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LBATT



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DECEMBER

1979

volume 9, number 95

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COVER: Contrary to what you are probably thinking, that beautiful 1/3-scale Pitts is not from a Byron Originals kit. Credit for an outstanding example of scratch building goes to Wayne Stanford, of Nampa, Idaho. The model is of all balsa and ply construction, uses a Quadra for power and a Kraft radio for guidance. Miss Linda Rife, a student at Boise State University in Boise, Idaho, is the other lovely model in the photo. Ektachrome transparency by Tony Huber.

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- Aluminum Die Cast Wheels with Simulated Disc Brakes
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Kraft's Eleck Rider is the first real innovative change in the sport of radio control in many years. It steers and handles like a real motorcycle with positive control. It is more exciting and satisfying to drive than a radio controlled car, and great fun for beginning or advanced modelers. The average person becomes reasonably accomplished after ½-hour of practice. Whether for oval racing, motocross, road racing, or jumping, this new machine will unquestionably open an entirely new radio control sport. Order P/N 004-014. (Sugg. retail price, \$79.95).

Recommended for use with the motorcycle kit is Kraft's KP-2A or KP-2AW 2-channel radio control system. Also required are the rechargeable 6 cell Ni-Cad battery pack (P/N 004-015) • Genuine Chain Drive

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K

Patented Steering System

C) Beta

GOODSYEAR

LOCKHEED

 13.6" Long, 9.75" High, 3½ Pounds, 25 MPH Maximum Speed

\$24.95 and the Ni-Cad battery charger (either the Fast Rate Auto Charger P/N 004-005 \$24.95, or the Home Wall Charger P/N 004-004, \$7.95).

The Eleck Rider is also available as a Ready-to-Run with a 2channel radio control system installed. A motorcycle rechargeable battery pack (P/N 004-015), and a fast rate charger (P/N 001-005) are included. For Eleck Rider complete, order P/N 004-016. (Sugg. retail price, \$229.95.)

See your local hobby dealer for more information on the exciting Eleck Rider, and on Kraft's entire line of quality radio control products.

Manufacturer of the World's Finest Proportional R/C Equipment 450 West California Ave. P.O. Box 1268 Vista, CA 92083 (714) 724-7146 TWX 910 322 1471



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ROAR stock legal. Many accessories and bodies available.



Features Include:

- #740 shaker plate mounting plate for radio, servos, speed control, battery, antenna, and switch.
- #487 Electronic Proportional 12 Amp Speed Control
- High strength molded controlled flex chassis
- Assembled charge cord for 15 minute fast charge (works from 12 volt source).
- * Adjustable independent front suspension w/Ackerman steering.
- * .05 ROAR legal stock motor.
- Cycolac molded body, no painting or trimming necessary.
- Molded long wearing front tires & sponge rear tires.
- * Heavy duty hex rear axle.
- 6 sealed fast charge G.E. Nicad batteries wired & dip protected.
- Mylar decal sheet.
- * 2 cell disconnect for 4 cell operation.
- Speed: 30 MPH 50 KPH

#264 SCHKEE 6 CELL ASSEMBLED ELECTRIC R/C RACE CAR LESS RADIO WITH RACING SPEED CONTROLLER

Designed as a full race top of the line ROAR legal modified race car for those who have their own radio.

Complete with #486 proportional race speed control, modified 05 race motor, 6 Nicad batteries, battery charge cord, Lexan Jerobee chassis.

Many accessories and bodies available

Features Include:

- * Motor mounts in front or behind axle.
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 National winning #486 race
- proportional speed control with adjustable dynamic brake and 24 amp high torque adjustable output.
- Lexan control flex chassis complete with bumper.
- Assembled charge cord for 15 minute fast charge (works from 12 volt source).
- Adjustable independent front suspension w/Ackerman steering.
- Modified rewound (32 turns of 22 gauge) .05 motor balanced and epoxied for maximum speed and reliability — ROAR modified legal.
- Painted Lexan Schkee Can Am body.
 #603 foam rear tires full legal 1½"
- wide and set screw wheels. * Heavy duty hardened round rear axle.
- 6 sealed fast charge G.E. Nicad batteries wired and dip protected.
- #621 ball bearing front wheels and #605 foam front tires.
- * Rear axle ball bearing.
- Mylar decal sheet.
- * 2 cells disconnect for 4 cell operation.
- Speed: 34 MPH 56 KPH



ELECTRIC R/C CAR SPEED CONTROLLERS

The JoMac 487 and 486 fully proportional modular forward speed controls have been designed to control the speed of electric motor driven model cars, boats, airplanes and similar models. The power for the motor can be 3-7 series connected 1.2 volt Nicad battery cells. These controllers are made to plug in and operate with most positive pulse radio control systems. Versatile battery power arrangement allows your complete system to be powered from one battery pack if desired.



Replaces and is better than

servo/resistor assemblies in these ways:

- 1) Less expensive than servo alone.
- 2) More reliable than resistor.
- 3) Truer proportional speed.
- 4) Faster reaction time by at least .3 seconds going from off to high speed and from high to off because you don't wait for the servo to travel.
- 5) Smaller, more compact.
- 6) Lighter in weight.
- 7) Easier to mount.

Specifications:

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Control Circuitry Supply: 4 Series connected AA or Nicad cells (4-6 volts). Motor Supply: 3 - 7 Series connected Average Stall Current: 6 cells (05 motor) = 487/15 amp 486/25 amp.

- #487 Modular Electronic Speed Controller 12 Amp Output. This unit is similar to the controller on JoMac #407 radio system.
- #486 Modular Electronic Speed Controller 24 Amp Output w/Adjustable torque and brake. This unit is similar to the controller on JoMac #406 radio system that has won five (5) national championship electric races.

For Complete Information, Send \$1.00 to: JoMac Products Inc., 12702 N.E. 124th St., Kirkland, Washington 98033 (206) 823-2303

SOME "NEW" PRODUCTS WE'VE HAD FOR YEARS



8 Brilliant Colors White Orange Black Yellow Red Light Blue Green Dark Blue

4 Ounce Jar \$1.49 8 Ounce Jar \$2.75

SILICONE



Medium (.062 I.D. - .156 O.D.) SH-288 (1 foot pkg.) \$.55 SH-289 (25 foot roll) \$10.50 Large (.092 I.D. - .187 O.D.) SH-290 (1 foot pkg.) \$.60 SH-291 (25 foot roll) \$11.50

PLASTINAMEL

Several companies have recently discovered that modelers like to paint their molded foam airplanes. Sig has taken care of this problem for many years with a time proven and tested product. The most important feature of Plastinamel is that it can be painted directly on molded foam without any protective primer or filler coats being required. Fillers are heavy and the performance of foam airplanes deteriorate rapidly when they are overweight. Weigh and compare!

Plastinamel Thinner

PE-030	4 Oz. Jar	\$.75
PE-031	8 Oz. Can	\$1.25
PE-032	Pint Can	\$1.75

E FUEL TUBING

Silicone Tubing has been busting out all over as the last word in fuel line. Read some old Sig catalogs, friends! Our Silicone Heat-Proof Tubing has been heading the Fuel Line page for more back issues than we can find. The Sig Factory Fliers haven't tried any of the new competition brands, for how can they be better than a typical local example which, after 5 years of use in a fuel tank, never removed, is still like new and good for another 5 years. Experiences like this prove that our fuel line won't harden in fuel or melt on a hot engine. Try Sig Silicone Heat Proof and see for yourself.

SIG-BOND GLUE

There's no need to buy an aliphatic resin type of glue made by a non-modeling company. Sig-Bond comes from the people who know balsa and is intended for model airplane use. A test in your workshop will confirm that this is a great adhesive for general balsa wood assembly and construction, as well as on joints involving hardwood. Good sanding characteristics when used in external planking seams. The plastic squeeze bottle serves as a selfcontained glue gun. Get it all together with Sig Bond!

 SB-001
 2 Oz. - \$
 .75
 SB-003
 9 Oz. - \$1.79

 SB-002
 4-1/2 Oz. - \$1.19
 SB-004
 Pint - \$2.98



CB-001 Pint \$3.25 CB-002 Quart \$5.75



EP-001 4 Oz. Set \$2.95 EP-002 8 Oz. Set \$4.95

KWIK-SET

KWIK-SET

CORE-BOND

These newborn Brand X foam wing adhesives with catchy names and sooper-dooper slogans have reminded us that we've been hiding our light under a barrel when it comes to Core Bond. Over the years it has gained a loyal following among some top notch competition fliers because it is light in weight and sticks down evenly. Best of all, where beginners to foam wing covering are concerned, it is not so likely to dissolve foam during construction as other types of glue might do. Cover your next foam wing with tried and dependable Sig Core Bond.

EPOXY PUTTY EPOXOLITE

Hobby Dealers have almost had to add an extra shelf to accomodate all the fillers, putties, pastes and mixes that have been showing up on the market lately. But there is only one Epoxolite by Sig-the standard by which all the rest should be measured. Notice when you read construction articles in back issues of the model magazines, the number of times plans call for Epoxolite fillets or the text tells how to shape a scale landing gear fork with this material. Designers automatically think Epoxolite when putty is called for. Get the one and only original Sig Epoxolite-not an imitation.

SIG KWIK-SET EPOXY GLUE

Back when Kwik-Set appeared on the market, a lot of modelers bought their 5-minute epoxy at the hardware store. But when our exclusive formula, specially designed for model airplanes, was made available, that habit changed fast. So now everyone's trying to get into the act. We've tried a lot of these products but Kwik-Set measures up and more. TRY IT! YOU'LL STICK WITH KWIK-SET.

KS-001 2 Oz. Set (1 oz. each A & B) \$1.98 KS-002 4 Oz. Set (2 oz. each A & B) \$3.50 KS-003 8 Oz. Set (4 oz. each A & B) \$5.50

See your dealer first! To order direct, add \$1 postage under \$10. Postage free over \$10. No C.O.D. Send \$2 for the latest catalog of kits, accessories and supplies by SIG and other major companies. SIG MANUFACTURING CO., Inc. ... Montezuma, Ia. 50171



from Bill Northrop's workbench

• For the first time since starting this magazine 8 years, or 96 issues ago, we are about to experience something that is entirely new to us. This, the December 1979 issue, is being "put to bed" without our presence! Although we are, at the time of this writing, having all sorts of worry pangs, we are...er, attempting to write them off as "first time nervousness," realizing full well that the other members of the crew can pull it off with no more than the standard number of boo-boos that occur every month.

As mentioned in previous issues, we are fortunate to be a guest of the South Africans, who are hosting the 1979 R/C Aerobatic World Championships in Johannesburg. Although this would permit us to return in time to be in on the final days of closing the issue, we have decided to make this our first vacation in eight years, and will "triangle" return by way of London, arriving in Los Angeles on October 11. By the way, our other monthly duty, "R/C World," will be more than adequately filled by Sally Brown, who for the second consecutive year, has provided us with a fine account of pattern competition at the Nationals.

Hopefully we should be able to present a complete account of the World R/C Champs in our January 1980 issue, and in the following month, Tom Hutchinson will give us a detailed run-down on the Free Flight World Championships at Taft, California.

CARR FURLS HIS SAILS

"Strictly Sail" editor Rod Carr, whose personal business recently brought about a transfer from Annapolis, Mary-



GONE TO WORK, STOP BACK LATER!

land to Redmond, Washington, has announced the necessity of discontinuing his model yacht sails manufacturing. His spare time has dwindled to the point that he feels he can no longer handle this "after hours" job properly. Fortunately for us, he will continue to write the "Strictly Sail" column. His address is now 4115 172nd Ave. N.E., Redmond, WA 98052. Let him know what you'd like to read about in his column.

FLASH
WINNERS OF 1979 FAL
WORLD AFPORATIC
JOHANNESBURG, SOUTH AFRICA
INDIVIDUAL STANDINGS
1) Wolfgang Matt, Liechtenstein
2) Dave Brown, U.S.A.
3) Mark Radcliff, U.S.A.
4) Gunter Hoppe, West Germany
5) Ivan Kristensen, Canada
TEAM STANDINGS
1) U.S.A.
2) Italy
3) West Germany
4) Switzerland
5) Liechtenstein

NFFS INTERNATIONAL PLANBOOK

Conceived by Hardy Brodersen, edited by Dave Linstrum, and printed by Doug Galbreath for the National Free Flight Society, this landmark volume is now available by mail order. It was published as part of the F/F World Champs and contains over 109 drawings (in 8-1/2x 11-inch form) of models flown in that competition. The Nordic, Wakefield, and Power classes are well represented, and photos back up the technical presentation of plans and text. This is a collector's item and should be on any serious F/Fer's bookshelf. There are also historical articles and photos for O.T. fans.

If you did not attend the WC at Taft and get a copy, order yours now from NFFS Plans & Publications, 4858 Moorepark Ave., San Jose, CA 95129 USA. Price is \$10 plus postage. Book rate postage in USA is \$1, and 1st class (priority) is \$2.25; these rates also apply to Canada and Mexico. For Airmail to Europe, add \$3.50, and to the Far East add \$5 postage. All payment must be in U.S. funds and payable to the NFFS. You may wish to order a copy of the 1979 NFFS Symposium Report at the same time ... price is \$7.50, and the postage rates noted above apply for book rate and airmail. Support the National Free Flight Society, an international fraternity of F/F.

THINK SCALE!

That's the byword of the NASA (National Association of Scale Modelers), and the following message comes from its President, Bob Underwood, our "1 to 1" columnist.

"Dear Modeling Friend,

"The National Association of Scale Aeromodelers is in its second year of operation. We presently have a membership roster of just under 400 and are becoming actively involved in the many areas of scale modeling, not only on a national level, but internationally as well. A very interesting sidelight of NASA is that our membership comes from all three disciplines of the modeling community: free flight, control line, and radio control. In addition, unlike some of the special interest organizations, a large portion of our members fall in the sport classification."

If the above description appeals to you, join the organization and help each other. Dues are \$5 per year, and can be sent to Bob at 4109 Concord Oaks Dr., St. Louis, MO 63128.

AND IN CLOSING

The following excerpts are from an Continued on page 117



• As you have probably noticed from recent ads, Kraft Systems is now marketing an electric-powered R/C motor-cycle (!) and two all-foam electric R/C airplanes, a sort-of-scale Chipmunk and Cessna Cardinal. We have one of the motorcycles and Cardinals here at the R/C MB office and have been having a ball with them, and plan on doing reviews on both in the very near future.

The motorcycle is by far the most intriguing of the lot, mainly because it's so unusual; you've never seen anything like this before! Unlike your average R/C car, a certain amount of skill is needed just to keep this thing up on its wheels. Too much or too little speed going into a turn, and it falls over just like a target duck in a shooting gallery. Learning to drive it well is a real challenge; you can't do it right off the bat. Maybe that's one reason why the bike is so appealing.

The motorcycle is officially called the "Eleck Rider" and requires a 2-channel radio for steering and motor speed control. It sells for \$79.95 in kit form, without motor batteries or charger. The batteries will set you back another \$24.95. We'll talk about the charger in a minute.

The Chipmunk and Cardinal are both completely molded from foam and require only assembly of the major components ... takes about an hour. Radio installation takes another hour or so. Our Cardinal impressed us as having one of the cleanest molding jobs we've ever seen, and we would assume that the same is true of the Chipmunk. It is very docile and easy to fly and will run for 3 to 4 minutes on a charge. Both planes require a 2-channel R/C rig, and both sell for \$99.95, motor battery and charger not included. The battery is the same for either plane and retails at \$24.95.

Now let's talk about the charger. It's a nicely made item with a clockwork timer and L.E.D., which indicates whether or not the batteries are indeed being charged. It plugs into the lighter socket in your car and will charge the aforementioned motorcycle or airplane battery in 15 minutes. It comes ready to go with all connectors installed. Retail price is \$24.95.

Also relatively new from Kraft is the KP-3AS radio system, a logical extension of the 2-channel KP-2A and KP-2AS Sport Series radios. It was intended especially for boats, gliders, or small powered planes designed for 3-channel systems. A few of the features are open-gimbal sticks on the transmitter, plug-in crystals, plug-in receiver antenna, and a choice of KPS-14IIA or KPS-15IIA servos. They'll let you have one for just \$149.95. An optional ni-cd battery and charger kit is also available for \$49.95 for converting the system to ni-cds (it normally comes set up for dry cells).

From Kraft Systems, 450 W. California Ave., Vista, CA 92083.

. . .

Attention, all you Mammoth Scale fans out there! Looking for a real challenge? If so, send off to Barron's Scale Classics and get a set of their plans for the Curtiss F11C-2 Goshawk in exact 1/4-scale. The plans are full size, show all the patterns, and even include a construction manual. Construction is all balsa and plywood. As we said, the model is exact scale, right down to the airfoil section, size of the control surfaces, rib spacing, etc. This biggie was designed from photos of the real plane and from drawings by Wylam and Pete Westburg. Wingspan is 94-1/2 inches.

After December 1, the plans will sell for \$30 plus postage. However, if you get your order in before then, the price is \$20 plus \$2 postage. Plans are scheduled to be shipped rolled by December 1.

For more information, contact Barron's Scale Classics, 1213 Holly Spring Lane, Grand Blanc, MI 48439.

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Midwest has a new addition to its series of Axiflo ducted fans. It's the RK-20B, and is designed for high-performance .21 size engines such as the K&B 3.5.

This fan is different from previous Axiflo fans in that all the parts are already made and need only be assembled; it's



Five-cylinder running radial being offered by Executive Engines.





New items from Kraft, the KP-3AS 3-channel R/C unit (left) and unbelievable electric-powered R/C motorcycle.





Two new all-foam electric airplanes being imported by Kraft, a Chipmunk (left) and Cessna Cardinal.

not a builder's kit like the earlier Axiflo fans. There are only five major pieces in the whole unit, these being molded from ABS plastic, nylon, and glass-filled nylon. A 4-1/2 ounce fuel tank is integral with the unit, which should give a run of several minutes. The fan is complete with hardware, instruction booklet, and full-size drawings.

The RK-20B is claimed to put out 4 pounds of thrust (not bad at all!) and has been tested in several different designs. In addition, Midwest plans to produce a kit for an airplane called the "Jetster 20," an all-wood sport ship designed by Dick Sarpolus especially for the RK-20B. We'll let you know when it becomes available.

If you're interested, write to Midwest Products Co., 400 S. Indiana St., Hobart, IN 46342.

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Aeromarine Enterprises sent us a poop sheet on its new Sea Tiger engine, designed for large R/C boats. Displacement is 1.35 cu. in., and although it wasn't specified, we suspect that the engine was adapted from an O&R industrial engine. The Sea Tiger is available set up for either ignition (8,000-9,000 rpm) or glow (11,000-12,000 rpm). The engine is really well built. with roller bearings throughout. The ignition version has a 3pole magneto and fully enclosed waterproof points. The engine comes complete with male and female universal joints.

The Sea Tiger can be purchased with a recoil starter for \$129.95, or for \$275 with an Eastcraft Specialties' Lectra-Starter already installed. No extra servo is needed to operate the Lectra-Starter, and one charge on the ni-cd batteries will give 50 to 75 starts.

Optional equipment for the Sea Tiger

includes an aluminum engine mount, 7-1/8 inches wide, pre-drilled and tapped and complete with all mounting bolts. Another accessory is a Norco Cable Connector, specially adapted to the engine, for use with standard 3/16inch cable. The Norco connector goes for \$5.95.

Interested boaters should write to Aeromarine Enterprises, 709 Longboat Ave., Beachwood, NJ 08722.

Whoopee! V-2 and V-3 size spark plugs are again available! Take a look at the ad on page 114. Prominent antique engine collector Dick Dwyer, of Replica Engines, has made arrangements with NGK to produce a number of 1/4-32 spark plugs. Dick sent us a couple to try out, and while we didn't have time to do a test, we have to say that they are beautifully made and well worth the asking price of \$4.95. Modelers who have tried these plugs state that they perform very well indeed.

The plugs are available now from Replica Engines, 14600 Ramstad Dr., San Jose, CA 95127.

It's now official: the running radials being produced by Executive Engines are finally available for public consumption. And from the photos we've seen, they look pretty darn good. They are available in five and seven-cylinder versions and are four-strokers, which accounts for the more than 300 components in each one. These engines are built to last, as attested to by the following, quoted from the factory info sheet:

"Crankcase, cooling fins, pistons and cylinder heads are machined aluminum. Crankshaft, cam, cam followers, rocker shafts and valves are hardened steel. Cylinder liners are cast iron. Pistons are aluminum with 2 cast iron rings. Valve guides and seats are phosphor bronze. The crankshaft is supported by 2 ball bearings and the cam assembly by 2 ball bearings. The master rod rides on needle bearings."

The five-cylinder engine has .96 cu. in., the seven-cylinder version 1.35 cu. in. Average weight is about a pound and a half. The rpm range for both is listed at 1,000 to 5,000 rpm, although the size prop being used was not mentioned. Each engine is test run at the factory before being shipped to insure that each one is in perfect working order.

Whether or not the running radials are rugged and reliable enough to be practical for the average modeler, only time will tell. Introductory price of the five-lunger is \$685, or \$785 for the seven. You can also get the engine with the crankcase, cooling fins and engine mount anodized black, for an extra \$50. To learn more, write to Executive Engines, 16650 S. 104th Ave., Orland Park, 1L 60462.

Jim Crocket is at it again! Free flighters know Jim as the fellow up in Fresno, California, who makes all sorts of hardto-get and many one-of-a-kind items for various types of free flight models. All of Jim's products are of first class quality, and his newest offering is no exception, although this time it has more to do with the flier than the model. What it is, see, is a "Survival Kit," a zippered bag and belt that is worn around the waist and which can be used to carry all sorts of good things ... a can of beer, tools, a can of beer, rolls of film, a can of beer, your lunch ... maybe even a can of beer!

The bag has a removable inside liner



Jim Crocket's "Survival Kit," just the thing for thirsty free flighters.



"Seguin" steam tugboat kit from The Laughing Whale.



The Sea Tiger, a 1.35 cu. in. engine for large R/C boats, from Aeromarine Enterprises.

that keeps things hot as well as cold. The bag itself is a rust color, the belt and liner are gold. The Survival Kit is presently available direct only. Introductory price is \$19.95, plus \$2 for handling and shipping. California residents add 6% sales tax. Order from Jim Crocket Replicas, 1442 N. Fruit Ave., Fresno, CA 93728.

That neat steam tugboat in one of the photos is a product of a company called The Laughing Whale (no joke, that's really the name of the company!). The boat is a 1/4" = 1' model of the "Seguin," the only wooden steam tugboat left in the country. The kit is exact scale throughout and can be powered by a small steam engine or electric motor and guided by R/C. The kit features plankon-frame construction, complete plans and instructions, material for the deck, cabin, keel, rudder, spars, etc., and a complete fittings set that includes the prop, shaft, log, stanchions, running lights, steering wheel, lifeboat, davits, stack, whistle, blocks and rigging cord. Sounds like a mighty complete kit! Overall length is 26 inches, beam is 5 inches.

The Seguin kit is being produced in limited numbers. Orders will be filled on

a first-come, first-serve basis. Retail price is \$97.50. By the way, this company has an extensive line of R/C boat kits and plans. Why not write and see what they have to offer? The Laughing Whale, Box 191, Wiscasset, ME 04578.

As is evident by one of our photos, there is yet one more 1/4-scale dummy pilot for modelers to choose from, this one being made by Bud Barkley's Vintage Models. It comes in two pieces, as most dummy pilots do, and includes material for making a scarf and a bit of fur for his jacket collar...really adds the finishing touch. Also included is an excellent rundown on how to paint him for a realistic appearance. Retail price is \$10.95 (gulp). It's a product of Bud Barkley's Vintage Models, Rural Rt. No. 4, Smiths Falls, Ontario, Canada K7A 455.

Rounding out the list this month is a new kit from Lou Andrews, his first in what seems like quite a while. It's called the "Quikray 500" and was designed with Quickie 500 and AMA Sport Pylon Racing events in mind, and looks about what you'd expect a high-wing Quickie 500 racer to look like. Span is just over 50

Latest offering from Bud Barkley, a 1/4-scale dummy pilot.

inches, area 503 sq. in., flying weight is 3-1/2 lbs., and the ship will fly with .19 to .45 size engines. Construction is all balsa and plywood, but that's all we can tell you, as the info sheet states that there are "A lot of surprises in this kit. We will not tell you so you will be surprised and also amazed." You'll have to check it out yourself at your local hobby shop.

The Quikray 500 goes for \$47.95 and is now in full production. Find out more (if they'll tell you!) from Andrews Aircraft Model Co., U.S. Route 1, Topsfield, MA 01983.

SAFE FLYING









Midwest's new Axiflo RK-20B ducted fan for .21 size engines.





Dave Brown, 1st in Masters, picks up his AMA and NSRCA trophies from Jim Vanderbeck.

Dave Brown and his wife, Sally, with their Tiporare. Uses an O.S. 61 FSR and 7-channel World Engines radio. Dave had some problems on Friday, had to land without ailerons (see text).



This month, Sally Brown takes over for an absent Bill Northrop with a blow-by-blow report on the R/C Pattern competition at the '79 Nats.

 NATS! How I do love the Nats! People. planes with radios, planes with lines, old friends, planes that are fast and sleek, gliders that are quiet, helicopters, new friends, free flight, buying, selling, trading, helping beginners, talkingtalking- TALKING, stimulating, frustrating, time consuming, happy, tired, glad-we-came-to-the-Nats-again feelings. I am always amazed coming home from the Nats at the variety of people and events which take place during that week in August, and although there are "discussions" and even a few arguments, the overall feeling is one of helping one another and cooperation. It is a rather good feeling, especially when you get home and pick up the newspapers and read about the ten murders which took place while you were gone.

This year's big event was held in Lincoln. Nebraska, and its emblem was an ear of corn, which we soon found out was very appropriate... miles and miles of corn wherever you looked is what Nebraska is made of, on first glance. On second glance you see lovely state parks, lakes, beautiful rolling hills with stately old farmhouses. It did my definitely country New England heart good (something about taking the girl off the farm but not the farm out of the girl). Anyway the state is beautiful and so, as we soon



Mid-air! Bailey Reese's Curare (left) and Mark Doucey's Dirty Birdy came together with spectacular results. The Curare is somewhat intact, but write off one Dirty Birdy.



Carl Goldberg never misses the Nats. Hope he didn't travel all the way on that thing!

found out, were the people ... as friendly and helpful as any we've met.

Dave, the kids and I packed up our camper and left Cincinnati for Lincoln on Friday, July 27. It took us approximately 16 hours to reach our destination, but finally, on early Saturday afternoon, we saw the airport signs and rejoiced as the trip was almost over (we



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Great way to set up your lines so that every pilot can see just where he is in the rotation. Saves a lot of questions, also saves having to call the pilots to the line, as they can see when they are due to fly. Somebody was really thinking!

thought!). After traveling around the airport for half an hour amid grumbles about signs not visible, we finally stopped at the National Guard post for directions. It seems we were on the wrong side of the airport and had to get back on the highway for another couple of exits. We did this and found our way to AMA headquarters, where we greeted them with "Where the H...'s the signs?" It seems AMA had put the signs up twice, and it also seems an overzealous environmental agency had taken them down within an hour! They had a call in to the state department and eventually a



Bill Seidler presents Dean Koger (left) with his trophy for 2nd place win in Masters.



Note the similarities in Joe Gross's Thunderbirds (in background) and Dean Koger's EU-I's. All beautiful fliers.



Ron Hesselbrock in deep discussion. His plane is a Tiporare, soon to be an R/C MB construction feature.



Roy Speights flew this Rossi-powered Curare to 5th in Advanced.

few signs were allowed to remain! I had a good laugh and decided this trip would be worth it after all.

The site was an old military base which had been made over and added onto, until today it has a large Air National Guard unit there plus a reasonably busy commercial airport plus many and varied small businesses in what were old military buildings. We even had a fire station next door to AMA headquarters. AMA headquarters was in fact an old fire station. AMA had many small and medium rooms for doing various chores, a medium large room which held a small concession area and where all airplane and transmitter processing was done, then a larger room for their AMA booth, information, bulletin boards and scale cages. This was quite a bit smaller than in years past, but adequate as long as

everyone was friends!

All flying that would be done on the site (helicopter, soaring, free flight, and indoor were all off the base) would be done within easy walking distance. All the control line events were along one side and behind AMA headquarters. In front of AMA headquarters was a large (very large!) cement area (it was an old taxi ramp), and all R/C flying was done there. Quarter Midget was scheduled for Monday-Wednesday morning from 8 a.m.-1 p.m., Pattern qualifying Monday-Thursday 2 p.m.-8 p.m., Formula I Thursday-Saturday 8 a.m.-1 p.m., Pattern finals Friday and Saturday 2 p.m.-5 p.m., Scale 5 p.m.-8 p.m. those evenings and Sunday morning. All of this took place within four hundred feet of headquarters! Some change from Lake Charles.

Sunday (July 29) was transmitter processing for the Pattern people, so attendance really began to liven up. Dave and I helped process, and it really is fun . . . you get to see every Pattern flier there. We ended up with approximately 140 Pattern fliers, with the breakdown to classes like this: 63 Novice, 30 Advanced, 23 Expert, and 24 Masters. This was down some from Lake Charles in 1978, where we had nearly 160, and I was amazed at the names missing: Chidgey, Helms, Radcliff, Lowe, Oddino, Kimbro, to name just a few. In fact, in looking back over the Masters Tournament list, only about 14 of those 36 fliers were at the Nats. I realize that for many of them it was a work-vacation problem, but we

Continued on page 113



Tim Just, 1st in Novice, flew a Deception with Rossi, Kraft radio.



Brian Crossley, 1st in Advanced, flew a Bootlegger. Rossi, Kraft.



Joe Bridi placed 5th in Masters, shown here accepting trophy from Bill Seidler.



Sally Brown was awarded an NSRCA plaque for all her work in that organization.



Cliff Hiatt, 1st in Expert, also flew a Bootlegger but with OPS engine, Kraft.



U.S. Precision Scale team for the 1980 World Champs, I to r: Bob Underwood with his Hiperbipe, Bob Wischer with his Piel Beryl, and George Rose with his P6E.



Hal Parenti accepts congrats from Sid Axelrod for his 3rd place win in Sport Scale. Bearcat will be a future Top Flite kit.



THE 1979 NATIONALS

The fields of corn that surround it cannot hide the little big city that is capped by an unusual, towering capital building. Unlike the normal squat, domed structures we so often see in the states' central city, the Nebraska government center soars skyward, topped by a 19-foot statue called the "Sower."

The Nats week this year enjoyed the fine hospitality of Lincoln, excellent dormitory facilities at the University of Nebraska, and for the most part, good weather that while "warm," did not show complete evidence of the fact that neighboring Omaha is one of the five windiest cities in the U.S. The phrase "for the most part" has a real meaning for the scalers, since the "best" wind was saved for Saturday, when both C/L and R/C were flown. An unfortunate aspect of this was that since C/L was flown on one day only. the FAI team for the Internats in Canada next year was selected in a very strong wind.

But we're ahead of ourselves! This article will encompass not only R/C but what we could cover in free flight and control line as well. This proved to be a difficult task for the Underwoods, since we were responsible for the AMA Souvenir sales, and along with Dave and Elsie Abel and family, took care of the AMA Cub (Delta Dart) program, which covered a three-day period. In addition, Dad was supposed to be competing. As a result, some of the coverage got a little thin at times.

Scale is really an all-week affair, starting early with indoor and stretching all week to the very last day. This was the first opportunity for us to see indoor scale, and it was super fun. Several things come to mind as being significant about the competition. The most important is certainly the age span represented. The person accustomed to the almost all open age members to be found in R/C finds it refreshing to watch youngsters doing their scale thing. One might point out a variety in sexes as well; however, nature seems to have limited that somewhat.

While there were standard types of models represented, some adventurous souls moved into those difficult and unusual areas. Two examples that come to mind are the Bristol Type 2 biplane of Bill Stroman and the Martin Baker MB-2 of senior Guy Larsen. It was intriguing to watch Guy's MB-2 "roar" from the floor and cruise at a relatively high speed,



U.S. Sport Scale team for Ottawa in '80, I to r: Ralph Jackson with his Windecker Eagle, Hal Parenti with his Bearcat, and George Buso with his Piper Navajo.



Garland Hamilton's Corsair was a victim of radio interference while it was on the ground, took off by itself and clobbered a fence.



Bob Karlsson just missed getting on the U.S. Sport Scale team with his PT-22, placed 4th.



George Buso accepts 1st place Sport Scale trophy from Scale Director John Preston, who was also in charge of F/F Scale events.



Bob Wischer (right) accepts 1st place Precision Scale congrats from John Preston. It's on to Ottawa in '80!

compared to other types, in large sweeping curves. I had just happened into the Larsen's area prior to the flight and I had the feeling that Guy's dad, Vic, felt there were a mite too much winds packed into the low-winger, but it turned out fine and the happy faces punctuated the success as the timer called it official as the model was still going up.

Watching Bill Stroman enjoy himself with the spidery Bristol was equally great. The early trim flights contained some of those unstable elements that make one hold his breath. Then, gradually, the biplane was brought into trim in the very warm, humid air of the auditorium. Bill was frequently hatted, since he claimed the flash glare off his shiny, perspiration-dotted pate made pictures difficult.

We were greatly pleased to see the



Two Hiperbipes... one's just a little bigger than the other. Alas, Bob Underwood's Hiperbipe is no more, a victim of deliberate radio interference on the last day. A new one is under way.



George Buso's Piper Navajo is a fairly large airplane, weighs 15 lbs. Two Webra Blackhead .60's move the 83-inch airplane at a rapid rate.

many spectators seated in the auditorium enjoying not only the scale flights but the Easy B and Pennyplanes that were softly bouncing off the smooth ceiling. Even though many were nonmodelers, they appreciated the flight achievements and registered their approval with vigorous rounds of applause. As they moved their models from center stage, some of the successful modelers seemed almost embarrassed at the spontaneous feelings of appreciation.

Several of the flights, such as those of Dan Domina and Clarence Mather, went to the ceiling. It was intriguing to watch the little gems slowly circle upward and bounce gently against the black. Dan's model often set up an unusual oscillation that gave one the feeling that a miniature student pilot aboard had contracted a case of slow motion hiccups.

Through all of this one could sense the dedication of each modeler. Whether the attempt was to wring out the longest

flight while perhaps sacrificing some static points, or achieving a super scale effort knowing the flight might be marginal, and exploring the unusual types, each person worked hard at making it a memorable event.

I regret that I can provide no color from the outdoor free flight scale event, since other duties prevented my being there. From what I understand, though, there was a good deal of wind and the site did not lend itself well to scale competition.

The control line competition, as noted earlier, was plagued with the modeler's curse, wind. It is most unfortunate that this should happen, since the control line entries were up with some 18 sport scale models and 11 precision scale, 7 of which were open entries.

The wind hovered in the 15-20 mph area all day from the 8 a.m. start to the 5 p.m. cutoff. Of those who made an attempt, most executed shortened or aborted flights, and damage became



Earl Thompson's outstanding Focke-Wulf 44 placed 4th in Precision, is the alternate for the U.S. team in 1980.



Precision Scale static judges Bob Karlsson, Le Roy Weber, and Bill Knepp giving Bob Wischer's Piel Beryl the once-over.



Guy Larsen with his very rare Martin Baker MB-2, 1st in Sr. Indoor F/F Scale.

almost a way of life. The models which were flying on many multi lines, such as Ralph Burstine's F4B-4 with its five lines, suffered from the monstrous drag created.

Of the seven open precision scale entries, only five made official flight attempts. Mike Gretz topped the class with a total of 543.2 points to once again lead the FAI team for 1980. Keith Trostle, flying an MB-5, was second with a total of 473.8, and Ken Long and his Betty Bomber finished third with 470.5. The alternate is Dan Osdoba's Zlin, with 428.8 points. This competition for the team places became a war of nerves. The control line competition is set up in a manner that when you are ready for an



Another unusual entry, a Bristol Flying Laboratory by Bill Stroman. John Preston photo.

official flight, you take it, since no flight order is set up. It was obvious to many that the early flights were marginal. The hope then was that the wind would die later, and so a waiting game began. This is, of course, a great source of frustration to everyone . . . contestants, officials, and spectators. It was just shortly before five that Ken Long made his official flight that bested Dan Osdoba's earlier flight. Hopefully, arrangements can be made next year to fly two half-days in an attempt to overcome Mother Nature's slaps.

Sport Scale competition resulted in a lower percentage of scalers making an attempt, with only five out of the 10 open doing so. Interestingly, all eight of the Jr. and Sr. contestants made one or more official flights.

Two youngsters provided some interest for the day. Kathy Kirn flew a Bonanza







Condenser paper really shows the structure on Dan Domina's Cub, 1st in Indoor Scale.

to first in Jr./Sr. Sport Scale. She had, as my girls described it, a "little tiny plane" which we believe was powered by an .049 on monoline. Kathy had her hands full in the wind, but managed it sans throttle and all.

