

# FLYING LINES

2456 Quince St., Eugene, OR 97404 JohnT4051@aol.com Editor: John Thompson/Publisher: Mike Hazel

## Latest news on Bill Riegel Field

By Mike Hazel

Over the past year or two there have been some rumors and speculation regarding the future status of the flying field in Salem, Ore., that the Western Oregon Control Line Flyers call home.

Sometime last flying season we had been informed by the airport management that indeed, they did have plans to place a business lot on the airport property that would affect our site.

Those of you who attended the Fall Follies contest last October saw the construction-zone fencing that was in place which cut the grass circle in two. The timing was poor, as actual work on the project did not start for weeks afterward.

However, the project is now completed and here are the results:

The North entry road to the airport has been relocated so there is a straight shot from the main road (instead of an angle) to the FedEx building. The new road cuts through what was one side of our grass circle, and on the other side now sits a Hertz rental & sales car business. There is still enough room left to fly short-wire planes on the grass, but the big stuff is definitely out. Everything else on the field is unaffected, including the paved circle and club shed.

Now for the good news:

The airport management has promised that we can utilize the grass field on the other side of the South entry road. This is only a few extra steps away. We are waiting to meet with officials to finalize details regarding this. After this is done, we will be moving forward with our activity plans for the year 2004.

Hope to see all of you in Salem sometime later this year!



Dave Royer and Alice Cotton-Royer enjoy a day of flying at Bill Riegel field. (FL photo)

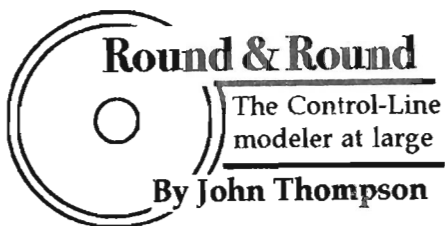
Make your mark in *Flying Lines*: Remember that every item you have published in *FL* gets you a month extended on your subscription.

How about sending in a picture and article on your favorite airplane? Or a tribute to an unsung hero, a modeler who has inspired you. Or advice drawn from your own special expertise.

Your fellow modelers will appreciate it!

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## Round & Round

The Control-Line  
modeler at large

By John Thompson

Modeling thought for the month:

*"Perseverance is the hard work you do after you get tired of doing the hard work you already did."*

— Newt Gingrich

### Passing of the baton, again

Mike Hazel and I have been partners for about 26 years now, and as such, we have a long history of trading off duties.

This applies to our partnership as a racing team, our sharing chores related to putting on contests, and certainly to and our partnership in producing *Flying Lines*.

*FL* began as something of a spur-of-the-moment idea in 1979 when we were trying to think up ways to prop up organized CL flying, which was waning at the time. We had two ideas. The Drizzle Circuit racing series was one, and that lasted for 11 years. Who knew in 1979 that we'd still be producing a regional newsletter in the next millennium, approaching our 200th issue?

It started out a simple monthly newsletter, a half-dozen pages of contest news. Twenty-five years later it's nine issues a year, 20 pages of news, photos, articles, standings, records, rules coordination and all kinds of other details.

It was a good idea that grew as it went along, and we think still has relevance in the electronic age. It's delivered regularly to subscribers by a uniformed government courier, it sits prominently on the workbench waiting to be read at leisure, and it doesn't require you readers to boot up your computer and go hunting for it. It comes to you!

And you're all part of it: Every Northwest flier has a standing invitation to submit items for publication in *FL*, and many of you do. When your item is published, your subscription is extended by one issue. Not a bad deal, and it enhances the CL flying for all of us.

I started out the column mentioning how *FL* is one of the many ways that Mike and I work in partnership.

When *FL* began, I was editor and Mike was publisher (meaning he handles the money, the printing and the circulation). As *FL* grew, I wilted

under the burden and resigned as editor in the mid-1980s, and Mike put on the second hat, acting both as editor and publisher. When he staggered under the load, we tried to give up the editorship to a third person, who put out two issues before realizing he'd gotten in over his head. *FL* disappeared from the scene for a couple of years.

Mike eventually resurrected it, with me as a sort of assistant editor, until I took over once again as editor in chief in February 2000, issue No. 160.

Well, it's happening again. A job like a newsletter, even though it's a labor of love, can take over your life, and certainly your modeling life. I came to realize that it takes me over a year to build a stunt plane. My half of the racing enterprise is a shambles. My combat fleet is buried under dust. And the rest of life (there is life beyond modeling) had begun to suffer, too, from too much time spent in the *FL* office.

So Mike Hazel, one of CL modeling's true heavy lifters, has cheerfully agreed to take over the editorship of *Flying Lines* again, for at least the rest of this year. Sometime in the future, we may hand the title off again. In the meantime, I will stay on board as an associate editor. I'll continue to write a column, keep track of standings and records, and help with contest reporting, photography and some other *FL* chores.

But, beginning with the next issue, No. 199, Mike will be editor and chief.

He'll retain the "publisher" role, too, which means his job will be even bigger than mine has been. That means he needs lots of help from all of us in keeping the newsletter afloat, timely, interesting and informative.

I know Mike will do a dandy job, just as he has in the past, and I know that many of you readers will pitch in to help. I thank you in advance for doing what you can to keep *FL* alive and well.

And I also thank Mike for his 25 years of service to Northwest modelers, not only through *FL* but also as a Regionals official, a *Model Builder* columnist, an AMA associate vice president, an AMA Speed Contest Board member, and an officer of the NCLRA and NASS.

I hope you'll say a kind word to him about all this, too. Nobody deserves thanks more than Zoot Zoomer for his hard work, and I'm especially grateful that he's taken this load off my own shoulders for a while.

*John Thompson can be contacted by mail c/o Flying Lines, or by e-mail at [JohnT4051@aol.com](mailto:JohnT4051@aol.com). Web site: <http://members.aol.com/JohnT4051/NorthwestCL.html>.*

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# Where the action is!

Coming events in Northwest Control-Line model aviation

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## Feb. 28-29

**Evergreen Aviation Museum** third annual **Flying Model Static Exhibition**, Evergreen Aviation Museum, 3685 N.E. Three Mile Lane, McMinnville, Ore. Bring a plane and get one free admission to the museum. Control-Line planes will be displayed along with others. ~~See flyer in this issue for details.~~ For info, contact Cecil Mead, (503) 864-3731.

## March 7

**DBat Training and Practice Day**, Rice Mill Road Site, Richmond, B.C. 10 a.m. start. For info, contact Mel Lyne, (604) 898-5581, e-mail mlyne@sea-to-sky.net.

## April 17

**Vintage Diesel Combat Five Rounds Fun Fly**, Arlington Airport, Arlington, Wash. For info, contact Mel Lyne, (604) 898-5581, e-mail mlyne@sea-to-sky.net.

## May 1

**Open Diesel Combat Five-Round Fun Fly**, Ole Johansen's place, 3188 Highway 9, Sedro-Woolley, Wash. Directions: From I-5 take Exit 236 (Bow-Edison) and head east about 7 miles to Highway 9. Turn North and go about 3 miles to the Prairie Fire Station on the left. Ole's place is 8 acres right behind the fire station. If you get lost, call Kenny Johansen at 425-876-4613. For info, contact Mel Lyne, (604) 898-5581, e-mail mlyne@sea-to-sky.net.

## May 28-29-30

**Northwest Control-Line Regionals**, Albany Municipal Airport, Albany, Ore. Full slate of AMA and Northwest CL competitive categories in the 33rd annual running of the West's biggest CL contest. For info, contact *Flying Lines*. Sponsored by Northwest Regionals Management Association and *Flying Lines*.

## June 12-13

**Stunt-a-Thon**, Clover Park Technical College, Tacoma, Wash. Stunt and Navy Carrier events. For info, e-mail sbasser@yahoo.com

## June 26

**Big Money Vintage Diesel Combat**, Arlington Airport, Arlington, Wash. 9 a.m. start. For info, contact Mel Lyne, (604) 898-5581, e-mail mlyne@sea-to-sky.net.

