a two-day meet and allow the contestant to fly either day. Besides having two regular AMA F/F events, they stage a flock of SAM Events: Cabin AB, Cabin C, Pylon AB, Pylon C, 30 Sec. Antique, .020 Replica, 1/2A Texaco, and Scale. For the first time in many years, the VAMPS failed to stage the standard Texaco event. Was this writer surprised when he showed up with a nine-foot Texaco model and no event to fly it in!

In this writer's meanderings, Sal Taibi came into his scrutiny. Something that has always frightened this writer is what would happen if Sal started flying some of the recognized hot designs? There is no attempt to cast aspersions on any of the Taibi designs, but imagine a master

flyer like Taibi with a Playboy or a Ranger!

Taibi had a Cabin Playboy with an Ohlsson three-port engine making enough noise to attract attention. Conversations revealed that this post-war stock Ohlsson 60 (not the custom!) would turn 8000 rpm with a 14-6 prop! Sal further claimed when he installed a front rotor setup on the Ohlsson (this is generally recognized to improve engine performance), he actually lost 500 rpm! Back to the stock engine running, hold down the rpm somewhat as the Playboy couldn't stand full power, and then bore a hole in the sky. Impressive performance!

Photo No. 3 is one of Phil McCary, the sparkplug of the SAFFS (Sierra Antique Free Flight Society, SAM 34), giving out a little advice to Bill Hanmer on getting the most out of his FOO-2-U-2. Can't recall if Bill took Phil's advice or just went ahead and did his thing and won anyway!



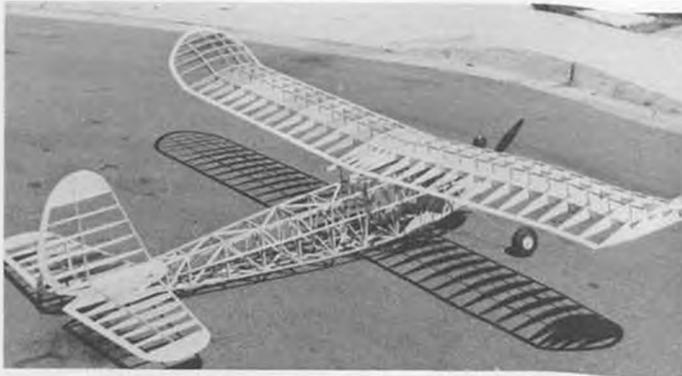
11. A real beauty by Nick Sanford. Ralf Lowe's "Vee Tailed Swallow", from 1937. (V-tail down by "Exit Only").



9. Classic photo of Danner Bunch getting his Bunch Tiger powered Scorpion Major away for a winning flight. Suhr photo.



7. Art Watkins always has something different. This time a Tex Rickard tailless.



12. Major Gomez, San Ramon, active SAM 32 member, did a nice framing job on this PB-2.



8. Bruce Lester photo of Peggy Snyder, of Modelcraft, with Pacific Ace (large version of Miss Tiny).

Photo No. 4 is what this writer considers a classic. How many times have you seen yourself in the position of Frank Szuchs, who is listening to well-meant advice on how to overcome some of the vices Buzzard Bombshells exhibit under high power. Interestingly enough, in spite of the rains several days previous to the meet, the ground can be seen to be breaking up already.

This can be seen quite clearly in Photo No. 5 showing Floyd Denny with a Playboy Senior. Floyd flew almost all the power events, placed in same, but failed to come away with a prize in this event! Incidentally, photo credit should be given to Bob Craig, who enthusiastically photographed everything in sight and promptly sent pictures to this columnist.

Craig is another "retread" from Indiana, who has spent most of his working career in Sun Valley, California. In considering retirement, Bob has moved to the Vegas outskirts and operates out of his home. After this meet, Bob has said he simply has to get back to the models. First step, join the VAMPS, second (as guaranteed by the wife) get the franchise on a hobby room, and third, gettum built! The only way to go!

Considerable interest has been



10. Ed Mate, Chicago Aeronut, with his fine performing Megow Korda Wakefield. It has never failed to place.

aroused by a new design recently approved by the SAM Board of Directors. This design has caught on like wildfire with the experts. Photo No. 6 clearly shows the simple lines of the "Kerswap", as designed and flown by Gil Robbins.

The strange name, Gil Says, was derived from the noise it made when it came spinning in. The model is quite durable, being of simple sound construction, and should be a winner in future meets!

Wrapping up the meet, the writer would again like to commend Bob Haight for his tireless efforts over a two-day meet. About the only complaint ever heard from Bob was his rendition of "Nobody loves a C.D." sung to the tune of "Nobody loves me". A real humorous touch to the meet!

Before closing out the meet, we had to run a pic of Art Watkins and his Tex Rickard Tailless as seen in Photo No. 7. This design appeared in the 1938 Jasco Year Book so ably edited by Frank Zaic.

No reports on flying ability yet!

Let's take a quick look at the results: .020

1. Bill Hanmer (FOO-2-U-2) . . . . . 15:00
2. Bill Stroman (Valkyrie) . . . . . 10:02
3. Fred Caballero (Strato Streak) . . . . . 8:30

**Class AB Pylon**

1. Frank Szuchs (Zipper) . . . . . 14:12
2. Fred Emmert (Kerswap) . . . . . 13:33
3. Floyd Denny (Playboy Jr.) . . . . . 13:08

**Class C Pylon**

1. Don Weitz (Playboy) . . . . . 14:27
2. Larry Schwarz (Pacer) . . . . . 9:01
3. Bob Chambers (Swoose) . . . . . 8:50

**Class AB Cabin**

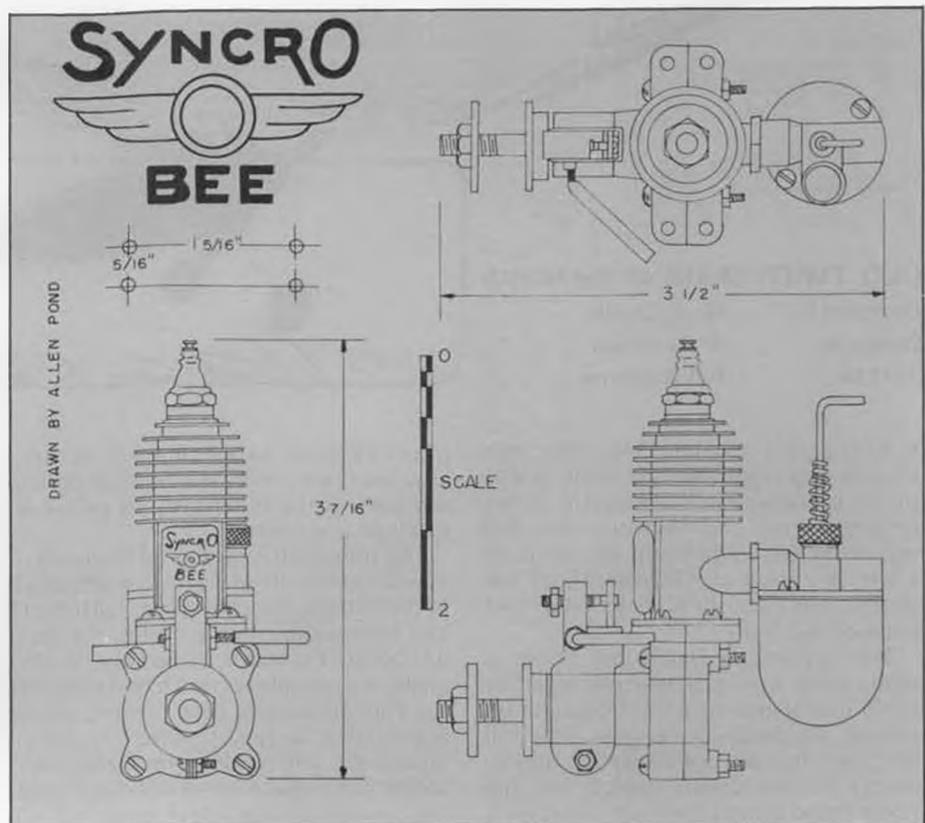
1. Floyd Denny (Cab-Ruler) . . . . . 14:11
2. Damon Adcock (Powerhouse) . . . . . 6:07
3. Bob Chambers (Challenger) . . . . . 4:24

**Antique**

1. Fred Emmert (Anderson) . . . . . 9:41
2. Don Weitz (Clipper) . . . . . 8:36
3. Floyd Denny (Trenton Terror) . . . . . 8:17

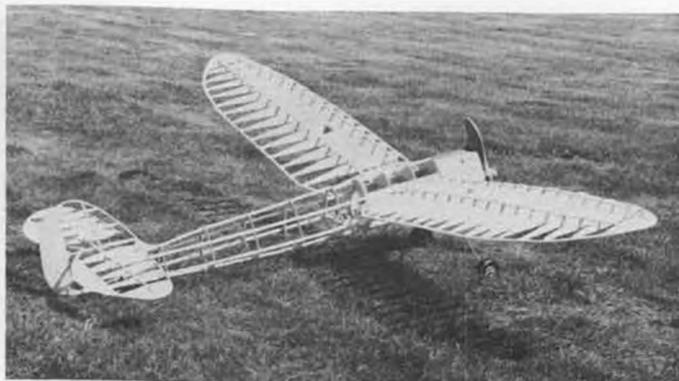
**Class C Cabin**

1. Sal Taibi (Playboy Cabin) . . . . . 14:48
2. Frank Szuchs (Bombshell) . . . . . 11:18





15. Nice shot of Kielcraft Junior 60, built by David Deadman, England. Out-of-focus background makes model stand out.



14. Photo from Gerhard Everwyn, Munich, Germany, of well built German design, "HS-100".

3. Brad Levine (Bombshell) . . . . . 3:52  
Scale

1. Bill Stroman (Taube)

1/2A Texaco

1. Sal Taibi (Powerhouse) . . . . . 29:24

2. Fred Caballero (Tluth) . . . . . 26:32

3. Sandra Chapin (Miss America) 26:22

**ENGINE OF THE MONTH**

This month's engine of the month is that much maligned motor known as the Super Bee, as produced by Syncro Devices, 611 Boydell Bldg., Detroit, Michigan.

The Syncro Bee first made its appearance in the 1938 July issue of Model Airplane News. Attractively priced at \$12.50, this motor was a follow-on to the Syncro Ace.

The reaction of the experts was after the Syncro Ace fiasco, what can you expect from the Syncro Bee? Actually,

*Continued on page 91*



13. Joe Konefes with his original 1938 design, forerunner of the Buzzard Bombshell. Pretty airplane!

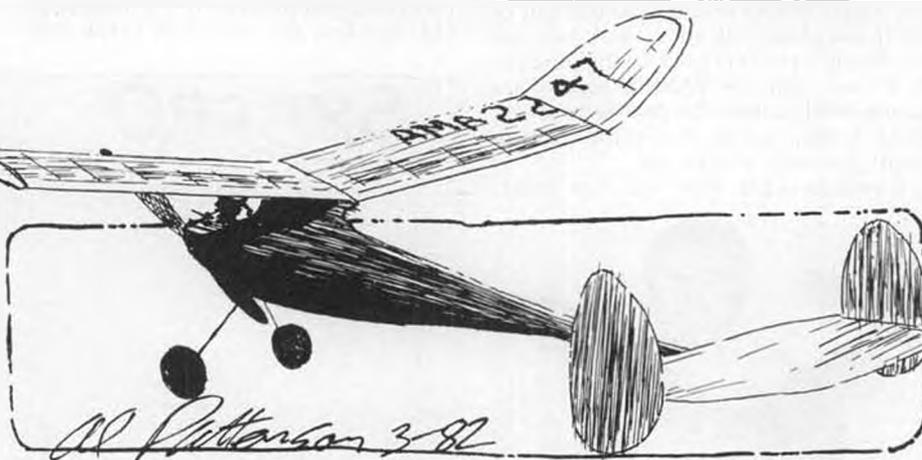
# The HERALD

**OLD TIMER Model of the Month**

Designed by: Gene Chaille

Drawn by: Al Patterson

Text by: Bill Northrop



• Redesigned to the 1940 rules, this Class B ship originally started life as a 16 ounce bomb with only 288 square inches of wing area. This version, with 342 square inches, had already proven itself a winner, using an Ohlsson 23, by the time it was published in the May 1941 issue of *Air Trails*.

The apparently fragile tail boom is really quite strong, being reinforced by an 18-inch length of 3/8 O.D. aluminum tubing. Bulkheads are easy to draw full size, and thus are not shown . . . they're simply circles drawn directly on the sheet wood using a compass. Fuselage is

planked with soft 1/8 x 3/8 strips, attaching two pieces at a time on opposite sides of the bulkheads, to preserve fuselage alignment.

The sheet stab is cambered by gluing it over a center rib which is first attached to the flattened portion of the tail boom. The twin rudders are glued to the stab tips *before* the stab is curved over its rib, giving it a variable section from center to tip. This should also help prevent warping of the fairly thin sheet surface. Obviously, adding dethermalizing capability will require some different ideas on stab-to-fuselage attachment.

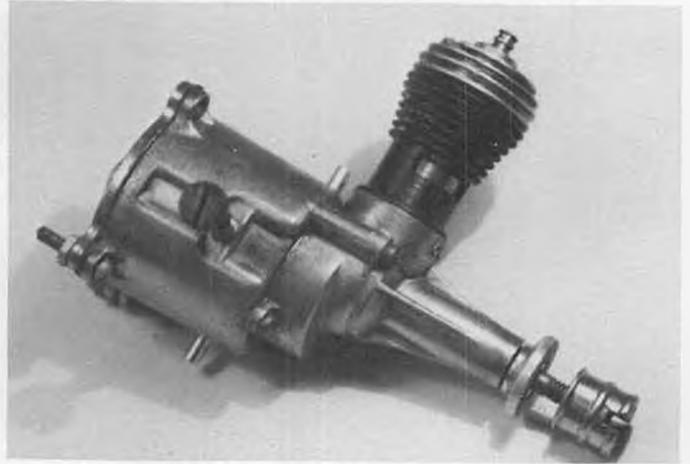
Neither the plans nor the text give any hint as to the balance point location, however, taking into consideration the lifting stab section, we'd suggest starting out with 50% of the wing chord, or 3-1/2 inches aft of the leading edge at the center section.

We'd like to hear from serious old-timer builder/fliers, telling us what types of models you'd like us to pull up from our old magazine files. More rubber, less rubber, competition oriented models, sport models, scale, etc? Or shall we just continue the mix as we have in the past? We aim to please. •





"As our story opens . . ." The K&B Infant .02, America's first production 1/2A, missing its tank. Anybody got one for Dave?



That big, ugly, old-fashioned engine that began the reed revolution . . . a Cox Space Bug from 1952.

# THORNBURG AT LARGE

By DAVE THORNBURG . . . This month, T-burg wanders among the tombstones of the early Half-A engines: Cubs, Spitfires, K&B, Wasp, Cox. Cox? That's like setting up a John Wilkes Booth at the Lincoln County Fair . . .

• I sing the praises of the rotary-valve 1/2A; those cranky, loveable, sometimes crudely-built little engines that flooded the American market during the long, fat decade following WW II.

Ray Arden was the father of them all, yet Ray Arden never sold an engine smaller than an .099. But he invented the glow plug, and freed us forever from the burden of coil, condenser, points and battery. "Simplicate and add lightness," Henry Struck advised airframe designers; Arden applied this dictum to the engine.

The result was a trickle, then a stream, finally a flood of miniature engines. Before the glow plug, the .099 was a "small" motor. Before the glow plug, the smallest free flights were around 36 inch span . . . and they carried a five to

six ounce payload up front, for power. If you wanted to build smaller and lighter, you used CO<sup>2</sup> engines, little gutless wonders that ran on compressed air, when they ran at all. Or you used rubber.

Then, in the spring of 1948, came the K&B Infant .02. With only 1/5 the displacement of the Atoms and Ardens then considered "miniature," the Infant was dismissed by most folks as a novelty. Bill Winter and Cal Smith, writing a "future trends" article for *Model Airplane News* that year fail to mention the Infant at all; just another fad from Hotel California, land of the fruits and nuts.

But Berkeley began to produce kits for the little beggar, and the kits began to sell. Other manufacturers started perking up their ears. Maybe .02 was a bit too small to be practical. (The Infant wasn't exactly a screamer, after all; kit instruc-

tions usually called for "one K&B .02, or two strands of 1/4 inch flat rubber.") Maybe a slightly larger engine could be made, something with a better power-to-weight ratio. Maybe something about .04 in size. . .

Meanwhile, the Infant had the field to itself. For over a year, K&B ground them out, and America's Hobby Center sold them . . . often in "combo deals" with kits like Berkeley's "Profile Powerhouse," a 24 inch version of Korda's pylon free flight. For over a year, the Infant was king. Then in midsummer of '49, came Mel Anderson's Baby Spitfire .045, followed quickly by the Cub .049, first of a long series of small engines produced by the Herkimer Tool & Model Works, makers of the "O.K." line of ignition engines (Bantam, Super 60,



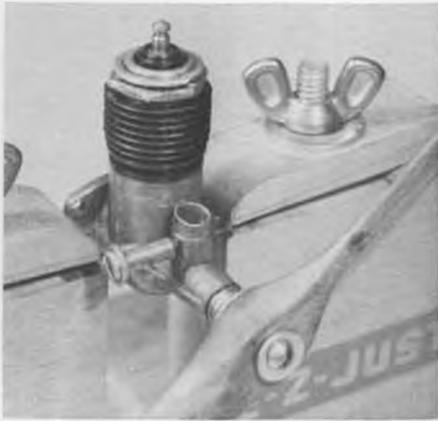
Second 1/2A on the market . . . Mel Anderson's Baby Spitfire .045. It went on sale in the summer of 1949.



An early Atwood, built after he sold the Wasp rights to Bob Holland in 1953. A light and powerful F/F engine.



K&B Torpedo .049 (1951-1955), mounted in the nose of a 36-inch Luton Minor free flight. Will it pull it? Just barely.



An .049 Cub, made by Herkimer. Author says his Cubs ran best on test stand, seldom started in field. Sudden launch would pull away fuel.



The nylon-tanked Space Bug Jr., engine that broke the low-price barrier in 1953 . . . \$3.95 complete!



A Spitzy .045, built somewhere between 1951 and 1955. Sold for as little as \$3.95 in them days!



Bob Holland's Hornet came out in 1956, the first rotary valve engine to rival the Thermal Hopper in power.



A cherry little McCoy .049 diesel the author gave \$20 for in 1981. Almost too nice to run!

Twin.)

"What's happening here?" said the AMA. "K&B is introducing an .035; Herkimer is tooling up to produce an .074. Perhaps we need some size guidelines, before these fellows run amuck." At that time "Class A" included all engines from zero to .19 cubic inch displacement. It was decided (in late

1949) to create a new class, from zero to .05 cubic inches, and call it "Half-A." Thus any engine from .051 to .20 would be "Class A," and anything smaller would fall into a different competition category.

This seemed like a tidy division. However, it didn't stop Herkimer from introducing, a year later, the O.K. Cub. .039. But it did influence K&B; its next engine in the Half-A market was the Torpedo .049, introduced late in 1950.

The Torpedo .049 was a lovely little

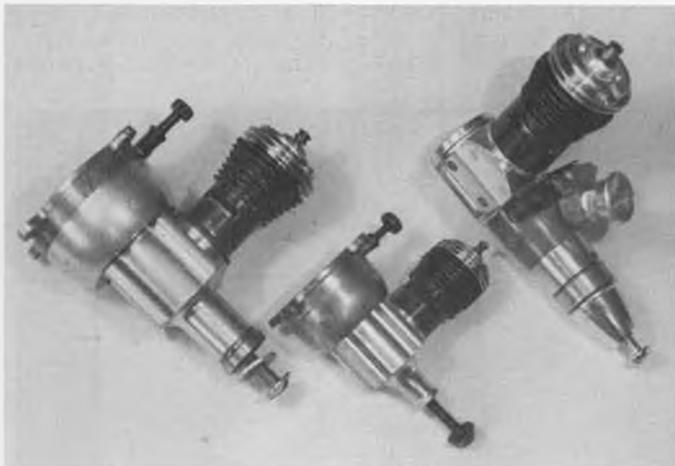
sport engine, just like its elder brothers, the .02 and the .035. All three of them looked something like scaled-down Ardens, with their rounded cylinder heads and underslung gas tanks. The Spitfire, by contrast, had the "stovepipe look" of the early Browns. And the Cubs . . . every one ever produced, from .039 to .099, including even the .075 diesel . . . looked something like a miniature O.K. Bantam.

But the Torpedoes and the Cubs and the Spitfires were basically sport engines, and the AMA had just created a new *competition* class. Pylon gassies were being scaled down to fit this new "Half-A" class; the ukie boys were already talking about Half-A speed. The time was 1951, and ripe for a horsepower race.

Enter Bill Atwood, with his Wasp .049.

The Atwood Wasp was the first engine to reverse the "stovepipe" design trend

*Continued on page 66*



Cox's 1-2-3 punch that killed the 1/2A market in the late '50's (l to r): Babe Bee .049, Pee Wee .02 (each \$3.95), and Tee Dee .049.



Wasp .049 (1951-1956) on the nose of a "Californian", a C.P. Moody free flight from August 1957 *Flying Models*.



Larry Jolly holding the Airtronics "Kitty", a good electric RTF. Docile and easy to fly.



The Kraft Cardinal, another good RTF electric. Now available from Tower, without radio. Hot for beginners.

# ELECTRIC POWER

By MITCH POLING

• Last month I said I would have a column on how to get longer flight times, but it looks like that will have to be put off a month. Due to the early arrival of a VIP in our lives (six weeks early!), Victoria Isabelle Poling, things have been hectic around here, to say the least, and it didn't get done! Victoria is a perfect "one-half A" model, my favorite size! So, instead, let's look at some of the things readers are doing.

Sometimes, what with digital charging, rare earth magnets, and so on, things get so sophisticated that one can forget how much fun it is if you can follow the "KISS" principle, that is, "keep it simple---." Gordon Coddling reminded me of that in his letter about his free flight models, which are powered by grass clipper motors and the VL 102 system. I'll let Gordon tell you about it in his own words.

For a long time I have enjoyed your column (flattery will get you everywhere, Gordon! MP) in the magazine. I have read them all and noted much discussion of commercial items, but not very much about "home made" systems. In order to help generate some development along this line, I am enclosing

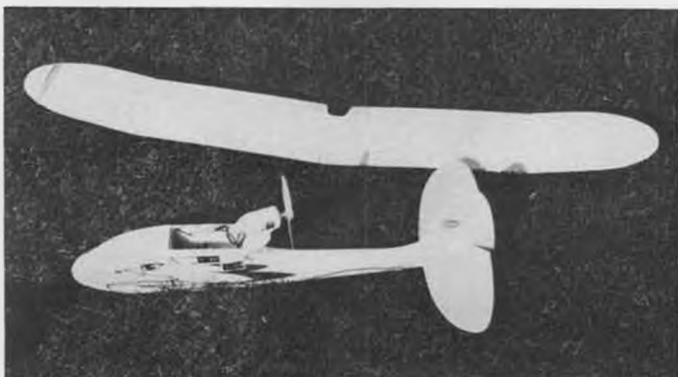
photos made recently of electric power experiments I've been making here at 3500 feet in the desert.

Photos show a pair of free flight models known as Civy Boy, a design from the late 1950's. The little one is the Civy Boy 31 or 31 inch span, originally produced by Austin Craft (now defunct), with a K&B "Torp Jr." .045 glow plug engine. After 20 years in storage, I obtained it (everything warped) and installed an old Monogram E unit, then made 90 flights with that unit. I now have installed a VL 102 unit (VL Products, 7871 Alabama Ave., No. 16, Canoga Park, Calif. 91304) and added 6 inches to the center section of the wing. The model now climbs like a F/F should, and will catch thermals on a calm day, although I have deliberately made it overweight and nose heavy (my model chasing ability is limited).

The larger Civy Boy is the 51 inch version that Austin Craft planned to produce but didn't. It was designed for the McCoy .19, and I have flown it so equipped. At present, I have installed the motor and batteries from a Black and Decker cordless hedge trimmer using a crude plywood mount with an ancient

Austin Craft flight timer from the spark ignition days (I know the type. I think they are still available. They use a vacuum type plunger MP). The installed system weighs 12 ounces and will spin a 10x8 Tru Flex control line prop fast enough to pull the model to telephone pole height in 15 seconds. After a bunch of test flights with that system, I installed an am now testing the motor and batteries from the "Wizard" cordless grass clipper sold by Western Auto Supply. This uses the Astro Flight 02 prop adapter and a 9x6 Power Prop (wood), and the climb is a bit better. The glide is still good, although the model is overweight by 5 ounces (same with the B&D system). I use a small switch from a local electronics supply in series with the Austin timer. I set and pull the timer, then slip the switch on and launch. After 15 seconds, the Austin timer cuts the circuit and she glides ... same as pre-war free flight days.

Photo shows the Radio Shack 100-watt car-converter with the B&D charger plugged in and a cheap wind-up timer to ring the bell so I know when the cooking is done. Normally, the clipper/cutter systems are charged many hours before



The Cox Hawk. Standard radio has limited range.



Cox Sportavia, a bit sluggish on the stock motor. Could be improved with an Astro or Leisure 05.



The Kraft Cardinal flies by. A good performer, but not a hands-off type for the beginner.



The Cox Cub with an Astro 020 is a great flier.

use, and with such a charge, I find I get many, many 30-second motor runs . . . Just plug in during the week and on Flying Day nothing else is required, just throw the switch and fly, again and again (I like that! MP)

This method eliminates all those "sexy, supersonic, sophisticated, stylish" field chargers . . . and the price on motors and batteries from the repair or service shop is quite reasonable . . . like under \$10 for a motor and \$12 for the battery. The two clippers cost me \$8 in a local pawn shop, and the Radio Shack converter (only used to boost batteries if I didn't charge long enough during the week) cost \$20 in the pawn shop. This week I bought a B&D grass clipper and a Disston grass clipper (cordless) for \$6 in a local flea market. They came with the factory charger and had some life in them "on the spot."

As soon as I can get the parts assembled, I'm putting two of the B&D motors, with their normal gears, together with a shaft and gear between them, to make a V-Twin "so to speak". This system will weigh 17 or 18 ounces with one set of batteries and the Austin timer. It will

go into my 72 inch span pre-war cabin model, the Scientific "Commodore", to replace the Ohlsson 60. It should spin the 14x6 prop adequately for sport flying here. Since the Ohlsson 60 system weight was 20 ounces, I may even come up a little light!"

Now that's the way to enjoy electrics with the minimum of hassle, and cheap too! Gordon is not the only one who would like to see more on "home built" equipment, Martin Sims wrote with the same request. Martin's experiences are worth relating, so here is his letter.

I have enjoyed your column for some time (love these beginnings—just right! MP) However, as a beginner, I believe you should try to advise beginners on how to get the most out of the equipment he might have. As an example, I will detail my own background and lack of experience.

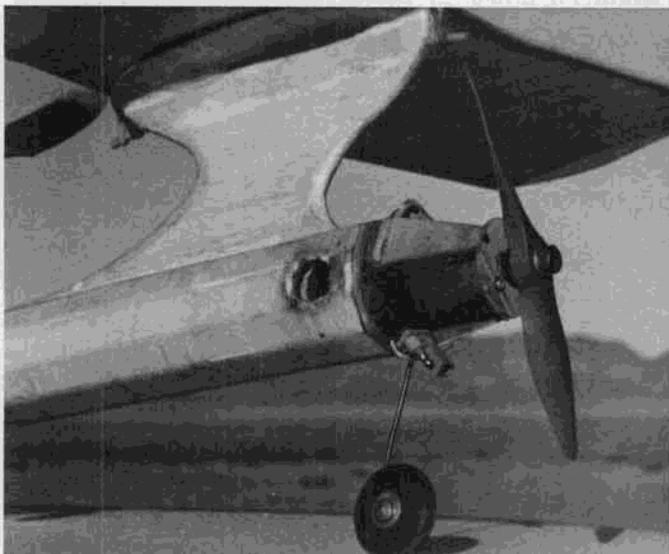
I first became interested in electric power with an article by Ed Sweeney in R/C Sportsman (now out of business—MP). He described the use of a Black & Decker motor, from the cordless clipper, in the Goldberg Ranger 42. The fact that this was a ready built plane, and required

no modification to the front end, is what attracted me. I got a couple of the motors, but couldn't get a Ranger for some time (they weren't made for awhile—MP). By the time I did obtain a Ranger, many commercial systems were available. I

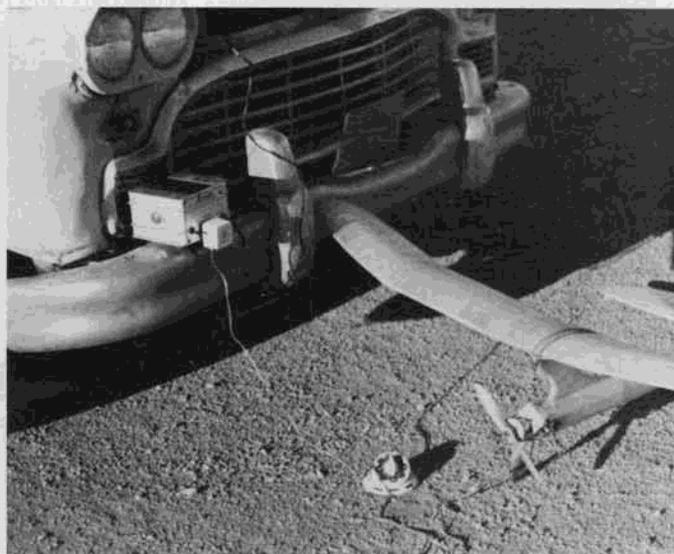
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Gordon Coddling's Civy Boy with motor and batteries from a Black & Decker cordless hedge trimmer.



Gordon didn't burn his bridge. The electric motor in his Civy Boy can be pulled, and the McCoy Redhead stuffed back in.



Charging the B&D power unit is accomplished with a Radio Shack 100-watt car-converter with B&D charger plugged in. Wind-up timer.



Jim Martin, Maui, Hawaiian Islands, has installed a camera in his glider for some interesting air-to-ground shots. Jim can be seen standing by his VW at left, and is at far right in photo at right.

# R/C SOARING

by Dr. LARRY FOGEL

• The typical weather forecast for Torrey Pines is "night and morning low clouds and fog with variable light breeze, becoming clear and sunny with sea breeze 10-15 knots in the afternoon." Once in a while, a weather front comes through and changes all that. The wind stirs up the dust and sometimes provides more lift than you know what to do with.

Well, one day last week the wind was from the west at 35 knots, gusting to fifty. Naturally, I spent my lunch hour flying. A few hang kites were assembled and ready to fly, but they remained on the ground for safety sake . . . just that much more space for my Pterodactyl. With only a single plane in a sky full of lift, you can do anything!

Late in the day, I went back to the cliff for one more session. Times like this are

too good to miss. The weather hadn't changed. But, there was another plane already in the air. I didn't recognize the craft, but did recognize the pilot to be Paul Palmer, of the Gulls. The plane was his new Akro . . . smoothly performing aerobatics in what would have been a difficult environment for most sailplanes.

The Akro comes as an almost-ready-to-fly kit manufactured by Multiplex, of West Germany. The obechi-covered foam wings span 71 inches. The airfoil is a Ritz-2. The fiberglass fuselage is 45 inches long. The all up weight is thirty-eight ounces, so the plane flies at about eleven ounces per square foot. It was fast and fully aerobatic, even without ballast.

A few days later the weather returned



Paul Palmer's Akro, with canopy airbrake deployed.

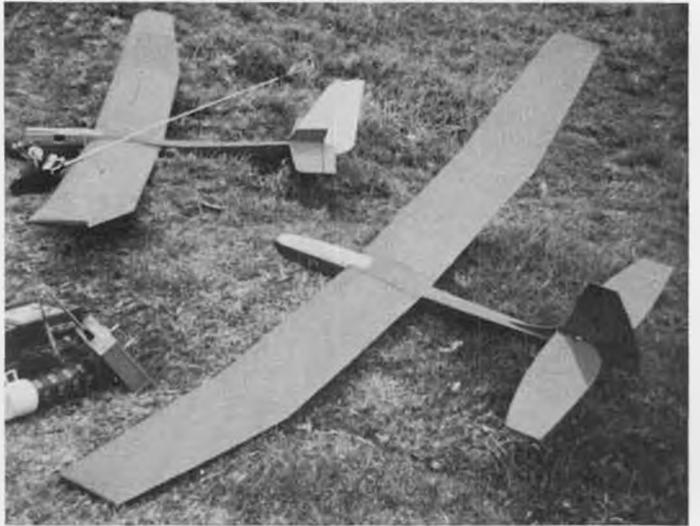
to the usual, and only a few floaters were aloft at Torrey. Here comes Paul with the Akro. Before I could console him on the lack of lift, he had that plane in the air . . . and it stayed up there. Naturally it moved faster than the floaters . . . but the point is . . . it stayed up there!

Last night I visited Paul at his home to talk about the Akro and to see the Alpina, another ARF kit manufactured by Multiplex. In both cases, the kits are of top quality; each component is carefully constructed and of fine finish. It took about twenty hours to complete mounting the ailerons and flaps, cover the flying surfaces, and install the radio gear.

The Alpina is intended for both aero-



Davy Launch Line Retrieval System, may bring about collapse of The Boy Scouts of America!

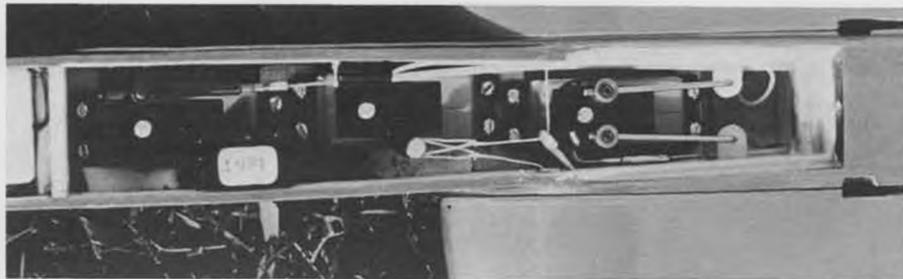


Maui Jim Martin's "Eula Mika" (two-meter in Hawaiian) has camera in nose, as does other ship in background.