Dan Abel had the conversation piece with his $12-\frac{1}{2}$ lb. ducted fan Mig-15. While he made an attempt, the model did not make an official flight. During the effort, various and sundry parts such as gear doors, etc. were shed about the circle. It is great fun to watch the starting procedure, since it appears that the Mig is swallowing Dan's dad, Dave, who reaches clear down the model from the nose to place the starter against the K&B 7.5.

Dan had volunteered to fly in the Sunday airshow, and he and his dad worked until 1 a.m. to get it back into shape to fly. Sure enough, on Sunday afternoon, the show included a complete flight much to the delight of all. (Not the least of whom was Dan.)

A note of concern was sounded with the entry of several profile fuselage models. The controversy developed as to whether they filled the spirit of the rules, even though they may meet the letter of the rules. While they were at first disqualified from competition, this was later reversed on the basis of, first, the specific rule used for the disqualification not seeming to apply, and secondly, that they had competed in

Continued on page 84



Mike Gretz's PT-19, 2nd in Sport Scale C/L. Ground handling proved to be a real problem in high winds.



A 3rd place win for Keith Trostle's Martin Baker MB-5 earned him a place on the 1980 U.S. C/L Scale team. Had highest static score.



'Twas the new Christmas issue And here at my place I was racking my brain Trying to fill all this space When all at once I heard such a clatter 'Twas the mailman at last I hope with a letter I ran to the mailbox and hoped for a pair But I came back downcast and full of dispair "Some day I'll get smart and give up this column"

I said with a voice slightly crackling and solemn.

C'MON, GUYS,

SEND ME SOME LETTERS. (I want you all to know that the typist-

WRONG

wife had nothing to do with that!)

As the Christmas season nears it is not only the season to be jolly but also the season when one should be getting down to the basement to create next Flight

Conducted by DAVE BROWN 8534 Huddleston Dr. Cincinnati, OH 45236

year's masterpiece. Among the most common mistakes I see is in the carving and hinging of control surfaces, and I've decided to cover this in the column this month. To begin with, many modelers seem to think that a rounded joint is the correct way to join the control surfaces to the stab, fin, and wing. In the old days, when we used cloth hinges, this was true, but today with the flex hinges or pinned type hinges, the rounded surfaces tend only to bind up the control surfaces. Fig. 1 shows the wrong and the right way.

I have said many times that it is important that you get a tight seal between the control surfaces and the surface they are hinged to. In order to accurately carve the bevel on the leading edge of the control surfaces, I use a few simple jigs which I have made up as carving guides. I have three different jigs, for the ailerons, elevators, and rudder. These all have different angles

RIGHT



to enable me to carve the appropriate angle on each control surface. I made my jigs out of maple on a tilt-arbor tablesaw, and they have held up well over the years. The cross-section of each is shown in Fig. 2.

The elevator and rudder jigs are faced with a piece of sandpaper to keep the surface from slipping while you carve the bevel on them. The aileron jig doesn't need the sandpaper, as on it we simply shim the trailing edge of the aileron parallel with the base of the jig and carve away. The use of the aileron jig is shown in Fig. 3.

The elevators and rudder are done in a similar fashion, except that due to the fact that they are usually tapered, they must be aligned by eyeball using a small straightedge. Start by drawing a center line on the leading edge of the surface to be carved, then align it in the jig as per Fig. 4 and carve and sand in the same way as the ailerons. This system works best if you can mount the jig in a vise so you can hold the surface securely while carving. If it slips, realign it before continuing.

Once you have accurately carved the leading edge bevels, it is important that you install the hinges so that the pivot point is exactly at the apex of the bevel,

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FIG. 1



FIG. 3

DECEMBER 1979



©A5A®VIGILANTE

By PAVEL BOSAK . . . Jet models don't all have to be ducted fans, nor do they have to look strange with an engine and prop in the nose. From Czechoslovakia, an interesting example for .40 engines and sharp pilots.

• After testing a pusher engine on a delta model and conducting experiments with this concept on the model L-39 Albatros, which was published in the January 1978 issue of RCM, and after the great interest shown by model builders (I received a lot of letters not only from the U.S.A. but also from Europe, Brazil, and even from Singapore and the Philippines), I wanted to build another model of this same concept. I decided to build a semi-scale model of the ASA Vigilante, which best suited my concept.

The development of the full-size Vigilante began in the later part of the fifties, when the U.S. Navy needed a carrier-based plane which would be able to transport an A-bomb. The first prototype was called the Vigilante YA 33-1, and its maiden flight was on the 31st of August, 1958. The first four planes were in use by flight VAH-3. The automatic flight control system of the Vigilante was the top electronic system in its time. In the case of airplane A3J-1, new construction techniques were introduced, and the airplane was used in the development of the Navajo B-64 pilotless missile. Another constructional specialty was represented by the somewhat unusual way of throwing bombs backwards from the long tunnel bomb rack. In 1962, the designation A3J-1 was changed to ASA. In the same year ASA airplanes appeared on the deck of the aircraft carrier Enterprise. The development of the Vigilante went on in versions ASB and RA-5c. These types are a little bit different in shape. Because of a new fuel tank location, the shape of the upper fuselage part was changed.

MAIN TECHNICAL DATA Wingspan: 16.15 meters Length: 23.25 meters Maximum speed: 2,230 km/hr. Maximum speed at sea level: 1,260 km/hr. Service ceiling: 19,500 meters **DESCRIPTION OF MODEL**

The model is made for a .40 engine; that is why its measurements are not big. Thanks to its sweptback wings it is also space-saving. That is also the reason why the wings are not removable. The final result is a far lighter and more compact model. In comparison with an authentic scale aircraft, net wing area and elevator area are larger. Some unimportant details are also left out. In spite of it, the model looks elegant and is very impressive in flight.

CONSTRUCTION

Begin the construction with the fuselage sides. There are four altogether; two inner longer ones and two outer shorter ones. The inner sides are strengthened with full-length plywood doublers, the outer ones in the place



Pusher engine installation in the Vigilante. Note that each elevator has its own pushrod, cables used on original model.



The author prepping his bird for a flight. Highly unusual model draws much interest wherever it is flown.

where the main undercarriage blocks are located. Cut the fuselage formers. On former F4 fasten the nose wheel leg and to former F6 attach the engine mount. Epoxy the inner sides and formers together. Epoxy part of the fuselage bottom in place from the notch on the outer sides to about 4 inches aft. Epoxy the main undercarriage mounting block in place. Epoxy the half-finished fuselage and outer sides together, as shown on the plan. When doing the top and bottom sheeting, epoxy the wood with the grain going across the fuselage. Whey dry, attach the main undercarriage so that your model can stand. Now do the front bottom part sheeting between the inner sides and also epoxy the nose in place. It can be cut from hard balsa or from spruce. Do not try to save weight in the nose. Now close up the top fuselage part as far as the end. The outer sides must be a little bent in the rear fuselage part, and this we can do by epoxying a cross-grain balsa strip in the rear bottom fuselage area.

According to the plan, build the stab and fin. Both of them are of the same construction: a balsa frame covered on both sides. In the rudder there are also spruce spars which go as far as the fuselage bottom. Sand the stab and fin and epoxy them to the fuselage. Cut a hole for the stab in the outer sides and in the inner ones cut a groove in the balsa as deep as the plywood doublers. Cut a hole for the fin in the top fuselage part. Now epoxy the stab and fin in place.

Now it is time for the wings. According to the plan, cut ribs and the web W10. Epoxy ribs to W10 and at the same time epoxy the spars in place. Cut notches in the inner and outer fuselage sides so that both wing halves meet in the fuselage center and rib W1 touches the outer fuselage side. Epoxy plywood triangles W10 to the center of the webs. When dry, epoxy leading edge W9 and trailing edge W11 in place, then make bottom wing balsa sheeting. To our halffinished model add the tank, servo rails, servos, and pushrods. You can see on the plan how to place the pushrods and servos. The tank in the original model is placed at the center of gravity. This is, however, made possible by an engine with pump or in-line fuel pump, such as that by Robart. If you do not want to use a pump, place the tank in the rear fuselage part, but then you must put



Air inlet ducts are open all the way down the fuselage, provide cooling air to the engine. Engine doesn't get cooled unless the model is moving, so don't spend too much time on the ground.



Half-finished basic framework. Long nose permits placing radio gear far enough forward to compensate for the engine in the tail. A very short-coupled model!



Installation of Futaba radio in the prototype. Switch is mounted in hatch, a good idea... if nothing else, it keeps the hatch from getting lost.

some extra weight into the nose, and thus the model's weight is higher.

When pushrods are dry, finish the fuselage and wing sheeting. Epoxy the wing tips in place, and also the fin. Now cut from harder balsa the engine cowl, which is gradually formed into a cone. Finish up the balsa front fuselage sheeting. Sand the whole model. Cut off the top front part of the fuselage; thus we get a removable hatch for battery, servos, and receiver. Sand the hatch edges and epoxy plywood strips in place, as shown on the plan. After epoxying these strips, put the hatch back on the fuselage, but between the edges place a thin piece of plastic wrap so that these two parts do not become glued together. While the whole thing is drying, bind a rubber band around it. In the places where the hatch is held, epoxy two threaded bicycle spokes in place. The whole hatch is held by two

nipples. Epoxy inside the top hatch a strip of plywood and also the windows. Now sand the whole front part of the fuselage and cover the whole model with thin tissue. Make the mold for the canopy and form your own canopy in a vacuum-former such as a Formicator. Now epoxy the canopy in place. For a more realistic appearance you can place a figure of a pilot in the cockpit. The last job is to cut the rudder, ailerons, and elevators from balsa and fix them in place with nylon hinges.

PAINTING THE MODEL

The whole model, when covered, is painted with clear and colored dope. Lines imitating sheet metal are done with drawing ink. This is surely not the only method of painting, and anyone can choose his own. The color scheme on my model does not exist on any fullsize plane; it is a combination of various color schemes of different types. As a base for an original color scheme, use a magazine with a published description of the Vigilante.

ADJUSTING AND FLYING THE MODEL

Install the receiver, pushrods, and engine. Solder the wheels on and check if controls move smoothly. Put some extra weight into your model if necessary to achieve the balance point. The engine has no side thrust, but does have 2° of downthrust. Now adjust engine throttle action. As a muffler you can use a Muffl-air or a standard muffler turned against the flight direction. In contrast to standard models, the pusher propeller is

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FULL SIZE PLANS AVAILABLE - SEE PAGE 116





Quarter Midget flight line at the '79 Nats. Almost all are Prather Little Tonis.

Loren Holm provided a portable micro-computer that provided heat data, times, and standings at end of each round.

BY JOE KLAUSE PHOTOS BY AUTHOR UNLESS NOTED AT THE 79 NATS

• Some years ago, the Marx brothers clowned their way to success in a movie titled "A Day At The Races." During Nats week, there were six days of pylon races, but there was no clowning around. These guys were serious, and in their scheme of things, they were eminently successful. Fine pilots, mechanics, and weather together with acres of smooth concrete and competent officials ... what more could anyone want? Obviously, it was a good week. Here are



Bob Sonheim (left) helps Kim McLure refuel his really nice Prather Little Toni, powered by Rossi .15.

some observations together with the nitty gritty numbers. **QUARTER MIDGET**

Following the same practical scheduling of previous years, the Quarter Midget rounds were held on Monday through Wednesday. This year, however, Loren Holm, of Quincy, Illinois provided a portable microcomputer to assist in organizing and promulgating data for both Quarter Midget and Formula I. Within minutes of the end of each heat, there was a computer printout of the heat data ready for posting. Upon completion of a round, the printout included the overall standings and low time. Not only novel, but certainly very useful. Next time, Loren hopes they'll also let him generate the matrix.

As usual, there were several instances of instant rekitting. However, one of them generated a little extra attention. This time, someone planted his plane just about straight in, right between the number two and three pylons. You can easily appreciate that the adrenalin flowed heavy with that one!

What else was unusual? Well, one thing that caught my eye was the entry

by Kevin Nelson, of Waterloo, Iowa. It was modeled after a pre-WW II, V-tailed European Buggatti. As you can see in one of the accompanying photos, it's quite a change of pace from the typical



John Kilsdonk placed a very creditable 10th in only his second try at Nats Q-M.



Q-M impound area. That strange-looking bird in the foreground is a pre-WW II Buggatti racer by Kevin Nelson.



A slightly damaged but repaired racer. Cartoon style markings read, "Oh Nooooo! Repairs by Mr. Bill."



Formula I flight line. Some really beautiful ships were entered this year. Total entry count was 56.



Gary Hover, San Luis Obispo, CA, with Terry Tigre powered Prather Toni, 10th in F1.

Quarter Midget.

By noon Wednesday, the last round and flyoffs were over. Here are the final standings after the nine rounds:

1)	Wayne Yeager	33-1/2	
2)	Lyle Larson	32	:
3)	Dennis Sumner	31	+
4)	Jimmy Bartels	29-1/2	Ē
5)	Kenneth Heatlie	29	
6)	Dave Pearce	28	T
7)	Don Fuller	28	-
8)	Richard Steine	27-1/2	F
9)	Douglas Brueshaber	27	6
0)	John Kilsdonk	27	Ĕ
		E 1	

A couple of other comments: Fourth place Jimmy Bartels, a Senior, certainly deserves special mention for his very professional effort. Similarly, Wayne Yeager merits a kudo for his fast time of 1:31.8. Finally, four members of the CAPS (Canadian American Pylon So-



Dennis O'Brien's Polecat was absolutely immaculate, was 2nd in static judging.

ciety) came to the Nats. All four finished in the top ten . . . first, third, fifth, and tenth. Not too shabby by any standard. **FORMULA I**

There were fifty-six entries this year. The top ten of them finished within six points of each other. That'll give you a good idea of the quality of the flight competition. But let's not forget the handicap judging. Who could possibly



Eric Meyers, Champagne, IL, takes a break inside his trailer, equipped with tools, workbench, the works. A workshop on wheels!

envy those judges who must decide the handicap line-up? Sometimes it almost seems that it has to be a mental toss of a coin to give the nod to one aircraft over another one. If you think I'm exaggerating, take a look at the photo of Dennis O'Brien's extraordinary Polecat. He was second in line!

As mentioned, flight competition was intense. No one established supremacy, and nothing was settled until the tenth and final round. When it was over, here's how they stood:

1)	Bill Preis	39
2)	Dave Shadel	38
3)	Eric Meyers	37
4)	Bill Grove	37
5)	Jim Moorehead	36
6)	Barrett Clay	35
7)	John McDermott	35
8)	Ron Gilman	34
9)	Dave Pearce	34
10)	Gary Hover	33
C.	managed at an Oth Deate for	In the

Congratulations to Bill Preis for his very consistent performance. Ironically, his one second place finish in the fifth round was his fastest heat time (1:18.7); he simply was not flagged off first. Fastest overall time was 1.17.9 by Jim Moorehead.

In summary, it was quality competition throughout the week. Friendships were made and renewed, and chances are that more than a couple said, "Wait until next year..."





Bill Preis (right) won 1st in Formula 1 with 39 out of a possible 40 points, used an S.T. X-40 in a Toni.



Second in F1 was Dave Shadel (left), Vista, CA, with 38 points. Only 6 points separated the top ten entries.



* EXCALIBER II *

By JERRY DUNLAP ... This fully competitive outboard tunnel-hull racing boat by our "R/C Power Boats" columnist has been winning races and setting records since early 1977. It's the first to go over 40 mph.

• The development of the Excaliber model outboard design has been somewhat of an evolutionary process covering the last three years. Since finding one's roots has become a rather "in" thing recently, let me take a little time to trace the roots of the Excaliber II model outboard tunnel.

The original Excaliber concept was developed by a good friend of mine, David Knowlen, back in February of 1977. Since designing the first Excaliber, David has moved on to slightly bigger things. He is the designer of the new Circus Circus unlimited hydroplane and its sister hull, the Squire Shop. At the time of this writing, David is serving as a design consultant for the Circus Circus unlimited racing team. David's involvement with full-size racing hydroplanes goes back over twelve years to a time when he designed, built, and raced his own 280 class limited hydroplane. In recent years, David has restricted his interest in hydroplanes to the research and development phases of this sport.

Although he now designs full-scale racing boats, David was an avid model boat and airplane builder in his youth. When the K&B .21 Outboard first became available in late 1976, David expressed an interest in designing a boat for me to use with this new power source. He provided me with aset of lines in February of 1977, and the original boat was featured in a fall issue of RC Sportsman in 1977. The original Excaliber was 29-1/2 inches in length and featured a tunnel width of 8-1/2 inches. I set a NAMBA straightaway record of 35.95 mph in March of 1977 with this boat. That record has since been broken a number of times. I used this same boat for racing during the spring and early summer of 1977 with pretty good results. However, I could see that the boat was a little bigger than it needed to be, and its potential was limited.

In July of 1977, three weeks prior to the 1977 NAMBA Nats in Reno, Nevada, I contacted David about redesigning the boat by making it smaller. At that time, he was heavily involved in other projects and couldn't take the time to redesign the boat. He said he wouldn't mind if I used his ideas to design a smaller version. Using the basic design concepts provided by David, I scaled the boat down to 26-1/2 inches in length, with a tunnel width of 7-1/2 inches. The new hull was completed just prior to the big race in Reno. The 1977 NAMBA Nats was its first race, and it placed first out of 48 entries in the outboard class. That hull went on to set an oval course record, win the District 8 Outboard High Point Award in 1977, and became the first stock outboard tunnel to be officially timed at over 40 mph.

As often happens when you hit upon something that works pretty well, others want to build your design. Such was the case with the redesigned Excaliber, to which I now added "II" after the name. During 1978, John Havens, Jr., from Olympia, Washington, used the Excaliber II design to establish a new stock outboard record in the NAMBA straightaway of just over 42 mph. Although this record has been broken by a hydroplane design, I think it still stands for stock outboard tunnel. John also used his



The author (left) and Dennis Caines, 1st and 2nd at Dist. 8 Points race in May '79.

Excaliber II to win the 1978 District 8 High Point Award, and my Excaliber II placed second to his. During the first half of the 1979 racing season, the Excaliber II belonging to Dennis Caines, also from Olympia, was the leading boat in District 8 Points. As the results show, the Excaliber II has been a rather successful design.

The Excaliber II has been built by a number of people, both experienced and inexperienced model boaters. It offers semi-scale appearance, and the construction isn't too difficult. The boat should be built entirely from plywood; the specific sizes needed are called out on the plans. Use epoxy glues for all



A simple building jig for the center section is a must; this one is made from plywood.



The center section framework attached to the building jig with C-clamps.



Center section bottom being attached to the framework. Clamps and masking tape and pins hold the plywood sheet in place.

construction. I personally prefer to use five-minute epoxies for building frameworks and slower drying epoxies for sheeting the hull and sponsons. Since the plywood will need to be cut to shape, it will be necessary to have access to either a band saw or a jig saw. A question that is often asked me is, "How long will it take to build this boat?" There is obviously no way I can give anyone an answer to how long it will take them to build the Excaliber II. However, I did build the first Excaliber II, paint it with clear, and install my equipment, in four days. I should also mention that those four days were spent entirely devoted to that project . . . like 12 hours a day. Well, let's get started with the construction of the Excaliber II outboard tunnel.

THE BUILDING JIG

A most important part of building this model is the use of a building jig for assembling the center section. This jig is simply a flat building surface with upright pieces attached to it where the first three frames are located. The importance of building a true center section cannot be overly emphasized,



The center section with the top pieces glued in place.



Rear of the center section.

since proper alignment of the sponsons depends on a squarely-built center section. The interlocking pieces of the center section require the building jig to hold them in proper alignment while the bottom is being attached. I have included a photo of the very simple jig used for building the boat. Any type of material can be used for the building jig. ASSEMBLING THE CENTER SECTION

The framework for the center section is really quite basic, with four frames running crosswise, four frames running lengthwise, and a nose piece. As shown on the plans, the frames are notched so they can be slipped together. The most important thing to remember about the framework is that it should be as true as possible. The two lengthwise frames forming the cowling can be inserted into the cross frames, and then the cross frames can be clamped to the building frame. Leveling the cross frames will bring the longitudinal frames into alignment when they are evened with the cross frames. This alignment process is probably the most important step in the



Center section ready for the top pieces to be epoxied in place.



Front of the center section.

building sequence. Time spent in doing this process right will yield dividends during later phases of the building and running of the boat.

ATTACHING THE CENTER SECTION BOTTOM

The 1/16-inch plywood for the bottom should be pre-cut prior to gluing to the framework. The bottom piece should be firmly clamped to the pieces at the back and front of the center section. Tape can be used to pull the bottom down against the outside frames. Weights or pins can be used to keep the bottom against the cross frames. Once the epoxy has set, the framework and bottom can be removed from the building jig and the bottom can be trimmed.

ATTACHING THE CROSS SECTION TOPS

Either 1/16 or 1/32-inch plywood can be used for sheeting the top of the center section. A strip of stringer material is glued along the outside of the cockpit longitudinal frame where the



Sponson frameworks being glued up. Be sure to make a right and a left!

top pieces will butt against this frame. The top pieces can be pinned to the transom frame and clamped to the front frame. Pins and tape can be used to keep the pieces in position while the glue sets.

When dry, trim the top pieces even with the outside frame. A cap piece can be cut for covering the back of the center framework. Prior to attaching the top pieces, it's a good idea to paint clear over all the interior that will be covered by the top pieces. The top pieces can be given a thin coating of epoxy over the entire surface when they are being attached. This will help insure a waterresistant interior.

BUILDING THE SPONSONS

The sponson frameworks are built separately from the center section and attached to the center section. The sponsons can either be sheeted first and attached, or the framework can be attached and then sheeted. I use the latter method, but I've seen others sheet the sponsons first. The construction of the sponsons is fairly simple. There is one longitudinal frame and four cross frames. A stringer is used for the bottom chine and plywood is cut for the top sheet. Remember to build one right sponson and one left sponson! I only mention this because in the past, I've glued two of the same sponsons up before realizing my mistake. One time I even placed the crossframes in position upside down! The mistakes were discovered very quickly, but it just goes to show that even someone who has built lots of model boats can goof when not paying careful attention. Tack the longitudinal frame to a flat building surface when gluing the top sheer piece and chine stringer in position. The top sheer



The author's Excaliber II has the radio box built into the boat. Plexiglass cover serves as a base for the driver and mount for the switch. Finish is K&B Superpoxy.

goes in place first, since the chine stringer attaches to it at the bow of the sponson.

Once the sponson framework is completed, it is ready for sheeting or attaching to the center section. I personally recommend attaching the sponson framework to the center section prior to sheeting. This will prevent the framework from twisting while the sheeting is being applied. Before sheeting the sponsons it will be necessary to bevel the outside edge of the chine stringer to allow the bottom sponson piece to fit flat on the framework. Pre-cut the sponson bottom and use small clamps and pins to hold it in place while the epoxy sets. When dry, trim the bottom piece so the sponson side can be attached. Masking tape and pins can be used to hold the part of this piece that attaches to the chine, and clamps can be used to hold it in position along the top sheer. The sponson sides are trimmed to accept the sponson tops. Since the front of the sponsons have somewhat of a compound bend for the plywood, it will be necessary to use lots of tape and pins to keep this piece down on the framework. The sponson bottoms should be 1/16 plywood, and the sponson sides and top can be 1/32. The 1/32 will bend much easier for the sponson top. Use the same procedure for sealing the sponsons as that used in sealing the center section.

Continued on page 101



K & B Autotrim installation. A valuable device for adjusting the engine settings.



Mike Wight's Excaliber II uses a separate waterproof radio box. Ready-made boxes are available, or you can make your own.



Stern view of the author's Excaliber II. Best performance is with a J.G. E-20 prop.



Excaliber II's by Mike Wight (left) and Leo Dreith. Cowling shapes can be easily modified for different appearance.



CHOPPER CHATTER

SCHLUTER HELICOPTER PARTY

A few days ago, I received in the mail a package from Dieter Schluter which contained literature and other bits of information on how modelers conduct their R/C Helicopter "Fun-Fly" parties in Germany. Earlier this summer we had discussed the fierce competition which is so prevalent in the usual helicopter contests, and the sometimes drastic results when each modeler "goes the limit" as he tries to outdo his competitor. And this isn't limited to the U.S., either . . . it's the same thing around the world! To help foster the hobby, by giving even the novice a good chance at winning trophies, Dieter embarked on a series of fun-fly parties which we'll try to describe below. The primary object was to eliminate the "precision-pattern" aspect (which is almost always won by the experts) and establish a completely different set of rules which essentially set forth a "task" to be performed as many times as possible in a given period of time. The grading system takes into account only the number of completed tasks, not the way the task is performed.

Admittedly, the modeler must have certain basic skills, such as the ability to hover within a fairly small area, and must also display the ability to safely control his helicopter at all times. Given these qualities, a beginner feels right at home while performing the tasks, without a lot of pressure competing against the more expert pilots. He is in a relaxed atmosphere, having fun, and above all he will take home some sort of a prize (even if it is just a diploma or certificate of accomplishment).

Once a time and place have been established for the "party," the paperwork starts to fly! First, invitations are printed for distribution to the known fliers, the hobby shops, clubs, and newspaper announcements, along with model magazine notices. The invitations are usually two pages; the first page contains the date, location, and the schedule of events, while the second page is a data page requesting your name, address, telephone number, helicopter type, motor, radio type, frequency, how long you have been flying, what different types flown, how did you hear of the party, and your helper's name. Yes, you do require a helper in these tasks, and he is not forgotten when the awards are handed out! The schedule of events contains an outline of the program, and might look something like this:

FRIDAY, SEPTEMBER 15, 1978

10:00 a.m.: Helicopter seminars, discussions, etc.

2:00 p.m.: Training and practice flights

By JOHN TUCKER

SATURDAY, SEPTEMBER 16, 1978 7:00 a.m.: Training and practice flights 9:30 a.m.: Briefing on rules and tasks 10:00 a.m.: "Party" begins 5:00 p.m.: Flying stops

- Evening: Get together for dinner
- SUNDAY, SEPTEMBER 17, 1978
- 8:45 a.m.: Impound transmitters
- 9:00 a.m.: Continue the "party"
- 1:00 p.m.: All flying stops
- 2:00 p.m.: Begin expert flight demonstrations
- 3:00 p.m.: Awarding of prizes
- 5:00 p.m.: End of party

As the applications are completed and returned to the party director, a start number is assigned to each participant and is printed on a "Flightprogram." The Flightprogram is then mailed to the modeler so that he can read about the tasks and still have ample time to practice them before the party date arrives. On the day of the party, each flier is also given a condensed version of the tasks along with other pertinent information, such as parking and overnight facilities, location of restaurants (and toilets on field!), etc.

In the meantime, the director prepares a checklist and assigns club mem-



PHOTOS BY AUTHOR UNLESS NOTED

bers to specific duties to make the party an outstanding success. Items covered include the following: Announcements, information packets, press and magazine coverage, posters, signs to flying site, printing, mailing, hotels, program, impound tent, food truck, wet-weather plans, guards, fences, music, loudspeaker, camping, parking, equipment for tasks, etc.

FLIGHTPROGRAM

Now that we know how to organize the fun-fly, let's examine the tasks themselves. The most important thing is to do your best, but don't forget, you're there to have fun. New pilots have a good chance to practice hovering maneuvers. Naturally, the better pilots will accomplish the tasks more quickly, but the not-so-expert pilot has realistic goals also. The helper will also influence the performance, inasmuch as he actively participates in the action. All tasks are performed in the same manner as you would expect a full-scale helicopter to perform them. Try to be realistic! The basic idea behind the given tasks is the assumption that on the top (roof) of a large house or building, there are a number of people who need rescue by





A sample of the certificates awarded to all contestants at the Schluter Helicopter parties.

helicopter. For some reason or other, the building is surrounded by floodwaters, and boat rescue is not practical. To add to their problems, the building is on fire and the helicopters must bring as much water as possible to the building to help put out the fire (sounds kinda like the borate bombers, doesn't it?). Of course, as the building burns, there is a considerable amount of debris and wreckage which must be cleared out of the way in order to affect a successful rescue.

The tasks are scored by how many persons are rescued from the building; how much water has been transported and dumped on the fire; and how many pieces of debris have been removed from the area. Prior to beginning the tasks, the modeler may declare which of the three tasks he will perform best; this will permit him to double his points on that particular event! This is much like having a "joker" or "wild card" which



may be used on one task only. In order to save time, all three maneuvers are performed in one flight sequence, but the maneuvers are scored separately. Depending upon the number of participants and the weather conditions, as many rounds as possible may be attempted in rotation with the other fliers. The final score is based upon the best round achieved.

STARTING

Time allowed for engine starting is 3 minutes. Any time in excess of 3 minutes is applied to the first task and thus shortens the time for task 1. In any event, he cannot take more than 5 minutes for engine starting (he loses his turn). The pilot may interrupt his round at any time for model adjustments, however, the time continues to run. If any interruption lasts in excess of 2 minutes, the round is cancelled.

A transport container is attached to the helicopter by twine or string approximately 5 feet long. It must be attached to the model at a minimum of 2 places. The distance below the model is up to the pilot; however, it must be of sufficient length to permit the helper to hook up people (pylons) to the container (in safety) and to be able to lower the container into a basin of water. During tasks "A" and "B", the helper must remain in the immediate area of the house. In task "C" the helper remains in the vicinity of the table used in this exercise. Obviously, it is prohibited to fly above spectators or other modelers, and the helper must exercise great caution when hooking up the pylons! If the pilot cannot safety control his model, the director/timer may ask him to terminate his flight. Anyone can participate if he has a safe and mechanically sound helicopter, and flies it in a safe manner.

PRIZES

All participants take part in the awarding of prizes, provided they have earned at least 10% of the points in the highest score. Since the points come from different tasks (plus the bonus "joker" points), there is no first place or other order of proficiency. Prizes are awarded strictly on the number of points received for your best round. The grand prize, the "Schluter Gold Cup" and \$165 in cash, is awarded to the modeler with the most points. The next three places receive \$100, \$50 and \$25. Donated merchandise prizes are next awarded down the point list, and all participants will be awarded a certificate of achievement for their efforts.

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R/C MODEL BUILDER



Marine Squadrons VF-9M and VF-10M put their ship numbers on sides of fuselage ahead of scarlet-and-gold Marine Corps insignia. "U.S. MARINES" appeared in black block letters on upper wing top surface. USMC photo via Johnny Burnett.

BOEING F4B-4

by PETER WESTBURG

• Research on the Boeing fighter uncovered several interesting items not hitherto evident to most of us. The compass was mounted on the aft face of the rear spar and on the centerline to get it out of the magnetic field of the iron masses of the two guns on each side of the instrument panel. A small window in the top surface of the wing illuminated the compass and the cover on the bottom ahead of the handgrip was transparent to enable the pilot to view it.

A hole in the fuselage ahead of the lower wing on each side appeared to have no useful function. It's there on some F4B-4's and on all F4B-3's. It turned out to be a clearance hole for a dive bomb cradle fitting on the lower longeron. Dive bombing was taken over by two-seaters, so the hole is not seen on

PART TWO

later F4B-4's. Marine squadrons flew the F4B-4, and these airplanes had leather covers on the aft landing gear struts to keep them from being nicked by stones. Apparently, the Marines operated from unimproved fields; the leather cover is never seen on Navy airplanes.

The most surprising discovery is an item not seen on any other plans or kits. A battery box is mounted on the left wing fillet between the spars. The box appears in all photos of the area, on both Army and Navy Boeings, and it is surprising that no one seems to have noticed it or thought about it. In those days, batteries were not as reliable as they are now, and they required constant checking and service. A hinged lid with blisters over the two terminals and two twist fasteners was provided for easy ser-

vicing.

Colors of the F4B's were standard Navy light gray fuselage and wings, except for the chrome yellow top surface of the upper wing. But markings were not always the same, particularly on Marine airplanes. The Marines retained the red, white and blue rudder stripes until camouflage was adopted in 1941, but fighters assigned to carriers had solid color tail surfaces, and when the squadron was assigned to another carrier, the color changed. The best bet for modelers is to stay with photos of one airplane.

Some Boeing fighters are still around. A civil Model 100 was restored in Seattle in late 1977 as a P-12 and it is flyable. The Orange County Airport Museum has a restored Model 100, and the Planes of Fame Museum at Chino, California, has a flyable P-12E (s/n 32-17) with a razorback headrest. The Air Force Museum, Dayton, Ohio, has a non-flyable P-12E (s/n 31-559). The only true F4B-1 is hanging from the ceiling of the National Air & Space Museum, Washington, D.C. And should you care to risk the trip, you can view an excellent F4B-3, one of several exported, in Bangkok, Thailand.



Rare cocarde on wing identifies this ship as one flown by Capt. "Monk" Hunter, March Field, CA, 1932. Nick Carstens photo.



F4B-4 9241, now in Smithsonian, being fitted with practice bombs. Rear I.g. strut has leather cover to protect against stone nicks.



Two in-flight shots of the "Snark 111," the super-fast slope pylon racer designed by Peter Edridge and Bill Drumm. It's the third in a series of slope gliders by these two talented modelers. Span is 8 feet, weight with ballast is 11 lbs., 8 lbs. empty. One of the sleekest slope racers ever.

R/C SOARING

by Dr. LARRY FOGEL.

It takes two to tango . . . I mean, two to team up for outstanding success. Bill Drumm, of Novato, California, has flown R/C sailplanes since 1975 ... ASW-15, the Wik Kestrel, and various versions of the Ridge Runner. Peter Edridge, of Mill Valley, California, watched him fly at Mt. Tamapais one day in February '79, and was "hooked." Peter bought a Kestrel and proceeded to learn that flying is not as easy as it looks. He thought, "Why not make the model indestructible for any beginner?"... not the first time we've seen that tried. But this was a natural for Peter, You see, he came to America from England in 1972 and found it impossible to pursue his chosen career in the States (research in artificial intelligence and pyscholinguistics). Instead he found employment in racing car design and fabrication. Surely the same fiberglass technology could be used to strengthen



Peter Edridge with his Snark III. He does the designing and building, Bill does the flying.

PHOTOS BY AUTHOR

and even lighten R/C sailplanes.

Once into the art and craft of redesign, he focused on attaining speed and stability ... the very qualities that put you in the winner's circle for slope pylon racing events. His first original design was the Snark I, a long-nosed sleek slope soarer (try saying that 10 times without stopping). The swept-wing configuration reduced the eight-footlong wings to a 7.6-foot span. The 9 percent thick airfoil was patterned after that of the Ridge Runner. He made the wings from 2.1-pound blue foam, covered with 1/64 plywood and lacquerbased paint. The fiberglass fuselage was 38 inches long. The full flying stab was made of sheet balsa. This very shortcoupled bird weighed in at about four pounds. In flight it was fast but somewhat squirrelly.

Longer fuselage (42 inches), less sweep, and greater tail volume made Snark II more stable. The airfoil was 11% thick at the root and 8.2% at the tips. The chord went from 10 inches at the root to 6 inches at the tips. The ailerons were moved outboard. Epoxy was used to hold the plywood to the foam to prevent any separation from the previously used adhesive transfer tape. The full flying



Snark III requires a good run and strong heave to get going, as Peter demonstrates.

stab was given a symmetrical airfoil section. The four-pound empty weight could be doubled by ballast for even greater speed. Normal operation was about nine ounces per square foot. Snark II performed well but fell short of challenging the eleven-pound planes that fly in unlimited pylon racing.

Snark III is designed to meet just such competition. Now the sweep is gone, as Peter feels it's better to have the control surfaces perpendicular to the airflow. The span is now the full eight feet. The chord goes from eleven inches at the root to seven inches at the tip. The airfoil slims to become reflexed at the tip. Peter notes that too thin an airfoil hurts high-speed cornering. Layers of fiberglass give the wing tremendous strength.

At full speed the now fixed stab provides a sturdy base for the elevators. The fuselage is now four feet long with a long, narrow nose. Control surface actuation is simple and clever ... a minimum bend Nyrod with clevis hooked to a drilled wing skid. The weight is placed farther from the CG, thus providing greater longitudinal stability. The empty weight is eight pounds. Three pounds of ballast make this plane fully competitive. Seeing it fly is an experience you won't forget.

Remember, I said this is a *team* effort. Each man does what he does best. Peter designs and builds the birds, while Bill is



A nylon wing tip skid, drilled for a clevis, serves as the elevator horn. Neat idea!



Peter and Bill with Snark III at Thornton Beach. Photo gives a good idea of the plane's very low frontal area.