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## July 3-11

**World CL Championships**, Muncie, Ind. See AMA Web site for info: [www.modelaircraft.org](http://www.modelaircraft.org).

## July 11-17

**U.S. National CL Championships**, Muncie, Ind. See AMA Web site for info: [www.modelaircraft.org](http://www.modelaircraft.org).

## July 24-25

**Wright Brothers Centennial + 1 Precision Aerobatics Fun Fly**, Arlington Airport, Arlington, Wash. Saturday: Trimming, coaching and practice, 8 a.m. start. Sunday: PAMPA stunt and judging clinic. For info, contact Steve Helmick, sbasser@yahoo.com.

## July 31-Aug. 1

**Bladder Grabber** triple-elimination fast combat tournament, Harvey Field, Snohomish, Wash. Big prizes! For information, contact Jeff Rein, jeffrey.a.rein@boeing.com

**Western Canada Stunt Championships**, Rice Mill Road Model Park, Richmond, B.C. For info, contact Chris Cox, (604) 596-7635, e-mail ccox1@telus.net. Sponsored by Vancouver Gas Model Club.

## Aug. 7-8

**Auburn Good Old Days CL flying demo**, at elementary school, 200 Main St., Auburn, Wash. For info, contact Chris Gomez, gomez580468@earthlink.net

**Prairie Fire Stunt Contest**, Edmonton, Alberta. For info, contact Bruce Perry, abperry@telus.net

## Aug. 8

**Tailhook 2004 Navy Carrier contest**, Carkeek Park, Seattle, Wash. All carrier events. Details TBA. For info, contact Mike Potter, skyshark58@cs.com

**Five Rounds Vintage Diesel Combat and BBQ lunch**, Mission Wings RC field off of Highway No. 7, Mission, B.C. Pilots' meeting, 9:45 a.m. E-mail map to the site available. For info, contact Paul Dranfield, (604) 826-3376, e-mail pdran@telus.net

## Aug. 14-15

**Hillsboro Air Show**, Northwest Fireballs flying demonstrations, Hillsboro Airport, Hillsboro, Ore. For info, contact Scott Riese at sriese5283@aol.com

## Sept. 4-5

**Can-Am Speed Championships**, Upper Coquitlam River Park, Coquitlam, B.C. For info, contact Bruce Duncan, (604) 513-9450, e-mail a.b.duncan@shaw.ca. Sponsored by Vancouver Gas Model Club.

## Sept. 11-12

**Raider Roundup**, for Old-Time, Classic and PAMPA Stunt, Navy Carrier and Scale. Clover Park Technical College, Tacoma, Wash. For info, contact Steve Helmick, sbasser@yahoo.com

## Sept. 16-19

**Great Intergalactic Fun Fly**, Waitsburg, Wash., in conjunction with Lions Salmon Bake and Waitsburg's annual Buffalo Feed. For info, contact Joe Just at ukeyman@justice.com

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# The Flying Flea Market

Classified advertisements — FREE for FL subscribers

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**SLOW RATS FOR SALE:** You just need a handle, battery and fuel, and you're off flying. Four AMA slow rat airplanes, with lines and engines. Two rear Nelson .36s, two front Nelson .36s (one brand new) and props. Also two extra O.S. drum rotors. All planes, engines and lines are switchable. All planes were built by me, and have taken second and third places at the Nats. With a good pilot and pit crew and some practice, these slow rats should be in the winner's circle. Total estimated value over \$2,800. Total price for all four \$1,400. Shipping free UPS. For more info, call Mike MacCarthy after 5 p.m. Pacific Time, (707) 542-2492.

**FOR SALE:** New-in-box Testors McCoy .19 and 29. \$40 each or the pair for \$75. Mike Hazel, (503) 364-8593, e-mail: zzclspeed@aol.com

**CONTROL-LINE SUPPLIES:** Just arrived: Top Flite Flite Streak ARF: Durable balsa/ply construction covered with MonoKote — a classic is reborn. Regular price is \$89.99. Special for *Flying Lines* readers, \$69.99. Also: Top Flite Nobler ARF: Wood covered with MonoKote, painted fiberglass cowl, leadout already installed!! Regular price is \$139.99. Special for *Flying Lines* readers, \$119.99. Remember — We ship UPS daily. Eugene Toy & Hobby, (541) 344-2117, www.eugenetoyandhobby.com.

**COMBAT SHUTOFF:** H&R MKIII Combat Fuel Shutoff now available. Sliding bellcrank design. CNC milled 7075 anodized and hard coated aluminum. Brass bushing and line buttons. 3" for Fast and 80MPH, all new 2" for F2D and 1/2A. \$25 plus \$5 S&H. Contact Jeffrey Rein at jeffrey.a.rein@boeing.com, or (425) 823-6053.

**VIDEOS FOR SALE:** Videos of the 2003 Vintage Stunt Championship and the 2003 Northwest Regionals Precision Aerobatics competition are available for \$15 plus \$3.85 shipping, each. Videos are 2-hour summaries of the highlight flights, with stills and captions. Available from Bruce Hunt. Call (503) 361-7491 or e-mail at bhunt@swbell.net

**DIESEL COMBAT BEGINNER HELP:** The Diesel Combat Group has beginner trainers and instruction available for new fliers to try control-line flying at most flying sessions. These will com-

mence in March 2004 at Arlington and Sedro Woolley, Wash., and at Richmond and Clayburn, B.C. For information on dates contact Mel Lyne at (604) 898-5581 or e-mail: mlyne@sea-to-sky.net.

**SPEED INTEREST GROUP:** Join the North American Speed Society. USA and Canada dues are \$25 annually, membership includes "Speed Times" newsletter. Write to: NASS, P.O. Box 371, Fenton, MI 48430.

**WANTED:** New Magnum .65 GP plain bearing engine. contact Rick Wallace, (360) 683-9860, or preferably by e-mail, toolman50@prodigy.net.

**WANTED:** K&B 4.9 engines and parts. Craig Bartlett, (541) 745-2025.

**FREE:** Old model magazines, in lots of five. Free plus cost of shipping, unless I deliver them to you at a contest, then free. Contact John Thompson, JohnT4051@aol.com

**FASCAL:** Back by popular demand. The ultimate combat plane covering, good over open frame or foam. Available in full 27"x150' rolls. Contact me for price and availability info. John Thompson, JohnT4051@aol.com.

**AEROBATICS INTEREST GROUP:** Right now — as in **TODAY** — is the very best time to join PAMPA! Your \$25.00 will see a full year's worth of the world's best CL-specific magazine (at 100-plus pages we no longer call it a newsletter!) dropped in your mailbox. Send check or money order to: Sharen Fancher, 158 Flying Cloud Isle, Foster City, CA 94404.

**COMBAT INTEREST GROUP:** Miniature Aircraft Combat Association offers national newsletter with technical articles, organizes national events, keeps national combat standings, and much more. Send \$15 dues to MACA, c/o Gene Berry, 4610 89th St., Lubbock, TX 79424.

**NAVY CARRIER INTEREST GROUP:** Navy Carrier Society offers newsletter with technical articles, organizes national events, keeps national standings and more. Contact NCS, c/o Bill Bischoff, 2609 Harris, Garland, TX 75041. Online: President Bill Calkins at cflyer@tbcnet.com.

**RACING INTEREST GROUP:** National Control Line Racing Association offers newsletter with technical articles, organizes national events, keeps national standings and more. To Join, send dues of \$10 U.S. (\$12 international) to NCLRA, c/o Mike MacCarthy, 4704 Hillsboro Ct., Santa Rosa, CA 95405. Online: www.NCLRA.org.

**YOUR AD HERE:** Remember, classified ads are free to *Flying Lines* subscribers. Send yours in today for publication in the next edition.

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# Northwest Rules update

Presented here are the current official rules for all Pacific Northwest control-line special competition categories. These rules have been approved by Northwest model aviators as coordinated by *Flying Lines* newsletter. For more information about the Northwest rules, contact the *Flying Lines* editor. Extra copies of the rules are available at any time from *Flying Lines*.