Terry Edmonds, Iowa City, Iowa, launching his Callisto . . . a modified standard class competition sailplane. Ballast tubes in wings.

batic and thermal flight. It's considerably larger than the Akro. The high aspect ratio wings (22.5:1) span 157.5 inches and cover 1100 square inches. The fuselage is sixty-six inches long. The all up weight is 110 ounces, so that it flies at over twelve ounces per square foot. The flaps are optional but highly desirable, to increase the efficiency of slow speed thermaling and for short field landing. If you want a new experience in ARF sailplanes, you can get the Akro, Alpina, and other multiplex planes from the Sailplane Factory, P.O. Box 341, Red Lion, Pennsyl-



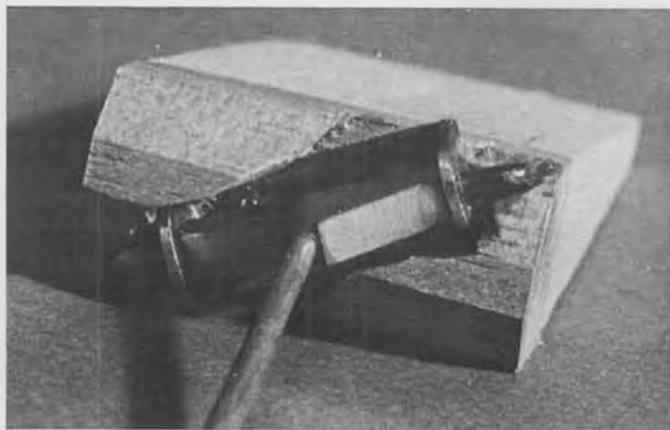
Internal layout of Callisto, by Terry Edmonds.

vania 17356, telephone (717) 244-4508. Terry Edmonds of Iowa City, Iowa, designed the Callisto . . . a modified standard class competition sailplane. This lightweight, high performance ship has already captured eight first place wins on the 1981 midwestern contest circuit. According to Terry, "There have been subtle improvements in airfoil, shape, lower drag, and so forth in recent years, but the predominant basic design still remains polyhedral wing, rudder/elevator . . . floater type sailplanes. In Europe, however, great advances have occurred in the FAI F3B sailplanes. They are generally stronger and heavier in order to survive the speed task. And yet, in general, the floaters turn in better times under light air conditions. The Callisto is a sailplane of F3B configuration but with a wing loading comparable to standard class planes (about seven ounces per square foot). Ballast tubes are in the wings. They span less than 100 inches and cover 843 square inches. The airfoil is Eppler 193. The fuselage is built of balsa and light ply. The built-up wings use carbon fiber or spruce spars. All-up

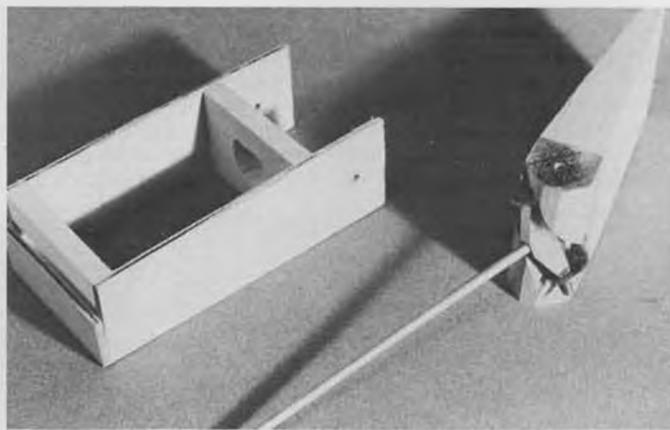
weight is 42.5 ounces. The design includes spoilers for landing in tight areas." Here's wishing Terry continued success with his new design.

Wouldn't you like to operate your control surfaces without any protruding parts? Well, Keith Thomas, of England, reports on a French design for doing just that. In fact, he built an experimental linkage just to make certain that it really works. In his words, "Basically we have a rod (or tube) with a hinge attached at one end arranged with the hinge pin at 90° to the rod. The moving part of the hinge is now attached to the leading edge of the control surface. (You have to imagine here that the rectangular framework in my testpiece is a small chunk of the wing, and the tapered piece is a section of the aileron.) The trick is that the pivot pin of the hinge is located at about 45° to the center line of the aileron leading edge when viewed from the front. Viewed from above, the pivot pin lies parallel to the leading edge. We now arrange a guide for the free end of the rod so that it can move only horizon-

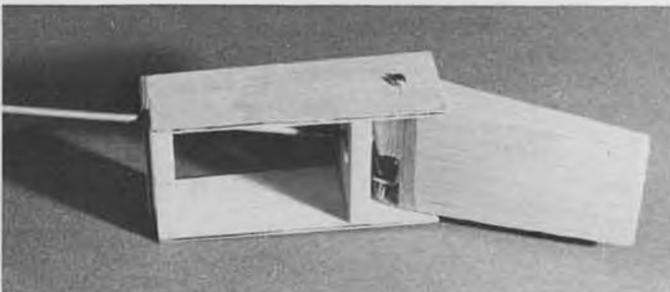
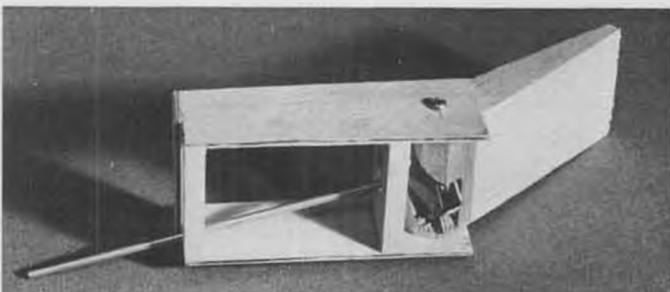
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Keith Thomas aileron control link. More details in text.



Mockup of aileron and wing "section".



Mounted together and in each extreme control position. Secret of operation is slot guide for lever.



Les Ruggles' "Miss Eagle Electric" won 1st Place in R/C Unlimited division at 1982 N.W. Model Exposition. Picco 65 powered.



Bill Osborne's beautiful 65" "Miss Thriftway", judged as 2nd Best of Show. OPS 90 power, complete engine detail.

# R/C POWER BOATS

By JERRY DUNLAP

PHOTOS BY AUTHOR

## JOHN BRIDGE, IMPBA HALL OF FAME MEMBER, DIES

In late February, I was informed of the death of John Bridge, of Warren, Michigan. John was a friend even though we belonged to different national model boating organizations. When I first became active in model boating at the national level, John and I served together as the IMPBA records and sanctions chairmen back in 1968 and 1969. John is survived by his wife Pat, a son, John, Jr., and a daughter. Pat has served as IMPBA secretary for the past five or six years. The memory of John is aptly captured in his induction to the IMPBA Hall of Fame.

John Bridge is best known for his accomplishments with class F twin engines geared together and driving a single shaft. Among his famous boats are *Double Trouble*, *The Lead Sled*, *Outrageous*, and *Lager Head*. John has held the class F straightaway record from 1972

through 1977 with the exception of October, 1976 to June, 1977.

*John's persistent interest and technical advances in class F twin engine racing has helped to develop a great interest in this class in recent years. It certainly has made class F Hydros one of the most exciting classes to watch. John is also the proud member of the 80 mile per hour club.*

*John's contributions to the advancement of model boating and IMPBA are extensive. Long before IMPBA established districts, John served on the executive board. John served continuously as District II Director until his election as President in 1975 and 1976. His efforts in safety, insurance, rule books, and in organizational leadership will be valued and remembered forever.*

With John's passing, model boating has lost a valued and respected individual. There were many who did not agree

with John's position on issues. However, you always knew where he stood and he was not afraid to make decisions based on what he believed to be in the best interest of this hobby he loved so greatly. John will surely be missed at national meetings and at the contests. Our thoughts are with Pat and her children during this period of adjustment to the loss of John.

## HOT STUFF VIDEO TIPS

Satellite City has just made a one hour VHS video cassette on the "how to's" of Hot Stuff and Super 'T' instant adhesives. The program is a modeler-to-modeler building session showing actual construction, speed/strength demonstrations and some new, time-saving building techniques, including the fastest fiberglassing you've ever seen.

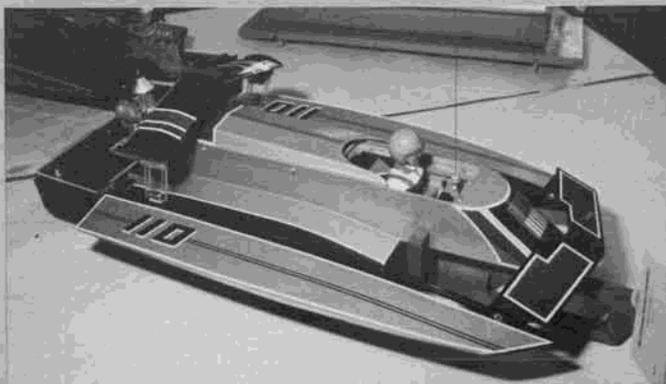
"Hot Stuff" Video Tips tapes are available **FREE** for up to 60 days to clubs and progressive hobby shops. Include a



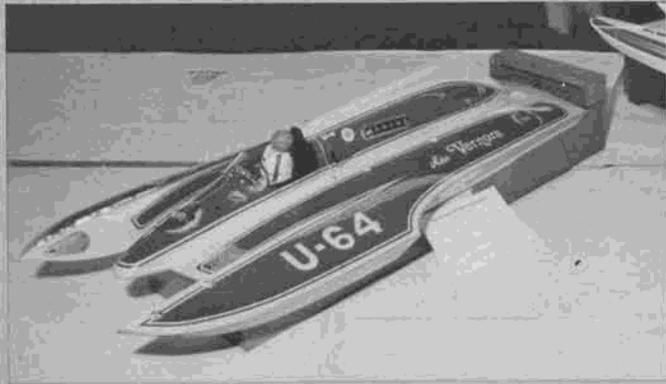
Jess Gray's "Miss Kentuckiana Paving" was 3rd in R/C Unlimited. Jerry King's "Smoother Mover" in background.



Bill Hornell, Renton, WA, former, NAMBA R/C Unlimited record holder, with his twin K&B 29 powered "Miss Wayne", running two props.



Rod Gerghy's original 3.5 tunnel outboard was second in OPC Tunnel division. Rod is from Seattle.



Two nicely done Sport 40 unlimiteds on display.

\$30 refundable deposit with your order to Satellite City, P.O. Box 836, Simi Valley, CA 93060-0836. Keep the cassette for up to 60 days. Show it as often, and to as many modelers as you like. Satellite City says you can even copy it. Just return the undamaged cassette within the time limit and you'll get your full deposit back immediately. The supply is limited. All orders will be shipped in rotation and in order of receipt.

Bill Hunter, of Satellite City, sent me the above information and asked that I share it with others. He thought the tape would be great for club meetings, both from an informative and entertainment point of view. Although an airplane is used for the demonstration, the applications of techniques are universal. I have become a real fan of adhesive like Hot Stuff and other similar products. I cannot imagine going back to mixing epoxies for many of the things that I stick together as I build a boat.

**AND DON'T FORGET TO TAKE IT TO THE POND**

Had the occasion the other evening to test out a new 3.5 tunnel of my own design. What I did was take my 7.5 tunnel design and reduce it down to 30 inches for the 3.5. There are limiting factors in attempting to run a boat after work in early March. Like it gets dark at 6:00. I knew I could get in a couple of

runs if things went okay. Forget that thought.

During the first run, a rudder linkage solder joint decides to let go. No problem, just kill the engine and row out and pick it up. Some people have soldering tools that plug into their car cigarette lighters. It so happens that I have one, also. It's sitting at home on the workbench. What to do? By the time I could load up, get home and make the repair, and then get back, it's dark. How about wrapping the two pieces with paper

towel soaked with Hot Stuff Super 'T'? It's worth a try, I figured, as I make what looked like a plaster cast around the two pieces. I gave it a "jerk test" (an easy test for me to perform) and it held. The mended linkage was stuck back in the boat and the boat was run several times more without any linkage problems. I don't think what I did was all that novel. But it does show what can be done with these new instant adhesives we now have available to us. I love 'em.

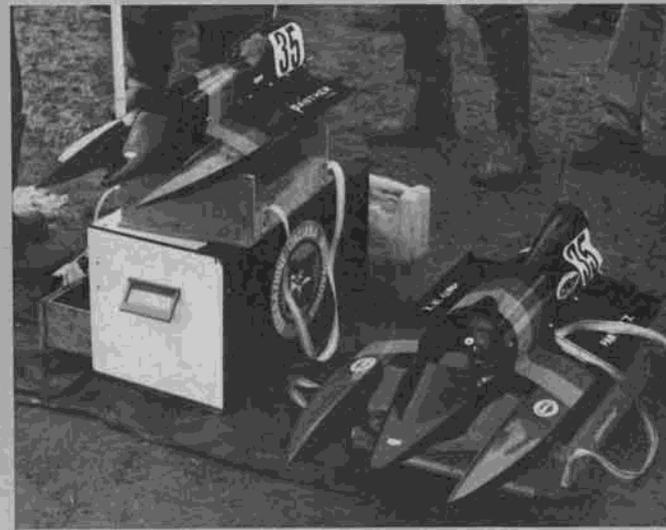
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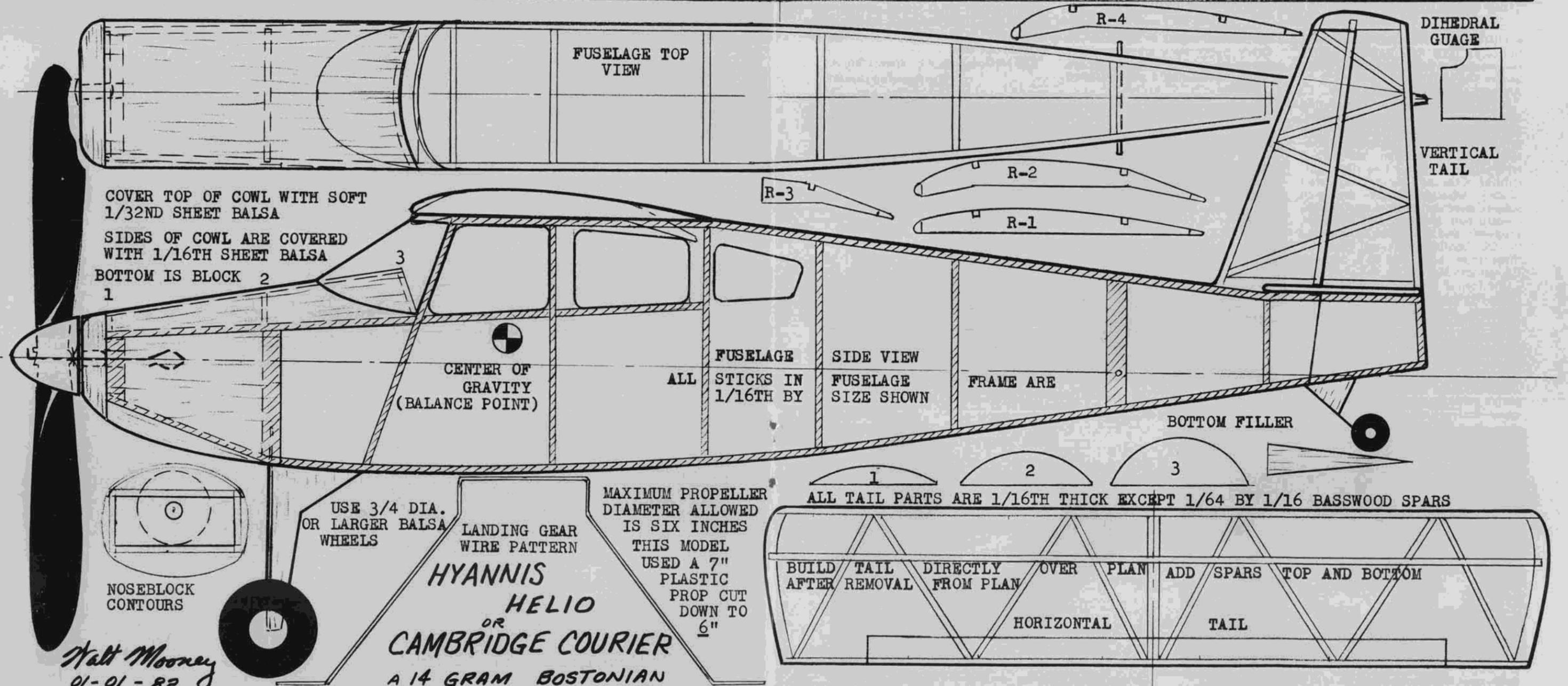
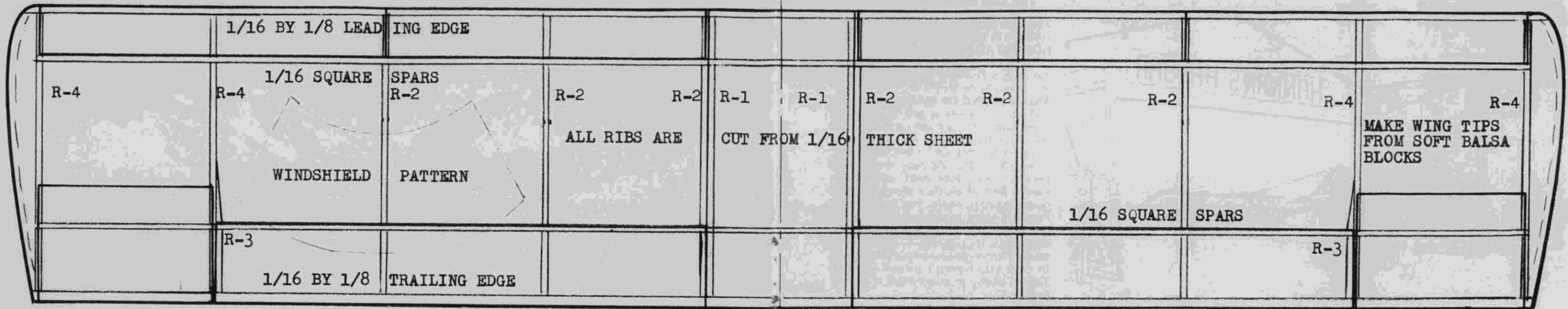
Two beautiful tunnel boats, powered by 90 CMB and 60 OPS engines, from Italy. Photos here and below provided by Vern Schmidt. See text for more info.



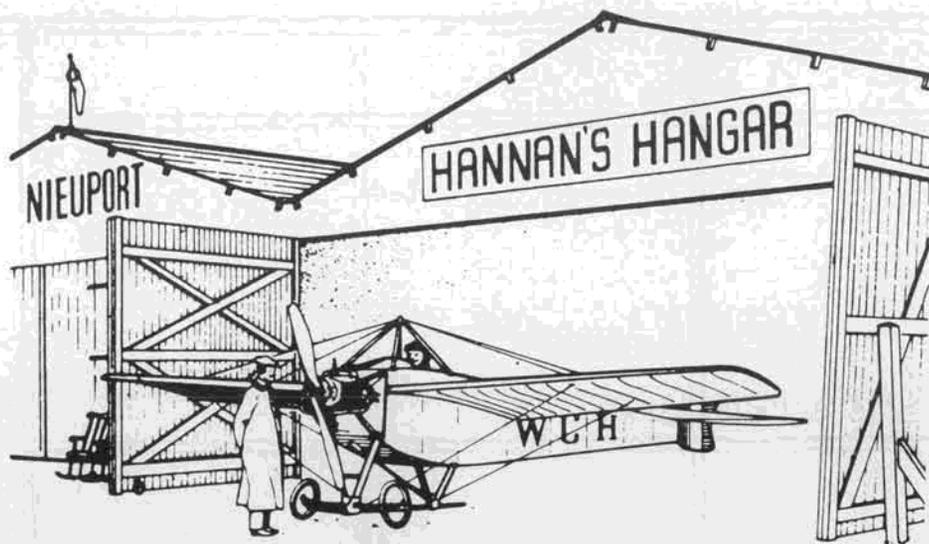
Fiberglass outrigger by Mario Bono, Italy.



CMB 90 and OPS 60 powered catamarans by Luipino, in startling orange-yellow-red over black.



*Halt Mooney*  
 01-01-82



"Guaranteed flying ability is, like most guarantees, a myth . . ."

• Our lead-in line this month was borrowed from Ron Williams' highly recommended book, *Building & Flying Indoor Model Airplanes*.

#### AND SPEAKING OF BOOKS

Bill McCombs, Senior Engineering Specialist for the Vought Corporation, has recently published *Making Scale Model Airplanes Fly For Sport or Contests*. Featured is design, stability and trim information for free flight gas, rubber, CO<sub>2</sub>, and electric powered models. Separate chapters deal with subject selection, engines and motors, construction methods and materials, propellers and more. Also included is a trouble-shooting chart and plans for three Peanuts (a Jodel D-9, Nesmith Cougar and SE-5A).

The format is similar to Bill's earlier book, *Flying and Improving Scale Model Airplanes*, published some years ago. Large amounts of data are reduced to tabular and graph form. For example, 93 different potential rubber-powered scale model subjects are compared, and their duration capabilities are predicted. The dedication involved in preparing such a guide boggles the mind . . . even proof-reading that page must have been

a monumental effort!

Other publications are also under preparation, and complete details are available by sending a pre-addressed

stamped return envelope to: AIRCRAFT DATA, P.O. Box 32021, Dallas, TX 75224. **HOWZAT AGAIN?**

"My first try looked more like a lug nut than a Peanut!" George P. Harris, San Diego Scale Staffel.

#### AND SPEAKING OF PEANUTS

Planters Peanuts is still offering its "Premiums". These make very appropriate prizes for contests. Among current items are Mr. Peanut T-shirts, cast metal belt-buckles, drinking cups, mechanical pencils, socks, tote bags, and beach towels. Best of all, they are obtainable quite inexpensively. For instance, a Peanut T-shirt, in choice of four sizes (intended for children, but will fit fairly slim adults too), is only \$1.95 plus two empty Planters peanut bags or wrappers. In case you haven't priced printed T-shirts lately, be assured that is quite a bargain.

Club contest directors may obtain a fully illustrated list of premiums from: Planters Peanuts, PC-4, Wilkes-Barre, PA 18762.

#### NOSTALGIA TIME

Ken McDonough, well-known British

*Continued on page 80*



Dennis Norman (at right) and Flying Aces crew prepare rubber powered Soviet "Bear" for flight. A good performer. Photo by Roger Wathen.



Benno Sabel, West Germany, with his 1911 Voisin canard Peanut, flown at Flemale, Belgium indoor contest. Reinhard Sabel photo.



Clarence Mather, San Diego, with his canard Bostonian. No separate vertical tail, but it flies beautifully.

# HYANNIS HELIO or CAMBRIDGE COURIER BOSTONIAN



By WALT MOONEY . . . Perfesser Peanut takes another side trip to Boston, by way of Hyannis (to visit the Kennedys?) and Cambridge, and comes back with a scale-like model that just HAS to be built.

• This month's model is not a Peanut and it is not a scale model either. However, it is scale like and it is relatively simple to build, and it will really fly well even if it is built by a rank beginner and is not assembled with a lot of skill.

The Hyannisport Helio, or Cambridge Courier, take your choice, is built to the Western style Bostonian rules. These are repeated here:

1. Maximum wing span, 16 inches.
2. Maximum wing chord, 3 inches.
3. Maximum length from the thrust bearing to the most aft point on the airplane, 14 inches.
4. Maximum propeller diameter, 6 inches.
5. Two wheels at least 3/4 inches in diameter.
6. The fuselage must contain a theoretical box of the dimensions 1-1/2 x 2-1/2 x 3 inches.
7. Airplane must have a windshield and clear vision to each side of at least one square inch each.
8. Minimum weight without motor must be at least 14 grams.

The Bostonian class was originated on

the east coast and their minimum weight is 7 grams. They also give points for charisma at their contests. Out West we have usually decided on some novelty rule for our contests. For instance, one July 4, we required all entries to have an American flag on their model. Further, most Western Bostonians have resembled real airplanes to some extent.

The original Helio Courier was built at Norwood, Massachusetts, a short distance south of Boston. The Courier was a short field airplane and incorporated large slotted flaps and full span leading edge slats. The ailerons were relatively short span with wide chord, (I know because I did the detail design drawings on the prototype Courier). Anyway, the Courier inspired this Bostonian and especially its wing design, which is the one significantly non-standard feature on the model.

The model flew right off the building board and won its first contest on the night of its first test flight. One adjustment was necessary to make the model fly safely in small enough circles for an indoor basketball court. This was the

addition of a 3/8 by 1 inch drag flap under the left aileron. The model will fly fine outdoors without it, but will not turn in quite so tight a turn radius.

Most of the model construction techniques are very standard, and so really need no comments, however, one feature of the tail surface and the entire wing structure requires some explanation.

The tail surfaces use diagonal ribs to resist warping and have external spars made of thin basswood which are added to both sides after the surfaces are removed from the work board. There are no notches cut for these spars, they are simply cemented on the diagonal ribs and the tail tips. The ends of the spars are sanded to a feather edge at the tail tips. After covering, this structure is very warp resistant.

The wing has four different rib shapes in its construction. "R-1" is the rib shape used over the fuselage and is flat bottomed for this reason. The wing tip blocks are also made to this rib shape. All the other ribs have a drooped nose to

*Continued on page 64*



A future Peanut is this Saiman 2000 Italian design, convertible CO2 and rubber!



The Hyannis Helio, with built-in drooped leading edge and partial flap, plus a drag flap for tight indoor turns.



Dave Stott, Bridgeport, Connecticut, tests the air with his rubber powered DH-4A. All photos this month by Don Ross.



John Stott, with his "Mauboussin" French homebuilt, at Glastonbury, Connecticut.

## FREE FLIGHT SCALE

By FERNANDO RAMOS

• I want to start this month's column by thanking all of you who have written to me. I really do appreciate the feedback. Those of you who have sent along a stamped-self addressed envelope have received an immediate reply. Those of you who have not, the replies are slow. Going to the post office is the biggest pain I know of, so going there to get stamps is a chore I infrequently do!

I would like to put in a request to all scale modelers out there; I am asking you for ideas on different items you want to see covered in this section. So send me your request, and I'll hop right on it and try to cover it the best I possibly can. I'm sure that there are many areas I haven't covered over these past 10 plus years.

Flying Aces fans! This year's 3rd Flying Aces Nationals will be held in Johnsonville, Pa. at the Naval Air Station, on July 17-18, 1982. On Friday, the sixteenth, they will hope to be able to do some of the scale judging so as to take some of the workload off of the judges on the days of the actual flying. They would like to urge all of you who can, to have your entires judged on Friday evening if at all possible. Here are a list of events:

1. FAC Scale
2. Jumbo FAC
3. Peanut FAC
4. Peannut GHQ
5. FAC Power
6. Embryo Endurance
7. WWI Combat
8. WWI Peanut Combat
9. WWII Combat
10. Greve Race
11. Thompson Trophy Race
12. Golden Age Mass Launch

New Products. A few months ago there were some pictures of some beautifully constructed models of the Boulton-Paul Defiant, Heinkel 112, a

Cessna Airmaster, and a P-35. Well, since then, I have seen the actual kits of these models. To tell you I'm enthusiastic would be an understatement! I've been around long enough to remember the old Megow, Cleveland, Scientific et al kits. These kits of Golden Age Reproductions remind me of those old kits of yore. The big difference is the vacuum-formed parts, decal sheets, and the beautiful balsa. These kits also include balsa sprays. These are sticks that are cut from a single sheet and are still attached at one end. At first glance you might wonder why, in this day and age, would they include sprays instead of balsa sticks? In other kits of today, the sprays are usually so bad they can't be used. Not so with Golden Age Kits. They are cut so that they are square and they have an added advantage that any one of

these sticks can be used for longerons without the usual fear of unequal bend forces. I always try to find four sticks of uniform hardness for longerons so that the fuselage will not turn into a banana shape due to one longeron bending more than another.

The vacuum-formed parts are first rate. For example, on the Boulton-Paul Defiant, the turret and canopy are one unit. You have to see it to appreciate it. Also, the vacuum-formed wheels are made out of a very light but strong material. One wheel half fits into a very small, inconspicuous groove on the other half, providing a neat joint. The Cessna Airmaster has a vacuum-formed engine cowl complete with valve cover bumps. If I sound enthusiastic about these kits, I am!

The first one I started was the Peerless Rearwin Speedster. I made a few structural changes only because I prefer doing certain steps my way rather than the more conventional approach. One major change I made was to sheet the upper portion of the front end of the fuselage with 1/32 balsa. This was in lieu of just stringers. I feel the appearance with the balsa is better; all-in-all a lovely model. The Defiant will be the next one I tackle. I eventually plan to build them all. For further information contact: GOLDEN AGE REPRODUCTIONS, P.O. Box 13, Braintree, MA 02184.

I received material for a very clever way of making a truly simple modeling balance. It is called the Micro-Air Wooden Beam Plan Set. The balance is an excellent little scale, satisfying most free flight and indoor builder's weighting needs, from a few thousandths of an ounce up to a pound. It is constructed of ordinary model builder's materials.

The plan set includes a theory of operation, complete bill of materials,



Mark Fineman is smiling because he finally got his Ascender trimmed out.

construction notes, photographs of the completed scale, and an ounce/gram/grain engineering conversion table, are also provided. All this for a mere \$3.50 prepaid.

Calibration is simple and requires only an accurate one-ounce reference to construct the sliding weights. The balance can be constructed in a single evening and will provide many years of weighing service.

The company, Micro-Air Precision, is a newly formed company dedicated to introducing innovative, well-engineered products to the modeling community. It has many years of experience in indoor, free flight gas and rubber, controlline, and RC. By combining these experiences with modern technology, it plans to introduce products that will supplement the modeller in the pursuit of his hobby. The address is: Micro-Air, P.O. Box 1129, Richland, WA 99352.

For those of you who have been reading this column, George James needs no introduction. He has provided us with some rather interesting building techniques. A while back, George and I rode together to a Flightmaster's R.O.W. contest at Lake Elsinore. While en route, I had a chance to pick his mind and discovered another way of building structures that might appeal to you. George uses Super Jet almost exclusively, and as a result, infrequently uses pins to hold things in place. As an example, he builds one fuselage side on the board over the drawing using as few pins as necessary. As soon as he completes attaching the last vertical member he removes the structure from the board and proceeds to build a mirror image of the other, building it in his hands rather than the usual pinning down method.

His approach to the wings is similar. He builds one wing half on the drawing and when the structure has dried, it is removed from the board. Then he builds the second wing half directly on the (bottom side) of the first panel. Talk about a mirror image! This way, there is no doubt that both halves will be exact. Another approach to building boring wings!! He enjoys building in 3-D!

Regardless of how many models I have built in the past, and how much I have learned about avoiding pitfalls... they still seem to crop up. Let me pass on



Thompson Trophy launch at Glastonbury, October 1981. Note plane launched by youngster in foreground is out of picture, yet others just leaving or still in hand.

some of the common ones, and I hope that you can learn from these so that you will not have to be frustrated for not catching them sooner. Many are quite trivial, but added up, can ruin an otherwise enjoyable past time.

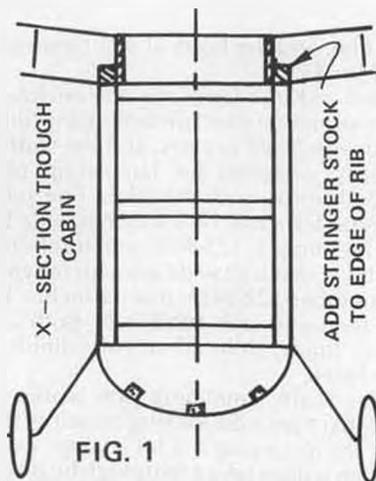
On cabin jobs, so often the center section of the wing is not the same width

as the fuselage where the wing attaches. (See illustration). Sometimes it's narrower and other times wider than the fuselage. The best thing is to build the fuselage first, then measure across the "roof" of the fuselage and check this dimension with the wing's center section. Adjust as necessary before actually building the wing. If you find that the wing will not fit properly, add stringer stock to either side of the rib. (See illustration). This way there is some material with which to glue the wings onto the fuselage. If this wasn't done, you'd be gluing the wing onto the fuselage by tissue only, and this is not the way to go!