Snark I, first in the Snark series. Fast but not all too stable. Note the full-flying stab, very short tail moment.

the pilot. They invited me to watch an "airshow" at Thornton Beach State Park (on the coast between Pacifica and San Francisco). We were to meet at 3 p.m. On the east side of the peninsula the weather was warm and sunny. I found myself wishing for a coastal breeze so that I could see the new design fly. Taking Skyline Drive into the cloud bank I entered another world . . . the air was cold and windy. At Thornton the wind was a steady 20 knots and too cold for a business suit, so I borrowed Peter's jacket. He launched the bird from about 150 feet above the white-capped surf. Bill was in complete control and in a few seconds Snark III had gained more airspeed than I like to handle. He'd dive and silently slip by at what must have been eighty miles per hour . . . yes, I said silently. Usually you hear a swish as the sailplane flies by with any significant speed . . . testimony to the turbulence it creates. But Snark III was silent.

Bill then demonstrated an inverted pass, tight turns, a loop, and even a slow roll. I couldn't resist the temptation when he offered to let me fly the Snark. but I maintained significant altitude and avoided any high speed maneuvering. It was still a thrill. OK, the challenge is out to all those interested in R/C sailplane pylon racing. Can anyone beat Snark 1117

By the way, Bill Mueller, of Hi-Flight Model Products (43225 Whittier Ave., Hemet, CA 92343), plans to offer carbon fiber laminate spars for those who want to make their ships "indestructible." The outer black material is about .050 inch thick. It is attached to the toughest foam I've ever seen. The 1/2-inch wide spars will come in 3/16 and 1/4-inch thicknesses. The 3/8-inch wide spars will come in 1/8 and 1/16-inch thickness. Sure, they'll cost more than spruce, but think of the investment you're protecting.

They're also having adventures in England. Keith Thomas of Frome, Somerset writes:

"Here are some photos taken at our recent White Sheet Club scale glider competition. There are pictures of Brian Hendy's Slingsby, which won the event. He is a fine craftsman with a relaxed and relaxing manner . . . a real pleasure in any competition where 'nerves' are all too frequent. Usually, Brian flies alone and is quite happy to launch his large, heavy model single-handed. Once under way, he nonchalantly strolls over to the judges and provides a light-hearted commentary on the flight in his own lilting Welsh accent. He's a character.

"The DFS Reiher is a most interesting model, representing a great deal of work. At 1:6 scale, the model suffers in 'wow' impact next to the more prevalent 1:4 models. That's a great pity. It's really worth a lot more than the ready-built



From England, this photo of the White Sheet R.F.C.'s mobile windsock. They stop flying when he falls over. Keith Thomas in back.

currently available 1/4 scales. It lacks the ability to handle strong winds. Its taking fourth place is quite an achievement.

"Ken Henridge is shown with his 1:8 Slingsby T-53, his first scale model. With a 25 mph wind the T-53 was doing 200



A seldom-seen DFS Reiher, nicely built by Pete Bradshaw. The 1/6scale ship took 4th at recent glider meet in England.



In the 25 mph wind, Ken Henridge's 1/8-scale Slingsby T-53B had to fly at 200 scale mph just to stay in one place!



Brian Hendy single-handedly launches his 1/4-scale Slingsby Tandem Tutor...no mean feat in 25 mph wind.



Brian's Slingsby penetrates out over the valley. Sure looks realistic. The model won 1st at recent White Sheet scale glider meet.

mph scale speed just pointing into the wind! On a calm day, though, Ken would still be flying when all the heavyweights were grounded. As our canine windsock shows, it was not Ken's day!

"The other photos show my CE-75 'Silene,' which I promised to report on in greater detail. The model is 1:5 scale, spans 3.6 meters (about 12 feet), and weighs 7-1/2 pounds, giving a wing loading of 14-1/2 ounces per square foot. Ailerons, elevator, rudder, spoilers, and retract wheel are fitted, and an aero-tow release will be added when I have the time. Two servos are fitted in each wing, making the linkages very straightforward. The drawback is the number of servos required; seven now and one to come. Also required: two Y-leads and two servo extensions. The canopy hinges up, and the whole of the cockpit fittings lift out to reveal sundry servos, retract mechanism, etc.

"The fuselage was planked over formers (later removed) and finished inside and out with 1-ounce glass cloth. It takes one sentence to say all that, but it took me weeks to build it!! The wings are orthodox, with lots of ribs, tapered wood spars top and bottom, webbed both sides, the whole lot 1/16 balsa sheeted. Internal horns, spoilers, etc. are expected in our contests, and the Silene is no exception. These little details can be time-consuming. The tail halves just slide onto wire dowels, the elevators being actuated by a wire bent at 90° which protrudes from the fin. I was very pleased with this system, as nothing shows at all from the outside. You probably guessed . . . as soon as I sheeted the fin, the whole shooting match jammed solid! Curses! At times like this, patience can be handy.

"The Silene flies superbly. The weight and size bring a solid feeling of stability, and as the controls all work pretty well, the model is almost boringly simple to fly. The ailerons are immediately effective, and careful use of rudder (often opposite rudder) is needed to keep things smooth. It is a great pleasure just to wheel round in circles trying to keep the angle of bank constant . . . tricky, but a pretty sight. Stalls are straight ahead, nothing vicious; in fact the model is very docile. I recently met the designer, Bruno Boulvois, who was over in England with the Silene for certification tests (imports are due to start soon), and we had a great time comparing the model with 'grand frere' (big brother). All those little details I got wrong! Maybe next time.... Kind regards to you and yours, Keith Thomas."

Next month . . . a kit review of a new Super Slope Soarer. See you then.





Keith Thomas sent these photos of his superb CE-75 "Silene" 1/5-scale sailplane which he has been flying a little over a year. He estimates that he has about 300 hours invested in this beauty. It's equipped with ailerons, elevator, rudder, spoilers, and retractable wheel. Full cockpit details.

GLIDER GIBBERISH PART ONE

By DAVE THORNBURG ... A sort of mini-dictionary of words and jargon that can be puzzling to aspiring sailplaners. Want to know the *real* difference between a glider and a sailplane? Dave's article tells all.

• Recently I've been hearing strange voices in the night. Not the kind they put Uncle Gridley away for, but the kind that come trickling in by telephone, usually right in the middle of dinner. Always these voices begin on an upbeat, and always they end in a question: "Ienjoyed your column on wombats ... but what does decalage mean?" or, "You're absolutely right about tip stability, but what is washout?"

If these seem like common, everyday words to you, try looking them up in the dictionary . . . you'll find that glider folk speak a language that Mr. Webster never heard of! So I spent a few nights skimming the recent glider articles in the model press with an eye for our jargon, those words and phrases that folks new to the sport are most likely to find puzzling. Then I sat down and defined them, taking care to work in as many of my own prejudices and crank opinions as possible. Finally, I pared this list down to a size that would just fit in two consecutive issues of R/C Model Builder. Here's the first half; you might want to keep it around to loan out to an occasional beginner ... if you're lucky enough to find one who can read. **AIRFOIL:**

The cross-section of a plane's wing, determined by the shape of its ribs (see drawing). The simplest airfoil is the *flat plate*; it has no curve top or bottom, and generates lift very poorly. Because it's so easy to build, the flat plate is often used for rudder and stabilizer airfoils, even by designers who know better. Nobody is currently dumb enough to use it for wings, but judging by the number of non-glider folk who are beginning to kit gliders, it's just a matter of time.

The commonest wing airfoil is the *flat* bottom. For 90% of American soaring, it fills the bill perfectly. It has a rounded nose (leading edge) and comes to a point at the rear (trailing edge). Its top surface is humped, like a turtle's backbone. People who care passionately about airfoils will argue for hours about where the peak, or high point, of this hump should be: at 30% chord? At 40%? At 42%? Don't get involved in these arguments, especially if they happen on the field. Take the frequency clip and go fly.

An undercambered airfoil has a slightly concave bottom. This generates more lift at a given airspeed, but also more drag, which reduces a plane's penetration.

A symmetrical airfoil has exactly the same curve on the bottom side as it does on the top. It has very low drag, but very low lift, as well. It is used mostly on aerobatic slope soarers and power models, almost never on the wings of thermal soarers. But it's great for empennages. A semi-symmetrical airfoil is an attempt to compromise between the high lift of the *flat bottom* and the low drag of the symmetrical. Something of this same effect can be had by adding *Phillips' entry* (q.v.) to a flat bottom airfoil.

ANGLE OF ATTACK:

The angle at which a wing or stabilizer "attacks" the oncoming air. For the wing, this is usually a positive (nose-up) angle, as shown in the drawing. At a given airspeed, a wing's lift will be more or less proportional to its angle of attack: high angle of attack, high lift; low or negative angle of attack, low or negative lift. Take a close look at the wing roots on any of the popular glass or plastic glider fuselages (Aquila, ASW-17, Cumulus, Windrifter, SD-100). The wing roots are molded into the fuselage side at a certain predetermined positive angle of attack. Of course, the fuselage can't hold the wing at this angle of attack; it's up to the stabilizer to do that (see DECALAGE). But if the designer has done his homework, he has "hung" the fuselage on the wing at the angle of attack that will provide minimum fuselage drag at the speed range in which he expects the model to be operated. The Aquila, for example, has a lot of positive angle of attack molded into the wing roots. This makes its fuselage very streamlined at thermaling speeds, but very nose-down-and-draggy at extremely high speeds, when the wing is operating much closer to the zero lift angle.

ASPECT RATIO:

The ratio of the chord to the span, a simple number that tells you at a glance how long and skinny a wing is. A 100-





DUCTED FANS

By BOB KRESS... Part 2 of 3 in the author's series on ducted fans. This month's article deals with running the Cox .049, inlets for pod-mounted fans, fuselage inlets, and how atmospheric changes affect fan thrust.

ROTOR/SPINNER WOBBLE

Just in case you think you have the RPM-eating engine vibration problem solved, the TD .049/.051 engines have the gold-colored aluminum prop hub splined to the shaft in a usually slightly misaligned manner. While this does not bother a prop much, since it only causes the tips to run out of plane, it drives the RK-049 rotor/spinner crazy, since the center of gravity of the combination is well forward of the hub. A wobble condition is thus set up. Fortunately, the cure is fairly simple.

Attach the rotor tightly to the engine on a trial basis. Set up a means for holding the engine firmly in an upright position on a bench. Locate the center of the spinner hole with a wire firmly fixed to the engine in some way. Now rotate the rotor (with cylinder head removed to make it easy) and watch for wobble in the spinner hole. If there is wobble, note the direction the hub would have to be tilted to correct the wobble. Now remove the rotor without rotating the prop shaft and place a 1/8x3/8-inch shim of aluminum foil on the hub in a location such as to produce the desired tilt. Replace and fully tighten the rotor and recheck the wobble. Repeat the process until there is no visible wobble of the rotor as the engine



FIG. 6. An RK-049 fan fitted with a bellmouth inlet from a Midwest Heinkel 162.



shaft is rotated. You can tell if you haven't corrected the problem by vibration and visible rotor wobble in operation. The tip of the spinner is blurred if wobble is present.

GENERAL

The usual Cox instructions on working down to one TD head washer should be scrupulously followed. Also, piston seating should be checked occasionally for slop and the ball socket reseated with a Davis Diesel Development tool, if necessary. Likewise, Davis can supply engine devarnishing brushes and procedures, if that is necessary. The devarnishing procedure is really very simple. Such things as a loose head or air leaks in the needle valve assembly can cause big losses in engine performance. The latter can be cured by a piece of tight-fitting plastic tubing placed over the needle valve threads. Also, make sure your fuel is filtered, before it gets to the needle valve.



FIG. 8. The RK-049 fan with no inlet.



FIG. 9. Thrust test with the hatch both on and off yielded surprising results.

The new Glow Bee heads reportedly will yield substantial power increases, particularly if high nitro content fuel is used.

Removal of the inlet screen on the TD will add about 250 rpm in the AXIFLO. Due to the protected location of the inlet within the fan, it is felt that the additional risk of dirt ingestion will be minimized.

Use of high nitro percentages in the TD .049/.051 engines doubtless yields power bonuses. I have no experience in this area, since I have been getting good performance on 25% nitro, with which these engines are happy. I would caution that high nitro is reputed to bang heck out of the engine, so don't move out in that area without good advice. By the way, the RK-049 AXIFLO rotor can take any nitro you give it, having been whirl tested to 30,000 rpm. There is no way a TD will drive the rotor past 23,000 rpm, due to its blade design.

POD-TYPE INLETS AND FAN INSTALLATIONS

All of my RK-049 rotor tests were run using the 1/2A Heinkel 162 jet pod



FIG. 10. A flush top inlet. Doesn't look too good but really boosts the thrust.

TABLE IIA POD-TYPE RK-049 AXIFLO Fan Inlet Tests				
Inlet	Throat Area Sq. In.	Throat Area As % of Fan Swept Area	Thrust As % of Bellmouth Thrust	
Bellmouth	7.07	100	100	
Original 1/2A He 162				
Inlet	4.22	59	92	
Same, Expanded Throat	5.43	77	90	
Production 1/2A He 162				
Inlet	6.15	87	100	
No Inlet	7.07	100	74	
	DOD TYPE 40 A	TABLE		
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Fan	Inlet	Throat Area Sq. In.	Throat Area As % of Fan Swept Area	Thrust As % of Bellmouth Thrust
RK-40	Bellmouth	16.4	100	100
RK-40	Production He 162	14.2	86	100
RK-40	No Inlet	16.4	100	65
RK-20 Grumman	No Inlet	10.8	100	83
8-in.	Bellmouth	39.48	100	100
8-in. 8-in.	No Inlet Design 698	39.48	100	92
8-in.	Spinner Same: short	12.83	32.5	90
• • • •	spinner	16.07	40.7	94
8-in.	Same; Williams Spinner	17.09	43.3	96
Scozzi	Sharp Production Inlet	14.89	100	55

previously shown in Fig. 3. Some tests of different inlets were also run with a common rotor. The results are particularly interesting.

As I have stated before, good jet model performance requires light model weight, efficient engine/fan combinations, and most importantly, a good inlet system.

The basics of good rounded inlet lips, good internal contours, and auxiliary inlet design have been covered in my prior articles. But I have never attempted to qualify just how good or how bad things can get for particular cases. Thus begins my inlet test story, initially confined to the simple and ideal podtype inlet case. For openers, remember that the model ducted fan, which runs at a fan pressure ratio of 1.02 or less, cannot stand any significant inlet losses (which normally would not even cause a sneeze in a full-scale turbofan!).

During the 1/2A Heinkel 162 inlet test program, several basic inlets were tested, with the results shown in Table IIA. All data were run with essentially a "zerocontraction" tailpipe (exit diameter equal to the equivalent of the fan swept diameter, or .906 times the fan tip diameter for the RK-series fans).

The bellmouth inlet was previously shown in Fig. 3. The production inlet is that being produced by KTI for the 1/2A Midwest Heinkel 162. A photo of this inlet is shown in Fig. 6, and the crosssection is shown in Fig. 7. The no-inlet test article is shown in Fig. 8. The data of Table IIA, as well as those of Table IIB to follow, will be discussed in conjunction with the fuselage inlet data of the next section.

Other enlightening pod-type ducted

fan inlet tests have been run by the author on .40 class fans, with results shown in Table IIB.

FUSELAGE INLETS

Turning now to fuselage type inlets, the only really accurate tests run by the author on installed inlet performance were conducted on the Midwest A4D, designed by Nick Ziroli for the RK-049 AXIFLO. Early flight tests of the prototype model showed good performance, but the forward-facing inlets were somewhat reduced in size for the production version, in the interest of scale. Poor takeoff and climb performance of the first production A4D's still persisted after the foregoing rotor design defi-ciencies were corrected. The author thus decided to place an A4D fuselage in the thrust stand with the wings chopped off. The inlet system was that shown in Fig. 1.

This turned out to be a smart move. With the fan turning at 21,500 rpm, only 11 oz. of static thrust was measured. Reference to Fig. 2 shows that approximately 15 oz. of thrust should be expected. Hence, losses of 4 oz., or 25% of the thrust were occurring. The next test run was that of Fig. 9, where thrust was measured, hatch off. The surprising result was that thrust only increased to 11-1/2 oz. at the same 21,500 rpm figure. With the fan inlet apparently wide open, a big thrust loss was still occurring! I then theorized that the fan inlet, while wide open, still had sharp lips, so the idea of closing the hatch and adding more wellrefined inlet area in the form of a flush top inlet emerged. This inlet is shown in Fig. 10, rather awful looking, but as results showed, very effective. With the top inlet installed, thrust jumped to 14-1/2 oz. at the same 21,500 rpm.





FIG. 12. (top): Multiple inlets worked as well as top inlet in FIG. 10. FIG. 13. (above): Easier to make, single inlet is as good as FIG. 12.

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Continued on page 72



Send in your questions, relative to glow or ignition engines, and these experts will give you the correct answers.

ALDRICH

• We've been doing this column for about a year and a half now, and over this period have continually stated that we no longer do any engine rework. Yet hardly a week goes by that we don't get inquiries as to what we charge to rework some engine.

In the hopes of squelching this and perhaps getting more readers, we are going to start a series covering some of the "tricks' we developed over the years to get more performance out of an engine. If any of you out there have something in particular that you would like covered, drop us a line and we'll do our best to do something on it.

Let me state at the beginning that 80% to 100% of what makes a great engine is the fit of the parts. "Tricks" can help in going faster, but all the "tricks" in the bag won't make up for badly fit parts. If you fly C/L Stunt, R/C Pattern, Scale, etc., the best advice we can offer is to select a quality engine, break it in carefully, and leave the damn thing alone!

Regardless, there are a bunch out there who want to make their engines run better or faster or something. In the following months we'll try to cover things that work, as well as those that don't . . . in a sense, some guidelines of do's and some don'ts as pertains to our model engines.

All other things being equal, the heart of an engine (and about 90% of whether it is a really good one) is in the fit of the cylinder and piston. There is no substitute for a round piston (or piston and ring) running in a round cylinder. Theoretically, we could also add the word "straight" in between the words "round" and "cylinder." Unfortunately, things don't always go as planned, and a straight cylinder does not always stay straight, nor a round one stay round. One of the worst power parasites is a bell-mouthed cylinder, that is, one that is larger at the top than at the exhaust. Most cylinders are relieved below the exhaust enough to avoid the piston dragging through the bottom of the stroke, but not so much that excessive slap will occur. Therefore, what we are generally concerned with is the cylinder walls from slightly below the top of the piston at bottom dead center (BDC) to the very top of the cylinder.

With everything round and straight (the ideal situation), all things are

blissfully perfect until the engine fires! And where does it fire? Why, at top dead center (TDC), that's where. Just think what happens to our nice straight cylinder when that explosion goes off up there at the top. Something eventually has to give, and what usually happens is the cylinder gets bigger up there at the top where the blasting is going on.

Most pistons have a wrist pin (not like the little 1/2A monsters with their ball socket/rod hook-up) that passes through the piston via at least one hole. Under load (running conditions), the wrist pin applies pressure to the piston which can make it grow to the wrist pin sides. In other words, the piston begins to take on an oval shape ... all of a sudden our piston isn't so round anymore. This condition is not very pronounced in so-called stunt and sport engines, but as the power, rpm, and thus heat, go up, this distortion can become more acute.

This sounds like everything has gone to hell in a hurry. And, in fact it is a good description of what causes a big power loss in an engine that has been pushed past its design limit.

Whether it be an extended over-lean run (cook job), a sport engine hopped up too much or run on too much nitro, or any one of dozens of things, the foregoing is basically what kills power.

It is easy to see that when a cylinder becomes bell-mouthed, compression will suffer, and thus power is lost. Likewise, if a piston gets very out of round, the cylinder can tend to follow, and the least that can happen is a loss of compression.

-We fought all of these problem conditions in various combinations when we got back into C/L Speed in the mid 1960's. Our pocketbook still pinches us on the fanny everytime we think of all the money that went into engine parts.

The first "trick" we picked up on was that some cylinder heads ran faster than other supposedly identical heads. In checking the portion of the head that went down into the cylinder, we found that the ones that ran the fastest were larger in diameter. What we came up with was that the aluminum bar stock head expanded more when hot than the steel cylinder. This meant that the best head was one that, when hot, actually became a tight fit in the cylinder. Now, why did this make the engine run faster? We decided it had to be that the "tight hot head" had to be holding the cylinder round right up there at TDC where all the blasting was going on. This got us to checking the diameter of the portion that fit down into the cylinder. We immediately discovered that the factory heads were not really round, but had high spots.

The solution to this problem was to turn down the diameter of the insert portion about .200, press on a band, and remachine to the correct dimension. What eventually evolved was that the band was machined .002 undersize. heated over a gas flame for one minute, and then popped onto the cut-down head that had been frozen. With this shrink fit, the band stayed put and it was virtually impossible to see that any new metal had been added. Then a few years later, when we were making our living full-time in the engine rework business, the NMPRA made a rule change that disallowed any added metal.

We found a way to get around this rule by simply putting the head on an anvil and pounding the insert portion down with a hammer until it spread out enough that the head could be remachined to fit the cylinder properly. We then re-cut the cylinder chamber to the correct shape and faced off the opposite side of the head so that the head now took a short reach plug where it required a long reach before. Now you know how the "double bubble" head evolved and why the use of short reach plugs increased so much.

Next month we'll carry on from here and get into how to stop, or at least limit, cylinder and piston distortion.

KLAUSE

POWER LOSSES

Have you ever heard or even made comments similar to these? "This morning my engine ran great; this afternoon it's a real dog..." Or, "For the first couple of months it was fine, but recently it's lost a lot of power..." Or, "It was a super engine for years, but this year it's sick." Whenever I hear such a comment, it's usually followed by, "What's wrong?" Unfortunately, there is no simple answer. However, a review of most of the common causes should help you to diagnose what's wrong.

To begin, let's assume you are absolutely certain that there has been a specific power loss ... not just a gut feeling. For the average modeler, the most practical way to know this is through the systematic use of a tachometer. If you don't have one, I strongly recommend that you get one. There are many brands available, and each has its good and sometimes bad points. My personal preference is the Royal Pro Tach. It reads up to 25,000 rpm in selectable 5000 rpm increments. It works well in dim light, and best of all, it has a large meter that enables you to easily read a 100 rpm change. They're available in kit form (\$64.95) or completely assembled (\$94.95). Write to Royal Electronics Inc., 3535 S. Irving, Englewood,



Neat California Champ flown at the Nats by Bill Baker, assisted by Jim Rummery. Scene is Mead Missile Base, Nats F/F site.



Dave Sweeney lights the fuse on a friend's Playboy. Crosswinds caused takeoff problems on the narrow runway at Mead.



O.T. EVENTS AT THE NATS

Hard on the heels of the SAM Champs (held during July 24-26, at Salt Lake City), the Old Timer events at the AMA Nationals were staged during the following week, August 1 to 3. This seemingly unusual arrangement is the normal way the SAM Champs are scheduled; i.e., one week in advance of the Nationals.

Under this system, a modeler has three days to drive to the SAM Champs, spend three days in competition, and have two to three days to get to the Nationals. By saving money on gas and travel, many fellows are able to take in both activities. In addition, this only takes up two weeks of highly prized vacation time!

At one time before the SAM Champs became large and popular, many modelers did not attend the SAM Champs, as they preferred to fly events all week at the Nationals. Friday gave them the chance to enjoy Old Timer free flight models. Generally speaking, the writer would set up an Old Timer booth to display Old Timer models, serve as an information center, and overall, provide for a meeting place for the fliers to swap tall tales. You could always count on the engine collectors to start a first-class swap session.

The past three years has seen a deterioration in the Old Timer display booth. Riverside AFB provided such a terrible location (winds of 15 to 30 mph through the hangar space), the booth was demolished again and again by the elements. Lake Charles found no Old Timer booth, as did the Lincoln Air Park Nats this year.

However, despite the lack of publicity, the decentralized location of all events (R/C 58 miles and F/F 42 miles from the Air Park), and the general paucity of information on O.T. action, the fun still went on.

WEDNESDAY, AUGUST 1

Thanks to Olie Olson, the spark plug of the Omaha Hawks, an excellent field was provided for the R/C O.T. events, held on about the best day of the Nationals week. Scheduled for the new Omahawk Field, the location was switched to the club's former site at the Omaha National Park. This turned out to be the best move; flights could be seen for much greater distances, as the field was located on a knoll above the surrounding vegetation and lakes.

Of course, the winning places were dominated by the Omaha modelers, but the Smith Boys (as Ed and Paul like to call themselves) from Gainesville, Florida, took several high places. Particular delight is expressed by this writer as his long time buddy, Bill Bowen, recently converted from free flight, won the Class A-B event by a convincing margin.

Most heartwarming sight was Ron Ross flying his model from a wheelchair (shades of Cliff Silva!). As pointed out many times by this columnist, Old Timers are the easiest way to learn radio control. When the model goes haywire, take your hands off the controls and the model is generally stable enough to right itself.

No meet would be complete unless someone launched with their receiver switch off. The writer, in this case, was no exception, as his Dallaire Sportster made three complete loops before returning to kit form. This did not go unnoticed by Ron Hess, of the Omaha Hawks club, and at the Victory Dinner the columnist was presented with the unwanted Switch Award, much to the amusement of the assemblage. Ron explained how the switch worked and how this award was



Chuck Trdvik's hot R/C Buzzard Bombshell had a K&B 5.8 with exhaust pipe running through cabin and exiting on side.



Omaha Hawks clubsman Mit Grimes readies his R/C Flying Quaker for a flight. Ron Hess holds. Site is Omaha National Park.



Doc Mathews really enjoyed himself with his R/C Buccaneer. Powered by an S.T. .35 diesel, shown at right.



Sniff, sniff...something smells funny! Must be the S.T. .35 dieset that Doc Mathews was running. From Davis Diesel Development.



Gene Lapansie sizes up his Westerner A prior to an official flight. He won Class A, but with a different airplane.

utilized, in that it allowed you to practice turning the switch on and off!

Luckiest guy on the field was Chuck Trdvik, when his Bombshell went out of control because the transmitter antenna wires inside the case came loose. At the last instant he was able to rescue the model from a death dive and land it quickly. This was strictly due to the good range of the set with its antenna in a disconnected state. Olie Olson fixed those antenna leads in a hurry for Chuck!

Best flying model on the field from the writer's viewpoint was Wally Miller's "Old Reliable," a design by Marcy that appeared in the 1938 Zaic Yearbook. The model flew extremely realistically, and although it did not win, the flier had the best time of all!

One of the better flights of the day was made by Ron Hess' MK II Comet Clipper ... unofficial, what else? As Ron pointed out, he was using his model to point out the thermals so other contestants could "piggyback" them. How about that?

After several Nationals, Jim Root's Cavalier, converted to R/C, finally came into its own with some fine flying times. The beautiful streamlined outline of the Cavalier made a picture background against the big cumulus clouds. This is what O.T. flying is all about; the enjoyment of a beautiful model under pictureperfect sky conditions!

Taking part in the general fun was Dee B. Mathews, O.T. writer for Model Aviation, who showed up with a welldone Buccaneer powered with a Super Tigre .35 converted to diesel. Although ineligible to enter (SAM rules prohibit diesel engines after 1950), the Super Tigre ran smoothly and quite reliably. "Doc" sez this is a product of the Davis Diesel Development Co., which specializes in converting standard glow engines to diesel operation.

If you are one of the fellows having a noise problem on your field or with your neighbors, the diesel engine (with a muffler) is about the neatest sounding, quietest motor you would ever want. About the only quieter thing in motors is electric power; hence, the diesel does offer certain advantages.

An interesting facet of the contest developed, as there was no definite end



Lovely Becky Whitney of Salt Lake City was Miss SAM Champs 1979. *Now* don't you wish you hadn't stayed home?

(4:00 p.m. had been announced) to the contest, but as all the fellows had flown, the flying just naturally ceased and most went home fully satisfied with a day's flying.

THURSDAY, AUGUST 2

Tried for the second time at the Nationals, the idea of Old Timer control line flying was tried again. Although the contestants were enthusiastic about the events, the turnout again was comparably poor to other phases of O.T. flying. If staged again next year, all control line editors and columnists will be contacted



Tony Italiano tried like crazy to get his 3rd flight in, barely made it. Thermal Thumber with Ohlsson .23 placed 3rd.



Rod Ross and wife in his go-kart, Mit Grimes on right. We love to see people like Rod participate in O.T. R/C events!



What a MECA Collectogether is all about...fun! Karl Spielmaker, Earl Moorehead, Clarence Bull, and Tim Dannels.



Mark Fechner quizzes Irwin Ohlsson about the ancestry of a particular O&R .60 model. John Pond (left) and Russ Stokes look on.

for publicity. This could be a real attractive feature at the Nats!!

The most enthusiastic C/L contestant on the field was Doug Dahlke, who single-handedly put himself from first to third by the dint of a lot of unselfish help to the other modelers. Doug needs no proof to show he is truly interested in O.T. Stunt flying!

Credit for a good judging job of the stunt pattern should be given to Jim Root and Carl Hatrak. One thing for sure, if the judging was poor, it was uniformly poor! After all, isn't this the name of the game ... fun!

FRIDAY, AUGUST 3

This is the day everyone was waiting for ... the day that eight free flight events would be held on one day. If you don't think this made C.D. Pond and Recorder Carl Hatrak hustle, then you have another thing coming! Also, before getting into things, a vote of thanks to timers Bill Bowen, Jim Root, and especially Harrison Knapp, who came all the way from San Francisco.

This year, the Nationals featured a truly decentralized Nationals, with the free flight site a mere 42 miles from Lincoln Air Park. A few more miles and we might have been clear out of the state of Nebraska!

From a Californian's standpoint, the field, Mead Missile Base, wasn't that great, being crisscrossed by small paved roads leading to concrete bunkers and small loading aprons. Besides the tall grass, the field was liberally sprinkled with trees of all sorts. Most of the modern type free flight was limited to two-minute flights, as the wind would take the models very quickly to the surrounding corn.

In view of the foregoing (the writer had visited the site three days early), the C.D. had the foresight to order good weather from Jupiter Pluvius who did respond with an excellent day for flying. All flying that day was for three-minute maxes, and could have probably been



Wally Miller thoroughly enjoyed flying his "Ole Reliable" all through the day. A fine flier.

longer if caution had not been exercised at the start of the meet.

The crux of Old Timer flying is the R.O.G. takeoff, and this did pose a problem with only the narrow roads available for a takeoff surface. Naturally, most of the day found the runway crosswise or quartering to the wind. However, some of the more ingenious souls, knowing which way their model circled under power, would launch crosswise to the wind and as the model turned it would rise into the wind, successfully clearing the tall grass. The grass, incidentally, did get to normally mildminded Gene Lapansie, who was noticed to comment on the takeoff area rather acidly. Being a religious man, this really indicated the problem in no uncertain terms.

However, you can't keep a good free flighter down, and it wasn't long before maxes started to be recorded. This was particularly evident with George Perryman in the two rubber events. He never did have a flight under a max in over eight flights. Perryman is unbeatable!

In rubber, two rather convincing crackups occurred almost in identical fashion. Marvin Bashaw launched his tractor at a steep angle just about the time a breeze picked up. The model with its fully wound motor hurtled over his head and straight into the ground. Instant kit! Tim Banaszak did it even more spectacularly with a twin pusher;



No C.D. could ask for a more faithful crew. In back: Jim Root and Bill Bowen, timers; front, Jim Root Jr. and Carl Hatrak, Recorders.



Ed Rangus makes adjustments to his Anderson Pylon. Daughter Sue (center) checks engine run. Carl Hatrak photo.



Jim Root threatens the Anderson in John Pond's Super Zilch if it doesn't run well. John placed 1st in C/L Ignition despite stiff competition...see results.

the motor sticks were flying all over the place upon impact!

Why are we talking so much about rubber? Because, for a change, the rubber entries outnumbered those in the gas events!

In that same line, the Junior-Senior Rubber event annually sponsored by George Perryman enjoyed a fair turnout of young fellows this time. Probably the most heartwarming sight was to see young Joe Ulibarri pick up his very first trophy at the Victory Banquet. He had to wait so long for his name to be called!

The most realistic flier on the field (although no great shakes as a competitor) was a Miss America which was continually trying to give all bystanders a haircut. With that slow rate of climb, it was real fun to watch the model and the antics of the people trying to avoid the model. Everyone was having fun over there! Guess the C.D. didn't publicize it well enough, but believe it or not, there were absolutely no takers for the Beauty event! Anyone who had registered an official flight (40 seconds or over) could have qualified. That's all right, fellows, I got pride, too. I know when I have a good looking model and when I don't ... haw-w!

Towards the end of the day, Tony Italiano discovered that all he needed was one more flight to place in Class B. One thing about Tony, he is one determined fellow. Despite sticking his thumb in the prop (gore all over!) and running into the grass innumerable times, he finally did crosswind launch the Thermal Thumber properly and got off like a shot from a cannon.

Like every other contest, .020 Replica was the most popular gas event. These simple glow-powered models draw like

Continued on page 110



Paul Smith releases his dad Ed's R/C Gladiator for an official in Class C. Both are from Gainesville, Florida.



Bert Pond is justly proud of his compressed air model with beer can tank. Budweiser, Lite, Falstaff, Schlitz, one unknown.

Miss

OLD TIMER Model of the Month

- Designed by: Barney Snyder
- Drawn by: John Muir

Text by: Phil Bernhardt

Model experts stand in awe at the performance of this new Tiny sensation.

So begins the ad in the April 1939 issue of M.A.N. for Modelcraft's then-new Miss Tiny gas model, a somewhat similar but smaller version of the 66-inch Pacific Ace also kitted by Barney Snyder's legendary model shop. Just for kicks, let's look at the rest of that ad: "Deluxe kit contains spun cowl, silk, 2-1/2" Voit Air Wheels, cement, dope, die-cut ribs, plenty of good balsa, and full size plans. Price: \$3.95." As if that isn't enough, you could get the same kit with bamboo paper instead of silk for a buck less! For yet another buck off, you got everything but the wheels, covering, cement, and dope. Or you could get the plans alone for 25¢. (Compare that to the \$3.00 you're going to have to pay to get them from us!)

The Miss Tiny was an excellent contest ship in its day and could still be competitive in modern O.T. events. Its first big win was in March of '39, when it won 1st, 2nd, and 3rd in a big meet in Pomona, California. For a while it was pretty much the airplane to beat, according to the Modelcraft ads ... that is, until the Modelcraft Spook came along. Then the Miss Tiny was touted as a general allaround sport model, the Spook being the airplane to build if you wanted to bring home the hardware. Model **Builder** featured plans for the Spook 48 some time ago; it's Plan No. 973-O.T., \$3.00, if you're interested.

The Miss Tiny spans 46 inches, has approximately 275 sq. in. of wing area, and would therefore have to weigh a minimum of about 15-1/2 ounces to fly in Old Timer events. It was designed for Class A and small Class B engines such as the Ohlsson .19, Arden .19, Bantam, or Ohlsson .23.

The model looks pretty good as far as the structural design goes, but as usual, we managed to find something that doesn't look too swift. This time the problem is with those hooks for the wing hold-down rubber bands. Please don't use those hooks, especially if you build the model as a free flight, because sooner or later the model is going to hit something that will skew the wing, and when it happens those hooks will really tear up the cabin. We suggest using the conventional dowel method instead; it's safer and a lot a easier to do, too.

The Miss Tiny would make a great little R/C model if sensibly powered; an .09 or .10 is about max. Use the same rudder size as shown on the plan, and put the elevator hinge about 1-1/4 inches forward of the t.e. at the center. Barney Snyder had an R/C Miss Tiny hanging from the ceiling of his famous hobby shop when it was located on Redondo Beach Blvd. in Gardena, California. The model was covered on one side and was open on the other, and there was some sort of ancient singlechannel gear installed. The model hung there until Barney sold the shop some years ago.

By the way, **R/C MB's** Miss Tiny plans are duplicates of original Modelcraft drawings and were supplied to us by Otto Bernhardt, who got them from Barney before he sold his shop.

R/C MODEL BUILDER



FULL SIZE PLANS AVAILABLE - SEE PAGE 116

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A very unusual electric canard seaplane by Rick Ruysink, of Holland. Spans 5 feet, weights 5 lbs. Not the easiest plane to fly.



One good feature of Rick's flying machine is that it takes off every time. Water handling is reported to be excellent.

BY MITCH POLING

• The electric planes in Europe, according to the letter written by Dietmar Volks (West Germany) and published in the March issue of RCS, are much bigger and more powerful than the ones here. Part of this is due to the larger motors available, which get into the 40 size category. Rick Ruysink, of Delft, Holland, sent some information on these and photos which show the philosophy in Europe for aerobatic competition planes. His friend Frank Bremer flies a 6-1/4 lb., 66-inch span stunt plane using a Keller 50-24 samarium cobalt motor swinging a 10x7 prop. It uses twenty-two 1.2 An cells for a power input of about 370 watts (1/2 hp). The plane shows the trend in Europe towards high wing loadings, fast, groovy flight even in wind, low drag, and high power. The plane appears to be about equivalent to a .40 powered stunt plane. I will be in Holland this summer, and it will be interesting to see how these planes perform. I have seen the twin 25 plane kitted by Astro Flight (the Electra 225) perform, and it is really impressive, capable of pattern performance. Perhaps it has been ahead of its time; it has been available for five years now!