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## RULES FOR NORTHWEST SPORT RACE

1. **Purpose:** It is the intent that this event will provide the novice competitor a beginning racing event, racing with other competitors using similar equipment which is readily obtainable and operates in a basic fashion.
2. All pertinent rules from AMA unified racing rules shall apply, in regard to safety and conduct of races, except as follows.
3. **Engine:** The only allowed engine shall be the Fox stunt .35, which shall be a stock, unmodified engine operated on suction feed. ("Stock" is defined as absolutely unmodified except for needle valves and spray bars.) No exhaust extensions are allowed except bona fide mufflers that do not increase engine performance. The Fox Manufacturing Co. hemi/stuffer kit modification is prohibited.
- 4.1. **Aircraft:** The model shall be built from, or an exact duplication of, a commercially manufactured kit. In the case of obscure or rare kits, some documentation, such as a set of plans, may be required by the contest director for confirmation of the airplane's kit status. Kits need not be in current production or distribution to qualify.
- 4.2. Models must be of profile fuselage type, and must conform to the general profile definition. The model must have a minimum fuselage length of 24" when measured from the propeller thrust washer face to the leading edge of the movable elevator surface.
- 4.3. The minimum wing area shall be 300 square inches. The wing must have a minimum thickness of 1 inch when measured at any point along the span, with the exception of the last two inches before each wingtip.
- 4.4. All models must have a canopy, horizontal stabilizer, elevator and vertical fin. Models must have a fixed landing gear with a minimum of one wheel, 2 inches in diameter or larger.
- 4.5. Modifications: Major changes to the kit design such as clipped wings, shortened fuselage, partial omission of the tail assembly, etc., are prohibited. Reinforcement of the nose and engine mount areas is permitted. Landing gear location and construction are entirely optional from what may be included in the kit, except as specified in section 4.4.
5. **Fuel tank:** The fuel tank shall be fully external and forward of the wing leading edge, and located on the outboard side of the fuselage. The tank may not be designed so as to cowl the engine. All tank vents are limited to a maximum size of 1/8-inch outside diameter. The tank may not be pressurized, but the vents may be directed forward into the airstream.
6. **Prohibited equipment:** Equipment and devices standard to full-race aircraft are prohibited. These include fuel shutoff, pressure refuelers, fast-fill systems, "hot glove" electrical contact systems, and centrifugal carburetor switches.
7. **Pull test:** The plane and entire control system shall undergo a pull test of 35 pounds.
8. **Lines** shall be of a minimum .018-inch diameter, and lines shall be of the stranded type, with a length of 60 feet measured from the handle grip to the fuselage, plus or minus 6 inches.
9. **Races:** Preliminary heats shall be of 70 laps duration, with one pit stop minimum required. Feature races shall be of 140 laps with two pit stops minimum. All races shall be flown with at least two entrants; and not more than four entrants. At contestants where entrants fly preliminary heats to determine finalists, at least three entries shall proceed to the final races. The decision on the number of final entries shall be made by the event director and made in advance before the start of any preliminary heats.
10. It is assumed that the usual sportsmanship of Northwest modelers will prevail in this event. The event director may disqualify any entrant that is not in keeping with the spirit or intent of this racing event.

FL/jmt9/29/85 //Ed:4/15/93//rev2/12/95

## RULES FOR NORTHWEST SUPER SPORT RACE

**1. Purpose:** It is the intent that this event will serve as an intermediate racing class between Northwest Sport Race and the AMA racing events.

**2.** All pertinent rules from the AMA control-line racing unified rules section shall apply in regard to safety and the conduct of races, except as follows.

**3. Engine:**

**3.1** The "engine" is defined as the complete unit, ready to run, needing only prop, fuel and starting voltage, except that the glow plug, venturi and/or restrictor and spraybar and needle valve, gaskets, bolts, drive washer, front washer, prop nut, shims, piston ring(s) (if used), and ball bearings (if used) need not be considered part of the production unit. These parts are not subject to the rules regarding quantity or source.

**3.2** No tuned pipes or exhaust extensions are allowed except bona fide mufflers which do not increase engine performance. Engines shall operate on suction feed. No variable or in-flight adjusting carburetors are allowed; however, any other modification of the intake is permissible except as noted below.

**3.3. Two types of engines will be allowed:**

**3.3.1.** Engines of .36 c.i.d. maximum with single bypass intake port. These engines shall not be restricted in regard to venturi dimension. There is also no restriction regarding engine rework, except that all major components shall be produced by the original manufacturer. No material or part may be added.

**3.3.2 (a).** Engines of maximum total nominal displacement of 0.4020 cubic inches (6.6 cc). Engines must be production units assembled from factory available production parts. Engines and parts, with the exception of the venturi-spraybar assembly, must have been produced in quantities greater than 500, and all must be available through normal retail outlets in the U.S.A. Parts substitution shall be limited to catalog listed parts produced in quantities greater than 500 units for the engine being altered and available commercially to anyone from the manufacturer of the engine. Engines may only be modified by removing parts or material from parts. No material or part may be added.

**3.3.2 (b).** The engine must be of the front-intake, single-bypass configuration. All air for the combustion process must come through the crankshaft. Altering nominal support induction, timed holes in the case and the sleeve, or other techniques to circumvent the requirement that all air come through the specified venturi opening, are prohibited.

**3.3.2 (c).** No ABC or AAC piston/sleeve configurations are allowed.

**3.3.2 (d).** Each engine shall be equipped with a venturi and spraybar meeting the following restrictions: The venturi shall have an inside circular bore of not more than 0.315 inch. The venturi will maintain this diameter for at least 0.25 inch above and below the spraybar centerline. The spraybar assembly will be located precisely through the centerline of the venturi bore and shall have a circular cross section of diameter not less than 0.155 inch for the portion in the throat of the venturi. Exception: R/C carburetors may be used with the opening fixed in one position.

**3.3.2 (e).** The complete engine/venturi/spraybar system shall weigh less than 10.5 ounces (excluding muffler).

**4. Aircraft:** The model shall conform to the AMA slow rat specifications:

"Models must be of profile fuselage type, and must conform to the general profile definition. The model must have a minimum fuselage length of 24" when measured from the propeller thrust washer face to the leading edge of the movable elevator surface.

"The minimum wing area shall be 300 square inches. The wing must have a minimum thickness of one inch when measured at any point along the span, with the exception of the last two inches before each wing tip.

"All models must have a canopy, horizontal stabilizer, elevator and vertical fin ... Models must have a fixed landing gear with a minimum of one wheel."

**5. Fuel tank:** The fuel tank shall be fully external and forward of the wing leading edge, and located on the outboard side of the fuselage. The tank may not be designed so as to cowl the engine. The tank may not be pressurized, but the vents may be directed forward into the airstream.

**6. Pull test:** The plane and entire control system shall undergo pull test of 35 pounds.

**7. Lines:** The minimum diameter of lines shall be .018". Lines shall be of the stranded type, with a length of 60 feet measured from the handle grip to the fuselage, plus or minus 6" tolerance.

**8. Races:** Preliminary heats shall be of 70 laps duration, with one pit stop minimum required. The final or feature race(s) shall be of 140 laps duration, with three pit stops minimum required. All races shall be flown with at least two entrants, and not more than three entrants. At contests where entrants fly preliminary heats to determine finalists, at least three entries shall proceed to the final race(s). The decision on the number of finalist entrants shall be made by the event director and be made before the start of any preliminary heats.

10/89/DC/jmt//Ed:jmt/4/15/93



## NORTHWEST FLYING CLOWN RACE

1. **PURPOSE:** This event is intended for all fliers and pit crews interested in a simple racing event which uses a common aircraft, emphasizes both speed and economy, and encourages the use of a wide variety of engines.

2. All AMA control-line unified racing rules apply, except as follows:

2.1. Airplanes and the entire control systems shall undergo a pull test of 25 pounds. Lines are .015 stranded steel. Length is 52 feet, plus or minus 6 inches, measured from the center of the handle to the fuselage.

3. **Engine:** Any design or make of piston engine is allowed, except that maximum engine displacement is limited to .19 cubic inches. Modifications are not restricted within the limits of the AMA safety code.