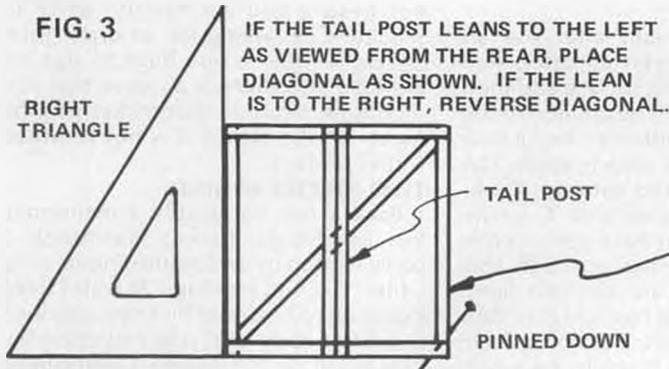
Sometimes, particularly on "old time" scale model plans, only one half of the stabilizer is shown. Such is the case with the Golden Age Reproduction's Peerless Rearwin. The intent here is to build each half and butt glue them onto the upper longeron of the fuselage. This may be OK for the pros, but with Murphy constantly peering over my shoulder, one side would end up pointing up and the other one down. (See illustration). Unless the stab sets directly on top of the fuselage, I prefer to build a slot for the stab to fit into. Then the stabilizer can be built in one piece for strength and alignment. An added advantage to this

*Continued on page 72*

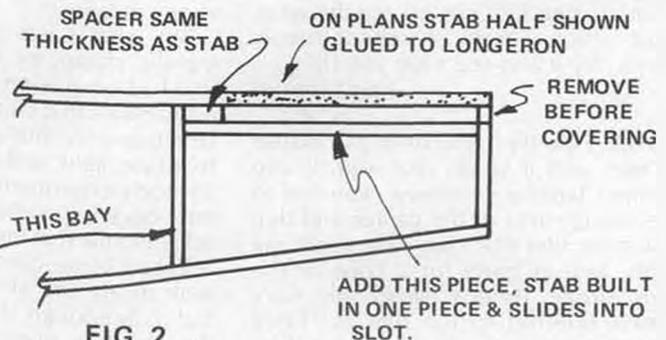
**CENTER SECTION TOO NARROW**



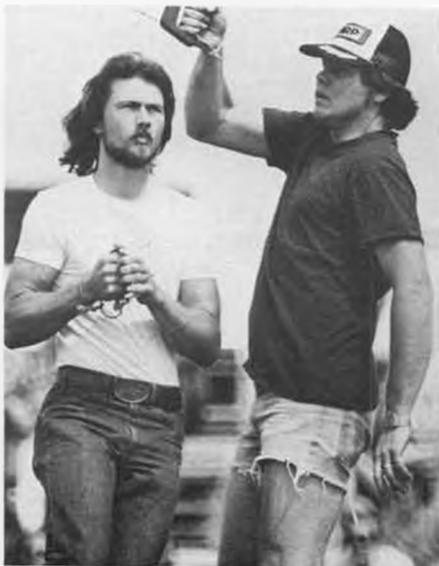
Method of providing strong wing/fuselage joint when ribs and longerons don't line up.



Straightening twisted fuselage framing with triangle and diagonal braces.



By adding support piece and providing slot, stab can be built in one (stronger) piece for better alignment.



Interesting sequence of four photos from Eugene, OR., Regionals, with Jeff Holzfelder (cap) and Bob Kerr, flying for Vic Garner. Safety thongs required, so no chance to change hands. Looked like two dead Rats, but Jeff finished race and Bob got down safely (ended flight lying on the ground).

# Control line

By "DIRTY DAN" RUTHERFORD

PHOTOS BY CHARLIE JOHNSON

## IN SEARCH OF THE PERFECT COVERING . . .

A short note came in from Ken Simpson, and it follows:

*I read about your desire for a glue for plastic film. No answer for that, but enclosed is a sample of a light plastic film that has the glue applied. This film has been used on CL, FF and RC models with good results; it can be painted with dope or with Rust-Oleum. It sags very little with cold or age . . . less than Monokote. Above all, it's a lot cheaper than any of the plastic films sold as model airplane covering material. For Combat models, the laminating material could be used unpainted.*

*I have used this film on a Lil Satan and had no problems. Everything was covered with it, including booms and elevator.*

*Laminating film can be purchased at most office, library or school supply stores. Try it and see what you think.*

Ken Simpson

Well, I did try it, just now, as a matter of fact, and it works real well. It also seemed familiar somehow. Ran out to the storage area of the garage and dug out some film that Gary James sent me years ago, in trade for a copy of the Two Stroke Tuner's Handbook. Gary always referred to the film as "Perry Patch" (I think), the Texas Combat fliers having used it for years and years.

Even bought as Perry Patch, the stuff is super cheap, Gary sent me a huge wad of

the film, and the book at that time only sold for \$5.

Back to Ken's letter: he also enclosed an information sheet on laminating films used with Seal® presses, and the stuff is actually designed for laminating pictures menus and the like. The part number for a roll 11-1/8 inches wide by 200 feet long is 122-8410, and it sells for \$11.00. If that isn't wide enough for you, try number 122-8420, it is 22 inches by 200 feet, and sells for \$21.20. Both are glossy finish, although a matte finish is also listed.

This Seal® laminating film works so well that I am now kicking myself in the rear for not trying it a lot sooner, even though it does take a fairly high heat and so wouldn't have worked on my foamie Combat models anyway. But it is light, easy to use, really cheap, and a ready source is as close as a decent office supply retailer.

But what I was really after was an equally cheap, or even cheaper, film that had no glue on its surface and then an adhesive that could be applied to the structure only, this adhesive being easy to locate, light, and a snap to apply. Has anybody experimented with the Quik-Stik covering adhesive that Coverite sells? I know that they have just recently released some covering materials that look strong and yet are also very light. Naturally enough, the cost is higher than the film Ken suggests, but for a Scale model or a Stunter, it might be worth looking at. In fact, I guess I should just get off my duff, call Coverite, and see

what they come up with for us CL types. More in a column or so. . . Maybe. . .

## VIDEO-TIPS ARE HOT STUFF

It looks as if Bill Hunter managed to figure out a way to buy a high-zoot video tape machine and write it off as a business expense, 'cause here comes "Hot Stuff" VHS cassettes for you to play at club meetings. The cassette plays for an hour. I would suspect that every imaginable gluing job that can be done with "Hot Stuff" is shown, and knowing Bill, there are probably a few off-the-wall features included.

The cassettes are free, although you do have to send them a \$30 deposit, which is refundable. The hot tip here, and it is OK with Satellite City, is to just make a copy of the tape, shoot the original right back to them and have the deposit back in the treasury before the club members even know it was gone! But before you act hastily, write to Satellite City, asking for an order form for Video-Tips, as you have to sign for the tape and there is a clause that you should be aware of that makes you the owner of the tape if it is not returned within 60 days.

## TWO-STROKE ENGINES

Back a few paragraphs I mentioned the Two-Stroke Tuner's Handbook, a piece written by my favorite Engineering Editor, Gordon Jennings. At least I think that used to be one of his titles, although the latest copy of Cycle magazine has him listed as the Senior Contributing Editor. Anyway, he has been around high-performance machines of all kinds,



doing some rather amazing things with two-stroke engines. An example that comes to mind instantly was the time Jennings persuaded a Yamaha production road racer to go faster than the factory's own machines at a Daytona race and it is basically a pure horsepower track. For a privateer bike to pull the factory bikes, which were always a year or two ahead in development, down the long straight was unbelievable, especially to the factory mechanics, who rushed over to count the teeth of the sprockets, thinking that Jennings was just gearing for the straight. He wasn't.

If you're not a bike nut, and I am, you probably don't care about all of that super-tuner stuff . . . But you should, as Jennings laid all the supposed "tricks" right out in black and white, all you have to do is read it a couple of times. Actually, I have read my handbook four or five times, pick up on a couple new things each time through, and would imagine I'll get some new stuff next time I read it.

The Tuner's Handbook shouldn't be too difficult to locate, I bought mine in a hobby shop and they got it from Shamrock, importers of OPS engines. It is a publication of H.P. Books, Box 5367, Tuscon, AZ 85703, and they frequently advertise for mail-order business in the better motorcycling magazines. A good motorcycle shop is another source, and of course any decent book store can also get it for you. They aren't \$5 anymore, but even if the price has doubled (and I don't know that it has) the handbook is easily worth it.

While on the subject of bikes and two-strokes, in the past I have mentioned that stealing tricks from the factories like Honda, Yamaha, Suzuki, would be a good way to go in getting even more power from out little engines. I really thought there would be a response to that suggestion . . . But nothing. C'mon, guys, even the Speed fliers are lagging several years behind what these factories are doing, in some cases even offering the tricko motors for sale to privateers. For example, Honda has for

two years been using oval pistons in a four-stroke GP bike and now has a two-stroke that also uses oval pistons. Yeah, I hear you, last motor you built-up ran like it had an oval piston, but here we are talking about a liner that is also oval, which will probably work better . . .

#### THAT MODEL'S BEST FEATURE IS LIGHTNESS

Hey, if these bozo college and pro athletic coaches can talk about players having "quickness", I can refer to a model as having "lightness". Ok?

Enough rationalizing for faulty English. Remember back a year or so ago when I told one and all who had the stomach for reading it, about that Airtronics S-Tee I built? Just a kick-around, 1/2A Sport model, but all the old tricks, and a couple of new ones, were used to make the thing just as light as possible, including sewn hinges, Japanese tissue covering, holes cut everyplace, 1/64 ply substituted for 1/16 material and a few more things that needn't be mentioned. The model came out so light . . . Tell me, Dirty, how light is it? This camel is so light that I have to put rags on it, just so it won't float out of the pits. It is so light that if I put it in the trunk of the car, the car's rear end gets squirrely and I can't hardly get around wet corners without the back of the car trying to pass the front. (Is Pat McCormick ghost writing for you? wcn).

But seriously, folks . . . No, I mean serious for-real, it will do things that a model like that is not supposed to do at all. Like vertical figure eights with the outside loop on top. Outside loops from level, inverted flight. Outside triangles, again from inverted, level flight. Remember, this piece of foof has a flat-bottom airfoil, hence the emphasis on inverted stuff. And it isn't particularly over-powered, just a mild TD 049 on equally mild fuel.

And, of course, it will do a bunch of other interesting tricks that make everybody ask if it has ailerons (no, it doesn't) but the point is that for the first time in my entire modeling career I have been able to see very graphically just what effect extra weight does to the

flying characteristics of a model. I suppose the chance was already there to see this, but in CL modeling, it seems to be harder to pick up on it, as most all of our stuff is terrifically over-powered to begin with. (Rock on a string. Rock on a string. wcn) One Combat plane seems to fly a lot like another, even with one being two ounces porkier, and both of the same design. The heavy one still flies well enough to be entered in a contest, in fact a lot of fliers could not tell you which was the heavy one, just by flying them both. Of course the light one flies better, all other things being equal, but that roaring motor on the front has so much excess power to begin with that a slight weight (or lightness!) advantage is not easily detected when the models are flown one at a time.

Where the advantage does show up is in the turns for most models, and in acceleration at take-off for all models. This is particularly true in Combat, where one model will consistently turn inside another seemingly identical model.

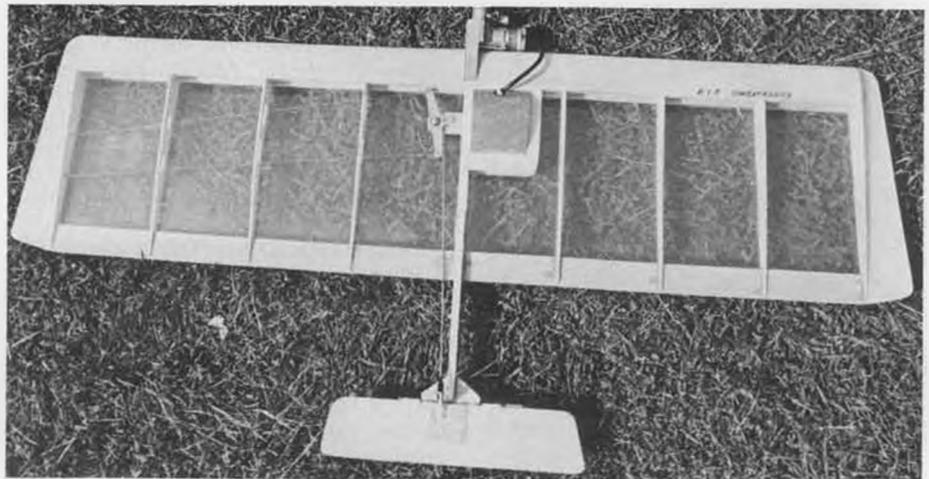
The only thing that really bothers me is that I had to see the in-the-air difference between a very light and a not-so-light model while flying RC . . . (RC is really more educational than you think, Dan. wcn)

#### AND DURABILITY?

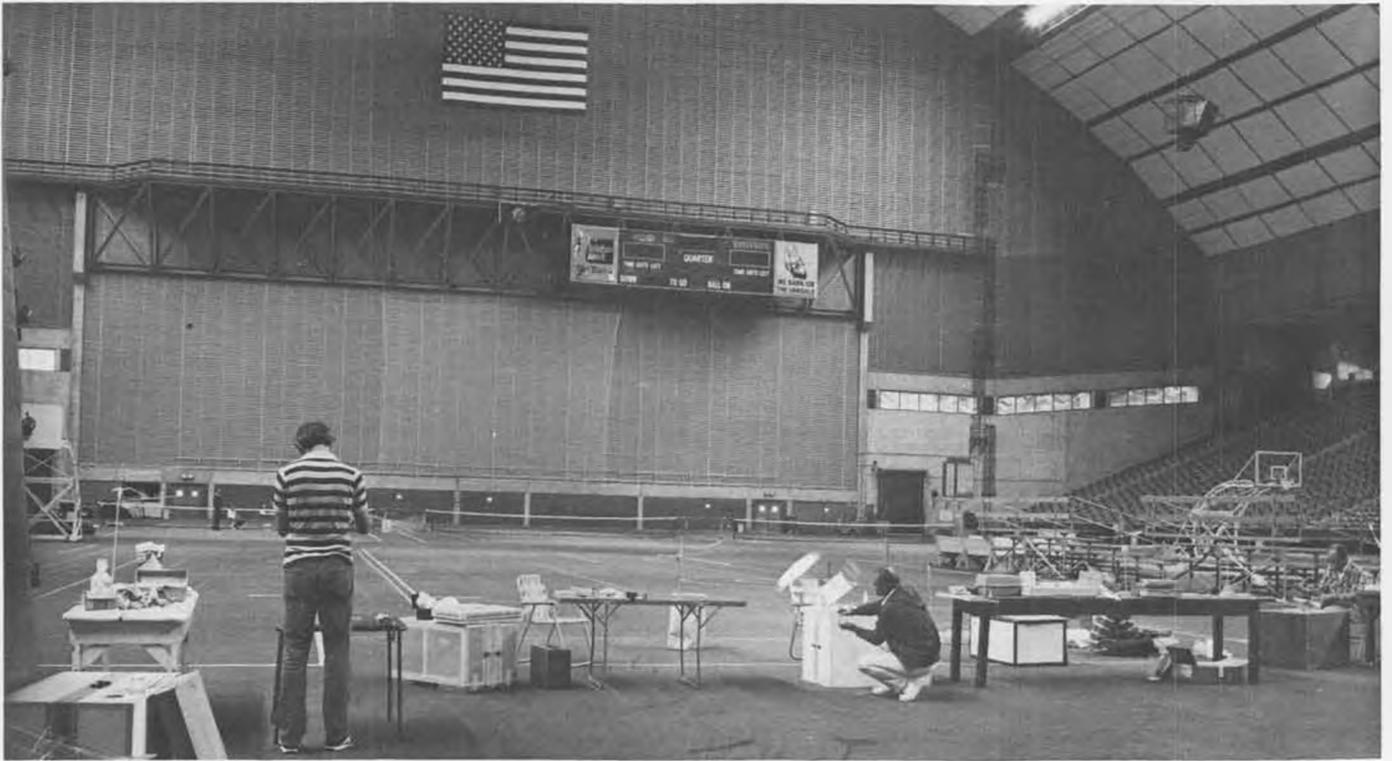
Ah, yes, it's light, but how long will it last, asks the guys who can't build models with lightness (well, that makes it a couple of times that I have referred to models with that strange adjective, and it just doesn't work, does it?)

My own opinion has always been that unless the model simply falls apart while flying, it is plenty strong enough; generally it is much stronger than is necessary. Every RC kit I've ever seen is designed a couple of times stouter than it really needs to be, mainly to ensure that any geek can successfully complete and fly the thing. Don't fall over laughing, fellow CL fliers, not until you can show me at least three widely available CL kits that aren't overengineered. And no fair using the kits that Hoffelt is

Continued on page 72



Millions of variations of this typical Texas model at Nashville. Could be Stubblefield's as he uses solid lead-outs and lots of rake.



Interior view of Kibbie Dome, Moscow, Idaho, site of high-ceiling indoor meet this June 5 and 6. See text for details. Photo by Joe Dvorak.

# FREE FLIGHT

by TOM HUTCHINSON

PHOTOS BY AUTHOR

## WANTA GO TO MOSCOW THIS SUMMER?

Dave Hagen has just told me that he has a confirmed date for a grand gathering of indoor flyers at the Kibbie Dome in Moscow, Idaho, for June 5 and 6. This is possibly one of the best sites in the world, according to ex-World Champ

Bud Romak, who flew there the past summer. This facility is used for football, basketball, and track events at the University of Idaho, to give you an idea of its size. Ceiling height is about 150 ft., with a 400 ft. width and enough length to accommodate a football field. Sounds like an ideal spot to set some AMA high-ceiling records, especially since it's large enough to accommodate both HL glider and microfilm events at the same time. (Seems as though microfilm flyers don't usually consider HLG a "serious" enough event to want to share their flying sites or times . . . maybe Stan Stoy will be able to repeat his 90-second flights made in Japan this year). Moscow is located about 80 miles from Spokane, for those of you making traveling plans. Dave Hagen is the contact man . . . phone him at (503) 631-7373 if you want to attend, as this will appear in print only a month before the event.

### DARNED GOOD AIRFOIL . . . Gard 7510

John Gard's airfoils have been used by many modelers who were looking for a good glide in calm air. I've already published a couple of his foils, but recently came across a few others in an issue of *Vol Libre*. The Gard 7510 belongs to the high-camber, small thickness group of airfoils that have traditionally provided good performance in still air. John uses twin turbulators, at 7% and 23% of the wing chord, to further assist

low Reynolds number performance. Upper surface drop-off (the "Eppler test") is less than 5% between the 40% and 80% stations. You might consider



Art Marian with Satellite, at Gardner Field. Pair a common site in the early 60's.



Young Flier of the Month, David Martin, with his P-30. Bob and Toni White's grandson.

this for a "morning round" Wakefield or Nordic.

#### MYSTERY MODEL

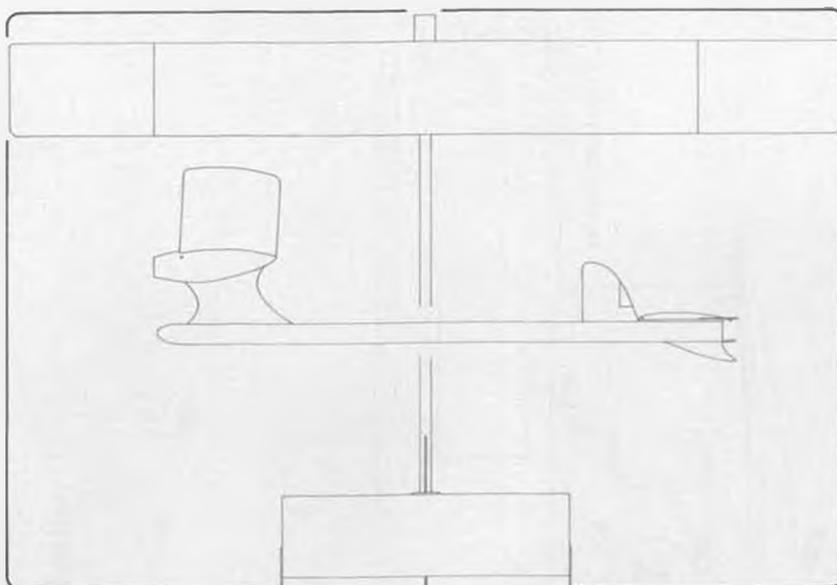
This month's Mystery Model is one of the gawkiest looking designs since Woody Blanchard's Gawn. It should be distinctive enough for those of you who remember the days when high-thrust models were the "new thing" to identify easily. The only other hint you'll need is that the designer has been a long-time magazine columnist and is still doing so, with the same publication. If you think you've got it pinned down, send your entry to *Model Builder* office (621 W. 19th, Costa Mesa, CA 92627). If your correct answer is postmarked early enough, using the mail handicap system, a free subscription to MB will be your reward.

#### ELECTRIC POWER FOLLOW UP

In case you were perplexed by some part of the piece on electric powered FF that appeared in the March issue, author Bill Baker was, too. In my transcription from the original CIA Informer article, I switched "current" to "charge" in the text I sent in, and this was compounded in Costa Mesa by omitting an entire line. (This was nothing compared to what was done with April's DGA . . . all the comments describing the airfoil were deleted and the last half of that section was printed twice!) (We'll do most anything to keep everyone confused! wcn) As Bill says: "The phrase 'half the elapsed time' in the first paragraph makes no sense. It should be replaced by 'one hour'."

"Obviously, the 0.1 hour rate (2.5 amps for 6 minutes on a 250 mah unit-TH) is the practical one and most NiCd batteries will accept this rate without damage if not overcharged. The usual charge rate for RC equipment and for household applications is the '10 hour rate' or (a charging current of) 25 ma for 250 mah cells, etc. The reason for this is that at this slow rate, the cells can stand overcharging . . . so you can leave them on charge for 24 hours or more and the heat can be dissipated with no serious damage.

"I am just hoping to encourage more activity in electric FF. With an Astro 02, the motor, batteries, timer, etc. will be 5-1/2-6 oz., and the leaves about 3 oz. for airframe to be competitive. My dead air time is only about 90 seconds, but it will max in light lift. My next electric will probably have a flat bottom airfoil, however, as will my next Coupe, for the same reason: more important to get



JUNE MYSTERY MODEL

higher. Most important thing in the climb, given the same power and good trim, is weight.

"The 225-250 cells that come with the 02 are about right. I tried to go with 100 mah cells . . . to save weight. Don't bother; it doesn't work."

#### CONVERTING TOMY TIMERS FOR DT & VIT

A few issues back, I gave some hints for using the mechanisms inside the Tomy brand of wind-up toys as model airplane timers. Since then, Tom Cashman wrote a more detailed essay on the subject for the Batsheet, which I'm reprinting here:

Of the multitude of small clockwork-motor-powered plastic toys around, the one I've found most suitable is the TOMY 2521 ACROBOT. This toy has a motor with shafts extending about one inch on each side of the case, allowing choice of clockwise or counterclockwise rotation. Its spring seems a bit stronger than some. I cut off the feet, pull off the arms and nibble the body apart with needle-nose pliers to free the motor. Take some care as you do this and save the two beautiful little springs and brass collars from the arm assembly. The springs are perfect for VIT use or for Montreal stop springs in Coupe front ends.

Extending the motor run is done by



George Perryman launches easily identified Great Speckled Bird in '81 Nats Mulvihill.

adding mass to the pawl of the motor; greater weight slows the pawl period, which in turn slows the rate at which the gear train can release stored energy of

#### DARNED GOOD AIRFOIL — GARD 7510





"MINI ROBOT BARED OF CHROME"



"ROBOTS SPLEEN BECOMES  
\$1.98 MOCK SEELIG"

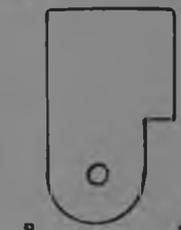
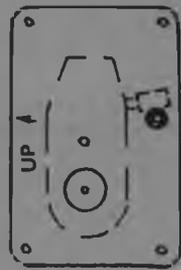
6 THREADS  
1/4-20 NYLON  
SCREW

V.I.T. DISC

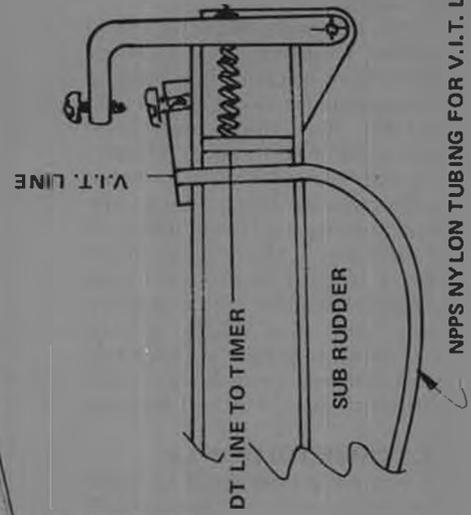
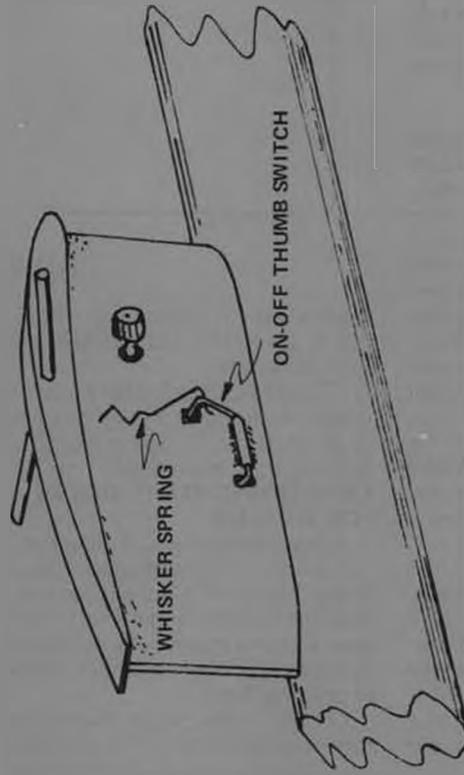
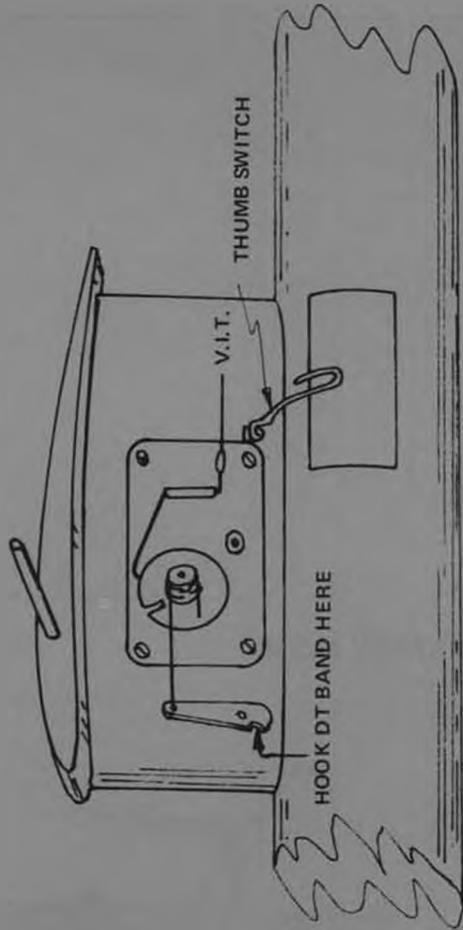
EYELET FOR HOLDING PIN

1/16" MUSIC WIRE & BRASS  
TUBING WEIGHT ADDED TO  
BALANCE RATCHET

OPTIONAL WINDING KNOB ON  
OPPOSITE SIDE OF PYLON OR FUSELAGE



TYPICAL CUTOUT IN PYLON OR FUSELAGE



GUMBANDITO'S  
V.I.T. FOR F1B

the spring. By trial and error I've found that a dependable 4-1/2 minutes results from adding as weight a 5/8 inch length of 1/16 music wire, with a 1/4 inch length of 1/16 ID brass tubing Hot Stuffed flush with one end. The other end of the wire goes into a hole carefully drilled 1/16 in both diameter and depth into the pawl. Check fit and then carefully secure with a small drop of Super Jet or Hot Stuff Super T.

I mount the motor on a 1/32 ply plate as shown. Use diagonal cutters to clip the smaller elbow shafts, cutting them off close to the case. Drill 3/32 holes 1/4 inch apart along the horizontal center line of the plate to provide clearance for the main shaft and stub. If you're sure you have the motor oriented for proper shaft rotation (you'll probably want clockwise rotation with pawl towards the tail), carefully epoxy it to the plate, forming a fillet over the edge and lip of the motor case, front and rear.

The simplest timer stop/start system is a 1/16 wire pin passing through an eyelet at right angles to, and right next to, the pawl weight. When this pin is pulled out of the eyelet in the mounting plate, the pawl weight is free to oscillate and the timer starts.

Next, we need some kind of scroll on the shaft, with a trip wire that will ride out to the end of the scroll as it rotates, finally slipping off the end to release a DT line. On earlier Coupe timers, a two-minute motor run (more motor torque) and light DT line tension allowed a simple hook on the end of the DT line to ride directly on the scroll. These scrolls were soft iron wire or silver solder spiral wrapped around a 1/16 i.d. brass tube. A slow speed drill press really helps here.

But slowing down the motor for Wake use, with high DT line tension, required a release that would only lightly load the scroll, or the motor would stall. The drawing shows a simple lever for this purpose, with the trip wire attached to a 1/16 aluminum arm, 1/16 wire pivot, and a teflon washer. The arm has a notch filed into the short side to hold a stretched rubber band tied to the end of the DT line.

A better scroll was discovered in the humble 1/4 x 20 nylon screws hanging on the RC hardware display rack. You must have clockwise shaft rotation to use these. The next problem was drilling a 3/32 hole lengthwise through the screw without 'bit wander.' What works is to thread the screw into a 1/4 x 20 hole in a one-inch wood plank. That holds it rigidly enough to drill it reasonably straight. Cut off a six-thread section of the screw with a Dremel cut-off wheel and you've got a scroll. The 1/32 trip wire rides these threads nicely. The scroll/screw is Hot-Stuffed onto a 1/16 i.d. brass tube of the same length, and the tube Hot-Stuffed flush with the end of the motor shaft. Excess shaft between scroll and mounting plate can be eliminated by pushing the shaft through the motor until there is only about 1/32 clearance between scroll and end plate. Cut off excess on the opposite side of



George Lupesey (sp?) with Wakefield. Other flyer is also in Wakefield; Miguel Santoya. Was on Mexican team in Spain.

the motor with diags, or let shaft protrude through pylon, add knob, and wind from that side. You can also wind by turning the scroll.

The next logical step was to add auto-surface capability. A brass disc was drilled, notched, and soldered to the end of the brass tube before it was inserted into the scroll. A simple release wire ala Tatone and Seelig is used, and is freed when the notch rotates to the wire end position. Only one wire for auto-stab is shown (I prefer prop-stop auto-rudder), but two wires are surely feasible.

A positive launch trigger is needed to start the timer precisely each flight when VIT is used. I use a bent wire linkage, through the pylon, pivoting in an aluminum tube, ending in a pin exactly parallel to the stop/start pin described earlier, but on the opposite side of the pawl weight. The stop/start pin becomes a holding pin for winding and standby. The pawl weight is now bracketed . . . if either pin is in position, the timer will not run. With the holding pin out, on launch, a whisker spring pulls the trigger pin out of the pylon, freeing the pawl weight and starting the timer.

Problems? The most serious one I've experienced is with motors that just don't run freely enough to be used for this purpose. About one in five seems to hang up when modified for extended running. . . I junk these quickly! Ground testing will show these up early. Don't risk loss of a model by messing with a balky timer motor (good advice even for more expensive timers . . . TH).

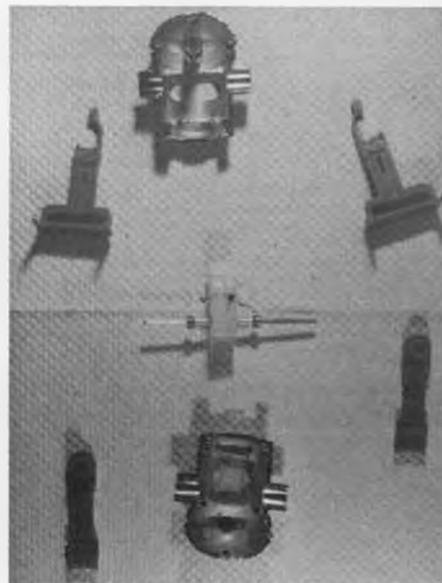
Some DON'TS: Don't lube the timer motor. It wants to be clean and dry.

Don't let balsa dust or metal filings get into it either.

If you get generous or careless with the Hot Stuff or epoxy and it gets inside . . . it's all over! Start with another motor.

Don't cut the shaft with a Dremel unless you use pliers as a heat sink between disc and motor case. Heat melts plastic gears.

Don't forget to wind the timer; it is as



Dissected Tomy robot ready to be made into \$1.79 timer. See text for how-to.

unforgiving of this error as any other timer system.

Is all this effort worth it? These timers come out 3.5 to 5.5 grams, depending on complexity, enabling me to build to weight. And VIT really makes good use of the power burst.

#### YOUNG FLYER OF THE MONTH: David Martin

This month's young flyer of the month is the 10-year-old grandson of Bob and Toni White. The photo shows David holding his P-30 rubber model, with which he's done very well indeed in his first year of competition. Let proud Toni fill in some of the details:

He takes his flying very seriously and wants now to build another P-30. (His grandfather's Mini Twin Fin design, of course.) Thus he will have a back-up ship for his current plane. He is coming along very nicely in HL glider, too. Besides being a good student, he engages in sports also. His grandfather said that David absorbs what he is told about building and flying, and so far has done a

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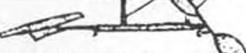
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very good job of picking air. He won the San Valeers Annual Junior P-30 event with a score that was better than some Open flyers.

Any of you proud parents, grandparents, or godparents out there who have a modeling offspring, are welcome to send in a BLACK & WHITE photo of your young hero for use in this column.

### TESTS ON DIFFERENT FIN POSITIONS FOR FAI MODELS

By Pete Buskell (Part 2)

(Last month, Pete told of his experiments with various fin locations in the late 50's/early 60's. As a result of these tests, he switched from a forward fin location to a location behind the stab, which gave 60 seconds better duration, better handling characteristics, and a more consistent power pattern.)

After completion of the tests, I changed to the rear fin layout, changing my contest performance from appearing consistently in the bottom half of the results to appearing reasonably near the top. I continued to use it successfully until the early 70's, when higher aspect ratio wing designs started to present trimming difficulties. When the aspect

ratio is raised, most of the reduction in wing chord is removed forward of the CT, giving a model with a long nose and a larger gap between prop and pylon front. The natural right turn produced by the pylon is reduced, and more rudder offset is required for the power turn. (The model also becomes much more sensitive to thrust adjustments. This is inherently less safe because the extra rudder causes the turn to tighten up if airspeed is raised for any reason. The use of a taper wing with larger center chord avoids this difficulty. The other main disadvantage of the rear fin layout is that weights are well spread out. Reduction of tailplane area to 25% made recovery from the stall difficult. If the CG is pushed forward to improve glide recovery, then a dose of the 'going flats' results on the climb!