The Keller motors are very innovative. They use samarium cobalt magnets, which are really space age stuff. They are ten times more powerful than the magnets used in electric flight in the USA. In fact, the Space Shuttle has a 17-Ib., 17-hp motor using these magnets. A pound per horsepower is better than most gasoline engines will do! I don't think the Keller motors are quite that potent, but I hope to get one while in Europe and find out.

Rick's own plane is really unique, an electric canard seaplane! It is 60 inch span, 540 sq. in., 5 lbs. flying weight. The battery pack is 18 GE 1.0 Ah cells for a power input of 260 watts on a 9x4 prop. The motor is an Igarashi seven-pole job that weighs 14-1/2 oz., with a power run of 3-1/2 to 4 minutes. This sounds like it is about equal to the Astro 25 or a little more. Rick says it ROW's every time (wish mine did that!) but is hard to fly, as the response to the canard elevator is sluggish. He says it is not a good idea to turn the motor on again if the altitude is less than 100 feet. The water handling is very good. Rick also flies a six-foot Astro 05 sailplane of his own design, which flies very well. In fact, Rick placed second in the electric glider finals last year in Holland, and this was with the plane just barely tested. Rick also does a lot of 020 flying, and designs and flies his own radio equipment to keep the costs down, as he is an aeronautical engineering student with not too much extra money for the hobby.

Bill Baker, my flying buddy from Norman, Oklahoma, sent photos of his free flight electrics. The Nesmith Cougar is about 32 inches in span and is powered by a Mattel E-Power module. Bill had to go to four 100 mah cells to get any climb, and it is still slow in climb (from a hand launch), but is very realistic in flight. It usually places in the contests because of this. At twelve ounces, it is a little heavy for the Mattel unit. Eight ounces would be the ideal, but would be hard to attain. Bill's General Aristocrat is 36 inches, built from a Flyline kit, and uses a VL 101 with four 100 mah cells. This delivers noticeably more power than the Mattel



Igarashi 7-pole motor on Rick's seaplane. It swings a 9X4 prop on 18 cells.

unit, and the climb is much better. It also weighs 12 ounces. This can be a little on the heavy side, though special designs can do quite a lot with the VL 101. Hal Cover's winning indoor R/C electric used one, and it weighed 24 ounces!

Robbie Mehmen had a good-looking Competition Models Eaglet free flight model at the Pasadena indoor meet. This uses an Astro 020, and looks like it should fly quite well. Robbie is only ten years old; I wish I could have done as well at his age!

In general, scale models of about 200 to 250 sq. in. are about right for the Astro 020 F/F unit, with 12 oz. the ideal weight. The Mattel unit is good for planes in the



Also from Holland, Frank Bremer and his super electric aerobatic ship, typical of the highperformance electrics being built in Europe. Uses the German Keller motor with 10X7 prop.





Robbie Mehmen, 10, had this very nicely built Competition Models Eaglet on display at the '79 Pasadena IMS show. Astro 020 motor.

One the few successful electric C/L models, Tony Naccarato's Baby Flite Streak. Battery mounts outside on top of wing.



VL 101 installation in Bill Baker's General Aristocrat, built from a Flyline kit.

100 to 150 sq. in. bracket, with eight ounces about the maximum. The VL 101 is about in between these units, about ten ounces and 180 sq. in. would be about right.

Electric U-Control is rarely seen, but it is quite practical, especially with the Astro 020. I flew control line in the 1974 and the 1975 Electric Championships and won first with a Baby Flight Streak with an Astro 020. I even did a loop! The Baby Flight Streak is especially good because it is a smooth flier with generous wing area. The wing is thick enough to put the 020 R/C battery pack inside it, which I did. Tony Naccarato had an 020 Baby Flight Streak on display at the Pasadena show, and flew it several times, much to the delight of the audience. Tony mounts the battery pack on top of the wing, which makes a simple installation. The overall flight weight should be in the 10 oz. bracket. I used the R/C battery pack (550 mah), but this gives such a long run that I got quite dizzy (yes, I fly mostly R/C!). Next time I will use the F/F pack (250 mah) to keep the time down. And yes, you can run the power through the control lines, with the battery at your waist, and this has been done frequently, but it doesn't appeal to me. The battery loses half of its

voltage going through the wires, and it is not as simple as having the plane carry its own power.

Cox markets an electric U-Control, the Charger series, which fly well. They do need a full circle on pavement or a smooth floor to take off, but they do surprisingly well in the air. The batteries are in the plane, and the two 100 mah cells deliver a little less than the power of a Cox .010. It would make a good F/F unit too, for planes under 8 oz.

Last but not least, back to R/C and Hank West's answer to Dale Black's Miss Fragility (an Astro 05 sailplane with all built-up construction), only in the 020 size. It uses an Ace rudder-only pulse radio, and thermals well, but Hank has to get it trimmed so it'll do something besides circle! Once Hank has the trim settled, this will be a good one. It weighs 18 oz., and has a 60-inch span and an area of 300 sq. in. Until next time, enjoy all the many ways to go electric!

ELECTRIC POWER



Bill Baker's Nesmith Cougar uses a Mattel E-power unit with four cells, produces a slow, realistic climb.



Hank West and his fully built-up Astro 020 powered sailplane. Ace radio, 5 foot span, uses straightforward construction throughout.



A before-covering photo of John Boyd's Velie Monocoupe, built from an Astro Flight kit. A Black Widow does a fine job of hauling this realistic flier around the sky. Structure is very light. Nose section is sheeted with 1/64 ply for extra strength.

The 1/2-A SCENE

By LARRY RENGER

 Why control line in an R/C world? I got the yen, the other day, to build a control line model even though I am up to my ears in R/C flying and equipment. Lots of people have never bothered to get into R/C at all. After a bit of reflection, I came up with several possible reasons. The most obvious one is cost. A 1/2A control line model kit costs less than half of what an R/C model would for the same engine. This is related to both the model size and complexity. Most control line designs are very old (Midwest seems unique in bringing out fresh new designs over the last few years), so the design and tool-up costs have long since been paid off. The volume of kits is much higher than for R/C, since they are quick to build and, being flown primarily by unassisted young fliers (that is where the Juniors are, by the way), they don't last long.

A second reason for the low cost is, of

PHOTOS BY AUTHOR

course, the fact that you don't need at least a hundred bucks' worth of R/C gear to get into the air. You have only your starting battery to worry about, and you can share that with others. Of course, control lines are a bit more reliable than radios. You can see the flaws in a mechanical system if you look for them, but electronics are much more subtle. Even simple broken wires and cold solder joints often take some really careful search to find.

To me, however, as a well experienced modeler and owner of R/C gear, there is one very great attraction to control line models. The key is the feel and responsiveness of being physically in touch with your model. By George, you have the controls in your hand, you can feel how that model is flying. If it is a light, responsive stunt model or a fast racer or a heavy scale model, you can tell it with your eyes shut, just by the feel. The line



Really neat C/L trainer, also by John Boyd, features a pop-off wing and pretty darn thick airfoil. Left-hand prop keeps the model out at the end of the lines, where it belongs.

tension, speed, and response rate information are all coming to you through touch, not remotely through the eyes. You can see too, of course, but that means that you have even more information. The only R/C models which come close to the responsiveness of your average control liner are the hot racing planes, and they usually only turn left. Try to take your aerobatic sport R/C through three consecutive vertical figure eights in under 10 seconds sometime. And there just isn't anything in R/C which can come close to the performance of a C/L combat model!

As it happens, I fly free flight, too. I have always wondered how come some modelers are at each other's throats, with the various factions acting like the others were stupid or downright evil. Hey, guys, we are all modelers. There are lots of anti-model people out there to bad-mouth without picking fights with members of our own clan! I figure that if you are a modeler, the best type of model is only what you happen to be flying right now. Each of the other types has its advantages, disadvantages, and unique thrills. Each phase of flying has its good guys and creeps too, probably in about the same proportions as the others.

BEGINNER'S WORKBENCH

This month I think I'll say a few words about how to clean an engine. Of course you and I never crash, but perhaps you know someone who has, and you just want to help him out.

Even a crash onto clean asphalt justifies an engine teardown and cleaning if you want to keep the thing running for anything like its potential life. There is no such thing as a clean crash. Also, there is no way to properly clean an engine without doing at least a partial disassembly on it. Grit won't just blow out of your engine the next time you run it; it gets imbedded in the metal and just keeps cutting away at umpty-zillion revs per minute.

Now, what equipment do you need to do a good job? Not much, actually. A



Newest engine from Cox, the R/C Bee. Not a reed-valve job. Details in text.

few scraps of clean, soft cloth, an old toothbrush, a few pieces of dowel, perhaps some steel wool if you want to de-varnish the engine while you have it apart. For cleaning I like rubbing alcohol, but it must be followed by careful drying and oiling to prevent rust. The proper wrenches and screwdrivers for your engine are a must, too. Stripped screw slots are one of life's greater frustrations. (When it comes to Phillips head screws, by the way, Japanese ones use a shallower angle than American; you have to file a new taper into the tip of your screwdriver for them!)

The minimum cleaning requires removal of the glow plug or head, and the engine backplate. Slosh and wipe out everything you can get at and reassemble. It helps to turn the engine over a few times too. Although better than nothing, this is really inadequate to get grit out from the crankshaft bearing area, and there is the risk of leaving some water in there, too.

For best results, do the above first to get the major crud out, then completely disassemble the engine. That way you minimize the scraping of dirt in taking the engine apart. Now, use the toothbrush and a bath of fresh alcohol or even soap and water to thoroughly scrub all bearing and other surfaces. Use the cloth and dowels to get inside the



Ted Strader has designed some of the nicest R/C models in recent years, and his "Corky" 1/2A flying boat is no exception. Simple yet attractive lines are typical of Ted's models.

crankshaft, venturi, and up inside the piston. Even flush out the glow element cavity, you can store enough grit in there to damage your engine. If the cleaning solution has visible dirt in it, change it and do the whole thing again. You want the engine to be totally free of grit, and if you can see it, some will settle out on the parts you just cleaned.

Dry all parts with towels, a hair dryer, or your hot air gun. You can even bake them at 200°F in your oven. Oil all the parts, then reassemble. Try each fit to see if it is running smoothly. If not, check for remaining dirt, lint, or unnoticed crash damage.

Enough on that, let's see what you guys are doing out there. First up, John Boyd (3005 Mayfair Dr., Sioux Falls, SD 57106) sent photos of a couple of new models. The first is, would you believe, a trainer for his son to learn control line on. John obviously believes in doing things right. The airfoil is a 24% semisymmetrical to give smooth, slow response with lots of lift. The model is moderate size at 24-inch span and 120 sq. in. wing area. He kept the weight down at 6.5 ounces despite the added feature of a wing held on with rubber bands to help reduce crash damage. The engine runs clockwise with a 6x3 Tornado pusher prop to give the best line tension.

John's second model is built from Astro Flite's Velie Monocoupe kit. He covered it with silkspan and Sig Lite-Coat dope. He says it weighs in at 3 ounces over the recommended 25 ounces, and has a very tired Black Widow on it, but despite 10 mph winds, it is a joy to fly! Says John: "Its slow powered flight, modest climb, and long, long glides give it a sense of realism in the air. Those relatively big Williams Brothers wheels afford a nice roll-out on our grassy flying field."

The next four photos were all shot at the 1979 International Modelers Show in Pasadena, California. First is Ted Strader with the Corky. Ted kits this design and flies it as a seaplane with three channels on a throttled .049 Black Widow. Ted has contributed a tremendous number of sport 1/2A designs to our hobby over the years. Look through your magazine collection and you'll find them. Ted's company is "Special Edition Plans," and Ace R/C carries his line of kits and accessories.

Cox has a new engine designed for the R/C modeler, to be called the R/C Bee. I understand that it is a rear rotary, not a reed valve engine, and that it has a clunk tank built in! Top that off with a throttle/ muffler combination and you have the 1/2A engine we have all been waiting



Latest 1/2A kit from Cox is the Warlock .05, a 32-1/2 inch sport model for 2 to 4 channels. Not designed by Lee Renaud!



Cute little outrigger hydro for .10 size engines, the "Lil Rascal" from Dumas. High performance and great fun on a limited budget.



The BONE II 50/800 canard design sports an aft-keel, forward rudder configuration. Looks odd in or out of the water, but runs like a scalded cat, which it is. Rod Carr photo.



• There is no substitute for a direct knowledge of the yacht racing rules. They are not simple, and many fine points can be debated. However, common sense is usually the most reasonable guide when one is confronted with a dangerous situation. A good example occurred at an early regatta this year. The location is not important, nor is the identity of the race committee who made an improper decision in the case. What *is* important is that the situation illustrates what happens to our sport when winning-at-any-cost outweighs the joy of sailing.



John Krick, 1978 Star 45 ACCR Champion. His winning boat, No. 99, still sports a patch where our "Strictly Sail" columnist clobbered it in 1977. E.F. Burnhans photo.

In Figure 1 we see A, running downwind on starboard tack. B and C are approaching on port tack. At this point B should be thinking ahead. He could have tacked at such time as to have kept clear of A (as at B*). B was unable to bear off to starboard due to the presence of C. C should have been thinking ahead too. In his present situation he could not tack because of B, and could only bear off to starboard hoping to clear A. The boats were 50/800's and the wind was 12-14 knots, so the situation was developing rapidly.

Boat A must have been moving well, given the wind strength. Whether he was a leg ahead or behind was not important. In order to make the best time on the course, he needed to keep up his speed. Even though he was the privileged boat on starboard tack, he could have easily hailed B and C and told them he would pass astern of them, as in A*. His alteration of his course would have been small, and he would have kept his speed.

So we see that as the situation developed, each boat had options that eliminated a future collision.

What actually happened was that A bore straight down, maintaining course and speed as the privileged boat should. Whether he hailed or not, B and C were faced with avoiding him. C was pressing his effort and pinching up on B to the point where B could not tack, for in so doing her stern would swing and hit C. C did not bear off and eventually a collision occurred.

At the protest meeting B was found guilty of failing to keep clear of C and hence causing the tragedy. The protest committee was interpreting on the basis



of only the few rules it really knew, port/starboard and leeward boat. B argued in vain that at a certain point she was unable to tack away from C, and having no choice but to continue on port tack, A became an obstruction for her. C should have given B room by bearing off so both could clear A's bow. the race committee should have penalized C for failure to give B room at an obstruction.

Each skipper was using a very limited view of the rules. Worse than that, they preferred to cling to their "rights of way" rather than anticipate the developing problem and use common sense and good seamanship in avoiding the eventual crash.

It is unfortunate but true that race committees are often drawn from the ranks of those who don't really know the rules. Even worse is the common practice of having the committee drawn from among the competitors, those who are most liable to be involved.

The best approach is for the skippers on the water to avoid mixing it up. Continual hailing between crossing boats or overtaking boats goes a long way toward maintaining order in the fleet. In our example, a simple hail from A that he would pass astern would have left B and C to scrap it out on port tack to their hearts' content. Boat A may have been able to either cut B and C's lead or extend his by such a tactic. In fleet

Continued on page 108

R/C MODEL BUILDER





*** Standuster * Joo * *

By STEVE GARDNER ... A really pretty rubber scale model of a popular two-seater homebuilt bipe. Could also be flown with a CO_2 motor.

• In 1954, Lou Stolp designed the original Starduster. This design was the first of a long line of beautiful elliptical wing biplanes conceived for homebuilders who want a beautiful airplane above all else. The second Stolp design is the Starduster Too, a 25% larger version of the original Starduster. The second seat and added horsepower make this airplane the most popular in the Stolp line.

This model is a 3/4-inch to the foot version of the SA300 Starduster Too, giving it a span of 18 inches. It follows the original very closely in an attempt to capture the grace of the airplane.

While the model is relatively simple, it is still full of curves and odd shapes, so a little previous experience will help.

Start the model with the tail surface. Laminate the edges with medium balsa, in one piece if you can, or you can do it in several pieces like the plans show. Note the slot formed by the fin cutout; this is for stab adjustment so you will not have to build separate elevators for trim. The original model had 1/32x1/16 caps added to each rib on top and bottom and were sanded to streamlined shape. A flat tail is shown on the plan and is suggested for lightness and simplicity. The vertical tail is scale in size and shape, but if you are building a specific example, you might check to see if the builder has changed the shape of the fin or rudder.

The fuselage is started by cutting out all the formers and other small pieces. Make the formers out of soft balsa, as they don't carry any structural loads. Fill, sand, and paint the formers that make up the backrests and instrument panels.



The author with his attractive biplane. Large stab area is evident in this photo.

Build the fuselage frames using very hard balsa for the longerons and medium balsa for the uprights and diagonals. The fuselage sides are built one on top of the other to insure identical sides. Don't omit any of the diagonals because they hold the pretty curve on the bottom, and more importantly they hold the top longeron straight. This is important, because everything is positioned by the top longeron.

Join the sides with crossbraces made of medium balsa, starting at the tail and working forward. While the glue is still wet you can jig the frame upside-down on the building board to hold it square while it dries.

Add the formers and cut the stringer grooves in the ones that need them, keeping in mind that the stringer locations shown on the plans are to be cut on the frame to eliminate errors in alignment. Add the bondpaper wrap, then the medium soft balsa sheet. The difference in thickness will make the cowling seam stand out.

Bend the gear wire to shape and fish it through the small holes in the bottom sheeting. Then glue with epoxy at the proper forward rake angle. Carve the balsa noseblock to the shape shown on the plans. This is another place to look for differences in specific examples. Be sure to include the down thrust when drilling the hole for the 1/16 I.D. aluminum tube bearing.

Build the cabane struts out of hard balsa sanded to streamline shape and glued together with epoxy. The landing gear fairings are made of 1/8 soft balsa cut to the shape of the fairings in the photos. Sand them to a thick streamline shape and paint or cover.

Start the wings by laminating the outlines out of basswood. Make the ribs next, leaving them a little long at the aft end and omitting the spar notches until later.

Pin the leading edge down and butt the front of each rib against it to mark the locations for the spars. Cut the spar notches very accurately to avoid problems later. Next add the trailing edge to the board and lay each rib in place to mark where to trim it. Cut the spars out of medium balsa and pin in place. Glue the ribs in place and add the gussets.



Two photos showing the relatively simple framework. Wing t.e. laminations are not hard to make. Full-size Stardusters often have different tail surface outlines or wheelpants; best bet is locate one (shouldn't be hard...it's a popular airplane) and build your model to match.





Ken Smith shows off his highly unusual Peanut "Payen," a surprisingly good flier. It's amazing what these guys can make fly!

FREE FLIGHT SCALE



Mik Mikkelson ready to launch his Blackburn Skua, slightly enlarged from Earl Stahl plans. Site is Cal State Dominguez Hills, Carson, CA.

Now that I have my feet back on the ground, so to speak, after Oshkosh, I have had a bit of time to get some serious modeling done, preparing for the Flightmasters Annual. Not only that, I have been working on some drawings for my rubber entry for the 1980 Flying Aces Annual. Even though there appears to be almost a year to go for this most outstanding event, and one that you scale modelers ought to plan to attend, it is not too early to get your models built and test flown. The competition is fierce in spite of the fact that the overall contest is low key, with the emphasis on fun. This is one place at which you do not want to show up with an unproven model. One remark that shows the low key attitude of this contest was made to me by Don Srull, who is already preparing his fleet for next year; "Our models are so secret, we only fly them in the dark!"

My method of getting my models back there next year has to be different than the one I chose before. I had shipped four models in a box 18x30x30 inches to Hurst Bowers. Hurst in turn graciously carried them by car to the contest. The cost of this operation was staggering to say the least, and certainly, I will not go this route again. Instead, I plan to build a model or models which will come apart and fit into a carry-on box on an airliner. Bill Noonan did this and it worked out most satisfactorily.

This leads me into how you can make carrying boxes for transporting your models to and from the flying field. In my instance, I can never find cardboard boxes that are just the size I need to carry my models in; therefore, I have to make my own. Some of you might think that the effort is not necessary, since you can just toss them into the back seat or arrange them carefully in the trunk of your car. Well, I can't disagree with you, but my lesson was learned when coming home from a contest one afternoon. I turned a corner just a bit too guickly when I heard that distinctive sound of crunching balsa. Seems that a heavy object I had on the seat clear across from my handiwork shifted in the turn and completely destroyed my model.

The same corrugated material that regular cardboard boxes are made from can be purchased from good art stores. From this material you can make any size box you need to accommodate your models (see Fig. 1). Scotch makes a good tape which is used for wrapping packages for mail, which can be used to hold the corners in place. If you want to get fancy, you can reinforce the upper ridge of the box with some 1/4x1/2 pine. I use white glue and staples to hold the strips in place. Place rectangular pockets for the wheels to fit into, then glue a couple of strips of balsa (1/4-in. sq.) vertically on either side of the rear of the fuselage, just ahead of the stabilizer. This keeps

By FERNANDO RAMOS

the fuselage from rattling around in the box, and the box can be picked up almost vertically without fear of dislodging the model. Very simple, yet effective. Finish up with a shallow lid made to fit the box, and then some heavy twine for handles on either end, if desired.

K&S, who handles all of the brass and aluminum tubes and other shapes which one finds in his favorite model shop, has a real neat tube cutter. For years I have used either a razor blade or Zona saw for cutting tubing. Recently I got a hold of one of these tube cutters and found it to be a real useful tool around the shop. It is a miniaturized version of a regular tube cutter. Each cut is a square cut, and it will handle any size that modelers will usually need. Try one.

While on the subject of tubing, K&S also handles streamline tubing. I know that this is not new to most of you out there, but I have never used any except for exhausts on a WW-I BE-2e a few years ago. However, the other day, while finishing my Flyline General Aristocrat, I had everything completed except the struts. For some reason, I didn't want to go through the trouble of shaping them from balsa, and to make special fittings for attachment. I took some of the 1/4inch wide streamline aluminum tubing and cut them to the correct length. I then fitted the smallest of the Robart hinges into each end. These were attached using five-minute epoxy. In the



Even died-in-the-wool hardcore F/F Scale maniac Fernando Ramos builds an R/C model once in a while, his latest being this Fairchild 22 from a Flyline kit. Weighs 2-1/2 lbs., flies beautifully with an O.S. .10. Color is red and silver. Spans 48 inches.





wings and fuselage, I provide small blocks that the fittings could be secured into. These in turn were also attached with the quick-drying epoxy. The whole procedure took less time than it would have to make just one balsa strut. The same principle can be used for cabane and interplane struts on biplanes. The weight is negligible and the appearance well worth it. Incidentally, the hinges will come apart during impact, so that everything isn't destroyed on a hard or unusual landing. I brushed on a coat of Floquil, which covered them in one coat, and the hinges actually look like wing attach fittings.

The next hint that I'm passing along will make some of you wonder whether it's worth the space in this column even to mention it. Well, I'm going to pass it along anyway. Most bottles of epoxy have two different colored caps. I use Devcon, and it comes with a blue and red cap on the bottles. Some have black and red, etc. OK, when I mix I always use the blue cap bottle first ("b" before "r"), so that if I'm distracted by a phone call, or if a neighbor drops in to talk, when I get back to mixing the epoxy, I know which bottle I have poured from. Now I've conditioned myself and I always reach for the blue cap bottle first. Is that a hint or is that a hint!?

With hand launching being done more and more, I believe that there is a need to reinforce the area of the fuselage where it is natural to hold it for launching. How many times have you given the ole heave, only to have gripped a bit too tightly on the launch, causing the tissue to rip or structure to give way? This can happen more readily with heavier models, and in particular, gas models. Therefore, on your next project, I recommend that you consider some kind of reinforcement where you would normally grip the fuselage (see Fig. 2). Probably a triangular gusset will be more than adequate on a rubber model. It may take a bit more for a gas model, but at any rate, it sure could save you some grief later.

Next, I would like to mention a few items regarding covering. All of us appreciate a model which has an excellent covering job. There is no question that covering is a kind of art form, and there are modelers who can do this task with little effort and with magnificent results. I have mentioned on many occasions how you can cover a model and get pretty good results, so I don't want to go into the same detail now. However, there are a few items which I have not talked about before that could help some of you on your next covering job. First off, if you have an idea of where there could be a problem, then by avoiding it your job should turn out better.

As an example, take a look at Fig. 3. If a fuselage you are covering has a stringer(s) on the side, what can happen is that the tissue lays up on the fuselage side,



Another of Fernando's just-finished projects is this General Aristocrat, also from a Flyline kit. Orange and black, weighs 8 oz., powered by a Cox .020 with Davis Diesel conversion.



Tom Comparet launching his electric ASL Valkyrie. Model was reluctant to take off, was destroyed in a hand launching attempt.

Winner of Outdoor Scale Gas, Larry Kruse's CO₂ powered LWF Butterfly comes cruising by. Model spans 23 inches.

AT THE

FREE FLIGHT SCALE

PHOTOS BY LARRY KRUSE AND JOHN PRESTON

• To a Southern Californian, the Nats at Lincoln, Nebraska was looked forward to with mixed feelings. The tales of high winds, tornados that had more force than a Taft trash lifter, corn so tall that even a Jumbo Scale model would be lost forever, and no beer sold on Sunday!! However, on the plus side was the enjoyment of seeing old friends, making new ones, seeing different models and new techniques of how to make them,



Scale Director, John Preston, holds John Oldencamp's entry, a Japanese homebuilt.

and perhaps most important, helping Free Flight Scale by attending the events instead of complaining about the low attendance while staying at home. This latter burns me more than anything else when I hear it.

So, with four models, a five gallon can of gas, my Datsun pickup, and Bob Haight's tent trailer, plus his models, we set out for the Nats at Lincoln. I won't go on about the trip there, as I'm sure you want to hear about the Nats, but we had a ball getting there, saw many sights... Golden, Colorado for instance. By the way, we didn't use the gas until I got back to Los Angeles; plenty of gas on the way at below a dollar a gallon!!

The first Saturday night was spent at the scale judges meeting; as I have a big mouth, Bob and I wound up being static judges for all the events in Free Flight Scale that we were not entered in. This may seem like a lot of work, and it is, but how else can one really see how well some of the models are made, and what new ideas can be picked up for future models? Think about it!!

Sunday morning we gathered at Pershing Auditorium for Indoor Scale. As 1 was entered in AMA Rubber Scale, I helped judge Peanut. Bill Warner's design of the Lacey was very popular; there were nine of them. To balance



Carl Miller's Cornet Taylorcraft took 3rd in Gas. One of the few glow-powered entries.

this, there were four Fikes and eleven other designs from a Volksplane to a Curtiss XF-13-C1 monoplane fighter.

The Curtiss was made by Lloyd Wood Florissant, of Missouri, and looked great in its yellow and silver finish; very detailed, too! As most of you know, the 3-view of the Fike leaves much to be desired as far as detail goes. Bob Willey, of Lincoln, Nebraska, overcame this by using colored photos of a full-sized Fike in his presentation, then duplicated each detail on his model, right down to the pitot tube under the left wing. The



Bob Haight of Las Vegas gets a good launch on his Bellanca Columbia. Model is highly detailed and is a smooth, stable flier.



Bob's Bellanca was highest in static score, but the engine wouldn't keep running long enough to post an official flight.





Carl Miller's Lanzo Puss Moth flew well, but a low static scale score kept it out of the running. That's George Perryman holding the tail.

Don Srull's Waterman Racer was tops in Outdoor Rubber Scale. In spite of high wind, model turned in one-minute flights.



Pilatus Turbo Porter garnered second highest static score in Indoor Scale for Ron Roberti.

judges were very impressed with Clarence Mather's Davis DA-5. It even has a tube motor stick inside with wire bracing, and in spite of being very light, is detailed and not a ghost ship in any way, a real tribute to a fine builder.

The AMA Rubber Scale event had some very good models also. Among these were Ron Roberti's Heinkel 100D with a great deal of detail, including panel markings and even some oil spills near the engine. Don Srull had a model of Walt Mooney's full-sized Piper Vagabond, with photos of the full-sized plane taken by Walt himself. As this plane was an early Vagabond, it didn't have the black stripe on the side. Bill Knapp, one of the judges in the event, told me that the stripe was not on the full-sized plane because of drastic cost measures to keep the company in business at the time.

Some thought my Bristol Flying Laboratory looked rather odd. Can't understand this, as it's a tractor, doesn't have bent wing tips, only one engine, and the wings are in front; how common can one get? Must be because it was a biplane. Oh well, can't please them all.

After all the static judging was over, we all took our models into the main room. This was big, at least to me. I had trimmed mine in a 20-foot ceiling gym in Long Beach; someone told me that the top of this one was 65 feet or more. Put the same winds in as I had in California and R.O.G.'ed the model. What a disappointment, it only rose about 10 feet from the floor!! Clarence Mather was consulted about this, and he told me that the high humidity had caused most of the models to gain weight, and would require more power to fly as well as in California. A larger rubber motor was made, wound, and sure enough, the model climbed much higher. That Mather sure knows his stuff, and like all free flighters in Scale is willing to share



Bill Stroman continues to come up with strange and unusual scale models. His Bristol Flying Laboratory was an entry in Indoor Scale.



Bill Stroman's Stinson SM-2 Junior gets off on one of its usual good flights. Won 2nd in Outdoor Gas Scale. Astro 020 power.



A very nice Gordon Israel "Redhead" racer by an unknown builder. Built from Peanut plans in March '75 MB.



Kinner Sportster by Duke Horn was one of a growing number of low-wingers that flew at this year's Nats. Flies well with Mills diesel.



Pat Wilcox, George Cleveland, and Jim Ong discuss possibility of the two pilots getting together in the center of the circle. Anyone for "Overlapping Circle Combat"?



Bill Lee launches his well-known and respected Goodvear. It decided to run rich for the last 18 laps so turned only a 6:01.



SORRY

Last month I started the column off saying that it would include a piece dealing with Bob Whitely's Derringer model, then ran out of space and said it would be in this month's column. If you believed that, you were wrong again... I have been desperately searching for that particular copy of Stunt News and can't find it. Every effort will be made to get the material into the next column. Sorry.

CONTROL LINE RULES

No, not another long tirade about the CLCB (Control Line Contest Board) or the rules coming up here shortly. Instead, a compliment of sorts.

I have been on the CLCB for a few years now, thanks primarily to District XI Vice President Homer Smith who somehow convinced me to "volunteer" for this job. At the time I was asked to do this chore, being on the CLCB was not exactly a prestigious position. Still isn't, I suppose, but as I spent part of my Labor Day weekend working on the final vote of rules to go into the '80-'81 rulebook, I finally realized that today the CLCB is functioning as should be expected and has far fewer controversies than in years past.

Remember that really stupid controversy about cheek cowls on Goodyear models? The people racing the event didn't care much about what kind of cowl the other guy used, but an individual who didn't even fly the event saw a "problem" and in trying to correct something nobody even cared about, successfully caused a wild controversy and probably overlooked other items of much more importance in that particular rules cycle.

It is not hard to remember more controversies, but that is past history and the real point is that we are remembering controversies, not discussing the present one . . . because as far as I know, there aren't any. The closest we have come lately was a safety proposal to put a ban on single-blade propellers. It was proposed, voted on with the majority deciding against immediate enforcement (safety item, remember), the Speed fliers wrote their views on the proposal and the CLCB listened to them, finally voting to not take any action in banning short-leg props. The Speed guys are evidently now going to tackle the problem by coming up with a sug-gested construction technique for these props and this will be included, if at all possible, in the new rulebook.

In my opinion, this change in the lifestyle of your basic CLCB representative is due to having Dr. Ron McNally as Chairman of the CLCB. He never seems to fly off the handle over certain proposals or proposers, is able to communicate with short notes instead of bound volumes, understands the procedures we work under, and knows how to apply these procedures to get where we want to go. This is an important point. In the past it seemed as though the rules cycle was played like a big game. Didn't make a lot of difference how the rules came out, what counted was picking up on controversial points (Goodyear cheek cowls, for instance) and blasting the whole thing as far out of proportion as possible. This type of thing was always good for lots of points in the rulemaking game. Politics played a big part; get the "name" guys on your side and write letters. Great Fun.

But Ron has turned all of that around and uses the CLCB members and the procedures to come up with rules that will help each event. Some of the rules and events are very difficult to deal with, so yes, we do still have a problem now and then, but nothing like we used to. When this new rulebook is out and in your hands, there may be some new rules that you don't like, but damn few, I would bet.

Knowing Ron, I imagine he won't be completely satisfied, but I am convinced that this rules cycle went better than any previous ... so much better that I congratulate him on a job well done, and how many times do you see that kind of compliment paid from the pages of the C/L column?

Another help in dealing with rules has been the Advisory Committees representing the special interest groups: Combat, Speed, Precision Aerobatics, Carrier, and Racing. As a rule, these



Father and son Rat Racers by Dave Braun. Big one has a K&B. Dave flies it for fun and to warm up for the little one with the TD .049 and left-hand everything.







George Cleveland doesn't quite believe Rick Stubblefield's story about how he just won his match 6 cuts to 2 with his eyes closed.

groups poll their members, or at least conduct their own voting on the rules that will affect their event(s). The results are forwarded to each CLCB member, and even though it is emphasized that the Advisory Committees are in fact only *advising*, their advice is followed, almost to the letter. Helping along considerably here is the fact that a number of the original proposals are made by these AC's.

The ultimate example here is the Precision Aerobatics boys. They sent in a couple of proposals, asked that they be passed, and that was about it. Going in they knew what they wanted, no fuss, no muss, and going out they probably got it (I haven't seen the voting results yet) without a single negative vote from the CLCB.

ANOTHER MONTHLY READER, UP TO 14 NOW

In the "...Three if by Air" letters section, I see a missive from none other than Bill Gieskieng, and in it he indicates that he now reads the C/L column. That is fine, but also means that he hasn't read it in the past. And after all of that writing Stalick did about challenging me to this and that, you would think that Bill had long ago checked out the C/L column to see what we were up to on this side of the challenge.

For those who don't know, Bill is a genuine F/F nut and has built some rather inspiring FAI Power models. After years of me reading about Bill, being conditioned to relate his name to "flappers," I think it only proper that he read, even if force-fed, some of the C/L ramblings.

Perhaps Bill went far enough back in his issues to get to the column about the very special Trash Can Event, where a group of Combat fliers tried to stuff their 100-mph-plus models straight into a trash can, the winner getting a prize worth almost \$300.00. 'Twas a classic, Bill, something you as a modeler known to stuff in a plane or two could gleefully relate to.

Say, Bill, the Denver area is known to have a few C/L enthusiasts. Might want to check it out, we have several events in C/L where flaps are in style....

ALONG THE SAME LINE

Directly below Bill's letter was another from a friend of mine, Steve Helmick. And it appears that Steve hit a nerve at \mathbf{R}/\mathbf{C} MB, as his short note prompted a quite long and blasting response.

In a way, I can go along with both sides. Steve is right in saying that most R/C'ers don't qualify as being model builders, so the new title of this magazine is indeed a bit of a contradiction. But the very definition of what is a model builder has changed a lot; there is the problem. I can point out to Steve (who happens to be a very good model builder) that there are those still around who started model building a long time ago and can justifiably say that we don't have but a handful of true model builders in the whole world. Their definition of such a person would eliminate anybody who bought anything ready made for their model.

Steve flies a lot of A/2 Nordic, so builds complex and sophisticated models. But the last time I was talking with him he was using a trick towhook somebody else made and sold him. And the towline reel was somebody else's handiwork.

Although I find it difficult to define, in today's terms, what constitutes a model builder, it is certain that the person who met this criteria would be possessed of much less in the way of model building skills than someone like Steve is. So if the F/F guys, and a lot of the C/L guys as well, prefer to place themselves upon a pedestal, self-constructed or not, I personally feel they deserve to be there and when looking down at the majority of R/C activities can indeed be outwardly smug, knowing that whatever those fellows below have built, they can do it far, far better.

However, all of us have to realize, as WCN points out, that all of us are into our selected activities to have fun. And it seems that with the R/C activities, the fun comes from actually going out and flying the thing. There is today far less emphasis on actually building it ... buy it already built, throw together a foamie kit, whatever, but the flying is where it's at.

As I am one of few who take an active part in modeling activities that are worlds apart, I feel qualified to illustrate an example. In C/L modeling, where traditional model building skills are required for any real success, I have become (in my own ego-inflated estimation) a fairly skilled modeler and have accomplished a few things of significance that I am proud of. So, from that point of view, I share with Steve and others a downward slant in my vision when looking at R/C activities.

However, I also fly some R/C models, although I am not interested enough in them to have gone flying for several months now. For some reason my R/C



Participants at the West Coast FAI Speed Trials, I to r: Bob Spahr, Doug Hinckley, Chuck Schuette, Luke Roy, and John Newton. See text for results. Photo by Trials C.D., Joe Klause.



Winners in FA1 Combat, I to r: George Cleveland, 1st; Richard Stubblefield, 2nd; and Gary Fentress, 3rd. All used all-balsa models.