4. **Fuel tank:** Any design of fuel tank is allowed, including pressure systems, except as follows:

4.1. Fuel capacity is restricted to 1 ounce, with a +5% tolerance, 31cc maximum.

4.2. The fuel tank shall be fully external of the plane, on the outboard side of the fuselage, and entirely in front of the leading edge.

4.3. All tank vents are limited to a maximum size of 1/8-inch outside diameter. A spring-loaded pinchoff device capping the overflow vent on a uniflow tank is permitted.

5. **Fuel:** Glow fuel shall contain a maximum of 10 percent nitromethane with 20 percent lubricant and the rest methanol. Glow fuel will be supplied by the contest management. Diesel engines may use diesel fuel.

6. **Aircraft:** The only aircraft allowed is the PDQ Flying Clown or faithful replica. Changes to the planform, profile, or wing thickness are prohibited. Cheek cowls are prohibited. Wheels must be at least 1 inch in diameter, and be spaced laterally about 7 inches.

7. **Prohibited equipment:** Hot glove electrical contact systems, fast-fill setups and fuel shutoffs are prohibited. Shutoffs may be installed on the plane for test-flying, but must be bypassed during races.

8. **Races:** All preliminary heats and the final race will be timed for 15 minutes from start to finish. The contestant with the most laps wins. Preliminary heats may be 7-1/2 minutes if agreed to by a majority of contestants or required by contest time constraints. Records shall not be established for heats less than 15 minutes. There shall be either two or three pilots in heat races. At least three aircraft shall advance to the feature race. The decision on the number of feature entries shall be made by the event director in advance before the start of any preliminary heats. If more than three planes advance to the feature, races will involve at least two and no more than three airplanes.

jmt/cbbb/FL/rev:6-10-94/4/15/96\*

rev1-10-98\* rev2-12-99\*

\* ballot

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# AIR MAIL

Letters from FL readers

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*Regarding Bob Palmer's article about the birth of inverted flight (Issue No. 197), John Clemans offers this memory of his own explorations of "upside-down."*

I was living in McMinnville, Ore. at the time. I was in junior high at the time, so it was around 1951-52. I

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don't remember the plane. It was one of the popular profiles, P-51 Mustang or Super Clown. I know the engine was a K&B .35.

My buddy and I were sneaking up on flying inverted by stretching the lazy eight. He finally went a couple laps inverted and right in front of me, he yanked full up to return to level flight.

Yes, you're right, that plane returned to kit form in a split second. When I looked up at him, he was still holding full up and had a confused look on his face. Wow, that plane could sure turn!

— John Clemans Longview, Wash.

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## RULES FOR NORTHWEST GOODYEAR RACING

1. **Purpose:** It is the intent that this event will provide a form of Scale Racing similar to the AMA Scale Racing (Goodyear) class but without the expense and high speeds required in that class.
2. All rules for AMA Scale Racing shall apply except as follows:
3. **ENGINES:** The following list of .15-size engines are those permitted in this event. The engine used shall be a standard production unit; no prototypes or "factory specials" are allowed.
  - AME/Norvel: Any aircraft version.
  - Fox: Any aircraft version.
  - K&B: Any aircraft version.
  - Cox: Any aircraft version.
  - Conquest: Any aircraft version from K&B, Cox or R/L
  - Enya: Any aircraft version.
  - O.S.: Any aircraft version.
  - Magnum XL-15A
  - MDS: Any aircraft version.
  - Mecoa Wildcat EP15
  - Moki: Any aircraft version.
  - MVVS 15 DFS/R
  - MVVS 15 GFS/R
  - Picco: Any aircraft version.
  - Supertigre: Any front-intake version
  - Thunder Tiger GP15

Engine reworking is permitted, providing that all major engine components are from the original manufacturer. (No hybrids or scratch-built major engine components permitted.)

4. Lines shall be 60 feet long, plus or minus 6 inches. Lines shall be .014" single strand lines (per AMA rulebook) or .015 multistranded.
5. Pull test will be 25 pounds.

mwh/jmt 3-27-93 // revFL 1/20/99\* revFL12/1/99\*  
\*ballot

## RULES FOR NORTHWEST .15 CARRIER

(Provisional)

1. **PURPOSE:** It is the intent that this event will provide an entry level Navy Carrier competition using a simple airplane.
2. **AIRPLANES:** Any model is allowed; it is not required to be a model of a full-scale aircraft. Working functions are strictly limited to throttle, hook and elevator; no working flaps, ailerons, rudder, etc. The tail "wheel" may be a non-moving hook.
3. **ENGINES** are limited to .15 displacement. Muffler pressure is allowed. Mufflers are recommended but not mandatory.
4. **LINES**, as measured from the center of the handle's grip to the center line of the aircraft, must be between 52 feet and 52 feet, 6 inches, with a diameter of .012 inch or larger.
5. All AMA general rules, control-line rules and Navy Carrier rules shall apply unless specifically addressed above.

oh/jmt/4/16/93



## NOSTALGIA NAVY CARRIER RULES

**3.1. Engine Specifications:** Engine and fuel system specifications shall be as listed in the current AMA regulations for each event.

**3.2. Moveable Leadouts:** Vertical or horizontal position of the leadouts relative to the model may not change in flight.

**3.3. Electronic Control Systems:** Electronic control systems are not permitted

**4. Builder of the Model:** The builder of the model rule does not apply to Nostalgia Navy Carrier.

**5. Historic Model Bonus:** A bonus of 20 points will be awarded for models which were published or manufactured prior to January 1, 1978. The Contest Director may require proof of eligibility, which shall be the responsibility of the contestant. Proof may consist of dated published plans, magazine construction articles, or advertisements. To qualify for this bonus, models must comply with the following requirements:

**5.1. Modifications:** No modifications to the original design are permitted, except as listed below. Any modifications other than those listed in section 5.2 which, in the opinion of the event director, significantly change the appearance or performance of the model as it was originally designed, shall not be permitted. This prohibition includes, but is not limited to, changes in airfoil, changes in dimensions, and use of moveable control surfaces not included on the original design.

**5.2. Allowable Modifications:**

**5.2.1.** Landing gear may be changed in length or material, but must exit the model at the original position. A tail wheel may be substituted for a skid and vice versa. Wheels may be of any diameter.

**5.2.2.** Leadout position may be changed from that shown on the plan. Ground-adjustable leadouts are permitted.

**5.2.3.** Control travel, control mechanism location, and control mechanism may be changed.

**5.2.4.** Tip weight may be changed or may be adjustable.

**5.2.5.** Tail hook and its location may be changed.

**5.2.6.** Structural changes to strengthen the aircraft are permitted.

**5.2.7.** Building and finishing material substitutions are permitted.

**5.2.8.** Location of access hatches may be changed.

**5.2.9.** Engine mountings may be changed, and engines of different displacement may be used.

**6. Non-Schnuerle Engine Bonus:** Non-schnuerle engines will receive a bonus of 20 points.

**7. Carrier Deck:** A carrier deck corresponding to current AMA regulations will be used.

**8. Records:** Records will not be established for Nostalgia Navy Carrier.

**9. Combination of Classes:** Class I and Class II may be combined for Nostalgia Navy Carrier. If classes are combined, Class I models will receive a five percent bonus on total score (multiply Class I total score by 1.05). Profile Class will not be combined with Class I and Class II in Nostalgia Navy Carrier.

## RULES FOR NORTHWEST 80MPH COMBAT

1. **PURPOSE:** It is the intent that this event will provide a form of combat that is slower, more relaxed, and less destructive to equipment than all-out AMA combat events.
2. All rules for AMA (fast) combat shall apply except as follows:
3. **ENGINES:** Any engine up to .40 displacement is permitted.
4. **SPEED LIMIT:** The airspeed limit for all contestants shall be 80 mph, which is defined at 6.43 seconds for a two-lap period at 20-foot height. No devices capable of varying the speed of the airplane in flight, such as throttles or carburetors adjusted by elevator trim, are allowed.
5. **MATCH PROCEDURE:** Flying of matches shall be exactly the same as in AMA combat except as follows:

### Airspeed timing:

The first airplane to launch will be timed for two laps after the first full lap, at a height of approximately 20 feet (brief deviations in height for safety reasons are permitted). If the time for those two laps is greater than 6.43 seconds, the airplane will be judged eligible to compete. Pilots must keep the plane near the 20-foot height; failure to do so will delay timing.