In an attempt to overcome these difficulties, a triple fin version was produced. Proportions were moderate . . . 76 by 7 inch wing with a Fryges-modified Benedek wing section, 25% tail with a near-symmetrical entry, and with all other proportions as on the 'fin behind' airplane. Initial flights (on C 15 power) were promising. A good power trim was easily obtained, and the only deficiency noted was lack of directional stability at launch, making it necessary to concentrate hard on launching correctly. However, when a Rossi 15 with carbon fiber prop was fitted, things got more difficult. The near symmetrical entry of the Fryges section made it a very fast airplane indeed. Longitudinal trim was almost neutral, imparting an 'it goes where it's pointed' quality. Coupled to the poor directional stability of the triple fin layout, a good launch into the correct pattern became an achievement in itself. From a good launch, the climb continued steep and very fast to the end of the motor run, but if it got its nose down for any reason (e.g., bad launch to the right), then a severe dose of the 'going flats' resulted. The inevitable high velocity collision with the airfield following a bad launch ended the experiment. A version with my usual thicker wing/tail section would no doubt have been easier to handle, but by now I had come to realize how much launch stability was provided by a large fin in the slipstream. As the airplane survived the crash intact, it was decided to convert it to T-tail rather than just set fire to it!

The main disadvantage became apparent in the first few flights. Because the tailplane operates out of the slipstream, the high tailplane lift provided by the other layouts at launch is not present and there is a marked tendency to over elevation in the first 2-3 seconds of the motor run. This can be countered by a shallower launch, but height is then wasted on the climb, especially with the engine run current at the time. Apart from this, the layout had definite charm, grooving naturally to the right. If right turn increased for any reason, then the nose came up with it, resulting in a steep spirial climb . . . positive stability. It gave the fastest climb of the layouts tested

and the reason for not proceeding with it, was glide stalling. It would recover quickly from a moderate stall, but if stalled badly, wouldn't recover at all. The tailplane operated out of the wing wake normally, but dipped into it at the top of a bad stall, imparting a nasty little kick, thus preventing recovery. A 1/2-A version produced at the same time had similar characteristics, although it was based on my usual thicker and much less touchy wing and tail sections.

In the account of the tests I have tried to avoid too much detail in order to outline the main characteristics of the types tested. In practice, it took a lot longer to carry out the tests than to write about them. In testing the triple fin and T-tail layouts, for example, a large amount of time was spent grappling with that main disease of the Rossi model, colloquially known as the 'going flats'. The need to match wing and tail section entry to minimize this is well-known, but little has been written on the basic cause. The mechanism seems to be that with most of the sections currently in use, when operated near to zero lift, the center of pressure moves back smartly if the wing moves into a lower angle of attack for any reason (e.g. going over the top.) With a forward CG and a small tailplane on the model, this amounts to a significant reduction in the wings' moment about the CG and can be an irreversible 'runaway' condition, ending in a vertical dive. Keeping the CG aft minimizes the condition, but at the expense of longitudinal recovery. For the small tail model this manifests itself in an increase in the 'duff flight' or disaster count.

Personally, I have adopted the coward's solution and have returned to the larger tailplane area (25-30%). My preference is still for the rear fin model, which despite its difficulties offers by far the most stable handling.

After reading Pete's article (taken from Free Flight News), perhaps it's not a mere coincidence that the top two power models at the last World champs used rear fin designs, as did Doug Galbreath, who narrowly missed the flyoff and had what was acclaimed as the highest climbing model there. •

Bostonian . . . . Continued from page 55

simulate the slats on the real Helio Courier. However, in the area of the ailerons, the outer "R-4" ribs are flat bottomed all the way back from the droop nose to the trailing edge for no simulated aileron deflection. All the "R-2" ribs are made with a drooped aft end to simulate the flaps in a deflected position. The little "R-3" ribs are required as the transition from the deflected flaps to the undeflected ailerons.

The wing is therefore best built in three separate pieces, the center section and the two outer panels. Note that the trailing edge is discontinuous at the flap/aileron interface.

A little extra care is required to get this

wing assembled, but when it is finally done you have a wing that fits nicely on top of the fuselage, is undercambered for maximum model flight capability, and has built-in washout because of the undeflected aileron sections, for resistance to tip stalling and spiral dives following the stall. Besides, the wing looks a little like the real Helio wing at takeoff and landing.

This Bostonian was covered with tissue remnants from previous model projects, and ended up with yellow wings and horizontal tail, and a blue fuselage and vertical tail. A black tissue antiglare panel was put on the top of the fuselage forward of the wing. The resulting color scheme looked like the military airplane of the 1930's so military insignia was added. Control surface outlines were added using a black fineline felt tip pen. The cowl inlet and the tires were simulated with flat black paint.

If your model balances at the CG as mine did, the model should fly with only minor adjustments. For outdoor flying you will not need the drag flap, but if you are flying in the typical high school or recreational center gym, the drag flap is a useful device to get a tight enough turn to miss the walls.

Have fun with this semi-scale whimsical Bostonian, I did.

Incidentally, the winning time for its first contest was a flight of just over 40 seconds. Outdoors this model will be easy to lose in a thermal.

#### Fuel Lines . . . . Continued from page 20

photo, one tong has a rather blunt end. That's the way they'll both be when you purchase it. It's almost useless that way, but after a couple of minutes of grinding and/or filing, you can make it look like the other one in our photo. When they're both that way, they'll readily engage and hold hubs, etc. This tool is well worth the money and effort to modify it. The K-Mart nomenclature is: Large Gear Puller, NBR 1457 Code 82-40-73.

The two other photographs in this month's column show a fueling bulb. Although it was made especially for refueling Mouse Racers, it can also be used with other fuel tanks. The bulb is a 4-ounce one from Pylon Brand Products. The probe is a piece of 3/16 inch brass tubing, and the tip is machined from a piece of 3/8 diameter inch nylon. As you can see in the close up, the tip is countersunk. To use it, simply stab at the fuel vent of the tank and it will seat itself. This is most useful during the frenzy of a pit stop. It practically eliminates the fumbling and bumping due to a shaking, nervous pitman, and believe me all pitmen are nervous and shaky . . . like a lady of the night in church. You can make one quite easily if you have a few simple tools and an electric hand drill. Otherwise, they can be bought from competition accessory suppliers. See Kustom Kraftsmanship advertisement elsewhere

in this issue.

Guys, that's it for this month. If you need any information on subjects appropriate to this column, just drop me a note. Even if it's just to air a gripe, let's hear it!

#### Tires . . . . . Continued from page 36

the same side.  
**BALANCING PROCEDURE WITH FIXED ASSEMBLY ON LEVELED PARALLELS**

1. With the tire mounted on a wheel and, if necessary, trued on both the face and sides, insert a specially provided threaded axle into the wheel that contains either plain type or ball bearings, depending on which type bearings are in place and what axle diameter is available.

a. For example, a ball bearing with a 0.187-inch bore will not take a 10-32 threaded shaft for an axle. If necessary, therefore, remove both ball bearings from the wheel and select an axle diameter that is a light press fit in the wheel hub. Plain type bearings usually take a standard fractional size axle diameter.

b. The axle cannot be a loose fit or the wheel will not mount centered on the axle.

c. Install and tighten both axle nuts. Use a large diameter flat washer under each nut to lock together the inner and outer race, if ball bearings (without extended inner race) are in the wheel. Plain type bearings will be locked to the axle when the nuts are tightened.

2. Carefully level the knife-edge parallels on both the crosswise and lengthwise axis. A bubble level is recommended to ensure the very critical leveling of the crosswise axis.

3. Place the axle/wheel/tire assembly centered on the parallels and carefully release it.

4. If the assembly rolls one way or the other, it is out of balance. If the parallels are long enough, the assembly will roll to a position where the heavy side is downward. Or, the assembly may have to be picked up and replaced on the parallels to provide distance for the roll to stop.

5. Correct any imbalance by performing Steps 5 through 9 in the procedure for balancing with freely turning wheel bearings.

#### R/C World . . . . Continued from page 12

bird owner will fly his plane over to see the little one fly, and Bill was impressed! Byron originals should be proud. Their model is awesome in flight!" Now guys, don't everyone raise their hand wanting to do a kit review . . .

On the 21st of February, the Scale Squadron hosted another of its famous Uncontests. Connie Vaughn and Don Nelson, plus the rest of the Squadron, put together another great gathering of scale model builders, flyers, and a huge crowd of spectators. Close to one hundred various and sundry scale models, some resplendent in



## Hobby Horn

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1941 Request, 30" Span, .020 engines	\$12.95

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their bones, were displayed, flown, and eye-balled. The weather was great (for a change), lots of flying (what it's all about), a few problems with some RF gremlins, and an excellent running commentary by Fred Browns.

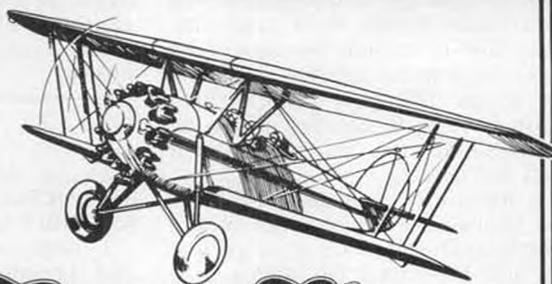
Fred, the current Finance Officer of the Scale Squadron (with an assist from Buzz Watson now and then) is quite active in west coast EAA activities (owning and flying his own Starduster!), and with his knowledge of full scale aviation, coupled with a fair gift of gab, has proven to be most valuable in keeping the many interested spectators informed. Scale 'happenings' draw a heluva crowd and a good man on the mike is worth his weight in gold. Sorry How-wud . . .

★ ★ ★

Always a source of enjoyment (and a good place to document a possible scale subject) for airplane nuts, full and model size, are fly-ins of antique and homebuilt aircraft. Flabob airport, a sleepy looking, one runway airport near Riverside, California, recently staged just such a fly-in. A low key affair; lots of nostalgic aircraft to measure, photograph and drool over. For instance, a replica Fokker Eindecker, not flown, but having its LeRhone engine run up, smelling of castor oil, and making nice sounds in preparation of future flights; a replica Fokker 'Tripe' (complete with steerable tailwheel) being flown; and how about a pair of Fournier RF-4s making passes down the runway in close formation for contrast? Neat. Then there was the

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gorgeous Stearman, resplendent in a glossy silver finish with black trim that made you want to rush out and grab a Sterling kit and start building! For contrast, a T-28 made several low, ground throbbing passes, and early in the afternoon, a very sharp, Dornier built Bucker Jungmeister side-slipped in for a landing. Watching one of Ken Rands mini-creations tear down the runway, retract its gear, and then initiate climb-out was inspiring to say the least. This bird isn't too much bigger than some of our bigger 1/4-scale models . . .

One of the local R/C clubs had set up a display of many scale models and drew lots of interest. The prime question was, "When are you going to fly them?" Unfortunately, space did not allow the mixing of model and full-size aircraft this weekend. Several car types had some nicely restored, Fords, Mercs, Packards, and other Vintage '34 through '49 cars on display. Check with the local EAA chapters in your area for fly-ins; you never know when that particular, restored Globe Swift, or Beech Staggerwing might show up . . .

★ ★ ★

A quick update on the Meyer Brothers XB-35 Flying Wing project. Construction has proceeded to the point where final details and bench running is now under way on the engine/drive train package. A liquid cooling system with radiators is being finalized and tested with the engines. We will include some details and pictures of the drive units in the near future. A 28-inch long drive unit can pose some in-

teresting problems. Noticed a large 'Wing' on the front cover of the February '81 *Radio Modeller* (English) Magazine built by our modeling cousins OCS (over choppy seas), but to our knowledge, as yet unflown. Power is to be four .21 size diesels. Ones first thought might be that not enough power would be available to fly a 16-foot, 28-pound model, but bear in mind that our large models fly on the 'wing,' not on the raw ability of the engines to drag the model through the sky. Witness the fact that the Meyer Brothers 'Hercules' was able to maintain altitude, at a flying site 2,000 feet above sea level, on THREE K & B .61 engines at an 87 pound flying weight. That's flying on the 'wing,' to say the least . . . ●

Thornburg . . . Continued from page 45

in Half-A's. Instead of a long stroke and small bore, the Wasp had a short stroke and a large bore. The result was a squat, racy-looking little engine that fitted comfortably into a tight cowling. . .and screamed! The short stroke meant more RPM, and more RPM was just what was needed for competition. Never mind that Atwood had jumped the \$5.95 price barrier for half-A's . . . if you wanted to win, you lined up and paid your \$6.50 with the rest of the hotshots.

The only engine that could touch the Wasp was the new Royal Baby Spitfire, by Anderson, and they wanted a whopping \$7.95 for it. (By comparison, the

Cub and Torp .049's sold from \$5.95, the Infant .02 was still \$4.95, while the Spitfire .045 and Torp .035 sold for \$5.50.) Who would pay eight dollars for an .049 in 1951? Lots of folks, and they got a pretty hot engine for the money, though not as consistent in quality as the Wasp.

While folks were recovering from the shock of the \$7.95 price tag on the top-of-the-line Spitfire, Mel Anderson hit them with another surprise: a sport engine priced 10% below anything on the market. It was the Spitzzy .045, at \$4.45. Same stovepipe cylinder as the Baby Spitfire; new underslung tank that was part of the crankcase casting. I have a great fondness for the Spitzzy, and for Mel Anderson, whom I've never met. At a time of 25¢-a-week allowances, that \$4.45 price tag got me a new engine two to four weeks earlier than any other manufacturer. And two weeks is an eternity to a nine-year-old!

The year 1952 saw only one new engine of interest. It came from a manufacturer of race cars and car engines, and it looked like a real dud. It had a huge, old-fashioned stovepipe cylinder, and a great gray gas tank on the back that made the motor over three inches long. It didn't have any venturi at all . . . yes it did, but the thing stuck out the back of the gas tank, so you had to drill a special hole through the firewall for it. What a bore!

And the needle valve! Why, it came out the side of that huge gas tank. No

more fingers in the prop when adjusting the needle valve. What's that? No more cut fingers? Hmm... there might be something to this engine, after all. But does it run?

Run, indeed. This great, clunky, old-fashioned looking engine... it was called the "Space Bug"... would out-rev and out-pull anything on the market in the year of our Lord 1952!

"I can dig it!"

"Ike and Mamie!"

Seems this Space Bug had a new-fangled kind of carburetor called a "reed induction," built right into that big gas tank. And this new carburetor was what made it turn so fast.

Or was it the precision with which the engine was produced? They said you could interchange the pistons among any of the engines, and they'd still run. And so of course everybody who could afford two engines tried it, and by gum it was true!

Too bad this Space Bug was so big and awkward... it would have made a fine ukie speed engine. Too bad it had that integral tank... no way to time it accurately for a free flight engine run. That race car feller... what was his name, Leroy Cox... had gone and made the world's hottest sport engine. Just wouldn't never work for competition. Too bad.

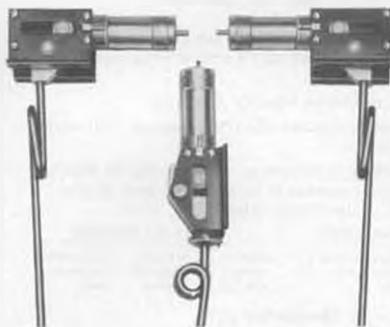
The next year, 1953, Bob Holland bought the rights and the machinery to produce the Wasp, and Bill Atwood came out with an even hotter .049... and one of the two bright ideas of the year. He bored out the .049 cylinder, turned a new piston, and presto, the .051 was born.

What made the .051 so special? Just this, now you could build one free flight and enter it in both Half-A and A classes. All you had to do was switch two externally identical engines. But what about the power difference between the .049 and the .051? There wasn't any; and there still isn't today.

The second bright idea of '53 came from Bob Holland, the guy who inherited Atwood's Wasp. By inserting a baffle in a standard Wasp "u-control" tank, and adding a short piece of spring-loaded brass tubing, Holland came up with the "Timer-tank," a device that gave reliable 20-second engine runs (well... accurate to a second or two, at least) without pneumatic timers and a lot of plumbing.

Oh, lots of things happened in 1953, yes indeed. And not all of them were good. The Wen-Mac hit the market, for example. And the Allen Sky Fury .049. But then, to balance the picture, McCoy put its lovely little red-headed diesel on the market. And Herkimer kept adding to its line of Half-A's; by December they were selling the .039, the .049, the .049B, and the .049X... as well as an .06 and an .075 diesel. I was always a sucker for the Cubs, even though they seemed to run best on test stands. I seldom got them to start on the field. Rumor had it that Cubs were afraid of heights: they would all run fine in boats and cars...

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And meanwhile, what about that fellow Roy Cox, with his Space Bug? Had he tucked in his tail and gone back to race cars, where he so clearly belonged? He had not.

Instead, he had created a market for his "sport" engine by building it into a plastic ready-to-fly ukie, called the Thimble-drome TD-1. Now the TD-1 was not the first plastic RTF on the market. But it was so far superior to all the others that its quality has never been equalled since. Only its fuselage and empennage were plastic; the wing was made of two extruded aluminum shells, joined to form a fully symmetrical, elliptical wing of 24 inch span, a wing that would fly the TD-1 through the full stunt pattern, pilot willing.

And that was not all. He had stripped the obnoxious tank from some of his Space Bugs and created the Thermal Hopper, a lighter and more practical engine for both FF and controlline. Competition FF and controlline.

And that was not all. Mr. Cox had detuned some other Space Bugs, and

fitted them with an inexpensive nylon tank, and marketed them for the unheard-of price of \$3.95, under the name "Space Bug Jr." just to show folks that he understood the meaning of the word sport.

By the summer of 1954, the handwriting was on the wall for most of the half-A engine manufacturers. Competition engines, it's true, get all the publicity, but it's the sport engines that sell by the thousands. And who could compete with a \$3.95 price tag? Atwood tried, with the "Cadet," a detuned contest .049, but soon had to raise the price a dollar to make it worth his while. Cub put out the .049B as a kit... build it yourself from a box of parts... for the magic \$3.95 pricetag. And Anderson dropped the price of the Spitzzy Senior to the magic number. But no one's heart was in it.

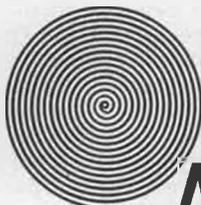
Not even Leroy's, it turned out. After K&B stopped production of the .035 and .049, and the McCoy .049 glow came and went, Cox raised the Space Bug Jr. to a solid \$4.95, where it stayed until produc-

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tion ceased in 1957.

But this is a story about rotary-valve half-A's, not about the reed valves that killed them. And we left the rotary valves in late 1954, obviously losing to the reeds in the sport market, but still battling in the contest market. Atwood introduced the Signature, a hopped-up .049. Then the Shriek. Then the Super Signature. Holland dropped the Wasp in favor of the Hornet, a potent little low-profile screamer that was all venturi. My first one, in fact, sucked so much air that it would lean out and quit whenever it was tilted into a nose-up attitude.

Apparently others had the same problem, because the Hornet became the Hornet II, with a round brass restrictor in the venturi. The Hornet II was the only engine I had that would outperform a Thermal Hopper.

All this in an attempt to stop Cox from boasting each fall, "Thimble-drome... winner of more first places, winner of more second places at the Nationals than all other half-A engines combined!"

Couldn't anyone come up with a rotary valve half-A that would stop those damn reeds? Were the reeds, which had already taken over the sport market, destined to win all the contests, as well?

Someone did, finally, build a rotary valve to beat the Thermal Hopper. But it didn't happen until 1960, long after the close of our magic postwar decade, long after the Spitfires and the K&B's and the Atwoods had faded into history. The new engine was the Tee Dee, another product of the ingenious Mr. Cox. The Cub line was almost dead by then, a victim of the Babe Bee .049 and the Pee wee .02, a pair of \$3.95 reed engines Cox introduced in 1958. The Holland Hornet took one look at the Tee Dee and expired immediately, leaving the American 1/2A market in the hands of a single company. Where it still is today.

★ ★ ★

If I sound sentimental over the early 1/2A rotary valves, it's because I am. My first engine-powered plane was a Berkeley Yank, a profile version of Struck's American Ace/New Ruler.

Power was a Torp Jr., and it was lost out over Galveston Bay in the spring of 1951.

Lately, in an effort to correct some of the errors of my early youth, and exercise my middle-aged body, I've been reflying some of these early freeflights. (Gatsby: "Can't relive the past, old chap? Don't be silly. Of course you can!") Reflying them in the relative safety of the New Mexico desert, a thousand miles from Galveston Bay.

And the problem with the desert is this: it eats reed valves. If Roy Cox had lived in Albuquerque he would have dropped the reed like a hot potato. Reeds only function reliably in dust-free environments; grassy schoolyards, padded cells, and the like. To fly on dirt you need rotary valves... engines that can be blown out occasionally without total disassembly.

And that means Cox Tee Dees... engines that have too much speed, to much power, too little romance. So I've been hounding my friends for their old rotaries. Not collectors' quality, what the MECA people call "New In Box." Just the funky old used Cubs and K&B's and Wasps and Spitfires that have occasional broken lugs, bent cooling fins, missing needle valves. I like these old clunkers. They're gentle, slow-revving little beasts that are just right for sport free flight.

You can see some of the better ones in the pictures. They all run... some as poorly as they did when they were new! But they're still great for sport freeflight or small controlline, provided you design around their limited power capabilities. I'd like to see more of these old clunks dragged out of drawers and put back into the air.

To rehabilitate them, just soak 'em overnight in gasoline or methyl-ethyl-ketone (MEK), and scrub 'em down with an old toothbrush. (Beware: MEK eats some plastics and rubber.) Then mount 'em on something simple, apply fuel and battery, and start flipping until you're blue in the face.

Whee! Just like old times! Ain't nostalgia great? ●

Visibility . . . . Continued from page 21

man) did a similar study using cars in haze and fog conditions against darker backgrounds. Their results placed luminous orange 10% above white. Choosing two colors, one from each end of the chart or graph, will give best contrast under the widest possible background variations.

It is possible to wear glasses, which when properly colored, can increase color contrast under certain conditions, but this is a fairly complex approach. The use of special optical aids, e.g. sunglasses, polarized filters, binoculars, etc. will be discussed in future articles. Meanwhile, don't neglect your most important flying aid... your eyes. Use safety glasses when operating tools or when working near a running engine. ●

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**Duckling . . . . . Continued from page 15**

the plans show it to be . . . or maybe a tad forward. If you let it get back of that point, you'll find the model very skittish on the elevator.

With the balance established, and the servos and flexrods installed, you can now Hot Stuff the top sheeting in place. It isn't absolutely necessary to waterproof the inside of the top sheeting, but you can do it by brushing some dope on the inside surface before you glue it in place.

#### EMPENNAGE

In case you don't recognize the term, empennage is French for "tail surfaces." Just thought I'd keep you alert. These are cut to shape from sheet balsa, and the stabilizer and fin combination glued to the top of the aft end of the hull. The rudder and elevators can be attached later, during the covering process.

#### ASSEMBLY

A quick look at the plans shows how the wing is held in place with rubber bands. I get a kick out of one manufacturer, who says "rubber bands went out with high button shoes." Mebbe so . . . but high button shoes kept a lot of feet dry when later, "more modern" fasteners let the mud and slush into your shoes and gave you a sniveling cold. So, I still use rubber bands. If you have a better way, use it.

Since the Duckling is amphibious, it must be water resistant in the covering.

Doping the surfaces will accomplish this; alternatively, covering the surfaces with Super Monokote overlapped, will also do the trick. Either way will work.

To hinge the rudder to the fin, and the elevator to the stab, I used Monokote trim strip. It's simple, it's quick, and it does the job. Here again, the process is a matter of builder's choice. You like hinges? Use hinges.

#### TIP FLOATS

These are built up from small pieces of scrap balsa which nearly every modeler has in his balsa box. Just cut them to shape, Hot Stuff them together, and then attach them to the rib at the location shown on the plans. Dope them to waterproof them.

#### LANDING GEAR

This is an optional feature. If you only plan to use the Duckling as a flying boat, don't bother. But if you want to fly off a runway, just make a main gear axle out of 1/16 wire, put one inch wheels on either end, and Hot Stuff the wire to the bottom of the hull. Then, Hot Stuff a Goldberg wingtip skid to the center of the bottom of the hull at the rear step, as shown on the plans, and you have a "traildragger."

#### FLYING

The Duckling has a very standard type of plan form, with wing and stabilizer surfaces at normal differential angles of incidence relative to a reference line, and the vertical fin and rudder area is also within the usual relationship of wing area and dihedral for rudder

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controlled movement. As a result, the flight performance can also be best described as "normal." Just one word of caution; the model is small. Thus it reacts very positively to control surface actions, so keep the movement of the controls limited to small angles. As a starting point, set up the linkage to the elevator so that maximum travel is about 3/16 inch up and down from neutral, and maximum travel of the rudder is about the same, or maybe a bit less, around 1/8 inch to either side of neutral. Later on, if you want more violent action, you can realign the control horns and servo wheel offsets to suit your taste. But the Duckling is very "zippy" and if you aren't ready for it, it will snap roll

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Finally, one last word of advice. When you go out to the pond to fly the Duckling, be sure to take along some kind of "retrieval" vessel. All seaplanes and flying boats are subject to water spray getting into the prop and stopping the engine . . . usually just out of reach (Murphy's Law) . . . so be prepared. But if you taxi out, line; up into the wind, apply full power, and keep the Duckling going straight, she'll come up on the step, take off (maybe with a bit of up elevator) and then you can throttle back and cruise around for about four or five minutes. Or, leave the engine at full power, and do aerobatics. Whatever turns you on.

And I'll guarantee you. When you fly the Duckling, it'll turn the crowd on. It's fun to fly, and fun to watch.

What more can you ask?

Let me know how yours turns out •

Ascender . . . . . Continued from page 27

than the tail.

### RADIO INSTALLATION

My Futaba radio was installed using S-20 servos and four channels working the throttle, elevator, ailerons, and nosewheel. Rudder control is not needed. A three-channel radio using a Y-harness to hook the aileron and nosewheel servos together could be used or only three servos with a long cable to

attach the nosewheel to the aileron servo, although this will make the wing installation a bit tricky. It was used on the first prototype, however. There isn't much excess room to mount a non-miniature radio, so you will probably have to place the components in the location shown on the plans. A 225 mah battery pack is the largest that can be placed in the rear section. Depending upon your choice of engine and radio, you may have to add ballast to the nose or the tail, since they are both so far from the center of gravity.

### ENGINE

A .15 to .25 size engine is required. The first prototype flew well with an O.S. .15, although some ballast was needed in the nose. With an O.S. .25 in the second model and an all up weigh, less fuel, of 40 ozs., no weight was required. An 8 x 6 prop is used with the .25, and a 7 x 6 with the .15.

### FINISHING

Since the foam surfaces require a low heat film, the entire model was covered with ECONOKOTE. To prevent fuel seep, the firewall, all joints, and all exposed wood and foam areas (especially around the wing saddle) were covered with a thin layer of epoxy overlapping the covering. Once covered, the ailerons and elevator may be attached using your favorite hinge system.

### TRIMMING AND FLYING

The center of gravity shown on the plans is with the fuel tank *EMPTY*. Add weight to the nose or tail until yours balances correctly. The neutral position of the elevator is shown in the side view on the plans. Elevator travel is a total of one inch. Aileron travel is a total of 1/4 inch. Remember that the trailing edge of the elevator moves up for down and vice-versa. On takeoff, hold full up until the model breaks ground. In flight you will find the ship to be fast and groovy, rather like a pattern ship, and thus, not a trainer. Control response is crisp, with the model capable of all aerobatics except for spins, snaps, and knife-edge. Inverted flight, surprisingly, requires little down elevator.

Since the fuel tank is so far ahead of the center of gravity, the model will be somewhat nose-heavy until some of the fuel is burned off. For this reason, if you

must land with a full tank, keep your speed up for an adequate flare. That goes double with a full tank and a dead engine, as the elevator loses some of its effectiveness without the prop-wash blowing over it. If you flare too late, or while too slow, you will see what I mean as your model bounces back into the air. As I mentioned earlier, having the model set slightly nose-down on the ground will make landings a bit less dicey.

I do hope you enjoy your Ascender. I've found it to be a cheap and economical change of pace. I would appreciate any photos or comments regarding this model. My address is: Skip Ruff, 128 Lexington St., Taft, CA 93268. If you wish a reply, please include a S.S.A. envelope.

Oh yeah, about the name of the plane, well, don't blame me. It was Bill Northrop's idea! (That's \$1 out of your check . . . for passing the buck! wcn)

R/C Boats . . . Continued from page 51

### PROPPING THE 7.5 TUNNEL

As more testing is done with the new K&B 7.5 Outboard, it appears that the Octura Model X-series works very well. The two best props I've tried in that series are the X-447 and the X-450. The best recorded straightaway times have been established with the X-450. Al Prather, of Prather Products, used this prop to push the Prather 35 tunnel to a 45.49 mph clocking. This same prop on a Dumas Hotshot 45, driven by Norm Teague, set a new NAMBA B Outboard Tunnel record of 46.87 mph. Norm told me he was running the prop a 1/4 inch higher than the plans show in the Dumas Hotshot 45 kit.

Jim Gale, of J.G. Props, sent me a couple of his new props for the 7.5 outboard. This is called the J.G. R25 series and the one that worked best on my Hotshot 45 was the R25-1 version. These props are pre-production castings and Jim is currently deciding whether or not to make them as production versions. By the time this article is published, the props may be available.

Jim Burba, a member of our local boat club, has run an Octura 1650 on his original tunnel and it seems to work well. However, the prop is being surfaced more than what I've tried on my boat.

### VERN SCHMIDT AND THE ITALIAN CONNECTION

Vern Schmidt, of JVS Models, has received several letters and a phone call recently from model boaters in Italy. I thought what he wrote was worth sharing in this column.

As you know, the Italian modelers were here for the 1981 World Enduro Championships held with the IMPBA Internats. I have been telling these boaters for years they were running their heat races in the wrong direction. (They raced counterclockwise.) After seeing the performance of the American modelers racing their boats in a clockwise direction, they returned to Italy and voted to race their heat races as we do,

clockwise.

While the Italians make some of the fastest model engines in the world, they are just a little behind us in model boat hulls. Their faster boats (hydro class) or as they call them "Pluricarne" are mostly tunnel hulls. The Italians have reached 70 mph with a CMB engine in a tunnel hull. I think this is very commendable.

The national Italian model boat association is planning several Italian sponsored races for 1982. These will be international invitational affairs and will be in addition to their regular racing schedule. Airfare and hotel may be supplied to some entrants. These international races are to be world class races, and only the finest in the world will be invited.

Should anyone be interested in attending one of these affairs, time trials and heat racing, they can contact me and I will see that they reach the right people in Italy. These races will be held in August or September of 1982.

Vern's address is P.O. Box 452, Anza, CA 92306. I'd encourage anyone interested to get in touch with Vern. Sounds like it could be lots of fun.

#### HELPING OUT THE NEW MODEL BOATER

The Puget Sound Model Boat Club, the local club I belong to, is once again approaching 70 members. Each year we try to help those just starting in the hobby to get ready for heat racing, as most who join our group wish to race their model boats. This certainly isn't a unique undertaking for a club, and is something that most clubs attempt to do. This year we developed a new simulation to provide practice in making a start using a clock and to also have a little competition involved.

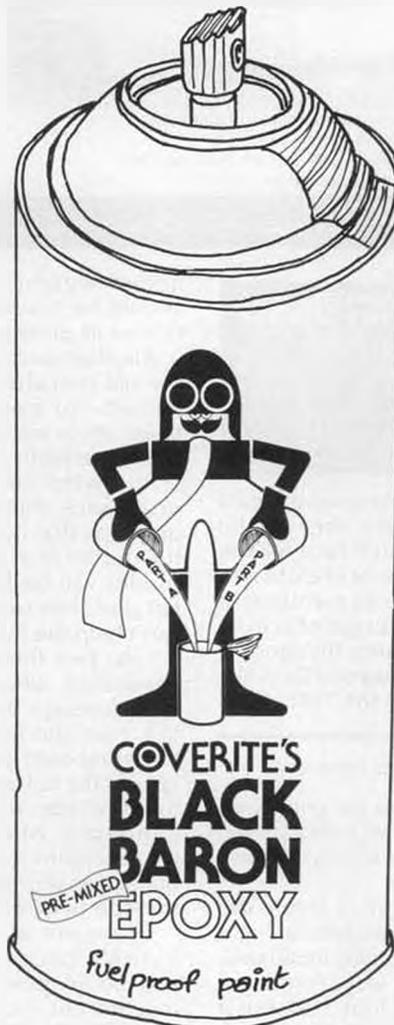
Making a clock start is one of the more difficult skills to acquire. It is also one of the most important skills that needs to be mastered if one hopes to be competitive. A good start will often be the difference between winning or losing a heat race.

I call the event "Don't Beat the Clock." It's really fairly easy to play and serves to provide practice in making starts under racelike conditions. One nice thing about the event is that any class of boat can compete against another because the competition is to see who can make the best start. Once the starting line is crossed, the event is over. Maybe an example will help in understanding the event.

All boats wishing to participate are arranged in heats according to frequency compatibility. The heats should be balanced as numerically equal as possible. The first heat is called and begun just like a regular heat race. You are allowed a certain amount of time to start your engine and launch the boat, usually two minutes in a sanctioned race. There is then thirty seconds of additional mill time prior to the actual start of the race. For new model boaters, just getting started on time and preparing to make a start is a real challenge.