Duke Fox, George Cleveland, Mike Guthomson, and Pete Plunket. The Fast Combat 1st, 2nd, and 3rd place finishers.



• The American National Championships are always a great pleasure to attend and participate in. I look forward to renewing friendships with modelers from all over the country and even the world. It is a time to exchange ideas and pick up new techniques for model aviation. The 1979 Nationals in Lincoln, Nebraska, were exciting from the competition point of view and satisfying from the social point of view.

As always, there were many of the country's top pilots and personalities in attendance. The Combat site at Lincoln Air Park was very adequate, but not exceptional. The field was just that: a field, not a plush manicured putting



Charlie Johnson and Phil Granderson talking over the situation. Phil was Fast Combat National Champ in 1978.

green type of surface. The concentric circles were well marked and accurately measured out. Marlin McGee, the Combat Director from Oklahoma City, was



Riley Wooten and Jim Mears pitting for Bob Mears. Riley is a 5-time Nats Combat Champ and the designer of the VooDoo.





Fantastic shot of David Owen bending over backward to get the kill on Tom Fluker.



Duke Fox tunes the engine (guess what kind) on a model he is about to fly. Dick Imhoff built it for Duke.



Debbie Imhoff worked the pits. She is shown here pull-testing Tom Fluker's model.



Howard "Ronald McDonald" Rush waits for Kit Gerheardt and Mike Guthomson to get his Flite Streak ready. Rand Rozzle in back.



Marvin Denny is happy about being No. 1. He's now the National Slow Combat Champ.



Junior Fast Combat National Champ, Greg Strombeck. Greg won with a Matador pulled by a Fox Combat Special.

events was the same as that of previous years, with Junior and Senior Slow Combat on Monday, Open Slow Combat on Tuesday, FAI Junior, Senior, and Open on Wednesday, Junior and Senior Fast Combat on Thursday, and finally Open Fast Combat on Friday and Saturday.

One change to note is that FAI Combat was broken down for the first time



Combat Director, Marlin McGee, did a great job of keeping the events running smoothly.

into Junior, Senior, and Open. In the past this event has been flown only as Open. I would have to say that by Nationals standards, the Combat turnout was low, especially in the Junior and Senior events. Junior Slow Combat only had 8 entries, while Senior Slow Combat had only 4 entries. Junior Fast Combat had 7 entries, while Senior Fast Combat had 3 entries. The weatherman was very cooperative in providing us with warm and calm days up until Saturday, when the winds did blow. Fortunately everything had finished by that time except for the unofficial 1/2A Combat event. Oh yes, we did have one rain shower on Tuesday for just a little while, about 30



Marvin Denny and Richard Stubblefield have at it in a Slow Combat match. Marvin won.



Les Pardue finished 5th in Fast Combat, used a TWA engine that showed some power.

minutes. Overall, the conditions were very good for flying Combat.

EQUIPMENT

None of the competitors really had any revolutionary new equipment. In fact, one might say that the trend is to go back to some of the tried and proven pieces of equipment. There were plenty of all-balsa designs and only a few of the foamies scattered about. The all-balsa models won everything. None of these designs were anything that hadn't been seen before. George Cleveland used his standard design to win Fast Open Combat, as did Richard Stubblefield to win FAI Combat. Robert Autry of Southern



Up from Mexico are Raul Monge and Leonardo Silva. Also part of the Mexican crew is Francisco Zuloaga, standing at left.



Good action shot of Ron Esman and George Cleveland getting their man into the air first. A very efficient pit crew!



Moderation is O.K. unless carried to extremes!

GEE REE 7 STORIES

Those who have followed the progress of the Gee Bee Z reproduction through the mentions in this column might care to read what the machine is like to fly in the words of its owner, Bill Turner. Excellent accounts by him have appeared in Private Pilot for July, 1979 and Sport Aviation for July, 1979. Both feature color photos by Japanese fashion photographer Hiroshi Seo, which may be some of the finest air-to-air shots ever taken. For those of you with overseas connections, you might try to obtain the copy of the Japanese magazine Aviation Journal, No. 75, which features a fullcolor fold-out of both Turner's Gee Bee Z and Miss Los Angeles flying in very close formation. And for our readers in the United Kingdom, the Aeroplane Monthly has also scheduled an article by Turner.

During a recent talk, Bill remarked that it had taken Ed Marquart and himself five years to build the reproduction ... whereas the Granville brothers did the job in five weeks!

AND SPEAKING OF GEE BEES

Dr. Julian Steinberg met the most famous Gee Bee pilot under rather unusual circumstances: "Jimmy Doolittle once used our bathroom back in 1932 when he was testing planes in Long Island; needless to say, the bathroom became a shrine since 'Doolittle' was here.

"In 1946 I met him at an officers' party in Hollywood when he came back with General Patton, and reminded him of his visit to our house when I was 19 years old. Now that I was 33 in 1946, he said I'd grown some.

GONE WITH THE WIND

From Aero magazine, March 16, 1912: "The recent high wind experienced in Los Angeles raised havoc with some of the partially completed hangars at the new Griffith aviation field, and one building, that of Jay Gage, was lifted from its foundation and carried away over 50 feet by the wind. The machines which the structure sheltered were uninjured. In a letter to Aero, Gage

comments on his experience as follows: 'I knew that I could make an aeroplane that would fly, but I never dreamed that I could go one better and make a darned hangar that would fly too. However, I am starting in again and will be in operation in a short time.' "

THOSE WERE THE DAYS

Bill Kee, of Twin Falls, Idaho, enjoyed our mentions of early models, and hopes someone will undertake a more complete history. Meanwhile, here are a few more tidbits from a pre-war George D. Wanner & Co. catalogue, via Sears McCorrison:

Japanese tissue, 21"x31" sheets ... each 5 cents

21" A.M.L.A. Soaring Glider kit, com-



Cedric Galloway ready to launch his very nice Sig "Mr. Mulligan" at Flightmaster meet.

plete with all materials, sandpaper and glue ... 25 cents 3/32" flat rubber ... 1 cent per foot or

\$1.25 per 210 foot skein

3/16" flat rubber ... 1-1/2 cent per foot or \$1.60 for 210 foot skein

How do those prices grab you, gumbanders?

AND SPEAKING OF RUBBER

Scale Staffel Vice President Bob Boehme calls that form of power "Norwegian steam," but declines to elaborate further.

WRIGHT WAY TO CONSTRUCT **AN AEROPLANE**

It was our privilege to sit in on a session at the soon-to-be-reopened San Diego Aerospace Museum. One of the aircraft on display will be a full-scale



Rollout of the Gee Bee Z reproduction at Brown Field emphasizes the small area of fin and rudder. Owner Bill Turner is at the tail.



Highly detailed F/F scale Hawker Fury by Doug McHard, one of England's best-known scale builders. A good subject for F/F. Photo taken by Pete Redhead.



Super-short nose requires making the tail end as light as possible. All-sheet rudder is shown built-up on the plan.



This photo should clear up any questions about the landing gear assembly. Note Hungerford spoke wheels with white tires.



By WALT MOONEY ... The Ole Perfesser presents yet another interesting Peanut, this one a Bleriot-like Italian flying machine from 1912.

• This airplane is a classic shape from the year 1912. Except for the fact that it has brace wires and fixed landing gear, and the old-fashioned engine was so heavy that it only took a short nose to balance it, the configuration is quite similar to the configurations used in the modern Goodyear type racers. It is a midwing, short span monoplane with relatively small tail surfaces. We have learned a lot over the years about structural integrity and aerodynamic drag, but the basic airplane shape has been around since at least 1912.

A pair of white-tired Hungerford wheels that happened to scale into a Peanut-sized Chiribiri was the true inspiration for this model. The white wheels and the skid type of landing gear strutting make this a very interesting model.

All the struts and wire bracing make this a very draggy model. Interestingly, the very fact that the model tends to be aerodynamically dirty, makes it imperative to keep it as light as possible. The heavier a model is, the faster it has to go to stay in the air. And the drag forces increase as the square of the velocity. Therefore, it is much more important to make a draggy airplane light than, for instance, a very clean airplane.

After that lecture, lets just say, "Make every effort to keep your model of the Chiribiri as light as possible." In an attempt to improve the model as drawn with respect to the one in the photos, you will note that the drawing shows a built-up rudder. The sheet balsa rudder of the prototype model is a lot easier to build, but its weight needs to be balanced by ballast in the nose. Because the nose length forward of the center of gravity is only one-eighth of the tail length to the rudder, any weight saved by making the built-up rudder will allow you to remove eight times as much nose ballast weight. That says, "All other things being equal, you'll save nine times the weight saved when you lighten the tail." And this is just in structure and ballast. The power necessary to fly the model at its lighter weight and speed will also be less, so the rubber motor can also be lighter ... why do these thoughts always intrude after the model is built, rather than before?

The plans are fairly simple, and since this series has been going along for some time, a part-by-part instruction lesson will be dispensed with in favor of discussing some of the more obscure details.

The landing gear structure is probably most likely to give interpretation trouble. First, there are two skids, one on each side. These are supported from the fuselage bottom longerons by three members, the most forward and the two rear ones shown in the side view. The second strut in the side view is a center "V" that goes down to the center of the

cross axle brace. There is a straight crossbrace between the skids at the location of the most aft struts. The cross axle brace has a slight bend at the center. The wheels are mounted on the ends of a straight axle wire that is connected to the cross axle brace at the center. Wrap that connection point with three turns of fine thread and cement. There is a single cross diagonal brace at the aft legs running from the left longeron to the right skid. These details were determined by studying a couple of old magazine photos and the three-view. They are probably correct. If somebody happens to have a better idea, perhaps he'll let us know about it.

Interestingly, there is no tail skid on the airplane. That's because the skids are long enough to keep the rudder from touching.

Wing warping was used on the original airplane, so there are no ailerons.

Wing tips and tail outlines are made from basswood laminations. This technique has been discussed in many articles, including my last Peanut, the Polish "Lublin," published by **R/C MB.** Details are generally rather sparse on

Details are generally rather sparse on Pioneer models, and this one is no exception. However, there are a few that give it a distinctive character. The top and sides of the engine cowl have significant louvers. These are added by making short lengths of triangular cross-



Walt's next Peanut is an Owl Racer... quite a jump in years over this month's feature! Should be pretty fast with that thin wing and symmetrical airfoil.



DECEMBER 1979



Carolyn Burks and daughter Patti prepare Carolyn's B&B Special (this month's 3-view) at Pensacola. This one is 520 sq. in., with an S.T. .19, but other sizes are also available.



Doug Joyce and his FAI Power canard (what else?) at Pensacola. Uses carbon fiber and steel reinforcing on stab.

• I thought I'd start out this month by sharing with you some of the comments about this year's Nats, gleaned from newsletters around the country (but mostly from the Midwest, which is where most of the entries originated).

FREE

"The F/F site was an abandoned Atlas ICBM missile base, featuring a halfdozen above-ground concrete launch bunkers scattered over a half square mile and connected by numerous asphalt roads and dirt paths, making motorbike chasing a snap. The total site was encompassed in an area approximately 1-3/4x3/4 miles, and was bounded on 3 sides by corn and/or soybeans, and the 4th by some old munition bunkers. In Indiana and Ohio this might have been considered to be an adequate Category II site, but the typical Nebraska winds which finally arrived on Saturday immediately reduced its size to marginal Category III" . . . Dick Covalt, writing in the CIA Informer.

Also in the CIA Informer. Gib Robbins tells about the "Nebraska Thermal Meter":

"While Mattes and Covalt were attempting to help me spot a thermal, we noted a couple of flights of barn swallows flitting about at 200-300 feet in the air. Then we discovered that they had purpose about them. The swallows would await thermals to carry bugs and insects aloft and then follow the thermal across the field while picking it clean of food or until the thermal dissipated." So, with the birds picking thermals that soap bubbles did not indicate, Gib racked up a few more maxes to win A Gas going away.

FLIGHT

Also, according to Covalt: "The celebrated gasoline crunch and the general bad pre-Nats press regarding the flying site and no close-in housing surely was responsible for the sparse attendance (1/2A Gas had 61 entries in Open, compared to 385 at Springfield in 1976)."

Chris Matsuno adds these comments in the *Turbulator*, voice of the St. Louis Thermaleers:

"...Bill Shailor's last A-2 max had landed in the corn far downwind, and a large contingent, including the Fat City (Detroit) boys, the Stoys, Doug Joyce, et al. were combing the corn and beans looking for Bill's model. They found a couple of other models, but not his. Greg Simon was standing on top of someone's VW van with a walkie talkie directing the searchers. Anyway, some local residents noticed the goings-on and called the cops to tip them off that a big marijuana operation was going on. Four or five state police descended upon the area just as the guys were leaving the site, and it took a bit of time before our heroes were able to convince the fuzz that they were just looking for a toy airplane. Mike Stoy said that there was indeed a lot of marijuana growing at random, but there were patches which looked like they had been deliberately planted in rows."

by TOM HUTCHINSON

PHOTOS BY AUTHOR

And Gil Morris had a gadget to defeat the cornfields completely. Listen: "It is true what they said about the Nebraska winds; they blew, but the predicted afternoon rains never materialized. The corn was definitely there, however, the beeper' of Keith Fulmer's that you featured in the Dec. '77 issue of the Informer gave me a retrieval edge that apparently no one else had. It worked great! I could always pick up a signal from 300 to 500 feet from the model, except when there was a hill between. I thought the lack of directional quality of the unit might result in problems, but the volume of the tone made retrieval very easy. Also, the tone would become staccato as you got closer to the lost model. I would not have had enough confidence to have flown Class B in all that wind without it.'

The beeper Gil is referring to is produced by Estes and is a modified model rocket finder transmitter which is monitored by a standard walkie talkie. If



Homer Smith takes time off from his District XI V.P. duties to fly his Ranger .020 Replica at Hawks Spring Opener contest.



Casey Hornbeck with his nicely trimmed Class C "Maxus" at Pensacola meet. Dihedral in stab is an unusual feature.



Well-known flier George Batiuk poses with his Wake. Photo taken at this year's Nats.

you're interested, you can write Keith Fulmer, 15688 Kern Rd., Mishawaka, IN 46544, for details.

A BIG FREE FLIGHT MODEL IS BEAUTIFUL

According to Ralph Prey, writing in the San Valeers' Satellite. "Building a Class D model is easy

"Building a Class D model is easy when compared to some of the smaller models (it's more like carpentry than model building ... TH), even rubber ones where you have to carve the prop. And flying a big Class D ship can be easy too, if you go about it slow and easy on the first dozen test flights. Many fliers flying big Class D ships will tell you that they feel it is easier to fly a big model than a small 1/2A or hot K&B 3.5 design. The big models are more forgiving of adjustments, provided you make your adjustments within reason and not make more than one at a time.

"Transporting a big free flight model can be a problem, especially in today's small compact cars which so many of us have to use for gas reasons. But I notice the R/C types have figured that out, too. The 1/4-scale models almost all have a 2-piece wing. Same for the R/C glider boys; most all of their models use 2piece construction. The FAI Power fliers have gotten on the 2-piece bandwagon for the same transportation reasons, so what's the problem with having an AMA gas model like our big B, C, or D designs



DECEMBER MISTERT MODEL

with 2-piece wings? Are we free flighters so bigoted that we can't look at the progress being made in other phases of our hobby? I'm sure we're NOT, and it's just that we sometimes hesitate to try out a new idea on our pet model design. A 2-piece Satellite 1300 wing sounds very feasible to me. Sure would make it easier to decide whether to rebuild it after it DT'd into a pole or cactus if only one half of the wing was damaged. Next time you are at the local hobby shop, take a long hard look at how the R/C boys make their 2-piece wings, and then check out your dealer's shelves for the hardware.

DARNED GOOD AIRFOIL Bogart 560-26

This month's DGA was part of Bill Bogart's paper in the 1971 NFFS Symposium, which introduced a new family of free flight airfoils. This particular section has been proven very successfully in Wakefields by Bob White and Walt Ghio. The section has 5% maximum camber at 60% chord, and is 6% thick at 20% of the chord. The rear part of the airfoil may cause construction problems because of lack of depth.

MYSTERY MODEL OF THE MONTH

Here's an easy one. It's a very distinc-Continued on page 92



Ralph Prey says Big is Beautiful in free flight, too (see his comments in text). Here Bill Hunter prepares his big Satellite for a flight at the Nats. Note fuel can...talk about a gas crisis!

DARNED GOOD AIRFOIL - BOGART 560-26

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STATION	0	1	3	5	7	10	15	20	25	30	40	50	60	70	80	90	1
STATION	0	1	3 2.1	5 2.9	7 3.4	10 4.2	15 5.1	20 5.8	25 6.2	30 6.5	40 6.8	50 6.7	60 6.4	70 5.7	80 4.5	90 2.6	1



64



If you've been wondering about the health of the patient known as Control Line, there's some pretty solid lab reports from the 1979 Nats. Normally, when we hear the term "patient," we think of someone or something that's sick. Well, in this case the patient seems to be very well indeed. AMA keeps Nats statistics in four general categories. They are, together with the 1979 entries, as follows: Indoor, Free Flight, 202; Outdoor Free Flight, 687; Control Line, 562; and Radio Control, 435.

Now, I'm not a statistician, and I don't mean to urge any particular conclusion upon the reader; however, it is inter-esting to note the tallies for Junior, Senior, and Open entries in the four categories. Draw whatever personal conclusions you may, but guys, I caution, if a particular category is your thing, that's great, but please don't badmouth another group, or throw these facts at them to try to prove a personal point. Statistics can too easily be twisted around many ways. The data is shown in the table.

So much for the overall numbers, let's get into the Control Line story. Combat, Racing, Aerobatics, and Carrier were again very popular. If you're a Combat enthusiast, stop, do not pass Go, but proceed directly to Rich (alias Dirty Dan) Von Lopez' in-depth coverage elsewhere in this issue.

RACING

Call it a figment of the imagination, a visceral feeling, or what have you, but my impression was that everyone who raced at this Nats sincerely felt he could



The Tom Flukers, Sr. and Jr. Tom Jr. flew the Goodyear to 3rd place for his dad.

win. In past years, there always seemed to be a percentage who were there just to have competed, with no expectancy of even placing. Now, it's good to compete for the sake of competition, but it's tremendous when everyone really feels they can beat everybody else.

As you can guess, the competition was keen. In every event, none of the early leaders strutted about until the last lap of the last heat was over. That's competition! Here are some of the results, together with the number of entries:

GOODYEAR (Open 28)

1) Bill Lee	
2) John Ballard 5:48.6	
3) Tom Fluker Sr 6:03.0	
It's only fair to mention that Tim Gillott	
flew a fourth place 6:09.2, and that	
included a plug change!	



Category	Entrants	Entries	Junior	Senior	Open
Indoor F/F	76	202	60 (29.7%)	30 (14.9%)	112 (55.4%)
Outdoor F/F	178	687	127 (18.5%)	82 (11.9%)	478 (69.6%)
U-Control	263	562	59 (10.5%)	72 (12.8%)	431 (76.7%)
R/C	360	435	10 (2.3%)	42 (9.7%)	383 (88.0%)



Mike Hazel and John Thompson, the Nitroholics racing team from Oregon.



Kerry Turner about to pass Big John Ballard during a Fast Rat heat.



Jim Ricketts, Sioux Falls, SD, working on his scale racer. Note Fire Plug on his arm.



Tim Gillott launches his Goodyear. Note the "starting stick" in his right hand.



Bob Oge pitting his Goodyear entry. Another Glo Bee Fireplug, on another arm!



Tim Gillott with his Shark. Note finger ... he must have forgotten his "starting stick"!



Tim Gillott about to catch his Shark. Tim was 2nd in Fast Rat with 4:53.5.

It's a distinct pleasure to comment on the father and son team of the Tom Flukers. Dad does the pit work, and his son does the flying. Young Tom, a Senior, also placed in Slow Rat, Fast Rat, and Goodyear, and he took first in all three Senior Combat events! Take a look at the accompanying photo of the Flukers. All you Open competitors better remember young Tom's face. When you see it again, he'll most probably be beating you...

FAST RAT (Open 24)

1) Ron Esman 4:49.7
2) Tim Gillott 4:53.5
3) Paul Tune 4:57.7
With three pits in the finals, those
times are excellent. Seven of the 23
entries were Texans, including Ron
Feman And how about this: Ron used