If the second airplane launched appears to the circle marshal to be slower than the first plane, after the first plane has been declared eligible, the circle marshal may waive the timing of the second plane and signal the start of combat. If the second plane appears equal to or faster than the first plane, the circle marshal may time the second plane as well before beginning combat.

In the case of a simultaneous launch, the faster airplane will be timed.

Airplanes will not be timed on successive launches in the same match, unless the circle marshal has reason to believe that a plane has passed the 80mph speed limit. The circle marshal retains the right to stop combat at any point and re-time any airplane that appears to have passed the 80mph speed limit.

### Exceeding the speed limit:

If, on the initial launch, a plane is judged to be flying in excess of the 80mph speed limit, that plane's airtime watch will be cleared, and airtime will not be counted until the plane is judged to be consistently flying below the airspeed limit; combat will not be started until both airplanes are within the speed limit. If a plane is judged to exceed the limit at sometime during the match — after the initial timing — the airtime watch will be stopped and not restarted until the plane is judged to be consistently flying below the speed limit; combat will be stopped until both planes are below the speed limit.

6. **SCORING:** Per AMA Combat.

jmt/FL/1-21-94/rev:2-18-94/6-10-94/4-15-96\*

\* ballot

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## The end is near!

You don't want to miss an issue of your Northwest CL modeling news! Those whose subscriptions expire with this issue include:

Stephen Barkley, Frank Boden, Ken Burgar, Bob Einhaus, Henry Hajdik, Ted Kraver, Cecil Mead, Shawn Parker, Gerald Schamp, Keith Varley.

## New address next month

Beginning with Issue No. 199, the *Flying Lines* primary mailing address will change to:

Flying Lines  
1073 Windemere Drive N.W.  
Salem, OR 97404

The e-mail address will be  
ZZCLSpeed@aol.com.

## RULES FOR .15 NOSTALGIA DIESEL COMBAT

**1.1. Engine:** Any production .15 c.i.d. maximum diesel having a single ballrace or plain bearing, non-Schneurle, iron piston/steel cylinder.

**1.2** Only suction fuel systems are permitted.

**1.3** The propeller must be a Grish Tornado 8" x 6" White Nylon Flexi prop. The diameter must remain at 8", balancing may be done by sanding one blade face.

**2.1 Aircraft:** A nostalgia combat model must be a design which was in common use or kitted prior to December 31, 1970. It must have been designed for a .15 cu in engine.

**2.2 Models** must be an accurate plan view of the original. The following alterations are permitted:

- Addition to or omission of sheeted areas. Omission of vertical fins.
- Changes to airfoil or internal structure. Additional booms or substitution of wire for wood, or vice-versa.
- Recessing engine into leading edge.
- An upright engine mount may be changed to side mount.
- A balanced elevator may be changed to a conventional, and vice-versa. The elevator must retain the original outline.

Such changes must be done using constructional techniques that were commonly used at the time the model was in use. Carbon, Kevlar or boron fiber is not permitted. Modern adhesives and coverings are permitted.

**2.3** The following alterations are not permitted:

- Foam construction may not be used. Exterior controls may not be used.
- Metal motor mounts may not be used. Any changes to the original plan view except those outlined in 2.2 are not permitted.

The CD may decide to not accept a model which has been altered from the original design outline.

**3.1 Pull test:** 25 lb.

**4.1 Lines** shall be a minimum .015" diameter, stranded type, with a length of 52'-3" measured from the handle grip to the fuselage, plus or minus 6 inches.

**5.1 Speed limit:** 64 mph = 7.0 seconds/2 laps towing a streamer.

**6.1 Number of models.** One model per match. 3 models maximum per contest.

**7.1 Pit crew.** Two pit crew are allowed per contestant. A contestant may start his own engine.

**8.1 Officials:** A contest shall be run by a circle marshal who shall be the overall timekeeper, plus one scorer per contestant.

**9.1 The match:** One minute for engine starting and launching. The 5-minute match clock is started as the second plane launches or at the end of the one minute, whichever comes first. The match lasts 5 minutes.

Engines must be started by hand.

**9.2 Scoring:** One point is deducted for each second a contestant's plane is on the ground during the 5 minute match. 50 points are awarded for each cut of their opponent's streamer or string with knot. There are no kills.

The match shall continue after a mid-air collision or line break. Lines may not be changed during a match.

**10.1 Contest Procedure:** Each contestant shall compete in 5 rounds. 2 points for a win, 1 point for a tie, 0 for a loss. The top 4 flyers will then compete in 2 semifinals and a final to determine the winner.

**10.2 Combat Site:** A 5 foot radius pilots circle and a concentric 65 foot radius safety circle.

ml/jt/FL5/00p/ballot#164

## RULES FOR OPEN DIESEL COMBAT

- 1.1. **Engine:** Any diesel engine up to .21 c.i.d.
  - 1.2 Only suction fuel systems are permitted.
- 2.1 **Aircraft:** Any design is permitted.
- 3.1 **Pull test:** 25 lb.
- 4.1 **Lines** shall be a minimum .015" diameter, stranded type, with a length of 52'-3" measured from the handle grip to the fuselage, plus or minus 6 inches.
- 5.1 **Speed limit:** 70 mph = 6.4 seconds/2 laps.
- 6.1 **Number of models:** One model per match.
- 7.1 **Pit crew.** Two pit crew are allowed per contestant. A contestant may start his own engine.
- 8.1 **Officials:** A contest shall be run by a circle marshal who shall be the overall timekeeper, plus one scorer per contestant.
- 9.1 **The match:** One minute for engine starting and launching. The 5-minute match clock is started as the second plane launches or at the end of the one minute, whichever comes first. The match lasts 5 minutes.

Engines must be started by hand.
- 9.2 **Scoring:** One point is deducted for each second a contestant's plane is on the ground during the 5 minute match. 50 points are awarded for each cut of their opponent's streamer or string with knot. There are no kills.

The match shall continue after a mid-air collision or line break. Lines may not be changed during a match.
- 10.1 **Contest Procedure:** Each contestant shall compete in 5 rounds. 2 points for a win, 1 point for a tie, 0 for a loss. The top 4 flyers will then compete in 2 semifinals and a final to determine the winner.
- 10.2 **Combat Site:** A 5 foot radius pilots circle and a concentric 65 foot radius safety circle.

ml/jt/FL3-2003p/ballot189

## NORTHWEST P-40 STUNT

1. **PURPOSE:** This event is intended to provide a competitive opportunity for fliers of all ability levels using profile-fuselage airplanes limited to .40 engine displacement.
2. All rules for AMA precision aerobatics shall apply except as follows:
3. **Airplane:** Any profile airplane is allowed.
  - 3.1. The engine may be mounted in any configuration — side-mounted, upright or inverted.
  - 3.2. Doublers or triplers and cheek cowls are allowed, including faired spinners, but the fuselage must meet the "profile" definition of 3/4" thickness by the trailing edge of the wing/flap hinge line, and the engine must be fully exposed from lugs to plug.
4. **Engine:** Any engine up to .40 size, including four-strokes (no 60% rule for four-strokes).
  - 3.1. Mufflers are allowed, but not mandatory. Any exhaust system is allowed.
5. **Lines:** Line sizes must follow AMA Precision aerobatics guidelines
6. **Pattern:** Standard AMA Precision Aerobatics pattern.
7. **Appearance:** There are no appearance points.
8. **Skill classes:** Whenever possible, competition shall be divided into two skill divisions, as follows:
  - 8.1. **Expert:** Any flier may enter this class.
  - 8.2. **Sportsman:** PAMPA expert-class skill fliers may not fly in this class.

jmt/mwh/dg/12-02/FL/186ballot

## NORTHWEST SPORT JET SPEED

All A.M.A. rules from the control line general and control line speed sections shall be applicable, except as follows:

### 1) AIRFRAME:

1.1 Any design configuration and construction method is permissible so long as the contest management considers the model to be safe and sound.