The object in making a clock start is to be at the start line just as the starting

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clock reaches zero. Crossing the starting line prior to the expiration of clock time will garner you a lap penalty. Crossing the start line considerably after the clock has lapsed will place you back in the field, forcing you to work your way through boats to take the lead. Too early, or too late are not positions one wants to be in at the start of a race. However, given the choice of the two, there's less ground to make up by being late rather than jumping the start and having to run an additional lap.

Here's how "Don't Beat the Clock" is scored. The first legal starter receives 1 point, the next 2 points, and so on through the number of legal starters. If six boats made legal starts, the last boat would receive 6 points. A boat jumping

the start or stopping prior to the start would receive one more point than the total number of entries in that heat. In a six boat heat, a boat jumping the start or quitting before the start would be assigned 7 points for that heat. After everyone has run one time, redraw the heats and do it three or four more times. It doesn't take long to run since the event is finished at the start. Is that last sentence as dumb as it sounds? Well, you get the idea. It's really a lot of fun and it does provide practice at a most important racing skill. Make sure there are sufficient judges to identify the boats as they make the start.

After three or four heats have been run, the points are totalled and low scores determine the winners. In this

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way it's scored like a cross-country team race. Should there be ties, they can be broken by having a match race for the best start. Since the purpose of clubs is to promote and encourage its members in their hobby pursuits, this type of activity can be of value in meeting that goal.

Jerry Dunlap, 119 Crestwood Dr. S.W.,  
Tacoma, WA 98498. 206-584-7131.

F/F Scale . . . . Continued from page 57

slot, is that the stab can be contained with a dab of glue. This way, in a prang, the stab can give without being destroyed.

Another possible problem area is the base of the fin. Most plans show a single stick. Build it as shown, and invariably, after covering, it gives way, forming a curve. Not only does it look bad, but it doesn't lay flat on either the stab or fuselage. A simple solution is to use a wide piece of stock across the section. If the tail outlines are made with 1/16 square, I use 1/16 x 1/8; if they are 3/32 or 1/8, I'll use a piece of 1/4 wide. If you feel that the model can't stand the small

added weight, then the rudder/fin should be covered in a frame as mentioned in previous articles.

Another occasional problem area is the tail post after the fuselage has been framed. No matter how careful I have been, there are times when the tail post is not perfectly vertical. It will tend to lean toward one side or the other. At first glance, this may not appear to be a problem, that is, until you want to attach the rudder to it. As you can imagine, the rudder will be leaning the same as the tail post. Not only does this look bad, it can't help the flying of the model either.

I do two things to take care of this annoyance whenever it occurs. Since most fuselage substructures have a flat top, I pin the fuselage upside down on the workboard, and place a right triangle against the tail post. I spray the aft end of the fuselage with water, and let dry thoroughly. After it has dried and while it is still pinned down I place a diagonal brace (see illustration) which will insure that the twist will not come back.

These are all little items, but collectively can cause problems later on, and could possibly ruin an otherwise magnificent model. It's taking care of the little details that separate the winners from the also-rans.

That's all for now . . . Don't forget to send me your ideas on what you would like to see covered in this column. Send to Fernando Ramos, 19361 Mesa Dr., Villa Park, CA 92667. ●

Control Line . . Continued from page 59

doing, as Mike is into some pretty high-zoot stuff. The Nemesis II would be one such kit, at least back when it was in its prime, and now that we know the center section sheeting and leading edge sheeting can be eliminated, even this exceptional kit can only just squeak into the line-up. I am still waiting for two more designed-to-fly, not-to-be-fondled CL kits, only then can you laugh at the RC guys . . .

But that got me off-track, as so easily happens. The point was going to be made that until you build a model so light that it just shakes itself to pieces in the air, or is so lightly constructed that you can't even handle it without breaking something, you still have some distance to go in arriving at that light, yet durable, model that just wows them at the field.

That durability aspect should be looked at more. We've all heard the guy who tells one and all that he built (insert name of model) so strong that it will survive any kind of crash. That always seems to be a good thing, too, as those kinds of models tend to crash a lot. They also tend to break a lot in crashes, or at least to break in areas that are very difficult to repair properly.

In CL, many of these crashes take place at the bottom of the loop. The heavy, built-to-be-crashed model can't quite develop enough lift to miss the ground, where the lightly-constructed ones miss it completely. Now, which would you prefer, a tough model that bellies in, or a light number that cheats the ground one more time? But they all go in, sooner or later, right? I'll still take the light model, it simply has less weight driving it into the ground and even if it does crunch, quite often it will be one localized break that absorbs a lot of the shock, and this break can (usually) be fixed easily.

One more argument. When you finally hammer a model straight into the ground, and we all do this at least once, a built-stout model will be garbage, as will the light model. But the light one will make such a beautiful mess, with itty-bitty pieces spread all over the field. Done properly, and with the right model, there will be one more horrific crash story to tell for years and crash tales are one of the most popular things in the hobby.

**MAKING RIBS . . .**

Thornburg devotes a whole article to the making of ribs, Unca' Bill adds on another half of a story, as to how he makes ribs. And I'll be damned if neither one of them described my favorite method. (Rib cutting discussions may replace the down wind turn! wcn) So . . . I pin a stock of rectangular blanks together, trace around a template on the top blank in the stack and just run the whole mess up against a table-model disc sander.

This should work with most of the units I see for sale, even the small



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"hobby" type, although my Dad (terrific guy that he is) made mine for me and it has a table that is 12 x 8 inches with a disc that is 7 inches in diameter. Power is way more than needed; a used one horsepower electric motor, but there isn't a material used in modeling that can't be sanded very quickly on it. I guess I should take some pictures of it as it would be fairly easy to make most of it and any machine shop can whittle out a disc at a small charge. Handiest modeling tool that I've got ... I'll take pics ...

Scale . . . . . Continued from page 17

proof time called flying. These people do not see a model, but rather, X number of hours of work or X number of dollars. It is interesting how quickly their confidence in their design or building skill evaporates in the breeze.

The worry can be divided into two types. There are those who exhibit unreasonable fear. There are a number of things in this world that are unreasonable to worry about. To sit around all day and bemoan the fact that the sun might burn out or that a meteorite might spear your house and bury itself in the basement floor is not reasonable and is self-defeating. Other fears are more reasonable and may be controlled to a greater degree. Using proper precautions to see that your equipment is working properly, waiting for good flying conditions, taking things in considered steps, are examples of things you can do to see that your project will be as successful as possible.

To suggest to you that a model is inanimate and just balsa, glue, and paint is easy to say, but to comprehend and accept it is far more difficult. Every scale project encompasses many experiences both pleasant and unpleasant. To dismiss these as meaningless is a difficult, if not impossible task.

Perhaps to a large degree, the manner in which you lose the model has a great bearing on your attitude. The unknown gremlins that sometimes do us in are frustrating. To commit what can best be described as a stupid mistake (flying error, missing part, etc.) is another level, and to have someone else's mistake cause your problem yet another. You'll have to weigh the pain of each type. I have been bitten by all varieties, such as self-inflicted judgment and flying errors, equipment failure, the whole range.

The important key to developing the right attitude is to remember that they are going to crash from time to time. Such accidents are going to happen and the important fact is that you should, if possible, learn something from the incident. All experiences of this type have some lesson to share with you. Thus, an important feature of the crash will be to carefully analyze the reasons for it. As an example, last year at the Mint Julep, I lost a neat little Chipmunk when it attempted to burrow through a paved runway. One could hardly fault the

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model, for it did just what I directed it to do. There was only one person out of several thousand competitors and spectators who did not know from the instant the maneuver was called what the ultimate outcome had to be. Unfortunately, he was flying the model. One cannot do a three-turn spin in two turns of altitude. The lesson was an expensive one (not to mention embarrassing).

I hope that you can develop an attitude that will allow you to continue to enjoy scale modeling even if little setbacks creep in from time to time. Perhaps you'll be stubborn enough to become more determined to succeed. Think about it.

#### An Enlarging Thought

I have on several occasions revealed my fantastic method of producing working drawings by using an opaque projector to enlarge a three-view. Dave Abel recently shared with me a technique which produces excellent results and nice clear, crisp, thin-lined reproductions. Dave used the old "take a slide and project it on the wall" method. But in the process he tried two things new to me. First, he used a type of 35mm film called Kodak Technical Pan Film 2415 Estar AH Base. This film, when developed in D 19, produces a very high contrast negative. The lines, even when projected great distances for very big enlargements, stayed very thin and sharp.

Dave also tried a different method other than tracing it on paper. He actually printed it on photographic paper by converting the entire basement into a darkroom, taping the paper to the wall, and exposing it with a quick flash of the slide projector. When the sheets were developed and pieced together, a very accurate set of plans resulted, with every item correctly recorded. I suspect I would simply continue to trace the material on a large

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sheet of paper with a marker pen, but the process is interesting.

If this type of enlargement is utilized, remember to index the corners of the original with lines at right angles so the blow-up may be checked for an accurate projection. Some time ago, when I first suggested my opaque projector bit, I was sent a note by Ed McCollough, the new District XI V.P., suggesting the corner indexing method. I failed to mention it in a future column (until now!). Don't fail to do this, because quite a bit of distortion can creep in with just a little tilt of the projector. I'd hate to have you build a model with 100 sq.in. more wing area on one side!

#### Bits and Pieces

I regret the lack of info concerning who won the Tangerine scale event, even though I've got pictures from the contest. Friend Frank Broach, who judged there, provided the photos, but had to leave before the results were in.

World Championships R/C Team Manager, John Guenther, is getting the crew in shape for Reno. I'm glad I had a

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chance to help some in little areas. The bill for shirts for both C/L and R/C teams is being picked up by Sig Manufacturing, as it has done in the past. Patty and Monty Groves indicate that a number of teams have responded so far. Canada, two full teams; West Germany, F4C (precision) team; Denmark (a new one), Standoff team; Australia, Standoff team; Japan, two "observers"; Sweden, Standoff and a potential F4C team. It is certain that Great Britain and France will be there with bells on, so it is all beginning to come together.

Received word from Harris Lee that Datsun will be sponsoring the Masters

event at Mile Square this August. He indicated a little negative comment relative to the combination of Giant and Sport Scale in one event. We'll see how it works and whether it has any effect on the relative success of either one. Personally, I was a little disappointed to see that the event dropped Precision, although I guess I can understand it since there were only three in Louisville last year. The Underwood clan is shut out for that weekend any way (even if I can qualify), as we have to start Number One pit crew member, Cathy, in college for her freshman year, and we have our school jobs to start at the same time. That's life!

Enuf fer now! One to One, Bob ●

Soaring . . . . . Continued from page 49

tally. If we now move the free end of the rod to and fro, the aileron moves up and down. So all we need to do is to connect a pushrod from a suitable point along the hinged rod to the servo, and there is your aileron linkage . . . no bell crank, no horn, nothing external at all. Ingenious, isn't it?

I keep a high start in my car just in case I come upon a suitable soaring site when the weather's just right. But what if the open area is almost too small? Well . . . I usually set up to fly anyway. There are a number of fishing line connectors in the

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high start so I can conveniently shorten it to whatever the scene will bear.

Soon the plane slips off the line, and the parachute opens. But, what if the line falls through some trees? Well, don't try to pull the parachute through the trees. The trick is to first disconnect the parachute. Then it's easy to retrieve the line and reconnect the parachute. What if the parachute directly lands in the trees? . . . Please note that tree climbing can be dangerous!

You can generally get higher on launch and have better control if you use an electric winch. Problems of getting the line and parachute back disappear if you have a retrieval system. After three years of testing and refinement, the Davey Systems Corporation now offers a new Sailplane Launch Line Retrieval System. Used with existing launching systems and available batteries, this system does away with expensive parachutes and hiking to retrieve the line . . . and some long delays due to wind shift and line crossings. Used properly, this system allows a launch a minute.

Ted Davey tells me that the system uses welded steel angle frame construction and includes a ballbearing line swivel, a solenoid protected hand control switch, battery cables with heavy duty clips, 1,000 feet of braided line, and a 12-volt motor capable of operating on six volts. For further information, contact Ted at Davey Systems Corporation, One Wood Lane, Malvern, Pennsylvania 19355. (215) 644-0692.

Knut Bauer, of Stuttgart, West Germany, suggests two new uses for your hot soldering iron. Here's the way to remove hardened epoxy and to soften Hot Stuff or similar glue from metal surfaces. The hot tip simply pulverizes the epoxy. After adjusting a metal clevis for the proper position, he adds a tiny drop of glue to keep the clevis in place. To change that setting, just melt the Hot Stuff with a hot iron.

★ ★ ★  
A new covering material is now available. Micafilm is an ultralight covering reinforced with extremely thin, very tough mica fibers. It is highly puncture and tear-resistant and less subject to being scratched. The color is impregnated throughout the film. It comes in translucent red, yellow, and blue, as well as opaque pearl white and clear, and this new material does not become brittle with age.

Micafilm is reversible, that is, it can be ironed down on either side. With the slick film side on top, you get a semi-gloss finish. With the mica fibers on top, the surface looks like old-fashioned silkspan covering. This surface is easily painted. It requires fewer coats than silk because it is pre-filled due to the film side. A few "test pilots" have been experimenting with the covering. Before ironing they paint the mica side, let it dry, then iron on with the painted mica side down, using an iron temperature of up to 300° F . . . without burning the paint! This keeps the paint on the inside

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with the protective film on top, thus providing a slick protective outer sheet. According to the manufacturer, "This is still experimental, but so far, it seems to work perfectly using dopes."

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★ ★ ★

In the words of John Malkin, "Whenever I wanted a particular airfoil section, I'd have to search through all my magazines and books, and this usually took an evening or more, since I'd invariably come across some interesting article or plan that would divert me from my original theme. This in itself didn't bother me, but occasionally, because of it, I would miss seeing the section and have to start all over again. This *did* annoy me."

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And so he compiled and edited the book, *Airfoil Sections*, first printed in 1971, then revised in 1981. This reference provides the profile of over 400 airfoils, together with the numerical data required for plotting these to whatever scale you like . . . and the book begins with a few pages on how to plot airfoils on the basis of such data. He also recommends airfoils for different kinds of models.

Before you jump into designing your own airfoil, why not look at those that have been "through the mill"? (And there have been some wild ones.) You then know what to call for in the way of performance data. You can obtain a

copy of this book by sending \$10.60 to John Malkin, 51 Clyma Street, Upper Hutt, New Zealand, or by sending \$7 to the National Free Flight Society in care of Fred Terzian, 4858 Moorpark Avenue, San Jose, California 95129.

Photography and R/C sailing go well together. All too often, sailplanes are short lived. It's wise to document your creation. A picture allows you to remember and share that memory with others. In the last few years, I've taken a load of pictures of sailplanes and pilots, and I've learned some things along the way.

Above all, be close enough to have the sailplane fill the photo. Obviously, a

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telephoto lens is required. I use an Olympus OM-1 body and only a single lens . . . a Vivitar macrozoom 85 to 205mm. That's a wide enough range of magnification to get close up at a distance and useful for framing closer subjects. Greater magnification becomes unwieldy. The macro feature allows you to photograph the radio installation and other details.

Try to get action into every shot. It's far better to show the plane in flight than resting on the ground. If it must be a static photo, try for an unusual vantage point. For example, place the camera at ground level so that the poised plane looks more like full-scale. Or, put your camera onboard your sailplane to get a "pilot's eye-view." Jim Martin, of Maui, Hawaii, and others have been experimenting with this technique. Note that you don't need a big plane and fancy camera to get good results.

In any case, check the background to ensure against clutter. Try for highlighting by getting reflections from the shiny edges. Seek sufficient contrast between

the model and background so that its features are clearly apparent.

Try to set up action photos before they happen. This includes checking the expected distance, light level, background, and so forth. Sometimes the pilot can take you through a dry run so that you can make certain everything is just right before you actually take the photo. Presetting the distance makes it easier to get good pictures. If you can't prefocus, use a slower shutter speed and stop down so that the in-focus range is greater. I usually shoot at 1/250th second. But, there are times when I am willing to shoot at a slower speed and pan to keep the plane "center stage". Most of my photos are black and white so I use ultraviolet and yellow filters combined. This darkens the sky and increases the contrast.

In any case, I know that the best way to get really good photos is to take lots of them. You increase the probability of getting that perfect photo every time you trigger the shutter. Good photography is a combination of time, effort, expense . . . and luck.

See you next month. ●

#### Rebuttal . . . Continued from page 37

clutter up your column with such nonsense?

As a responsible writer for this hobby, I have always tried to emphasize the positive side, while you seem to be looking for villains.

The plain fact is, you do not know what you are talking about. You even admit it, stating, "I don't know of any race-for-pay situations." Ever heard of Art Carbonell? How about people who work for any of the manufacturers?

What is worse is that you make an awful lot of assumptions about a race

you did not even see!

Is that your idea of responsible journalism?

But, back to the subject of "sour grapes", or how can guys like you get rid of the fast guys.

In Southern California, we simply put them in different classes: Novice, Amateur, and Expert.

Novice drivers run in Novice; if they keep winning A-mains, they get bumped up to Amateur. At the Western Regionals, Mike Westfall and I made the final move into Expert simply because of our qualifying times. Maybe you should try this system before any more writing outbursts occur.

I ran a lot of races in 1981, more than I had ever run before. That includes the McCoy race, the Nationals at Rattey's, the Western Regionals at Sylmar, a good portion of the California Championship series, and the Los Angeles Grand Prix.

Outside of the Western Regionals, where I qualified third in Stock and second in Modified, I made a paltry 12 A-mains, winning a grand total of 0. My venture back to gas cars at the McCoy race got me into the K-main, while the best I could do in Boston was the C-main in Modified. That may not be average, but it is typical enough.

The fact is, outside of getting around Lavacot for a few laps in the LA Grand Prix, the high point of the year was that C-main. I had run in four of the five 1:12 classes that week, gradually improving every day. Up to that point, all I had to show for this 6,000 mile trip was concern over the Air Traffic Controllers strike (same week) and a second-place trophy in the indoor stock E-main.

But when I looked down the driver's stand for the "C", I felt pretty good. Good because the other drivers included Curtis Husting, Bruce and Steve Hickman, Jim Aguirre, Mike Wibben, and David Johnson. Every one of these guys has qualified for the U.S. World Championship team and every one of them was on a "factory team".

Now if, by your confused reasoning, we were to eliminate all of these guys (and Tina Burch) along with all of the factory drivers in the A and B, then I could have been the second fastest 1:12 scale/Modified qualifier, behind Joe Sullivan and just ahead of Al Chuck. I am more than willing to admit that would be ridiculous.

Just like everybody else, I use the factory drivers as a yardstick for my own performance. If they were not a part of the Nationals, then winning the Nats would mean absolutely nothing.

I am a competitor, just like you. When I qualified within a lap of Lavacot at Sylmar, I was elated. When he increased the margin to four laps at Costa Mesa, I was discouraged. I know that it takes a lot of work and practice to be a champion. When I was Mike's age, and could spend all of my spare time racing, I was recognized as one of the best.

Sure, it is hard for adults with families and jobs and responsibilities to compete with youngsters with PAC-MAN tuned

reflexes and few other interests. A look at the ROAR Nats, shows that among A-main winners only Gary Kyes is old enough to drink or vote!

RC car racing is not the most popular hobby, but there are more than enough drivers willing to practice every weekend of the year. I may not be as fast as I used to be, but if I practiced that much, I would certainly be faster.

If you cannot run with the fast guys with your skill on the track, don't try to beat them with your typewriter. Bruce Hickman wiped out a field of top SoCal racers at the last SCAR event, and he buys all of his equipment (causing one Associated factory man to quip, "It's downright Un-American!"). Frank Killam also beat a world class field in the prestigious Western Regionals running a dead stock Leisure car, even though the Leisure team had disbanded.

Do your readers a favor and admit that winning is a product of skill, practice and patience, not "speed secrets" and tricks. The Ralph Burch Jr's., Mike Lavacots, and Joel Johnsons beat you with something called talent. And they do it with class. They deserve credit instead of innuendo. Your column is called RC Auto News, why don't you report that?

In conclusion, Dan, wise up. The slow guys are always bitching and moaning about the fast guys and they always will. That's racing. If you want your column to have any credibility at all, stop pointing fingers and crying foul. You were not even at the Nats in Boston and I do not remember seeing you in Fremont the year before.

I think the time has come for you to show up or shut up.

Sincerely,  
Chris Chan

R/C Auto . . . . . Continued from page 38

used to get into some of the tricky stuff myself, with fogged colors, multi-colored paint jobs, cob-webbing and all that. No more. I just run a wide strip of tape from the front bumper, up over the front wheel well, straight back and up the air dam. A narrower strip of tape down the side of the body, often through the center of the meatball, and that's it. The primary color is shot, all the tape is pulled off and a shot of white does the stripes, as well as the number backgrounds.

But I got ahead of myself. Once all the tape is applied, carefully go over all edges, being sure that none of the tape has lifted. A thumb nail run along the edges of the tape works as well as anything. Double-check it, nothing worse than paint bleeding under the tape. Triple-check if you have more than 10 minutes invested in the masking operation.

If using an aerosol can for painting, be sure it is mixed real well; shake it for more than the minute suggested, and application as well as drying time can be improved by placing the can in a pan of



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hot tap water. Spray on a very light fog coat, let dry, spray again. Repeat until you get adequate coverage and do not apply so heavily that any runs develop. When dry, peel off the tape from the next area to paint and do it all again. Keep at it until doing the number backgrounds, when it often helps to give the whole body an undercoat of white.

If mixing your own paint, be real careful and experiment, even if using the RM, which I know works. Scraps of Lexan probably litter the floor, try any paints on these pieces first. You've been warned. . .

With RM lacquers, I use only enough thinner (medium) to get the paint to flow through the gun and to avoid the cob-webbing effect you can get from using too little thinner. Remember that the thinner attacks Lexan, use too much of the stuff and it is easily possible to paint a body and have it literally curl up into an unusable mess. Along that same line, if you paint a body and then a couple of days later flex the sides in and out and hear a cracking, popping sound, you used too much thinner, or applied the paint, especially the first couple of coats, too heavily. The body will probably still be useable, although it will develop sides that suck in a little and will not withstand as much abuse as it would otherwise.

As with the aerosol cans, just start spraying each color in turn, finishing up with a nice, even coat of white over it all.

If you haven't already done so, all the cut outs should be completed and the body set in place. Notice that if you want it to be as low as possible, the body can sometimes be trimmed below the molded-in trim line, especially in the front, where cutting to the trim line can result in a lot of clearance to the ground. No, I'm not sure that running the body real low to the ground helps much, if at



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all, but it does make the car look more race. . .

Doing the wheel wells is one of the easiest operations. Take a very sharp knife and lightly score the Lexan around the wheel well. At the lower edge of the body, cut through on this scored line and then simply grab the material to be removed and pull on it. Lexan is tough, but will easily tear along a scored line. The other cut outs, especially large ones like those around an engine, can be done with sheet metal shears, or even scissors, using a sanding drum in a Dremel tool to complete the cut and to clean up edges. Also, use this tool to finish off any cuts made in the body, particularly around front wheels. Remember that Lexan tears along a scribed line? This also applies to little nicks and gouges, so remove any and the body will last longer.

The body should be mounted loosely on flat-pan cars, allowing the chassis to twist and flex without the body interfering in any way. Also allow plenty of clearance around the engine on 1/8

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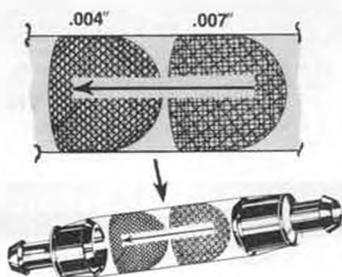
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cars. The holes for the wing tubes can be elongated so that in frontal crashes (the most common) the body can slide back without getting jammed against the tubes.

For decoration, you're on your own; almost every imaginable sponsor-type sticker is available from the manufacturers; we use them quite a lot to dress up what are, admittedly, pretty much plain-jane paint schemes. Depending upon who made the car we are wrapping in plastic, one of their large size mylar stickies is placed on that white strips that runs the length of the car, which seems to be effective visually, as it is always black on white.

For numbers, I use only Associated's 1/8 sized numbers on both 1/12 and 1/8 cars. For \$1.50 you can get a whole 8-1/2 x 11 sheet of one number, a mere \$3.00 will set you up in your favorite two-digit number for a long time to come.

That's about it for the 1/12 scale bodies, but with 1/8 bods, there are a couple of things extra you can do that help in keeping it race-ready for a few more heats. On Can-Am bodies we always run a bead of silicone glue along the lower edge of the fins as this keeps junk 'n crud from getting up there where it just can't be cleaned out. It also reinforces this area that gets slapped against the walls and if you happen to get a body that wasn't pulled real tightly in molding, having the sides slightly bowed out, this can be corrected by placing the body upside down on a table and using blocks to hold the sides in while the silicone dries.

For the front end that takes so much abuse, a product called Shoo-Goo can be smeared on the front end from about the body posts forward and along the tops of the wheel wells, if there is clearance for it, and especially if your favorite body is prone to breaking along the wheel wells. Of course, the stuff goes on the inside of the body, it is messy to apply and quite heavy, but can easily double the life expectancy of the body. Most variety stores stock Shoo-Goo, and we found that while it works super on bodies, it leaves a lot to be desired in its intended application, that of repairing shoes. In case you were wondering...

A whole article just on painting bodies, jeez I had a whole bunch more stuff to go over! Next time... ●

Electric . . . . . Continued from page 47

have purchased the Cox electric Sportavia and the Kraft Cardinal and Chipmunk. Very few people locally are willing to help me, because they fly high powered acrobatic stunt and scale ships. We have only tried to fly the Sportavia so far. It is sluggish. I have now built a digital multimeter, by Heath, so I should be able to charge the battery more fully by watching for the peak voltage. I remember reading in one of your columns a different propellor would improve performance, but I cannot find the article (oops! No such article, Martin,

sorry, but the prop it has does the best—MP).

One evening at the field I ran into another beginner with a Kraft Cardinal. Unfortunately, he had already asked one of the very opinionated flyers to help him. After one try, this "expert" proceeded to berate the Cardinal, and any electric models, as completely unsuitable. I talked to the other beginner later, and we agreed to keep on trying, but I have not seen him since.

I think you should take the time to advise how to get the most out of equipment that many beginners such as myself might have, e.g., the Cox and Kraft foamies, and how to use other readily available planes like the Ranger 42. Most of us do not have the time to build or funds to buy the most advanced equipment until we get the most out of what we have. Then, as the foamies become unuseable, we can build replacements and use the motors and batteries in them. In terms of upgrading, could the Leisure 05 or the Astro 05XL be used in the Sportavia (definitely — and with much improved performance—MP). Why not in the Kraft Chipmunk (the ads only mention the Cardinal). Does the Leisure system have a motor mount as the Astro Flight has? (no, it doesn't—MP) Does the Leisure have a charging jack? (again, no—MP)

Well, as Lucy says in the Peanuts cartoon . . . why can't life be all "ups"? I think beginners who choose ready-to-fly electrics have the hardest row to hoe. I started out with a ready-to-fly (before electrics), the Testors .049 plane, and discovered that right away. Often marketing (good looking appearance, nice box, etc., etc.) takes priority over thorough testing and performance. That's the bad news. The good news is that the motors and batteries are fine, and will perform well in a plane that you build yourself.

There are two foam ready-to-fly planes that I do think are better than the rest, the Kraft Cardinal and the Airtronics Kitty. The Kraft Cardinal is not a "hands off" (automatically stable) plane, so a beginner should have help flying it. It also needs more dihedral to make the turns easier, particularly on the "final approach" turn to the landing. Cut the wing in two, put in a dihedral brace, and epoxy the panels back together with 4 inches under one tip with the other panel flat on the table. This will improve the turns tremendously. The other complaint about the Cardinal is that the flight times are short. Get a six-cell sub C pack (the one used for 1/12th scale cars) and a charger from any of the manufacturers (Jomac, MRP, Delta, Leisure, Astro Flight, MRC, etc., etc.), and your flight times will increase to six to eight minutes, with some increase in power as well. The last and best "hop up" is to put in a Leisure 05 or Astro XL, with these the performance is very good. The stock battery and motor can be used in a plane you build yourself, the Astro Sport (Astro Flight) and the Yardbird featured

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in MAN, Feb 82 issue. Both will give a lot better performance.

The Airtronics Kitty is a new entry in the ready-to-fly field, and it is the easiest to fly for a beginner. It is "hands off" stable, so a beginner, with luck, could teach himself. The climb is not fast, so a large clear area should be used for the first flights. The motor and batteries should fit in, and fly well, a Q-Tee (Airtronics) quite nicely. The Kraft Chipmunk is an unknown to me, I have not seen one fly, so I cannot really say too much about it. It is an attractive plane, but with a smaller wing than the Cardinal, and the same power, I would think it would be more than a beginner could handle. I think a Leisure or Astro 05XL would fly it quite well, in the hands of someone who already knows how to fly. The motor and battery pack should do quite well in the Yardbird or Astro Sport, and would be more appropriate for a beginner.

The Cox Sportavia, as Martin said, is quite sluggish in its performance. It also has a tendency to go into "roller coaster" dips and dives, which a beginner cannot possibly handle. This is due to wing flex, the cure would be to lay in another spar, about 3/16 square, in the top surface of the wing (there is already one in the bottom). I have heard (but not tried it) that a 1/8 shim at the trailing edge improves the climb quite a bit. Launching is hard, due to the low wing, I use an underhanded pitch, holding the canopy, like a softball pitch. The performance, I

am sure, would be much improved by an Astro 05XL or a Leisure 05. The motor and battery are fine, and should do well in an Airtronics Q-Tee or maybe even the small Questor glider. The Cox Centurion, which is a ready-to-fly plane, but with gas, is really excellent with this motor and battery. I wish Cox had used this combination in the first place. The Ranger 42 should also fly well with the Cox motor and battery.

The Cox Hawk has me stumped, as I have not been able to get it to fly well. The original radio didn't have enough range (it was only 100 milliwatts), and after about 150 feet out, it would spiral in. I put in my own radio, and it would not climb out, so I gave up. The motor and battery look all right though, so I would try them in the Q-Tee, or in the Cox Cub. The Cox Cub is another sleeper in the ready-to-fly. It comes with a Cox .020 glow, and it has the same low power radio as the Hawk, with the same range problems, but once a good radio is in it, it flies beautifully. I fly it with one servo and an Astro 020, and it is great, my 11 year old niece loves it, and flew it all over the place with great nonchalance on her first try (in a small schoolyard, yet!). The Hawk motor and battery should be just right for it, as would the motor and battery from the Airtronics Kitty. I wish Cox would make this one electric, it is a winner.

On the Ranger 42, I think the Cox motor and batteries from the Sportavia would be best for it. The Astro 05XL and

the Leisure 05 will fly it quite well, but the weight and wing loading will be high and hard to handle for a beginner. So, that is the long and short of it, the ready-to-fly scene is not quite as ready-to-fly as one might like, but you certainly can get working combinations. It should be more straightforward than that, and hopefully, eventually, it will be.

Last, but perhaps not least, who do you ask for help on your first try? Glider pilots and those who fly old timers are the best instructors; they have more patience, both with the plane and with the beginner, and they understand how to fly planes with no power to moderate power. Next best are the guys who fly high wing, slow flying three-channel planes, for the same reasons as before. The four-channel pilots are, for some reason, the least patient, and will usually try to talk you into getting a four-channel plane and a big engine. Nothing has changed! I learned to fly, before electrics, on 1/2A size planes, and I loved it, but these guys would pull that same routine; 1/2A's are no good, can't control 'em, etc., etc.! So, judge the birds by their feathers, and pick the flock that matches your style! Such is life.

Thank you Martin, and Gordon, for the neat letters. These are the types of things that are the rewards for writing a column such as this! It also keeps me reminded that I gotta keep the basics in mind. So, readers, keep me on my toes with your comments, they are much appreciated. Charge up and fly high till next time! ●

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Hannan . . . . Continued from page 54

aviation artist and scale model builder opines: "Whatever they say, aeromodelling is a game of pretend. When we were kids, my brother and I had a couple of stick models (they had to be identical to avoid jealousy!) which flew quite well. I called mine a Comper Swift and to me it was just that. Fuselage models were the last word in realism and were completely beyond our pockets at that time. But the fun we derived from our stick models was probably more than that achieved by someone who has worked for a whole year on a super-scale model for the Nationals."

**MORE NOSTALGIA**

Old-timer John Pond favored us with a National Model Aircraft & Supply

Company brochure. How old was it? Well, let's just note that it was originally mailed from New York to Texas with a one-cent stamp! Actually, it was about 1935, and a few price sampling are sobering:

1/16 square balsa strips, 36 inches long: 25 for 5 cents.

1/16 x 3 x 36 inch sheet balsa: 2 for 10 cents.

1/4 x 6 x 36 inch sheet balsa: 25 cents. Complete flying scale model kits ranged from 25 cents for an 18 inch wingspan Monocoup (plus 10¢ postage), through a one inch to the foot scale Gee Bee Super Sportster for \$3 (plus 20¢ postage).

But if money was no object, how about a complete model airport? This kit contained a 44 x 62 inch base with runways, aprons, and green back-

ground; an administration building, a post office, a gas station, refreshment stand, machine shop, radio station, power house, three hangars, water tower, radio towers, three pylons, six commercial model airplane kits, and six sport model airplane kits. All for the sum of five dollars!

**CONTEST RULES**

"Regulation is the substitution of error for change". Or so said Fred J. Emery, according to Richard Miller. Rules of any sort, even those relating to "toy aeroplanes" seem the subject of endless discussion. Merv Buckmaster, Editor of Australia's *Airborne* magazine reports: "Peanuts over here have three or four devotees who would welcome (new) rules, FAI status, etc. The rest of us see it as a fun event; inside, out of the weather; and the first time a new design is seen is the cream on the cake. Nice to see the Lacey and Fikes getting longer and longer flights, but. . . We are currently using the AMA rules to provide a ranking a la Mooney system. We had nearly 30 entries at our recent Nationals — good show — and the hall was a good one so the event was highly acclaimed."