the same engine he won with at the '76 Nats! There has to be some sort of a lesson to be learned from that, but as yet I haven't completely figured it out.

~~~	· · · ·		-	r	 	-	 • /						
1)	Larry	Hill .	_										5:31.9
2)	Paul	Tune											5:35.9
3)	Bill L	ee											5:40.2
'	0 1	1								1	L		 t I.

One's first reaction may be to sigh,



Texan Ron Esman, Fast Rat winner. Ron won with same engine in Dayton in 1976.

and say the Nashville Rats took first and second once again. Yes, they did, but they had plenty of close competition. In fact, they did not have the fastest qualifying times. Their reign may be just about over. Was it all the O.S. .36? No, Bill Lee and several others used K&B 5.8's. Times between 5:30 and 6:00 are now very common.

FAI TEAM RACE (Open 10)

1)	Gillott/Ballard	 8:05.1
2)	Jackson/Nelson	 8:43.6
3)	Willoughby/Oge	 9:09.9

Despite the fact that some people say they'd rather eat worms than fly a diesel, this is a very sophisticated event. If you think you're pretty good at other racing events, this one just may cut you down to size. It's a real challenge.

MOUSE RACE (Jr. 10, Sr. 6, & Open 13) This was an unofficial event spon-

sored by the Orbiting Eagles of Omaha. Also, as his friends well know, it's John



Three original Slow Rat designs by the Nashville Rats. They took 1st and 2nd for the fourth year in a row, but this year the competition was closer than in years past.



A look down the Slow Rat pit line. The Nashville Rats cleaned up again this year.

Ballard's favorite event. The winners: Junior: Marc Robe Senior: Tony Smedley

enior: Tony smealey

Open: Les Pardue

If you're not into Control Line Racing, but have thought about it, why not try this event? It's not only inexpensive, but it's a lot of fun. Well, racing certainly wasn't everything, so let's look elsewhere.

#### PRECISION AEROBATICS

Some people refer to this as "stunt." That's a no-no, and rightfully so, because their patterns are literally precision. Not only that, but their models have incredibly beautiful finishes. The entire event has evolved to a point of almost perfection. Does that leave you, a beginner, out of the picture? No. PAMPA, the Precision Aerobatics Model Pilots Association, has four skill levels for local and regional contests. Don't hesitate to give it a try.

As you've guessed, at the Nats, it was "top drawer" competition. The accompanying photograph tells the story on the Open scoring. Congratulations to Bob Gieseke, the first five-time Nats winner! At the Junior and Senior levels, here are the winners: JUNIOR

1)	Andrew Harrissiadis .					429.0
2)	Kenneth Purzycki		,			387.5



A pair of "Lil' Rodent" Mouse Racers designed and built by Joe Klause. Write to Joe at Kustom Kraftsmanship for kit info.



Mouse Race winners, I to r: Tony Smedley (Sr.), Marc Rose (Jr.), and Les Pardue (Open). All three flew "Lil' Rodents."

	DPEN TOP-5 FLY-OFF
B GJESEKE T FANCHER W RABE L MEDONALD W WERWAGE	2 52153 501 5 52075 104225 1 5 495756 516257 50775 10240 5 4 515257 51450 1 50850 1029 75 4 5 50625 5 450253 52675 1033 0 3 7 51475 1 4985 4 52125 10360 2
	Derig del Archer

Scores for the top five in Precision Aerobatics. Bob Gieseke became the first five-time winner of the event.



Les McDonald's immaculate Stiletto, which he flew to 3rd place. Won PAMPA "Most Beautiful Stunt Plane" award.

#### SENIOR

1)	David Fitzgerald 473.8
2)	Kevin Capitanelli 450.5
3)	Andrew Blank 428.0
As	someone who has perfected the
fig	ure nine, let me just say a hearty "well
do	ne" to all the winners.

#### CARRIER

This has been a very popular event for many years. The '79 Lincoln Nats was no exception. Here are some of the results:

#### PROFILE (Open 24)

1)	Frank Kelly	241.3
2)	Pete Mazur	240.1
3)	Leroy Cordes	236.5
CL	ASS I (Open 10)	
1)	Pete Mazur	357.1
2)	Bob Reynolds	329.6
31	Paul Kegel	323 5

3) Paul Kegel ...



 
 1) Pete Mazur
 354.4

 2) Bob Reynolds
 342.2
places were identical in both Class I and 11.

Well, control liners, it was a good Nats. The site and weather were beautiful. The event directors and helpers did a splendid job, and everyone seemed to thor-oughly enjoy themselves. In fact, I can't recall a single hassle. Quite remarkable. Hope to see you at the 1980 Nats.





An original by Dennis Adamisin. An ordinary but very eye-catching color scheme. Note four-point landing gear.



Keith Trostle's nicely-finished FW-190 seems to follow AI Rabe's thoughts on realistic looking stunters.



Carl Miller with the Corsair he flew in Class I Carrier. Carl flew in many events, C/L and F/F, at this year's Nats.



Class I and II and Profile Carrier Fairey Firefly entries by Bob Reynolds. Won 2nd in both Class I and II.



About to snag a line is Pete Mazur's Bearcat. Pete got 2nd in Profile, also won 1st in both Class I and II!

#### **DECEMBER 1979**

## We've Built the Case for Your Radio Control System



#### Hannan ..... Continued from page 58

reproduction of the Wright Flyer constructed, appropriately enough, by a brother team, Tom and Bob Valentine. The Valentines and their associates constructed the flying reproductions for the unfortunate Wright TV non-documentary of last season, and it was most enlightening to hear their story of the aircraft and models used in the production.

The basic Wright reproduction used had not originally been intended for that purpose and was hastily modified in an effort to fulfill the diverse requirements. This involved changes which were performed under difficult condi-

tions and almost impossible deadlines. Additionally, the studio ordered Wright and Lilienthal glider reproductions, adding complications to an already crowded schedule, necessitating a round-the-clock working routine. As other people were recruited to help, it became obvious that those with no previous aviation experience were the most efficient workers, as they "had not been polluted with modern tech-niques." This was in keeping with the Valentine brothers' belief that the Wrights' methods had been demonstrated in the first place and should work again. This was in marked contrast to some "reproductions" which have incorporated "modern corrections" to pioneer designs that inevitably introduced problems unknown in the originals!

Some concessions to progress were of course adapted in the Valentine flying reproductions, primarily for reasons of safety. This included the use of aircraft bolts instead of the wood screws employed by the Wrights, and the substitution of chrome-moly in place of coldrolled steel at points of high stress.

For power, the Valentines selected a newer unit (but not much!) in the form of a 1929 Model A Ford engine. This was modified to include such niceties as a more efficient oiling system, compression release via valve actuation, and an external water pump which cosmetically more nearly resembled the type employed by the Wrights. The choice of the Model A engine was predicated upon its ability to deliver adequate power at low rpm within established weight parameters. Most modern powerplants fail miserably in this respect, which accounts for the tiny "toothpick" props flailing the air at outrageous rpm in so many homebuilts.

When the Wright reproduction began in San Luis Obispo, California, it was undertaken strictly on a speculation basis, since no sponsorship was available at the time. In fact, Tom Valentine and his wife were working in a restaurant then, and declare the project to be a "monument to tips."

When the machine was finally flown it was remarkably successful in spite of being inhibited by relatively inefficient propellers (again concessions to modern "improvements") and overheating problems with the engine, which limited the average flight duration to about six minutes.

All in all, a remarkable accomplishment and a magnificent example of workmanship throughout, including such formidable assemblages as the radiator, which is almost akin to a fine piece of sculpture in its execution.

piece of sculpture in its execution. Although the "Flyer" featured in the San Diego Aerospace Museum is a nonflyer, it is finely detailed and beautifully finished. By all means, plan to examine it if you visit the area.

#### THE ITALIAN WRIGHTS

Shortly after the Valentine presentation, a brief account of Wilbur Wright's flight demonstrations in Italy during 1909 and subsequent activities of Wright aircraft in that country was given by Contessa Maria Fede Caproni Ramani, daughter of the famous Italian designer Caproni. Although little known in the United States, the early aircraft activities in Italy were to have far-reaching effects on aviation everywhere, and indirectly, on model building. For example, one of the first passengers to go aloft in a Wright plane was Dr. Pirelli. Yup, the same one who founded the producers of the rubber strip used today to power so many miniatures.

The practical mindedness of Wilbur Wright was well demonstrated by the fact that he insisted upon supplying quantities of extra spruce with the first Wright aircraft sold in Italy, "for when

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repairs are needed," not "if repairs are needed"! Ultimately, according to the Contessa, the machine was repaired many times, and once almost reduced to kit form. After that damage it was completely rebuilt inside a church...an edifice that had to be almost demolished in order to remove the aeroplane! WOMENS' LIB STRIKES AGAIN!

A traditional feature of the AMA Nationals is the publication of a newsletter which gives daily event results and miscellaneous banter about the proceedings. We liked the introduction heading this year, which stated: "Any misspellings, typos, and other errors are inserted at the editor's discretion." But returning to the womens' lib bit, we noted that the top four places in Junior Free Flight Scale were girls! Congratulations! Female builders are a distinct minority in any class, but lady SCALE MODEL builders are scarcer than productive bureaucrats!

#### **GOSSAMER DOCUMENTATION**

Anyone interested in modeling the English Channel-crossing Gossamer Albatross? If so, by all means obtain a copy of the September 1979 Aeromodeller magazine, which features the first accurate deliniation of the machine to be published. It is accompanied by a superb account of the epic flight, written by Ron Moulton, an official observer for the Kremer committee as well as Editorial Director for the magazine. Also included are first-rate photographs of the men and machinery involved. Our own "remote control" summary of the venture appears in the October *R/C Sportsman*.

But for the complete coverage, watch for Dr. Morton Grosser's book Gossamer Odyssey, The Triumph of Human-Powered Flignt, to be published by Houghton Mifflin.

### THEM ARE THE CONDITIONS WHAT PREVAIL

This old line from limmy Durante seems an appropriate title to this note from Bob Farrenkopf, of Ohio: "We are having our usual beautiful summer weather, nice, calm and sunny all week, with wind and a chance of rain on weekends and other flying days. Ha." SUSPICIONS CONFIRMED?

According to Crosswinds, newsletter of the Cleveland Free Flight Society, there are two classes of Scale, the most popular of which is Standard off-scale. (Emphasis ours!)

#### INDUSTRY RECOGNITION

Carl Hatrak sent us a colorful brochure from VARIG, the largest of the Latin American airlines. In it was a sentence that caught our attention: "VAE (Varig Aero Sport) was accordingly created, as an organization for promoting the liking for model airplanes, gliders and, in a special way, aeronautics."

#### DOWN MEMORY'S LANE

Frank Scott favored us with this bit of wistful nostalgia: "I doubt very much that kids have changed as much as the times have. Seems a shame; we had a lot of fun leaning on the airport fence, and spending rainy summer days in the dark, dusty, and terribly friendly hobby shop. It was not uncommon for me to put 50 miles on my bike (the pedal kind, no Yamahas then) in a day, just making the rounds of the area hobby shops, and I might not buy a thing (save for an occasional Coke to wash down the dust of travel). Such warm, friendly memories . . . and yet, not only is it unlikely that my own son will experience such, but I would be appalled if he were to try to follow my bicycle trails through the mists of time. A pity, but the happy shops of yore have succumbed to chrome and electronic cash registers; the two-lane road is a super highway, and worst of all, so many cranks and weirdos (and worse) loose.

#### SILLY SIGN-OFF

Whew, after that heavy philosophy we had better close on a humorous note, for which we can thank (blame?) Georges Chaulet, of France: It seems that some astronomers were observing the planet Mars, and noticed some strange blinking lights on its surface. Perhaps, they thought, the Martians are trying to contact Earth. After a great deal of discussion, the astronomers agreed that it was necessary to communicate with the Martians in order to find out what they were saying. Finally they evolved a plan to place a series of enormous words across the Sahara Desert in order that they could be seen from Mars. Using carbon powder, letters some 100 miles high were traced across the desert, then




the astronomers took up positions at their telescopes to await an answer.

Finally it came: "We're not speaking to you; we are talking to the Venusians."

Fan ..... Continued from page 35 Furthermore, one could run a most graphic demonstration of the effect by simply dropping a sheet of paper over the top inlet with the fan running; the shock effect of the thrust change on the balance cart was most impressive! Flight tests of the top inlet finally showed the A4D performance we were looking for. All of the thrust increase was reflected as power for maneuvering and climb, above and beyond that needed to simply drag the model through the air. The combination of the fuselage inlet

data just discussed with the pod-type

inlet data of the prior section yields Fig. 11, which is a summary of my available data on inlet losses. At the outset, I must apologize to my engineering colleagues who will probably be revolted at gaps in data collected and the interpretive liberties I will take in the following paragraphs. My only defense is that data, time, and resources are limited, prior art has not dealt to any extent with low pressure ratio fan inlets, and the need for guiding conclusions (however tentative) is pressing.

The Fig. 11 data on thrust losses of pod-type inlets and long internal inlets seem to plot up into two distinct bands, if only good rounded inlet lip cases are considered. Thrust of the particular inlet as a fraction of the "perfect" bellmouth inlet thrust is plotted as a function of throat area expressed as a fraction of bellmouth area (fan swept area). This has been done, since the throat area is the primary inlet parameter if inlet lip shape is good and the internal inlet shape is good, which was the case for all inlets of Fig. 11. The throat area in the case of fuselage inlets is the sum of the forwardfacing inlet area plus flush inlet area as defined in the sketch of Fig. 11. The major conclusion of Fig. 11 is that more throat area is apparently required to avoid excessive thrust losses in long internal inlets.

A minor conclusion of Fig. 11 is illustrated by the solid data points which are all no-inlet (or worse) cases. The Grumman 8-inch square-edged inlet point shows less of a loss than the same case for the RK-049, the RK-20, and the



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Wing Area	573 in. ²
Flying Weight	24 oz.
Landing Speed (most trainers	
Wing Loading	6 oz./ft. ²
Engine	.049 reed valve
Airfoil 1	2% flat bottom

RK-40. This is theorized to be due to the more favorable corner flow Reynold's number for the larger fan. The devastation wrought by the sharp inlet lip on the Scozzi fan is guite evident. (Of course, properly installed in a fuselage, that effect is not encountered.)

The success of the top inlet both in the test stand and in flight bred two cosmetic modifications which were both flight tested. "Gill 1" of Fig. 12 performed as well as the top inlet in flight as far as we could tell. "Gill II" of Fig. 13, easier to manufacture, was equally effective.

So ends the A4D saga.

#### ATMOSPHERIC EFFECTS **ON FAN THRUST**

The topic of atmospheric effects on thrust comes up from time to time with those who live in particularly hot or high locations. The effects can be severe, as illustrated in Fig. 14. The curves are based upon NACA tests of compressionignition engines, which closely resemble glow plug engines in performance characteristics (a glow plug is an "aided" diesel). Thrust falls from 100% at sea level, 58°F "standard day" conditions to 76% of that value at 5,000 ft. on a 90°F hot day. Recognizing that thrust minus drag is what makes loops, and that drag is a substantial percent of thrust, a 24% reduction of thrust can wipe out most, or all, of the performance for a marginal design, normally a decent flier at sea level.

DUCTED FAN MODEL PERFORMANCE

...crash resistant

All of the foregoing discussion of installed ducted fan thrust has little value unless examined in the context of its effect upon model flight performance. For this reason, the following sections have been prepared. As a point of departure, the in-flight performance of a typical prop drive 1/2A high-performance model belonging to the author is discussed. That model is an Me109.

#### THE 1/2A Me 109 PROP **AIRCRAFT BASELINE**

Without going into the details of the calculations, Fig. 15, showing drag of the model and available thrust, has been prepared. Model weight is 28.5 oz. The prop is a wide-blade Cox black 5x3 fitted on a stock Cox TD .049. Static thrust measured in thrust stand tests was 16 oz. Fuel was 25% nitro. The intersection of the thrust and drag curves shows a level flight maximum speed of 55 mph. The best climb angle speed is 25 mph, showing a climb angle of 19.9 deg., which is equivalent to a rate of climb of 749 ft./min. The rate of climb number is of significance, since it is the fundamental measure of how fast the model can gain potential (height) energy which is then available for "spending" in maneuvers. All further jet model performance will be examined in comparison with the Me 109 base heretofore established. A few words should be said about how the Me 109 performs.

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vigorous heave. Its initial climbout is not hot, considerable distance being spent in "getting up on the step." Thereafter, it gives the impression of great speed and quick maneuvers, which is a bit misleading, since it's not really that allfired fast. But in terms of body lengths traversed per second and how fast it appears to be disappearing away from you, it is going like blazes. The reason 1/2A models in this class appear to be so fast, tricky and hard to handle is that you unconsciously fly them much closer to you in order to maintain good visual contact. Enough said, the Me 109 as portrayed in Fig. 15 is known to be a pretty hot performer.

The area of Fig. 15 bounded within the thrust and drag curves down to the bottom of the drag curve at 25 mph is a pretty good measure of the climb/ maneuvering capability of the model. We shall call it the "maneuverability zone.'

#### Combat ..... Continued from page 57

California used his Pegasus design. which is a combination of foam and balsa. There were a number of persons flying Riley Wooten designed VooDoos, Sneekers, Demons, and Shadows. I suppose that he would feel good about that. For those of you who are newcomers to Combat flying, Riley Wooten is a 5-time National Combat Champion. His VooDoo design has sold tens of thousands of kits for Carl Goldberg. I

# everybody should have one little vise!

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personally have built about 20 of these kits. Howard Rush was flying some foam models that looked very good and flew just as well. However, John Jo of Southern California beat Howard with a VooDoo and an antique Fox 36X Combat Special.

Charlie Johnson of San Diego brought along some of Mike Hoffelt's Monoboom FAI and AMA Fast Combat models. There is no doubt in my mind that Mike is a super builder and that his designs are super trick, but I feel there is too much time involved in building his designs. During the lunch break for FAI Combat, Charlie was test flying the FAI Monoboom. At that time he let Sherwood Buckstaff try it out; he liked it but wanted to try it out when it had some wingtip weight. I got a chance to fly it after Buckstaff. The outboard wing blew off halfway through the flight. Prior to that it felt real good. The majority of models were of moderate size; that is, below 400 square inches of wing area. William La Jack of Detroit had some trick pieces of equipment that he made himself, such as a torque wrench for engine head and backplate bolts, a custom control handle, fuel pinch-offs, syringe, and a custom hex wrench. William is a metal model maker for Fisher Body, of General Motors.

There were two TWA engines in use during Fast Combat. Joe Ambrose used one while Les Pardue was using the other. Joe's was unimpressive, but the one Lee had ran quite well; in fact, it ran well enough to catch the attention of Duke Fox, who later went over to examine the motor. Generally speaking, Duke Fox has now captured the Combat market, with about 80% of the contestants using his motors. His motors won Open Fast, Open Slow, and Open FAI, where the real competition is taking place. There were still a number of Super Tigres in use, but the number is dropping off every year. Mike Guthomson did, however, place second in Open Fast with this G21-35. Lots of pilots were using G15's and X15's in FAI Combat, and still others were using the hard-tocome-by Rossi 15's. I did not see any Cox Conquest 15's in use. The Fox seems to run very well, but it requires lots of nitro; 50 and 60% was being used by many of the fliers. Most of the FAI pilots were using 7x4 props manufactured by Rev-Up, Top Flite, or Taipan. In Fast Combat, the competitors still like the Top Flite 8-1/2x6-1/2 pylon racing prop or the wooden Rev-Ups of 8-1/2, 8-3/4, and 9-inch diameters with 6-1/2 to 7inch pitch.

#### COMPETITION

The main event is Fast Open Combat. I took some notes on who got kills in this event; there were 18 altogether. Leonardo Silva of Mexico got one on David Denny, Howard Rush got one on Steve Gardinier, Steve Strombeck on Sherwood Buckstaff, Robert Autry on Bob Burch, and George Cleveland on Tom Shaw, all in the first round. The second round saw kills by Robert Autry on Riley Pate, Steve Strombeck on Leonardo Silva, Mike Guthomson on Mike Heard, Jim Gall on Mike Greb, Don Gutschar on William La Jack, and Marvin Denny on Joe King. In round three the kills went something like this: Steve Strombeck on Robert Autry, Ron Jaden on Jim Gall, Mike Guthomson on Greg Hissem, and Les Pardue on Marvin Denny. Mike Guthomson's kill on John Jo was the only one in the fourth round. Les Pardue put a kill on Ron Jaden to place fifth, and George Cleveland put one on Mike Guthomson in the final.

Other highlights of the competition were that Tom Fluker of Gainsville, Texas, won three first places in Slow, Fast, and FAI Combat all in the Senior category. And, last but not least, 48-yearold Marvin Denny of Wichita, Kansas, finally won a National Championship after over thirty years of trying. **TRIVIA** 

Duke Fox put on a flying demonstration with a model that was given to him by Dick Imhoff. Duke was also around every day to watch the goings-on at the Combat circle. Debbie Imhoff presented Duke Fox with a ceramic fox that she made herself in appreciation for all the support Duke has lent to the Combat event. Debbie also had the Combat pilots autograph one of her T-shirts; this stunt is becoming a tradition with her. In Texas, anything that is big is said to be "big as Dallas." In Seattle, items that are rejects are called "Sub Standard," while in Texas these same items are "Kulls." In







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Mexico, Richard Stubblefield has been given the nickname of "El Esponjoso"; I will let you translate it for yourself. A guick verbal survey of Combat pilots revealed that most were in favor of a double elimination system for at least the first round in Fast and Slow Combat. Perhaps MACA should consider it for next year. Although Dirty Dan Rutherford was not present in Lincoln, someone was running around impersonating him. Who could that be? Is it true that some zealous modelers on the second floor of the Sandoz Hall dorms were starting Combat motors and flying helicopters in a dorm room? Nobody is foolish enough to do that, right? On a more serious note, Combat circle helpers Alan Bumbaugh, Gayle McGee, Judy Curtis, Debbie Imhoff, Rhonda Rozzle, Neal Rose, Bob Burch, Paul Curtis, Bill Bieda, John Jo, Rand Rozzle, and Rich von Lopez are all to be thanked for all the work they put in during the week. Special thanks has to go to Marlin McGee, who took on the thankless job of being Combat Director.

The Čombat Team from Mexico was extending invitations to any American Combat pilots to attend the Mexican Nats on November 16, 17, and 18, 1979, in Mexico City. Contact Francisco Zuloaga at No. 175 – 2  $\Rightarrow$  Piso, Mexico 4, D.F.

#### 1979 NATIONALS COMBAT RESULTS SLOW COMBAT JUNIOR

- 1) Glenn Fultz, Cincinnati, OH
- 2) Gregory Strombeck, Rockford, IL

3) Rob Baldus, Des Moines, IA 4) Pat Baldus, Des Moines, IA 5) Kyle Mathis, Maitland, FL 6) Christopher Thomas, Ft. Worth, TX SLOW COMBAT SENIOR 1) Tom Fluker, Gainesville, TX 2) David Owen, Nashville, TN 3) Paul Hartlaub, Cincinnati, OH 4) Page Peterson, Villa Park, IL SLOW COMBAT OPEN Marvin Denny, Wichita, KS 1) **Richard Stubblefield, Houston, TX** 2) 3) Michael Guthomson, Kingsbury, TX Joseph Ambrose, Brooklyn Park, MN 4) 5) Joseph King, Baton Rouge, LA 6) James Mathis, Maitland, FL 7) Eddie Thomas, Ft. Worth, TX 8) William Hess, San Antonio, TX FAI COMBAT JUNIOR 1) Christopher Thomas, Ft. Worth, TX 2) John Hess, San Antonio, TX FAI COMBAT SENIOR 1) Tom Fluker, Gainesville, TX Page Peterson, Villa Park, IL 3) David Owen, Nashville, TN FAI COMBAT OPEN 1) Richard Stubblefield, Houston, TX 2) Gary Fentress, Sellersburg, IN 3) George Cleveland, Kenner, LA Phillip Granderson, Seattle, WA **4**) 5) Michael Guthomson, Kingsbury, TX 6) Sherwood Buckstaff, Houston, TX FAST COMBAT JUNIOR 1) Gregory Strombeck, Rockford, IL 2) Pat Baldus, Des Moines, IA Rob Baldus, Des Moines, IA 4) Kyle Mathis, Maitland, FL FAST COMBAT SENIOR 1) Tom Fluker, Gainesville, TX 2) David Owen, Nashville, TN 3) Page Peterson, Villa Park, IL FAST COMBAT OPEN 1) George Cleveland, Kenner, LA Michael Guthomson, Kingsbury, TX 2) 3) Peter Plunkett, Austin, MN Will Rogers, E. Hartford, CT 4) 5) Les Pardue, Albuquerque, NM 6) Lyle Strombeck, Rockford, IL 7) Ron Jaden, Lubbock, TX 8) John Jo, Van Nuys, CA

Choppers .... Continued on page 27

#### TASKS

Task "A": Rescue of people from the burning house. Time: 2 minutes. The model has a container hanging on the landing gear, attached with twine. The model is resting behind a starting line, engine running and is ready to fly; the helper is waiting at the house. The starter calls "Time" and the pilot takes off and flies to the house. The helper reaches up through the roof of the house and attaches a pylon (representing a person) to the container. The model then flies back behind the start line and drops off the pylon. This pro-cedure is repeated until the 2-minute limit is over. If a pylon is being hooked up when the time runs out, the maneuver may be completed, but the overrun of time will be applied to the next task. One point is awarded for each pylon (person) transported back behind the start line.

Continued on page 84

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Task "B": Transporting water to put out the fire. Time: 2 minutes. The model flies to a water basin (children's play pool), lowers the container into the water, fills it, and then transports it to the house. The container has a 3/16-inch hole in the bottom and the helper (in the house) is catching the water in a pan. If desired, the pilot may overturn the container on the roof. (The roof consists of a wire mesh to protect the helper, but has large enough openings for him to work the pylons and pan through it.) This procedure continues until the time is up. The helper then takes the pan in which he collects the water to a scorekeeper, who measures the amount of water collected during that task. If the time runs over the 2 minutes, it is applied against the next task. One point is awarded for each fluid ounce of water collected.

Task "C": Clearing away the debris. Time: 2 minutes. The model is behind the start line, ready to go. When the starter calls "time," the helper (who is behind the start line also) picks up a tennis ball, runs to the table and places the ball inside a ring which is attached to the table top. He then runs back to the start line for another ball. At this time, the model takes off, flies to the table and pushes the ball off the table, then flies back to the start line. The helper runs to the table again and places another ball in the ring. This is repeated until the time is up. One point is awarded for each ball pushed off the table.



#### **FINAL APPROACH**

Perhaps the above will spark your imagination in thinking up different stunts which can be adapted to this type of fun fly. Already, I can envision a model equipped with a balloon filled with water and a servo-driven needle to pop it over a small fire on the ground. Or how about some war games, with the ever-popular bomb drop (flour sack) on the target? The ideas are endless. If you dream up any new ideas, drop me a line c/o R/C Model Builder and I'll see that they get published. Many thanks to Chris Blum of Kavan, Santa Ana, for her help in translating the "party" data from Dieter's German text. Until next month



1 to 1 . . . . . Continued from page 14

1978. It is a certainty that either the Scale Contest Board or AMA in general will have to speak to this concern in the near future.

The R/C portion of scale brought forth some six Precision Scale entries and about forty Sport Scale. The judging in Precision was very tight, with the range running form 360 for Ralph Jackson's Comanche to 394.4 for Steve Sauger's Lockheed Orion. Please remember that in Precision Scale, the flight score of 450 maximum points is accumulated by adding the three flight judges' scores together. Therefore, when the contestant, for instance, misses the spot after landing scores of, let's say, 8, he has blown 24 points. Therefore, the 34-point spread in static made it certain that the winner would come from the flight line. Bob Wischer's Piel Beryl posted the highest flight score and garnered first place on the U.S. team for Canada in '80 with a total of 761.4. George Rose with his P6E followed with a 740.2, and Bob Underwood was third with 733.6. The alternate is Earl Thompson with his Focke-Wulf, just .2 of a point behind Underwood's Hiperbipe at 733.4. The importance of just one maneuver is shown by the fact that had Underwood's landing on Saturday night been in the spot, he would have just missed first place by .8 of a point.

Some persons in attendance during the earlier part of the week when the Precision Scale models were judged by the panel of LeRoy Weber, Bill Knepp, and Bob Karlsson, were confused to see Bob Wischer's model back on the block a second time for judging. It had been agreed upon before the start that the model judged first would be rejudged at the conclusion to determine the validity of the first judging. So oftem an unreal pattern is set at the first model, either too high or too low, which presents a penalty to that model or leaves the judges nowhere to go.

Before the flying, two interesting experiences occurred. Monty and Patty Groves, returning from Oshkosh and the EAA Fly-In, stopped over in Lincoln on their way back to California. They were flying the Focke-Wulf in Swedish





markings that Earl Thompson has modeled. Unfortunately, their journey westward had to continue before we were able to bring model and prototype together. What a scale pre sentation that would make, to park the big one outside the scale cage!

A second incident that proved interesting to the Underwood clan occurred when representatives from a local flying service at the airport spotted the Hiperbipe in the scale area. It seemed that a big one had just been completed a week and half before (not actually completed ... no paint, wheel fairings, etc.). The 25 hours necessary for it to leave Lincoln had been quickly gathered and it went off to Oshkosh. Upon its return, our model and it were brought together for some pictures and a videotape made by the owners.



The crowning touch came when they asked if I'd like a ride. Hmmm, I thought. It's unfinished but then the fella flying built it and just brought it back from Wisconsin. Why not! So off we went into the bouncy yonder. No cockpit insulation or upholstery made it sound like a trip in a tin can full of firecrackers.

Then he asked, "How about a barrel roll?" So we did, except it wasn't a barrel roll since the spinner point never left the horizon line. The flight was super! Crisp! Exciting! The pilot and builder is a crop duster who has recently gotten into the Sportsman class in aerobatics and is teaching himself.

The R/C scale flying occurred on Friday and Saturday evenings between 5 and 8 p.m. and on Sunday beginning at 8 a.m. It was impossible to begin at 5 each evening and, as a result, one round was not completed each evening. This is an unfortunate circumstance, since it tends to create at least a weather imbalance. Hopefully, this can be resolved.

The flying judges had been selected and screened for full-scale flying experience as well as scale model judging. A long session was held with Dick Carson, Scale Manager; Dale Arvin, Scale R/C Director; and John Preston, Scale Director. John has been working diligently through the Contest Board and NASA to develop judges guides, and much of this information was put into play. The attempt was to work toward "scale-like" judging of the flying. Through these procedures it is hoped that refinement of the Scale Judging Guide can be accomplished. It is a difficult task at best, but the effort is beginning to bear fruit.

The presence of this effort can be noted by the fact that one contestant protested the amount of downgrading received by him for what the judges felt was "un-scale" flying. The factors involved would appear to be model speed and scale maneuver quality. These factors are obviously judgment concerns and we do not have the space nor the facts to debate the issue now, but I know that while some may be quiet because they were downgraded, others support the concept of more care being given to judging the "scale-like" quality of flight.

After a thorough briefing by Dale Arvin, the scale R/C flying commenced. One concession which had to be made to fit the site was the positioning of the figure 8. Since there was only about 600 feet of space from the flight line across to the "no man's land" of actual airport operation, the FAI 8 was used. Actually, it would appear that most fellows prefer it, since it is easier to fly and judge. (Anybody ever think about submitting a rules proposal?) Even at that, it was difficult for some to keep within bounds. This was true of models such as the ducted fans belonging to Bob Violett and Tom Cook, which really move out. Bob did an impressive job of flying, and had he not experienced flameouts would have been right at the top. Tom lost one fan on his twin ME 262 and with a lack of maneuvering room, the model was lost.

Another factor that appeared to play a role in the competition was the heat. Earl Thompson's engine went warm on the first flight and caused a quick landing. Yours truly never did get a good run, and while one flight was satisfactory, the Hiperbipe appeared more like a "Lowperbipe" compared to its usual flying characteristics.

It was great to note the flying area filled with a great variety of types of models. Some years the flight lines have appeared to be factory assembly lines with the same version of the same aircraft appearing over and over. With the excellent job the industry is doing, it's becoming much more difficult to come up with a model that hasn't been done.

Three rounds were flown, and each person had an opportunity to fly in front of each set of judges. While there was some point spread between sets, it was not excessive, and from the beginning it would appear that in Sport Scale the necessity of having two consistent flights was important. Of course, in Precision, only one flight score is used. The weather factor did not completely even out, since Saturday was quite a bit windier, and since it was not possible to get in one round each day, some missed the opportunity to fly on Saturday.

The results of the event were as follows:

PRECISION SCALE Bob Wischer — Piel Beryl





George Rose - P6E Bob Underwood - Hiperbipe SPORT SCALE George Buso — Navajo Ralph Jackson — Windecker Eagle

Harold Parenti - Bearcat

Steve Sauger won the Sterling Award for highest static in Precision Scale and Harold Parenti took the best Military Scale Award with his Bearcat.

In all three scale events, free flight. control line, and radio control, the National Association of Scale Aero-



modelers (NASA) awarded flight achievement awards. The basis of these awards is not only the scale quality of the flight but the difficulty of the subject as well. In free flight, the awards were won by Tom Comparet in Indoor and by Bob Haight in Outdoor. The control line awards went to Ken Long in Precision Scale with his Betty Bomber and to Kathy Kirn flying an .049 Bonanza. Radio control flight achievements went to Steve Sauger in Precision Scale with his Lockheed Orion and Bob Violett's A4 in Sport Scale.

There were several protests which were generated by the competition this year. One we have already alluded to



concerned the emphasis placed on model speed and maneuver quality. A second protest tends to follow the same type of line, while a third one concerns prefabrication and the "builder of the model" rule. Strangely enough, this column spoke to the third item in the September '79 R/C MB, which came out during the week of the Nats. The concerns, of course, still exist and will be addressed by the Scale Contest Board. The problem of prefabrication is very complex. As one Board member mentioned, every time someone produces a kit, the "average" raises. This is natural. By the same token, the ardent scale builder who works from scratch feels that some compensation need be made for six months to a year's work on a single subject. In addition, he runs the risk of losing points for outline, while the prefab kit has it built in. Such items as decals, etc. fit into the picture as well. Yes, indeed it poses a complicated problem to solve.

The bonus which used to be given to scratch built models caused problems as well. Sometimes "scratch" was interpreted to be from plans but no kit. Others held it to be from nothing but a picture or three-view. In addition, the reward of 10 bonus points proved to be a bundle in Sport Scale, where bare fractions of points separate models.

My tendency now would be to state that certainly there were some problems at the Nats. When you have a competition involving so many personalities you almost always do. But I would urge patience. With the advent of judging guides which are currently being voted on and the dedicated work of a number of persons toward training individuals, I sincerely feel that within the next few years we can achieve much in this area.

There are a number of scalers about the country who have weathered problems and discouraging circumstances but continue to work patiently and quietly to overcome them. They realize that perfection is probably not possible, but that goal provides direction.

Some time ago, I was told that a baseball umpire is never wrong on a safe-out call at first base. He is always right, because what he is called upon to do is to make a judgment call. Your judgment may not agree with his, but he is not wrong. Neither are you. It is simply a matter of perception. What is needed is work to bring these perceptions closer in line. This is exactly what the Contest Board and NASA are attempting to do through the development of judging guides. Your input in the form of suggestions and understanding is needed. In some cases your physical help is needed to put the items into practice.

In conclusion, it is interesting to note that two of the protests include inaccurate interpretations of the rules. In one case the protest stated, "Several airplanes were picked up and (the) bottom of the airplane (was) shown while being judged in (the) circle. This is a 'no-no' in Sport Scale." That statement is not true, as per rule 6.1, and has become increas-

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ingly common in some areas. The rule only establishes that the judges remain a specific distance away from the model, not that they cannot view the bottom of the model.

In a second protest, the originator states, when concerned with model speed, that "this prejudice almost eliminates smaller airplanes and emphasizes airplanes 1/4 scale or larger. Which, by the way, are illegal per AMA rules." This also is not true. Nowhere in the rules is the scale which can be used limited. The limits are placed on weight and engine size. If a model can be constructed to fit within those limits it could be any scale. 1/4 or larger. Those limits are 15 lbs. for single engine, 20 lbs. for twin engines, and 1.25 cu. in. total displacement.

There are many models which can be constructed even in 1/3 scale within those guidelines.

**PIONEERS IN SILENT FLIGHT** 

Let us carefully weigh all our decisions and proceed in an orderly, purposeful manner. We all wish to enjoy the wonderful world of scale modeling.

#### Peanut . . . . . Continued from page 59

section wood pieces and cementing them in the proper locations. A fine gridwork of lines can represent the radiator on the front face of the nose block.

The cabane struts form a four-legged pylon above the cockpit. They meet at the center and are cemented to the top longerons.

There is a kingpost at the center of the horizontal tail on top. Wire bracing is used to support the wings and the tail. Small "X"s mark the points where the bracing will penetrate the covering. If desired, put a small pad of wood at each "X" where there isn't already some structure.

Propeller diameter is restricted by the skids, so either carve one to suit yourself or cut down a commercially available plastic one.

A realistic covering for this model can be condenser paper. To keep your lightweight structure from warping, omit the dope. Condenser paper is already pretty impervious to the flow of air, so it really doesn't need doping. If it is water shrunk it will be smooth until you get a humid day, when some wrinkles may appear. These are not necessarily out of scale, considering the date the original was made. They will disappear again when the weather gets dryer. A close look at the photographs will reveal that they were taken on a humid evening.

The original model flies in smooth left circles. It is heavier than it should be at 3/4 ounce, counting about 1/4 ounce of ballast in the nose. Best flight time so far is 25 seconds. Average flights have been about 18 to 20 seconds long.

Oh yes, a carved styrofoam pilot also adds weight, but adds something to the impression of scale.

#### Fuel Lines ..., Continued from page 36

CO 80110. If that's a bit steep on your budget, then you might consider a Heathkit Thumb Tach; \$29.95 for an easy-to-assemble kit. There is one drawback to the Thumb Tach. On the high rpm scale, 1000 rpm markings are only slightly less than 1/16 of an inch apart. Thus, you must interpolate for hundreds, and about the best one can do is to estimate in several hundred rpm chunks.

Ideally, one should record engine performance subsequent to a thorough engine break-in. Keep a logbook for each engine. Use a reference prop. glow head or plug, and fuel for each particular type of engine, and record the atmospheric conditions at the time of the test. At the minimum, note the temperature, pressure, and elevation. If you can obtain the dew point, so much the better. Keep that prop, and only use it with the same fuel mixture and glow element whenever you want to check the performance of the engine. On both T.D. and reed valve engines, also record the number of glow head gaskets together with the type of glow head. Thus, you will have a reference or standard against which you can check the performance of an engine, taking into consideration the atmospheric conditions.

OK, you're down 1000 rpm. That's a lot. There may be one or several reasons why. For convenience, I'll discuss them in two categories: mechanical and other.

#### **MECHANICAL LOSSES**

Perhaps the most common cause of

power degradation in Cox engines is socalled "varnish." It's that brownish looking coating that accumulates on the cylinder wall, piston, and head. It's due to incomplete fuel combustion. It's unavoidable, it increases friction, and it interferes with heat dissipation. However, we can easily remove accumulated deposits. Simply remove the cylinder and piston and scour them with plain 000 steel wool. Wrap some of it around a piece of guarter-inch dowel ... like a cotton Q-tip... to clean up the inside of the cylinder. Do not use wire brushes. If you do, you'll probably damage the unhardened steel cylinder. After you've devarnished the cylinder and piston, wash them with a detergent and warm water. Then thoroughly rinse and dry them, apply some WD-40, and reassemble the engine. I suggest you install a new glow head rather than trying to salvage one that's really varnished. Further, often just installing a new glow head will bring back some power.

Another very common power robber is a loose ball-socket joint where the connecting rod is connected to the piston. I've mentioned this previously as a problem area (see **R/C Model Builder**, September '79). Prudent use of a reset tool is the answer to this problem.

Next on the list is loss of compression. Put a prop on your engine, juice it up with a little fuel, and gently flip the prop without pulling your finger away. If a blade doesn't come around and strike your finger smartly, you may be losing compression. Now give it a hefty flip just as if you were starting the engine. The prop should rock back and forth several times against compression. If not, look for compression leaks. Maybe you have a scored cylinder and piston, or a poorly fitting set, or possibly they're just worn out after long and faithful service. Another area to examine is where the head fits into the cylinder. Dowse it with fuel and pull the prop through compression. Bubbles around the head are a sure reason for power loss. Try several heads and new gaskets. If it still leaks, then the head seat of the cylinder is the problem. In unusual instances, this could be a manufacturing defect. Other times it is due to cylinder distortion caused by overheating. Unless you have considerable machining capability, the only solution here is a new cylinder.

Other areas to check for leaks are the backplate and crankshaft. Bad leaks at the backplate can be observed by using the same technique described for glow head leaks. Small leaks at the backplate are more difficult to detect. Examine the mating surfaces of the backplate and crankcase. If the backplate has nicks, etc., replace it. If it's the crankcase, you might salvage it by refinishing it. Use a flat surface such as a piece of glass and a piece of 600 grit silicone carbide sandpaper. Place some newspapers on a table, then the glass, and last the 600 grit paper. Hold the 600 grit in place with one hand, and using a circular motion, hone the back of the crankcase. Be extremely careful to remove metal



#### uniformly.

As for the fit between the crankcase and crankshaft, some clearance is obviously necessary. But if you can feel very noticeable radial play between them, they may be too loose. If fuel really slops out the front end when the engine is running, the fit is too loose. When in doubt, replace them, especially the crankcase.

Another frequently overlooked cause of power loss is the engine mount. Do you have a solid one with smooth parallel surfaces? How about the crankcase mounting lugs? Are all your mounting bolts torqued equally? Crankcase distortion due to poor mounting can easily rob you of a thousand or so rpm. Check it out carefully. If your tachometer shows more power on a good test stand than in your plane, the answer is obvious.

What else can go wrong? Well, carburetion could be the culprit. Don't hesitate to thoroughly clean the needle valve assembly, and replace any seals with new ones. This includes the plastic carburetor housing. If it's old, it could be distorted and thus be a source of unwanted air leakage.

Finally, be absolutely sure of the integrity of your fuel system. This was covered in depth in the October '79 issue of **R/C Model Builder.** Perhaps you may want to review it again.

That pretty well covers the common causes of T.D. mechanical power losses, however, there are a few others that can affect reed valve engine power. Foremost of these is the reed itself. A cracked or deformed reed is bad news. Even if it



looks good, try changing it, and then clean the housing, and recheck the power. When you do this, it's also a good idea to replace the gaskets between the tank, crankcase, and backplate. Reed valve overhaul kits are inexpensive (\$1.60), and they contain new gaskets, a reed, all screws, and even a new spinner. A good investment. When you overhaul your reed engine, examine the backplate very carefully with a magnifying glass. These backplates are die-cast, and can be cracked by overtorquing the mounting or machine screws. Any crack in the backplate is certain to cause a power loss. When you reassemble the engine, be sure everything is clean, and torque all machine screws equally.



That completes the discussion on mechanical power losses. Unfortunately, space is running short, so I'll cover the other principle causes of power losses next month. Until then, have some good flying sessions, and remember to think SAFETY.