1.2 The engine and engine mounts shall receive a 35 pound pull test.

1.3 The control system must be mounted external to the normal aircraft contours. This includes the bellcrank, leadouts or control lines, pushrod, and elevator horn. No more than one inch of the leadouts or control lines can be enclosed by the leadout guides.

1.4 The maximum weight of the aircraft in ready-to-fly condition, including fuel shall be 40 ounces.

### 2) LINES & PULL TEST:

2.1 The model must be flown on two single strand steel control lines of .018 minimum diameter. The distance between the centerline of the fuselage and the center of the control handle grip shall be a minimum of 70 feet.

2.2 The model and entire control system, lines and handle shall receive a 75 pound pull test.

### 3) ENGINE:

3.1 The allowed jet engines are the Dyna-Jet, Bailey Sport Jet, and the O.S. II.

3.2 It is required that the engine shall be in stock condition internally. No material may be removed or added to the engine, except as follows:

a. Engine head: Part or all of the head fins may be removed. Holes may be drilled into the head for purposes of engine mounting. Valve face may be lapped as needed for routine maintenance. Engine cowling is permitted, but the front of the cowl must be behind the intake throat.

b. Flowjector: Fuel feed holes may be drilled out to larger size, or filled and re-drilled. (holes allowed in original location only). A short piece of metal tubing may be installed into the tire pump connection to facilitate quick removal of the air supply hose. Alternatively, the threads on the tire pump connection may be filed off, or filled in so as to make a smooth surface to facilitate quick removal of the air supply hose.

c. Metering jet: Any metering jet may be used, and may be located anywhere between the tank and the flowjector.

d. Tailpipe: A stock tailpipe with ignition plug in place must be used. (starting ignition may be by means of a starting probe). Repaired tailpipes are permissible, provided stock dimensions have been faithfully adhered to. The front surface of the tailpipe (combustion chamber screw ring) and the lock ring may be lapped.

e. Reed valve: Any commercially available valve may be used.

3.3 Interchanging of parts between the above listed engines is permissible.

3.4 Fuel delivery to the engine shall be by suction, no pressure feed is allowed.

### 4) FUEL:

4.1 Fuel used shall be the A.M.A. formula: 80% methanol & 20% propylene oxide.

### 5) OTHER:

5.1 Timing will be for 1/2 mile (6 laps).

5.2 All other general rules for control line speed flying (attempts, number of models, competition flying from pylon, timing of flights, etc.) shall be applicable.

5.3 Builder of the model rule is not applicable to this event.

5.4 Entrant of the model shall either be the pilot, or shall start the engine.

## QUICKIE RAT (NCLRA 1998 RULES)

**1. OBJECTIVE:** To provide a racing event that may easily be flown "three up" and which employs relatively inexpensive and easily constructed control line racing models. To encourage and promote the success of the "average" control line flyer in control line racing competition.

### 2. GENERAL:

**2.1 Applicability:** All rules from the Unified Control Line Racing Rules apply to this event except as modified, appended or specified here.

**2.2 Maintenance:** It is imperative that the performance level of this event be maintained such that it is always possible to safely race "three up" on stranded lines. If at any time it is felt that the event must be changed from the three up format for safety concerns or that solid lines are required, then the event rules should be immediately modified so as to reduce the aircraft performance level. It is recommended that this event be reviewed by the National Control Line Racing Association on a yearly basis. As a guideline, if nominal speeds surpass 105 MPH (17.14sec/7 laps), then the allowable venturi (part 4.7.1) should be reduced by 0.010". The sport of three up control line racing should be preserved at all costs even if individual equipment is temporarily obsolete.

### 3. MODEL SPECIFICATIONS:

**3.1 Models** will be of profile construction only. Refer to profile definition in Control Line General section. The use of cast pan or metal engine crutch is not allowed.

**3.2 The control system**, consisting of leadouts, bellcrank, pushrod and control horn will be totally exposed and external to normal airplane contours. The leadout wires will not be recessed into the wing, the pushrod will not be mounted inside the fuselage, nor will the bellcrank be allowed to be mounted inside the fuselage. The leadout tip guides may be inset into the wing but should not be more than 1/2 inch in length.

**3.3 The line connections** to the model will be external to the aircraft wing tip.

**3.4 The fuel tank** shall be totally outboard of the centerline of the crankshaft of the engine.

**3.5 Pressure fuel systems** are not allowed, with the exception that the fuel tank vent tubes may be directed into the airstream.

### 4. ENGINE SPECIFICATIONS:

**4.1 Maximum total displacement** shall be 0.4028 cubic inches (6.6cc). Engines must be production units assembled from factory available production parts. Engines and parts must have been produced in quantities greater than 500 and all must be or have been available through normal retail outlets in the USA. Parts substitution shall be limited to catalog listed parts produced in quantities greater than 500 units for the engine being altered and available commercially to anyone from the manufacturer of the engine. Engines may only be modified by removing parts or material from parts except as noted in the following paragraphs. No material or part may be added except as noted in the following paragraphs under this section.

**4.2 The "engine"** is defined as the complete unit, ready to run, needing only prop, fuel and starting voltage except that the glow plug, venturi and/or restrictor, spraybar and needle valve, gaskets, bolts, drive washer, front washer, prop nut, shims, piston ring(s) (if used) and ball bearings (if used) need not be considered part of the production unit. These parts are not subject to the rules re-

garding quantity or source. In addition, chrome plating of a production cylinder is allowed.

**4.3 The glow plug** must have a thread dimension of 1/4-32.

**4.4 The engine** must be of the front intake configuration. All air for the combustion process must come through the crankshaft. Altering nominal sub-port induction, timed holes in the case and sleeve or other techniques to circumvent the requirement that all air come through the specified venturi opening are not allowed.

**4.5 Only single by-pass port engines** are allowed. The engine as purchased and as used shall be of the single by-pass configuration. No Schneurle or PDP porting is allowed.

**4.6 No ABC or AAC piston/sleeve configurations** are allowed.

**4.7 No variable area carburetors** shall be allowed. Each engine shall be equipped with a venturi and spraybar meeting the following restrictions.

**4.7.1 The venturi** shall have an inside circular bore of not more than .315". The venturi will maintain this diameter for at least 0.25" at the throat of the venturi where the spraybar will be located at the midpoint of the area.

**4.7.2 The spraybar assembly** will be located precisely through the centerline of the venturi bore and shall have a constant circular cross section of diameter not less than 0.155" for the portion in the throat of the venturi.

**4.8 No tuned pipes, mufflers or exhaust extensions** are allowed.

**4.9 The complete engine/venturi/spraybar system** shall weigh less than 10.5 ounces.

### 5. FUEL SPECIFICATION:

**5.1 The fuel** for this event shall be supplied by the contest organizers and shall contain not more than 10% Nitromethane not less than 20% lubricant and the rest shall be methanol.

### 6. RACES:

**6.1 Each contestant** shall be allowed at least two qualifying heat races.

**6.2 Qualifying heat races** shall be 70 lap races with one required pit stop. It is suggested that only the best time of the two qualifying attempts be used as the basis for advancement to the finals.

**6.3 Finals race** shall be 140 lap races with three mandatory pit refueling stops.

**6.4 All races** shall be run with no less two or more than three flyers, races should be flown three up.

### 7. LINES:

**7.1 Shall be minimum of two .018 diameter multi-strand only**, and length shall be 60 feet plus or minus 6" as measured from center line of handle to center line of fuselage.

**7.2 Pull test** 35 Lbs.

### 8. FLYING REGULATIONS:

**8.1 All flying** shall be done between 6 and 20 feet altitude.

### 9. SPECIALTY ITEMS:

**9.1 Shutoffs:** allowed; fuel shutoffs are recommended for safety.

**9.2 Hot gloves:** allowed

**9.3 Prop:** open

NCLRA 12/99 ed/jmt



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# Combat Cornucopia

Combat news and views by Mel Lyne

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## Fox .36X Combat Motors, Keeping Them Alive (Part 8)

Now we'll move on to the crankshaft.