Alain Parmentier, commenting upon the French Peanut Nationals, says: "The 'Formule Speciale' category is actually a bonus (20 points) for unorthodox aircraft. For a long time this most important bonus was strictly for canards. All canards were first in static (points) with a great advantage, and were winning all the contests. So now the canards are considered as classic models." Back to square one.

Here in the United States, the Flying Aces Club continues to favor fun over regimentation. Their current newsletter presents updated versions of all their rules, both official and unofficial. Example: Presumably as an incentive toward reducing noise pollution, FAC Power Scale bonus points are now as follows: Internal combustion engines, 0 points; CO2 engines, + 10 points; Electric

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### HANDY HINTS

Gerald Myers, of Redway, California, points out that many of the best ideas go unnoticed. While visiting his friend Will Bosco's model workshop, he noticed an old-fashioned pin-cushion at the front of the bench. How obvious! Yet so logical. Most of us keep our pins loose in a plastic box, inviting stuck fingers and spills, overlooking the centuries-old common pin-cushion! (*Ours is a 3 x 6 inch piece of 1/2-inch cork. wcn*)

On the same workbench were a series of expired "C" and "D" dry cell batteries. Instead of just discarding them, Will had put them to use as uprights and weights for framework construction. Recycling at its best.

And we have added a simple, inexpensive tool to our bag-of-tricks, in the form of a crochet hook. Available in various sizes, these polished metal sewing store items are just the ticket for burnishing, poking and reaching into inaccessible areas of model structures. Selling for less than a dollar, they might also form a useful addition to a model builder's field box.

### WHO WERE THE FIRST?

The Federation Aeronautique Internationale (FAI), the same organization which sanctions aeromodelling records today, compiled a list of the world's licensed aviators during 1910. When published in the *AERO* magazine in 1911, the Editor appended this note: "Of course, this list by no means presents the total of fliers in existence, for there are many very competent aviators who have never applied for licenses. This is particularly true in the United States."

The list runs into the hundreds, but we have singled out the names of some of the more well-known pioneers:

License Number:

- 1 Louis Bleriot
- 2 Glenn Curtiss
- 3 Leon Delagrangé
- 4 Robert Esnault-Pelterie
- 5 Henry Farman
- 5 (bis) Capitaine Ferber
- 6 Maurice Farman (Henry's brother)
- 7 Jean Gobron
- 8 Comte De Lambert
- 9 Hubert Latham (famed Antoinette pilot)
- 10 Lois Paulhan
- 11 Henri Rougier
- 12 Alberto Santos-Dumont
- 13 Paul Tissandier
- 14 Orville Wright
- 15 Wilbur Wright
- 16 Etienne Bunau Varilla
- 17 Alfred Leblanc
- 23 C.S. Rolls (of Rolls-Royce fame)
- 30 Claude Graham-White
- 36 Mme. Raymonde De Laroche
- 40 J.T.C. Moore-Brabazon
- 52 Louis Breguet
- 54 Leon Morane (or Morane-Saulnier fame)
- 95 Marcel Henriot (world's youngest pilot, at 15)
- 105 Edouard Nieuport (designer of

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It is interesting to note that in America, Glenn Curtiss obtained the first license, Lieut. Frank P. Lahm the second, Frenchman Louis Paulhan the third, Orville Wright the fourth and Wilbur Wright the fifth.

### BIPLANES AND AUTOGIROS

*Legacy of Wings*, subtitled *The Harold F. Pitcairn Story*, is a valuable research source for model builders as well as an important addition to aviation history. The mere mention of "Pitcairn" brings to mind beautiful biplanes and fascinating autogiros, yet, the average enthusiast knows little of the man or the company that carried his name. *Legacy of Wings* remedies that shortcoming in a most thorough manner. Written by Frank Kingston Smith (described by *AOPA Pilot* magazine as a "reformed lawyer and the original week-end pilot") examines in great detail Pitcairn the man, the company, and its products.

Of Scottish descent, Harold Pitcairn, like so many aero pioneers, began with models, and at the age of 15, produced a remarkable rubber-powered delta-wing pusher. By 1916 he was actively building model helicopters and dreaming of full-size rotary wing aircraft.

Apprenticed in the Glenn Curtiss aircraft factory, young Pitcairn not only gained a priceless background in manufacturing processes, but also a deep appreciation for patents, as Curtiss was still locked in battle with the Wright brothers' attorneys. This was to have far-reaching effects upon Harold's later life. Meanwhile he became a pilot, manufacturer, airport developer and founder of what eventually became Eastern Air Lines.

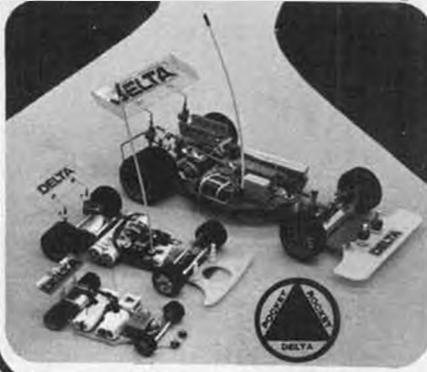
Along the way, he became involved with the air mail business and aviation promotion, which brought him in close contact with many of the "greats", such

as Charles Lindbergh, Amelia Earhart, and Charles Nungesser.

The Pitcairn biplanes established enviable reputations, and are still today regarded as classics. But it was probably the autogiros that focused most of the attention upon the Pitcairn name. Harold and his associates successfully concluded a licensing agreement with autogiro inventor Juan de la Cierva, and brought the first "windmill plane" to the United States during 1928. There followed a series of Pitcairn Autogiros that refined the genre and gained massive media coverage. Yet, commercial success was never reached. The book discusses the many difficulties encountered by the early 'giro experimenters, the solutions and partial solutions.

The visits of Juan de la Cierva to this country offer lucid insights into that gentleman's personality and frustrations, which stemmed both from the nature of his work and the sinister political situation in his Spanish homeland. In point of fact, Pitcairn himself encountered far more than his share of

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political problems, which unfortunately were not resolved until after his death; truly a pity, and a shameful waste of many years which might have been more creatively employed.

From a model builder's standpoint, much of the book's appeal is in the 175 photographs which cover the majority of the Pitcairn products and the people involved with them. Many of the aircraft shots show unusual markings and variations. Also included are some instrument panel photos for the Mailwing biplane and two of the autogiros, usually so difficult to locate for modeling use. Very rare for a basically biographical publication is the incorporation of 3-view drawings... some 27 of them. Although they are somewhat sketchy, reminiscent of the early *Aircraft Year Book* illustrations, they do at least form a useful starting point for model builders, and are augmented by comprehensive specification tables.

Criticisms? A few. For instance, we were somewhat surprised to see the Chevrolair captioned as "an inverted Chevrolet auto engine", and George Townson overlooked as the pilot of two autogiros shown in flight. And we would have liked a more balanced view of foreign contributions to autogiro developments, which were presented in a quite negative manner.

Complaints aside, we regard this book as a monumental effort in recognizing an heroic figure in America aviation

history, and bringing to light his vital though almost unsung contributions to progress, particularly in rotating wing aircraft.

Our thanks to Ralph H. McClarren for making this book available for review. Copies of *Legacy of Wings* are available directly from Stephen Pitcairn, Jenkintown Plaza, Jenkintown, PA 19046, at a special discount price of \$21 plus \$1.09 postage in the United States. (Regular price is \$25.) Please tell them where you heard about the book, and let's all get busy on Pitcairn models!

Counter . . . . . Continued from page 9

Delta Mfg. Inc. has just released its "EAGLE" 1/8 scale four-wheel independent suspension gas racing car. Using many of Delta's World Champion Super J proven parts, the car features "coil over shock" configuration which is far advanced over the separate torsion bar/shock systems. A very simple "Angle-winder" gear drive is employed, as are front and rear adjustable anti-roll stabilizer bars. Quick-change wheels are mounted front and rear, and Delta's proven ball type adjustable limited slip differential is fitted as standard. The chassis successfully completed the 1981, 24 Hours of Miami Enduro Race, finishing 4th after leading the first hour. Careful attention to details has been taken to assure the performance and

reliability you expect from the 1/8 World Champion. Delta Mfg. Inc., 27 Racecar Court, Lorimor, IA 50149.

★ ★ ★

Astro Flight Inc., home of the cobalt motor developed in 1975 for powering the solar powered SUNRISE aircraft built under Air Force sponsorship, and designers of the solar propulsion system used in the DuPont sponsored SOLAR CHALLENGER, which made a historic crossing of the English Channel on July 7, 1981, has just made available the ASTRO CHALLENGER COBALT 05. The heart of this high performance Cobalt motor, designed for the serious hobbyist who won't settle for second best, is the new high-energy, rare-earth Cobalt magnet. They are practically impervious to overloading and overheating. A new high-performance commutator capable of operating at 35,000 rpm at 350 degrees F., coupled with a new silver graphite brush design which can safely commutate up to 25 amperes, are incorporated in the Astro Cobalt 05. Each Cobalt 05 is run and tested at the factory and no break-in is required. Available factory direct only for \$75.00. Californians add 6% tax. For a copy of performance curves at 6 and 8 volts and with 6, 7, and 8 cells of 1200 mah capacity, send a SASE requesting the information sheet for the Cobalt 05, stock #2060 to: Astro Flight, Inc., 13311 Beach Ave., Venice, CA 90291.

★ ★ ★

For a unique and satisfying experience, Meta Models has just made available its latest release, an all heavy paper and cardboard model of the Vultee P-66 Vanguard. All parts have the correct colors applied, and an insignia sheet supplied has several types of U.S. and Nationalist Chinese markings.

The P-66 was designed by Richard Palmer, who also designed the famous Howard Hughes Racer now hanging in the National and Space Museum. The U.S. took over an order for 144 of these aircraft originally ordered by Sweden, which Britain had taken over when an arms embargo had been imposed on Sweden. A few P-66's served with the U.S. Army Air Corps shortly after Pearl Harbor, but the majority reached Nationalist China via Karachi, India. Their combat record is still the subject of ongoing research. In 1/24th scale, the P-66 kit is \$5.50 postpaid. A catalog is available for 25¢ from: Meta Model, P.O. Box 221, Batavia, NY 14020. Dealer inquiries invited.

★ ★ ★

Dynamic Models now offers its new 1/2-inch to the foot, one-piece fiberglass hull of a modern motor trawler. Fifty inches in length, with a beam of 12 inches, the basic hull (plans for a typical motor trawler are included) may be built up as a motor yacht, a coastal freighter, or even a tuna boat. The hull is molded extra strong so that no interior bulkheads are required, giving the entire space below deck for the installation of any type of motive power and R/C



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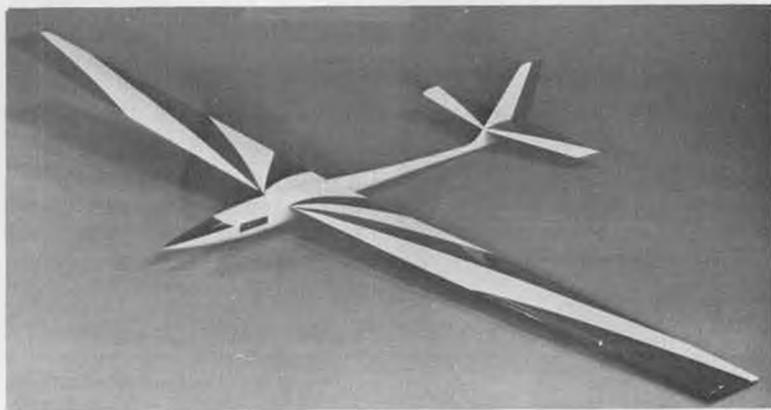
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★ ★ ★

Nick Zirolì Models, headed up by Nick Zirolì, Jr., has put into limited production, the sport-scale Eindexer, produced by Major Model and Mfg. some years ago. The kit has been updated, using die-cut poplar plywood for fuselage construction, yielding a much stronger part. The firewall is now 1/4-inch plywood. An engine of .35 to .45 is recommended. Complete with die-cut plywood and balsa parts, formed landing gear, full size plans, it is available direct for \$34.95, plus \$1.50 for postage and handling. New York residents add 7 1/4% tax. Send a SASE for complete list of kits, plans, and accessories to: Nick Zirolì Models, 29 Edgar Dr., Smithtown, NY 11787.

★ ★ ★

The new 'Super Pumper 5' by Robart has been designed to provide three basic advantages for R/C model airplane, boat and car engines: (1) to allow for a uniform engine run regardless of fuel tank location or fuel remaining; (2) the ability to locate the tank over the balance point of the aircraft, or having

one fuel tank, conveniently located, to supply two or more engines; and (3) the ability to use a larger carburetor venturi for more power, large carburetors normally reducing fuel draw for reliable operation. A "Return Limiter" allows adjustment of needle valve sensitivity from critical to broad, enhancing use of the Super Pumper 5. From: Robart, 310 N. 5th St., St. Charles, IL 60174.

★ ★ ★

Condor Hobbies has announced that it has acquired the entire product line of Kavan Model Aircraft, including its high quality R/C helicopters, engines, and accessories. The complete line will be stocked and serviced by Condor Hobbies. Full service and technical updates will continue to those on the Kavan mailing lists. Coming soon will be the new Kavan FK50 MK-150cc opposed four-cycle twin, reported to develop 4.1 hp at 8,500 rpm on an 18 inch prop. A finned oil sump, working oil pump, and a pre-heat carburetion system are just a few of the features of this new engine. For complete information, contact: Condor Hobbies, 17835-F Sky Park Circle, Irvine, CA 92714; or call (714) 556-1888.

★ ★ ★

California Model Imports is the sole U.S. distributor of three new, super-flying free flight models, the "Skyboy," "Schwiezer 1-30," and "Skykid," as manufactured by the Bentom Corporation. They are molded of polystyrene foam and come complete with Bentom's

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beautiful set of plans for John Pahlow's 1/4-scale "Spirit of St. Louis." The plan set consists of 6 sheets, totaling almost 80 square feet, plus construction notes for building. Construction is quite conventional (just a lot of it!) and should not present a problem for the average builder. Suitable for Quadra power and with a flying weight of about 27 pounds, this is the model that flew 206 non-stop miles in 4 hours, 47 minutes at the 1980 QSSA Fly-in in Las Vegas.

All parts are drawn, both wing halves are shown, templates for cowling, landing gear parts, etc., and aircraft identification lettering and numerals are detailed out. Plans are rolled and mailed in a cardboard tube. Price is \$30.00, which includes shipping and handling. California residents add 6%. Send money order to: Granada Services, 13214 Ingres Ave., Granada Hills, CA 91344.

For light where you need it, Dremel has introduced its Model 1305 portable, flexible, swing arm-type lamp for the hobbyist, do-it-yourselfer, student, or wherever the need for directional light is required. The Model 1305 will clamp to any vertical or horizontal surface with its adjustable mounting bracket. Clamp it to a table, desk, workbench, shelf, headboard, ladder, drafting board, or sewing machine table. An optional weighted base, Model 1306, is available for use on a table top. A long lasting porcelain socket combined with durable metal and nylon construction and finished with a high quality, baked enamel finish ensure years of rugged, trouble-free use. Completely adjustable within the range of its 38-inch radius of mounting, the lamp head swivels and adjusts to put light where you want it. From: Dremel Division, Emerson Electric Co., Racine, WI 53406.

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Granada Services is now offering a

**Two Meter Cup . Continued from page 31**

they flew their flight. Alex Bower, who flew the original design ship, Tern, with an MB-303515 section (15% thick), finished with the fast time. He got 1,000 points for a 199 second flight. Sam Brown, flying a Hbu 2-meter with E-205 section, had second fastest time, 216 seconds, for a total of 921 points. Jack Strother (I'm sorry I can't remember what he flew) finished third with a time of 253 seconds and 786 points. The two fliers who didn't complete the ten laps were Tim Renaud, flying a Sagitta 650 (E-205), who got 431 points for his 6-1/2 laps, and Peter Stevens from England, flying his backup ship, Factor (E-193), who did four laps for 265 points. As you can see, finishing was very important!

One thing that impressed me about the above mentioned example, was, that the MB-303515 section was quite literally flying formation with Sam Brown's E-205 sectioned Hbu for the last four laps of the heat. I asked Sam Brown what he thought about it and he replied, "We could have flown formation for hours." When I

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asked what their wing loadings were, Alex said 13 oz./ft.<sup>2</sup> and Sam said 11 oz./ft.<sup>2</sup> Could that be the difference in drag, 2 ounces per square foot? Or could it be the reason Alex finished 17 seconds faster? You decide.

Heat number one of the first round of day two was flown early in the day. Larry Pettyjohn, Don Edberg, Fred China, and Chris Adams flew against each other. These guys were in the top four places after round three of day one, so it was interesting to see who would do what to whom. Don Edberg blitzed the course in his usual style averaging 21-1/2 mph. He only completed 7.75 laps, however, and for the first time in the contest, he looked beatable. Larry Pettyjohn flew a little more conservatively with his original design, constant chord aileron ship (MB-273515), and finished eight laps. Fred China, flying equally conservatively, finished only 7-1/2 laps. Chris Adams had the unfortunate luck of having a pop-off launch due to a helper who was unfamiliar with Chris' launching technique and finished only three laps for 375 points. This dropped him from third place to 23rd. Don remained in first place due to his massive point lead at the end of the round. At no time did Don's ship, the Hustler-M, look bad.

Looking at the computer printouts, one can tell which rounds had the good air and which had sink. Heats three, seven, eight, and twelve were the only ones to have 10-lap finishers. While in heats ten, and nine, nobody got more than seven laps. The beauty of man-on-man scoring is that even if you get that bad air, you can still get a max, if you beat your opponents. FAI hasn't yet caught on. . .

The second round of day two was pretty much the same as the first. The weather was still overcast, there was still a three to six mph breeze blowing, and there was still very little lift. The only ten lap maxes occurred during heat number two. Alex Bower and his Tern, Joe Newland with his Mini-Merlyn (modified, 12-1/2% thick E-374), Howard Short (flew kind of a free-flightish airplane with an underchambered airfoil), Sam Brown and his Hbu, and Bob Worley flying a V-dihedral rudder-elevator ship with an E-205 airfoil, were all in this one heat that maxed. Joe smoked the course in 156 seconds, followed closely by Alex Bower at 160. That's an average of over 21 miles per hour. Needless to say, stopping to thermal was unnecessary with air like that. Just get the nose down and fly fast and smooth.

By the end of the second round there were a lot of re-flights because of winch problems. Line breaks were fairly frequent on the 180 pound test braided nylon line. The stand-offs used to keep the line off the ground were not located in the ideal spot due to a rise in the ground about 70 feet from the turnaround, which would have made putting them in the middle of the line ridiculous. They were placed on the top of the rise in order to clear the ground at that point, and the line ended up rub-

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bing the rocky ground in the middle anyway. This line breakage problem made an already slow moving contest run even slower.

Sometime around three o'clock, round two of day two was completed. With only one and a half to possibly two hours of useable light left, and one whole round to fly, there was a pilots meeting called and a proposal made.

It was decided, due to the fact that we were running out of time, that the pilots who had a shot at the top ten should be flown at all cost, and if time permitted, then the rest of the contestants could fly.

Three flight groups were hastily organized with the top fifteen guys. The first group to fly was heat three. Why heat three? Well, it was an attempt to put a little suspense into the contest. You see, ever since the end of round two of the first day, top pilots were flown against other top pilots to keep the competition fair. So, to fly the top guys in the last round first would have made the rest of the flights seem anti-climactic. A nice touch really.

Fred China, Woody Blanchard Jr., Gary Ittner, Bob Worley, and Sam Brown were first to fly. The air was good and the contestants had very good flights. Sam Brown was the only one not able to complete his full ten laps (9.75 laps).

The air remained good for heat number two. Rich Schramack really cooked the course in 149 seconds. He flew a very interesting ship called a Whisper Speed. It originated in Luxembourg as an FAI ship. It was brought over by one of the contestants in the World Champs held last summer in Sacramento. The incredible thing is that it was GIVEN to Rick by Romain Sfreda from Luxembourg. It had an E-182 section (very thin) with flaps and ailerons and a fiberglass fuselage. Larry Jolly used it recently in the West Coast FAI Soaring Champs and

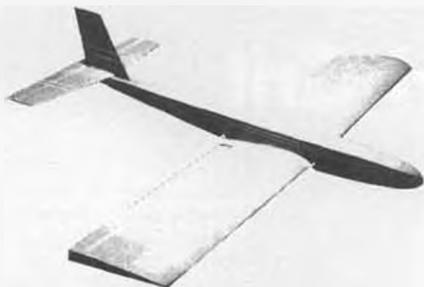
placed very high with it. Its element is distance, where its penetration is very good at medium wing loadings. (Larry liked the section so much he used it in his 2-meter, Altair, and plans an FAI version of same.)

Also in heat two were Alex Bower, who tied for second fastest with Mike Reagan, who flew his Lyre Bird 8 to a respectable 194 seconds. Mike Welch, flying a Sagitta 650, was third fastest finisher at 210 seconds or 16 mph avg. And Howard Short was last at 238 seconds.

Heat number one involved myself, Don Edberg, Larry Pettyjohn, Joe Newland, and Dick Odle. I was flying my original design Poohawk which featured an E-205 section, CAR and (coupled aileron-rudder) and elevator. No flaps, spoilers, retractable tow hooks; just two functions. At no time did I feel disadvantaged. Poohawk flew very predictably, and easily. It had to be easy to fly and simple because I knew I wouldn't get much stick time on it after it was finished. . . which was two weeks before the contest.

Don Edberg was flying his well-known Hustler-M, which was seen at the World Champs in Sacramento. Don modified the Hustler FAI ship by chopping off the wing tips. I heard that it was actually his backup ship at the WC's, and that it had a slightly warped wingtip to begin with. The Hustler-M featured spoilers, ailerons, releasable tow hook, and rudder (not coupled). Don has been fond of the E-205 for some time now, and it certainly performs well for him.

Larry Pettyjohn flew his original design 2-meter which sported the new MB-273515 airfoil. It differed from other MB sections present (MB-303515 — Tern; MB-253515 — Illusion) by having a 2.75% mean camber line. His ship was almost as simple as mine; ailerons,



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coupled rudder, and dual rates (most handy) on the two functions.

Joe Newland flew his Mini-Merlyn, with spoilers, ailerons, releasable tow hook, and elevator (no rudder). Basically a simple airplane and a good flying one.

Dick Odle was also in this heat (number one) flying his RO-4teen. Probably the simplest of the bunch, it featured rudder-elevator controls with dual rates, and a four-panel polyhedral design wing. Dick is one of the many SFVFL fliers who believe in thick sections. His was an original 14% thick, 2.75% mean camber airfoil with conventional construction (ribs and sheeting). Dick also designed in a lifting stab which was

about 20% of the wing area. Needless to say he flew with a rather rear-ward CG.

For the first time in the contest I had to concentrate on my flying and pre-flight setup to keep myself from being anxious about the competition. I had talked to Don Edberg earlier in the day about wing loading and he had told me that he almost always flies distance at close to the same loading as he flies speed. This was on my mind as I set up for my last flight. I put in two pounds of lead. Why not, the previous two heats all had maxes and I thought the lift was holding, so it seemed the reasonable thing to do. Well, time came for the launch. I believe Don was first to launch and I was third. I told my helper, Mike Bame, to forget about all the other guys in the flight group, and to just keep an eye on Don Edberg. I figured he was the most likely to win the heat and I wanted to be hot on his tail. The air was not what I expected. The lift was past the course. As the flight progressed, I was updated on Don's whereabouts and progress. I was flying in the right track. Poohawk was flying smoothly and quickly. The laps clicked by, 6, 7, 8, 9! For the kind of air it was, I was well pleased with 9 laps. I couldn't help but ask how the others did in the group. Dick did 7.75, happiness for me, sorrow for Dick. Larry did 8, more happiness. Joe Newland completed 8.75, close, but still more elation! I had a hard time getting a straight answer to Edberg's performance. Some said nine,

yipee! Some said more, oh well. As it turned out, Don almost completed ten!!! That would have hurt. Nine and three-quarters laps. I was second-best of the group. I knew then that I had a shot at second place in the contest, but not knowing for sure was driving me nuts.

Thirty-two contestants flew the last round before the CD called the contest. The results were: Don Edberg first, I was second, and Larry Pettyjohn was third. Rick Schramack was fourth; Joe Newland, fifth; Dick Odle, sixth; Alex Bower, seventh; Woody Blanchard, eighth; Fred China, ninth; Gary Ittner, tenth.

This year's batch of two-meter sailplanes was a quantum leap ahead of last year's. There were probably 75% aileron ships there this year, compared to about 50% last year and 20% in 1980. This is the second year that I have flown ailerons, and there is no way I want to change back. The control afforded by the ailerons is valuable in flying laps where your turn is critical. Time spent in the turn is time wasted. You have to make the turn quickly (especially in four-lap speed), with little loss of altitude or loss of speed. I believe those who came with aileron ships were at an advantage over rudder-elevator ships. The trend for next year should continue with even higher percentages of aileron ships.

Eppler airfoils were dominant. If not by performance, at least by sheer numbers. The E-205, E-374, E-387, E-182, and E-193 were all flown by various competitors. These sections are in the 9 to 12% thick range, and most of them are well suited for distance flying. Personally, I think that the advantages of flying the E-205 don't outweigh the disadvantages. When I saw the Tern and Hbu flying side-by-side and neither one showing a clear advantage over the other, I decided to go with a thick section next year (MB-303515). They are so much better launching it's not funny. They climb at a noticeably steeper angle and can really "sing" the winch line. They carry lead like it was nothing, and then GO FAST in speed runs. They are SO MUCH EASIER to build, and build strong! On the other hand, the E-205 is more work to "hide" things in the wing (like servos, ballast tubes). It's a more critical airfoil to shape (leading edges must be more accurate).

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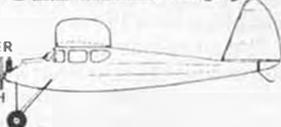


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# Performance Comparison of FOX EAGLE III with other Popular .60's: How Does Your Observation Compare with Ours?

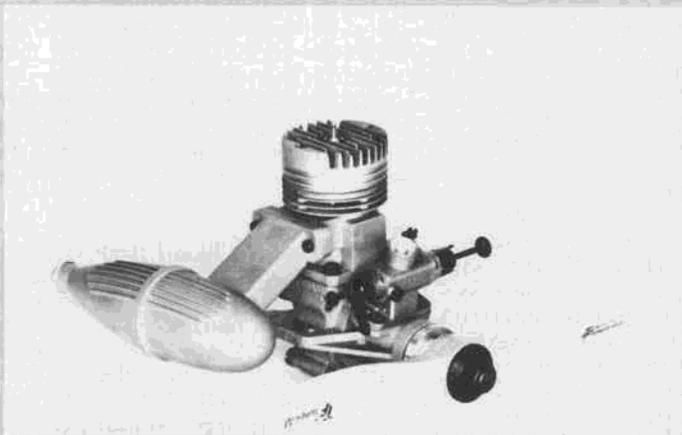
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	FOX EAGLE III \$125.00	O.S. SCHNURLE \$165.00	ROSSI .61 \$ ?	ENYA XFTV \$158.98	WEBRA .61 \$206.82	SUPER TIGRE X.60 \$134.95	RJL (KRAFT) \$ ?	O.P.S. BIG RED \$ ?	PICCO P.60RC SE \$219.95
11-7 Prop Gold Star Fuel Conv. Muffler	12,900	12,300	13,000 (Fox Muffler)	11,500 *		12,600	12,200		
11-7 Prop Duke's Fuel 10% No Muffler	13,100	13,000	13,200 (Fox Muffler)	13,000		12,700	12,500		
11-7 Prop Gold Star Fuel Conv. Muffler	13,500	13,200	13,700	12,000 *	13,100	13,000	13,000	12,300	12,800
11-7 Prop Gold Star Fuel Tuned Pipe	13,800 Stock Sleeve 14,000 Opt. Sleeve		14,100			11,700	11,300		
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The FOX EAGLE III engine used was the middle performer of three pulled off the line at random. Other engines used were bought on the open market and presumed to be good specimens.

\* ENYA ran very well on 10% Nitro, but rather poorly with no Nitro. PICCO had above average fuel draw, perhaps would run faster with a larger carburetor.

**CONCLUSIONS:** The FOX EAGLE III with conventional Muffler and No-Nitro Fuel runs slightly faster than a ROSSI on a large prop (12-6) and slightly slower on a small prop (11-7). It is faster than any other engine tested.

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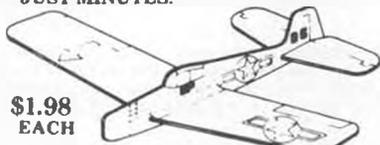
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It is not as strong for equal construction techniques. And it won't launch as steeply, nor as well with the same amount of lead as a thicker section will, unless flapped.

tubes). It's a more critical airfoil to shape (leading edges must be more accurate). It is not as strong for equal construction techniques. And it won't launch as steeply, nor as well with the same amount of lead as a thicker section will, unless flapped.

Drag reduction techniques were evident on most aircraft. Molded fuselages were everywhere. Fillets were to be seen on a lot of ships at intersections of wings, stabs, and fins. More detail was paid to the little things on most of the 2-meters: retracting tow hooks; streamlined but non-reacting tow hooks; hatch-less fuselages with smooth finishes; fully sheeted wings; internal on-off switches, and just plain-old fashioned good design work.

The Two Meter World Cup is, in my opinion, THE MOST FUN of any contest I've ever flown. Two meter designs are quick and easy to design and build; they don't cost much money to produce; and they are a real gas to fly because of their size.

Next year's 2MWC will probably be held in the Southern California area. Nothing is for sure yet, but a combination of clubs may act as hosts: Soaring Union of Los Angeles, Pacific Soaring Association, and the Torrey Pines Gulls of San Diego. As of February, everything is still in the proposal stages.

If I were you, I'd start planning to come to the 1983 2MWC . . . and bring you best two meter design!!! ●

### Elect. Corner . . . Continued from page 35

on both ends, are polarized. That is, they will transmit, and be more efficient in the receiving mode, in an expanding donut shaped pattern, with the maximum strength at right angles to their length, and minimum strength at the tips. An antenna installed or held upright, is said to be vertically polarized, one installed parallel to the earth is said to be horizontally polarized. For maximum energy transfer, like polarized antennas work best . . . that is, a vertical in the model will receive more energy from a transmitter antenna also being held vertically, or near vertical. A chopper, with it's receiver antenna dangling out the bottom is doing the same thing in reverse.

The whole thing is really much more complex than that, the actual patterns are modified by many factors, including height above ground, but that is it in a nutshell.

The bottom line is that a vertical antenna on the airplane, and training yourself not to drag the transmitter antenna in the grass while you are flying, will assure you of the best possible link, at the same time getting the receiving antenna up and away from all that rf garbage at it's base. To install one, simply

attach a long piece of 1/16 music wire to the model, insulated with plastic at the base, being sure that it never comes in contact with anything metallic. Cut off the original flexible wire antenna by the same length as the vertical 1/16 wire, and solder the remaining wire from the receiver to the base of the vertical. (Kraft System offers an antenna disconnect so that the main antenna can be left in the model, allowing the receiver to be removed and used elsewhere. wcn) As mentioned before, the more antenna outside the airplane, the better. Before flight, make those comparative range checks. In the air, with plenty of altitude, collapse the transmitter antenna one section at a time. With everything being 100%, most modern systems will maintain solid contact with the antenna collapsed down to one section.

Mr. Onderka, I believe your well-meaning friend confused the term "omnidirectional" in this respect. It actually means "all-directions", which in antenna talk is the opposite of simply "directional", such as a TV antenna which is designed for maximum signal pickup in one direction only, being relatively insensitive to the sides and rear. Being omnidirectional is beneficial in our case, on both ends, since the airplane needs to be free to maneuver relative to the transmitter with the same strength signal being received, and the flyer can still apply his body English without regard for the relationship of the transmitter antenna to the model. However, boresighting, aiming the transmitter antenna directly at the plane, is not recommended, due to the lower emission off the end.

If a new radio is in the works, and licensing permits it, consider FM. Again using helicopters as a test bed, FM is supposed to be less critical to metal around it than AM systems.

We hope both of you will share the results of your experiments and experience with us in later issues, and as they say in South Venezuela, buen vuelo y'all!

### MODE WHAT?

Another flyer heard from regarding my Mode One/Mode Two discourse is Paul Maharis, from Kew Gardens, NY. According to him, we are all wrong, including Bob Aberle and his single stick mortar and pestle. Paul flies with elevator/ailerons on the left stick; throttle/rudder on the right. Sounds like a ripe opportunity for an ethnic joke, but we'll just call it Mode 1-Plus, or is it 2-Minus.

Paul also points out that Mode Two'ers did themselves rather proud at the Texas NATS, in the form of Tony Bonetti, Steve Helms, Dave Brown, and Don Weitz. Well, yes, but only because neither Hanno, Matt, nor I could make it this year! Seriously, Paul, thanks for the letter, there is room for everyone and all opinions.

★ ★ ★  
IN ANTICIPATION OF THE GOING OF  
THE ICE AND SNOW, NEW YORK  
IS HEARD FROM:

Hi Eloy,

I have a problem with my transmitter batteries and I hope you can solve it.

My transmitter is a Kraft Sport Series 6-channel.

I cycle my batteries once a month with L&R Taylor's Power Pacer model #200. The transmitter and airborne are on a constant trickle charge with L&R Taylor's multi-charger. I never let the batteries sit all winter, or when I'm not flying, without a charger on them.

Last week, I cycled my airborne and transmitter batteries, and found that the transmitter batteries are only holding around 350 mah. The airborne are holding 500 mah. This will be the THIRD pair of Ni-Cds going defective in the transmitter!

Can you recommend a different brand of batteries other than the ones Kraft supplies? Am I doing something wrong?

Also, should I put on my transmitter and airborne pack switches and let the batteries drain down to (total discharge) zero (keep the R/C system on for two days) and then recharge? Someone told me this, but I think this would damage the Ni-Cds. Ni-Cds should never be allowed to discharge totally . . . right? (Note: I made the transmitter modification to disconnect the internal charger.)