**F/F** ..... Continued from page 57 tive-looking FAI model by a famous designer. The wing and stab outlines should let you know the ancestry, and the 3 engines should jog your memory. If you think you can identify it, send your guess to the **R/C Model Builder** office to see if you've won a one year subscription.



#### MODEL OF THE MONTH B&B Special 520

The October column featured a photo of Carolyn Burks and her Class A model which she flew at Pensacola. Hubby Bill sent me this 3-view and a few more details on this good-flying model. The weekend following the Pensacola meet, Carolyn put up 9 straight maxes at a Cliff Cloud Climbers meet and won a first place trophy for the first time in her 4-year flying career.

The B&B Special is a joint design effort by Bill and his son Bob, starting with a 1/2A version (280 sq. in.) back in 1973. The Burks are a real free flight family. Bill, Bob, Carolyn, and 14-year-old Patti have won some 50-plus trophies with various size B&B's, including National records and placing at the Nats.

The 3-view is the 520 sq. in. size, for .19 to .23 size engines. Other sizes are available from Bill Burke, 14351 Olympic Dr., Dallas, TX 75234.

#### **ROLL YOUR OWN**

By Louis Joyner, from the FFFliar, newsletter of the Birmingham, Alabama FFFlyers.

Rolled balsa tube fuselage construction offers several advantages over conventional sheet box or built-up building techniques. Rolled tube fuselages or booms are quick and easy to build, are more streamlined than square sections, and look better. There are, however, a few drawbacks: you have to have a form to roll the tube on; wing and stabilizer mounting is more difficult; covering with tissue is a little harder; and a round rubber model tube is harder to hold when fully wound.

If you would like to try a rolled tube fuselage, here are some general tips and a few specific suggestions for different model types. The proper size form is essential! For constant diameter tubes (i.e., rubber model motor tubes) use a shower curtain rod (available at most hardware stores). For a Wakefield or Mulvihill model use 1-1/4 inch diameter rod; for Coupe or P-30, use 1-inch diameter rod. Other possible forms are aluminum tubing (expensive) or fluorescent light tubes (usually a little big). These two form sizes (1-1/4 and 1 inch) are a near-perfect match for standard width balsa sheet (4 and 3 inch) so little or no cutting is required.

For a tapered boom the most readily available form is a pool cue stick. Choose an inexpensive one that is straight and has a constant taper. Billiard equipment suppliers are the best source (consult the yellow pages). A cue stick is suitable for booms for almost every model type except large gas models.

Balsa used for rolled fuselages should, of course, be straight-grained and flex evenly across its width without any hard or soft spots. Thickness and density will depend on use. Here are some suggestions:

BOOMS: P-30: medium 1/32 Coupe: medium 1/20 Wakefield and A/2: medium 1/16 MOTOR TUBES:

#### P-30: medium 1/20

Coupe, Mulvihill, Wakefield: medium 1/16 with various treatments inside and out.

#### **BOOM CONSTRUCTION**

Select balsa sheet of desired width and thickness, cut to desired length, then cut strip of stiff paper to same width as balsa sheet and wrap around tapered form at point where ends of strip just meet; mark this point on form. Next, measure and mark boom length on form. Wrap another paper strip around form at this point and mark circumference. Mark and cut balsa sheet so that it tapers from full width to end circumference. Next, soak balsa for half an hour in warm water, gently wrap around form using strips of masking tape to hold temporarily. Be sure seam is straight! Then wrap rubber strip (old motors) around boom, being careful not to crush the balsa. Let dry overnight. Remove from form, glue seam with Titebond or Hot Stuff, sand, dope, and cover with tissue. If you can stand the weight, cover with 3/4 oz. fiberglass cloth for added strength (highly recommended for power models).

#### MOTOR TUBE CONSTRUCTION

Follow same procedure described above, but tissue the inside (before rolling!) for protection against rubber lube. Simply dope one side of the sheet (which will be the inside) and tissue cover in the usual manner. Then soak and wrap as above.

Outside reinforcing of the motor tube will depend on how much weight you can stand and whether you use a winding tube. For Wakefield, I spiral wrap the balsa tube with 2-inch wide veneer edging tape (available at most hardware stores) using Titebond as the adhesive. The tube is then tissued. Other possible treatments include tissue only (P-30 and Mulvihill) and fiberglass.

Inside reinforcing, for Wakefield motor tubes, consists of 2 layers of 1/64 ply (about 1 inch long) glued inside the front of the tube. At the rear, use a longer (1-1/2 to 2-inch) strip of 1/16 balsa, extending out the end of the tube about an inch. The 1/64 plywood is then glued inside. The balsa tube extending out the back is sanded to a slight taper and the boom glued on. Then sand, dope and tissue the whole assembly. Pour dope down the motor tube and pour out for extra protection from lube. It is easier to cut access holes, notches for stab mounts, rear anchors, etc., after covering.

#### AN ERA PASSES

I guess all good things must come to an end, but writing an epitaph for the ubiquitous Starduster just doesn't seem possible. With the possible exception of Carl Goldberg's "Zipper," no other free flight design has impacted the sport more than Sal Taibi's Duster. Since 1958, every new free flight design worth its salt has had to be compared to a Starduster.

The secret to its success (and overwhelming popularity through the years) was that ANYBODY could make one fly well enough to win contests. A Star-



duster kit just defied you to make it fly badly. All the wood was of top quality, the die-cutting was clean, all the parts fit, and the flying directions told you just how to make it fly. And a lot of reason for the kit being so good was that Sal gave every kit his personal attention, from selecting and cutting every piece of wood, to supervising the die-cutting and making sure the orders went out on time. And if he was at the same flying field and noticed you having problems, he'd personally walk over with some friendly advice. If you flew a Duster, Sal was in your corner!

If you want a Starduster kit, for collecting, flying, or growing nostalgic over, this may be your last chance. Competition Models is going out of business, since Sal wants to take it a little easier now. Kits will no longer be made, but those remaining can be ordered from Sal Taibi, 4339 Conquista Ave.. Lakewood, CA 90713. Sal informed me that copies of the original kit plans, including a sheet of airfoils, may be ordered through John Pond's Plans Service (see ad in this issue).

#### Au revoir, Duster! COX CONQUEST UPDATE

On August 29, I received an answer to my question, "What happened to the Cox Conquest .15" from the Cox Marketing Department.

"Dear Mr. Hutchinson:

"I regret that your May 8, 1979, letter





of inquiry has been discovered unanswered.

"The Conquest .15 engine was not carried in our 1979 catalog because it has been shelved for future development.

"Service parts are available from the Customer Service department by mailing us your check for the price of the parts needed, plus a 10% handling charge."

Cox is a bit quicker in handling parts orders than in answering letters. My local hobby shop provided me with a copy of the appropriate parts numbers and prices, and Cox was able to supply me in about 2 weeks. However, the 10% handling fee sounds like an unmitigated ripoff, since the parts prices are full retail, and your local shop can't get them for you unless they're an authorized Cox Service Agency.

Anybody out there got any ideas about how to get Rossi parts?

#### Gibberish .... Continued from page 33

inch wing with an 8-inch chord would (quick! divide 100 by 8!) have a 12.5 aspect ratio; a 100-inch wing with a 12inch chord would have an AR of only 8.3. Which one would fly better? The answer depends on the current fad. Ten years ago, high AR's were in, 18 to 20 being common figures. Today most of the contest winners fall between 10 and 13. High aspect ratios are more efficient in theory, but lower ones usually launch better, turn tighter, and are structurally stronger. As newer building materials (carbon fiber, kevlar) come into use, AR's may eventually climb back up a bit. But don't hold your breath. Incidentally, if you know only the span and area, but not the chord of a wing, the aspect ratio formula is span squared divided by area. It works!

#### BALANCED RUDDER:

A bad idea, stolen from full-scale design, in which part of the movable rudder is hung out ahead of the hinge line to help "balance" the load on the controls. It has two distinct disadvantages. In a turn (see drawing) it presents simultaneously two radically different airfoils to the airstream: one of them is a kind of "curved plate" and the other is a flat plate at twice the angle of attack of the curved plate. Common sense tells us that both these airfoils can't operate efficiently at the same time; by the time the curved plate assumes an efficient angle of attack, the flat plate has long since stalled. The result is a high-drag turn, and who needs it?

The second disadvantage is that a balanced rudder ALWAYS fishtails at very high speeds. I've seen lots of excellent builders try to overcome this problem, but I've never seen one succeed.

#### **CENTER OF GRAVITY:**

For our purposes, this means the foreand-aft balance point of the complete plane, with prop on and a full tank of fu ... oops, excuse me, I mean fully charged and ballasted and ready to launch.

Careful, consistent pilots like Colorado's Skip Miller carry a small "CG tester" in their field kit: a flat board for a stand, about 6 inches square, with two holes in it for a couple of dowels that stick up like football goalposts. This device Skip sets on the ground or the hood of somebody's Continental, and hangs his glider between the dowels to check the CG. The dowels are rounded on top, and large enough in area not to leave dents in the bottom of the wing. A couple of wedge-shaped pencil erasers slipped over them would be ideal. In serious competition, Skip checks his plane often; even relatively small (1/8inch) CG shifts can make a differrence in how a plane handles, penetrates, and responds to lift.

The important thing to remember about the CG is that it is always mea-





fuselage, if your plane has rubber-band wing tie-downs.

**CENTER OF PRESSURE** (alias "center of lift," "aerodynamic center of the wing"):

This is the point on the wing chord where all of the wing's lift appears to be concentrated. I think of it as a sort of invisible arrowhead that supports the plane, holds it up, while it's flying.

The center of pressure isn't a fixed point, unfortunately. On the kind of airfoils we use (flat-bottom, semi-symmetrical) it shifts around constantly. depending on the angle of attack. At high angles of attack it moves forward; at low angles of attack it moves back. In normal flight it hangs out in the region of the airfoil's high-point. Its relation to the center of gravity is crucial. An article in the October 1978 MB will tell you more than you want to know about center of pressure.

CHORD:

The width of the wing, usually measured where it joins the fuselage. Constant chord means the same width all the way out to the tip. Tapered chord is more common; the chord gets smaller towards the tip, as in most full-scale sailplanes. This makes the tips lighter (and that's nice) but more important, it reduces the size of the tip vortex (q.v.). **DECALAGE:** 

The difference in angular setting ("angle of attack") between the wing and stabilizer. Decalage is the most important single measurement on a model (and you thought it was bustline, I

wing at the desired angle of attack is what the whole business of "flying" is about. Too much decalage (read: "too much up-trim in the stab") makes the wing try to fly at too high an angle of attack, so the plane constantly wants to loop or stall. Of course, it's possible to correct this condition by moving the CG forward (read: "by adding weight to the nose"), but what you wind up with is a plane that mushes through the sky in a nose-heavy condition: slow and easy to fly, it's true, but a real dog, performancewise.

Too little decalage, on the other hand. can be even worse. As you reduce the angular difference between wing and

in free flight as "zero-zero trim," when both the wing and stab are flying at zero angle of attack. In this condition no lift is generated by either surface, and the plane will begin to assume the flight trajectory of a rainbow, or a plucked chicken, striking the earth smartly at the far end of the curve.

Whole books could be written about decalage. The most painless way to come to grips with it is to buy a 25¢ chuck glider and clear all the furniture out of the living room and start making glide tests, changing CG and decalage around until it all begins to make sense. If you feel self-conscious doing this, try wearing a white lab coat and taking lots of notes. Nod wisely whenever you think





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#### anyone is watching. DIHEDRAL, POLYHEDRAL:

Dihedral refers to the upward sweep of each wing panel from the fuselage. I used to think that rudders made airplanes turn, and that dihedral was only to keep the wingtips from dragging the ground on landings. Then I built a plane with no dihedral, and found that it wouldn't turn. It seems that a rudder can steer the fuselage towards a turn, but only a wing with dihedral can make the plane bank and pull itself around through the turn with its own wing lift. Because that's really what makes a plane turn: wing lift. In the popular press rudders get all the credit for the job, but just between us scientific types, it's the wing that's doing the heavy work.

To see exactly how dihedral makes it all happen, cut out the top view of an airplane, or reasonable facsimile, from heavy construction paper, bend some dihedral into the wings, and hold it in flying position in front of a low-speed fan. As long as the plane faces the fan it will "fly" straight and streamlined. But suppose you swing the nose to the right a few degrees, like a weathervane. Now the fan is blowing on the bottom of the left (upwind) wing and the top of the right (downwind) wing. So the upwind wing is suddenly flying at a high angle of attack and generating tons of lift, while the downwind wing is getting hit by a wind from above, which means its angle of attack is either very low or possibly even negative. Presto: the plane rolls up

into a right bank. Bend the wings down flat (no dihedral) and this bank won't occur. And that's how dihedral makes turns happen.

Of course, if you had a set of ailerons you could have rolled up into the bank without all this fuss ... you wouldn't need the dihedral OR the rudder, then. But that would be cheating.

Polyhedral (or the older form, polydihedral) refers to a wing with center dihedral as well as one or more "dihedral breaks" further out on each wing panel towards the tip (see drawing). Most designers feel that dihedral is more effective when it's placed out toward the wingtip a ways, so it has a longer moment arm to work through for lifting the wing up into bank. They're right. DRAG:

The "wind resistance" of an airplane; the friction with the air that degrades a plane's performance. Two kinds of drag are important to glider folk, *induced drag* and *profile drag*. Induced drag is the drag penalty you pay for getting lift out of an airfoil, the drag that's "induced" or caused by the lift. It's approximately proportional to the lift; when lift increases, induced drag increases right along with it. Which only goes to prove that you still can't get something for nothing in a second-rate universe like the current one.

Profile drag is everything else: the fat fuselage you should have made skinnier, the receiver antenna dangling out there in the airstream, the exposed wing dowels and rubber bands, the sloppy hinge job on the elevator, the unpatched holes in the Monokote. Reducing profile drag is vastly more important on models than it is on full-scale aircraft, but few designers seem to realize this yet. Perhaps it's because most model designers still believe that full-scale aeronautical math applies to models as well. And sometimes they're right.

#### EMPENNAGE:

The rudder and stab collectively; the plane's "tailfeathers."

FULL-FLYING STABILIZER (also called an "all-flying stab," or simply "flying stab"):

A stab that moves up and down as a single unit, instead of being divided into a fixed stabilizer and a movable elevator, connected by hinges. In theory, a flying stab is a bit cleaner and more efficient than a hinged one. In practice, it is usually heavier and harder to build, and always harder to design properly. The whole trick is in finding the right chordwise position for the pivot wire, or main axle. The pivot wire is the stab's primary load-bearer; any time you see a flying stab with two identical-sized wires, you can bet there's laziness or sloppy engineering at work, because only the wire at the stab's center of pressure is carrying the load. The other one is merely an alignment pin.

Finding that center of pressure can be a chore. The usual figures (25% chord for flat plates, 30-33% for symmetrical airfoils) are only approximate ... each stab configuration varies a little. Bad

#### MINIMOUSETANG **BY KEN WILLARD**

The Minimousetang is a sport airplane designed by Kan Willard with kill engineering by Model Engineering of Norwalk

This quick building, fun flying plane will put you at ease on the ground and in the air. With a Cox QRC motor this plane can easily be flown in areas where noise and size would not have permitted you to fly before

Model Engineering of Norwalk's "THRU-CUT" die cutting, combined with "TRI-SQUARE-LOC" as-sembly in Ille phywood and balsa makes construction simple enough for the beginner

The inherent strength of our lite ply construction provides durability and lasting performance. You will be spending more time on the flying field and less at the repair bench.

TRI-SQUARE-LOC enables us to bring you the best in lite plywood construction. This method of squar-ing, straightening and holding parts in relation to one another revolutionizes construction

The Minimousetang is designed for two channel radio control operation with a  $\frac{1}{2}$  A motor.

The 35 Inch wing span combined with approximately 15 ounce liying weight gives a wing loading of 9.2 ounces per square foot. The kit features quality materrals, rolled plans, building instructions, complete hardware package, canopy, and pre-shaped landing gear. The building time for the Minimousetang is 7 to gear ine 14 hours

The following items are needed to finish the model radio motor, tank, covering material, glue, 1%" man wheel,  $\frac{1}{2}$ ,  $\frac{1}{2}$  following bolts.



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design only shows up at high speeds: pivot too far forward, surface too hard to move; pivot too far back, surface too hard to keep centered. Either way, your servo loses.

Model Engineering of Norwalk

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tor, Rudder/Elevator/Throttle.

#### **GLIDER, SAILPLANE:**

Competition.

Interchangeable words, to most people. A few cranks insist that a glider glides downward after release, a sailplane soars upward. This would seem to make the definition largely dependent on the weather. In the 1920's the British formally declared a sailplane to be "a glider having a sinking speed of less than .8 meters (2.6 feet) per second." Conclusion: the British had long winters, with very little to do, back before BBC. **GLIDE RATIO (LIFT-TO-DRAG** RATIO, L/D):

A measure of a plane's efficiency, the glide ratio simply states how far the plane moves forward for each foot of altitude that it loses. (Altitude is measured in feet in all civilized countries.) Example: a plane has an 8:1 glide ratio, and you release it six feet above the ground. If it glides eight feet forward for every foot that it falls, it should go 48 feet during a six-foot descent, right? And if it has a 10:1 glide ratio it should go 60 feet. Simple.

The problem is, these figures are totally meaningless. ALL glide ratio figures for model sailplanes are totally meaningless. You can't "release" a plane at six feet of altitude. You have to throw it. How hard you throw it, and at what angle, will directly affect how far it goes. (My daddy can throw a higher L/D than your daddy can.) Then there's the question of wind: a plane will glide farther downwind than upwind. And how about the quality of the air? A plane will glide farther in rising air than in sinking air, and all air is constantly rising and sinking, even at 4 a.m. Wind tunnels aren't much help, because their air is too smooth, too perfect . . . we need models that fly well in real conditions, not ideal.

Models are not a bit like full-scale planes; the fact that they resemble them in outward appearance only confuses the issue. Models have ridiculously low inertial forces, compared to man-carrying craft. This makes all the differ. The air viscosity is identical for models and full-scale aircraft, but the model's inertia, the energy it has available for wedging air molecules apart in order to fly between them, is miniscule. The energy of air turbulence, of upsetting forces, is enormous in comparison to a model's inertial stability. There are few formulas that account for these things. Reynold's numbers are worthless; lift and drag formulas are a joke. Someday there may develop a science of model aerodynamics; meanwhile, don't spend a lot of time worrying about glide ratios. Go fly.

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Starduster . . . . Continued from page 48

When the wing panel is dry, remove it from the board and sand to shape. If you want a more accurate wing, add a 1/16x1/32 cap under each rib to give it a semi-symmetrical airfoil like the original aircraft. This will cut down on the flight time a little, but it sure looks neat. Join the upper wings to the center section with no dihedral. The lower wings have 3/8 inch dihedral per panel.

Carve the carburetor air box, interplane struts, wheel pants, and spinner from soft balsa and fill the grain of the items to be painted.

Cover the model with Japanese tissue or domestic tissue of the base color chosen. The wings were covered wet and were pinned to the board while they dried. Cover the struts and any other small details that you think you can cover without wrinkles. Cover the tail dry and take care to avoid warps. The fin fairing is covered after assembly.

The model is now given two coats of thinned nitrate dope. Add a few drops of castor oil to your dope to reduce the amount it will shrink the tissue.

Add the trim now with tissue if the base color is light. The model in the photos is deep blue, so enamel was used for trim. Masking tissue is very tricky, but the method given here will do the job without damaging the tissue. Buy some sticky-backed cabinet paper and cut the mask out of it with a very sharp knife. After the mask is cut, flip it over and cut a 1/16 border around the mask through the backing only. Peel the thin strip of backing off the mask and apply to the model, taking care to put the mask on with as little pressure as possible to avoid stretching the tissue and making dents. Apply the paint with a soft brush, or an airbrush if you have one. Remove the mask before the paint dries.

Assemble the model now, starting with the top wing and proceeding with the bottom wings using the length of the interplane struts to set the bottom wing dihedral.

Add the horizontal tail, tack gluing only at the leading edge. Glue the fin in place and cover the fin bay over the stab center section. This will have to be covered wet because it must take on a natural curve as it shrinks.

The stars and lettering were added with a pen and white ink. Glue the fairings, wheel pants, and struts onto the gear, using the photos for a guide. Add the tail wheel now, using paper strips for springs. Finish with the aileron pushrods, headrests, carburetor airbox, spinner, windscreens, and rigging. Some aircraft have windscreens on the rear cockpit only, so as to be able to streamline the aircraft with a front cockpit cover. The rigging is made from gray silk thread and is glued with Pliobond.

Install a motor made up of two loops of 1/8 Sig gray rubber about 20 inches long. Balance the model as indicated on the plan with clay or lead shot. The model flies to the left with 1/16 inch left rudder offset and 3/32 wash-in in the left lower wing panel. Juggle the thrust line for fine adjustment.

Enjoy the model, and by all means write to me about it care of **R/C MB** if you build one.

#### Half-A ..... Continued from page 45

for. The engine even features a selfengaging spring starter for the greatest possible ease of starting.

While we are talking about Cox Hobbies, here is Cox's latest kit, the Warlock .05. This is probably the first Cox kit not designed by Lee Renaud. We can credit Scott Christenson for this little beauty. Wingspan is 32.5 inches and it will fly with two to four channels on a Tee Dee .049.





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Performance should be excellent, since the wing is built up for light weight and strength.

Last item for the month is a new boat kit from Dumas Boats. The "Lil Rascal" is a high performance Outrigger Hydro for two channels and a .10 size throttled engine. Construction is wood and metal, not fiberglass in this case. I think the clear radio compartment cover in the photo was just for the show model; I doubt that it is part of the kit. Dumas has done a tremendous service for the R/C boater by making a wide variety of hardware available. Their line of kits is broad in size, complexity, and range of interest. You can get scale models, racers, speed jobs, sailboats, and just sport models with all the goodies you need to hook up your engine without having to be a machinist.

Vigilante ..... Continued from page 17

something very unusual, and that is why when adjusting the needle valve you must firmly hold the whole model. If a standard model moves a little bit it means nothing, but here an inch is enough and your fingers are cut by the propeller, which is nearly a saw. That is why you must pay attention to it. On takeoff, let it run about 60-70 meters on the runway, and do not move the elevator. Then slightly touch it and the model will take off. If the takeoff is too sudden, the propeller can touch the ground. I should like to mention that this has never happened to me. Of course, I have been flying from a flat and straight runway. While landing, the propeller of my model touched the ground a few times, but that was because the landing speed was too slow. If the landing is in jet style nothing can happen.

The model is controlled as any other F3A model. During the flying you can hardly recognize that there is a pusher engine. The model is small, and that is why it flies fast with an O.S. Max .40 FSR. It performs every F3A maneuver with the exception of a spin. I think it could perform it, but I have not tried it yet. As I found out during meetings with other model builders, the model itself is nice and attractive. There have been discussions about it, and a lot of people want to build it. If anyone decides to build a Vigilante, I wish many nice takeoffs. If there is anything in my description that is not understood well, I shall answer every question by way of correspondence.

**C/L**..... Continued from page 55 models just don't fire that urge to go flying like the C/L and F/F models hanging about the shop do.

But what seems to be the ultimate example, illustrating that it is not model building skills determining the fun quotient, is my heavy involvement in R/C cars. To approach these models looking for an outlet for modeling skills is almost a waste of time ... if the traditional model builder is doing the looking.

Take a look around at what is offered to the car racers. Everything is ready

built, most cars can be purchased as complete, ready-to-race units. Even if bought as a kit, the car goes together easily and is readily recognizable as being from a certain manufacturer. About the only creative thing a car racer can do is paint the molded body in an individualized manner.

One of the people I race with, Greg Sheehan, is just about the best example I can think of as enjoying a modeling activity and yet not having any of the traditional model building skills (and without any desire to acquire these skills), and yet having fun racing R/C cars. Greg absolutely loathes working on his and his boy's car. He has Bob Welch paint his bodies for him, not even wanting to get that deep (?) into building the cars. Last year Greg mentioned that it was a tough season, he actually had to reset his needle valve twice in the





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flying, however. . . .

#### AND THE SHOW GOES ON...

The October issue of R/C MB hit the stands and very shortly thereafter an overpaid civil service employee delivered to me a couple of interesting Bill Winter and John Worth. Seems the guys in D.C. are very upset with me again. I would use their letters in this column, as I have done in the past with one from Mr. Worth, but with the AMA sticking to a policy of not publishing anything to the negative in their stuff, I

What they questioned, primarily, was my stating that Winter had asked Horace Cain to change something he had written for his District Report column. I reviewed that letter and will stick with what I said. I will admit that Winter didn't actually come out and demand that Cain's text be changed, but keeping in mind that the future of Model Aviation rests in the hands of the Executive Council, of which Horace Cain is a vocal member, he didn't dare demand anything, anyway, nohow. I would judge the request to have been as strong as possible, considering the circumstances.

Besides, it was used to illustrate the strong feelings, backed up by equally strong actions, of Mr. Cain. In the past we have had people on the Executive Council (still do, as far as I am concerned) who were only moved to go with the flow, the headwaters being located in Washington, D.C. Horace Cain seems to think the flow is reversed, or should be reversed, as he is out there trying to determine what the AMA members in his District want and then trying to get it. His response to Winter's letter backed that up in his stating that he represented

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0.051       17,17       Dirac       19.99       GILBERT ENGINES       20.01/ve       29.95       Chris Colling 1       59.95       Chris Catt 6.3       47.47       Computer       59.55         0.051       12.12       121       Long       24.95       O/4       59.55       Chris Catt 6.3       47.47       Computer       59.55         0.051       12.12       121       Computer       24.95       O/4       59.55       Chris Catt 6.3       47.47       Computer       59.55         0.051       12.12       22.12       24       Long       24.95       O/4       59.55       Chris Catt 6.3       47.47       Computer       59.55         0.05       11       11.57       24       Long       24.95       O/4       59.55       Chris Catt 6.3       47.47       Computer       59.55         0.05       11.57       0.05       12.12       10.06       Files All 0.06       12.22       55.55       Sole for       Sole for       50.55       Sole for       Sole for       18.33       Of Elec Motor       18.88       Nacd & Charger       Sole for       18.95       MAR.C.       -WERA       40.72       20.90       10.00 for elgo Charge Silo for       10.00 for elgo Charge Silo for       10.00	aby Bee .049	\$ 7.77 Box Hugh Source	2V5 AMP	9.95	Min+ Pile	29.95	Compativen	60 60	King Fish	22.22	w/Programmable	*
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thousands of flying buddies and that their interests were more important to him than those of one flying buddy off in D.C.

In his letter, Mr. Worth tried to make me feel as if I was an inaccurate and irresponsible reporter. Lots of stuff about inuendo and distortion. Gotta admit, he writes a mean letter....

The trick is that when writing for any length of time, you are bound to sooner or later make an honest mistake; the law of averages just has to get you once in awhile. I don't feel I have made any mistakes for quite some time, certainly not within the past year or so, even if some people within the AMA feel I have. Chalk it up to a difference of opinion.

What I do know is that in looking back at all of the stuff I have written in MB and now R/C MB, my record has to come off as being absolutely sparkling when compared to what you read in Model Aviation, and more specifically, the AMA News section of that magazine. Here we have people who have been "names" in the AMA and modeling, but are they heard, or their cases, aired in AMA News? There are problems within AMA, problems that for the good need to be discussed and then solved. Are these problems discussed anyplace in Model Aviation, or is only the opinion (defense) of AMA HQ managed to be published?

Of course, with columns like that of

Horace Cain's, this situation is at least starting to change, but I don't think we can thank anybody other than Mr. Cain for that, do you?

#### FAI SPEED TRIALS

(By Joe Klause)

Over Labor Day weekend, the West Coast portion of the FAI speed trials was held at Santa Ana, California. On the same weekend, the eastern trials were held at Dayton, Ohio. The average of each contestant's two fastest official flights was used to select the team members. Californians Chuck Schuette and Bob Spahr gualified as the first and third members of the 1980 USA team; their respective times were 161.92 and 155.75 mph. Charlie Lieber averaged 158.91 at Dayton for second place. The World FAI Championships tentatively will be held in Poland during the summer of 1980.

#### Excaliber .... Continued from page 24

#### **BUILDING THE COWLING**

The plans show a simple, straight type of cowling for the Excaliber II. I have seen many different cowling schemes used on this boat besides that shown on the plans. You can see some of these different cowlings from photos in the article. The aft cowling is removable to allow access to the fuel tank, mounted in the aft cowling, and for making adjustments to the engine. For anyone who might be interested, Vic Drew, 1628



Iron-on coverings tend to stick only to the surface of balsa, often leaving trapped air, then sagging and coming unglued. Balsarite sinks deep into the wood, then melts and intermixes with the adhesive of the covering as it is ironed on. No trapped air, only deep permanent adhesion. Eliminates sagging, fuelcreep, warping due to moisture, and makes hard-to-reach fillets easy to cover. If you use Monokote, Solarfilm and Coverite, you must use Balsarite. It takes the gamble out of covering with iron-ons.







Corona. Medford, OR 97501, can probably provide you with a fiberglass aft cowl like that used on the fiberglass Excaliber II he makes. I don't know what Vic might want for making and shipping an aft cowl, but you could drop him a note and ask for a price quote.

#### INSTALLING THE RADIO SYSTEM

There are two methods available for installing the radio system in the Excaliber II. Many model boaters prefer to mount their equipment in waterproof boxes and then install the box in the boat so it can be removed. An excellent choice for a radio box for the Excaliber II is the one available from G&M Models, P.O. Box 342, Broadview, IL 60153. The box, measuring 2x3x5 inches, would fit very nicely into the radio compartment. I have used this box in other installations and have found it to be an excellent product.

It is also possible to build a radio compartment into the boat, and this is the method I've used with the Excaliber II's I have built. Four 1/4x3/8 hardwood strips can be glued inside the radio compartment so that a plexiglass lid can be screwed atop the radio compartment. Use either gasket material or silicone sealer to make a seal between the plexiglass and the wood strips. Waterproof radio box seals are available from a number of sources. G&M Models



has a fine radio box seal, and I've also had good luck with the radio box seals from K&B Manufacturing. The Kwik Switch from DuBro Products does an excellent job in the mounting of the on/off switch for the receiver.

If the radio is installed in the boat, K&B Manufacturing has a kit for hooking up the throttle linkage that works very well. I have used it on my boat and found it to be most satisfactory. For the rudder linkage, use 1/8-inch brass tubing with threaded shafts soldered to both ends to attach Kwik Links to the servo and engine.

Use of heavy-duty type servos is a good idea on the outboard engine. The outboard unit can place a great amount of stress on the rudder servo, especially the servo gears.

INSTALLING THE OUTBOARD ENGINE

I recommend using either the K&B Autotrim or the Hughey Adjustable Outboard Mount on the Excaliber II. To achieve maximum performance from your outboard tunnel, it will be necessary to adjust the height of the engine on the transom. The K&B Autotrim also allows for adjustment of the engine angle away from the transom. If an engine mount isn't used, mount the engine where it is shown on the plans. **FINISHING THE EXCALIBER II** 

It is definitely recommended that an epoxy type finish be used on the Excaliber II. There are a number of good products available at most hobby shops that will provide a good finish for the boat. It should be remembered that a good finish is directly related to good preparation of the hull for finishing. I like to use auto body putty for filling cracks and pin holes; it dries very hard in a short time and is quite easy to work. The boat should be sanded and filled prior to the application of any finishing material.

After filling cracks and holes, I like to brush on a couple of coats of K&B clear, thinned about 25%. This helps seal the wood and also fills the grain. When the clear has dried thoroughly, the hull is sanded with 220 grit paper and a coat of K&B primer can be brushed or sprayed on the hull. The primer will fill the grain and also assist in making any blemishes

#### **POWERFUL - RELIABLE - DURABLE** AMERICA'S FINEST MOTORS AT A PRICE YOU CAN AFFORD.

#### FOX 15 SCHNEURLE BALL BEARING



Bore

Stroke

Disola

The new Fox 15 BB is truly an exceptionally advanced design motor. The Fox version of schneurle porting provides four separate bypasses arranged to produce maximum amount of power as well as exceptional low speed charactenstics. Performance-wise the Fox 15BB is in the same league as the most powerful full race engines However, unlike others, the Fox is neither cranky nor difficult to keep running at idle and cruise speeds. Some outstanding construction features are. Fox patented crankcase; separate head button; flange mounted carburetor for quick change from control line to R/C; removable prop stud; special 10mm bore ball bearings, super durable 8620 crankshaft The Fox 15BB is your best bet for FAI Combat. Goodyear type control line racing, or Quarter Midget R/C racing, as well as sport FC flying

11698	Fox	15	RB	for	C.L.								\$4	9.9	15
21 <b>698</b>	Fox	15	BB	for	R/C	• • •		• •	- 4		•	•	-	59.9	15
90242	Con	ver	ntio	nal	Silen	Cel	r							5.9	15

21750 Oversize Carburetor									
for Quarter Midget Racing	• •						1	12.	00
40716 Button Plug for Racing					6			.3.9	50

RPM with 8-4 prop .....14,000

#### FOX 40BB

The parts are sturdy and structural failures almost never occur. The cylinder is nitrided for long life, the piston fitted with

	.800	Weight
	.790	RPM with 10-6 prop14,000
cement	.399	

The Fox 40BB is undoubtedly one of the finest 40s you can buy. We have concentrated on getting the Fox 40BB to pull a useable size propeller as fast as possible. We know of no other 40 engine, regardless of cost, which will pull a 10-6 prop faster. However, this has been done without any sacrifice of idle or throttle characteristics. The motor features the Fox patented crankcase design which is extremely sturdy and crash resistant. The flange mounted carburetor we feel is superior to the clamp in design because it produces no crankcase distortion. Improvements for 1979 include a completely redesigned bell shaped combustion chamber which runs faster than before, and a restyled extenor which we feel you will like. The measure of any engine is how it flies your airplane. In this department the Fox 40 excels. It is very easy starting, docile to handle, and puts out excellent power even in over-rich or over-lean settings.

14100 Fox 40 Schneurle BB for C.L. ..... \$54.95 24100 Fox 40 Schneurle BB for R/C ...... 64.95 

#### FOX COMBAT SPECIAL

one free to rotate compression ring which practically never wears out.



Bore	800
Stroke	715
Displacement	359
Weight	oz.
RPM with combat prop18.	000

First introduced in the summer of 1976, this new Fox Combat Special was an immediate success. It won first place at the American Nationals and the Canadian Nationals, and first places at many contests throughout the country. Whenever the Combat Special was flown it was obviously faster than the rest of the field. A suction type restrictor and needle valve are included with the motor. This suction ventur makes the Combat Special a surprisingly docile motor for beginner type profile airplanes. As modeler's skill progresses and he wants to go faster, he will be able to switch from the suction intake to bladder type and this way the same motor will progress right along with the modeler from the first profile model up through the fastest competition type combat models

13700 Fox Combat Special	 \$49.95
90412 1/2" Prop Extension	 3.00

90412	1/2"	Prop	Extension		•				 					3.00
90413	3/4**	Prop	Extension	_		_			 				_	3.00

	FOX 60 EAGL	.E
Bore		Veig
Stroke		IPN
Displacement	604	

Although schneurle ported engines generally produce more power, the baffle type configuration still has quite a bit going for it. A baffle type engine burns less fuel because the gas strikes a hot baffle which more thoroughly atomizes and vaporizes the fuel. A baffle engine is also more economical to produce. Unless you are power hungry and prepared to shell out substantial quantities of money for an engine and fuel the Fox Eagle 60 may be your best bet. Of all the baffle 60s on the market the Eagle is probably the most powerful and certainly one of the most economical.

For 1979 the Fox Eagle has many significant refinements. The whole crankcase lower end has been enlarged to provide heavier wall sections and clearance for a more sturdy rod. We have developed improved machining techniques and now the crankshaft bore is step



Weight ......15 oz. RPM with 11-7 ½ prop .....12,000



bored to provide a close fitting seal area forward of the carburetor and absolute concentricity with the front bearing. The port section and aft is bored larger to provide shaft clearance. The problem of heat sag which we had on some earlier Eagles has now been completely eliminated. The new crankcase also features bosses on the front and rear of the motor which make the muffler attachment easier. We no longer install exhaust valves except on special order, as most people use a muffler which makes the exhaust valve unnecessary. The crankcase is now bead blasted which we think

gives a very pleasing contrast to the polished head and rear cover and the black hardware. If you have to work for your money, you should take a long hard look at the Fox Eagle.

16099 Fox Eagle for C.L. ...... \$59.95 26099 Fox Eagle for R/C ..... 69.95 90232 Conventional Silencer ...... 9.95





appear that went undetected during the initial filling and sanding. These areas can be filled and the primered hull sanded with fine grit paper. The hull can now be primered again and final sanding done in preparation for the application of the color coats. I personally lean



towards one solid color for the entire hull, with trim tape, lettering, and numbers used for contrast. There are certainly many things a builder can do with the finishing of the model to add realism to its appearance. **RUNNING THE EXCALIBER II** 

#### After three years of working with this design, some things have become rather obvious on trimming the hull. The prop that has proven most successful is the J.G. E-20. This is available from J.G. Products, 8030 Fordham Road, Los Angeles, CA 90045, if you can't find one at your local hobby shop. Be sure to check any prop for balance before running on the outboard. An out-of-balance prop will cause increased wear on the lower

The Excaliber II is designed to ride on the last few inches of the sponsons. Most of the Excaliber II's in this area are running with six to eight ounces of weight up front to keep the bow down on windy days. The boat is very responsive to changes in the prop depth and changes in the angle of the engine under or away from the transom. Shimming the engine under the hull will cause the boat to ride wetter; shimming the engine away from the transom will lift the bow.

The only way to find the best ride is to spend lots of time experimenting with engine setting Prather Produ

ray to find the best ride is to f time experimenting with logs and weighting the hull. ucts has stick-on lead strips	The flight of Srull's Vagabond was really realistic; it would have a long takeoff, then slowly climb to the top of the auditorium, circle there for a while, then glide down. The Old Perfesser should have been there to see it, it
DRIZED SERVICE DLLOWING BRANDS	would have brought tears to his eyes. Another great flier was Guy Larson's Martin Baker. His model was designed and drawn by him, built and finished to a
Cirrus EK Logictrol RS* Micro Avionics D & D World Engines JoMac NTY SERVICE	very high standard. This may seem to be a little unusual in a world of ARF models in R/C, but the real kicker is that Guy is a Senior, not an Open flier! Guy also had a Heinkel 119 Peanut that was scraping the ceiling from time to time, and which was also built to his fine standards.

While we were testing our models, a local man named Perry Peterson came up to us to chat for a while. He makes rubber scale models, many from the R/CModel Builder centerfolds, and was saying that he was probably the only scale free flighter in the area, and that all the clubs were R/C. Bob and I had him write his name and address down for us,

that are really great for experimenting

available for racing in rough water or

windy days. The tunnel configuration is

designed for maximum lift on flat water.

When the conditions get rough and

windy, driving the Excaliber II takes

a fairly easy boat to build for even a

beginner. If assembled properly, it

should prove to be a competitive hull for

outboard tunnel racing. I would be

interested in hearing any comments

from those who build the hull. You can

send these comments to R/C Model

Builder and they will be forwarded to me. Good luck with building the Excali-

ber II and welcome to model outboard

for King Arthur's sword is Excalibur.

Dave Knowlen, designer of the original

Excaliber, purposely misspelled the

F/F Nats .... Continued from page 53

his knowledge. Guess that's why I like

this part of modeling.

P.S.: I realize that the proper spelling

I believe the Excaliber II should be

The Excaliber II is not the best tunnel

with weighting the hull.

extra attention.

tunnelst

name.

#### **R/C MODEL BUILDER**

and by the time the week was over, we had found four or five other local men with the same interest. We gave them Perry's address and hope that they may start a Free Flight Scale club in Lincoln. By the way, we asked Perry if he was entered; he replied that he wasn't, as he thought his models were not up to the standards for the Nats. A few days later he showed us some photos of his Peanut models; they were fantastic, and we really got after him for not entering them !! I wonder how many modelers out there have the same feelings as Perry. Please enter a contest; if you don't place high, at least you can gather a lot of good ideas for that next model, meet other modelers, exchange plans, and have a good time.

While Bob and I were repairing a landing gear strut (will make a better one for the next contest), a young, pretty reporter from the Lincoln Star, named Kathy Chenault, interviewed us. Seems she was doing the Nats story for the paper, and wanted to know about Indoor Scale. Bob and I told her all we knew (took about ten minutes) and thanked her for the chance to do so. Next morning we saw our picture on the front page of the paper, along with a good plug for Free Flight Scale. Thanks, Kathy.

Monday morning, due to my big mouth, we judged the Outdoor Rubber Scale models. It seemed that some of the contestants were confused on the registration time and the scale entry time, 9 a.m. and 10 a.m. respectively. This left some of the contestants out of the official contest, so we had an unofficial contest too; can't keep a good modeler down!! Also, we decided that we would have time to judge the Outdoor Peanuts on the same day. This saved many of the fliers the problem of being at the flying site 40 miles away at 8 a.m. and having their Peanut models in for judging by 10 a.m. at the scale judging area. Can you imagine trying to explain to a policeman that you were driving over the speed limit on a two-lane road just so you could enter that 13-inch wingspan model on the back seat for a contest?

The one thing that was tiresome was that some of the models were entered in Peanut, and in AMA Rubber also. This



meant that we had to judge the same model two or more times; in fact, we judged some Laceys four times each! As these were Juniors, I can't blame them for doing this, as it's hard enough for a young guy to build one model, let alone four, then trim each one out to boot!!