To measure crank intake timing, set the piston at BDC (bottom dead center). Now loosen the timing wheel and set it so that the pointer points at zero degrees. Have the spray bar (NVA) out of the motor so you can see better down the venturi. Whilst looking down the venturi at the crank, slowly rotate the crank counterclockwise and notice when the crank intake just starts to open. The pointer shows the opening in degrees. Keep rotating counterclockwise and watch for the intake closing. The pointer now shows the closing timing. On a stock Mk VI the crank timing is set at about 50-248 degrees. It varies a bit from engine to engine. To go really fast, you need the timing advanced so that it is close to 35 - 248 degrees. To mark the crank properly for modification it should be painted with "bluing" at the intake, then installed and marked. However, if you have just "normalized" your crank, then the steel will be very blue. Get a sharp scribe ready. The sharpened end of a file tang works well. Just grind a nice point using your bench grinder. Set the crank at 35 degrees from BDC going counterclockwise, look down the venturi and scratch a mark on the crank directly against the case on the transfer passage side. Carefully take the crank out and go over the scratch to make it more visible. If you have done it right your scratch mark will be about 1/16" or 3/32" past the existing intake edge. This is where you need to open up the intake for 35 degree opening. If you are handy with a dremel you can use this to grind out the material. I have a wheel on my bench grinder that is just the right size, so I use this. At the same time I increase the length of the intake opening. Later, in a tricky bit of case grinding, we will open up the venturi base front and back to match the lengthened hole in the crank. The original hole in the crank is about 13/32" long which matches the original case. Both of these we will open up to be about 17/32"

long.

So scratch a mark 1/16" along the crank front and back of the intake to show where you will grind to. I grind this on my bench grinder, stopping frequently to check how far I've gone. When I'm up to the 3 marks (the closing edge is not touched), I switch to a Dremel or drill press grinding tool. With this I contour the inside of the intake hole. Now if you have a lathe, you may decide to open up the hole in the crank. I have seen Mk VI cranks opened up to as much as .460" dia. And I've even seen an eccentric hole bored larger so that it just missed the crank pin. How much extra performance this gives I really don't know. But there is plenty of meat in the crank body, so modifications can be intelligently done without compromising strength. After doing the intake mod be sure you round off sharp edges and put a smooth radius in all the corners. This is important for eliminating stress raisers or points where cracking may start. Other than the crank pin and counterweight areas, the crank can be lightened considerably. The lower the rotating mass, the lower the stress on the crank pin. I have several Mk VI cranks which have shed the crank pins. At some time in the future I hope to have one of these fitted with a pressed in crank pin. This will be a project for a skilled machinist.

Now that the crank is finished we'll return to the case.

The 3 transfer passages are now matched in height to the cylinder, and the bearings are still in the case, although they will be loaded with machining bits. Remove both bearings. You'll probably be changing the rear one to a phenolic cage type anyway. Remember to heat the case for removal and installation, to avoid permanently distorting (stretching) it.

Put a small barrel cutter on your Dremel and start cutting away the front and rear edges at the base of the venturi inside opening. You are trying to take about 1/16" off front and rear and have a smooth slope merging into the existing venturi section. Clean up with 240 grit paper when the cutting is finished. If you've done it right, this enlarged opening 17/32" long will match the



enlarged crank opening when the motor is assembled.

Clean up all the components, install the 2 bearings(covered previously), and assemble the motor less the backplate, head button and head clamp. You should have a con-rod bushed at both ends, a RPM or similar, and a RTV'd rollpin/wrist pin in the piston. I do not recommend lightening of the piston.

Now you have to set the deck height with your new head button at about .010". You will need a much deeper head button than previously because the cylinder has been raised .020" and you are decreasing the deck height.

You'll have to do some measuring and calculate what depth you need. Add another .005", and that way you can add button shims to get exactly what you want. I have had very fast motors with deck heights between .008" and .013". The deck height varies according to the volume of the head button, the quality of the piston/cylinder seal, and the amount of nitro you like to run. Setting the deck height at .010" is a good starting point. The head button should be a double bubble or a modified(covered previously) single bubble to simulate a double bubble. I have found that all single bubble buttons with a sharp 90 degree corner tend to burn plugs. I'm told it is the pressure shock wave that destroys the elements. Double bubbles don't seem to do this. For best performance the head button should be a snug sliding fit in the cylinder. A sloppy fit here will cost you rpm. When ordering the new head button you should give the bore size of your cylinder top end or the piston diameter. Slightly large buttons can be lapped to fit, but a loose one can only be used on a smaller bore cylinder.

The final fit up and tightening of the head is very important. As covered previously, the piston must not bind in the cylinder. After a couple of rich runs the motor should feel silky smooth. If the piston is binding anywhere except at TDC, then you need to find out why. The cylinder flange could need lapping to the case, or the head button could need lapping to the cylinder flange. If a free piston starts to stick during head tightening, then some lapping is required to get the button and the cylinder flange sitting perfectly flat on the case.

At the flying site put on a light prop. I use the Scimitar combat 8x6 for testing, and wood Top Flite or Rev-Up for competition. Start with 15% or 20% nitro fuel with at least 25% total oil

content. Make the first run very rich. Some of these motors really lean out in the air, and each motor has to be learned. Provided you are not burning plugs, increase the nitro.

Go to 35% and see how the motor feels after a slightly rich run. If the motor feels lumpy after a run, investigate and find out why. As the piston breaks in to the cylinder over 8 or 10 runs it should feel silky smooth.

Finally, when you have a silky smooth fit, try a rich run on 40% nitro. If the piston/liner has reached the "magic fit" stage, the motor will lean out in the air and go really fast. If you have a really good fit in the motor, you should be getting over 22,000 ground rpm on the 8 x 6 Scimitar and 35% nitro when you lean the motor out on the ground. Always try and run a bit rich. This is your crank pin's best insurance!

If you up the nitro and start blowing plugs even though you are a bit rich, then the motor is telling you that it is a tad over-compressed, and it needs less nitro. McCoy or Rossi plugs seem to be the toughest, but if your motor is running at the correct compression with the right amount of nitro, you should rarely blow plugs. If you repeatedly blow plugs even on low nitro, then you need to increase deck height. Try adding a .002" shim and test again. If you are using a double bubble button, then you should be able to arrive at a deck height where the motor howls and doesn't burn plugs.

Be really careful about lapping the aluminum piston to fit the chromed liner. Always under-lap to give a tighter fit than you want. Even though you clean the piston/liner really well after lapping, a tiny amount of lapping compound remains in the piston's surface layer. When you run the motor this then does further lapping and can ruin the fit. A motor that feels too tight usually just needs lots of running to get to the "magic fit". Just run it a bit rich on lower nitro. It will eventually get there.

Once you do have a very fast Mk VI, make notes on how much nitro it likes and how rich it likes to be launched, then put it aside and save it for the big contests. You just have so many flat-out runs in these motors before they lose compression and performance, or the crank pin lets go.

Good luck building your super-fast Fox VI.

*Mel Lyne can be contacted in care of Flying Lines.*

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## The Real 'Dirt'

Some tight lines from the bad boy of CL flying, "Dirty Dan" Rutherford

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### A powerful Disc-covery!

There is a huge selection of power tools. While I have the basics for all sorts of wood- and metalworking operations, I believe the single piece I could not do without in model building is a simple disc sander. There many options here, but mine was a gift from Dad. Yep, homemade.

The electric motor is something he got at a scrap yard or out of his pile of, ahem, stuff. It's a mere 1/3 hp, 1,725 rpm unit, but that is a lot of power, certainly more than needed. The motor came with a mounting bracket and this is bolted to a 3/4" ply base.

More 3/4" ply served to make a rest for pieces which are being sanded. It's not complex, just hard to describe with the written word. Still, it's simply a four-sided box with open ends facing disc and operator. Bottom plate is slightly wide than the two uprights and slotted for a couple carriage bolts coming up from ply base which also has motor attached.