Next problem . . . or idea. For Christmas, my wife bought me a L&R Taylor Super Power Panel. It's great . . . but it will not charge my Kraft Sport Series transmitter. It's 6-volt. Now, is there any kind of resistor or whatever, that I can put between the transmitter batteries and the Power Panel so I can charge this 6-volt transmitter?

Or, now that my transmitter batteries are shot, could I install an 8.6 volt pack into my Kraft Sport Series transmitter (so I can now charge it at the field), but install a resistor so my transmitter will only receive the 6 volts it was designed for?

Thanks for your great column, keep up the good work . . . I will not touch anything till I hear from you.

Thanks again,  
Paul Maharis

Well Paul, thanks very much for the vote of confidence, I'll do my best to help you.

Barring the almost unbelievable coincidence of your having received three sets of defective Ni-Cds, I believe you are more the victim of misinformation than anything else, starting with the use of the Taylor Power Pacer, or any similar device, once a month. This is simply too often, especially under the circumstances of keeping the batteries charged as you do, and from the tone of your letter, you also fly often. I personally cycle once every six months or so; I fly on the average of three week-ends a month. I also don't store equipment with discharged batteries, and if it does sit for two or three months between flights, then I do charge and test for capacity with a cyler before it goes in the air. Not that cycling in itself is dangerous, if the cyler is properly adjusted to cut off at the right voltage

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(1.1 per cell); it just isn't necessary.

I am not far from Kraft Systems, have a lot of friends there, and I think I would know if they had received a batch of less-than-acceptable batteries, which does happen. Such is not the case, to my knowledge, but then I also wouldn't blame you in this case for wanting to try something else. I am having excellent luck with Sanyo cells, which I get from Novak Electronics, at \$7.00 a pair. There are cheaper cells advertised, but my models are worth that much to me.

Next point, you are right . . . don't drain the batteries completely down, in any manner. In fact, they should not be allowed to get below 1.1 volt per cell, or 5.5 battery pack voltage in the case of your Kraft Sport. Doing so sometimes causes the cell to take a reverse charge the next go around.

Now we get down to what might be the real cause of your problems. You mention the constant use of a Taylor Multi-charger to trickle charge. I will assume that you are talking about a stock charger, which I don't believe has any switchover to trickle charge rate, at least none is advertised for it. Also, it is marked with two transmitter outputs, and though the ads don't specify, we must assume that it is intended for the more common eight-cell, 9.6 volt transmitters. Using it on your five-cell transmitter means that you have been over-charging, even if it was left on for normal periods. Leaving it constantly connected, at a higher than normal charge current,



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means definitely over-charging, and thus reduced capacity and life. Whatever charger you use, be sure that you are not putting more than 50 mils in for normal charging and 10 mils for trickle, assuming 500 mil cells.

And last, but certainly not least, field charging. This too can be a battery-eater if improperly done, and all batteries are not quick-charger types. I recommend it only if you know that you are going to fly close to the limit of your battery capacity. Two flights a Sunday does not do this. If you need it, in the case of the equipment that you have, there are various ways to reduce the voltage from 9.6 (you wrote 8.6, I'm sure your meant 9.6) down to six, but the easiest, least



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fool-proof way is to install eight cells, charge through the eight cells, and simply tap off five for the transmitter supply. The extra three cells can also be external, connected into the circuit through the harness during charging. I'm not wild about the idea, but sometimes you have to be flexible; I can't just recommend that you run out and buy an eight-cell transmitter. And don't, for any reason, be tempted to connect more than the six volts to the Kraft Sport, to do so will take out the FET (Field Effect Transistor) in the output.

And finally, there is also the possibility that a resistor may be installed in the line from the Taylor Power Panel that will allow proper charging of the five-cell pack, but I am not familiar enough with the unit to advise it. I do advise that you check with the Taylor company.

And now I have a question for you that a lot of guys will want to know about: Where do you get the kind of wife who gives you neat model stuff for Christmas? . . .

Mr. J.C. Jordan, Rock Hill NC writes:  
Dear Mr. Marez,

*I am really glad to see MB has started an electronic construction column. I build most of my radios and other gadgets that we "must" have for our hobby (R/C). I enjoy your style of writing, so I hope you stay with us.*

*I would like to see you do a construction article on a fairly simple optical tach. There was one in the Jan. '71 issue of RCM that worked well. I used a MC724 Quad NOR Gate which is no longer available. Maybe you could update this circuit. . .*

*I would like to include one of my "pet" circuits. It is an automatic current regulated charger. I got the circuit from National's Linear Data Book. It uses a LM317 adjustable voltage regulator, and the output voltage and current are*

*adjustable. As the voltage of the battery under charge nears the preset output voltage, the current starts to drop and will go to almost zero (5 mils or less) when the preset voltage is reached. I use it mainly for charging Gel Cells, where the end point voltage and current are critical, but it will work as well with lead acid or Ni-Cds. The beauty of it is that you can leave it on charge indefinitely and never worry about overcharging. . .*

J.C., thanks for the kind words, and especially for sharing your charger with us. That is exactly the kind of hope I have for the column, a place where we can meet, compare, share, and maybe even argue a bit when the time comes, but with the successful enjoyment of our shared hobby in mind.

The tachometer! It is on my list, somewhere about number forty-eleven. There has not been a good tach to come along since the Pro-Tach, in July '75 RCM, and which is still available in kit and assembled form from Royal Electronics. However, what with all the advances in opto-electronics, and with new chips like the National LM-2907 frequency-to-voltage converter, it should be possible to come up with a simple tach, which should include an expanded scale, and possibly audio as well as optical pickup. It should be an interesting project, just as soon as I get some time. . .

The charger information does not need a thing from me, you've covered it perfectly and it appears just as you sent it. What's more, it is timely. It appears that gelled electrolyte batteries are getting a reputation as being relatively short lived; I am convinced that this is a result of improper charging. If there are enough requests, I'll have to schedule a piece-by-piece construction article around the circuit, for our doctor, lawyer, Indian Chief readers whose

expertise lies outside electronics.

## WE HEAR FROM WACO!

In this case it is pronounced "Wayco", being the town in Texas. The airplane is pronounced "Wahco", which is apropos of nothing electronic, but we don't want to insult our friends in the "Heart of Texas Model Airplane Club" there, most specifically Frank Cross, who wrote to say:

*To Contributing Editor, Eloy Marez*

*Your mention of a servo tester really rang my bell!!! I built a World Engines MAN 2-3-4 and a servo tester, using a MC717P quad gate about 10 years ago. It lacks many features, the biggest being a "burn-in" auto-cycler function. I am greatly interested in building one such as you write of. If you want a preliminary test of your circuit . . . I'm willing!!*

*I really enjoy your column and boating articles in Model Builder magazine. Keep it up!!!*

Well, Frank, you and the other written and personal comments I've had since the servo tester appeared confirm what I have always felt, that there are a lot of R/C'ers out there who are interested in the electronic side of the hobby past the point of turning on the switches. The servo tester now exists in quantity, I've built a few for friends, and friends of friends. But as usual, the paper work is far behind, since I originally did not intend it to be a complete how-to article. I am rapidly becoming convinced I've wrong though.

What I have now are rough drawings and notes . . . you know the kind, it would take the crypto team that broke the Japanese codes during the big war to decipher them. I do plan to get them all in order as soon as time permits, and I've added you to my list of whom to send copies to.

Which brings up a point! Copies cost money, and while it isn't going to break me, it is starting to eat into my K&B 500 money. I won't push it, especially knowing that it isn't easy to send 30¢ through the mail, and I certainly don't expect anyone to write a check for that amount. About the only practical solution I can think of is to ask every *third* guy who asks for copies of anything to send in a dollar bill! (Eloy, give me the names and addresses of the ones who send you the dollar. I've got a neat bargain on a bridge in Brooklyn, and would like to let them in on it! wcn)

## HINT OF THE MONTH

Did you ever wonder why the component leads of the commercially made equipment always look so much neater than those of your home brewed project? Well, there are two reasons, one being that the larger electronic assemblers buy components with the leads bent to certain dimensions, and even clipped to specified lengths so that they fall right into the holes without the pressures that distort the leads. The smaller outfits rely on lead benders of various types, the cheapest and simplest being the type in the photo. This is a double-sided device, made to be used with 1/4 and 1/2-watt resistors, and

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similarly sized capacitors, diodes, and even jumpers. It goes from .4 to 1.5 inch hole spacing, in increments of .05. The components are automatically centered on the guide, thus between the leads, making things look neater and more professional. The leads are radiused smoothly, eliminating any sharp stressed corners.

Mine is made by Production Devices, San Diego, but there are probably other makers as well. They cost about two dollars at electronic suppliers . . . not Radio Shack in this case. Look for more specialized houses.

I have yet another hint for would-be kit builders and home brewers. When installing color coded components, such as resistors, do so with the color code running from left to right on those installed parallel to the board, and down, on those installed upright. This makes it easier to read the values during your before-power check, or in the sad event that things aren't working as expected and you have troubleshooting to do. Those components, such as disc capacitors, that have value markings etched on the sides should be installed so that the markings can be read from an unobstructed side, if at all possible. Tubular components with markings on the body installed parallel should have the markings on the top surfaces. None of the above is essential to the proper operation of anything electronic, but it can sure make life easier later.

## QUESTION OF THE MONTH

Digital tach's have been with us for some time. I am wondering how they compare in user's opinions with the old fashioned meter type. Not in terms electronic, but in use. Are they easier to use, more accurate; in other words, if you've used them both, which do you prefer, why, and what kind of engines do you use them with. Race, anyone?

Letters can come direct, to: 231 Cottage Pl., Costa Mesa, CA or to five-minute-away *Model Builder* offices. •

**Plug Sparks . . . Continued from page 42**

the motor had two strikes on it before it ever hit the street. The original design by John L. Doll lost something in the transition from prototype to production model.

Actually the Syncro Bee was the fore-runner of the Syncro B-30, the first of the "slag engines". From then on, it was Rogers, Thor, Genie, Buzz, ad nauseam. Most all the engines looked so much alike, one wonders what was the correct sequence of motor designs (?).

For \$12.50, the Syncro Bee wasn't a bad buy, as it included coil and condenser. Interestingly enough, the Syncro people marketed their own spark coil known as the "Super Light".

Performance-wise, figures are pretty hard to come up with, as apparently no interested party, company, or magazine

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took the time to run strobatac tests on the Syncro Bee. The Syncro Devices Co. claimed rpm figures of 1000 to 8000 using a nine to ten inch prop with 6 to 6-1/2-inch pitch.

Specifications of the Syncro Bee shows a bore of 1/2 inch and stroke of 5/8 inch to give a displacement of .122 cubic inches. Weight was 3-3/4 ounces, so-called flying weight of 8 ounces (probably includes B or C size batteries).

As far as metallurgy went, the later Bee models featured a "chapmanized" steel piston. This gives a very hard surface for long wear. This improvement did not seem to alter the performance appreciably.

One feature of the engine was the

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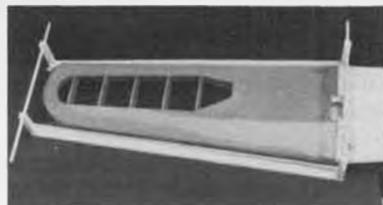
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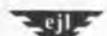
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split-type crankcase held together by four bolts, which allowed for quick disassembly and inspection of the front bearing.

Reading of the operating instructions gleaned a few interesting facts, to wit: They sold no partly finished knock down kits, something which was employed by later slag motor manufacturers to help spur sales.

When a motor was returned for repairs, a 50 cent charge was made for inspection. The guarantee covered workmanship and materials. One wonders what the actual production cost of the engine was, in light of similar charges by other manufacturers such as Scripto pens asking for 35¢. This was more than the cost of manufacture!

### THIRTY YEARS AGO, I WAS...

Roy Mayes of 2372B Mariposa Way, Laguna Hills, CA 92653, writes to say, "Just read in your Model Builder column about the passing of Joe Culver. I was very sorry to hear it. Joe was the real 'expert' of the 'Old Oakland Bunch' and we surely kept him busy answering questions. Best part was that he was always willing and able to help.

I was just looking at my old scrapbook with pictures and articles from the Oakland Tribune circa 1929-1931. These were the good old years of our group. Earl Vivell was the Model Airplane Editor for the Tribune. We could hardly wait for the Sunday edition which always had plans, articles, and the latest contest scoop. I'll never forget the time my Baby R.O.G. (from a 65¢ Vivell kit) did 30 seconds R.O.G. in my dining room very cleverly missing chairs, tables, etc., not to mention the ceiling light (columnist note: everyone must have built one of those, although I cannot say mine was as successful).

At the first big Tribune contest in 1929, Joe Culver placed first in indoor stick endurance. For this, the Tribune gave him a free trip to the National AMLA meet in Detroit, where he set a new record and another free trip, this one to Europe. What a wonderful achievement... 8-1/2 minutes and what a prize! From then on, Joe was OUR CHAMP.

A few words about some of the old gang may be in order. Herb Owbridge, who beat Culver in 1930, was sent to Detroit, but only placed fourth at the Nationals, later manufactured the "Ruddervator", a very clever type of escape-ment for the old single-channel type radios which gave us up, down, left, and right. You could even get a two speed motor if you could figure out an air choke for the motor you were using.

Dick Schumacher (we called him "Shuey") and I designed a small radio model called the "42'er" which used the Ruddervator quite successfully. Plans were published in Model Airplane News in the 1950-51 era. Last I heard of Owbridge was that he had moved to Las Vegas in 1965.

Another one of the gang still actively flying is Warren Williams. I bumped into him at the 1977 Nationals at Riverside. I had not seen him for 35 years, yet we

recognized each other immediately. Was over to his house last year to burn some good nitrate dope and condenser paper.

I couldn't forget Al Hoosopian and his brother, Joe. Al was usually a winner in the old rubber contests, and as you outlined in your article on the Micro 19, went on to produce model airplane engines. I worked for Al from 1945 to 1951. We made a lot of stuff for Bill Atwood, Mel Anderson, Lucas & Smith. Our specialty was punch press work and we used to punch the rectangular ports in their cylinders.

I suspect you forgot about Ted Morrison (no I didn't!). Just about every model builder in the Bay Area sooner or later built one of Ted's kits. Starting out as the M&L Model Co. (Morrison & Lucia, Ted's brother-in-law) in 1929, when Lucia left, Ted changed the name of the shop to Sky Devil Model Co. (This columnist still has M&L small rubber scale models and Ted's two gas kits, Bumblebee and Miss Wild Fire, a Schumacher design). I worked at the shop after school and on Saturdays during 1930 to 1932. I actually designed some of the kits, as did Ted. I used a lot of Joe Ott plans for War Plane Kits.

I was the jack of all trades man, from filling the 1/2 oz. glue bottles using a grease gun, to making up the kits and finally delivering them to the various stores on my bicycle (I later graduated to a motorcycle).

After the Tribune dropped model activity in 1932, Ted Morrison sponsored many a contest in the '32 Depression.

Another good old boy was Kenny Agmar who was one of the first lunch car vendors in Oakland. He would always stop at Ted's shop after he finished his route in the afternoon. We would finish off whatever doughnuts and sandwiches he had left over (in exchange for model supplies, natch!).

About the only models Kenny built were S.E.5 types, no matter what the event called for (another biplane enthusiast!). Kenny is now living in Burbank and was in charge of the model shop at Lockheed during World War II. It's a wonder that Lockheed didn't manufacture an S.E.5 for the war!

About Rod Doyle: Rod, Shuey, and I built our first gas models at the same time. Shuey called his most successful, the "Ethy", Doyle named his the "Folly", and mine was the "Jeep". Doyle came up with the idea of the triangular fuselage in the area behind the cabin (this was an old device in rubber designs to keep the model from getting tail heavy). I came up with the sub-rudder on the bottom of the fuselage that Doyle employed on his Folly.

Also, I had a sheet covered fuselage and tail group. The wing was silk covered and featured curved dihedral. Took me a week to steam the curve in the spar, leading and trailing edges before the wing was assembled. Came out beautiful and always won the Beauty event. Not a bad flyer either, although Rod and Shuey usually beat me. Pete Bowers

must have taken 20 or 30 pictures of the Jeep at Sunnyvale (Moffett NAS), as his "Rebel" design reflected most of my features except for the substitution of "vee" dihedral.

I got Rod Doyle a job working in the shop where I was employed during 1937-38. His wages were twice what he had gotten before. Unfortunately, he was laid off three months later and was without work for a time. He wouldn't speak to me for several months but finally got over it. Ain't that life!

As I look at the Tribune photo of the contestants at the 1930 Annual Indoor meet, I see many faces I know well. A lot of them I went to school with. There are about 100 modelers in the photo. Most dropped out of modeling when the Tribune abandoned model airplane activity. Some stayed on a little longer while others never gave up modeling. But, come what may, all of us will never forget the good old Oakland bunch and the wonderful time we had together.

(Columnist Note: One of these days, we'll write up the activity on the San Francisco side of the bay as sponsored by the S.F. Examiner, with our "gurus", Glenn Hainer and Howard Bonner.)

#### BRUCE LESTER GOODIE

Just received a whole flock of photos from Bruce Lester taken at the various Nationals of 1937 through 1939. Unfortunately, most of them have fallen victim to age with many fading and turning yellow.

However, the good pics we will continue to use, as can be seen in Photo No. 8. Peggy Snyder, wife of Barney Snyder, is shown with a Modelcraft Pacific Ace. Barney and Peggy attended the 1938 Nationals, causing quite a stir with their precision type models, as compared to the eastern style of long motor runs and huge floating airplanes designed strictly for duration.

Although the Snyders didn't have a chance with their fast flying airplanes, this style of flying was one of the contributing factors leading to the limited engine run type contest. This is amply demonstrated in Photo No. 9, showing Danner Bunch getting his Scorpion away.

It is ironic nowadays that the situation has reversed itself, with the big floaters now being flown in the West, and the East using smaller and more compact airplanes. Hopefully R/C Assist will be the great evening factor.

#### CARLSON REVISITED

All one has to do these days is to make a wrong identification and you will be amazed how many read your column.

The photo we ran on Karl Carlson of Chicago with his Wall engine powered model was correct; however, Doc Mathews, 506 South Walnut, Greensburg, Kansas 67054, writes to say that it was actually Harold Carlson with a Cavalier who actually got beat out. Slide of the model is available from Bill Effinger.

Also, Ed Mateo writes to say that Carl Carlson is still active and a member of the Illinois MAC (formerly the Chicago



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Aeronuts). Veep Mate says you can obtain Carlson's address from President Charlie Sotich at 3851 W. 62nd Pl., Chicago, IL 60629.

Ed also says the photo of Bill Englehart's So Long was actually a B-C version. He also says how about some credit for the photo as this is the second time it has been run. Actually, the photos were taken in his office after Mitch Post gave him the model.

As Mate points out, here is my chance to make amends, so Photo No. 10 is a shot of Ed Mate with his 1939 Korda Wakefield that has never failed to place (1st, '78 O/T Nats, 3rd '79 O/T Nats, and 3rd at '79 Aeronuts O/T Fall Meet). The remarkable thing about these wins is that the model has never been wound over 3/4 capacity of turns.

The reason for the splendid performance can be found in the weight of the model; wing, 3/4 oz.; fuselage, silk covered, 1 oz.; stab and rudder, 1/4 oz.; 2 ounces without rubber! That should go like a scalded cat!!

#### AMERICAN TURF FLYERS

Just received a letter from Bill Salnikov of Rt. #1, Box 42AD, Corveta, OK 74429, who writes to announce their first O/T R/C Assist meet to be held on July 25 in the Tulsa area.

C.D. Salnikov states rules will be as outlined by the SAM 40 "Fun-Fly" write-up appearing in the March-April 1980 issue of SAM Speaks. With over 50 members in the club, this promises to be

an outstanding meet. Be there!

#### SAM CHAMPS 1982

Just received the latest action of the AMA Executive Council. They have approved my application (as President of SAM) for a four star rating of the SAM Championships. How about that? This will assure the sponsors of the meet they will have first choice of the annual date in their area. Great stuff!

By now, the official entry sheets will have been published in the SAM publication, "SAM Speaks", along with the instruction sheets. George Armstead notes that quite a few of the free flight events, particularly the gas classes, have been reduced to two minute flights. This is due in part to the size of Westover AFB, and partly in respect to the unpredictable winds that periodically come howling in on any particular day.

George Armstead, the Contest Manager, further points out there will be an event director for every event staged by SAM 7 at the SAM Champs. One thing for sure, we won't lack from proper officiating!!

#### ELECTRIC AT THE SAM CHAMPS

Latest letter from Joe Beshar, 198 Merritt Dr., Oradell, NJ 07649, indicates he has been selected by George Armstead, 1982 SAM Champs Contest Manager, to C.D. the .020 Free Flight Electric Event. For the benefit of those who are not aware of the rules, here they are again:

1. Any model, full size, scaled up or

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2. For official flight, plug in or switch on battery power. Hand launch free flight for motor run out, glide, and landing. Official time begins at launch and ends at landing.

3. First three flights over 10 seconds are official. An attempt is any flight under 10 seconds. Only six attempts are allowed. Maximum flight rules of the day for free flight will be covered.

### RADIO CONTROL ELECTRIC

There will be one event for radio

controlled electric at the Champs. Motor run will be 1-1/2 minutes. Whether there will be time to have three official flights or have a "shoot-out" where the last man wins is unknown at this time. Best guess is that the event will feature the head-to-head type competition in the form of a flyoff.

### SAM 27 RUBBER ANTICS

Ever since the Marin MAC gave the SAM 27 boys a shellacking in the Pacific Ace Challenge meet, there has been a growing rapport between the clubs to the extent they have now amalgamated under one banner: SAM 27.

Tom Brennan, the head honcho for rubber events, sends us the revised schedule for rubber events in Marin County . . . for that matter, all of Northern California and any others that care to attend. (We ran the schedule before, so only the changes are listed.)

### May 23

Peanut Scale (WWII Combat Aircraft 1939-1945)

AMA Rubber Scale  
Cabin, 36" w/s

### June 27

Joe Ott Day (all Joe Ott plans)

Scale models under 20" w/s

Scale models over 20" w/s

Embryo Event

### August 8

Biplanes Only

Peanut Scale

AMA Rubber Scale

Rubber Duration

### August 22

SAM Pacific Ace Challenge

Of all the events listed, the most exciting to this columnist is the Joe Ott Flying Scale events. To that end, this writer has drawn up ten 30-inch flying scale models from old Popular Aviation Magazines, 1929 to 1932, and from Ott's book on Model Airplanes. There were close to 30 different plans of the "Sky

Flyer" series which gave two sizes; 15 and 30 inch w/s.

Some notes are in order. All scale events will be judged on the Mooney system. On the cabin 36 event, any rubber cabin model not more than 36 inch wingspan is eligible. The Embryo Event will observe Peck Polymer rules. (Embryo and Cabin 36 must R.O.G.). All scale events will be hand launch. (Peanut scale, AMA scale, or rubber powered scale model).

For further information on this exciting schedule of rubber power events, write to Tom Brennan, 588 Cedarberry Lane, San Rafael, CA 94903, or call (415) 479-7088. Don't miss the fun!

Before closing off on SAM 27 activities, lest the reader think this SAM Chapter is strictly rubber, Photo No. 11 shows Nick Sanford with the framework of a model designed by Ralph Lowe, of San Jose, in 1937, called the "V-Tail Swallow".

This writer can fondly remember the gracefulness of this model powered by an Ohlsson Gold Seal engine. Most all the gas model flying in those days was done off Moffett N.A.S., a simply great site for free flight! Unfortunately, about 1940, the Ames Research Laboratory moved in with its myriad of wind tunnels, ruined the flying area, and placed the base on a security basis. Progress . . . rats!!

### SAM 32

The AMPS (Antique Model Plan Society of No. Cal.) has been making a comeback under the aegis of Major John Gomez III. Regular meetings are being held at his place, plus the area nearby his home is excellent for flying. John is a prolific builder, but also a good one. Photo No. 12 shows his excellent PB-2. Great stuff!

### BUZZARD BOMBSHELL ANCESTOR

Ted Dock is responsible for sending Photo No. 13, showing Joe Konefes with one of his early gas designs that appeared in the 1938 era. Of course, nowadays, all these old models have radio installed to cut down those long hikes for those old tired legs. It is a great source of pleasure to see the Konefes boys, Joe and Ed, active in old timers. This is what is needed. Some of the old masters to show how it is done (model flying, of course!).

### GERMANY

Gerhard Everwyn of Munich has been extremely active in organizing the SAM movement in Germany. Everwyn now writes a column for "Flug" magazine. This can only increase the interest!

Photo No. 14 shows a pre-WWII design known as the HS100. As was noticeable in European designs of that era, the emphasis was on scale looking competition aircraft. Then too, with the shortage of balsa, many of the models featured spruce construction. Actually, there is nothing wrong with hardwood construction, as long as you don't use large cross-section members.

### ENGLAND

Bill Hannan (of Hannan's Hangar) is responsible for Photo No. 15, received

from David Deadman, of Nottingham, London. The model, a Keilkraft Junior 60, is an extremely popular model in England. The model is quite straight-forward in construction and flies with a minimum of adjustments. Ben Buckle, who runs a plan service in England, is quite responsible for the resurrection of this design.

**CREATIVE HOBBIES**

We don't often give plugs to dealers or distributors, but Karl Kusche is so delighted with the old timer movement, he wants to get every SAM member into the R/C end of the game.

Generally speaking, R/C gear is quite expensive and costly to keep maintained. However, the ability to fly your favorite old timer in small fields is the terrific attraction. Hence, Karl has offered a deal to any interested SAM member by simply writing him: Karl P. Kusche, 6921 Fourth Avenue, Brooklyn, NY 11209. Hopefully, this should get a SAM Chapter going in Brooklyn!

**THE WRAP-UP**

This columnist can't say how pleased he is to see a full program of Old Timer R/C Assist contests for 1982. With three new clubs filling out the agenda, there is action for everyone.

Received reports that the Cactus Club SAM 31 put on a good meet at Phoenix in January. No writeup or photos received. This was followed by the SAM 41 (San Diego) meet at Perris Valley, using the SAM 49 flying field for the contest site. George Wagner, newsletter editor for SAM 41, gave us a full report but unfortunately we ran out of space. We'll cover that next month. All clubs when first starting out, need all the help they can get.

The last of the mailbag items is a contest announcement from Monti Farrell, P.O. Box 1261, San Luis Obispo, CA 93406, that annual meet held at the Cal Poly University Airport is now scheduled for September 25-26.

To prevent some confusion from occurring it must be noted the meet will no longer be called the "Pond Commemorative". In deference to the new sponsor, the meet will now be known as "The Cal Poly SAM Annual R/C Old Timer Contest". The columnist must also point out, it is important to get a preliminary flyer as soon as possible as there have been additional changes over last year's rules. As the old saying goes, "You can't tell the players without a program". Make sure you qualify for this meet. See you-all on the field!

**Big Birds . . . Continued from page 19**

9850, almost 2000 less than the 14x4, it produced a solid five percent more thrust. And the 16x6, which tached only 7500, outdid the 16x4 by a healthy ten percent. I also tried a 15x8, which came out to a disappointing 6800 RPM and ten percent less thrust than the 16x4.

In the interest of science, and to satisfy my burning yearning, I snuck an 18x6 on that 5/16x24 shaft; she started on the first flip and idled down to 900 RPM without

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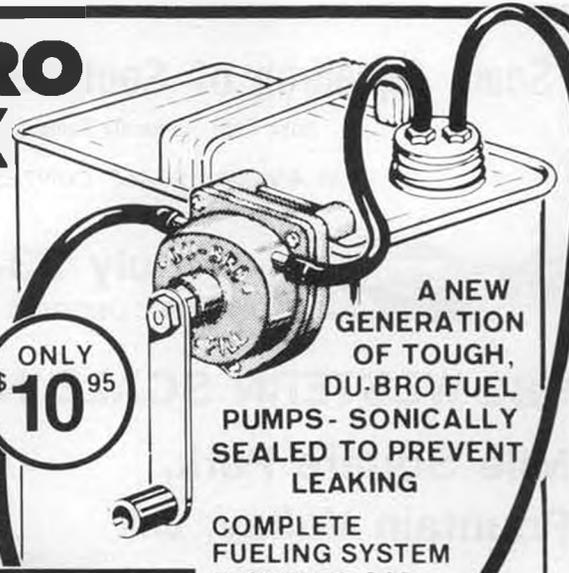
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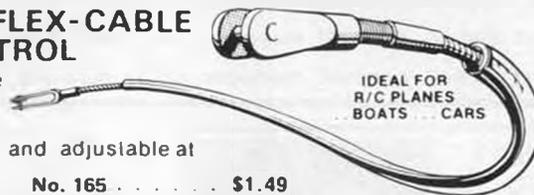
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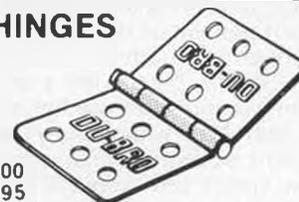


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skipping or missing (how's that for fantastic flywheel action), but the 4700 revs could only bring the scale to within seventeen percent of the 16x6 reading. Even though I ran out of compression adjustment (the bigger the prop, the lower the compression will be), the DE turned that 18x6 without any sign of overheating or distress. I ran some high and low speed taxi tests and throttle response was great, as the engine never faltered coming up from that low of 900.

Since diesels don't need as much air coming through the carburetor as glow engines do, the larger props tend to reach their max RPM before the barrel is fully opened. On the 16 inch props, this seemed to be at about ninety percent,

and opening the carb that last ten percent had no apparent effect. However, when swinging the 18x6, max RPM was reached at fifty percent open, and pushing the throttle beyond that point really unbalanced the fuel/air mixture and caused severe bucking; I was afraid the poor engine was going to do itself in with a double-hernia. Davis does cover this salient point in his instructions and recommends that you readjust your servo throw (move your connection one hole in at the servo or one hole out at the throttle arm).

After I got through playing the numbers game on the ground, it was time to evaluate the DE the only way that really counts . . . in the air, pulling that 15 pound airplane. I started with the 16 x 4 and, in keeping with my static readings, the engine performed very much like she did as a glow with a 14x4, which was very well, indeed. Three flights later I switched to the 16x6 . . . and couldn't believe the difference; it was like having a brand new birdie, especially in any kind of climb attitude, where the diesel refused to lug or sag. That 16x6 worked the same kind of magic Cinderella's Fairy Godmother did, only I didn't have to sweat the midnight curfew. Both "Bouncing Bertha" and I really got turned on by that engine/prop combination, and I was riding such a big high by then that I flew till it got too dark to see. I'd have to say, unequivocally, that the satisfaction I got from those last three hours of flying time would have

easily rivaled any other kind of erotic stimulation (I do follow my own advice and always wear dark trousers when flying.)

I put in over a dozen flights that afternoon and found that I was consistently getting at least 15 minutes out of the newly installed 8-ounce tank. Since I never did run out of fuel and was able to taxi back every time, Mr. Davis' claim that the diesel will average 2 to 2½ times more minutes per ounce than a glow engine seems to have a lot of credibility.

A few days later I located a 16x8 and found that it couldn't match the 16x6 for pull . . . and since the flight tests seemed to correlate pretty well with my ground readings on the other props, it's quite probable that the 16x6 is optimum for my BIG Bird. In fact, it would also be the best prop for any other similar size and weight airplane (using the same or comparable engine).

According to Davis, you really don't have to back the compression off to where she misses, and then increase the setting till she's running smoothly (a la the instructions, which he'll be changing appropriately). As you reduce the compression after that first start, you'll find that there are a few areas of compression setting that allow for maximum RPM. If you leave the head set for one of these highest RPM peaks, you won't even have to hardly mess with making compression adjustments too often. My Diesel-Eagle hand starts on one or two flips and does a lot of typical diesel burping at first; then when warmed up, she smooths out and runs and sounds great. At this point you open the throttle and, after leaning the needle valve till she starts to miss, back off a tad to achieve smooth running . . . and you're ready to go.

Every other diesel I know of has an extended arm on the compression screw that is bent ninety degrees and acts as a handle for adjusting compression. Bob Davis feels that this encourages tinkering, so his compression screw is a 1/4 inch socket-head type that accepts a 3/16 inch Allen wrench (included in the package). I've got to admit that his nicely machined and personalized head looks very neat with the socket-head bolt instead of a lever, but I'd recommend attaching some kind of orange or yellow streamer to the wrench . . . otherwise you'll lose it the first time out.

Also, as with gasoline, you've got to replace all your silicone and surgical tubing with neoprene or whatever else won't be affected by the diesel fuel. And while mentioning fuel, let's talk about cost: Davis' fuel is currently fifteen bucks a gallon, however, he'll let you have a case (4 gallons) at a 25 percent discount. Considering this saving and the economy of a diesel, actual fuel costs shouldn't exceed the price of a gallon of FAI mix. And don't forget you won't have any more plugs or batteries to buy or mess with . . .

My DE idled beautifully at 1600 (Duke's recommended low needle valve setting is very much in the ball park), and

throttle response with a 16x6 was amazingly good. A prolonged idle of two minutes or more would allow for a burp or two if the throttle was jammed to maximum go, but even then the engine never came close to crapping out.

The bottom line on the Diesel-Eagle is that it impressed the hell out of me; Bob Davis' conversion head converted me from diesel-hater to diesel-lover, because it did everything Bob said it would . . . which is a lot more than you can say about most other products available today.

My diesel delivered good usable power on large props, and did it while being a fuel miser. She started easy, had an outstanding idle, and ran as smoothly as the glow version. Between the different sound of the diesel and the prop running at lower RPM (7500), my DE became hard to hear at about 250 feet. She ran cooler than the glow did, and the variable compression head allowed the ignition timing to be set for whatever size prop was being used on any particular day, regardless of the temperature and humidity. And since two of any engines worst enemies, heat and friction, are less, it's reasonable to assume that a diesel will last longer than a glow engine.