There were several models worth mention in this event. Don Srull's Waterman Gosling Racer looked like a brand new racer just out of the hangar. It had a great deal of detail, right down to the control wires for the ailerons, rudder, and elevator. His Crosby racer in Peanut was just as nice, and flew well too; so much for saying that the low-wing models can't fly well! John Oldencamp had built a Japanese homebuilt (sorry, forgot to write the name down) that was good looking, a low-wing also. Think this is a new trend starting?? There was also a Dayton Wright racer with retract gear that was outstanding.

Finished up the Outdoor Peanut judging Tuesday, entered our gas entries for judging, and drove out to the free flight site near Mead. First thing I noticed was TALL GRASS. I had always read about this stuff for testing models, but as a native Southern Californian, had never seen the real thing! It's great stuff, causes far less damage than the asphalt we use at Mile Square, but it's hard to R.O.G. from. This was taken care of by laying four sheets of plywood edge-toedge to form an 8x16-foot area. This was fine for the short takeoff of the rubberpowered models, but not enough for

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our gas-powered heavyweights, so I asked John Preston, the man in charge, if we could have something better for the next day. Just say what you need, and Preston will get it! Next day we had a one-lane paved road! Many thanks, John!! Back to the rubber flying, the day was windy, about 10 to 15 mph, but this didn't seem to bother the modelers, as many good flights were seen. Carl Miller, of Ventura, California, had some high flights with his Lanzo Puss Moth that were something to behold.

Wednesday morning we picked up our models and went back to Mead . . .

sure were putting the miles on the truck. What fantastic luck, no wind!! Perry

Peterson said that we were lucky indeed, as they only get about two or three days a year like this on the prairie. Did an official hand launch to get on the board and relieve the tension with the Stinson, then tried to R.O.G. Had some trouble here, as our models would seem to turn into the grass at each side of the road with each try. We decided it must be the crown in the road. Did do an unofficial R.O.G. with a little more up elevator, but the flight looked terrible . . . stalled all over the sky and wound up in a tree, no damage though. Larry Kruse had a CO₂ powered LWF Butterfly from volume XI of the Historical Aviation Album, by Paul Matt. When I saw his flight I knew that he was the man to beat. His takeoff was long and smooth, the climb slow (the full-sized plane had a two-cylinder engine), then it seemed to cruise around for at least a minute and transcend into a nice landing approach. As it turned out, Larry got first place, and it was well deserved.

Duke Horn had a diesel-powered Kinner Sportster monoplane that sure was a beauty. It had some problems with spiraling in at first, but soon had an official flight in. Carl Miller was the most fun to watch; each time he would fly his glow-powered Taylorcraft, he would talk the plane around during flight. If it would do the wrong thing, he would yell at it, and sure enough, it would correct itself. Very realistic flier, smooth and slow.

Bob Haight's Bellanca must have heard that it got the highest static scale points, for it became a real prima donna, and its diesel engine would not put out enough power to fly well, or should I say long enough. One of the sights I will always remember was the Bellanca slowly passing over my head at about eight feet as if on its way to Berlin.

Guy Larson's CO₂ powered Nieuport II flew very well; in fact, after Guy got his four officials in, he fun flew it for the rest of the day. Tom Comparet was not as fortunate; his A.S.L. Valkyrie canard didn't want to take off from the road. In a last chance attempt, Tom tried to hand launch it, but it crashed and was damaged beyond repair. As this was one of my designs, I really felt bad.

The N.A.S.A. (National Association of Scale Aeromodelers) had a special achievement award for both Open and Junior/Senior, in Free Flight Scale. Bob Haight got the Open award for the highest static points in a model that flew (missed an official by 1.8 seconds). Tom Comparet got the Junior/Senior award for the most difficult modeling subject. Both of these persons well deserved to get the awards.

Although the next two events are not scale, I thought you may be interested in them from the modeling standpoint. On



Friday, Free Flight Electric was flown. Jim McNiell ran this event and did a fine job of it. Being a scale modeler at heart, I made a 020 Replica of Carl Goldberg's Valkyrie, minus the 1500 pieces in the wing of the full-sized one. John Pond has the plan for this, and it's fun to build and a good flier. I found that an Astro 02 fit just right in the nose of it, and also that it had more than enough power for a good climb, the one thing that many of the other motors seemed to lack. Got there a little late, about 9:30 a.m., and the wind was up to about 15 mph. Two fliers had maxed two of their flights the first thing in the morning when it was calmer, so I had my work cut out for me. Had one good flight, next one hit a downer, then I maxed my last flight. As it turned out, I got a fourth place . . . not too bad for a beginner. Many of the modelers commented on my using an Austin timer. Well, it's the lightest thing I could find, and was very consistent (after I learned how to adjust it).

The other event was Embryo Endurance, and was flown on Saturday. This was the windiest day of the week; the wind was blowing up to 30 mph. As Bob and I had offered our table for the R.O.G. requirement to Terry Rimert, who ran the event, we figured we had the edge; we had tested on it!!! Well, there were many thoughts of the best way to launch the models. First, there was the traditional launch into the wind; this was done with some luck by some, but not many. Then we tried to launch behind a haystack, but the turbulence was bad and we hit a priest, the haystack, and other things. Found that the best system was to launch downwind. Then came the other problem: chasing the model. We found that if you got a oneminute max, you had to be prepared to run about a mile or more. Then one had to find a 50-square-inch wing model in tall grass, or worse yet, taller corn. To make a long story short, Bob and I both lost our Peck-Polymer Prairie Birds on our last max flight. We thought it fitting that we left a Prairie Bird on the prairie, hope some kid finds it and has a ball with it. Charlie Sotich won the event, Bob Haight came in second, and I followed with third. The Juniors were, in order, David Turgeon, Stefanie Sanford, and Mike Watson. Terry handed out some very fine trophies and an iron-on transfer for our T-shirts that said "NFFS UNOFFICIAL WINNER," very nice.

I'd like to say a few things in general about the Nats. The most important is to thank all those who made it possible. Dick Carson, Rolfe Gregory, John Preston, Bill Knapp, Chuck Dial, and all the many others who worked so hard and got little thanks for it. One girl by the name of Janet Wolfe, who worked at the food stand, seemed to be always running for more food, driving or loading the truck, or helping Ruth Degarmo serve the food. Sure could have used that energy while chasing my models! Saw Johnny Clemens there, who told me he was writing a cookbook. He let me in on one of the recipes: how to make




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control surface in as tight as possible and

some of our readers, but the jigs are

reusable many times, and once made

this system is extremely fast. I have

found that I can bevel an entire set of

This may seem like a lot of work to

taping them until the glue hardens.

**Instructor ....** Continued from page15 as shown in Fig. 5.

3) Stefanie Sanford

2) William Stroman

SENIOR

1) Guy Larson

1) Larry Kruse

3) Carl Miller

OPEN

I glue (epoxy) the hinges into the control surfaces first, putting the pivot point exactly on the apex of the bevel. When this has set up completely I epoxy them into the other half, pushing the



control surfaces in about a half hour and still maintain extremely good accuracy.

If this isn't enough, I still seal the bottom of the control surfaces with tape, as in Fig. 6. Believe me, this is worth doing. You're probably saying that this is great for a high-performance pattern ship, but why bother on my slow trainer airplane. Take my word for it, it does make a difference, and the difference will surprise you by requiring less control surface throw and results in more predictable, smooth controls.

As this is being written I am preparing to leave next week for South Africa for the World R/C Aerobatic Championships, and am also starting to campaign for AMA VP for District III. There has been much discussion lately in all the magazines on the AMA. I'd like to say that we need good officers within the AMA for the next few turbulent years, and this is up to you. If you don't vote, you have no right to complain later. Whatever district you reside in, please vote and end the general apathy among AMA members. Keep in mind that it is NOT necessary to send in your renewal at the same time as your ballot, so send in the ballot the day it comes!

Next month's column will probably be written on a 747 somewhere between Johannesburg and New York, and I'll let you know how the team made out.

### Sailing ..... Continued from page 46

racing, double boat duels usually benefit the other boats more than the duelists. I always encourage others to engage in luffing matches and backwinding. While they are taking part in such activities I can take advantage of a wind shift or clear air. They will slow each other, leaving me free to make significant gains.

### LIGHT AIR SAILING

Every now and then, one gets to a regatta and finds no wind. Knowing how your boat will behave in such a situation will pay off. I recommend patience, conservation of momentum, and standing next to a smoker. The latter will provide you with valuable information on what little air movement may be happening. This is especially crucial if the wind is not making any ripples on the water.

Light air sailing is dominated by the psychology and attitude of the skipper. If you have prepared your boat and believe it to be fast in light conditions, it will be fast. Conversely, if you're sure that your boat can't handle the soft breezes, then you are doomed from the start. I keep reminding myself that the trophies for the light air days are just as tall and just as shiny! If there is any difference, it is in the sense of accomplishment that comes after a day of intense concentration.

Boat preparation starts with the choice of gear to be installed. If you will be faced with light airs, a proportional winch is a good choice. This gear will allow you to know the position of your booms when the boat is becalmed

### **R/C MODEL BUILDER**

offshore, waiting for a puff. You can set the booms so the sails will produce drive from each errant puff ... if you know which way you want to go and have guessed right where the puff is going to come from!! Sails should be set flatter than normal, in an effort to keep the low speed flow attached to the sail so that it will produce useful thrust. In a way, we might say that too much camber or draft in a sail will try to change the wind's direction too much. The inertia of the air would prefer to continue moving in a straight line and will break away from the leeward side of the sail if we try to bend it too much.

When flattening the sails, do not haul on the luff excessively. Too much luff tension will haul the draft too far forward in the sail and increase the camber near the leading edge to a too tight radius. Generalities are hard to give for the vang. In still water I favor no vang at all, since the gooseneck will swivel much easier. In a chop, some experts tighten the vang and try to get the leech of the sail to flop as the boat rolls and pitches. Whether this ooches the boat forward or not will have to be determined by some practice with your boat on the water. There are not too many sites that I'm familiar with that have waves left when the wind dies. Newport, Rhode Island, off Fort Adams is one place.

Set the sheets to allow the slot to be plenty wide. In very light airs, one should really try to close the reach to allow boat speed to increase the apparent wind. In no case should the boat have the boom and club strapped in. If the class rules allow it, light air days are good candidates for a jib twitcher. This is a pair of lines from a heavy-duty servo that exit the deck a couple of inches on either side of the jib swivel and are then tied off at the front of the jib club. Hauling on one will swing the jib out and hold it out. Remember that the club is being forced toward the centerline of the boat by the upward tension in the jib stay. Backstay tension should be at an absolute minimum to unload the jibstay as much as possible. In very light air, the wind won't wing the jib for you, but the twitcher will. Then you can take advantage of the drive of all your square inches. Minimize all friction by oiling



fittings and swivels with sewing machine oil.

On the water remember the following: • Minimize rudder movement; steer with the trim lever if you can.

• When starting, stay close to the line. Keep to windward if the wind is variable to keep from getting blown away from the line.

• Ballast the boat slightly bow down to decrease wetted surface by lifting the afterbody out of the water.

• DON'T PINCH!!! Keep the boat moving at any cost. Pinching can actually increase the slippage to leeward and reduce the distance made good to weather.

• When tacking, coast up to windward more than you would on a breezy day. With light breezes, the boat will carry well up into the eye of the wind with little flogging. Any distance made good to weather is money in the bank. Nevertheless, tack as few times as you can. The amount of rudder required to turn the boat slows it substantially. Every bit of boat speed should be hoarded like King Midas' gold.

A last word of good advice: if you go to the lake on purpose when there isn't any wind and practice, you'll learn a lot about handling your particular boat. Those skippers who wait to do their research on regatta day are inevitably doomed to learn their lessons too late to finish in the top half of the fleet. Since light air practice is so low key and



potentially boring, take the opportunity to write down all the adjustments you finally choose. Next time, you can set up your boat "by the book" and just do a little tweaking between heats to maximize its performance.

I am now operating out of our new location and will field questions accompanied by a stamped, self-addressed envelope sent to Rod Carr, 4115 172nd Ave. N.E., Redmond, WA 98052.

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### F/F Scale ... Continued from page 51

making the tissue tangent with some of the verticals and diagonals. This is not only frustrating, it looks terrible! Ideally, the tissue should be tangent only at the corners. This, of course, is a bit difficult to do. With longerons of 1/16 square it is almost unnecessary to worry about, but if you don't want the tissue to attach to the vertical members, here's what to do. Any place that you suspect that the tissue will want to lay but shouldn't, take a candle and rub it on the areas where you don't want the tissue to attach. Very simple but effective. Another area where this works well is around the wing tips. For the best appearance, the tissue should be tangent only at the tip's very edge. If the longerons are 1/8-inch or larger, I would recommend chamfering the corners and adding 1/16 square stock, rounding off the corners. This gives the covering a very high quality. Again, with a little awareness, you can do wonders with your covering techniques.

When it comes to repairing tissue that has been ripped or torn, there are some easy ways to mend the covering without having to recover the whole surface. Let's say that in the middle of a wing (where else?) you have a nice hole where you cannot piece the tissue back together. The easiest way to repair it is to take a very sharp razor blade and cut a hole as round as you possibly can make it. (I realize that sounds funny, since we consider most holes as being round, but I think you get the drift.) Now cut a piece of tissue round in shape that is just a bit larger than the hole you are trying to fix. Attach it by using thinner, then clear dope. I have found that this method works much better than trying to cut away whole sections at a time, such as the space between two ribs, etc.

If there is a small tear or even a fairly long rip, I choose to make the repair by using white glue. Take a small brush and place a fine bead of white glue on the tear. If the edges of the tissue will not lay flat, take some drafting tape (a tape that will not tear tissue when removing) to hold the torn edges down. In this case, put just a bit of glue on the torn portion, not under the tape. Remove the tape down the line and apply more glue until the whole tear has been glued. The glue causes enough shrink that the tear looks pretty good.

One more item regarding covering. Floquil makes a product called "Crystal Coat." This is a clear, fairly thick substance that is used over the normal Floquil paints to give a very high gloss to the finish. For the most part, most of us would not want or need to have this kind of finish on a scale model. However, by using Crystal Coat mixed with the Floquil paint and clear nitrate dope, the finish tends to be more resilient and has a bit of sheen. I have noticed, after many years of using the Floquil/nitrate dope finish on all of my scale models, that the tissue tends to be brittle. With the addition of the Crystal Coat, I think you will find this not to be the case.

I have been asked how much paint to add to how much dope, and now I get the same questions with the Crystal Coat. For one thing, I have my wife save all of the jars that food comes in. My favorite is baby food jars, because I seldom have to use any more material than these will hold. So, if you know anyone with a baby in the house, you might ask them to save you the jars. That's how I get mine. If I'm using a color that Floquil doesn't already have, such as that used on military type aircraft, I'll get a shade of Floquil that comes close, then mix until I get the shade I want. Usually the total volume is equal to one bottle of Floquil. I'll pour this into a baby food jar. I'll then add about one half bottle of the Crystal Coat. If non-tautening nitrate dope is used, this is the time to add TCP (tricresyl phosphate) for the plasticizer. This mixture is then stirred thoroughly. The clear nitrate dope is added so that the total volume is just a bit over half the size of the jar. Thinner is added to bring the mix up to spraying consistency. Don't forget to strain the paint before spraying.

If you don't need that much volume, cut it down proportionally. Floquil in this form lasts for many years. The addition of a bit of thinner on occasion will keep this product for a long time. It is always best to keep leftover paint in a container that will just hold that amount. The less air space there is in the jar, the longer the paint will last.

One last comment: Label the bottles. I always tell myself that I can't possibly forget what color I have just mixed. Unfortunately, this is not the case. It only takes a minute to write down what color it is and for what airplane it was used on. By the way, I use lacquer thinner for the solvent. I will, on the other hand, use Floquil's Dio-Sol solvent when I'm using only Floquil paint without the addition of nitrate dope.

### Plug Sparks . . Continued from page 40

crazy, and best of all, are quite crashable. In other words, they don't break as easily as their big brothers! Generally takes straight maxes to win this event, and this day was no exception.

### VICTORY BANQUET

This is something started back in 1964 by John Pond and Jerry Burk at the Dallas NAS. This being the 16th Annual Old Timer Reunion Banquet, some comments should be made.

Actually, no SAM business is ever run at these get-togethers. After all, we came to have fun. Generally, the program features speakers, awards, and whenever possible, films of bygone Nationals. This year had the 1952 Dallas Nats (in color!).

Well, you've waited long enough.

Here are the results as based on the trophies handed out by Carl Hatrak. WEDNESDAY, AUGUST 1: R/C O.T.
1) Bill Bowen (Playboy)         10:33           2) Ron Hess         5:36           3) Fred Wilke         4:09
1) Olie Olson (Playboy)
<ol> <li>Ed Smith (Cloud Cruiser) 20:10</li> <li>Jim Root (Cavalier)</li></ol>
1) Lou Wolgast (Smoothie)
1) John Pond (Super Zilch)
1) Gene Lapansie (American Ace) 3:40 CLASS B CAS
<ol> <li>Tim Banaszak (Twin Cyclone) 3:23</li> <li>Gene Lapansie 1:50</li> <li>Tony Italiano (Thermal Tumber) 1:35</li> </ol>
CLASS C GAS1) Dave Sweeney (Playboy)2) Toby Blizzard (Playboy)3) Frank Carney (Playboy)6:30
<ol> <li>30 SECOND ANTIQUE</li> <li>1) Sal Taibi (Anderson Pylon) 8:00</li> <li>2) Tim Banaszak (Powerhouse) 5:22 .020 REPLICA</li> </ol>
<ol> <li>Lee Campbell (Dodger)</li></ol>
<ol> <li>George Perryman (Dethermalizer)</li></ol>
3) Ed Mate (Korda)6:58 RUBBER STICK
<ol> <li>George Perryman (Korda Stick) . 9:00</li> <li>Charles Sotich</li></ol>
<ol> <li>Stephanie Perryman (Gollywock)</li></ol>
ENGINE COLLECTORS' NOTICE We had to insert this little note to say
and the state of time and room to testure

an Engine of the Month. It was rather surprising to the columnist that quite a few engine men look forward to these three-views every month, so we won't miss an issue any more than we have to!

In that same line, efforts are being made to make available all three-views published to date in full size. Drop the columnist a line so that he may determine whether it is worth his time to make these drawings available to all interested modelers.

### **CONTEST TRAVEL NOTES**

Probably the most intimidating problem in traveling long distances was the problem of getting gas on the road. Most surprising, particularly on the interstate highways, this was no problem even on Saturdays and Sundays. If the driver could stay away or avoid the major metropolitan areas, the problem



of a gasoline shortage was not encountered

With all contest attendance down at least 25% (as noted at the SAM Champs and AMA Nationals), some of the service stations on the road do not sell out their monthly guota. This was very noticeable at the motels along the way, being as high as 33% vacant. The shortage and high cost of gas (at least \$1.00/gallon) is enough to discourage any vacationer. In the writer's case, every 15 miles costs \$1.00 in gasoline, not to mention normal wear and tear costs. Also worth mentioning is the cost of meals being at least 25% higher.

In the future, trips by contestants involving long distances will have to be carefully considered from the standpoint of cost. In many cases, contestants should double or triple up in one automobile to share expenses. So, be a Boy Scout, be prepared!

### SAN DIEGO STIRRINGS

Received several letters from George Wagner, of 2879 Marathon Drive, San Diego, California, who inquired on how to start a SAM Chapter. For those who are not aware of the procedure, you

need at least six SAM members in good standing. You then send these names to Woody Woodman, 389 Floral Lane, Saddle Brook, NJ 07662. In due time you will receive a handsome charter. (This is something new that Woody Woodman and Pete Vano are working up.)

George further states he has been organizing the San Diego Aeroneers (now there is a long-time free flight name!) into a SAM Chapter. Reports reaching this columnist indicate this chapter may be designated as No. 41.

Wagner is amazed at the number of unattached SAM members there are in the San Diego County. Fellows in that area should contact George, as any SAM activity is devoted strictly to fun!

### TEXAS PRIDE TOURNAMENT

Helmer Johnson, of SAM 29, Fort Worth Thunderbirds, writes to say the Fourth Annual Texas Pride Tournament was held in mid-ninety temperatures and winds of 20 mph with gusts registering 30 mph! Truly a shame, as there was all sorts of libation available, as the Texas Pride Beer was supplied by the local brewery in copious amounts. That's one



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#### way to take care of the heat!

Entries were down to eleven in each event, as the winds did deter quite a few fellows. Helmer sez they weren't "chicken" but just plain smart for not flying. The meet, held at Benbrook Lake, a "tad southwest" of Fort Worth, shows the following results:

	ANT	IQU	t .									
1)	Brud	ce N	orn	nan							10(	)4
2)	Edd	Ale	xan	der							. 9	54
3)	Rich	nard	Gr	eer							. 80	)7
	OLD	TIN	1ER									
1)	Ted	Wh	ite								11	86
20	644	A		4							- 74	cr.

- 3) Dick Huang ......612

### ORIGINAL IGNITION

1)	Bruce Norman8	64
2)	Dick Huang2	65
зi.	Edd Alexander	60

Helmer Johnson concludes his writeup by pointing out what he said on his contest notice. We excerpt the following: "You will be timing when not flying, so be sure to bring a watch. If you do not own one, buy one now so you will know how to use it. Borrowing a watch and not knowing how to read it isn't fair to the fellow you are timing. Please get a timer before you go to fly. Don't go to the line and yell 'I want a timer.""

Sage words that could fit any contest!



Modelers would do well to pay attention to the above.

#### FLORIDA FLASHES

Terry Rimert reports the Rebel Rally enjoyed terrific weather, warm with little or no wind. Hot dog!

Terry says they also have their "trash movers" without the benefit of dust. One came along and all the registration cards maxed along with the paper cups from the concession stand garbage cans. He thinks this one outdid anything in Taft, even if it is over swamps.

The Atlanta boys, headed up by George Perryman, enjoyed their usual "benefit contest" by taking all rubber places, except for Ron Sharpton who snuck in for a second in Mulvihill. Terry opines they make better rubber in Atlanta. Gotta be some reason!

As usual, the .020 Replica event had the biggest entry, with Walt Rozelle nosing out Al Wright and Tom Mc-Laughlin. In Old Timer Gas, McLaughlin was unbeatable, although Frank Carney made it close. John Hemphill placed third.

Our hero, Terry Rimert, again looped his Playboy. (Note on Playboys to Terry: Playboys as built have entirely too much wing incidence. Drop the front of the platform a good 1/8-inch and then watch it go!) Anyway, Terry ruined his McCoy .49, bending the crankshaft housing. He inadvertently left the housing on the stove and forgot it for ten minutes. When it cooled off, he found the housing had stress relieved itself and was again straight! Terry sez anyone with a bent aluminum housing should give it a try on an electric stove. It might not work every time, but what have you got to lose?

### 1980 SAM WEST COAST R/C O.T. CHAMPS

Great news! As we go to press, the columnist has just received a letter from Jim Adams, Western SAM Vice President, who has officially OK ed the holding of the Western SAM R/C O.T. Champs at Sacramento over the Memorial Day holiday. The host club will be SAM 30, and the site will be that incomparable dichondra field located 10 miles southwest of Sacramento.

Held over three days, this will give some of the boys at the U.S. F/F Champs a chance to come up on Monday and fly the very popular R/C Texaco event. Don't miss this great contest that comes only once a year!

### THE WRAP-UP

In reading the SCIF newsletter, The *Flightplug*, as so ably edited and written by Ken Sykora, the columnist spotted some humor that was worth passing on.

"At the June SCIF meeting, Bill Krecek recently found a pile of dirt and green mould at an engine swap meet. He brought to the meeting restored like new (Krecek is a craftsman!) a real monster of an engine, looking like some early engine casting kit, or maybe just a shop project (home-built). A boat engine? All eyes turned to the engine collector expert, Bruce Chandler. Bruce lifted it up from the table, using both hands. Suddenly he set it down, grabbed at his abdomen and immediately identified the engine as a 1932 late model 'Hernia 49.' " Morn darn fun!

### R/C World ... Continued from page 11

sure did miss these guys.

Monday, July 30, was the first day of qualifying. The Quarter Midget racers had the morning (8-12) and we were to begin at 1 p.m. Betty Stream, our category director, and Bill Seidler, our event director, were out early trying to get us set up, but the Quarter Midget guys had gotten a late start and so were late finishing. There were two circles ap-proximately 2000 feet apart, with two flight lines per circle . . . a grand total of four flight lines going at once. There were two lines of 34 fliers and two with 36, and each line had three USPJA judges plus a timer. The circles were set in the middle of the large taxi ramp I spoke of before; 300 feet to the rear of us was AMA headquarters and the fire station (the fire station required a 250-foot fire lane in front). In front of us was 300 more feet of ramp, then a grass area with two single-story cement block buildings and a small tower, then approximately 1500 feet in front was the full-scale runway, where everything from F-4's to 737's were active. When I expressed concern over the closeness of the full-scale traffic, I was told there was plenty of room, especially if the fliers stuck to the 300 foot distance rule (actually the rulebook says the optimum distance out is approximately 300 feet; it does not put any definite limit on this, and even if it did, it would be impossible to judge). We finally started flying at 1:40 p.m., and things seemed to be going well if you discounted an occasional model seen to disappear momentarily behind a landing full-scale airplane. We had been flying approximately one-half hour when we were suddenly told to land all models, as the FAA was shutting us down for violating its airspace(!) and we would not be allowed to fly again until this was corrected. It seems that many of our fliers were doing their patterns directly over the active runway. Well, that put everyone in a hard place; we couldn't move further back because of the fire



department's fire lane rule; moving to either side would gain us nothing, as we were parallel all the way with the active runway. Dick Sonheim, who was the category manager, finally held a meeting with the pilots and gave them these rules: the edge of the grass strip (approximately 300 feet out) was the limit on distance out to fly, and any infraction of this would result in 1) first crossover, a warning issued; 2) second crossover would result in a call down and a zero flight from there on. Continued disregard of this rule would result in permanent shutdown by the FAA. The fliers grumbled about the site (justifiably, 1 feel), but because they all came to fly they did their best to comply with the new rules and in most cases succeeded. The maneuvers were brought in and to me appeared too close, especially the Figure M's, loops, etc. It was especially hard on less experienced pilots, as they were so aware of the outer limits and tried so hard to avoid it that they got too close in and were called for the usual zero line, which is behind the judges' area. Actually I felt a bit more compassion on the part of the judges and officials was in order, as on at least two





occasions I saw a pilot go over the outer marker and be warned, only to become nervous and get the very next maneuver in "too close to be recognized" and zeroed for that! On neither occasion was the pilot in a dangerous situation (my judgment) and I think he should have been allowed the benefit of the situation.

Flying began again after approximately an hour's delay. The pilots were very careful, and takeoffs and landings seemed to pose the biggest problems. Takeoffs were worst, because the three lower classes were required to do a 90° turn before calling complete, which of course headed them directly into the area the officials demanded we not go! We did manage to get in one complete

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round, and even began a second. Flying stopped at 8 p.m.

Tuesday (second qualifying day) was sunny and hot, with a bit more wind than Monday. This was to be the weather all week; winds varying from 5 to 25 mph. The sun was nearly always bright, and except for one morning, very hot. It was especially bad on the runway, as the cement bounced all the heat back up, and I'd be very surprised if we didn't hit 110° plus a few times. Pity the judges and line crews!

Tuesday also brought us another problem, that of the Air National Guard. Seems they fly these F-4 Phantoms every day. Very loud, these creatures, also very disconcerting if they happen to be taking off in the middle of your nice smooth eight-point roll! After the first few we all wised up considerably and the callers would warn a pilot of a jet takeoff so he could compose the thumbs. By far the larger problem was that we were taking off from right to left and so were they, but that meant they were using the far right end of our taxi ramp to do just that ... taxi out for their takeoff run. They were taxiing out approximately 200 feet to the right of the right hand circle and were turning away from us but were still on our taxiway. I would say we had approximately ten of these a day, usually in groups of two. And each time we were warned and had to shut down our flying, or if they weren't seen in time we had to break out of our pattern and fly elsewhere until they cleared our runway.



Very frustrating!!

We did finish the second complete round and got over half the third round finished. Individual fliers were beginning to emerge ... Tim Just and Scott Murray were flying high in Novice, Brian Crossley and Roy Speights doing very well in Advanced. Expert was a horse race from day one through the finals, particularly between Cliff Hiatt, Dave Wilson, Dave Doucey, and Mark Doucey. Masters was led by Dave Brown with Dean Koger in close second. There were a couple of surprises; Joe Gross was flying the best I've seen him, as was Chuck Shade. Joe Bridi was again flying well (this is a new Joe; I haven't seen him crash in ages ... amazing how much higher you place when your airplane remains intact! Sorry, Joe, I couldn't resist).

Wednesday was the same weather, same conditions . . . for variety we had a full-scale pilot after a thrill as he landed on our taxiway, taxied full length and parked it just to the right of the right hand circle, out near the grass strip. Believe me, he gave the four pilots in the air at that time a real thrill. When asked if he didn't see all the activity and planes, he said, "Oh yes, but I figured they'd stay out of my way!" (Heaven help us all from STUPID pilots of all kinds!) Anyway, he couldn't be persuaded into moving his plane from our taxiway, so we were instructed to "not fly over him." What with zero lines behind us and in front of us and now not flying over this guy, it became a real challenge trying to figure out where to fly!!

The gentleman finally did come back and move his airplane, and as things go it wasn't but a few minutes later that we had a mid-air and one plane hit the ground very close to where that fullscale ship had been. The mid-air was between Mark Doucey, who was at that time fourth in Expert, and Bailey Reese, who was tenth in Novice. Mark's plane was the one trying to smash holes in the runway. He ended up with lots of balsa pieces. Bailey's Curare ended up landing minus a chunk of wing and one aileron. It will live to fly again with some work. It is a shame, though, as neither pilot ended up making the finals, and before that happened each was most definitely a contender (neither had a backup plane, although each borrowed one and kept trying). We did manage to complete round three, fly a full round four, and begin a round five . . . this was mainly because we started almost on time and had no major shutdowns.

Thursday was the final qualifying rounds. We ended up getting six full rounds for everybody. The flying had gotten much better through the week. For example, Jim Vanderbeck (NSRCA prez), a first-time Nats flier in the Expert class, claimed his first round flight was among the worst he has ever flown. "I was so nervous . . . everything was shaking. The problem was that nothing was in unison!" Nerves are not reserved for the lower class members. The best get nervous enough to be glad when the

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first flight is over. As I mentioned, flying was better today. The aforementioned Jim V. was fourteenth Thursday, yet he qualified eighth. The top ten in all classes flip-flopped around faster than the F-4's took off! There were even some ties, and in Novice a tie for tenth. And more than one pilot suggested "just one more round," hoping for more juggling. The judging was such that on the first four rounds, everyone had equal exposure to the judges, then on the fifth and sixth rounds they juggled the sets somewhat, so equal exposure was of course impossible.

There was some problem with judging (an annual event!), and with the juggling, two of the most inconsistent judges ended up on the same line. This was very hard on the guys who had to fly for them and still try to gain on guys who didn't. But the scores tell all, and for this Nats the highest three scores were counted for everyone, and the top ten from each class went on into the finals.

For qualifying, a shortened pattern was used for all classes, but the finals was full pattern for all classes with the Masters using schedule C, where each flier chooses his own pattern under certain rules. Friday and Saturday were finals days, and we flew from 2-5 p.m. each day. The set-up was similar . . . two circles, four flight lines, three judges per line. There were ten pilots per line (separated by frequency, not class) and each pilot got four total flights (two on Friday and two on Saturday), of which the best three would count for final placement. Friday was the hottest yet at 90° plus, with slightly higher winds which made the heat more bearable and the pilots work harder. The largest

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amount of excitement was made by Dave Brown, who lost an aileron servo just as he began his eight-point roll. Being a very calm, unnervous person myself. I could only think he had a monumental brain-lock as he called his eight-point and proceeded to do a beautiful straight and level flight. He flew way past himself before quietly

Classifieds ..... 115 Plans Service ..... 116 announcing. "I have a problem." We (Dave flying, me praying) spent five minutes trying to save that plane. It had quit with just a bit of left aileron and the wind didn't help, plus that large rudder on the Tiporare isn't at all effective in rolling the beast. Our model decided that knife-edge was a great way to fly, the only problem being that knife-edge

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is not a great way to land! Dave coaxed and coaxed and had it nearly down when BLIP up went the wing for a knifeedge again, so we went straight up (thank you, engine) and tried again. Finally we did get it down in rather a hard nose-first arrival, but it was in one piece. Actually it wasn't hurt much... scraped paint, bent landing gear, crimped steering cable, etc. The problem? A broken wire on the aileron servo motor. Oh well, we livened up the day for everyone.

What with fewer people (40 as compared to 140) it was easier to watch everyone fly in the finals. Very impressive was Dean Koger's EU-1. That sure is a nice airplane. I think the thing I like best is its nearly constant speed ... it goes up, down, and sideways at the same speed, giving the flight a very organized, stable impression. This year loe Gross had a new plane he designed, called the Thunderbird. It is a take-off on Dean's EU-1, as it uses a very similar wing and tail surfaces, but has a much smaller and different shaped fuselage. The strange part is that it flies very similar to Dean's and looks much like his in the air. Again, a very stable, solid airplane. It must work, as Joe was flying the best I've ever seen him.

The Curare/Tiporare craze is going full

swing, as very many were in evidence in all classes, with many more people asking about them. Tony Bonetti chose the snaps in opposite directions for one of his finals maneuvers. Tony does it very well, slows nearly to a stop before beginning. It is a crowd pleaser and different!

Saturday came, the last day of finals, and so came the winds; 20-25 mph shifting from nearly straight down the runway (right to left) to from over our right shoulder. It gave the pilots an added problem and made playing catchup awful hard for us (remember, we have a built-in throw away!). It also made the outer zero line hard to miss, especially on the rectangular approach in the lower classes. Tony Bonetti, Dean Koger, and Dave Brown had a heck of a battle and the flying was very good. In fact, the major problems I saw were centering of maneuvers and drifting in the Figure M's and Square Horizontal Eights. As you can see from the results, Dave won his third straight Nats, but by the narrowest of margins (four points). I think that is called close!! One point from one judge anywhere along the way could have made the difference. I am very proud of Team Brown but equally proud of Dean Koger and his wife/caller, Barbara. Can't wait for South Africa with a team like that! They WILL know we were there.

The trophy presentation was held at the field directly after the flying was over and tabulation finished. Bill Seidler gave out the AMA trophies and Jim Vanderbeck gave special NSRCA trophies to the

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**R/C MODEL BUILDER** 

highest placing NSRCA member in each class (the winner of the class in each case). Betty and Suzi Stream were both awarded plaques from the NSRCA for their time and effort spent in the past three Nats and as editors for the K-Factor. And yours truly received a beautiful plaque for my secretary-treasurer duties and other faithful service.

The Nats was over for us Pattern types. Oh, there was still plenty of action in the Scale areas, and on Saturday evening AMA held its workers party in honor of all the people who did the thankless jobs, from cleaning up garbage to judging, timing, water carrying, etc. Betty Stream was honored here again for her many contributions to model aviation by being awarded AMA's Distinguished Service award.

Also honored at this get-together were members of the Sky Knights club, who was the host club for this Nats. They were the most active host club we've had in ages. Dozens of members could be seen every day, doing everything from clean-up work to helping run an event. Wherever they were needed, they were there. They were also highly visible, as they all had brightly embroidered shirts proclaiming who they were. Thanks, Sky Knights.

There was still the airshow on Sunday, which is an annual event. This one was marred by a frequency problem which resulted in three bad crashes, one of which was Bob Underwood's Hiperbipe which was World Championships bound. What a shame, but as Bob says, it is part of the game, and he does have another Hiperbipe begun.

Thanks to AMA and everyone who helped put on the '79 Nats. You shared a week of memories.

### NOVICE

- 1) Tim Just
- 2) Scott Murray
- 3) Terence Ferentinos
- 4) Kevin Castaing
- 5) Mike McConville
- Larry Kramer 6)
- Daniel Crosswhite 71
- 8) Joe Barnes
- Vernon Kramer 91
- 10) Robert Condra
- ADVANCED
- 1) Brian Crossley
- 2) Jamie Strong
- Bob Pannell 3)
- 4) Mark Been
- 5) Roy Speights
- 6) Lee McDufee Jerry Voth
- 7) 8)
- James Bennett 9) Terry Throckmorton
- 10) Dan Sheridan
- **EXPERT**
- 1) Cliff Hiatt
- 2) David Wilson
- 3) David Doucey
- 4) LaVega Green
- 5) Robert Krafft
- 6) loe Utasi
- 7) lim Vanderbeck **Dave Patrick**
- 8) 9) Thomas Kirk
- 10) Bob Crump





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- 2) Dean Koger
- 3) Tony Bonetti
- Don Weitz 4)
- Joe Bridi 5)
- 6) loe Gross
- 7) Bill Thomas
- 8) Chuck Shade
- 9) Marty Wittenberg
- 10) Robert Redmon



engineering design manual. The exact source is unfortunately not known, but the Orbiteers (San Diego) newsletter, edited by Howard Haupt, recently contained it as a filler piece.

From: The National Board for Aircraft Improvement.

To: All aircraft manufacturers, research facilities and military squadrons.

Subject: More effective military and civilian aircraft construction and utilization.

The following directives are to be implemented immediately to reduce cost, improve efficiency and improve front line readiness.

1) All funding and research will cease on the bullet-proof balloon project.

2) Designers shall no longer include the half-moon cutout on the doors of restroom facilities. Recent improve-



ments in literacy have eliminated this historic requirement.

3) Concrete will not be used for any airframe despite its availability.

4) Catapult launches combined with air starts of the new Gumbo Red Eye engines have resulted in a number of crashes. Starting the engines first should improve the performance of this engine.

5) Muzzleloading weapons will no longer be carried by any first-line Na-

6) Wagers shall not be conducted between designers within the hearing of



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Unlike other quick-build kits that often sacrifice authentic detail for fast assembly, Byron Originals has kept both authenticity and simplicity high on the priority list. All die-cut wood parts and 11 foam components needed for completion are designed with quick assembly, scale accuracy and minimized weight in mind. All foam modules consist of lightweight yet impact resistant injection molded polystyrene.

Fuselage consists of hand-layed fiberglass and arrives with fan unit, thrust tube, radio compartment and push rods already installed. All decals and color scheme templates also included.

All control surfaces utilize center point hinging requiring standard servos. Every last item, except radio, engine and final paint are included in kit. No shaping or carving required. No guesswork involved. Only quick, accurate and enjoyable building.

Optional epoxy/fiberglass kit for glassing wings and tail surfaces available for \$22.50.



The ducted fan with exclusive quick-start capabilities.



Add \$8.00 for shipping to any U.S. address. Items shipped by United Parcel Service.



# IN THE BEST CIRCLES, **IT'S über skiver**



### **A PRECISION INSTRUMENT** FOR THE DISCRIMINATING MODELER

- Safe, Rear Draw-Bar Clutch
- Precision, Instrument-Quality Materials
- Strong-Holding Advanced Collet Design
- Non-Rolling Hex Cross-Section
- Deeply Knurled, Non-Slip Grip
- Long-Life, Stainless, Surgical Steel Blades

See your dealer, or order direct. Dealer inquiries are invited. All direct orders sent postpaid in U.S. California residents add 6% sales tax.



Available in seven satin anodized handle	colors:
silver, blue, red, green, gold, copper,	violet.
Complete set in fitted hardwood case; i	ncludes
uber Skiver, together with two vials con	itaining
four No. 11, and one each of Nos. 10,	12, 15,
and 20	\$14.95
Individual handles (specify color)	\$5.95
Vial of 6 blades (No. 10, 11, or 15)	\$2.10
(No. 12 or 20)	\$3.30

621 West Nineteenth St., Costa Mesa, California 92627





## OS 50 FSR

We are pleased to share with OS the announcement of the new 50 FSR. This middle size Schnuerle will take its place beside the OS 40 and the OS 45 FSR's. The 50 has a slightly larger frame than the 40 and the 45 but it is substantially smaller than the 60. If you are using a 40 or 45 size Kaos, for instance, this might be just what you are looking for to put some more excitement in your life. This engine is also going to be offered as a U/Control engine. The wire size for the 50 is the same as the 45, whereas if you go to a 60, it is substantially heavier and you have to have longer lines. Having another engine in this size range will be excellent for World Engines as the demand for the 40's and the 45's has exceeded the supply. OS 50 FSR R/C.....\$109.00 U/Control Version . . . . . . . . . . . \$95.00

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Telephone (513)793-5900 Telex 214557



MRC-Webra's Awesome Threesome... You're looking at three of the most powerful engines MRC-Webra has ever made. An awesome array of brute force and controlled performance. Each has been carefully honed for the 80's...and each comes with our new slide valve Dynamix carburetor...the most advanced and efficient carb ever designed...proven in competition by the world's national and international champions.

It's ready now for another decade of tilles, with increased RPM's, improved timing and advanced porting.



Speed .61 Side Exhaust (1024 R/C) State Of The Art Carb...Each of these engines has in common the new MRC-Webra Dynamix Slide Valve Carburetor featuring with these

extraordinary advantages: State of the art linear

design

increases

RPM's Advanced fuel metering system controls flow Adjustable lever for precise matching of carb to servo throw Elimination of sag at mid-range an end to hesitation.

> Speed .91 Side Exhaust

(1037 R/C)

See these three, hot Schneurle ported screamers at your hobby dealer ... and get ready for the 80's and beyond.

The (1030R/C) Schneurle .61 with rear exhaust is new with a beefy 17mm crankshaft, a hefty crankcase and jumbo ball bearings. It can handle top end heat in stride, easily reaching 1 85hp at 16,000 RPM. It's the ultimate pattern engine.

And there's no secret about the proud past of these other two screamers. The big (1024R/C) Speed .61 with a slew of nat Ready too for tomorrow is the .91R/C (1037R/C), the brute that took the '78 Tournament of Champions single handed with 18 of 28 entrants using it to harness pattern power including the winner It too now has the Dynamix carb and it too is bursting with raw force for the big payloads and ¼ scale craft of the 80's

MODEL RECTIFIER CORP. 2500 WOODBRIDGE AVE., EDISON, NJ 08817