The top of this box is wide enough to allow use of entire disc, meaning this surface is actually a couple inches wider than diameter of the disc. Yes, this means you'll have to figure most of the actual dimensions for your own disc sander...

The disc itself is the only tricky part. Dad simply screwed 1/8" steel plate to a pulley which has a wide flange on one side, chucked it all in his lathe and made a couple passes to be sure 7"-diameter disc was flat and running true. The pulley/adaptor was then mounted to motor shaft.

Full sheets of 50- or 60-grit paper are easily mounted with a light coating of 3M 77 Spray Adhesive on both paper and disc. Use a knife you don't care about to trim excess paper from disc. When the paper is toast, hit it with a heat gun, strip off the old stuff.

And why is this tool so valuable? Because very little of what goes into a model need be worked down to the perfect size with hand tools. Build oversize, shove the piece into this disc sander and it's almost magic how quickly and accurately good parts can be made. Plus it's a dynamite pencil sharpener...

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## Flyaways

Random tips and ribs from the FL workshop floor

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**We're out in the COLD:** The sad news is in. Despite his best efforts, Nils Norling was unable to arrange for a site to host the previously annual Central Oregon Lawn Darts contest on the date that it's possible for him to do so. The date, as it turned out, conflicted with the Jefferson County Fair. The plan had been to hold the COLD meet at the fairgrounds, alas. The future of the COLD contest is unknown, but there will be none this year.

**Combat news:** Bob Furr has been publishing an e-mail-only combat newsletter oriented to speed-limit activity. To receive it, contact [icerinkdad@aol.com](mailto:icerinkdad@aol.com)

**You think your stunt plane is light, huh?** It may simply be a matter of how you measure. You may not realize, for example, that your svelte 40-ounce stunter actually weighs 1/800 of a ton! Thinking about it that way, you may want to go a little lighter on the paint next time.

**Tom's a busy guy:** We don't know how Tom Morris manages to find time to do such basic things as eat, sleep, etc., along with putting out *Stunt News*, presumably holding a day job, and producing fabulous CL products, too. Anyway, we recently received his 2005-2005 product list, and it's worth having for any CL flier. To get a copy, e-mail [ctmorris@cableone.net](mailto:ctmorris@cableone.net), or check out the Web site, [www.tombsbuildingservice.biz](http://www.tombsbuildingservice.biz), phone (256) 820-6970, or fax (256) 820-6977. The mailing address is 327 Pueblo Pass, Anniston, AL 36206.

**Scale up!** Bill Boss, CL scale columnist for *Model Aviation*, writes that he would like to receive photos of scale planes and info about planes, building projects, etc., from Northwest fliers. Contact Bill by e-mail at [bossmosquito@aol.com](mailto:bossmosquito@aol.com), or by mail at 77-06 269th St., New Hyde Park, NY 11040, phone at (718) 343-6461, or fax, (718) 343-3024.

**Club Cubs:** Here's an idea your club can use when trying to hook kids into model aviation. In your annual club charter packet from the Academy of Model Aeronautics, there's a bargain deal for Delta Dart (AMA Cub) rubber-powered models. These easy-to-build-and-fly planes are available to clubs in a package of 40 for \$34.

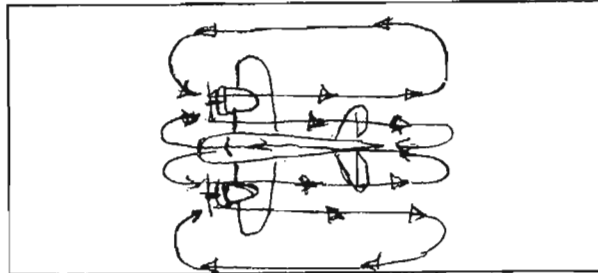
## PROPELLORS I

This subject is so central to what we do; I would like to return to it, after so long an absence from the scene. It will take a couple of editions to cover it. First, I will cover some mis-information regarding the behavior of props.

When I was a teenager, I worked at Felts Field in Spokane scrubbing bellies for a ride once around the windsock. On one memorable day, some one was running up a Cessna UC-78 BAMBOO BOMBER. It was smoking something fierce after two months without attention. As it sat there, the props were acting like pumps, blowing the air across the wing, as you would expect. We would expect that the smoke would just keep going. It didn't. It re-circulated in a closed loop pattern.

Fig.1

From seeing things like this and from holding a model waiting for the launch signal from the pilot, we come to believe that the props are always blowing air over the wings. Not so. Once the plane starts to move, things change.



Very soon after the takeoff roll begins, the propeller's action on the air changes from pump to slicer. You may have seen footage from WWII of prop-driven carrier planes starting to roll along the deck. With high enough humidity, the tip vortices from the blades trace the path of each tip through the air. Recall that the carrier will always have 25+ knots of wind over the deck. The condensed moisture in these tip trails forms a spiral pattern like the threads on a screw. The faster the plane moves along the deck the farther apart the threads get. To begin with, the threads are maybe a half-foot apart. Even on a three-or four-bladed prop at takeoff RPM, by the time the plane reaches the bow the threads are 3-4 feet apart! That illustrates another misconception. We tend to visualize the individual prop tips as thoroughly chewing up the air from one blade passage to another. Not so. Each blade is moving through relatively undisturbed air.

More importantly, the prop is not acting like a pump and blowing air over the plane. It is threading its way through the air with little disturbance to it. True, there are small effects, seen in the 2° offset the left of the vertical tail's leading edge. Ever noticed that? Check out a warbird at the next airshow.

Let's apply this knowledge. People look at the Gee Bee racer family of planes with the huge radial engine taking up most of the space behind the prop. They think the engine is blocking the prop and this is a very inefficient design. Now that you know a prop in flight is threading its way through relatively undisturbed air, instead of blowing it over the airplane, you can more readily believe that the loss in efficiency is less than 10%. This loss comes from the fact that the air is starting to move out of the engine's way and is thus not going straight through the prop.

Modelers tend to think that the static thrust of a model means something. Just for what flight regime would that be? It is measured when the prop is in pump mode. That is not the condition in flight, as you now know. There are only two times static thrust can mean something. One would be for a Carrier plane in slow speed, when it is hanging from the prop, and the other would be for RC aerobatic maneuvers such as the hammerhead stall, wingover, etc.

There is a reason the British call props "airscrews".

In the 1980's I did a lot of prop tests for my Carrier birds by timing the lap from release to passing the launch point. To my surprise, the prop that gave the fastest takeoff was not the fastest seven-lap prop. We will get into that in time. For now, it was the same old problem they had before variable pitch props came along. The best takeoff prop was a lousy cruise prop, and vice versa.

SIDE BAR: Howard Hughes was preparing for one of his 'round the world record attempts. At the time, he and Kathryn Hepburn were "an item", for you movie trivia buffs. Since adjustable props didn't exist, he bankrolled their invention and used them setting that record! Was he flying a Boeing 247? Ugh! I said the "B"-word. I will wash my mouth out with Jack Daniels Black Label...☺

The P-3 ORION is a plane near and dear to my heart, having spent 14 years in the Naval Air Reserve in a squadron flying them. The first time you look out the bubble window and see the black "sail" of a submarine cutting the surface of the blue Pacific, and it's not a movie, it really makes the hair on the back of your neck stand up! There is no way to describe just how blue the ocean is, thousands of miles from land. Jay Beasley was the Lockheed tech rep for the aircraft. He was "Mr. P-3". I once asked him if there was any truth to the belief that the plane flew well in the landing pattern because 80% of the wing was in "powered lift", as they said. That is, the total prop span was 80% of the wing span. He wasn't sure. Then, I got the aero degree and found out it wasn't prop wash; it was hogwash. Props *thread their way through relatively undisturbed air*. They do not blow air over the wing in flight.

In those decades I did spend a little time in Peanut Scale Indoor Free Flight. There were a lot of articles on how to make your own props for those planes. They all got the tip pitch done correctly, but every one of them screwed up the pitch of the blade from there in to the hub. This will be a forthcoming subject. Mess it up and you are shoving air forward with the inner portion of your blade. Probably not the best thing for Speed planes. Until next time, have fun flying.

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