But, as with everything in life, it ain't all roses. At the present time, diesel fuel is not as easy to find in your average hobby shop as glow fuel, so a little planning is needed to keep from running out and missing some good flying weather. Also, a diesel doesn't run as clean as a gasoline engine, although making sure that you get some of Bob's newer fuel (much less oil) will help here.

I'll tell you one thing; had those McCoy's and OK's run as well as my Diesel-Eagle, I would have stayed with diesels the whole time.

And for those who can get the makin's and like to brew their own juice, here's a recipe that's sure to keep your engine running well:

Ethyl Ether .....	30%
Kerosene .....	49%
Castor Oil .....	20%
Amyl Nitrate .....	1%

There's considerable latitude here; the Amyl Nitrate is not absolutely necessary, and the oil content can be reduced to at least 15 percent without any worry. The problems with mixing your own stuff is twofold; first you've gotta find all the ingredients . . . and then comes the harder part, being able to buy everything in small quantities at reasonable prices.

**I FORGOT . . .**

Somehow, while presenting alternatives to the gasoline engine, I plumb forgot to mention the Tartan (I hope John Maloney and all you Tartan lovers will pardon me for the oversight).

There isn't an overwhelming number of Tartans out there (yet), but the engine is doing well. One staunch Tartan advocate, former *Model Aviation* Editor, Bill Winter (who's now doing things "Just For The Fun Of It"), has become rather intimately familiar with this BIG glow



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engine . . . and loves it. Bill finds that too many Tartan owners are not feeding their engines properly, and offers this advice . . .

"There seem to be two criticisms of this engine: one is that it won't rev up, and the other that it starts backwards. It's a glow with reed and, like the little Cox, can go the wrong way; we found that both fuel and procedure are responsible.

"This engine should have 7 to 8% oil and not more than 5% nitro. With the normal 20% oil, common in glow fuels, it smokes heavily because it can't burn all that oil. Guys then lean it out trying to eliminate the smoke. This causes lean running, in that condition 6000 is all you get . . . and engine failures occur in flight. We have never had a failure and idle is beautiful.

"The mix then is, in our case, due to convenience: 8% oil (Ucon), 7½% nitro (too much for correct starting), and the balance methanol. It's the extra nitro that causes wrong way starts. If we get one we shut off the engine by radio . . . idle trim full back . . . and reflip. I position prop at one o'clock and pull through hard, swinging arm out of way to left. I suggest anyone wear a glove to handflip a prop . . . wrong way start can pull prop TE against inside of starting hand fingers.

"Wrong way starts can be eliminated, or made infrequent, by using low nitro. I'm sure the engine will do well on only 3% nitro. It can run on FAI, but a bit of

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nitro makes reliable idle in flight. The more the nitro, the more the chance of early ignition and wrongway starts."

As for fuel costs, Bill doesn't find it to be a problem. "High glow consumption is not true. This type of plane cruises, so my consumption is way down. It averages about the same as a .40 wide open, and beats any pattern .60. If you must run at full power . . . that's different."

Bill points out that he lives on social security and some side stuff, ". . . probably one of the poorest of all big scalers. I mix glow fuel and I am not bothered by my costs."

Now here's the eye-opener, although the Tartan is rated at only 1.33 cubes, it

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flies Bill's 28 pound Aristocrat quite well with an 18x6. In fact, 1 1/4 pounds of that gross weight is lead ballast "not to balance, but to get the precise performance I wish. In other words, I am throwing weight away on purpose."

And the Tartan sounds good. Bill and many others think it's equal to the gas engines when it comes to that "more realistic sound." Bill also owns a Quadra; it's well-balanced . . . but he doesn't use it.

"One of the biggest reasons is weight," he said. "The power to weight ratio of the Tartan is at least 2 to 1 more favorable than the Quadra for my plane."

And therein probably lies the Tartan's secret; it is a glow engine, and therefore

can deliver much more power than the equivalent size gasoline burner. Keeping this in mind, you may be interested to know that World Engines has the Tartan Twin, which ought to be dynamite for large/heavy planes. Going one step further, Davis Diesel Development now has diesel heads for the Tartan. I'm not sure what size prop a Tartan Diesel Twin will swing with authority, but I'm sure going to find out just as soon as I can.

### IT'S DOWNRIGHT CRAZY . . .

. . . not to balance those B-I-G props. No matter how smoothly your engine runs, an unbalanced prop will ruin it, and that goes for your airframe and radio, too. Don't be a dummy. Protect your large investment in time, effort and money . . . and balance *all* your props. This makes for airplanes with long lives, which in turn makes for happy pilots.

Here's how I do my props: first, you've gotta have a good balancer, and those two and three dollar jobbies just won't cut it. The High Point Balancer is the only commercially available unit I know of that is easy and non-critical to handle, yet so supersensitive to any imbalance. How super-sensitive you ask? Allow me to illustrate . . .

Last fall I did a product review on the Midwest Jetster and RK-20 Fan Unit, and the most crucial part was getting the fan rotor balanced right down to a gnat's behind. I followed the instructions and installed a 4-40 bolt in the hub section, grinding off a little at a time until I achieved maximum balance. However, this was still not good enough for an expected rotor speed of 22,500 . . . so I fine-tuned the impeller by hot-stuffing pinches of micro-balloons on the inside of the hub. It took about four or five such pinches, but I soon had a balanced rotor, and I do mean *BALANCED*. Can you imagine how receptive the High Point is to be able to react to the miniscule weight of a pinch of micro-balloons and a couple of drops of Hot-Stuff? Obviously then, you should be able to get down to the nitty-gritty of balancing any size prop . . .

But here's where too many guys go wrong. They scrape the heavy side to bring the prop into balance, and before they know it they're down to the bare wood. Let me tell you, gang, there's no way that prop is going to stay balanced for long, because the exposed wood is going to soak up moisture and/or raw fuel . . . and you're right back to an unbalanced condition, again. What's that you say? Before that happens you're gonna spray some clear over the exposed area? Fine, but then you're gonna have to spray the other blade to equalize the weight of the spray . . . You're making it twice as hard for yourself.

I don't scrape props . . . only resin and epoxy finishes. And I don't cut or trim prop blades to get them into balance. If the prop is that far out, it becomes a paint stirrer or an epoxy mixer . . . or a coggie poop-scoop.

I gently smooth out the props trailing edge with 400 or 600 paper to make

cranking easier on my fingers. Then using Krylon yellow or orange (other brands should work equally well), I spray the outer 2 inches of each tip for maximum visibility when spinning (of course I mask off the rest of the prop with tape and newspaper). I usually wait about a day and then, using the High Point, spray Krylon Clear on the tip of the lighter blade (front and/or back) until it's in balance. At this point I hit the hub area on that same blade with a very short burst, making it a tad heavy. This is to allow for the slight reduction in weight due to the spray drying. Next morning I check the balance again and touch up whichever blade seems light.

What you end up with is a *WELL-BALANCED* prop that will stay that way because you haven't left any exposed area, and it's as safe as you can make it because you'll be able to see those yellow or orange tips whirling 'round and 'round . . . And please don't forget to clean that prop after every flight, otherwise fuel, dirt, bugs, and grass will undo all your efforts and throw the balance out of whack . . . and you'll have a shaker.

### JURY STRUTS: WHAZZAT?

Flying buddy Don Langer became somewhat appalled at the lack of both jury struts and any information pertaining to them in most kits he's encountered, which prompted him to write this treatise. As Don points out, there are many ways to skin a cat, and this particular jury strut installation has proved to be worth consideration . . .

*You probably know about flying and landing wires on bipes and ancient monos. Most scale builders include these for looks only; I recommend they be made totally functional on any quarter-size or larger model.*

*The JURY STRUT serves nearly the same purpose as the landing wires in that it insures the integrity of the wing during negative "G" situations. The wing strut alone is fine for positive "G" loads if properly set up; but without a functional JURY STRUT that same wing strut is prone to bowing and snapping when air pressure (or a small child) pushes down on the wing.*

*A 20 to 30-inch 1/4x1/2-inch undamped spruce (or other equally feeble) strut is just fine for those who fly straight and level with a totally vibration-free engine . . . and grease every landing. However, some of us do fly in a somewhat different manner and must concern ourselves with struts that work under both tension and compression.*

*Not less than one of the popular jumbo kit manufacturers leaves this lifesaving device completely off, or merely includes it for scale appearance only. Current production kits may have improved in this area, but the Howard DGA-6 (Mister Mulligan) I built two years ago showed "fake" JURY STRUTS on the plane; the upper ends were to be run up through small plywood plates in the underside of the wing.*

*The Citabria kit I just finished didn't show a thing. I've seen a beautiful J-3*



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*Cub assembled and flown with the "fake" JURY STRUTS missing those little holes, which caused an unsightly and dangerous half-inch bow in the struts.*

*As in skinning cats and mounting canopies, there are probably a thousand and one ways to set up struts and JURY STRUTS. The illustrations show how I've done it, successfully, on two different airplanes.*

### MATERIALS FOR JURY STRUTS

1. Eight Du Bro LG Straps for 1/8-inch gear (Du Bro #238).

2. Eight Goldberg LG Straps (Goldberg #LGS-50), used to stand off Jury Strut

ends 1/16 from covering material.

3. Sixteen 2-56x3/8 machine screws with blind nuts ... unless you dare to use #2 or #3x3/8 wood screws (use Hot Stuff in the pilot holes if you do).

4. Length of 1/8 dia. piano wire.

5. Good quality, multi-lamination 1/8-inch plywood (not lite-ply).

### I DIDN'T PROMISE A ROSE GARDEN;

But I did promise you all sorts of BIG birds, and here's a one-of-a-kind ... as designed and built by Cecil Haga of Arlington, Texas. For those who aren't into, or up on, soaring, Cecil's the guy who sired the Legionaire line of soaring

machines ... and they've done quite well for the past 10 years.

He calls it the "Chaparral" ... all 175 inches of it, which towers over its creator (can't deny that Cecil isn't the tallest Texan in Arlington, or any other part of Texas for that matter, but you gotta admit that 175 inches is a lot of airplane) as you can see from the pic. She weighs 7-1/4 pounds, has 2322 square inches of projected area and a nearly symmetrical foil that has 2% camber inboard, 4% at the poly break, and 6% camber at the tips.

The bird features a fiberglass fuse,

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four-piece wing, aluminum wing spars, and a 1/2 inch diameter 4130 aircraft steel tubing wing rod carry-through. The four pound ballast box is built into the fuselage and the "Chaparral" has a nominal wing loading of 7-1/2 ounces per square foot. Spoilers on the wing trailing edges pitch her nose up just like a D/T would, and Cecil wants everyone to know that he has no plans to kit this BIG Bird; he built it as a one-of-a-kind distance and task machine.

Yes, it has flown a number of times and is absolutely beautiful to watch, even though it's kinda scary when it blots out the sun.

### IMAA '82 FLY-IN

Byron Godbersen (otherwise known as Byron's Originals) made us an offer we just couldn't refuse, so the 2nd Annual IMAA International Fly-In Festival will be held at the Byron's Originals Flying Site in Ida Grove, Iowa on August 27, 28 and 29.

I've never been there, but I'm told that it's an R/C version of Disneyland, so who needs to know anything else about the place. The weather in late August is supposed to be nothing less than great, and since both Byron and the IMAA don't like to get involved in anything that's not first rate, this may very well be The Ultimate Fly-In. Also, this site is more centrally located than Louisville was, so it should draw a good many BIG Buffs from both coasts.

Mr. Godbersen, bless his heart, has pledged his full support to this fly-in, so plan on being there; everyone else will and we sure don't want to miss seeing you, too.

To register as a pilot, and for information, send your SASE to . . . Don Godfrey, 254 Washington Street, Binghamton, NY 13901.

### UPPING THE QUADRA

According to Erv Jackson of E&R Hobbies, RR 1, Box 10, Edgeley, NC 58433, he's working on some more major changes that will increase the Quadra's power by . . . another 40%. Actually, it's not a question of whether or not he can squeeze more power from the engine; the question is whether "the little gem will take the increase horsepower and keep on ticking for a normal life." If the engine can take it, Erv figures he'll be able to make these improvements by early '83.

And for those who like really BIG Birds, E&R will be coming out with blue prints of trainers having wing spans ranging from 8 feet to 14 feet; they should be ready by late '82.

### GOOFED

I'll have to own up to a couple of errors in last month's column: the full and accurate name for our Jumbo Fly-In is . . . the 5th Annual Southwestern Jumbo Fly-In; and Bob Boucher's electric-powered Velie Monocoupe weighed in at only seven pounds, not the eight and a half pounds that I threw at you.

### TIP OF THE MONTH

Never fly your BIG Bird more than one flight if you find that your transmitter has been left on over three weeks . . .

Al Alman, 2609 Burningtreet Court, Arlington, Texas 76014. ●

Workbench . . . Continued from page 6  
does he buy any blind item.

The point of all this is to reinforce the idea that we have a certain obligation to support the local hobby store, even if it costs a few more bucks in the end. I know it sounds crazy, and I can hear the groans coming from all who read this, but consider the alternative. If we continue to buy from remote mail order houses and pick up things from the Super Market . . . it will be just a matter of time before we have no other choice than to continue this pattern, for the local guy will be out of business by then. As potential customers in the RC hobby, we have a certain responsibility for this happening, because no one in their right mind is going to continue for long trying to breathe life into a corpse.

Finally, to the die-hards out there who want it all and are willing to give nothing in return . . . consider this:

When ordering by mail to those far away places, be sure to include on your list a good lathe. Shop around and get the lowest possible price on this because they can be expensive. While waiting for it to arrive, take a night school course in becoming a machinist. You will need these skills and the lathe to make all the things that used to be available to you at the local hobby shop that closed because you never supported it with your business.

Get the idea? Think about it. Meanwhile, have fun, and I'll see you at the field.

While the above is fresh in your mind, think about your own situation. If you're an active model builder/flier, it is almost certain that you're a fairly regular visitor to your local hobby shop. Think about the times you have gone there to pick up a few odds and ends . . . things you had to have right away to finish off that big project; an item

# 40 BEST SELLERS!

SEE PAGE 100 FOR ORDERING INSTRUCTIONS. COMPLETE PLANS LIST SENT WITH EACH ORDER.



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R/C Sport Scale, balsa and ply const., a trophy winner, big, 8' span. Art Johnson.  
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Exact quarter scale (7-1/2 ft. span) R/C of famous D.H. biplane. By Bill Northrop.  
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Chet Lanzo's famous rubber F/F scale Puss Moth returns! By Hal Cover  
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Reprint of Miniature Aircraft Corp. plans plus ribs and bulkheads from printwood.  
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Jumbo scale rubber powered model of a 1928 classic. Span 48". By Jim Adams.



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EAA type R/C sport biplane, mostly spruce, for 60 engines. By Bill Northrop  
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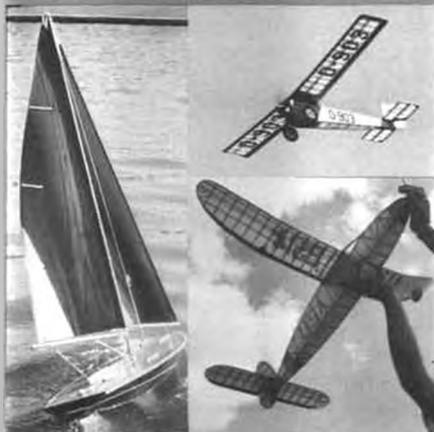
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**No. 8781 R/C VELIE MONOCOUCPE** \$9.50  
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that has hung up progress on your current project that you need *right now*; a can of fuel or a couple of props that you need for this coming weekend.

Face it, man . . . You need that shop, just as that shop needs you!

## INDUSTRY NEWS

Joe Ott . . . what a familiar name that is to many old timers in the hobby. Well, now it will be familiar to new timers. Joe is back in the hobby business, and has brought his famous jig-built system into R/C. We've seen preliminary plans for the first aircraft in the line, a trainer type for medium size engines. By the time you see this, it will have been introduced at Toledo.

Joe's not stopping with models, however.

He's also introducing his own radio system, which features an entirely new concept in transmitters. Though we're not sure how much chance you'll get to observe it while you're flying, this transmitter has a transparent face panel, through which can be seen tiny control surfaces, moving in response to deflections of the control sticks! Again, we've seen full-size drawings of the transmitter front panel . . . and it is different!

★ ★ ★

Kraft Systems is going into kits, and we don't mean kits for its radios! Kraft will be introducing a series of model aircraft kits . . . for R/C, naturally . . . to be distributed through its dealer direct network. The kits are to be manufactured by Joe Bridi, and at least in the beginning, will consist of his own designs. Watch for a trainer, a couple of sport aircraft, one of which resembles Phil Kraft's Bar Fli, and Joe's latest large pattern bird.

## UNUSUAL LIQUIDS

Al Heinrich, DBA Aero Dyne, Box 17696, Irvine, California 92713, phone 714-593-5789, has been supplying Southern California modelers with some liquid items which aren't always easy to find, and is now expanding his market area with mail orders, shipped by UPS. What kinda liquids? How about nitrate dope and thinner, covering adhesive, acetone, Klotz Oil, N.P.G. Oil, high and low octane ignition fuel, several mixes of diesel fuel, Aero Dyno Mite (65% nitro fuel for .049 and under glow engines), and F.A.I. 80/20 glow

fuel.

Dopes are available in gallons, quarts, and pints. Diesel fuel comes in quarts and pints. Ignition and FAI fuel is packaged in gallons and quarts, and the Dyno Mite sells in quarts and pints. For more details and current prices, send A1 a stamped, self-addressed No. 10 envelope.

## THREE-VIEW REVIEW

Jack Little, Redwood City, California, just sent us samples of items he has placed on sale through our Classified Ad section. Wouldn't ordinarily review such products "Up Front," but these have a special attraction to this Scale-From-the-Golden-Era nut.

Jack came across a copy of an *Aircraft Yearbook-1929* published by the "Aeronautical Chamber of Commerce of America, Inc." The collection of aircraft three-views therein should be of interest to any modeler looking for particular documentation or some obscure design to model. Jack has copied, and put together three volumes: I and II each have 38 three-views, and Volume III has 31 engine two-views, plus an "Aircraft." Most have dimensions indicated. Photo reproduction isn't great, but better than none at all. Anyway, if you love biplanes . . .

The booklets are \$4.00 each, or \$10.00 for the lot, plus 10% postage. His street address is 1414-B Brewster Ave., Zip 94062, or check the classifieds.

## THINGS TO DO

The International Miniature Aircraft Association, Inc. (really "Not So Miniature," as it's an association for BIG Birds), is having its 2nd Annual International Giant Fun Fly Festival at the Byron Godbersen family estate in Ida Grove, Iowa, on August 27, 28, and 29, 1982. An estimated 1,000 modelers, "dedicated to the safe enjoyment of flying giant scale and non-scale R/C aircraft" will come to this geographically centrally located town from all parts of the U.S., also from Canada, France, Germany, and England.

The Byron complex, home of the well known Byron Originals line of large scale model aircraft kits, includes a huge castle with a full-scale hangar attached, which converts to a banquet hall. There is a full-scale airport with concrete runways, acres of sod and flat land, and an eight-acre man-made lake, complete with swans and a half-size, fully rigged and detailed model of the H.M.S. Bounty!

In addition to open flying all day every day, each pilot, for a flat fee of \$30, will receive complete breakfasts, barbecue style buffet dinners, lots of free "Bud," live music for entertainment and dancing, door prizes, non-competitive awards, special air shows, etc., etc. Canopies will be furnished for all flying pilots, and the 100 or so R/C exhibitors and manufacturers will be provided canopies, tables, chairs, electricity, etc. Several TV stations will be on hand, and it is expected that PM Magazine and "Real People" will want to get involved.

Interested? Contact Don Godfrey, IMAA Pres., at 254 Washington St., Binghamton, N.Y. 13901, (607) 722-1982, and send a stamped, self-addressed envelope.

★ ★ ★

The Keystone R/C Club is holding its

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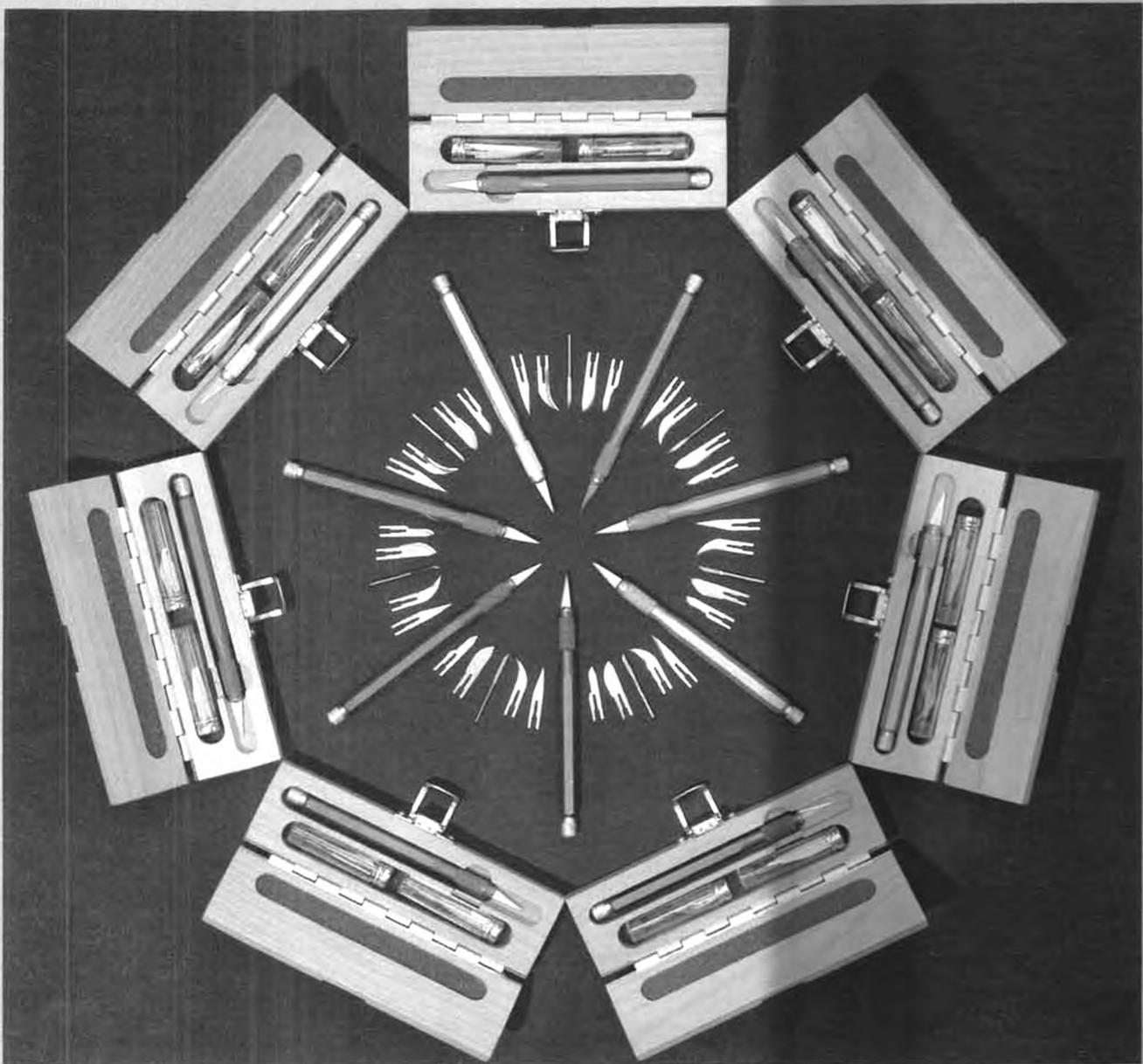
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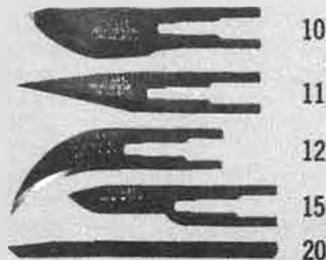
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Third Annual KRC *Electric Fly*, on September 18 and 19, 1982, in Hatfield, PA. Intended for the promotion of electric powered R/C model flying, it is a fun-fly for any type of electric powered model: scale, sport, aerobatic, old-timer, motor glider, etc. In addition to on-field charging facilities, there will also be an Electric Fly Clinic, including seminars, static displays, product information, flight demonstrations, selected parts and supplies, and personalized technical assistance. There's an informal Saturday evening social and plenty of nearby motels, dining, and campsites, so bring the family. For more information, contact Bob Kopski, 25 West End Dr., Lansdale, PA. 19446.

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# MODEL BUILDER

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Champions (also nicknamed The Hanno Prettner Benefit) is scheduled for November 4 through 7, 1982, in Las Vegas, Nevada, sponsored by Circus Circus Hotel/Casinos in Las Vegas and Reno. This year's \$100,000 pot makes it the richest purse in the history of competitive aeromodelling.

Leading contender for the \$25,000 first prize money is obviously Hanno Prettner, current World Champion and winner of all previous Circus Circus Tournament of Champions contests. The other 19 top aerobatic contenders include Wolfgang Matt, of Liechtenstein; Tony Bonetti, current U.S. Champ, Emerson, N.J.; Dave Brown, Hamilton, Ohio; Tony Frakowiack, Cincinnati, Ohio; Steve Helms, Pensacola Fla.; Dean Koger, Papillion, Neb.; Don Lowe, Altamonte Springs, Fla.; Mark Radcliff, St. Marys, W.Va.; Steve Stricker, Baltimore, Md.; Don Weitz, Henderson, Nev.; Dave Wilson, Fountain Valley, Ca.; V. Akiba and Giichi Naruke, Japan; Benito Bertolani, Italy; Ivan Kristensen, Canada; Jeff Tracy, Australia; and the entire 1981 FAI team from West Germany, Gunter Hoppe, Werner Schweiker, and the new young sensation, Bertram Lossen.

As last time, the contestants will be required to duplicate maneuvers performed by full-size aircraft, and will follow Aresti-style, continuous schedules while executing known compulsory, unknown compulsory, and free programs. Again, the models used must be scale replicas of real aerobatic aircraft.

Internationally recognized experts in the fields of both full-scale and model aerobatics will serve on the judges' panel headed by Dr. Jim Edwards, and this year's Contest Director is Phil Kraft.

For further information or reservations, write to Circus Circus Hotel/Casino, P.O. Box 14967, Las Vegas, Nev. 89114.

### AND STILL ANOTHER WAY

Dave Thornburg really started something, with his dissertation on covering with silk, especially the matter of sealing the fabric with those first few coats of dope. It was enough to stir Don Jenkins, Indianapolis, Indiana, into dusting off his old typewriter in order to pass on his method . . . one we've heard about before, but not in so much detail.

*I have silked, tissueed and even, on occasion, used condenser paper, but I have yet to find a better way to apply dope, than in the following related way . . . several years ago. Clarence Haught put me on to this little trick, which is not so much a trick as just using good old yankee ingenuity. He suggested that on my next oldtimer, I try a method that he had used with success.*

*Instead of using gelatin or talcum powder or other fillers, use one of those new-fangled foam applicators, which is shaped somewhat like a paint brush. I don't know what type of foam they use in these critters, but you're going to throw it away after using it for the few coats it takes to seal the silk, so why worry? The dope is not hot enough to melt the foam, although, it will "work on it," after using it for more than a day or so. Ya don't hafta clean out the thing, either just toss it in the trash, since about one*

*model is all you'll be able to get out of one applicator. Not too bad, considering they cost from 29¢ to 49¢, depending on size and how bad the store wants to sell them. I paid less than a buck for three of them, from 1" to 2", and I have used two and have been most pleased with the results.*

*As to why to use foam applicators? Well, for one thing, they don't shed HAIRS, and for another thing, you can apply the dope very accurately and not have a big dose of it go through the surface and either drop on to the opposite surface or blob up on the bottom of the surface you're doping. You can "pull" a coat of dope onto the surface, like pulling on a sheet or blanket, and it doesn't take as many coats to get ALL the silk completely sealed and air tight. I did manage to save one of the applicators by storing it in a small baggie, and I used it two days later, but the next one, I stored the same way for about 10 days and by that time, the foam was softening to the point that I didn't feel that it would stay on the handle! The dope "got to it," but only after a week and a half.*

*There may be applicators (foam) on the market which will withstand the solvents in thinned dope . . . You can pick up these applicators at about any paint or hardware store, even some drugstores handle them. The very porous state of the foam applicator allows you to "blot," more or less, any excess dope which might soak through the silk, and it sucks the dope right back into the applicator. After doping a coupla panels, I think anyone will be pleased with the way the dope applies with a foam applicator. And as mentioned, ya don't loose any thinner having to clean the thing out when you're done doping. Put it in a plastic bag, if you plan to use it real soon; otherwise, it will probably get too soft to use again. Also, I ALWAYS use several coats of NITRATE dope, to get the silk shrunk. If the model happens to be an oldtimer, I add one more coat of plasticised nitrate; if a glo engine is to be used, I add a coat of plasticised butyrate dope, maybe a thin coat and two heavier coats. Let the first coat of buty dry overnight and apply the next two fast, and dry with a low setting on an old hair dryer. Don't use excess heat, silk will eventually sag if exposed to these modern day HOT dryers.*

### ABOUT THAT SHARK!

If plans sales are any indication, a lot of our readers will be flying Harold Lanser's R/C version of the famous Stanzel Shark, as published in our April 1982 issue. A few, however, have come back with questions about two items inadvertently left out of the plans and instructions. Yes, the power to use is a sporty forty. As for the balance point, I could not catch up with Harold in time to get his answer, but noting the symmetrical stab and the Goldberg Falcon wing section, you can't go wrong starting with three inches aft of the leading edge (30% of chord). Remember, too far forward isn't bad. It just means that the elevator response might be a little sluggish and the model hates to get out of its groove. Too far back, though, and the elevator becomes too touchy, making it difficult to fly a smooth path, and in fact, just difficult to fly, period!

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John Pahlow with the record setting Spirit of St. Louis—Span: 11' 6"; Weight: 27 lbs. + 15 lbs. fuel; Engine: 2 H.P. QUADRA. Other members of the record setting team were Joe Bridl, Jim Claussen, Bob Feirlel and Tim Just.

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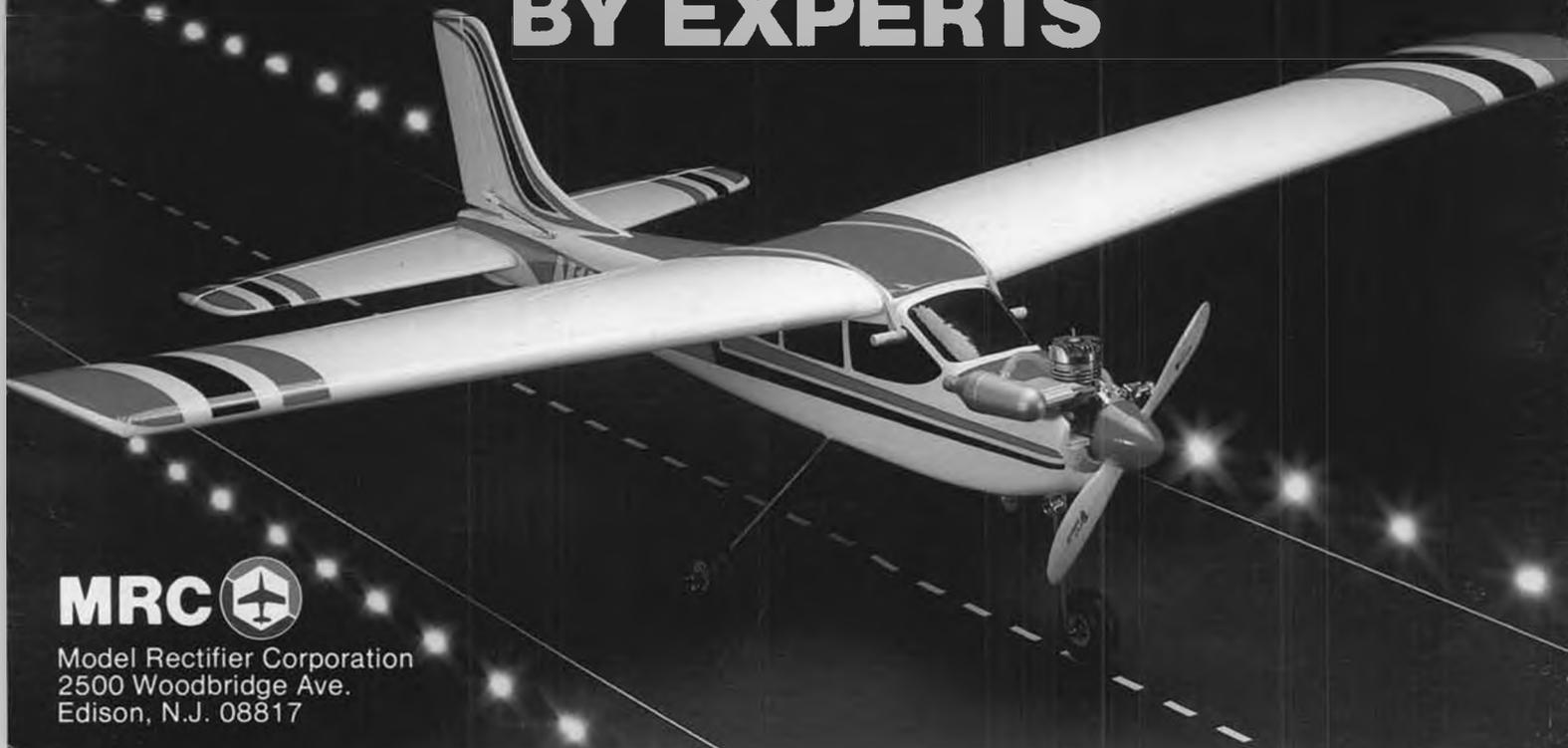
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